

## Accepted Manuscript

Cost-effective synthesis and superior electrochemical performance of sodium vanadium fluorophosphate nanoparticles encapsulated in conductive graphene network as high-voltage cathode for sodium-ion batteries

Kelu Liu, Ping Lei, Xin Wan, Wenting Zheng, Xingde Xiang

PII: S0021-9797(18)30878-6  
DOI: <https://doi.org/10.1016/j.jcis.2018.07.114>  
Reference: YJCIS 23905

To appear in: *Journal of Colloid and Interface Science*

Received Date: 25 June 2018  
Revised Date: 23 July 2018  
Accepted Date: 26 July 2018

Please cite this article as: K. Liu, P. Lei, X. Wan, W. Zheng, X. Xiang, Cost-effective synthesis and superior electrochemical performance of sodium vanadium fluorophosphate nanoparticles encapsulated in conductive graphene network as high-voltage cathode for sodium-ion batteries, *Journal of Colloid and Interface Science* (2018), doi: <https://doi.org/10.1016/j.jcis.2018.07.114>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



**Cost-effective synthesis and superior electrochemical performance of sodium vanadium fluorophosphate nanoparticles encapsulated in conductive graphene network as high-voltage cathode for sodium-ion batteries**

*Kelu Liu, Ping Lei, Xin Wan, Wenting Zheng, and Xingde Xiang\**

Department of Chemistry and Chemical Engineering, College of Science, Northeast Forestry University, Harbin 150040, China.

E-mail: xiangxingde@efu.edu.cn

**Abstract:** Sodium vanadium fluorophosphate ( $\text{Na}_3(\text{VO})_2(\text{PO}_4)_2\text{F}$ , denoted as NVPF) has attracted particular interests as cathode for high-energy sodium-ion batteries (SIBs) owing to the high working potential, high specific capacity, and robust structural framework. However, it is challenged by the low electron conductivity and lack of available facile synthesis method. Herein, an environmentally benign, cost-effective synthesis route is reported to produce NVPF nanoparticles encapsulated in conductive graphene network (NVPF/C), involving low-temperature synthesis of NVPF nanoparticles in absolute aqueous solvents and subsequent construction of conductive network through thermally induced transformation of graphene-oxide nanosheets. The resultant product is structurally and electrochemically investigated by combining X-ray diffraction, fourier transform infrared spectroscopy, scanning electron microscope, transition electron microscope, and electrochemical analysis. Experimental results show that the optimized NVPF/C product possesses a

Download English Version:

<https://daneshyari.com/en/article/6989452>

Download Persian Version:

<https://daneshyari.com/article/6989452>

[Daneshyari.com](https://daneshyari.com)