

## **Pretreatment of oil palm trunk in deep eutectic solvent and optimization of enzymatic hydrolysis of pretreated oil palm trunk**

### **ABSTRACT**

Deep eutectic solvents (DES) were utilised as pretreatment media on oil palm trunk (OPT) fibre in order to change the morphology of the highly crystalline cellulose prior to enzymatic hydrolysis. Among all the DESs tested, ethylammonium chloride: ethylene glycol (EAC:EG) was found to be the most efficient solvent for the pretreatment of OPT fibre. The pretreatment of OPT by EAC:EG had removed 42% lignin and 83% hemicellulose with the ability to dissolve the OPT biomass (58%) after heating at 100 °C for 48 h. FTIR analysis was used in determining the chemical characteristic changes where OPT treated in EAC:EG had more disruption of hydroxyl bond and indication of delignification compared to OPT treated with other DESs. Enzymatic hydrolysis was carried out on OPT treated in EAC:EG and the highest glucose production (74%) was achieved at 50 °C after 24 h with 15 mg/mL substrate concentration, 50 FPU/g of Celluclast 1.5 L and 100 CBU/ml of Novozyme 188.

**Keyword:** Deep eutectic solvent; Lignocellulosic biomass; Oil palm trunk; Pretreatment; Enzymatic hydrolysis