

CHAPTER 4

CONCLUSION

The procedures for determination of phosphate and chlorate based on stopped-flow injection technique were investigated.

4.1 Determination of phosphate

The proposed method is based on the phosphate-molybdate-ascorbic acid reactions (the molybdenum blue method). Effect of concentrations of reagents was studied. The suitable concentrations for sodium molybdate, ascorbic acid and nitric acid, were 0.02 M, 0.25 %w/v and 0.15 M, respectively. A linear calibration graph (plot of slope of the stopped-FIgram versus phosphate concentration) in the range of 0.3-6 mg P l⁻¹ was employed for the determination of phosphate in soil samples.

This method showed good precision with RSD being 2.6 % (for 2 mg P l⁻¹; n = 10). The proposed method was successfully applied to determine phosphate in soil samples. Concentrations of phosphate in soil extracted solutions were found in the range of 1.18-9.62 mg P l⁻¹. The results obtained by the stopped-flow injection analysis and conventional batch molybdenum blue method were in good agreement (paired t-test of 95% confident level). Comparing to the standard method, the proposed method consumed much less amounts of reagents and was rapid and more selective.

4.2 Determination of chlorate

Iodometric method was employed to determine of chlorate by using stopped-flow injection analysis. Effect of concentrations of reagents; potassium iodide and hydrochloric acid, was studied. The suitable concentrations were 0.1 M potassium iodide and 7 M hydrochloric acid. a linear calibration graph (plot of peak height of the FI Agram versus chlorate concentration) in the range of 5-50 mg $\text{ClO}_3^- \text{ l}^{-1}$ was used for determination of chlorate in soil samples. This method showed good precision which RSD 2.2 % (for 30 ppm chlorate; n = 10). The results of 20 samples determined by the proposed method were compared to batch method (method of decolorization of indigo carmine) and titrimetric standard method and found that all agreed well with each others (the t-test at 95 % confident level). Comparing to the standard method and batch method, the proposed stopped-FI method consumed smaller amounts of reagents and was more rapid.