545b Extraction of Hemicellulose from Mixed Southern Hardwood Using Hot Water Extraction

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The kraft process is the most widely used in chemical pulping technology. Up to 20% of wood weight, in the form of hemicelluloses, is removed from the fibers during kraft cooking. Degraded hemicelluloses, in waste pulping liquor, are combusted during the kraft recovery process. The heating value of wood carbohydrates of 13.6MJ/kg is only half that of lignin. Therefore, a more economical use of hemicelluloses would be to extract them as oligomers, prior to pulping, followed by conversion to higher value-added products such as ethanol, polymers and chemicals. In order to maintain a high pulp yield as well as the integrity of cellulose, in the cooked pulp, a fundamental understanding of the kinetics of hemicellulose removal during the extractive treatment is required. This paper presents the influence of the operation conditions such as temperature, time as well as chip dimensions on the extraction yield of hemicelluloses from mixed southern hardwood by using hot water. A (modified) Dionex ASE-100 (Accelerated Solvent Extraction Equipment) was utilized at elevated pressures. The compositions of the extract as well as that of theextracted wood were determined by HPAEC analysis. GPC is also utilized to determine the molecular weight distribution of hemicelluloses in the extract.