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Electrochemical Synthesis and Characterization of PANI/Graphene-foam Composite Films

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Intrinsically Conducting Polymers (ICPs) hold promise for future electronics due to their low cost, light weight and easy processability. Among them, Polyaniline (PANI) is the most widely studied because it is environmentally stable and possesses interesting redox properties which gives it a high level of tunability in electronic structure. However, since PANI can exist in a multiplicity of oxidation/protonation states, it is still a challenge to prepare it in a specific predetermined state with reasonable precision. Voltammetric scanning provides a clean and facile way of electrodepositing PANI films while monitoring, in real time, their oxidation/protonation state. Further, the method is suitable for producing thin films that are not only homogeneous and well-adherent but also with controllable thicknesses. This technique has not been fully exploited to incorporate hybrid nano-fillers such as graphene into the PANI matrix to afford functional materials with high dielectric constant, as required for electronic devices. This study reports, for the first time, the synthesis of composite films of PANI and graphene-foam using cyclic voltammetry. The results of UV-Vis, X-ray Diffraction and Raman Spectroscopy are presented herein.

Apply to be considered for a student ; award (Yes / No)?

Yes

Level for award;(Hons, MSc, PhD, N/A)?

PhD

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