Electrochemical Determination of Tyrosine in Human Serum Based on Glycine Polymer and Multi-walled Carbon Nanotubes Modified Carbon Paste Electrode

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A modified carbon paste electrode (CPE) for the sensitive detection of tyrosine (Tyr) in human serum has been fabricated by glycine polymer (Poly(Gly)) and multi-walled carbon nanotubes (MWCNTs). Poly(Gly) was prepared by in situ electrochemical polymeric deposition. The operational parameters of electrochemical polymeric deposition such as concentration of Gly solution and CV scan cycles which affected the analytical performance of the modified electrode were optimized. Compared to the bare CPE and MWCNTs modified CPE, Poly(Gly)/MWCNTs/CPE exhibited excellent electrooxidation towards Tyr. Under the optimized conditions, the value of the linear sweep voltammetry (LSV) oxidation peak current was linearly related with 0.2~400 μM Tyr, with the detection limit of 0.07 μM (S/N=3). Furthermore, Poly(Gly)/MWCNTs/CPE was applied to the determination of Tyr in diluted serum samples.

Keywords: Tyrosine; Glycine polymer; Multi-walled carbon nanotubes; Electrochemical polymeric deposition; Carbon paste electrode.

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