



Influence of the deposition parameters on the morphology and electrical conductivity of PANI/PSS self-assembled films[☆]

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Received 26 October 2006; received in revised form 22 May 2007; accepted 18 June 2007

Available online 27 June 2007

Abstract

The influence of deposition parameters, namely polymer concentration and pH of the deposition solution, cleaning, and drying steps on the morphology and electrical characteristics of polyaniline and sulfonated polystyrene (PANI/PSS) nanostructured films deposited by the self-assembly technique is evaluated by UV–Vis spectroscopy, optical and atomic force microscopy, and electrical resistance measurements. It is found that stirring the cleaning solution during the cleaning step is crucial for obtaining homogenous films. Stirring of the cleaning solution also influences the amount of PANI adsorbed in the films. In this regard, the drying process seems to be less critical since PANI amount and film thickness are similar in films dried with N₂ flow or with an absorbent tissue. It is observed, however, that drying with N₂ flow results in rougher films. As an additional point, an assessment of the influence of the deposition method (manual versus mechanical) on the film characteristics was carried out. A significant difference on the amount of PANI and film thickness between films prepared by different human operators and by a homemade mechanical device was observed. The variability in film thickness and PANI adsorbed amount is smaller in films mechanically assembled.

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Keywords: Self-assembly; Polyaniline; Nanostructured films; Morphology

[☆] Presented at the V MRS Brazilian Meeting, code I566.

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