Electronic Supplementary Material (ESI) for CrystEngComm.

Designed synthesis , formation mechanism of CeO_2 hollow nanospheres and its facile functionalization with Au nanoparticles

Wei Liu,[a]Tian Deng,[a] Lijun Feng,[a] Anran Xie,[a] Jingcai Zhang,[a] Shuping Wang,[a] Xiufang Liu,[a] Yanzhao Yang,* [a] Jinxin Guo*[a]

[a] Key Laboratory for Special Functional Aggregate Materials of Education Ministry, School of Chemistry and Chemical Engineering, Shandong University, Jinan, 250100, P. R. China. Fax: +86-531-88564464; Tel: +86-531-88362988; E-mail: yzhyang@sdu.edu.cn; jinxinguo@sdu.edu.cn.

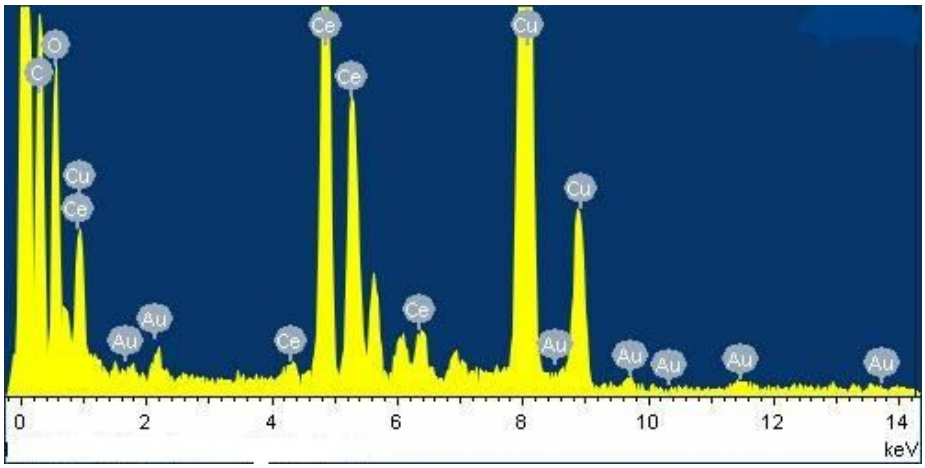

Fig. S1 EDS spectrum of the synthesized Au/CeO_2 nanospheres.

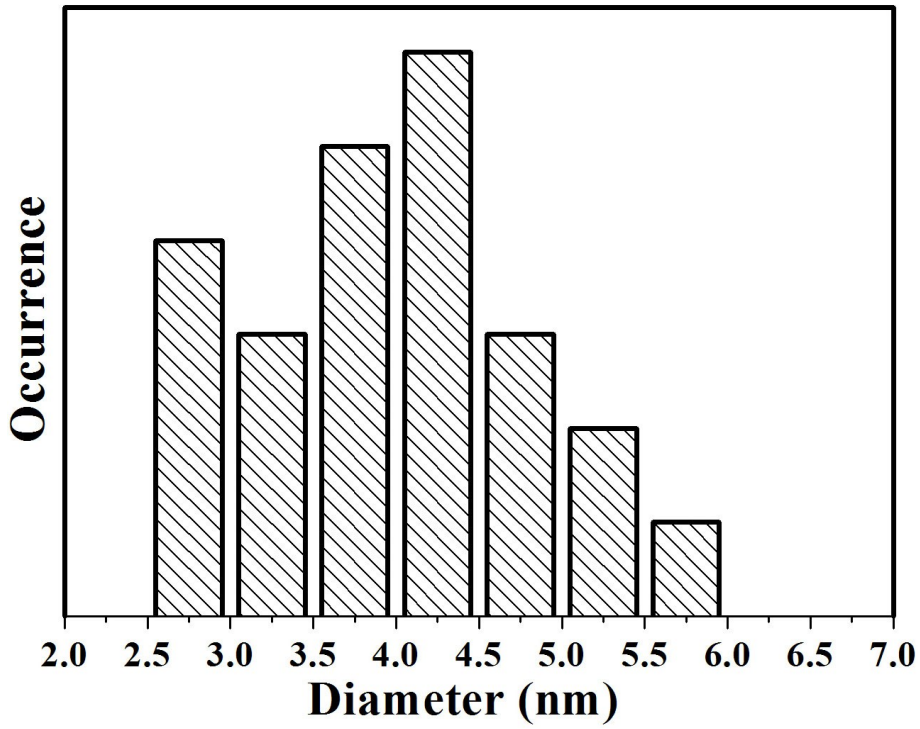

Fig. S2 The corresponding diameter distribution of the as-prepared samples: the Au NPs in the Au/CeO_2 spheres.

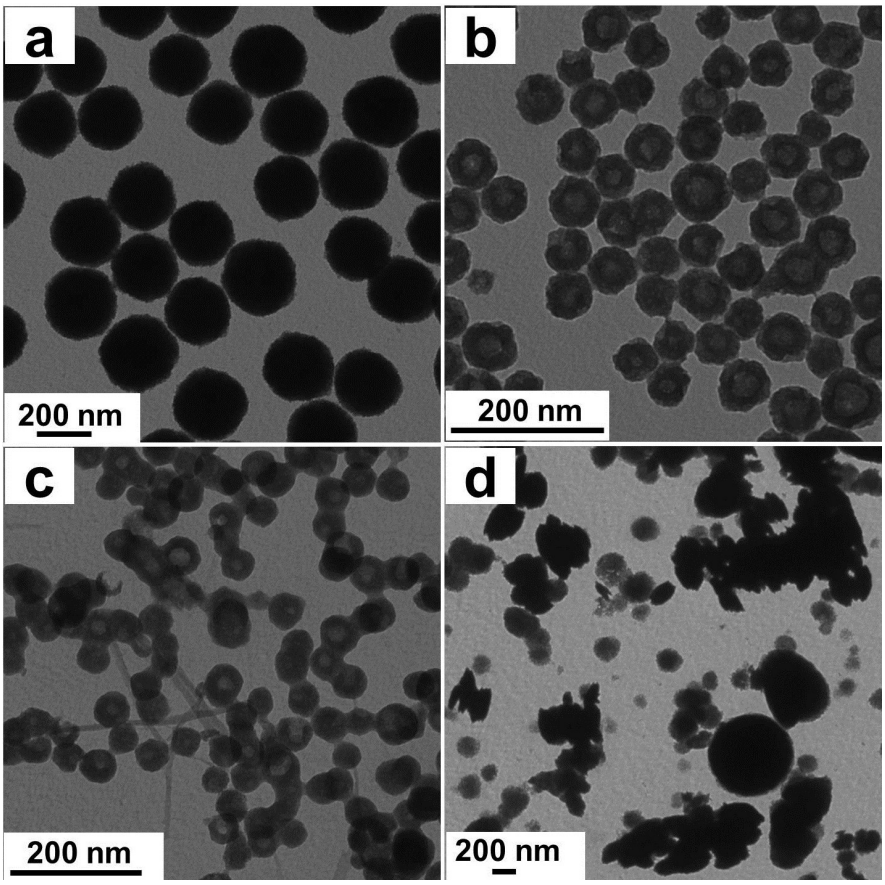

Fig.S3 The TEM images of the products obtained at different temperature: (a) 140°C, (b) 180°C, (c) 200°C and (d) 220°C.

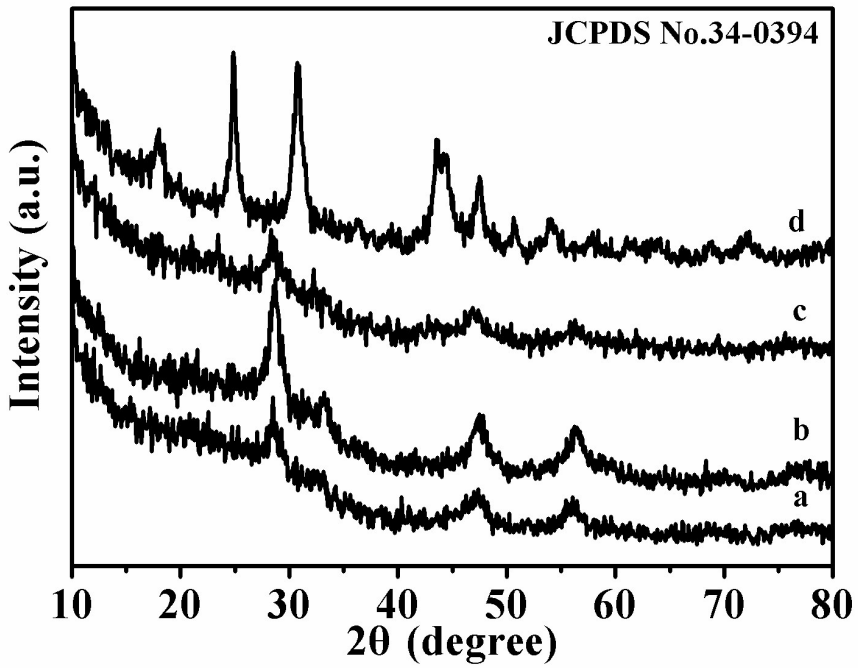

Fig.S4 The corresponding XRD patterns of the products obtained at different temperature: (a) 140°C, (b) 180°C, (c) 200°C and (d) 220°C.

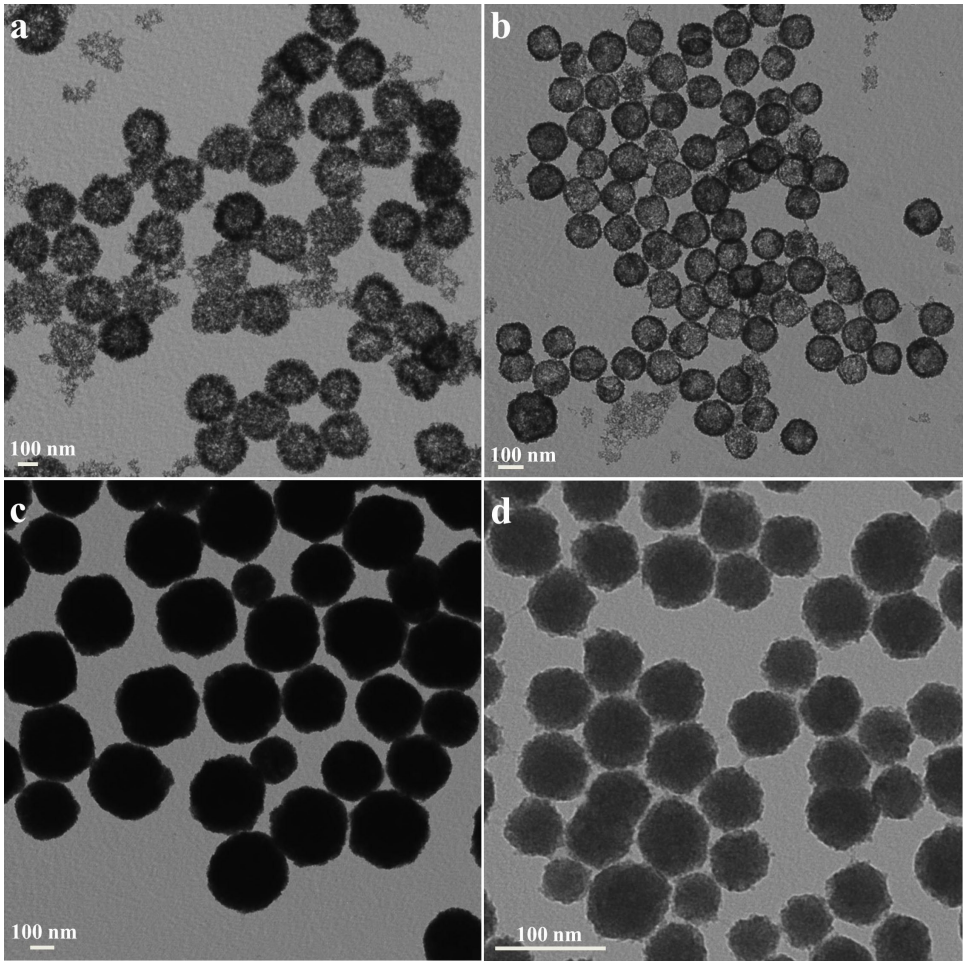

Fig. S5 The TEM images of the as-prepared products at different conditions. The CeO_2 products prepared in two-step synthesis with the etching acid: (a) 1 mol·L^{-1} HCl, (b) 1 mol·L^{-1} HNO_3. The CeO_2 products prepared in one-step synthesis when the 1 mol·L^{-1} HCl is replaced by (c) 1 mol·L^{-1} NaCl, (d)1 mol·L^{-1} HNO_3.

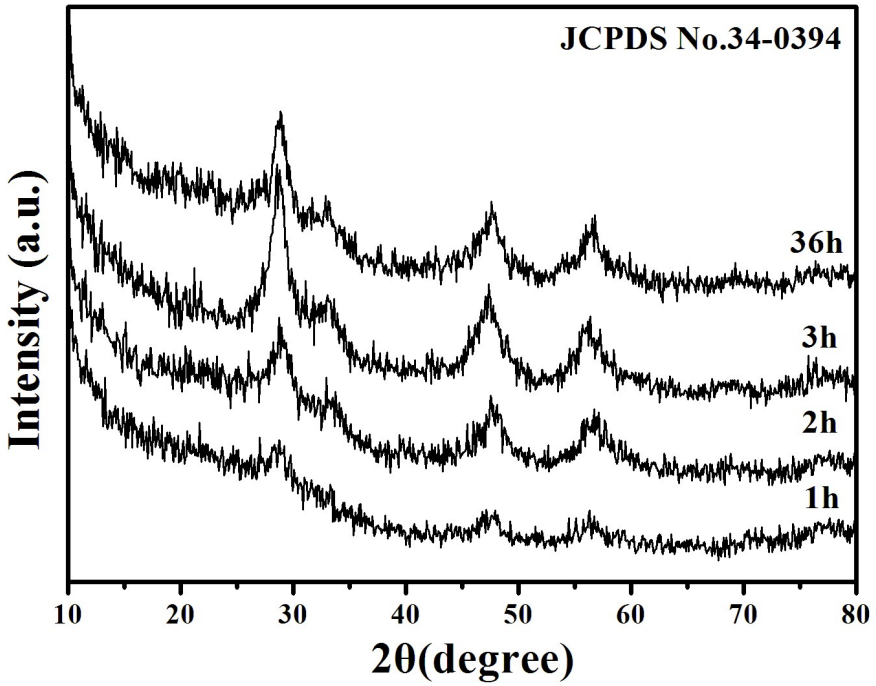

Fig. S6 The XRD patterns of the CeO_2 products obtained at different times.

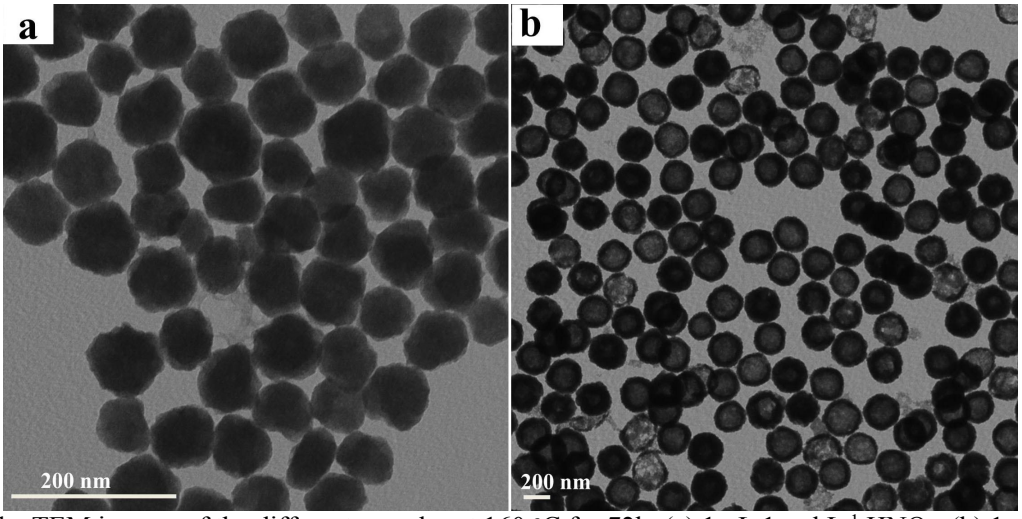

Fig. S7 The TEM images of the different samples at 160 ^{o}C for 72h: (a) 1mL 1mol·L^{-1} HNO_3, (b) 1mL H_2O.

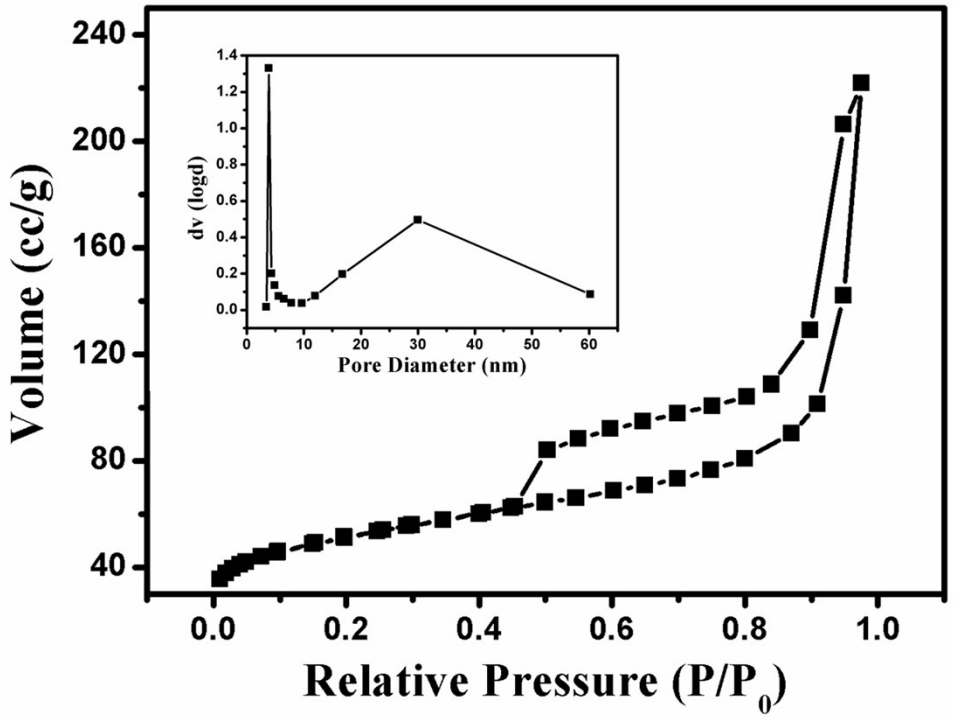

Fig. S8 The N_2 adsorption-desorption isotherms of the obtained samples: pure CeO_2. Inset is the corresponding BJH pore size distribution curves.

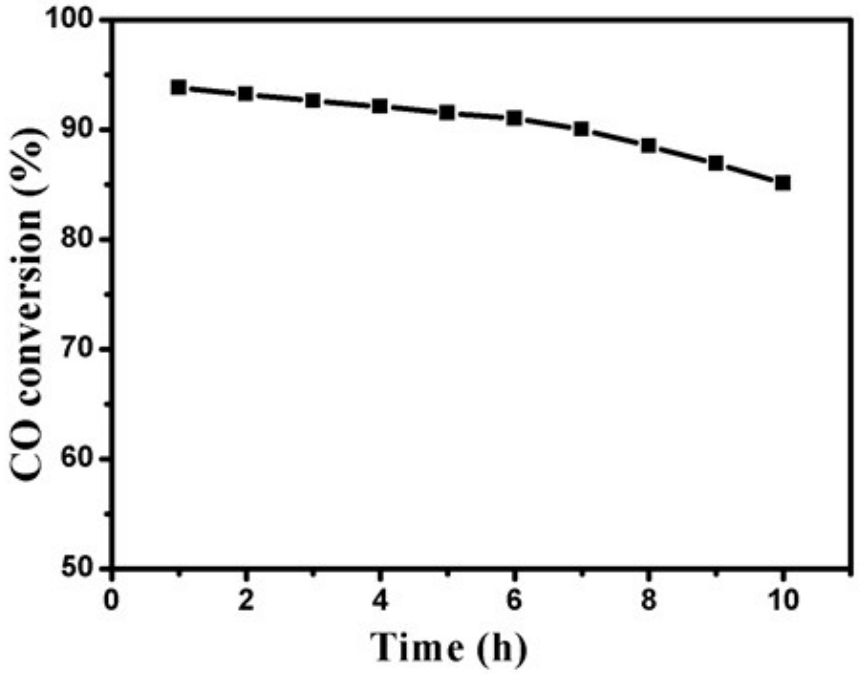

Fig. S9 The CO conversion stability tests of the supported Au/CeO_2 catalysts at 160°C for 10h.