PRODUCTION OF SUGAR REDUCTION FROM COCONUT COIR DUST BY SUBCRITICAL WATER PROCESS

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ABSTRACT

Lignocellulosic material is a material which is very potential to be developed for the manufacture of reducing sugars and then fermented into biofuel. However, the main problem for converting cellulosic materials \((C_6H_{10}O_5)_n\) into cellulose and hemicellulose sugars are bound by lignin and cellulose crystalline structures strongly connected by hydrogen bonds. There are some efforts have been made to destroy the lignin and cellulose crystalline structure damage (then called pretreatment) so that enzymes can easily break the bonds of \(\beta\) - glycosides to form sugars. Our study did pretreatment of lignocellulosic materials with high lignin using subcritical water. Subcritical method will get two products, namely (a) a solution containing sugar and products derived from lignin, (b) solids containing cellulose, hemicellulose and lignin. With research, namely: subcritical water Method: Pretreatment of lignocellulose with subcritical water and solids enzymatic hydrolysis. The crystal structure of the substrate analyzed by XRD and liquid analyzed by DNS. After subcritical water pretreatment, liquid sugar concentration of the best results obtained at a pressure of 40 bar at a temperature of 160\(^\circ\)C, which amounted to 4.96 g / L and yield 10.993\%. The results of hydrolysis is best viewed from reducing sugar concentration by using pure cellulase enzymes at a pressure of 40 bar at a temperature of 160\(^\circ\)C is obtained sugar concentration of 4.55 g / L and yield 15.497\%.

Key word: cellulose; lignocellulose; subcritical water; sugar