Supporting Information for

Sol-gel syntheses, luminescence, and energy-transfer

properties of α -GdB₅O₉:Ce³⁺/Tb³⁺ phosphors

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x	a (Å)	c (Å)	$V(Å^3)$
0.0	8.2426	33.6702	2287.56
0.10	8.2423	33.6638	2286.97
0.20	8.2390	33.6526	2284.35
0.30	8.2365	33.6423	2282.32
0.40	8.2353	33.6369	2281.28
0.50	8.2327	33.6277	2279.18
0.60	8.2315	33.6232	2278.22
0.70	8.2293	33.6145	2276.39
0.80	8.2267	33.6053	2274.38
0.90	8.2242	33.5954	2272.31
1.00	8.2228	33.5908	2271.25

Table S1. Unit Cell parameters of α -GdB₅O₉:*x*Tb³⁺ ($0 \le x \le 1$) obtained by sol-gel method.

Table S2. Unit Cell parameters of α -Gd_{1-x}Ce_xB₅O₉ ($x \le 0.40$) obtained by sol-gel method.

x	a (Å)	<i>c</i> (Å)	$V(Å^3)$
0.0	8.2426	33.6702	2287.56
0.05	8.2500	33.6829	2292.53
0.10	8.2554	33.6904	2296.05
0.20	8.2698	33.7238	2306.35

0.30	8.2835	33.7559	2316.22
0.40	8.2959	33.7789	2324.75

Table S3. Unit Cell parameters of α -GdB₅O₉:*x*Ce³⁺, 0.30Tb³⁺ ($0 \le x \le 0.15$) obtained by sol-gel method.

x	a (Å)	<i>c</i> (Å)	$V(Å^3)$
0.0	8.2365	33.6423	2282.32
0.01	8.2382	33.6455	2283.45
0.03	8.2412	33.6498	2285.38
0.06	8.2452	33.6600	2288.33
0.09	8.2491	33.6712	2291.26
0.12	8.2531	33.6806	2294.09
0.15	8.2567	33.6898	2296.76

Table S4. Unit Cell parameters of α -GdB₅O₉:0.20Ce³⁺, *x*Tb³⁺ ($0 \le x \le 0.10$) obtained by sol-gel method.

x	a (Å)	c (Å)	$V(Å^3)$
0.0	8.2698	33.7238	2306.35
0.01	8.2698	33.7226	2306.29
0.03	8.2688	33.7193	2305.48
0.05	8.2684	33.7175	2305.14
0.07	8.2680	33.7154	2304.78
0.10	8.2677	33.7121	2304.39

x in	CIE	x in	CIE
α -GdB ₅ O ₉ :xCe ³⁺ ,0.30Tb ³⁺	chromaticity	α -GdB ₅ O ₉ :0.20Ce ³⁺ , <i>x</i> Tb ³⁺	chromaticity
	coordinates		coordinates
0.0	(0.298,0.552)	0	(0.148,0.112)
0.01	(0.298,0.560)	0.01	(0.298,0.550)
0.03	(0.300,0.561)	0.03	(0.298,0.554)
0.06	(0.299,0.561)	0.05	(0.298,0.555)
0.09	(0.298,0.559)	0.10	(0.297,0.555)
0.12	(0.298,0.559)		
0.15	(0.298,0.559)		

Table S5. CIE chromaticity coordinates of α -GdB₅O₉:*x*Ce³⁺,0.30Tb³⁺ and α -GdB₅O₉:0.20Ce³⁺,*x*Tb³⁺ phosphors.



Fig. S1 Emission spectra of the α -GdB₅O₉:*x*Tb³⁺ ($0 \le x \le 1$) samples under 273 nm excitation (Gd³⁺ ⁸S_{7/2} \rightarrow ⁶I_J transition).