World Academy of Science, Engineering and Technology
International Journal of Chemical and Materials Engineering
Vol:8, No:12, 2014

Fermentable Sugars from Palm Empty Fruit Bunch Biomass for Bioethanol Production

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Abstract : This study investigated the effect of a dilute acid, lime and ammonia aqueous pretreatment on the fermentable sugars conversion from empty fruit bunch (EFB) biomass. The dilute acid treatment was carried out in an autoclave, at 121ºC with 4 % of sulphuric acid. In the lime pretreatment, 3 wt % of calcium hydroxide was used, whereas the third method was done by soaking EFB with 28 % ammonia solution. Then the EFB biomass was subjected to a two-stage-acid hydrolysis process. Subsequently, the hydrolysate was fermented by using instant baker's yeast to produce bioethanol. The highest glucose yield was 890 mg/g of biomass, obtained from the sample which underwent lime pretreatment. The highest bioethanol yield of 6.1mg/g of glucose was achieved from acid pretreatment. This showed that the acid pretreatment gave the most fermentable sugars compared to the other two pretreatments.

Keywords : bioethanol, biomass, empty fruit bunch (EFB), fermentable sugars
Conference Title : ICCBE 2014 : International Conference on Chemical and Bioprocess Engineering
Conference Location : Penang, Malaysia
Conference Dates : December 16-17, 2014