Supporting Information

Monolithic Wood-Based Carbon Supported Pd Nanoparticles with Tunable Exposure for Boosting Semi-Hydrogenation of Alkynols

AUTHOR NAMES

*Cheng-Long Li, Rui-Ping Zhang, Lu Hou, Ya-Dong Xie, An-Hui Lu**

AUTHOR ADDRESS

State Key Laboratory of Fine Chemicals, Liaoning Key Laboratory for Catalytic Conversion of Carbon Resources, School of Chemical Engineering, Dalian University of Technology, Dalian 116024, P. R. China

E-mail: anhuilu@dlut.edu.cn

Supplementary Figures and Tables

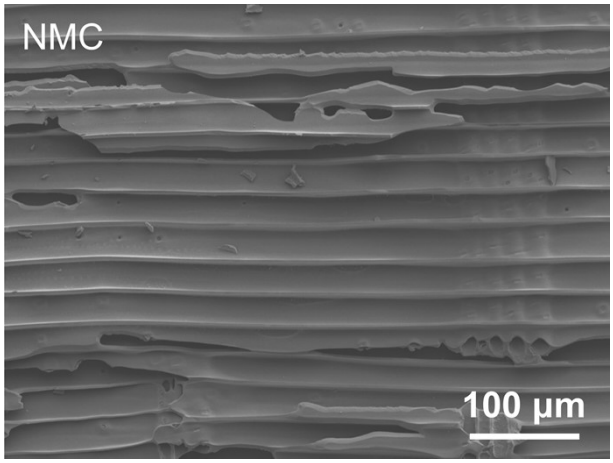

Fig. S1 SEM image of NMC along the parallel growth direction of the wood.

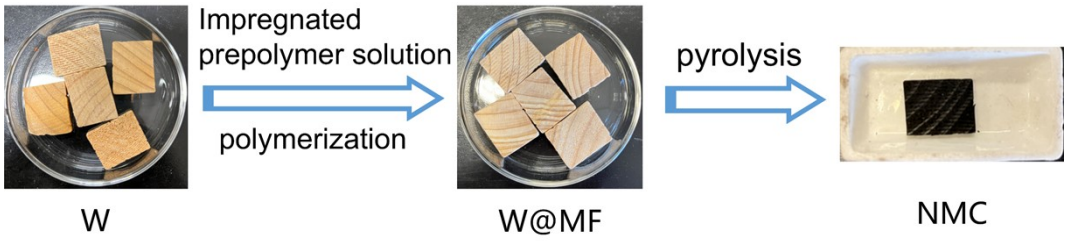

Fig. S2 Photographs of W, W@MF, and NMC.

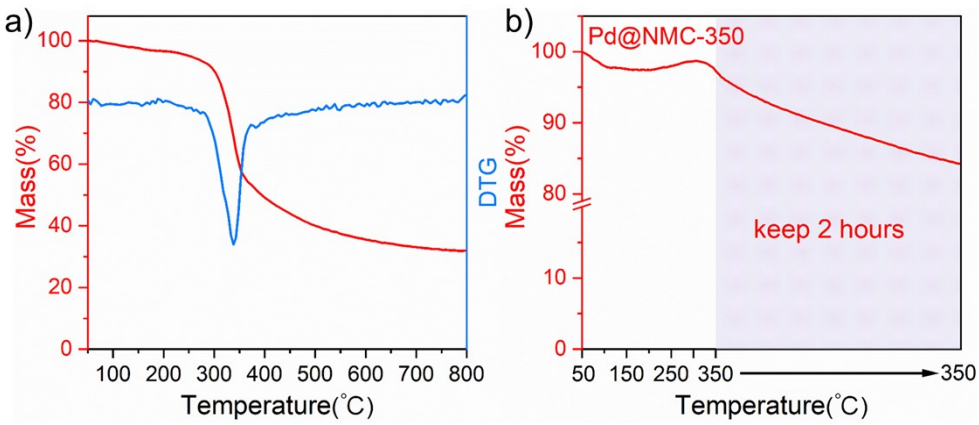

Fig. S3 a) TG and DTG curves of the W@MF heated from ambient temperature to 800 ℃ at a rate of 10℃ min^{-1} under N_2 flow. b) The TG curve of the NMC heated from ambient temperature to 350 ℃ staying for 2 h at a rate of 10℃ min^{-1} under the Air flow.

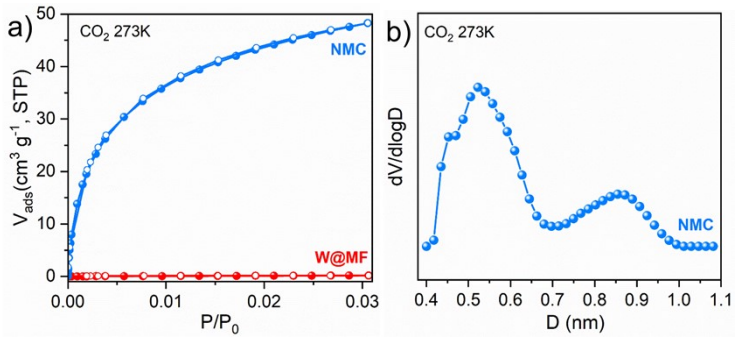

Fig. S4 a) CO_2 adsorption-desorption isotherms of W@MF and NMC at 273 K. b) Pore size distribution of NMC determined from CO_2 adsorption at 273 K.

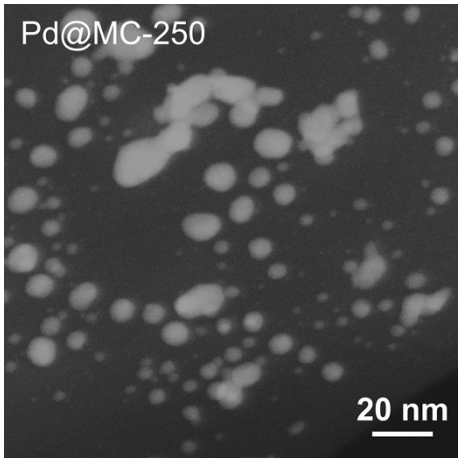

Fig. S5 STEM image of the Pd@MC-250 catalyst.

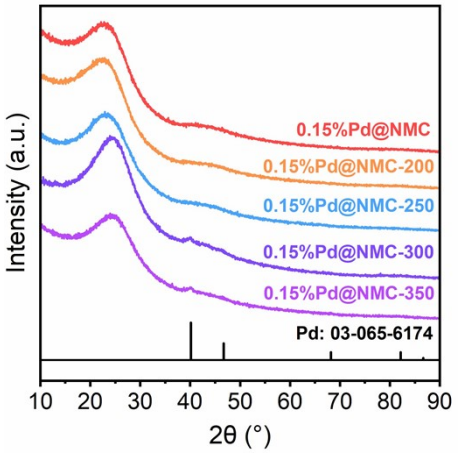

Fig. S6 XRD patterns of the different monolithic carbon catalysts.

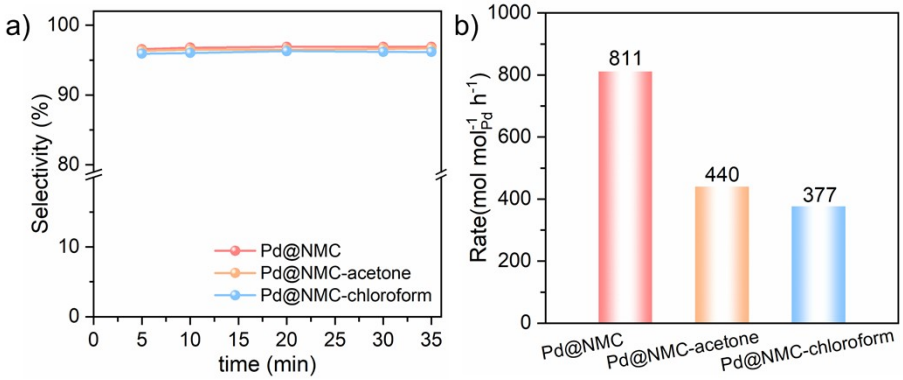

Fig. S7 a) Selectivity of MBE upon Pd@NMC, Pd@NMC-acetone and Pd@NMC-chloroform. b) Reaction rates of the catalysts.

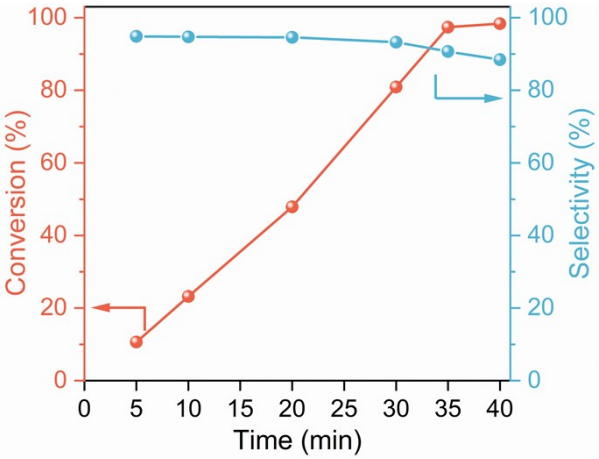

Fig. S8 Conversion of MBY and selectivity of MBE upon Pd@NMC-250.

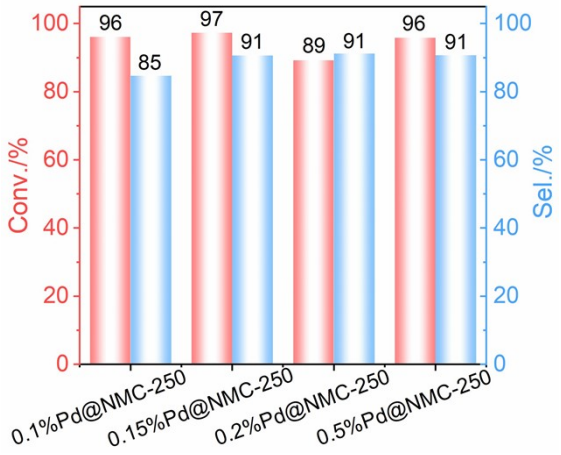

Fig. S9 Conversion of MBY and selectivity of MBE upon catalysts with different metal loadings.

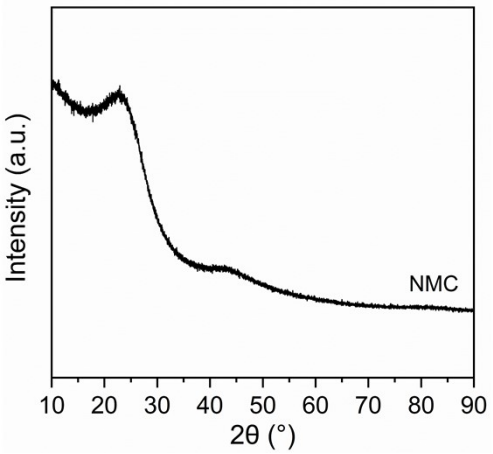

Fig.S10 XRD patterns of the N-doped monolithic carbon (NMC).

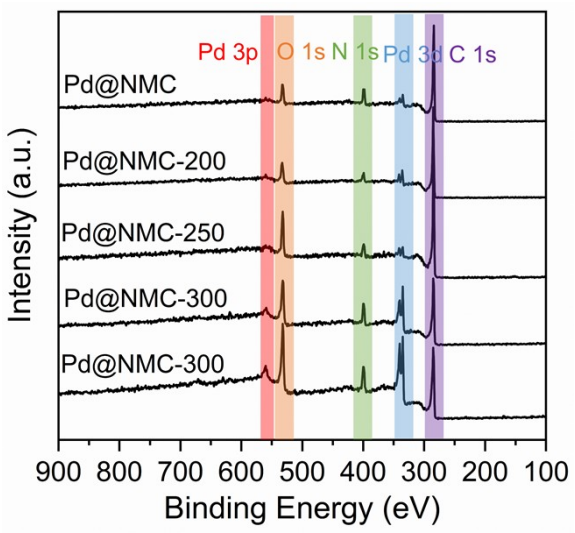

Fig.S11 XPS spectrum of different monolithic carbon catalysts.

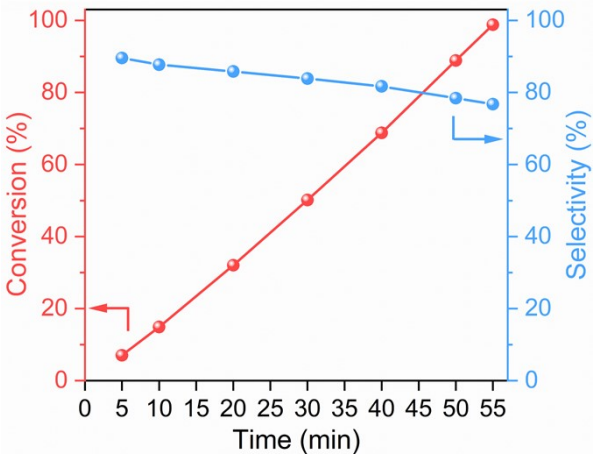

Fig. S12 Conversion of MBY and selectivity of MBE upon Pd@MC-250.

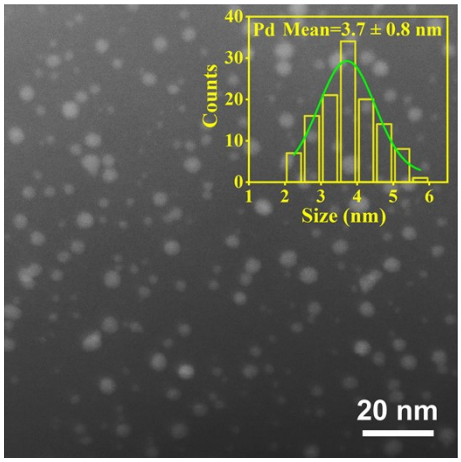

Fig. S13 STEM image and particle size distribution of the Pd@NMC-250

(The catalyst after five cycles of reaction).

Table S1 Surface atomic ratio obtained from X-ray photoelectron spectroscopy.

Sample	C (%)	N (%)	O (%)	Pd (%)
Pd@NMC	79.12	10.93	9.29	0.66
Pd@NMC-200	79.20	8.22	11.64	0.94
Pd@NMC-250	76.50	6.92	15.03	1.55
Pd@NMC-300	63.38	12.33	21.45	2.84
Pd@NMC-350	56.76	12.76	26.70	3.78

Table S2 ICP-OES of the different monolithic carbon catalysts.

Entry	Catalysts	Theoretical Pd loading/wt.%	Actual Pd loading/wt.%
1[a]	Pd@NMC	0.150	0.133
2[a]	Pd@NMC-200	0.150	0.137
3[a]	Pd@NMC-250	0.150	0.138
4[b]	Pd@NMC-250	0.150	0.135
5[a]	Pd@NMC-300	0.150	0.132
6[b]	Pd@NMC-300	0.150	0.114
7[a]	Pd@NMC-350	0.150	0.139

[a] As-prepared fresh catalysts; [b] The catalysts after five cycles.

Table S3 Catalytic performance in the 2-methyl-3-butyn-2-ol hydrogenation reaction over various catalysts.

Catalysts	Conv. (%)	Sel. (%)	Rate (mol mol_{cat}^{-1} h^{-1})	Conditions	Ref.
Pd-In/In_2O_3-250	99	95	1340	30 ºC, 1 bar H_2	[1]
PdZn/CN@ZnO	96	92	434	35 ºC, 5 bar H_2	[2]
Pd/ZnO/SMF	100	95	2556	35 ºC, 5 bar H_2	[3]
Pd(B,C)/OMC	100	95	3333	25 ºC, 1 bar H_2	[4]
UiO-67@Pd@UiO-67	100	92	15495	10 ºC, 5 bar H_2	[5]
Pd/NHPC-DETA-50	100	94	6846	90 ºC, 3 bar H_2	[6]
Pd_3S/C_3N_4	85	100	300	30 ºC, 1 bar H_2	[7]
Pd@NMC-250(This Work)	97	91	5110	35 ºC, 5 bar H_2	

Notes and references

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