



SIGMA-ALDRICH

Material Safety Data Sheet

Date Printed: 01/24/2002
Date Updated: 01/14/2002
Version 1.60

Section 1 - Product and Company Information

Product Name	POTASSIUM DICHROMATE, 99%
Product Number	209244
Brand	Aldrich Chemical
Company	Sigma-Aldrich
Street Address	3050 Spruce Street
City, State, Zip, Country	SAINT LOUIS, MO 63103 US
Technical Phone:	314 771 5765
Fax:	800 325 5052
Emergency Phone:	414 273 3850 Ext. 5996

Section 2 - Composition/Information on Ingredient

Substance Name	CAS #	SARA 313
POTASSIUM DICHROMATE	7778-50-9	No
Formula	Cr2O7.2K	
Synonyms	Bichromate of potash, Dipotassium dichromate, Iopezite, Kaliumdichromat (German), Potassium bichromate, Potassium dichromate, Potassium dichromate(VI)	

Section 3 - Hazards Identification

Emergency Overview

Oxidizing. Highly Toxic (USA) Very Toxic (EU). Contact with combustible material may cause fire. Very toxic by inhalation, in contact with skin, and if swallowed. Causes burns. May cause cancer. May cause heritable genetic damage. May cause sensitization by inhalation and skin contact. Target organ(s): Lungs. Kidneys.

HMIS Rating	Flammability: 1	Reactivity: 3	Special Hazard(s) : Oxidizer
Health: 4*			
NFPA Rating	Flammability: 1	Reactivity: 3	Special Hazard(s) : Oxidizer
Health: 4			

*additional chronic hazards present.

For additional information on toxicity, please refer to Section 11.

Section 4 - First Aid Measures

Oral Exposure

If swallowed, wash out mouth with water provided person is conscious. Call a physician immediately.

Inhalation Exposure

If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

Dermal Exposure

In case of skin contact, flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician.

Eye Exposure

In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

Section 5 - Fire Fighting Measures

Autoignition Temp: N/A

Extinguishing Media

Suitable

Carbon dioxide, dry chemical powder, or appropriate foam.

Firefighting

Protective Equipment

For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment. This may include self-contained breathing apparatus to protect against the hazardous effects of the normal products of combustion or oxygen deficiency.

Specific Hazard(s)

Contact with other material may cause fire. Emits toxic fumes under fire conditions.

Section 6 - Accidental Release Measures

Procedure to be Followed in Case of Leak or Spill

Evacuate area.

Procedure(s) of Personal Precaution(s)

Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

Methods for Cleaning Up

Sweep up, place in a bag and hold for waste disposal. Avoid raising dust. Ventilate area and wash spill site after material pickup is complete.

Section 7 - Handling and Storage

Handling

User Exposure

Do not breathe dust. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated exposure.

Storage

Suitable

Keep tightly closed. Keep away from combustible materials, heat, sparks, and open flame. Store in a cool dry place.

Section 8 - Exposure Controls / PPE

Engineering Controls

Safety shower and eye bath. Use only in a chemical fume hood.

Personal Protective Equipment

Respiratory

NIOSH/MSHA-approved respirator.

Hand

Compatible chemical-resistant gloves.

Eye

Chemical safety goggles.

General Hygiene Measures

Wash contaminated clothing before reuse. Wash thoroughly after handling.

Exposure Limits, RTECS

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Country	Source	Type	Value
USA	ACGIH	TWA	0.05 MG(CR)/M3
USA	MSHA Standard-air	TWA	0.5 MG(CR)/M3
USA	OSHA.	PEL	CL 0.1
			MG(CRO3)/M3
USA	NIOSH	TWA	0.001
			MG(CR)/M3

Section 9 - Physical/Chemical Properties

Appearance	Form
Physical State	Fine crystals
Solid	

Molecular Weight: 294.19 AMU

pH	3.5 - 5.0
BP/BP Range	N/A
MP/MP Range	390 °C
Freezing Point	N/A
Vapor Pressure	N/A
Vapor Density	N/A
Saturated Vapor Conc.	N/A
SG/Density	2.676 g/cm3
Bulk Density	N/A
Odor Threshold	N/A
Volatile%	N/A
VOC Content	N/A
Water Content	N/A
Solvent Content	N/A
Evaporation Rate	N/A
Viscosity	N/A
Partition Coefficient	N/A
Decomposition Temp.	N/A
Flash Point °F	N/A
Flash Point °C	N/A
Explosion Limits	N/A

Flammability	N/A
Autoignition Temp	N/A
Solubility	

Solubility in Water: 0.1 M in H₂O, 20°C, Complete, orange

Section 10 - Stability and Reactivity

Stability

Materials to Avoid

Organic materials, Avoid contact with acid, Finely powdered metals.

Hazardous Decomposition Products

Hazardous Decomposition Products
Potassium oxides, Chromium (VI) oxide.

Hazardous Polymerization

Hazardous Polymerization
Will not occur.

Section 11 - Toxicological Information

Route of Exposure

Skin Contact

Causes burns.

Skin Absorption

May be fatal if absorbed through skin.

Eye Contact

Causes burns.

Inhalation

Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract. May be fatal if inhaled.

Ingestion

May be fatal if swallowed.

Sensitization

Sensitization

May cause allergic respiratory and skin reactions

Target Organ(s) or System(s)

Lungs, Kidneys, Blood.

Signs and Symptoms of Exposure

Inhalation of dichromate dusts can cause ulceration and perforation of the nasal septum. Contact with breaks in the skin can cause ulceration (chrome sores). Other symptoms of exposure include erosion and discoloration of the teeth, nephritis, epigastric pain (inflammation and ulceration of the gastrointestinal tract). Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin. Inhalation may result in spasm, inflammation and edema of the larynx and bronchi, chemical pneumonitis, and pulmonary edema. Symptoms of exposure may include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and vomiting. Ingestion can cause: Vomiting, Cyanosis, Coma.

RTCS Number: HX7680000

Toxicity Data

Oral - Child: 26 mg/kg (LDLO)

Remarks: Behavioral:Somnolence (general depressed activity).
Lungs, Thorax, or Respiration:Respiratory stimulation.
Gastrointestinal:Nausea or vomiting.

Oral - Man: 143 mg/kg (LDLO)

Remarks: Vascular:BP lowering not characterized in autonomic section.
Lungs, Thorax, or Respiration:Dyspnea.
Kidney, Ureter, Bladder:Urine volume decreased.

Oral - Child: 50 mg/kg (LDLO)

Oral - Rat: 25 mg/kg (LD50)

Remarks: Sense Organs and Special Senses (Nose, Eye, Ear, and Taste):Eye:Other.
Behavioral:Somnolence (general depressed activity).
Behavioral:Ataxia.

Intraperitoneal - Rat: 28 MG/KG (LD50)

Oral - Mouse: 190 mg/kg (LD50)

Intraperitoneal - Mouse: 37 MG/KG (LD50)

Skin - Rabbit: 14 mg/kg (LD50)

Remarks: Lungs, Thorax, or Respiration:Acute pulmonary edema.
Gastrointestinal:Hypermotility, diarrhea.
Skin and Appendages:Skin: After systemic exposure: Dermatitis, other

Chronic Exposure Carcinogen

Result: This is or contains a component that has been reported to be carcinogenic based on its IARC, OSHA, ACGIH, NTP, or EPA classification.

IARC Carcinogen List

Rating
Group 1

ACGIH Carcinogen List

Rating
A1

Chronic Exposure - Teratogen

<u>Species</u>	<u>Dose</u>	<u>Route of Application</u>	<u>Exposure Time</u>
Rat	1 GM/KG	Oral	(0-19D PREG)
Mouse	2546 MG/KG	Oral	(14-19D PREG)
Mouse	20 MG/KG	Intraperitoneal	(1D MALE)

Result: Specific Developmental Abnormalities: Musculoskeletal system.
Result: Specific Developmental Abnormalities: Musculoskeletal system.
Specific Developmental Abnormalities: Blood and lymphatic system (including spleen and marrow).
Result: Effects on Embryo or Fetus: Fetal death.

Chronic Exposure - Mutagen

<u>Species</u>	<u>Dose</u>	<u>Cell Type</u>	<u>Mutation test</u>
	Result: May alter genetic material.		

Human	300 UG/L			lymphocyte	Micronucleus test
Human	200 NMOL/L			fibroblast	Morphological transformation.
Human	500 NMOL/L			fibroblast	DNA damage
Human	10 UMOL/L			lung	DNA damage
Human	1 UMOL/L			liver	DNA damage
Human	50 UMOL/L			fibroblast	Unscheduled DNA synthesis
Human	100 UMOL/L			fibroblast	DNA inhibition
Human	13 UMOL/L			HeLa cell	DNA inhibition
Human	100 UMOL/L			fibroblast	Other mutation test systems
Human	150 UG/L			fibroblast	Other mutation test systems
Human	3 MG/L			lymphocyte	Other mutation test systems
Human	500 MG/L			Other cell types	Other mutation test systems
Human	100 UMOL/L		1H	Other cell types	Other mutation test systems
Human	500 NMOL/L			leukocyte	Cytogenetic analysis
Human	300 UG/L			lymphocyte	Cytogenetic analysis
Human	500 MG/L			Other cell types	Cytogenetic analysis
Human	150 UG/L			fibroblast	Cytogenetic analysis
Human	300 UG/L			lymphocyte	Sister chromatid exchange
Human	100 NMOL/L			fibroblast	Sister chromatid exchange
Rat	5 MG/KG	Intraperitoneal			Cytogenetic analysis
Rat	1200 NMOL/L			lymphocyte	Cytogenetic analysis
Rat	12 MG/KG	Intravenous			Cytogenetic analysis
Rat	365 MG/KG	Oral	1Y		Cytogenetic analysis
Mouse	50 MG/KG	Intraperitoneal			Micronucleus test
Mouse	200 UMOL/L			leukocyte	DNA damage
Mouse	20 GM/KG	Intraperitoneal			DNA inhibition
Mouse	20 MG/KG	Oral			Cytogenetic analysis
Mouse	1 UMOL/L		48H	mammary gland	Cytogenetic analysis
Mouse	1 UMOL/L			lymphocyte	Sister chromatid exchange
Mouse	1 UMOL/L			Embryo	Sister chromatid exchange
Mouse	1 UMOL/L			Other cell types	Sister chromatid exchange
Mouse	20 MG/KG	Intraperitoneal			Dominant lethal test
Mouse	20 MG/KG	Unreported			Dominant lethal test
Mouse	1 MG/L			lymphocyte	Mutation in mammalian somatic cells.
Mouse	4 MG/KG	Intraperitoneal			sperm
Hamster	20 MG/KG	Intraperitoneal			Micronucleus test
Hamster	200 UG/L			Embryo	Morphological transformation.
Hamster	25 UG/L			kidney	Morphological transformation.
Hamster	10 MG/L			kidney	DNA damage
Hamster	10 MMOL/L			ovary	DNA damage
Hamster	10 UMOL/L			lung	DNA damage
Hamster	300 UMOL/L			lung	DNA inhibition
Hamster	1 MG/L			kidney	DNA inhibition
Hamster	100 UMOL/L			fibroblast	DNA inhibition
Hamster	10 MG/L			kidney	Other mutation test systems
Hamster	8 MG/KG	Intraperitoneal			Cytogenetic analysis
Hamster	500 UG/L			lung	Cytogenetic analysis
Hamster	100 UG/L		24H	Embryo	Cytogenetic analysis
Hamster	250 UG/L			ovary	Cytogenetic analysis
Hamster	10 NMOL/L			ovary	Sister chromatid exchange
Hamster	800 UG/L			fibroblast	Sister chromatid exchange
Hamster	16 MG/L			lung	Sister chromatid exchange
Hamster	10 MG/KG	Intraperitoneal			Sister chromatid exchange
Hamster	20 UMOL/L			kidney	Sister chromatid exchange
Hamster	100 UG/L			lung	Mutation in mammalian somatic cells.

Hamster 7 UMOL/L ovary Mutation in mammalian somatic cells.

Chronic Exposure - Reproductive Hazard

Species	Dose	Route of Application	Exposure Time
Rat	525 MG/KG	Oral	(21D PREG)
Result: Effects on Fertility: Pre-implantation mortality (e.g., reduction in number of implants per female; total number of implants per corpora lutea). Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants). Specific Developmental Abnormalities: Musculoskeletal system.			
Rat	500 MG/KG	Oral	(0-19D PREG)
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants). Effects on Fertility: Litter size (e.g., # fetuses per litter; measured before birth). Effects on Embryo or Fetus: Extra embryonic structures (e.g., placenta, umbilical cord).			
Rat	1771 MG/KG	Oral	(90D PRE)
Result: Effects on Fertility: Pre-implantation mortality (e.g., reduction in number of implants per female; total number of implants per corpora lutea). Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants). Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).			
Rat	980 UG/KG	Intraperitoneal	(7W MALE)
Result: Paternal Effects: Spermatogenesis (including genetic material, sperm morphology, motility, and count). Effects on Fertility: Pre-implantation mortality (e.g., reduction in number of implants per female; total number of implants per corpora lutea). Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).			
Mouse	1710 MG/KG	Oral	(19D PREG)
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants). Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Specific Developmental Abnormalities: Craniofacial (including nose and tongue).			
Mouse	1 GM/KG	Oral	(20D PRE)
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants). Effects on Embryo or Fetus: Extra embryonic structures (e.g., placenta, umbilical cord). Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).			
Mouse	1697 MG/KG	Oral	(14-19D PREG)
Result: Maternal Effects: Other effects. Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants). Effects on Embryo or Fetus: Extra embryonic structures (e.g., placenta, umbilical cord).			
Mouse	700 MG/KG	Unreported	(35W MALE)
Result: Effects on Fertility: Other measures of fertility			

Section 12 - Ecological Information

Acute Ecotoxicity Tests

Test Type	Value:
LC50 Fish	
Species	
Pimephales promelas (Fathead minnow)	
Time:	Value:
96.0 h	25 - 150 mg/l
Test Type	
EC50 Daphnia	
Species	
Daphnia magna	
Time:	Value:
48.0 h	0.035 mg/l

Section 13 - Disposal Considerations

Appropriate Method of Disposal of Substance or Preparation

Contact a licensed professional waste disposal service to dispose of this material.
Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.
Observe all federal, state, and local environmental regulations.

Section 14 - Transport Information

DOT

Proper Shipping Name: Toxic solid, corrosive, inorganic, n.o.s.
UN#: 3290
Class: 6.1

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Packing Group: Packing Group II
Hazard Label: Corrosive
PIH: Not PIH

IATA

Proper Shipping Name: Toxic solid, corrosive, inorganic, n.o.s.
IATA Number: 3290
Hazard Class: 6.1
Packing Group: II

Section 15 - Regulatory Information

EU Directives Classification

Symbol of Danger: T+ N

Indication of Danger

Very toxic. Dangerous for the environment.

Risk Statements

R: 49 46 21 25 26 37/38 41 43 50/53

May cause cancer by inhalation. May cause heritable genetic damage. Also harmful in contact with skin. Also toxic if swallowed. Also very toxic by inhalation. Irritating to respiratory system and skin. Risk of serious damage to eyes. May cause sensitization by skin contact. Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Statements

S: 53 45 60 61

Restricted to professional users. Attention - Avoid exposure - obtain special instructions before use. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). This material and its container must be disposed of as hazardous waste. Avoid release to the environment. Refer to special instructions/safety data sheets.

US Classification and Label Text

Indication of Danger

Oxidizing. Highly Toxic (USA) Very Toxic (EU).

Risk Statements

Contact with combustible material may cause fire. Very toxic by inhalation, in contact with skin, and if swallowed. Causes burns. May cause cancer. May cause heritable genetic damage. May cause sensitization by inhalation and skin contact.

Safety Statements

Wear suitable protective clothing, gloves, and eye/face protection. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). Restricted to professional users. Attention - Avoid exposure - obtain special instructions before use. This material and its container must be disposed of as hazardous waste. Avoid release to the environment. Refer to special instructions/safety data sheets.

US Statements

Target organ(s): Lungs. Kidneys.

United States Regulatory Information

SARA Listed: No

TSCA Inventory Item: Yes

United States - State Regulatory Information

California Prop - 65

This product is or contains chemical(s) known to the state of California to cause cancer.

Canada Regulatory Information

WHMIS Classification

This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.

Section 16 - Other Information

Disclaimer

For R&D use only. Not for drug, household or other uses.

Warranty

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. Copyright 2002 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.