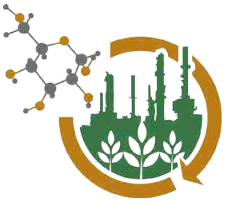

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POTENTIAL OF AGAVE BAGASSE FEEDSTOCK FOR BIOREFINERY – HYDROTHERMAL PRETREATMENT

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Abstract

Agave bagasse (AB) has been studied as potential feedstock for bioethanol production in Mexico. AB is a tequila industry residue mainly composed by cellulose, hemicellulose and lignin. Under biorefinery concept, high added-value compounds need to be produced in order to have an economically feasible process. Hydrothermal pretreatment aims to solubilize and depolymerize hemicellulose, using water as reagent at high temperatures. Therefore, high added-value compounds such as xylooligosacharides (XOS) and furfural, among others, can be obtained. Using a simple mathematical formula known as severity factor ($\log R_0$), pretreatments that were carried out at different conditions of temperature and time can be easily compared. The aim of this work was to characterize the AB and compare the behavior of hemicellulose at different conditions of hydrothermal pretreatments using the severity factor. The experiments were carried out using a batch reactor with PID controller at temperatures from 160-200ºC, 1:10 and 1:15 solid/liquid ratio and residence times from 0-100 min. Results showed the solubilization and depolymerization of the hemicellulose at the three temperatures tested. The highest concentration of XOS was found above $\log R_0$=3.9 where the maximum concentration was 11.97 g/L of XOS at $\log R_0$=4.40. The highest concentration of furfural was 6.57 g/L, in this condition the presence of XOS was nearly 0, thus meaning the degradation of hemicellulose at harsh conditions (200ºC). Results evidence the use of AB as a potential raw material for bioethanol production.