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**Successive pretreatment and enzymatic saccharification of sugarcane bagasse in a packed bed flow-through column reactor aiming to support biorefineries**

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**Abstract**

A packed bed flow-through column reactor (PBFTCR) was used for pretreatment and subsequent enzymatic hydrolysis of sugarcane bagasse (SCB). Alkaline pretreatment was performed at 70°C for 4h with fresh 0.3 M NaOH solution or with liquor recycled from a previous pretreatment batch. *Scheffersomyces stipitis* NRRL-Y7124 was used for fermentation of sugars released after enzymatic hydrolysis (20 FPU.g<sup>-1</sup> of dry SCB). The highest results for lignin removal were 61% and 52%, respectively, observed when using fresh NaOH or the first reuse of the liquor. About 50% of cellulosic and 57% of hemicellulosic fractions of pretreated SCBs were enzymatically hydrolyzed and the maximum ethanol production was 23.4g.L<sup>-1</sup> (ethanol yield of 0.4 g<sub>p</sub>.g<sub>s</sub><sup>-1</sup>), with near complete consumption of both pentoses and hexoses present in the hydrolysate during the fermentation. PBFTCR as a new alternative for biorefineries is presented, mainly considering its simple configuration and efficiency for operating with a high solid:liquid ratio.

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