

1 Enzymatic hydrolysis of steam-treated sugarcane bagasse: effect of enzyme loading and substrate total solids on its fractal kinetic
2 modeling and rheological properties

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6 **Table S1.** Release of glucose equivalents from steam-treated sugarcane bagasse as a function of hydrolysis time under the conditions given in the
7 experimental design of the CCRD.

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Time (h)	GlcEq (g L ⁻¹)								
	A1	A2	A3, 4, 5	A6	A7	A8	A9	A10	A11
3	18.7 ± 0.4	24.9 ± 1.6	16.4 ± 2.0	10.2 ± 0.1	26.0 ± 0.8	2.5 ± 0.1	27.6 ± 0.3	15.8 ± 0.2	24.9 ± 2.2
6	24.0 ± 1.1	37.4 ± 3.6	27.0 ± 1.7	15.4 ± 0.3	36.2 ± 1.1	3.6 ± 0.6	39.7 ± 0.6	22.3 ± 0.9	34.0 ± 1.7
9	28.6 ± 2.8	43.5 ± 2.4	33.6 ± 3.0	19.6 ± 1.1	41.3 ± 0.1	4.7 ± 0.4	48.0 ± 0.4	26.8 ± 0.9	42.9 ± 3.7
12	32.4 ± 1.8	52.2 ± 1.6	40.5 ± 2.1	22.5 ± 0.4	44.1 ± 1.2	6.0 ± 1.0	54.6 ± 2.1	29.6 ± 1.1	50.8 ± 3.2
24	46.3 ± 3.6	71.9 ± 0.8	54.2 ± 0.7	32.7 ± 0.1	53.1 ± 0.7	10.1 ± 0.6	74.3 ± 1.0	38.6 ± 1.0	65.5 ± 2.1
48	56.7 ± 1.0	89.6 ± 2.5	69.9 ± 3.6	42.6 ± 0.4	57.5 ± 0.7	14.6 ± 1.0	85.5 ± 1.1	44.6 ± 0.9	85.2 ± 2.8
72	62.6 ± 2.4	102.3 ± 4.4	79.5 ± 2.1	49.9 ± 2.3	58.5 ± 1.0	18.1 ± 0.2	87.1 ± 0.5	47.2 ± 1.0	90.8 ± 0.5
96	67.0 ± 3.1	110.0 ± 1.2	85.3 ± 2.2	52.3 ± 1.0	58.9 ± 0.7	21.1 ± 2.4	87.9 ± 0.5	47.6 ± 1.0	95.3 ± 2.1

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Table S2. Release of cellobiose from steam-treated sugarcane bagasse as a function of hydrolysis time under the conditions given in the experimental design of the CCRD.

Time (h)	Cellobiose (mg L ⁻¹)								
	A1	A2	A3, 4, 5	A6	A7	A8	A9	A10	A11
3	118 ± 14	236 ± 6	112 ± 36	78 ± 3	116 ± 11	44 ± 8	210 ± 37	62 ± 3	142 ± 14
6	232 ± 11	397 ± 96	251 ± 21	108 ± 11	268 ± 60	60 ± 14	442 ± 29	140 ± 50	208 ± 46
9	325 ± 163	520 ± 40	343 ± 114	210 ± 40	392 ± 20	63 ± 10	602 ± 20	220 ± 25	522 ± 104
12	343 ± 188	822 ± 94	630 ± 72	259 ± 30	616 ± 10	74 ± 15	784 ± 257	294 ± 10	626 ± 64
24	638 ± 62	1485 ± 16	883 ± 181	506 ± 16	726 ± 124	126 ± 8	1518 ± 124	336 ± 23	1111 ± 140
48	1392 ± 22	2640 ± 45	1740 ± 366	952 ± 11	1280 ± 23	176 ± 23	2416 ± 158	912 ± 23	2384 ± 497
72	1592 ± 170	3680 ± 23	2416 ± 157	1232 ± 45	1256 ± 11	216 ± 11	2752 ± 23	960 ± 23	2960 ± 23
96	1712 ± 45	4536 ± 57	2928 ± 150	1392 ± 23	1360 ± 45	248 ± 34	2552 ± 419	952 ± 11	3320 ± 33

Table S3. Analysis of variance (ANOVA) of the fractal kinetic parameters that were derived from the central composite rotatable design (CCRD, Design A) of Table 1.

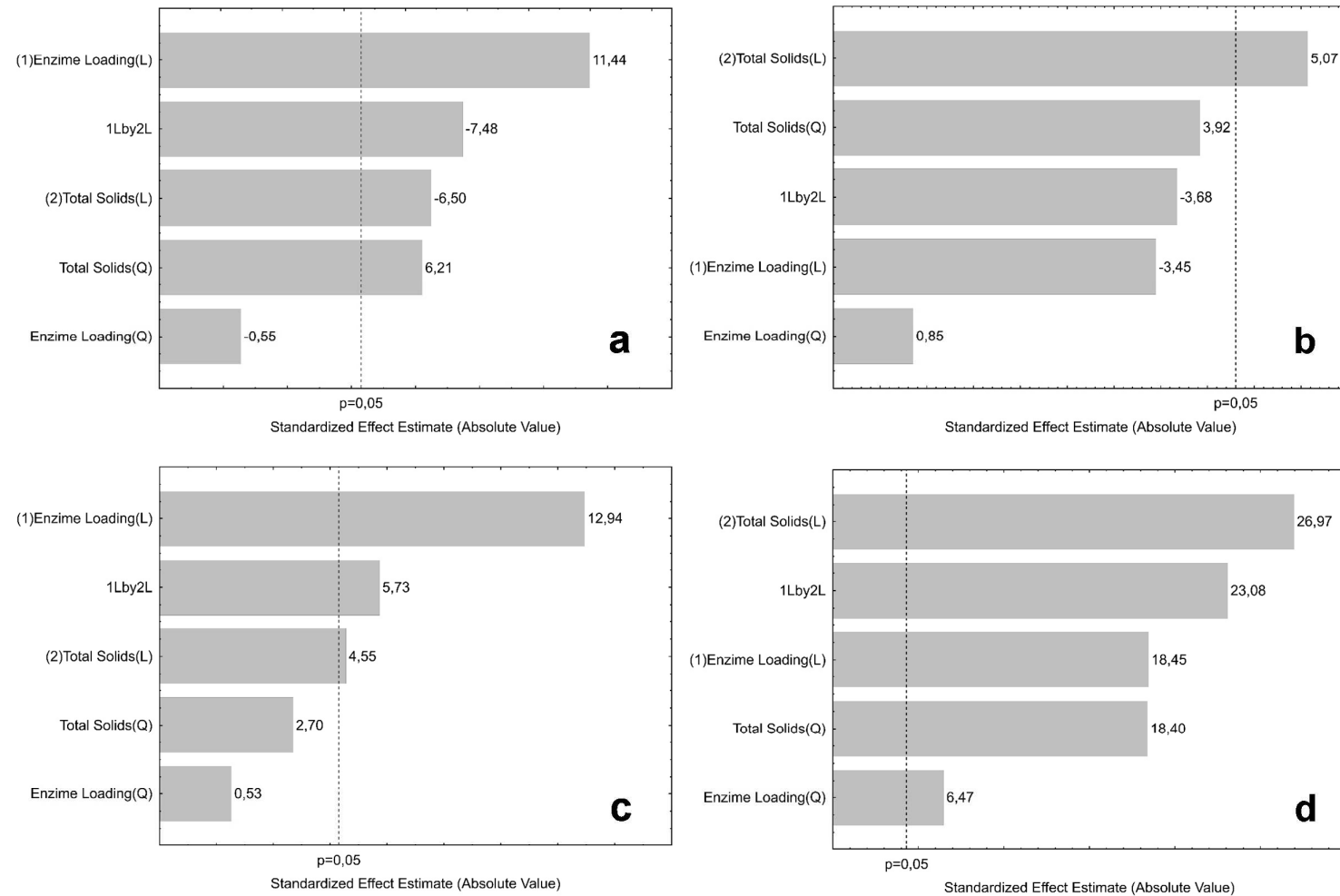
Response	Source	SS ¹	DF ²	MS ³	F _{value}	F _{table}	R ²	% Var ⁴
<i>Glucan conversion</i>								
Parameter <i>k</i> (h ⁻¹)	Regression	0.0376	4	0.0094	21.864	5.192	0.939	0.946
	Residual	0.0021	5	0.0004				
	Lack of fit	0.0019	3	0.0006	4.550	19.164		
	Pure error	0.0003	2	0.0001				
	Total	0.0397	9	0.0044				
Parameter <i>h</i>	Regression	0.0719	4	0.0180	20.185	5.192	0.913	0.942
	Residual	0.0045	5	0.0009				
	Lack of fit	0.0023	3	0.0008	0.708	19.164		
	Pure error	0.0022	2	0.0011				
	Total	0.0764	9	0.0085				
<i>Xylan conversion</i>								
Parameter <i>k</i> (h ⁻¹)	Regression	0.0754	4	0.0189	41.619	5.192	0.962	0.971
	Residual	0.0023	5	0.0005				
	Lack of fit	0.0016	3	0.0005	1.639	19.164		
	Pure error	0.0007	2	0.0003				
	Total	0.0777	9	0.0086				
Parameter <i>h</i>	Regression	0.0408	5	0.0082	29.696	5.192	0.973	0.974
	Residual	0.0011	4	0.0003				
	Lack of fit	0.0011	3	0.0004	16.758	19.164		
	Pure error	0.00004	2	0.00002				
	Total	0.0419	9	0.0047				

¹ Sum of squares;

² Degrees of freedom;

³ Mean square;

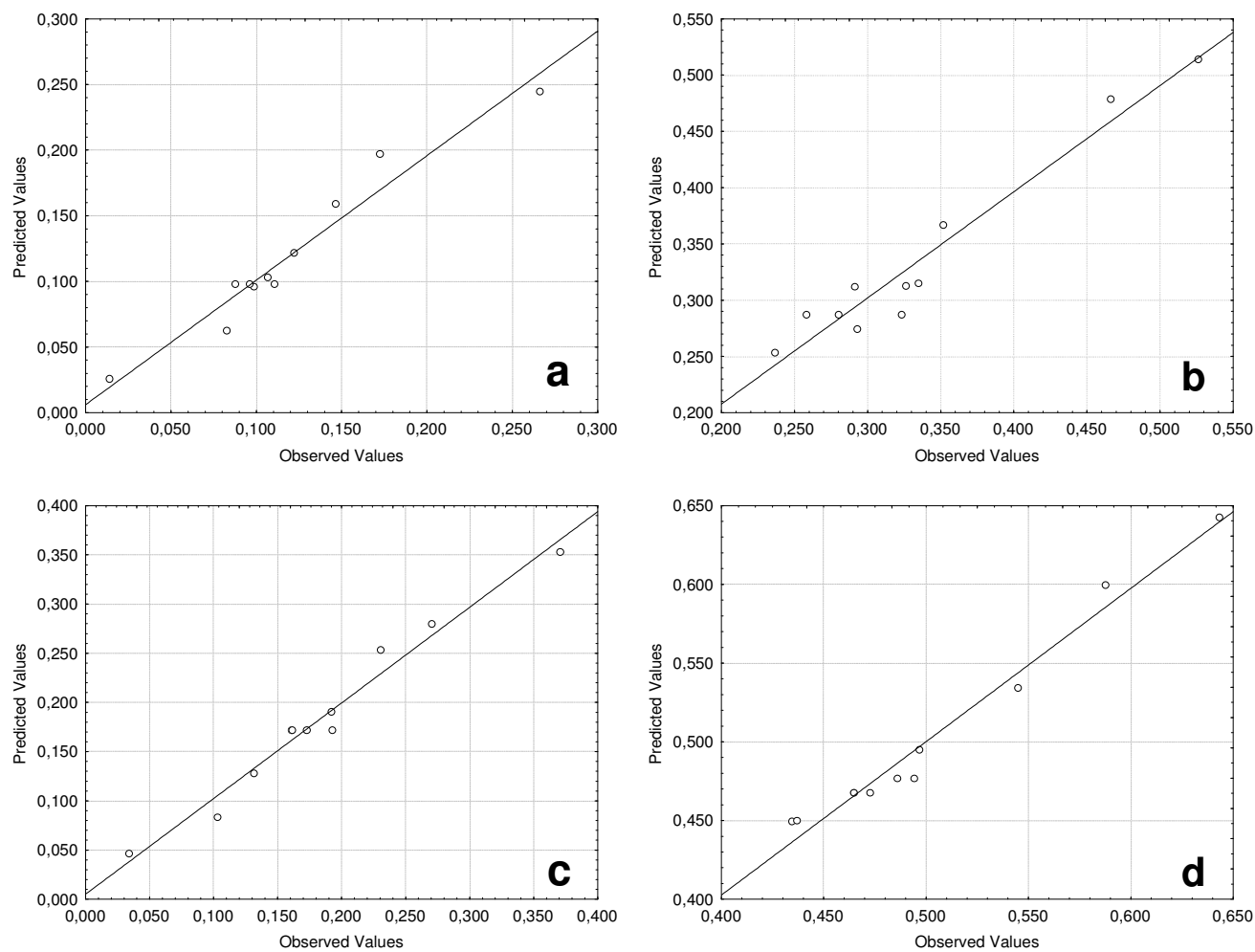
⁴ Maximum percentage of variance.



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24 **Figure S1.** Pareto chart describing the primary and secondary effects of different total solids and enzyme loadings in: **(a)** parameter k (h^{-1}) and

25 **(b)** parameter h for glucan conversion; and **(c)** parameter k (h^{-1}) and **(d)** parameter h for xylan conversion.



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27 **Figure S2.** Correlation between the observed and predicted values for the fractal parameters (a) k (h^{-1}) and (b) h for glucan conversion and (c) k
 28 (h^{-1}) and (d) h for xylan conversion.

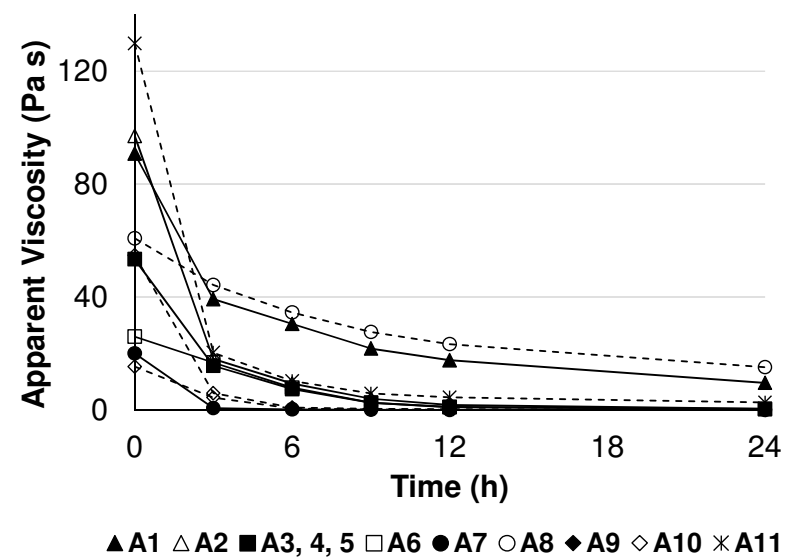


Figure S3. Apparent viscosity at 10 s^{-1} of steam-treated sugarcane bagasse during enzymatic hydrolysis with Cellic CTec3 under the conditions given in Table 1 (CCRD).