Supplementary Material

Hydrochlorination of acetylene catalyzed by mesoporous carbon with hierarchical assembly of polyimide nanosheets

Zihan Guo [a], Wencai Peng [a], Jian Li [a, c], Feng Li [a], Qiangang Zhang [a], Lijie Yang [a], Dongyang Xie [a], Yanzhao Dong [a]*, Jinli Zhang [a, b] and Haiyang Zhang [a]*

[a] *School of Chemistry and Chemical Engineering/ State Key Laboratory Incubation Base for Green Processing of Chemical Engineering, Shihezi University, Shihezi, Xinjiang, 832000, P.R. China;*

[b] *School of Chemical Engineering and Technology, Tianjin University, Jinnan District, Tianjin, 300072, P.R. China.*

[c] *Yunnan Precious Metals Lab Co., Ltd, Kunming 650106, P. R. China.*

* Corresponding authors.

Fax: +86-993-2057006; Tel: +86-993-2057006;

E-mail address: yzdong2012@shzu.edu.cn (Y. Dong);

zhy198722@163.com(H. Zhang);

Table of contents:

Table S1 Comparison of performance of the reported non-metallic catalysts for acetylene hydrochlorination reaction in recent years.

Catalysts	Conversion of Acetylene (%)	Conditions	Ref.
Z_4M_1	60	180°C, GHSV(C_2H_2) = 50 h^{-1}, and V(HCl)/V(C_2H_2) = 1.15	1
PANI-AC-900	76	180°C, GHSV(C_2H_2) = 36 h^{-1}, and V(HCl)/V(C_2H_2) = 1.1	2
N@CBC-FE	75	220°C, GHSV(C_2H_2) = 50 h^{-1}, and V(HCl)/V(C_2H_2) = 1.1	3
MF-600	95	220°C, GHSV(C_2H_2) = 30 h^{-1}, and V(HCl)/V(C_2H_2) = 1.2	4
20%[DBU][Cl]/AC	86	240°C, GHSV(C_2H_2) = 30 h^{-1}, and V(HCl)/V(C_2H_2) = 1.2	5
DF/BC-850	92	220°C, GHSV(C_2H_2) = 45 h^{-1}, and V(HCl)/V(C_2H_2) = 1.15	6
1.00NPC	87	220°C, GHSV(C_2H_2) = 30 h^{-1}, and V(HCl)/V(C_2H_2) = 1.2	7
PACP-800	84	180°C, GHSV(C_2H_2) = 30 h^{-1}, and V(HCl)/V(C_2H_2) = 1.15	8
NPCs-900	91	180°C, GHSV(C_2H_2) = 30 h^{-1}, and V(HCl)/V(C_2H_2) = 1.15	This work

Table S2 Relative atomic percentage of different O-containing species, determined by XPS.

Samples	Atomic O (at%)	Area (%)	
		C=O	C-OH
NPCs-600	11.52	51.67	48.33
NPCs-700	9.58	54.33	45.67
NPCs-800	12.31	57.06	42.94
NPCs-900	12.19	57.93	42.07
NPCs-1000	10.61	53.78	46.22

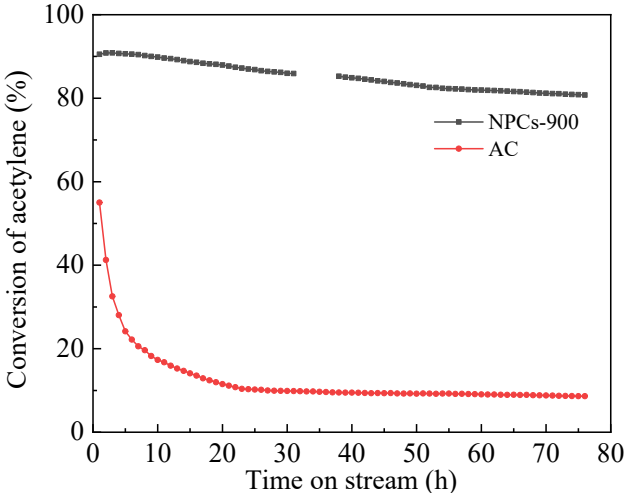

Figure S1. Comparison of stability of NPCs-900 and AC catalysts in the acetylene hydrochlorination reaction. Reaction conditions: T = 180°C, GHSV(C_2H_2) = 30 h^{-1}, and V(HCl)/V(C_2H_2) = 1.15.

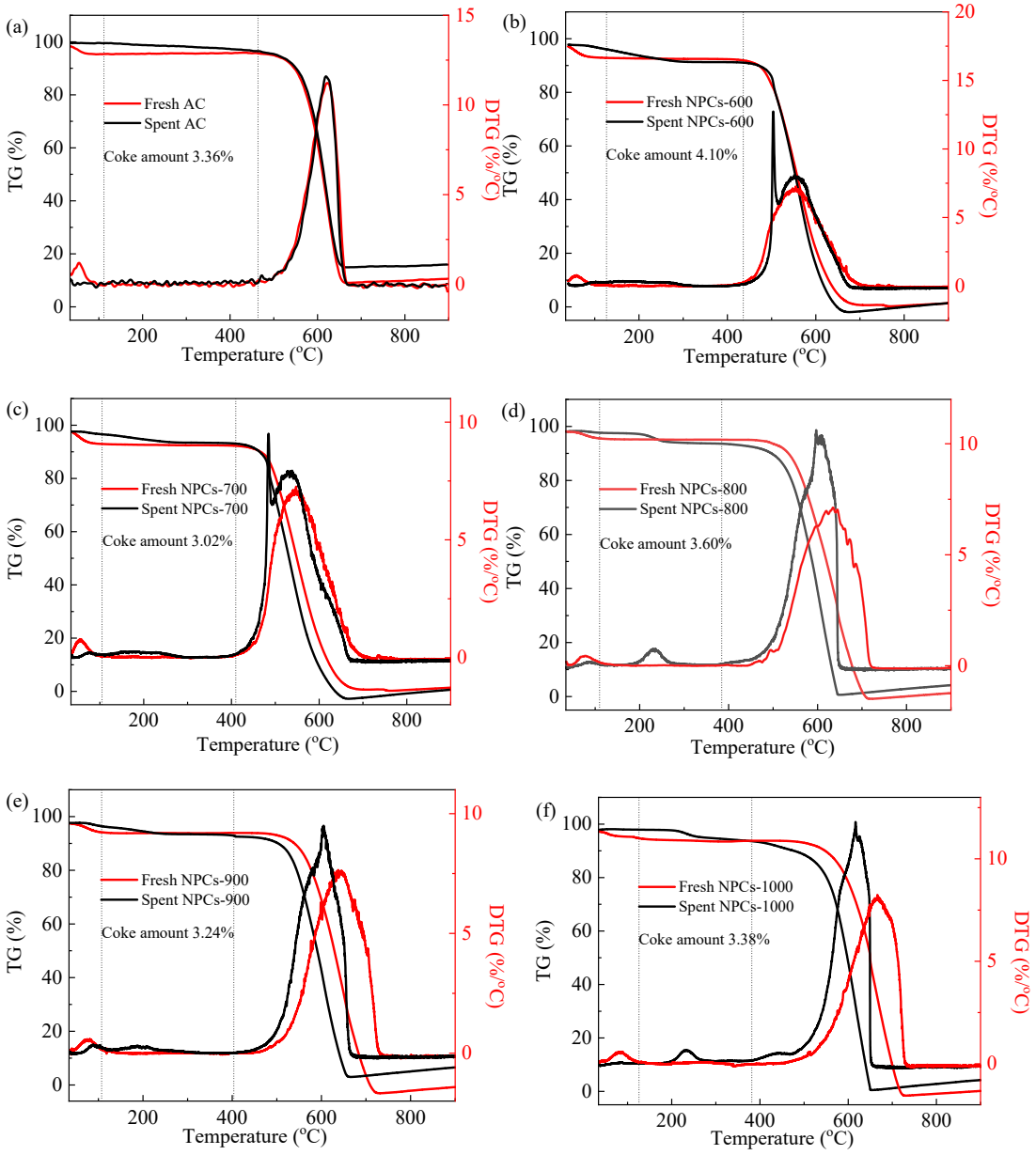

Figure S2. TG curves of the fresh and spent catalysts recorded in air atmosphere.

References

1. X. Li, J. Zhang and W. Li, *J. Ind. Eng. Chem.*, 2016, **44**, 146-154.
2. C. Zhang, L. Kang, M. Zhu and B. Dai, *RSC Adv.*, 2015, **5**, 7461-7468.
3. Y. Liu, H. Zhang, X. Li, L. Wang, Y. Dong, W. Li and J. Zhang, *Appl. Catal. A*, 2021, **611**, 11702.
4. X. Qiao, Z. Zhou, X. Liu, C. Zhao, Q. Guan and W. Li, *Catal. Sci. Technol.*, 2019, **9**, 3753-3762.
5. X. Dong, G. Liu, Z. Chen, Q. Zhang, Y. Xu and Z. Liu, *Mol. Catal.*, 2022, **525**, 112366.
6. S. Wu, A. Jiang, X. Zhou, Y. Liu and S. Cao, *Mol. Catal.*, 2022, **532**, 112719.
7. S. Wei, Y. Qiu, X. Sun, X. Wang, H. Li, G. Lan, J. Liu and Y. Li, *ACS Sustain. Chem. Eng.*, 2022, **10**, 10476-10485.
8. F. Li, H. Zhang, M. Zhang, L. Li, L. Yao, W. Peng and J. Zhang, *ACS Sustain. Chem. Eng.*, 2022,

10, 194-203.