Short Communication

A Selective Electrochemical Sensor based on TiO₂/reduced graphene for Efficient Determination of Methanol

*Na Dong[1], Bing Gao[2] Shuai Chen[3]**

[1] Inner Mongolia Electronic Information Vocational Technical College, Huhhot, 010028, China
[2]School of Civil Engineering, Jilin Jianzhu University, Changchun, 130118, China
[3] Department of Electronic Information Engineering, Huaiyin Institute of Technology, Huaian, 223003,China
*E-mail: chen4307@hyit.edu.cn

Titanium dioxide (TiO₂) nanoparticles-reduced graphene oxide (rGO) nanocomposite modified glassy carbon electrode (GCE) were produced by drop casting and electrochemical reduction for the sensitive determination of methanol. The as-prepared TiO₂-rGO composite was characterized by X-ray diffraction and scanning electron microscopy. The electro-catalytic performance of electrochemical methanol sensor was evaluated by amperometry and cyclic voltammetry techniques in alkaline media. The electrochemical results indicated that the TiO₂-rGO/GCEs enhanced the electrochemical active surface area for the prepared electrode and significantly improved the electrochemical responses to methanol. This electrochemical methanol sensor revealed excellent stability and reproducibility with 0.7 µM limit of detection and sensitivity of 0.026 µA/µMcm² which showed that TiO₂-rGO/GCE electrode had an excellent electro-oxidation to the methanol solution.

FULL TEXT