

Monolithic columns with mixed modes of reversed-phase and anion-exchange stationary phase for capillary electrochromatography

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“...log P data of analytes were calculated accordingly [18] . The pK_a values of anilines were predicted with the soft PALLAS (Compudrug) ...”

Abstract

A capillary electrochromatography (CEC) monolithic column with mixed modes of reversed-phase and anion-exchange stationary phases was prepared by in situ polymerization of 2-(methacryloxy) ethyltrimethylammonium methyl sulfate (MEAMS) and ethylene dimethacrylate (EDMA) in a binary porogenic solvent consisting 1-propanol and 1,4-butanediol. The ammonium groups on the surface of the stationary phase generate an electroosmotic flow (EOF) from cathode to anode, and serve as a strong anion-exchange stationary phase at the same time. The EOF of the stationary phase can be determined by the amount of MEAMS monomer in reaction mixtures during the polymerization. The monolithic stationary phases exhibited reversed-phase chromatographic behavior toward neutral solutes. For charged solutes, hydrophobic as well as electrostatic interaction/repulsion with the monoliths was observed. Separations of aromatic compounds and basic compounds on the prepared column were performed under the mode of CEC. Peak tailing of basic compounds was avoided and the efficient separation of aromatic acids was achieved using neutral mobile phase due to the same direction of EOF and electrophoretic mobility of negatively charged solutes.

Author Keywords: Monolithic columns; Mixed-mode separations; Stationary phases, electrochromatography; Electrochromatography; Anilines; Alkylbenzenes; Polynuclear aromatic hydrocarbons; Caffeine; Barbitals; Benzoic acids; Terephthalic acid

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