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Prevention of Cellulose and Hemicellulose Degradation on Fungal Pretreatment of Water Hyacinth Using Phanerochaete Chrysosporium

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Abstract : Potential degradation of cellulose and hemicellulose during the fungal pretreatment of lignocellulose has led to fermentable sugar yield will be low. This potential is even greater if the pretreatment of lignocellulosic that have low lignin such as water hyacinth. In order to prepare lignocellulose that have low lignin content, especially water hyacinth efforts are needed to prevent the degradation of cellulose and cellulose. One attempt to prevent the degradation of cellulose and hemicellulose is to replace the substrate needed by the addition of a simple carbon compounds such as glucose. Glucose sources used in this study is molasses. The purpose of this research to get the right of concentration of molasses to reduce the degradation of cellulose and hemicellulose during the pretreatment process and obtain fermentable sugar yields on high. The results showed that the addition of molasses with a concentration of 2% is able to reduce the degradation of cellulose from 25.53% to 10% and hemicellulose degradation of 20.12% to 10.89%. Fermentable sugar yields produced only reached 43.91%. To improve the yield of glucose is then performed additional combonation of molasses of 2% molasses and co-factor Mn2+ 0.5%. Fermentable sugar yield increased to 67.66% and the degradation of cellulose and hemicellulose decreased to 2.44% and 2.71%, respectively.

Keywords : water hyacinth, cellulose, hemicelulose, degradation, pretreatment, fungus
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