Non-enzymatic electrochemical glucose sensor based on palladium nanoparticles-graphene oxide (PdNPs-GO) modified electrode

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Abstract: A non-enzymatic electrochemical sensor using a glassy carbon electrode (GCE) modified with palladium nanoparticles-graphene oxide (PdNPs-GO/GCE) was developed for the determination of glucose by flow injection amperometry (FI-Amp). PdNPs were synthesized on GO by electroless deposition. The electrochemical behavior of glucose on PdNPs-GO/GCE was characterized by cyclic voltammetry. The FI-Amp was optimized for its applied potential, sample volume and flow rate. Under the optimal conditions, the current response when glucose standard was injected provided a detection limit of 0.03 mM (LOD = 3σ/S), a limit of quantitation of 0.10 mM (LOQ = 10σ/S) and linearity in the range of 0.05 to 10 mM. This sensor had excellent repeatability (%RSD = 1.9–5.0%). It is possible to apply this sensor to detect glucose in biological fluid samples.

Keywords: Non-enzymatic; Glucose; PdNPs-GO; Flow injection amperometry