

Hemicellulose Recovery from Lignocellulosic Material Hydrolyzed by Water

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Various recovery methods were investigated to maximize hemicellulose recovery from lignocellulosic material hydrolyzed by pure water. The pretreatment conditions of water hydrolysis were 170~180°C and 1 hour of reaction time. The percentage of xylan solubilized increased as the temperature increased from 170 to 180°C. However, significant decomposition of sugar was observed at temperature of 180°C. From the results of water hydrolysis, the total amount of glucan in solid residue and liquid hydrolyzate was close to the total glucan in the original biomass. For hemicellulose, however, there was a significant difference between both contents. To prove this difference, various recovery methods were proposed. From the total sugar accountability (sugar in liquid + sugar in solid), it was confirmed that hemicellulose recovery in the hydrolyzate was increased if the product including both hydrolyzate and solid residue was physically stimulated by such as heating and ultrasound irradiation. This indicated that, in commercial scale processes that much bigger substrate sizes are used and a sufficient amount of leaching solvent can not be used after pretreatment, a significant amount of oligomers could be trapped in the solid matrix.

References

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