CaFe₂O₄-type Structure NaRu₂O₄: a Novel Cathode Material for Li-ion Batteries

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CaFe₂O₄-type structure NaRu₂O₄ nanorod with a diameter of 100 nm has been synthesized through a simple solid-state method. As a novel cathode material for Li-ion batteries, the nanosized NaRu₂O₄ can deliver an initial capacity of 106 mAh g⁻¹ at the current density of 20 mA g⁻¹ and display a small capacity loss of 0.56% and 0.49% per cycle at the current density of 50 mA g⁻¹ and 100 mA g⁻¹. To better understand the process of the Li⁺ insertion/extraction, cyclic voltammetry and electrochemical impedance spectroscopy are performed. The NaRu₂O₄ nanorod demonstrates a potential of cathode material for Li-ion batteries.

Keywords: Lithium-ion battery; Cathode materials; Sodium ruthenate

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