Abstract:

Sweeping is an important online focusing method in capillary zone electrophoresis and electrokinetic chromatography, which is employed in numerous methods for analyte enrichment and improvement of detection and quantitation limits. This review intends to summarize the present state of developments in the understanding of sweeping processes with special emphasis on the modeling of moving and stationary boundaries with assumed moving and/or stationary accelerating or decelerating planes. Starting from the description of sweeping for a neutral analyte under homogeneous field conditions, it is shown that the methodology of modelling zone focusing processes with moving and/or stationary accelerating or decelerating planes allows extending the description to charged analytes, inhomogeneous field conditions, retention factor gradient effect conditions, complex formation ligand as sweeping carrier and dynamic pH junction conditions. The present article introduces a generalized theoretical basis that allows a better understanding of the various factors influencing sweeping processes. The discussion is completed with a section on limitations of the presented approach.

Keywords:

Electrokinetic chromatography, Sweeping, Retention factor gradient effect, Intrinsic stacking, Dynamic pH junction.

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