

MATERIAL SAFETY DATA SHEET

1. Chemical Product and Company Identification

- a. Product name : MMB
- b. Information on manufacturer
- Company name : Kuraray Co., Ltd.
- Address : Ote Center Building, 1-1-3 Otemachi, Chiyoda-ku, Tokyo 100-8115, Japan
- Relevant division : Isoprene Chemicals Division,
Chemicals Marketing and Sales Department
- Phone number : +81-3-6701-1638
 - Fax number : +81-3-6701-1646
- E-mail : msds_qm-ps@kuraray.co.jp
- Emergency phone number : Chemicals Marketing and Sales Department
+81-3-6701-1638
- c. Reference no. : KIM-019e (1st edition)
-

2. Hazards Identification

- a. GHS Classification
- Physical and chemical hazards
- | | |
|---|-----------------------------|
| - Explosives | Not applicable |
| - Flammable gases | Not applicable |
| - Flammable aerosols | Not applicable |
| - Oxidizing gases | Not applicable |
| - Gases under pressure | Not applicable |
| - Flammable liquids | Class 4 |
| - Flammable solids | Not applicable |
| - Self-reactive substances and mixtures | Not applicable |
| - Pyrophoric liquids | Not classified |
| - Pyrophoric solids | Not applicable |
| - Self-heating substances and mixtures | Classification not possible |
| - Substances and mixtures,
which in contact with water, emit flammable gases | Not applicable |
| - Oxidizing liquids | Not applicable |
| - Oxidizing solids | Not applicable |
| - Organic peroxides | Not applicable |
| - Corrosive to metals | Not classified |
- Health hazards
- | | |
|-----------------------------|----------------|
| - Acute toxicity(Oral) | Not classified |
| - Acute toxicity(Dermal) | Not classified |
| - Skin corrosion/irritation | Not classified |

- Serious eye damage/irritation	Class 2B
- Respiratory sensitization	Classification not possible
- Skin sensitization	Not classified
- Germ cell mutagenicity	Classification not possible
- Carcinogenicity	Classification not possible
- Reproductive toxicity	Classification not possible
- Specific target organ toxicity (Single exposure)	Classification not possible
- Specific target organ toxicity (Repeated exposure)	Classification not possible
- Aspiration hazard	Classification not possible
Environmental hazards	
- Hazards to aquatic environment- acute hazard	Not classified
- Hazards to aquatic environment- chronic hazard	Not classified

b. Label elements

- Pictograms : none
- Signal words : Warning
- Hazard statements : Combustible liquid
Causes eye irritation
- Precautionary statements
[Prevention]
 - Keep away from heat/sparks/open flames/hot surfaces.
 - Keep cool.
 - Wash hands thoroughly after handling.
 - Wear protective gloves/protective clothing/eye protection/face protection.
 [Response]
 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

c. National/local information :

- Class 4 flammable liquids, Class 2 petroleum chemicals under the Fire Service Law

3. Composition/Information on Ingredients

properties :

Single chemical substance/mixture :	Single chemical substance
Chemical name or common name :	3-methoxy-3-methylbutane-1-ol
CAS No. :	56539-66-3
Components and concentration or concentration range (content) :	≥99%
Serial no. of government gazette:	ENCS : (2)-3079
	ISHL : Listed
	TSCA : Listed
	EU EINECS : 260-252-4
	AICS:Listed
	NZIoC:Listed
	PICCS:Listed
	IECSC:Listed

DSL:Listed
SWISS: G-117002
ECL:KE-24367

4. First-aid Measures

- a. If inhaled :
Remove victim to fresh air and keep warm by covering with a blanket and rest.
If not breathing or breathing is weak , give artificial respiration until get medical attention.
Immediately get medical attention.
 - b. If on skin :
Remove contaminated clothing, shoes, etc. promptly. Flush affected area with running water or lukewarm water and wash off with soap and water. If any change in appearance develops or pain persists, immediately get medical attention.
 - c. If in eyes :
Rinse eyes with clean water at least 15 minutes and get medical attention from an ophthalmologist immediately. Hold eyelids open and away from eyeballs with fingers to ensure that all surfaces are flushed thoroughly.
 - d. If swallowed :
Do not induce vomiting
Keep victim at rest and then immediately get medical attention.
Never give anything by mouth to an unconscious person.
-

5. Fire Fighting Measures

- a. Extinguishing media :
Block off the sources of fire, and use carbon dioxide, foam, water spray, etc.
 - b. Special fire fighting method :
Toxic gases such as carbon monoxide may form upon combustion. Therefore, fire-fighters should wear self-contained breathing apparatus with full face piece operated in positive pressuer mode.
-

6. Accidental Release Measures

- a. Personal precautions, protective equipment and emergency measures :
 - b. Precautions for the environment :
 - c. Recovery, neutralization and method for containment and clean-up :
Absorb spill with inert material(e.g., dry sand or earth), then place in a chemical waste containers using unsparking tools. Flush residual spill(area) with copious amount of water.
Ventilate area after material pick up is complete.
-

7. Handling and Storage

- a. Handling :
 - Technical measure :
 - Use only in a well-ventilated area.
 - b. Storage :
 - Storage condition (Technical measures, incompatible materials, etc.):
 - Store in a cool, dry, well-ventilated location.
 - Keep away from all possible source of ignition.
 - Keep out the moisture.
-

8. Exposure Controls and Personal Protective Equipment

- a. Permissible exposure level : Not established.
 - b. Engineering measures
 - Use in a totally enclosed system.
 - c. Personal protective equipment :
 - Hygiene Measures : Practice good personal hygiene after using this material.
 - Respiratory Protection : Chemical cartridge respirator with an organic vapour cartridge.
 - Hand Protection : Protective gloves
 - Eye Protection : Safety glasses
 - Other Protective Clothing or Equipment : Full-body suits should be worn.
-

9. Physical and Chemical Properties

- a. Appearance (physical state, color, etc.) : Colorless clear liquid
 - b. Odor : slight ether odor
 - c. pH : No applicable.
 - d. Melting point/freezing point : $< -50^{\circ}\text{C}$
 - e. Initial boiling point and boiling range : 174°C
 - f. Flash point : 68.0°C (Tag Closed cup)
 - g. Upper/lower flammable or explosive limits : Lower 1.2vol% Upper 13.1vol%
 - h. Vapor pressure : 47 Pa (20°C)
 - i. Vapor density : 4.1(air=1)
 - j. Specific gravity (relativity density) :0.927@ 20°C / 20°C
 - k. Solubility : in water : infinite
 - l. Viscosity : $7.3\text{mPa}\cdot\text{s}$ (20°C)
 - m. Ignition temperature : 395°C
-

10. Stability and Reactivity

- a. Stability : Stable (Under normal conditions, before opened.)

- b. Reactivity : Not specified.
- c. Condition to avoid : Not specified.
- d. Incompatible materials : Strong oxidizing reagent, Strong reducing reagent.
- e. Hazardous decomposition products : Not specified.

11. Toxicological Information

ACUTE TOXICITY : Rat (Oral) LD50 4.3 g/kg
 Mouse (Oral) LD50 5.83g/kg
 Rat(Dermal) LD50>2000mg/kg

INHALATION NEAR-ACUTE TOXICITY :

MMB does not produce any significant effect on each internal organ under the test condition.
 But MMB slightly affect the kidney and liver.

IRRITANT EFFECTS ON THE RABBIT EYE : moderate irritating.

IRRITANT EFFECTS ON RABBIT SKIN : non-irritant

BACTERIAL MUTATION ASSAY (Ames test)

MMB shows no evidence of mutagenic activity in this bacterial system.

SKIN SENSITISATION IN THE GUINEA-PIG:

MMB shows no evidence of skin sensitization.

IN VITRO CHROMOSOME ABERRATION TEST

MMB is considered not to induce chromosome aberrations.

28-days Repeat Dose toxicity:

MMB cause reversible effects mainly on the liver and kidney in this test.
 NOEL(male)=60mg/kg/day, NOEL(female)=250mg/kg/day

12. Effects on the Environment

Biodegradability : biodegradable.
 Fish toxicity: Medaka:LC50(96h)>100mg/L
 Daphnia toxicity: EC50(48h)>1000mg/L
 Algal growth inhibition:EC50(72h)>1000mg/L
 COD : 8,060mg/L (1% aqueous solution COD)

13. Precautions for Disposal

Burn in a chemical incinerator equipped with afterburner and scrubber. Don't flush in to the sewer.
 Observe all federal state and local regulations, when disposing of this substances.

14. Transport Information

Any transportation practice must be in compliance with laws and regulation in your country or region.

15. Regulatory Information

Regulatory information with regard to this substance in your country or region should be examined by your own responsibility.

16. Other Information

- This Material Safety Data Sheet is necessary to use this product appropriately and summarized briefly the matter which user must be careful and is intended for the normal handling.
- It is the responsibility of the user to handle the product properly after referring to this Material Safety Data Sheet.
- The information on this Material Safety Data Sheet represents our current data and is accurate to the best of our knowledge, but no warranty is made with respect to such data or assessment.
- This Material Safety Data Sheet may be revised based on the revision of a statute and new knowledge.