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A simple and sensitive method for determination of taxifolin on
palladium nanoparticles supported poly (diallyldimethylammonium chloride)
functionalized graphene modified electrode

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Abstract

Palladium nanoparticles with diameter of around 5-10 nm supported on poly (diallyldimethylammonium chloride) (PDDA)-functionalized graphene composites were prepared by a simple chemical method. As-prepared nanocomposites were characterized by transmission electron microscopy (TEM), x-ray diffraction (XRD), ultraviolet-visible spectrophotometry (UV-vis) and electrochemical techniques, which were clearly demonstrated that palladium nanoparticles were uniformly dispersed on the graphene sheets. Based on the PDDA-Gr-Pd nanocomposites, a new voltammetric sensor was established and exhibited excellent electrocatalytic activity and fast electron transfer rate toward taxifolin. Under the optimal conditions, a lower detection limit of 1×10^{-9} mol L⁻¹ (S/N=3) and a wide linear detection range from 4×10^{-8} to 1×10^{-6} mol L⁻¹ were achieved by square wave voltammetry (SWV). The proposed method was successfully applied for determination of taxifolin in fructus polygoni orientalis with well results.

Keywords: taxifolin; poly(diallyldimethylammonium chloride), functionalized graphene; palladium nanoparticles; square wave voltammetry

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