



Surfactant free chemically deposited wheat spike-like nanostructure on Cu foam for supercapacitor applications

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Abstract

The wheat spikes like CuO nanostructured material synthesized by simple, low-cost chemical deposition method under thermal treatment. The copper foam having 3 D network structures was used as the substrate as well as current collector, for binder free electrode material for supercapacitor. The structural and morphological study of nanostructured CuO were carried out by using scanning electron microscopy (SEM), X-ray diffraction (XRD) and Fourier transform infrared spectroscopy (FTIR). The XRD results were revealed the formation of monoclinic CuO, while wheat spike like morphology obtained from SEM images. The specific capacitance, cycle life and energy density of nanostructured CuO were elucidated by means of cyclic voltammetry (CV) and galvanostatic charge-discharge (GCD) using three electrodes in 2 M KOH electrolyte. The prepared electrode CuO exhibited specific capacitance 184.58 Fg^{-1} at scan rate 10 mVs^{-1} with excellent cycle life. The experimental results showed that synthesize material would be the potential candidate for the use of supercapacitor electrode.

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Keywords

Supercapacitor; CuO; Nanomaterials; Cu foam

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