Effects of Citric Acid on the Preparation of a LiFePO₄@C Cathode Material Assisted by Biomineralization

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A carbon-coated LiFePO₄ (LFP@C) cathode material was prepared by a bio-template-assisted sol-gel method in which yeast acts both as a structural template and as a carbon source. Citric acid monohydrate as a chelating agent was added in different experimental steps to investigate its effect on the crystallinity, specific capacity and electrochemical performance of the positive electrode material LFP. Systematic studies show that LFP@C-3 exhibits the best specific capacity, with discharge capacities of 156.4 mAh g⁻¹ and 97.5 mAh g⁻¹ at 0.1 C and 5 C, respectively. The improved electrochemical properties of the resulting LFP@C-3 can be attributed to its good crystal purity and carbon coating. The chelating agent citric acid has important positive significance when preparing LFP@C by the sol-gel method and using yeast as a structural template.

Keywords: LFP@C, yeast, sol-gel method, chelating agent, structural template.

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