

论文

集成化液膜萃取-反萃取-毛细管电泳联用芯片

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摘要:

我们设计并制作了集成有支持液膜萃取-反萃取试样预处理的毛细管电泳(SLMEBE-CCE)微流控芯片. 分别以荧光素钠和丁基罗丹明B作为模型待测物和共存物, 在该芯片上进行了在线试样预处理与毛细管电泳联用的初步实验.

关键词: 微流控芯片; 毛细管电泳; 支持液膜萃取-反萃取; 预分离富集

A Microfluidic Chip-based Capillary Electrophoresis System with Integrated Supported-liquid-membrane Extraction-back-extraction Sample Pretreatment

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Abstract:

This article presents the designing and fabrication of a microfluidic chip with an integrated supported-liquid-membrane extraction-back-extraction and chip-based capillary electrophoresis system(SLMEBE-CCE). A 3-dimensional channel network for the SLMEBE-CCE system was fabricated with a four-layer glass/PTFE-membrane hybrid structure. With a gravity pump for sample and back-extraction solution delivery and a multi-channel high-voltage supply for CCE separation, the microchip with the coupled SLMEBE-CCE system was demonstrated by the pre-concentration, separation and detection of a mixed solution of fluorescein and butyl-rhodamine B. Compared to chip-based CCE without SLMEBE, the developed SLMEBE-CCE system produced a 7-fold increase in the signal of the model analyte of fluorescein and a 4-fold decrease in the signal of the model co-existing compound of butyl-rhodamine B.

Keywords: Microfluidic chip; Capillary electrophoresis; Supported liquid membrane extraction and back extraction; Pre-concentration; Sample cleaning-up

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