Fabrication and characterization of aPES/zeolite nanocomposite RO membrane

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Recently, membrane desalination technology is gaining importance in the fields of sea water purification. Polyamide (PA) thin-film composite (TFC) reverse osmosis (RO) membrane is currently used in commercial RO plants. The active top layer of these membranes is formed by interfacial polymerization. PA membranes have some drawbacks as chlorine susceptibility in the desalination process. Therefore, the improving chlorine resistance is most important in RO membrane.

In this study, the development of chlorine resistance of TFC membrane is investigated by introducing zeolite nanoparticles, and Disulfonated 4,4-bis(3-aminophenoxy)phenyl sulfone (aPES) for reverse osmosis membrane. The synthesized zeolite nanoparticles and molecular structure composition of the aPES were characterized by Fourier transform infrared (FT-IR), ^{1}H-NMR in DMSO-d_6. The zeolite composite TFC membrane was prepared through an interfacial polymerization on the polysulfone ultrafiltraion membrane. The chemical structure of polymer, morphology of the TFC membrane, and the chlorine resistance of resulting membrane were also discussed.