

Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Morphology and Proton Transport in Porous Block Copolymer Electrolyte Membranes CHELSEA CHEN, University of California, Berkeley, JEFFREY KORTRIGHT, Lawrence Berkeley National Lab, DAVID WONG, Exponent, NITASH BALSARA, University of California, Berkeley — Block copolymer electrolyte membranes consisting of a proton-conducting block and an uncharged structural block are attractive due to their potential in clean energy applications. Herein we demonstrate a novel approach of fabricating block copolymer electrolyte membranes, by inducing pores in the proton-conducting phase. We examine morphology of these membranes with contrast-matched resonant soft X-ray scattering (RSoXS) and electron tomography. Proton conductivity as a function of porosity and water activity is also investigated. By tuning the porosity of the membranes, we are able to adjust the water uptake of the membranes for improved proton conductivities, in both humid air and liquid water.

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Date submitted: 02 Dec 2014

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