SIMULATION OF BIOMASS GASIFICATION IN DOWNDRAFT GASIFIER USING ASPEN PLUS

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2017

ACKNOWLEDGEMENT

Alhamdulillah, thank to Allah S.W.T for giving me the strength to finish up this project report. Without Your Willingness, I would not be able to complete this project. It would be impossible to acknowledge adequately all people who have been influential, directly or indirectly in completing this research project. I would like to express my sincere gratitude and appreciation to my supervisor, Prof. Dr. Mohammad Asadullah for his constant encouragement, constructive advises and patient in monitoring my progress in this project. He always gives positive inputs and helpful ideas in the early stages of this project and continued to give his time and concerned throughout the course of this project. He also encourages, guidance, critics and support to make this research project successful. His supports and advice have directly helped me to complete this research project successfully within the time frame. The gratitude also for my research project coordinator, Dr. Siti Noor Suzila Bt Magsood ul Haque and Madam Norasmah Mohammed Manshor for her convenience and valuable information. I owe special debt to families and friends who encouraged me throughout the process of getting the report completed. Their support, love and dedication helped me through when things seem unkind and pleasant. Finally, I hope that this project report will give readers some insight as to information about the Simulation of Biomass gasification in Downdraft Gasifier using Aspen Plus.

ABSTRACT

The purpose of this study is to study the simulation of biomass gasification in downdraft gasifier using ASPEN Plus and to identify the characteristics and chemical composition of biomass. To achieve this objective, the chemical and physical characteristics of biomass and how to simulate the biomass gasification process in downdraft gasifier using Aspen Plus were studied. Simulation of biomass gasification was done using Aspen Plus. The parameter that were used to study the simulation of biomass gasification using Aspen Plus were the effect of gasification temperature and air-fuel ratio towards the amount of syngas produced. It was observed that the gasification product which is syngas was dependent on the gasification temperature and the air-fuel ratio used.

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CHAPTER 1

INTRODUCTION

1.1 Research Background

Nowadays, demand for energy keep increasing because of many factors. Recently, the U.S. Energy Information Administration has released *International Energy Outlook* 2016 (IEO2016) projects that world energy utilization will develop by 48% between 2012 and 2040. Most of this growth will come from countries that are not in the Organization for Economic Cooperation and Development (OECD), together with countries where demand is guided by stable economic advancement, mainly in Asia. Non-OECD Asia, as well as China and India, accounts for more than half of the world's total rise in energy utilization over the forecast period (Doman, 2016). Figure below shows the world energy consumption by source from 1990 to 2040.

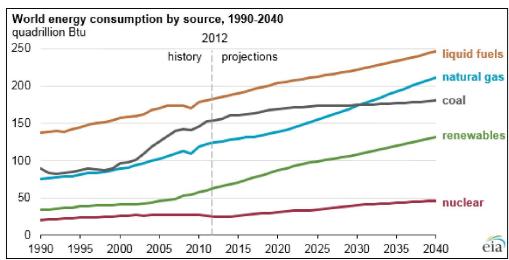


Figure 1.1: World energy consumption by source