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CVD REDUCED GRAPHENE OXIDE: ELECTROCHEMICAL PLATFORM FOR ANALYTE SPECIFIC DETECTION

This study presents the characterization of ethanol-assisted chemical vapor deposition (CVD) reduced graphene oxide and its application as a platform for electrochemical sensors. Using CVD, graphene oxide thin films were reduced on quartz substrates by varying the temperature and reduction time with ethanol to improve the electrical conductivity and electron exchange capacity of the material. The structural, morphological and electrochemical properties of the resulting films were characterized using techniques such as scanning electron microscopy, Raman spectroscopy and four-point spectroscopy. The results indicate an effective reduction of graphene oxide with a significant improvement in electrochemical activity. The platform was developed for the immobilization of bacteria (E. coli O157:H7), glucose and even the binding of antibodies to recognize antigens (P53 Elisa Kit - MBS355295). The platform demonstrated high sensitivity and selectivity for the detection of these specific analytes when coupled to a TFT that acts as a transducer and allows us to analyze the analyte concentration on the platform by observing changes in the TFT output currents, making the platform a promising alternative for applications in biosensors and biological detection devices. This work highlights the potential of CVD-reduced graphene oxide as a versatile and effective platform for a wide range of electrochemical sensing applications.

Keywords

CVD, graphene, oxide, platform, electrochemical

Reference

N. Alzate-Carvajal y A. Luican-Mayer, «Functionalized Graphene Surfaces for Selective Gas Sensing», ACS Omega, vol. 5, n.o 34, pp. 21320-21329, sep. 2020, doi: 10.1021/acsomega.0c02861.

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