Electrochemical Determination of Sulfonamide Based on Glassy Carbon Electrode Modified by Fe₃O₄/Functionalized Graphene

Baoshan He*, Sasa Yan

School of Food Science and Technology, Henan University of Technology, Zhengzhou 450001, People's Republic of China

*E-mail: hebaoshan@126.com

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A novel strategy for the sensitive determination of sulfonamide using glassy carbon electrode(GCE) modified by Fe₃O₄/functionalized Graphene (Gr/Fe₃O₄) was successfully developed in this work. The fabricated Gr/Fe₃O₄/GCE sensor demonstrated remarkable merits such as higher electrocatalytic activity, higher sensitivity and lower detection limit. Under optimized conditions, the modified electrode achieved a linear range of $5 \times 10^{-7} \sim 1.1 \times 10^{-4}$ mol/L with a detection limit of 5.0×10^{-8} mol/L. The calibration curve could be expressed by the equation $i_{pa}(10^{-6}A) = 1.356 \times 10^{-4} c (10^{-5} \text{ mol/L}) + 0.898$ with a linear coefficient of 0.994. The recovery rate was in the range of 88.5% ~ 104.0%, indicating the enormous potential and prospects of this method.

Keywords: Electrochemical Determination; Sulfonamide; Graphene; Fe₃O₄; Glassy carbon electrode

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