



## Improved elimination of organic micropollutants by a process combination of membrane bioreactor (MBR) and powdered activated carbon (PAC)

Pia Lipp\*, Hans-Jürgen Groß, Andreas Tiehm

DVGW-Technologiezentrum Wasser, Karlsruher Str. 84, D-76139 Karlsruhe, Germany  
Tel. +49 721 9678 127; Fax: +49 721 9678 109; email: pia.lipp@tzw.de

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### ABSTRACT

Membrane bioreactors (MBR) are increasingly considered for de-centralized wastewater treatment. As MBR can be operated with higher sludge retention time and total suspended solids than conventional wastewater treatment plants (WWTP) the elimination of micropollutants is slightly better for MBR than for WWTP. However to be able to use the MBR filtrate for artificial ground water recharge it is necessary to further improve elimination of micropollutants. In this study, the MBR process has therefore been combined with the adsorption on powdered activated carbon (PAC). PAC was dosed to the MBR filtrate of a pilot plant and removed again after a contact time of 30 min. PAC was recycled to the MBR process tank to use the residual adsorption capacity. The process was operated continuously for a period of 110 d. With 5–10 mg l<sup>-1</sup> PAC dosage a 50–80% improved elimination of carbamazepine and diclofenac could be achieved compared to the process without PAC.

*Keywords:* Organic micropollutants; Membrane bioreactor MBR; Powdered activated carbon (PAC); Waste water treatment; Fouling; Elimination of persistent organic pollutants (POPs)

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\*Corresponding author.