Catalyzing cascade production of methyl levulinate from polysaccharides using heteropolyacids $H_nPW_{11}MO_{39}$ with Brønsted/Lewis acidic sites

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Supplementary figure captions:

Fig. S1 The XRD patterns of the cellulose.

Fig. S2 The solubility of HPWTi in methanol as being treated at 200 ºC for different time.

Fig. S3 The IR (a) and UV-Vis spectrum (b) of reaction mixture after centrifugation for HPWTi catalysis.

Fig. S4 FTIR spectra of the fresh HPWTi (a) and recovered one (b).

Fig. S5 ^{31}P MAS NMR spectra of the fresh HPWTi (a) and recovered one (b).

Supplementary scheme captions:

Scheme S1 The secondary structure of HPWTi and probable for loss its crystal water.

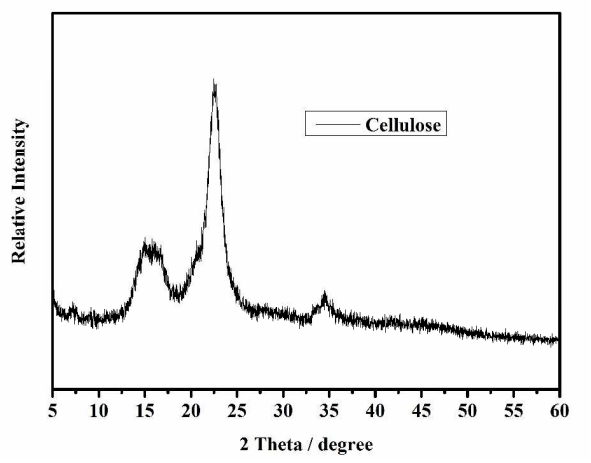


Fig. S1 The XRD patterns of the cellulose.

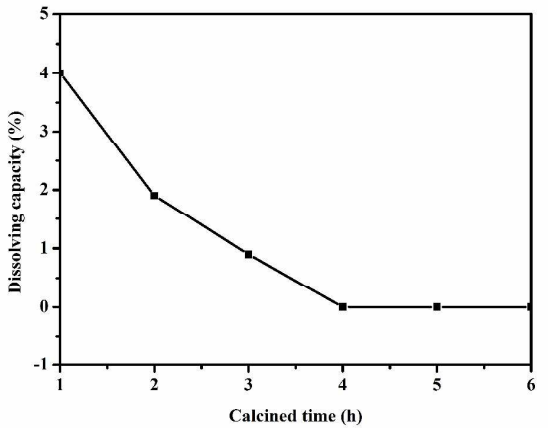


Fig. S2 The solubility of HPWTi in methanol as being treated at 200 ºC for different time.

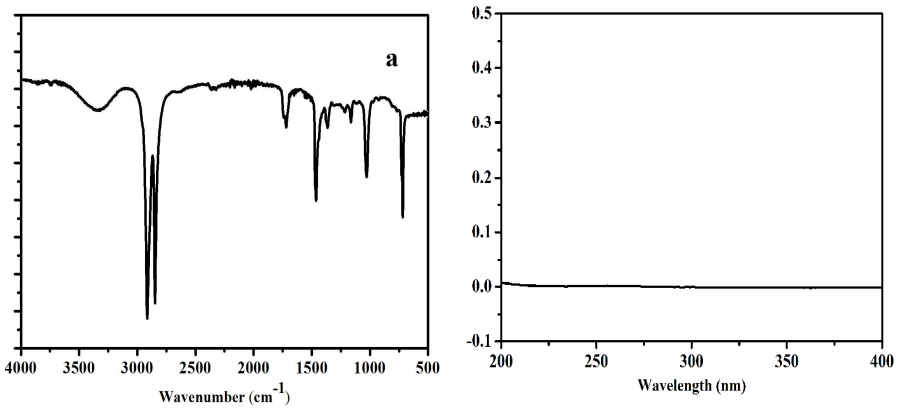


Fig. S3 The IR (a) and UV-Vis spectrum (b) of reaction mixture after centrifugation for HPWTi catalysis.

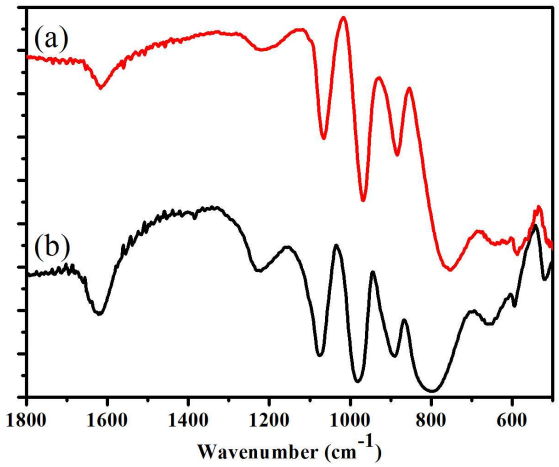


Fig. S4 FTIR spectra of the fresh HPWTi (a) and recovered one (b).

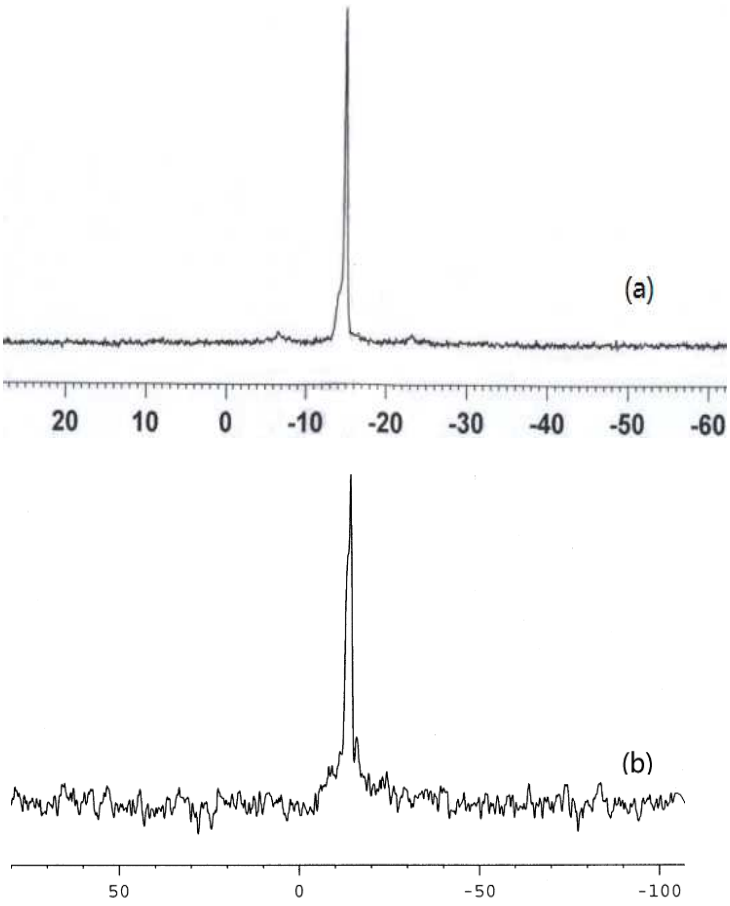
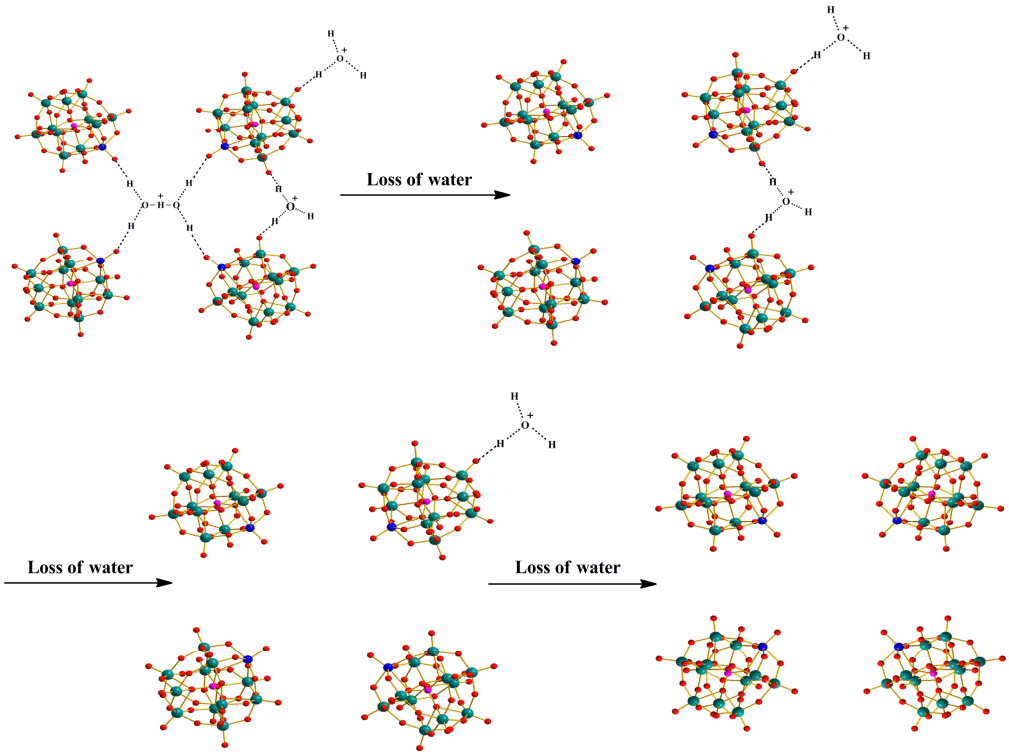


Fig. S5 ^{31}P MAS NMR spectra of the fresh HPWTi (a) and recovered one (b).



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