SAUD RICHY JUARA. Detoxification of Cassava’s Acid Hydrolyzate by Activated Carbon Method for Bioethanol Production. Under direction of DWI SETYANINGSIH and INDAH YULIASIH.

Cassava is one of natural resources for carbohydrate that also available for bioethanol production. Starch and fibers hydrolysis maybe conducted on acid condition. The restriction in acid hydrolysis is 5-hydroxymethyl furfural (HMF) and furfural formation, which inhibit yeast fermentation. This study applied two stages of detoxification, which are overliming and activated carbon adsorption methods for lowering HMF and furfural concentrations. In order to obtain tolerable amount in sugar solution, detoxification by activated carbon adsorption was done by concentration of 1%, 2.5%, 5% and 10% and duration of contact are 30, 45 and 60 minutes. The results showed that overliming method decreased HMF and furfural concentrations 34.38% and 60.81%, respectively. Overliming followed by 5% activated carbon adsorption for 30 minutes produced the best sugar solution which has a lower HMF and furfural concentrations by 72.03% and 89.11%, respectively. Adsorption constants of HMF and furfural by 5% activated carbon were 0.044 g/min and 3.7 x 10^{-5} g/min, respectively. The concentration of ethanol produced was 5.00% (b/v) or 63.22% higher than obtained from detoxification by neutralization (NH_4OH) which produced ethanol only 3.06%.

Keywords: detoxification, overliming, activated carbon, HMF, ethanol