

Effect of working conditions on the morphology of electrosynthesized polyfuran

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Abstract

The influence of electrolyte and deposition potential on polyfurane doped/undoped electrogenerated films was analyzed by potentiodynamic profiles and current–time transients. The films were formed on platinum electrodes from the monomer and tetrabutylammonium hexafluorophosphate, tetrabutylammonium tetrafluoroborate, or tetraethylammonium perchlorate in acetonitrile. Results were also discussed with the aid of X-ray photoelectron spectroscopy (XPS), electron probe microanalysis (EPMA), and primarily by scanning electron microscopy (SEM). It was shown that there is some oxygen contamination not only after ClO₄ doping. However, it was shown by XPS and EPMA that C–O–C bonds are present in the films, which confirmed that there was no destruction of the furan ring during electropolymerization. SEM study showed film morphology evolution with monomer concentration, and with the electrolyte or the dopant used. The undoping effect was also visualized, showing that doped polyfuran was more homogeneous than the respective undoped deposits. © 2004 Wiley Periodicals, Inc. *J Appl Polym Sci* 92: 1346–1354, 2004.

Keywords

Conjugated polymers, Heteroatom-containing polymers, Electrochemistry, Scanning electron microscopy, X-ray photoelectron spectroscopy.