

## Sakarifikasi dan fermentasi Bagas menjadi Ethanol menggunakan Enzim Selulase dan Enzim Sellobiase

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### Abstrak

The bioethanol development from biomass bases of lignocellulose like bagasse is one of alternative energy which has potential to be applied in Indonesia. Beside of raw material source that is so many in our country, the process is also environmentally friendly. Conversion of bagasse becomes ethanol using Simultaneous Saccharification and Fermentation (SSF) technology by cellulase and cellobiase enzyme had been done on this research. Saccharification process or hydrolysis process, cellulase enzyme will break cellulose polymer becomes glucose whereas cellobiase enzyme will break cellobiose becomes glucose.

Then, glucose through fermentation is changed to ethanol by using yeast *Saccharomyces cerevisiae*. The variations include pH of system that is pH 4, 4,5 and 5, HCl addition low concentrated HCl at pH 5 with variation of concentration that is 0,5 % and 1 %, also variation of sample at pH 5 where bagasse without pretreatment is compared with bagasse which had been done pretreatment by using fungi *Lentinus edodes* for 4 weeks.

The result shows that the use of cellulase and cellobiase enzyme with system optimum condition pH 5 produce ethanol concentration is higher than using only cellulase enzyme at the same pH condition. For substrate concentration 50 g/L, on the use of cellulase and cellobiase, the highest ethanol concentration which is produced bagasse without pretreatment is 5,62 g/L or 11,24 % from bagasse. On HCl addition, the highest ethanol concentration is produced by concentration HCl 1 % with amount 6,52 g/L or 13,04 % from bagasse. With bagasse *L. edodes* and *P. ostreatus* 6 weeks, the highest ethanol concentration that is 6,86 g/L and 6,50 g/L or 13,72% and 12,99% from bagasse. It also shows that HCl addition low concentrated and pretreatment by white rot fungi *L. edodes* and *P. ostreatus* can increase the ethanol quantity that is produced from bagasse conversion.