

CHAPTER 4

CONCLUSION

Flow injection amperometric method for the estimation of antioxidant activity is based on the detection of the decreasing of amperometric current from the reaction between antioxidant and triiodide. Triiodide is produced by the reaction of iodate with iodide in acidic medium. Triiodide undergoes electrochemical reduction on a glassy carbon working electrode at 200 mV versus Ag/AgCl reference electrode producing electrical current. Antioxidant reacts with triiodide leading to the decrease in the electrical current which was directly proportional to antioxidative activity. The amperometric method was combined with FI system to increase degree of automation for analysis, high sample throughput and convenient operation. And it employs low cost chemical reagent and low reagent consumption.

The parameters which affected analytical performance for operating the system efficiently have been optimized and the optimum conditions were obtained as summarized in Table 3.1. Using the optimum conditions, the calibration graph was linear in the range of 8-100 ppm and the limit of detection was 2 ppm. Relative standard deviations were 1.2 and 1.6 for 9-replicate injections of 8 ppm and 100 ppm, respectively. A sample throughput was about 45 h⁻¹. The method is successfully applied for the estimation of antioxidant activity in tea infusion samples. The results from the proposed method were in good correlation with FI-ferrous tartrate method and FI – colorimetric method based on FRAP reaction.

Suggestion for further study on the FI amperometry system using triiodide as a reagent are given as follow: although the method provide a high sensitivity, the preparation of the working electrode is required. The electrode was polished by water slurry of 1 μm alumina particle (Al_2O_3) on a polishing pad for about 2 min to obtain a fresh surface. The standard solution of ascorbic acid and reagent should be kept in amber bottle to protect the decomposition of standard and reagent by light. Further application of the method to other kinds of sample are interesting to investigation.