Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Water Uptake and Proton Conductivity of Asymmetric Poly(styrenesulfonate-block-methylbutylene) Copolymers XIN WANG, Environmental Energy Technologies Division, Lawrence Berkeley National Laboratory, University of California, Berkeley,California 94720, MOON JEONG PARK, Materials Sciences Division, Lawrence Berkeley National Laboratory, University of California, Berkeley, California 94720, NITASH BALSARA, Department of Chemical Engineering, University of California, Berkeley, California 94720 — The effect of chain architecture on water uptake and proton conductivity of poly(styrenesulfonate-block-methylbutylene) (PSS-PMB) copolymers at equilibrium with moist air is studied as a function of temperature, and relative humidity of the air. Symmetric and asymmetric PSS-PMB copolymers were synthesized by anionic polymerization of poly(styrene-block- isoprene) copolymers, followed by hydrogenation of the polyisoprene block and sulfonation of the polystyrene block. Previous studies have shown that symmetric PSS-PMB block copolymers in the presence of humid air (relative humidity>50%) are excellent proton conductors at temperatures as high 90 C. Current work is focused on water uptake and conductivity measurements on asymmetric PSS-PMB block copolymers with PSS as the minor component.

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Date submitted: 12 Dec 2007 Electronic form version 1.4