Electrochemical Rate Capability and Cycle Stability of Co_3O_4/graphene Composite Electrodes containing Carbon Blacks

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Supercapacitors attracted much attention because of their pulse power supply, long cycle, simple principle, and high dynamic of charge propagation. Supercapacitors are probably the one of the most important next generation energy storage device. Most reaserch in this area has focused on the development of different electrode materials such as carbon, conducting polymers and trasition metal oxides. Recent works have reported the usage of metal oxides coupled with graphene in energy storage applications. In this study, Co_3O_4/GNS composites were synthesized by microwave-assisted reduction method. Carbon black was added as spacers between graphene sheets. The embedment of carbon blacks into composites can inhibit agglomeration of graphene sheets and increase structural stability. Electrochemical properties and surface morphology of materials were characterized using cyclic voltammetry (CV), scanning electron microscope (SEM), and transmission electron microscopy (TEM). The results indicated that carbon black effectively modified the microstructure and resulting electrochemical behaviors of Co_3O_4/GNS composites.