Short Communication

Solvo-Thermal Synthesis of $\text{H}_6\text{V}_4\text{O}_{10}$ Microspheres as Stable Electrode Materials for Lithium and Zinc-ion Batteries

Hailong Fei^{1,2}

¹ Colloge of Chemistry, Fuzhou University, Fuzhou, Fujian 350002, China.

²Key Laboratory of Advanced Energy Materials Chemistry (Ministry of Education), Nankai University, Tianjin 300071.

E-mail: fimer99@163.com

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$\text{NH}_4\text{V}_4\text{O}_{10}$ based ammonium vanadium bronze has been widely investigated as a cathode material for lithium-ion batteries. A V_4O_{10} group based $\text{H}_6\text{V}_4\text{O}_{10}$ might be a potential anode material due to its high hydrogen content and similar composition. Microspheres modified by loosely distributed nanoparticles showed higher discharge capacity and better cycling stability than those composed of tightly packed micro-blocks for lithium-ion batteries and zinc-ion batteries. The former can steadily cycle at current densities of 400 mA g^{-1} for 1000 cycles with a capacity of up to 387 mA h g^{-1} . The discharge capacity of aqueous zinc-ion batteries can be up to $238.8 \text{ mA h g}^{-1}$ with a capacity retention of 87.8% after 26 cycles. The improved electrochemical performance can be ascribed to the nanoparticles modifying the loose surface, which promotes ion and electron transfer.

Keywords: Hydrogen Vanadate; Microspheres; Anode

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