

Table S1 ANOVA analysis and principal effects for temperature (T)

Effects		Sum of squares	d.f. ^a	Mean square	F-value	p-value
Solid Recovery (%)	T	4392.690	3	1464.230	27763.427	<0.001*
	Error	0.211	4	0.053		
	Total	4392.901	7			
The content of cellulose (%)	T	1411.174	3	470.391	3480.504	<0.001*
	Error	0.541	4	0.135		
	Total	1411.715	7			
The content of xylan (%)	T	294.433	3	98.144	598.141	<0.001*
	Error	0.656	4	0.164		
	Total	295.089	7			
The content of lignin (%)	T	138.156	3	46.052	276.061	<0.001*
	Error	0.667	4	0.167		
	Total	138.823	7			
Cellulose Recovery (%)	T	711.886	3	237.295	1664.141	<0.001*
	Error	0.570	4	0.143		
	Total	712.456	7			
Xylan Removal (%)	T	2744.377	3	914.792	0.732	0.585
	Error	5000.310	4	1250.077		
	Total	7744.687	7			
Lignin Removal (%)	T	9361.896	3	3120.632	13070.529	<0.001*
	Error	0.955	4	0.239		
	Total	9362.851	7			
Cellulose conversion (%)	T	6976.229	3	2325.410	2182.668	<0.001*
	Error	4.262	4	1.065		
	Total	6980.491	7			
Glucose recovery (%)	T	2596.289	3	865.430	704.256	<0.001*
	Error	4.915	4	1.229		
	Total	2601.205	7			

^a Degree of freedom

*Significant

Table S2 ANOVA analysis and principal effects for concentration of substrate (S)

Effects		Sum of squares	d.f. ^a	Mean square	F-value	p-value
Glucose concentration (g/L)	S	1364.691	3	454.897	7335.112	<0.001*
	Error	0.248	4	0.062		
	Total	1364.939	7			
Xylose concentration (g/L)	S	3.598	3	1.199	1986.614	<0.001*
	Error	0.002	4	0.001		
	Total	3.600	7			
Cellulose conversion (%)	S	0.031	3	0.010	21.198	0.006
	Error	0.002	4	0.000		
	Total	0.033	7			
Ethanol concentration (g/L)	S	244.284	3	81.428	612.377	<0.001*
	Error	0.532	4	0.133		
	Total	244.816	7			

^a Degree of freedom

* Significant

Table S3 Components content from recycled DES pretreated WS.

Cycle time	Solid Recovery (%)	Content (%)			Cellulose Recovery (%)	Xylan Removal (%)	Lignin Removal (%)
		Cellulose	Xylan	Lignin			
WS	100.00	33.02	17.26	18.58	-	-	-
1st	45.8	68.29	3.94	8.09	94.73	89.53	80.05
2nd	49.70	64.90	9.82	11.22	97.69	75.11	69.98

Table S4 ANOVA analysis and principal effects for cellulase loadings (E)

Effects		Sum of squares	d.f. ^a	Mean square	F-value	p-value
Glucose concentration (g/L)	E	457.677	3	152.559	2207.255	<0.001*
	Error	0.276	4	0.069		
	Total	457.953	7			
Xylose concentration (g/L)	E	0.030	3	0.010	0.161	0.917
	Error	0.246	4	0.062		
	Total	0.276	7			
Cellulose conversion (%)	E	0.051	3	0.017	283.102	<0.001*
	Error	0.000	4	0.000		
	Total	0.051	7			
Xylan conversion (%)	E	0.006	3	0.002	0.113	0.948
	Error	0.076	4	0.019		
	Total	0.083	7			

^a Degree of freedom

* Significant