How can I be exposed to copper?

Copper and its compounds are common in the environment. You may be exposed to copper by breathing air, eating food or drinking water containing copper. You may also be exposed by skin contact with soil, water or other copper-containing substances.

Copper forms differ when joined with one of more other chemicals. These may be naturally-occurring or manmade. Most copper compounds found in air, soil and water are strongly attached to dust or embedded in minerals, and cannot easily enter the body. These forms become dissolved in water and are not attached to other particles. In this form, copper is more likely to affect your health.

How does copper get into my water supply?

Levels of copper found naturally in ground water and surface water are generally very low; about 4 micrograms of copper in one liter of water(4 ug/l) or less. Copper levels may increase significantly if corrosive water comes in contact with copper plumbing and copper-containing fixtures in the water distribution system. This normally occurs if corrosive water remains motionless in the plumbing system for six hours or more. Copper in drinking water increases with the corrosivity of the water and the length of time it remains in contact with the plumbing.

Higher copper levels have sometimes been noted in new homes constructed with copper plumbing. Copper levels tend to decrease with time as coatings form a natural barrier between the water and the plumbing materials

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The United States environmental protection Agency (EPA) sets drinking water standards and has determined that copper is a health concern at certain exposure levels. Copper, a reddish-brown metal, is often used to plumb residential and commercial structures that are connect to water distribution systems. Copper contaminating drinking water as a corrosion by-product occurs as the result of the corrosion of copper pipes that remain in contact with water for a prolonged period of time. Copper is an essential nutrient, but at high doses it has been shown to cause stomach and intestinal distress, liver and kidney damage, and anemia. Persons with Wilson's disease may be at a higher risk of health effects due to copper than the general public. Any water system that exceeds the action level shall also monitor their source water to determine whether treatment to remove copper in source water is needed.

What Should I Do If My Drinking Water Has Elevated Copper Levels?

The easiest and most effective method for reducing exposure to copper is to avoid drinking or cooking with water that has been in contact with your house plumbing for more than six hours. When first drawing water in the morning or after a work day, flush the system by running the cold water faucet for 2-3 minutes, or until the water gets as cold as possible. (If you live in an apartment complex, flushing the system may take longer). Water used for showering or washing also helps flush the system. It is still a good idea to flush each faucet where water is drawn for drinking or cooking purposes since some fixtures contain copper.

Another option for reducing your exposure to copper is to purchase bottled water. This may be a useful option, particularly if it will be used by young children as drinking water, or for making infant formula. However, you should be careful to obtain bottles water which meets all drinking water standards.

How can copper affect my health?

Copper in our diet is necessary for good health. You eat and drink about 1000 micrograms (1000 ug) of copper per day. Drinking water normally contributes approximately 150 ug/day. Immediate effects from drinking water which contains elevated levels of copper include vomiting, diarrhea, stomach cramps, and nausea. The seriousness of the effects can be expected to increase with increased copper levels or length of exposure.

Long-term exposure (more than 14 days) to very high levels of copper in drinking water has been found to cause kidney and liver damage in some people. Children under one year of age are more sensitive to copper because it is not easily removed from their system. People with liver damage or Wilson's disease are highly susceptible to copper toxicity.
On the average, drinking water accounts for less than 5% of our daily copper intake. The U.S. Environmental Protection Agency (U.S. EPA) has determined that copper levels in drinking water should not exceed 1300 ug/l. No adverse health effects would be expected if this level is not exceeded. Measures should be taken to reduce exposure to copper if this level is exceeded.

How can I find out if my water is safe to drink?

Elevated copper levels in drinking water may significantly increase your exposure to copper and cause adverse health effect. You may find that there is a metallic taste in your drinking water before copper levels are high enough to cause adverse health effects. You may also notice blue or blue-green stains around sinks and plumbing fixtures. The only way to be certain of the copper level in you drinking water supply is to have the water tested. It is recommended that you use a laboratory that is state certified to analyze copper levels in drinking water.

If you are being served by a public water system, the owner of the utility will have results of copper sampling which has been done in parts of the distribution system. If the EPA action level of 1300 ug/l for copper is exceeded in more than 10% of samples collected, the utility must conduct further testing to determine if the corrosivity of the water is contributing to an increase in the copper levels. They are also required to optimize corrosion control measures to reduce the corrosivity of the water to acceptable levels. If you have any questions regarding copper monitoring, contact your water utility.

If you are experiencing elevated copper levels in drinking water, it may be likely that lead levels are also elevated. This is especially true if the plumbing system in your home or apartment contains lead solder joints, lead service lines, or brass fixtures. Since lead and copper enter drinking water under similar conditions, it is advisable to test for lead when testing for copper.

FOR MORE INFORMATION CONTACT:

Wisconsin State Laboratory of Hygiene at 800-442-4618

I certify that the information and statements contained in this Public Education are true and correct and have been provided to consumers in accordance with the delivery, content, format and deadline requirements of Subchapter X of ch. NR 809, Wis. Adm. Code.

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What is Copper?

Copper is a reddish metal that occurs naturally in rock, soil, water, sediment, and air. Its unique chemical and physical properties have made it one of the most commercially important metals. Since copper is easily shaped or molded, it is commonly used to make pennies, electrical wiring, and water pipes. Copper compounds are also used as an agricultural pesticide and to control algae in lakes and reservoirs.

Copper also occurs naturally in plants and animals. It is an essential element for all known living organisms including humans. However, very large single or long-term intakes of copper may harm your health.