

Preparation of CNTs/PAN-based carbon nanofiber webs and their electrochemical characteristics for EDLCs

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In this work, the multi-walled carbon nanotubes (MWCNTs) embedded polyacrylonitrile (PAN) solutions in N,N-dimethylformamide (DMF) were electrospun to be webs consisting of ultrafine fiber webs in 15 kV apply voltage, 10 wt.% PAN concentration, and 15 cm tip-to-collector distance (TCD). The nanofiber webs were stabilized by oxidation at 250°C for 2 h, carbonized at 1000°C for 2 h and then activation at 700 °C for 2h. The surface characteristics of the nanofibers before and after oxidation and carbonization were studied by Fourier transform infrared spectroscopy. The resultant diameter distribution and morphologies of the nanofiber webs were evaluated by scanning electron microscope analyse and transmission electron microscope. The electrochemical behaviors of the nanofiber webs were also observed by cyclic voltammetry tests.