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Electro-oxidation of amino acids in *Parkia speciosa* using a novel Ag₂O/CNT/ND-based electro-chemical biosensor

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The increasing awareness of the importance of a healthy diet has led to the development of new, safe and healthy foods. Natural food-derived peptides with specific bioactivity have attracted a considerable interest among researchers. *Parkia speciosa* (stink bean), a southeast Asian legume, is composed of chemically-medicinal compounds which exhibit biological activities. It is reported to be anticancer, antibacterial, antioxidant, antiangiogenic and demonstrates hemagglutinating activity. The compositional analysis of amino acids in *Parkia speciosa* seeds have been reported through hydrolysis using alcalase enzyme. The cyclic voltammetry (CV) technique using biosensors has been well established with broad applications in quantitative and qualitative analyses. Our novel electro-chemical biosensor Ag₂O/CNT/ND comprises silver-oxide, nano-diamond (ND) and carbon nanotube (CNT), fabricated on glassy carbon electrodes. The Ag₂O/CNT/ND-based biosensor exhibited irreversible oxidation and reduction peaks at 0.85 V and -0.95 V in a phosphate buffer carrier (0.01 M, pH 6.8), respectively. At higher scan rates, the CVs were slightly shifted to the more negative potentials with a maximum peak at about -1.3 V. This suggested the formation of H₂O₂/H₂S which was also confirmed by a reduction in pH value from 6.8 to 6.55. It was observed that the anodic and cathodic peak currents increased linearly with the square root of the scan rate ($v^{1/2}$) over the studied scan range of 0.01 – 0.1 V/s indicating a diffusion-controlled irreversible electro-chemical process. The developed biosensor displayed a very good electro-catalytic activity towards the oxidation of H₂O₂ and the release of H₂S as a result of the reaction between the active sites and the *Parkia speciosa* ingredient.

Biography

Soraya Hosseini has completed her PhD from Universiti Kebangsaan Malaysia and Post-doctoral studies from Universiti Putra Malaysia. She has published more than 45 papers in reputed journals. Her primary area of research has focused on fabrication anhydrous membrane in fuel cell application. She is working on several fields especially Environment. Her specific interest is research on advanced materials and electrochemical reaction. She is interested to work on biomedical field and fabrication biosensors for various disease and tissue engineering. Currently, she is working on biosensors and investigating their performance via electrochemical reaction and impedance spectroscopy.

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