DRYING KINETICS OF *PHALERIA MACROCARPA* LEAVES: EXPERIMENTAL INVESTIGATION AND MODELLING

AZMANSYAH SUDIRMAN

BACHELOR OF CHEMICAL ENGINEERING (ENVIRONMENT) WITH HONOURS

UNIVERSITI TEKNOLOGI MARA

2017

AUTHOR'S DECLARATION

I declare that the work in the thesis was carried out in accordance with the regulation of Universiti Teknologi MARA. It is original and is the results of my own, unless otherwise indicated or acknowledge as reference work.

I, hereby acknowledge that I have been supplied with the Academic Rules and Regulations, Universiti Teknologi MARA, regulating the conduct of my study and research.

Signed : .....

Date : 28/12/2016

Azmansyah Bin Sudirman

Student ID: 2013535857

SUPERVISOR'S CERTIFICATION

We declared that we read this thesis and in our point of view this thesis is qualified in terms of scope and quality for the purpose of awarding the Bachelor of Chemical Engineering (Environment) with Honours.

Signed : .....
Date : 28/12/2016

Main Supervisor
Dr. Nor Fariza Ismail
Faculty of Chemical Engineering
Universiti Teknologi MARA
Cawangan Pulau Pinang
13500 Permatang Pauh
Pulau Pinang

Signed : .....
Date : 28/12/2016

Co-Supervisor
Nurulhuda Amri
Faculty of Chemical Engineering
Universiti Teknologi MARA
Cawangan Pulau Pinang
13500 Permatang Pauh
Pulau Pinang

ACKNOWLEDGEMENT

Thank God, give thanks to the divine mercy and grace period, the energy that is given to me so that I can complete the task successfully.

Firstly, I would like to dedicate this award to the lecturers say my beloved, Dr Nor Fariza Ismail, due to the guidance and supervision for me to complete this task with success. I also want to thank you goes to my parents who gave me a facilitator to complete the work. They give me all the infinite moral support to me to spend effort on this task.

Gratitude also goes to the Puan Nurulhuda Amri, Dr. Fakhrony Sholahudin Rohman and many friends who warn against any of what I have been negligent. They help me by answering any questions to them. The final appreciation, I would like to thank those involved directly or otherwise in the course work issue. Thank love.

ABSTRACT

Phaleria macrocarpa plant is one of the alternative medicines to cure various human health problems. Drying is one of the well-known pre-treatment before the extraction process. In order to determine the efficiency of a drying process, the effective utilization of the temperature supplied is crucial. In this study, the effects of temperature on the drying of *Phaleria macrocarpa* samples were investigated. Drying experiment were conducted with temperatures of 50ºC, 60ºC, 70ºC, 80ºC and 90ºC. The dehydration times for reaching the equilibrium moisture content were approximately 460, 461, 456, 443, 439 minutes for the drying temperature for of 50, 60, 70, 80, and 90°C respectively. The experimental data were using fitted to the polynomial mathematical equation represent by Page model and power mathematical equation represent by Lewis model. These models were evaluated by comparing the coefficient of determination (R^2). The highest value of regression coefficient R^2 which is 0.9987 at temperature of 60^{o}C with k = 0.02137 and n = 1.058 show that Lewis model best fit the experimental data. The best model applied to validate the experimental data using ODE solver which is the Fourth order Runge-kutta method shows the highest value of regression coefficient of R^2 =0.9989 is at temperature 60^{o}C in 461 of drying time.