

## **Physical behavior of hydro-thermally treated oil palm wood in different buffered pH media**

### **ABSTRACT**

This study investigated changes in the physical properties of oil palm (*Elaeis guineensis*) wood (OPW) using various buffered media for the hydrothermal treatment process. The buffered media were prepared separately for three different treatment conditions: pH of 8, pH of 5, and tap water. These treatments were compared with unbuffered, control samples. The OPW samples were taken from the outer part of the trees. The OPW samples were treated with the buffered media at a temperature of 140 °C for 120 min. The parameters evaluated were wood density ( $\rho$ ), equilibrium moisture content (EMC), mass loss (ML), water absorption (WA), volumetric swelling (SV), anti-swelling efficiency (ASE), and water repellent efficiency (WRE), for both treated and untreated samples. The buffered media significantly affected the EMC (%),  $\rho$  (g/cm<sup>3</sup>), ML (%), and WA (%), with no significant effects on the ASE (%) and WRE (%). It was concluded that the hydrothermal treatment in the buffered medium with a pH of 8 had the most significant effect on the physical properties of OPW.

**Keyword:** Oil palm wood; Physical properties; Buffered mediums; Thermal modification