

CHAPTER V

CONCLUSION

Forty-six PAMEs with different analyte structure were examined to study the effect of type, position and number of substitution towards enantioselectivity by gas chromatography using capillary GC columns containing different size of derivatized CDs as stationary phases: hexakis(2,3-di-*O*-acetyl-6-*O*-*tert*-butyldimethylsilyl)- α -cyclodextrin (ASiAc) and octakis(2,3-di-*O*-acetyl-6-*O*-*tert*-butyldimethylsilyl)- γ -cyclodextrin (GSiAc). The significance of size of CD to enantioseparation was clearly shown. GSiAc column could separate enantiomers of thirty-four analytes. On the other hand, smaller-size ASiAc column could not separate any enantiomeric pair.

In this research, methyl 2-phenoxypropanoate (H) with no substitution on the aromatic ring was used as a reference analyte. PAMEs with substitution on the aromatic ring showed lower $-\Delta\Delta H$ values than H. GSiAc column could separate eighteen enantiomeric pairs out of twenty-four mono-substituted PAMEs over the temperature range studied. The influence of position of substituent on the aromatic ring of mono-substituted PAMEs on enantioseparation was studied. All *meta*-substituted PAMEs could be enantioseparated. The results suggested that substitution at *meta*-position of the aromatic ring provided good enantioseparation. Among all *meta*-substituted PAMEs, better enantioseparation (high $-\Delta\Delta H$ values) was observed with high electronegativity substitution such as fluoro and trifluoromethyl groups, suggesting the influence of type of substituent on enantioseparation.

For di-substituted analytes, GSiAc column could separate twelve enantiomeric pairs out of eighteen di-substituted PAMEs over the temperature range studied. Difluoro-substituted analytes showed better enantioseparation than dichloro- or dimethyl-substituted analytes. All six isomers of difluoro-substituted PAMEs could be enantioseparated, while only four isomers of dichloro- and only two isomers of dimethyl-substituted PAMEs could be enantioseparated. The results also agreed with mono-substituted PAMEs, suggesting the influence of type of substituent

on enantioseparation. The effect of number of substitution on the aromatic ring could not be concluded as most isomers of tri-, tetra- and penta-substituted PAMEs could not be obtained.

