KAYAKU ADVANCED MATERIALS

Safety Data Sheet
acc. to OSHA HCS

Printing date 09/06/2019 *Reviewed on 09/06/2019*

1 Identification

· **Product identifier**

· **Trade name: MicroChem Remover 1112A**

· **Product number:** L320000
· **Application of the substance / the mixture** Photoresist remover

· **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**

GHS08 Health hazard

Carc. 2 H351 Suspected of causing cancer.
STOT RE 2 H373 May cause damage to organs through prolonged or repeated exposure.

GHS05 Corrosion

Skin Corr. 1B H314 Causes severe skin burns and eye damage.
Eye Dam. 1 H318 Causes serious eye damage.

GHS07

Acute Tox. 4 H302 Harmful if swallowed.
Acute Tox. 4 H312 Harmful in contact with skin.

Flam. Liq. 4 H227 Combustible liquid.

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

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· **Hazard pictograms**

GHS05 GHS07 GHS08

· **Signal word** Danger

· **Hazard-determining components of labeling:**
Proprietary solvent blend
Monoethanolamine
Furfuryl alcohol
Proprietary Polyether

· **Hazard statements**

H227	Combustible liquid.
H302+H312	Harmful if swallowed or in contact with skin.
H314	Causes severe skin burns and eye damage.
H351	Suspected of causing cancer.
H373	May cause damage to organs through prolonged or repeated exposure.

· **Precautionary statements**

P210	Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P261	Avoid breathing dust/fume/gas/mist/vapors/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 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 = 2
Reactivity = 1

· **HMIS-ratings (scale 0 - 4)**

Health = *2
Fire = 2
Reactivity = 1

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

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· **vPvB:** Not applicable.

3 Composition/information on ingredients

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

· **Dangerous components:**		
112-34-5	Butyl carbitol Eye Irrit. 2A, H319	25-50%
	Proprietary solvent blend Acute Tox. 4, H302; Acute Tox. 4, H312; Acute Tox. 4, H332; Skin Irrit. 2, H315; Eye Irrit. 2A, H319; Flam. Liq. 4, H227	25-50%
141-43-5	Monoethanolamine Skin Corr. 1B, H314; Acute Tox. 4, H302; Acute Tox. 4, H312; Acute Tox. 4, H332; Flam. Liq. 4, H227	10-25%
34590-94-8	Dipropylene glycol monomethyl ether Flam. Liq. 4, H227	10-25%
	Proprietary Polyether Acute Tox. 4, H302	5-15%
98-00-0	Furfuryl alcohol Acute Tox. 3, H331; Carc. 2, H351; STOT RE 2, H373; Acute Tox. 4, H302; Acute Tox. 4, H312; Eye Irrit. 2A, H319; STOT SE 3, H335; Flam. Liq. 4, H227	1-5%

· **Additional Components:**		
7732-18-5	Water	1-5%

4 First-aid measures

· **Description of first aid measures**
· **General information:**
Immediately remove any clothing soiled by the product.
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.
· **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; immediately call a doctor.
Drink copious amounts of water and provide fresh air. Immediately call a doctor.
· **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.

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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
· **Special hazards arising from the substance or mixture** No further relevant information available.
· **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
· **Environmental precautions:**
Dilute with plenty of water.
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).
Use neutralizing agent.
Ensure adequate ventilation.
· **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 ventilation/exhaust at the workplace.
Prevent formation of aerosols.
· **Information about protection against explosions and fires:**
Keep ignition sources away - Do not smoke.
Protect against electrostatic charges.
Use explosion-proof apparatus / fittings and spark-proof tools.

· **Conditions for safe storage, including any incompatibilities**
· **Storage:**
· **Requirements to be met by storerooms and containers:** No special requirements.
· **Information about storage in one common storage facility:**
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.
Store receptacle in a well ventilated area.

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· **Specific end use(s)** For Research and Development Use Only

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:**	
112-34-5 Butyl carbitol	
TLV	Long-term value: 67.5* mg/m³, 10* ppm *Inhalable fraction and vapor
Proprietary solvent blend	
PEL	Long-term value: 240 mg/m³, 50 ppm Skin
REL	Long-term value: 24 mg/m³, 5 ppm Skin
TLV	Long-term value: 97 mg/m³, 20 ppm BEI
141-43-5 Monoethanolamine	
PEL	Long-term value: 6 mg/m³, 3 ppm
REL	Short-term value: 15 mg/m³, 6 ppm Long-term value: 8 mg/m³, 3 ppm
TLV	Short-term value: 15 mg/m³, 6 ppm Long-term value: 7.5 mg/m³, 3 ppm
34590-94-8 Dipropylene glycol monomethyl ether	
PEL	Long-term value: 600 mg/m³, 100 ppm Skin
REL	Short-term value: 900 mg/m³, 150 ppm Long-term value: 600 mg/m³, 100 ppm Skin
TLV	Short-term value: 909 mg/m³, 150 ppm Long-term value: 606 mg/m³, 100 ppm Skin
98-00-0 Furfuryl alcohol	
PEL	Long-term value: 200 mg/m³, 50 ppm
REL	Short-term value: 60 mg/m³, 15 ppm Long-term value: 40 mg/m³, 10 ppm Skin
TLV	Short-term value: 60 mg/m³, 15 ppm Long-term value: 40 mg/m³, 10 ppm Skin

· **Ingredients with biological limit values:**	
Proprietary solvent blend	
BEI	200 mg/g creatinine Medium: urine Time: end of shift Parameter: Butoxyacetic acid with hydrolysis

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· **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.
· **Material of gloves** Neoprene gloves
· **Penetration time of glove material** Contact glove manufacture for break-through time.
· **Eye protection:**

Tightly sealed goggles

· **Body protection:** Apron

9 Physical and chemical properties

· **Information on basic physical and chemical properties**	
· **General Information**	
· **Appearance:**	
Form:	Fluid
Color:	Light yellow
· **Odor:**	Etheral
· **Odor threshold:**	Not determined.
· **pH-value at 20 °C (68 °F):**	>12
· **Change in condition**	
Melting point/Melting range:	Undetermined.
Boiling point/Boiling range:	100 °C (212 °F)
· **Flash point:**	82 °C (179.6 °F)
· **Flammability (solid, gaseous):**	Not applicable.
· **Ignition temperature:**	225 °C (437 °F)
· **Decomposition temperature:**	Not determined.
· **Auto igniting:**	Product is not selfigniting.
· **Danger of explosion:**	Not determined.

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· **Explosion limits:**	
Lower:	0.9 Vol %
Upper:	14.0 Vol %
· **Vapor pressure at 20 °C (68 °F):**	1.2 hPa (0.9 mm Hg)
· **Density:**	See other information
· **Relative density**	Not determined.
· **Vapor density**	Not determined.
· **Evaporation rate**	1.6-2.3 (BuAc=1)
· **Solubility in / Miscibility with**	
Water:	Fully miscible.
· **Partition coefficient (n-octanol/water):**	Not determined.
· **Viscosity:**	
Dynamic:	Not determined.
Kinematic:	Not determined.
· **Solvent content:**	
Organic solvents:	88.9 %
VOC content:	931.04 g/L
Solids content:	6.1 %
· **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** No dangerous reactions known.
· **Conditions to avoid**
Heat, flames and sparks. Extremes of temperature and direct sunlight.
Contact with incompatible materials.
· **Incompatible materials:**
Strong oxidizing agents
Strong acids
· **Hazardous decomposition products:**
Carbon monoxide and carbon dioxide
Nitrogen oxides (NOx)

11 Toxicological information

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

· **LD/LC50 values that are relevant for classification:**		
Proprietary solvent blend		
Oral	LD50	1480 mg/kg (Rat)
Dermal	LD50	400 mg/kg (rab)

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141-43-5 Monoethanolamine		
Oral	LD50	2050 mg/kg (Rat)
Dermal	LD50	1000 mg/kg (rabbit)
98-00-0 Furfuryl alcohol		
Oral	LD50	160 mg/kg (mouse)
Dermal	LD50	400 mg/kg (rabbit)
Proprietary solvent blend		
Oral	LD50	1300 mg/kg (Rat)
Dermal	LD50	400 mg/kg (rab)
34590-94-8 Dipropylene glycol monomethyl ether		
Oral	LD50	5135 mg/kg (Rat)
Dermal	LD50	>19000 mg/kg (rab)

· **Primary irritant effect:**
· **on the skin:** Caustic effect on skin and mucous membranes.
· **on the eye:** Strong caustic effect.
· **Sensitization:** No sensitizing effects known.
· **Additional toxicological information:**
The product shows the following dangers according to internally approved calculation methods for preparations:
Harmful
Corrosive
Irritant
Swallowing will lead to a strong caustic effect on mouth and throat and to the danger of perforation of esophagus and stomach.

· **Carcinogenic categories**

· **IARC (International Agency for Research on Cancer)**	
Proprietary solvent blend	3

· **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:**	
112-34-5 Butyl carbitol	
ErC50 96 hour	>100 mg/l (algae)
LC50/96 h	1300 mg/l (Lepomis macrochirus (Bluegill))
Proprietary solvent blend	
EC50/48 h	1550 mg/l (Water flea)
LC50	1474 mg/l (rainbow trout (Oncorhynchus mykiss))
34590-94-8 Dipropylene glycol monomethyl ether	
LC50/48 hr	1919 mg/L (daphnia magna)
LC50/96 h	>1000 mg/l (Poecillia reticulata (guppy))

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141-43-5 Monoethanolamine	
LC50/96 h	349 mg/l (Cyprinus carpio (common carp))
98-00-0 Furfuryl alcohol	
EC50/24 h	115 mg/l (daphnia magna)
LC50/48 hr	701-1356 mg/L (Leuciscus idus)

· **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.
· **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.
Must not reach bodies of water or drainage ditch undiluted or unneutralized.
· **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.

· **Uncleaned packagings:**
· **Recommendation:** Disposal must be made in accordance with Federal, State, and Local regulations.
· **Recommended cleansing agent:** Water, if necessary with cleansing agents.

14 Transport information

· **UN-Number**	
· **DOT, ADR, IMDG, IATA**	UN2491
· **UN proper shipping name**	
· **DOT, ADR**	Ethanolamine solutions
· **IMDG, IATA**	ETHANOLAMINE SOLUTION
· **Transport hazard class(es)**	
· **DOT**	

· **Class**	8 Corrosive substances

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· **Label**	8
· **ADR, IMDG, IATA**	

· **Class**	8 Corrosive substances
· **Label**	8
· **Packing group**	
· **DOT, ADR, IMDG, IATA**	III
· **Environmental hazards:**	
· **Marine pollutant:**	No
· **Special precautions for user**	Warning: Corrosive substances
· **EMS Number:**	F-A,S-B
· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.
· **UN "Model Regulation":**	UN2491, Ethanolamine solutions, 8, 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.

· **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)**

Proprietary solvent blend	NL

· **TLV (Threshold Limit Value established by ACGIH)**

Proprietary solvent blend	A3

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

· **California SCAQMD Rule 443.1 VOC's:** No information available.
· **GHS label elements** The product is classified and labeled according to the Globally Harmonized System (GHS).
· **Hazard pictograms**

GHS05 GHS07 GHS08

· **Signal word** Danger

· **Hazard-determining components of labeling:**
Proprietary solvent blend
Monoethanolamine
Furfuryl alcohol
Proprietary Polyether
· **Hazard statements**
H227 Combustible liquid.
H302+H312 Harmful if swallowed or in contact with skin.
H314 Causes severe skin burns and eye damage.
H351 Suspected of causing cancer.
H373 May cause damage to organs through prolonged or repeated exposure.
· **Precautionary statements**
P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P261 Avoid breathing dust/fume/gas/mist/vapors/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 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.

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)

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· **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** *09/06/2019 / 1*
· **Abbreviations and acronyms:**
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
BEI: Biological Exposure Limit
Flam. Liq. 4: Flammable liquids – Category 4
Acute Tox. 4: Acute toxicity – Category 4
Acute Tox. 3: Acute toxicity – Category 3
Skin Corr. 1B: Skin corrosion/irritation – Category 1B
Skin Irrit. 2: Skin corrosion/irritation – Category 2
Eye Dam. 1: Serious eye damage/eye irritation – Category 1
Eye Irrit. 2A: Serious eye damage/eye irritation – Category 2A
Carc. 2: Carcinogenicity – Category 2
STOT SE 3: Specific target organ toxicity (single exposure) – Category 3
STOT RE 2: Specific target organ toxicity (repeated exposure) – Category 2