Green Photocatalytic Synthesis of Au Nanoparticles/Multi-walled Carbon Nanotubes Nanocomposites and their Application for Glucose Sensing

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Abstract

In this communication, we report on a novel green photocatalytic route to synthesize Au nanoparticles/multi-walled carbon nanotubes (AuNPs/MWCNTs) nanocomposites with the use of Sn-porphyrin (SnP) as a high-efficiency photocatalyst to reduce Au3+ to form AuNPs onto MWCNTs. Such AuNPs/MWCNTs nanocomposites exhibit good catalytic performance toward both oxidation and reduction of H2O2. An electrochemical glucose biosensor was further constructed by dropping glucose oxidase on the surface of AuNPs/MWCNTs nanocomposites modified glassy carbon electrode. The biosensor shows linear response toward different concentrations of glucose from 1 to 33 mM (r = 0.998) and the detection limit at 0.5 V is estimated to be 240 mu M at a signal-to-noise ratio of 3.

Keywords

Author Keywords: Au nanoparticles; multi-walled carbon nanotubes; photocatalyst; glucose; biosensor

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