

Novel thin film composite membrane for seawater desalination with sulfonated poly(arylene ether sulfone) containing amino groups

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Sulfonated poly(arylene ether sulfone) containing sulfonic acid groups and amino groups (aPES) were successfully prepared using aromatic substitution as thin-film composite (TFC) reverse osmosis (RO) membrane material for good chlorine resistance. RO membranes were prepared using an interfacial polymerization (IP) reaction with trimesoyl chloride (TMC) and amine solution, containing m-phenylenediamine (MPDA) and aPES, on a polysulfone (PS) support membrane. RO performances, salt rejection and water flux, were measured using cross-flow cell test instrument. The chlorine resistance was evaluated using 2,000 ppm sodium hypochlorite (NaOCl) solution. The membrane fabricated with aPES was compared with typical polyamide (PA) membrane which was prepared by IP reaction with TMC and MPDA on a PS support membrane. The aPES membrane had much higher chlorine resistance than that of PA membrane and showed good RO performances, such as water flux (31 L/m²h) and salt rejection (94.1%).