

**SOLVENT-FREE SYNTHESIS OF CHALCONE BY ALDOL  
CONDENSATION CATALYZED BY SOLID SODIUM  
HYDROXYDE (NaOH)**

**MUHAMAD FARIDZ BIN OSMAN**

**BACHELOR OF SCIENCE (Hons.)  
CHEMISTRY  
FACULTY OF APPLIED SCIENCES  
UNIVERSITI TEKNOLOGI MARA**

**APRIL 2009**

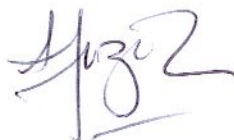
**SOLVENT-FREE SYNTHESIS OF CHALCONE BY ALDOL  
CONDENSATION CATALYZED BY SOLID SODIUM HYDROXYDE  
(NaOH)**

**MUHAMAD FARIDZ BIN OSMAN**

**Final Year Project Report Submitted in  
Partial Fulfilment of the Requirements for the  
Degree of Bachelor of Science (Hons.) Chemistry  
in the Faculty of Applied Sciences  
Universiti Teknologi MARA**

**APRIL 2009**

The Final Year Project Report entitled "**Solvent-free Synthesis of Chalcone by Aldol Condensation catalyzed by solid sodium hydroxide (NaOH)**" was submitted by Muhamad Faridz bin Osman, in partial fulfilment of the requirements for the Degree of Bachelor of Science (Hons.) Chemistry in the Faculty of Applied Sciences, and was approved by



---

Assoc. Prof. Yazan Zakaria  
Supervisor  
B.Sc. (Hons.) Chemistry  
Faculty of Applied Sciences  
Universiti Teknologi MARA  
40450 Shah Alam  
Selangor



---

Dr. Famiza Abdul Latif  
Project Coordinator  
B.Sc. (Hons.) Chemistry  
Faculty of Applied Sciences  
Universiti Teknologi MARA  
40450 Shah Alam  
Selangor



---

Assoc. Prof. Dr. Faizah Md Salleh  
Head of Programme  
B.Sc. (Hons.) Chemistry  
Faculty of Applied Sciences  
Universiti Teknologi MARA  
40450 Shah Alam  
Selangor

Date:  17 MAY 2009

## **ACKNOWLEDGEMENTS**

Upon completion of this project, I would like to express my gratitude to many parties. My heartfelt thanks go to my supervisor, Assoc. Prof. Yazan Zakaria because she gave me a lot of help, advice and support during the completion of this project. I also want to thank my partner, Norizan binti Tajudin who always help me and right here beside me whenever I need helps. Other than that, thank you to all my lecturers and friends who had involved directly and indirectly in accomplishing this project.

Muhamad Faridz bin Osman

## ABSTRACT

### **SOLVENT-FREE SYNTHESIS OF CHALCONE BY ALDOL CONDENSATION CATALYZED BY SOLID SODIUM HYDROXIDE (NaOH)**

Chalcones represent a group of compounds with interesting biological activities that are formed from an aldol condensation between a benzaldehyde and an acetophenone in the presence of NaOH as a catalyst. Although traditionally synthesized using aqueous sodium hydroxide in organic solvents, in this study three different chalcones were synthesized using a solventless procedure. The solvent-free synthesis of three chalcones was carried out by grinding the benzaldehyde (3-nitro, 4-methoxy, 4-chloro) and 4-methoxyacetophenone in the presence of solid sodium hydroxide with a mortar and pestle. Chalcones were obtained in high yields (76-86%), high purity, and shorter reaction time (within five minutes). The results seemed to indicate the success of the solvent-free aldol synthesis which is simple, highly efficient and eco-friendly. For comparison, the three chalcones were also synthesized by the traditional aldol condensation catalyzed by aqueous sodium hydroxide in ethanol afforded lower yield (62-72%) and required longer reaction time (62-75 min).