

Electrochemical properties of LiFePO_4/C synthesized by mechanical activation using polymer electrolyte

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Carbon-coated lithium iron phosphate (LiFePO_4/C) cathode material suitable for lithium batteries was synthesized by mechano-chemical activation method from a mixture of lithium carbonate, ferrous oxalate, ammonium dihydrogenphosphate and acetylene carbon black. The performance of LiFePO_4/C as cathode active material in lithium battery was tested with an electrospun polymer-based electrolyte. Liquid electrolyte of 1M LiPF_6 (lithium hexafluorophosphate) in EC/DMC (ethylene carbonate / dimethyl carbonate) (1:1 vol) was incorporated in electrospun poly(vinylidene fluoride-co-hexafluoropropylene) P(VdF-HFP) microfibrinous membrane to prepare the polymer electrolyte (PE). Good cycling performance even under the high current density of 2 C could be obtained. Impedance spectroscopy was applied to investigate the material behavior during 0.1 C-rate charge-discharge cycling. When the fresh cell and the cell after different cycles were compared, impedance resistance was found to decrease with cycling.