

Preparation and characterization of PPEES/chitosan composite nanofiltration membrane.

ABSTRACT

Composite membrane having chitosan (CH) as the active layer supported on Poly(1,4-phenylene ether ether sulfone) (PPEES) membrane was synthesized in the current study. The chitosan layer was crosslinked by glutaraldehyde in two different concentrations. The scanning electron microscopic images and hydraulic permeability coefficient revealed the ultrafiltration (UF) nature of the neat PPEES membrane. This was used as a new support material for the casting of chitosan layer in order to get composite membranes. The composite nature of the PPEES/CH membranes was confirmed by FESEM and DSC analysis. The Infrared spectroscopy results confirmed the crosslinking of the chitosan surface by glutaraldehyde (GA). The changes in the hydrophobic nature of the PPEES membrane surface due to deposition of chitosan active layer followed by crosslinking were studied by their contact angle measurement and water flux study. From our studies, PPEES has proved to be a good support membrane for preparation of composite membranes. Increase in GA concentration increased the salt rejection of the membrane up to 34% for NaCl and 53% for MgSO₄ on one hand with a simultaneous decrease in the flux values. The hydraulic permeability coefficient values confirmed that the prepared membranes are in nanofiltration range.

Keyword: PPEES; Chitosan; Composite membranes; Crosslinking; Salt rejection; Nanofiltration