

# Comparison of Acid and Alkaline Methods for Pretreatments of Sugar Cane Bagasse

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The sugar cane bagasse (SCB), the major byproduct of the sugar and alcohol industries in Brazil, could be used to increase ethanol production, in function of its abundance and low cost. The enzymatic hydrolysis is a promising way for obtaining sugars from SCB, but the low enzymatic accessibility of the native cellulose is a key problem in this processes. For this reason, the pretreatment of biomass is required to remove lignin and hemicellulose, reduce cellulose crystallinity and increase the porosity of the materials, enhancing the susceptibility of this material to enzyme action. In this context, there is great interest in developing a simple and cost-effective method for biomass pretreatment, which increase the formation of sugars by enzymatic hydrolysis and avoid the degradation of carbohydrate and the formation of byproducts inhibitory to the subsequent fermentation processes. In this study were compared acid and alkaline methods for pretreatments of the bagasse. Acid pretreatment of SCB was carried out at 122°C for 30 minutes with dilute hydrochloric acid (0.5, 1.0 and 2.5%, v/v) and in the alkaline pretreatment was used calcium hydroxide (1%, m/v) in temperatures of 65°C and 122°C for different incubation time. In all experiments was used a solid:liquid ratio 1:10 (m/v). The results showed that both methods altered the SCB structure in function of the mass reduction of the original biomass and high concentration of sugar released, which depends on treatment time, temperature and chemical agents. Although, the acid pretreatment release more reducing sugars than alkaline pretreatment, the HPLC analysis is being done to determine the composition of hydrolysate for a possible utilization as fermentation media.

Key words: Acid hydrolysis, Alkaline hydrolysis, Pretreatment, Sugar cane bagasse.

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