

PC 16 - Chiral Separation of Amino Acids by Using Chitosan derivatives as Mobile Phase Additives

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Chemically modified chitosan can be used as a chiral selector in the separation of racemic compounds. We report here the preparation of N-carboxyalkylated chitosans and their chiral recognition behavior toward DL-amino acids as mobile phase additives in HPLC. Depolymerization of chitosan was carried out with concentrated hydrochloric acid to enhance its solubility. The resulting low molecular weight chitosan (M_w=4500) was subjected to the Schiff base formation with α-ketoacids, followed by reduction with sodium cyanoborohydride to give N-carboxyalkylated chitosans.

The enantiomeric separation of DL-amino acids in HPLC was studied on an ODS column with an eluent containing the chitosan derivatives and copper(II) under a ligand-exchange chromatographic separation mode. The chiral separation of amino acids was effected with N-(1-carboxyisobutyl)chitosan. Two similar chitosan derivatives, N-(1-carboxyethyl)chitosan and N-(1-carboxyphenyl)chitosan, proved to be less effective. These facts indicate that the steric hindrance and the conformation of a ternary complex consisting of a chitosan derivative, amino acid, and copper(II) play an important role in the separation.