PRODUCTION OF BIORESIN BY PARTIAL REPLACEMENT OF PHENOL IN PHENOL FORMALDEHYDE FORMULATION WITH SODA PULPING

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CANDIDATES DECLARATION

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ABSTRACT

PRODUCTION OF BIORESIN BY PARTIAL REPLACEMENT OF PHENOL IN PHENOL FORMALDEHYDE FORMULATION WITH SODA PULPING

Bioresin of formaldehyde-based has been prepared by replacing phenol with lignin extracted from black liquor of *Acacia mangium*. Lignin content used in this study is 81% from light hardwood source. A comparison with commercialized phenol-formaldehyde (PF) was done to see the performance of lignin-phenol-formaldehyde (LPF). Both resin has been characterized using Fourier Transform Infrared (FTIR) and Thermogravimetric Analysis (TGA). The results showed LPF has similar structure characteristics and have higher thermal stability than PF. The specification of resin such as pH, non-volatile content (NVC) and viscosity has done in the study. The pH showed that LPF resin is acid, NVC (36.9%) and viscosity (1264 cps). The strength of plywood using LPF adhesives tested by shear test. A *t*-test analysis has performed showing both modulus of rupture (MOR) and modulus of elasticity (MOE) are not significant. Therefore, LPF higher in MOE with 512.701 MPa while PF higher in MOR with 2.19 MPa.