An amplified sensor based on improved carbon paste electrode with 1,3-Dipropylimidazolium Bromide and MgO/SWCNTs Nanocomposite for tramadol determination

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The electrochemical behavior of tramadol at carbon paste electrode amplified with the 1,3-dipropylimidazolium bromide and MgO/SWCNTs nanocomposite (1,3-DI-Br/MgO/SWCNTs/CPE) has been studied in aqueous solutions. The oxidation of tramadol at the pH range of 6.0-9.0 has been investigated. At the optimum condition of pH 8.0, the tramadol shows an irreversible signal at 0.81 V. The scan rate investigation confirms a diffusion process for the electro-oxidation of tramadol at a surface of 1,3-DI-Br/MgO/SWCNTs/CPE. Square wave voltammetric investigation shows a linear relation between the tramadol current and concentration within the range of 0.05-280 μ M with a detection limit of 8.0 nM. The 1,3-DI-Br/MgO/SWCNTs/CPE has been applied to analyze the tramadol in injection and urine samples.

Keywords: Tramadol, MgO/SWCNTs nanocomposite, 1,3-dipropylimidazolium bromide, Electrochemical sensor

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