

Supporting Materials:

Table S1 The lattice constants of $\text{Ba}_5\text{Gd}_8\text{Zn}_4\text{O}_{21}$ with different dopant contents.

	a/b (Å)	c (Å)	volume (Å ³)
JCPDS 51-1686	13.919	5.768	1117.484
0.3%Tm ³⁺	13.911	5.765	1115.619
0.3%Tm ³⁺ /10%Yb ³⁺	13.946	5.707	1109.959
0.5%Tm ³⁺ /10%Yb ³⁺	13.937	5.690	1105.225
1%Tm ³⁺ /10%Yb ³⁺	13.935	5.665	1100.054

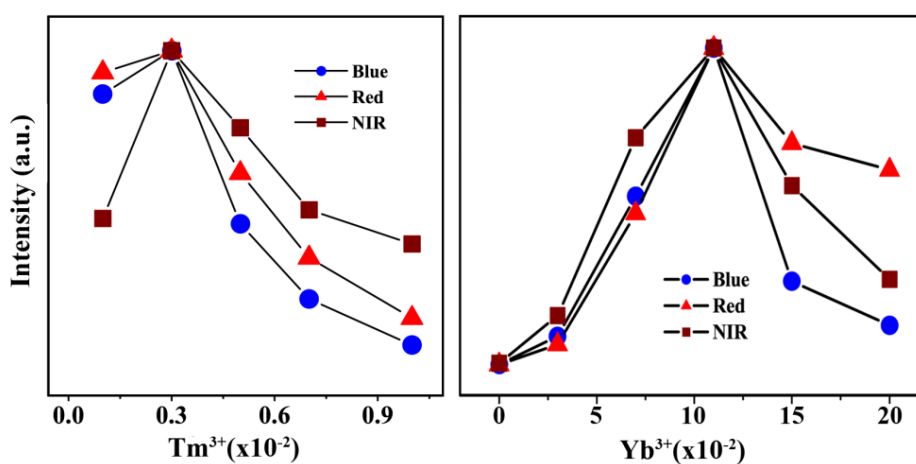


Fig.S1 Plot of integrated blue, red and NIR intensities as functions of Tm³⁺ concentrations (10%Yb³⁺) and Yb³⁺ concentrations (0.3%Tm³⁺)