GHS Classification

ID262 Potassium dichromate

CAS 7778-50-9 Date Classified: May 24, 2006 (Environmental Hazards: Mar. 31, 2006)

Physical Hazards Reference Manual: GHS Classification Manual (Feb. 10, 2006)

Hazard class		Classification	symbol	signal word	hazard statement	Rational for the classification
1	Explosives	Not applicable	-	-	-	Containing no chemical groups with explosive properties
2	Flammable gases	Not applicable	-	-	-	Classified as "solid" according to GHS definition
3	Flammable aerosols	Not applicable	-	-	-	Not aerosol products
4	Oxidizing gases	Not applicable	-	-	-	Classified as "solid" according to GHS definition
5	Gases under pressure	Not applicable	-	-	-	Classified as "solid" according to GHS definition
6	Flammable liquids	Not applicable	-	-	-	Classified as "solid" according to GHS definition
7	Flammable solids	Not classified	-	-	-	Non-flammable (ICSC, 2001)
8	Self-reactive substances and mixtures	Not applicable	-	-	-	Containing no chemical groups with explosive or self-reactive properties
9	Pyrophoric liquids	Not applicable	-	-	-	Classified as "solid" according to GHS definition
10	Pyrophoric solids	Not classified	-	-	-	Non-combustible (ICSC, 2001)
11	Self-heating substances and mixtures	Not classified	-	-	-	Non-combustible (ICSC, 2001)
12	Substances and mixtures, which in contact with water, emit flammable gases	Not classified	-	-	-	Stable to water (water solubility:12g/100mL (20degC), ICSC (2001))
13	Oxidizing liquids	Not applicable	-	-	-	Classified as "solid" according to GHS definition
14	Oxidizing solids	Classification not possible	-	-	-	Classification not possible due to the absence of data, though the substance is an inorganic compound containing oxygen and "may intensify fire" according to ICSC (2001).
15	Organic peroxides	Not applicable	-	-	-	Not organic compounds
16	Corrosive to metals	Classification not possible	-	-	-	Test methods applicable to solid substances are not available

Health Hazards

Hazard class		Classification	symbol	signal word	hazard statement	Rational for the classification
1	Acute toxicity (oral)	Category 3	Skull and crossbones	Danger	Toxic if swallowed	Based on the LD50 value of 62mg/kg calculated from the testing data of rat LD50 (oral route) of 177mg/kg (EHC 61 (1988)), 149mg/kg (EHC 61 (1988)), 74mg/kg (EU-RAR No.53 (2005)), 48mg/kg (EU-RAR No.53 (2005)).
1	Acute toxicity (dermal)	Category 4	Exclamation mark	Warning	Harmful in contact with skin	Based on the rabbit LD50 (dermal route) of 1,150mg/kg (EU-RAR No.53 (2005)).
1	Acute toxicity (inhalation: gas)	Not applicable	–	–	–	Due to the fact that the substance is "solid" according to the GHS definition and inhalation of its gas is not expected.
1	Acute toxicity (inhalation:	Classification not possible	–	–	–	No data available
1	Acute toxicity (inhalation: dust, mist)	Category 2	Skull and crossbones	Danger	Fatal if inhaled	Based on the rat LC50 (inhalation of dust/mist) of 0.099mg/L (EU-RAR No.53 (2005)).
2	Skin corrosion / irritation	Category 1A-1C	Corrosion	Danger	Causes severe skin burns and eye damage	Based on the description in the report on rabbit skin irritation tests (EU-RAR No.53 (2005)): "erythema (up to Grade 3) and edema were observed after application of the material diluted or moistened with saline solution. The effects subsided but still observed after 6 days from exposure. The similar skin reactions were noted when applied to the abraded skin," and guinea pig skin irritation tests: "skin 'sores'" (EU-RAR No.53 (2005)) and "skin ulcer" (ATSDR (2000)), and the human evidence of "skin corrosion" following repeated or prolonged occupational exposure. Although classified into 1A-1C, the substance should be placed in Category 1A from the viewpoint of safety, if further subclassification is needed.
3	Serious eye damage / eye irritation	Category 1	Corrosion	Danger	Causes serious eye damage	Based on the description of human health effects of occupational exposure provided by ATSDR (2000): "blebs in cornea were observed after accidental splashing of the substance (solid or liquid) in the eye," and the description in the report on exposure to Cr (VI): the substance causes irreversible or reversible corrosion of an unknown degree.
4	Respiratory/skin sensitization	Respiratory sensitization: Category 1 Skin sensitization: Category 1	(Respiratory sensitization) Health hazard (Skin sensitization) Exclamation mark	(Respiratory sensitization) Danger (Skin sensitization) Warning	(Respiratory sensitization) May cause allergic or asthmatic symptoms or breathing difficulties if inhaled (Skin sensitization) May cause allergic skin reaction	Respiratory sensitization: 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. These classifications, though not specifying potassium dichromate, seem to include chromium compounds. Potassium dichromate, which is a chromium compound, should thus cause respiratory sensitization. Skin sensitization: chromium is classified into "Skin Sensitizing Substance" by the ad hoc committee of the Japanese Society of Occupational Allergy, and "Skin Sensitizing Substance: Group 1"* by the Japan Society for Occupational Health. These classifications, though not specifying potassium dichromate, seem to include chromium compounds. Potassium dichromate, which is a chromium compound, should thus cause skin sensitization. * There is a provision to the effect that "the category refers to the substance concerned and its compounds, but does not identify all substances
5	Germ cell mutagenicity	Category 1B	Health hazard	Danger	May cause genetic defects	Based on positive data on multi-generation mutagenicity tests (dominant lethal tests), described in IARC 49 (1990), EHC 61 (1988) and NTP DB (access on October 2005).
6	Carcinogenicity	Category 1A	Health hazard	Danger	May cause cancer	Due to the fact that the substance is classified as Category K (as Chromium hexavalent (VI) compounds) by NTP (2005), Category A1 (as Water-soluble Cr VI Compounds) by ACGIH (2001), Category 1 (as Chromium (VI)) by IARC (1990).
7	Toxic to reproduction	Category 1B	Health hazard	Danger	May damage fertility or the unborn child	Based on the evidence of adverse effects on reproduction and development observed at dosing levels producing no other effects on parental animals, described in EU-RAR No.53 (2005), ATSDR (2000), EHC 61 (1988), IARC 49 (1990).

8	Specific target organs/systemic toxicity following single exposure	Category 1 (kidneys, central nervous system, liver, blood system, respiratory organs, heart)	Health hazard	Danger	Causes damage to organs (kidneys, central nervous system, liver, blood system, respiratory organs, heart)	Based on the human evidence including "oliguresis, uroschesis, hyperhydration" (EHC 61 (1988)), "dilation and edema of the brain, necrosis of the liver, achromasia and hypertrophy of the kidney, necrosis and edema of the renal tubules, decreases in hemoglobin levels and hematocrit, increases in WBC count and plasma hemoglobin, reticulocytosis, pulmonary congestion, pleural effusion, decreases in cardiac output/heart rate/blood pressure, hemorrhage of the left ventricle anterior papillary muscle, necrosis of the renal tubules" (ATSDR (2000)). The acute toxicity of hexavalent chromium compounds manifests as "cough, yellow-green phlegm, dyspnea, pulmonary congestion, vomiting (yellow-green mucus), gastralgia, diarrhea, nausea, vomiting, hepatic damage, renal damage" (CERI Hazard Data 97-18 (1998)).
9	Specific target organs/systemic toxicity following repeated exposure	Category 1 (liver)	Health hazard	Danger	Causes damage to organs through prolonged or repeated	Based on the human evidence including "necrosis and congestion of the liver" (EHC 61 (1998)). The chronic toxicity of hexavalent chromium compounds manifests as "nasal mucosa, inflammation and ulcers in the pharynx and larynx, nasal septum perforation" (CERI Hazard Data 97-18 (1998)).
10	Aspiration hazard	Classification not possible	-	-	-	No data available

Environmental Hazards

Hazard class	Classification	symbol	signal word	hazard statement	Rational for the classification
11	Hazardous to the aquatic environment (acute)	Category 1	Environment	Warning	Very toxic to aquatic life	It was classified into Category 1 from 48 hours EC50=0.0225mg/L of the crustacea (Moina) (ECETOC TR91, 2003).
11	Hazardous to the aquatic environment (chronic)	Category 1	Environment	Warning	Very toxic to aquatic life with long lasting effects	Since acute toxicity was Category 1 and it was a metallic compound, and since an underwater action and bio-accumulation were unknown, it was classified into Category 1.