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Relating osmotic performance of thin film composite hollow fiber membranes to support layer surface pore size

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Abstract

Thin film composite (TFC) membranes are considered a preferred platform for forward osmosis (FO) wherein the selective and support layers can be tailored independently for preferred chemistry and structure. TFC hollow fiber membranes in particular have garnered interest because of their high packing density. In previous studies, TFC hollow fiber membranes are made by forming the selective layer via *in-situ* interfacial polymerization onto a porous supporting layer. These studies, however, have not examined how the surface properties of the support layers, the pore size in particular, impact the selective layer formation and its ultimate properties. In this study, we conducted a systematic investigation on the influence of support layer pore size on the osmotic performance of TFC hollow fiber FO membranes. A series of commercially available ultrafiltration membranes with similar physical and chemical properties but different pore sizes were employed as the support layer. The resulting roughness of the selective layer was found to be dependent on