



# Ultrasonic pretreatment of lignocellulosic feedstock as substrate for sugar based biotechnology in an industrial scale

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Agro-industrial residues generated by agricultural crops processing are abundant sources of lignocellulosic feedstocks, which could be further processed into added-value platform chemicals (sugars, lignin, polyphenols etc.). Using wheat straw as feedstock and following the biorefinery concept, this topic was investigated within the BBI project US4Greenchem (H2020) developing a versatile integrated protocol.

Delignification is a primary step in biomass pretreatment for further fermentation to sugars. Besides mechanical grinding, the ultrasonic pretreatment in flow-mode exploiting strong acoustic cavitation at room temperatures. The aim of the pretreatment was to enhance the sugar yields after the following enzymatic hydrolysis.

Herein we report the successful process scaling-up to an industrial demonstration setup. Starting from a preliminary study using ultrasonic baths all the main working parameters have been optimized and transferred to larger scale flow reactors. Thanks to the strong cavitation fields by optimizing the sonication parameters the yield of the enzymatic hydrolysis could be significantly improved even in larger scales. As a result, the ultrasonic pretreatment of biomass could provide an energy saving and efficient alternative to other established pretreatment methods.

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