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VO<sub>2</sub> (A)/graphene nanostructure: Stand up to Na ion intercalation/deintercalation for enhanced electrochemical performance as a Na-ion battery cathode

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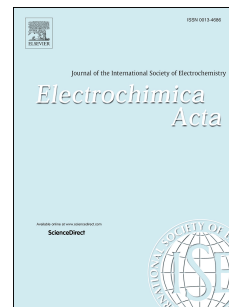
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**VO<sub>2</sub> (A)/graphene nanostructure: stand up to Na ion  
intercalation/deintercalation for enhanced electrochemical performance as a  
Na-ion battery cathode**

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**Abstract**

Intercalation/deintercalation of large size Na ion leads to serious electrode materials fragmentation that would be the main reason of Na-ion battery capacity fading. Herein, we reported a Na-ion battery cathode material composed of layer-structured VO<sub>2</sub> (A) nanowires wrapped with graphene. The VO<sub>2</sub> (A)/graphene nanostructure which effectively suppressed pulverization of VO<sub>2</sub> (A) nanowires during cyclic charging and discharging exhibited prominent cycle stability and high specific capacity. A reversible capacity of 115 mA h g<sup>-1</sup> was retained over 100 cycles at a high current density of 100 mA g<sup>-1</sup>. Comparing to the electrochemical performance of other vanadium oxides, VO<sub>2</sub> (A)/graphene demonstrates a potential cathode material for Na-ion batteries.

Keywords: Na-ion battery; VO<sub>2</sub> (A) nanowire; VO<sub>2</sub> (A)/graphene composite; battery cathode material; cycle stability.

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