Unveiling high specifc energy supercapacitor from layer-by-layer assembled polypyrrole/graphene oxide|polypyrrole/manganese oxide electrode material

ABSTRACT

A novel layer-by-layer (LBL) based electrode material for supercapacitor consists of polypyrrole/ graphene oxide and polypyrrole/manganese oxide (PPy/GO|PPy/MnO2) has prepared by electrochemical deposition. The formation of LBL assembled nanocomposite is confrmed by Fourier transform infrared spectroscopy, Raman spectroscopy and X-ray difraction. The feld emission scanning electron microscopy images clearly showed that PPy/MnO2 was uniformly coated on PPy/GO. The PPy/ GO|PPy/MnO2 symmetrical supercapacitor has revealed outstanding supercapacitive performance with a high specifc capacitance of 786.6F/g, an exceptionally high specifc energy of 52.3Wh/kg at a specifc power of 1392.9W/kg and preserve a good cycling stability over 1000 cycles. It is certain that PPy/GO|PPy/MnO2 has an extraordinary perspective as an electrode for future supercapacitor developments. This fnding contributes to a signifcant impact on the evolution of electrochemical supercapacitor.