A STUDY ON CONSTITUENTS OF ESSENTIAL OILS FROM THAI VETIVER ROOT

PATCHAREE PRIPDEEVECH

DOCTOR OF PHILOSOPHY

IN CHEMISTRY

ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่ Copyright[©] by Chiang Mai University All rights reserved

THE GRADUATE SCHOOL

CHIANG MAI UNIVERSITY

SEPTEMBER 2007

A STUDY ON CONSTITUENTS OF ESSENTIAL OILS FROM THAI VETIVER ROOT

PATCHAREE PRIPDEEVECH

A THESIS SUBMITTED TO THE GRADUATE SCHOOL IN PARTIAL FULFILLMENT OF THE REQUIREMENTS

FOR THE DEGREE OF

DOCTOR OF PHILOSOPHY

IN CHEMISTRY

ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่ Copyright[©] by Chiang Mai University All right GRADUATE SCHOOL erved

SEPTEMBER 2007

CHIANG MAI UNIVERSITY

A STUDY ON CONSTITUENTS OF ESSENTIAL

OILS FROM THAI VETIVER ROOT

PATCHAREE PRIPDEEVECH

THIS THESIS HAS BEEN APPROVED TO BE A PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY IN CHEMISTRY

EXAMINING COMMITTEE

Asst. Prof. Dr. Sunanta Wangkarn	CHAIRPERSON
Assoc. Prof. Dr. Sugunya Wongpornchai	MEMBER
Assoc. Prof. Dr. Duang Buddhasukh	MEMBER
Copyright Warmy Tally Mai C	MEMBER MEMBER
Dr. Pakawan Puangsombat Dr. Sermsakul Pojanagaroon	MEMBER

28 September 2007

© Copyright by Chiang Mai University

ACKNOWLEDGEMENTS

I am deeply grateful to my supervisor, Assoc. Prof. Dr. Sugunya Wongpornchai, for her excellent supervision, valuable guidance and constant encouragement throughout this study. I also wish to express thanks to my thesis cosupervisor, Prof. Philip Marriott, Australian Centre for Research on Separation Science, School of Applied Sciences, RMIT University, Melbourne, Australia, who guided me on the principle of GC×GC technique and provided kind suggestions on my thesis work. I also would like to thank Assoc. Prof. Dr. Duang Buddhasukh, Assist. Prof. Dr. Sunanta Wangkarn and Dr. Pakawan Puangsombat of the Chemistry Department, Chiang Mai University, and Dr. Sermsakul pojanagaroon, Department of Chemistry, Faculty of Science, Konkean University for their valuable comments.

Many thanks are due to the academic staff of CMU Chemistry Department for their technical help particularly Mr. Pisan Kitsawatpaiboon for GC and GC-MS operating and rice chemistry research lab for all help. I also wish to express my appreciation to the group of separation science, School of Applied Sciences, RMIT University, Melbourne, Australia for their facilitation. I am very much grateful to Mr. Paul Morrison for GC×GC technical services.

I wish to express appreciation to M. R. Samjamjars Rajani and the Royal Project for providing vetiver grass (Mae Hae ecotype), and to the Postgraduate Education and Research in Chemistry Program (PERCH) for the support of GC×GC instrument, and the Royal Golden Jubilee Ph.D. Program for financial support from the Thailand Research Fund.

Last, I would like to express my appreciation to all of my friends and colleagues for their help and encouragement during the course of my study. To my family, I am deeply grateful to my father and mother for their love and understanding.