

Advice Sheet 6 - Metals



Lead

Lead may be present naturally in water to a small degree as a result of dissolution from natural sources. However, it is mainly present from household plumbing systems in which the pipe, solder, fittings or service connections contain lead. The Regulations specify a standard for lead of 25 µg/l. However, this level is to be reduced in 2010 to 10 µg/l. Wherever practicable lead pipework should always be replaced. As an interim measure, water that has been in contact with the lead may be run to waste. The concentration of lead in water is a function of the plumbosolvency of the water together with the contact time.

Copper

Copper levels in drinking water vary naturally from 10µg/l to 500µg/l. Copper in water has an unpleasant, astringent taste. The taste threshold is above 5000µg/l, although taste is detectable in distilled water at 2600µg/l. The presence of copper in the water supply above the 3000 µg/l standard, although not constituting a hazard to health, may interfere with the domestic use of water. It may also be an indication of a corrosive supply and its presence may enhance corrosion of aluminium and zinc utensils and fittings. Staining of laundry and plumbing fixtures occurs when copper concentrations in water exceed 1000µg/l, and this is the value recommended by the World Health Organisation as a guideline value.

Aluminium

Aluminium is a widespread and abundant element, found as a normal constituent of all soils, plants and animal tissues. It is usually present in natural waters from leaching from soil and rock, particularly in acidic surface waters derived from upland catchments.

The typical daily intake of aluminium from food is between 5,000 and 20,000 µg, depending on individual variations in eating and drinking habits. Aluminium in drinking water will usually contribute only a very small proportion of the total daily intake. If a contribution of 5,000 µg/day from food is assumed, an adult

drinking 2 litres of water per day containing 200 µg of aluminium per litre would receive approximately 8% of his or her total intake from drinking water.

Although some researchers have linked aluminium with Alzheimer's disease, available evidence does not support the derivation of a health based guideline value for aluminium in drinking water, consequently current limits are set for aesthetic reasons.

Iron

The presence of iron in natural water, can be attributed to a number of causes such as the dissolution of rocks and minerals, acid mine drainage, landfill leachates, or the dissolution of iron pipes. It may also vary considerably depending on the amount of rainfall and the season. The presence of iron in drinking water supplies is objectionable for a number of reasons unrelated to health. Ferrous salts are unstable and precipitate as insoluble ferric hydroxide, which settles out as a rust coloured silt. Such water often tastes unpalatable and stains laundry and plumbing fixtures. The sediment may gradually reduce the flow of water and promote the growth of *iron bacteria* which eventually deposit a slimy coating on the piping. The above problems usually arise, especially in distribution systems, when the iron concentration approaches 300µg/l. High levels of iron are usually removed from small supplies by catalytic filtration.

Manganese

Elevated levels of manganese are often found in underground water as a result of the dissolved salt from the rocks. Manganese is an essential element in animals and man and is regarded as one of the least toxic elements. The presence of manganese in drinking-water supplies may be objectionable for a number of reasons unrelated to health. At concentrations exceeding 150 µg/l manganese imparts an undesirable taste to beverages and stains plumbing fixtures and laundry. It may also precipitate and cause problems of encrustation. Even at 0.02mg/l (20µg/l), manganese will form coatings on piping which may slough off as a black precipitate and may be visible in kettles. Manganese may be removed from a small supply by catalytic filtration.

For further advice or information, please contact:

Environmental Health
South Hams District Council
Follaton House
Plymouth Road
Totnes
Devon TQ9 5NE

Telephone: 01803 861234
Fax: 01803 861294

Email: environmental.health@southhams.gov.uk
www.southhams.gov.uk

January 2006