SUPERCAPACITIVE PERFORMANCE OF rGO/Ni CODOPED ZnO NANOCOMPOSITE

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ABSTRACT

SUPERCAPACITIVE PERFORMANCE OF REDUCED GRAPHENE OXIDE/NICKEL CODOPED ZINC OXIDE NANOCOMPOSITE

In this work, the supercapacitive performance of carbon-metal-metal oxides nanocomposites were observed with various addition of metal oxides nanocomposites. The supercapacitive behaviour of rGO/Ni/ZnO with different weight of ZnO were studied at various scan rate of 20 mV/s to 100 mV/s using the electrochemical properties test, Cyclic Voltammetry (CV) in 1 M sulphuric acid (H_2SO_4) was used as an electrolyte. There are four parameters have been determined the supercapacitive behaviour which are specific capacitance, energy density, power density and discharging time. Based on this electrochemical findings, the incorporation of 10 % ZnO boost the specific capacitance (Cs) from 96.46 F/g of pure rGO to 131.24 F/g at 20 mV/S. Also, it did the same towards energy density, from 48.23 Wh/kg to 65.62 Wh/kg and power density from 1.073 kW/kg to 1.328 kW/kg. The effect of ZnO addition were further analysed by charge discharge test where the tribrid nanocomposite with 10 % weight of ZnO shows the highest discharging time, 449.423 s compared to other ZnO weight addition and pure rGO. The results obtained were further compared with previous studies where its shows a comparable results and better performance in all four parameters.