

Ion conducting properties of polymeric ionic liquids containing ethylene oxide pendant group

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Imidazolium based polymerized ionic liquids (PILs) containing mono or triethylene oxide pendant group were synthesized via radical polymerization. The effects of ethylene oxide unit of PILs on the physical, electrochemical properties were investigated. As the length of the ethylene oxide pendant group increased, the PILs exhibited higher ionic conductivities and lower T_g than the PIL which did not contain ethylene oxide unit. This results implying that the introduction of ethylene oxide pendant group strongly increases the chain mobility of the PILs. When an equimolar amount of LiTFSI to the ionic groups in the PIL was added, the ionic conductivities were further enhanced up to $3 \times 10^{-5} \text{ Scm}^{-1}$ at room temperature.