

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

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Identity of Substance/Mixture : Certified reference material: NMIJ CRM 3681-a
 Lead Isotopic Standard Solution
 Recommended Use of the Chemical and Restriction on Use : This CRM is intended as a standard for isotope ratio measurement in mass spectrometer. 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: Metal corrosives : Hazard Category 1
 Skin corrosion/irritation : Hazard Category 1A
 Serious eye damage/ Eye irritation : Hazard Category 1
 Respiratory organ sensitization : Hazard Category 1
 Carcinogenicity : Hazard Category 2
 Reproductive toxicity : Hazard Category 1A
 Specific target organ toxicity/Systemic toxicity (Single exposure) : Hazard Category 2
 Specific target organ toxicity/Systemic toxicity (Repeated exposure) : Hazard Category 2
 Water environment toxicity (Acute) : Hazard Category 3

GHS Label Element:



Signal Word: Danger
 Other Hazards Statement: Metal corrosives
 Causes severe chemical injury and eye damage
 Causes serious eye damage
 Suspected of causing cancer

Precautionary
Statement:

May damage fertility or the unborn child
 May cause allergy, asthma or breathing difficulty if inhaled
 Harmful to aquatic life
 May cause damage to the following organ: Respiratory system
 May cause damage to the following organs through prolonged or repeated exposure: Respiratory system and tooth

[Precaution]
 Do not breathe dust, mist, vapors, etc.
 Avoid release to the environment.
 Do not eat, drink or smoke when using this product.
 Use appropriate personal protective equipment.
 Wash personal protective equipment thoroughly after use.
 Wash hands thoroughly after handling.

[Action]
 If inhaled: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical advice/attention if you feel unwell.
 If swallowed: Rinse mouth. Do not induce vomiting. Immediately get medical advice/attention.
 If in eyes: Rinse with running water for several minutes. Get medical advice/attention.
 If on skin: Remove/Take off all contaminated clothing and adhered materials. Rinse skin with running water. Immediately get medical advice/attention.
 If exposed: Get medical advice/attention.

[Storage]
 The solution of this CRM should be kept in the high-density polyethylene bottle sealed in the plastic bag. This CRM should be kept in a clean refrigerator (less than 10 °C) where the solution could not be frozen.

[Disposal]
 Dispose of this reference material in accordance with applicable legislation and local government ordinance.
 Entrust disposal of this reference material to a professional waste disposal company licensed by prefectural governor.

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

3. Composition/Information on Ingredients

Substance or mixture	: Mixture	:
Compound 1	: Lead	
Amount	: 0.1 %	
Chemical or structural formula	: Pb	

Atomic weight	:	207.2
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.	:	7439-92-1
Compound 2	:	Nitric acid
Amount	:	2.4 %
Chemical or structural formula	:	HNO ₃
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 No.	:	7697-37-2
Compound 3	:	Water
Amount	:	97.5 %
Chemical or structural formula	:	H ₂ O
Molecular weight	:	18.02
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
Hazardous substance	:	Nitric acid

4. First-aid Measures

If in Eyes	:	Rinse cautiously with clean water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical advice/attention immediately.
If on Skin	:	Remove/Take off contaminated clothing, etc. Rinse thoroughly with clean water. Wash polluted clothing, if reuse them.
If Inhaled	:	Remove victim to fresh air and keep at rest and warm. Get medical advice/attention immediately.
If Ingested	:	Rinse mouth thoroughly with water. Do not induce vomiting, if it is not the instructions from a doctor. Get medical advice/attention when feeling unwell.
Predicted immediate and delayed symptoms	:	Inhalation of nitric acid vapor may cause throat burning sensation, sore throat, cough, breathlessness, and pulmonary edema, These symptoms may be delayed. If on skin, causing redness, pain, blurred vision, severe burns.
Most important symptom/effect	:	-

Protecting Personnel in emergency measures : Wear protective equipment such as rubber gloves, eye protective goggles.

5. Fire-fighting Measures

- Extinguishing Media : This material is incombustible, use a fire extinguishing agent suitable for surrounding fire.
- Fire-Specific Hazards : In the case of fire, irritating or toxic fume (or gas) may be generated.
- 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 fire protection clothing, heat-resistant clothing, protective clothing, breathing apparatus, circulating oxygen respirator, rubber gloves, and rubber boots.

6. Accidental Release Measures

- Personal Precaution : Use appropriate personal protective equipment during the operation to avoid contact with skin, eyes, and clothes.
- Personal Protective Equipment and Emergency Procedures : Ventilate the affected areas thoroughly, if it is in an indoor 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 earth and sand, etc. Then neutralize with slaked lime or soda ash, and wash away with a large amount 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 : Use appropriate personal protective equipment to avoid inhalation and contact with eyes and skin.
- Local and General Ventilation : When vapor or mist is generated, seal the source, and provide local exhaust ventilation or central ventilation.
- Precautions for Safe : Avoid rough handling such as turning over, dropping, giving a

Handling	<p>shock to or dragging containers.</p> <p>Prevent spill, overflow and scattering, and avoid vapor generation.</p> <p>Keep container tightly closed after using this reference material.</p> <p>Wash hands, face etc. thoroughly and gargle after handling this reference material.</p> <p>Restrict drinking, eating and smoking to a designated area.</p> <p>Do not bring gloves and other contaminated personal protective equipment into staff room.</p> <p>Make a place handling this reference material a restricted area to keep out unauthorized people.</p> <p>Use appropriate personal protective equipment to avoid inhalation and contact with eyes, skin and clothing.</p> <p>Use local ventilation system in indoor handling areas.</p>
Storage	
Appropriate Storage Conditions	: The solution of this CRM should be kept in the high-density polyethylene bottle sealed in the plastic bag. This CRM should be kept in a clean refrigerator (less than 10 °C) where the solution could not be frozen.
Safe Container Packaging Material	: Polyethylene

8. Exposure Controls/Personal Protection

Threshold Limit Value	: • Not specified
Permissible Concentration (Nitric acid)	
• ACGIH	: STEL:4 ppm, TWA:2 ppm
• Values recommended by Japan Society for Occupational Health	: 2 ppm, 5.2 mg/m ³
• OSHA PEL TWA	: 8H TWA 2 ppm, 5 mg/m ³
Permissible Concentration (Lead)	:
• ACGIH	: TWA:0.05 mg/m ³
Facility engineering	
• Ventilation, exhaust	: Local exhaust ventilation system or general ventilation system
• Safety management/ gas detector	: Measuring instrument, detector tube
• Storing precaution	: Ventilate along floor surface. Seal.
Personal Protective equipment	
Respiratory protection	: Protective gas mask
Hands	: Impervious protective gloves
Eyes	: Eye protector (Goggle type as necessary)
Skin and Body	: Protective clothing (long-sleeved work clothes), protection boots, protective clothing, etc.
Hygiene measure	

Treat in accordance with rules on Industrial hygiene and Industrial safety.

9. Physical and Chemical Properties

• Appearance, etc.	:	Liquid
• Color	:	Colorless
• Odor	:	Odorless
• pH	:	Strong acid
• Melting point	:	Ca. 0 °C
• Boiling point	:	Ca. 100 °C
• Flashing point	:	Non-flammable
• 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 in water and soluble in ethanol
• <i>n</i> -Octanol/water partition coefficient (Log Po/w)	:	No data
• Auto-ignition temperature	:	No data

10. Stability and Reactivity

◇Stability

- Stable in normal conditions

◇Reactivity

- This material may corrode metal to generate hydrogen gas.

◇Conditions to Avoid

- Sunlight, Heat

◇Hazardous Decomposition Products

- Nitrogen oxides (NO_x)

11. Toxicological Information

Acute Toxicity	(as nitric acid)
	Oral Human LD ₅₀ =430 mg/kg
	Inhalation Rat LC ₅₀ =130 mg/m ³ /4 h
	Dermal Rat TDLo=150 ml/kg
Skin Corrosion/Irritation	There is a description of corrosivity of nitric acid on human skin (ICSC (1994) and HSDB (2005)).
Serious Eye Damage/ Eye Irritation	If in eyes, nitric acid causes thermal burn and may cause corneal opacity, visual impairment and eventually blindness.
Carcinogenicity	Lead is classified as R in NTP (2005), Group 2B in IARC (1987), A3 in ACGIH (2001) and 2B in Japan Society for Occupational Health.
Reproductive Toxicity	Lead is known as developmental neurotoxic substance and

<p>Specific Target Organ Toxicity/Systemic Toxicity (Single Exposure)</p>	<p>reproductive toxic material for humans.</p> <p>When humans inhale vapor generated from nitric acid, irritation of upper airway, coughing, breathing difficulty or pain of breast are caused. Pulmonary edema may be caused, depending on the exposure concentration and exposure time. (ACGIH (2001), DFGOT vol.3 (1991), ICSC (J) (1994), HSDB (2005))</p> <p>It was reported that inhalation or oral ingestion of inorganic lead caused contraction and thirst in mouth and such impacts on digestive organs as nausea, vomiting, discomfort in epigastrium, anorexia, abdominal pain and constipation. Impacts on blood-producing functions are typical actions of inorganic lead. Hemoglobin synthesis inhibition due to inhibition of δ-aminolevulinic acid and heme synthetase as well as anemia due to shortened red blood cell life span were observed. The reported impacts on kidney include interstitial nephropathy and oliguria as well as proximal tubule disorder developing Fanconi syndromes such as albuminuria, hematuria, urinary casts, glycosuria and aminoaciduria. Inorganic lead also acts on peripheral nervous system, particularly causing weakness, pain and spasm of limb muscle. Though rare in adults, exposure to extremely high concentration of inorganic lead (the details are uncertain) caused impacts on central nervous system including ataxia, cephalalgia, abnormal perception, depression and lethargy. Children are, however, highly sensitive to the impacts on central nervous system, and symptom accompanied by restlessness, aggressive personality, difficulty in concentrating and deterioration of memory has become an issue in the U.S. (CERI Hazard Data Collection 2001-9 (2002))</p>
<p>Specific Target Organ Toxicity/Systemic Toxicity (Repeated Exposure)</p>	<p>It was reported that occupational exposure to mist or vapor generated from nitric acid caused chronic bronchitis and tooth erosion. (ACGIH (2001)) and tooth erosion (ACGIH (2001), DFGOT vol.3 (1994))</p> <p>Almost the same symptoms were observed for acute and chronic effects of inorganic lead.</p>

※The Toxicological Information is based on the information of raw materials, because there is not the available information as the mixture. This reference material is stable under the normal condition, and there is not the danger that a noxious additive ingredient elutes, however, when handling this reference material under special conditions such as the use under the high temperature etc., it is recommended to take safety precautions appropriate to use.

12. Ecological Information

Degradability, concentration

- No data available

Bioaccumulation

- No data available

Ecotoxicity

- Crustacea(Daphnia magna) 48H EC50=0.492 mg/l EC50=0.492 mg/L

13. Disposal Considerations

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

14. Transport Information

- UN number : UN2031
- UN classification : Corrosives.(Class 8)
- Name : Nitric, excluding fuming nitric acid with a concentration less 20%
- Container class : PG II
- Marine pollutant : N/A
- Precaution : Transport carefully avoiding direct sun light, prevent the container from leaking, spilling due to fall or dropping.

15. Regulatory Information

- ◇Poisonous and Deleterious Substances Control Act
 - N/A
- ◇Industrial Safety and Health Act
 - 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
 - Class 3 Specified Chemical Substances
- ◇Water Pollution Control Act
 - N/A
- ◇Soil Contamination Countermeasures Act
 - N/A
- ◇Act for the Prevention of Marine Pollution and Maritime Disasters
 - Enforcement Order Appendix 1 Hazardous Liquid Substance Class Y Substance
- ◇Ship Safety Law

- Regulations for the Carriage and Storage of Dangerous Goods in Ship, Article 3
Corrosive substance
- ◇ Civil Aeronautics Act
 - Ordinance for Enforcement of the Civil Aeronautics Act, Article 194 Corrosive
substance

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.
