Determination of Hydrazine in Various Water Samples by Square Wave Voltammetry with Zinc-Layered Hydroxide-3(4-methoxyphenyl) Propionate Nanocomposite Modified Glassy Carbon Electrode

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The application of zinc-layered hydroxide-3(4-methoxyphenyl) propionate (ZLH-MPP) nanocomposite as a suitable mediator in a voltammetric sensor for the determination of hydrazine by square wave voltammetry (SWV) were evaluated. The ZLH-MPP modified glassy carbon electrode exhibited a good sensitivity in 0.7 M Na₂SO₄, pH 10.0 and using square wave parameter of 120 Hz frequency, 25 mV pulse size and 3 mV step size. The SWV response showed a linear dependence of the peak current to the concentration in the range of 1.0×10^{-6} – 1.0×10^{-4} M hydrazine with limit of detection 6.7×10^{-7} M and correlation coefficient of 0.9966. The presence of 200 fold of metal ions and 500 fold organic substances in excess to the concentration of hydrazine did not interfere. Electrochemical impedance spectroscopy showed that the charge transfer at the electrode-solution interface was favourable. The proposed electrode was applied for the recovery of the real samples studies by using standard addition method.

Keywords: glassy carbon electrode, hydrazine, hydroxide-3(4-methoxyphenyl) propionate, square wave voltammetry

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