Adhesive based upon polyvinyl alcohol and chemical modified oca *(Oxalis tuberosa)* starch

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Abstract

The preparation of adhesive for lignocellulosic substrate was studied using polyvinyl alcohol (PVA) and native oca (O*xalis tuberosa*) starch as raw materials. At first, native starch was chemically modified by means of acid hydrolysis and a subsequent urea treatment. Afterward, adhesive preparation was conducted with native and modified starch, separately, according to three PVA: starch ratios (1,0:0,3; 1,0:1,0 and 1,0:1,7). Characterization was performed in terms of Fourier transform infrared spectroscopy (FTIR), instantaneous viscosity and shear strength. An analysis of the results within a functional groups context permits to corroborate the presence of starch carbamates as a product of the chemical modification processes. On the other hand, FTIR analysis of adhesive showed a significant intensity variation in the band associated to alkanes group at around 2900 cm^{-1}. Moreover, viscosity and mechanical results exhibit similar trends concerning not only to raw materials but also to native and modified starch compositions. Lowest values of viscosity and shear strength were observed at 1,0:1,0 ratio which suggest that the crosslinking in adhesive structure seems to be reduced with equal proportions of PVA and starch. From a visco−mechanical perspective, both adhesive with high concentrations of native starch and those with low composition of modified starch exhibit similar results.

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Biography

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