

Supporting information

Site occupancy preference of Bi^{3+} and $\text{Bi}^{3+}\text{-Eu}^{3+}$ codoped Yttrium Gallate phosphors for white LEDs

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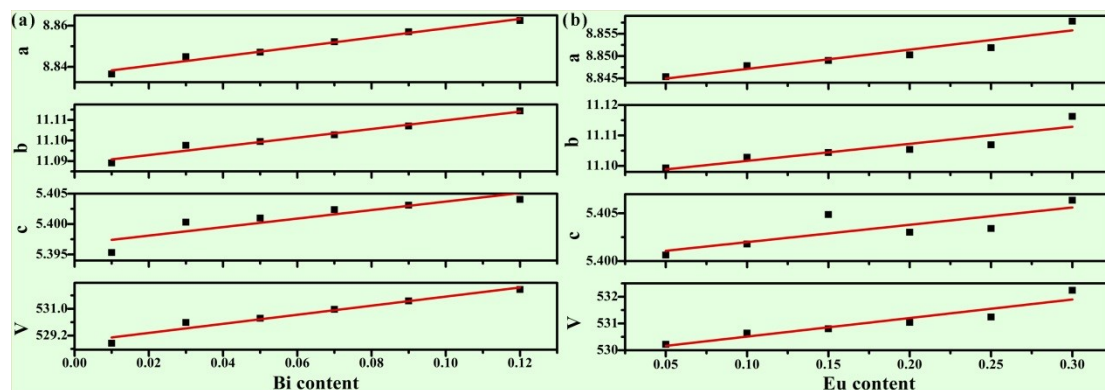


Fig. S1 Unit cell parameters of the YGO: $x\text{Bi}^{3+}$ phosphors (a) and YGO: $0.01\text{Bi}^{3+},y\text{Eu}^{3+}$ phosphors (b).

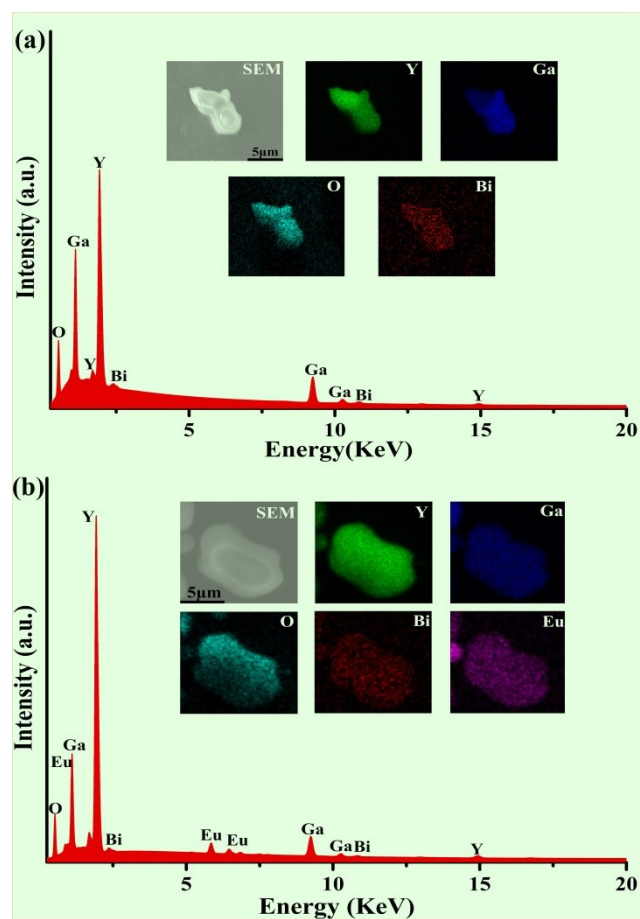


Fig. S2 SEM images and EDX spectra of the obtained (a) YGO:0.07Bi³⁺, and (b) YGO:0.01Bi³⁺, 0.15Eu³⁺ samples.

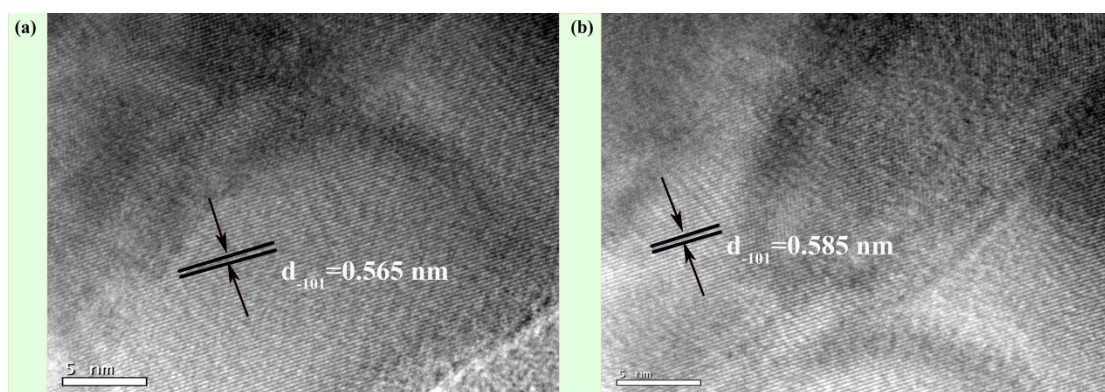


Fig. S3 HRTEM images of YGO:0.07Bi³⁺ (a), and YGO:0.01Bi³⁺, 0.15Eu³⁺ (b).

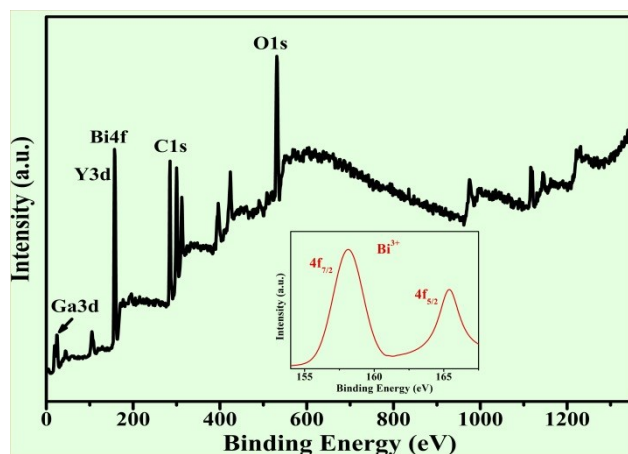


Fig. S4 XPS spectra of the YGO:0.07Bi³⁺.

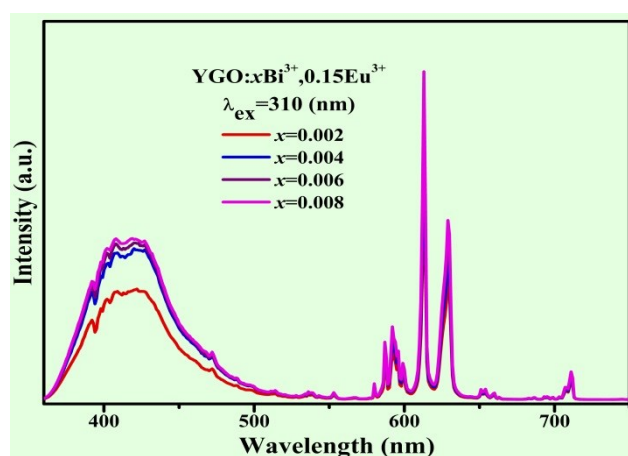


Fig. S5 PL spectra of the different contents of Bi³⁺ in YGO:xBi³⁺, 0.15Eu³⁺.

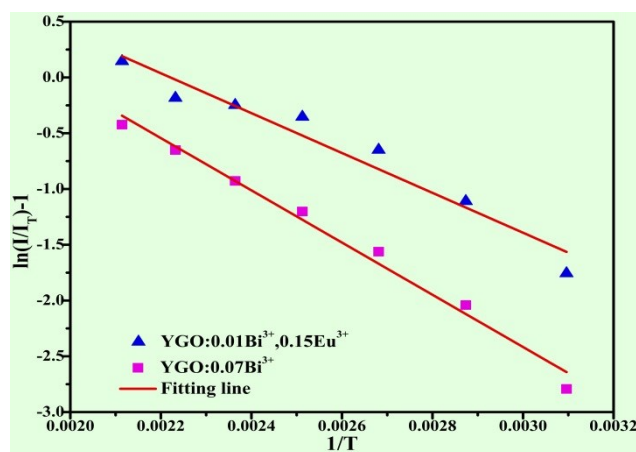


Fig. S6 Activation energy (E_a) of YGO:0.07Bi³⁺, and YGO:0.01Bi³⁺, 0.15Eu³⁺.

Table S1 Selected bond lengths of YGO:0.07Bi³⁺

	Bond Lengths		Bond Lengths		Bond Lengths
	(Å)		(Å)		(Å)
Y1-O1	2.33583	Y2-O1	2.42643	Ga-O1	1.85276
Y1-O1	2.30989	Y2-O1	2.42643	Ga-O1	1.85276
Y1-O2	2.14904	Y2-O2	2.28862	Ga-O3	1.72470
Y1-O2	2.27022	Y2-O2	2.28862	Ga-O4	1.88565
Y1-O3	2.56187	Y2-O2	2.28941		
Y1-O3	2.60099	Y2-O2	2.28941		
Y1-O4	2.30935	Y2-O4	2.41053		
Average	2.362	Average	2.346	Average	1.829

Table S2 Selected bond lengths of YGO:0.01Bi³⁺,0.15Eu³⁺

	Bond Lengths		Bond Lengths		Bond Lengths
	(Å)		(Å)		(Å)
Y1-O1	2.23812	Y2-O1	2.21960	Ga-O1	1.99075
Y1-O1	2.46452	Y2-O1	2.21960	Ga-O1	1.99075
Y1-O2	2.12341	Y2-O2	2.15273	Ga-O3	1.76190
Y1-O2	2.30830	Y2-O2	2.15273	Ga-O4	1.65066
Y1-O3	2.57085	Y2-O2	2.58090		
Y1-O3	2.57085	Y2-O2	2.58090		
Y1-O4	2.23595	Y2-O4	2.79705		
Average	2.359	Average	2.386	Average	1.848

