MECHANICAL PRETREATMENT EFFECT ON CELLULOSE ENZYMATICAL HYDROLYSIS

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ABSTRACT

Lignocellulosic materials are very interesting for the production of bioethanol after chemical or enzymatical hydrolysis of cellulose. To optimise production rate and increase the output of these processes, different kinds of pre-treatments (grinding, steam explosion,...) are often needed for opening the fibrous structure of the cellulose and increase the specific surface of the materials. The present study is focused on two models of “pure” cellulose (cellulose C200 microtechnik, cellulose FD100 FMC biopolymer) in order to analyse the effects of mechanical pretreatments on the kinetics and yields of hydrolysis. The crystallinity index differentiates the two celluloses. Hydrolysis is realized by a cellulase mix (cellulase Trichoderma reesei C2730, Novozyme; cellulobase Aspergillus niger C6105). Results present the influence of homogenisation pretreatment and analyse different parameters of this technology.

METHOD

RESULTS

CONCLUSION

This study shows that mechanical shearing pretreatments have significative effects on the kinetics and yields of hydrolysis of cellulosic substrates. Results show that similar effects are observed for the two models of “pure” cellulose, homogenisation increasing the specific surface of the substrate and allowing an increase of the kinetics and the yields of hydrolysis.