**Abstract**

A battery type electrode material of FePO4 nano particles have synthesized through facile combustion method for the fabrication of aqueous type hybrid supercapacitors. The phase purity, homogeneity and the functional groups present in the synthesized FePO4 are characterized through X-ray diffraction and FTIR measurements. Field emission scanning electron microscopy (FESEM) images show that there is a uniform and spherical shaped nano particles present in the electrode material. The electrochemical properties of the FePO4 electrode are studied in various aqueous electrolytes of 1 M LiOH, 1 M KOH and 1 M NaOH to explore their superior electrochemical performances. Among these aqueous electrolytes, the FePO4 electrode provides a maximum specific capacitance of 400 F g-1 in 1 M NaOH at 2 mV s-1 and also retained about 93% of the initial capacitance value even after 5000 cycles at a current density of 1 mA cm-2. These results suggest that the synthesized sample has higher potential as a newer electrode material for hybrid supercapacitors. By employing FePO4 as a negative electrode in hybrid supercapacitor configuration of FePO4║Co3O4, it exploits an outstanding electrochemical with an enhanced energy density of 18 W h kg−1 at an improved power density of 443 W kg−1 and protracted cyclic stability for about 5000 cycles. The higher electrical conductivity of FePO4║Co3O4 hybrid device is confirmed by the lower charge transfer resistance (5.5 Ω) of EIS measurements, which is slightly increased to 38 Ω after 5000 cycle’s performance. From these results, it is evident that the FePO4║Co3O4 hybrid supercapacitor shows better electrical conductivity, higher diffusion of ions and more charge propagation behaviour.