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On-Line Preconcentration Method Using Normal Stacking Mode and Dynamic pH Junction for the Quality Control of Herbal Medicines Containing Related Phenolic Compounds

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Abstract:

An on-line preconcentration capillary electrophoresis (CE) methodology, which combines a normal stacking mode (NSM) with a dynamic pH junction technique, is introduced in this paper. A systematic study of the parameters (concentration and pH value of background electrolyte, composition of sample matrix, injection pressure and time, separation voltage and temperature) affecting on-line concentration of seven related phenolic compounds was investigated and optimized. Under the optimum focusing conditions, about 54-fold improvement in the detection sensitivity was obtained compared with usual hydrodynamic sample injection (0.5 psi, 5 s) without detriment in separation efficiency.

In particular, the concentration limits of detection (LOD) ($S/N = 3$) for the phenolic compounds obtained after preconcentration were from 6.0 to 11.0 ng mL⁻¹ with UV detection without any pretreatment procedure. The proposed method has been validated with RSD values between 1.13% and 1.98% for migration times and between 1.28% and 4.65% for peak areas. Developed NSM-dynamic pH junction method was applied for determination of related phenolic compounds in labeled *M. officinalis* medicinal herbal products commercialized in our country.

Keywords:

Capillary electrophoresis, dynamic pH junction, normal stacking mode, on-line preconcentration, phenolic compounds.

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