

Properties of particleboards made from *Acacia seyal* var. using UF-tannin modified adhesives

ABSTRACT

The aim of this study was to investigate the effect of adding a blend of tannins to commercial urea formaldehyde (UF) on the properties of particleboard made from wood particles of *Acacia seyal* var. *seyal*. The tannins were extracted from the bark of *Acacia seyal* var. *seyal* (Ass) and *Acacia nilotica* subsp. *tomentosa* (Ant) with hot water (initial temperature was 90 °C), using a ratio of powdered bark to water of 1:6 (w/v). The tested *Acacia* species (Ass and Ant) exhibited high tannin contents (82.18% and 73.09%, respectively). A blend from the two tannin types (BT) was made (1:1 w/w) and added to UF in the form of a concentrated solution (35%) at three different percentages (5%, 10% and 15%, weight/weight). The different UF–BT formulations were used to produce particleboards (340 mm × 340 mm × 10 mm in size). The obtained panels were tested according to the BSEN relevant standards and showed high mechanical properties, compared to the ones produced by solely UF. It was also observed that the addition of BT to UF did not improve the physical properties of the panels (thickness swelling (TS) and water absorption (WA)), but the results obtained were slightly higher than the ones for the UF panels.

Keyword: Tannins; UF; *Acacia nilotica* subsp. *tomentosa*; *Acacia seyal*; Particleboard