

Lead chromate (PbCrO₄) is a toxic substance widely used as a yellow coloring pigment. Lead chromate is an odorless powder with a vivid yellow color. Lead chromate is composed of two very toxic heavy metals: lead and hexavalent chromium.

Common names:

chrome yellow, pigment yellow 34, Cologne yellow, Paris yellow, Leipzig yellow, King's yellow, lemon chrome pigment, medium chrome, lead chromate, sicomin yellow L1635 S, crocoite, chrome gelb, lead crowns (yellow crowns, orange crowns, lemon crowns, medium yellow crowns, intense yellow crowns), pigment green 15, chrome green (numbers: UC61, UC74 and UC76), pigments: VOXCO VO-STC, VOXCO VO-BC, VOXCO Chrome Yellow VUA-260, VOXCO CHROME Yellow vu-150, Chrome Yellow VSO-250

Lead chromate is relatively simple to produce and has bright and clear color. It is used for manufacturing paints, enamels, primers, coloration of fabrics, leathers and plastics. Van Gogh even used lead chromate to create the famous series of paintings titled "Sunflowers" in the 1800s



Exposure Pathways

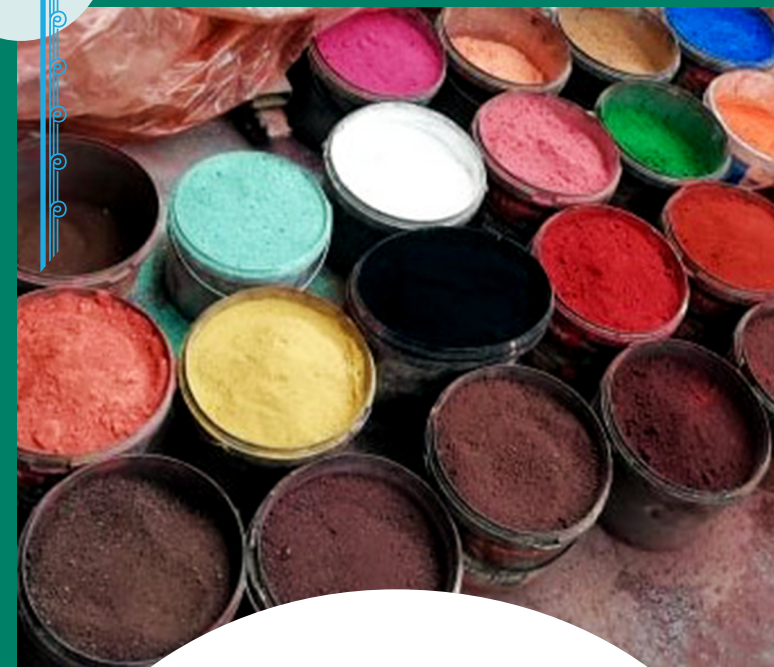
- Exposure could occur via inhalation, but consumption of adulterated spices is the most likely pathway

Acute Health Effects

- If lead chromate is inhaled, it may cause scratchy throat, cough, shortness of breath, or pneumonia
- Dermal contact may irritate skin, mucous membranes, eyes, or cause ulcerations
- If lead chromate is swallowed, it may cause acute symptoms like nausea, vomiting, diarrhea, or ulcers

Poisoning Effects

- Dermatitis and chronic ulcers
- Lung damage, asthma
- Cancer
- Renal failure
- Cardiovascular disease, bone marrow damage, anemia, arrhythmia, hypertension
- Disruption of endocrine system and metabolism
- Lead is a neurotoxin that causes irreversible damage to the nervous system, problems with vision, hearing, paralysis, and in large doses death
- Reproductive dysfunctions, complications of pregnancy and childbirth, developmental disorders of the fetal nervous system
- Causes digestive system diseases include gastritis, duodenal ulcer, heartburn, nausea, abdominal pain
- Even small doses of lead are dangerous for children, causing slowed development and learning disabilities



HEALTH HAZARDS OF TOXIC SPICES

LEAD CHROMATE
CHROME YELLOW

According to the UN Global System of Standards and Labeling of Hazardous Chemicals, lead chromate is listed as a class 6.1 chemical, meaning it may cause death or serious harm via single or short-term exposure if inhaled, absorbed through the skin or swallowed. When heated, lead chromate decomposes to form toxic fumes containing lead oxides, so the presence of these colorants in spices and foods during cooking increases health risks.



Lead is included in the United Nations (UN) lists of priority environmental pollutants. Lead poisoning of children is one of the biggest heavy metal poisoning problems in the world. A survey conducted by UNICEF and the NCDC in Georgia in 2018 indicated that 41% of children nationwide were at risk of lead poisoning, and 85% in western Georgia. A follow-up study revealed that the consumption of spices adulterated with lead chromate was the main lead source for those children.

POISONING PREVENTION

- Any direct contact with lead chromate must be avoided!
- Lead chromate may never be added to spices
- Avoid using spices that may contain lead chromate such as marigold-containing spices or spice mixes. It is safer to buy branded packaged ground spices, or whole spices and ask the seller to grind them in front of you
- Pregnant women and children have the highest health risks from exposure to lead chromate

CRIMINAL RESPONSIBILITY ARTICLE 197 OF THE CRIMINAL CODE OF GEORGIA:

"Food adulteration is punishable by fines, correctional labor, ... imprisonment up to 1-year; repeated action could be punished by imprisonment up to 5 years; if there is a threat to human health... imprisonment up to 7 years; if caused health damage... up to 10 years."



In the 1980s, due to a poor turmeric harvest in Bangladesh, local producers started adding lead chromate to improve the color of the powdered spice. Ground spices sold loose at informal markets are among the most frequently adulterated food products because they are powdered before sale and easily falsified. Hazardous concentrations of heavy metals were detected in 2011-2018 in the United States, not only in spices, but also in medicinal herbs, traditional medicines and ceremonial powders.

Since 2013, the EU Restriction of Hazardous Substances Directive 2, also called the "lead-free directive", established a widespread ban on the use of lead and hexavalent chromium compounds in household appliances, electronic equipment, lighting, sports and medical equipment, toys, paints, cables, wires, lamps, batteries, etc.