Pretreatments as important factors in chemical composition of different sugarcane bagasse varieties: engineered Brazilian sugarcane

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ABSTRACT

Brazil is the first country concerning sugarcane production, followed by India and China. The utilization of this kind of biomass is integral, ranging from extraction of sugarcane broth, to the application of their inputs for energy generation and synthesis of bio-based products. Many varieties of sugarcane are produced in biotechnological centers, aiming pest-resistant seedlings with greater genetic potential. Sugarcane biomass is basically composed of hemicellulose, cellulose and lignin – chemical structures that are tightly linked to each other and are responsible for the integrity of the vegetal. The present work has as objective to show the influence of pretreatments into chemical compositions of 5 different bagasse varieties (CTC-9; CT99-1906; SP81-3250; RB86-7515 and CT99-1902) and the sugar composition presented in the hydrolysates. Bagasses from different varieties were first milled in knife mill using a 20 *mesh* sifter, and then moisture determination was performed before pretreatments. The pretreatment conditions for acid (15% w/v ratio, H_2SO_4 2.5%, 150 °C, 30 min) and alkaline (1:10 s/l ratio, NaOH 1%, 100 °C, 60 min) hydrolysis were performed in thermostatic bath using 200 mL reactors and 125 mL Erlenmeyers flasks in autoclave, respectively. As previous results the hydrolysate compositions concerning sugars (xylose: 17.69 to 22.59 g/L; glucose: 10.65 to 13.19 g/L; arabinose: 0.51 to 2.75 g/L) were analyzed. The compositions of biomass were available in sugarcane bagasse *in natura* and after each pretreatment (acid and alkaline). The results show biomass

pretreatment as important the step into obtainment of fermentable sugars for second generation ethanol production, considering different varieties of sugarcane bagasse. Authors acknowledge CAPES and FAPESP (08/57926-4) for the financial support.

Keywords: Sugarcane bagasse, cellulose, hemicellulose, lignin, acid hydrolysis, alkaline hydrolysis, enzymatic hydrolysis.