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Abstract

Steam explosion treatment is used to modify crop materials such as sugarcane bagasse, straws asraw fiber materials attributes for pulp and paper production and fiberboard manufacturing. In particular, the effect of steam pressure and retention time on morphology and lignin, holocellulose and α -cellulose contents of bagasse was investigated. Bagasse were cooked with saturated steam at pressure of 17 and 19 bar for 2 and 5 minutes in a steam explosion batch reactor. After steam explosion treatments, proportion of large particles decreased, while fiber bundles increased. Higher steam pressure and longer retention time resulted in more homogeneous fiber-like material and darker fibers. Chemical analysis of the pulp before and after steam explosion treatments showed that optimum condition for the production of pulp and paper from the bagasse fiber is 19 bar with retention time of 2 minutes according to the high holocellulose and α -cellulose contents and low lignin content. Optimum condition for binderless fiberboard production is 19 bar with retention time of 5 minutes because of high lignin content which is a required property for gluing the fiber bundle. The severity values of the treatment were in the range of 3.45-4.05 showing that the greater amount and smaller size of bagasse pulps were obtained with increasing severity of steam explosion treatment.

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Keywords : Steam Explosion, Bagasse, Holocellulose, Lignin and α -cellulose

Advisor