

Electronic Supplementary Information (ESI) available for:

Fabrication of Ag/CeO₂ core-shell nanospheres with enhanced catalytic performance through strengthening the interfacial interactions

Jun Zhang,^{a,c} Liping Li,^b Xinsong Huang,^a Guangshe Li^{a*}

^a State Key Lab of Structural Chemistry, ^b Key Lab of Optoelectronic Materials Chemistry and Physics, Fujian Institute of Research on the Structure of Matter, Chinese Academy of Sciences, Fuzhou 350002; ^c School of Chemistry and Chemical Engineering, Inner Mongolia University, Hohhot 010021, People's Republic of China.

Fax: (+) 86-591-83714946

E-mail: guangshe@fjirsm.ac.cn

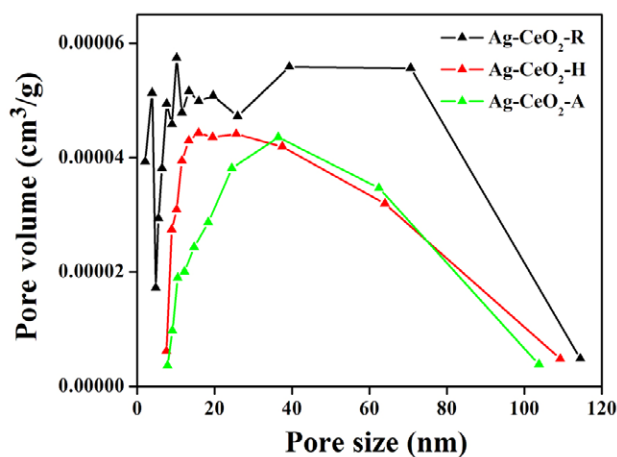


Figure S1 Pore size distribution curves of the samples *Ag-CeO₂-R*, *Ag-CeO₂-H*, and *Ag-CeO₂-A*. As the treatment temperature increased, pore distribution of the samples became relatively narrowed, while the catalytic property was improved. The uniform pore distribution may be beneficial for adsorption and desorption of CO and O₂, leading to the enhanced catalytic performance.

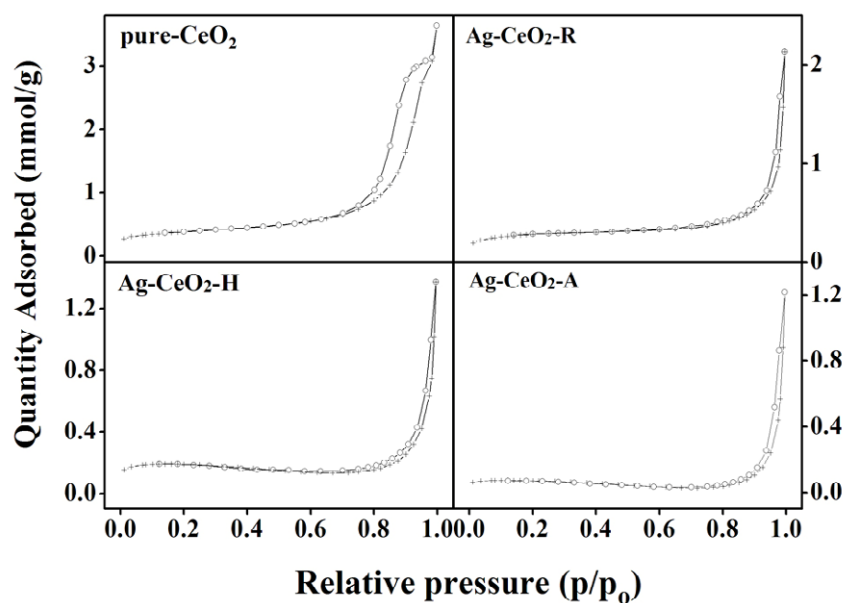


Figure S2 N₂ adsorption and desorption curves of pure-CeO₂, *Ag-CeO₂-R*, *Ag-CeO₂-H* and *Ag-CeO₂-A*. The quantity of N₂ adsorption and desorption monotonously decreased in the sequence of pure-CeO₂ > *Ag-CeO₂-R* > *Ag-CeO₂-H* > *Ag-CeO₂-A*, which is consistent with BET surface areas, but opposite to the activity sequence. These observations indicate that BET surface area is not the predominant factor for the catalytic property.

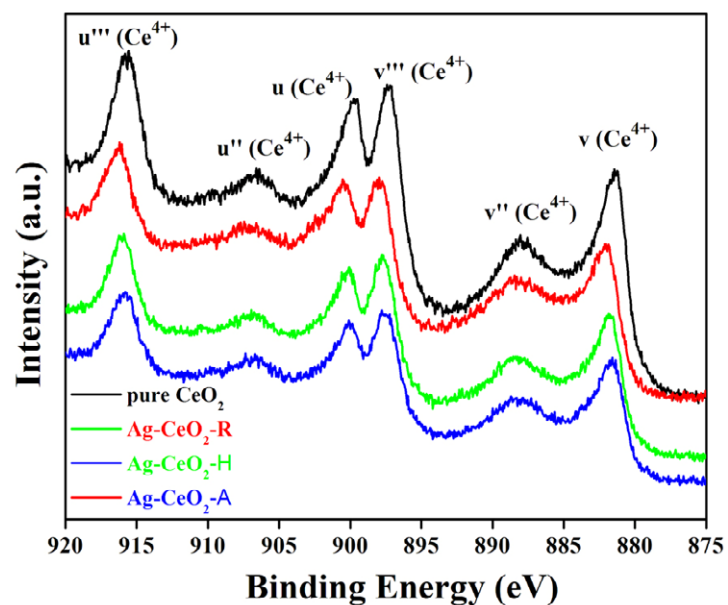


Figure S3 Ce 3d XPS core level spectra for samples pure-CeO₂, Ag-CeO₂-R, Ag-CeO₂-H, and Ag-CeO₂-A. It can be seen that all XPS signals for cerium can be well assigned to Ce⁴⁺ with no signals of Ce³⁺ species, according to the assignments from literatures.^{1, 2}

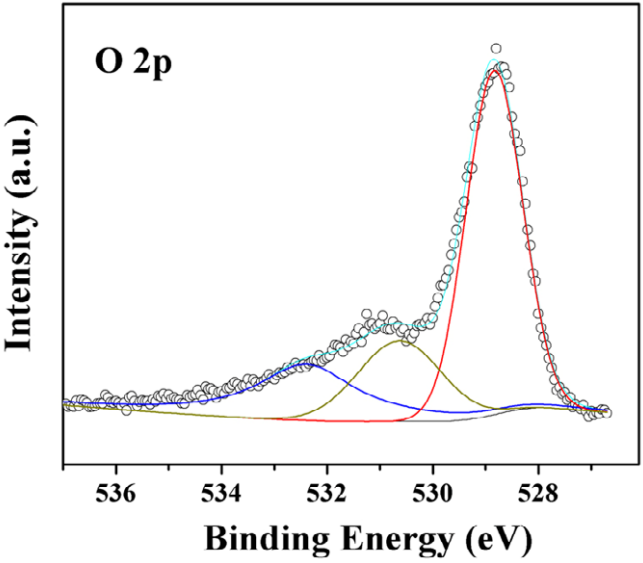


Figure S4 O2p core level spectrum for sample pure-CeO₂.

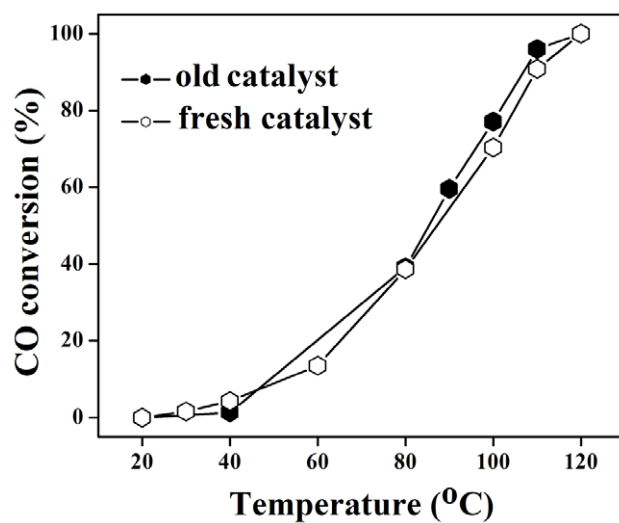


Figure S5 CO catalytic oxidation performances for fresh and old Ag-CeO₂-A catalysts. The old Ag-CeO₂-A catalyst denotes the sample after fresh Ag-CeO₂-A stayed in air for a long period of 10 months. As can be seen, both catalysts kept almost the same conversion rate of CO as featured by a full complete temperature around 120 °C.

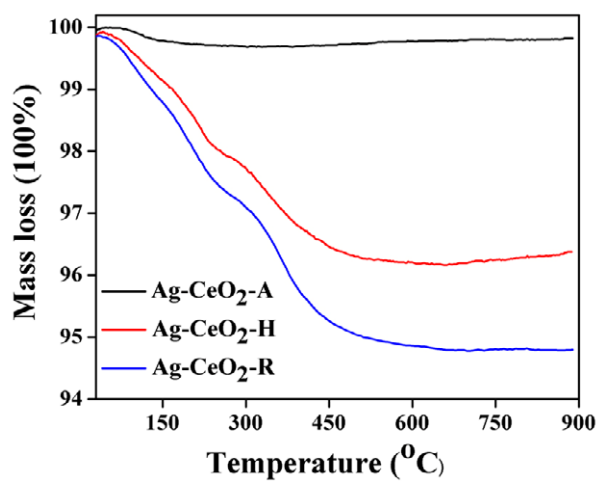


Figure S6 Thermal gravimetric analyses (TGA) of the samples Ag-Ce₂-R, Ag-Ce₂-H and Ag-Ce₂-A.

References

1. J. P. Holgado, G. Munuera, J. P. Espinos and A. R. Gonzalez-Elipe, *Appl. Surf. Sci.*, 2000, **158**, 164-171.
2. Q. Xiang, G. Meng, Y. Zhang, J. Xu, P. Xu, Q. Pan and W. Yu, *Sens. and Actuators, B*, 2010, **143**, 635-640.