

OVERLOADING STUDY OF ZWITTERIONIC CHIRAL STATIONARY PHASES
BASED ON CINCHONA ALKALOIDS

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Abstract

Nowadays, chirality has great importance in the life sciences as well as in the pharmaceutical industry. Usually the enantiomers have diverse activity in the living systems: one of the enantiomers possesses positive effect, while the other may be inactive or toxic. Thus, the separation of the enantiomers is very important.

On the *Cinchona* alkaloid-based ZWIX(+) and ZWIX(-) zwitterionic chiral stationary phases, simultaneous anion- and cation-exchange takes place. These stationary phases are good choice for the separation of the enantiomers of chiral acids, amines, amino acids and peptides.

Nonlinear chromatography was used for the investigation of the retention mechanisms. The stationary phases were overloaded by large volume injection of DL-*tert*-Leucine. *Bi-Langmuir* isotherm was used for modeling the adsorption because of the heterogeneous surface of the zwitterionic stationary phases. The isotherm parameters were determined by the *inverse method*.

In the optimization of the enantioseparation, the acid and base additives play an important role, they ensure the ionization of the selector and the selectand. Therefore, the effect of the nature and the ionic strength of the additives on the overloaded chromatographic bands were investigated.

Keywords: separation of the enantiomers, quinine- and quinidine-based chiral zwitterionic stationary phases, nonlinear chromatography, column overload, inverse method