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School Materials Safety Manual:

No. 287 Potassium Chromate Issued 10/91

◆ SECTION 1 INTRODUCTION

Material Potassium Chromate, ca 100%

Synonyms Bipotassium chromate; chromate of potash; chromate of potassium; dipotassium chromate; dipotassium monochromate; neutral potassium chromate; potassium chromate (VI); potassium chromate, yellow; Tarapacite®.

Chemical Formula K_2CrO_4

CAS Number 7789-00-6

DOT Classification ORM-E. Not listed as a Hazardous Material for Transportation (49 CFR 172.101)

EPA Classification Listed as a CERCLA Hazardous Substance (40 CFR 302.4). Not listed as a RCRA Hazardous Waste (40 CFR 261.33), a SARA Extremely Hazardous Substance (40 CFR 355), or a SARA Toxic Chemical (40 CFR 372.65).

OSHA Classification Listed as an Air Contaminant (29 CFR 1910.1000, Table Z-1-A)

NFPA Hazard Rating Not found

Genium Hazard Rating

4 = Extreme
3 = High
2 = Moderate
1 = Slight
0 = Minimum



HMIS

H 3
F 1
R 0

Description Odorless, lemon-yellow rhombic crystals. Derived by roasting powdered chromite with potash and limestone, then treating the cinder with hot potassium sulfate solution, followed by leaching. Also obtained by reaction of potassium bichromate with potassium hydroxide. Used in photography (sensitizer for gelatin coatings), textile printing pads, metal finishing and chrome plating; in manufacturing and packing the cement and glue used in shoes, furniture, and packaging materials; as a corrosion inhibitor in batteries, radiator coolants, internal combustion and gas turbine engines, refrigerator and air-conditioning systems, and water-cooled nuclear reactors; as mordant in dyeing; as an analytical reagent; and a fungicide in aqueous wood preservatives.

Overview Potassium chromate is a highly corrosive, toxic, and powerful oxidizer. Keep away from combustibles. It is harmful to skin, eyes, and respiratory tract. Use appropriate personal protective gear to avoid skin or eye contact and dust inhalation. The commonest area of use in the school environment is the chemistry laboratory as an analytical reagent. As a chemical family, chromates deserve special safety attention from science teachers. Chromium and compounds are alleged carcinogens.

Manufacturer Always request an up-to-date MSDS from your chemical supplier. That sheet should include the substance's manufacturer and emergency phone numbers. This *Manual's* Resources/Manufacturers Index lists some larger manufacturers and available emergency phone numbers.

◆ SECTION 2 USE AND STORAGE DATA

Preliminary Planning Considerations Plan and provide for safe disposal of all school-generated chemical waste. Use alternatives to potassium chromate where possible. Check applicable regulations prior to use. Provide adequate ventilation or restrict use to fume hood to avoid exceeding the TLV

(Sec. 4). Contact lens use in the laboratory is controversial. In some cases, soft lenses can actually protect eyes from chemicals. In other cases, chemical entrapment is presumed a possible hazard. Particles adhering to contact lens surfaces can cause corneal damage. For safety, always wear safety glasses or goggles. Wear rubber gloves to minimize skin contact. Employees and students should know the location of eyewash and shower facilities near where chemicals are used. Be sure eyewash stations and safety showers are in good working order.

Usage Precautions and Procedure Before using, read this material's container label and follow all precautions. Do not smoke in usage or storage areas. Practice good housekeeping to avoid unintentionally mixing incompatibles. Do not allow chemical residue or dust buildup in lab or work areas. Wear safety glasses or goggles and appropriate protective clothing to work with this substance. Keep this material away from notebooks, textbooks, and personal belongings to avoid transporting chemical residues from the lab/work area. After working with chemical materials, and before eating, drinking, or smoking, always wash hands and face. Remove and launder contaminated clothing before reusing.

Additional Data Potassium chromate is stable at room temperature under normal handling and storage conditions. It has an indefinite shelf life. It does not polymerize. Potassium chromate violently decomposes hydrazine and is incompatible with readily oxidizable materials such as organic material, paper, wood, sulfur, aluminum, and plastics.

Preferred Storage Location and Methods Store in tightly closed containers in a cool, well-ventilated area away from incompatibles and combustible materials. To separate incompatible chemicals, store by chemical family, not by alphabetical name. Protect all chemical containers from physical damage. Prohibit smoking in chemical storage areas. Purchase amounts equal to only a year's needs, if at all.

◆ SECTION 3 SPILL/DISPOSAL PROCEDURES

If Spilled Ventilate spill area. Clean up spilled material promptly and thoroughly. Cleanup personnel should protect against skin or eye contact and dust inhalation. For liquid (solution) spills, cover with an inert solid absorbent (vermiculite, dry sand, etc.) and scoop into appropriate disposal containers (with a secure lid) for disposal in accordance with existing regulations. Dike the spill area with an inert absorbent material, as needed, to contain the spilled material. For dry spills, carefully collect and scoop the spilled dry material into secure disposal or reclamation containers. Avoid creating airborne dust conditions. Vacuum (with an appropriate filter) or wet mop to minimize dust dispersion.

Disposal of Small Quantities Handle emptied containers carefully since residues may remain. Always check regulations before disposal. Investigate recycling, reclamation, or destruction to a less hazardous material rather than disposal of untreated waste to a landfill. If this method is not practical, feasible, or in accord with existing regulations, contact your supplier or a licensed disposal contractor for specific treatment/disposal procedures.

Disposal of Larger Amounts Contact your supplier or a licensed disposal company.

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Follow all applicable local, state, and Federal regulations for all waste disposal.

◆ SECTION 4 HEALTH HAZARDS

Potassium chromate is corrosive to skin and mucous membranes and toxic by inhalation and ingestion of small amounts. Symptoms range from respiratory and gastrointestinal (GI) tract irritation to severe corrosion and, in some cases, kidney, liver, and blood damage. Long-term exposure may aggravate pulmonary conditions such as asthma, certain skin conditions, allergies, or chromate sensitization.

1991-92 ACGIH TLV 8-hr TWA: 0.05 mg [Cr (VI)]/m³

1990 NIOSH REL 10-hr TWA: 0.025 mg/m³ [Cr(VI)]

1990 OSHA PEL Ceiling: 0.1 mg (CrO₃)/m³

IDLH Level* 30 mg/m³ (as CrO₃)/m³

1985-6 Toxicity Data Human, estimated lethal dose: 1 to 10 g. Dog, intravenous, LD₅₀: 2900 µg/kg, no toxic effects noted. Dog, subcutaneous, LD₅₀: 19 mg/kg, toxic effects not yet reviewed.

Carcinogenicity In 1990 reports, the IARC lists chromium and many of its compounds as carcinogens, with the qualification that they have not yet reviewed potassium chromate. In general, hexavalent chromium compounds are established as bronchogenic (lung) carcinogens. However, there is some controversy regarding potassium chromate. NIOSH states that potassium chromate is not a carcinogen.

Acute Effects Inhalation may cause severe irritation or corrosion of the mucous membranes of the nose, throat, airways, and lungs. Skin contact can result in irritant or allergic contact dermatitis (rash) or penetrating ulcers. Eye contact can cause conjunctivitis (inflammation of the lining of the eye) or burns. Ingestion can be highly corrosive to the esophagus and stomach and can cause severe poisoning. Systemic effects from absorption by any route may include kidney failure (acute tubular necrosis with uremia), liver damage, hemolysis (destruction of red blood cells), and other changes in the blood (e.g., alterations of white blood count: leukocytosis, leukopenia, or monocytosis). Shock or death may result. Acute ingestion may cause a violent gastroenteritis with watery diarrhea (rice water stools), vomiting, and central nervous system (CNS) injury.

Chronic Effects Possible effects of chronic exposure may include ulceration or perforation of the nasal septum (tissue separating the nostrils), rhinitis (runny nose), pharyngitis (sore throat), penetrating skin ulcers, allergic sensitization, and possible lung cancer. Chronic eye changes, including corneal pigmentation, are noted with exposure to chromium salts.

* See page 9 of the Glossary for Terms and Abbreviations for definition.

◆ SECTION 5 FIRST AID PROCEDURES

Eye Contact Promptly flush eyes with plenty of running water for at least 15 min, including under the eyelids. Get prompt medical attention.

Skin Contact Remove contaminated clothing. After flushing with large amounts of water, wash exposed areas with soap and water. However, if clothing sticks to skin after flooding with water, do not remove it. For reddened or blistered skin, consult a physician. Do not break open blisters or remove skin.

Inhalation Remove victim from exposure to fresh air and support breathing as necessary. Encourage blowing of nose, coughing up, and spitting out any retained particulate matter.

Ingestion Get prompt medical attention. Never give anything by mouth to an unconscious or convulsing person. If ingested, have that *conscious and alert* person drink a glass of milk (or, if unavailable, water). *Do not induce vomiting!* If vitamin C is available, give a high dose—5 to 10 g—as soon as possible.

Get proper in-school, paramedic, or community medical attention and support.

◆ SECTION 6 FIRE PROCEDURES AND DATA

Fire Hazards Potassium chromate is a powerful oxidizer. Potassium chromate becomes a possible explosion hazard when shocked, heated, or exposed to hydrazine. Fire may increase in intensity if potassium chromate contacts combustibles. For major fires, or for fires involving large quantities, firefighters should wear appropriate protective clothing and respirators. A self-contained breathing apparatus (SCBA) is recommended. Also, wear full protective clothing. If possible without risk, move containers from hazard area. Do not scatter material with more water than needed to put out fire. Dike fire control water for later disposal. Be aware of runoff from fire control methods. Do not release to sewers or waterways.

Flash Point and Method None reported

Autoignition Temperature None reported

Flammability Limits in Air (vol. %) None reported.

Hazardous Decomposition Products Thermal oxidative decomposition of potassium chromate can produce toxic fumes of potassium oxide (K₂O).

Extinguishing Media Potassium chromate may burn, but it does not ignite readily. For small fires, use dry chemical, carbon dioxide (CO₂), water spray, or foam. For large fires, use water spray, fog, or foam. Cool containers with a water spray to the side until fire is well out.

◆ SECTION 7 PHYSICAL DATA

Melting Point (at 1 atm) 1787 °F (975 °C)

Vapor Pressure (air = 1) 0

Solubility in Water Soluble; 69.9 g/100 cc in water at 68 °F (20 °C), 79.2 g/100 cc in water at 212 °F (100 °C)*

pH of Aqueous Solution Alkaline

Molecular Weight 194.2

Density 2.73 at 64.4 °F (18 °C)

* Insoluble in alcohol.

References 73, 101, 103, 124, 126, 127, 132, 136, 140, 142, 153, 527; Genium's *Material Safety Data Sheets Collection*, No. 744 (7/91)

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