

Studies on preparation and performances of carbon aerogel/polymer composites electrode materials for supercapacitor

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The electrochemical storage of energy in various carbon materials used as capacitor electrodes is considered. In this study, electrode materials using mesoporous carbon aerogel/polymer composites were developed. Carbon aerogels are promising materials for electrodes due to their large specific surface area and their high electrical conductivity. The carbon aerogels were obtained by pyrolyzing the RF aerogels at 1173K. The RF aerogels were synthesized by polycondensation of resorcinol(R) with formaldehyde(F) using sodium carbonate as a catalyst in a slightly basic aqueous solution. Mesoporous carbon aerogel/polymer composites were prepared by electrospinning blend solutions of polyacrylonitrile(PAN) and poly(methyl methacrylate) (PMMA) added carbon aerogel in N,N-dimethylformamide(DMF). The control of mesoporous structure and surface area of the aerogels was studied by changing the amount of resorcinol(R) and sodium carbonate(catalyst, C) used in the polycondensation. The morphology of carbon aerogel/polymer composites were investigated using scanning electron microscope(SEM). The surface area and pore size of carbon aerogel/polymer composites were measured by BET.