Fouling reduction by UV-based pretreatment in hollow fiber ultrafiltration membranes for urban wastewater reuse

Aleix Benito, Gerard Garcia, Rafael Gonzalez-Olmos

www.elsevier.com/locate/memsci

PII: S0376-7388(17)30307-1
DOI: http://dx.doi.org/10.1016/j.memsci.2017.04.070
Reference: MEMSCI15237

To appear in: *Journal of Membrane Science*

Received date: 31 January 2017
Revised date: 26 April 2017
Accepted date: 27 April 2017

Cite this article as: Aleix Benito, Gerard Garcia and Rafael Gonzalez-Olmos Fouling reduction by UV-based pretreatment in hollow fiber ultrafiltration membranes for urban wastewater reuse, *Journal of Membrane Science* http://dx.doi.org/10.1016/j.memsci.2017.04.070

Fouling reduction by UV-based pretreatment in hollow fiber ultrafiltration membranes for urban wastewater reuse

Aleix Benito, Gerard Garcia, Rafael Gonzalez-Olmos*

IQS School of Engineering, Universitat Ramon Llull, Via Augusta 390, 08017 Barcelona (Spain)

*E-mail: rafael.gonzalez@iqs.url.edu, tel: +34 93 267 20 80, fax: +34 93 205 62 66

ABSTRACT

Effluent organic matter (EfOM) is the major cause of fouling in low pressure membranes processes for wastewater reuse. UV light and UV/H_2O_2 have been applied as pretreatment to control the fouling in ultrafiltration membranes. The results show that both pretreatments decreased 30-44 % the transmembrane pressure (TMP), and consequently the membrane fouling. The removal of dissolved organic carbon (DOC) by the membrane was improved by 31 % in the case of UV/H_2O_2 pretreatment. The turbidity removal was improved more than 30 % when both UV-based pretreatments were used. The removal of SUVA, which it is a measurement of the aromaticity of the EfOM, correlated well with the maximum TMP reached so, the reduction of SUVA can be an indicator of the membrane fouling reduction in order to assess other pretreatments. The application of these pretreatments can represents important savings in the operational costs related with the membrane cleaning procedures and maintenance. So, the application of UV-based pretreatments seems to be a promising technique to reduce the membrane fouling and to increase the water quality for water reuse applications.

Keywords:

water reuse, UV, UV/H_2O_2, fouling, ultrafiltration, water reclamation

1. Introduction