

Nanochemistry and biotechnology

Green synthesis of silver nanoparticles from walnut for biotechnological applications

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In recent years, metal nanoparticles have been gained much attention due to their wide application areas [1-3]. There are various synthesis methods as chemically, physically and biologically for metal nanoparticles [2]. Among the various metal nanoparticles, silver nanoparticles (AgNPs) have novel properties such as physico-chemical properties, including a high electrical and thermal conductivity, antibacterial properties, chemical stability, and catalytic activity [3].

From the point of this view, as the basic step of this research, a green, simple and low cost synthesis method of AgNPs from walnut was formed. Synthesized AgNPs were characterized by Scanning Electron Microscope and the formation of nanostructures was confirmed by UV-Vis spectroscopy. Carbon surfaces were modified with AgNPs before glucose oxidase immobilization in order to investigate the electrochemical catalytic activity of nanostructures towards glucose oxidation. The data were compared with the surface which was not modified with AgNPs. All surfaces were characterized by Scanning Electron and Atomic Force Microscopes.

The electrochemical results performed with AgNPs-modified carbon electrode showed that system had excellent selectivity towards glucose and demonstrated good operational-stability.

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2. Narayanan K.B., Sakthivel N. *Biological synthesis of metal nanoparticles by microbes* // Adv Colloid Interfac-2010.-**156**.- P.1-13.

3. Tran H.Q., Nguyen Q.V., Le A.-T. *Silver nanoparticles: synthesis, properties, toxicology, applications and perspectives* // Adv Nat Sci: Nanosci Nanotechnol-2013.-4.- P.1-20.