

ALTERNATIVES NON-WOOD FIBERS FOR PACKAGING APPLICATIONS: AN EVALUATION OF AMMONIUM SULFITE AS A POTENTIAL PULPING METHOD FOR CORRUGATING MEDIUM AND LINER

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ABSTRACT

Traditional kraft and soda processes often pose challenges for non-wood materials due to the high content of non-process elements in the spent liquor [1]. A solution to the complex chemical recovery system for handling spent liquor can be found in non-sodium alkaline methods, such as ammonium sulfite. This method has the added benefit of being usable as a soil amendment or value-added product [2]. The current study contrasts the mechanical properties of non-wood pulps, processed through an alternative non-sodium technique (ammonium sulfite semi-chemical process), with conventional OCC and softwood pulps used in manufacturing corrugated medium and liner grades. Wheat straw, Miscanthus, and Switchgrass were exposed to specific pulping conditions, yielding pulps with a total yield ranging from 58% to 80%. These conditions were evaluated at various cooking times and then compared with refined OCC and softwood, targeting different freeness values. The handsheets of non-wood pulps were refined and assessed, and the Wheat straw pulps demonstrated higher mechanical properties in several areas compared to OCC. Miscanthus pulps showed comparable behavior to OCC, while Switchgrass performed below conventional fibers. The study's findings indicate that adjustments in ammonium sulfite pulping conditions can significantly influence the mechanical properties of non-wood pulps, particularly in Wheat straw and Miscanthus. These modifications can be strategically employed to create suitable fibers for manufacturing packaging grade.

Keywords: non-sodium alkaline pulping, corrugated medium, liner, Semi-chemical process, OCC (Old corrugated containerboard), STFI, CTM test.

References:

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