

芯片毛细管电泳的系统级建模与仿真技术研究

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摘要：

芯片毛细管电泳分离是微流控芯片系统中的重要组成部分，其电泳分离效率直接影响着芯片的整体功能。本文运用多端口组件模型技术建立了透迤型芯片毛细管电泳分离的参数化行为模型及系统级模型。模型仿真结果与有限元仿真软件的仿真结果相比较，仿真速度提高了100多倍，而相对误差小于3.8%，表明论文所建立的芯片毛细管电泳分离行为模型，能够在不降低系统仿真精度的同时更加快速高效地对系统性能做出评价。

关键词：微流控芯片；芯片毛细管电泳；系统级模型；多端口组件模型

System-level Modeling and Simulation for Chip-based Capillary Electrophoresis

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Abstract:

Aim. To develop computer aided design software of microfluidic chip system. In this paper, the parameterized behavior model of chip-based capillary electrophoresis was established by using the system-level modeling method. The length of microchannel and the broadening of band are main factors influence electrophoretic separation chips. Compared with the finite element model, the simulation based on the established behavior model speeds up 100 times with a relative error of 3.8%.

Keywords: microfluidic chip; chip-based capillary electrophoresis; system - level modeling; multi-port element modeling

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