

# Safety Data Sheet



## 1. Identification of the Substance/Mixture and the Supplier

Supplier : National Institute of Advanced Industrial Science and Technology (AIST)  
 Address : 1-3-1 Kasumigaseki, Chiyoda, Tokyo, Japan  
 Office in Charge : Reference Materials Office, Center for Quality Management of Metrology,  
 National Metrology Institute of Japan  
 Person in Charge : Certified Reference Material Staff  
 Telephone No. : +81-29-861-4059 Fax No. : +81-29-861-4009  
 Emergency Contact : Same as above

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 Reference No. : 4229001

Identity of : Certified reference material NMIJ CRM 4229-a  
 Substance/Mixture : Water in Methyl Cyclohexane (0.02 mg/g)  
 Recommended Use and Restrictions on Use : This reference material can be used, in moisture quantification by means of Karl Fischer (KF) moisture titrator, for analysis accuracy control, validation of analysis methods and equipment, and calibration of analysis equipment. Do not use this reference material for other purposes than testing/research. This CRM is a reference material (specified in the Japanese Industrial Standard (JIS) Q 0030).

## 2. Hazards Identification

GHS classification : Flammable liquids : Category 2  
 Acute toxicity (Oral) : Category 4  
 Severe eye damages/eye irritation : Category 2B  
 Specific target organ toxicity/Systemic toxicity (Single exposure) : Category 3 (Narcotic effects)  
 Aspiration hazard : Category 1  
 Toxicity to the aquatic environment (Acute) : Category 1  
 Toxicity to the aquatic environment (Long term) : Category 1

GHS label element :



Signal word : Danger  
 Hazards Statement : Highly flammable liquid and vapor  
 Harmful if swallowed  
 Eye irritation  
 May cause drowsiness or dizziness  
 May be fatal if swallowed and enters airways

Precautionary statement : Very toxic to aquatic life  
Very toxic to aquatic life with long lasting effects  
[Safety Precaution]  
Keep away from open flames and hot surfaces. No smoking.  
Wear protective gloves/eye protection/face protection.  
Wash hands and exposed parts thoroughly after handling.  
Do not eat, drink or smoke when using this reference material.  
Avoid breathing dust/fume/gas/mist/vapor/spray.  
Use only outdoors or in a well-ventilated area.  
Avoid release to the environment.  
[First-Aid Measures]  
In case of fire: Use powder, carbon dioxide, dry sand and foam extinguishing agent to extinguish fire.  
If swallowed: Rinse mouth. Immediately call a doctor/physician. Do not induce vomiting.  
If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
If eye irritation persists: Get medical advice/attention.  
If inhaled: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a doctor/physician if you feel unwell.  
Collect spillage.  
[Storage]  
Protect container from sunlight. Store locked up. Store in a clean place at temperatures of 15 °C to 30 °C.  
[Disposal]  
Abide by applicable legislation and ordinances set by local governments.  
Entrust disposal of this reference material to a professional waste disposal company licensed by prefectural governor.

The other hazards than the above do not result in classification or are not classifiable.

### 3. Composition/Information on Ingredients

Substance or mixture : Single substance  
Chemical name : Methyl cyclehexane  
Synonym : Hexahydrotoluene  
Chemical formula :  $\text{CH}_3\text{C}_6\text{H}_{11}$   
Molecular weight : 98.19  
CAS number : 108-87-2  
Content : 99.9 % or more  
Reference Number in : Act on the Evaluation of Chemical Substances and Regulation of Their  
Gazetted List in Japan : Manufacture, etc. : (3)-2230  
 : Industrial Safety and Health Act : Published  
TSCA inventory : Present(ACTIVE)  
EINECS No. : 203-624-3

### 4. First-aid Measures

If inhaled : Remove victim to fresh air and keep at rest and warm. Get medical

	advice/attention.
If on skin	: Rinse with clean water thoroughly. Remove contaminated clothing, shoes, etc. If skin irritation or rash occurs: Get medical advice/attention.
If in eyes	: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.
If swallowed	: Rinse mouth. Immediately call a doctor/physician. Do not induce vomiting.
Most Critical Characteristic and Symptom of Expected Acute and Delayed Symptom	: If inhaled: Causes dizziness or drowsiness.
Measures to be taken to protect the person applying first aid	: Wear personal protective equipment such as rubber gloves and enclosed goggles.

### 5. Fire-fighting Measures

Extinguishing Media	: In the early stages of fire, use powder, carbon dioxide, dry sand and foam extinguishing agent to extinguish fire.
Unsuitable extinguishing media	: Water
Fire-Specific Hazards	: May emit irritating or toxic fume (or gas) in case of fire.
Specific Fire-Fighting Method	: Move movable containers promptly to a safe place. If containers are immovable, cool their surroundings with water spray. Fight fire upwind. In the early stages of fire, use powder, carbon dioxide, dry sand, etc. In case of major fire and large quantities, it is effective to seal it from the air by using foam extinguishing agent, etc.
Protection of Fire-Fighters	: Make it sure to wear personal protective equipment when fighting fire.

### 6. Accidental Release Measures

Personal Precaution	: Remove potential ignition sources from surrounding areas. Make fire extinguishing media/equipment available to prepare for potential ignition.
Personal Protective Equipment and Emergency Procedures	: Ventilate the affected areas thoroughly, if it is in an indoor environment, until the clean-up operation is completed. Use appropriate personal protective equipment during the operation to avoid skin contact of splash etc. and inhalation of dust and gas.
Environmental Precautions	: Take precautions to prevent spillage from draining into rivers etc. to adversely impact the environment. Make it sure to appropriately treat contaminated wastewater to prevent untreated wastewater from being released into the surrounding environment.
Recovery and Neutralization	: Collect leaked liquid in empty containers by making it adsorbed to waste cloth, soil, sand etc. Rinse away the remains with plenty of water.

Prevention of Secondary Disaster : Mark the restricted area with rope etc. to keep out unauthorized people. Carry out the clean-up operation from the upwind side and make people on the downwind side evacuate.

## 7. Handling and Storage

### Handling

Engineering : Strict ban on fire.

Precautions : Use appropriate personal protective equipment to avoid contact on skin and inhalation of vapor.

Local and General Ventilation : If vapor and/or mist is emitted: Seal the emission source and install local ventilation system.

Precautions for Safe Handling : Avoid rough handling such as knocking over, dropping, giving a shock to and dragging container.  
Prevent this reference material from leaking, overflowing and splashing. Do not allow vapor to be emitted.  
Keep container tightly closed after using this reference material.  
Wash hands, face, etc. thoroughly and gargle after handling.  
Restrict drinking, eating and smoking to a designated area.  
Do not bring gloves and other contaminated personal protective equipment into staff room.  
Make a place handling this reference material a restricted area to keep out unauthorized people.  
Wear appropriate personal protective equipment to avoid inhalation and contact with eyes, skin and clothing.  
Use local ventilation equipment in indoor handling areas.

### Storage

Appropriate condition : Protect container from direct sunlight. Store locked up. Store in a well-ventilated place. Keep cool as much as possible. Keep container tightly closed.

Safe packing material : Glass

※ See the Certificate for the details on appropriate storage conditions and instructions for use as a reference material.

## 8. Exposure Controls/Personal Protection

### Administrative levels

Not specified

### Occupational exposure limit (Methyl cyclehexane)

- ACGIH TLV-TWA : 400 ppm
- Values recommended by Japan Society for Occupational Health : 400 ppm, 1600 mg/m<sup>3</sup>

### Engineering Controls

Ventilation/Exhaust : Local ventilation system or general ventilation system

Safety Control/Gas Detection : Measuring equipment, Detecting tube

Storage Precautions : Keep this reference material sealed. Keep away from combustible and reducing substances and strong oxidizers.

Personal Protective Equipment

- Respiratory organ : Gas mask against organic gas
- Hand : Solvent-resistant gloves
- Eyes : Goggle-type eye protection
- Skin and body : Protective clothing

Hygiene Controls

Handle this reference material in accordance with the industrial health and safety codes.

## 9. Physical and Chemical Properties

- Appearance, etc. : Liquid
- Color : Colorless
- Odor : Aromatic odor
- pH : No data
- Melting point : -126.6 °C
- Boiling point : 100.9 °C
- Flashing point : -6 °C
- Explosive range : Upper limit: 6.7 vol%, Lower limit: 1.2 vol%
- Vapor pressure : 48 hPa (20 °C)
- Relative vapor density : 3.4  
(Air=1)
- Specific gravity : No data available
- Solubility : 0.01 % in water (20 °C).  
Soluble well in many kinds of organic solvents.
- n*-Octanol/water partition coefficient (Log Po/w) : 3.61
- Auto-ignition temperature : No data available
- Decomposition temperature : No data available
- Flammability : No data available
- Density : 0.7648 g/cm<sup>3</sup> (25 °C), 0.7691 g/cm<sup>3</sup> (20 °C), 0.7734 g/cm<sup>3</sup> (25 °C)
- Viscosity : 0.685 cP (20 °C)

## 10. Stability and Reactivity

- Stability : Stable under normal condition
- Reactivity : May react in contact with oxidizers.
- Hazardous Reactivity : Reacts with strong oxidizers violently to pose a risk of fire and/or explosion.
- Conditions to avoid : Light, heat
- Incompatible materials : Oxidizing agents
- Hazardous decomposition products : Carbon monoxide

## 11. Toxicological information

Acute toxicity

- Acute toxicity (Oral) : Toxic if swallowed. (Category 4)      Mouse(oral): LD50=1200 mg/kg
- Acute toxicity (Skin) : Not classified.                              Rabbit (dermal): LD50>86700 mg/kg

Acute toxicity (Inhalation, vapor)	:	No classification for acute toxicity. It was reported, in the studies using mice, that mice did not die after being exposed to Methyl cyclehexane of 7500 to 10000 ppm and that they died after two-hour exposure to Methyl cyclehexane of 10000 to 12500 ppm (28.399 mg/l(4H)). Based on the results, it is decided that no death was observed after the exposure to 28.399 mg/l (converted value: 7082 ppm). Mouse Oral LD50 = 1200 mg/kg Rabbit Dermal LD50 > 86700 mg/kg
Acute toxicity (Inhalation, dust/mist)	:	Not classifiable due to insufficient data
Skin Corrosion/Irritation	:	No classification; although mild skin irritation was observed in the study using rabbits
Serious Eye Damage/ Eye Irritation	:	Causes eye irritation (Category 2B); It is classified as Category 2B since mild eye irritation was observed in the study using rabbits.
Respiratory sensitization	:	Not classifiable due to insufficient data
Skin sensitization	:	Not classifiable due to insufficient data
Germ cell mutagenicity	:	Not classifiable due to insufficient data
Carcinogenicity	:	Not classifiable due to insufficient data
Reproductive Toxicity	:	Not classifiable due to insufficient data
Effect on or via lactation	:	Not classifiable due to insufficient data
Specific Target Organ Toxicity/Systemic Toxicity (Single Exposure)	:	May cause drowsiness or dizziness (Category 3); It is classified as Category 3 (Narcotic effects) since it was reported that prone position was observed in the inhalation exposure study using mice and that narcotic effects were observed in the inhalation exposure study using rabbits.
Specific Target Organ Toxicity/Systemic Toxicity (Repeated Exposure)	:	Not classifiable due to insufficient data
Aspiration Hazard	:	Category 1: May be fatal if swallowed and enters airways; It is classified as Category 1 since it is considered to be hydrocarbon and to feature kinematic viscosity of about 0.95 mm <sup>2</sup> /S and 20.5 mm <sup>2</sup> /S or less at 20 °C and 40 °C, respectively.
Aquatic Environment Toxicity (Acute)	:	Category 1: Toxic to aquatic life; based on Crustacea (Brown shrimp) EC50 = 0.33 mg/l/96 hours
Aquatic Environment Toxicity (Long Term)	:	Category 1: Very toxic to aquatic life with long lasting effects; It is classified as Category 1 since 1) Acute Toxicity is classified as Category 1 and 2) rapid degradation was not observed (Degree of degradation measured with BOD: 0%) though bioaccumulation potential is low.

## 12. Ecological Information

### Ecotoxicity

Hazard to the Aquatic Environment  
(Acute aquatic toxicity) : Highly harmful to aquatic life (Category 1)

Hazard to the Aquatic Environment : Highly harmful to aquatic life with long lasting effects (Category 1)

Environment (Chronic aquatic toxicity)	Crustacea ( <i>Daphnia magna</i> ) EC50 = 0.33 mg/l/96 hours
Persistence and Degradability	: No microbial degradability. 0 % by BOD
Bioaccumulation	: No or low bioaccumulation or concentration in fish and shellfish. Bio-concentration factor Carp: 95 - 321 times (0.1 mg/l) Carp: 134 - 237 times (0.01 mg/l)
Mobility in soil	: No data available
Ozone depletion potential	: No data available

### 13. Disposal Considerations

Residual Waste	: Incineration method Incinerate in an incinerator equipped with scrubber. Dispose of this reference material in accordance with applicable legislation and local government ordinance. When the above-mentioned treatments are not possible, entrust disposal of residual waste to a professional waste disposal company licensed by prefectural governor.
Contaminated Container and Package	: Dispose of containers after thoroughly removing their contents.

### 14. Transport Information

UN Number	: 2296 (Methyl Cyclohexane)
UN Classification	: Class 3 (Flammable liquid), Grade II
Material name	: Methylcyclohexane
Container grade	: II
ICAO/IATA	: Class 3, Grade II
Marine pollutant	: Not applicable
Precautions	: Transport this reference material carefully while keeping it away from direct sunlight and fire and preventing accidental release due to falling, being knocked over, etc.

### 15. Regulatory Information (as Anisole)

#### Industrial Safety and Health Law

- Dangerous and hazardous substance whose name must be indicated (Article 57 of the Law, Article 18 of the Order; Appendix 9)
- Dangerous and hazardous substance whose name, etc. must be notified (Article 57-2 of the Law, Article 18-2 of the Order; Appendix 9)
- Dangerous and hazardous substance against which risk assessment must be conducted (Article 57-3 of the Law)
- Dangerous substance/Flammable material (Enforcement Order Appendix 1-4)

#### Fire Service Act

- Class 4: Flammable liquid, Class 1 petroleum::Non water-soluble liquid (Article 2-7 of the Act,

Dangerous Substance Appendix 1)

Ship Safety Law

- Flammable liquids (Dangerous Material Rule; Articles 2 & 3; Dangerous Material Announcement Appendix 1)

Civil Aeronautics Act

- Flammable liquid (Enforcement Regulation; Article 194; Dangerous Material Announcement Appendix 1)

Act for the Prevention of Marine Pollution and Maritime Disasters

- Enforcement Order Appendix 1; Hazardous liquid substance (Class Y)

- ◎ **This SDS is originally prepared for the use of the material in Japan, thus the stated laws and regulations are stipulated and carried out in Japan. The use of the material in other countries should be referred to and by application of the relevant laws and regulations of the country in which the material will be used.**
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## 16. Other Information

Others

The information in this document is not intended to be exhaustive and is based on currently available information and data. The measures given in this document are applicable only to normal handling conditions. When handling this reference material under special conditions etc., it is recommended to take safety measures appropriate to each specific application and context of use. This document is intended to provide information and not intended to guarantee anything in handling this reference material.

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