Effects of amphiphilic additive Pluronic F127 on performance of poly (ether sulfone) ultrafiltration membrane

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\textbf{ABSTRACT}

The amphiphilic additive Pluronic F127 can effectively improve the hydrophilic character of membranes. This article reported the effects of Pluronic F127 additive, Pluronic F127/oxalic acid, and Pluronic F127/polyethylene glycol 4000 blended additives on morphology, separation properties and hydrophilic of poly (ether sulfone) (PES) ultrafiltration membrane. The membrane was made by liquid/solid phase inversion method. The results showed that the Pluronic F127 can improve the water flux and retention of PES ultrafiltration membrane, increase pore size and porosity, and change the cross-section structure. The flux of PES membrane with F127 was lower than that with oxalic acid at the same concentration. As the concentration of F127 increased, the flux increased, the retention showed undulation, and the hydrophilic improved. Compared with only F127, the flux of the membrane with F127 blended additives slightly increased and the effect of F127 is the major in the blending system, and the blended additives changed the hydrophilic of membranes. The blended additives have a greater impact on the performance of F127 membrane. As the blended additives concentration increased, the membrane structure exhibited a skin layer, a porous layer, and a support layer. When blended additives were in high concentration, the morphology changed from finger-like to sponge-like macro-voids structure.

\textbf{Keywords:} PES; Ultrafiltration membrane; Pluronic F127; Oxalic acid; PEG4000

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