

Comparison of Acid and Base Pretreatment of Switchgrass (*Panicum virgatum* L.) for Bioethanol Production

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Abstract : The aim of this study was to compare acid and base pretreatment of switchgrass for bioethanol production. Switchgrass was pretreated with sulfuric acid and sodium hydroxide at 0.5, 1.0 and 1.5% (v/v) at 120, 140, 180 °C for 10, 60 and 90. Optimization of enzymatic hydrolysis of the pretreated switchgrass samples were carried out using three different enzyme mixtures (22.5 mg cellulase and 75 mg cellobiase /g biomass; 45 mg cellulase and 150 mg cellobiase /g biomass; 90 mg cellulase and 300 mg cellobiase /g biomass). Samples were removed at 24-h interval for fermentable sugar analyses with HPLC. The results showed that use of 90 mg cellulase and 300 mg cellobiase/g biomass resulted in the highest fermentable sugar formation. Furthermore, the highest fermentable sugar yield was obtained by pretreatment at 120 °C for 10 min using 1.0 % sodium hydroxide.

Keywords : switchgrass, acid pretreatment, enzymatic hydrolysis, base pretreatment, ethanol production

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