

6th International Conference and Exhibition on

Materials Science and Engineering

September 12-14, 2016 Atlanta, USA

Synthesis of vanadium oxide/carbon nanotubes for anodes for lithium-ion batteries

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Vanadium oxides are considered as the most promising anode materials for lithium-ion batteries because they have high theoretical reversible capacity, abundance, low cost, and eco-friendly properties. However, the dramatic volume variation could take place during practical discharge/charge processes, which leads to in the pulverization of electrodes and poor cycling stability. Here hollow porous VO_x/C tubes were synthesized by combining solvothermal and annealing process. The VO_x/amine nanotubes were firstly prepared, and then transformed into VO_x/C nanotubes. In the heating process, the intercalated amines in the VO_x/amine nanotubes escaped, resulting in the formation of the porous walls. Such hollow porous VO_x/C nanoscrolls have a high capacity and long cyclic performance as the anode of lithium-ion batteries. The unique structure of the hollow hierarchical porous nanoscrolls with low crystallinity could significantly suppress irreversible Li⁺ trapping and improve Li⁺ diffusion kinetics.

Biography

Baorui Jia has completed his PhD from University of Science and Technology Beijing. He is now a Lecturer of Institute for Advanced Materials and Technology, University of Science and Technology Beijing. He is interested in synthesis and energy storage of nanomaterials, and has published more than 20 papers in reputed journals.

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