TITLE: ***Synthesis and Characterization of the Composite Polypyrrole/Botriospheran: A Physical-Chemistry Study.***

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ABSTRACT

The polypyrrole films were electropolymerized on the surface of FTO. From two solutions: (i) pyrrole 0.025 M and KCl 0,1 M; (ii) pyrrole 0.025 M and botriospherana 0,5 mg ml-1 applying a potential of + 0,7 V, the polymeric film was deposited until reach a relative thickness of 20 µC cm-2. The spectrophotometric measurements were carried out with the Genesys 2, for UV-vis, and Bomen, for FTIR, both from Shimadzu. The electrochemical experiments were carried out in a potenciostat (MQPG01 Microquimica). The electrode of reference utilized was Ag/AgCl (1.0 M) and as counter electrode a Pt foil. The comparison of the cyclic voltammograms, in KCl 1.0 M solution, for the polypyrrole films electropolimerized in a solution with KCl (PPy/Cl) and another in a solution containing the botriospherana (PPy/EPS) observes a significant change in the profile, indicating that the polysaccharide (EPS) has a significant influence in the electrochemistry behavior of the polypyrrole film. The FTIR results, for both polypyrrole films, were awfully similar. In the spectra is observed a band more pronounced in 1619 cm-1, characteristic of the angular vibration N-H, in 1373 cm-1 presents a band characteristic of the C-N stretching from the anime, and the band between 3200 to 3500 cm-1 is characteristic of the OH. For the film of PPy/EPS two bands, an in 1384 cm-1 and another one in 1163 cm-1, characteristic of C-O from the phenol group, were attributed the incorporation of the polysaccharide to the polymeric matrix. Furthermore to the oxi-reduction process in the polymer films was observed the electrochromic effect, by the promotion of a change in the coloring of the film from the blue dark (oxided) to yellow (reduced). This color change was accompanied by the transmittance variation. The results presented change of approximately 30% in transmittance value. Moreover, an analysis of the transmittance as a function of time, shows that not all the current densities involved in the redox process, was utilized for the color change in the polymeric film.