

Short Communication

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

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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.

Keywords: Titanium dioxide nanoparticles; reduced graphene oxide; Methanol detection; Amperometry technique; cyclic voltammetry

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