

International Conference on

# Battery and Fuel Cell Technology

December 08-09, 2016 Dubai, UAE

## Facile synthesis of nanoscale laminated $\text{Na}_3\text{V}_2(\text{PO}_4)_3$ for high performance sodium ion battery cathode

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A facile synthesis of nanoscale laminated  $\text{Na}_3\text{V}_2(\text{PO}_4)_3$  for high performance sodium ion battery cathode is firstly proposed. In the synthesis process, a crystallized intermediate precursor with low cost raw materials is prepared by introducing a high temperature melton-state  $\text{NH}_3$  thermal reduction process, which acts as a reaction template to control the crystal growth and the morphology of the final product- $\text{Na}_3\text{V}_2(\text{PO}_4)_3$  (X-NVP). The synthesized nanoscale laminated structure of X-NVP cathode shows high discharge specific capacity and decent rate performance. At low rate of 0.5C, the discharge specific capacity is in the proximity of 117mAh g<sup>-1</sup>, which is very close to its theoretical specific capacity (117.6 mAh g<sup>-1</sup>), and there is only a very small capacity fade after 250 cycles at 2C. Even at 50C, the discharge specific capacity is higher than 80 mAh g<sup>-1</sup> and the reversible capacity retention after 3000 cycles keeps higher than 78%. The intermediate precursor prepared by the high temperature melton-state thermal reduction method, acting as the reaction template of the final product, provides a solution for the synthesis of high-performance sodium ion battery cathode materials with excellent crystallinity and homogeneous nanoscale laminated structure.

### Biography

Qiong Zheng has completed her PhD from Dalian University of Technology and Dalian Institute of Chemical Physics (DICP), Chinese Academy of Sciences (CAS). She is currently a Post-doctor in the Division of Energy Storage in DICP, CAS. Her research interests focus on the key materials of sodium ion batteries and structure design and numerical simulation of flow batteries. She is also responsible for the battery performance evaluation and the standardization work on flow batteries.

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