

Optimized Hydrothermal Synthesis of LiFePO_4 -C Composites for Rechargeable Lithium Batteries

김 파^{1,2,*}, 김은미¹, 박경희¹, 구할본¹

¹전남대학교 전기공학과; ²School of Materials Science and Engineering, Jilin University, China
(jinbo@jlu.edu.cn*)

LiFePO_4 -C composites were synthesized by a hydrothermal method and subsequent high-energy ball-milling. Different carbon conductive additives including nano-sized acetylene black and multi-walled carbon nanotube (MWCNT) were used to enhance the electronic conductivity of LiFePO_4 . The structural and morphological performance of LiFePO_4 -C composites was investigated by X-ray diffraction (XRD) and scanning electron microscopy. The electrochemical properties of $\text{Li}/\text{LiFePO}_4$ -C batteries were analyzed by cyclic voltammetry and charge/discharge tests. XRD results demonstrate that LiFePO_4 -C composites have an orthorhombic olivine-type structure with a space group of $Pnma$. $\text{Li}/\text{LiFePO}_4$ -C battery with 5 wt.% MWCNT displays the best electrochemical properties with a discharge capacity of 142 mAh g^{-1} at 0.25 C at room temperature.