Development of polyamide forward osmosis membrane for humic acid removal

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Received 2 September 2015; Accepted 30 November 2015

ABSTRACT

This paper presents synthesis and performance of polyamide forward osmosis (FO) membrane for humic acid (HA) removal. Three polyamide membranes were synthesized by reaction between m-phenylenediamine and trimesoyl chlorideat different reaction times (10, 30 and 60 s). Five different concentrations of sodium chloride draw solutions and 15 mg/L of HA solution as feed solution were tested in one hour to obtain water flux, reverse salt diffusion and HA removal. Reverse salt diffusion and HA removal were measured using conductivity and a UV–vis spectrometer, respectively. Overall, membranes modified for longer reaction times (30 and 60 s) exhibited good performance in term of moderate flux, higher HA removal and low reverse salt activity. In addition, it was found that higher concentration of draw solution leads to lower HA rejection and higher reverse salt diffusion, which indirectly represented overall membrane performance.

Keywords: Forward osmosis; Polyamide forward osmosis membrane; Water flux; Reverse salt; Humic acid removal