

## CHAPTER V

### CONCLUSION

The multiple linear regression analysis and a computer program SPSS/PC<sup>+</sup> can be used for analysing data from potentiometric titration of binary weak acids mixtures which their pK<sub>a</sub> values are quite close (  $\Delta pK_a$  was less than 2 ). The multiple linear equations in this study were improved by using the activity dissociation constant (  $K_a^0$  ) of weak acid instead of the concentration dissociation constant (  $K_a$  ) since the ionic strength of solution titrated would be changed during the course of titration.

Titration data ranges applied to analysis affect to the accuracy and reproducible of equivalence volumes of the individual acids obtained. For choosing titration data ranges, it would be classified into 5 methods : Method A , B , C , D and E ( see page 45 - 48 ). From this research , it has been found that the satisfying results of equivalence volumes can be obtained if titration data ranges chosen by Method D are interpreted and the difference between pK<sub>a</sub> values of weak acids is more than about 0.8.

Moreover, it has been found that factors affecting the accuracy and precision of the equivalence volumes of the individual weak acids obtained from titrations of binary weak acid mixtures which their  $\Delta pK_a$  are less than two can be classified into three factors , as followed.

1.  $\Delta pK_a$  : The accurate and reproducible results can not be obtained if the difference between  $pK_a$  values of each acids is less than about 0.8 .

2. The ionic strength of the solution during titration : For the mixture between benzoic acid and potassium biphthalate , the accurate equivalence volumes of each acids can not be obtained since there is a doubly charge ion such as phthalate ion, which its activity coefficient is more affected by changed in ionic strength when compared to singly charge ions, occurred during the course of titration. Whereas the other pairs of acid mixtures titrations , there are only singly charge ions occurred.

3. Titration data ranges applied for analysis : The satisfying results can be obtained if Method D are used for choosing the titration data ranges. The titration data ranges of two-mixed weak acids being interpreted should be within the linearity range of Gran plots of each single acid titrations.

There are many pharmaceutical preparations which compose of two weak acidic compounds. Thus , more study about this research may be useful in pharmaceutical analysis .