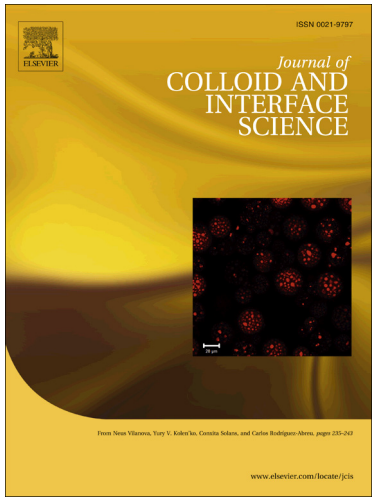

Regular Article

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Electro-synthesized fibrous polyaniline electrode as an active electrochemical supercapacitor material

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Abstract

Polyaniline (PAni) electrode has been successfully electro-synthesized and further envisaged in electrochemical supercapacitor (ES) application. PAni formation with various bands was confirmed from the X-ray photoelectron and Fourier transform infrared spectroscopy. Morphological analysis revealed the formation of nanofibrous network of PAni with an average diameter of ~80 nm. The nanofibrous PAni electrode surface is hydrophilic in nature (water contact angle ~45°), which is beneficial for accessing an entire electrode area with minimum interfacial resistance loss when in contact with the aqueous electrolyte in ES application. The PAni electrode, characterized electrochemically using cyclic-voltammetry and galvanostatic charge–discharge measurements, has demonstrated a specific capacitance of 508 $F.g^{-1}$, a specific energy of 32.12 $Wh.kg^{-1}$, a specific power of 13.39 $kW.kg^{-1}$ and a Coulombic efficiency of 100% in 1 M H_2SO_4 electrolyte solution.

Keywords: Supercapacitor; Cyclic voltammetry; Electro-synthesis; Morphology analysis; Charge transportation

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