

Hbt compressed water pretreatment of lignocellulosic biomass and its kinetics

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Tulip poplar sawdust was selected as lignocellulosic biomass in this study. Subcritical water(SCW) Pretreatment was conducted with 26.7 ml batch type reactor varying temperature from 180 °C to 220 °C and reaction time from 5 min to 30 min. Enzymatic digestibility of pretreated samples was measured to evaluate the pretreatment. Kinetic study for SCW pretreatment was carried out. Hemicellulose in lignocellulosic biomass was mainly hydrolysed and dissolved in subcritical water. About 96 % of hemicellulose was dissolved in subcritical water at reaction temperature of 220 °C and reaction time of 20 min. About 20 % of cellulose and lignin was dissolved in subcritical water. Enzymatic digestibility of SCW pretreated samples was improved compared to raw sample. Activation energy and pre-exponential factor in Arrhenius equation for hemicellulose hydrolysis reaction were calculated from the experimental results.