Formation of Highly Dispersed Ultrafine MnO₂ Nanoparticles on Nitrogen-doped Porous Carbon for Supercapacitor Applications

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Formation of transition metal oxide doped nanostructures with high surface area is highly desirable for electrochemical applications. Here, ultrafine MnO₂ nanoparticles dispersed nitrogen-doped porous carbons (MnO₂/N-C) was synthesized using chitosan and Mn(NO₃)₂ as precursor. The MnO₂/N-C demonstrates outstanding supercapacitive properties and great potential for real-world applications. The capacitance of the nanocomposite is as high as 340.1 F g⁻¹ (1 A g⁻¹) in 1 M KOH solution. The MnO₂/N-C also shows high-rate capability, retaining a specific capacitance of 270.2 F g⁻¹ at 10 A g⁻¹. The large specific surface area and highly-dispersed MnO₂ combined with its unique structural advantages, make it a very promising electrode material for energy storage devices.

Keywords: MnO₂; Supercapacitor; N-doped; Highly dispersed; Nanocomposite

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