A New Coated Wire Selective Electrode for Quetiapine in Biological and Pharmaceutical Analysis

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Fabrication of organic PVC membrane based coated wire electrode for sensitive, fast, precise and simple determination of quetiapine in pharmaceutical formulation and urine samples is demonstrated. The new electrode was constructing using quetiapine : tetraphenyl borate ion pair complex as electro-active material, PVC as supporting matrix, 2-nitrophenyl octyl ether as mediator of solvent and potassium tetrakis (4-chlorophenyl) borate as lipophilic additive. The electrode provides Nernstian response (57 ± 0.2 mV/decade) over a wide concentration range of 1×10^{-5} to 1×10^{-2} mol L⁻¹ of quetiapine with lower limit of detection (3.2×10^{-6} mol L⁻¹), fast response time (less than ten seconds) and relatively long life span (30 days). Stability with verification of the suitability of the electrode to be applied in the analysis of drug quality control in pharmaceutical and biological (urine) samples was assessed. The results obtained revealed a good agreement with those obtained from independent standard method (high performance liquid chromatography). In the pharmaceutical analysis application, the recovery of the quetiapine selective electrode ranging from 98.83 to 103.27 %, the confidence of the two methods is 95% and the standard deviation is 2.49. While in the biological analysis of urine, the recovery of the electrode with respect to the standard method ranging from 96.45 to 97.48 %, the confidence is 95 % and the standard deviation is 1.48.

Keywords: Quetiapine; PVC membrane; coated wire electrode; pharmaceutical analysis; biological applications.

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