Safety Data Sheet

1. Product and company identification
   - Product name: Potassium dichromate
   - Name of manufacturer: KANTO CHEMICAL CO., INC.
   - Address: 2-1, Nihonbashi, Muromachi 2-Chome, Chuo-Ku, Tokyo, 103-0022, Japan
   - Name of section: Reagent division, catalog and products information section
   - Telephone number: +81-3-6214-1090
   - Facsimile number: +81-3-3241-1047
   - Mail address: BC32@gms.kanto.co.jp
   - SDS No.: 32334

2. Summary of danger and Hazard
   - GHS classification
     - Physical and chemical hazard
       - Flammable solids: Out of category
       - Pyrophoric solids: Out of category
       - Self-heating substances and mixtures: Out of category
       - Substances and mixtures which, in contact with water, emit flammable gases: Out of category
     - Human health hazard
       - Acute toxicity (oral): Category 2
       - Acute toxicity (dermal): Category 3
       - Acute toxicity (inhalation: dust, mists): Category 1
       - Skin corrosion・Irritation: Category 1A
       - Serious eye damage・Eye irritation: Category 1
       - Respiratory sensitization: Category 1
       - Skin sensitization: Category 1
       - Germ cell mutagenicity: Category 1B
       - Carcinogenicity: Category 1A
       - Reproductive toxicity: Category 1B
       - Specific target organ systemic toxicity (single exposure): Category 1
       - Specific target organ systemic toxicity (repeated exposure)
Environmental hazard
Hazardous to the aquatic environment—acute hazard
: Category 1
Hazardous to the aquatic environment—chronic hazard
: Category 1

Pictogram or symbol

Signal word : Danger
Hazard statement : Fatal if swallowed
Toxic in contact with skin
Fatal if inhaled
Causes severe skin burns and eye damage
Causes serious eye damage
May cause allergy or asthma symptoms or breathing difficulties if inhaled
May cause an allergic skin reaction
May cause genetic defects
May cause cancer
May damage fertility or the unborn child
Causes damage to organs (kidneys, central nervous system, liver, blood, respiratory organs, heart)
Causes damage to organs (liver) through prolonged or repeated exposure

Cautions
Safety measurements : Do not handle until all safety precautions have been read and understood.
Do not breathe dust, mist, and vapor.
Use only in a well-ventilated area.
Avoid release to the environment.
Do not eat, drink or smoke when using this product.
Contaminated work clothing should not be allowed out of the workplace.

Wear appropriate protective gloves, glasses, clothing, face shield, or mask.
Wash protective equipment thoroughly after use.
Wash hands thoroughly after handling.

First-aid measures : If inhaled: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately get medical treatment.
If swallowed: Induce vomiting, if possible, and rinse mouth. Immediately get medical treatment.
If in eyes: Rinse cautiously with water for several minutes. Get medical treatment.
If on skin: Remove contaminated clothing and the substance. Immediately get medical treatment.
If exposed, get medical treatment.
Get medical treatment, if you feel unwell.
Collect leakage

Storage: Tightly container closed and store in a well-ventilated area.
Store locked up.

Disposal: Dispose of contents and containers appropriately in accordance with related regulations.

3. Composition/Information on ingredients
Substance/Mixture: Substance
Chemical name or commercial name: Potassium dichromate
Synonyms: Red potassium chromate
Ingredients and composition: Potassium dichromate min. 99.5%
Chemical formula: K2Cr2O7
CAS No.: 7778-50-9
TSCA Inventory: Registered
EINECS No.: 2319066
Dangerous and hazardous ingredients: Potassium dichromate

4. First aid measures
Inhalation: Remove the victim to fresh air. and make him blow his nose and gargle.
Skin contact: Wash the affected areas under running water.
Eye contact: Wash the affected areas under running water for at least 15 minutes. Get medical treatment.
Ingestion: Rinse mouth with water. Give the victim one or two glasses of water or milk. do not induce vomiting. Get medical treatment as soon as possible.

Protection for first aid person: Savers wear proper protective equipment like rubber gloves, goggles.

5. Fire fighting measures
Extinguishing media: This product is noncombustible.
Prohibited extinguishing media: None
Danger and hazards under fire: Thermal decomposition emits harmful Chromium oxide fume.
Particular fire fighting: Move containers from fire area if it can be done without risk. If not possible, apply water from a safe distance to cool and protect surrounding area.

Protection for firefighters: Firefighters should wear protective equipment.

6. Accidental release measures
Cautions for personnel: Wear proper equipment and avoid contact with skin and inhalation of dust. Keep away personnel except for authorized ones from spillage area by stretching ropes.
Cautions for environment: Do not wash away into rivers or sewage directly.
Removal measure: Sweep up in a chemical waste container. Flush residual area with copious amounts of water.

7. Cautions of handling and storage
Handling
Engineering measures: Wear appropriate protective equipment not to contact with skin or inhale the dust. Wash hands, a face, and gargle after handling.
Cautions for safety handling: Handle the chemical not to generate aerosol or dust.
Cautions: Avoid contact with organic substances because of oxidizer.
Storage
Adequate storage condition: Store in a dark, cool place and tightly closed.
Safety adequate container materials: Glass, polyethylene, polypropylene

8. Exposure control/Personal protection
Engineering measures: Use only with adequate ventilation and in closed systems.
Control parameters
ACGIH(2009): 0.05mg/m³ (as hexavalent chromium compounds)(TLV-TWA)
Protective equipment
Respiration protective equipment: Dust mask
Hands protective equipment: Impervious protective gloves
Eyes protective equipment: Safety goggles
Skin and body protective equipment: Protective clothing, protective boots

9. Physical and chemical properties
Appearance: Crystal or crystalline powder
Color: Orange
Odor: Odorless
Potassium dichromate

Date of issue: 12 November, 2003
Date of revision: 7 April, 2016

10. Stability and reactivity

Stability: The chemical releases oxygen more than 500°C and increase the susceptibility of substances to burn.
Reactivity: The chemical has oxidizibility and mixture with organic substances or reducing substances may ignite or explode.
Incompatible conditions: Light, heat

11. Toxicological information

Acute toxicity:
- Fatal if swallowed (category 2)
- Toxic in contact with skin (category 3)
- Inhalation (vapor): Not possible to classify because of insufficient data.
- Fatal if inhaled (dust, mist) (category 1)
  - rat oral LD50 = 17mg/kg
  - rat inhalation LC50 = 0.029mg/L/4H (dust)
  - rabbit skin LD50 = 403mg/kg

Skin corrosiveness:
- Causes severe skin burns and eye damage (category 1A)
  - Results of guinea pig skin irritation tests: "skin sores" and "skin ulcer", and the human evidence of "skin corrosion" following repeated or prolonged occupational exposure. Therefore it was classified into category 1A.

Irritation to skin, eyes:
- Causes serious eye damage (category 1)
  - Based on the evidence that blebs in cornea were observed after accidental splashing of the substance (solid or liquid) in the eye, it was classified into category 1.

Respiratory sensitization or skin sensitization:
- May cause allergy, asthma symptoms or breathing difficulties if inhaled (category 1)
  - Chromium is classified into "Respiratory Sensitizing Substance" by the ad hoc committee of the Japanese Society of Occupational Allergy, and "Respiratory Sensitizing Substance: Group 2" by the Japan Society for Occupational Health.
- May cause an allergic skin reaction (category 1)
  - Chromium is classified into "Skin Sensitizing Substance: Group 1" by the ad hoc committee of the Japanese Society for Occupational Health.

Mutagenicity:
- May cause genetic defects (category 1B)
In the dominant lethal test in mice in vivo, is positive, negative. positive in the chromosomal aberration test of mouse spermatocytes, mouse spot test, mouse, micronucleus test of hamsters, chromosome aberration test of mouse bone marrow cells, mouse liver cells and bone marrow gene mutation test cells, murine leukemia, liver, kidney, spleen, lung, none in DNA damage test using the cells in the brain that are positive. In ln vitro, reverse mutation test of bacteria, gene mutation test of cultured mammalian cells, chromosome aberration test, both in DNA damage test of human lymphocytes that are positive. The above findings and the substance because of the water-soluble Cr (VI), therefore it was classified into category 1B.

Carcinogenic effects : May cause cancer(category 1A)

IARC classifies hexavalent chromium compounds as group 1(carcinogenic to humans).

Effects on the reproductive system :
May damage fertility or the unborn child(category 1B)

Adverse effects on reproduction and development were observed at dosing levels producing no other effects on parental animals.

Specific target organ systemic toxicity single exposure :
Cause damage to organs (kidneys, central nervous system, liver, blood system, respiratory organs, heart) (category 1)

In humans, inflammation of the airways, nose, chest pain, cough, dyspnea, cyanosis have been reported by the inhalation exposure of the other hexavalent chromium compound. In the oral route, burning sensation of the digestive tract such as mouth, throat, stomach, the duodenum, due to corrosion of this material, abdominal pain, nausea, vomiting, diarrhea, ulcers and bleeding of the digestive tract, convulsions as the central nervous symptoms, stupor, pupil dilation, swelling of the brain at autopsy, brain edema, pulmonary congestion as effects on the respiratory, respiratory failure, hypotension as effects on the cardiovascular system, decreased heart rate, inhibit blood coagulation as effects on the blood system, leukocytosis, intravascular hemolysis, liver hypertrophy as effects on the liver, liver cell necrosis, acute hepatitis, proteinuria as effects on the kidneys, oliguria, hematuria, anuria, symptoms of acute renal failure exhibiting moisture excess, hypertrophy of the kidney, edema, renal tubular necrosis are reported.

In experimental animals, difficulty breathing was observed at 0.029-0.045 mg/L inhalation exposure of this substance to rats, and airway inflammation, pulmonary edema, tracheal epithelial necrosis were observed at 0.099 mg/L. In experimental animals, difficulty breathing was observed at 0.029-0.045 mg/L inhalation exposure of this substance to rats, and airway inflammation, pulmonary edema, tracheal epithelial necrosis were observed at 0.099 mg/L. In 48 mg/kg oral administration test to rats, corrosion of the gastrointestinal tract mucosa, pulmonary congestion, lowering activity in rats with other hexavalent chromium compound, lacrimation, mydriasis, diarrhea are reported. From the above, it was classified into category 1 (central nervous system, respiratory, cardiovascular, blood, liver, kidney).

Specific target organ systemic toxicity repeated exposure :
Cause damage to organs (liver) through prolonged or repeated exposure (category 1)
Major toxic effects which is caused to human who are repeated inhalation exposure to dust of sodium or potassium salts of chromic acid or dichromate including this substance, or hexavalent of water-soluble chromium through the aqueous solution, is effect to respiratory organs. And there is the description of ulceration and perforation of the nasal septum, inflammation of the respiratory tract, emphysema, fibrosis of the lungs, chronic obstructive bronchopulmonary disease. Based on the humans knowledge, it was classified into category 1 (respiratory).

Aspiration hazard : Not possible to classify because of insufficient data.

12. Ecological information
Ecotoxicity
Fish toxicity : Very toxic to aquatic life (category 1)
Very toxic to aquatic life with long lasting effects (category 1)
Monia macrocopa EC50=0.061mg/L/48H

Residuality and degradability :
: Not available

Ecorediualbility :
: Not available

Mobility :
: Not available

13. Disposal consideration
Residual disposal :
Dissolve in diluted sulfuric acid to isolate chromic acid and add the reducing substances like iron(II) sulfate solution to reduce chromic acid. After that, add calcium hydroxide or sodium carbonate to precipitate chromium(III) oxide.

Bury in a landfill site approved for hazardous waste disposal after the dissolving quantity is conformed under criteria. Or entrust approved waste disposal companies with the disposal.

<Note> :
* Reduction process should be taken enough time, for at least 15 minutes. and pH is under 3.0.
* When formed chromium(II) hydroxide is dried, it is oxidized and is converted to hexavalent chromium. But the addition of exceed iron(II) hydroxide prevents conversion.
* When the solution becomes to be alkaline at the neutralizing process, precipitated chromium(III) oxide will dissolve and a part of it returns to be hexavalent chromium.

Add the chemical gradually in alkaline water solution like calcium hydroxide, sodium carbonate to neutralize and flush in a drain with a large amount of water.

Containers :
In case of disposal of empty bottles, dispose bottles after removing the content thoroughly.

14. Transport information
UN class :
Class 6.1 (Toxic substances) P. G. I
UN number :
3288

Marine regulation information
UN No. :
3288
Proper shipping name :
TOXIC SOLID, INORGANIC, N.O.S.
Class :
6.1
Sub risk :
-
Packing group : I
Marine pollutant : P
Aviation regulation information
UN No. : 3288
Proper shipping name : Toxic solid, inorganic, n.o.s.
Class : 6.1
Sub risk : -
Packing group : I

15. Regulatory information

Ensure this material in compliance with federal requirements and ensure conformity to local regulations.

16. Other information

References
Encyclopaedia Chemica, Kyoritsu Shuppan Co., Ltd. (1963)
Handbook of dangerous and hazardous chemicals, Japan Industrial Safety & Health Association. (2000-2001)
Handbook of Poisonous and Deleterious substances, revised and enlarged edition, Yakumu Kohosa (2000)

The information contained herein is based on several references and the present state of our knowledge. However, the SDS does not always cover all information about the product. Handle the product carefully. The information is intended for ordinary usage, in case of particular handlings, conduct appropriate safety measurements. The information herein is only provision of information, and it does not represent a guarantee the properties of the product. The Safety Data Sheet (SDS) is prepared based on JIS Z7253, and it has the same required elements on the Material Safety Data Sheet (MSDS) which is prepared based on JIS Z7250:2010.