THERMAL DEGRADATION AND KINETICS ANALYSIS OF *IMPERATA CYLINDRICA* BIOMASS

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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

JANUARY 2017

ABSTRACT

THERMAL DEGRADATION AND KINETIC ANALYSIS of

Imperata cylindrica BIOMASS

Renewable fuel that derived from the plant biomass was the one of the good alternatives to replace the limited and non-environmentally friendly fossil fuel. The research presents the physical characteristics of *Imperata cylindrica* (*I.c*) biomass using TGA and ATR FT-IR instrument. In TGA, the degradation of biomass component such as hemicellulose, cellulose and lignin occur in two stages that release volatile components. By ATR FT-IR, the volatile components can be determine by interpreting the spectrum peak produced. In the proximate analysis, the moisture content, ash, fixed carbon and volatile matter were calculated as 9.7, 7.89, 10.47 and 71.94 weight % respectively after heated in oven and burned in furnace. While, the result that obtained from TG/DTG curve were used for the kinetic analysis of *I.c* biomass. In this analysis two kinetic model which is Kissinger-Akihira-Sunose (KAS) and Flynn-Wall-Ozawa (FWO) model were used to obtain the activation energy E_a. From the result, the range of activation energy for FWO model was 36.552-120.632 kJ.mol^{-1} and for KAS was 32.173-117.793 kJ.mol^{-1} were obtained. This result can be compared to the previous research to know the potential of *I.c* biomass as renewable fuel.

TABLE OF CONTENTS

CHAPTER 4 RESULT AND DISCUSSION

CHAPTER 5   CONCLUSION AND RECOMMENDATIONS

LIST OF TABLES