

# Supporting information: The influence of the explosive decompression in steam explosion pretreatment on the enzymatic digestibility of different biomasses

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Received Xth XXXXXXXXXXXX 20XX, Accepted Xth XXXXXXXXXXXX 20XX

First published on the web Xth XXXXXXXXXXXX 200X

DOI: 10.1039/b000000x

## S1 Scanning electron microscopy

### S1.1 Experimental

Scanning electron microscopy (SEM) was used to study selected biomass samples. A small amount of biomass was oven dried for 24 h at 45° C and fixed on conductive polycarbonate stickers with graphite (G3347, Plano, Germany). For sputtering the samples a sputter coater (MED 010, Bal-Tec, Liechtenstein) was used and the samples were coated with a 5 nm thick layer of platinum. The microscope (Leo 1530, Zeiss, Germany) was operated at an acceleration voltage between 2 and 5 kV.

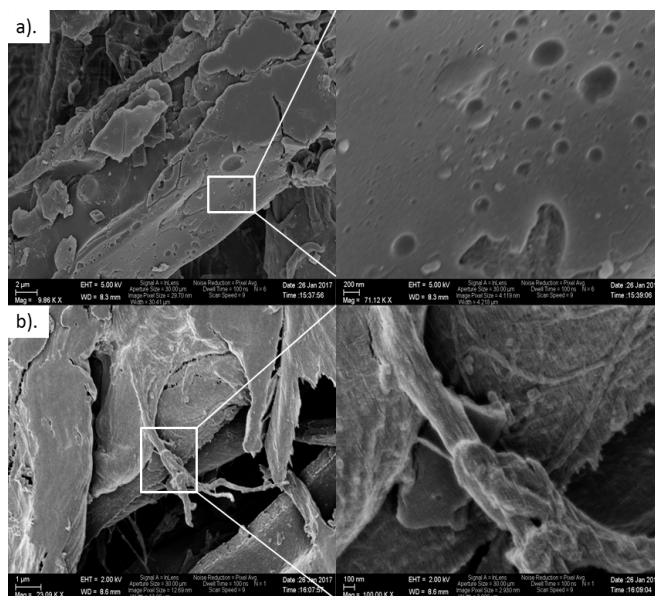
### S1.2 Influence of the explosive decompression on the surface

SEM was performed to analyse the surface at micro scale. Differences between the surfaces of exploded and non-exploded corn stover in SEM could not be found. However, SEM images of pretreated beech showed differences for the exploded and non-exploded samples. The exploded biomass has a larger amount of holes in the range of 30 to 475 nm (see Fig S1).

## S2 Sugar yields

### S2.1 Beech

### S2.2 Corn stover

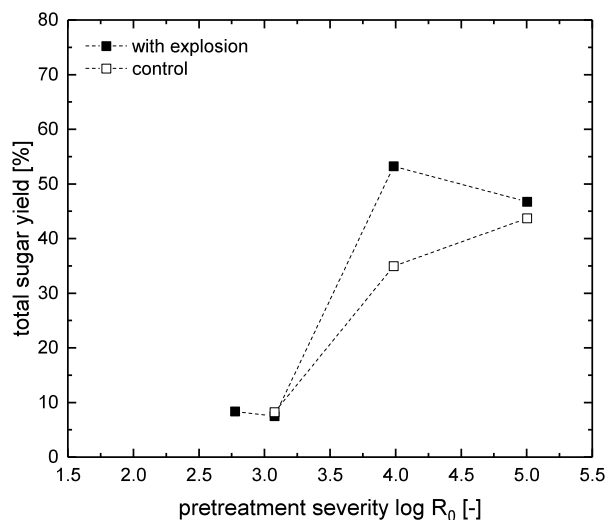


**Fig. S1** SEM images of exploded beech chips after a steam pretreatment at  $\log R_0 = 3.98$  (15 bar for 10 min) a). with explosion of 15 bar b). without explosion

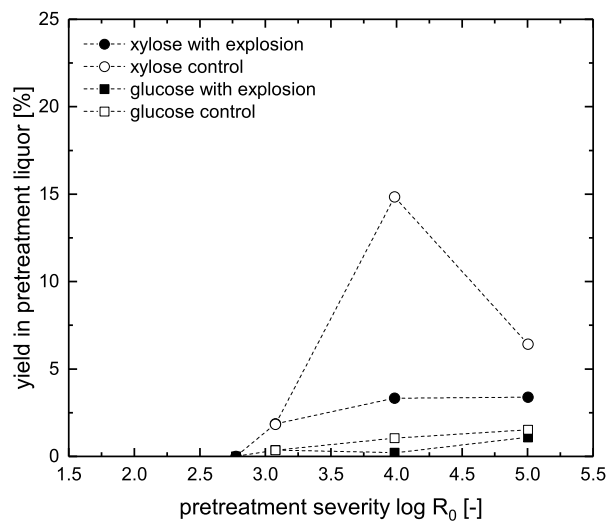
† Electronic Supplementary Information (ESI) available: [details of any supplementary information available should be included here]. See DOI: 10.1039/b000000x/

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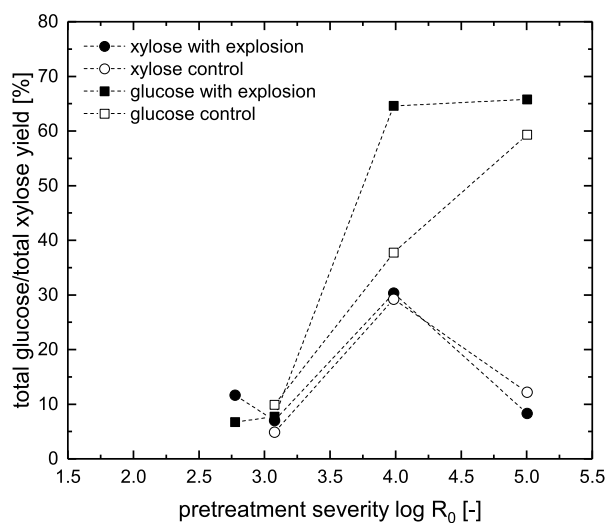
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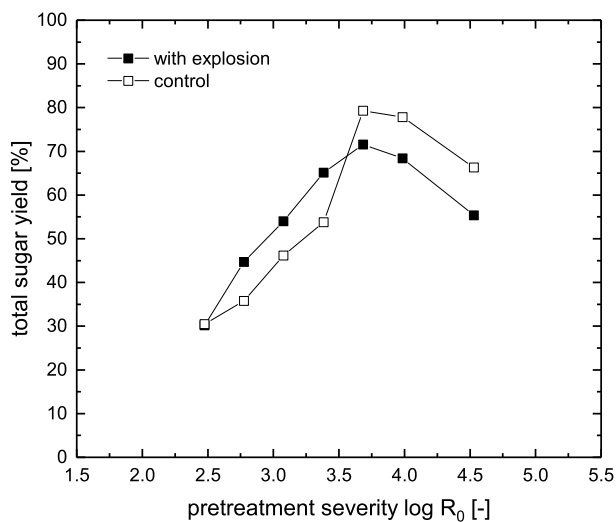
**Fig. S2** Total sugar yield from the combined operations of pretreatment and enzymatic hydrolysis from beech pretreated with explosion and without explosion(referred as control) as a function of pretreatment severity. Hydrolysis conditions: 1% w/w cellulose, 60 FPU  $g^{-1}$  cellulose



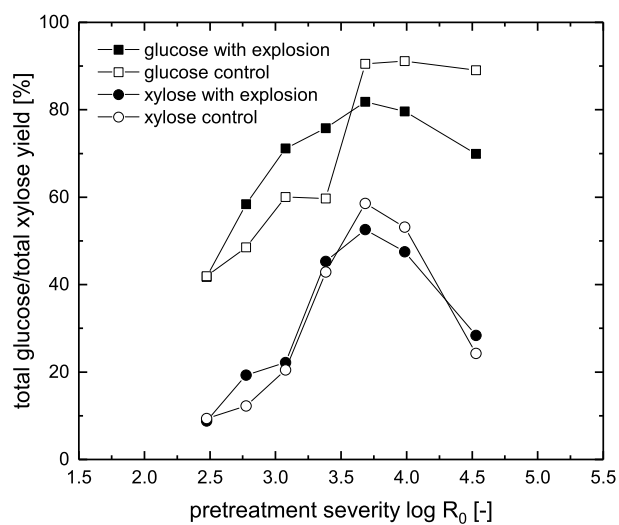
**Fig. S4** Total glucose and xylose yields in the pretreatment liquor of beech pretreated with explosion and without explosion(referred as control) as a function of pretreatment severity.



**Fig. S3** Glucose and xylose yields of beech pretreated with explosion and without explosion(referred as control) as a function of pretreatment severity. Hydrolysis conditions: 1% w/w cellulose, 60 FPU  $g^{-1}$  cellulose



**Fig. S5** Total sugar yield from the combined operations of pretreatment and enzymatic hydrolysis of corn stover pretreated with explosion and without explosion(referred as control) as a function of pretreatment severity. Hydrolysis conditions: 1% w/w cellulose, 60 FPU  $g^{-1}$  cellulose



**Fig. S6** Total glucose and xylose yields of corn stover pretreated with explosion and without explosion(referred as control) as a function of pretreatment severity. Hydrolysis conditions: 1% w/w cellulose, 60 FPU g<sup>-1</sup> cellulose