Abstract Title	Perspective on PFAS removal by ionexchange or activated carbon in the drinking water domain
Topic	**x Improving water quality** O Resilient water systems **x Circular solutions: Reuse, Recover and Recycle** O Transitions in water, agro/food and energy
Challenges and Solutions	Challenge: PFAS in sources for drinking water production Solutions: Ion exchange or activated carbon
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Abstract	Poly- and perfluoroalkyl substances (PFAS) are a group of synthetic organic compounds widely used in various industrial and commercial applications. They are known to be mobile and persistent in the environment and regarded as a risk for the ecosystem and human health. PFAS has already for more than a decade been detected in drinking water sources worldwide, recently leading to public debate on their discharge into water bodies. The Netherlands Institute for Public Health and Environment (RIVM), following advice of the EFSA, has raised concerns about the level of PFAS concentrations in drinking water, leading to strict guideline values. Already for many years, the Dutch drinking water association VEWIN successfully advocates pristine surface water sources for drinking water production. Main approach is raising political awareness regarding discharge of OMP's. In the case of persistent and mobile classes of compounds such as PFAS, this approach has not prevented pollution, leading to challenges and additional treatment requirements for drinking water production. The nature of drinking water treatment consists of retention (membranes), adsorption (GAC or IEX) and

degradation. In the context of evaluating emerging technologies for drinking water production, PWNT focuses on assessing the ability of activated carbon and suspended ionexchange technologies to remove PFAS.

The two technologies, especially in suspended form, allow an adequate additional treatment step, targeting PFAS specific removal. Preliminary results on the performance of the two selected technologies, suspended ion exchange resin and activated carbon, in terms of PFAS removal in the drinking water domain are shared.

Knowledge regarding application and performance of activated carbon regarding PFAS removal is well established. Therefore, the majority of this work focusses on the removal efficiency of different PFAS compounds using commonly available ionexchange resin and PFAS specific ionexchange resin.

To ensure accurate detection of residual PFAS after each treatment, a spike solution containing elevated concentrations of different PFAS compounds was added to the feed water prior to each test. Equilibrium adsorption of spiked PFAS onto two microporous resins in suspension was assessed using jar tests with constant agitation.

The preliminary results showed complete and targeted removal across all PFAS species, using the PFAS specific resin (TP108) (figure 1). In comparison, a regular natural organic matter targeting ionexchange resin (S5128), proved to achieve PFAS removal as well, although to lower levels.

The disadvantage of applying a non PFAS specific ionexchange resin is a reduced efficiency in the use of exchange sites. Furthermore, in case of regeneration of the ionexchange resin, a mixed PFAS polluted waste stream is generated, disabling reuse or efficient destruction.

The suspended and single pass ionexchange concept (SIX) allows implementation in existing treatment trains. The suspended mode avoids clogging of media beds and allows a targeted constant contaminant (PFAS) level in the finished water, making this also a promising

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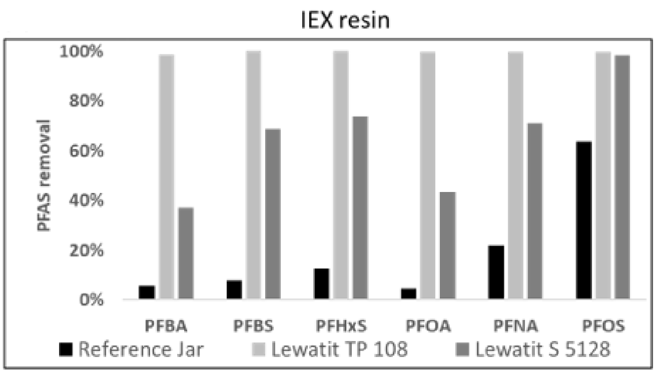
In conclusion, the PFAS specific ionexchange resin demonstrated the highest PFAS removal efficiency among all the compounds tested, owing to its modified properties and successful performance in suspension mode.</td></tr>
<tr><td>Figures/diagrams/illustrations</td><td>Figure 1

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