Ultrasensitive Quantification of Ellagic Acid using Gr/Bi₂O₃/GCE as Voltammetric Sensor

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A simple and sensitive voltammetric sensor Gr/Bi₂O₃/GCE is being reported for the quantification of Ellagic acid (EA). The developed sensor was characterized by Scanning Electron Microscopy-Energy Dispersive X-Ray (SEM-EDX), Electrochemical Impedance (EI), Fourier Transformed Infrared (FTIR) and X-Ray Diffraction (XRD). The Electrochemical measurements were performed using square wave and cyclic voltammetry. The fabricated sensor exhibits an excellent catalytic response towards the oxidation of EA with a well-defined oxidation peak at 0.6 V in Britton Robinson buffer at pH 3.0. Variation in the peak response through solution variables viz. pH and amount of analyte has also been studied. The fabricated sensor depicted an excellent linear calibration curve for EA with sensitivity of 0.07 nM. The fabricated sensor is proficient to quantify EA effectively without any interference. The analytical application of the sensor has been authenticated by quantifying the EA in real samples.

Keywords: Ellagic acid; Glassy Carbon Electrode; Electrochemical Impedance Spectroscopy

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