ABSTRACT

Onggok is solid waste from industrial processing of tapioca flour, obtained from pemarutan and pressing process that can cause environmental pollution. Onggok utilization is still limited to animal feed, additives sauce, and paper industry is still low economic value. Besides it does not interfere with the utilization onggok food program into custody because as a waste or byproduct. Therefore utilized as a raw material for making onggok Bioethanol. This is because Bioethanol is one of the alternative fuel blending premium, but it can save on fuel usage. The purpose of this study was to determine the temperature and the concentration of sulfuric acid (H2SO4) a maximum acid hydrolysis process to manufacture ethanol by fermentation of Saccharomyces cerevisiae onggok samples. Raw materials used in this study is onggok as much as 250 grams of hydrolyzed with 500ml (1:2 w / v). On acid hydrolysis process, onggok added with various concentrations of H2SO4 (sulfuric acid) of which 0.2 M: 0.6 M; 2M and 4 M. Acid hydrolysis process is conducted in a wide range of temperatures of 60oC, 100oC, 120oC, then the results of hydrolysis (hydrolyzate) is separated from his cake, and neutralizing the pH with 2M NaOH solution. Then do a batch fermentation in temperature 30°C incubator shaker with 150rpm speed using the yeast Saccharomyces Cerevisiae for 60 hours, after which the sample per 15 hours in the analysis cell count, sugar residue, Ethanol levels, and pH. Analysis of cell number calculated by the method of using the tool Haemacytometer Counting Chamber, Sugar residues were analyzed using spectrophotometric method with a solution of DNS, while the ethanol product was analyzed by the method Chromatografi Gas (GC).

From the results of this study found that acid hydrolysis
is capable of producing sugar ie 21.11% maximum reduction in 2M H2SO4 concentration and temperature of 120°C. Cerevisae Saccharomyces yeast growth curve reached a point at the 15th logarithmic, so the starter before the fermentation carried out for 15 hours. Results optimum batch fermentation process based on ethanol concentration, ethanol yield achieved in variable hydrolysis with 2M H2SO4 concentration and temperature of 120°C is the concentration of ethanol 17.93 g / L (3.32%) and ethanol yield obtained for 20.98%, the substrate decreases versus time of fermentation processes, greater the concentration of ethanol produced, the greater the reduction of sugar consumed.

**Keywords:** batch fermentation, Saccharomyces Cerevisae, onggok, Counting Chamber