ACKNOWLEDGEMENTS

First and foremost, I would like to grateful thank and deeply indebted to my advisor, Assoc. Prof. Dr. Cholticha Noomhorm for advice, encouragement and valuable suggestion for completely writing of thesis. I would also like to thank Dr. Wirunya Keawwattana and Dr. Pinsuda Viravathana, my committees, and also Assoc. Prof. Dr. Nipon Tungkananuruk from the representative Graduate School for their valuable comments and suggestion.

I wish to acknowledge the Department of Chemistry, Faculty of Science, Kasetsart University for making this research program possible.

Finally, I am especially appreciated my parents, my relatives and my friends, who have given me support and encouragement throughout my graduate career. Their love and companionship have been an essential source of strength to me during this course.

> Sarawut Pongpattanapanich May 2007