

Abstract Submitted  
for the MAR12 Meeting of  
The American Physical Society

**Desalination membranes from functional block copolymer via non-solvent induced phase inversion** HYEMIN SUNG, Korea University, JUSTIN POELMA, FRANK LEIBFARTH, CRAIG HAWKER, University of California, Santa Barbara, JOONA BANG, Korea University — Commercially available reverse osmosis (RO) and forward osmosis (FO) membranes are most commonly derived from materials such as polysulfone, polyimide, and cellulose acetate. While these membranes have improved the efficiency of the desalination process, they suffer from mechanical and chemical stability, fouling issues, and low fluxes. In this study, we combine a well-established membrane formation method, non-solvent-induced phase separation, with the self-assembly of a functional amphiphilic block copolymers. An amine and acid functional polystyrene-block-poly(ethylene oxide-co-allyl glycidyl ether) were chosen for the membranes. Membranes were formed by casting a concentrated polymer solution (12 to 25 wt% polymer) on PET fabric followed by immersion in a non-solvent bath. Scanning electron microscopy revealed an asymmetric porous structure consisting of a dense skin layer on top of a highly porous layer. Membrane performance was investigated using an FO test cell under the seawater condition.

Hyemin Sung  
Korea University

Date submitted: 27 Nov 2011

Electronic form version 1.4