Title: Simultaneous Voltammetric Determination of Antihypertensive Drugs Nifedipine and Atenolol Utilizing MgO Nanoplatelet Modified Screen-Printed Electrodes in Pharmaceuticals and Human Fluids

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Nifedipine and atenolol drugs are conjugated in several anti-hypertensive pharmaceutical formulations. Herein, a reproducible and sensitive voltammetric procedure has been developed for the simultaneous analysis of nifedipine and atenolol for the first time using MgO - nanoplatelets modified screen-printed electrodes (MgO - SPEs) via differential pulse voltammetry (DPV). Two very well-resolved and reproducible signals/oxidation peaks with a voltammetric separation of 0.35 V were obtained in Britton–Robinson (BR) buffer (pH 9).
MgO NPLs are found to exhibit a high electrocatalytic activity and improved voltammetric response compared to unmodified (bare) SPEs. Under optimum pH conditions (pH 9), the DPV curves exhibit linear responses to nifedipine and atenolol over the concentration ranges of 0.2–104.41 µM and 6.66–909.09 µM with detection limits of 0.032 µM and 1.76 µM, respectively. The applicability of the MgO-SPEs is successfully utilized for simultaneous determination of nifedipine and atenolol in pharmaceutical tablets and human urine samples with good accuracy and precision, these results agreeing with independent high-performance liquid chromatography (HPLC).

**Keywords:**

Nifedipine, Atenolol, Magnesium oxide, Screen-printed electrodes, Antihypertensive, Nanoparticles