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Smartphone application for captopril determination in dosage forms and synthetic urine employing digital imaging

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ABSTRACT

A simple, accurate, and low-cost analytical procedure for captopril determination through digital imaging is presented. The method relies on the spot test reaction between captopril and palladium (II) chloride, which produces a yellow and water-soluble complex with maximum absorption at 380 nm. A smartphone camera and a portable apparatus built for internal lighting control were put together to acquire digital images of reaction mixtures. Digital image processing through the RGB approach was used to establish a quantitative relationship between color intensity and captopril concentration. Under the most suitable operational and experimental conditions, an analytical curve was built monitoring the Blue channel within the concentration range of 3.12×10^{-5} to 1.21×10^{-3} mol L⁻¹. Limits of detection and quantification were equal to 8.06×10^{-6} and 2.69×10^{-5} mol L⁻¹, respectively. Recovery percentage in synthetic urine samples ranged from 97.1 to 102.9 %. Results were compared with a reference method and no significant differences were detected at the 95% confidence level. The developed

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