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Amino acid biosensor based on L-amino acid oxidase immobilized onto Ag2O/CNT/ND/ Sago in *Parkia speciosa* juice

Soraya Hosseini[1], Salman Masoudi Soltani[2], Asefe Mousavi Moghadam[1], Alireza Abbaspourrad[3] and **Farahnaz Eghbali Babadi[1]**

[1]University of Malaya, Malaysia

[2]Imperial College London, UK

[3]Cornell University, USA

Natural food-derived peptides have attracted a great deal of interest among researchers due to the importance of a healthy diet. *Parkia speciosa* (stink bean), a Southeast Asian legume, is composed of medicinal chemicals which exhibit biological activities. *Parkia speciosa* has been reported to be anticancer, antibacterial, antioxidant, antiangiogenic and demonstrates hem-agglutinating activity. The compositional analysis of amino acids in *Parkia speciosa* seeds have been reported through hydrolysis using alcalase enzyme. Cyclic voltammetry (CV) using biosensor is a well-established technique with broad applications in nutrition analyses. A novel electrochemical Ag2O/CNT/ND biosensor, comprising silver-oxide, nano-diamond (ND) and carbon nanotube (CNT), has been fabricated on a copper sheet and used as the working electrode. In order to increase the stability of the biosensor, Sago, a natural biopolymer, was added to the composite. The Ag2O/CNT/ND and Ag2O/CNT/ND/Sago biosensors exhibited irreversible reaction free oxidation with reduction peaks at -1.25 and -1.16 V in 10 mM buffer phosphate solution/*Parkia speciosa* (pH 6.8), respectively. Amino acid biosensor was fabricated after the immobilization of L-amino acid oxidase on the Ag2O/CNT/ND/Sago electrode to estimate the level of amino acids in *Parkia speciosa* juice. The analysis of results suggested that the irreversible electro-chemical process was simultaneously adsorption and diffusion-controlled. The developed biosensor displayed a very good electro-catalytic activity toward the oxidation of amino acid to release H2O2 and NH3 as a result of the reaction between the active sites and the *Parkia speciosa* ingredient. This was also confirmed by a drop in the pH value from 6.8 to 6.55 and a change in the color of the solution from green to yellow. An increase in the charge transfer resistance at potentials higher than -1 V could be also explained by the co-formation of hydrogen peroxide (H2O2) and water on the electrode surface.

Biography

Soraya Hosseini has done her PhD in Chemical Engineering from University Kembangan Malaysia in 2010. It was then followed by a series of Post-doctoral positions at University Putra Malaysia from 2010 to 2016. Her PhD and the subsequent Post-doctoral research have led to about 45 research papers published in high-profile scientific journals in the field. She has been actively involved in environmental research and catalyst fabrication; however, her main research interest falls in the area of the fabrication of anhydrous membranes in fuel cell application. She has also been developing a growing interest in the area of advanced materials and electrochemical reactions. She has also conducted in-depth research on the fabrication of biosensors, employed in a range of food and energy. Her current research is concentrated around the fabrication of biosensors and probing into their performance by means of electrochemical reaction and impedance spectroscopy..

soraya20h@gmail.com

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