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Porous MnO_2 prepared by sol-gel method for electrochemical supercapacitor[1] K. BAZZI, A. KUMAR, Wayne State University, O.D. JAYAKUMAR, Bhabha Atomic Research center, G.A. NAZRI, Wayne State University, V.M. NAIK, University of Michigan-Dearborn, R. NAIK, Wayne State University — MnO_2 has attracted great attention as material for electrochemical pseudocapacitor due to its high theoretical specific faradic capacitance ($\sim 1370\ F{\cdot}g^{-1}$), environmental friendliness and wide potential window in both aqueous and nonaqueous electrolytes. However, the MnO_2 has a low surface area which depresses its electrochemical performance. The amorphous α-MnO_2 composite was synthesized by sol gel method in the presence of the tri-block copolymer P123. Our aim is to investigate the role of P123 on the electrochemical performance of MnO_2. The samples with and without P123 were prepared and characterized by x-ray diffraction (XRD), SEM, TEM and Brunauer–Emmett–Teller (BET) method. The electrochemical performances of the amorphous MnO_2 composites as the electrode materials for supercapacitors were evaluated by cyclic voltammetry and AC impedance measurements in a 1M Na_2SO_4 solution. The results show that the sample prepared without P123 exhibited a relatively low specific capacitance of $28F{\cdot}g^{-1}$, whereas the porous MnO_2 prepared with P123 exhibited 117 $F{\cdot}g^{-1}$ at 5 mV/s. The results of crystalline MnO_2 composites will also be presented.

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