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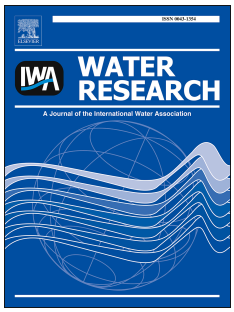


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# Simultaneous removal of dissolved organic matter and nitrate from sewage treatment plant effluents using photocatalytic membranes

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**Abstract** The residual dissolved organic matter (DOM) and nitrate in sewage treatment plant (STP) effluent have potential negative impacts on the aqueous environment. To that end, we used formic acid (FA) to enhance the photochemical behavior of the photocatalytic membrane for the simultaneous removal of DOM and nitrate from secondary STP effluent. Effluent samples were collected from two different biological treatment processes, Anaerobic-Oxic and Anaerobic-Anoxic-Oxic-membrane bioreactor, respectively. Through Fourier transform-ion cyclotron resonance-mass spectrometry (FT-ICR-MS) analysis, we found that the addition of FA resulted in a similar molecular transformation in different STP effluent samples. Besides, the radical signal of the carboxyl anion could be observed during the photocatalytic process. Based on the results, we proposed the mechanism of the process that carboxyl anion radicals generated by FA could attack