

Pemanfaatan Selulosa Bagas untuk Produksi Ethanol melalui Sakarifikasi dan Fermentasi Serentak dengan Enzim Xylanase

Staff : M. Samsuri, M. Gozan, R. Mardias, M. Baiquni, H. Hermansyah
and A. Wijanarko, B. Prasetya, dan Mohammad Nasikin
Students : -
Sponsors : -
Email : mgozan@che.ui.edu

Utilization of Bagasse Cellulose for Ethanol Production through Simultaneous Saccharification and Fermentation by Xylanase. Bagasse is a solid residue from sugar cane process, which is not many use it for some product which have more added value. Bagasse, which is a lignosellulosic material, be able to be use for alternative energy resources like bioethanol or biogas. With renewable energy resources a crisis of energy in Republic of Indonesia could be solved, especially in oil and gas. This research has done the conversion of bagasse to bioethanol with xylanase enzyme. The result show that bagasse contains of 52,7% cellulose, 20% hemicelluloses, and 24,2% lignin. Xylanase enzyme and *Saccharomyces cerevisiae* was used to hydrolyse and fermentation in SSF process. Variation in this research use pH (4, 4,5, and 5), for increasing ethanol quantity, SSF process was done by added chloride acid (HCl) with concentration 0.5% and 1% (v/v) and also pre-treatment with white rot fungi such as *Lentinus edodes* (L.edodes) as long 4 weeks. The SSF process was done with 24, 48, 72, and 96 hour's incubation time for fermentation. Variation of pH 4, 4,5, and 5 can produce ethanol with concentrations 2,357 g/L, 2,451 g/L, 2,709 g/L. The added chloride acid (HCl) with concentration 0.5% and 1% (v/v) and L. edodes can increase ethanol yield, The highest ethanol concentration with added chloride acid (HCl) concentration 0.5% and 1% consecutively is 2,967 g/L, 3,249 g/L. The highest ethanol concentration with pre-treatment by L. edodes is 3,202 g/L.

Keywords: bagasse, bioethanol, hemicelluloses, SSF, xylanase, *S. cerevisiae*, *Lentinus edodes*