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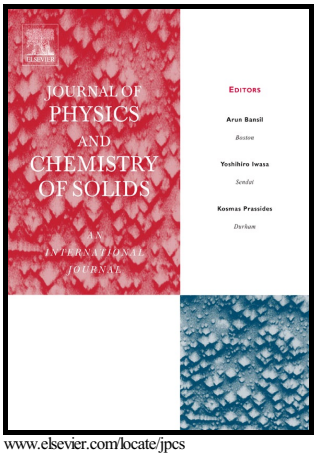

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A thermal and electrochemical properties research on gel polymer electrolyte membrane of lithium ion battery

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Abstract

N-methyl-N-propyl-piperidin-bis(trifluoromethylsulfonyl)imide/bis(trifluoromethylsulfonyl) imide lithium base/ polymethyl methacrylate(PP_{13}TFSI/LiTFSI/PMMA) gel polymer electrolyte (GPE) membrane was prepared by in situ polymerization. The physical and chemical properties were comprehensively discussed. The decomposition characteristics were emphasized by thermogravimetric (TG-DTG) method in the nitrogen atmosphere at the different heating rates of 5, 10, 15 and 20 ^{o}C min^{-1}, respectively. The activation energy was calculated with the iso-conversional methods of Ozawa and Kissinger, Friedman, respectively, and the Coats-Redfern methods were adopted to employ the detailed mechanism of the electrolyte membrane. The equation $f(\alpha)=3/2[(1-\alpha)^{1/3}-1]$ was quite an appropriate kinetic mechanisms to describe the thermal decomposition process with an activation energy (E_α) of

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