Effects of SAA Pretreatment on Fermentation at Low Temperature Using Cellulosic Biomass

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The global annual potential bioethanol production using the lignocellulosic biomass is estimated. However, physical and chemical barriers caused by the close association of the main components of lignocellulosic biomass, hinder the hydrolysis of cellulose to fermentable sugars. Rice straw, corn stover, miscanthus sinensis and empty fruit bunch (EFB) were selected as substrates by their rigidity. The soaking process using aqueous ammonia solution was conducted to pretreatment for break of structural barriers and selective removal of lignin with low cost and easy process for increment of accessibility of cellulose. The enzymatic hydrolysis was performed at 30, 40 and 50 °C. And SHF(separate hydrolysis and fermentation) was performed at same temperature range for looking at the possibility of SSF(simultaneous saccharification and fermentation) at low temperature conditions. SSF was done to investigate characteristics by effect on its enzymatic hydrolysis, temperature, fermentation time, and reaction rate according to pretreatment. As a result performing SSF, SSF at lower temperature conditions than its conventional SSF took feasibility to bioethanol production with SAA pretreatment of cellulosic biomass.