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*Short Communication*

# Electrochemical Properties of Single-crystalline $Mn_3O_4$ Nanostructures and their Capacitive Performance in Basic Electrolyte

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Single-crystalline $Mn_3O_4$ square-shaped nanostructures have been successfully synthesized by hydrothermal method without using any surfactant. The as-prepared products were characterized by X-ray diffraction (XRD), field emission scanning electron microscopy (FESEM), Transmission electron microscopy (TEM) and High Resolution transmission electron microscopy (HRTEM). To assess the potential properties of nanostructures, galvanostatic charging–discharging and cyclic voltammetry measurements were performed for their use in supercapacitors. The $Mn_3O_4$ nanoarchitectures used as supercapacitor electrode in 1mol $L^{-1}$ KOH electrolyte have a specific capacitance value of 355.5 F $g^{-1}$ at a low current density of 0.35 $A.g^{-1}$. The device still retain 85.08% of its initial capacitance afterwards 2000 cycles at a current density of 5 $A.g^{-1}$. The as-synthesized $Mn_3O_4$ nanostructures exhibited a good rate capability and stability for electrochemical properties. These results indicate their potential application as electrode material for high performance supercapacitor in basic medium.

**Keywords:** Hydrothermal Method; Optical Properties; Transition metal oxides; Supercapacitance; Electrochemical properties;

FULL TEXT