

Comparative study on two-step concentrated acid hydrolysis for the extraction of sugars from lignocellulosic biomass

Philip Wijaya^{1,2}, 최재욱¹, 하정명¹, 서동진¹, 김창수^{1,*}

¹한국과학기술연구원; ²과학기술연합대학원대학교

(mizzou333@kist.re.kr*)

The potential of lignocellulosic biomass utilization in bioethanol production is still promising nowadays since its abundant availability on earth and the opportunity to integrate all the downstream products from which the biomass-based processes could be developed. One of the feasible thermochemical conversion processes is concentrated acid hydrolysis, which can be applied to break the crystalline structure of cellulose without further sugar degradation.

This study aimed to investigate the effect of decrystallization sulfuric acid concentration, hydrolysis temperature, hydrolysis reaction time, and biomass species (oak wood, pine wood, and empty fruit bunch (EFB) of palm oil) towards sugar (glucose and xylose) recovery and wood conversion. Analysis of the reaction products was performed by using high performance liquid chromatography (HPLC). Crystallinity degree of cellulose in each raw biomass was also measured in X-ray diffraction (XRD) analysis to study how the cellulose crystalline structure might relate to the ease of biomass conversion.