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The Effect of Long Range Order on Ionic Conductivity in a Solid Block Copolymer Electrolyte MAHATI CHINTAPALLI, JACOB THELEN, ALEXANDER TERAN, Graduate Student, NITASH BALSARA, Principal Investigator — Poly(styrene)-block-poly(ethylene oxide) (SEO) mixed with lithium bis(trifluoromethanesulfonyl)imide (LiTFSI) salt is a promising material for battery electrolytes due to its high ionic conductivity and ability to suppress lithium dendrite growth. Ion conduction has been found to depend on many aspects of the electrolyte microstructure, including the morphology and degree of ordering. The effect of long range order on ionic conductivity was investigated in a lamellar SEO/LiTFSI mixture by in situ small angle x-ray scattering and ac impedance spectroscopy during polymer annealing. The observation that increasing long range order decreases ionic conductivity indicates that disorder, due to small grain size or defects, enhances the ionic conductivity of the electrolyte.

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