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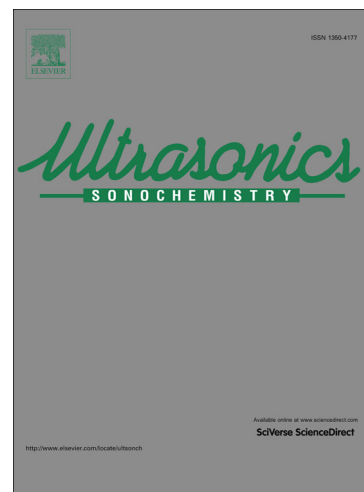
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**A new approach for bioethanol production from sugarcane bagasse
using hydrodynamic cavitation assisted-pretreatment and column
reactors**

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Abstract

Hydrodynamic cavitation (HC) was adopted to assist alkaline-hydrogen peroxide pretreatment of sugarcane bagasse (SCB). In the following condition: 0.29 M of NaOH, 0.78 % (v/v) of H₂O₂, 9.95 min of process time and 3 bar of inlet pressure, 95.4% of digestibility of cellulosic fraction was achieved. To take the best use of the pretreated biomass, the overall process was intensified by way of employing a packed bed flow-through column reactor and thus enabling to handle a high solid loading of 20%, thereby leading to cellulose and hemicellulose conversions to 74.7% and 75%, respectively. In the fermentation step, a bubble column reactor was introduced to maximize ethanol production from the pretreated SCB by *Scheffersomyces stipitis* NRRL-Y7124, resulting in 31.50 g/L of ethanol, 0.49 g/g of ethanol yield and 0.68 g/L.h of productivity. All this showed that our HC-assisted NaOH-H₂O₂ pretreatment strategy along with the process intensification approach might offer an option for SCB-based biorefineries.

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