

## **Effect of extraction solvent on mechanical properties of particleboard produced from cultivated Acacia hybrid**

### **Abstract**

In this study, Acacia hybrid was divided into bark, sapwood and heartwood. Each portion undergone Soxhlet extraction according to ASTM Standard D1108- 96, D1107- 96 and D1110-84, but the solvents from the standard was changed to different solvent polarities that were hexane, methanol and hot water. In producing particleboard, large amount of wood particles were extracted using the ratio of extraction on wood particle to solvent extraction; 1 g of wood particle to 10 ml of solvent extraction for 6 h of extraction period. Wood particles were glued using urea formaldehyde and the targeted density was 500 kg/m<sup>3</sup>. Particleboards produced were tested on static bending and internal bonding according to ASTM D1037-06a. Results shown that particleboard made from methanol extracted wood particle for sapwood and heartwood had a significant difference at  $P \leq 0.05$  for MOE, MOR and internal bonding. Sapwood extracted by methanol was 0.5 times higher for both MOE and MOR, and 0.3 times higher for internal bonding as compared to control sapwood particleboard. Meanwhile, heartwood extracted by methanol was 2.0 times higher for MOE and MOR as compared to the control heartwood, and 0.6 times higher for internal bonding as compared to control heartwood particleboard. Bark extracted by hexane was 0.4 times higher for MOR, 2.0 times for MOE as compared to the control bark, and 0.3 times higher for internal bonding as compared to control bark. Generally, wood particles extracted by different extraction solvents could be used to produce particleboard but better properties of particleboard were observed for methanol extracted sapwood and heartwood, and hexane extracted bark.