

Sulfonated poly(arylene ether sulfone) RO membranes for seawater desalination

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Sulfonated poly(arylene ether sulfone) copolymers containing amino groups (aPES) were successfully prepared by an aromatic substitution polymerization reaction from bis(3-amino-4-hydroxyphenyl) sulfone (B3a4h), 3,3'-disulfonated-4,4'-dichlorodiphenyl sulfone (SDCDPS), as novel thin film composite (TFC) reverse osmosis (RO) membrane material for high chlorine resistance. TFC membranes were fabricated by an interfacial polymerization with organic trimesoyl chloride (TMC) solution and aqueous amine solution, containing m-phenylenediamine (MPDA) and aPES, on a polysulfone (PS) support membrane. The synthesized polymers and fabricated membranes were characterized by nuclear magnetic resonance spectroscopy (NMR), Fourier transform infrared spectroscopy (FT-IR), scanning electron microscope (SEM), salt rejection and water flux measurements in our laboratory. The chlorine resistance is evaluated using sodium hypochlorite (NaOCl) solution. The aPES RO membrane has much higher chlorine resistance than that of commercial polyamide (PA) RO membrane.