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Impact of synthesized amino alcohol plasticizer on the morphology and hydrophilicity of polysulfone ultrafiltration membrane

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Abstract

In this work, polysulfone (PSF) ultrafiltration membranes with increased hydrophilicity were prepared using the amino alcohol plasticizer (AAP). The AAP was synthesized by the reaction of polyethylene glycol (PEG) and isatoic anhydride (IAH). Different molecular weight of PEG and IAH (molecular weight 163 Da) were used for preparing the AAP. Asymmetric membranes were fabricated by blending these plasticizers in membrane casting solution. Formation of AAP was confirmed by FTIR and ¹HNMR spectra of AAP. Characterization of membranes was done in terms of hydraulic permeability, pure water flux (PWF) and hydrophilicity. PWF was found to be increased from 29.3 L/m²h to 110.1 L/m²h and water contact angle also reduced from 72⁰ to 62⁰ for plain and AAP containing PSF membrane, respectively. The morphological and structural analysis of the membranes was done by scanning electron microscope and field emission scanning electron microscope. Permeation and rejection behaviour of fabricated membranes was studied by Bovine serum albumin (BSA) solution. Maximum BSA rejection was increased by 20.5 % for the modified membrane. FESEM images affirm that the pore size of the membranes

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