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Study of the behavior of biodegradable starch/polyvinyl alcohol/rosin blends

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Highlights:

- -Biodegradable potato starch/PVA/rosin blends were developed.
- -Addition of rosin to the blends improves mechanical properties substantially.
- -Mechanical properties are comparable to those offered by polymers such as LDPE.
- -Starch/PVA/rosin blends could be interesting materials for packaging applications.

Abstract

Biodegradable potato starch/PVA samples containing different concentrations of rosin were prepared by melt-mixing in order to study the enhancement of the properties of native starch films. Glycerol and polyvinyl alcohol (PVA) are commonly used as plasticizers of starch. Their relatively low molecular weight (compared with starch) contributes to a good processability. Rosin is a renewable product whose incorporation in the starch/PVA matrix induces processing aid and reinforcing effects. Its relatively high molecular weight might prevent its migration to the surface of the final product. Water content, solubility in water, mechanical properties, microstructure and dynamic mechanical analysis of the samples were studied. The addition of 8% rosin to starch/PVA blends led to tensile strength values higher than 10 MPa and elongation at break values close to 2000%, values comparable to those offered by conventional polymers used in

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