

## CHAPTER V

### CONCLUSION

#### 5.1 Conclusion

An electrical field assisted liquid phase microextraction (LPME) has been developed for determination of metal oxoanion in aqueous sample. The analyte model for this work was chromium(VI). Cr(VI) in anion form ( $\text{HCrO}_4^-$ ) was extracted through SLM and into the acceptor solution via electrokinetic migration and anion exchange process. 1-heptanol mixed with methyltrioctylammonium chloride (Aliquat336) was used as the extracting solvent. Sodium hydroxide solution was used as the acceptor solution. After the extraction, the concentration of Cr(VI) in the acceptor solution was determined by colorimetric method of Cr-DPC complex, which can be detected by a fiber optic UV-Vis spectrophotometer with z-flow cell at 544 nm.

Parameters that influenced the efficiency were investigated. The optimal conditions for extraction of Cr(VI) were 5% (v/v) Aliquat336 in 1-heptanol, 1.0 M NaOH as acceptor solution, 5 min extraction time, 30 volt applied voltage and 500 rpm stirring rate. The effect of common ions was also studied. The concentration of common ions which is not effect to the extraction efficiency were in the range of  $0.03 - 300 \mu\text{g L}^{-1}$  for  $\text{Cl}^-$  and in the range of  $0.03 - 3 \mu\text{g L}^{-1}$  for  $\text{SO}_4^{2-}$  and  $\text{HPO}_4^{2-}$ .

The method validation shows that the working range is  $3$  to  $15 \mu\text{g L}^{-1}$  with high preconcentration. Accuracy and precision are in the acceptable range. The method detection limit is lower than the regulation of WHO. Moreover, the proposed method was compared to ICP-OES method. The results showed that both methods were not significantly different (t-Test,  $P > 0.05$ ).

In the real sample, ionic salts played an important role as the electrolyte that could enhance the conductance of the donor solution leading to instable system.

The proposed method can be applied for determination of chromium(VI) in water samples with relatively low conductance. Besides, the proposed method was simple, fast, inexpensive, provided high preconcentration factor, and used less solvent, which can be considered as a green chemistry.

## 5.2 Suggestion of future work

The major problem of this work is the limitation of application for sample due to the bubble formation during extraction of water sample with high conductance. High current flow in the system leads to poor repeatability. Various extraction solvents may be studied based on conductance and resistance properties for applying for other water samples. Besides, for improving precision of method, automated system for electrical field assisted LPME is interesting.