

Development of Microwave-Assisted Alkalic Salt Pretreatment Regimes for Enhanced Sugar Recovery from Corn Cobs

Authors : Yeshona Sewsynker

Abstract : This study presents three microwave-assisted alkalic salt pretreatments to enhance delignification and enzymatic saccharification of corn cobs. The effects of process parameters of salt concentration (0-15%), microwave power intensity (0-800 W) and pretreatment time (2-8 min) on reducing sugar yield from corn cobs were investigated. Pretreatment models were developed with the high coefficient of determination values ($R^2 > 0.85$). Optimization gave a maximum reducing sugar yield of 0.76 g/g. Scanning electron microscopy (SEM) and Fourier Transform Infrared analysis (FTIR) showed major changes in the lignocellulosic structure after pretreatment. A 7-fold increase in the sugar yield was observed compared to previous reports on the same substrate. The developed pretreatment strategy was effective for enhancing enzymatic saccharification from lignocellulosic wastes for microbial biofuel production processes and value-added products.

Keywords : pretreatment, lignocellulosic biomass, enzymatic hydrolysis, delignification

Conference Title : ICBBCB 2017 : International Conference on Bioinformatics, Biomedicine, Biotechnology and Computational Biology

Conference Location : Cape Town, South Africa

Conference Dates : November 02-03, 2017