



Reverse osmosis desalination membrane formed from weak polyelectrolytes by spin assisted layer by layer technique

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ABSTRACT

Thin film bi-polar membranes were prepared by depositing alternate layers of polyallylamine hydrochloride (PAH) and polyacrylic acid (PAA) by Spin Assisted Layer-by-Layer (SA-LbL) coating technique. These polyionic coatings were deposited on silicon wafer substrates as well as on polysulfone ultrafiltration (UF) membranes. The suitability of these coated membranes for use as reverse osmosis seawater desalination membranes was investigated using a single pass-cross flow permeation test cell. Membrane testing showed that with only 35 bi-layers of PAH/PAA on a polysulfone ultra filtration membranes, NaCl rejection of 88% and water permeability of $0.22 \text{ l.m}^{-2}\text{h}^{-1}\text{bar}^{-1}$ was achieved for feed water with NaCl concentration of 15000 ppm and pressure of 700 psig.

Keywords: Reverse Osmosis; Nanofiltration; Membranes; Spin Assisted Layer-by-Layer; PAA/PAH; Polysulfone, Plasma

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