CHAPTER 4
CONCLUSION

The main purpose of this research is to study the effect of chromatographic variables in the separation of some anions by ion interaction chromatography. Ion interaction chromatography was used in this work because of its flexibility and advantages over conventional technique such as ion chromatography, spectrophotometry, etc.

There are many variables which must be considered and optimized to control retention and separation. These include the concentration of ion interaction reagent that appeared to accur in the trend that the increase of the concentration causes the anions to be retained longer in the column. Whereas, the increase in the concentration of methanol and the pH of the mobile phase resulted in the faster elution of the anions, the types of ion interaction reagent also affected the separation in the fashion that the longer the alkyl chain, the longer the retention times. In case of the variation of the detection wavelengths, the sensitivity of detection changed when changes of the wavelength were made. The elution order was IO_3^-, BrO_3^-, NO_3^-, I^- and SCN^-, respectively, which depended on the physical and chemical properties of the analytes such as radii of the free ions, hydrophobic, hydrophilic, eluophilic, eluophobic and electrostatic forces.

The investigation of the optimum conditions for separation and analysis of anions was accomplished with the Microsorb MV-100 column, 3 μm (4.6x50 mm) with 5.0 mM heptylamine-phosphate as ion interaction reagent at pH 6.4±3 together 5 % v/v MeOH with a flow rate 0.5 mL/min, employing UV detector at wavelength 200 nm. The linearity ranges of IO_3^-, BrO_3^-, NO_3^-, I^- and SCN^- were found to be 0.04-100, 0.06-100, 0.06-100, 0.06-100 and 0.04-100 ppm, respectively. The detection limit of these anions were found to be 0.031, 0.027, 0.022, 0.030 and 0.027 ppm, respectively.

The relative standard deviations of retention times and peak areas were found to be between 0.029-0.365 (n=5) and 0.626-3.198 (n=5), respectively. The percent recoveries of this method for each anion were found to be between 96.8-99.8. The obtained condition were employed to analyze some anions in drinking and tap water samples obtained from Chiang Mai and Phitsanuloke. There were not iodate, bromate, iodide and thiocyanate found in the samples, but the nitrate was found in all the analyzed sample with the concentration in the range 0.41-2.73 ppm.