

UNIVERSITI TEKNOLOGI MARA

**PRODUCTION OF BIO-ETHANOL
FROM FRUITWASTES: BANANA
PEELS**

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ABSTRACT

Bioethanol are known as the renewable energy and an economically friendly type of energy where it can replaced the uses of natural gas and also petroleum in the future. Banana peels are classified in fruit waste category where it can be used as the raw material in producing ethanol since it have high content of cellulose and low content of lignin. This study has conducted in order to observe the concentration of ethanol produce from the banana peels through few steps which were pre-treatment, hydrolysis and also fermentation process. This study were focusing on the effect of pH value on the concentration ethanol from banana peels. Different pH value has been applied in the hydrolysis process where it is in the range of 4 to 12 in order to observe the optimum pH value in producing ethanol.

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CHAPTER 1 : INTRODUCTION

1.1 Research Background

Biofuels are known as the alternative source of energy that can replace the need of petroleum and natural gas in the future since the source of both energy are going to be depleted in the future. The world has been relying on fossil fuels as the primary source of energy. Biofuel also known as a cleaner type of energy since biofuels are low in carbon intensity where it can't directly affect the global warming. In year 2010, the worldwide production of biofuel has reached 105 billion litres where the biodiesel contributed 2.7% of total fuel consumption for road transport in 2010. (Walker, 2013)

There are three types of biofuels which are bioethanol, biodiesel and also biobutanol. Bioethanol is a flammable and renewable liquid produces by the fermentation of biomass, agricultural waste , foodwaste and also fruitwaste. Meanwhile for biodiesel produced through the combination of an alcohol with the recycled cooking grease, animal fat or vegetable oil. During the production biodiesel, glycerin is produced as a by-product where the glycerin is known as a highly combustible chemical but there are some studies said that biodiesel produces a harmful emissions such as carbon monoxide and also particulates to the enviroment. (Walker, 2013) The last type of biofuels is biobutanol where it is derived from algae and bacteria. The fuels that are produced can be directly used in standard gasoline engines without any modification since the fuels produced contains high level of octane.

Banana biomass is one of the second generation of biomass where production of bioethanol from second generation interests many researchers. (Aditiya, dll., 2016) The optimal temperature for banana to grow is at 26.67 °C where banana plant can definitely grow comfortably within the Malaysia's geographical location since Malaysia climate is being hot and humid throughout the year. (Aditiya, dll., 2016) Even though Malaysia is not one of the biggest banana production but the production of banana in Malaysia was large enough for its residue to be produced as well. Banana peel residue was exerted about 117,250 tonnes in year 2012 (Aditiya, dll., 2016) and the number of the banana production kept increasing every year by looking to its positive production every year.