Accepted Manuscript

Effect of sodium hypochlorite exposure on polysulfone recycled UF membranes and their surface characterization

Serena Molina, Junkal Landaburu-Aguirre, Laura Rodríguez-Sáez, Raquel García-Pacheco, José G. de la Campa, Eloy García-Calvo

PII: S0141-3910(18)30055-7

DOI: 10.1016/j.polymdegradstab.2018.02.012

Reference: PDST 8466

To appear in: *Polymer Degradation and Stability*

Received Date: 15 November 2017

Revised Date: 29 January 2018

Accepted Date: 13 February 2018

Please cite this article as: Molina S, Landaburu-Aguirre J, Rodríguez-Sáez L, García-Pacheco R, de la Campa JoséG, García-Calvo E, Effect of sodium hypochlorite exposure on polysulfone recycled UF membranes and their surface characterization, *Polymer Degradation and Stability* (2018), doi: 10.1016/j.polymdegradstab.2018.02.012.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

ACCEPTED MANUSCRIPT

Effect of sodium hypochlorite exposure on polysulfone recycled UF membranes and their surface characterization

Serena Molina[1,*], Junkal Landaburu-Aguirre[1], Laura Rodríguez-Sáez[1], Raquel García-Pacheco[1], José G. de la Campa[3], Eloy García-Calvo[1,2].

[1] *IMDEA Water Institute, Punto Com. n◦2. 28805. Alcalá de Henares. Madrid. Spain.*

[2] *Chemical Engineering Department. University of Alcalá. Ctra. Madrid-Barcelona Km 33.600. 28871. Alcalá de Henares. Madrid. Spain.*

[3] *Institute of Polymer Science and Technology, Consejo Superior de Investigaciones Científicas, ICTP-CSIC, Juan de la Cierva 3, 28006 Madrid, Spain.*

Abstract

The present work aims to investigate the effect of chlorine on the surface of the polysulfone (PSF) layer uncovered in the transformed ultrafiltration (UF) membranes (recycled from end-of-life reverse osmosis (RO) membranes). With this purpose, 6 end-of-life RO membranes used previously during their useful life to treat brackish water or seawater were transformed using two higher exposure doses of free chlorine (50,000 and 300,000 ppm·h). On one hand, the end-of-life membranes were first characterized in terms of the type of fouling identified by TGA, ICP and bacteria detection. On the other hand, to determine the stability of the PSF layer, the transformed PSF UF membranes were then characterized by means of its permeability and molecular weight cut-off (MWCO). In addition, membrane surface characterization was performed by ATR-FTIR, SEM and AFM. The results show that all the end-of-life RO membranes with organic and inorganic fouling were effectively transformed to PSF UF membranes at the ppm·h values studied. However, one of the analysed sea water membrane model (HSWC3) showed more resistance to be transformed and the pores of the uncovered PSF layer only appeared at 300,000 ppm·h. This membrane showed different surface appearance, with bigger pores after 300,000

Download English Version:

https://daneshyari.com/en/article/7824095

Download Persian Version:

https://daneshyari.com/article/7824095

Daneshyari.com