

# Safety Data Sheet



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

Supplier : National Institute of Advanced Industrial Science and Technology (AIST)  
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Identity of Substance/Mixture : Certified Reference Material NMIJ CRM 4074-a  
 Trichloroacetic Acid  
 Recommended Use of the Chemical and Restriction on Use : This reference material can be used 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 : Skin corrosion/irritation : Hazard Category 1A  
 Serious eye damage/ Eye irritation : Hazard Category 1  
 Germ cell mutagenicity : Hazard Category 2  
 Reproductive toxicity : Hazard Category 2  
 Specific target organ toxicity/Systemic toxicity (Single exposure) : Hazard Category 3 (Narcotic effects)

GHS label element :



Signal word : Danger  
 Hazard and toxicity : Causes severe skin chemical burns and eye damage.  
 Causes serious eye damage.  
 Suspected of causing genetic defects.  
 Suspected of damaging fertility or the unborn child.  
 May cause drowsiness or dizziness.  
 Precautionary : [Safety Precaution]  
 Obtain special instructions before use.

statement

Do not handle until all safety precautions have been read and understood.

Use only outdoors or in a well-ventilated area.

Do not breathe dust/mist.

Wash hands thoroughly after handling.

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

[First-Aid Measure]

If swallowed: Rinse mouth. Do not induce vomiting.

If on skin or hair: Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.

Wash contaminated clothing before reuse.

If inhaled: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

Call doctor/physician if you feel unwell.

If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do so. Continue rinsing.

If exposed or concerned: Seek medical examination/treatment.

[Storage]

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

Store in a clean place at around -20 °C.

Store locked up.

[Disposal]

Dispose of this reference material in accordance with applicable legislation and local government ordinance.

Entrust disposal of this reference material and its containers to a professional waste disposal company licensed by prefectural government.

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	:	Trichloroacetic acid
Synonym	:	2,2,2-trichloroacetic acid, TCA
Chemical formula	:	CCl <sub>3</sub> COOH
Molecular weight	:	163.39
CAS number	:	76-03-9
Content	:	99 % or above
Reference Number in Gazetted List in Japan	in	Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc. : 2-1188 Industrial Safety and Health Act : Published

### 4. First-aid Measures

If Inhaled : Remove victim to fresh air and keep him/her at rest and warm.

If on Skin	: Seek medical examination/treatment. : Rinse away thoroughly with clean water. Remove/Take off contaminated clothing/shoes, etc. Seek medical examination/treatment.
If in Eyes	: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do so. Continue rinsing. Seek immediately medical examination/treatment.
If Swallowed	: Rinse mouth thoroughly with water. Do not give anything to mouth of unconscious victim. Call immediately doctor/physician. Do not induce vomiting if there are no instructions from doctor/physician.
The Most Critical Characteristics and Symptoms of Expected Acute Symptoms and Delayed Symptoms	: Inhalation: Sore throat, coughing, burning sensation, headache, nausea, vomiting, panting, breathing with difficulty Skin: Pain, flare, blister, thermal burn of skin Eyes: Pain, flare, serious thermal burn Ingestion: Burning sensation, stomachache, shock/collapse Corrosive to eyes, skin and airway.
Protection of First-Aid Provider	: Use personal protective equipment.
Special Precautions for Doctor/Physician	: Medical attention to delayed health effects is required. Symptoms of pulmonary edema are often observed two to three hours later. They will deteriorate unless victim is kept at rest. Keeping victim at rest and taking a watch-and-wait approach, therefor, are essential. Prompt application of appropriate respiratory therapy by doctor/physician or person qualified by doctor/physician must be considered.

## 5. Fire-fighting Measures

Extinguishing Media	: Water spray, Foam extinguishing agent, Dry chemical extinguisher, Carbon dioxide, Dry sands Unsuitable extinguishing media: Direct water jets
Fire-Specific Hazards	: In case of fire, may emit irritating or toxic fume (or gas).
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	: Remove potential ignition sources from the vicinity promptly. Make fire-fighting kit available to be prepared for potential ignition.
Personal Protective	: Ventilate the affected areas thoroughly, if it is in an indoor

Equipment and Emergency Procedures	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 in order to prevent untreated wastewater from being released into the surrounding environment.
Recovery and Neutralization	: Collect spillage in empty containers by getting it adsorbed to wiping cloth/rag or 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 windward and make people on the leeward side evacuate.

## 7. Handling and Storage

### Handling

Engineering Precautions	: Keep away from strong oxidizer. Keep away from alkali substances. Care must be taken against hygroscopicity. Use local ventilation system.
Local/General Ventilation	: If emitting vapor or mist: Keep container tightly closed and use local ventilation system.
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 emission. 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 designated areas. 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 to avoid inhalation and contact with eyes, skin and clothing. Use local ventilation system in indoor handling areas.

### Storage

Appropriate Storage Conditions	: Store in a light-shielded clean place at around -20 °C. Store locked up. Keep away from incompatible substances.
Safe Container Packaging 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

Threshold Limit Value

Not specified

Permissible Concentration

- ACGIH TLV-TWA : 1 ppm
- Values recommended by Japan Society for Occupational Health : Not specified
- OSHA PEL TWA : Not specified

Engineering Controls

- Ventilation/Exhaust : Local or general ventilation system
- Safety control/  
Gas detection : Measuring equipment, Detecting tube
- Storage Precautions : Ventilation along floor surface. Keep container tightly closed. Keep away from flammable substances, reducing substances and strong oxidizers.

Personal Protective Equipment (PPE)

- Respiratory System : Mask to protect against dust
- Hands : Impermeable protective gloves
- Eyes : Eye protection with side shields
- Skin and Body : Work clothing with long sleeves, Protective boots

Hygiene Measures

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

## 9. Physical and Chemical Properties

- Appearance, etc. : Solid
- Color : White
- Odor : Irritating odor
- pH : Strongly acidic
- Melting point : 57.4 °C
- Boiling point : 197.5 °C
- Flashing point : Non Flammable
- Explosive range : No data
- Vapor pressure : 0.06 mmHg (25 °C)
- Relative vapor density(Air=1) : 5.64
- Specific gravity or bulk specific gravity : 1.629 g/cm<sup>3</sup>
- Solubility : Easily soluble in water, ethanol, diethyl ether
- *n*-Octanol/water partition coefficient (Log Po/w) : 1.7
- Auto-ignition temperature : No data
- Decomposition temperature : No data
- Flammability : Non Flammable

## 10. Stability and Reactivity

◇Stability

- Deliquescent

- ◇Reactivity
  - Reacts with alkali substances, if in contact with, as this reference material is acidic
- ◇Hazardous Reactivity
  - Corrodes iron, zinc, aluminum, etc. Decomposed, if heated, to emit toxic and corrosive fume containing hydrogen chloride and chloroform. Aqueous solution of this reference material is strong acid, which violently reacts with bases and is corrosive to a number of metals.
- ◇Conditions to Avoid
  - High temperature, Direct sunlight
- ◇Incompatible Substance
  - Strong oxidizers, Alkalis, Metals
- ◇Hazardous Decomposition Products
  - Carbon monoxide, Carbon dioxide, Halides

## 11. Toxicological Information

Acute Toxicity	Oral Rat: LD <sub>50</sub> =3320 mg/kg Dermal Rat: LD <sub>50</sub> >2000 mg/kg
Skin Corrosion/ Irritation	It is reported that this reference material is corrosive to rabbit skin. In the test using another rabbit, mild irritation was observed when this reference material of 0.21 mg was applied, and serious irritation was observed when 3.5 mg was applied. Depending on concentration and duration of exposure, this reference material was reported to cause thermal burns. In addition, it features pH<1 (900 g/l, 20 °C). Based on the above, this reference material is classified as Hazard Category 1A.
Serious Eye Damage/ Eye Irritation	In the test using rabbits, it was reported that serious and extensive loss of the epithelia and endothelia as well as moistening and bleeding near blood vessels were observed. When 30% solution of this reference material was applied to rabbit eyes, serious eye damage was observed, and in 24, 48 and 72 hours later, modified maximum average score (MMAS) of irritation remained at 106. This eye damage did not cure completely even 21 days later. In addition, it features pH<1 (900 g/l, 20 °C). Based on the above, this reference material is classified as Hazard Category 1.
Germ Cell Mutagenicity	In the test in which this reference material was orally administered rats during the organogenic period, it was reported that development of general toxicity including suppression of weight gain of parent rats as well as dose-dependent rise of fetal resorption rate, reduction of weight and height of survival embryo/fetus, and, at high dose, deformity of cardiovascular system and skeleton were observed. Based on the above, this reference material is classified as Hazard Category 2.
Specific target organ toxicity/Systemic toxicity (Single exposure)	It was reported that oral exposure promptly brought animals into the narcotic or semi-narcotic state and that within 36 hours they either died or completely recovered. Based on the above, this reference material is classified as Hazard Category 3 (Narcotic effects).

## 12. Ecological Information

### Toxicity

- No data available

### Persistence and Degradability

- Microbial degradability is considered to be not high. from 0 to 46 % by BOD.

### Bioaccumulative Potential

- No or low bioaccumulation or concentration in fish and shellfish.

Concentration (Magnification)	Carp	0.4 - 1.0 times (0.2 mg/l)
	Carp	< 1.7 times (0.02 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.  
 When entrusting the disposal, provide the professional waste disposal company with thorough information on danger and harmful effects in advance.

Contaminated Container and Package : Dispose of containers after thoroughly removing their contents.

## 14. Transport Information

UN number : 1839  
 UN classification : Class 8 (Corrosive substance)  
 Material name : Trichloroacetic acid  
 Container grade : II  
 ICAO/IATA : Class II  
 Marine pollutant : Not applicable  
 Precautions : Avoid direct sunlight, pay attention to leaks due to falling, overturning, etc. and flames carefully. Transport this reference material carefully.

## 15. Regulatory Information

- ◇Poisonous and Deleterious Substances Control Act
  - Deleterious substance: Packaging Grade 2
- ◇Act on Confirmation, etc. of Release Amounts of Specific Chemical Substances in the

Environment and Promotion of Improvements to the Management thereof

- Class 1: Designated Chemical Substance (Cabinet Order No. 282)
- ◇Industrial Safety and Health Law
  - Article 57-1 (Enforcement Order: Article 18) Hazardous substance whose name must be indicated: No.385
  - Article 57-2 (Enforcement Order: Article 18-2) Hazardous substance whose name, etc. must be notified: No.385
- ◇Ship Safety Law
  - Dangerous Material Rule Article 3: Dangerous Material Announcement Appendix 1: Corrosive Substance
- ◇Civil Aeronautics Act
  - Enforcement Order Article 194: Dangerous Material Announcement Appendix 1: Corrosive Substance
- ◇Act on Port Regulations
  - Enforcement Order Article 12: Dangerous Material Announcement: Corrosive Substance
- ◎ **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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