

ABSTRACTS (MASTER THESIS)

Development of Wood-based Molding bonded with Tannin and Sucrose

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Introduction

Recently, synthetic adhesives derived from fossil resources are used in many wood-based materials. However, considering the finite fossil resources, it is desirable to replace natural-based adhesives based on non-fossil resources. Condensed tannin has been used as a main raw material for tannin-based adhesives. Conventional tannin-based adhesives are usually synthesized by reacted with compounds derived from fossil resources such as formaldehyde. It is beneficial to develop a tannin-based adhesive composed of only natural materials derived from bio-resources. In this research, sucrose was used as a raw material for a tannin based adhesive. The physical properties of wood-based molding bonded with the tannin adhesive were investigated.

Materials and Methods

Wood powder of *Acacia mangium*, tannin and sucrose were used in this research. Powder size of materials was 60 mesh pass (under 250 μ m). Dried raw materials were added to a beaker, and shaken sufficiently by hand. Mixture of powder was added to dies, and pressed to yield molded products by hot press. The mixture ratios of tannin and sucrose were 100:0, 75:25, 50:50, 25:75 and 0:100. The contents of adhesive were 0~40wt%. Three-point bending and repeated boiling tests were performed to evaluate physical and mechanical properties of the molded products.

Results and discussion

Figure 1 shows the relationship between the adhesive content and bending properties under the mixing ratio of 50:50 with tannin and sucrose. The bending properties were increased with increasing of adhesive content, and modulus of rupture (MOR) of 33.3wt% adhesive content was 39MPa. In addition, this molding had good water resistance. Consequently, there is a possibility that a mixture of tannin and sucrose can be used as a natural adhesive for wood-based molding.

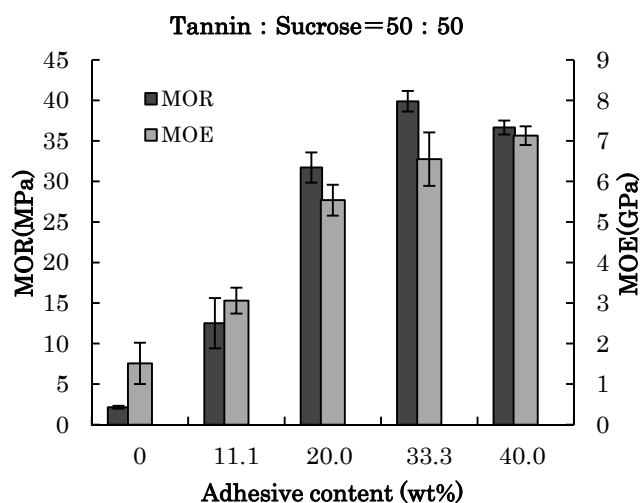


Fig1. Effects of adhesive content on bending properties
Molded at 200°C, 4MPa, for 10minutes