



Zinc Chromate

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Zinc chromate (Zinc Salt, Zinc Yellow, $ZnCrO_4$, CAS no 13530-65-9) is a yellow crystalline powder.

Usage and Exposure

Zinc chromate is used in paints, inks, plastics, and corrosion inhibitors. Zinc chromates are the pigments most commonly used in primer paints [HSE, IARC].

Routes of Exposure

Zinc chromate can be absorbed into the body by inhalation of dust, mist or spray during application, through direct skin or eye contact with paints, and by ingestion [CDC, HSE].

Target Organs

Chromium (VI) compounds can produce noncancerous effects in several target organs:

Respiratory system: Nasal and lung irritation, altered pulmonary function

Gastrointestinal system: Irritation, ulceration and nonneoplastic lesions of the stomach and small intestine

Hematological: microcytic, hypochromic anemia

Reproductive system: Effects on the male reproductive organs, including decreased sperm count and histopathological changes to the epididymis [ASTDR].

Health Hazards

The adverse effects on health associated with exposure to chromium and its inorganic compounds vary according to valency state and water solubility. Compounds of hexavalent chromium (chromium VI) include all chromates, dichromates, and polychromates, which are the most hazardous.

Acute effects

Zinc chromate is irritating to the eyes, the skin, and the upper and lower respiratory tract.

Chronic Effects

Zinc chromate can affect the respiratory tract, resulting in nasal septum perforation. Exposure to zinc chromate can also result in liver and kidney impairment. Repeated or prolonged contact may cause skin sensitization. Repeated or prolonged inhalation exposure can cause asthma [ICSC, New Jersey].

There are few data on the effects of exposure to primer paints containing chromium VI [HSE].

Carcinogenicity

According to the IARC, there is sufficient evidence for carcinogenicity of chromium (VI) compounds in humans. Chromium (VI) compounds can induce lung cancer. Positive associations have also been observed between exposure to Chromium (VI) compounds and cancer of the nose and nasal sinuses.

Chromium (VI) compounds are carcinogenic to humans (Group 1) [IARC].

The Globally Harmonized System of Classification and Labelling of Chemicals (GHS) classifies carcinogens into two categories.

Category 1 has two sub-categories:

Category 1A – Known human carcinogens (based upon human evidence)

Category 1B – Presumed human carcinogens (based upon animal evidence)

Category 2 – Suspected human carcinogens

Zinc chromate is not listed in Annex VI of the European Regulation on classification, Labeling and Packaging of Substances and Mixtures (CLP), which uses GHS classification of carcinogens. However, zinc chromates, including zinc potassium chromate, are classified by the Regulation as Category 1A Carcinogens – known human carcinogens [CLP, GHS].

References:

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