Highly Sensitive Nonenzymatic Glucose Sensor Based on Reduced Graphene Oxide/Ultrasmall Pt Nanowire Nanocomposites

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An amperometric nonenzymatic biosensor for sensitive and selective detection of glucose has been developed by using reduced graphene oxide/ultrasmall platinum nanowire nanocomposites (rGO-PtNW) as electrode material. rGO-PtNW displays good electrocatalytic activity towards the oxidation of glucose in alkaline solution. The fabricated biosensor shows good analytical performance including low detection limit (4.6 $\mu\text{mol/L}$), wide linear range (0.032-1.89 mmol/L), high sensitivity (56.11 $\mu\text{A}\cdot(\text{mmol/L})^{-1}\cdot\text{cm}^{-2}$), and good anti-interfering ability towards species (uric acid and ascorbic acid) coexisting with glucose in human blood at the work potential of 0 V. It indicated that rGO-PtNW nanocomposite can serve as a promising candidate material for high-performance glucose nonenzymatic biosensors.

Keywords: glucose; biosensor; nonenzymatic sensor; reduced graphene oxide; Pt nanowire

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