

**ADVANCED MATERIALS 2020: Fabrication of SnO<sub>2</sub> multiporous-Au nanoparticle-modified electrode for an amperometric biosensor - A.K.M. Kafi, Faculty of Industrial Sciences & Technology, Universiti Malaysia Pahang, Kuantan 26300, Malaysia**

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### Abstract

A novel amperometric H<sub>2</sub>O<sub>2</sub> biosensor based on immobilization of Hemoglobin with MPNFs of SnO<sub>2</sub> and Au nanoparticle (Au NP) onto glassy carbon electrode with chitosan have been proposed in this work. Multiporous nanofibers of SnO<sub>2</sub> were synthesized by electrospinning method from the tin precursor by controlling the concentration. Hb was then co-immobilized with the SnO<sub>2</sub> and Au NP nanofibers on the surface of glassy carbon electrode by using chitosan. The MPNFs of SnO<sub>2</sub> play a significant role in facilitating the electron exchange between the electroactive center of catalase and the electrode surface. Cyclic Voltammetry and amperometry were used to study and optimize the performance of the fabricated H<sub>2</sub>O<sub>2</sub> biosensor. The AuNP/SnO<sub>2</sub>-MPNFs/Hb/Ch/GCE biosensor displayed a linear amperometric response towards the H<sub>2</sub>O<sub>2</sub> concentration range from 1 to 120  $\mu$ M with a detection limit of 0.05  $\mu$ M (based on S/N=3). Furthermore, the biosensor reported in this work exhibited acceptable stability, reproducibility, and repeatability.

### Biography

A.K.M.Kafi has completed his PhD at the age of 29 years from Dong-A University and postdoctoral studies from The University of Tokyo and the university of Sydney. He has published more than 40 papers in reputed journals. She has extensive experience in the academic field which extends to more than 10 years. She is currently a Lecturer at Azad University. She earned her Ph.D. degree in Nano-biotechnology from Tarbiat Modares University in 2018. Her master degree was in Enzyme Biotechnology from University Putra Malaysia. She published many peer-reviewed papers in Scopus indexed journals with impact factor as well as conference papers.

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