Electronic Supplementary Material (ESI) for Inorganic Chemistry Frontiers.

Electronic supporting information

Cerium-based porous coordination polymer with hierarchical superstructures: Fabrication, formation mechanism and its thermal conversion to hierarchical CeO_2

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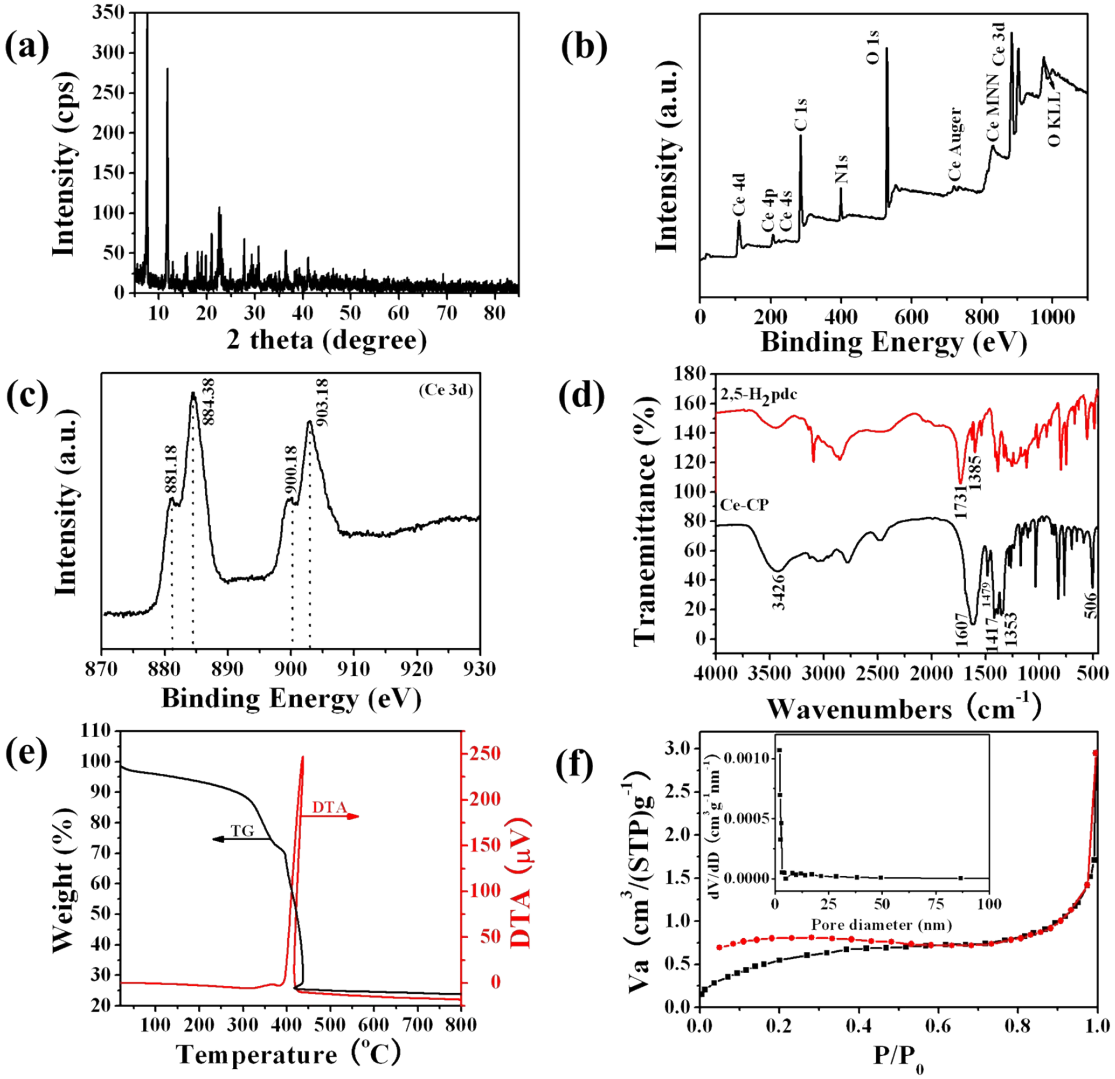

Fig. S1 (a) XRD pattern, (b) XPS survey spectrum, (c) Ce 3d spectrum, (d) FTIR data, (e) TG-DTA curves and (f) N_2 adsorption-desorption isotherms at 77 K of the Ce-CP hierarchical superstructures (sample 1). The inset in Fig. S1(f) is the BJH pore size distribution curve.

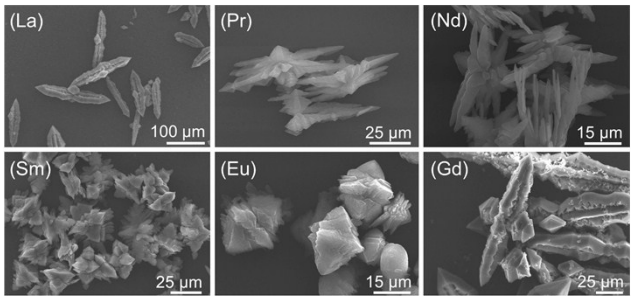

Fig. S2 SEM images of the as-prepared rare earth-based CP (La→Gd).

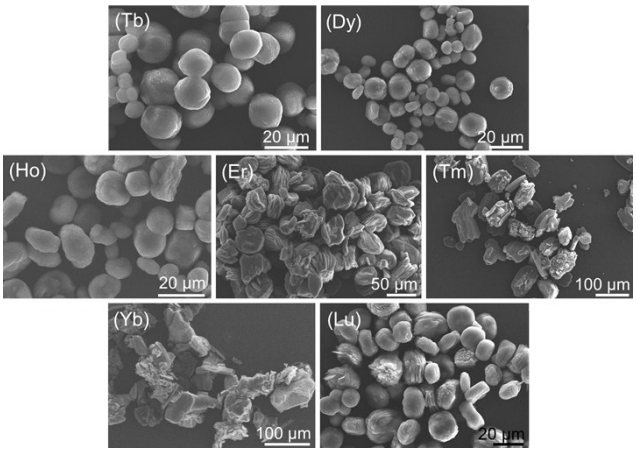

Fig. S3 SEM images of the as-prepared rare earth-based CP (Tb→Lu).

Table S1. Samples and Corresponding Experiment Parameters.

Sample	Reaction temperature (°C)	Reaction time (h)	n(Ce^{3+}) (mmol)	n(2,5-H_2pdc) (mmol)	Volume of dmf (mL)	Total volume (mL)
1	160	12	0.2	0.8	22	32
2	80	12	0.2	0.8	22	32
3	100	12	0.2	0.8	22	32
4	140	12	0.2	0.8	22	32
5	180	12	0.2	0.8	22	32
6	160	12	0.05	0.2	22	32
7	160	96	0.05	0.2	22	32
8	160	12	0.1	0.4	22	32
9	160	12	0.15	0.6	22	32
10	160	12	0.2	0.8	12	32
11	160	12	0.2	0.8	32	32
12	160	1	0.2	0.8	22	32
13	160	4/3	0.2	0.8	22	32
14	160	3/2	0.2	0.8	22	32
15	160	24	0.2	0.8	22	32

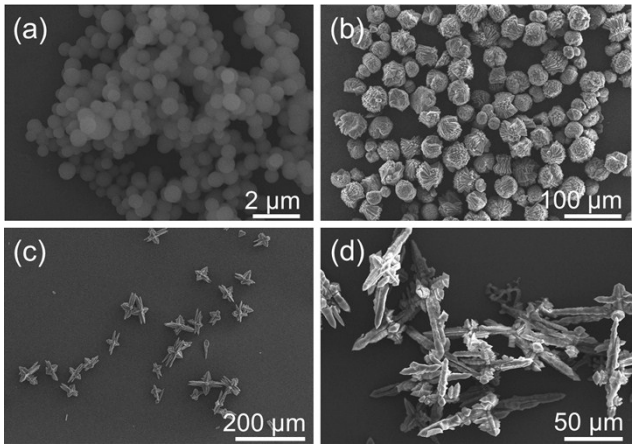

Fig. S4 SEM images of the products at different temperatures of (a) 80 °C (sample 2), (b) 100 °C (sample 3), (c) 140 °C (sample 4), and (d) 180 °C (sample 5).

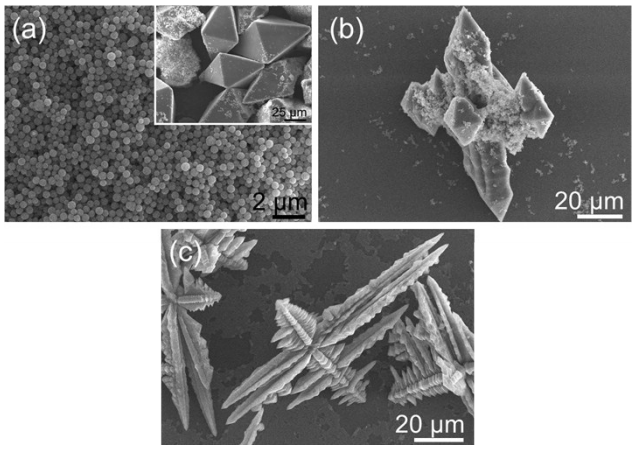

Fig. S5 SEM images of the products obtained with Ce^{3+} amounts of (a) 0.05 mmol (sample 6), (b) 0.1 mmol (sample 8), (c) 0.15 mmol (sample 9), and the molar ratio of Ce^{3+} to 2,5-H_2pdc was 1:4. The inset in Fig. S5(a) is the SEM image of the product (sample 7) after reaction at 160 °C for 96 h with the molar ratio of Ce^{3+} : 2,5-H_2pdc was 1:4, and the Ce^{3+} was 0.05 mmol.

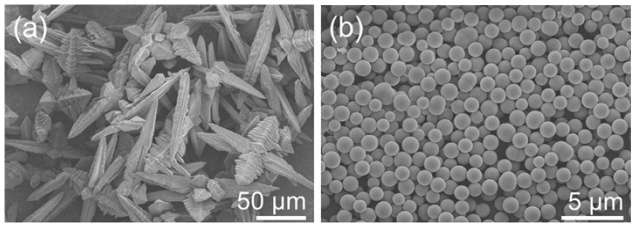

Fig. S6 SEM images of the products prepared with different volume of dmf: (a) 12 mL (sample 10), (b) 32 mL (sample 11).

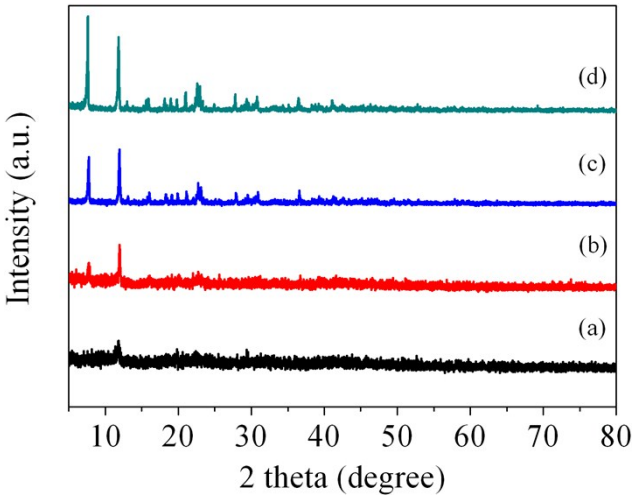

Fig. S7 XRD patterns of the products obtained after (a) 60 min, (b) 80 min, (c) 1.5 h, and (d) 12 h, reaction at 160 °C with the molar ratio of Ce^{3+} : 2,5-H_2pdc = 1:4, and the Ce^{3+} is 0.2 mmol.

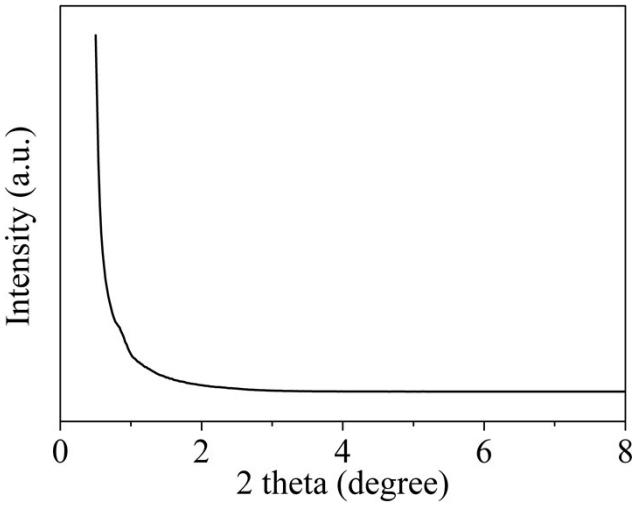

Fig. S8 Small-angle XRD pattern of the as-obtained CeO_2.

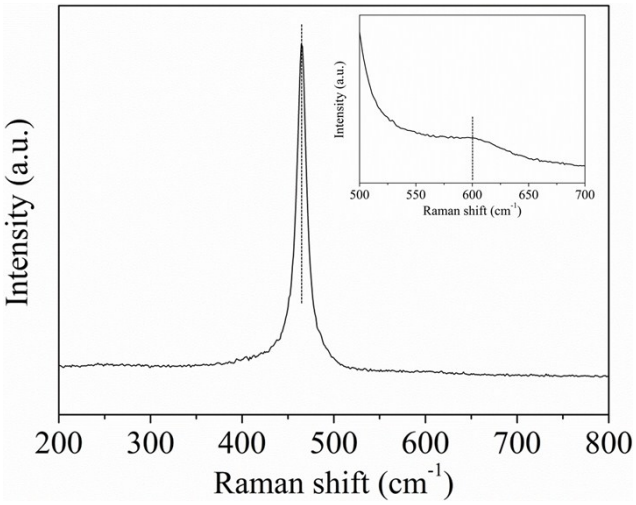

Fig. S9 Raman spectra of the as-obtained CeO_2 at 633 nm excitation laser line. Inset: the regional magnification.