Effect of Different Carbon Sources on Electrochemical Performance of LiFePO₄/C

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In this paper, LiFePO₄/C material was prepared by hydrothermal method. The effects of organic carbon source ascorbic acid, glucose and inorganic carbon source acetylene black on the properties of materials were studied. The specific capacity of the first discharge at 0.2C of the three kinds of carbon coated lithium iron phosphate reached 132.5mAh/g, 128.1mAh/g and 126.2mAh/g, respectively. Experiments show that the electrochemical performance of the LiFePO₄ coated with ascorbic acid is best. With ascorbic acid as the carbon source, when the addition amount of ascorbic acid was 5%, 7% and 10%, the first discharge specific capacity reached 132.5 m Ah/g, 156.9 m Ah/g and 130.8 m Ah/g, respectively. The results show that when the addition amount of ascorbic acid is 7%, the electrochemical performance is the best, reaching more than 90% of the theoretical capacity of LiFePO₄. After 100 charge and discharge cycles at 0.2 C, the capacity retention rate is still 97.1%.

Keyword: Lithium-ion batteries; hydrothermal method; Carbon coating; FePO₄ precursor; LiFePO₄ positive electrode material

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