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**Effect of Increasing Molecular Weight on the A and B blocks of a Single-ion-conducting Block Copolymer Electrolyte for Lithium Batteries** ADRIANA ROJAS, University of California, Berkeley, SEBNEM INCEOGLU, Lawrence Berkeley National Laboratory, KANAV THAKKER, NIKOLAUS MACKAY, NITASH BALSARA, University of California, Berkeley — Single-ion-conducting block copolymer electrolytes are desirable for lithium metal batteries due to their ability to eliminate salt concentration gradients across the electrolyte; i.e., the lithium ion transference number is approximately unity. A series of poly(ethylene oxide)-*b*-poly(styrenesulfonyllithium(trifluoromethylsulfonyl)imide) (PEO-*b*-PSLiTFSI) copolymers was studied wherein the molecular weights of both blocks were varied. Small angle x-ray scattering and ac impedance spectroscopy were used to probe the dependence of ionic conductivity on morphology. Preliminary work suggests that increasing the molecular weights of the blocks results in increased disorder and lower conductivity.

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