

Improved electrochemical performance of SiO-based composite anode for Li-ion battery

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With rapidly growing application of lithium-ion batteries in electric vehicles and renewable energy storage, there is a huge need on high performance batteries in terms of energy density and power density. For anode materials, the traditional graphite can not meet these requirements, high capacity anode materials are being widely investigated, including Si-based materials. Typically, SiO is considered to be a promising anode material for the practical use because of its high capacity and relatively lower volume change upon cycling compared with pure silicon¹.

Here, we report the d-SiO/Graphite/Carbon anode materials with a good cycle performance, which were prepared by the disproportionation reaction of SiO followed by a pitch pyrolysis. The d-SiO acts as the main active component of the composite, while the graphite and carbon introduced during the mechanical milling and heat treatment process can accommodate volume changes of the silicon and improve the electrical conductivity of the electrode. As a result, the novel d-SiO/Graphite/Carbon composite exhibits a high capacity of 614 mAh g⁻¹ and an excellent cycling performance.

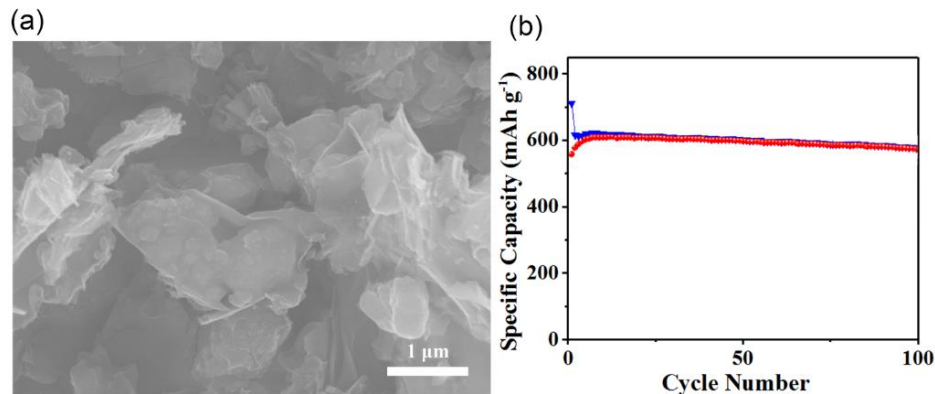


Figure 1: (a) The SEM image of d-SiO/Graphite/Carbon; (b) cycle performances of d-SiO/Graphite/Carbon

References:

1. L. Shi, C. Pang, S. Chen, M. Wang, K. Wang, Z. Tan, P. Gao, J. Ren, Y. Huang, H. Peng and Z. Liu, *Nano Letters*, 2017, 17, 3681-3687.