

# Capillary electrophoresis in the determination of anionic catecholamine metabolites from patients' urine

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**“...Calculation of  $pK_a$  values. The  $pK_a$  values for catecholamines in aqueous conditions were predicted using Pallas program (CompuDrug)...”**

## Abstract

A micellar electrokinetic capillary chromatographic method for determining anionic catecholamine metabolites from patient urine samples was established. The optimum electrolyte solution (pH 10.6) was made of tetraborate and sodium dodecyl sulphate into water. Furthermore, studies were focused to optimize solid-phase extraction clean-up steps to concentrate patient urine samples for identification of catecholamines with UV detection. The water-micelle distribution coefficients (octanol–water partition coefficient,  $\log P_{ow}$ ) for the analytes were determined by conductometric titration. High plate numbers (120 000–200 000/40 cm detection window) and small diffusion coefficients ( $2.00\text{--}3.50 \times 10^{-6} \text{ cm}^2 \text{ s}^{-1}$ ) resulted in high resolution and symmetry of the analyte zones. The standard deviations of the migration times and the peak heights were less than 3 and 7%, respectively. The octanol–water coefficients increased in the order of decreased  $pK_{a1}$  value of the analytes, why separation between structurally related vanillinic mandelic acids could be obtained. Limits of detection and quantification were around 0.05 and 0.1 g/ml, respectively, except for dopamine. The concentrations of the catecholamine metabolites in the studied patient urines varied from 0.186 to 76.4 g/ml. The results showed evidences of serious diseases among the patients.

**Author Keywords:** Author Keywords: Octanol–water partition coefficients; Capillary electrophoresis; Catecholamines

[Journal of Chromatography](#)

[Volume 1032, Issues 1-2](#), 2 April 2004, Pages 289-297

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