Modified silica gel for practical preparative chromatographic resolution of $D, L$-aspartic and glutamic acid derivatives

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Abstract: Common method for chromatographic resolution of racemic mixtures employs chiral absorbent and achiral eluent. Alternatively, achiral adsorbent such as silica gel and eluent containing chiral selector such as $\beta$-cyclodextrin can bring about separation of the two enantiomers. Polar compounds such as amino acids have strong affinity to silica gel therefore the silica surface has to be modified as in C-18 reverse-phase adsorbent. In this study we examine cheaper method for practical separation of less polar derivatives of $D,L$-aspartic acid and glutamic acid obtained from $N$-benzylation of the amino acids. The silica gel used in the separation was modified by simpler and cheaper methods using stearic acid and polyethylene glycol (PEG) then coated on glass plate for preparative thin layer chromatography. Organic solvent systems containing $\beta$-cyclodextrin as a chiral selector were used as the mobile phase and resulted in separation of enantiomers. The effectiveness of separation were observed by comparing the sign (+ or -) and magnitude of the optical rotation of each fractions of the chromatogram.

Keywords: Modified silica gel; Chromatography; $\beta$-Cyclodextrin; $D,L$-Aspartic acid; $D,L$-Glutamic acid