

Abstract Submitted
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Characterization of a Model Polyelectrolyte Membrane Using a Semi-crystalline Block Copolymer KEITH BEERS, XIN WANG, NITASH BALSARA, UC Berkeley — The microstructured block copolymer sulfonated polystyrene-block-polyethylene is studied as model system for use as a proton exchange membrane in a fuel cell. Self-assembly of this system creates proton conducting hydrophilic channels in the form of sulfonated polystyrene domains, while the polyethylene domains create a hydrophobic matrix to provide mechanical stability. This system serves as a powerful model system since the effects of domain size, morphology and crystallinity on water uptake and proton conductivity can be investigated. Similar systems have shown the ability of small hydrophilic channels to prevent drying at high temperatures in humid air, but have focused on amorphous hydrophobic blocks. The morphology, water uptake, and proton conductivity of this semi-crystalline model system will be discussed.

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