Effect of Bark content on the Physical and Mechanical Properties of Phosphate Bonded Wood Composites of Black Wattle (Acacia mearnsii De Wild)

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Aim

The presence of bark in wood-based panels leads to undesirable properties, and debarking as an option can be cost implicative. This study investigates the effect of bark content on some properties of phosphate bonded composites made from Black Wattle.

Introduction

Black wattle (Acacia mearnsii) is a fast growing invasive leguminous tree. Apart from the commercial value of its tannin-rich bark, the timber is used for firewood and building purposes. The waste from the processing of the species can be considered as potential feedstock for the production of phosphate bonded wood composites.

Experimental procedure

Wood chips and bark of Black Wattle were milled, mixed and bonded with magnesium phosphate cement. The effect of bark content on the properties of the composite was investigated using a central composite design (CCD).

Results

The addition of bark to phosphate bonded wood composites increases the density, MOR, and MOE. The best effect was observed at bark loading of 50% of the wood content.

Conclusions

It is clear that wood waste can be processed without removing the bark to produce phosphate bonded wood composites. From this study, the addition of bark improves the properties evaluated on the composites.

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