

Single Ion Conductors Based on Poly(Ethylene Oxide) and Lithium Montmorillonite

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The conductivities of lithium containing polymer clay nanocomposites are greatly enhanced over synthetic polymer single ion conductors (SIC) because only cations are mobile in these materials. In this work, SIC was prepared by poly(ethylene oxide) (PEO), sodium montmorillonite (Na-MMT), and lithium salts. The Na-MMT was exchanged to Li-MMT using a 1M lithium chloride solution. The Li-MMT clay was investigated in EDS, EA, and XRD measurements. The ionic conductivities of SIC were determined by the frequency response analyzer (FRA), and the layered structure of the Li-MMT/PEO composites was monitored by X-ray diffraction. As a result, the conductivity was enhanced with increasing the MMT contents due to the immobility of the MMT which was served as the anion rendering the system. It was also found that the conductivity was increased significantly at the melting point when Li-MMT/PEO composites were heated.