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Evaluation of Optimized Conditions of Modified Kraft-Anthraquinone Cooking Processes Using Laboratory Wood-Cooking Equipment

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Abstract: Various kinds of modified cooking methods have been used in many kraft pulp mills to improve properties of pulp from wood. Furthermore, anthraquinone compounds have been used as cooking additives to improve both delignification and pulp yield. This paper discusses the way to apply 1,4-dihydro-9,10-dihydroxy-anthracene sodium salt (SAQ), one of the anthraquinone compounds, to the recent modified cooking processes. In order to investigate the conditions of modified cooking, we developed laboratory cooking equipment that can reproduce the cooking by a mill-digester. The equipment has a small autoclave in which part of the cooking liquor can be added separately.

Using the equipment, kappa numbers of hardwood kraft pulp could be decreased by exchanging part of black liquor with fresh white liquor at the middle of cooking process. When the entire amount of SAQ was added at the beginning of cooking, the pulp yield at a given kappa number was more efficiently improved than when it was separately added at the beginning and the middle, the effect of SAQ, meaning the improvement of the pulp yield, was as good or better under the various alkali-concentrations than when the entire amount of white liquor was added at the beginning of cooking. The amount of the anthraquinone compound in black liquor extracted at the middle of cooking was only less than 5% of the total charge.

Keywords: kraft pulp, continuous cooking, anthraquinone, hardwood, laboratory



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