Self-Assembly of Mn₃O₄ Nanoparticles into Mesoporous Microstructures for Use as Supercapacitor Electrode Material

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The exceptional and unusual properties of hierarchically structured inorganic materials have led to a major push forward in related research and development. In the present study, a simple modified version of the room-temperature one-pot co-precipitation method was employed to synthesize Mn₃O₄ nanoparticles which then self-aggregated into mesoporous microstructures. The obtained structures were used as for the electrodes in electrochemical capacitors. The as-obtained Mn₃O₄ microstructures exhibited acceptable specific capacitances of 260 and 180 F g⁻¹ at current densities of 1 and 5 A g⁻¹, respectively, with 98% capacity retention after 2000 cycles.

Keywords: chemical method; microstructures; supercapacitors; specific capacitance

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