Capillary Electrophoresis Coupling with Electrochemiluminescence for Bisoprolol, Emolol, Propranolol Enantioseparation and Detection

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A simple, convenient and flexibility capillary electrophoresis coupling with electrochemiluminescence (CE-ECL) detection method was carried out for simultaneous enantioseparation of three β -blocker drugs (bisoprolol, esmolol, propranolol). In CE-ECL system, the buffers of the capillary outside and inside was not the same including the buffer composition, pH value, and concentrations. In order to simultaneously improve the detection sensitivity and enantiomer separation, the conditions of capillary inlet and outlet buffer were optimized in detail. Under the optimized conditions, the separation efficiency for enantiomers of three β -blocker drugs were improved and baseline resolution was achieved. The limit of detection (LOD) were in the range of 0.01-0.08 ng/mL for bisoprolol, esmolol, propranolol enantiomers. The RSDs of peak areas peak, heights, and migration time were in the range of 2.1-2.5 %, 2.0-2.3 %, and 1.9-2.2 % for enantiomers, respectively. The separation-detection techniques was applied to analysis enantiomers of bisoprolol, esmolol, propranolol in urine sample successfully, the recoveries of the six enantiomers were in the range of 94.0 % -100.7 % with RSDs less than 3.1 %.

Keywords: Enantioseparation, β -blocker drugs, capillary electrophoresis, electrochemiluminescence.

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