

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

Printing date 12.05.2023

Version number 7 (replaces version 6)

Revision: 12.05.2023

SECTION 1: Identification of the substance/mixture and of the company/undertaking**1.1 Product identifier****Trade name:** MIBK/IPA 1:3 Positive Radiation Resist Developer**Article number:** M089025**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**Product category** PC21 Laboratory chemicals**Application of the substance / the mixture** Solvents**1.3 Details of the supplier of the safety data sheet****Manufacturer/Supplier:**

Kayaku Advanced Materials, Inc.

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. 2 H225 Highly flammable liquid and vapour.



GHS08 health hazard

Carc. 2 H351 Suspected of causing cancer.



GHS07

Eye Irrit. 2 H319 Causes serious eye irritation.

STOT SE 3 H336 May cause drowsiness or dizziness.

2.2 Label elements**Labelling according to Regulation (EC) No 1272/2008**

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

(Contd. on page 2)

Safety data sheet

according to 1907/2006/EC, Article 31

Printing date 12.05.2023

Version number 7 (replaces version 6)

Revision: 12.05.2023

Trade name: MIBK/IPA 1:3 Positive Radiation Resist Developer

(Contd. of page 1)

· Hazard pictograms



· Signal word Danger

· Hazard-determining components of labelling:

Methyl isobutyl ketone

Isopropyl alcohol

· Hazard statements

H225 Highly flammable liquid and vapour.

H319 Causes serious eye irritation.

H351 Suspected of causing cancer.

H336 May cause drowsiness or dizziness.

· 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/hearing 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

· Results of PBT and vPvB assessment

 · **PBT:** Not applicable.

 · **vPvB:** Not applicable.

· Determination of endocrine-disrupting properties

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.

SECTION 3: Composition/information on ingredients

· 3.2 Mixtures

 · **Description:** Mixture of substances listed below with nonhazardous additions.

(Contd. on page 3)

Safety data sheet

according to 1907/2006/EC, Article 31

Printing date 12.05.2023

Version number 7 (replaces version 6)

Revision: 12.05.2023

Trade name: MIBK/IPA 1:3 Positive Radiation Resist Developer

(Contd. of page 2)

· Dangerous components:		
CAS: 67-63-0 EINECS: 200-661-7 Index number: 603-117-00-0	Isopropyl alcohol ⚠ Flam. Liq. 2, H225; ⚠ Eye Irrit. 2, H319; STOT SE 3, H336	70-80%
CAS: 108-10-1 EINECS: 203-550-1 Index number: 606-004-00-4	Methyl isobutyl ketone ⚠ Flam. Liq. 2, H225; ⚠ Carc. 2, H351; ⚠ Acute Tox. 4, H332; Eye Irrit. 2, H319; STOT SE 3, H336, EUH066 ATE: LC50/4 h inhalative: 11 mg/l	20-30%

 · **Additional information:** 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.

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; call for medical help immediately.

· 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

· 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.

Keep away from ignition sources.

(Contd. on page 4)

Safety data sheet

according to 1907/2006/EC, Article 31

Printing date 12.05.2023

Version number 7 (replaces version 6)

Revision: 12.05.2023

Trade name: MIBK/IPA 1:3 Positive Radiation Resist Developer

(Contd. of page 3)

Ensure adequate ventilation

 · **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.

Dispose contaminated material as waste according to section 13.

 · **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**

Ensure good ventilation/exhaust at the workplace.

Store in cool, dry place in tightly closed receptacles.

Prevent formation of aerosols.

 · **Information about fire - and explosion protection:**

Keep ignition sources away - Do not smoke.

Protect against electrostatic charges.

Use explosion-proof apparatus / fittings and spark-proof tools.

 · **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 oxidising and acidic materials.

Do not store together with alkalis (caustic solutions).

 · **Further information about storage conditions:**

Store in cool, dry conditions in well sealed containers.

Store receptacle in a well ventilated area.

Store under lock and key and with access restricted to technical experts or their assistants only.

 · **7.3 Specific end use(s)** No further relevant information available.

SECTION 8: Exposure controls/personal protection

 · **8.1 Control parameters**

 · **Ingredients with limit values that require monitoring at the workplace:**
108-10-1 Methyl isobutyl ketone

 IOELV Short-term value: 208 mg/m³, 50 ppm

 Long-term value: 83 mg/m³, 20 ppm

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

 · **8.2 Exposure controls**

 · **Appropriate engineering controls** No further data; see section 7.

 · **Individual protection measures, such as 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.

(Contd. on page 5)

Safety data sheet

according to 1907/2006/EC, Article 31

Printing date 12.05.2023

Version number 7 (replaces version 6)

Revision: 12.05.2023

Trade name: MIBK/IPA 1:3 Positive Radiation Resist Developer

(Contd. of page 4)

Avoid contact with the eyes.

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.

· **Hand protection**



Protective gloves

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

· **Material of gloves** PVA gloves

· **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/face protection**



Tightly sealed goggles

· **Body protection:** Long-sleeved work clothes

SECTION 9: Physical and chemical properties

· **9.1 Information on basic physical and chemical properties**

· **General Information**

· Physical state	Liquid
· Colour:	Colourless
· Odour:	Like alcohol
· Odour threshold:	Not determined.
· Melting point/freezing point:	Undetermined.
· Boiling point or initial boiling point and boiling range	82-116 °C
· Flammability	Not applicable.
· Lower and upper explosion limit	
· Lower:	1.7 Vol %
· Upper:	12.0 Vol %
· Flash point:	13 °C
· Auto-ignition temperature:	425 °C
· Decomposition temperature:	Not determined.
· pH	Not determined.
· Viscosity:	
· Kinematic viscosity	Not determined.
· Dynamic:	Not determined.
· Solubility	
· water:	Partly miscible.
· Partition coefficient n-octanol/water (log value)	Not determined.

(Contd. on page 6)

Safety data sheet

according to 1907/2006/EC, Article 31

Printing date 12.05.2023

Version number 7 (replaces version 6)

Revision: 12.05.2023

Trade name: MIBK/IPA 1:3 Positive Radiation Resist Developer

(Contd. of page 5)

- **Vapour pressure at 20 °C:** 43 hPa
- **Density and/or relative density**
- **Density:** Not determined.
- Not determined
- **Relative density at 20 °C** 0.789 g/cm³
- **Vapour density** Not determined.

· 9.2 Other information

- **Appearance:**
- **Form:** Liquid
- **Important information on protection of health and environment, and on safety.**
- **Ignition temperature:** Product is not selfigniting.
- **Explosive properties:** Product is not explosive. However, formation of explosive air/vapour mixtures are possible.
- **Solvent content:**
- **Organic solvents:** 100.0 %
- **Change in condition**
- **Evaporation rate** Not determined.

· Information with regard to physical hazard classes

- **Explosives** Void
- **Flammable gases** Void
- **Aerosols** Void
- **Oxidising gases** Void
- **Gases under pressure** Void
- **Flammable liquids**
- Highly flammable liquid and vapour.
- **Flammable solids** Void
- **Self-reactive substances and mixtures** Void
- **Pyrophoric liquids** Void
- **Pyrophoric solids** Void
- **Self-heating substances and mixtures** Void
- **Substances and mixtures, which emit flammable gases in contact with water**
- Void
- **Oxidising liquids** Void
- **Oxidising solids** Void
- **Organic peroxides** Void
- **Corrosive to metals** Void
- **Desensitised explosives** Void

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** Possible formation of peroxide.
- **10.4 Conditions to avoid**
- Heat, flames and sparks. Extremes of temperature and direct sunlight.

(Contd. on page 7)

Safety data sheet

according to 1907/2006/EC, Article 31

Printing date 12.05.2023

Version number 7 (replaces version 6)

Revision: 12.05.2023

Trade name: MIBK/IPA 1:3 Positive Radiation Resist Developer

(Contd. of page 6)

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

Flammable gases/vapours

SECTION 11: Toxicological information

 · **11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008**

 · **Acute toxicity** Based on available data, the classification criteria are not met.

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

67-63-0 Isopropyl alcohol

Oral	LD50	5045 mg/kg (Rat)
Dermal	LD50	12800 mg/kg (rabbit)
Inhalative	LC50/4 h	30 mg/l (Rat)

108-10-1 Methyl isobutyl ketone

Oral	LD50	2080 mg/kg (Rat)
Dermal	LD50	1600 mg/kg (rab)
Inhalative	LC50/4 h	100 mg/l (Rat)

 · **Skin corrosion/irritation** Based on available data, the classification criteria are not met.

 · **Serious eye damage/irritation**

Causes serious eye irritation.

 · **Respiratory or skin sensitisation** Based on available data, the classification criteria are not met.

 · **Germ cell mutagenicity** Based on available data, the classification criteria are not met.

 · **Carcinogenicity**

Suspected of causing cancer.

 · **Reproductive toxicity** Based on available data, the classification criteria are not met.

 · **STOT-single exposure**

May cause drowsiness or dizziness.

 · **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.

 · **Experience with humans:** No further relevant information available.

 · **11.2 Information on other hazards**

 · **Endocrine disrupting properties**

None of the ingredients is listed.

SECTION 12: Ecological information

 · **12.1 Toxicity**

 · **Aquatic toxicity:**

67-63-0 Isopropyl alcohol

EC50/48 h	7550-13300 mg/l (daphnia magna) (immobilization)
EC50/72 h	>1000 mg/l (scenedesmus subspicatus) (Growth rate inhibition)
LC50/96 h	9640-10400 mg/l (Pimephales promelas)

(Contd. on page 8)

Safety data sheet

according to 1907/2006/EC, Article 31

Printing date 12.05.2023

Version number 7 (replaces version 6)

Revision: 12.05.2023

Trade name: MIBK/IPA 1:3 Positive Radiation Resist Developer

(Contd. of page 7)

108-10-1 Methyl isobutyl ketone

EC50/96 hr	980 mg/l (<i>scenedesmus subspicatus</i>)
	400 mg/l (<i>Selenastrum capricornutum</i>)
LC50/24 h	5000 mg/l (<i>daphnia magna</i>)
	460 mg/l (goldfish)
LC50/96 h	505 mg/l (fathead minnow)
	505-540 mg/l (<i>Pimephales promelas</i>)
	600 mg/l (<i>Salmo gairdneri</i>)

 · **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.

 · **12.5 Results of PBT and vPvB assessment**

 · **PBT:** Not applicable.

 · **vPvB:** Not applicable.

 · **12.6 Endocrine disrupting properties**

The product does not contain substances with endocrine disrupting properties.

 · **12.7 Other adverse effects**

 · **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.

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 or ID number**

 · **ADR, IMDG, IATA**

UN1993

 · **14.2 UN proper shipping name**

 · **ADR, IMDG, IATA**

 FLAMMABLE LIQUID, N.O.S. (ISOPROPYL ALCOHOL,
METHYL ISOBUTYL KETONE)

 · **14.3 Transport hazard class(es)**

 · **ADR, IMDG, IATA**

 · **Class**

3 Flammable liquids.

(Contd. on page 9)

Safety data sheet

according to 1907/2006/EC, Article 31

Printing date 12.05.2023

Version number 7 (replaces version 6)

Revision: 12.05.2023

Trade name: MIBK/IPA 1:3 Positive Radiation Resist Developer

(Contd. of page 8)

· Label	3
· 14.4 Packing group · ADR, IMDG, IATA	II
· 14.5 Environmental hazards: · Marine pollutant:	No
· 14.6 Special precautions for user · Hazard identification number (Kemler code): · EMS Number:	Warning: Flammable liquids. 33 F-E, S-E
· 14.7 Maritime transport in bulk according to IMO instruments	Not applicable.
· Transport/Additional information:	
· ADR · Limited quantities (LQ) · Transport category · Tunnel restriction code	1L 2 D/E
· UN "Model Regulation":	UN1993, FLAMMABLE LIQUID, N.O.S. (ISOPROPANOL (ISOPROPYL ALCOHOL), METHYL ISOBUTYL KETONE), 3, II

SECTION 15: Regulatory information

· **15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**
No further relevant information available.

· **REGULATION (EC) No 1907/2006 ANNEX XVII** Conditions of restriction: 3

· **DIRECTIVE 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment – Annex II**

None of the ingredients is listed.

· **REGULATION (EU) 2019/1148**

· **Annex I - RESTRICTED EXPLOSIVES PRECURSORS** (Upper limit value for the purpose of licensing under Article 5(3))

None of the ingredients is listed.

· **Annex II - REPORTABLE EXPLOSIVES PRECURSORS**

None of the ingredients is listed.

· **Regulation (EC) No 273/2004 on drug precursors**

None of the ingredients is listed.

· **Regulation (EC) No 111/2005 laying down rules for the monitoring of trade between the Community and third countries in drug precursors**

None of the ingredients is listed.

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

EU

(Contd. on page 10)

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

Printing date 12.05.2023

Version number 7 (replaces version 6)

Revision: 12.05.2023

Trade name: MIBK/IPA 1:3 Positive Radiation Resist Developer

(Contd. of page 9)

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

- H225 Highly flammable liquid and vapour.
- H319 Causes serious eye irritation.
- H332 Harmful if inhaled.
- H336 May cause drowsiness or dizziness.
- H351 Suspected of causing cancer.
- EUH066 Repeated exposure may cause skin dryness or cracking.

· Classification according to Regulation (EC) No 1272/2008

Art. 9(1) of Regulation (EC) No. 1272/2008 was used for classification purposes.

· Department issuing SDS: Product safety department**· Contact: Tom Cole, EHS Manager (tcole@kayakuam.com)****· 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.

· Version number of previous version: 6**· 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. 2: Flammable liquids – Category 2
- Acute Tox. 4: Acute toxicity – Category 4
- Eye Irrit. 2: Serious eye damage/eye irritation – Category 2
- Carc. 2: Carcinogenicity – Category 2
- STOT SE 3: Specific target organ toxicity (single exposure) – Category 3