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**The effect of varying linker length on ion-transport properties in polymeric ionic liquids** JORDAN KEITH, University of Texas at Austin, SANTOSH MOGURAMPELLY, Temple University, BILL WHEATLE, VENKAT GANESAN, University of Texas at Austin — We report results of atomistic molecular dynamics simulations on polymerized 1-butyl-3-(n-alkyl)imidazolium ionic liquids with  $PF_6^-$  counterions. Consistent with experimental observations, we observe that the mobility of the  $PF_6^-$  ions increases with increasing n-alkyl linker length. Analysis of our results suggests that the motion of  $PF_6^-$  ions is driven by intermolecular ion hopping between chains, which in turn is influenced by ion-pair coordination numbers and intermolecular ionic separation distances. With increasing linker length, we observe 1) the anions coordinating less closely with cations and 2) intermolecular hopping distances decreasing.

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