

Safety Data Sheet

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name	2-HEMA(2-Hydroxyethyl Methacrylate)
Company Name	MITSUBISHI GAS CHEMICAL COMPANY, INC.
Address	5-2,Marunouchi 2-chome Chiyoda-ku, Tokyo
Responsible Department	Natural Gas Chemicals Company
Person in Charge(Maker)	Organic Chemicals Division
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SDS No.	1-34-0800-2

2. HAZARDS IDENTIFICATION

GHS classification

Physical Hazards

Explosives	Not applicable
Flammable gases	Not applicable
Aerosols	Not applicable
Oxidizing gases	Not applicable
Gases under pressure	Not applicable
Flammable liquids	Not classified
Flammable solids	Not applicable
Self-reactive substances & mixtures	Classification not possible
Pyrophoric liquids	Classification not possible
Pyrophoric solids	Not applicable
Self-heating substances & mixtures	Classification not possible
Substances & 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	Classification not possible

Health Hazards

Acute toxicity(Oral)	Not classified
Acute toxicity(Dermal)	Not classified



Acute toxicity(Inhalation: gas)	Not applicable
Acute toxicity(Inhalation: vapor)	Classification not possible
Acute toxicity(Inhalation: dust)	Not applicable
Acute toxicity(Inhalation: mist)	Classification not possible
Skin corrosion /irritation	Not classified
Serious eye damage/eye irritation	Category 2A
Respiratory sensitization	Classification not possible
Skin sensitization	Category 1
Germ cell mutagenicity	Not classified
Carcinogenicity	Classification not possible
Reproductive toxicity	Classification not possible
Specific target organ systemic toxicity- Single exposure	Classification not possible
Specific target organ systemic toxicity- Repeated exposure	Classification not possible
Aspiration hazard	Classification not possible
Environmental Hazards:	
Hazardous to Aquatic Environment-Acute Hazard	Not classified
Hazardous to Aquatic Environment-Chronic Hazard	Not classified
Hazardous to the ozone layer	Classification not possible

Label Content:**Pictograms/Symbols****Signal Ward**

Warning

Hazard Statements

Causes serious eye irritation

May cause an allergic skin reaction

Precautionary Statements

Do not handle until all safety precautions in the Safety Data Sheet have been read and understood.

Prevention

Wear protective gloves/protective clothing/eye protection/face protection.

Avoid breathing mist/vapors.

Contaminated work clothing should not be allowed out of the workplace.

Wash hands and face thoroughly after handling.

Response

If on skin, wash with soap and plenty of water.

Take off contaminated clothing and wash before reuse.

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.

Storage Store in a well-ventilated place. Keep cool. Store locked up.

Disposal Dispose of contents/container in accordance with the Waste Disposal and Public Cleansing Act, etc.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Distinction of Substance or Mixture: Substance

Chemical name or generic name	2-HEMA 2-Hydroxyethyl Methacrylate
Chemical property (Chemical formula, etc.)	$\text{CH}_2=\text{C}(\text{CH}_3)\text{-COOCH}_2\text{CH}_2\text{OH}$
CAS. No.	868-77-9
Concentration or concentration range(content)	97.0% or greater
Class reference number in the gazette list	
Chemical Substances Control Law	2-1044
Industrial Safety and Health Law	(Published)
TSCA Registration	Registered
EINECS No.	212-782-2
DSL/NDSL Registration	Registered
AICS Registration	Registered

4. FIRST AID MEASURES

If Inhaled:	Immediately remove to fresh air and keep at rest in a position comfortable for breathing. Keep quiet and warm, get medical advice.
If on Skin:	Immediately remove contaminated clothing and shoes. Rinse the affected skin thoroughly with soap and plenty of water/shower, get medical advice. 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 for at least 15 minutes. Immediately get medical advice. If eye irritation persists: Get medical advice/attention.
If Swallowed:	Rinse mouth with water. Drink one or two glasses of water or milk. Immediately take medical treatment. Do not induce vomiting. If the victim is unconscious, do not give anything into the mouth.
Others:	If skin irritation or rash occurs, feel unwell: get medical attention/advice.

5. FIRE FIGHTING MEASURES

Media: Powder, carbon dioxide, dry sand, alcofoam

Unsuitable Extinguishing Media: Use of jet water may cause spreading of fire.



Specific Hazards: A fire may cause irritating, corrosive, and/or toxic gas.

The container may explode when heated.

Fire-Fighting Measures: Remove containers from a fire area if safe to do so.

Keep cooling containers thoroughly with plenty of water after extinguishing fire.

Fight a fire at an effective and farthest place using a hose holder and a nozzle with a monitor.

In the case of a major fire, fight a fire using a hose holder and a nozzle with a monitor. If this is not possible, flee from the area and let it burn.

Use appropriate extinguishing agent according to the type of the fire.

Special Protective Actions for Firefighter: In fighting a fire, wear appropriate fresh-air respiratory equipment and chemical resistant clothing.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures:

Immediately isolate the spill area wide enough in all directions.

Evacuate non essential personnel. Stay on the windward side.

Do not touch damaged containers or leakages when not wearing proper protective clothing.

Leave lower-lying areas. Ventilate confined rooms before entering.

Prevent contact with the eyes and skin or inhalation by wearing proper protective equipment(Refer to “8. Exposure Controls/Personal Protection”).

Environmental Precautions: Avoid release to the environment.

Take care that the product will not be discharged into a river, etc. to exert a harmful influence on the environment

Methods and Materials for Containment: Stop the leak if safe to do so.

Ground all the equipment used for handling spills.

Prevention Measures for Secondary: Remove all ignition sources immediately. (Do not smoke nearby and keep away from sparks and flames.).

7. HANDLING AND STORAGE

Handling:

Technical measures

(Local or general ventilation, etc.): When indoors, provide total ventilation system, and confine sources or provide local exhaust ventilation.

Precautions for safe handling

(Including Conditions to Avoid): Do not handle until all safety precautions in the Safety Data Sheet have been read and understood.

Avoid high temperature equipment, sparks, flames, and contact with strong oxide. Keep away from fire.

Avoid foreign substances(acid, alkali, heavy metal, organic matter, and



garbages) to get mixed.

Wear appropriate protective gloves/protective clothing/eye protection/face protection.

Avoid eye or skin contact. Avoid breathing mist/vapors.

Hygienic Precautions:

Contaminated work clothing should not be allowed out of the workplace.

Take off contaminated clothing and wash before reuse.

Wash hands and face thoroughly after handling.

Storage:

Conditions for safe storage:

Facilities for sunlight, lighting, and ventilation are required to store or handle dangerous goods in the storage.

Store away from oxidizer. Keep container tightly closed.

Avoid direct sunlight. Store in a well-ventilated place.

Keep cool. Store locked up.

Safe Materials for Containers/Packaging: Use containers provided in the Fire Service Law.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls:

Eyewash stations and emergency showers are required in the storage or the workplace.

Control Limit:

Not established

Exposure controls:

Japan Society for Occupational Health (2014): Not established

ACGIH (2014): Not established

Personal Protective Equipment:

Respiratory Protection

Respirator with organic vapor cartridge

Hand Protection

Rubber gloves

Eye Protection

Protective glasses (goggles, face shield)

Skin and Body Protection

Work clothing, helmet, safety boots/rubber boots, rubber apron.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance(physical state, shape, color)	Colorless liquid
Odor(odor threshold value)	Aromatic odor
pH	No information
Melting/Freezing Point	-12°C
Boiling Point、 Initial boiling point and Boiling range	205°C
Flash Point	107°C(Cleveland Open Cup)
Auto-Ignition Temperature	No information
Flammability (solid, gas)	Not applicable
Flammability or Explosive Limit(Upper/lower)	No information
Vapor Pressure	No information



Vapor Density	No information
Evaporation Rate	No information
Specific Gravity(Density)	1.072~1.076(20°C)
Solubility	Soluble in water
Partition Coefficient : n-Octanol/Water	log Pow = 0.42 (25°C) *2)
Decomposition Temperature	No information

10. STABILITY AND REACTIVITY INFORMATION

Stability and reactivity	Stable under anticipated storage and handling conditions.
Possibility of Hazardous Reaction	Polymerizes with sunlight, heat, catalysts
Conditions to Avoid	Direct sunlight, high temperature, mixed impurities, etc
Incompatible Materials	No information
Hazardous Decomposition Products	No information

11. TOXICOLOGICAL INFORMATION

Acute Toxicity:

Oral: Rat LD₅₀: 5564mg/kg*3)
>4000mg/kg *2)*3)

Dermal: Rabbit LD₅₀: >3000mg/kg *2)*3)

Inhalation: No information

Rat exposures 90ppm 15 times 6 hours Inspected organs were normal.

(GAGE. J. C., BRIT. J. INDUST. MED., 27,1-18, (1970))

Skin Irritation/Corrosion:

Due to the description, "Rabbit skin primary irritation tests, Drize Method, P.I.I.=0.92 Mild irritation" *1), and "Rabbit skin primary irritation tests, Drize Method, P.I.I.=0.08(24h)" , Not classified was assigned.*3)

Serious Eye Irritation/Eye Damage:

There is a description, "severe" irritation, ulcers of the cornea was seen and recovered in 15 days* 3), and the result showed "moderate irritation" * 2) , Category 2A was assigned.

Respiratory Sensitization: Classification Not Possible due to no data available.

Skin Sensitization:

Positive reactions appeared on three fourths (9 out of 12) at maximization tests with guinea pigs and therefore "Sensitizing" was evaluated. Patch tests on humans shows both positive and negative.

Germ Cell Mutagenicity:

Negative results were obtained at rat bone marrow micronucleus tests (somatic cells in vivo mutagenicity tests), Not classified was assigned.*3)

Ames test: Negative *4)

Chromosomal aberration test: Positive*4)

Micronucleus test: Negative results were obtained at rat bone marrow micronucleus tests (somatic cells in vivo mutagenicity tests).*2)



Carcinogenicity: No information

Reproductive Toxicity: Rat(male) NOAEL \geq 1000mg/kg/day *2)

Specific target organ systemic toxicity-Single exposure: No information

Specific target organ systemic toxicity-Repeated exposure:

Oral rat NOAEL=30mg/kg/day *2), LOAEL=100mg/kg/day *2)

Aspiration Hazard: No information

12. ECOLOGICAL INFORMATION

Ecotoxicity:

Fishes: *Oryzias latipes* LC₅₀ (96hr) > 100mg/L *2)*3)

Crustacea: *Daphnia magna* EC₅₀ (48hr) = 380mg/L*2)*3)

Algae : *Selenastrum capricornutum* ErC₅₀ (72hr) = 710mg/L*3)

Persistence /Degradability: Readily degradable*2)

BOD_{14 days}: 95% degradation*5)

DOC_{14 days}: 87% degradation*5)

GC_{14 days}: 100% degradation *5)

Bioaccumulative potential: No information

Mobility in soil: No information

Hazardous to the ozone layer: No information(The substance is not listed in Annex of the Montreal Protocol)

13. DISPOSAL CONSIDERATIONS

Disposal of remaining wastes:

Conform to related laws and regulations as well as the standard of a local government for waste disposal.

Commission an authorized waste disposal company or a local public organization if they dispose of wastes.

Commission a waste disposal company to dispose of wastes after informing them thoroughly of dangers and hazards.

Disposal of contaminated containers and packaging:

Recycle containers after washing them or properly dispose of them in accordance with related laws and standards of the local government.

Dispose of empty containers after all the contents have been removed.

14. TRANSPORTATION INFORMATION

International regulations:

Transport hazard class(es): Not applicable

United Nations number (UN No): Not applicable

Marine pollutant: Not applicable

Japanese Regulation:

Transport by Land: Fire Service Law Dangerous goods (Type 4, Class 3 Petroleums) (Danger Grade 3)

Display 'Danger' vehicle signs in prominent places at the front and end of the vehicle.



If the vehicle is a tank truck, a licensed handler of Kou or Otsu Type 4 Dangerous Goods is required to ride.

Loading Method: The maximum height of cargo allowed during transport is 3 meters.

For transport, make sure that there is no leak on containers and load so that they may not be fallen, dropped, and damaged to ensure that the cargo should be protected from collapsing.

Avoiding Loading Incompatibles: 1) Class 1 and Class 6 Dangerous Goods

2) Gasses under pressure

Follow the directions below for Containers and Container Labeling of packaged product transportation:

Container: Use containers provided in the Regulation for regulating dangerous goods, Attached List 3, 2.

Container Labeling: 1. Class 3 Petroleums, Danger Grade 3, Water soluble, 2-Hydroxyethyl Methacrylate

2. Quantity

3. Flames prohibited

Transport by Sea: Although Ship Safety Law does not apply, conform to the general precautions described below.

Transport by Air: Although Civil Aeronautics Law does not apply, conform to the general precautions described below.

Relevant transport specific safety measures:

Make sure that there is no damage, corrosion, leak, etc. on containers before transporting them.

Load dangerous goods or containers with dangerous substance in a manner to prevent them from falling, turning, or getting damaged. Load the containers in a manner that they are certain not to result in direct sunlight exposure, damage, corrosion, leak, or collapse while being transported.

If a hazard occurs due to an accident, etc. during transport, inform the nearby fire authorities and/or other related organizations.

Carry a yellow card while transferring.

Emergency Response Guide Number: 171

15. REGULATORY INFORMATION

Industrial Safety and Health Law: Regulation Article 594 Skin Obstacles applies.

Fire Service Law: Dangerous goods Type 4 Class 3 Petroleums Water insoluble Specified quantity 4,000L

Labour Standards Law: Substances covered by Labour Accident Recuperation Indemnity (Notification No. 33 by Ministry of Labor of March 29, 1996)

Regarding Industrial Hygienic Measures for Sensitizing Chemical Substances

(Notification No. 182 by Director-General of the Labour Standards Bureau of March 29, 1996)

Poisonous and Deleterious Substances Control Law, PRTR Law, Ship Safety Law, Civil Aeronautics Law do not apply.

16. OTHER INFORMATION

References:



- *1) Test result of Safety Science Institute of MITSUBISHI GAS CHEMICAL(No.55-236) (S55.9.26)
- *2) OECD SIDS Initial Assessment Report (2001)
- *3) GHS classification table of National Institute of Technology and Evaluation(ID20A2058)
- *4) Chemical toxicity test report Vol.5,P525(1997) supervised by Life chemical safety measures office, Planning Division, Life Health Bureau, Ministry of Health and Welfare(Chemical Substances Inspection Promoting Liaison Council)
- *5) Existing Chemicals Safety Inspection Data (2001) in NITE Chemical Management Center's Homepage

Others: CHEMWATCH GHS-MSDS

MSDS prepared by Japan Chemical Database Ltd.

Japan Chemical Industry Ecology-Toxicology & Information Center

Disclaimer:

The described information has been prepared based on the latest materials, information, and data available at the time of preparation; however, it does not intend to guarantee anything like contents, physical/chemical properties, and danger/hazards.

Also, the cautions have been prepared for ordinary handling; therefore, for special handling, please use on implementing the safety measures suitable for new usage.

In addition, GHS classification is in accordance with domestic standards, so it may be different from the classification from overseas standards in certain respects.