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Electrochemical Preparation and Sensor Properties of Conducting Polyaniline Films

of

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Abstract: A polyaniline-glucose oxidase electrode was prepared by the electrochemical polymerization of aniline on a Pt electrode that was already pre-adsorbed by the enzyme (glucose oxidase) at a potential of 1 V vs. Ag/AgCl. Then, the amperometric responses of the enzyme electrode to the electroactive hydrogen peroxide formed by the enzyme-catalyzed reaction of the substrate (glucose) with oxygen were measured at a potential of 0.7 V in PBS solution. The effects of electrochemical polymerization (i.e., concentrations of monomer and electrolyte, film thickness) and amperometric measurement parameters (i.e. pH, temperature) on the amperometric response characteristics to glucose of the resultant enzyme electrode were systematically investigated and all these parameters were optimized. The prepared polymeric sensor exhibited a fast steady-state amperometric response time (4-5 s), a linear amperometric response up to 6 mM glucose through with poor stability. Also, it was found that the sensor responded successfully to glucose injections in the presence of some interfering substances such as ascorbic acid, oxalic acid, lactose, sucrose and urea.

Key Words: Polyaniline, enzyme electrode, amperometric biosensor.

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