

### Optimization of planetary mill and enzymatic hydrolysis of Pitch pine (*pinus rigida*) wood sawdust waste using response surface methodology (RSM)

\_\_\_\_\_ 1,2, 3, Robert J. Mitchell<sup>3</sup>, 2, 1,\*  
 1 ; 2 ; 3  
 (leejinh1@kicet.re.kr\*)

Previously we reported the potential using planetary milling to pretreat plant biomass for downstream fermentations. In this study, we investigated the effects of buffering medium, milling time, enzyme quantity and incubation time on enzymatic hydrolysis using a response surface method to find the optimal conditions of pretreatment and saccharification processes. Glucose production was slightly higher at acetate buffer than citrate when it used for milling and enzymatic hydrolysis. Optimal conditions were investigated by changing one independent variable at a time. From the single variable tests, we found the optimal values at 100 min, 16 FPU/g-biomass and 12hr for milling time, enzyme quantity and enzyme reaction time, respectively. Interaction effects of variables on glucose production were investigated by response surface methodology (RSM). From the data of RSM, it was better to increase the enzyme reaction time to improve glucose yield when considered costs of three operational parameters.