

Theerapong Suksawang 2007: Cassava Waste Fermentation for Amylase Enzyme Production in Packed-Bed Fermentors. Master of Engineering (Chemical Engineering), Major Field: Chemical Engineering, Department of Chemical Engineering. Thesis Advisor: Associate Professor Penjit Srinophakun, Ph.D. 150 pages.

The objective of this research studies was to find the optimum condition of amylase production in 250 ml flask and 30 l packed bed fermentor. To find the suitable % *Rhizopus olisporus* inoculum, the initial moisture content of 100% cassava waste was fixed at 55% and the inoculum was varied 5, 7.5 and 10% of dry substrate. This substrate was incubated at 37 °C, 96 hr. The result showed that 7.5% inoculum gave the maximum amylase activities at 8,987.60 unit/gram of dry substrate at 84 hr. Then the suitable initial moisture content was investigated. The experiment was fixed at 7.5% inoculum but varied the initial moisture of substrate to 50, 55 and 60% at 37 °C for 96 hr of fermentation. From this study, the moisture content 55% gave the maximum amylase activities at 8,987.60 unit/gram of dry substrate at 84 hr. Therefore, the chosen initial condition were 7.5% inoculum and 55% initial moisture content.

Finally, the substrate thickness was varied at 7.5, 10 and 12.5 cm by using the 100% cassava waste as the substrate. The 7.5% of inoculum dry substrate and 55% of initial moisture content were applied. After 12 hr, the air was continuously fed at the flowrate of 0.1 m/s and long baffle pattern was used until 96 hr. The result showed that at the substrate thickness of 12.5 cm, the maximum amylase activities of 8,283 unit/g of dry substrate was obtained at 72 hr of fermentation. Besides, the crude enzyme solution was stored at 4 °C for at least 30 days, and the amylase activity loss 30%.

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Student's signature

Thesis Advisor's signature

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