KAYAKU ADVANCED MATERIALS

Safety Data Sheet
acc. to OSHA HCS

Printing date 09/20/2019 Reviewed on 09/20/2019

1 Identification

· **Product identifier**

· **Trade name: XP MicroSpray SU-8 Photoresist Spray**

· **Product number:** MSS0014
· **Application of the substance / the mixture** Photoresist

· **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

· **Information department:**
Product Safety
Email: productsafety@kayakuAM.com
· **Emergency telephone number:**
Kayaku Advanced Materials : 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. Aerosol 1	H222	Extremely flammable aerosol.

GHS07

Acute Tox. 4	H332	Harmful if inhaled.
Skin Irrit. 2	H315	Causes skin irritation.
Eye Irrit. 2A	H319	Causes serious eye irritation.
Skin Sens. 1	H317	May cause an allergic skin reaction.
STOT SE 3	H336	May cause drowsiness or dizziness.
Aquatic Acute 3	H402	Harmful to aquatic life.
Aquatic Chronic 3	H412	Harmful to aquatic life with long lasting effects.

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

GHS02 GHS07

· **Signal word** Danger

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· **Hazard-determining components of labeling:**
Epoxy resin
1-Methoxy-2-propanol acetate
Sulfonium, diphenyl[4-(phenylthio)phenyl]-, (OC-6-11)-hexafluoroantimonate(1-) (1:1)
Sulfonium, (thiodi-4,1-phenylene) bis[diphenyl-,(OC-6-11)-hexafluoroantimonate (1-) (1:2)
· **Hazard statements**
H222 Extremely flammable aerosol.
H332 Harmful if inhaled.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H317 May cause an allergic skin reaction.
H336 May cause drowsiness or dizziness.
H402 Harmful to aquatic life.
H412 Harmful to aquatic life with long lasting effects.
· **Precautionary statements**

P211	Do not spray on an open flame or other ignition source.
P251	Pressurized container: Do not pierce or burn, even after use.
P260	Do not breathe dust/fume/gas/mist/vapors/spray.
P273	Avoid release to the environment.
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 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.

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

Health = 2
Fire = 4
Reactivity = 2

· **HMIS-ratings (scale 0 - 4)**

Health = 2
Fire = 4
Reactivity = 2

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

US

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3 Composition/information on ingredients

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

· **Dangerous components:**

108-65-6	1-Methoxy-2-propanol acetate Flam. Liq. 3, H226; STOT SE 3, H336	50-70%
	Epoxy resin Skin Irrit. 2, H315; Eye Irrit. 2A, H319; Skin Sens. 1, H317	20-30%
115-10-6	dimethyl ether Flam. Gas 1, H220; Press. Gas, H280	10-25%
108-32-7	Propylene carbonate Skin Irrit. 2, H315; Eye Irrit. 2A, H319	1-5%
89452-37-9	Sulfonium, (thiodi-4,1-phenylene) bis[diphenyl-,(OC-6-11)-hexafluoroantimonate (1-) (1:2) Aquatic Acute 1, H400; Aquatic Chronic 1, H410; Skin Sens. 1, H317	<1%
71449-78-0	Sulfonium, diphenyl[4-(phenylthio)phenyl]-, (OC-6-11)-hexafluoroantimonate(1-) (1:1) Aquatic Acute 1, H400; Aquatic Chronic 1, H410; Skin Sens. 1, H317	<1%

4 First-aid measures

· **Description of first aid measures**
· **General information:**
Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.
· **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.
In cases of frost bites, rinse with plenty of water. Do not remove clothing.
· **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:**
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** Treat symptomatically.

5 Fire-fighting measures

· **Extinguishing media**
· **Suitable extinguishing agents:**
Carbon dioxide
Fire-extinguishing powder
Alcohol resistant foam

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· **For safety reasons unsuitable extinguishing agents:** Water with full jet
· **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**
Wear protective equipment. Keep unprotected persons away.
Ensure adequate ventilation
Keep away from ignition sources
· **Environmental precautions:**
Inform respective authorities in case of seepage into water course or sewage system.
Do not allow to enter sewers/ surface or ground water.
· **Methods and material for containment and cleaning up:**
Dispose contaminated material as waste according to Section 13.
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.

7 Handling and storage

· **Handling:**
· **Precautions for safe handling**
Ensure good interior ventilation, especially at floor level. (Fumes are heavier than air).
Ensure good ventilation/exhaust at the workplace.
Keep away from heat and direct sunlight.
Open and handle container with care.
· **Information about protection against explosions and fires:**
Do not spray on a naked flame or any incandescent material.
Keep ignition sources away - Do not smoke.
Use explosion-proof apparatus / fittings and spark-proof tools.
Protect against electrostatic charges.
Pressurized container: protect from sunlight and do not expose to temperatures exceeding 50°C, i.e. electric lights. Do not pierce or burn, even after use.

· **Conditions for safe storage, including any incompatibilities**
· **Storage:**
· **Requirements to be met by storerooms and containers:**
Store in a cool location.
Observe official regulations on storing packagings with pressurized containers.
· **Information about storage in one common storage facility:**
Do not store together with alkalis (caustic solutions).
Do not store together with oxidizing and acidic materials.
· **Further information about storage conditions:**
Keep container well-sealed in cool, dry location.
Protect from heat and direct sunlight.

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Store receptacle in a well ventilated area.
· **Specific end use(s)** No further relevant information available.

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:**	
108-65-6 1-Methoxy-2-propanol acetate	
WEEL	50 ppm
115-10-6 dimethyl ether	
WEEL	1000 ppm
89452-37-9 Sulfonium, (thiodi-4,1-phenylene) bis[diphenyl-,(OC-6-11)-hexafluoroantimonate (1-) (1:2)	
ACGIH TLV TWA	0.5 mg/m³
NIOSH IDLH	50 mg/m³
OSHA PEL	0.5 mg/m³
71449-78-0 Sulfonium, diphenyl[4-(phenylthio)phenyl]-, (OC-6-11)-hexafluoroantimonate(1-) (1:1)	
	ACGIH TLV TWA: 0.5 mg/m³
NIOSH IDLH	50 mg/m³
OSHA PEL	0.5 mg/m³

· **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.
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.
· **Material of gloves**
Butyl rubber, BR
Nitrile rubber, NBR
· **Penetration time of glove material** Contact glove manufacture for break-through time.

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· **Eye protection:**

Tightly sealed goggles

9 Physical and chemical properties

· **Information on basic physical and chemical properties**	
· **General Information**	
· **Appearance:**	
Form:	Aerosol
Color:	Amber colored
· **Odor:**	Ester-like
· **Odor threshold:**	Not determined.
· **pH-value:**	Not determined.
· **Change in condition**	
Melting point/Melting range:	Undetermined.
Boiling point/Boiling range:	-24 °C (75.2 -24 °F)
· **Flash point:**	-42 °C (107.6 -42 °F)
· **Flammability (solid, gaseous):**	Not applicable.
· **Ignition temperature:**	235 °C (455 235 °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:	1.5 Vol %
Upper:	18.6 Vol %
· **Vapor pressure at 20 °C (6820 °F):**	5200 hPa (3,900.3 5200 mm Hg)
· **Density:**	Not determined.
· **Relative density**	Not determined.
· **Vapor density**	Not determined.
· **Evaporation rate**	0.39 (BuAc=1)
· **Solubility in / Miscibility with**	
Water:	Water miscible No
· **Partition coefficient (n-octanol/water):**	Not determined.
· **Viscosity:**	
Dynamic:	Not determined.
Kinematic:	Not determined.
· **Solvent content:**	
VOC content:	70-80 %

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

10 Stability and reactivity

· **Reactivity** No further relevant information available.
· **Chemical stability** Stable
· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
· **Possibility of hazardous reactions**
Possible formation of peroxide.
Exothermic polymerization.
· **Conditions to avoid**
Heat, flames and sparks. Extremes of temperature and direct sunlight.
Contact with incompatible materials.
· **Incompatible materials:**
Strong Oxidizing Agents, Strong Bases, Strong Acids, Strong Reducing Agents, Iron, Hydrazine
· **Hazardous decomposition products:**
Carbon monoxide and carbon dioxide
Corrosive gases/vapors
Danger of toxic pyrolysis products.

11 Toxicological information

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

· **LD/LC50 values that are relevant for classification:**		
108-65-6 1-Methoxy-2-propanol acetate		
Oral	LD50	8532 mg/kg (Rat)
Dermal	LD50	>5000 mg/kg (Rat)
Inhalative	LC50/6 h	4345 ppm (Rat)
Epoxy resin		
Oral	LD50	>2000 mg/kg (Rat)
Dermal	LD50	>2000 mg/kg (rabbit)
Inhalative	LC50	>5 mg/L (Rat)
115-10-6 dimethyl ether		
Inhalative	LC50 4 hr	164000 ppm (Rat)
108-32-7 Propylene carbonate		
Oral	LD50	>5000 mg/kg (Rat)
Dermal	LD50	>2000 mg/kg (rabbit)

· **Primary irritant effect:**
· **on the skin:** Irritant to skin and mucous membranes.
· **on the eye:** Irritating effect.
· **Sensitization:** Sensitization possible through skin contact.
· **Additional toxicological information:**
The product shows the following dangers according to internally approved calculation methods for preparations:
Irritant

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· **Carcinogenic categories**

· **IARC (International Agency for Research on Cancer)**
None of the ingredients are listed.

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

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

12 Ecological information

· **Toxicity**

· **Aquatic toxicity:**	
89452-37-9 Sulfonium, (thiodi-4,1-phenylene) bis[diphenyl-,(OC-6-11)-hexafluoroantimonate (1-) (1:2)	
LC50/24 h	4.4 mg/l (daphnia)
LC50/48 hr	0.68 mg/L (daphnia)
71449-78-0 Sulfonium, diphenyl[4-(phenylthio)phenyl]-, (OC-6-11)-hexafluoroantimonate(1-) (1:1)	
LC50/24 h	4.4 mg/l (daphnia)
LC50/48 hr	0.68 mg/L (daphnia)
115-10-6 dimethyl ether	
EC50/48 h	>4400 mg/l (daphnia magna)

· **Persistence and degradability** No further relevant information available.
· **Behavior in environmental systems:**
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.
· **Ecotoxical effects:**
· **Remark:** Toxic for fish
· **Additional ecological information:**
· **General notes:**
Water hazard class 1 (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.
Also poisonous for fish and plankton in water bodies.
Toxic for aquatic organisms
· **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:**
Must not be disposed of as regular garbage/trash. Do not allow product to reach sewage system.
Disposal must be made in accordance with Federal, State, and Local regulations.

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

14 Transport information

· **UN-Number**
· **DOT, ADR, IMDG, IATA** UN1950

· **UN proper shipping name**
· **DOT, IATA** AEROSOLS, flammable
· **ADR** 1950 AEROSOLS
· **IMDG** AEROSOLS

· **Transport hazard class(es)**

· **DOT**

· **Class** 2.1
· **Label** 2.1

· **ADR**

· **Class** 2 5F Gases
· **Label** 2.1

· **IMDG, IATA**

· **Class** 2.1
· **Label** 2.1

· **Packing group**
· **DOT, ADR, IMDG, IATA** Void

· **Environmental hazards:**
· **Marine pollutant:** No

· **Special precautions for user** Warning: Gases
· **Danger code (Kemler):** -
· **EMS Number:** F-D,S-U

· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code** Not applicable.

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· **UN "Model Regulation":** UN1950, AEROSOLS, 2.1

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):**

89452-37-9	Sulfonium, (thiodi-4,1-phenylene) bis[diphenyl-,(OC-6-11)-hexafluoroantimonate (1-) (1:2)
71449-78-0	Sulfonium, diphenyl[4-(phenylthio)phenyl]-, (OC-6-11)-hexafluoroantimonate(1-) (1:1)

· **TSCA (Toxic Substances Control Act):**
1-Methoxy-2-propanol acetate
Epoxy resin
dimethyl ether
Propylene carbonate
Sulfonium, (thiodi-4,1-phenylene) bis[diphenyl-,(OC-6-11)-hexafluoroantimonate (1-) (1:2)
Sulfonium, diphenyl[4-(phenylthio)phenyl]-, (OC-6-11)-hexafluoroantimonate(1-) (1:1)
Polymer 1 in FluorN 562 Surfactant
Polymer 2 in FluorN 562 Surfactant

· **Proposition 65**

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

· **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.

· **Massachusetts State Right To Know List**

115-10-6	dimethyl ether

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

115-10-6	dimethyl ether

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· **Pennsylvania Hazardous Substances List**	
115-10-6	dimethyl ether

· **California SCAQMD Rule 443.1 VOC's:** 969 g/l; vapor pressure 3982 mm Hg @ 20C
· **GHS label elements** The product is classified and labeled according to the Globally Harmonized System (GHS).
· **Hazard pictograms**

GHS02 GHS07

· **Signal word** Danger

· **Hazard-determining components of labeling:**
Epoxy resin
1-Methoxy-2-propanol acetate
Sulfonium, diphenyl[4-(phenylthio)phenyl]-, (OC-6-11)-hexafluoroantimonate(1-) (1:1)
Sulfonium, (thiodi-4,1-phenylene) bis[diphenyl-,(OC-6-11)-hexafluoroantimonate (1-) (1:2)
· **Hazard statements**
H222 Extremely flammable aerosol.
H332 Harmful if inhaled.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H317 May cause an allergic skin reaction.
H336 May cause drowsiness or dizziness.
H402 Harmful to aquatic life.
H412 Harmful to aquatic life with long lasting effects.
· **Precautionary statements**

P211	Do not spray on an open flame or other ignition source.
P251	Pressurized container: Do not pierce or burn, even after use.
P260	Do not breathe dust/fume/gas/mist/vapors/spray.
P273	Avoid release to the environment.
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 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.

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

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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 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.
· **Date of preparation / last revision** *09/20/2019 / 4*
· **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
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
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety & Health
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit
Flam. Gas 1: Flammable gases – Category 1
Flam. Aerosol 1: Aerosols – Category 1
Press. Gas: Gases under pressure – Compressed gas
Flam. Liq. 3: Flammable liquids – Category 3
Acute Tox. 4: Acute toxicity – Category 4
Skin Irrit. 2: Skin corrosion/irritation – Category 2
Eye Irrit. 2A: Serious eye damage/eye irritation – Category 2A
Skin Sens. 1: Skin sensitisation – Category 1
STOT SE 3: Specific target organ toxicity (single exposure) – Category 3
Aquatic Acute 1: Hazardous to the aquatic environment - acute aquatic hazard – Category 1
Aquatic Acute 3: Hazardous to the aquatic environment - acute aquatic hazard – Category 3
Aquatic Chronic 1: Hazardous to the aquatic environment - long-term aquatic hazard – Category 1
Aquatic Chronic 3: Hazardous to the aquatic environment - long-term aquatic hazard – Category 3