

## **Acknowledgement**

The author would like to gratefully acknowledge his advisor, Assoc.Prof.Dr. Supachart Chungpaibulpatana for his helpful comments, advice, kind, guidance, and encouragement throughout his study. The study could never emerged in its present form without his supervision. The author also wishes to express his sincerely gratitude to Assoc.Prof.Dr. Bundit Limmechokchai for useful advices as well as kindly consenting to be the co-advisor.

The author also wishes to faithfully acknowledge Assoc.Prof.Dr. Satha Apornratana and Assoc.Prof.Dr. Thananchai Leephakpreeda for kindly consenting to be members of thesis examination committee.

The author also would like to thank his external examiner, Prof.Dr. Tanongkiat Kiatsirirot for his valuable comments and suggestions.

The author is grateful to Sripatum University for providing the scholarship, and to the Energy Policy and Planing Office--EPPO (formally called the Thailand National Energy Policy Office--NEPO) for their kind contribution in providing partial financial support.

Thanks are extended to Dr. Jerasorn Santisirisomboon for his heartfelt help in constructing the computer program, to Dr. Pongsit Srikhirin for all his valuable suggestions and to Mr. Somlerk Suttichai for his assistance in fabrication of the experimental setup.

Finally, the author would like to gratefully thank to his parents for their endless encouragement, love and sacrifices, to his wife for her continual patronage and patience throughout the hardest time.