

Consumer Fact Sheet: Copper in your Drinking Water

What is copper?

Copper is a reddish metal that occurs naturally in rock, soil, water, sediment, and air. Since copper is easily shaped and molded, it is commonly used to make pennies, electrical wiring, cooking utensils, plumbing fixtures, and water pipes used for internal plumbing in homes.

How does copper get in drinking water?

Copper can contaminate the drinking water when pipes and plumbing fixtures with copper in them are corroded from being in contact with water for long periods of time. Drinking water sources can also be contaminated from erosion of natural copper deposits in the soil and leaching from wood preservatives.

Are there drinking water standards for copper?

The California Department of Health Services (DHS) has set an Action Level for copper of 1.3 milligrams per liter [mg/L; 1,300 micrograms per liter (ug/L)] based on possible health effects. Some people who drink water with copper in excess of the Action Level over a relatively short amount of time (hours or days) may experience gastrointestinal distress. Some people who drink water with copper in excess of the Action Level over many years may suffer liver or kidney damage. People with Wilson's Disease can be more sensitive to the effects of copper and should consult their personal doctor if their drinking water has copper above the Action Level. Water utilities with copper levels above the Action Level are required to implement treatment or other control strategies to reduce the copper levels.

Unlike some "contaminants in drinking water," copper is an essential nutrient, and is necessary in our diet for good health. Copper, along with iron, helps in the formation of red blood cells. It also helps in keeping the blood vessels, nerves, immune system, and bones healthy. According to the National Institutes of Health, the recommended normal daily intake for copper is: 0.5-1 mg/day for infants, 1-2 mg/day for children, and 2 mg/day for adults. You may wish to ask your health care provider for your specific dietary needs.

In addition to the Action Level, the U.S. Environmental Protection Agency has set a maximum contaminant level goal (MCLG) of 1.3 mg/L and the Cal/EPA Office of Environmental Health Hazard Assessment has set a public health goal (PHG) of 0.17 mg/L for copper (see http://www.oehha.ca.gov/water/phg/pdf/coppr_c.pdf). These levels are nonenforceable goals for levels of copper in the drinking water. The levels differ because the two agencies have different approaches to setting such levels.

Since copper concentrations above 1.0 mg/L may cause blue or green stains around sinks and plumbing fixtures, and may impart a light blue color and a bitter metallic taste to the water, DHS has set a secondary drinking water standard for the aesthetic quality of the water of 1.0 mg/L for copper. You may notice the aesthetic effects before the copper levels are high enough to pose a risk of adverse health effects.

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What should I do to reduce the risk of being exposed to copper and other metals in drinking water? Since the presence of copper and other metals in drinking water (e.g., lead) is most often the result of corrosion of pipes and fixtures, consumers should always let the water run from the tap before using it for drinking or cooking any time the water in a faucet has gone unused for more than six hours. Flushing the tap means running the cold water faucet until the water gets noticeably colder, usually about 15 to 30 seconds. Also, since metals can leach from the inside of hot water heaters, only cold water should be used for drinking and cooking.

What should I do if I suspect that my water may have elevated copper levels?

You may want to have your drinking water tested by a laboratory certified by the Department to determine if it contains elevated concentrations of copper. Check your phone book or contact your water provider or the DHS Environmental Laboratory Accreditation Program at 510.540.2800 to get information on certified laboratories in your area.

What should I do if the copper level in my drinking water is higher than the Action Level?

You should use bottled water for drinking water and cooking while you investigate to determine the source of the copper. Do not boil the water because boiling will concentrate and increase the copper levels in the water.

Contact your water supplier to determine whether the copper is from the drinking water provided by your supplier, or whether it is from internal corrosion of household piping. Please keep in mind that your water supplier is not responsible for the quality of the water on your side of the meter.

If you determine that your piping or fixtures are to blame, you may wish to change out the pipes or fixtures, though this can be very costly. Another alternative is a home treatment device that has been certified by DHS to remove copper. A directory of certified home treatment devices is on the Internet at:

<http://www.dhs.ca.gov/ps/ddwem/technical/certification/device/table.htm>.

There are no data to suggest that water with copper at levels near the Action Level poses a health risk with respect to dermal contact (bathing or washing) or inhalation. Higher levels may also be safe, but there are no studies available on which to base such a conclusion. Skin contact with metallic copper can result in an allergic reaction in some people, usually as skin irritation or a skin rash. Anyone concerned about an individual sensitivity to dermal or inhalation exposure should consult with a health care provider.

Please share this information with other people who may be drinking water with copper above the Action Level. For more information about contaminants and potential health effects, call your water utility, the local Department of Health Services Field Office (619-525-4834), or the USEPA's Safe Drinking Water Hotline (1-800-426-4791).

Unit Conversions

1 mg/L = 1,000 ug/L

mg/L = milligrams per liter, or parts per million (ppm)

1 gallon = 3.8 L (liters)

ug/L = micrograms per liter, or parts per billion (ppb)

Action Level	The concentration of a contaminant which, if exceeded, triggers actions, such as treatment or other control strategies to reduce the concentration in the drinking water
Maximum Contaminant Level Goal (MCLG)	The concentration of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the U.S. Environmental Protection Agency.
Public Health Goal (PHG):	The concentration of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California Environmental Protection Agency's Office of Environmental Health Hazard Assessment.