Supercapacitance Performances of Electrodeposited Co(OH)₂ /three-dimensional Graphene Nanocomposite

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In this paper an electrodeposited Co(OH)₂ and three-dimensional graphene (3DGR) nanocomposite was directly synthesized on the surface of carbon ionic liquid electrode (CILE) with its supercapacitance performances checked in detail. The structure and morphology of the prepared Co(OH)₂/3DGR nanocomposite was characterized by scanning electron microscopy (SEM), which gave a porous microstructure on the electrode surface. Various electrochemical methods were applied to investigate the electrochemical performances. The results indicated that Co(OH)₂/3DGR nanocomposite possessed a superior specific capacitance of 730.23 mF/cm² at the current density of 5 mA/cm². And 79.83% of the specific capacitance was retained after 3000 cycles at the current density of 20 mA/cm². Owing to its favorable electrochemical performance, Co(OH)₂/3DGR nanocomposite had a great potential application in the fabrication of electrochemical supercapacitors.

Keywords: three-dimensional graphene; electrochemistry; supercapacitor; cobalt hydroxide

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