Supplementary Data

An integrated strategy for corncob pretreatment and coproduction of furfural and monosaccharides based on *p*-toluenesulfonic acid and deep eutectic solvent system

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2. Materials and Methods

2.1 Recyclability and reusability of DES

After the DES catalytic reaction of the xylose-rich hydrolysate, the reaction solution was filtrated from the solid residue. Then ethyl acetate was added to the reaction mixture for the recovery of furfural while DES was recovered in the aqueous phase. After separation of the aqueous and organic phase, the FF in the organic and liquid phase was determined. Then, water in the aqueous phase was removed by rotary evaporator at 95 °C to collect pure DES. The collected DES was used without any further purification in the next recycle runs. In a typical recycle run, xylose-rich hydrolysate collected from the pretreatment step was added and mixed with the recovered DES, then reacted under the optimized reaction conditions. All the reactions for the recycle runs were performed at 190 °C for 10 min.

Table S1. pH of different DESs

HBD	HBA	pH
Latic Acid	TEBAC	0.13
	ChCl	0.07
	DTAC	0.13
Ethylene Glycol	TEBAC	3.43
	ChCl	1.69
	DTAC	3.78
Acetamide	TEBAC	5.9
	ChCl	6.8
	DTAC	6.1

The molar ratio of HBA:HBD=

Figure S1

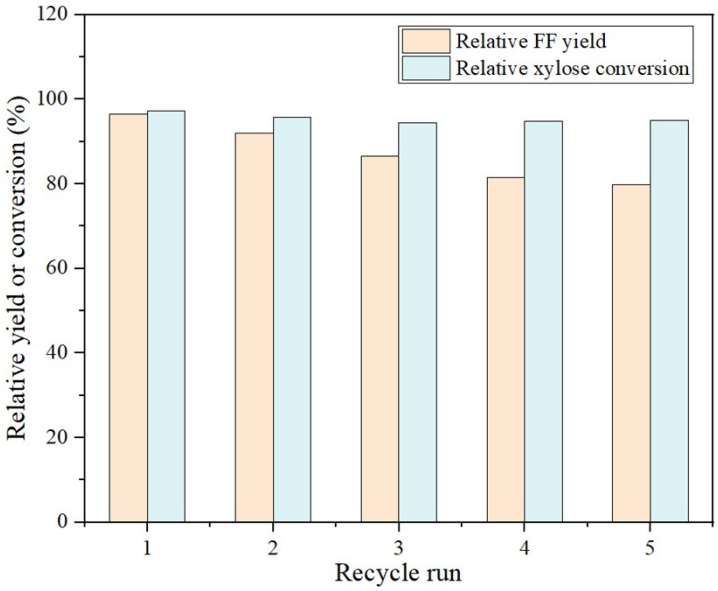

Fig. S1 Relative xylose conversion and FF yield under different DES recycling runs.

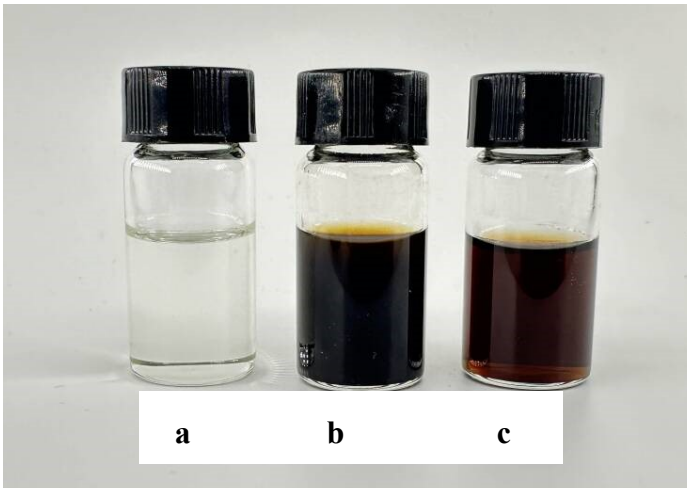

Fig.S2 The photo of fresh DES (a), DES collected after catalytic reaction (b), and DES collected after ethyl acetate extraction (c).

The reusability of DES is an important indicator for its large-scale use performance. Fig. S1 indicated the catalytic performance of the DES used in five sequential recycle experiments. As shown in the figure, the xylose conversion and FF yield gradually decreased with the number of recycle runs. In the first three recycle runs, the xylose conversion and FF yield didn't decrease obviously, indicating that the recycled DES still exhibited good catalytic performance However, as the number of recycling cycles increased, with the increase of the

impurities and degradation products accumulated in the DES and the rise in viscosity, the xylose conversion and FF yield were inclined to a decrease more notably.