

Determination of Roxithromycin Tablets by Capillary Electrophoresis Employing Non-aqueous Media with Square-wave Amperometric Detection

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Abstract: A new method of determination for roxithromycin tablets by non-aqueous capillary electrophoresis (NACE) with square-wave amperometric detection was carried out. Several parameters affecting the NACE-AD determination were studied. The data was modified by spline wavelet least square (SWLS). The method is simple, rapid and highly reliable for routine analysis.

Keywords: Non-aqueous capillary electrophoresis (NACE), amperometric detection, roxithromycin, spline wavelet least square (SWLS).

Roxithromycin is usually determined by liquid chromatography in the literature¹⁻². In this paper, capillary electrophoresis (CE) was first used to separate roxithromycin from other ingredients of tablets. UV detection has been the most popular detection method, but being a mass-dependent, its sensitivity is severely compromised by the short light path length of CE. With UV detection, the maximum absorption of roxithromycin is at 212 nm. It is interfered by the background absorption. Another absorption at 235 nm would sacrifice the detection limit¹. In this paper, we found it is very sensitive detecting roxithromycin by square-wave amperometric³ method.

CE is widely applied in pharmaceutical analysis because of its small sample injection, short analytical time and high separation efficiency. There is no report of roxithromycin detected by CE. Usually water is used as the normal media in CE, but roxithromycin is water insoluble, so organic solvent must be used. The properties of the organic solvents, ion strength, and pH* values all affect the separation of roxithromycin from other compositions⁴.

Methanol and formamide 5/5(v/v) were used as media. The running buffer was 10 mmol/L NH₄AC – 2 mmol/L HAC. By hydrodynamic voltammogram of roxithromycin, the best working electrode potential was +0.93 V. The separation voltage was 20 kV. The capillary column was 25 μ m (i.d.) \times 65cm. With the above condition, roxithromycin was well separated from other ingredients of tablets. The data were modified by SWLS⁵, which increased the accuracy of quantitation and improved the separation. The electropherograms are shown in **Figure 1**, The linearity of the calibration curves was

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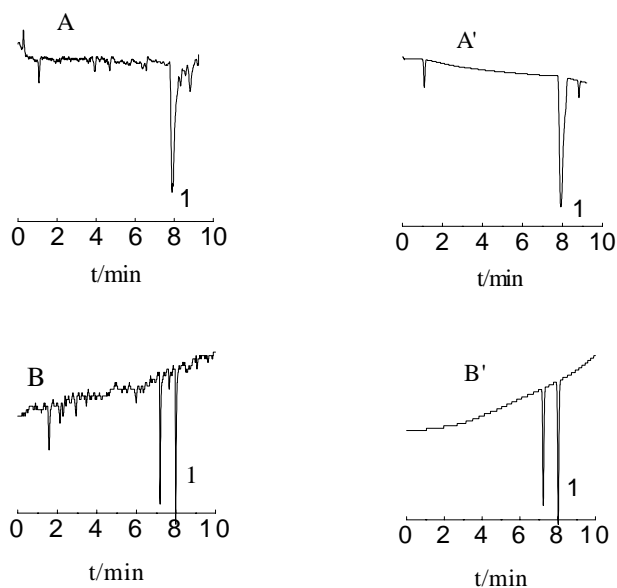
preserved over the concentration ranges of 5.0 mg/L ~ 100 mg/L, S (peak area) = $80.1+73.1C$ (mg/L). The detection limit was 0.1 mg/L. The results are shown in **Table 1**.

Table 1 The determination results and recovery rates of the samples (n=5)

Analyte	background (mg)	added (mg)	found (mg)	recovery (%)	RSD (%)
Roxithromycin tablets	40.5	20	59.7	96.1	1.62
Roxithromycin dispersible tablets	20.8	10	30.2	94.5	2.43

Figure 1 CE of roxithromycin tablets (A) and its dispersible tablets (B) and CE modified by spline wavelet least square (A', B').

1. roxithromycin.



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