Abstract

The pursuit of meeting global energy demands, along with depletion of fossil fuels and related environmental concerns, has led to the development of supercapacitors. Among various components of supercapacitors, electrode substrate plays an essential role in their performance. Bimetallic Metal Organic Framework (MOF) has attracted the attention of researchers as a supercapacitor electrode material because of its abundant active sites, huge surface area, adjustable porosity structure and ease of synthesis. Incorporating transition metal oxides into MOF can further enhance electrochemical performance. Here, we synthesized MnO_2@Zn/Ni-MOF using the solvothermal method. We characterized the fabricated electrode material using various physical and electrochemical analytical techniques. The MnO_2@Zn/Ni-MOF exhibited a specific capacitance of 2555 F g^{-1} at 1 A g^{-1}, which is greater than that of pristine Zn/Ni-MOF (1805 F g^{-1} at 1 A g^{-1}). After performing 4000 cycles, MnO_2@Zn/Ni-MOF also retained 89% of its initial capacitance at 6 A g^{-1}, indicating its suitability for supercapacitor applications.