WATER VAPOUR BARRIER PROPERTIES OF STARCH AND POLY(BUTYLENE ADIPATE-CO-TEREPHTHALATE) (PBAT) FILMS CONTAINING SOYBEAN OIL

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The use of thermoplastic starch (TPS) films as packaging is limited by its high water vapour permeability (WVP). Some studies indicate that adding PBAT, a more hydrophobic polymer than starch, reduces WVP, although the values are still high in comparison to the WVP of conventional films. Soybean oil (SO) can reduce WVP improving greater hydrophobicity in the matrix of films. This study evaluated the effect of the addition of 0, 0.5 and 1.0% SO to TPS+PBAT films produced by blow extrusion on WVP. Films with 100% TPS were used as controls. The values for WVP and the water vapour solubility ($\beta_w$) and diffusion ($D_w$) coefficients were determined at 33, 64.5 and 90% relative humidity (RH) with a gradient of 33% of RH. The TPS+PBAT films did not vary in thickness (p>0.05). The WVP of TPS+PBAT films was lower than in the 100% starch films. Films with 0.5% SO added had significantly reduced WVP, $\beta_w$ and $D_w$ at 64.5% RH compared to the TPS+PBAT films, and WVP similar to the of polyethylene films. The SO films were no different from the TPS+PBAT at 90% RH. The addition of low quantities of oil significantly reduced WVP, which was associated with the reduction in water vapour solubility and diffusion, although the effect of SO on WVP was dependent on the RH.