

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
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 Emergency Contact : Same as above

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Reference No. : 7912001

Identity of Substance/Mixture : Certified Reference Material NMIJ CRM 7912-a Arsenate [As(V)] Solution
 Recommended Use of the Chemical and Restriction on Use : This CRM is intended for controlling the precision of analysis or to confirm the validity of analytical methods or instruments during the analysis of arsenate.
 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 (inhalation: dust and mist) : Class 4
 Skin corrosivity/irritant : Class 1A
 Severe damage to eye/eye irritant : Class 1
 Particular target organ/systemic toxicity (single exposure) : Class 1 (respiratory organ)
 Particular target organ/systemic toxicity (repetitive exposure) : Class 1 (respiratory organ)

GHS Label element :



Signal word : Danger
 Hazard and toxicity: Toxic if inhaled (Gas, vapor, dust, mist)
 Severe dermal damage, eye damage
 Severe eye damage

Damage to organs (respiratory organ)
Damage to organs due to longtime or repetitive exposure
(respiratory organ)

Precautionary Statement : [Precaution]
Wear protective glasses / face protection.
Wash hands thoroughly after handling.
[Action]
If inhaled: Remove victim to fresh air, and bite his nose and gargle.
Get medical advice/attention if you feel unwell.
If swallowed: Wash mouth and drink one or two glasses of water or milk. Immediately get medical advice/attention.
Rinse cautiously with clean water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.
If on skin: Rinse skin with running water. Get medical advice/attention if necessary.
[Storage]
Store in a dry environment at less than relative humidity of 60 %.
Close cap tightly and hermetically after use. Avoid exposure to acids and alkalis. This CRM is regulated poisonous substance and store in a locked and keyed area.
[Disposal]
Incinerate this reference material and its containers in an appropriate incinerator. Or entrust disposal of this reference material and its containers 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

Single or compound product : Compound product

•Component 1

Chemical name : Water
Chemical formula or structural formula : H₂O
Content : Approximately 95 %
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 No. : 7732-18-5

•Component 2

Chemical name : Nitric acid
 Chemical formula or structural formula : HNO_3
 Content : Approximately 5 %
 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 No : 7697-37-2

•Component 3

Chemical name : Arsenic acid
 Chemical formula or structural formula : H_3AsO_4
 Content : Approximately 0.02 %
 Reference Number in Gazetted List in Japan : Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc. : (1)-33
 Industrial Safety and Health Act : Published
 CAS No : 7778-39-4
 Hazardous component : Nitric acid, Arsenic acid

4. First-aid Measures

◇If in eye

- 1.Flush carefully with plenty of clean water. If using contact lenses, take out if possible and continue rinsing.
- 2.Get medical assistance

◇If on skin

- 1.Take off all the contaminated clothes, flush the skin with plenty of water using soap.
- 2.Get medical assistance

◇If inhaled

- 1.Move to get some fresh air and ease the breathing/respiration
- 2.Get medical assistance

◇If swallowed

- 1.Wash mouth thoroughly, do not induce vomit
- 2.Get medical assistance

◇Measures to be taken to protect the person applying first aid

- 1 Use personal protective equipment.

5. Fire-fighting Measures

Extinguishing media : This material itself is nonflammable, but use distinguishing medium compatible with the fire in the surrounding area
 Specific hazards at the time of fire : Decomposes when heated and may generates toxic gases such as nitrogen oxide and arsenic compounds
 Specific extinguishing measures : Transfer the movable containers to a safe place promptly. If impossible to move, cool the periphery by water-spray,

Extinguishing activity from windward to avoid inhaling toxic gas

Protecting fire-fighting personnel. : Fire-safe clothing, air-breathing apparatus, self-contained compressed air breathing apparatus, rubber boots

6. Accidental Release Measures

Personal precaution, protective equipment and emergency procedure : If released indoor, ventilate well until the treatment is completed
Use appropriate protective equipment to avoid contact with eye and skin, inhaling vapor and mist.
Rope-off the leaked area to limit the access to authorized personnel only.

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.

Recovery, neutralization : Remove the spilled liquid as much as possible by adsorbing to diatom earth and then neutralize the rest with sodium carbonate, etc. and wash out the contaminated spot with plenty of water.

7. Handling and Storage

Handling

- Use appropriate protective equipment to prevent inhaling vapor, contact with eye and skin.
- Wash hands, face well, and gargle. after handling.
- No eating, drinking and smoking when handling.

Storage

- Protect from light at room temperature in a clean place.
 - 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

Administrative levels

Standards of work environment evaluation : $3 \mu\text{g}/\text{m}^3$ (as As)

Occupational exposure limit

1. Arsenic acid

- ACGIH TLV-TWA : $0.2 \text{ mg(As)}/\text{m}^3$
- Japan Society for Occupational Health Recommended Reference Value : $3 \mu\text{g}/\text{m}^3$ (excess lifetime carcinogenesis risk level of 10^{-3})
 $0.3 \mu\text{g}/\text{m}^3$ (excess lifetime carcinogenesis risk level of 10^{-4})
- OSHA PEL 8H-TWA : $0.5 \text{ mg(As)}/\text{m}^3$

2. Nitric acid

- ACGIH TLV-TWA : 2 ppm

- Japan Society for Occupational Health Recommended Reference Value : 2 ppm, 5.2 mg/m³

Facility engineering control

- Use local ventilation system when handling
- Install emergency eye washer and shower near the handling place and indicate the facility location conspicuously.

Protective equipment

- Breathing apparatus, protective gloves, safety goggles, protective clothing, protective mask

9. Physical and Chemical Properties

- Appearance, etc. : Liquid (normal temperature)
- Color : Clear and colorless
- Odor : No data
- pH : Strong acidity
- Melting point : No data
- Boiling point : No data
- 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 : No data
- n*-Octanol/water partition coefficient (Log Po/w) : No data
- Auto-ignition temperature : No data

10. Stability and Reactivity

◇Stability

- Stable under normal condition
- Decomposes when heated, generates nitrogen oxide gas
- Generates arsenic compound gas when heated, and may inhale as vapor

◇Reactivity

- Reacts in contact with alkaline materials

◇Conditions to avoid

- Sunlight, heat and alkaline substances

◇Hazardous decomposition products

- Nitrogen oxide, arsenic compound

11. Toxicological information

<Nitric acid>

Acute toxicity (Inhalation:dust and Rat inhalation LC50=0.067mg/L/4H (HNO₃))

mist)	Classified 4, as it contains approximately 5 % of class 2 nitric acid
Skin corrosivity and irritancy	Classified 1A, as it contains approximately 5 % of Class 1A nitric acid
Severe damage to eye/eye irritancy	Classified 1, as it contains approximately 5% of Class 1 nitric acid
Particular target organ/systemic toxicity (Single exposure)	It is stated that when humans inhale the vapor generated from nitric acid, irritation in upper respiratory track, cough, breathing difficulty, chest pain occurred; moreover, depending on the exposure concentration or time, it may cause emphysema
Particular target organ/systemic toxicity (repetitive exposure)	It is stated that occupational exposures to the mist or vapor generated from nitric acid caused chronic bronchitis and dental erosion, etc.
<Arsenic acid> Acute toxicity (Inhalation:dust and mist)	Oral-rat LD50:48mg/kg Oral-rat LDLo:5mg/kg Based on the test using peroral administration to rats LD50 48mg/kg (RTECS (2006))
Carcinogenicity	As arsenic series inorganic compound, it is categorized as K (Arsenic Compounds, inorganic) by NTP (2005)、Group 1 (ARSENIC AND ARSENIC COMPOUNDS) by IARC (1987)、A1 (Arsenic and inorganic compounds) by ACGIH (2001)、and Class 1 (Arsenic and arsenic compounds (as As)) by Japan Society for Occupational Health
Reproductive toxicity	Peroral administration test performed by giving dosages having general toxicity impact to mother animals resulted in the increase of absorbing embryo and weight loss of fetus (EHC 224 (2001))
Particular target organ/systemic toxicity (Single exposure)	To humans, it is stated that 'acute toxicity of arsenic compounds affects digestive tract, circulatory organ, nerves, hematological symptoms, conjunctival inflammation, dermatitis, and also the irritation of nasal membrane, pharynx and trachea, frequent micturition or anuria due to tubular blockage by hemoglobin clot' (IARC 84 (2004)), 'suppression of bone-marrow function, enlargement of the liver' (EHC 224 (2001)) etc. Based on this description, digestive tract, circulatory organ, nerve, blood system, respiratory organ, skin,

Particular target organ/systemic toxicity (repetitive exposure)

kidney, bone marrow and liver are considered the particular target organs
Chronic toxicity to humans are stated as 'various upper respiratory symptoms including nasopharyngitis and nasal septal perforation', 'breathing problem deriving from drinking water', 'pigment deposition and keratosis', 'hepatic cirrhosis', 'cardiovascular abnormality', 'peripheral vascular disorder' (IARC 84 (2004)), etc.
Based on the description, respiratory organ, skin, liver, cardiovascular are considered the related target organs

12. Ecological Information

Degradability, concentration

•No data available

Bioaccumulation

•No data available

Ecotoxicity

•Fish (striped bass) 96 hours LC50=30.5 mg As/L (EHC224, 2001)

13. Disposal Considerations

- Disposal shall be in compliance with the ordinances and regulations of local authorities
- Disposal of an empty container shall be after removing/decontaminating the content completely.

14. Transport Information

UN Number : 1553

UN Classification : Class 6.1(Poisonous substance) Group I

Shipping Name : ARSENIC ACID, LIQUID

Packing Group PG I

ICAO/IATA UN1553

Marine pollutant : Not applicable

Precautions : Transfer with care avoiding direct sunlight, leakage or spill due to fall or drop.
Keep the container away from fire sources.

15. Regulatory Information

◇Poisonous and Deleterious Substances Control Act

- Article 2 Appended Table No. 1 Poisonous Substances (Arsenic compounds and the formulation containing the substances)

◇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.307
- Cabinet Order Appended Table No. 3 Ordinance on Prevention of Hazards Due to Specified Chemical Substances (Class 3 Substance) (Formulation containing nitric acid)
- ◇ Law Relating to the Prevention of Marine Pollution and Maritime Disaster
 - Enforcement Order Appended Table No. 1 Toxic liquid substance (Group Y) (Nitric acid)
- ◇ Ship Safety Act
 - Regulations for the Carriage and Storage of Dangerous Goods in Ships Article 3 Hazardous Materials Public Notice Appended Table No. 1 Corrosive substances (Nitric acid)
 - Regulations for the Carriage and Storage of Dangerous Goods in Ships Article 3 Hazardous Materials Public Notice Appended Table No. 1 Poisonous substances (Arsenic acid (liquid))
- ◇ Civil Aeronautics Act
 - Enforcement Order Article 194 Hazardous Materials Public Notice Appended Table No.1 Corrosive substances (Nitric acid)
 - Enforcement Order Article 194 Hazardous Materials Public Notice Appended Table No.1 Poisonous substances (Arsenic acid (liquid))
- ◎ **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.
