

Preparation Of Polycurcumin By Electropolymerisation On Graphite Electrodes And Its Application As A Simultaneous Electrochemical Sensor Of Heavy Metals

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ABSTRACT

The graphite electrode was changed by applying cyclic voltammetry to electropolymerized curcumin. The polycurcumin-graphite modified electrode (GECU) was then used for the determination of Cd^{2+} and Pb^{2+} individually and simultaneously. The performance of this modification has shown excellent electrocatalytic activity toward Cd^{2+} and Pb^{2+} than bare graphite electrodes. Additionally, the impact of the scan rates shows that the electrochemical process controlling the redox behavior of Cd^{2+} and Pb^{2+} on GECU is a diffusion-controlled electrochemical process. Under experimental, at the linear regression equation of $I_p = 89.78C + 635.96$ (A, $R^2 = 0.9932$), the oxidation peak current (I_p) increases linearly with the concentration (C) of Cd^{2+} ranging from 0.43 - 11.08 ppm under experimental conditions. On the other hand, the oxidation peak current of $I_p = 27.18C + 1185.00$ (mA, $R^2 = 0.9923$). The LOD and LOQ were measured at lower concentrations of Cd^{2+} , 0.76 ppm, and 2.51 ppm, respectively. On the other hand, a simultaneous analysis gives the result of the LOD and LOQ 0.86 ppm, and 2.84 ppm. The reproducibility was 1.44% for Pb^{2+} and 1.01% for Cd^{2+} . The electrode application was carried out for measuring Cd^{2+} metal ions in laboratory waste, the results obtained show a recovery of 101.03% And 99.80% for Pb^{2+} .

Kata Kunci: Cd^{2+} - Pb^{2+} , curcumin, electropolymerization, voltammetry