

Optimization of concentrating temperature and seed concentration in xylose crystal sugar production using Response Surface Methodology
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ABSTRACT

This study was conducted to determine the optimal concentrating temperature and concentration of crystal seeds in producing crystal xylose from hydrolysate of coffee skin waste. The method used in this research is Response Surface Methodology with two factors, namely concentrating temperature (50°C, 60°C, and 70°C) and seed concentration (2%, 4.5%, and 7%) as well as three responses, namely xylose content, glucose content, and yield. The resulting xylose content was 0.409 mg/mL to 0.703 mg/mL, the resulting glucose content was 0.562 mg/mL to 0.848 mg/mL, and the yield was 23.791 mg/mL to 44.206 mg/mL. The best treatment resulting from the Central Composite Design (CCD) design is with a concentration temperature of 63.9°C and the addition of 7% seeds with xylose levels of 0.654 mg/mL, glucose levels of 0.759 mg/mL, and yields of 41.135%. The validation result of xylose content was 0.615 mg/mL, glucose content was 0.787 mg/mL, and yield was 38.705 mg/mL. These values are close to the predicted values and can verify the suitability of the model. The best treatment resulting from the CCD design was carried out physical color testing resulting in $L^ = 37.349$, $a^* = 14.388$, and $b^* = 26.426$, total calorie test of 3.524 kcal/g, and total sugar of 64.31%.*

Keywords: *Xylose, Crystallization, Crystal Seedling, and Response Surface Methodology*