Electrosynthesis and Characterization of Polypyrrole/Cashew Gum Composite Grown on Gold Surface in Aqueous Medium

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One of the current trends in the design of electronic materials is the use of agro-based, renewable materials with a minimum amount of toxic substances present. Consistent with this trend, we investigated the electrosynthesis and the electrochemical, morphological, and topographical characteristics of a novel conducting polypyrrole/cashew gum (PPy/CG) composite. The composite films were grown on gold surface by cyclic voltammetry and chronoamperometry in an aqueous medium. They were characterized using FTIR-ATR, SEM, AFM and cyclic voltammetry. The composites gave evidence of the incorporation of CG in PPy film, which had a granular and nodular morphology with grain size ranging from 0.7 to 2.0 μm . Moreover, the films produced by cyclic voltammetry and chronoamperometry carried an anodic load of 3.83 and 4.34 mC cm^{-2} , respectively. The data also showed that the polypyrrole surface roughness was strongly affected by the CG concentration. This study demonstrated the feasibility of producing an alternative conductive biobased film through electrodeposition of PPy/CG and gave useful information about its structural and electrochemical properties.

Keywords: composite; polypyrrole; cashew Gum; electrodeposition; conductor.

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