High Performance Separations on Microfluidic Devices

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For many of the electrokinetically driven separation techniques demonstrated on microfluidic devices, the separative performance measured per unit length is similar to or exceeds that of conventional capillary separations. However, the absolute efficiencies tend to be lower primarily due to the shorter separation lengths. As more challenging separations are attempted on microchips, higher peak capacities are sought. Two strategies for increasing peak capacities are to lengthen the separation channel and to perform multi-dimensional separations. To lengthen the separation channel and maintain a small footprint, we are using serpentine channel designs with low dispersion turns, and to execute two dimensional separations, we are serially coupling chromatographic and electrophoretic separations. Device design and performance for these one- and two-dimensional separations on microchips will be discussed.

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