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Development of liquid phase microextraction in-line coupled with capillary electrophoresis

Doo Soo Chung
Seoul National University, Korea

Abstract

In liquid phase microextraction, high enrichment factors can be obtained using an acceptor phase of small volume. As a means of reducing the acceptor volume, single drop microextraction (SDME) has been used. In SDME in-line coupled with capillary electrophoresis (CE), analytes are extracted into an acceptor drop hanging at the tip of a capillary. Since the drop volume can be as small as a few nanoliters, the consumption of solvents can be minimized and the preconcentration effect is greatly enhanced. In addition, by covering the acceptor phase with an organic layer or by using an organic acceptor phase, inorganic ions such as salts in the sample solution can be blocked from entering the acceptor phase, providing desalting effects. Moreover, the enriched acceptor drop can be introduced into the capillary without additional interface for the subsequent CE analysis. Headspace (HS) SDME coupled with CE has also been demonstrated using a drop of an acceptor phase. Thus SDME is a convenient and powerful preconcentration and sample cleanup method for CE before injection. In addition, to improve the concentration effect further, SDME can be coupled with on-line (after injection) sample preconcentration techniques. To reduce the acceptor phase volume further, we demonstrate no drop microextraction (NDME) using the liquid inside a separation column of CE as an acceptor phase. Due to the lack of a hanging drop, the present scheme was simple and reliable. The procedures of NDME were carried out using the built-in programs of a commercial CE instrument.

Biography

Doo Soo Chung has completed his PhD from Harvard University and postdoctoral studies from MIT and Iowa State University. He has published more than 100 papers in reputed journals.