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Effect of matrix crystallinity on the ionic conductivity in microstructured block copolymer solid electrolytes NICHOLAS YOUNG, NITASH BALSARA, University of California, Berkeley — Polyethylene oxide (PEO)-based block copolymers have been studied extensively for use as solid electrolytes for rechargeable lithium metal batteries. Previous work has concentrated on block copolymers containing an amorphous second block, such as polystyrene, for which the modulus is sufficiently high to resist growth of dendrites that would lead to short circuiting. In this work, we instead focus on using semicrystalline polyethylene as the mechanically robust component. Polyethylene-polyethylene oxide (EEO) block copolymers doped with lithium bis(trifluoromethanesulfone) imide (LiTFSI) were characterized using AC impedance spectroscopy over a range of temperature, molecular weight, and composition values in order to determine the effect of crystallinity in the structural microphase on the conductivity of this material.

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