DELAWARE HEALTH AND SOCIAL SERVICES
Division of Public Health

Frequently Asked Questions

CHROMIUM(III) and CHROMIUM(VI)

What are chromium(III) and chromium(VI)?
Chromium is a solid metal that is normally silver of black in color. Chromium(III) is found in nature, while chromium(VI) is man-made

Where can chromium(III) and chromium(VI) be found and how are they used?
Chromium(III), also called Cr(III), is an important nutrient that the body needs to process certain sugars, proteins, and fats. Both Chromium(III) and chromium(VI) are used in industry for chrome plating, dyes and pigments, leather tanning, and preserving wood.

How can people be exposed to chromium(III) and chromium(VI)?
People who work with chromium(III) or chromium(VI) in industry are the most likely to be exposed. People who live close to a hazardous waste site are also at risk for exposure.

You could be exposed to chromium(III) and chromium(VI) through:

- **Breathing** chromium(III) or chromium(VI) dust particles in the air.
- **Drinking** chromium(III) in well water near a waste site containing chromium.
- **Swallowing** chromium(III) in foods. Children swallow chromium if they eat dirt near waste sites containing it.

How do chromium(III) and chromium(VI) work and how can they affect my health?

Chromium(III): Breathing chromium(III) does not irritate the nose or mouth in most people. There is not enough data to know if breathing in chromium(III) causes cancer.

Eating small amounts of chromium(III) is healthy but eating too much is harmful. The recommended daily dose of chromium(III) is 50 to 200 µg. There is not enough data to know if eating large amounts of chromium(III) causes cancer.

Chromium(VI): Breathing chromium(VI) at high levels can irritate the nose and cause sneezing, itching, nosebleeds, ulcers, and holes in the nasal septum. It can also cause asthma attacks in people who are allergic to chromium. Long term exposure to high levels is linked to lung cancer. Breathing low levels of chromium(VI) for a short period does not cause health problems for most people.

Eating small amounts of chromium(VI) is not harmful. However, eating or drinking large amounts in food or water can cause an upset stomach, ulcers, convulsions, and damage the kidneys and liver. This type of exposure can be fatal. There is not enough data to know if eating or drinking chromium(VI) causes cancer.

Frequently Asked Questions

How are chromium(III) and chromium(VI) poisoning treated?
Treatments for chromium poisoning vary depending on the route of exposure. For example, the treatment for inhaling dust with chromium differs from the treatment for eating food contaminated with chromium. If you suspect someone was exposed to high levels of chromium, seek medical help.

What should I do if exposed to chromium(III) or chromium(VI)?
If exposure is to dust or air contaminated with chromium, move to fresh air and seek medical help. If chromium was ingested, seek medical help.

What factors limit use or exposure to chromium(III) or chromium(VI)?
To avoid eating harmful levels of chromium(III), follow all dosage recommendations on the food package. The usual recommended daily dose is 50-200µg. Keep packages away from children.

To limit exposure to chromium(VI), avoid working in soil near a hazardous waste site containing chromium. Do not allow children to play in dirt or to eat dirt. Wash their toys. Everyone should wash hands before eating.

Is there a medical test to show whether I've been exposed to chromium(III) or chromium(VI)?
Chromium can be measured in hair, urine, serum, red blood cells, and whole blood. The chromium can be detected for about 120 days from the time of the exposure.

Technical information for chromium

	Cr(VI)	Cr(III)
CAS Number:	18540-29-9	16065-83-1
Chemical Formula:	Cr^{+6}	Cr^{+3}
Carcinogenicity (EPA):	A – Known carcinogen.	D – Not classifiable.
MCL (Drinking Water):	0.1 mg/L (Total Cr)	0.1 mg/L (Total Cr)
OSHA Standards:	0.1 mg/m^3 – Ceiling	0.5 mg/m^3 8-Hour TWA
NIOSH Standards:	0.001 mg/m^3 8-Hour TWA	0.5 mg/m^3 8-Hour TWA

Resources

Agency for Toxic Substances and Disease Registry (ATSDR), 2012. *Toxicological Profile for Chromium.*
https://wwwn.cdc.gov/TSP/ToxProfiles/ToxProfiles.aspx?id=62&tid=17

Agency for Toxic Substances and Disease Registry (ATSDR), 2012. *ToxFAQs for Chromium.*
https://wwwn.cdc.gov/TSP/ToxFAQs/ToxFAQsDetails.aspx?faqid=61&toxid=17