Electronic Supplementary Material (ESI) for Dalton Transactions

Supporting information

Induced Morphology Control of Ln-asparagine Coordination Polymers from Macro to Nanoscopic Regime in Polar Solvent/Water Mixtures

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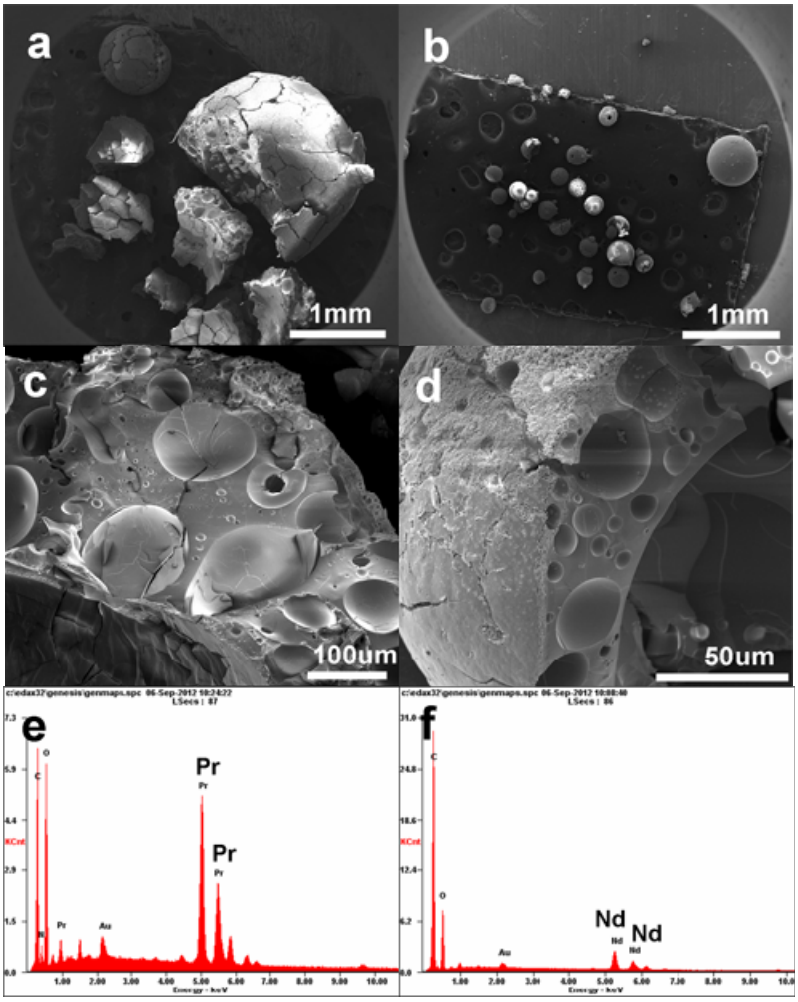


Figure S1 SEM images and EDX spectra of (a, c, e) Pr-Asn CPs large spheres; (b, d, f) Nd-Asn CPs large spheres.

Figure S2 The optical image of Ce-Asn CPs large spheres.

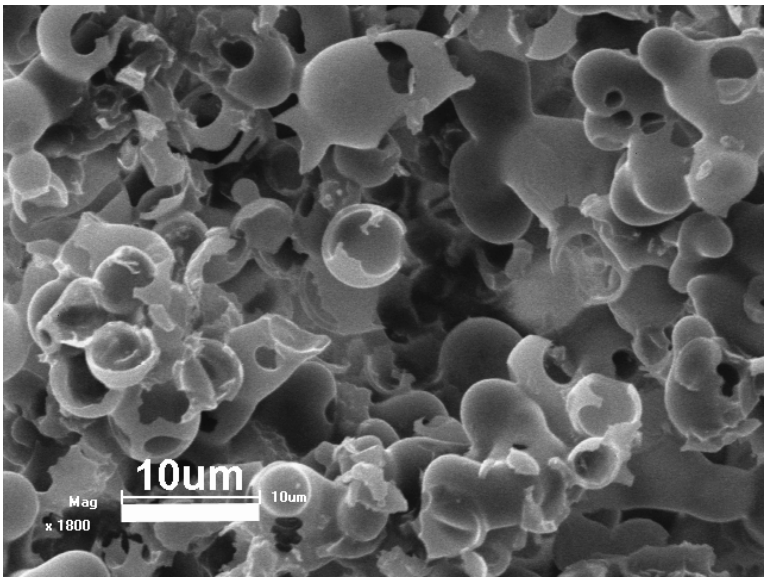


Figure S3 SEM images of Ce-Asn CPs obtained at molar ratio of Ce^{3+}:asparagine= 0.15: 6 in pure water at 160 ^{o}C for 12 h, and the quantity of asparagine is 6 mmol.

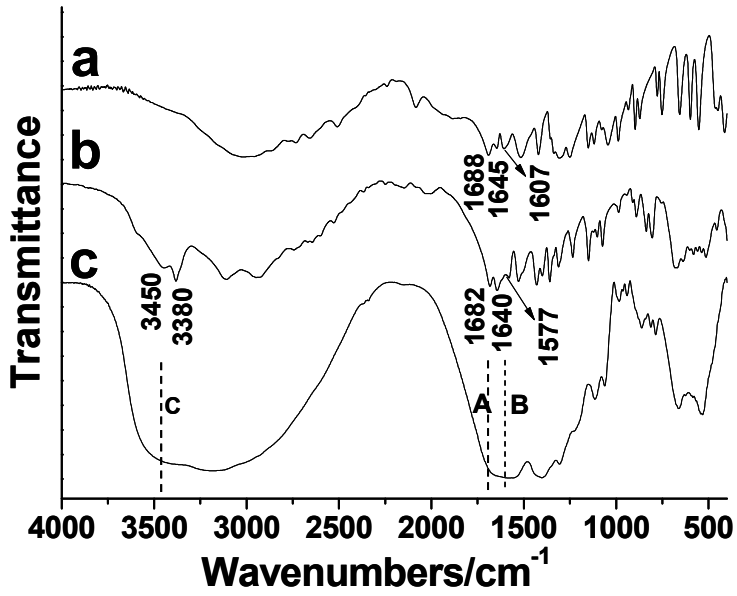


Figure S4 FT-IR spectra of (a) L-aspartic acids; (b) L-asparagine; (c) Ce-Asn CPs large spheres. Band A, B and C pointed out by dash line cantered at c. a. 1680 cm^{-1}, 1580 cm^{-1} and 3480 cm^{-1}.

Table S1 Assignments of binds in the FT-IR spectra of L-asparagine and L-aspartic acid.

Sample	Bands in IR spectra/ cm^{-1}	Assignment
L-aspartic acid	1688	C=O (-COOH) stretching
	1645	NH_3^+ (protonated α-amino) asymmetric deformation
	1607	COO^- asymmetric stretching
L-asparagine	3450, 3380	-OH (crystal water) stretching/ $-NH_2$ ($CONH_2$) stretching
	1682	C=O (-COOH) stretching
	1640	NH_3^+ (protonated α-amino) asymmetric deformation
	1577	COO^- asymmetric stretching

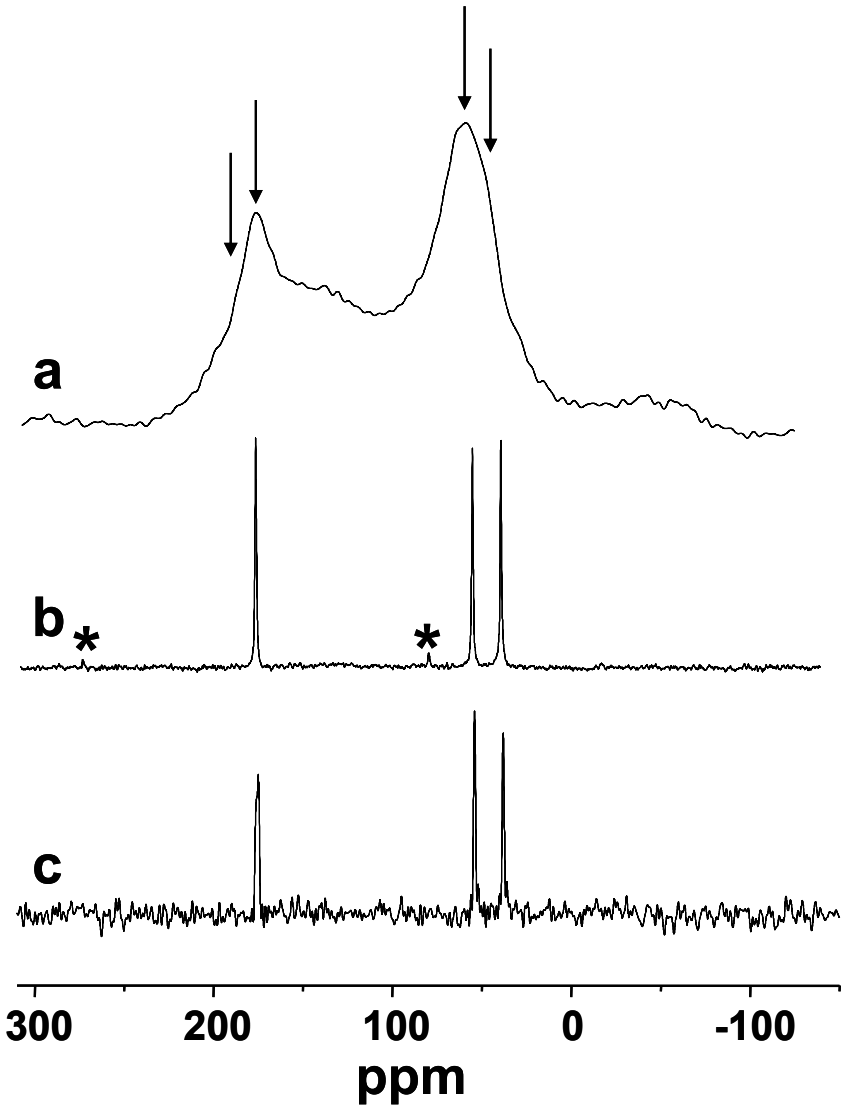
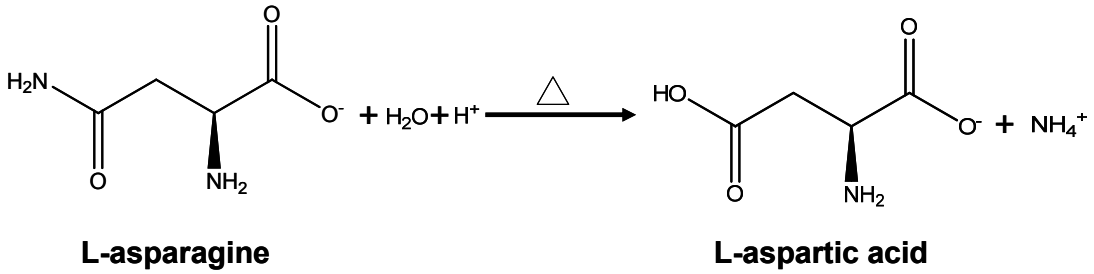


Figure S5 Solid state ^{13}C CP/MAS NMR spectra of (a) Ce-Asn CPs large spheres, the arrows pointed out four peaks at (left to right): shoulder signal at c.a. 185 ppm, 175 ppm, 53 ppm and 39 ppm; (b) L-asparagine; (c) L-aspartic acid. *: spinning side bands.



L-asparagine **L-aspartic acid**

Scheme S1 Transformation of L-asparagine to L-aspartic acid in our synthesis.

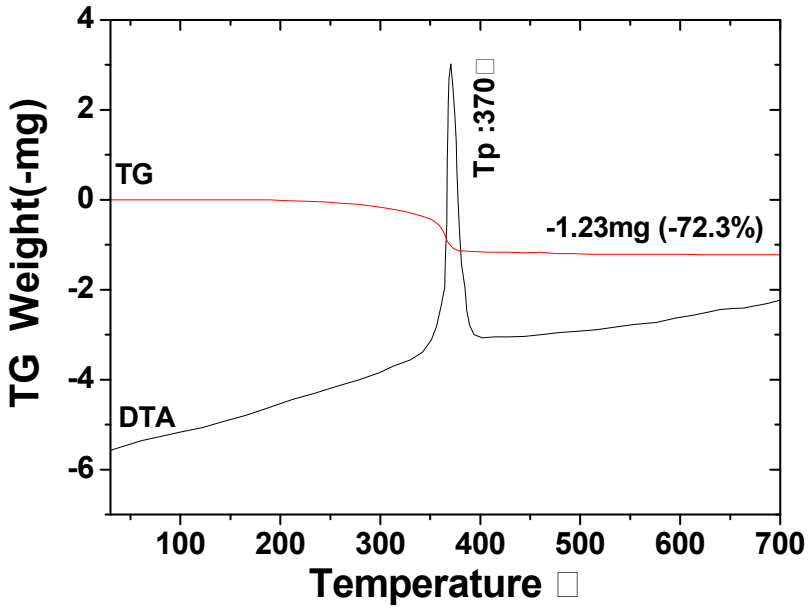


Figure S6 The TGA curve of Ce-Asn CPs large spheres.

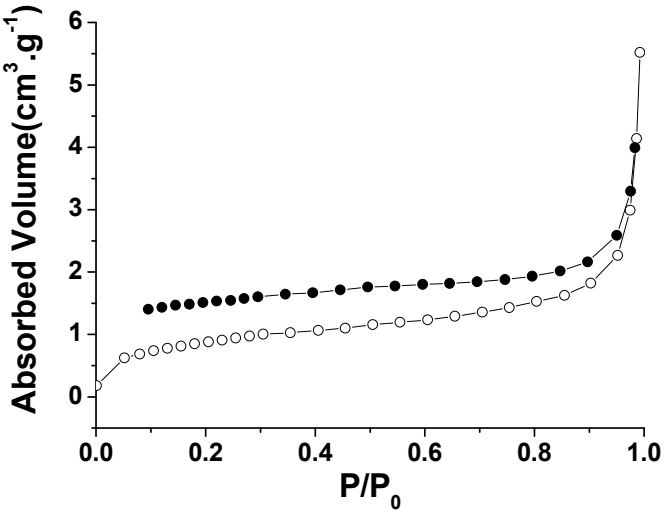


Figure S7 N_2 adsorption and desorption isotherms of Ce-Asn CPs large spheres.

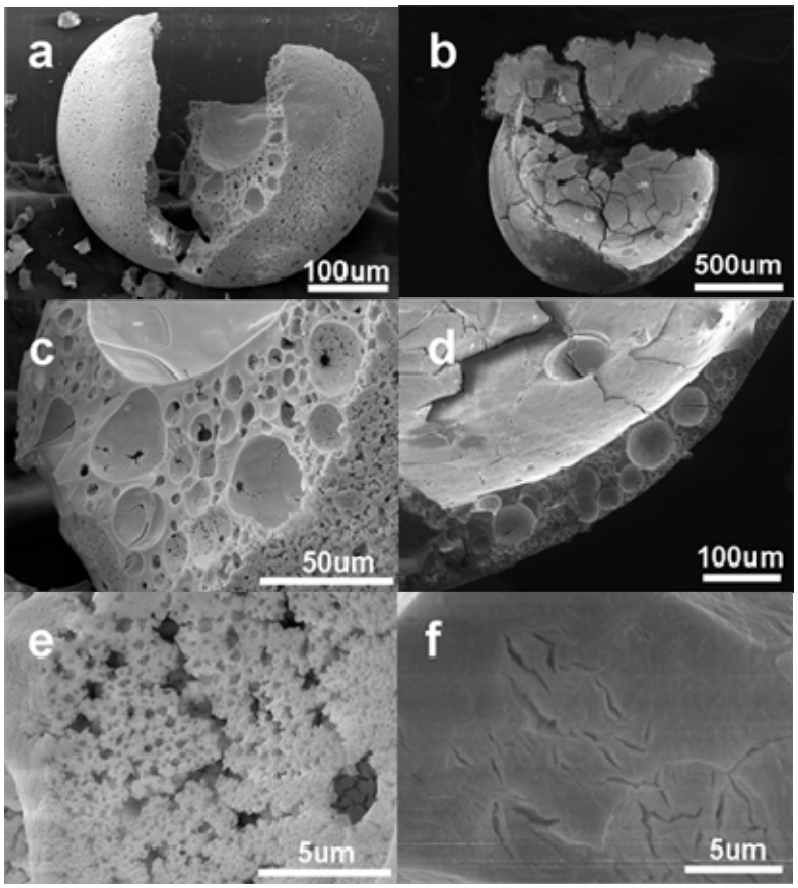


Figure S8 SEM images of (a, c, e) ceria large spheres obtained obtained by calcination of Ce-Asn CPs at 600 ^{o}C for 1.5 h. (b, d, f) lanthana hollow large spheres obtained by calcination of La-Asn CPs at 720 ^{o}C for 5 h.

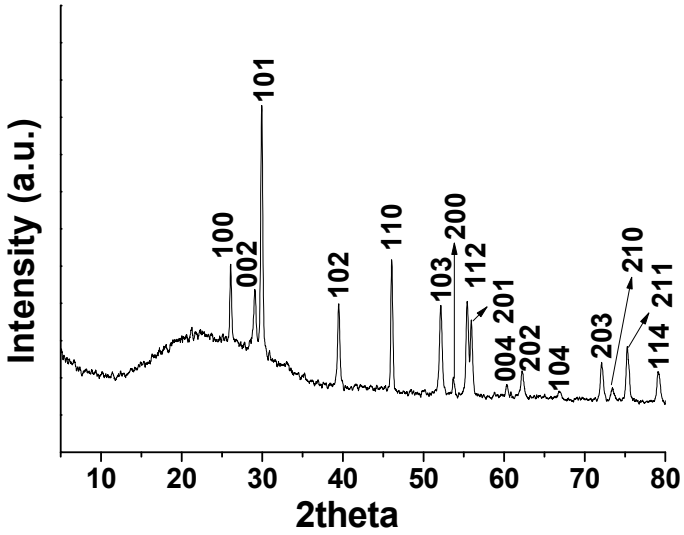


Figure S9 The XRD pattern of lanthana large hollow spheres, the peaks were indexed according to the card of JCPDS No. 05-0602.

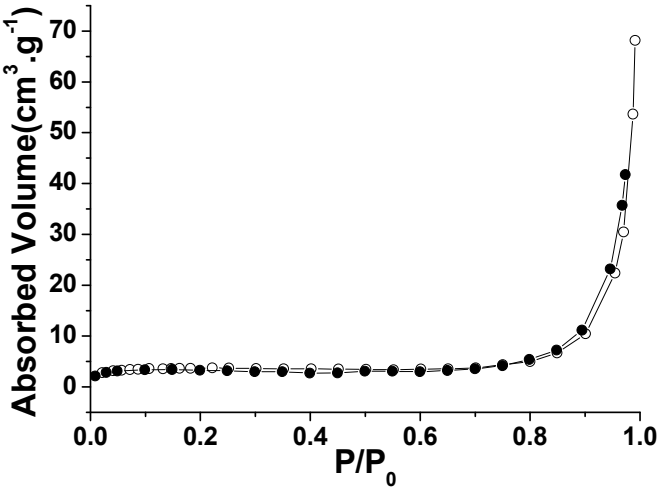


Figure S10 N_2 adsorption and desorption isotherms of lanthana large spheres.