

## Abstract

Dissertation thesis is a 5-publications' collection concerning characterization and application potential of cyclodextrins, polysaccharides and macrocyclic antibiotics based chiral stationary phases. The effects of stationary phase and mobile phase are studied. This approach ensures the complex insight into separation systems studied.

Systems with different nature of chiral selector were studied by HPLC. Namely, macrocyclic antibiotics and derivatized polysaccharides were used for experiments. Former ones provided better results for enantioseparation of non-coded amino acids than latter ones.

Dynamic coating procedure was used for preparation of a new chiral stationary phase. Characterization of new cationic cyclodextrin based chiral stationary phase was performed. Linear free energy relationship method was used for characterization of two different separation systems, *i.e.* newly prepared stationary phase and commercially available stationary phase. Based on results obtained, newly prepared stationary phase showed better results for separation of different achiral groups of analysts.

New stationary phase prepared by dynamic coating was compared with chromatographic system, in which the chiral selector was used as a mobile phase additive. The chiral selector used for the two different approaches was identical. The set of chiral amino acids and non-chiral mixtures of dipeptides was used as analysts for the experiment. Different performance of the two separation systems was shown.

Linear free energy relationship method was used for examination of effect of mobile phase composition on separation. Results carried an important message – inappropriate choice of a specified part of mobile phase should have fatal influence on analyst separation.

Polysaccharide-based chiral stationary phases were studied via supercritical fluid chromatography. The set of 52 biologically active compounds was tested. The influence of different polysaccharide backbone, different organic modifier and mobile phase additive on retention and enantioseparation was examined.