United States
Environmental Protection
Agency

Chromium-6 in Drinking Water

The current maximum contaminant level for chromium in all forms in drinking water is 100 parts per billion, which includes chromium-6. EPA regularly revaluates drinking water standards and based on new science, the agency has launched a rigorous and comprehensive review of the effects of chromium-six on human health. In September, we released a draft of that scientific review for public comment. When this scientific assessment is finalized in 2011, EPA will carefully review the conclusions and consider all relevant information to determine if a new standard needs to be set.

Chromium is a metallic element in the periodic table. It is odorless and tasteless. Chromium is found naturally in rocks, plants, soil and volcanic dust, humans and animals. The most common forms of chromium in the environment are trivalent (chromium-3), hexavalent (chromium-6) and the metal form, chromium-0. Chromium-3 occurs naturally in many vegetables, fruits, meats, grains and yeast. Chromium-6 and -0 are generally produced by industrial processes. Major sources of chromium-6 in drinking water are discharges from steel and pulp mills, and erosion of natural deposits of chromium-3. At many locations, chromium compounds have been released to the environment via leakage, poor storage, or improper disposal practices. Chromium compounds are very persistent in water as sediments.

Why doesn't EPA regulate chromium-6?

EPA does regulate chromium-6 (or hexavalent chromium) as part of the total chromium drinking water standard since 1992.

The current drinking water standard sets the maximum level of total chromium allowed in drinking water, and this standard addresses all forms of chromium, including chromium-6. Since current testing does not distinguish what percentage of the total chromium is chromium-6 versus chromium-3, EPA's regulation assumes that the sample is 100% chromium-6. This means the current total chromium standard has been as protective and precautionary as the science of that time allowed.

What is the current standard for total chromium in drinking water?

The current standard is set at 100 parts per billion. EPA's regulation assumes that the sample is 100% chromium-6. This means the current chromium standard has been as protective and precautionary as the science of that time allowed. The current standard is based on potential adverse dermatological effects over many years, such as allergic dermatitis.

Why are chromium-6 and chromium-3 covered in the same standard?

These two forms of chromium can convert back and forth in water and in the human body, depending on environmental conditions. Measuring just one form may not capture all of the

chromium that is present. In order to ensure that the greatest potential risk is addressed, EPA's regulation assumes that the sample is 100% chromium-6, the more toxic form.

Is the EPA currently considering putting a limit on how much chromium-6 can be in drinking water?

EPA currently regulates chromium-6 as part of the total chromium drinking water standard. New health effects information has become available since the original standard was set, and EPA is reviewing this information to determine whether there are new health risks that need to be addressed. When the review is complete, we will consider this and other information to decide whether the drinking water standard for total chromium needs to be updated.

How often does EPA update the total chromium drinking water standard?

As mandated by the Safe Drinking Water Act, EPA regularly reviews drinking water standards to make sure they are up to date with the best available science. When new peer-reviewed data become available (like the 2008 cancer studies by the National Toxicology Program), EPA reviews that, along with other information, to determine whether the drinking water standard needs to be updated to better protect human health. EPA is currently in the process of conducting a human health assessment for chromium-6.

What is EPA doing to better understand the health risks from exposure to chromium-6?

The agency regularly re-evaluates drinking water standards and, based on new science on chromium-6, in September 2010 released for public comment a draft risk human health assessment for chromium-6. When this human health assessment is finalized in 2011, EPA will carefully review the conclusions and consider all relevant information to determine if the standard needs to be revised.

Is chromium-6 a carcinogen?

In the draft human health assessment for chromium-6 that was released in September 2010 by EPA for independent expert peer review and public comment, EPA is proposing to classify hexavalent chromium (or chromium-6) as likely to cause cancer in humans when ingested over a lifetime. EPA will make a final determination by the end of 2011.

In 1998, EPA's Integrated Risk Information System (IRIS) Program classified hexavalent chromium as a known human carcinogen via inhalation but did not have the science at that time to be able to classify it as to human carcinogenicity via ingestion.

What did the EPA release in September?

On September 30, 2010, a draft human health assessment for chromium-6, was released by EPA's IRIS Program for independent expert peer review and public comment. This draft IRIS health assessment addresses both noncancer and cancer health effects associated with the ingestion of chromium-6 over a lifetime. This is the first EPA cancer assessment for hexavalent chromium (chromium-6) by ingestion.

EPA worked in conjunction with the New Jersey Department of Environmental Protection, California Environmental Protection Agency, and Agency for Toxic Substances and Disease Registry on the development of this draft IRIS assessment and is using information from their recent draft assessments of hexavalent chromium (chromium-6) as the primary basis for the IRIS assessment.

For a copy of the draft risk assessment and further information about its results, visit EPA's website at: http://cfpub.epa.gov/ncea/iris_drafts/recordisplay.cfm?deid=221433

What are sources of chromium-6?

Chromium in different forms can be used for making steel and other alloys, for chrome plating, for dyes and pigments, and for leather and wood preservation. It can also be found naturally in soil. The primary forms of chromium found in the environment are chromium-3 and chromium-6 and these forms can convert back and forth depending on environmental conditions.

What advice does the EPA offer to those worried about whether their tap water is safe enough to drink?

Ensuring safe drinking water for all Americans is a top priority for EPA and the agency has a standard for total chromium – which includes chromium-6 - which water systems must meet by law. According to the most recent data, all public water facilities are in compliance with the existing total chromium standards. However, citizens concerned about the safety of their drinking water can take additional steps. Consumers of public water can check their provider's website to access the provider's consumer confidence report (CCR) or contact the provider to ask if their tap water contains chromium. You can find contact information for your public water system on your water bill. Consumers served by private wells can have their water tested by a state certified laboratory. You can find one in your area by calling the Safe Drinking Water Hotline at 800-426-4791 or by contacting your state water certification officer. Contact information for your state can be found at http://water.epa.gov/scitech/drinkingwater/labcert/

If a consumer is concerned about chromium in their water, then they can consider installing a home treatment unit that has been certified to remove chromium-6 (hexvalent chromium). NSF International http://www.nsf.org/Certified/DWTU/ and the Water Quality Association http://www.wqa.org/sitelogic.cfm?id=1165 provide lists of treatment devices they have certified.