

## Supporting information

### **A facile ionic liquid approach to prepare cellulose-rich aerogels directly from corn stalks**

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Figure S1 The photographs of aerogels prepared by different solvent systems

Table S1 The regeneration rate of aerogels with different dissolving systems

Dissolving system	Regeneration rate (%)	Dissolving system	Regeneration rate (%)
[Emim]Cl	11.9 ± 0.9	[Emim]Cl+	21.1 ± 0.9
[Pmim]Cl	14.8 ± 0.4	[Pmim]Cl+	24.3 ± 0.6
[Amim]Cl	16.8 ± 0.4	[Amim]Cl+	35.2 ± 0.5
[Bmim]Cl	12.3 ± 0.7	[Bmim]Cl+	22.6 ± 1.5
[Hmim]Cl	9.6 ± 0.3	[Hmim]Cl+	14.4 ± 0.7
[Omim]Cl	7.4 ± 0.4	[Omim]Cl+	9.4 ± 0.6

Table S2 The specific surface area, pore size and pore volume of aerogels with different ionic liquid systems

(a) Pure IL			
Sample	Specific surface area (m <sup>2</sup> /g)	Pore volume (cm <sup>3</sup> /g)	Pore size (nm)
[Emim]Cl	94	0.44	14.33
[Pmim]Cl	108	0.36	13.6
[Amim]Cl	119	0.57	17.1
[Bmim]Cl	97	0.52	16.45
[Hmim]Cl	62	0.2	19.84

(b) IL + ASA			
Sample	Specific surface area (m <sup>2</sup> /g)	Pore volume (cm <sup>3</sup> /g)	Pore size (nm)
[Emim]Cl+	123	0.42	14.39
[Pmim]Cl+	110	0.37	14.45
[Amim]Cl+	201	0.55	15.37
[Bmim]Cl+	149	0.58	16.26
[Hmim]Cl+	99	0.41	17.63
[Omim]Cl+	67	0.29	18.01

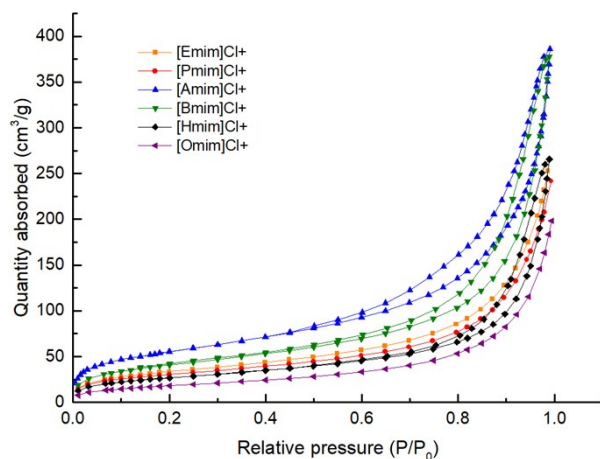


Figure S2 The adsorption-desorption isotherms of the aerogels made by IL+ASA systems

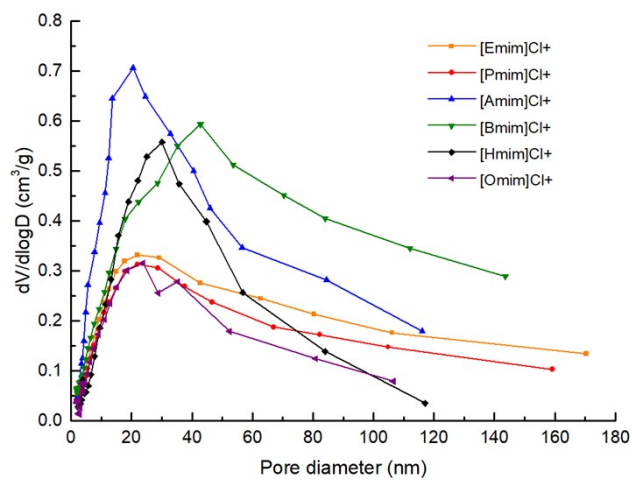


Figure S3 The pore size distribution of aerogels made by IL+ASA systems

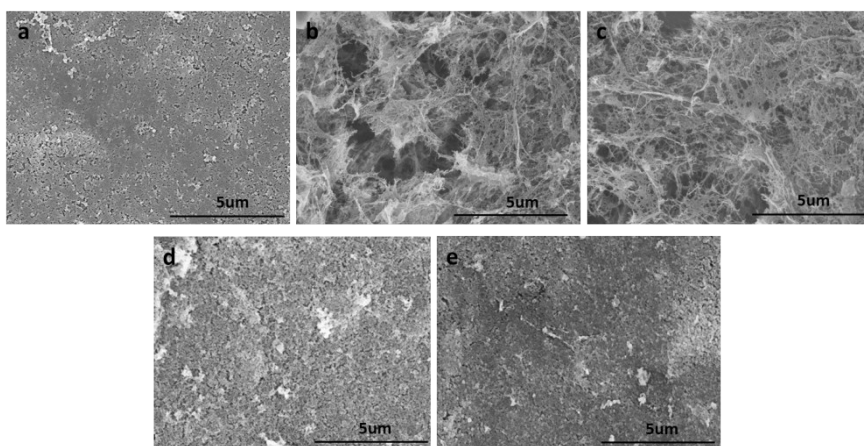


Figure S4 The morphology of aerogels made by IL (a-f: [Emim]Cl, [Pmim]Cl, [Amim]Cl+, [Bmim]Cl, [Hmim]Cl)

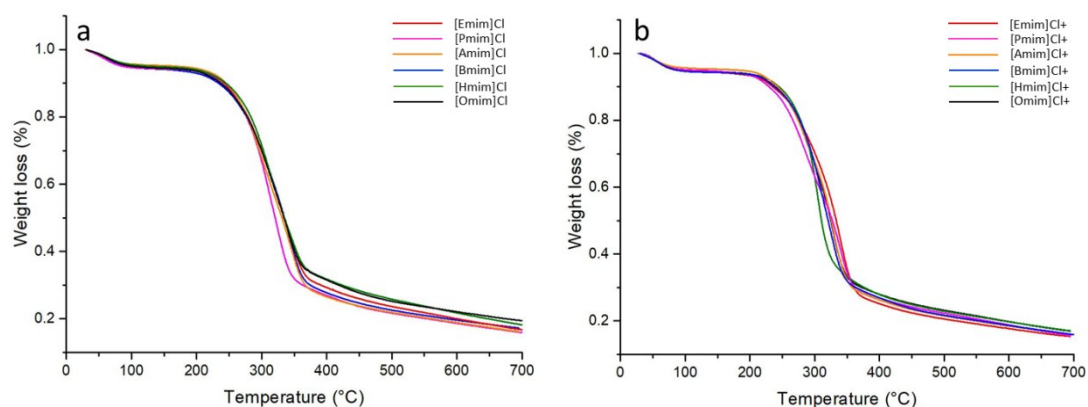


Figure S5 The thermal gravimetric diagram of aerogels with different dissolving systems

Table S3 The ratio of carbon residues of aerogels prepared by different ionic liquid systems

Dissolving system	Ratio of carbon residue(%)	Dissolving system	Ratio of carbon residue(%)
[Emim]Cl	4.7	[Emim]Cl+	4.4
[Pmim]Cl	4.7	[Pmim]Cl+	4.2
[Amim]Cl	4.4	[Amim]Cl+	3.8
[Bmim]Cl	4.1	[Bmim]Cl+	3.8
[Hmim]Cl	4.8	[Hmim]Cl+	4.6
[Omim]Cl	5.6	[Omim]Cl+	4.8

Table S4 The compressive strength of prepared aerogels

Aerogel	Compressive strength (N/cm <sup>2</sup> )	Aerogel	Compressive strength (N/cm <sup>2</sup> )
[Emim]Cl	30.99	[Emim]Cl+	35.77
[Pmim]Cl	30.80	[Pmim]Cl+	34.00
[Amim]Cl	37.21	[Amim]Cl+	41.26
[Bmim]Cl	34.18	[Bmim]Cl+	39.89
[Hmim]Cl	28.47	[Hmim]Cl+	30.95
[Omim]Cl	-	[Omim]Cl+	30.04

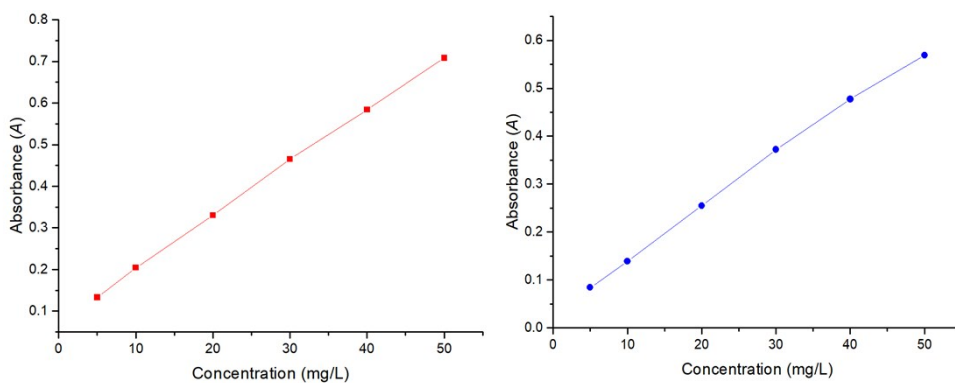


Figure S6 The standard curves of Congo red (left) and Coomassie brilliant blue (right) aqueous solution

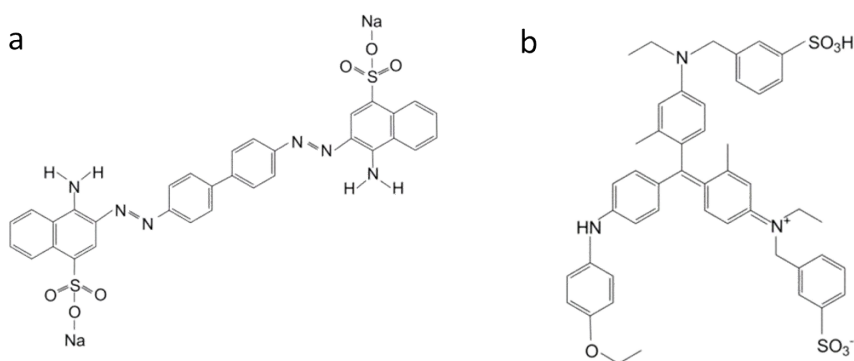


Figure S7 The structure of Congo red and Coomassie brilliant blue

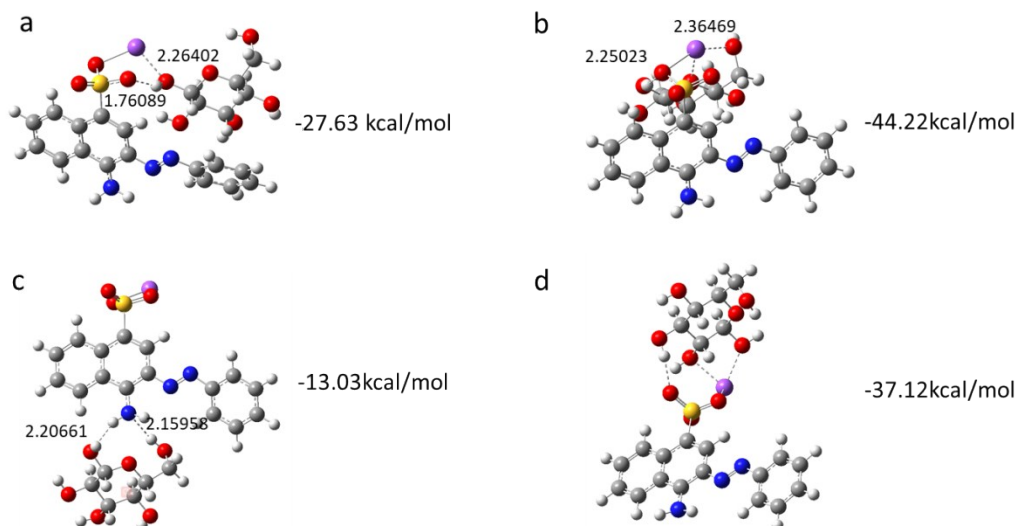


Figure S8 The interactions of Congo red and glucose

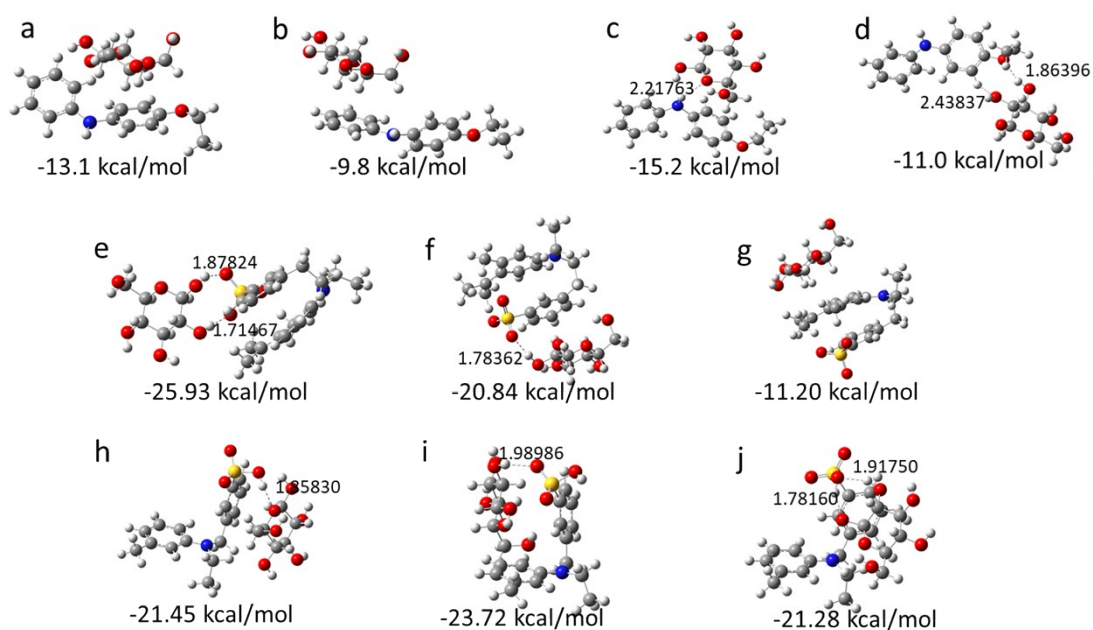


Figure S9 The interactions of Coomassie brilliant blue and glucose