

# Electronic Supplementary Material

## Enhanced bioethanol production from sugar cane bagasse: combination of liquid hot water and deep eutectic solvent pretreatment for optimized enzymatic saccharification

Xiaoling Xian, Biying Li, Shiyong Feng, Jiale Huang, Xinyuan Fu, Ting Wu,

Xiaoqing Lin (✉)

School of Chemical Engineering and Light Industry, Guangdong Provincial Key  
Laboratory of Plant Resources Biorefinery, Guangdong University of Technology,  
Guangzhou 510006, China

E-mail: [linxiaoqing@gdut.edu.cn](mailto:linxiaoqing@gdut.edu.cn)

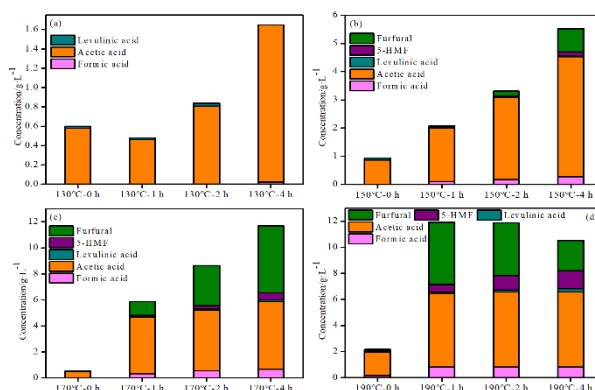


Fig. S1 The content of inhibitors in LHW liquid after LHW pretreatment at different times and temperatures. (a) 130 °C; (b) 150 °C; (c) 170 °C; (d) 190 °C.

Table S1 ANOVA analysis and principal effects for the DES pretreatment temperature (T).

Effects		Sum of squares	d.f. <sup>a)</sup>	Mean square	F-value	p-value
Glucose concentration/g·L <sup>-1</sup>	T	1276.954	4	319.238	2852.790	<0.001 <sup>b)</sup>
	Error	0.560	5	0.112		
	Total	1277.513	9			
Xylose concentration/g·L <sup>-1</sup>	T	10.917	4	2.729	42.145	<0.001 <sup>b)</sup>
	Error	0.324	5	0.065		
	Total	11.240	9			
Enzymatic conversion of glucose/%	T	1274.214	4	318.553	1658.041	<0.001 <sup>b)</sup>
	Error	0.961	5	0.192		
	Total	1275.174	9			
Enzymatic conversion of xylose/%	T	1865.033	4	466.258	119.204	<0.001 <sup>b)</sup>
	Error	19.557	5	3.911		
	t	1884.590	9			

<sup>a)</sup> Degree of freedom <sup>b)</sup> Significant

Table S2 ANOVA analysis and principal effects for the DES pretreatment time (t).

Effects		Sum of squares	d.f. <sup>a)</sup>	Mean square	F-value	p-value
Glucose concentration/g·L <sup>-1</sup>	t	40.472	4	10.118	40.808	<0.001 <sup>b)</sup>
	Error	1.240	5	0.248		
	Total	41.711	9			
Xylose concentration/g·L <sup>-1</sup>	t	2.950	4	0.738	11.301	0.010
	Error	0.326	5	0.065		
	Total	3.277	9			
Enzymatic conversion of glucose/%	t	126.523	4	31.631	91.422	<0.001 <sup>b)</sup>
	Error	1.730	5	0.346		
	Total	128.253	9			
Enzymatic conversion of xylose/%	t	209.393	4	52.348	13.750	0.007
	Error	19.035	5	3.807		
	Total	228.429	9			

<sup>a)</sup> Degree of freedom <sup>b)</sup> Significant

Table S3 ANOVA analysis and principal effects for the enzyme loadings (E).

Effects		Sum of squares	d.f. <sup>a)</sup>	Mean square	F-value	p-value
Glucose concentration/g·L <sup>-1</sup>	E	1050.418	4	262.605	1180.152	<0.001 <sup>b)</sup>
	Error	1.113	5	0.223		
	Total	1051.531	9			
Xylose concentration/g·L <sup>-1</sup>	E	0.287	4	0.072	0.869	0.541
	Error	0.413	5	0.083		
	Total	0.700	9			
Enzymatic conversion of glucose/%	E	1328.980	4	332.245	1180.152	<0.001 <sup>b)</sup>
	Error	1.408	5	0.282		
	Total	1330.387	9			
Enzymatic conversion of xylose/%	E	2.927	4	0.732	0.869	0.541
	Error	4.209	5	0.842		
	Total	7.136	9			

<sup>a)</sup> Degree of freedom <sup>b)</sup> Significant

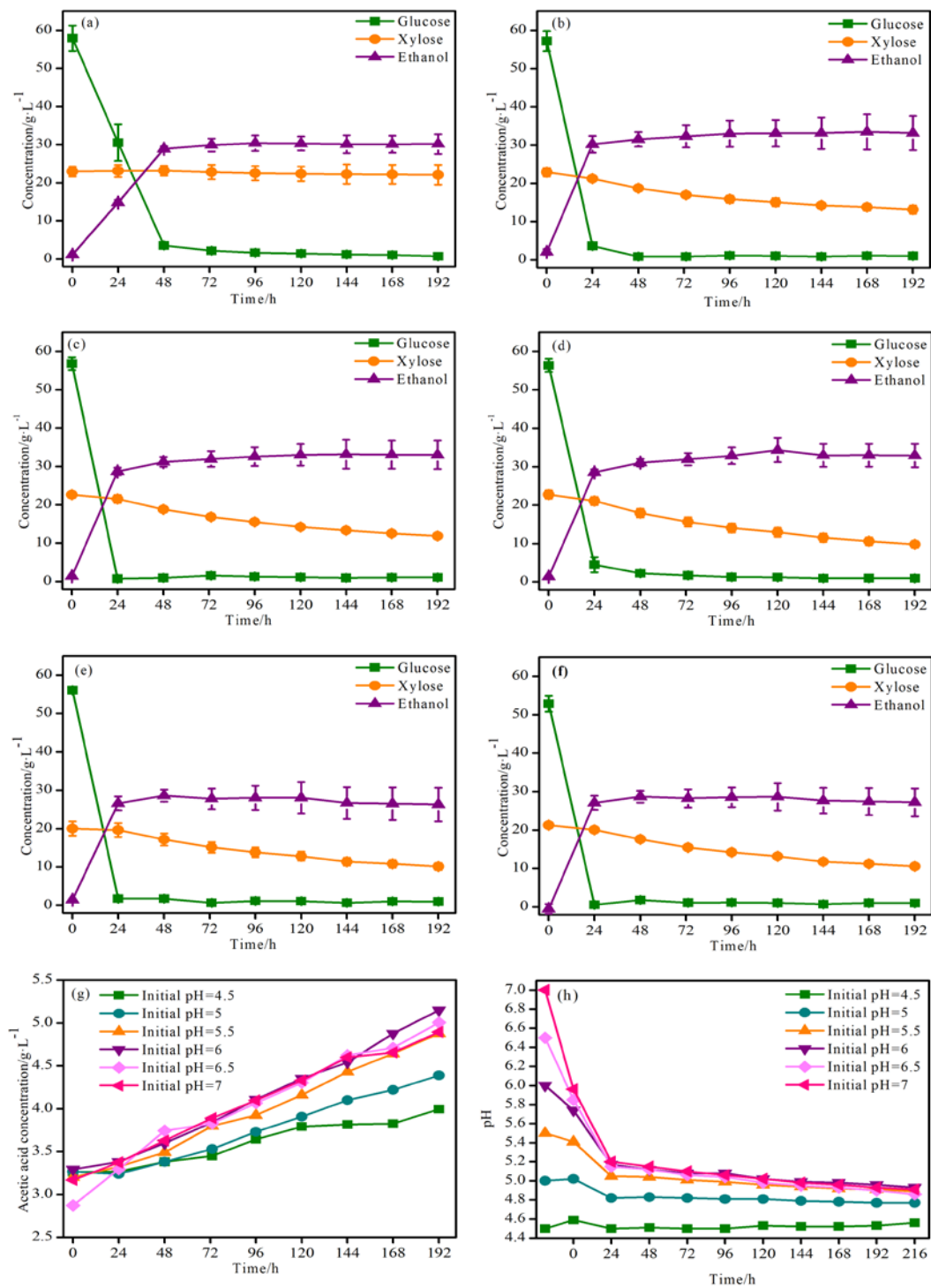


Fig. S2 (a)-(f) The fermentation curves of enzymatic hydrolysate at initial pH 4.5, 5, 5.5, 6, 6.5, 7. (g) The acetic acid concentration curves of enzymatic hydrolysate at different initial pH during fermentation. (h) The change of pH value in fermentation process of enzymatic hydrolysate at different initial pH.