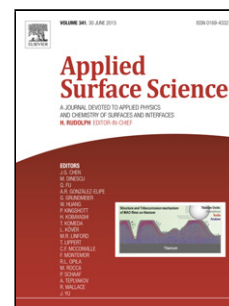


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Ammonium vanadate@polypyrrole@manganese dioxide nanowire arrays with enhanced reversible lithium storage

Chang Wang¹, Hui Liu², Ming Jiang¹, Yingde Wang³, Ruina Liu¹, Zhiping Luo⁴, Xiaoqing Liu⁵,
Weilin Xu¹, Chuanxi Xiong⁵, and Dong Fang^{*1}

¹ Key Lab of Green Processing and Functional Textiles of New Textile Materials Ministry of Education, College of Material Science and Engineering, Wuhan Textile University, Wuhan 430070, P. R. China

² School of Metallurgy and Environment, Central South University, Changsha 410083, P. R. China

³ Science and Technology on Advanced Ceramic Fiber and Composites Laboratory, National University of Defense Technology, Changsha 410073, P. R. China

⁴ Department of Chemistry and Physics, Fayetteville State University, Fayetteville, NC 28301, USA

⁵ School of Materials Science and Engineering, Wuhan University of Technology, Wuhan 430070, P. R. China

*Corresponding Author

E-mail: csufangdong@gmail.com (D. Fang)

Highlights:

- An architectural design of a ternary ammonium vanadate ($\text{NH}_4\text{V}_4\text{O}_{10}$)-based electrode was proposed.
- The electrode structure and electrochemistry characters were examined based on experimental data.
- The capacity and the cycle-life were actually improved with PPy@ MnO_2 core-shell-shell structure.

Abstract

Design and fabrication of novel optimized electrode materials is important for the development of new batteries for energy storage applications. Herein, we report on a hierarchical bulk electrode material with a tailored nanostructure that which consists of three components: a $\text{NH}_4\text{V}_4\text{O}_{10}$ nanowire as an active skeleton, an intermediate polymer layer (polypyrrole, PPy), and a metal oxide layer (MnO_2) as the outside shell. The $\text{NH}_4\text{V}_4\text{O}_{10}$ -PPy- MnO_2 nanowires exhibit present higher capacitance than that of the simple $\text{NH}_4\text{V}_4\text{O}_{10}$ -PPy core@shell or $\text{NH}_4\text{V}_4\text{O}_{10}$ nanowires. The structure of double shells of combined PPy and MnO_2 is a key factor in enhancing their electrochemical

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