Development of an Electrochemical Approach for Proline Content Detection in Winter Wheat

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A novel glassy carbon electrode (GCE) modified with polymerized film of acid chrome blue K (ACBK) was successfully synthesized by electropolymerization. The electrochemically synthesized poly-ACBK film was characterized by attenuated total reflection (ATR)-FTIR, voltammetric methods and electrochemical impedance spectroscopy (EIS) as well. The as-prepared poly-ACBK/GCE displayed excellent electrocatalytic activity towards the oxidations of proline in comparison with bare GCE. The effect of various experimental parameters such as electrolyte and thickness of poly-ACBK on the oxidation performance of proline on poly-ACBK/GCE electrode was studied. The proposed sensor exhibited linear response in the proline concentration ranging from 1 to 1500 μM with the detection limit of 0.25 μM . In addition, the proposed proline sensor exhibited outstanding performance in the determination of proline in winter wheat samples as well owing to its remarkable stability and repeatability.

Keywords: Proline; Electrochemical sensor; Poly-ACBK; Winter wheat; Determination

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