



# Adsorptive Square Wave Voltammetric Determination of Acyclovir and Its Application in a Pharmacokinetic Study Using a Novel Sensor of $\beta$ -Cyclodextrin Modified Pencil Graphite Electrode

Gamal A. Saleh, Hassan F. Askal, Ibrahim H. Refaat, Fatma A. M. Abdel-aal

## Abstract:

An electrochemical sensor for acyclovir (ACV) based on polymerization of  $\beta$ -cyclodextrin ( $\beta$ -CD) on electrochemically pretreated pencil graphite electrode (PGE) was built for the first time. A synergistic effect of  $\beta$ -CD was used to construct this sensor for quantification of this important drug. Scanning electron microscope (SEM) images show that polymer of  $\beta$ -CD has been successfully modified on the electrode. Square wave voltammetry (SWV) exhibited two linear dynamic ranges of  $5 \times 10^{-8}$  to  $6 \times 10^{-7}$  M and  $1 \times 10^{-6}$  to  $9 \times 10^{-6}$  M of ACV for its oxidation and the detection limit was found to be as low as  $7.59 \times 10^{-9}$  M of ACV. The parameters affecting ACV oxidation were investigated. The prepared electrodes showed good fabrication reproducibility. The analytical applications of the prepared electrodes were tested by using ACV dosage forms and human urine as a real sample. The SWV analysis has been successfully applied to pharmacokinetic studies of ACV in health human volunteers after oral administration of a single dose of Zovirax suspension (400 mg/5 mL).

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