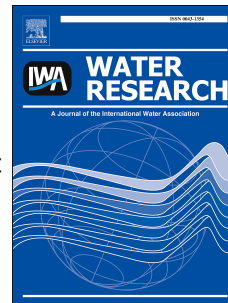


# Accepted Manuscript

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

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PII: S0043-1354(18)30494-9

DOI: [10.1016/j.watres.2018.06.044](https://doi.org/10.1016/j.watres.2018.06.044)

Reference: WR 13871

To appear in: *Water Research*

Received Date: 24 March 2018

Revised Date: 24 May 2018

Accepted Date: 18 June 2018

Please cite this article as: Xu, H., Li, Y., Ding, M., Chen, W., Wang, K., Lu, C., Simultaneous removal of dissolved organic matter and nitrate from sewage treatment plant effluents using photocatalytic membranes, *Water Research* (2018), doi: 10.1016/j.watres.2018.06.044.

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

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10  
11     **Abstract** The residual dissolved organic matter (DOM) and nitrate in sewage  
12     treatment plant (STP) effluent have potential negative impacts on the aqueous  
13     environment. To that end, we used formic acid (FA) to enhance the photochemical  
14     behavior of the photocatalytic membrane for the simultaneous removal of DOM and  
15     nitrate from secondary STP effluent. Effluent samples were collected from two  
16     different biological treatment processes, Anaerobic-Oxic and  
17     Anaerobic-Anoxic-Oxic-membrane bioreactor, respectively. Through Fourier  
18     transform-ion cyclotron resonance-mass spectrometry (FT-ICR-MS) analysis, we  
19     found that the addition of FA resulted in a similar molecular transformation in  
20     different STP effluent samples. Besides, the radical signal of the carboxyl anion could  
21     be observed during the photocatalytic process. Based on the results, we proposed the  
22     mechanism of the process that carboxyl anion radicals generated by FA could attack

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