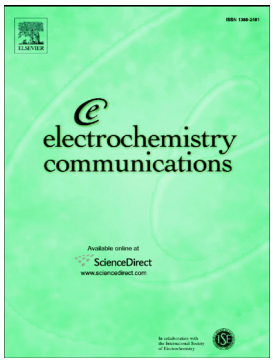

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Modification of glassy carbon with polypyrrole through an aminophenyl linker to create supercapacitive materials using bipolar electrochemistry

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Abstract

Bipolar electrochemistry was applied to create new supercapacitive composite materials. A glassy carbon substrate was functionalized with polypyrrole through aminophenyl bridges. The composites were studied by XPS and SEM to characterize their structure. The electrical properties of the material was also tested. The specific capacitance of the material was found to be 11 mF/cm^2, and the degradation potential over pure polypyrrole was improved (up to 0.70 V). Other electrochemical tests performed were short term charge-discharge and coulometry to obtain the diffusion coefficient.

Keywords: Bipolar electrochemistry, Glassy carbon, 4-nitrobenzenediazonium, 4-aminophenyl, Polypyrrole, Supercapacitance

1. Introduction

Bipolar electrochemistry is an electrochemical technique discovered by Fleischmann et al. [1–3]. Recently it has become a focus of interest due to the possibility for wireless electrochemical reactions [4–6]. Without the need for wires, the door to working with micro- and nano-scale electrodes opens up [7, 8]. Another advantage arises from the potential gradient developed over the electrode

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