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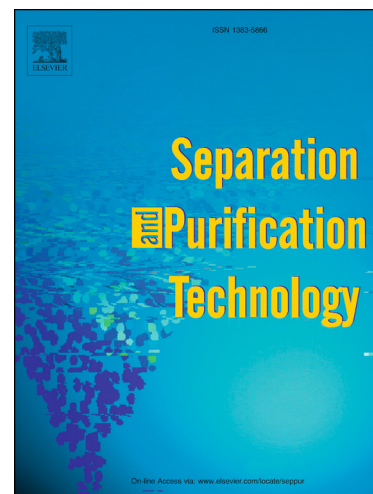
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Poly (vinylidene fluoride) / Polyaniline/ MWCNT nanocomposite ultrafiltration membrane for natural organic matter removal

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Abstract

Multi-wall Carbon Nanotubes (MWCNT)/ polyaniline (PANI)/ poly (vinylidene fluoride) (PVDF) ultrafiltration membrane was prepared by phase inversion technique through in situ polymerization method of aniline for removal of natural organic matter (NOM) in water. Aniline was polymerized in situ with different dosages of MWCNT ranging from 0.25 wt. % to 2 wt. % in PVDF casting solutions. Permeability, rejection studies, contact angle, porosity measurement, tensile strength, zeta potential and characterization by scanning electron microscopy (SEM) were performed. The resultant membrane of (PANI/ 1.5 % MWCNT) showed the highest permeability results (1320 LMH/bar) among membranes we tested, with 40 folds permeability improvement in comparison to pristine PVDF ultrafiltration membrane. Furthermore, it showed about 79% rejection of Suwannee River Humic acid (HA) filtration test. This significant enhancement of the fabricated membrane is attributed to the high hydrophilicity, porosity, larger pore sizes and positive membrane charge resulting from modification with MWCNT/PANI complex.

KEYWORDS: MWCNT,PANI,PVDF,Ultrafiltration,Membrane, NOM removal.

1. Introduction

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