Electrocatalytic Determination of L-cysteine in the Presence of Tryptophan Using Carbon Paste Electrode Modified with MgO Nanoparticles and Acetylferrocene

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The electrical conductivity effect of MgO nanoparticle (MgO-NPs) and electro-catalytic effect of acetylferrocene (AF) was studied for modification of carbon paste electrode (CPE) as a highly sensitive electrochemical sensor for electro-catalytic determination of L-cysteine in the aqueous solution. The AF/MgO-NPs/CPE showed good electro-catalytic activity for analysis of L-cysteine in the concentration range 0.1-700.0 μ M with limit of detection 30.0 nM using differential pulse voltammetric method (DPV). In addition, the AF/MgO-NPs/CPE showed two separated oxidation signals with $\Delta E \sim 170$ mV in the solution containing L-cysteine and tryptophan that is sufficient for simulations determination of these amino acids with same oxidation potential at a surface of unmodified electrode.

Keywords: Acetylferrocene; MgO nanoparticle; L-cysteine, Tryptophan, Electrocatalysis

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