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Supplemental Information

Rapid and productive extraction of high purity cellulose material via

selective depolymerization of the lignin- carbohydrate complex at

mild conditions.

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Determination process of the Kamlet–Taft parameters

The chromatographically pure methanol was used to prepare a concentration of 0.35 g/L solution of probe molecular such as 4-nitroaniline, N,N-diethyl-4-nitro-aniline and 2,6-dichloro-4-(2,4,6-triphenyl-1-pyridinio) phenolate (Reichardt's dye 33). The solution was kept in brown bottle. 10-20uL prepared solution was added into the bottle, and the methanol was blow dried by the N₂. Than 1.5 g IL was added into the bottle and mixed. The TU-1810 ultraviolet-visible spectrophotometer was used to determine the maximum absorption (λ_{max}). At first the scanning baseline was obtained via scanning the pure ILs system without the probe molecular. Than the sample with the probe molecular was scanned to obtain the maximum absorption (λ_{max}). The α , β and π^* values was calculate by the following equations:

 $v(dye) = 1/(\lambda_{max(dye)} \times 10.4)$

 $E_T(30) = 0.9986 \times (28592 / \lambda_{max}(Reichardt's dye 33)) - 8.6878$

 $\pi * = 0.314 \times (27.52 - v(N,N-diethyl-4-nitro-aniline))$

 $\alpha = 0.0649 \times E_T(30) - 2.03 - 0.72 \times \pi *$

 $\beta = (1.035 \times v(N,N-diethyl-4-nitro-anilinedyetroaniline) + 2.64 - v(4-nitroaniline)$



Fig. S1 Influence of dissolution conditions on the depolymerization of cellulose, hemicelluloseand lignin (a) dosage of the AS, (100 $^{\circ}$ C, 1h), (b) dissolution temperature, (1h, 1.5 wt%), (c) dissolution time, (100 $^{\circ}$ C, 1.5 wt%)



Fig. S2 Mass spectra of ILs and IL-AS systems. [Bmim]Cl (A), [Emim]Cl (B), [Amim]Cl (C) (The mole ratio of [Amim]Cl, [Emim]Cl, to AS is 37:1. The mole ratio of [Bmim]Cl to AS is 1:0, 111:1, 55:1, 37:1,27:1, 10:1, 1:1 for 1,2,3,4,5,6[Bmim]Cl-AS systems.

ILs	AS /g	<i>T</i> /K	<i>t</i> /h	S _c /%
[Bmim]Cl	0.15	373	1.25	57.66±1.21
[Bmim]Cl	0.00	373	1.25	19.51±1.32
[Emim]Cl	0.15	373	1.25	54.10±0.95
[Emim]Cl	0.00	373	1.25	18.41±1.42
[Amim]Cl	0.15	373	1.25	52.31±1.36
[Amim]Cl	0.00	373	1.25	17.54±1.25

Table. S1 Solubility of cornstalk in different solvent system

the temperature was fixed on 373 K , the dosage of acids was fixed at 1.5 wt%, the time was fixed at 1h