Vertically Aligned Manganese-doped ZnO Nanorods Synthesized on Glassy Carbon Electrode for Detection of Colorants in Soft Drinks

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Synthetic dyes in foods are chemical added to soft drinks and foods during processing or manufacturing. It is very important to monitor artificial colorants in foods due to their potential harm to humans. Herein, sensitive and novel electrochemical sensor based on manganese-doped ZnO (MZO) nanorods was prepared by one step electrochemical method on glassy carbon electrode (GCE) to determine a synthetic food colorant. Differential pulse voltammetry and cyclic voltammetry were applied to study the electrochemical performance of sunset yellow. As-prepared MZO/GCE was directly used as electrochemical sensor for amperometric determination of sunset yellow, which indicated a high sensitivity of 7.75 $\mu\text{A}/\mu\text{M}$ and a low detection limit of 5.2 nM. This proposed technique exhibited good stability, outstanding selectivity, and satisfactory reproducibility and repeatability, and also had been applied to simultaneously detect sunset yellow in soft drinks with suitable results.

Keywords: Artificial colorants; Soft drinks; Differential pulse voltammetry; Manganese-doped ZnO nanorods; Sunset yellow; Electrochemical sensor

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