

Abstract in English

This diploma thesis is focused on the evaluation and comparison of the enantioselective potential of two columns CHIRAL ART Amylose-SA and CDShell-RSP using a set of 29 chiral drugs in high performance liquid chromatography. The separations of enantiomers were performed in three modes: reversed-phase, normal-phase, and polar-organic mode. The CHIRAL ART Amylose-SA column was tested in normal-phase mode, the CDShell-RSP column in reversed-phase and polar-organic modes.

The CHIRAL ART Amylose-SA column contains amylose tris(3,5-dimethylphenylcarbamate) immobilized on 3 μm porous silica gel particles. The CDShell-RSP column contains a chiral selector hydroxypropyl- β -cyclodextrin, which is covalently bonded on 2.7 μm superficially porous particles.

In the normal-phase mode, mobile phases composed of hexane and propane-2-ol were used. Furthermore, the effect of various additives (triethylamine, diethylamine, trifluoroacetic acid, and the mixture of diethylamine and trifluoroacetic acid) in the mobile phase on the enantioseparation of chiral drugs was tested. The most universal additive was a mixture of diethylamine and trifluoroacetic acid. A total of 22 chiral drugs were enantioseparated on the CHIRAL ART Amylose-SA column, 10 of them were baseline separated.

Mobile phases for reversed-phase mode composed of 10 mM ammonium acetate (pH 3,0; 4,0; 6,5) or 1% triethylammonium acetate buffer (pH 4,0; 6,5) and methanol in various volume ratios. The best results were obtained in 10 mM ammonium acetate, pH 6,5/methanol (v/v) as mobile phases. Using the CDShell-RSP column, 10 drugs were partially separated in reversed-phase mode.

In the polar-organic mode, mobile phases composed of acetonitrile, methanol, acetic acid, and triethylamine were used. Under these conditions, none of the tested drugs were separated.

Key words: chiral separation, chiral stationary phase, HPLC, drugs