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安培检测芯片毛细管电泳及其初步应用

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摘要 在玻璃芯片上设计集成了具有工作电极导管的柱端安培检测器。其制作采用两步刻蚀技术, 将工作电极导管直接制作在检测池末端, 便于工作电极与分离毛细管对齐。方法用于多巴胺、肾上腺素和邻苯二酚三种物质的分离与检测, 80

秒内获得良好的结果。多巴胺和邻苯二酚的迁移时间与峰高的标准偏差均小于5.2%

($n=5$)。在此毛细管电泳芯片上加标准样品检测了尿液和血浆中多巴胺, 回收率在83%至103%之间。

关键词 [芯片毛细管电泳](#), [柱端安培检测](#), [两步刻蚀](#), [尿](#), [血浆](#)

分类号

Microchip Capillary Electrophoresis with an End-Channel Amperometric Detector and Its Preliminary Application

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Abstract An end-channel amperometric detector with a guide tube for working electrode was designed and integrated on a home-made glass microchip. The guide tube was directly patterned and fabricated at the end of the detection reservoir, which made the fixation and alignment of working electrode relatively easy. The fabrication was carried out in a two-step etching process. A 30 μm carbon fiber microdisk electrode and Pt cathode were also integrated onto the amperometric detector. The baseline separation of dopamine (DA), catechol (CA) and epinephrine (EP) was achieved within 80 s. Relative standard deviations of not more than 5.2% were obtained for both peak currents and migration times of DA and CA ($n=5$). Using standard adding method, DA in urine and plasma samples was detected. The recoveries were in the range of 83%—103%.

Key words [microchip capillary electrophoresis](#), [end-channel amperometric detection](#), [two-step etching](#), [urine](#), [plasma](#)

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