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Tannin – Phenol Formaldehyde Resins As Binders for Cellulosic Fibers: Mechanical Properties

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ABSTRACT

In this study Eucalyptus tannin (T) was isolated from outer bark of Eucalyptus trees; as sodium phenoxide salt and used as extender or copolymer into phenol formaldehyde (PF) resin at five percent (10, 20, 30, 40 and 50)% W/W. Tan-nin-phenol formaldehyde (TPF) and tannin formaldehyde-phenol formaldehyde (TFPF) resins that synthesized in this study were evaluated as adhesive material for cellulosic fibers by study the mechanical properties of the composite sheets .The results show that the substituting of (PF) with tannin at (10 – 50)% W/W give resins with mechanical properties comparable or near to those of pure (PF) , where the tensile strength at break (Tb) ranging from 15.15 Mpa to 22.27 Mpa as compared with 17.6 Mpa for pure (PF); while the impact strength properties (Im) of composites sheets increased with increased the (T) percents which were about 5.16 KJ/m2 for (TPF – 10%) and 7.21 KJ/m2 for (TPF - 50%) .On the other hand modification of (T) to tannin formaldehyde resin (TF) appear less performance at the results of this study , this effect probably to low penetration of (TFPF) resins between the small voids of cellulose fibers when soaked it in resin solutions. In general the results of this study indicate that the Eucalyptus tannin can be used for par-tial substitution of (PF) to produce resins with feasible mechanical properties and can be used in some applications of (PF) resins.

KEYWORDS

Tannin, Tannin-formaldehyde Resins, Phenol- formaldehyde Resins, Mechanical Properties

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