Electronic Supplementary Material (ESI) for RSC Advances.

One Step Hydrothermal Synthesis of CeO_2-ZrO_2 Nanocomposites and Investigation of the Morphological Evolution

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Supporting information

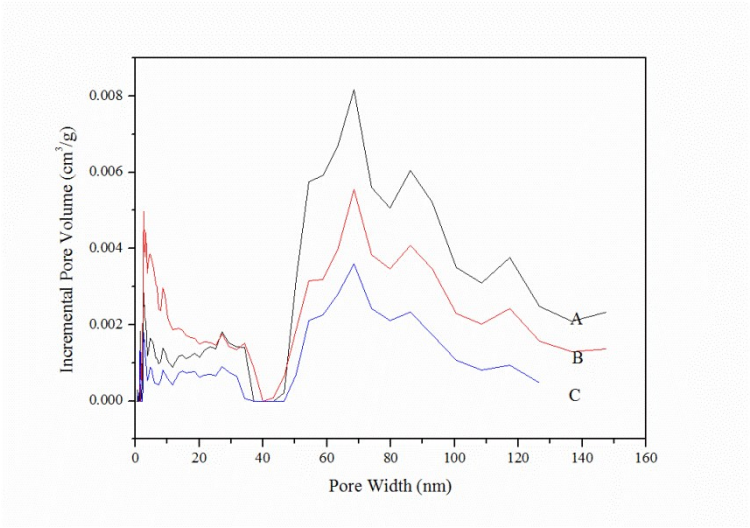

Fig. S1 The pore size distribution: $Ce_{0.9}Zr_{0.1}O_2$ hydrothermal treated at 373K for A: 10 h, B: 24 h , C: 48 h then calcined at 673K.

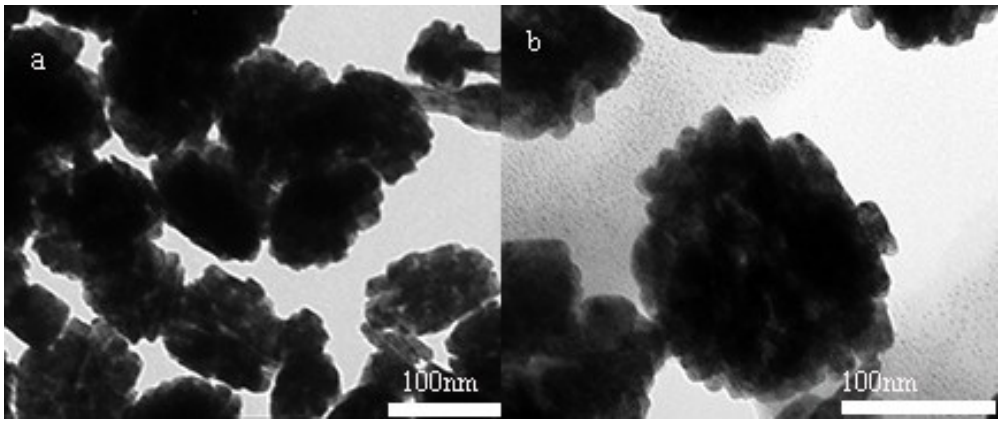

Fig. S2 CeO_2 hydrothermal treated at 373K for 48 h then calcined at 673K.

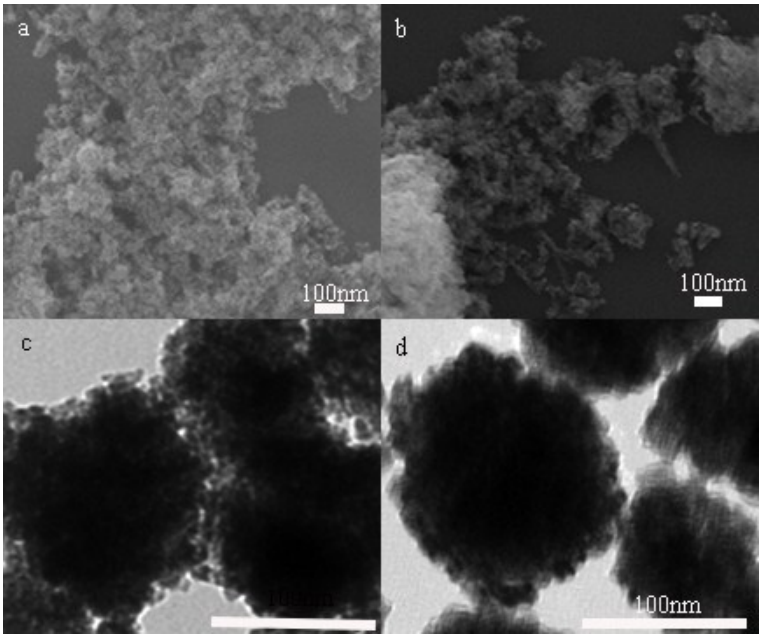

Fig. S3 The molar ratio of urea to precursor was 30:1 after hydrothermal treated at 373K for (a) 4 h, (b)8 h, (c)10 h, (d) 15 h.

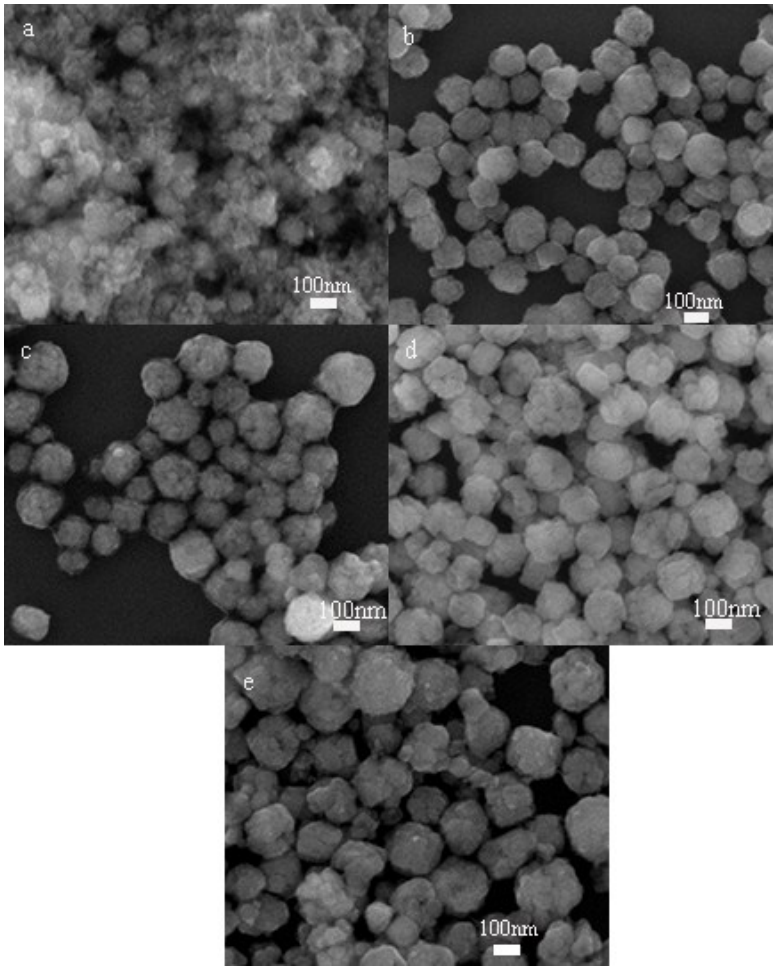

Fig. S4 The molar ratio of urea to precursor was 40:1 and hydrothermal treated at (a) 393K, (b) 413K, (c) 433K, (d) 453K, (e) 473K for 4 h.

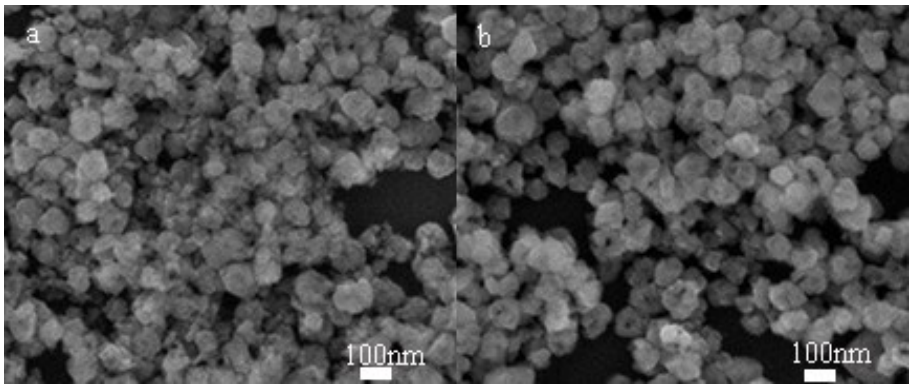

Fig. S5 SEM images of $Ce_{0.9}Zr_{0.1}O_2$ calcined at 1173K with the molar ratio of urea to precursor was 40:1 and hydrothermal treated for (a) 10 h, (b) 48 h.

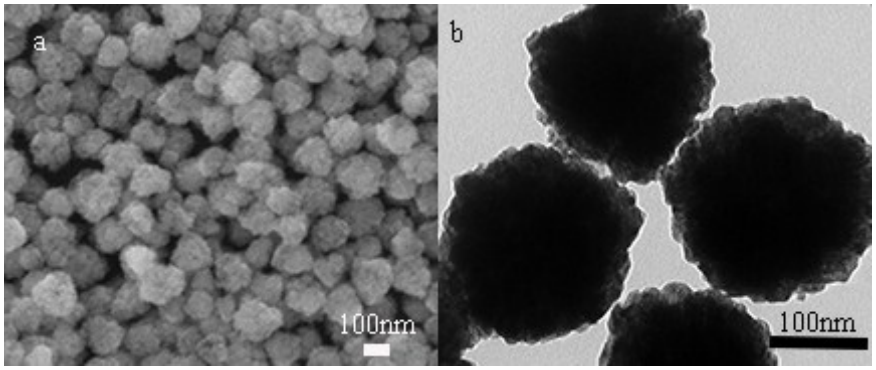

Fig. S6 (a) SEM images of $Ce_{0.75}Zr_{0.25}O_2$ synthesized at 373K of 48h and calcined at 773K; (b) TEM images of $Ce_{0.75}Zr_{0.25}O_2$ synthesized at 373K, 48 h and calcined at 773K.

Briefly, 0.2 g of CeO_2 and $Ce_{0.9}Zr_{0.1}O_2$ were first added into the calculated amount of GO (8wt%) solution followed by ultrasonic dispersion for 30 min and vigorous stirring for another 2 h to disperse CeO_2 and $Ce_{0.9}Zr_{0.1}O_2$ sufficiently. Then, the mixing solution was transferred into a 100 ml Teflon-sealed autoclave at 423K for 5 h and cooled down to room temperature naturally. The resulting hybrids were recovered by centrifugation, washed with water and alcohol several times, and fully dried in air

at 333K.