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Studies of a pyridino-crown ether–based chiral stationary phase on the enantioseparation of biogenic chiral aralkylamines and α-amino acid esters by high-performance liquid chromatography

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Graphical abstract

Highlights

- Primary aralkylamines and α-amino acid esters were separated on a (*S*,*S*)-CSP-6.
- The effect of mobile phase composition on the enantiomeric recognition was studied.
- The enantioselectivity was rationalized by strong π–π interaction of the CSP.

Abstract

This paper reports the enantioseparation ability of a pyridino-18-crown-6 ether–based chiral stationary phase [(*S*,*S*)-CSP-**1**]. The enantiomeric discrimination of chiral stationary phase (*S*,*S*)-CSP-**1** was evaluated by HPLC using the mixtures of enantiomers of various protonated primary aralkylamines [1-phenylethylamine hydrogen perchlorate (PEA), 2,3-dihydro-1*H*-inden-1-amine (1-aminoindan), 2,2'-(1,2-diaminoethane-1,2-diyl)diphenol (HPEN)] and perchlorate salts of α-amino acid esters [alanine benzyl ester (Ala-OBn), phenylalanine benzyl ester (Phe-OBn), phenylalanine methyl ester (Phe-OMe), phenylglycine methyl ester (PhGly-OMe), glutamic acid dibenzyl ester (Glu-diOBn) and valine benzyl ester (Val-OBn)]. The best enantioseparation was achieved in the case of PEA. The high enantioselectivity was rationalized by the strong π–π interaction of the extended π system of the aryl–substituted pyridine unit.

Keywords

chiral stationary phase; crown ether; pyridine; enantiomeric separation; HPLC