european aluminium association

ALUMINIUM AND HEALTH

Fact sheet 4

ALUMINIUM CHEMICALS IN WATER TREATMENT

Aluminium is a natural component in surface and ground water. Most water authorities throughout the world also use aluminium sulphate or “alum” as a flocculating agent in treating their water supplies. A flocculating agent is a substance that, when added to water, attracts small inorganic particulate matter, bacteria, virus and other organisms potentially harmful to humans, to assist in their filtration. Some water supplies do not need to be treated with a flocculant, while other supplies are undrinkable without treatment due the high levels of turbidity, naturally occurring chemicals and disease causing bacteria and virus.

At present there is a WHO (2003) guideline for aluminium in drinking water from treatment plants of 0.1 mg/l in a large water treatment facilities and 0,2 mg/l in small facilities based on practical optimisation of the process. This guideline is essentially set for the visual effect and taste. No health-based criteria have been proposed for aluminium levels in drinking water by the World Health Organisation.
The European Commission has also adopted the same guideline level, which is used by EU Member States.
Virtually all water contains small amounts of aluminium. In neutral waters this is present as insoluble compounds, while in highly acidic or alkaline water it may be present in dissolved form.
Several epidemiology studies have looked at the relationship between aluminium in water and Alzheimer's Disease. These show very different results, often because it is difficult to correct for all the other factors influencing the results. A Canadian study (2008), where the authors have tried to correct for other factors, shows no relationship between aluminium content in water and Alzheimer's Disease. It must also be kept in mind that aluminium in water accounts for less than 1,0% of the total daily aluminium intake. Some articles have listed the hypothesis that aluminium in drinking water is more bio-available than other ingested aluminium. A paper (1995) suggests that this is not the case, and a study from Australia (1998) showed that the bio-availability of aluminium naturally present in food and in drinking water treated with alum was the same. Latest animal studies have also shown that it is impossible to predict the aluminium level present in the human body only from calculating aluminium in drinking water.
An US study found that 40% of the treatment plants tested had lower total aluminium content in their output than in their raw supply.

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Alum has become the benchmark in water treatment world-wide. Alum is arguably the most effective flocculant available; it is relatively safe to handle, cheap to produce and due to its very low impurity levels presents little risk of exposure to toxic chemicals. It is also current expert opinion that alum at conventional levels poses no risk to human health.

References :

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