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: May 13, 2011
Revised on: May 16, 2018
ID Number: 7202002

Identity of Substance/Mixture: Certified reference material: NMIJ CRM 7202-b
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.

2. Hazards Identification

GHS Classification:
- Acute toxicity (Oral): Hazard Category 5
- Acute toxicity (Inhalation: dust and mist): Hazard Category 5
- Skin corrosion/irritation: Hazard Category 3
- Serious eye damage/ eye irritation: Hazard Category 2A

GHS Label Element: Warning

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 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]
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 : H₂O
  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 : HNO₃
  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 : \( \text{As}_2\text{O}_3 \)
  Content : 1.10 \( \mu \)g/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
  CAS Number : 1327-53-3
  EINECS : 2154814

· Ingredient 4
  Chemical Identity : Selenium dioxide
  Chemical Formula or Structural Formula : \( \text{SeO}_2 \)
  Content : 1.00 \( \mu \)g/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
  CAS Number : 7446-08-4
  EINECS : 2311947

· 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.

  Hazardous Ingredient : Nitric acid, Arsenic trioxide and Selenium dioxide

4. First-aid Measures
  ◇ Eye Contact
    1. Irrigate eyes thoroughly with clean water.
  ◇ Skin Contact
    1. Flush exposed skin area thoroughly with clean water.
    2. Take off contaminated clothing and shoes. Seek medical examination/treatment.
  ◇ Inhalation
    1. Move the person to fresh air and keep him/her at rest and warm.
  ◇ Ingestion
    1. Have the person drink a large amount of water or milk.
2. Do not make the person vomit. Seek medical examination/treatment immediately.

5. Fire-fighting Measures

Extinguishing Media: CO₂, powder, sand, water, foam
Fire-Specific Hazards: -
Specific Fire-Fighting Method:
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

1. Prevent this reference material from flowing into drain sewers and public waterways.
2. In the event of massive spill, use earth, sand, etc. for spill prevention and recover this reference material.

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 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/m³, 2 ppm
- ACGIH TLV-STEI (2006): 10 mg/m³, 4 ppm
- Value recommended by Japan Society for Occupational Health (2006): 5.2 mg/m³, 2 ppm
- MSHA TWA: 5 mg/m³, 2 ppm
OSHA PEL TWA: 5 mg/m³, 2 ppm

Permissible Concentration (Arsenic trioxide)
- ACGIH TLV-TWA (2003): 0.01 mg/m³ (as As)
- OSHA PEL TWA: 0.01 mg/m³ (as As)

Permissible Concentration (Selenium dioxide)
- ACGIH TLV-TWA (2003): 0.2 mg/m³ (as Se)
- OSHA PEL TWA: 0.2 mg/m³ (as Se)
- Value recommended by Japan Society for Occupational Health (2003): 0.1 mg/m³ (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
- PPE for respiration

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: 1.000 g/cm³ (25 °C)
- Solubility: Freely mixed with water
- Octanol/water partition coefficient (Log Po/w): No data
- Auto-ignition temperature: No data

10. Stability and Reactivity
- Stability
  - Stable in normal conditions
- Reactivity
  - React with alkali substances
- Conditions to avoid
  - Sunlight and contact with alkali substances

11. Toxicological Information
Acute Toxicity (RTECS)
(Nitric acid)
Oral Hamster LDL0: 430 mg/kg
Inhalation Rat LC50: 130 mg/m³/4H
Dermal Rat TDL0: 150mL/kg
(Arsenic trioxide)
Oral Mouse LD50: 31.5 mg/kg
Oral Rat LD50: 14.6 mg/kg
(Selenium dioxide)
Oral Mouse LD50: 23.3 mg/kg
Oral Rat LD50: 63.1 mg/kg

12. Ecological Information
Persistence and Degradability
• No data available
Bioaccumulative Potential
• No data available
Ecotoxicity
• No data available

13. Disposal Considerations
• Entrust disposal of this reference material to a professional waste disposal company licensed by prefectural government.

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 : Not applicable
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)
  • Article 2 Appendix Table 1: Toxic Substance (Selenic compounds and formulation containing selenic 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 57-2 (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. 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.