

Safety Data Sheet



1. Identification of the Substance/Mixture and the Supplier

Supplier : National Institute of Advanced Industrial Science and Technology (AIST)

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Person in Charge : Certified Reference Material Staff

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Identity of Substance/Mixture : Certified reference material NMIJ CRM 3002-a
Potassium Dichromate

Recommended Use of the Chemical and Restriction on Use : This CRM can be used for the primary standard in titrimetric analysis. Do not use this reference material for other purposes than testing/research.

2. Hazards Identification

GHS Classification:

Skin corrosion/irritation	: Hazard Category 1A
Serious eye damage/ Eye irritation	: Hazard Category 1
Acute toxicity (Oral)	: Hazard Category 3
Acute toxicity (Dermal)	: Hazard Category 4
Acute toxicity (Inhalation)	: Hazard Category 2
Respiratory organ sensitization	: Hazard Category 1
Skin sensitization	: Hazard Category 1
Germ cell mutagenicity	: Hazard Category 1B
Carcinogenicity	: Hazard Category 1A
Reproductive toxicity	: Hazard Category 1B
Specific target organ toxicity/Systemic toxicity (Single exposure)	: Hazard Category 1 (Kidney, Central nervous system, Liver, Blood system, Respiratory organ, Heart)
Specific target organ toxicity/Systemic toxicity (Repeated exposure)	: Hazard Category 1 (Liver)
Hazardous to the aquatic environment (Acute)	: Hazard Category 1
Hazardous to the aquatic	: Hazard Category 1

GHS Label Element:	environment (Chronic) 
Signal Word:	Danger
Hazards Statement:	Harmful if swallowed Harmful if contacted with skin Harmful to life if inhaled Causes serious chemical burn of skin / eye damage Causes serious eye damage May cause allergy, asthma or dyspnea if inhaled May cause allergic skin reaction May cause cancer May cause hereditary disease May damage fertility or the unborn child Causes damage to organs (Kidney, Central nervous system, Liver, Blood system, Respiratory organ, Heart) Causes damage to organs by prolonged or repeated exposure (Liver) Very toxic to aquatic life Very toxic to aquatic life with long lasting effects
Precautionary: Statement	[Precaution] Do not use or handle this reference material before reading and understanding all safety precautions. Do not drink, eat or smoke when using this reference material. Avoid breathing dust/fume etc. Use eye protector/face protector/protective gloves. Use only outdoors or in a well-ventilated area. Wash hands thoroughly after handling this reference material. Avoid release of this reference material to surrounding environment. [First-Aid Measure] If ingested: Flush mouth. Induce vomiting if possible. Get medical advice/attention immediately. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical advice/attention. If inhaled: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical advice/attention immediately. If on skin: Remove/Take off all contaminated clothing immediately. Wash exposed skin area with plenty of soap and water (running water/shower). Get medical advice/attention. If feeling unwell: Get medical advice/attention. Skin irritation: Get medical advice/attention. If exposed or concerned: Get medical advice/attention. Wash contaminated clothing before reuse.

[Storage]

Store in a closed container in a well-ventilated place.

Store in a locked area.

[Disposal]

Entrust disposal of this reference material and its container to a professional waste disposal company licensed by national, prefectural or local government.

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

3. Composition/Information on Ingredients

Substance or Mixture	: Substance
Chemical Identity	: Potassium Dichromate
Synonym	: Potassium Dichromate
Concentration or	: 99.9 %
Concentration Range	
Chemical Formula	: $K_2Cr_2O_7$
Molecular Weight	: 294.18
Reference Number in	: Act on the Evaluation of Chemical Substances and Regulation of
Gazetted List in Japan	Their Manufacture, etc. : (1)-278
	Industrial Safety and Health Act : Published
CAS Number	: 7778-50-9
Hazardous Ingredient	: Potassium Dichromate

4. First-aid Measures

If Ingested	: Flush mouth. Make victim drink plenty of water to induce vomiting. Get medical advice/attention immediately.
If in Eyes	: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical advice/attention.
If on Skin	: Take off/Remove all contaminated clothing immediately. Wash exposed skin area with plenty of soap and water (running water/shower). Get medical advice/attention.
If Inhaled	: Remove victim to fresh air. Make victim blow his/her nose and gargle. Keep victim warm and at rest. Get medical advice/attention immediately.

5. Fire-fighting Measures

Extinguishing Media	: Plenty of water
Fire-Specific Hazards	: Use respiratory protective equipment as irritating or harmful fume or gas is generated in the case of fire.
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 compressed air open-circuit self-contained breathing apparatus.

6. Accidental Release Measures

Personal Precaution : Ventilate the affected areas thoroughly, if it is in an indoor environment, until the clean-up operation is completed. 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.

Personal Protective Equipment and Emergency Procedures : Use appropriate personal protective equipment during the operation to avoid skin contact of splash etc. and inhalation of 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 as much as possible. Then spray aqueous solution of reducing agent (ferrous sulfate etc.) and treat spillage with aqueous solution of hydrated lime, soda ash, etc. And finally rinse away the remains with plenty of water.

7. Handling and Storage Precautions

Handling Engineering Precautions : Strictly ban on fire. Avoid mixing/contact with combustible substances and reducing substances as this reference material is a strong oxidizer.

Local and General Ventilation : Use local ventilation system in indoor handling areas.

Precautions for Safe Handling : Avoid rough handling such as turning over, dropping, giving a shock to or dragging containers. Prevent spill, overflow and scattering, and avoid vapor generation. Keep container tightly closed after using this reference material. Wash hands, face etc. thoroughly and gargle after handling this reference material. Avoid drinking, eating and smoking when handling this reference material. Do not bring gloves and other contaminated personal protective equipment into staff room.

Make a place handling this reference material a restricted area to keep out unauthorized people.

Use appropriate personal protective equipment to avoid inhalation and contact with eyes, skin and clothing.

Storage

Appropriate Storage Conditions : Store in a closed container in room-temperature environment with humidity of 60% or less.

Protect this reference material from effects of acids and alkalis.

Do not store this reference material in the vicinity of ignition source.

Store in a locked area.

Safe Container : Glass, Polyethylene, etc.

Packaging Material

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

8. Exposure Controls/Personal Protection

Threshold Limit Value/ Working Environment Evaluation Criteria

0.05 mg/m³ (as Cr)

Permissible Concentration

- OSHA PEL : air CL 0.1 mg(CrO₃)/m³
- ACGIH TLV : TWA 0.05 mg/(Cr)/m³
- Value recommended by Japan Society for Occupational Health : 0.05 mg/m³ (as Cr)

Engineering Controls

- Keep container tightly closed and install local ventilation system when using this reference material in an indoor workplace.
- Install facilities to rinse eyes and to wash hands and body in the vicinity of a place handling this reference material and label them clearly.

Personal Protective Equipment (PPE)

Respiratory System : Dust protective mask, Compressed air open-circuit self-contained breathing apparatus

Hands : Protective gloves

Eyes : Eye protector

Skin and Body : Protective clothing, Protective boots

Hygiene measure

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

9. Physical and Chemical Properties

- Appearance, etc. : Powder
- Color : Red-orange color
- Odor : No data

- pH : No data
- Melting point : No data
- Boiling point : 398 °C
- Flashing point : Decomposed at 500 °C or higher
- Explosive range : No data
- Vapor pressure : No data
- Relative vapor density(Air=1) : No data
- Specific gravity or bulk specific gravity : 2.7 g/cm³
- Solubility : Soluble in water, Insoluble in alcohol
- *n*-Octanol/water partition coefficient (Log Po/w) : No data
- Auto-ignition temperature : No data

10. Stability and Reactivity

Stability/Reactivity

Strong oxidizer

May be ignited or exploded if being mixed with combustible substances and reducing agents

Conditions to Avoid

- Sunlight, Heat

Hazardous Decomposition Products

- Chromium fume

11. Toxicological Information

Acute Toxicity	<ul style="list-style-type: none"> Oral Rat LD50:25 mg/kg (RTECS) Abdominal cavity Rat LD50:28 mg/kg (RTECS) Oral Mouse LD50:190 mg/kg (RTECS) Abdominal cavity Mouse LD50:37 mg/kg (RTECS) Dermal Mouse LDLo:100 mg/kg (RTECS) <p>LD50=62mg/kg is obtained, by applying calculation formula, based on LD 50 of the oral administration studies using rats: 177 mg/kg (EHC 61(1988)), 149 mg/kg (EHC 61(1988)), 74 mg/kg (EU-RAR No.53(2005)) and 48 mg/kg (EU-RAR No.53(2005)).</p> <p>Based on LD50 of the dermal administration study using rabbit: 1150 mg/kg (EU-RAR No.53(2005))</p> <p>Based on LC50 of the inhalation exposure study using rats (dust/mist): 0.099 mg/L (EU-RAR No.53(2005))</p>
Skin Corrosion/ Irritation	<p>Corrosive, attacking skin and mucous membrane of nose, throat and bronchial tube</p> <p>Results of the skin irritation study using rabbits: “Erythema and edema of Grade 3 or below were observed when this reference material was applied in saline solution or in wet condition. The reactions were observed even six days after though they got</p>

	<p>weaker. In general, the same reactions were observed on abraded skin.” (EU-RAR No.53(2005))</p>
	<p>Corrosion was observed also in repeated or prolonged exposure according to the skin irritation studies using guinea pigs “skin ‘sores” (EU-RAR No.53 (2005)), “skin sores” (ATSDR (2000)) and occupational exposure case report.</p>
<p>Serious Eye Damage/ Eye Irritation</p>	<p>Suspected of causing eye corrosion, though it is not clear whether or not it is reversible or how reversible or irreversible it is, based on 1) the case reported in ATSDR (2000) occupational exposure report on potassium dichromate, i.e. “In the accident, crystalline or liquid potassium dichromate got into worker’s eyes and vesicle was observed on the cornea.” and 2) EU-RAR No.53 (2005) exposure report on hexavalent chromium.</p>
<p>Respiratory or Skin Sensitization</p>	<p>Airway sensitizer Group 2 (substance suspected of causing hypersensitivity in humans) Skin sensitizer Group 1 (substance to clearly cause hypersensitivity in humans) (Recommendation on permissible concentration etc.) Respiratory sensitization: Based on the existing classification information, Japanese Society of Occupational and Environmental Allergy classifies chromium as a substance with respiratory sensitization and Japan Society of Occupational Health classifies chromium as airway sensitizer “Group 2.” These existing classifications seem to include chromium compounds though they explicitly refer to this reference material. Skin sensitization: Based on 1) the “positive” result in the sensitization study using guinea pigs in ATSDR(2000), EHC 61(1988) and EU-RAR No.53(2005) and 2) the patch test result “developed contact dermatitis (demonstrating skin sensitization)” in the occupational exposure reports of CaPSAR (1994), DFGOT vol.15 (2001), EHC 61 (1988) and ECETOC TR45 (1994).</p>
<p>Germ Cell Mutagenicity</p>	<p>Positive result based on the inter-generation mutagenicity study (dominant lethal test) of IARC 49 (1990), EHC 61 (1988) and NTP DB (access on October 2005)</p>
<p>Carcinogenicity</p>	<p>Classified as Cr(VI) compound in K(as Chromium Hexavalent(VI) compounds): NTP (2005) in A1(as Water-soluble Cr VI Compounds): ACGIH (2001) in 1(as Chromium(VI)): IARC (1990) in K(expected to carcinogenic in humans): NTP in Group 1(carcinogenic in humans): IARC in A1(known to be carcinogenic): ACGIH</p>
<p>Reproductive Toxicity</p>	<p>Effects were observed in fertility of parent animals and development of fetus animals at dose indicating no toxic effects on parent animals, based on EU-RAR No.53 (2005), ATSDR</p>

Specific target organ toxicity/Systemic toxicity (Single exposure)	(2000), HC 61 (1988) and IARC 49 (1990) For humans, “oliguria, urinary retention and hyper-hydration” were reported in EHC 61 (1988) and “cerebral dilatation and edema, liver necrosis, kidney achromasia and hypertrophy, necrosis of uriniferous tubule and edema, drop of hemoglobin concentration and hematocrit, increase of total leukocyte count, increase of reticulocyte, increase of plasma hemoglobin, lung blood congestion, pleura effusion, drop of cardiac output/heart rate/blood pressure and bleeding from frontal papillary muscle of left ventricle” were reported in ATSDR (2000), etc.
Specific target organ toxicity/Systemic toxicity (Repeated exposure)	For humans, “necrosis and blood congestion of blood” were reported in EHC 61(1988), etc.

12. Ecological Information

Persistence and Degradability

No data available

Bioaccumulative Potential

No data available

Ecotoxicity

Crustacean (*Moia macrocopa*) 48 hours EC50=0.0225 mg/L (ECETOC TR91 (2003))

13. Disposal Considerations

- Dispose of this reference material in accordance with applicable legislation and local government ordinance.
- Dispose of containers after thoroughly removing their contents.

14. Transport Information

UN Number	: 3288
UN Classification	: Class 6.1 (Toxic)
Shipping Name	: TOXIC SOLID, TOXIC, N.O.S.
Packing Group	: PG III
ICAO/IATA	: UN3288
Marine Pollutant	: Applicable
Precautions	: When transporting this reference material, make it sure that its containers are not leaky, load it in a way to prevent turning over, dropping and being damaged, and take appropriate measures to avoid collapse.

15. Regulatory Information

Fire Defense Law

- Class 1 Type 3 Oxidizing solid (Dichromate) Danger Rating 3

Poisonous and Deleterious Substances Control Law

- Deleterious substance Packing Grade 3

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.142
- Enforcement Order Appendix 1-3 Oxidizing Materials
- Ordinance on the Prevention of the Hazard due to Specified Chemical Substances Class 2 substance
- Working Environment Measurement Criteria, Working Environment Evaluation Criteria

Ship Safety Law

- Oxidizing substance group

Civil Aeronautics Act

- Oxidizing substance

Pollutant Release and Transfer Register Act (PRTR Act)

- Specified Class 1 Designated Chemical Substance No.88

Water Pollution Control Act

- Article 2-2 (Hazardous substance)

Soil Contamination Countermeasures Act

- Specified hazardous 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.
