Modification of Lithium Iron Phosphate by Carbon Coating

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Lithium Iron Phosphate (LiFePO_4) for lithium-ion batteries is considered as perfect cathode material for various military applications. Carbon coating has a great influence on the properties of lithium iron phosphate. In this paper, the effects of in-situ carbon coating and non-in-situ carbon coating on the structure and properties of lithium iron phosphate were analyzed. For LiFePO_4/C synthesized by carbon coating, no matter it is non-in-situ coating or in-situ coating, it can improve the electrochemical performance of LiFePO_4 . In this paper, ascorbic acid was used as the carbon source, and the sample coating layers formed by in-situ carbon coating and non-in-situ carbon coating were 10nm and 20nm respectively. Through the electrochemical measurements, In situ carbon coated and non-in-situ carbon coated lithium iron phosphate, the specific capacity of charge and discharge for the first time reached $125 \text{ mAh}\cdot\text{g}^{-1}$ and $112 \text{ mAh}\cdot\text{g}^{-1}$ respectively at the rate of 0.1C. Meanwhile, comparing the two coating methods, The structure and properties of in-situ carbon coating are better than those of non-in-situ carbon coating.

Keywords: lithium iron phosphate, In situ carbon coating, Non-in-situ carbon coating, electrochemical performance

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