

Optimization of xylose production from sago trunk cortex by acid hydrolysis

ABSTRACT

Sago trunk cortex is a renewable source for the production of many useful products, such as xylose and xylitol. The potential of bioconversion xylose to xylitol from sago trunk cortex is justifiable as these materials are cheap and widespread sugar sources. Lignocellulose type of residue such as sago trunk cortex structure can break to their monomeric sugars with hydrolysis process. Various hydrolysis temperature and acid concentration at constant temperature were investigated to evaluate the potential maximum xylose concentration in the sago trunk hydrolysate. The objectives of this study were to determine the composition of sago trunk cortex and the effects of sulphuric acid (H₂SO₄) concentration and hydrolysis time on the production of xylose from sago cortex waste. Response surface methodology (RSM) based on central composite design (CCD) was used to optimize the hydrolysis conditions in maximizing the xylose concentration. The optimum hydrolysis time and acid concentration found were 60 min and 8%, respectively. Under these conditions, the xylose concentration achieve was 22.78 g/l. The study provides efficient analysis on optimizing xylose concentration, in order to obtain higher productivity and yield of xylitol.

Keyword: Sago trunk cortex; Xylose; Xylitol; Response surface methodology; Dilute acid hydrolysis