1. Chemical product and company identification

Product name: Potassium dichromate

Company information
Name of manufacturer: KANTO CHEMICAL CO., INC.
Address: 2-1, Nihonbashi, Muromachi 2-Chome, Chuo-Ku, Tokyo, 103-0022, JP
Name of section: Reagent Division, Business Administration Department
Telephone number: +81-3-6214-1090
Facsimile number: +81-3-3241-1047
Mail address: BC32@kanto.co.jp
Reference No: 32334

2. Hazards identification

GHS classification
Health hazards
- Acute toxicity (oral) Category 2
- Acute toxicity (dermal) Category 3
- Acute toxicity (inhalation: dust/mist) Category 1
- Skin corrosion/irritation Category 1B
- Serious eye damage/eye irritation Category 1
- Respiratory sensitization Category 1B
- Skin sensitization Category 1A
- Germ cell mutagenicity Category 1B
- Carcinogenicity Category 1A
- Reproductive toxicity Category 1B
- Specific target organ toxicity (single exposure) Category 1 (central nervous system, respiratory organs, cardiovascular, blood, liver, kidney)
- Specific target organ toxicity (repeated exposure) Category 1 (respiratory organs)

Environmental hazards
- Aquatic acute Category 1
- Aquatic chronic Category 1

Hazard pictograms

Signal word: Danger

Hazard statements:
- Fatal if swallowed or if inhaled
- Toxic in contact with skin
- Causes severe skin burns and eye damage
- May cause an allergic skin reaction
- May cause an allergy or asthma symptoms or breathing difficulties if inhaled
- May cause genetic defects
May cause cancer
May damage fertility or the unborn child
Causes damage to organs (central nervous system, respiratory organs, cardiovascular, blood, liver, kidney)
Causes damage to organs (respiratory organs) through prolonged or repeated exposure
Very toxic to aquatic life
Very toxic to aquatic life with long lasting effects

Precautionary statements

Prevention
Do not handle until all safety precautions have been read and understood.
Do not breathe dust.
Wash hands, forearms and face thoroughly after handling.
Do not eat, drink or smoke when using this product.
Use only outdoors or in a well-ventilated area.
Contaminated work clothing should not be allowed out of the workplace.
Avoid release to the environment.
Wear protective gloves/protective clothing/eye protection/face protection.
Wear respiratory protection.

Response
IF SWALLOWED: Immediately call a POISON CENTER or doctor.
IF SWALLOWED: Rinse mouth. Do not induce vomiting.
IF ON SKIN: Wash with plenty of water.
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
IF exposed or concerned: Call a POISON CENTER or doctor.
IF exposed or concerned: Get medical advice/attention. Immediately call a POISON CENTER or doctor.
Call a POISON CENTER or doctor if you feel unwell.
Get medical advice/attention if you feel unwell.
Rinse mouth.
If skin irritation or rash occurs: Get medical advice/attention.
If experiencing respiratory symptoms: Call a POISON CENTER or doctor.
Take off immediately all contaminated clothing and wash it before reuse.
Take off contaminated clothing and wash it before reuse.
Collect spillage.

Storage
Store in a well-ventilated place. Keep container tightly closed.
Store locked up.

Disposal
Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation.

3. Composition/information on ingredients

Distinction of substance or mixture
Substance

Synonyms
Potassium bichromate
Chemical name | Concentration (%) | Formula | TSCA | EC-No. | CAS RN
---|---|---|---|---|---
Potassium dichromate | ≥ 99.5 | K2Cr2O7 | Listed | 231-906-6 | 7778-50-9

4. First aid measures

First aid measures

First-aid measures after inhalation: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately get medical treatment.

First-aid measures after skin contact: Wash the affected areas under running water, get medical treatment as soon as possible.

First-aid measures after eye contact: Wash the affected areas under running water for at least 15 minutes. Get medical treatment.

First-aid measures after 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.

Personal Protection in First Aid and Measures: Rescuers should wear proper protective equipment like rubber gloves, goggles.

5. Fire fighting measures

Suitable extinguishing media: This product is noncombustible.

Unsuitable extinguishing media: None

Fire hazard: Thermal decomposition emits harmful chromium oxide fume. Contact with combustible material may cause fire.

Firefighting instructions: 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.

Personal protection (Emergency response): Firefighters should wear protective equipment.

6. Accidental release measures

Personal Precautions, Protective Equipment and Emergency Procedures

General measures: Wear proper protective equipment and avoid contact with skin and inhalation of dust. Conduct operations from upwind and evacuate people downwind.

Environmental precautions: Attention should be given to avoid discharge of spilled product into rivers and resulting environmental damage. When diluting spill with large amounts of water, discharge of untreated wastewater into the environment must be avoided.

Methods and Equipment for Containment and Cleaning up

For containment: Sweep up in a chemical waste container. Flush contaminated area with copious amounts of water.

Prevention Measures for Secondary Accidents: Do not allow contact with organic substances or combustible substances.

7. Handling and storage

Handling
Technical measures: Wear appropriate protective equipment to avoid contact with skin or inhalation of dust.

Precautions for safe handling: Avoid formation of dust and aerosols. The substance is an oxidizer. Avoid contact with organic substances.

Storage:

Storage conditions: Store in a dark, cool place and tightly closed. Keep away from combustible materials.

Material used in packaging/containers: Glass, polyethylene, polypropylene.

8. Exposure controls / Personal protection equipment

<table>
<thead>
<tr>
<th>ACGIH TWA</th>
<th>0.0002 mg/m³ (l) (as Cr(VI))</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACGIH STEL</td>
<td>0.0005 mg/m³ (l) (as Cr(VI))</td>
</tr>
<tr>
<td>Remark (ACGIH)</td>
<td>Skin</td>
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Appropriate engineering controls: Install a local ventilation system in case of dusty condition.

Protective equipment:

Respiratory protection: If necessary, wear dust mask

Hand protection: Impervious protective gloves

Eye protection: Safety goggles

Skin and body protection: Protective clothing, protective boots

9. Physical and chemical properties

Physical state: Solid

Color: Orange

Odor: Odorless

pH: 4.04 (1% Aqueous solution)

Melting point: 398 °C

Freezing point: No data available

Boiling point: No data available

Flash point: No data available

Auto-ignition temperature: No data available

Decomposition temperature: ≥ 500 °C

Flammability (solid, gas): Non flammable.

Vapor pressure: No data available

Relative density: 2.676 (25°C)

Specific gravity / density: No data available

Relative gas density: No data available

Solubility: Organic solvents: Insoluble in ethanol. Water: 4.7 % (0°C)

Partition coefficient n-octanol/water (log Pow): No data available

Explosive limits (vol %): No data available

Viscosity, kinematic: No data available
Particle characteristics : No data available

10. Stability and reactivity

Reactivity : Has strong oxidizing properties.

Chemical stability : Stable under normal conditions.

Possibility of hazardous reactions : May ignite or explode when in contact with flammable or reducing substances.
   Mixtures with iron and tungsten reach high temperatures of 1000℃ or higher by combustion.

Conditions to avoid : Light, heat.

Incompatible materials : Reducing substances, combustible materials.

Hazardous decomposition products : Chromium oxides.

11. Toxicological information

Acute toxicity (oral) : Fatal if swallowed
   rat LD50=17mg/kg

Acute toxicity (dermal) : Toxic in contact with skin
   rabbit LD50=403mg/kg

Acute toxicity (inhalation) : No classification (gas)
   No classification (vapor)
   Fatal if inhaled (dust, mist)
   rat LC50=0.029mg/L/4h

Skin corrosion/irritation : Causes severe skin burns
   There are reports that after application of this substance to rabbits for 4 hours, erythema and edema of Grade 3 or less were observed and the reaction was still observed even after 6 days, and that irritation reactions were observed in a skin irritation test with guinea pigs. In addition, there is a report that after application of a 0.5% solution of this substance to volunteers, slight irritation was observed. From the above, it was classified into category 1B.

Serious eye damage/irritation : Causes serious eye damage
   There is a report that although vesiculation was observed in a human accident case in which a crystal or a droplet of this substance entered the eye, reversibility was unknown. In addition, this substance was classified into category 1B in the classification for skin corrosion/irritation. From the above results, it was classified into category 1.

Respiratory sensitization : May cause an allergy or asthma symptoms or breathing difficulties if inhaled
   Chromium and chromium compounds are designated as group 2 of airway sensitizer in Recommendation of Occupational Exposure Limits (Japan Society For Occupational Health), therefore, this substance was classified into category 1B. Besides, it is reported that workers handling compounds containing hexavalent chromium developed respiratory organs sensitization such as asthma and dyspnea.
Skin sensitization: May cause an allergic skin reaction
There is a report of a positive reaction after application of this substance in a patch test in humans. In addition, there is a report that a positive reaction was observed in a maximization test with guinea pigs. Chromium and chromium compounds are designated as group 1 of skin sensitizer in Recommendation of Occupational Exposure Limits (Japan Society For Occupational Health), therefore, this substance was classified into category 1A.

Germ cell mutagenicity: May cause genetic defects
As for in vivo, it was positive or negative in dominant lethal tests with mice, positive in a chromosomal aberration test with mouse spermatocytes, and it was positive throughout in a mouse spot test, micronucleus tests with mice and hamsters, chromosomal aberration tests with mouse bone marrow cells, gene mutation tests with mouse hepatocytes and bone marrow cells, and DNA damage tests with leukocytes and in cells of the liver, kidney, spleen, lung and brain of mice. As for in vitro, it was positive throughout in bacterial reverse mutation tests, a gene mutation test and a chromosomal aberration test with cultured mammalian cells, and a DNA damage test with human lymphocytes. From the above findings and because this substance is water-soluble Cr(VI), it was classified into category 1B.

Carcinogenicity: May cause cancer
IARC classifies chromium(VI) compounds as group 1(carcinogenic to humans).

Reproductive toxicity: May damage fertility or the unborn child
In a teratogenicity test with pregnant mice by the oral route, reproductive and developmental effects were observed at doses where no maternal toxicity was observed. In addition, in reproduction/developmental toxicity tests with mice or rats which were mated after oral administration, reproductive and developmental effects were seen at doses where slight effects were observed in the maternal animals. Therefore, it was classified into category 1B.
STOT-single exposure

Causes damage to organs (central nervous system, respiratory organs, cardiovascular, blood, liver, kidney)

In humans, by the inhalation exposure, inflammation of the respiratory tract, pain in the nose and chest, cough, dyspnea, and cyanosis were reported for other hexavalent chromium compounds. As for the oral route, there are many cases such as accidental ingestion of this substance and suicide cases. Burning sensation in the gastrointestinal tract such as the mouth, throat, stomach and duodenum, abdominal pain, nausea, vomiting, diarrhea, and ulceration and bleeding of the gastrointestinal tract due to corrosivity of this substance, convulsions, stupor, dilated pupils, and an enlarged brain and cerebral edema at necropsy as effects on the central nervous system, pulmonary congestion and respiratory insufficiency as effects on the respiratory organs, hypotension and decreased heart rate as effects on the cardiovascular system, inhibition of blood coagulation, increased leukocyte counts and intravascular hemolysis as effects on the hemal system, liver hypertrophy, hepatocyte necrosis and acute hepatitis as effects on the liver, and proteinuria, oliguria, hematuria, anuria, symptoms of acute renal failure with excess water, renal hypertrophy and edema, and renal tubular necrosis as effects on the kidney were reported. In addition, also through the dermal route, failures of the liver and kidney were reported. From the above, it was classified into category 1 (central nervous system, respiratory organs, cardiovascular, blood, liver, kidney).

STOT-repeated exposure

Causes damage to organs (respiratory organs) through prolonged or repeated exposure

There are descriptions that the main toxic effects developing in humans repeatedly exposed by inhalation to hexavalent water-soluble chromium via dust or an aqueous solution of sodium salts or potassium salts of chromic acid or dichromic acid including this substance were effects on the respiratory organs such as ulceration and perforations of the nasal septum, inflammation of the respiratory tract, emphysema, lung fibrosis and chronic obstructive bronchopneumopathy. From the above, it was classified into category 1 (respiratory organs).

Aspiration hazard

Classification not possible

12. Ecological information

Ecotoxicity

Aquatic acute

Very toxic to aquatic life

Daphnia obtusa EC50=0.061mg/L/48h

Aquatic chronic

Very toxic to aquatic life with long lasting effects

Chlorella pyrenoidosa NOEC=0.1mg/L/96h

Persistence and degradability

No additional information available

Bioaccumulative potential

Low bioconcentration

BCF : 2.8

Mobility in soil

No additional information available
Hazardous to the ozone layer
Ozone : Classification not possible

13. Disposal considerations

Ecology - waste materials : Reduction precipitation method:
Dissolve in dilute sulfuric acid to isolate chromic acid and add an aqueous solution of reducing agent (e.g. iron(II) sulfate) in excess to reduce chromic acid. Then, add an aqueous solution of calcium hydroxide or sodium carbonate to precipitate chromium(III) oxide. Bury in a landfill site approved for hazardous waste disposal after confirming that dissolving quantity is under criteria. Or entrust approved waste disposal companies with the disposal.

<Note>
* Reduction process requires sufficient time (at least 15 minutes) with pH below 3.0.
* When chromium(III) hydroxide is dried, some of it may be oxidized and converted to hexavalent chromium. When excessive iron(II) hydroxide is present, oxidation can be prevented. When neutralized, the pH of the solution should be below 8.5. Above pH 8.5, the obtained chromium(III) hydroxide is dissolved and partly converted to hexavalent chromium. Cement solidification process is not appropriate because it shows a similar phenomenon.
* Dissolution test and dissolution standard for the disposal are in accordance with provisions under related laws.

Contaminated container and packaging : In case of disposal of empty bottles, dispose bottles after removing the content thoroughly.

14. Transport information

International Regulations

Transport by sea (IMDG)
UN-No. (IMDG) : 3290
Proper Shipping Name (IMDG) : TOXIC SOLID, CORROSIVE, INORGANIC, N.O.S.
Packing group (IMDG) : I
Transport hazard class(es) (IMDG) : 6.1 (8)

Air transport (IATA)
UN-No. (IATA) : 3290
Proper Shipping Name (IATA) : Toxic solid, corrosive, inorganic, n.o.s.
Packing group (IATA) : I
Transport hazard class(es) (IATA) : 6.1 (8)

Marine pollutant : Applicable
MFAG-No : 154

15. Regulatory information

Regulatory information with regard to this substance in your country or region should be examined by your own responsibility.
16. Other information

Data sources:

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 of the properties of the product. The Safety Data Sheet (SDS) is prepared based on JIS Z7253.