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Short communication

The Effect of Ti Doping on the Electrochemical Performance of Lithium Ferrite

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For the first time, a novel composite anode material of titanium (Ti)-doped lithium ferrite (denoted as Ti/LFT) was successfully prepared under air conditions by a high temperature solid state reaction. In this work, the influence of Ti:Fe atomic ratio on the electrochemical performance of the produced Ti/LFT composite was systematically investigated. The crystal structure and morphology of the prepared Ti/LFT composite material were probed by X-ray diffraction (XRD) and scanning electron microscope (SEM). And the electrochemical performance of the resultant materials was chiefly studied by using cyclic voltammetry (CV), electrochemical impedance spectroscopy (EIS) and galvanostatic charge-discharge tests. Results of the electrochemical tests substantially demonstrated that as the atomic ratio of Ti to Fe was 1:8, the best electrochemical performance was exhibited by the as-prepared composite, showing an initial discharge capacity of 761 $mAhg^{-1}$ at the current density of 100 mAg^{-1} and better rate capability (200 mAh g^{-1} at 700 mA g^{-1}), which was markedly superior to the pure lithium ferrite that was prepared using the same process in the absence of Ti-doping.

Keywords: effect; titanium; doping; lithium ferrite; anode material; lithium-ion batteries

FULL TEXT