Int. J. Electrochem. Sci., 12 **(2017)** 9925 – 9932

International Journal of
ELECTROCHEMICAL
SCIENCE
www.electrochemsci.org

Short communication

Integrated Charge Transfer in $Li_3V_2(PO_4)_3$/C for High-Power Li-Ion Batteries

Xianghua Zhang[1], *Dong Chen*[1], *Yipei Liu*[1], *Weiwei Han*[1], *Huaqiang Chu*[1,*], *Xianhong Rui*[1, 2,*]

[1]School of Energy and Environment, Anhui University of Technology, Maanshan, Anhui 243002, China
[2] Key Laboratory of Advanced Energy Materials Chemistry (Ministry of Education), Nankai University, Tianjin 300071, China
[*]E-mail: hqchust@163.com (H.Q. Chu), xhrui@outlook.com (X.H. Rui)

doi: 10.20964/2017.11.26

Received: 3 July 2017 / *Accepted:* 30 August 2017 / *Published:* 12 October 2017

To improve the charge transfer kinetics in monoclinic $Li_3V_2(PO_4)_3$ (LVP), LVP nanoparticles with sizes ranging from 100 to 200 nm that were completely encapsulated in amorphous carbon networks (LVP/C) are synthesized by a facile sol-gel method using two carbon sources of citric acid and span80 ($C_{24}H_{44}O_6$). Span80, possessing strongly hydrophilic functional groups, is essential for the formation of the three-dimensional conductive carbon matrix. When applied as the cathode for Li-ion batteries, LVP/C nanocomposite displays an excellent cycling stability and rate capability, e.g., delivering the capacity of 85 mAh g^{-1} at the high rate of 30 C.

Keywords: lithium ion battery, lithium vanadium phosphate, 3D carbon network, nanocomposite, high-power

FULL TEXT