



## Chemical Quality: Copper (Cu)

### What is Copper?

- 💧 Copper occurs in nature as an orange metal.
- 💧 We need copper in our bodies as it forms an integral part of the fatty covering of nerve fibre sheaths.
- 💧 Copper is useful in the electrical industry, since it is an excellent conductor of both heat and electricity.

### Copper in water

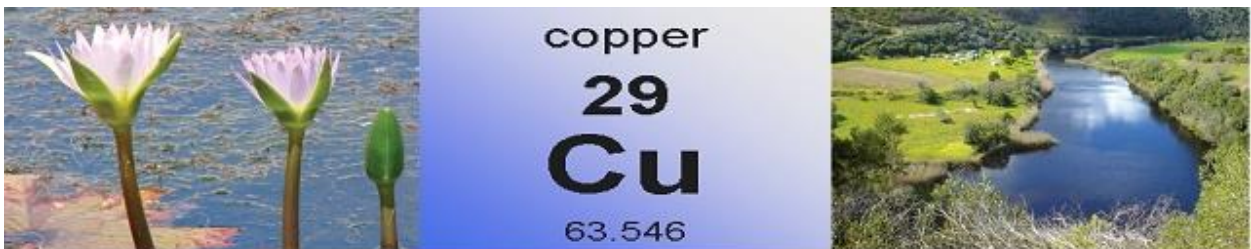
- 💧 Copper occurs in natural, unpolluted water in concentrations of less than 0,1 mg/l.
- 💧 Copper concentrations of more than 1 mg/l occur when the water has a relatively low pH and subsequently corrodes the copper from the water pipes in which it flows. Such water has a blue-green colour.

### What problems can Copper cause?

- 💧 Copper concentrations in natural water usually have no adverse effects on **healthy** people
- 💧 People suffering from Will's disease (a hereditary disease which can also be acquired from abnormally high iron intake, e.g. through beer brewed in cast-iron kettles) are however very **sensitive** to copper and can develop chronic health effects. People that drink a lot of water, living under hot conditions, are also sensitive to copper.
- 💧 Very high concentrations of copper can cause acute damage to the liver and kidneys with symptoms such as nausea and vomiting.
- 💧 **Aesthetically**, higher copper concentrations can change the water colour to blue/green and subsequently stain clothes and hair. The water can taste like metal as well.

### How can Copper in water be treated?

- 💧 In order to remove copper from water, you need a pH of between 6 and 7 and flocculate the copper, using aluminium and ferric salts.
- 💧 Water with very high copper concentrations may need to be treated with lime and a precipitation method, whereby the copper is precipitated as copper hydroxide under alkaline conditions.
- 💧 Home treatment kits, using ion-exchange processes are expensive and treat only small volumes of water.



Reference: DWAF (1998). Quality of domestic water supplies. Vol. 1: Assessment Guide. WRC No. TT 101/98, pp. 21.