

Performance Improvement of Supercapacitor of PVA-based Electrolyte with  $\text{Co}_3\text{O}_4$  nanofiller

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One of the energy storage devices, electric double-layer capacitors (EDLCs) have attracted a considerable attention in recent years because of the high power density and long cycle stability. In this work, metal oxide nanofillers were added in the electrolyte to facilitate ion transport by increasing the free volume within the polyvinyl alcohol (PVA) electrolyte. By using different cobalt oxides as nanofillers, one-dimensional and polyhedral morphologies were applied to increase performance. One-dimensional cobalt oxide was synthesized by a chemical bath deposition and polyhedral cobalt oxide was obtained by oxidation of ZIF-67 powder. The morphology characterization of nanofillers was investigated by using scanning electron microscopy (SEM), X-ray diffraction (XRD), and X-ray photoelectron spectroscopy (XPS) analysis. The electrochemical performance was evaluated by cyclic voltammetry (CV) and electrochemical impedance spectroscopy (EIS).