

Incorporation of propylene oxide into poly(ethylene oxide) electrolyte for enhancing electrochemical performance of lithium polymer battery

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Nowadays, non-fluidable and incombustible solid-state polymer electrolyte (SPE) is considered a promising alternative to volatile and flammable liquid electrolyte for highly stable lithium battery. Especially, poly(ethylene oxide) (PEO) based SPE are studied due to its high solubility for lithium salts and good ionic transfer behavior. However, high crystallinity of PEO at room temperature lowers ionic transfer, and affects as a main obstacle for PEO-based electrolyte development. Here, we introduced propylene oxide group into PEO-based SPE for decreasing the crystallinity of PEO and also enhancing electrochemical stability. Its effect was verified by DSC, ionic conductivity measurement, and electrochemical tests. Furthermore, we fabricated coin and pouch-type cell, and evaluated their rate capability and cycling performance.