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Hydrolysis of Corn Stalk Enzymatics using Cellulation Enzyme as an Efforts to Increase Reducing Sugar Levels

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Abstract : Bioethanol can be processed from various types of starchy plants (cassava, corn, seed sorghum, sago), sugary plants (sugar cane, sweet sorghum, beets) as well as cellulose (straw, sawmill residue, bagasse, soybean seed skin). Cellulose is the main constituent of plant cells and is an abundant organic compound on earth. Cellulose material which is not a food ingredient can be used as bioethanol raw material. One of them is corn stalk waste. Corn stalk waste is obtained from the corn harvest. In the corn harvest, there is a cellulose waste that can be utilized, including corn leaves and corn cobs. This study aims to utilize corn stalk waste to obtain optimum reducing sugar levels using variations in cellulase enzyme concentration and hydrolysis time. Before the hydrolysis process, initial processing is carried out using alkaline solutions, namely NaOH, for the delignification process. The variables used in the study include: cellulase enzyme concentration: 2%; 2.5%; 3%; 3.5%; 4% and hydrolysis time: 6, 8 and 10 hours. The effect of Physical treatment and Chemical treatment affect the levels of Lignin and cellulose. After the corn stalk waste has undergone physical and chemical treatment using 10% NaOH, there is a decrease in lignin levels from 12% to 4% and there is an increase in cellulose levels from 40% to 75%. While for the best result is obtained at the enzyme concentration of 3.5% with hydrolysis time of 10 hours which produces a reducing sugar of 2214.900 mg/L.

Key words : Corn stalk waste, Reducing sugar, Cellulase enzyme.

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