Electrochemical Performances of Maricite NaFePO₄/C as cathode material for Sodium-Ion and Lithium-Ion Batteries

Ling Zhao¹, Dengmei Zhou¹, Wanxia Huang^{1,*}, Xueya Kang^{2,3}, Qiwu Shi¹, Zhilin Deng³, Xianwei Yan³, Yongbo Yu³

¹ College of Materials Science and Engineering, Sichuan University, Chengdu 610065, China

² Xinjiang Technical Institutes of Physics and Chemistry, Chinese Academy of Sciences, Urumqi, Xinjiang 830011, China

³ Sichuan Guorun New Materials Co., Ltd, Meishan 620010, China

*E-mail: huangwanxia@scu.edu.cn

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Carbon-coated NaFePO₄ (NaFePO₄/C) with a maricite structure was synthesized by a two-step solid-state method with sucrose as carbon source. The electrochemical performances of NaFePO₄/C were evaluated for sodium-ion batteries (SIBs) and lithium-ion batteries (LIBs), respectively. For SIBs, the initial reversible capacity of 48.8 mAh g⁻¹ at 0.05 C (1 C=154 mAh g⁻¹) has obtained. For LIBs, the initial discharge capacity of NaFePO₄ can reach up to 75.7 mAh g⁻¹ at 0.05 C. The reversible capacity of 50.6 and 38 mAh g⁻¹ can be obtained at 0.1 C, 0.2 C, respectively. With a simple synthetic process, cost-effective chemicals, and desirable electrochemical performance, the maricite NaFePO₄/C is a possible application for large-scale energy devices and stationary storage.

Keywords: NaFePO₄, maricite, carbon coating, cathode, sodium-ion batteries, lithium-ion batteries

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