Wpływ mycia wyporowego na zawartość ligniny i kwasu heksenuronowego w masie siarczanowej świerkowej

Influence of Displacement Washing upon Lignin and Hexenuronic Acid Content of Spruce Kraft Pulp

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W artykule opisano wahania liczby kappa, zawartości ligniny i kwasu heksenuronowego przed i po myciu masy siarczanowej z drewna świerkowego.
Mycie wyporowe zastosowano do masy siarczanowej świerkowej o siedmiu poziomach liczby kappa. Zaobserwowano, że spadek zawartości ligniny po myciu zależy od liczby kappa masy. Największe zmiany zaobserwowano w przypadku zawartości w masie ligniny Klasona. Wymywanie ligniny było najmniejsze w przypadku mas o najniższej liczbie kappa. Mycie wyporowe miało znaczący wpływ na skład kwasu heksenuronowego w mytej masie.
Słowa kluczowe: *masa siarczanowa świerkowa, mycie wyporowe, kwas heksenuronowy, liczba kappa, lignina*

The paper deals with the variation of the kappa number, lignin and hexenuronic acid content of the washed and unwashed spruce kraft pulp. The displacement washing was carried out with the spruce kraft pulp having seven levels of kappa number. It was noticeable that the depletion of lignin content after washing depends upon the kappa number of the pulp. The most variation was found in the Klason lignin content of the pulp. The leaching of lignin was least for the pulp with the lowest kappa number. Hexenuronic acid composition of the unwashed pulp was hardly affected by the displacement washing.
Keywords: *spruce kraft pulp, displacement washing, hexenuronic acid, kappa number, lignin*

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Introduction

Kraft brown stock contains a complex mixture of different unexpected soluble materials including desirable cellulose fibres. A larger part of soluble materials is lignin which degraded from the wood by the reaction of chemicals used for cooking. First and foremost objective of brown stock washing is to remove undesirable soluble chemicals from the mixture. It is a dynamic process, which makes the use of material balance techniques of great importance to identify how well the system is operating. Inefficient brown stock washing negatively affects the all next operations of the mill as well as the quality of the finished products [18].

Displacement washing is the most efficient washing operation in comparison to all other washing processes. Theoretically, one volume of wash liquor should displace the same volume of soluble substances from the pulp bed [3]. But, the reality is far away from the theory because of interfacial mixing and diffusion of soluble substances into the wash liquor. Although brown stock contains many chemical compounds, the content of either lignin or sodium or both in the washed pulp or effluent liquid determines the washing efficiency. Grähs [5, 6] examined the comparative efficiency of washability of sodium and lignin for the pine sulphite pulp. Sodium can easily be washed out than lignin because of its higher mass transport coefficient. Although lignin washed out faster than sodium at the beginning of washing, the slow diffusivity of lignin compounds makes it more difficult to remove from the bed at the end. However, the last section of the washing breakthrough curve always indicates the leaching mechanism which prevails over the displacement mechanism [15]. The lignin adsorbed on the fibres