

CHAPTER V

CONCLUSION

The effects resulting from different sample solvent and mobile phase composition on chromatographic behavior of phenol, L-ascorbic acid, benzoic acid, acetylsalicylic acid and salicylic acid in pH range of 2.5 - 6.5 on multimodal stationary phase which is phenylpropanolamine bonded-silica column with acetonitrile / 30 mM buffer (10:90, 20:80, 30:70, 40:60 and 50:50, v/v) as mobile phase were investigated. The trend of plots between $\log k'$ and % acetonitrile (v/v) in mobile phase of four organic acids *i.e.* phenol, benzoic acid, acetylsalicylic acid and salicylic acid show decreasing of retention which represent hydrophobic interaction predominate. These trends accordance with alkylparaben on phenylpropanolamine column by changing % methanol (v/v) which hydrophobic interaction predominate [6]. On the other hand, L-ascorbic acid shows increasing of retention when % acetonitrile (v/v) is increased which agree with predominant ionic interaction obtained when phenyl-substituted alkylcarboxylate anions as a model on styrene-divinylbenzene copolymeric anion exchanger by decreasing ionic strength of mobile phase [23]. The plots of $\log k'$ by varying % acetonitrile (v/v) in mobile phase show linear curves in low pH range while higher pH show decreasing of linearity.

The sample solvent strength illustrates significant effect to theoretical plates of all these organic acids and enhance at higher pH to produce broadened peak and splitted peak while the retention of all organic acids were rarely affected. The number of theoretical plate (N) for studied compounds depended on solvent strength and pH of mobile phase system. The pattern of decreasing N values by increasing % acetonitrile (v/v) in sample solutions of these organic acids are indicated hydrophobic

interaction which accordance with many drugs in reversed-phase column [22] while increasing of N values by increasing % acetonitrile of these organic acids are indicated ionic interaction perdominate [23].

The species distributions of all organic acids show ionized and unionized species which are used to explain the predominant mechanism. Ionisation of organic acids depend on pH of mobile phase which more ionize when pH were increased and increase ionic character while hydrophobic interaction was reduced. The species distribution of L-ascorbic acid, benzoic acid, acetylsalicylic acid and salicylic acid when using 10 % acetonitrile (v/v) in bulk solution are investigated by potentiometric titration method. Additionally, the pK_a obtained from computer refinement are closed to the values from reference [39].