Desalination and Water Treatment
www.deswater.com

15 (2010) 84–91
March

1944-3994 / 1944-3986 © 2010 Desalination Publications. All rights reserved.
doi: 10.5004/dwt.2010.1671

Desalination properties of a novel composite membrane prepared by electrospinning method

Young-Jea Kim[a], Hee-Sang Shim[b], Jae-Suk Lee[a]*

[a]*Department of Material Science and Engineering and Department of Nano Bio Materials & Electronics, Gwangju Institute of Science and Technology (GIST), 261 Cheomdan-gwagiro, Buk-gu, Gwangju 500-712, Korea Tel. +82 (62) 970-2306; Fax +82 (62) 970-2304; email: jslee@gist.ac.kr*
[b]*Research Institute for Solar & Sustainable Energies (RISE), Gwangju Institute of Science and Technology (GIST), 261 Cheomdan-gwagiro, Buk-gu, Gwangju 500-712, Korea*

Received 12 November 2009; Accepted in revised form 24 December 2009

ABSTRACT

A novel composite membrane for potential desalination was prepared by coating of sulfonated poly(arylene ether) on the non-woven web. The non-woven web was made of end-group cross-linkable flurorinated poly(arylene ether) nanowires fabricated by electrospinning method. The crosslinked non-woven web was obtained by covalent crosslinking among ethynyl groups at the polymer chain end via thermal curing. The salt rejection and permeability of the crosslinked non-woven web were controlled by varying degrees of sulfonation (DS) of sulfonated poly(arylene ether). The compostie membranes show the increase of NaCl rejection as DS decreases from 20% to 60%, while water permeability decreases due to the increase of hydrophilicity. The order of salt rejection was as follows: Na_2SO_4 (88.4%), NaCl (79.3%), $MgSO_4$ (70.2%), Mg_2Cl_2 (62.3%).

Keywords: Electrospinning, Desalination, Composite membrane, Poly(arylene ether)

* Corresponding author.