



Tropentag, September 17-19, 2018, Ghent

“Global food security and food safety:  
The role of universities”

## Properties of Particleboards Manufactured from Acetylated Poplar Wood

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### Abstract

The aim of this study was to investigate the possibility of using acetylated poplar wood particles in the manufacturing of particleboard panels.

Three effective factors were studied namely; periods of impregnating and heating with phthalic anhydride, and levels of resin content in boards: two levels of heating time ( 1/2 and 1 hr.), three levels of impregnating period ( 6, 9, and 12 hrs. ), and three levels of resin content ( 8, 10, and 12 % ) were studied. In addition control panels were also manufactured for comparison. All particleboard panels were produced by using urea-formaldehyde as an adhesive at target board density of 0.60 gm/cm<sup>3</sup>. pressing time used in the experiment was 15 minutes.

The physical and mechanical properties of the manufactured panels were tested according to American Standard ( ASTM-standard D-1037-72 ). The result showed, that impregnating periods as a factor had a high significant on weight percent gain, while heating time had no significant effect on this property, it appeared that the panels made from particles acetylated with phthalic anhydride for particled 12 hrs. gave highest average of WPG compared with the periods ( 6 and 9 hrs. ).It was also noticed that the panels produced from acetylated impregnated for 12 hrs.had lower tendency to absorb water, to swell in thickness and to expand linearly after exposing to 50 and then to 90 % relative humidity in comparison to the other treatments along with the control samples.

The results also showed, that resin content as a factor had significant effect On modulus of rupture, modulus of elasticity, and on internal bonds of produced panels,it appeared that panels made at 12 % resin content had higher values of the mechanical properties in contrast with the other two levels of resin, while the effects of impregnating with phthalic anhydride and heating time were not significant.

**Keywords:** Acetylation, particleboard, Properties, Wood