Detection of Chloridazon in Aqueous Matrices Using a Nano-Sized Chloridazon-Imprinted Polymer-Based Voltammetric Sensor

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This study attempts to present the validation and of an efficient and development reliable detection technique for determining chloridazon in surface, ground, and drinking water. This method is essentially based on Differential pulse voltammetric (DPV) determination of chloridazon (CLZ) at a nano molecularly imprinted polymer (MIP) modified carbon paste electrode. Due to the weak electroactivity of the organochlorine herbicide, developing the voltammetric methods for electrochemical assay of CLZ gives rise to problems. Herein, utilizing a simple precipitation polymerization technique, CLZ-imprinted nanopolymer was polymerized. The resultant polymer, accompanied by MWCNT, was consequently utilized for producing the modified carbon paste electrode that indicated a straightforward cathodic peak for CLZ at almost -0.6 V (vs. Ag/AgCl); however, at the same circumstances the associated blank electrode showed substantially lower signal. Using MWCNTs, the remarkably efficient MIP, (caused an increase in the charge transfer at the electrode surface) introduced the method as a selective and greatly sensitive tool for CLZ measurement. In favorable investigational circumstances, the provided sensor, showed the detection limit of 6.2×10^{-8} mol L⁻¹ and linear response range of 5.0×10^{-7} - 4.0×10^{-4} mol L⁻¹. Here, the first MIP voltammetric sensor for CLZ, ever reported, is shown. It seems that this method provides an operative way for fast screening of CLZ in water specimens.

Keywords: Chloridazon, Voltammetric sensor, Carbon paste electrode, Molecularly imprinted polymer

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