Abstract Submitted
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Charge Transport and Ion Dynamics in Copolymers Containing Ammonium-based Polymerized Ionic Liquids[1] MATTHEW HARRIS, MAXIMILIAN HERES, University of Tennessee, Knoxville, VERONIKA STREHMEL, Hochschule Niederrhein, University of Applied Sciences, ROBERTO BENSON, JOSHUA SANGORO, University of Tennessee, Knoxville — Charge transport is investigated in copolymers containing polymerized ionic liquids (polyIL) using broadband dielectric spectroscopy. The lowest volume fraction polyIL copolymer studied exhibits interfacial polarization at the polyIL/PMMA phase boundary. At the intermediate volume fraction, ionic diffusion rates are identical to those of the polyIL homopolymer but ionic conductivity is lower due to a reduction in the number density of mobile charge carriers. The highest polyIL volume fraction studied showed enhanced conductivity over the PIL homopolymer due to improved ion dissociation, evidenced by increased static permittivity. We demonstrate that ion transport can be enhanced in a PIL block copolymer system by incorporating a non-conducting phase and conclude that the conductivities of the PIL copolymers are significantly altered by varying the volume fraction.

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