Compositional mass fraction of bamboo hydrolysis residue

Table S1 Compositional mass fraction of bamboo hydrolysis residue

Component	Cellulose	Hemicellulose	Lignin	Others
Content(%)	55.6	6.5	34.2	3.7

XRD analysis

XRD spectras of crude cellulose and BHR were shown in Fig. S2. It can be seen that cellulose's degree of crystallinity was higher than BHR. According to Segal expression [49], we knew that BHR's degree of crystallinity was 48.66%, while that of cellulose was 58.55%, indicating that the purity of cellulose was high.

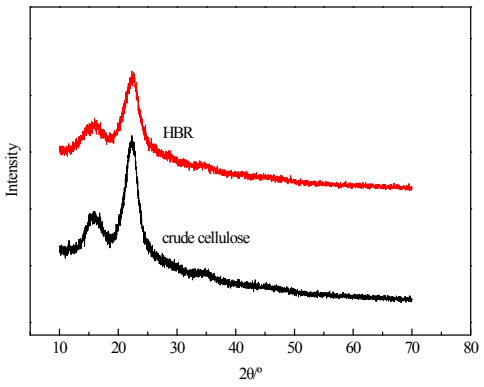

Fig. S1. The XRD spectra of crude cellulose and BHR

XRD spectrogram of cellulose before and after saccharification was shown in Fig. S1. As shown in Fig. 14, it can be seen that the degree of crystallinity of cellulose after saccharification was lower than that of cellulose before saccharification. According to Segal expression, we knew that the degree of crystallinity of cellulose before saccharification was 58.55%, while that of cellulose after saccharification was 48.27%, indicating that the strcture of cellulose was broken by cellulase, which was easily enzymatic hydrolyzed second time.

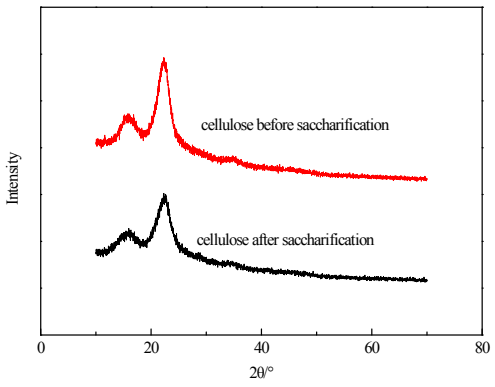

Fig. S2. XRD spectra of cellulose before and after enzymatic saccharification

Cyclic utilization of [AMIM]Cl

The repeat use times was shown in Fig. S3.

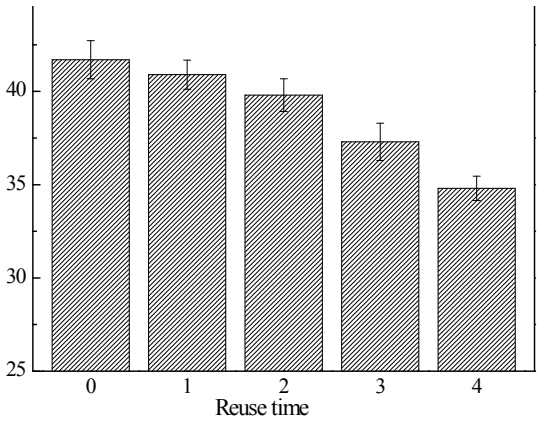

Fig. S3. Repeat use of [AMIM]Cl

Total mass balance

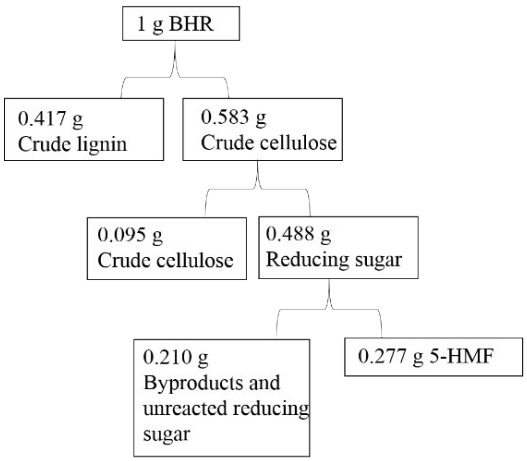

Fig. S4. Total mass balance in the whole process

Cyclic utilization

It's important to reuse the solvent and catalyst in chemical industry. In this work, ILs and catalyst were combined with each other as a whole. And the property for reuse was investigated as shown in Table S2. It can be seen that the yield of 5-HMF maintained stable after the reaction system being used for five times, indicating that [AMIM]OAc/$CrCl_3$ system was efficient and stabilized for preparation of HMF.

Table S2. Cyclic utilization of [AMIM]OAc/$CrCl_3$

Reuse times	5-HMF yield (%)

1	56.3
2	55.2
3	53.5
4	51.1
5	48.8