INTEGRATION OF A KRAFT PULPING MILL INTO A FOREST BIOREFINERY: PRE-EXTRACTION OF HEMICELLULOSE BY STEAM EXPLOSION VERSUS STEAM TREATMENT (AUTOHYDROLYSIS).

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ABSTRACT

Growing interest in alternative and renewable energy sources has brought increasing attention to the integration of a pulp mill into a forest biorefinery, where other products could be produced in addition to pulp. To achieve this goal, hemicelluloses could be extracted from wood prior to pulping by alkaline extraction, acid hydrolysis, steam explosion, autohydrolysis, etc.

In this work, Eucalyptus globulus chips were subjected to either steam explosion or autohydrolysis and their subsequent effects in kraft pulping and paper strength have been evaluated. Results showed that similar hemicelluloses extraction was achieved with both pre-treatments (32-67% of pentosans), increasing the extraction when the severity of the treatments increased. Although both pre-treatments increased delignification during pulping, steam explosion was significantly better: 12.9 kappa number against 22.6 for similar autohydrolysis pre-treated pulps and 40.7 for control pulp. Finally, similar reductions in paper strength were observed, independently of the type of treatment and severities assayed.