Kinetics of pretreatment of biomass using hot compressed water

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Nowadays, because of concern about depletion of fossil fuel, alternative sources are demanded, and Biomass can be an alternative renewable source for the fossil fuel. It is hard to use biomass as resources because of its complex structure and various components. Thus the pretreatment process in which the structure is simplified and components are separated is required. The aim of this process is to fractionate three major components of biomass (cellulose, hemicellulose, and lignin) to increase the yield of fermentable sugars and prohibit the undesired degradation of products that are strong fermentation inhibitors. In this work, hot compressed water (HCW) and batch-type reactors were used for the pretreatment of tulip tree. To understand the reaction and to choose the reaction condition, study about kinetics was conducted. Using some assumption, rate equation was taken. To estimate the equation, the equation was compared to data which gathered using HPLC, WAXRD, SEM, and FT-IR.