

Synthesis and characterization of electrode materials for EDLC 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. RF aerogels were synthesized via the sol-gel polycondensation of resorcinol(R) with formaldehyde(F) in a slightly basic aqueous solution. Carbon aerogels were obtained by pyrolyzing the RF aerogels at 1173K. We show that pore size distribution is easily controlled 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 nanosheets were prepared by electrospinning of polyacrylonitrile (PAN) and poly(methyl methacrylate)(PMMA) solution with carbon aerogel in N,N-dimethylformamide(DMF). Also, PMMA phase disappeared after thermal treatment. The morphology of carbon composites were investigated using SEM. The surface area and pore size were measured by BET. Also, electrochemical property were investigated by three electrode system.