

Accepted Manuscript

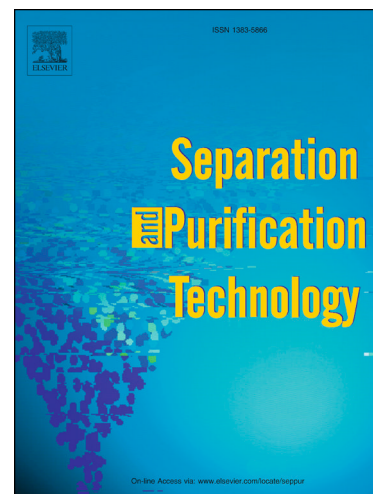
Preparation and characterization of a PVA/PSf thin film composite membrane after incorporation of PSSMA into a selective layer and its application for pharmaceutical removal

Fatemeh Medhat Bojnourd, Majid Pakizeh

PII: S1383-5866(17)31222-4
DOI: <https://doi.org/10.1016/j.seppur.2017.09.054>
Reference: SEPPUR 14063

To appear in: *Separation and Purification Technology*

Received Date: 16 April 2017
Revised Date: 19 September 2017
Accepted Date: 26 September 2017



Please cite this article as: F. Medhat Bojnourd, M. Pakizeh, Preparation and characterization of a PVA/PSf thin film composite membrane after incorporation of PSSMA into a selective layer and its application for pharmaceutical removal, *Separation and Purification Technology* (2017), doi: <https://doi.org/10.1016/j.seppur.2017.09.054>

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.

**Preparation and characterization of a PVA/PSf thin film composite
membrane after incorporation of PSSMA into a selective layer and its
application for pharmaceutical removal**

Fatemeh Medhat Bojnourd, Majid Pakizeh*

Department of Chemical Engineering, Faculty of Engineering, Ferdowsi University of Mashhad, P.O. Box
9177948974, Mashhad, Iran

Abstract

A thin film composite (TFC) membrane was synthesized by coating a layer of poly (vinyl alcohol) (PVA) cross-linked with Glutaraldehyde on a polysulfone (PSf) ultrafiltration support membrane. The effect of the incorporation of polyelectrolyte poly (4-styrenesulfonic acid-co-maleic acid) (PSSMA) into the PVA matrix at concentrations of 0% to 3% was investigated. The TFC membranes were characterized by field emission scanning electron microscopy (FESEM), atomic force microscopy (AFM), attenuated total reflection Fourier transform infrared (ATR-IR) spectroscopy, contact angle and zeta potential measurements. The rejection rates were measured for Na_2SO_4 , MgSO_4 and NaCl salts and cephalixin, amoxicillin, ibuprofen and povidone iodine (PVP-I) pharmaceuticals. The effect of molecular weight and size, hydrophobicity, and electrical charge of the pharmaceuticals on the rejection of the TFC membranes was also investigated. It was found that incorporation of PSSMA into the PVA layer could increase membrane pure water flux (PWF). The results revealed that the addition of 1% PSSMA (TFC1) increased PWF from 6.8 to 14 $\text{l/m}^2\text{h}$ and showed comparable rejection rates for all membranes. For this sample, rejections of 99%, 97.7%, 93.8% and 74% were obtained for cephalixin, amoxicillin, PVP-I and

* Corresponding author. Tel. /fax: +98 5138816840.
E-mail address: pakizeh@um.ac.ir (M. Pakizeh).

Download English Version:

<https://daneshyari.com/en/article/4989431>

Download Persian Version:

<https://daneshyari.com/article/4989431>

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