New Manufacturing Method of Solid Polymer Electrolytes for Lithium Batteries

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Solid polymer electrolyte system can be classified into three types, namely pure SPE(or dry SPE),gel-type SPE and hybrid-type SPE(or porous SPE) and widely used in batteries,capacitiors and fuel cells. Recently,the applications of gel-type and hybrid-type polymer electrolyte in rechargeable lithium batteries were investigated due to high ionic conductivity and stability over wide potential range. Gel-type SPE composed of a polymer electrolyte salt and a liquid plasticizer generally have higher ionic conductivity,but their mechanical properties are not sufficient for practical applications.Also Hybrid-type SPEs are generally prepared by injecting organic liquid electrolytes into small pores of the polymer matrices. After long time usage of hybrid-type polymer electrolytes,the leakage of organic liquid electrolytes can decrease the ionic conductivity. In this study,a novel pore-gel type SPE having a good mechanical strength and low solution leakage was prepared using new manufacturing method based on PVDF-HFP/$LiClO_4$ system. This pore-gel type SPEs are obtained by gelling in pores of the polymer membrane after absorption of electrolyte solution composed with $LiClO_4$/PC/EC/Acetone.