

Mimosa Tannin - Starch - Sugar Based Wood Adhesive

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Abstract : At present, formaldehyde based adhesives such as urea formaldehyde (UF), melamine formaldehyde (MF), melamine - urea formaldehyde (MUF), etc. are mostly used in wood based panel industry because of their high reactivity, chemical versatility, and economic competitiveness. However, formaldehyde based wood adhesives are produced from non-renewable resources. Hence, there has been a growing interest in the development of environment friendly, economically competitive, bio-based wood adhesives in order to meet wood based panel industry requirements. In this study, as formaldehyde free adhesive, Mimosa tannin, starch, sugar based wood adhesives were synthesized. Citric acid and tartaric acid were used as hardener for the resin system. Solid content, viscosity, and gel time analyzes of the prepared adhesive were performed in order to evaluate the adhesive processability. FTIR characterization technique was used to elucidate the chemical structures of the cured adhesivesamples. In order to evaluate the performance of the prepared bio-based resin formulation, particleboards were produced in a laboratory scale, and mechanical, physical properties of the boards were investigated. Besides, the formaldehyde contents of the boards were determined by using the perforator method. The obtained results revealed that the developed bio-based wood adhesive formulation can be a good potential candidate to use wood based panel industry with some developments.

Keywords : bio-based wood adhesives, mimosa tannin, corn starch, sugar, polycarboxylic acid

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