



DRINKING WATER: ALUM IN WATER TREATMENT



ALUMINIUM SULFATE OR ALUM IS USED AS A FLOCCULANT TO REMOVE UNWANTED COLOUR AND TURBIDITY FROM WATER SUPPLIES. IT HAS BEEN USED SINCE ANCIENT TIMES FOR THIS PURPOSE AND ITS USE TOGETHER WITH FILTRATION IS STANDARD PRACTICE IN CONVENTIONAL WATER TREATMENT PROCESSES AROUND THE WORLD.

AFTER PERFORMING ITS ROLE THE ALUM IS FILTERED FROM THE WATER BUT A SMALL FRACTION DISSOLVES AND IS NOT REMOVED

CONCERNS ABOUT ALUM

There has been ongoing debate in the water industry for a number of years regarding the use of alum in the water treatment process and the 'suspicion' that aluminium is linked to Alzheimer's disease. The cause of Alzheimer's disease is subject to international research. A variety of possible causes have been considered, however, no link between aluminium intake and the disease has been established.

RESEARCH FINDINGS

The CSIRO has conducted extensive research in this matter and in late 1998 found convincing evidence that the use of alum to treat drinking water is safe. The CSIRO found that the aluminium we obtain from treated drinking water is an insignificant amount: only 1 to 2% of our daily intake of aluminium comes from water and only the barest trace of this is absorbed. Most of the aluminium absorbed is excreted through urine.

OCCURRENCE OF ALUMINIUM

Aluminium is the third most abundant element and comprises about 8% of the earth's crust. It is never found in its natural form as a pure metal but is always locked in, or mixed with, other elements as very stable chemical compounds such as aluminosilicates. It occurs in most rocks, vegetation and soils (such as clay etc) in this combined form. Aluminium is widely used in many industrial and domestic products including antacids, antiperspirants and food additives, and in vaccines. It is

commonly used in the food industry as food containers and packaging and many cooking utensils are made of aluminium. It occurs naturally in many foods.

HOW DOES ALUMINIUM ENTER DRINKING WATER?

Aluminium occurs naturally and may be present in water due to natural leaching of soil and rock. However, most of this aluminium would be in the acid-insoluble form. It can also be present as a residual from the use of alum as a flocculant in water treatment. This would be in the acid-soluble form but should not contribute significant concentrations if the water treatment process is optimised.

IS WATER THE ONLY SOURCE OF ALUMINIUM?

No. It has been estimated that its intake from food and beverages is approximately 5-20 mg/day. Research has shown of the order of 0.4 to 1% of the lifetime body burden of bioavailable aluminium comes from alum treated drinking water, a minor proportion considering the relatively large and variable intake of aluminium from food. Hence if a link between aluminium and health were ever established, significant reduction in aluminium intake could only result from dietary change.



CAN WATER BE TREATED TO REMOVE ALUMINIUM?

Aluminium concentrations in drinking water can be reduced by utilising the conventional water treatment practices of flocculation and filtration. A well operated water filtration plant, even using alum as a flocculant, can achieve aluminium concentrations in the finished water of less than 0.1 mg/L.

WHAT CONCENTRATION OF ALUMINIUM IS PRESENT IN DRINKING WATER SUPPLIED BY HUNTER WATER?

The Australian Drinking Water Guidelines recommend that:

“Based on aesthetic problems caused by post-flocculation, the concentration of acid-soluble aluminium in drinking water should not exceed 0.2 mg/L. Water authorities are strongly encouraged to keep acid-soluble aluminium concentrations as low as possible, preferably below 0.1 mg/L

No health-based guideline is set for aluminium at this time but this issue will be kept under review.”

The concentration of acid-soluble aluminium in drinking water water supplied by Hunter Water well are typically less than 0.05 mg/L – well within the recommendations of the Australian Drinking Water Guidelines.

FOR MORE INFORMATION

YOU CAN FIND OUT MORE BY VISITING OUR WEBSITE AT

WWW.HUNTERWATER.COM.AU

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1300 657 657