

## **Combined effect of nitric acid and sodium hydroxide pretreatments on enzymatic saccharification of rubber wood (*Heavea brasiliensis*)**

### **ABSTRACT**

A combinatorial nitric acid and sodium hydroxide pretreatment for improving the enzymatic saccharification of rubber wood was proposed in this study. Effects of pretreatment time, temperature as well as nitric acid and sodium hydroxide concentrations on glucose yield were investigated. Rubber wood sawdust was sequentially pretreated with dilute nitric acid and dilute sodium hydroxide, respectively. The pretreated samples were hydrolyzed using cellulase together with  $\beta$ -glucosidase at enzyme loadings of 25 FPU and 60 CBUg/cellulose, respectively. Results from the enzymatic hydrolysis experiments showed that a glucose yield of 95% was achieved (within 24 h of hydrolysis) with rubber wood sample pretreated using 6% HNO<sub>3</sub>, at 100°C for 60 min followed by 1% NaOH at 90°C for 30 min. Comparison of these results with those reported in literature demonstrated that combining nitric acid and sodium hydroxide pretreatments resulted in higher rate of hydrolysis and better cellulose digestibility.

**Keyword:** Lignocellulose; Bioethanol; Pretreatment; Rubber wood; Enzymatic saccharification