UNIVERSITI TEKNOLOGI MARA

THE PRODUCTION OF BIO-ETHANOL FROM OIL PALM EMPTY FRUIT BUNCH BY ACID HYDROLYSIS AND FERMENTATION PROCESS

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Final Year Project Report Submitted in Partial Fulfilment of the Requirements for the Degree of
Bachelor of Sciences (Hons.) Plantation Technology and Management

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APPROVAL SHEET

This Final Year Project Report entitled "**The Production of Bio-Ethanol from Oil Palm Empty Fruit Bunch by Acid Hydrolysis and Fermentation Process**" was submitted by **Husein Bin Abdul Gani**, in partial fulfilment of the requirements for the Degree of Bachelor of Science (Hons.) Plantation Technology and Management, in the Faculty of Plantation and Agrotechnology, and was approved by

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ABSTRACT

Bio-ethanol can be produced from cellulose and hemicelluloses that originate from many sources of biomass. Oil palm empty fruit bunch is one of biomass that has potential to be a source of glucose which later can be a raw material for the production of bio-ethanol. Acid hydrolysis and fermentation process is known as technique in order to produce bio-ethanol from oil palm empty fruit bunch. The oil palm empty fruit bunch was prepared by thoroughly washed and then oven dried at 60^0C for about three consecutive days. Pre-treatment of oil palm empty fruit bunch was done at 130^0C for about 40 minutes using alkali sodium hydroxide (NaOH). The acid hydrolysis was carried out by using sulfuric acid (H_2SO_4) with 7% and 4% concentration. After that the fermentation process was carried out in the incubator shaker at 30^0C for 48 hours (2 days). The acid with concentration 7% producing 8215.02 μg/ml glucose and 4% acid producing 5221.51 μg/ml of glucose. Based on this result, with high concentration of acid in hydrolysis process, more glucose will be produced and vice versa. The glucose from hydrolysis process than being fermented and the highest bio-ethanol produced were from the glucose produced at 7% sulfuric acid with 2.47%v/v.

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