

## عنوان مقاله:

Design and construction of a new electrochemical nanobiosensor based on nanocomposite of polypyrrole and graphene for enantioselective detection of mandelic acid

## محل انتشار:

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## خلاصه مقاله:

Analysis of chiral mandelic acid (MA) is essential, owing to its important role in natural product synthesis and drug development [1]. Stereoselective electrochemical sensing based on chiralmodified-electrodes has recently been reported to provide a promising entry to direct screening of chiral molecules, especially MA [2-8]. Enantioselective sensing based on electrochemical sensors offers a variety of advantages over chiral chromatographic and spectrophotometric techniques, such as simplicity, low cost, rapid detection and possibility of real time analysis [9]. A novel chiral biosensor for enantioselective detection of mandelic acid enantiomers was fabricated based on multilayered electrochemically deposition of D-(+)-biotin-loaded overoxidized polypyrrole (OPPy-biot) film on the nanosheets of reduced graphene oxide (rGO)-modified glassy carbon electrode (OPPy-biot/rGO/GCE). The nanocomposite film was characterized by scanning electron microscopy (SEM), differential pulse voltammetry (DPV), cyclic voltammetry (CV) and electrochemical impedance spectroscopy (EIS). The composite of D-(+)-biotin-loaded OPPy and reduced graphene oxide (rGO) was highly stereoselective toward the R-mandelic acid (R-MA) in the presence of high concentrations of S-mandelic acid (S-MA). The sensing performance of the chiral-modified electrode was investigated by differential pulse voltammetry (DPV), revealing a linear range of 5–80 mM with a detection limit of 1.5 mM. Under the optimum conditions, the sensor exhibited good reproducibility and stability for R-MA determination. The designed sensor has been successfully applied for determination of R-MA and S-MA in a synthetic mixture and the satisfactory results were obtained.

## کلمات کلیدی:

Chiral electrochemical biosensor, D-(+)-Biotin, Mandelic acid, Enantioselective recognition

## لینک ثابت مقاله در پایگاه سیویلیکا:

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