

**SPECTROSCOPIC ANALYSIS OF UREA-FORMALDEHYDE
RESIN WITH AND WITHOUT ACRYLAMIDE**

NURUL SYAFIKAH BINTI SOHAIMI

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

JANUARY 2016

ACKNOWLEDGEMENT

In the name of Allah, the most Gracious, the most compassionate.

I would like to express my utmost gratitude firstly to Allah, with His willing finally I manage to complete this Final Year Project which is entitled as “**Spectroscopic Analysis of Urea-formaldehyde with and without Acrylamide**”. Secondly, deeply thanks to En. Haslizaidi bin Zakaria as my supervisor and my co-supervisor Pn. Zaimatul Aqmar binti Abdullah who had guided me with great cooperation, suggestion and guidance in completing this project.

I would also like to express my sincere appreciation to En. Amran bin Shafie for his guidance during the lab work process and my program coordinator Dr. Aiza binti Harun for her encouragement and reminders about all the important dates and information for my final year project.

Special thanks to my beloved mom and dad who always give support, advices and always pray for my success. A big thanks also to all my friend mainly Nur Syahira binti Mujib and Siti Hidayah binti Zainuddin, who willing to accompany me at the lab and also to all lab assistants especially En. Mohd. Fauzie bin Idrus and En. Azizi for their constant help. Last but not least, thank you to those who directly or indirectly helping me in completing this project. Thank you so much.

Nurul Syafikah binti Sohaimi

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ABSTRACT

SPECTROSCOPIC ANALYSIS OF UREA-FORMALDEHYDE RESIN WITH AND WITHOUT ACRYLAMIDE

The urea-formaldehyde of 1.2 mole ratio were prepared with and without acrylamide. The acrylamide was used to lower the emission of formaldehyde from urea-formaldehyde resin. The effect of acrylamide on urea-formaldehyde were studied based on the chemical properties. The functional group of the pure and modified urea-formaldehyde was determine by using the Attenuated Total Reflectance-Fourier Transform Infrared (ATR-FTIR) spectroscopy and the thermal decomposition of modified urea-formaldehyde were characterized by using Thermogravimetric Analyzer (TGA). The ATR-FTIR spectra of modified and pure resin show almost no difference. The addition of acrylamide cause the peak at 3329 cm^{-1} become broad due to the increase of $-\text{NH}_2$ amount. It was concluded that acrylamide was successfully introduced in the urea-formaldehyde resin. The acrylamide function in reducing formaldehyde emission during hot pressing at high temperature by forming N,N-bis(hydroxymethyl) acrylamide derivative that will be eliminate at high temperature. The TGA curve show four separate stage which is water, acrylamide, formaldehyde and urea due to the degradation of modified urea-formaldehyde resin and all the component were fully degrade at 900°C .