Microflow extraction: A review of recent development

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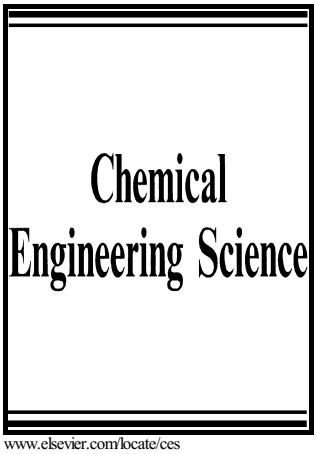

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Microflow extraction: A review of recent development

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Abstract

Liquid-liquid extraction plays an important role in separation and purification of substance. Miniaturized extraction processes based on microflow have received increasing attention for application in fields such as small-scale purification, fine chemical synthesis, and the rapid analysis of chemical and biological samples. To outline the microflow extraction from its more basic form to its utilizations, this review begins by introducing the progress of research into fluidic dynamics and mass transfer on the microscale. Typical miniaturized extractors and phase separators are then presented with analysis of their advantages. Finally, typical application of microflow extraction are demonstrated, which show great potential for the miniaturization of separation processes.

Keywords: Microflow, Extraction, Mass transfer, Separation, Purification

Nomenclature

A	cross-sectional area of a microchannel, m^2
C_{bulk}	substance concentration in the bulk phase, mol/m^3
$C_{C,eq}$	continuous phase concentration at equilibrium, mol/m^3
$C_{D,eq}$	dispersion phase concentration at equilibrium, mol/m^3
C_{inf}	final concentration in the droplet at equilibrium, mol/m^3
C_{int}	substance concentration at the interface, mol/m^3