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Characterization of Lithium Polysulfide Salts in Homopolymers and Block Copolymers[1] DUNYANG WANG, KEVIN WUJCIK, NITASH BALSARA, University of California Berkeley — Ion-conducting polymers are important for solid-state batteries due to the promise of better safety and the potential to produce higher energy density batteries. Nanostructured block copolymer electrolytes can provide high ionic conductivity and mechanical strength through microphase separation. One of the potential use of block copolymer electrolytes is in lithium-sulfur batteries, a system that has high theoretical energy density wherein the reduction of sulfur leads to the formation of lithium polysulfide intermediates. In this study we investigate the effect of block copolymer morphology on the speciation and transport properties of the polysulfides. The morphology and conductivities of polystyrene-b-poly(ethylene oxide) (SEO) containing lithium polysulfides were studies using small-angle X-ray scattering and ac impedance spectroscopy. UV-vis spectroscopy is being used to determine nature of the polysulfide species in poly(ethylene oxide) and SEO.

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