SYNTHESIS OF HOT MELT ADHESIVE BY USING HEXAMETHYLENE DIISOCYANATE

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

JANUARY 2015

ACKNOWLEDGEMENTS

Assalamu'alaikum warahmatullahi wabarakatuh

First of all, I'm grateful to Allah, with His grace and mercy, able to complete this assigned thesis. Although there are a lot of difficulties but Alhamdullillah, am managed to proceed the project until the end. The second thank to Mr. Haslizaidi B Zakaria for willing to be my thesis supervisor. He deserves a great deal of credit for his knowledge, advice, patient and trust. Then to lecturer's UiTM Cawangan Pahang. Yours guidance will never be forgotten, Insyaallah. To the second examiner, Madam Siti Norhafiza Binti Mohd Khazaai, thanks you so much for your compromise, Insyaallah that will not be forgotten. To Mr. Amran B Shafie, thank you for kindly go to the lab in the morning for its intended use. Thanks to Mr. Fauzi and Mr. Azizi who are willing to accompany, answer any questions and help when needed. And to my colleagues. Thank you so much for willing to stay by my side, hear my complaints, share everything and become my family during every semester.

Last but not least, thanks to the unwavering beloved family. Thanks to Allah, I'm grateful for given me such a lovely parents who really understanding theirs child. I love you so much. Lastly, thank you to those involved in preparing this thesis, either directly or indirectly. Thank you again.

Nur Aqieemah BT R.A Sharifudin

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ABSTRACT

SYNTHESIS OF HOT MELT ADHESIVE BY USING HEXAMETHYLENE DIISOCYANATE

Synthesis of hot melt adhesive based on aliphatic isocyanate which is hexamethylene diisocyanate (HDI) was prepared. Crude palm oil (CPO) was used as replacing petroleum as source of polyurethane production. The polyurethane is prepared by two stages: preparation of unsaturated alkyd resin by using palm oil and polyurethane synthesis. The first stage is by mixing the palm oil with LiOH and heat to 220 °C then added glycerol, lastly added potassium hydrogen phthalate. The second stage is when previous mixture is added with HDI and stir for three hours. The polyurethane synthesize with HDI then be compared with polyurethane synthesize with toluene diisocyanate (TDI) and isophorone diisocyanate (IPDI). The polyurethane then was analyzing using Fourier transform infrared (FTIR) and Thermogravimetry analysis (TGA). The FTIR spectrum show peaks at 1709 cm^{-1}, 1537 cm^{-1} and 1243 cm^{-1} for C=O stretching, N-H deformation and C-N stretching respectively. The TGA result show that the first decomposition occurs at 170 °C and the total percentage weight loss is 95 %. In comparison to PU-TDI and PU-IPDI, the spectrum of PU-HDI show low intense compare to PU-TDI and PU-IPDI meanwhile PU-HDI show high thermal stability than PU-TDI and PU-IPDI.