Electrochemical Study of Nitrobenzene Reduction Using Potentiostatic Preparation of *nephrolepis* Leaf Like Silver Microstructure

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Nephrolepis leaf-like silver microstructures (NLLS-Ag) were prepared through a single step potentiostatic electrodeposition strategy and employed for the electrochemical reduction of nitrobenzene (NB). First, the NLLS-Ag microstructures were prepared on glassy carbon electrode (GCE) from aqueous solution of silver nitrate. The prepared NLLS-Ag microstructures were characterized by scanning electron microscopy, Energy-dispersive X-ray spectroscopy studies, X-ray diffraction and electrochemical methods. At NLLS-Ag/GCE, well-defined reduction peak corresponding to the reduction of NB was observed at lower overpotential with highly enhanced peak currents. The influences of different scan rates and different pH were investigated. An amperometric sensor is fabricated which exhibited excellent electroanalytical parameters towards NB, such as wide linear range of 0.05 – 38.8 μM and low detection limit of 0.01 μM . Moreover, the sensor exhibits good repeatability, reproducibility and stability. Besides, Practical applicability has been addressed in biological sample which presents appreciable recovery results.

Keywords: Metal Nanoparticles, Nanotechnology, Nitrobenzene, Electrochemical sensor, Electrocatalysis, Modified electrode

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