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Effect of MnO_2 morphology on electrochemical capacitance of supercapacitor electrode

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In this study, different surface morphologies of MnO_2 (rod, wire, urchin and tube-like MnO_2) with an α -phase crystalline structure were synthesized via a hydrothermal process by adding various reagents. The crystalline structure and morphology were examined by X-ray diffraction (XRD) and scanning electron microscopy (SEM), respectively. In addition, the electrochemical properties were measured using cyclic voltammetry (CV) and galvanostatic charge/discharge (C.D.) in 1 M Na_2SO_4 aqueous solution. The specific capacitance of rod, wire, urchin and tube-like MnO_2 were about 110.20, 73.49, 53.80 and 64.31 F g^{-1} . Especially, the rod-like MnO_2 exhibits a highest capacitance of 110.2 F g^{-1} at the current density of 0.5 A g^{-1} due to its smallest size.

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