Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Decoupling of charge transport from structural dynamics in protic ionic liquids JOSHUA SANGORO, Oak Ridge National Laboratory, ALEXEI SOKOLOV, Oak Ridge National Laboratory and University of Tennessee, FRIEDRICH KREMER, University of Leipzig, MARIAN PALUCH, University of Silesia — Broadband dielectric spectroscopy, differential scanning calorimetry and rheology are employed to investigate charge transport and dynamics in protic and aprotic ionic liquids. While the structural α-relaxation rates and the characteristic charge diffusion rates coincide for aprotic ionic liquids, the latter is found to be more than 100 times for the protic ionic liquids studied. Moreover, the analysis of protic ionic liquids revealed a decoupling of temperature dependence of ionic transport from that of structural relaxation with the degree of decoupling increasing with fragility of the liquid. The potential technological impact of these results will be discussed.

Joshua Sangoro
Oak Ridge National Laboratory

Date submitted: 18 Nov 2012 Electronic form version 1.4