

Comparison of polymeric and ceramic membrane filtration for particles removal in the OBM (Deliverable D 2.2.3)



Ozonation followed by biofiltration is well known as one of the most promising processes in advanced drinking water treatment. However, the biofiltration step will produce/release particles (sludge, bacteria, and inorganic particles) which should be removed from the water before distribution.

Importance

The particles removal after the ozonation-biofiltration could be achieved by for instance membrane filtration, which also would provide a second hygienic barrier. Therefore, two membranes have been tested (a Zenon ZW10 ultrafiltration unit and a NGK ceramic microfiltration unit).

Approach

The membranes performances were evaluated by monitoring the development of the TMP and Δ TMP over time for different fluxes. Increase in TMP (absolute values) with time correlates to a permeability decline rate (i.e. fouling rate) and ultimately determines how long a sustainable operation of the membrane filtration unit can be achieved for a given operating mode (i.e. flux as a function of feed characteristics). Δ TMP is the difference in TMP immediately before and after backwash, and is directly correlated to the reversible fouling.

Result

The use of ceramic microfiltration membranes as applied in this study for the final filtration step has shown to be a poor choice due to severe fouling. Ultrafiltration using polymeric membranes, on the other hand, has worked very well as it could be operated at high fluxes (80 LMH) in an immersed configuration, with a high recovery (98%), still permitting operational time of approx 400 hrs before chemical cleaning was needed (approx. 600 hrs of operation at flux of 60 LMH).

More information

The results of this study have been submitted for publication in Organic Geochemistry under the title: "Removal of NOM by an Oxidation-Biofiltration-Membrane filtration (OBM) process" and the link to the published paper will be given as soon as it is accepted. However for further information contact:

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