Highly Effective Detection of 4-Nitrophenol by Tremella-like Indium Silver Sulfide Modified GCE

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doi: 10.20964/2018.07.28

Received: 30 March 2018 / Accepted: 9 May 2018 / Published: 5 June 2018

A highly sensitive electrochemical sensor for 4-nitrophenol was established based on a tremella-like indium silver sulfide modified glassy carbon electrode (TLISS/GCE). Indium silver sulfide was facilely synthesized by co-precipitation. The morphology and phase of TLISS was investigated by scanning electron microscopy and X-ray diffraction. An electrochemical study was conducted by an electrochemical impedance spectroscopic technique, cyclic voltammetry and differential pulse voltammetry. The as-prepared sensor detected 4-nitrophenol with high accuracy, satisfactory reproducibility and good stability in wide range of 4-nitrophenol concentrations, and the determination limit (3S/m) was as low as 1.09 μM . In addition, tap and river waters were used to evaluate the practical application of the newly developed TLISS/GCE sensor, and high performance was also obtained. To the best of our knowledge, this is the first report regarding the 4-nitrophenol detection performance of indium silver sulfide. The method reported here is helpful for developing more highly effective 4-nitrophenol detection methods.

Keywords: Sensors; Indium silver sulfide; Modified GCE; 4-Nitrophenol

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