Short Communication

Separation and Analysis of Chlorpromazine and Demethylchlorpromazine by Capillary Electrophoresis Coupled with Electrochemiluminescence

Fuxiu Yang¹, Zhaokuai Peng^{1,2}, Chunxiu Gu^{1,2}, Baining Liu^{1,2}, Kaowen Zhou^{1,2,*}

¹ Biochemical Engineering College, Beijing Union University, Beijing 100023, China

² Beijing Key Laboratory of Biomass Waste Resource Utilization, Beijing 100023, China

*E-mail: zhoukaowen@buu.edu.cn

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Demethylchlorpromazine (DMCPZ) is one of the main metabolites of chlorpromazine (CPZ). DMCPZ has only one methyl less than CPZ. The structural difference between them is too small to separate them by conventional capillary electrophoresis (CE). However, proper addition of additives in the separation buffer can improve their separation performance. The parameters related to CE separation were carefully studied. The optimized CE conditions were separation buffer of 17.50% iso-propyl alcohol aqueous solution (v/v) containing 21 mmol/L phosphate (pH 5.3), separation voltage of 13.1 kV, sample injection time of 6 s and sample injection voltage of 11.5 kV. Combined with electrochemiluminescence (CEL) detection technology, a separation and analysis method of CPZ and DMCPZ by improved CE coupled with end-column CEL was established. The limits of detection (3σ) of this method were 8.1×10^{-7} mg/mL for CPZ and 8.9×10^{-6} mg/mL for DMCPZ. The relative standard deviations were less than 2.5% for ECL intensity and less than 1.2% for migration time. This method had many advantages, such as fast speed, high sensitivity, small sample injection, and free from interference, and was successfully applied to simultaneously determine CPZ and DMCPZ in whole urine sample of pet dog.

Keywords: Improved capillary electrophoresis; Electrochemiluminescence; Chlorpromazine; Demethylchlorpromazine; Urine sample

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