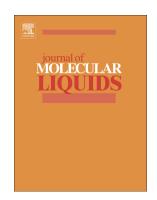
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Advanced sensing nanomaterials based carbon paste electrode for simultaneous electrochemical measurement of esomeprazole and diclofenac sodium in human serum and urine samples

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ABSTRACT

Herein, a novel electrochemical sensor for simultaneous analysis of esomeprazole (EZM) and diclofenac sodium (DICLS) in binary mixture was developed. This proposed sensor is carbon paste electrode (CPE) modified with reduced graphene oxide (rGO) and Co(OH)₂ nano-flakes (CHNF). This sensor was designed to tailor the extraordinary properties of rGO and CHNF to produce synergistic electro-catalysis with significantly improved electro-analytical response compared to an unmodified bare CPE. Several techniques were used to characterize the new developed electrochemical sensor. The electrochemical performance was improved by optimizing the effects of pH, scan rate, amounts of rGO/CHNF, frequency and other parameters. The new sensor was successfully applied for determination of the cited mixture, where the linearity was achieved in the range of 2.5-155×10⁻⁸ M and 1.5-105×10⁻⁸ M with detection limits of 8×10⁻⁹ M and 5×10⁻⁹ M for DICLS and EZM, respectively. The fabricated sensor was used for determination of the mixture in pharmaceutical preparations, human serum and urine.

Keywords: Esomeprazole; Diclofenac sodium; Reduced graphene oxide; Cobalt hydroxide nano-flakes; Human serum; Human urine.

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