

## Author's Accepted Manuscript

Fabrication of high flux nanofiltration membrane via hydrogen bonding based co-deposition of polydopamine with poly(vinyl alcohol)

Tunyu Wang, Hazim Qiblawey, Simon Judd, Abdelbaki Benamor, Mustafa S. Nasser, Abdolmajid Mohammadian



PII: S0376-7388(17)31397-2  
DOI: <https://doi.org/10.1016/j.memsci.2018.02.009>  
Reference: MEMSCI15933

To appear in: *Journal of Membrane Science*

Received date: 14 May 2017  
Revised date: 30 December 2017  
Accepted date: 7 February 2018

Cite this article as: Tunyu Wang, Hazim Qiblawey, Simon Judd, Abdelbaki Benamor, Mustafa S. Nasser and Abdolmajid Mohammadian, Fabrication of high flux nanofiltration membrane via hydrogen bonding based co-deposition of polydopamine with poly(vinyl alcohol), *Journal of Membrane Science*, <https://doi.org/10.1016/j.memsci.2018.02.009>

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 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.

# Fabrication of high flux nanofiltration membrane via hydrogen bonding based co-deposition of polydopamine with poly(vinyl alcohol)

Tunyu Wang <sup>a</sup>, Hazim Qiblawey <sup>a\*</sup>, Simon Judd <sup>b</sup>, Abdelbaki Benamor <sup>b</sup>, Mustafa S. Nasser <sup>b</sup>, Abdolmajid Mohammadian<sup>c</sup>

<sup>a</sup> Department of Chemical Engineering, College of Engineering, Qatar University, Qatar

<sup>b</sup> Gas Processing Center, College of Engineering, Qatar University, Qatar

<sup>c</sup> Department of Civil Engineering, University of Ottawa, CBY A114, 161 Louis Pasteur, Ottawa, ON K1N 6N5, Canada

\*Corresponding author. Tel: (974) 4403 4131. Fax: (974) 4403 4131. E-mail address: hazim@qu.edu.qa

## Abstract

The use of bio-inspired polydopamine (PDA) chemistry for membrane development has attracted increasing interest in recent years. This paper reports on the fabrication of new nanofiltration (NF) membrane with a robust and permeable barrier layer based on dopamine assisted co-deposition strategy. Hydrophilic and hydroxyl-rich polymer poly(vinyl alcohol) (PVA) was used as the key building block for co-deposition, successfully entrapping it within the self-polymerized polydopamine (PDA) matrix with stabilization through intermolecular hydrogen bonding between PVA and PDA moieties. As a result, visibly denser, thicker and more hydrophilic co-deposited layers were formed on polysulfone (PSf) substrates compared to the pure PDA layer. The surface properties of the co-deposited layers were found to be sensitive to the amount of PVA incorporated within the coating layers, while the latter positively correlated with the content of PVA in dopamine coating solution. Further crosslinking with highly electrophilic trimesoyl chloride (TMC) as a covalent linker effectively tightened the co-deposited layers, yielding NF

Download English Version:

<https://daneshyari.com/en/article/7020050>

Download Persian Version:

<https://daneshyari.com/article/7020050>

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