

## **Chemical, colour and strength changes of hot oil treatment process on 15-year-old cultivated acacia hybrid**

### **Abstract**

The chemical, color and strength properties of thermally modified cultivated 15-year-old Acacia hybrid were investigated. Logs of A. hybrid were harvested and cut at the bottom, middle and top sections. The wood later underwent hot oil thermal modification using palm oil at temperatures 180, 200 and 220°C for 30,60 and 90 min. Untreated wood was used as control. The hot oil thermal modification process caused some features changed in the chemical composition, color appearances and strength properties of A. hybrid wood. Parameters such as temperatures and treatment time were closely monitored as they influence the chemical, color and strength changes in the treated wood. Temperatures of 180, 200 and 220°C, and treatment time of 1,2 and 3 h. were used in the study. The degradation in holocellulose, cellulose, and hemicellulose contents was recognized when acacia woods were exposed to oil thermally modified process. Holocellulose and cellulose degraded with the increasing of treatment temperature and duration of heating exposure, while lignin showed the increment in content through this treatment. The color changes in the sapwood and heartwood were measured using the Minolta Chroma-meter CR-310 and the results are presented according to the CIE L\* a\*b\* color co-ordinates system. The results show that temperature at certain treatment time enhanced and darkened the treated wood. The color of the treated sapwood can be enhanced to match the color of the natural. A hybrid heartwood. The strength properties of the oil heat treated A. hybrid wood decreases in values of both MOR and MOE throughout the treatment process. The decreases in values were influenced by temperature and duration of the treatment