

Defence announcement

Public Defence on 23 Month 2024

Impregnation of mill chips in Kraft cooking

Title of the doctoral thesis	Studies on phenomena involved in impregnation of industrial wood chips
Content of the doctoral thesis	<p>In chemical pulping, sufficient and uniform impregnation of cooking chemicals into the wood tissue is prerequisite for effective cooking process and homogenous pulp quality. The transport of the cooking chemicals takes place by two mechanisms: penetration and diffusion. Although both mechanisms occur in parallel, their separate and combined influences on impregnation have been seldom studied in the same research.</p> <p>In the thesis, a new experimental method was developed and used for increasing understanding for impregnation. Practical outcomes and guidelines for the impregnation of all industrial wood chips were the following: Fresh wood chips are recommended to use. Impregnation should start with pre-steaming for the removal of air hindering of impregnation. Moderate alkali concentration should be used in order to avoid the risk of running out of alkali if the temperature is raised quickly to the cooking temperature after the impregnation. In addition, it was observed that lower impregnation temperature reduces the yield loss of the impregnation.</p> <p>Effective and uniform impregnation increases pulping yield and the homogeneity of the pulp. Besides, with shorter processing times the size of equipment can be decreased while keeping at least the same production capacity. The findings, developed experimental concepts and created knowledge of this thesis can be utilized in a wide range of different chemistries and raw materials for the production biobased materials and products in the future.</p>
Field of the doctoral thesis	Chemical pulping
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Remote defence	https://aalto.zoom.us/j/64668499024
Place of public defence	Aalto University School of Chemical Engineering, PuuL1, Vuorimiehentie 1, Espoo
Opponent(s)	Professor Richard Gustafson, University of Washington, USA
Custos	Professor Olli Dahl, Aalto University School of Chemical Engineering
Link to electronic thesis	https://aaltodoc.aalto.fi/handle/123456789/51
Keywords	impregnation, penetration, diffusion, mill chips, industrial wood chips