

## Author's Accepted Manuscript

Polyamide Thin Film Composite Nanofiltration Membrane Modified with Acyl Chlorided Graphene Oxide

Peng Wen, Yingbo Chen, Xiaoyu Hu, Bowen Cheng, Dongqing Liu, Yufeng Zhang, Sankar Nair



PII: S0376-7388(16)32441-3  
DOI: <http://dx.doi.org/10.1016/j.memsci.2017.04.043>  
Reference: MEMSCI15207

To appear in: *Journal of Membrane Science*

Received date: 5 December 2016  
Revised date: 16 April 2017  
Accepted date: 21 April 2017

Cite this article as: Peng Wen, Yingbo Chen, Xiaoyu Hu, Bowen Cheng Dongqing Liu, Yufeng Zhang and Sankar Nair, Polyamide Thin Film Composite Nanofiltration Membrane Modified with Acyl Chlorided Graphene Oxide *Journal of Membrane Science*, <http://dx.doi.org/10.1016/j.memsci.2017.04.043>

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 a review of the resulting galley proof before it is published in its final citable 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

**Polyamide Thin Film Composite Nanofiltration Membrane Modified with Acyl Chlorided Graphene Oxide**

**Peng Wen<sup>a</sup>, Yingbo Chen<sup>a,1\*</sup>, Xiaoyu Hu<sup>b</sup>, Bowen Cheng<sup>c</sup>, Dongqing Liu<sup>a</sup>, Yufeng Zhang<sup>a</sup>,  
Sankar Nair<sup>a,d</sup>**

<sup>a</sup>School of Materials Science and Engineering, State Key Laboratory of Separation Membranes and Membrane Processes, Tianjin Polytechnic University, Tianjin 300387, P. R. China

<sup>b</sup>State Key Laboratory of Membrane Materials and Membrane Applications, Tianjin Motimo Membrane Technology Co. Ltd., Tianjin 300042, P. R. China

<sup>c</sup>School of Textile, Tianjin Polytechnic University, Tianjin 300387, P. R. China

<sup>d</sup>School of Chemical and Biomolecular Engineering, Georgia Institute of Technology, Atlanta 30332, USA

\*chenyingbo@tjpu.edu.cn (Yingbo Chen)

## Abstract

In order to reach both high water permeability and high ion rejection, a thin-film composite nanofiltration membrane (PA/GO-COCl) with acyl chlorided graphene oxide (GO-COCl) embedded in polyamide (PA) layer was fabricated by interfacial polymerization of piperazine and trimesoyl chloride. GO-COCl was synthesized by acyl chloride reaction with graphene oxide and then added into a nonpolar organic (hexane) phase using 2% ethanol as dispersant. The surface morphologies and chemical structures of the modified membranes were observed by scanning electronic microscopy, atomic force microscopy, X-ray photoelectron spectroscopy and FTIR spectroscopy. Water flux of the PA/GO-COCl membrane increased from 11.6 to 22.6 L·m<sup>-2</sup>·h<sup>-1</sup>, and salt rejection of Na<sub>2</sub>SO<sub>4</sub> increased from 95.0% to 97.1%, compared with those of the pristine PA membrane. Enhanced performances of the PA/GO-COCl membrane were attributed to the incorporation of laminated graphene oxide sheets, which decrease effective thickness of the active layer and keep the layer intact for high rejection rate. This graphene oxide

---

<sup>1</sup> Tel: +86-22-83955357

Download English Version:

<https://daneshyari.com/en/article/4988909>

Download Persian Version:

<https://daneshyari.com/article/4988909>

[Daneshyari.com](https://daneshyari.com)