

*Optimization of Substrate and Enzyme Concentrations in Xylose Liquid Sugar
Production Using Response Surface Methodology*
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ABSTRACT

Hemicellulose content in coffee skin can be degraded through enzymatic hydrolysis process using xylanase enzyme into reducing sugar, namely xylose, to increase added value. This study aims to optimize the concentration of substrate and enzyme to produce optimum xylose content using Response Surface Methodology. The factors tested consisted of substrate concentration (10%, 15%, 20%) and enzyme concentration (1%, 3%, 5%). The optimized responses were xylose, glucose, and yield levels. The resulting xylose content was 0.3-0.6 mg/mL, glucose content was 0.4-0.8 mg/mL, and the highest yield was produced at the lowest substrate concentration of 33.249 mg/mL. The optimization results with Central Composite Design (CCD) statistical experimental design were 12.537% substrate concentration and 4.016% enzyme concentration with xylose content of 0.556 mg/mL, glucose content of 0.715 mg/mL, and yield of 27.756 mg/mL. Hail validation xylose content of 0.523 mg/mL, glucose content of 0.754 mg/mL, and yield of 24.984 mg/mL, these values are close to the predicted value and can verify the suitability of the model. Total sugar content in the best treatment was obtained at $63.44 \pm 0.17\%$.

Keywords: *Xylanase Enzyme, Enzymatic Hydrolysis, Xylose, RSM*