

ACKNOWLEDGEMENT

I would like to express sincere thanks to my advisor, Assist. Prof. Dr. Attasak Jaree for his guidance, supervision and helpful suggestion throughout this research. In addition, I am also grateful to Assoc. Prof. Dr. Metta Chareonpanich, and Assoc. Prof. Dr. Somkiat Ngamprasertsith for serving as committee members, and for their valuable comments and suggestions towards the completion of this thesis.

I am very grateful to Department of Chemical Engineering, Faculty of Engineering, Kasetsart University for equipments, facilities and financial support.

Finally, I would like to thank my family, my friends, and everyone who have contributed support and encouragement throughout this entire research work.

Nikorn Sornprom

April 2007