Abstract

In order to handle the energy difficulties of the modern world, electrochemical energy storage is an existing research field. Supercapacitor, electrode material based on transition metals oxides (CdO/ZnO) along with reduced graphene oxide and conducting polymer as a capping agent were synthesized using Green method with Cadmium Nitrate and Zinc Acetate dehydrate as precursor material. Among these material three samples were prepared i.e. CdO/ZnO nanocomposite, CdO/ZnO /PVP nanocomposite, CdO/ZnO/PVP/rGO nanocomposite. Out of all these material Graphene based nanocomposite reveals enhanced capacitive properties because addition of transition metals along with addition of conducting polymer characterize less resistance, thus shows excellent conductivity which is analyzed by CV analysis by depicting current value of 100mA at 100mV/sec (scan rate). Due to large area in CV curve Graphene based composite shows large specific capacitance of $307.3Fg^{-1}$ at 3mV/sec scan rate and energy density of $12.9Whg^{-1}$. GCD analysis characterize good charging and discharging retainability and gives discharging time of 507sec at $0.1Ag^{-1}$ current density which enhances its good capacitive results due to porosity and extraordinary conductivity of Graphene oxide. These all parameters highly enlighten this nanocomposite electrochemical properties and act as a best electrode material in Hybrid type of supercapacitor fabrication.