ACKNOWLEDGEMENTS

The success of this study would have been impossible, if it had not been the support provided by many people and organizations. I would like to acknowledge the support making this thesis successful.

First, I would like to thank my thesis advisor, Assit. Prof. Dr. Marasri Ruengjitchatchawalya and my thesis co-advisor, Dr. Somkeit Techkarnjanaruk. You both immensely shaped and guided for my thesis. Moreover, you also gave me kindly recommended comments on many drafts until being successful in the final thesis. Particularly, I also thank Assoc. Prof. Chalermraj Wantawin, Prof. Boonsirm Withyachumnarnkul and Dr. Sorawit Powtongsook for suggesting the topic and encouragement.

I would like to thank the colleagues from the Algal Biotechnology Lab at KMUTT and colleagues from BAFCO for friendships and their helps.

I am very grateful to the relatives and friends, who encouraged me all time I lived here. You all were my strength and inspiration. By the way, I also thank my friends at a Ph.D. program for their help and understanding throughout my Ph.D. study.

To my parents, Mr. Wichai Sombatjinda and Ms. Suwannee Jiaranaipayuk, thank you for your support and encouragement.