

Safety Data Sheet



1. Identification of the Substance/Mixture and the Supplier

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Identity of Substance/Mixture : Certified Reference Material NMIJ CRM 4001-b
 Ethanol
 Recommended Use of the Chemical and Restriction on Use : This reference material can be used for the calibration of instruments, and validation of analytical techniques and instruments during analysis of ethanol. 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 : Ignitable liquid : Class 2
 Severe damage to eye/eye irritant : Class 2A
 Germ-cell mutagenicity : Category 1B
 Reproduction toxicity : Class 1
 Particular target organ/systemic toxicity (Single exposure) : Class 3 (Respiratory tract irritant)
 : Class 3 (Anesthetic action)
 Particular target organ/systemic toxicity (Repeated exposure) : Class 1 (Liver)
 : Class 2 (Nervous system)

GHS Label element :



Signal word : Danger
 Hazard and toxicity : Highly ignitable liquid and fume
 Severe eye irritant
 Hereditary disorder

	May cause adverse effects on reproductive function or embryo/fetus
	May irritate respiratory organ
	May cause drowsiness or dizziness
	Organ damages due to long term or repeated exposure (Liver)
	May cause organ damages due to long term or repeated exposure (nerve system)
Other hazard and :	Inhaling gas, fume or mist may cause critical intoxication
toxicity information	
Precautionary :	[Safety Precaution]
statement	Do not handle before reading and understanding the safety precautions fully. Handle the substance outdoor or at well ventilated place. Take precautions against electrostatic discharge. Prevent the material from being released into the environment. Wash hands well after the handling. Avoid inhaling gas, mist, vapor, fume or spray. Use appropriate protective gloves, eyeglasses, protective mask, if necessary, use personal protective equipment.
	[First-Aid Measures]
	If swallowed : If feeling ill, get medical assistance. Rinse out the mouth; drink a large amount of water. Do not induce vomiting.
	If in eyes : Rinse carefully with plenty of water for few minutes. Get medical assistance.
	If inhaled : Move to get some fresh air and ease breathing/respiration rest.
	If on skin : Rinse with plenty of water using soap. Get medical assistance/treatment
	If exposed or possibility of the exposure : Get medical assistance/treatment Take off the contaminated clothes. Wash the clothes well if using them the next time. Collect the leaked substance promptly
	[Storage]
	Keep in a locked cabinet. Protect from light, store in a clean place at the temperature of about -20 °C
	[Disposal]
	The content or the container should be incinerated in an appropriate incinerator, or outsourced to a professional industrial waste disposal contractor licensed by the prefectural governor.

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

3. Composition/Information on Ingredients

Single or compound product	: Single product
Chemical name	: Ethanol
Other name	: Ethyl alcohol
Amount	: Over 99 %
Structural formula	: C ₂ H ₅ OH
Molecular weight	: 46.07
Reference Number in Gazetted List in Japan	: Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc. : (2)-202 Industrial Safety and Health Act : Published
CAS No	: 64-17-5

4. First-aid Measures

If in eyes	: Rinse carefully with plenty of clean water. Get medical assistance
If on skin	: Rinse with plenty of clean water. Take off all the contaminated clothes and shoes. Get medical assistance.
If inhaled	: Move to get a fresh air and ease the breathing/respiration. Keep warm and rest. Get medical assistance
If swallowed	: Wash the mouth thoroughly, drink a large amount of water. Do not induce vomiting. Get medical assistance
Anticipated acute symptoms and delayed symptoms	: Drowsiness, dizziness, nausea
Most important characteristics and symptoms	: Not specified
Measures to protect the person applying emergency first aid	: Not specified

5. Fire-fighting Measures

Extinguishing media	: Powder, alcohol-resistant foam, carbon dioxide, sand, water spray
Specific hazards at the time of fire	: Use appropriate protective equipment to avoid inhaling smoke
Specific extinguishing measures	: Remove fire sources and extinguish using appropriate agent. If possible, promptly move the container to a safe place. If the container cannot be moved, use water spray to cool the periphery.
Protecting fire-fighting	: Extinguishing activity on the windward and avoid inhaling toxic gas.

personnel. Use protective equipment such as air-breathing apparatus, etc.

6. Accidental Release Measures

- Personal precaution : Promptly remove any fire source from around the substance. Ready for a fire by keeping an appropriate fire extinguisher at hand. If released indoor, ventilate well until the treatment is completed
- Protective equipment and emergency procedure : Use appropriate protective equipment to protect the skin from the airborne droplets and avoid inhaling dust and gas
- Environmental precaution : To prevent causing environmental impact, do not release the spilled material into rivers, etc. directly. Treat the contaminated waste water appropriately before discharging to the environment.
- Recovery, neutralization : Open flames or other source of ignition prohibited. Adsorb the spilled liquid to a waste cloth or to sand and soil and wiped off completely. Collect everything used to clean up the spillage in an airtight container. Finally, wash away the spill with large amount of water
- Measures to prevent secondary accident : Rope-off the leaked area and restrict the access to authorized personnel only. Evacuate the people on the leeward and work on the windward side

7. Handling and Storage

Handling

- Technological counter measure : The floor should be of the material such as concrete, etc. that can prevent from seeping underground. Open flames or other source of ignition prohibited. Avoid contact with high temperature matter, sparks, strong oxidant, etc.
- Precautions for safe handling : Handle the container with caution and prevent from dropping, knocking down or dragging. Prevent leakage, spillage or overflow that causes fume to form. Wash hands and face, etc. well and gargle after the handling. Eating, drinking or smoking only at the designated areas. Entering the handling place only by authorized persons. Use appropriate protective equipment to prevent inhaling, coming in contact with eyes, skin and the clothing.

Storage

- Appropriate condition : Use explosion-proof electrical equipment in the storage room and earth (ground) all the equipment. Store in a dark clean place at the temperature of about $-20\text{ }^{\circ}\text{C}$. Open flames or other source of ignition prohibited. Do not store with perchloric acid, sodium peroxide, chromic acid, nitric acid, etc. Do not store near strong oxidizers and fire sources
- Material for safe : Glass

packing

8. Exposure Controls/Personal Protection

Administrative levels

Working Environment : 10 ppm

Evaluation Standards

Occupational exposure limit

- ACGIH TLV-TWA : 1000 ppm
- Japan Society for : Not established

Occupational Health

Recommended Reference value

- OSHA PEL TWA : Air TWA 1000 ppm

Facility engineering control

- Ventilation, exhaust : Install safety shower, hand/eye washer, and indicate their location conspicuously
Local exhaust system or general ventilation system
- Safety management/gas detector : Measuring instrument, detector tube
- Storing precaution : -

Personal Protective equipment

- Respiratory protection : Protective gas mask for organic vapors, self-contained compressed air breathing apparatus.
- Hands : Protective gloves
- Eyes : Protective glasses
- Skin and Body : Protective clothing

Hygiene measure : Replace adsorbent of protective mask every time periodical or every use. This CRM may corrode rubber part of protective equipment and be careful at inspection.

9. Physical and Chemical Properties

- Appearance, etc. : Liquid
- Color : Clear and colorless
- Odor : Distinct odor
- pH : No data
- Melting point : -117 °C
- Boiling point : 78.5 °C
- Flashing point : 12.8 °C (Tag closed cup method)
- Explosive range : 3.3 % to 19 %(v/v)
- Vapor pressure : 5.33 kPa (20 °C)
- Relative vapor density(Air=1) : 1.6 (Air=1)
- Specific gravity or bulk : 0.810 g/ml(20 °C)

specific gravity

- Solubility : Mixes with water and most organic solvents such as acetone, diethyl ether, etc. at arbitrary percentage.
- *n*-Octanol/water partition coefficient (Log $P_{o/w}$) : -0.32
- Auto-ignition temperature : 371 to 427 °C

10. Stability and Reactivity

- ◇ Stability
 - Stable under normal condition
- ◇ Reactivity
 - Reacts violently with strong oxidizers, causes fire or explosion
- ◇ Conditions to avoid
 - Sunlight, heat, open flames, high temperature, spark, static electricity, other source of ignition
- ◇ Hazardous decomposition products
 - Carbon monoxide

11. Toxicological information

Acute toxicity	Oral humans infant	TDL _o : 11712 µL/kg (RTECS)
	Oral humans male	TDL _o : 700 mg/kg (RTECS)
	Oral rats	LD ₅₀ : 7060 mg/kg (RTECS)
	Inhalation rats	LC ₅₀ : 20000 ppm/10H (RTECS)
	Oral mice	LC ₅₀ : 3450 mg/kg (RTECS)
Skin corrosivity/irritation :	Skin rabbits	LDL _o : 20 mg/kg (RTECS)
	Skin irritation rabbits	20 mg/24hr moderate (RTECS)
Severe damage to eyes/eye: irritant	Eye irritation rabbits	500 mg; severe (RTECS)
	Eye irritation rabbits	500 mg/24hr mild (RTECS)
Germ-cell mutagenicity :	Reports on dominant lethality in rats and mice and aneugenic effects in mice germ cells (DFG (1999), IARC (1988))	
Reproductive toxicity :	Many reports have been made on the adverse effects on human embryos/fetus such as deformity, etc. due to the habitual consumption of large amount of alcohol by dams (DFGOT (1996))	
Particular target organ/systemic toxicity (Single exposure)	: The intake of ethanol by humans has adverse effects on central nervous system that may result in headache, fatigue, inability to concentrate (ICSC (2000) and acute toxicity may result in death (DFGOT (1996) .Also the intake of 5000 ppm (9.4 mg/L) by humans results in respiratory tract irritation, confusion, intense drowsiness (ACGIH (2001)	
Particular target organ/systemic toxicity (Repeated exposure)	: Long-term heavy alcohol use by humans causes damages to almost all organs. The worst adverse effect is on liver. The onset of the adverse event is fatty degeneration (steatosis), then progresses to necrosis, fibril formation and eventually to liver cirrhosis (DFGOT	

(1996)".

12. Ecological Information

Degradability, concentration

- Degradability: 89 % by BOD(Existing Chemical Substances Safety Data by METI)

Bioaccumulation

- No data available

Ecotoxicity

- No data available

13. Disposal Considerations

- Spray into fire chamber of the incinerator.

14. Transport Information

UN Number : 1170

UN Classification : Class 3(Ignitable liquid)

Material name : Ethanol or ethanol solution (content rate of ethanol below 24% by a volume of aqueous solution)

Container grade : PG II

ICAO/IATA : Class 3 Grade II

Marine pollutant : Applicable

Precautions : Transfer with care avoiding direct sunlight, leakage or spill due to fall or drop.

Keep the container away from fire sources and transfer carefully by maintaining the temperature at about -20 °C.

15. Regulatory Information

◇ Fire Service Act

- Hazardous material Category 4 Alcohol (water-soluble) Hazard Class 2

◇ Industrial Safety and Health Law

- Article 57-2 (Enforcement Order: Article 18-2) Hazardous substance whose name, etc. must be notified No. 61

◇ Ship Safety Act

- Ignitable liquid

◇ Law Relating to the Prevention of Marine Pollution and Maritime Disaster

- Enforcement Order Appended Table No. 1 Toxic liquid substance Category Z 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.**

16. Other Information

Other

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.
