



Enantiomeric separation of 1-phenylethanols by gas chromatography using acetylated gamma-cyclodextrin as stationary phase

Somkiat Toboonpha, Aroonsiri Shitangkoon*

Department of Chemistry, Faculty of Science, Chulalongkorn University, Phayathai Road, Patumwan, Bangkok 10330, Thailand

* e-mail: aroonsiri.s@chula.ac.th

Chiral alcohols are among important precursors or products in pharmaceutical industries. However, each enantiomer of chiral alcohols may exhibit different bioactivity, toxicity or clinical activity. Gas chromatography (GC) can be employed to determine the enantiomeric purity of volatile organic alcohols. In this work, enantiomeric separation of eleven chiral alcohols with different type and position of substitution, based on the core structure of 1-phenylethanol, were studied by GC with split injector and flame ionization detector. Octakis(2,3-di-*O*-acetyl-6-*O*-*tert*-butyldimethylsilyl)- γ -cyclodextrin mixed in polysiloxane was used as a chiral stationary phase to coat on a 15 m long, 0.25 mm I.D. capillary column to provide 0.25 μ m thick film. The influence of temperature as well as analyte structure on retention factor and enantioselectivity were examined. The results showed that all chiral analytes could be separated into their enantiomers with symmetric peak shapes without derivatization. Alkyl substitution at *para*-position of the aromatic ring or at the stereogenic center seemed to provide better enantioselectivity than that of 1-phenylethanol. Among all alcohols studied, 2-methyl-1-phenyl-1-propanol could be enantioseparated with the shortest analysis time.

Keywords: Chiral alcohols; Cyclodextrin; Gas chromatography