Fabrication of NiOOH/Ni(OH)₂@C Electrode for Detecting Blood Glucose by Composited Plating Method

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A sensor of NiOOH/Ni(OH)₂@C electrode was fabricated by the following process: metallic Ni and carbon powder was simultaneously electroplated onto Ni wire by the composite plating method with the help of cationic surfactant, then followed by electrochemically oxidation of Ni to Ni(OH)₂ in alkali medium. SEM and XRD characterization results showed that shell-core structure of Ni@C could be formed by simply control the ratio of Ni²⁺ and carbon powder. The high electrochemical activity and high specific surface area of the fabricated NiOOH/Ni(OH)₂@C electrode make it good performance in detecting glucose: sensitivity of 10.81 mAcm⁻²mM⁻¹, good linearity (R²=0.99995) in range of 5μM~10mM with detection limit of 10⁻⁶M. The specific structure of the electrode also made the sensor display good selectivity to glucose when uric acid and ascorbic acid co-existed in the simulated serum sample.

Keywords: blood glucose, sensor, non-enzyme, NiOOH/Ni(OH)₂, composited plating

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