



#### ABSTRACT

The main disadvantage of biodegradable starch-based films is their hydrophilic character, which leads to low stability when these materials are submitted to different environmental conditions. The higher lipid content (1.36%) of oat starch compared to other traditional starches could impart more hydrophobic characteristics to its films, thereby increasing stability. The objective of this work was to investigate the behavior of oat starch films (produced by casting) and sheets (produced by extrusion), plasticized with urea, glycerol or sorbitol, and conditioned at 11, 57, 76 and 90% relative humidity (RH). In general, the increase of RH results in a decrease of stress and an increase of strain at break, independent of the type of plasticizer. The  $T_g$  of materials plasticized with polyols was similar. The extruded sheets were more permeable to water vapor than the casted films. Films containing urea presented a relative crystallinity (5.14%) four times lower when compared with the other films, but the same behavior was not observed for sheets. The lipid content of oat starch was not high enough to avoid altering of mechanical properties as a function of RH. When the two processes (*casting and extrusion*) applied for materials production were compared, similar trends were observed on the final effects.

<http://www.sciencedirect.com/science/article/pii/S0928493108002269>

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