Electrochemical Sensor for Hydroquinone based on Poly Eugenol/PVA-Modified Graphite Electrode

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The electrochemical sensor based on polyeugenol/polyvinyl alcohol-modified graphite electrode, i.e., GEPVAEu, was prepared for the determine the hydroquinone (HQ). The electrode was modified through an electropolymerization process. The modified electrode showed excellent performance for the HQ sensor in phosphate buffer solution (PBS) of pH 7.0 by the cyclic voltammetry method. The impact of scan rates confirms that the redox electrochemical behavior of HQ was a diffusion-controlled electrochemical process on the GEPVAEu electrode. The cyclic voltammetry results informed that GEPVAEu had excessive electrocatalytic activity towards HQ oxidation if compared to the unmodified graphite electrode. The GEPVAEu electrode was able to determine the HQ concentration across two linear response stages from 3.67-103.27 and 140.90 - 482.11 μM with the sensitivities of 4.13 and 1.02 $\mu\text{A } \mu\text{M}^{-1}$, respectively. The LOD and LOQ values were 2.27 μM and 6.87 μM , respectively, which were remarkable. Therefore, the GEPVAEu electrode has the potential to be used as an electrochemical sensor for the HQ.

Keywords: Hydroquinone, Electropolymerization, Poly Eugenol, PVA, Graphite

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