Electronic Supplementary Material (ESI) for CrystEngComm.

Supporting information

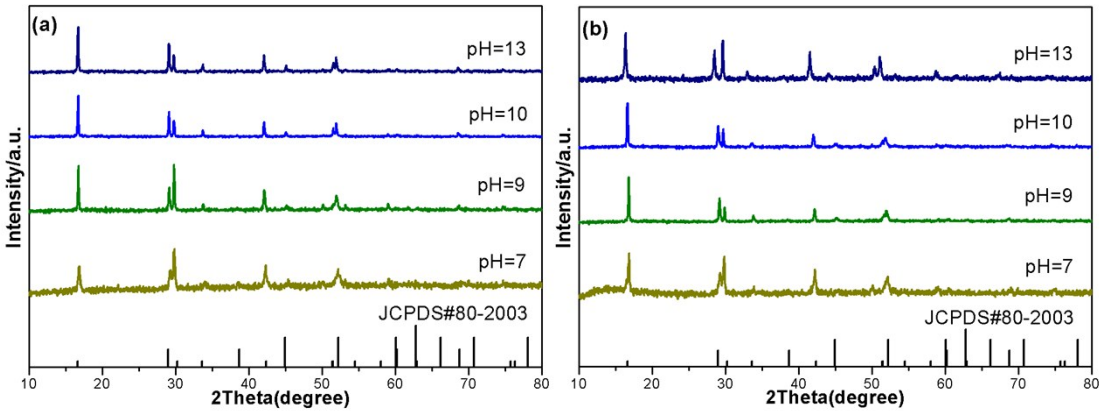

Fig.S1 XRD patterns of the precursor prepared at various pH values pH = 7, 9, 10, 13 (a) $NH_3 \bullet H_2O$ as the pH regulator; (b) using NaOH as the pH regulator.

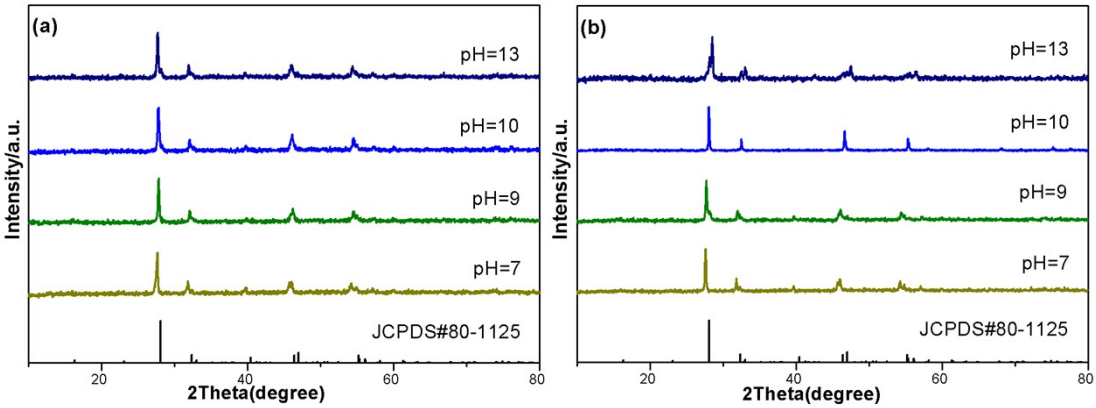

Fig.S2 XRD patterns of the ultimate product prepared at various pH values pH = 7, 9, 10, 13 (a) $NH_3 \bullet H_2O$ as the pH regulator; (b) using NaOH as the pH regulator.

(a)		
Formula	$Gd_6O_5F_8$	
Crystal system	Orthorhombic	
Space group	*Pcmb* (57)	
Cell parameters	a=5.5251 b=33.4860 c=5.5829	$\alpha=\beta=\nu=90^{\circ}$
Reliability factors	Sig=1.383 R_{exp}=5.53%	R_{wp}=6.83% R_p=4.29%

(b)				
Atom	Wyck	x	y	z
Gd(1)	4c	0.7967	0	0.25
Gd(2)	8e	0.2906	0.0837	0.2439
Gd(3)	8e	0.7182	0.1665	0.2348
Gd(4)	4c	0.2864	0.25	0.2899
O(1)	8e	0.49	0.0417	0.025
O(2)	8e	0.464	0.1253	0.99
O(3)	8e	0.448	0.2097	0.006
F(1)	8e	0.448	0.2097	0.006
F(2)	8e	0.031	0.0360	0.426
F3)	8e	0.928	0.111	0.11
F(4)	8e	0.09	0.182	0.368
F(5)	4d	0.903	0.251	0.149

Table.S1 (a) Refinement structure parameters and reliability factors and (b) atom site parameters.

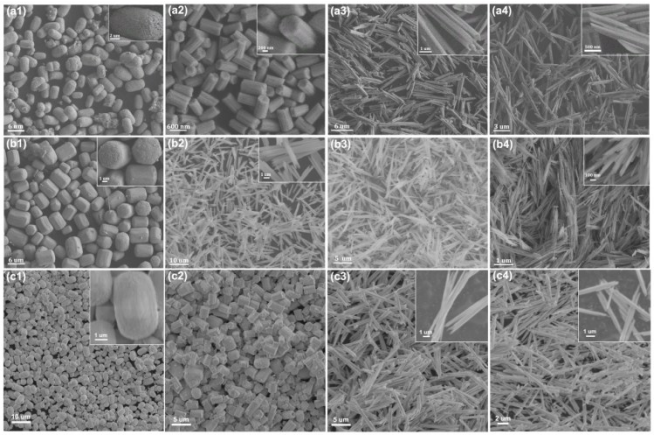

Fig.S3 SEM images of precursor while using NH_4F as fluorine source and diluted $NH_3 \cdot H_2O$ as pH regulator (a1) pH=7, (a2) pH=9, (a3) pH=10, (a4) pH=13; while using NH_4F as fluorine source and diluted NaOH as pH regulator (b1) pH=7, (b2) pH=9, (b3) pH=10, (b4) pH=13; while using NaF as fluorine source and diluted $NH_3 \cdot H_2O$ as pH regulator (c1) pH=7, (c2) pH=9, (c3) pH=10, (c4) pH=13.

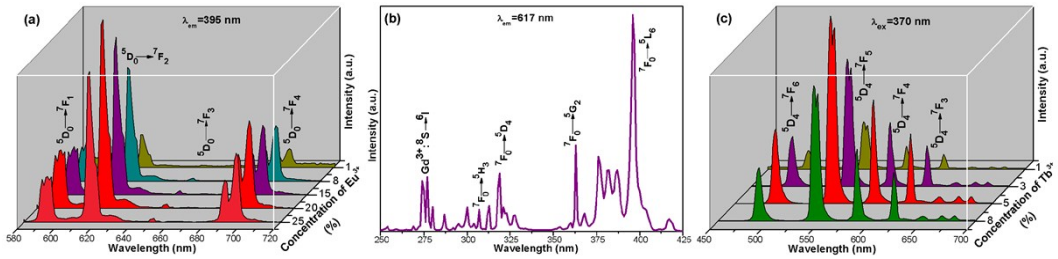

Fig.S4 PL spectra under UV (a) emission of $Gd(OH)_{2.14}F_{0.86}$: x% Eu^{3+} (1 ≤x ≤25); (b) excitation of $Gd(OH)_{2.14}F_{0.86}$ and (c) emission of $Gd(OH)_{2.14}F_{0.86}$: x% Tb^{3+} (1 ≤x ≤8).

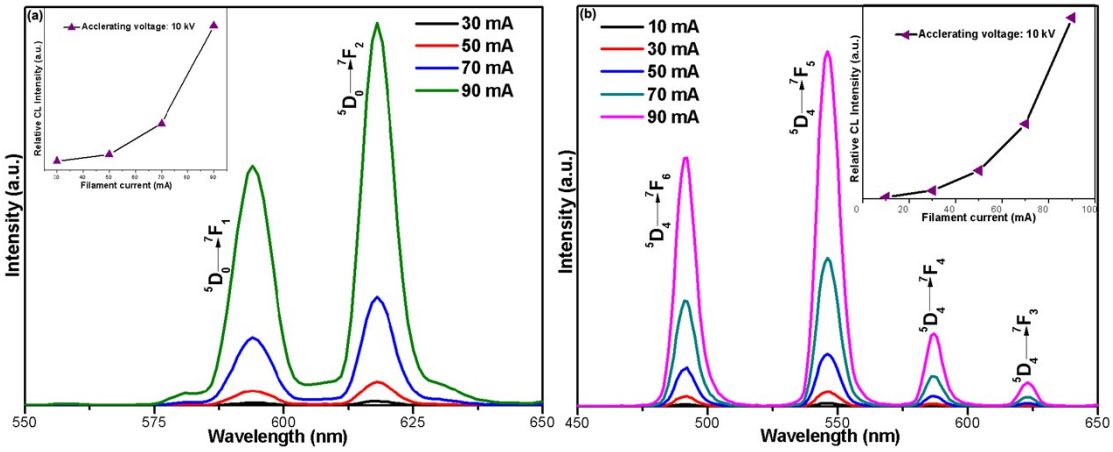

Fig.S5 CL spectra from (a) $Gd(OH)_{2.14}F_{0.86}$: Eu^{3+} (20%) and (b) $Gd(OH)_{2.14}F_{0.86}$: Tb^{3+} (5%) measured at 10 kV and various filament currents.