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Hollow irregular octahedra-like NiCo₂O₄ cages composed of mesoporous nanosheets as a superior anode material for lithium-ion batteries

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ABSTRACT

Hollow irregular octahedra-like NiCo₂O₄ cages composed of mesoporous nanosheets have been prepared by a facile template-assisted strategy under the auxiliary action of hydroxypropyl cellulose. As an anode material for lithium ion batteries, such a hierarchical hollow nanostructure can greatly alleviate volume change and effectively shorten lithium ion diffusion distance, as a result, it exhibits superior lithium ion storage performance with excellent cyclability and great rate capability. A reversible charge capacity of 903 mAh g⁻¹ at 0.2 A g⁻¹ is obtained in the first cycle, and 85.3% of the 2nd discharge capacity is retained after 300 cycles at 0.5 A g⁻¹. After tested at various current densities from 0.2 to 1.4 A g⁻¹, the reversible capacity can recover to 885 mAh g⁻¹ at 0.2 A g⁻¹. These results suggest a promising application for advanced energy storage units.

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