

Preparation and electrochemical characterization of ZnO based disposable urea biosensors

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Semiconductor based transducers play an important role in electrochemical sensing. Recently, zinc oxide (ZnO) nanostructures have drawn many attentions in the fabrication of biosensors with many advantages including nontoxicity, biological compatibility, fast electron transfer rates, high specific surface area, high catalytic efficiency and easy preparation. In this presentation, nanostructured zinc oxide thin films were prepared by different deposition methods such as sol-gel, RF magnetron sputtering, and electrochemical deposition on the F-doped SnO₂ conductive glass (FTO/ZnO-Nano). The effect of deposition technique on the growth and crystallization of ZnO, morphology, thickness and electrical conductivity of ZnO thin film transducer, enzyme immobilization, enzyme activity and stability, and biosensor response will be discussed. EIS technique as a powerful, non-destructive and informative diagnostic tool has become increasingly popular for sensing applications and is widely used for studying electrical and electrochemical interfacial properties of a large variety of systems. In these studies the electrochemical impedance spectroscopy (EIS) was applied as an assessment method. The fabricated biosensors showed remarkable stability and reproducibility for urea sensing with high sensitivity, low detection limit, broad dynamic range, fast response time and better calibration curve.

Biography

Sayed Ahmad Mozaffari received his PhD in Chemistry under supervision of Professor Reza Karimi Shervedani from University of Isfahan in 2006. Then he undertook Post-doctoral studies at Pohang University of Science and Technology (POSTECH) in South Korea under supervision of Professor Su-Moon Park (2008–2009). His main areas of interests include electroanalytical chemistry, thin layers and nanotechnology, sensors and biosensors, electrochemistry of solar cells and fuel cells, electrochemical impedance spectroscopy (EIS) and Fourier transform EIS.

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