

Electrochemical performance of graphene oxide coated cathode material in lithium metal polymer battery

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For lithium metal battery, thin, flexible and transparent polymer electrolyte films are synthesized using polymer poly ethylene oxide (PEO), salt lithium bis(fluoromethylsulfonyl)imide (LiFSI) and Ionic Liquid (IL) N-propyl-N-methylpyrrolidinium-bisfluorosulfonylimide (PYR₁₃FSI) by solution cast technique. To characterize these prepared polymer electrolyte films, different experimental techniques are used. Results show that 10% IL contained polymer electrolyte film exhibits the highest Li⁺ ion conductivity, good thermal stability and wide electrochemical window. LiFePO₄ (LFP) and graphene oxide (GO) coated LFP (GO-LFP) cathodes are also prepared to observe their performance with optimized polymer electrolyte in Li cell. By analyzing electrochemical performance, better discharge capacity (~163 mAh g⁻¹ at 0.1 C), cyclability (100 cycles) and efficiency are found for GO-LFP as compared to LFP cathode at room temperature. GO coating on LFP cathode provide protecting layer which improves the electrochemical performance of the lithium cell.

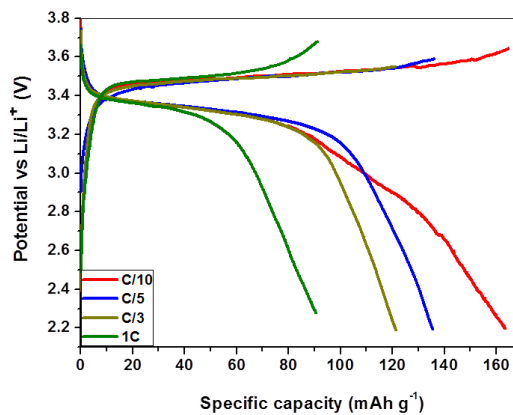


Fig. Cyclic performance of the cell (Li/GO-LFP) at various discharging current rate.

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