

## **Characterization of particleboard made from oil heat-treated rubberwood particles at different mixing ratios**

### **ABSTRACT**

Particleboard was produced by mixing oil heat-treated rubberwood particles at different ratios, with the goal of achieving high dimensional stability. Rubberwood particles were soaked in palm oil for 2 h and heat treated at 200 °C for 2 h. The treated particles were soaked in boiling water for 30 min to remove oil and were tested for chemical alteration and thermal characterization via Fourier-transform infrared spectroscopy and thermogravimetric analysis. Particleboard was fabricated by mixing treated rubberwood particles (30%, 50%, and 70%) with untreated particles (70%, 50%, and 30%, respective to previous percentages) and bonded with urea-formaldehyde (UF) resin. The results revealed that oil-heat treated particles had greater thermal stability than the untreated particles. The addition of oil heat treated particles improved the physical properties of the particleboard with no significant reduction in mechanical strength. However, this was only valid for ratios of 70% untreated to 30% treated and 50% untreated to 50% treated. When a ratio of 70% oil heat treated particles was used, both the physical and mechanical properties were reduced drastically, due to bonding interference caused by excessive oil content. Particleboard made with a ratio of 5:5 (treated to untreated) exhibited the best physical and mechanical properties.

**Keyword:** Oil heat treatment; Particleboard; Rubberwood; Palm oil; Green treatment