

Thermo-responsive ionic liquids with LCST-type phase transition as draw solutes in forward osmosis for sea water desalination

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The potential of various LCST-type ionic liquids (ILs) as osmotic generators to drive water permeation were elucidated with NaCl as a control in forward osmosis (FO) system. The FO performance of the ILs was evaluated through their respective water flux (J_v), reverse solute flux (J_s), and reverse flux selectivity during FO runs against deionized water and simulated sea water in pressure retarded osmosis mode. The combined effects of their ionicity, moderate molecular weight, and diffusion coefficient allowed them to generate considerable J_v with negligible J_s . This work was supported by the National Research Foundation of Korea funded by the Ministry of Science and ICT (No. 2016R1A2B1009221 and No. 2017R1A2B2002109), and the Ministry of Education (No. 2009-0093816).