Short Communication

Synthesis and Electrochemical Behavior of Na⁺ and Zr⁴⁺ Doped LiMnPO₄/C as Potential Cathode Material for Li-ion Batteries

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By using a simple sol–gel method, several compounds, including LiMnPO₄/C, Li_{0.9}Na_{0.1}MnPO₄/C, and Li_{0.9}Na_{0.1}Mn_{0.98}Zr_{0.02}PO₄/C, were successfully synthesised. We studied the effects of partial substitution of Li⁺ and Mn²⁺ with Na⁺ and Zr⁴⁺ doped in LiMnPO₄/C and the electrochemical energy storage behavior of the final product. At 0.05 C, discharge specific capacity of Li_{0.9}Na_{0.1}Mn_{0.98}Zr_{0.02}PO₄/C can be 159.4 mAh/g, which was much better than unmodified LiMnPO₄/C (121.9 mAh/g). Capacity retention rate was 98% after 50 cycles. Appropriate concentrations of Na⁺ and Zr⁴⁺ doping at different cation positions can effectively improve LiMnPO₄/C electrochemical behavior.

Keywords: Li-ion battery; LiMnPO₄; cation doping; Electrochemical behavior

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