

### Enhanced properties and performance of composite RO membrane containing HBP-g-silica

박시영, 김상곤, 진병희, 김성현\*  
고려대학교  
(kimsh@korea.ac.kr\*)

The reverse osmosis (RO) membranes were fabricated based on hyper-branched aromatic polyamide grafted silica nano particles (HBP-g-silica) to improve the salt rejection and water permeation performance. The properties of synthesized HBP-g-silica were characterized by Fourier transform infrared (FT-IR) spectrum and thermal gravimetric analyses (TGA). The FT-IR spectrum and TGA confirmed that HBP-g-silica was successfully conjugated to the aromatic polyamide onto nano-silica, and the amount of amino groups on the HBP-g-silica was measured 13 %. The composite RO membranes were characterized by FT-IR and scanning electron microscopy (SEM). The performance of RO membranes were tested with 2,000mg/L NaCl solution at an applied pressure of 15.5 bars. The composite RO membrane containing HBP-g-silica showed better salt rejection than conventional polyamide (PA) membrane and PA with neat silica membrane. These results demonstrate the HBP-g-silica which had high concentration of amide groups was effective to improve the performance.