

UNIVERSITI TEKNOLOGI MARA

**PHYSICAL CHARACTERISTIC STUDY OF SAW
DUST AS LIQUID FUELS APPLICATION**

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ABSTRACT

Nowadays major issues regarding the climate changes due to the emissions of greenhouse gases and increasing demand on usage of energy due the technological changes and population must be overcome. These issues brought the attentions of researchers on doing extensive study on the energy alternative which is ecofriendly and does not influenced on the global warming. Thus, this research study was focused on the characteristics of saw dust biomass as an alternative for liquid fuel application through analyzing of its physical properties; proximate, heating value, Fourier-Transform Infrared Spectroscopy (FTIR) and Thermogravimetric analysis (TGA). Biomass was good solutions for an alternative for energy production due to its low cost, energy saving and environmental friendly. This study shows the usage of saw dust biomass as an alternative for biofuel energy production towards the environment. The saw dust has high heating value of 3.0394 MJ/kg. Based from the proximate analysis, the saw dust has high volatile matter (60.47%), low fixed carbon content (21.71 %), low ash content (10.86 %) and low moisture content (6.96 %) which indicates it can be used as liquid fuel. On the other hand, FTIR analysis shows the result of the functional group obtain in the sample while TGA analysis produced the result on the mass loss achieved by saw dust sample during pyrolysis which is at 65.8% with high decomposition rate at 3.57 mg/min.

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CHAPTER ONE

INTRODUCTION

1.1 Research Background

Malaysia is a valuable country which rich with non-renewable energy sources (oil and gas) and renewable energy sources (hydro, biomass and solar energy). Nowadays, dependent on the usage of fossil fuels as the source of main power energy for transportations and power generation still in demand. Petroleum derivative are vital which is high in demand for the utilisation in food industry, medical sector and manufacturing.

However, the fossil fuel source-based energy is limited in supply and will increased in price when there is high in demand but less supply. In order to overcome this issue, new resources need to discover for the new production of fossil fuels as back up sources to meet the demands. On the other hand, utilisation of fossil fuels affects the environment in terms of climate changes with increased in temperature causing global warming.

As solved, renewable energy will be as backup energy sources for future needs as to meet the demands and supply. Biomass is the most suitable renewable energy to encounter this matter. Biomass product can be suitable as an alternative fuel for diesel as they are more environmental friendly (Martinez et.al., 2012). Thus, biomass is the most efficient because it has outstanding benefits than fossil fuels and can lower down the emission of greenhouse gases.

Biomass is a form of hydrocarbon material which contains carbon, oxygen, hydrogen and nitrogen. It is produced from organic matter. The energy obtained in the biomass came from the plant and animal which includes organic matter. Biomass energy is easily obtained and can be most found in forestry wood residues such as wood chips, branches, saw dust and tree stamps (Yaman, 2003). With the utilisation of biomass, the dependency on fossil fuels can be reduced as it to overcome the on-going uses on sources that are harming environment and natures in such a large number of ways. The