

## CHAPTER 4

### Conclusion

Sequential injection colorimetric system was developed for determination of iron, manganese, phosphate and ammonium in water samples. The developed system was successfully applied for monitoring water quality of the Ping river in Chiang Mai province.

A sample system was designed to be able to determine 4 parameters sequentially. Condition for operating the system including concentration of reagents used, flow rate and injection volume were optimized. Under optimum conditions, the sequential injection colorimetric system showed linearity in the range of 0.2 - 10.0 mg L<sup>-1</sup> for iron, manganese and ammonium determinations, and 0.2 - 5.0 mg L<sup>-1</sup> for phosphate determination. The developed system showed good detection limits of 0.05, 0.16, 0.08 and 0.03 mg L<sup>-1</sup> for iron, manganese, phosphate and ammonium, respectively. The precision (n=9) of the developed system was reported as RSD less than 5% indicating that the proposed methods give a good repeatability and high accuracy. Recoveries was obtained in the ranges 81.8 - 118.9%. The proposed system provided analytical results which is comparable to those obtained from batch methods.

Sequential injection colorimetric system offered automatic operation, multi-parameter analysis, low reagent consumption, low detection limit, high precision and cost effective instrument.

The developed system successfully accomplished for determination of iron, manganese, phosphate and ammonium in water samples, which were collected from Ping river in Chiang Mai province. It was used for monitoring water quality of Ping river in year round on February, May, August and November in of 2015. The amount of iron, manganese, phosphate and ammonium were obtained in range of 0.12 - 1.64,

0.28 - 1.84, 0.34 - 4.69 and 0.13 - 16.77 mg L<sup>-1</sup>, respectively. The results showed that the water quality of Ping River is mostly in good condition, except at some sampling point which indicate low water quality due to the effect of wastewater discharges from Chiang Mai community.



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