AMPEROMETRIC DETERMINATION OF CYSTEINE USING Au/PEDOT/ERGO/PB MODIFIED ELECTRODE

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Abstract. This study aimed to develop and validate an amperometric method for determining cysteine, an amino acid with significant clinical implications when elevated in plasma, using a poly(3,4-ethylenedioxythiophene)/reduced graphene oxide/prussian blue (PEDOT/ERGO/PB) modified Au electrode. Elevated cysteine levels can cause various disorders by disrupting intracellular metabolism. Advances in technology allow ions or molecules trapped within polymers to enhance electrode surfaces, making them effective in the voltammetric method. Cyclic voltammetry with the modified electrode showed an anodic peak at 807 mV in a 0.1 M phosphate-buffered saline (pH 7.0). The method demonstrated linearity within 10-500 μM ($R^2 = 0.9964$) and a limit of quantification of 8 μM. This biosensor-based approach is well-suited for analysing cysteine.

Keywords: cyclic voltammetry, cysteine, modified electrode.