Electronic Supplementary Material (ESI) for Nanoscale.

Supporting Information

Morphology-controlled synthesis of 3D mesoporous rosette-like CeCoOx catalyst by pyrolysis of $Ce[Co(CN)_6]$ and applied for the catalytic combustion of toluene

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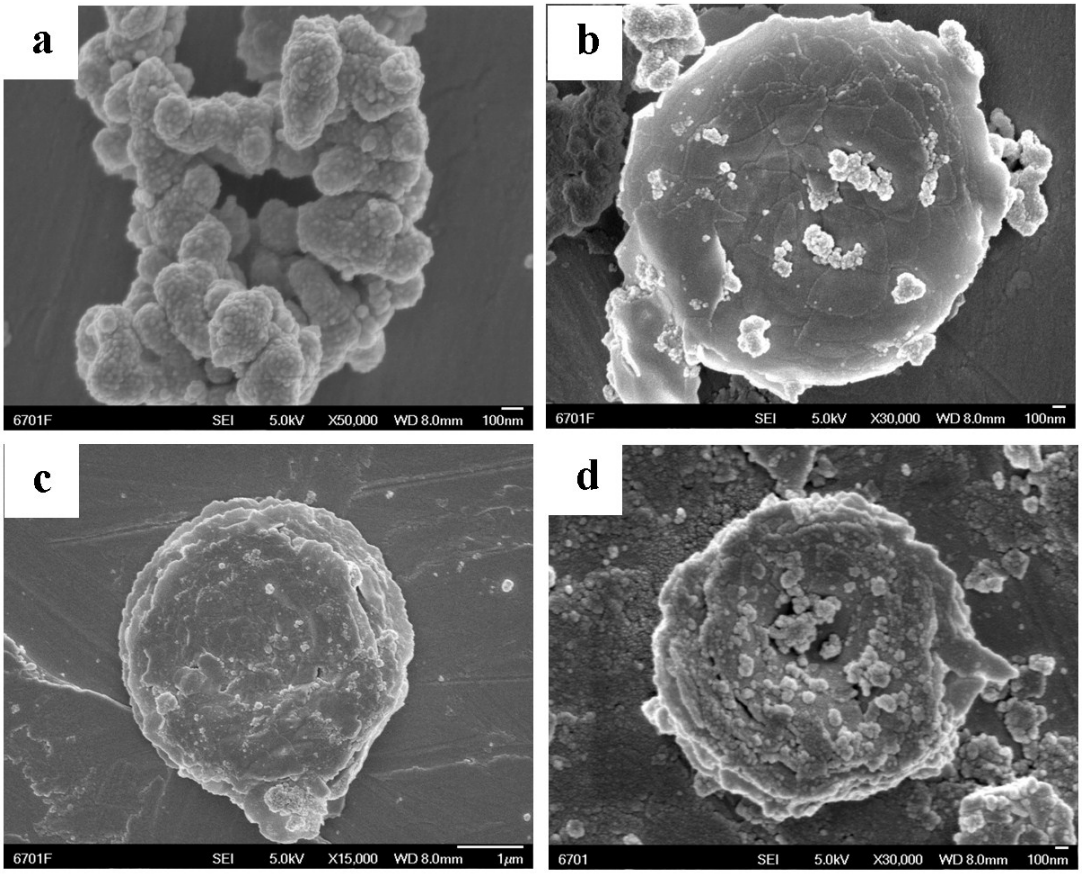

Fig.S1 SEM image of $Ce[Co(CN)_6]$-200 precursors with different hydrothermal time: (a) 6h, (b) 12h, (c) 18h (d) 24h.

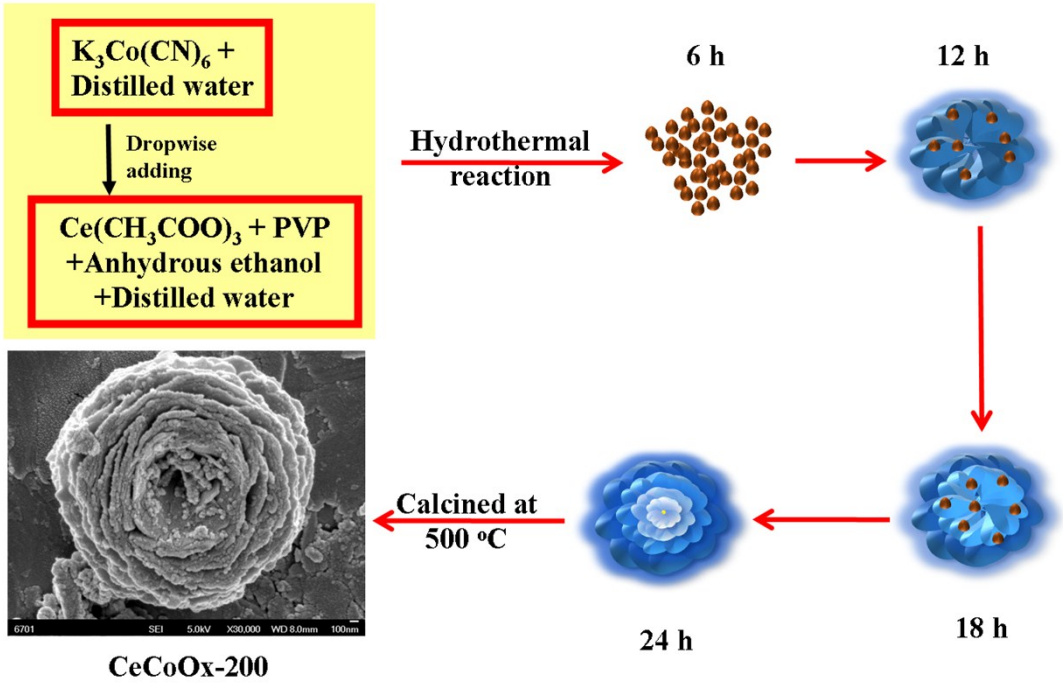

Fig.S2 The formation mechanism of CeCoOx-200.

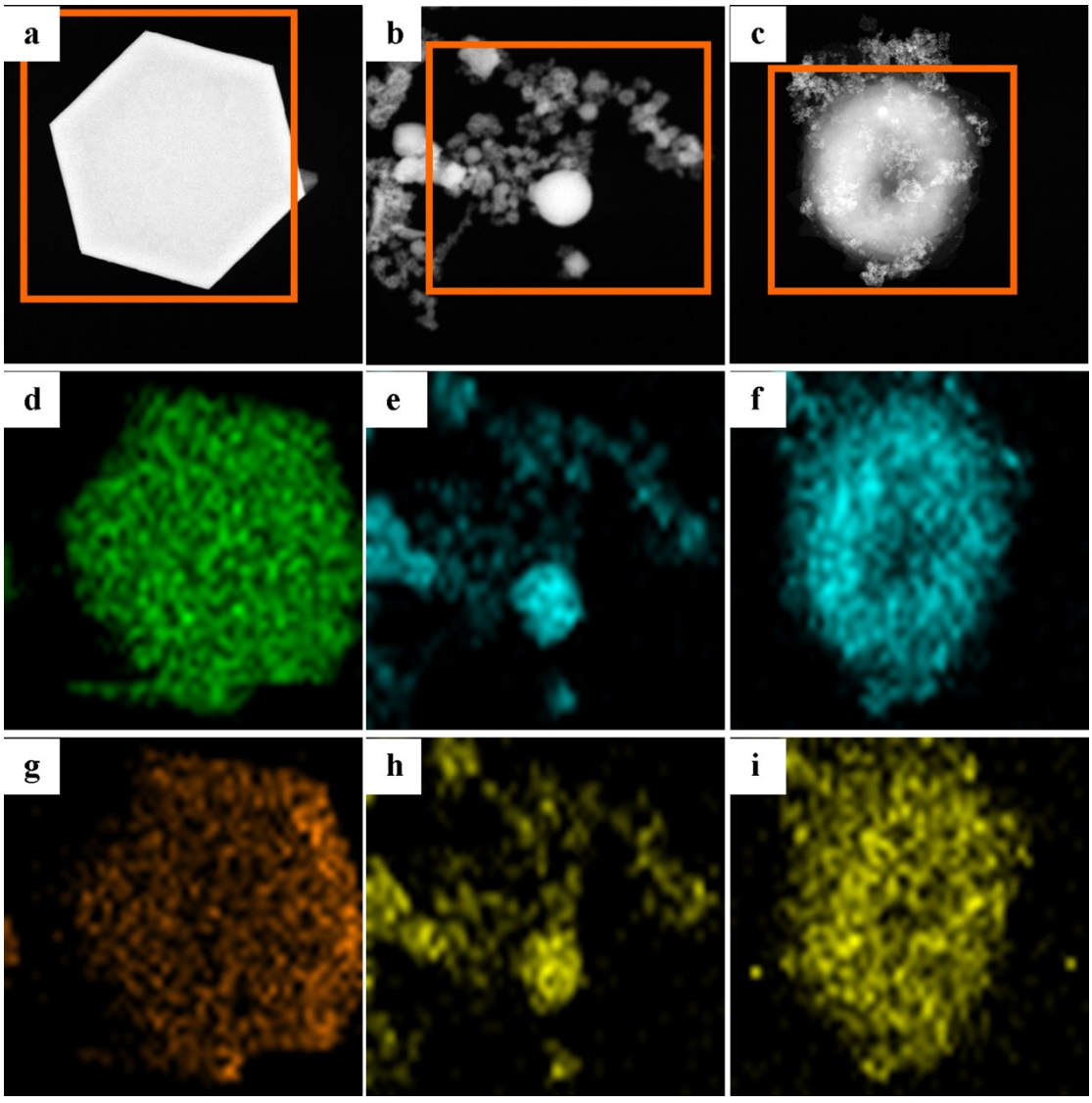

Fig.S3 STEM and Energy dispersive X-ray spectrometry elemental maps of CeCoOx-25 (a, d, g), CeCoOx-100 (b, e, h) and CeCoOx-200 (c, f, i)

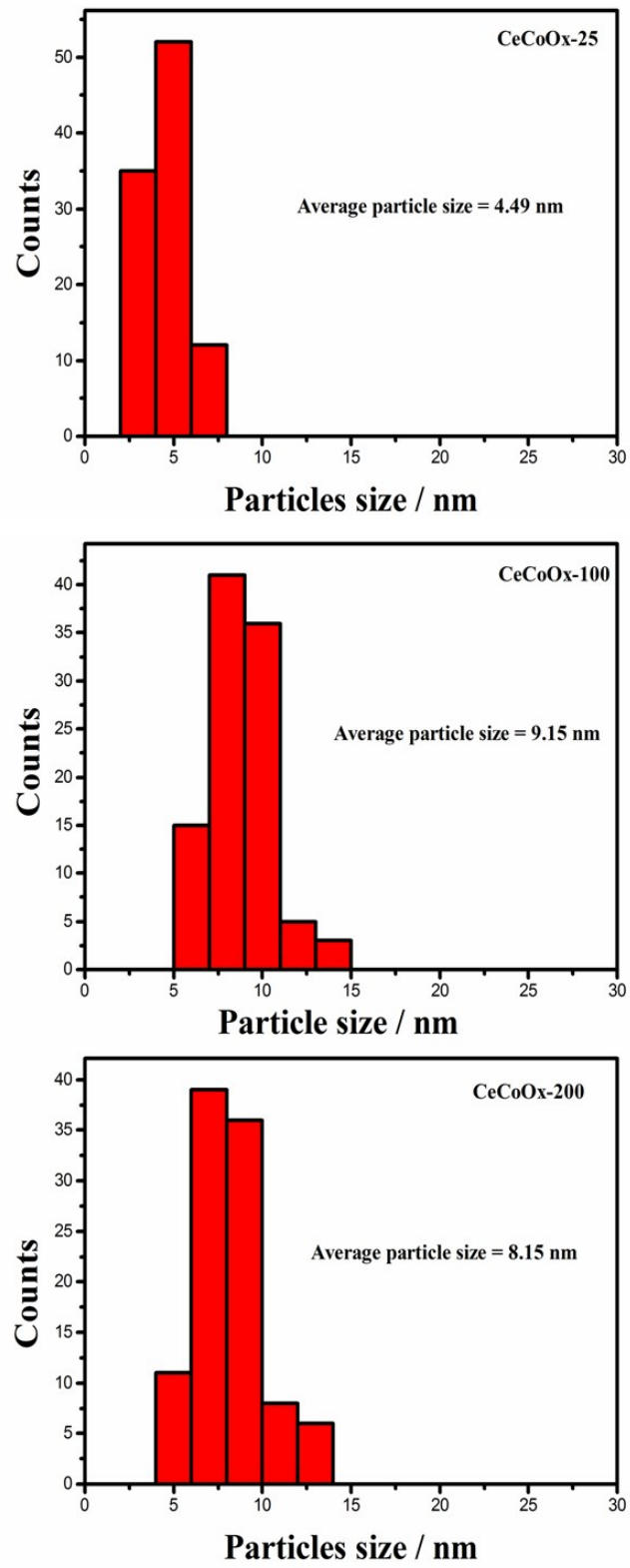

Fig.S4 The Size distribution of CeCoOx-100 and CeCoOx-200.

Table S1 Raman Shifts of the Characteristic Peaks of three CeCoOx catalysts.

Phonon Mode	F_{2g}(a)	2TA	F_{2g}(b)	E_g	F_{2g}(c)	O_v	F_{2g}(d)	A_{1g}
CeCoOx-25	187	-	460	479	520	597	-	680
CeCoOx-100	-	245	445	-	-	-	-	-
CeCoOx-200	181	-	446	-	510	591	605	665
Literature20, 23, 24	194	256	465	482	522	595	618	691

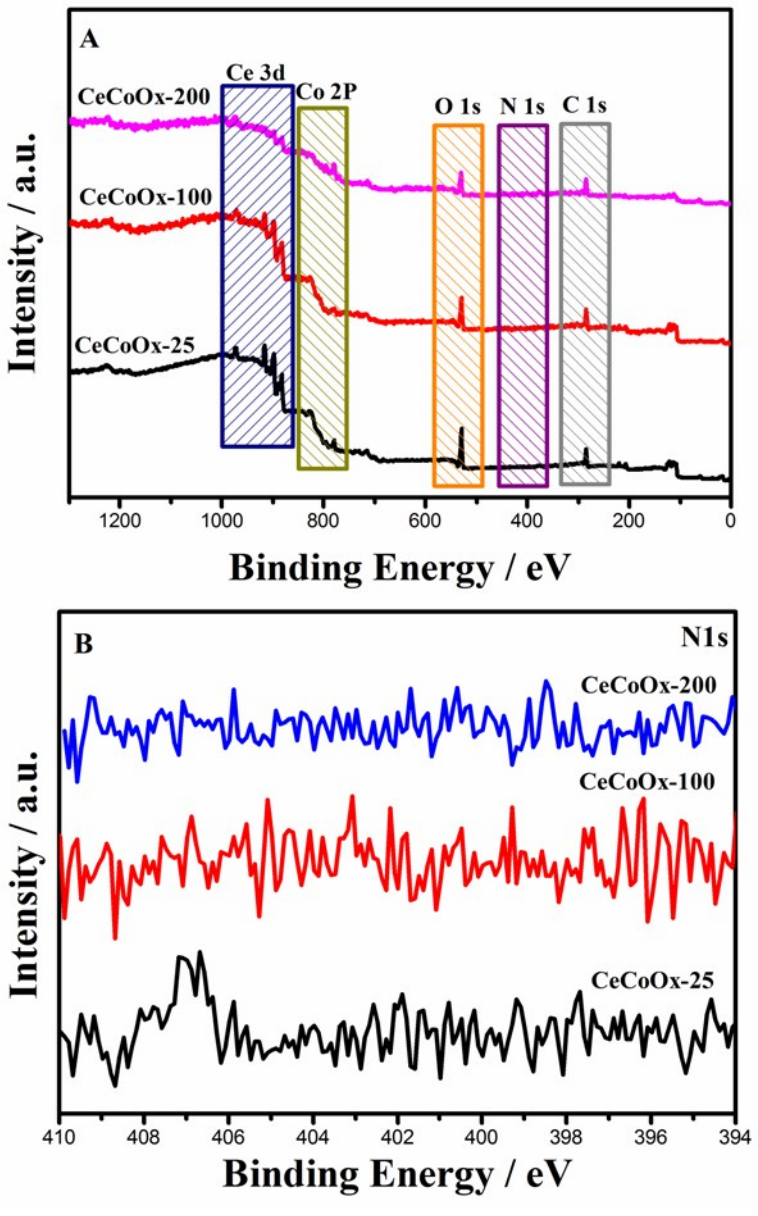

Fig.S5 The XPS survey and N1s of CeCoOx catalysts.

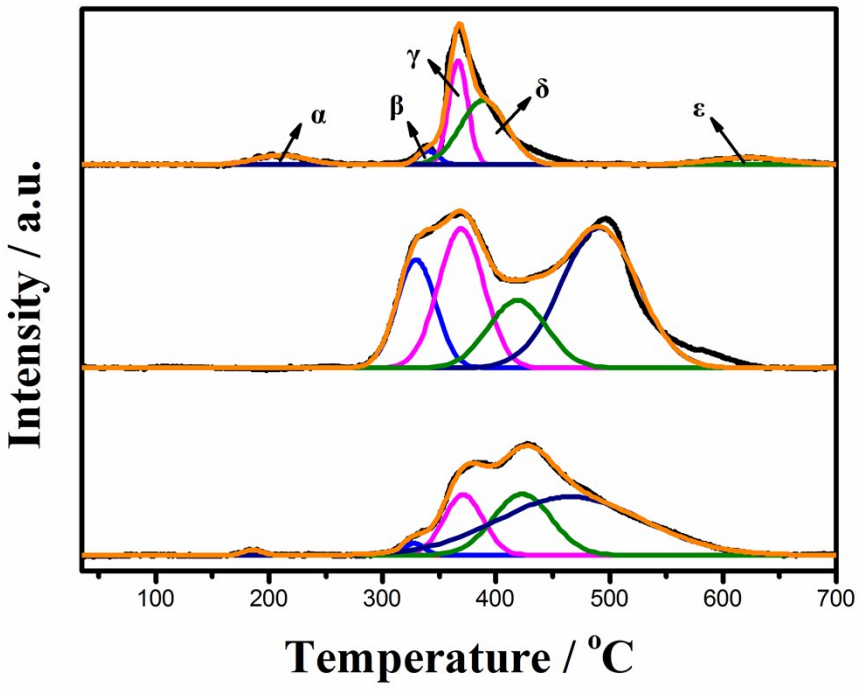

Fig.S6 CO-TPR of CeCoOx catalysts.

Table S2 The H_2-TPR consumption data of three CeCoOx catalysts

	Peak α		Peak β		Peak γ		Peak δ		Peak ε	
Catalysts	**Position / °C**	**Area a.u.**	**Position / °C**	**Area / a.u.**	**Position / °C**	**Area a.u.**	**Position / °C**	**Area a.u.**	**Position / °C**	**Area a.u.**
CeCoOx-25	**-**	**-**	**277**	**770**	**308**	**2000**	**480**	**3500**	**520**	**8000**
CeCoOx-100	**-**	**-**	**298**	**451**	**369**	**2112**	**431**	**1054**	**473**	**616**
CeCoOx-200	**136**	**275**	**297**	**9840**	**325**	**3745**	**415**	**41468**	**483**	**15179**