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Structure-morphology-property relationships in polymerized ionic liquids JOSHUA SANGORO, MAXIMILIAN HERES, JOSEPH MINUTOLO, JACOB SHAMBLIN, MAIK LANG, Univ of Tennessee, Knoxville, STEFAN BERDZINSKI, VERONIKA STREHMEL, Hochschule Niederrhein University of Applied Sciences, STEPHEN PADDISON, Univ of Tennessee, Knoxville — Charge transport and structural dynamics in systematic series of polymerized ammonium- and imidazolium- based ionic liquids are investigated by broadband dielectric spectroscopy, temperature-modulated differential scanning calorimetry, and x-ray as well neutron scattering techniques. Detailed analysis reveal strong decoupling of these processes in the polymerized ionic liquids, implying failure of the classical theories in describing charge transport and molecular dynamics in these systems. In addition, a strong correlation is observed between the ionic conductivity at the respective calorimetric glass transition temperatures and the morphologies revealed by the scattering experiments. In this talk, a physical explanation of the origin of the observed decoupling of ionic conductivity from structural dynamics will be proposed.

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