

Study of In-Channel Simplified Decoupler with Electrochemical Detection for Microchip Electrophoresis

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Abstract

Microchip electrophoresis (MCE) have the great benefit potential in recent year, especially polymer based microchip. The major drawback is the path length of microchip only μM level, limiting the integration of MCE. However, electrochemical (EC) detection offer a simple operate, economic and high sensitive method comparable to fluorescence. Therefore, it become the major detection of MCE gradually. In this research, we use the replica molding fabrication to make the polymer based microchip with the simplified decoupler serving an excellent isolation and use the amperometric detection.

The surface roughness between electrode and microchannel often cause the low separation efficiency. So, we make efforts in improving the surface roughness. In the performance test, the theoretical plate of two standard sample, dopamine and catechol, is 133,000 and 160,000.(N/m). This result is a great improvement of the low theoretical plate problem caused by the surface between electrode and channel not smooth.

We choose the commercial juice as the real sample, and can identify the peaks of sucrose and fructose in 120 seconds. We quantitatively determine that the sugar ingredient is 101.9 mM(sucrose)and 20.7 mM (fructose) in this juice by using standard addition method.