

Development of electrode materials for supercapacitor using carbon aerogel/polymer composites

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The electrochemical energy storage in various carbon materials is considered. In this study, electrode materials using carbon aerogel/polymer composites were developed to improve the electrochemical performance of supercapacitor. 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. When the R/C ratio was 800, it showed optimal mesoporous carbon aerogels. Carbon aerogel/polymer composites were prepared by electrospinning of polyacrylonitrile(PAN) and poly(methyl methacrylate)(PMMA) solution with carbon aerogel in N,N-dimethylformamide(DMF). PMMA was used as supporting materials which keeps pores of aerogel at calcinating temperature, and PMMA phase disappeared. The morphology of carbon composites were investigated using scanning electron microscope(SEM). The surface area and pore size of carbon aerogel/polymer composites were measured by BET. Also, electrochemical property of carbon aerogel/polymer composites were investigated by three electrode system.