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Determination of ceftriaxone, ceftizoxime, paracetamol, and diclofenac sodium by capillary zone electrophoresis in pharmaceutical formulations and in human blood serum

Amber SOLANGI[1], Saima MEMON[2], Arfana MALLAH[3], Najma MEMON[1], Muhammad Yar KHUHAWAR[1], Muhammad Iqbal BHANGER[1]

[1]National Center of Excellence in Analytical Chemistry, University of Sindh, Jamshoro-PAKISTAN

e-mail: ambersolangi@gmail.com

[2]Institute of Advance Research Studies in Chemical Sciences, University of Sindh, Jamshoro-PAKISTAN

[3]M. A. Kazi Institute of Chemistry, University of Sindh, Jamshoro-PAKISTAN

Abstract: A simple and fairly fast capillary zone electrophoresis method has been developed for the determination and separation of ceftriaxone, ceftizoxime, paracetamol, and diclofenac sodium in a mixture, in pharmaceutical formulations, and in blood serum. A 50 mM sodium tetraborate background electrolyte solution (pH 9.0) was found to be suitable for separation of all the drugs. An uncoated fused-silica capillary of a total length of 57 cm (effective length 50 cm) was used for separation. All the analytes were completely separated within 8.0 min at an applied voltage of 30 kV and detection was performed at 214 nm .Validation of the method was performed in terms of linearity, accuracy, precision and limit of detection, and quantification. The linearity of the calibration curves for paracetamol was 5-125 μ g/mL, for ceftizoxime was 5-500 μ g/mL, for diclofenac was 1-125 μ g/mL, and for ceftriaxone was 10-1000 μ g/mL, while LOD of the paracetamol, ceftizoxime, diclofenac, and ceftriaxone was found to be 1.0, 1.0, 0.5, and 5.0 μ g/mL, respectively. The proposed method was applied for the determination of active ingredients in pharmaceutical formulations and active drugs in human blood serum. The recovery was found to be >= 99% with the relative standard deviation (RSD) <= 2.1% for both matrices.

Key Words: Capillary zone electrophoresis, paracetamol, ceftriaxone, ceftizoxime, diclofenac sodium

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