

Gold Nanoparticles Decorated Graphene using Electrochemically Active Biofilm and their Enhanced Electrochemical Studies

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A simplistic and environment friendly approach using electrochemically active biofilm (EAB) has been successfully developed for the synthesis of an Au@Graphene (Au@G) nanocomposite. The as-prepared nanocomposite was analyzed and characterized by X-ray diffractometer, Diffuse reflectance spectroscopy, Raman spectroscopy, X-ray photoelectron spectroscopy, Photoluminescence spectroscopy, Scanning electron microscopy and Transmission electron microscopy. In this work the anchoring of gold nanoparticles on graphene sheet was achieved which prevents the aggregation of graphene sheets and keep them apart because of decrease in the attractive forces between the graphene layers. The electrochemical performance of Au@G nanocomposite was evaluated by electrochemical impedance spectroscopy and linear scan voltammetry. The results confirmed that the Au@G nanocomposite exhibited much better electrochemical performance than the pure graphene owing to the anchoring of gold nanoparticles that holds great promise for developing electrochemical devices.