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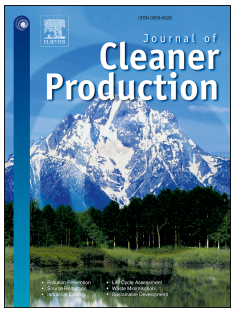

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Optimizing xylose production from pinewood sawdust through dilute-phosphoric-acid hydrolysis by response surface methodology

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Abstract: Response surface methodology was used to optimize the xylose production from pinewood sawdust through dilute-phosphoric-acid hydrolysis. The effects of independent variables on xylose yield were investigated, including reaction temperature (75–175 °C), reaction time (0–7.2 h), solution-to-feed ratio (4–20 mL/g), and phosphoric-acid concentration (0–6.67 wt%). Results indicated that the individual factor H_3PO_4 concentration and the interacting factors including temperature × time, temperature × H_3PO_4 concentration, and solution-to-feed ratio × H_3PO_4 concentration were all significant factors. Long reaction time (> 5.4 h) and high phosphoric-acid concentration (> 5%) showed little effect. Xylose yield increased with increasing temperature up to 125 °C. Higher phosphoric-acid concentration and larger solution-to-feed ratio also increased xylose yield. The coefficient of determination,