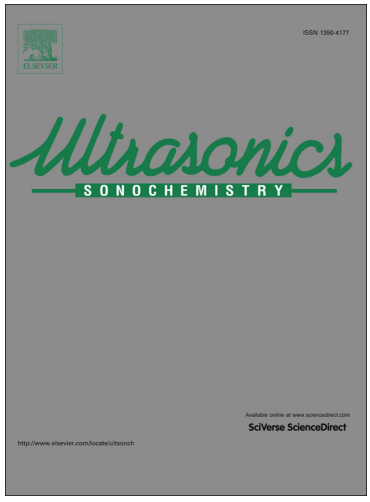

Silver-choline chloride modified graphene oxide: novel nano-bioelectrochemical sensor for Celecoxib detection and CCD-RSM model

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Silver-choline chloride modified graphene oxide: novel nano-bioelectrochemical sensor for Celecoxib detection and CCD-RSM model

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Abstract

In this study, silver nanoparticles modified choline chloride functionalized graphene oxide (AgNPs-ChCl-GO) was synthesized using sonochemical method and utilized as a bioelectrochemical sensor for detection of celecoxibe (CEL). The characterization studies were ultimately performed in order to acheive a more complete understanding of the morphological and structural features of the AgNPs-ChCl-GO using different techniques including FT-IR, AFM, FE-SEM, EDX, and XRD. AgNPs-ChCl-GO demonstrated a significant improvement in the reduction activity of CEL due to the enhancement in the current response compared to the bare carbon paste electrode (CPE). The optimum experimental conditions, were optimized using central composite design (CCD) methodology. The differential pulse voltammetry (DPVs) showed an expanded linear dynamic ranges of 9.6×10^{-9}- 7.4×10^{-7} M for celecoxib in Britton-Robinson buffer in pH 5.0 with. LOD (S/N = 3) and LOQ (S/N = 10) were obtained 2.51×10^{-9} M and 6.58×10^{-9} M respectively. AgNPs-ChCl-GO-carbon paste electrode exhibited suitable properties and high accuracy determination of celecoxib in the human plasma sample.

Keywords: Biosensor; silver nanoparticles; Choline chloride; Graphene oxide; Celecoxib; CCD.

1. Introduction