

## عنوان مقاله:

An Electrochemical Nanosensor for Voltammetric Determination of Caffeine in Food Samples

## محل انتشار:

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## خلاصه مقاله:

Caffeine is classified by the Food and Drug Administration as generally recognized as safe (GRAS). Toxic doses, over 10 grams per day for an adult, are much higher than typical doses of fewer than 500 milligrams per day. So, determination of this compound is very important in food and drug samples [1]. In the present study an easy-to-make and sensitive sensor based on CdO/SWCNTs nanocomposite ionic liquid (IL) composite for voltammetric sensing of caffeine in real samples was developed. In the first step, CdO/SWCNTs synthesis using chemical precipitation method and characterized with different methods such as transmission electron microscopy (TEM) and X-ray diffraction (XRD). The proposed sensor shows a better electrochemical response with lower over-potential and high sensitivity for caffeine compared with unmodified carbon paste electrode using cyclic voltammetry (CV). The electro-oxidation of caffeine occurred in a pH-dependent  $e^-$  and  $H^+$  process, and the electrode reaction followed a diffusion-controlled pathway. Under the optimum conditions in cyclic voltammetry (CV), the voltammetric oxidation peak current of caffeine showed linear dynamic ranges with a detection limit of  $0.02 \mu M$  for caffeine. The modified electrode was successfully used for the determination of the caffeine in food samples with satisfactory result.

## کلمات کلیدی:

Caffeine analysis, Voltammetric sensor, food samples, Modified electrode

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