Acknowledgements

I would like to express my deepest and sincere gratitude to the following persons:

- My supervisor, Dr.Prawit Kongjan, for his unconditional support, valuable supervision, valuable suggestion, valuable guidance and encouragement all the time during this work.
- My co-supervisor, Dr.Rattana Jariyaboon, for her helpful insight, the technical supervision, especially for the great help during advanced instrumental analysis.
- My sincere appreciation also goes to all lecturers and staffs under Chemistry Division,
 Department of Science, Faculty of Science and Technology, Prince of Songkla University
 (PSU), Pattani Campus, for the valuable knowledge, encouragement, practical and
 technical assistance.
- Appreciation is also expressed to the Energy Policy and Planning Office (EPPO), Ministry of Energy, Thailand, and Graduate School, Prince of Songkla University (PSU) for financial support of this work.
- Last but not least, I would like to express my deepest appreciation and sincere gratitude to my dear parents for a love, instruction, cheerfulness, encouragement, understanding and respect throughout my life.

Kullachat Sama