

**ANALYSIS OF FLUORIDE DISTRIBUTION IN SOIL AT THE  
INSTALLATION POINTS OF REVERSE OSMOSIS  
DRINKING WATER VENDING MACHINES**

**PATCHARAPORN KHAOKHAJORN**

**MASTER OF SCIENCE  
IN CHEMISTRY**

**THE GRADUATE SCHOOL  
CHIANG MAI UNIVERSITY  
FEBRUARY 2011**

ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่  
Copyright © by Chiang Mai University  
All rights reserved

**ANALYSIS OF FLUORIDE DISTRIBUTION IN SOIL AT THE  
INSTALLATION POINTS OF REVERSE OSMOSIS  
DRINKING WATER VENDING MACHINES**

**PATCHARAPORN KHAOKHAJORN**

**A THESIS SUBMITTED TO THE GRADUATE SCHOOL IN  
PARTIAL FULFILLMENT OF THE REQUIREMENTS  
FOR THE DEGREE OF  
MASTER OF SCIENCE  
IN CHEMISTRY**

**THE GRADUATE SCHOOL  
CHIANG MAI UNIVERSITY  
FEBRUARY 2011**

ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่  
Copyright © by Chiang Mai University  
All rights reserved

ANALYSIS OF FLUORIDE DISTRIBUTION IN SOIL AT THE  
INSTALLATION POINTS OF REVERSE OSMOSIS  
DRINKING WATER VENDING MACHINES

PATCHARAPORN KHAOKHAJORN

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

EXAMINING COMMITTEE

*Y. Vaneesorn* ..... CHAIRPERSON  
Assistant Professor Dr. Yuthsak Vaneesorn

THESIS ADVISOR

*S. Watanesk* .....  
Associate Professor Dr. Surasak Watanesk

*S. Watanesk* ..... MEMBER  
Associate Professor Dr. Surasak Watanesk

*Somporn Chantara* ..... MEMBER  
Assistant Professor Dr. Somporn Chantara

24 February 2011

© Copyright by Chiang Mai University

## ACKNOWLEDGEMENTS

I would like to express my heartfelt gratitude to my supervisor, Assoc. Prof. Dr. Surasak Watanesk at the Department of Chemistry, Faculty of Science, Chiang Mai University for his supervision, guidance, continual encouragement and assistance. I would like to thank Assoc. Prof. Dr. Ruangsri Watanesk, as well, for her helpful recommendations. Another thank would be given to Dr. Monton Kongpun, DDS of the International Center for Oral Health (ICOH), Chiang Mai for his guidance on sample collection and some chemicals provision.

I wish to express my thanks to “Center for Innovation in Chemistry: Postgraduate Education and Research Program in Chemistry Higher Education Development Project, Ministry of Education (PERCH-CIC)” for the partial support. I also thank the Graduate School and the Faculty of Science, Chiang Mai University for their partial funding to attend the 10<sup>th</sup> National Graduate Research Conferences for presenting part of my work.

I would like to express my deepest gratitude to my parents for their tender love, continuous care and encouragement.

Finally, I would like to thank those whose names are not listed here, who have one way or another contributed to the success of this work.

Patcharaporn Khaokhajorn