

Abstract Submitted
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Correlating

crystallization and ionic conductivity of PEO/graphene oxide nanocomposite SHAN CHENG, DERRICK SMITH, GRACE HSUAN, CHRISTOPHER LI, Drexel University — Polyethylene oxide (PEO) is one of the best candidates for solid state electrolyte due to its chemical stability and strong ability to form complex with lithium salts. Crystallization behavior of PEO directly affects the lithium ion transport, and in turn the ionic conductivity of the electrolyte. By adding two dimensional graphene oxide nanosheets into PEO matrix, mechanical property of the latter is significantly strengthened, while the crystallization behavior of PEO is also altered by the graphene oxide sheets. The crystallization of PEO/graphene oxide nanocomposites was studied by differential scanning calorimetry (DSC) and the orientations of graphene oxide and PEO crystal were studied by small angle X-ray scattering and wide angle X-ray diffraction. PEO/graphene oxide nanocomposite doped with lithium salt was further fabricated and characterized by electrochemical impedance spectroscopy. Anisotropic ionic conductivity was observed for the nanocomposite electrolyte due to the orientation of graphene oxide and directional growth of PEO crystals.

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