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带有两个伸出尖端的聚二甲基硅氧烷微芯片的制备及其在动态涂层条件下对蛋白质的分离

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收稿日期 2006-8-28 修回日期 2006-11-6 网络版发布日期 2007-2-9 接受日期

摘要 本文介绍了一种带有两个伸出尖端的整体式聚二甲基硅氧烷 (PDMS) 微芯片的制备方法及其应用, 进样、缓冲溶液更新及微通道清洗等操作在该芯片上变得简单易行。样品可以直接通过伸出尖端引入分离通道, 不需要复杂的电源切换设备及进样通道。清洗微通道或更新缓冲溶液时, 只需在一个伸出尖端抽真空, 将另一伸出尖端插入溶液中即可完成。制备方法经济方便, 可在大多数实验室中使用, 不需要软刻蚀和等离子体粘结等装置。制备的PDMS微芯片已用于蛋白质的激光诱导荧光法分离检测中: 在0.04 mol/L磷酸盐缓冲溶液 (pH 7.0) 中加入0.04%的Brij 35可以减小多酶片中的蛋白质在PDMS微芯片上的吸附, 使分离简单易行。经过此动态改性的微通道其电渗流 (EOF) 在pH 3~11范围内保持稳定。

关键词 [聚二甲基硅氧烷](#), [微流控芯片](#), [进样](#), [动态涂层](#), [蛋白质](#)

分类号

Poly(dimethylsiloxane) Microchips with Two Sharpened Stretching Tips and Its Application to Protein Separation Using Dynamic Coating

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Abstract An integrated poly(dimethylsiloxane) (PDMS) microchip with two sharpened stretching tips for convenient sample injecting, running buffer refreshing and channel cleaning has been presented. The sample was directly introduced into the separation channel through the stretching inlet tip without complicated power switching supplies and injection cross channel. The operation of running buffer refreshing or channel cleaning was simplified by vacuuming one end of the tip and placing the other tip into the solution vial. Therefore, this fabrication method can be easily applied to most analytical laboratories economically without soft lithography and plasma bonding equipments. The attractive performance of the novel PDMS microchips has been demonstrated by using laser-induced fluorescence detection for separation of proteins. The addition of 0.04% Brij 35 in 0.04 mol/L phosphate buffer (pH 7.0) can reduce the adhesion of proteins in multienzyme tablet and make separation more easily. The electroosmotic flow (EOF) exhibits pH-independence in the range of 3—11 in dynamic modified microchannel.

Key words [poly\(dimethylsiloxane\)](#), [microfluidic chip](#), [sampling](#), [dynamic coating](#), [protein](#)

DOI:

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