

ABSTRACT

EFFECTS OF CELLULASE, α -AMYLASE, AND GLUCOAMYLASE ENZYME CONCENTRATIONS ON REDUCED SUGAR FROM SOLID CASSAVA WASTE

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Solid cassava waste, by product of tapioca industries, contains fiber and starch which can be used as raw materials of bioethanol production. Both fiber and starch of the cassava solid waste are able to be enzymatically hydrolyzed into reduced sugar. The fiber is hydrolyzed with cellulase and the starch is hydrolyzed with α -amylase and glucoamylase. Objectives of this research were to find out cellulase, α -amylase, and glucoamylase concentrations yielding the highest concentration of reduced sugar. To achieve the objectives, the fiber of the cassava solid waste was hydrolyzed with 5, 10, 15, 20, and 25 FPU cellulase enzyme at 40°C, pH 4,8 and 200 rpm for 20 minutes. The cassava solid waste, which has been hydrolyzed with the best concentration of cellulase enzyme, was then hydrolyzed with 0,58; 1,15; and 1,37 μ l α -amylase and 1,1 μ l enzyme glucoamylase/g the cassava waste dry weight. After filtration, filtrate was analyzed to determined its reduced sugar content and residue was analyzed to determine its fiber and starch contents. Research results shown that the best

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cellulase concentration was 25 FPU and yielded 32,19 mg reduced sugar/100mL. A combination of 1,15 μ L α -amylase dan 1,10 μ L glucoamylase/g the cassava waste dry weight was the best concentration of the enzymes and yielded 62,21 mg reduced sugar/100mL.

Key words : cassava solid waste, cellulase, α -amylase, glucoamylase, reduced sugar.