Comparison of Acid and Enzymatic Hydrolysis of Palm Empty Fruit Bunch for Fermentable Sugar Production

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Abstract

Palm empty fruit bunch (EFB), one of agriculture waste that in abundance in Malaysia, is suitable to be converted to bioethanol production. Two distinguished route; which are acid and enzymatic hydrolysis of EFB were compared in producing fermentable sugars, the intermediates for bioethanol production. The EFB samples were pretreated with low pressure steam heating (LPSH) method before being hydrolyzed to fermentable sugars (glucose and xylose). In acid hydrolysis, the steam treated sample was mixed with 72% (w/w) of sulphuric acid (H_2SO_4) for 2 hours at room temperature and further diluted with distilled water. Subsequently, the mixture was autoclave at 121°C at 1 hour. Whereas, in enzymatic hydrolysis, the steam treated EFB was hydrolysed with cellulase enzyme in 20 % (w/w) in citrate buffer solution of pH 4.8 at temperature of 40°C. A kinetic study was done to evaluate the rate of conversion for both processes. The performance of each process will be compared and discussed.

Keywords: *Acid hydrolysis, Enzymatic, Fermentable Sugars, Bioethanol*