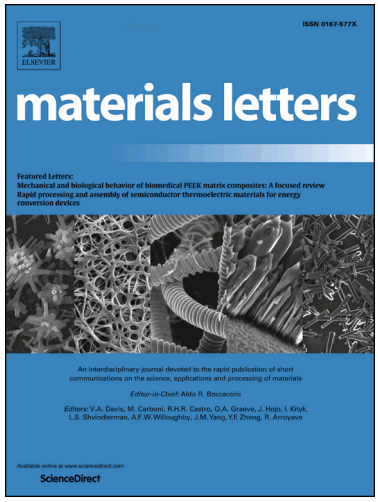

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The fabrication of polypyrrole/D-tartaric acid composite used as electrode in supercapacitors

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Abstract

Polypyrrole/D-tartaric acid composite is successfully fabricated by homogeneous coating of a polypyrrole (PPy) layer around D-tartaric acid (D-TA) nanospheres and the pyrrole (Py) quantity is adjusted. X-ray powder diffraction characterization demonstrates that the PPy is amorphous in PPy/D-TA composite, which is beneficial for ion transfer. The specific capacitance of the polypyrrole/D-tartaric acid electrode obtained with the ratio of [Py]/[D-TA]=1:1 is 200 F g^{-1} at a scan rate of 5 mV s^{-1}. Moreover, the polypyrrole/D-tartaric acid ([Py]/[D-TA]=1:1) displays satisfactory electronic conductivity in EIS measurement. The electrochemical results indicate that the D-tartaric acid is a promising support for the fabrication of electrode in electrochemical energy-storage devices.

Keywords: Polypyrrole, D-tartaric acid, Nanocomposites, Energy storage and conversion

1. Introduction

Electrochemical capacitors, also called supercapacitors, are one of the most promising electrochemical energy-storage systems and have attracted extensive attention because of their high energy density and long cycle stability [1-4], which play an increasingly important role in power-source applications such as hybrid electric vehicles, short-term power sources for mobile electronic devices. The electrochemical performance of the supercapacitors largely depend on the electrodes materials. Therefore, developing new active electrode materials has become a pivotal issue for the supercapacitors