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 : January 29, 2019
		Revised on : August 31, 2022
		ID Number : 7202003
Identity of Substance/Mixture	:	Certified reference material: NMIJ CRM 7202-c Trace Elements in River Water (Elevated Level)
Recommended Use of the Chemical and Restriction on Use	:	This reference material can be used for controlling analysis precision or for confirming the validity of analytical methods or instruments during the analysis of trace elements in river water or similar water samples. 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 :	Acute toxicity (Oral)	:	Category 5
	Acute toxicity (Inhalation: dust and mist)	:	Category 5
	Skin corrosion/irritation	:	Category 3
	Serious eye damage/ eye irritation	:	Category 2A

GHS Label Element:

Signal Word : Warning

Hazards Statement: May be harmful if swallowed
May be harmful if inhaled
Slight skin irritation
Serious eye irritation

Other Hazards : Toxicity of arsenic and selenium is low as their content is below water quality criteria of tap water specified in Article 4 of the Waterworks Law (10 µg/L).

Precautionary : ［Precaution］

Statement: Use eye protector and face protector.
［Action］
Eye contact: Irrigate eyes carefully with water for a few minutes. Then take out contact lenses if it is possible to easily do so. Keep irrigating eyes after taking out contact lenses. Seek medical examination/treatment if eye irritation is prolonged.
Seek medical attention when feeling sick.
Ingestion: Seek medical attention when feeling sick.
Wash hands after handling this reference material.
Seek medical examination/treatment if skin irritation develops.
［Storage］
Store this reference material, whether its package is opened or not, in light-shielded clean environment at about 5 °C.
Store in a locked area.
［Disposal］
Dispose of in accordance with relevant laws and regulations of the country in which the material will be used.
Entrust disposal of this reference material to a professional waste disposal company licensed by prefectural government.

Hazards not mentioned above are either not classifiable or not applicable.

3. Composition/Information on Ingredients

Substance/Mixture : Mixture

・Ingredient 1

Chemical Identity	:	Water
Chemical Formula or Structural Formula	:	H_2O
Content	:	99%
Molecular weight	:	18.01
Reference Number in Gazetted List in Japan	:	Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc. : Industrial Safety and Health Act : -
CAS Number	:	7732-18-5

・Ingredient 2

Chemical Identity	:	Nitric acid
Chemical Formula or Structural Formula	:	HNO_3
Content	:	About 0.3 mol/L
Molecular weight	:	63.01
Reference Number in Gazetted List in Japan	:	Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc. : (1)-394

Industrial Safety and Health Act : Published
CAS Number : 7697-37-2
TSCA : Applicable

・Ingredient 3
Chemical Identity : Arsenic trioxide
Synonym : Assenious acid anhydride
Chemical Formula or Structural Formula : As_2O_3
Content : 1.17 µg/kg (as As)
Molecular weight : 197.84
Reference Number in Gazetted List in Japan : Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc. : (1)-35
Industrial Safety and Health Act : Published
CAS Number : 1327-53-3

・Ingredient 4
Chemical Identity : Selenous acid
Chemical Formula or Structural Formula : H_2SeO_3
Content : 1.03 µg/kg (as Se)
Molecular weight : 110.96
Reference Number in Gazetted List in Japan : Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc. : (1)-546
Industrial Safety and Health Act : Published
CAS Number : 7783-00-8

・Other ingredients
In addition to the ingredients 2, 3 and 4, this reference material contains the elements shown in the table below, all of which are spiked to river water;
B, Al, Cr, Mn, Fe, Ni, Cu, Zn, Rb, Sr, Mo, Cd, Sb, Ba, Pb, Na, Mg, K, Ca.

4. First-aid Measures

Inhalation : Move the person to fresh air and keep him/her at rest and warm.
Seek medical examination/treatment.
Skin Contact : Flush exposed skin area thoroughly with clean water.
Take off contaminated clothing and shoes. Seek medical examination/treatment.
Eye Contact : Irrigate eyes thoroughly with clean water.
Seek medical examination/treatment.
Ingestion : Have the person drink a large amount of water or milk.
Do not make the person vomit. Seek medical examination/treatment immediately.
Protection of first- : Wear personal protective equipment.

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5. Fire-fighting Measures

Extinguishing Media	:	CO_2, powder, sand, water, foam
Fire-Specific Hazards	:	N/A
Specific Fire-Fighting Method	:	Remove any combustible sources from the seat of fire and extinguish using appropriate extinguishing agent. Transfer the movable container to a safe place promptly. If impossible to transfer, use water spray to cool the periphery.
Protection of Fire-Fighters	:	Use personal protective equipment such as fireproof clothing, heat-resistant rescue suit, protective clothing, air respirator, closed-circuit SCBA, rubber gloves and rubber boots.

6. Accidental Release Measures

Personal precautions	:	Wear appropriate protective equipment to prevent contamination of the skin, eyes and individual clothing.
Protective equipment and emergency measures	:	When accidental release takes place indoors, thoroughly clear the air until the emergency measures are complete. Before the operation, wear appropriate protective equipment to protect skin from droplets and to prevent inhalation of dust and gas.
Environmental precautions	:	Prevent the released product from being drained into a river or other area that might cause environmental damage. Prevent the polluted discharge from being drained into the environment without being processed properly.
Recovery and neutralization	:	Wipe off it with wet cloth or paper. In case of a large extent, wash and clean the spilled area with plenty of water.
Prevention of the second accident	:	-

7. Handling and Storage

Handling

- Use eye protector/face protector.
- Avoid contact with eyes, skin and clothing.
- Avoid vapor inhalation.
- Avoid prolonged or repeated exposure.
- Refrain from eating, drinking and smoking while handling this reference material.
- Wash hands thoroughly after handling this reference material.
- Avoid vapor generation and provide sufficient ventilation.
- Prevent this reference material from contacting with inflammables and organic matters.
- Do not use this reference material for other purposes than testing.

Storage

- Store this reference material in light-shielded clean environment at about 5 °C.
- Store in a locked area.

※ Please refer to the reference material certificate for the precaution statement regarding the appropriate condition of the storage and usage of the reference material.

7. Handling and Storage

Handling

Technical measures	:	N/A
Local ventilation and general ventilation	:	When handling indoors, provide local exhaust ventilation.
Precautions for safe handling	:	Use eye protector/face protector. Avoid contact with eyes, skin and clothing. Avoid vapor inhalation. Avoid prolonged or repeated exposure. Refrain from eating, drinking and smoking while handling this reference material. Wash hands thoroughly after handling this reference material. Avoid vapor generation and provide sufficient ventilation. Prevent this reference material from contacting with inflammables and organic matters. Do not use this reference material for other purposes than testing.

Storage

Appropriate storage conditions	:	Avoid direct sunlight and store in a well-ventilated, cool place about 5 °C. Keep in a locked place.
Safe packaging materials	:	Glass

※ Please refer to the certificate regarding details of appropriate storage conditions and precautions for use as reference material.

8. Exposure Controls/Personal Protection

Safety Precaution

Not specified

Cut-Off Value/Concentration Limit

Not specified

Permissible Concentration (Nitric acid)

・ACGIH TLV-TWA (2006)	:	5.2 mg/m^3, 2 ppm
・ACGIH TLV-STEL (2006)	:	10 mg/m^3, 4 ppm
・Value recommended by Japan Society for Occupational Health (2006)	:	5.2 mg/m^3, 2 ppm
・MSHA TWA	:	5 mg/m^3, 2 ppm
・OSHA PEL TWA	:	5 mg/m^3, 2 ppm

Permissible Concentration (Arsenic trioxide)

・ACGIH TLV-TWA (2003)	:	0.01 mg/m^3 (as As)
・OSHA PEL TWA	:	0.01 mg/m^3 (as As)

Permissible Concentration (Selenous acid)

- ACGIH TLV-TWA (2003) : 0.2 mg/m^3 (as Se)
- OSHA PEL TWA : 0.2 mg/m^3 (as Se)
- Value recommended by Japan Society for Occupational Health (2003) : 0.1 mg/m^3 (as Se)

Engineering Controls

Personal Protective Equipment (PPE)

Use appropriate PPEs such as

- gas mask (for acid vapors)
- impermeable protective gloves
- goggle-type eye protector.

9. Physical and Chemical Properties

- Appearance, etc. : Liquid
- Color : Clear and colorless
- Odor : Irritating odor
- pH : About 1.3
- Melting point : About 0 °C
- Boiling point : About 100 °C
- Flashing point : No data
- Explosive range : No data
- Vapor pressure : No data
- Relative vapor density(Air=1) : No data
- Specific gravity or bulk specific gravity : No data
- Solubility : Freely mixed with water
- *n*-Octanol/water partition coefficient (Log Po/w) : No data
- Auto-ignition temperature : No data
- Decomposition temperature : No data
- Flammability : No data
- Density : 1.007 g/cm^3 (25 °C)

10. Stability and Reactivity

Stability

- Stable in normal conditions

Reactivity

- React with alkali substances

Possibility of hazardous reaction

- No data

Conditions to avoid

- Sunlight and contact with alkali substances

Incompatible materials

- No data

Hazardous decomposition products

・No data

11. Toxicological Information

Acute Toxicity (RTECS)

(Nitric acid)		
Oral	Hamster	LDL_0: 430 mg/kg
Inhalation	Rat	LC50: 130 mg/m^3/4H
Dermal	Rat	TDL_0: 150mL/kg
(Arsenic trioxide)		
Oral	Mouse	LD_{50}: 31.5 mg/kg
Oral	Rat	LD_{50}: 14.6 mg/kg
(Selenous acid)		
Oral	Mouse	LD_{50}: 23.3 mg/kg
Oral	Rat	LD_{50}: 63.1 mg/kg

12. Ecological Information

Ecotoxicity

・No data

Persistence and Degradability

・No data

Bioaccumulative Potential

・No data

Mobility in soil

・No data

Influence to the ozone layer

・No data

13. Disposal Considerations

Residues	:	Dispose of in accordance with relevant laws and regulations of the country in which the material will be used. Entrust disposal of this reference material to a professional waste disposal company licensed by prefectural government. When entrusting waste disposal, entrust residues after adequately announcing the danger and hazard.
Contaminated containers and packaging	:	To dispose of an empty container, completely remove the contents.

14. Transport Information

UN Number	:	2031
UN Classification	:	Class 8
Shipping Name	:	Nitric acid other than fuming nitric acid with concentration of 20 weight % or less
Packing Group	:	PG Ⅱ
ICAO/IATA	:	Glass 8 Group Ⅱ
Marine Pollutant	:	Harmful liquid substance (Type C)
Precautions	:	Transport this reference material carefully while keeping it away

from direct sunlight and paying due attention to avoid accidental release due to dropping and turning over and fire.

15. Regulatory Information

◇ Poisonous and Deleterious Substances Control Act
- Article 2 Appendix Table 1: Toxic Substance (Arsenic compounds and formulation containing arsenic compounds)

◇ Ship Safety Law
- Hazardous Materials Regulations; Article 3; Hazardous Materials Notification Appendix Table; No.3 Corrosive Substance

◇ Civil Aeronautics Law
- Regulations for the Enforcement; Article 194; Hazardous Materials Notification Appendix Table; No.11 Corrosive Substance

◇ Port Regulation Law
- Regulations for the Enforcement; Article 12; Hazardous Materials Notification; Corrosive Substance

◇Industrial Safety and Health Law
- Article 57 (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. 307.

◇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

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.