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
		Prepared on : February 23, 2010
		Revised on : August 31, 2022
		ID Number : 4038001
Identity of Substance/Mixture	:	Certified reference material NMIJ CRM 4038-a 1,2-Dichloropropane
Recommended Use of the Chemical and Restriction on Use	:	This CRM is intended for use in calibration of analytical instruments, quality control of analytical instruments, and validation of analytical techniques and instruments. 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 liquid	:	Hazard Category 2
	Skin corrosion/irritation	:	Hazard Category 2
	Serious Eye Damage/ Eye Irritation	:	Hazard Category 2A
	Skin sensitization.	:	Hazard Category 1
	Acute Toxicity(Oral)	:	Hazard Category 4
	Reproductive toxicity	:	Hazard Category 2
	Specific Target Organ Toxicity/Systemic Toxicity (Single Exposure)	:	Hazard Category 1 (Liver, blood, kidney) Hazard Category 3 (respiratory tract irritation, anesthetic action)
	Specific Target Organ Toxicity/Systemic Toxicity (Repeated Exposure)	:	Hazard Category 1 (Liver, kidney, blood system) Hazard Category 2 (Respiratory organ)
	Water environment toxicity (Acute)	:	Hazard Category 3
	Water environment	:	Hazard Category 3

	toxicity (Prolonged)
GHS Label Element:	
Signal Word:	Danger
Hazards Statement:	Highly flammable liquid and vapor Skin irritancy Strong eye irritancy It may cause an allergic skin reaction. Harmful if swallowed. Suspected of damaging fertility or the unborn child May cause damage to organ (Liver, blood system, kidney) May cause an irritation on respiratory organ May cause drowsiness or dizziness Causes damage to organ (liver, kidney blood system) through prolonged or repeated exposure May cause damage to organ (respiratory organ) through prolonged or repeated exposure Harmful to aquatic life May cause damage to aquatic life through prolonged or repeated exposure
Precautionary Statement:	[Safety Precaution] Do not eat, drink or smoke when using this product. Do not handle until all safety precautions have been read and understood. Use protective gloves, protective glasses and face mask. Use only outdoors or in a well-ventilated area. Keep away from ignition sources such as heat/sparks/open flames/hot surfaces. – No smoking. Take precautions against electrostatic discharge. Use explosion-proof electrical/ventilating/lighting equipment. Wash hands thoroughly after handling. Do not breathe dust, fume, mist, vapors, spray, etc. Avoid release to the environment. Seal tightly after use. ［First-aid Action］ If swallowed:Rinse his/her mouse with plenty of water. Get medical advice/attention if you feel unwell. 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 you feel unwell:Get medical advice/attention. If inhaled: Remove victim to fresh air and keep at rest in a position comfortable for breathing. If on skin (or hair): Remove/Take off immediately all contaminated

clothing. Rinse skin with plenty of soap and water/shower.
If skin irritation occurs: Get medical advice/attention. Wash the contaminated clothing before re-used.
If exposed or concerned: Get medical advice/attention.
［Storage］
Store this CRM in dark, cool (about −20 °C), clean and well ventilated place.
［Disposal］
Entrust disposal of this reference material or empty containers 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/Mixture	:	Single substance
Chemical Identity	:	1,2-dichloropropane
Content	:	99.9 %
Chemical Formula	:	$CH_3CHClCH_2Cl$
Molecuar Weight	:	112.99
Reference Number in Gazetted List in Japan	:	Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc. : 2-81 Industrial Safety and Health Act : Published
CAS Number	:	78-87-5
Hazardous Ingredient	:	1,2-dichloropropane

4. First-aid Measures

If in Eyes	:	Rinse away thoroughly with clean water. Get medical advice/attention.
If on skin	:	Remove/Take off immediately all contaminated clothing. Wash skin with plenty of soap and water/shower. If skin irritation occurs: Get medical advice/attention.
If Inhaled	:	Remove victim to fresh air and keep at rest and warm. Get medical advice/attention.
If swallowed	:	Give plenty of water or salt water. Get medical advice/attention immediately.
Expected Acute and Delayed Symptom	:	If Inhaled: Cause cough, insomnia, headache, and sore throat
Most Critical Characteristic and Symptom	:	-
Protecting Personnel in emergency measures	:	Wear protective equipment such as rubber gloves, and goggles.

5.Fire-fighting Measures

Extinguishing Media	:	Powder, foam (alcohol resistance foam), carbon dioxide, and water spray (rod-like water injection prohibited).
Fire-Specific Hazards	:	Wear respiratory protective equipment as toxic gases (carbon monoxide, etc.) are generated due to combustion or high temperature. The vapor may form explosive mixtures with air.
Specific Fire-Fighting Method	:	Eliminate ignition sources at the origin of a fire and put out fire by using extinguishing media. Remove movable containers promptly to a safe place. In the case of immovable containers, cool their surroundings with sprayed water.
Protection of Fire-Fighters	:	Carry out fire-fighting from the windward in order to avoid breathing hazardous gas. Use personal protective equipment such as fireproof clothing, heat-resistant clothing, protective clothing, compressed air open-circuit self-contained breathing apparatus, compressed oxygen closed-circuit self-contained breathing apparatus, rubber gloves and rubber boots.

6. Accidental Release Measures

Personal Precaution Personal Protective	:	Remove ignition source in the vicinity immediately. Prepare fire-fighting equipment for the possibility of fires. Ventilate the affected areas thoroughly, if it is in an indoor environment, until the clean-up operation is completed.
Equipment and Emergency Procedures	:	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 in order to prevent untreated wastewater from being released into the surrounding environment.
Recovery and Neutralization	:	Strict ban on fire. Adsorb spillage with waste clothes or dry sand, and collect in empty containers. 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 windward and make people on the leeward side evacuate.

7. Handling and Storage

Handling		
Engineering Precautions	:	Strict ban on fire. Keep away from hot surfaces and sparks.
Local and General Ventilation	:	Use local ventilation system in indoor handling areas.
Precautions for Safe Handling	:	Avoid rough handling such as turning over, dropping, giving a

shock to or dragging containers.
Prevent spill, overflow and scattering, and avoid vapor generation.
Electrical equipment to be used in the storage location should be explosion-proof structure, and grounded, if necessary.
Keep container tightly closed after using this reference material.
Wash hands, face etc. thoroughly and gargle after handling this reference material.
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.
Use appropriate personal protective equipment during the operation to avoid skin contact of splash etc. and inhalation of dust and gas.

Storage

Appropriate Storage Conditions	:	Store in a closed container in a cool and dark place at temperatures around −20 °C. Use explosion-proof electrical equipment and ground all equipment in storage area. Store away from strong oxidizer and ignition source.
Safe Container Packaging Material	:	Glass

※Please refer CRM certificate about storage conditions as reference material.

8. Exposure Controls/Personal Protection

Threshold Limit Value Working Environment Evaluation Criteria

Not specified

Permissible Concentration

・OSHA PEL	:	air TWA 75 ppm
・ACGIH TLV	:	TWA 10 ppm
・Value recommended by Japan Society for Occupational Health	:	Not specified

Engineering Controls

・Keep container tightly closed or use local ventilation system in indoor handling area.
・Use explosion-proof equipment. Take precautionary measures against static discharge for facilities.
・Install safety shower and facilities to rinse eyes and to wash hands in the vicinity of a place handling this reference material and label them clearly.

Personal Protective Equipment (PPE)

Respiratory System	:	Protective gas mask for organic vapors, Self-contained compressed air breathing apparatus.
Hands	:	Protective gloves

Eyes	:	Protective glasses
Skin and Body	:	Protective clothing, protection boots

9. Physical and Chemical Properties

・Appearance, etc.	:	Clear liquid
・Color	:	Colorless
・Odor	:	Chloroform odor
・pH	:	No data
・Melting point	:	−100.4 °C
・Boiling point	:	96.4 °C
・Flashing point	:	15.6 °C
・Explosive range	:	3.4 % to 14.5 %
・Vapor pressure	:	53 hPa (20 °C)
・Relative vapor density(Air=1)	:	3.9 (air=1)
・Specific gravity or bulk specific gravity	:	1.16
・Solubility	:	Slightly soluble in water (0.27 g/100ml in water at 0 °C), easily soluble in ethanol and ether.
・*n*-Octanol/water partition coefficient (Log Po/w)	:	2.02 （calculated value）
・Auto-ignition temperature	:	557.2 °C

10. Stability and Reactivity

◇Stability

Stable under recommended storage conditions.

◇Reactivity

・Can cause violent reaction if in contact with strong oxidizer, alkali metal, alkali earth metal, various metal powders, sodium amide.

・Corrodes magnesium, aluminum, brass and polyethylene.

◇Conditions to Avoid

・Sunlight, Heat, open flame, high temperature material, spark, static electrical charge, and other fire sources.

◇Hazardous Decomposition Products

・Carbon monoxide, chlorine, hydrogen chloride, phosgene

11. Toxicological Information

Acute toxicity	Oral Rat LD50:1900 mg/kg（EHC 146(1993)） Dermal Rat LD50:10114 mg/kg（EHC 146(1993)）
Skin Corrosion/ Irritation	Considered to cause “mild skin irritation” based on the description of results of the skin irritation test using rabbits (“CERI・NITE Hazard Assessment Report No.39 (2005)”) and the description of effects on humans (Ministry of Environment “Risk Assessment

	vol. 2 (2003)”).
Serious Eye Damage/ Eye Irritation	Considered to cause “moderate irritation” based on the description of results of the eye irritation test using rabbits (“CERI･NITE Hazard Assessment Report No.39 (2005)”) and the description of effects on humans (Ministry of Environment “Risk Assessment vol. 2 (2003)”).
Respiratory Sensitization Or Skin Sensitization	Skin sensitization: Considered to cause “skin sensitization” based on the description of two human cases (EHC 146 (1993)).
Carcinogenicity	ACGIH: A4 (Not classifiable as a human carcinogen) IARC: Group 3 (Not classifiable as to its carcinogenicity to humans)
Reproductive Toxicity	In the two-generation test using rats, low values of body weight at birth and increase of neonatal mortality rate were observed at the doses which affected parent rats.
Specific Target Organ Toxicity/Systemic Toxicity (Single Exposure)	For humans: “Shock, talking in delirium and damage to cardiovascular system was observed and the patient died 36 hours after. The autopsy report indicates hepatic necrosis.” (ACGIH (2006)). There are also descriptions of “acute effects on kidneys and renal tubular necrosis” (EHC146 (1993)), “feeling of fatigue, which is considered to be attributed to depression of central nerve system” (ATSDR (1989)), etc. In animal tests, there are descriptions of “respiratory irritation” (ACGIH (2006)), “difficulty in breathing, impairment of mobility and coma” (“NITE Initial Risk Assessment Report No.39 (2005)), etc., based on which liver, blood system and kidney are considered to be target organs. Airway irritation and anesthetic action were observed.
Specific Target Organ Toxicity/Systemic Toxicity (Repeated Exposure)	For humans, “hemolytic anemia and functional disorder of liver and kidney” are reported (“NITE Initial Risk Assessment Report No.39 (2005),” ACGIH (2006), etc.). In animal tests, “olfactory epithelium degeneration” is reported (“NITE Initial Risk Assessment Report No.39 (2005)”), based on which kidney, liver, blood system and respiratory organ are considered to be target organs.

12. Ecological Information

Degradability, bioacumulation properties

・Degree of decomposition: 0 %(by BOD)

Bioaccumulation

・Bio-concentration factor (BCF): 1.2～3.2 (Concentration: 0.4 mg/L) and 0.5～6.9 (Concentration: 0.04 mg/L)

Bioaccumulation is considered low.

Ecotoxicity

・Oryzias latipes　LC50: 104 mg/L/48 hours

・Crustacea (Ceriodaphnia): 48 hours EC50=13600 μg/L (Ministry of Environment "Risk Assessment vol. 2 (2003)")

13. Disposal Considerations

・Dispose in accordance with applicable regional, national and local laws and regulations.

・Dispose of containers after thoroughly removing their contents.

14. Transport Information

UN Number	:	1279
UN Classification	:	Class 3 (Flammable Liquid)
Shipping Name	:	1,2-Dichloropropane
Packing Group	:	PG Ⅱ
Marine Pollutant	:	Not specified
Precautions	:	Transport this reference material carefully while keeping it away from direct sunlight and fire and preventing accidental release due to falling, overturning, etc.

15. Regulatory Information

◇ Fire Service Act

・Hazardous Materials 4 Class 1 petroleum (insoluble in water) Danger Rating 2

◇Industrial Safety and Health Act

・Article 57-2 (Enforcement Order: Article 18) Hazardous substance whose name, etc. must be labeled.

・Article 57-2 (Enforcement Order: Article 18-2) Hazardous substance whose name, etc. must be notified No.254

・Enforcement Order Appendix 1-4; Hazardous material/Flammable material

・Specified Chemical Substance; Type 2 substance

◇Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc.

・Article 2-5: Priority assessment chemical substance

◇Pollutant Release and Transfer Register (PRTR) Law

・Class 1 Designated chemical substances No.178

◇Ship Safety Law (Dangerous Material Rule)

・Flammable Liquids

◇Civil Aeronautics Act

・Flammable Liquid

◇Act for the Prevention of Marine Pollution and Maritime Disasters

・・Enforcement Order Appendix 1 Hazardous Liquid Substance Class Y Substance

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.