A Facile Synthesis of Cu-MnO/CNF by Electrospinning Method and Its Electrochemical Performance for Supercapacitor Application

Chunyong Zhang^{1,2,*}, Lei Su^{1,2}, Linna Huang^{1,2}, Jiehong Cheng^{2,3,*}, Jianning Li^{1,2}, Hengfei Qin^{2,3}

¹ Jiangsu Key Laboratory of Precious Metal Chemistry and Technology, Jiangsu University of Technology, Changzhou, 213001, China

² School of Chemistry and Environmental Engineering, Jiangsu University of Technology, Changzhou, 213001, China

³ Jiangsu Province Key Laboratory of E-Waste Recycling, Jiangsu University of Technology, Changzhou, 213001, China

Chunyong Zhang, Lei Su contributed equally to this work and should be considered as co-first authors

*E-mail: zhangcy@jsut.edu.cn, cjh@jsut.edu.cn

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The carbon nanofiber composite containing Cu and MnO was fabricated by electrospinning method. The precursor solution was prepared by mixing Cupric Acetate Monohydrate, Manganous acetate, N,N-dimethylformamide (DMF) and polyacrylonitrile in a certain proportion. Then the material of Cu-MnO/CNF with higher capacitance was prepared by electrostatic spinning at 15 kV and high temperature heat treatment. The Cu-MnO/CNF was characterized by scanning electron microscopy (SEM) and X-Ray diffraction (XRD). It's clear from the results that, carbon nanofiber had overlapped by metal oxides and metals, at the same time, the Cu(OAc)₂ was converted to Cu and the MnACAC was turned into MnO after thermal treatment. Through a series of electrochemical tests, it showed the Cu-MnO/CNF has excellent electrochemical performance and indicated its potential advantages for supercapacitors. The results indicated the specific capacitance of the Cu-MnO/CNF displayed a larger specific capacitance of 581 F/g than the electrical capacity of Cu-CuO/CNF and MnO-Mn(OH)₂/CNF.

Keywords: Supercapacitor; Carbon Nanofiber; Electrospinning; Specific Capacitance

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