Polyacrylic-polyethersulfone membrane modified via UV photografting for forward osmosis application

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ABSTRACT
In this study, commercial nanofiltration polyethersulfone (NFPES) membrane was modified via ultraviolet (UV) grafting for forward osmosis (FO) application. Two grafting parameters, namely monomer concentration (acrylic acid) and grafting time were considered. Characterization was done with respect to modification using different techniques to evaluate the chemical composition, morphology, hydrophilicity, water flux, reverse salt diffusion and structural parameter. The result shows that the modified membrane exhibits highly desirable performance compared to the unmodified one. Interestingly, chemical and physical modification did not only reflect on the surface of the active layer but also the porous support layer of the membrane. Therefore, UV-photografting of polyethersulfone membrane can be considered as an alternative technique to improve commercial membrane performance in FO application.

KEYWORDS:
Forward osmosis; Polyethersulfone (PES); UV-photografting; Structural parameter; Reverse salt diffusion