

Supporting Information

**Boosting acetone oxidation efficiency over MnO₂ nanorods by
tailoring crystal phases**

Li Cheng, Jinguo Wang*, Chi Zhang, Bei Jin and Yong Men

*College of Chemistry and Chemical Engineering, Shanghai University of Engineering
Science, Shanghai 201620, P. R. China*

*Author to whom correspondence should be addressed. E-mail address:

Jinguowang1982@sues.edu.cn, Tel: +86-21 6787 4046

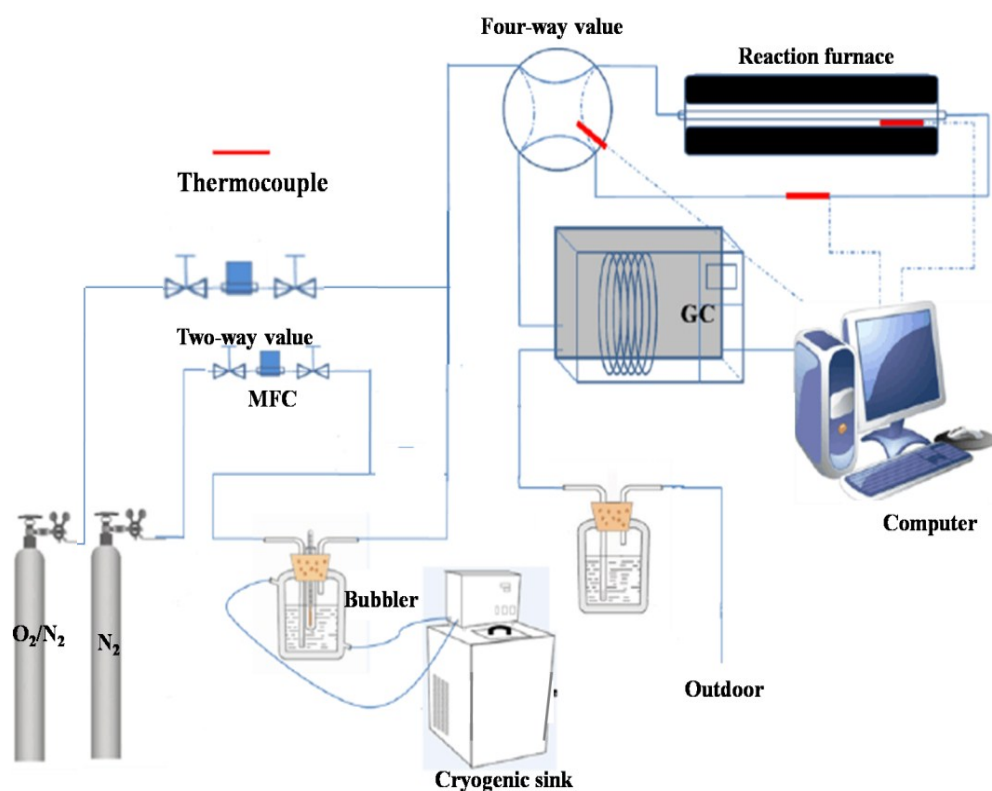


Fig. S1 Schematic flowing chart of the reaction system for acetone oxidation.

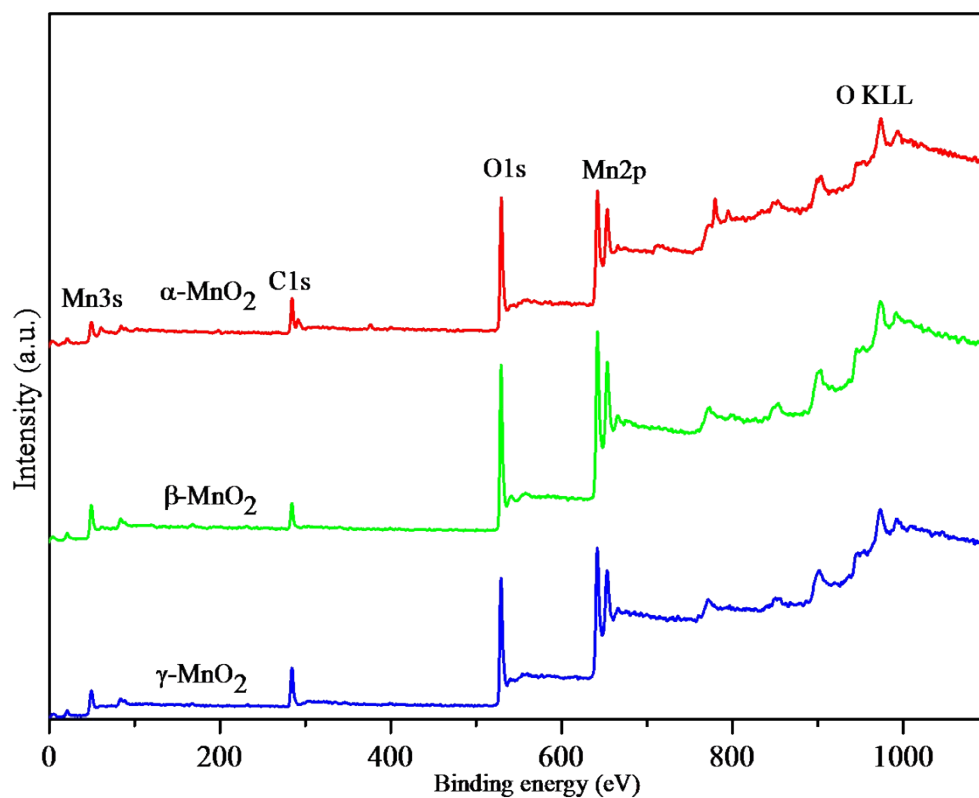


Fig. S2 XPS surveys of MnO_2 with different crystal phases.

Table S1 Activity data of different catalysts for acetone oxidation as previous studies.

Catalyst	Acetone (ppm)	O ₂ (vol%)	T ₅₀ (°C)	T ₉₀ (°C)	Reference
α -MnO ₂ nanorods	1000	20	93	104	This work
CuCo ₂ O ₄ hollow spheres	1000	20	157	183	1
Ordered mesoporous Fe ₂ O ₃	1000	20	136	186	2
CoAl mixed oxides	1000	20	189	222	3
Cu _{0.13} Ce _{0.87} O _y foam	1000	20	200	223	4
MnO _x /TiO ₂ nanofibers	500	5.0	275	360	5
CuCeO _x nanofibers	500	20	190	225	6
V-TiO ₂ -carbon composite	500	5.0	230	292	7
V ₂ O ₅ /TiO ₂ nanofibers	500	5.0	270	300	8
Au/Fe ₂ O ₃ nanoparticles	700	10	≈235	≈268	9
Au/CeO ₂ nanoparticles	700	10	218	240	10
Ag/CeO ₂ nanoparticles	700	10	220	245	10
Cu/CeO ₂ nanoparticles	700	10	240	260	10

References:

- [1] C. Zhang, J. G. Wang, S. F. Yang, H. Liang and Y. Men, *J. Colloid Interf. Sci.*, 2019, 539, 65-75.
- [2] Y. S. Xia, H. X. Dai, H. Y. Jiang, J. G. Deng and Y. X. Liu, *J. Hazard. Mater.*, 2011, 186, 84-91.
- [3] Q. Zhao, Y. L. Ge, K. X. Fu, N. Ji, C. F. Song and Q. L. Liu, *Chemosphere*, 2018, 204, 257-266.
- [4] C. Q. Hu, Q. S. Zhu, Z. Jiang, L. Chen and R. F. Wu, *Chem. Eng. J.*, 2009, 152,

583-590.

[5] X. C. Zhu, S. Zhang, X. N. Yu, X. B. Zhu, C. H. Zheng, X. Gao, Z. Y. Luo and K. F. Cen, *J. Hazard. Mater.*, 2017, 337, 105-114.

[6] R. Qin, J. H. Chen, X. Gao, X. B. Zhu, X. N. Yu and K. F. Cen, *RSC Adv.*, 2014, 4, 43874-43881.

[7] J. H. Chen, X. N. Yu, X. C. Zhu, C. H. Zheng, X. Gao and K. F. Cen, *Appl. Catal., A*, 2015, 507, 99-108.

[8] X. C. Zhu, J. H. Chen, X. N. Yu, X. B. Zhu, X. Gao and K. F. Cen, *RSC Adv.*, 2015, 5, 30416-30424.

[9] S. Minicò, S. Scire` and S. Galvagno, *Appl. Catal., B*, 2001, 34, 277-285.

[10] S. Scire` , P. M. Riccobene and C. Crisafulli, *Appl. Catal., B*, 2010, 101, 109-117.