

Elimination of micro-pollutants in drinking water

Today, new analytical tools enable the detection of so-called micro-pollutants in water in concentrations as small as 1 ppb. The effects of these modern substances on human health are yet to be fully investigated. In modern drinking water treatment measures should be taken to handle such problems by implementing the necessary process stages as part of a multi-barrier system. The most common micro-pollutants include pesticides, drugs, diagnostic agents, endocrine effective substances and organic environmental chemicals.

One of WABAG's R&D focal points is the investigation and optimisation of known and new processes for the elimination of such substances during drinking water treatment. The main basic treatment processes are:

Ozonation (O₃); biofiltration/adsorption (GAC); ultra filtration (UF); Chlorination (CL); adsorption onto powder activated carbon (PAC)



This treatment combination was realized in a 15 MLD treatment plant on Lake Zürich in 2005. Micro-pollutants are eliminated or reduced by ozonation and in the GAC filter mainly through biological degradation. Substances are also adsorbed with the degree of adsorption being in ratio to GAC operating time.



This treatment chain is under construction for the new multi-barrier-system at the Horgen WTP on Lake Zürich. This process combination also includes the treatment of micro-pollutants, mainly by means of oxidation, adsorption and biological degradation.



When micro-pollutants are limited to known single substances, instead of ozonation in combination with GAC, pure adsorption can be sufficient for the treatment of such types of raw water. If powder-activated carbon is utilised, it is essential that a highly efficient filtration system is employed. The use of membranes for such an application would be the obvious choice, however operational experience is limited, especially with regard to continuous PAC dosing.



Another highly promising technology involves the application of ozone in direct combination with ceramic membranes. In the WABAG CERAMOZONE process, raw water is ozonated and fed directly onto the membranes. This preserves a certain residual ozone concentration in the water while it passes the membranes prior to entering a GAC filter.



WABAG pilot ultra filtration plant, which can be enlarged with a PAC dosing system

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