

Ethanol production from hydrolysate of hot-water wood extracts by *Pichia stipitis*

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Hot water extraction of sugar maple woodchips at 160°C produced an extraction liquor containing hemicellulosic oligomers and extractives. The hot-water extract was concentrated and hydrolyzed with 1.5 wt% H₂SO₄. The supernatant of the hydrolysate was neutralized with Ca(OH)₂ and again the solids were removed. The remaining liquor was twice diluted with 10 times of fresh tap water and concentrated with a nanofiltration membrane. The resulting concentrated hydrolysate of hot-water wood extracts was used as the substrate for *Pichia stipitis* to produce ethanol. Xylose was found to be the main sugar in the wood extract hydrolysate and the total sugar concentration in the concentrated hydrolysate was over 15%. The kinetics of the mixed sugar consumption and ethanol production is studied after diluting the concentrated hydrolysate with fresh water. Both high concentration of mixed sugar and the aromatic compounds remaining in the hydrolysate are inhibitory to cells. There was a delay in ethanol production after sugar consumptions. Glucose was first converted, mannose and galactose were also preferentially utilized. Arabinose and rhamnose were not consumed after 40 hours cultivation.

Biography

Shijie Liu holds a Ph.D of Chemical Engineering from The University of Alberta. He is a Professor of Paper and Bioprocess Engineering at The State University of New York – College of Environmental Science and Forestry. He is the Associate Director of Biorefinery Research Institute. He has published more than 80 papers in reputed journals and serving as the Editor-In-Chief of the Journal of Bioprocess Engineering and Biorefinery, and an Executive Editor of the Journal of Biobased Materials and Bioenergy.

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