A Highly Selective and Sensitive Detection of Ellagic Acid by Using Ethylenediamine Ligand Based Cobalt (II) Complex Modified Glassy Carbon Electrode

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We have successfully prepared simple and sensitive ethylenediamine ligand based cobalt (II) inorganic complex ($[\text{Co}(\text{en})_3]^{2+}$) (en = ethylenediamine) modified glassy carbon electrode (GCE) and used for the electro chemical detection of Ellagic acid (EA). The prepared inorganic complex was characterized by the suitable physical and chemical characterization technique. Moreover, the modified electrode performance was monitored by the cyclic voltammetric (CV) and amperometric technique (*it*). Besides, the GCE/ $[\text{Co}(\text{en})_3]^{2+}$ electrode has remarkably enhance the electrocatalytic activity towards the detection of EA. Using the optimized condition, the sensor exhibited the linear detection response range (0.1 μM -929 μM) with the limit detection (0.035 nM) and the sensitivity is (0.06709 $\mu\text{A } \mu\text{M}^{-1} \text{cm}^{-2}$). Furthermore, the fabricated electrode is an exhibited the acceptable repeatability, reproducibility and stability. On the other hand, the GCE/ $[\text{Co}(\text{en})_3]^{2+}$ modified electrodes have been applied for the real sample analysis, which exhibit the acceptable recovery. The practical application of the modified electrode was successfully applied for the determination of EA from the real samples with good recovery.

Keywords: Ellagic acid, Electrochemical sensor, Cobalt complex, Real sample analysis, Limit of detection.

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