

# Safety Data Sheet acc. to OSHA HCS

Printing date 04/11/2023

Reviewed on 04/11/2023

## 1 Identification

- **Product identifier**
- **Trade name:** Remover PG
- **Product number:** G050200
- **CAS Number:**  
872-50-4
- **Application of the substance / the mixture** Photoresist remover
- **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
- **Information department:**  
Product Safety  
Email: [productsafety@kayakuam.com](mailto: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

Toxic to Reproduction 1B

H360 May damage fertility or the unborn child.



GHS07

Skin Irritation 2

H315 Causes skin irritation.

Eye Irritation 2A

H319 Causes serious eye irritation.

Specific Target Organ Toxicity - Single Exposure 3 H335 May cause respiratory irritation.

Flammable Liquids 4

H227 Combustible liquid.

- **Label elements**

- **GHS label elements**

The substance is classified and labeled according to the Globally Harmonized System (GHS).

- **Hazard pictograms**



GHS07 GHS08

- **Signal word** Danger

(Contd. on page 2)

## Safety Data Sheet

acc. to OSHA HCS

Printing date 04/11/2023

Reviewed on 04/11/2023

**Trade name: Remover PG**

(Contd. of page 1)

· **Hazard-determining components of labeling:**

*N-methyl-2-pyrrolidinone*

· **Hazard statements**

*H227 Combustible liquid.*

*H315 Causes skin irritation.*

*H319 Causes serious eye irritation.*

*H360 May damage fertility or the unborn child.*

*H335 May cause respiratory irritation.*

· **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 to extinguish: Alcohol resistant foam, Fire-extinguishing powder, Carbon dioxide.*

*P403+P233 Store in a well-ventilated place. Keep container tightly closed.*

*P501 Dispose of contents/container in accordance with local/regional/national/international regulations.*

· **Classification system:**

· **NFPA ratings (scale 0 - 4)**



*Health = 2*

*Fire = 1*

*Reactivity = 0*

· **HMIS-ratings (scale 0 - 4)**



*Health = \*2*

*Fire = 1*

*Reactivity = 0*

· **Other hazards**

· **Results of PBT and vPvB assessment**

· **PBT:** Not applicable.

· **vPvB:** Not applicable.

### 3 Composition/information on ingredients

· **Chemical characterization: Substances**

· **CAS No. Description**

*872-50-4 N-methyl-2-pyrrolidinone*

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

US

(Contd. on page 3)

## Safety Data Sheet

acc. to OSHA HCS

Printing date 04/11/2023

Reviewed on 04/11/2023

**Trade name: Remover PG**

(Contd. of page 2)

### 4 First-aid measures

- **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.
- **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:**  
Alcohol resistant foam  
Fire-extinguishing powder  
ABC powder
- **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.  
Keep away from ignition sources
- **Environmental precautions:** 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).  
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.
- **Protective Action Criteria for Chemicals**

 · **PAC-1:**

30 ppm

(Contd. on page 4)

## Safety Data Sheet

acc. to OSHA HCS

Printing date 04/11/2023

Reviewed on 04/11/2023

**Trade name: Remover PG**

(Contd. of page 3)

 · **PAC-2:**

32 ppm

 · **PAC-3:**

190 ppm

### 7 Handling and storage

 · **Handling:**

 · **Precautions for safe handling**

Ensure good ventilation/exhaust at the workplace.

Open and handle container with care.

Prevent formation of aerosols.

 · **Information about protection against explosions and fires:**

Keep respirator available.

Keep ignition sources away - Do not smoke.

 · **Conditions for safe storage, including any incompatibilities**

 · **Storage:**

 · **Requirements to be met by storerooms and containers:**

Store in a cool location.

Suitable material for receptacles and pipes: steel or stainless steel.

 · **Information about storage in one common storage facility:** Store away from oxidizing agents.

 · **Further information about storage conditions:**

Keep container tightly sealed.

This product is hygroscopic.

 · **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 section 7.

 · **Control parameters**

 · **Components with limit values that require monitoring at the workplace:**

The following constituent is the only constituent of the product which has a PEL, TLV or other recommended exposure limit.

At this time, the remaining constituent has no known exposure limits.

**872-50-4 N-methyl-2-pyrrolidinone**

WEEL 10 ppm

Skin

 · **Ingredients with biological limit values:**
**872-50-4 N-methyl-2-pyrrolidinone**

BEI 100 mg/L

Medium: urine

Time: end of shift

Parameter: 5-Hydroxy-N-methyl-2-pyrrolidone

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

(Contd. on page 5)

## Safety Data Sheet

acc. to OSHA HCS

Printing date 04/11/2023

Reviewed on 04/11/2023

**Trade name: Remover PG**

(Contd. of page 4)

- **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.  
 Pregnant women should strictly avoid inhalation or skin contact.
- **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
- **Penetration time of glove material** Contact glove manufacture for break-through time.
- **Eye protection:**



Tightly sealed goggles

### 9 Physical and chemical properties

- **Information on basic physical and chemical properties**
- **General Information**
- **Appearance:**

<b>Form:</b>	Liquid
<b>Color:</b>	Clear to light yellow
<b>Odor:</b>	Amine-like
<b>Odor threshold:</b>	Not determined.
- **pH-value:** Not determined.
- **Change in condition**

<b>Melting point/Melting range:</b>	Undetermined.
<b>Boiling point/Boiling range:</b>	202 °C (395.6 °F)
- **Flash point:** 86 °C (186.8 °F)
- **Flammability (solid, gaseous):** Not applicable.
- **Auto igniting:** 270 °C (518 °F)
- **Decomposition temperature:** Not determined.
- **Ignition temperature:** Product is not selfigniting.
- **Danger of explosion:** Not determined.

(Contd. on page 6)

## Safety Data Sheet

acc. to OSHA HCS

Printing date 04/11/2023

Reviewed on 04/11/2023

**Trade name: Remover PG**

(Contd. of page 5)

· <b>Explosion limits:</b>	
Lower:	1.3 Vol %
Upper:	9.5 Vol %
· <b>Vapor pressure at 20 °C (68 °F):</b>	0.39-0.43 hPa (0.3-0.3 mm Hg)
· <b>Density at 25 °C (77 °F):</b>	1.030 g/cm <sup>3</sup> (8.59535 lbs/gal)
· <b>Relative density</b>	Not determined.
· <b>Vapor density</b>	Not determined.
· <b>Evaporation rate</b>	0.03 (BuAc=1)
· <b>Solubility in / Miscibility with Water:</b>	Fully miscible.
· <b>Partition coefficient (n-octanol/water):</b>	Not determined.
· <b>Viscosity:</b>	
Dynamic:	Not determined.
Kinematic:	Not determined.
Organic solvents:	<99 %
VOC content:	<99 %
· <b>Other information</b>	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
- **Hazardous decomposition products:**  
Carbon monoxide and carbon dioxide  
Nitrogen oxides

### 11 Toxicological information

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

 · **LD/LC50 values that are relevant for classification:**
**872-50-4 N-methyl-2-pyrrolidinone**

Oral	LD50	3914 mg/kg (Rat)
Dermal	LD50	8000 mg/kg (rabbit)
Inhalative	LC50/4 h	>5.0 mg/l (Rat)

- **Primary irritant effect:**
- **on the skin:** Irritant to skin and mucous membranes.
- **on the eye:** Irritating effect.

(Contd. on page 7)

## Safety Data Sheet

acc. to OSHA HCS

Printing date 04/11/2023

Reviewed on 04/11/2023

**Trade name: Remover PG**

(Contd. of page 6)

 · **Sensitization:** No sensitizing effects known.

 · **Additional toxicological information:**

 The product shows the following dangers according to internally approved calculation methods for preparations:  
 Irritant

 · **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:**
**872-50-4 N-methyl-2-pyrrolidinone**

EC50/24 h &gt; 1000 mg/l (daphnia magna)

LC50/96 h &gt; 500 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 (Assessment by list): slightly hazardous for water

Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.

 · **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.

US

(Contd. on page 8)



## Safety Data Sheet

acc. to OSHA HCS

Printing date 04/11/2023

Reviewed on 04/11/2023

Trade name: Remover PG

(Contd. of page 7)

### 14 Transport information

· UN-Number	
· DOT, ADR, ADN, IMDG, IATA	Not Regulated
· UN proper shipping name	
· DOT, ADR, ADN, IMDG, IATA	Not Regulated
· Transport hazard class(es)	
· DOT, ADR, ADN, IMDG, IATA	
· Class	Not Regulated
· Packing group	
· DOT, ADR, IMDG, IATA	Not Regulated
· Environmental hazards:	
· Marine pollutant:	No
· Special precautions for user	Not applicable.
· Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code	Not applicable.
· Transport/Additional information:	Not Regulated
· UN "Model Regulation":	Not Regulated

### 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):
872-50-4   N-methyl-2-pyrrolidinone
· TSCA (Toxic Substances Control Act): All ingredients are listed or comply with TSCA regulations.
· Hazardous Air Pollutants
None of the ingredients are listed.
· 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:
872-50-4   N-methyl-2-pyrrolidinone

(Contd. on page 9)



## Safety Data Sheet

acc. to OSHA HCS

Printing date 04/11/2023

Reviewed on 04/11/2023

**Trade name: Remover PG**

(Contd. of page 8)

· **Carcinogenic categories**

· **EPA (Environmental Protection Agency)**

None of the ingredients are listed.

· **TLV (Threshold Limit Value)**

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**

872-50-4 | N-methyl-2-pyrrolidinone

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

872-50-4 | N-methyl-2-pyrrolidinone

· **Pennsylvania Hazardous Substances List**

872-50-4 | N-methyl-2-pyrrolidinone

· **California SCAQMD Rule 443.1 VOC's:** 1026 g/l; vapor pressure 0.3 mm Hg 20C

· **GHS label elements**

The substance is classified and labeled according to the Globally Harmonized System (GHS).

· **Hazard pictograms**



GHS07   GHS08

· **Signal word** *Danger*

· **Hazard-determining components of labeling:**

N-methyl-2-pyrrolidinone

· **Hazard statements**

H227 Combustible liquid.

H315 Causes skin irritation.

H319 Causes serious eye irritation.

H360 May damage fertility or the unborn child.

H335 May cause respiratory irritation.

· **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 to extinguish: Alcohol resistant foam, Fire-extinguishing powder, Carbon dioxide.

(Contd. on page 10)

**Safety Data Sheet**  
**acc. to OSHA HCS**

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**Trade name: Remover PG**

P403+P233 Store in a well-ventilated place. Keep container tightly closed.  
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.

(Contd. of page 9)

**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.com)

- **Revision History:** The manufacturer's information in Section 1 has been updated.

- **Date of preparation / last revision** 04/11/2023

- **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

DOT: US Department of Transportation

IATA: International Air Transport Association

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

Flammable Liquids 4: Flammable liquids – Category 4

Skin Irritation 2: Skin corrosion/irritation – Category 2

Eye Irritation 2A: Serious eye damage/eye irritation – Category 2A

Toxic to Reproduction 1B: Reproductive toxicity – Category 1B

Specific Target Organ Toxicity - Single Exposure 3: Specific target organ toxicity (single exposure) – Category 3