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Facile hydrothermal synthesis of urchin-like cobalt manganese spinel for high-performance supercapacitor applications

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Abstract

A facile hydrothermal method has been adopted to synthesize the spherical urchin-like hierarchical CoMn_2O_4 nanostructures on the nickel foam substrate. The as-synthesized urchins have an average diameter of $\sim 3-7 \mu\text{m}$ with numerous self-assembled nanoneedles grown radially in all the directions from its center with a huge void space between them. For comparison, we have also studied the electrochemical as well as other physicochemical properties of parent simple Co_3O_4 and MnO_2 materials, which were also synthesized by a similar hydrothermal method. The results show that CoMn_2O_4 electrode displayed significantly higher (more than two times) areal and specific capacitances compared to Co_3O_4 and MnO_2 electrodes

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