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Facile synthesis of $\text{Co}_3\text{O}_4@\text{MnO}_2$ core-shell nanocomposites for high-performance supercapacitor

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Abstract: $\text{Co}_3\text{O}_4@\text{MnO}_2$ core-shell arrays hybrid electrode directly grown on Ni foam for supercapacitor was obtained by two-step hydrothermal processes. $\text{Co}_3\text{O}_4@\text{MnO}_2$ core-shell arrays hybrid electrode exhibited a high specific capacitance of 1920 F g^{-1} at current density of 1 A g^{-1} . This was attributed to relative high conductivity of the Co_3O_4 nanowire arrays and the large surface area provided by the ultrathin MnO_2 nanosheets. The porous MnO_2 nanosheets stack provided numerous channels for rapid diffusion of electrolyte ions and fast electron transport, which enhanced the electrochemical reactions. The synergetic effect between Co_3O_4 nanowire and MnO_2 nanosheets also improved the supercapacitor performance. In addition, the $\text{Co}_3\text{O}_4@\text{MnO}_2$ core-shell arrangement also exhibited excellent cyclic stability.

Keywords: Co_3O_4 nanowires; MnO_2 nanosheets; Hydrothermal; Supercapacitors; Microstructures

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