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Modeling the effect of film-pore coupled transport on composite Forward Osmosis membrane performance

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Abstract

The methods used to quantify membrane structural contributions to transport resistance in engineered osmosis (EO) processes contain inherent assumptions and inaccuracies. Consequently, incomplete information is available on the actual effects of the support layer and overall composite membrane characteristics, on EO performance. In this work, the effects of support properties such as pore radius, porosity and thickness on membrane transport are studied using a 2D numerical model that accounts for coupled transport of water and solute within both the selective thin-film as well as the support pores. The results indicate that reducing support thickness by half enhanced performance to a greater extent (~40-

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