MICROCHIP DEVICES FOR HIGH EFFICIENCY SEPARATIONS

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It has now been nearly a decade since the first demonstration of liquid phase chemical separations on microfabricated structures. Moreover, such devices have gone from being a curiosity to a serious technology that includes commercially available products. While microchip-based chemical separations have always been considered rapid compared to conventional technology, many separation scientists have viewed microchips as relatively low performance with regards to addressing needs that require high efficiency separations. We have recently demonstrated efficiencies on microfabricated structures for capillary electrophoresis that exceed that typically produced by conventional technology while exhibiting plate count rates at least one order of magnitude greater. Moreover, two-dimensional separations have been implemented on microfabricated structures that may lead to even greater peak capacities for complex mixtures such as protein samples and protein digests. Prospects for moving to separations of higher dimensionality and the integration of chemical processing steps for proteins will also be discussed.

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