CABBAGE-LIKE $NiCo_2O_4$/rGO NANOCOMPOSITES: BOOSTING CAPACITANCE AND POWER DENSITY FOR NEXT-GENERATION SUPERCAPACITORS

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In the present work, $NiCo_2O_4$ and $NiCo_2O_4$/rGO nanocomposites were synthesized by using hydrothermal method. Thermogravimetric analysis (TGA) reveals that $NiCo_2O_4$/rGO was more stable as compared to $NiCo_2O_4$. Electrochemical studies reveal that the $NiCo_2O_4$/rGO exhibits high specific capacitance of 1960 *F/g in comparison with $NiCo_2O_4$ of* 870 *F/g. $NiCo_2O_4$/rGO has energy density of* 300 *Wh/Kg at low power density and ultra high power density of* 18.74 *KW/Kg at low energy density. Incorporation of reduced graphene oxide increases the specific capacitance, energy density and power density of the electrode material. The SEM micrographs reveal the formation of cabbage-like structure of the nanocomposite. These results of $NiCo_2O_4$/rGO have drawn increasing attention as the latter is a promising electrode material for high performance supercapacitors.*

Keywords: nanocomposite, supercapacitor, thermal stable.

1. Introduction. The global economic and social security heavily depends on carbon-based energy sources such as coal, gas, and oil [1]. With fossil fuel demand projected to reach 1.830 billion tons by 2035, the need for efficient energy storage technologies becomes critical [2]...

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