Electronic Supplementary Material (ESI) for Faraday Discussions.

Tunable and selective hydrogenation of furfural to furfuryl alcohol and cyclopentanone over Pt supported on biomass-derived porous heteroatom doped carbon

Xiuyun Liu,[ac] Bo Zhang,[ab] Benhua Fei,[b] Xiufang Chen,[*a] Junyi Zhang,[a] and Xindong Mu[*a]

a Key Laboratory of Bio-based Materials, Qingdao Institute of Bioenergy and Bioprocess Technology, Chinese Academy of Sciences, Qingdao 266101, China. Email: chenxf@qibebt.ac.cn; muxd@qibebt.ac.cn

b International Centre for Bamboo and Rattan, Beijing 100102, China

c Fujian Provincial Key Laboratory of Ecology-Toxicological Effects & Control for Emerging Contaminants, Putian University, Fujian 351100, China

The conversion of furfural, the yield and selectivity of products are calculated according to the equations as following:

$$\text{FFA conversion (\%)} = \frac{n_{FFA}^{in} - n_{FFA}^{det}}{n_{FFA}^{in}} \times 100 \quad (1)$$

$$\text{FA yield (\%)} = \frac{n_{FA}^{det}}{n_{FFA}^{in}} \times 100 \quad (2)$$

$$\text{FA selectivity (\%)} = \frac{n_{FA}^{det}}{n_{FFA}^{in} - n_{FFA}^{det}} \times 100 \quad (3)$$

$$\text{CPO yield (\%)} = \frac{n_{CPO}^{det}}{n_{FFA}^{in}} \times 100 \quad (4)$$

$$\text{CPO selectivity (\%)} = \frac{n_{CPO}^{det}}{n_{FFA}^{in} - n_{FFA}^{det}} \times 100 \quad (5)$$

$$\text{CPL yield (\%)} = \frac{n_{CPL}^{det}}{n_{FFA}^{in}} \times 100 \quad (6)$$

$$\text{CPL selectivity (\%)} = \frac{n_{CPL}^{det}}{n_{FFA}^{in} - n_{FFA}^{det}} \times 100 \quad (7)$$

where n^{in} means the initial amount of reactant added into the reactor, n^{det} means the amount of products detected after reaction.

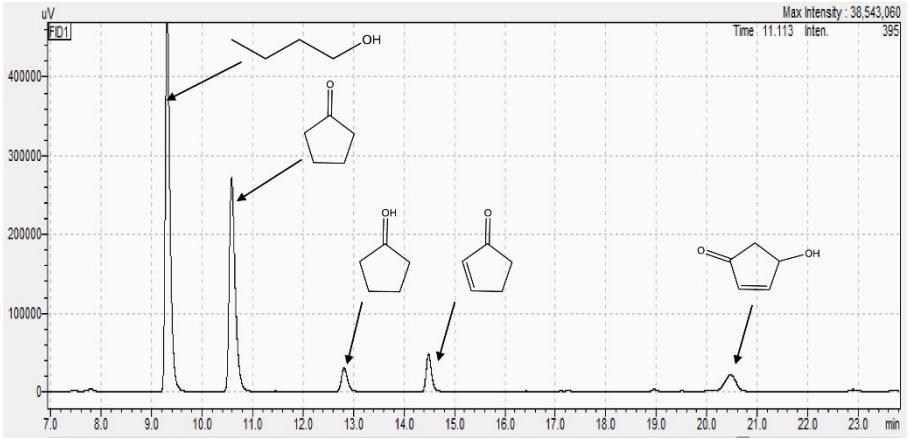
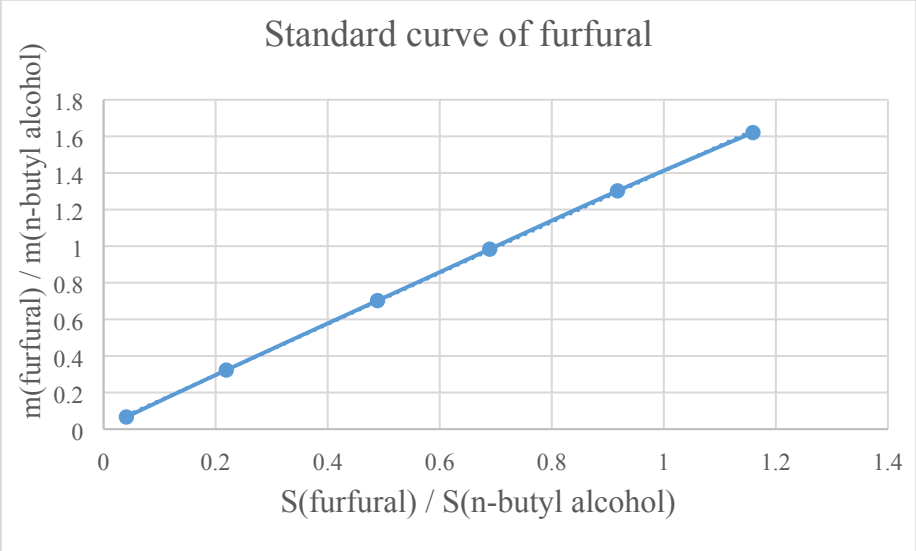
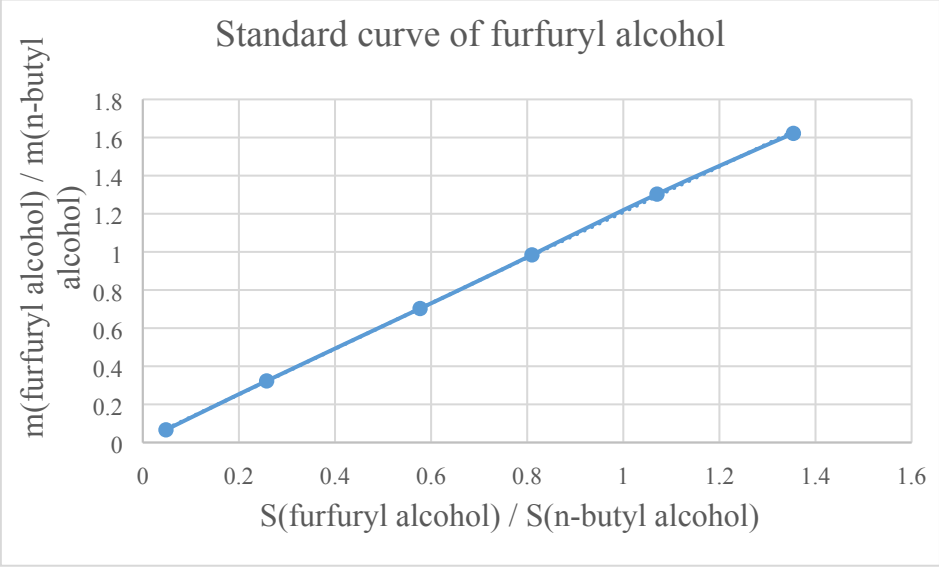
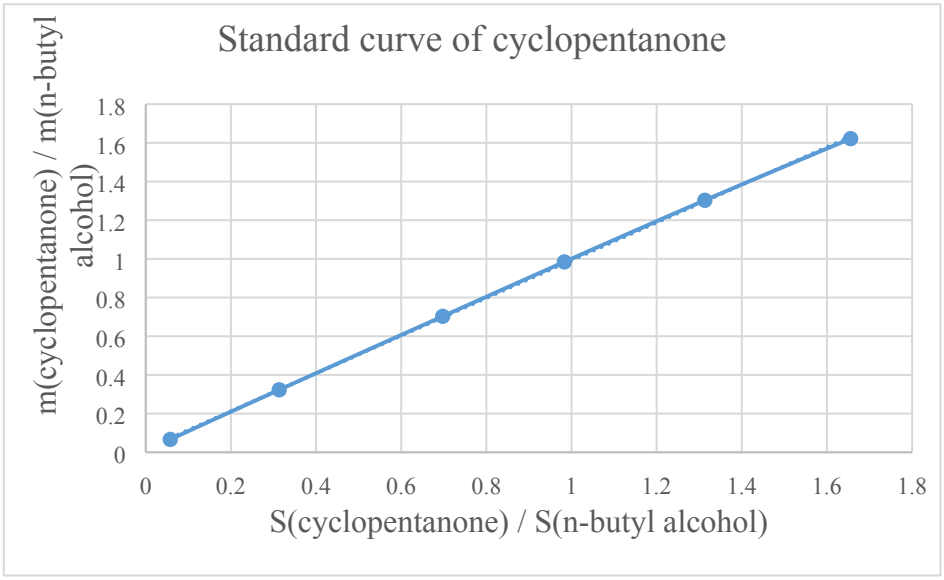


Fig. S1 Representative GC spectrums of furfural hydrogenation in water.







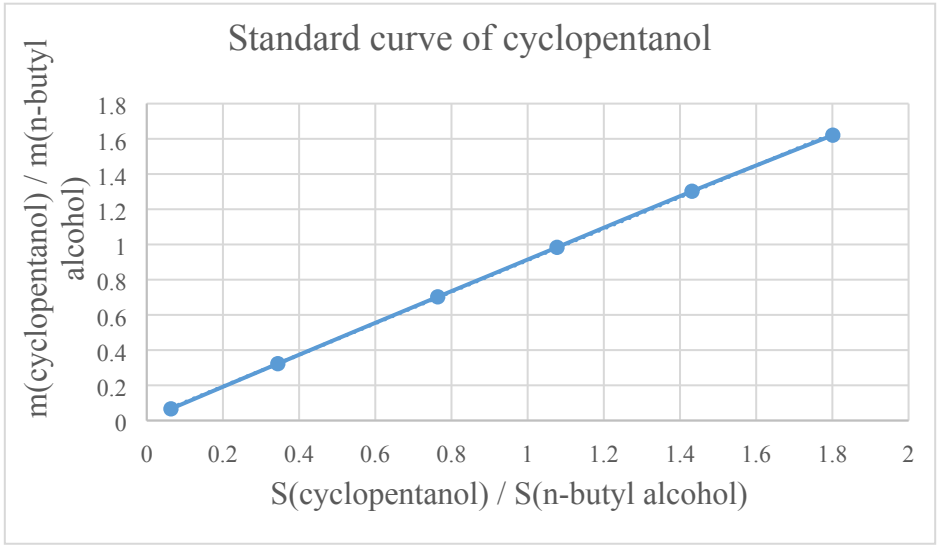


Fig. S2 Standard curve of furfural with n-butyl alcohol and furfuryl alcohol , cyclopentanone, cyclopentanol with n-butyl alcohol.

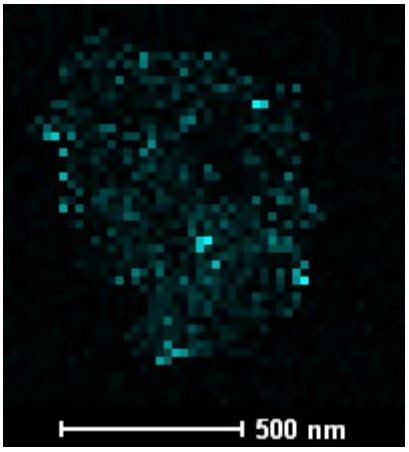


Fig. S3 Pt STEM mapping images of Pt/NC-BS-800.