Supplementary Information

Photoluminescence and Energy Transfer Studies of Ce^{3+} Sensitized $BaF_2:Tb^{3+}$: Anti-counterfeit and Finger Print Detection Applications

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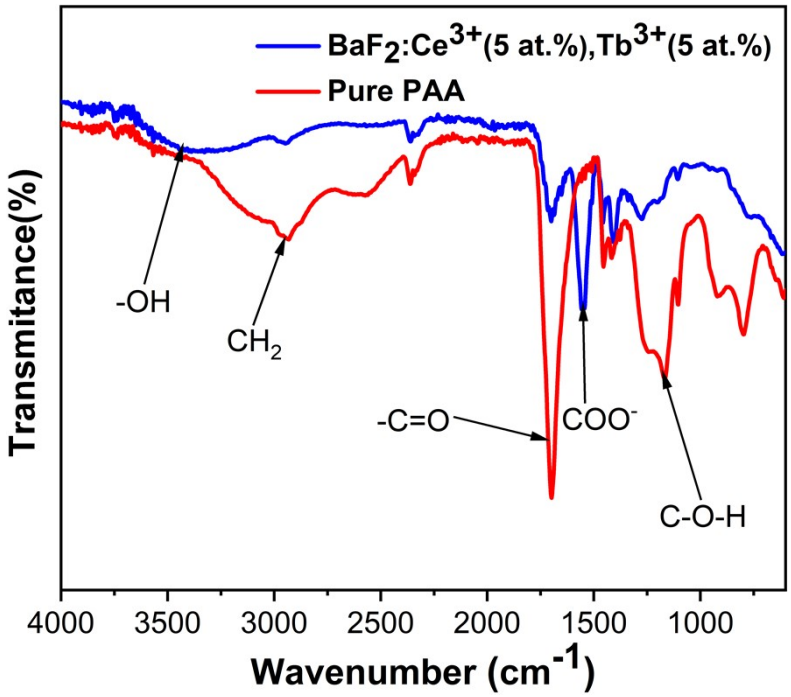


Fig. S1 FT-IR spectrum of Ce^{3+} (5 at.%) sensitized $BaF_2:Tb^{3+}$(5 at.%) and Pure Poly acrylic acid.

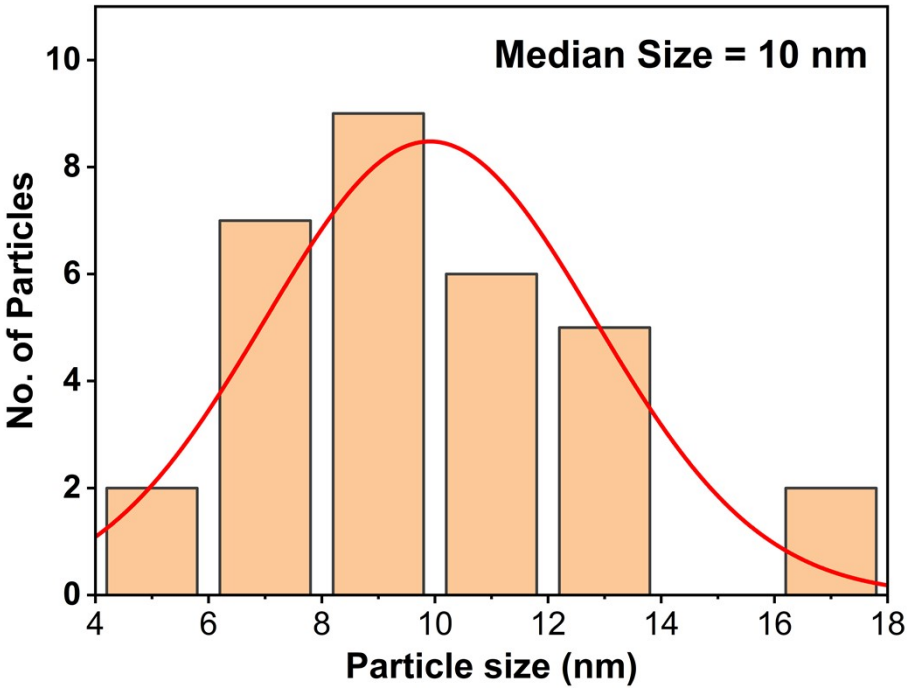


Fig. S2 Average particle size distribution of Ce^{3+} (5 at.%) sensitized BaF_2:Tb^{3+}(5 at.%)

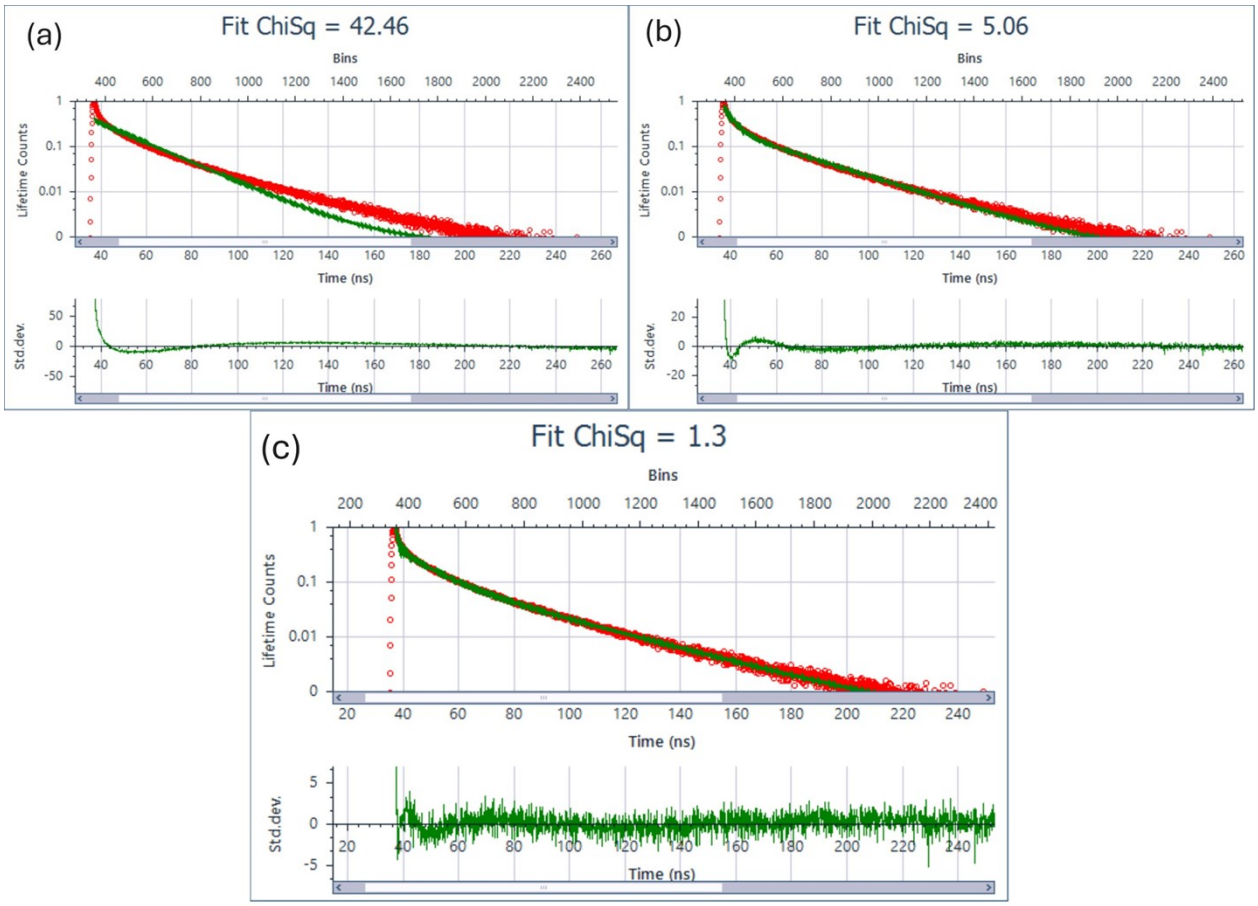
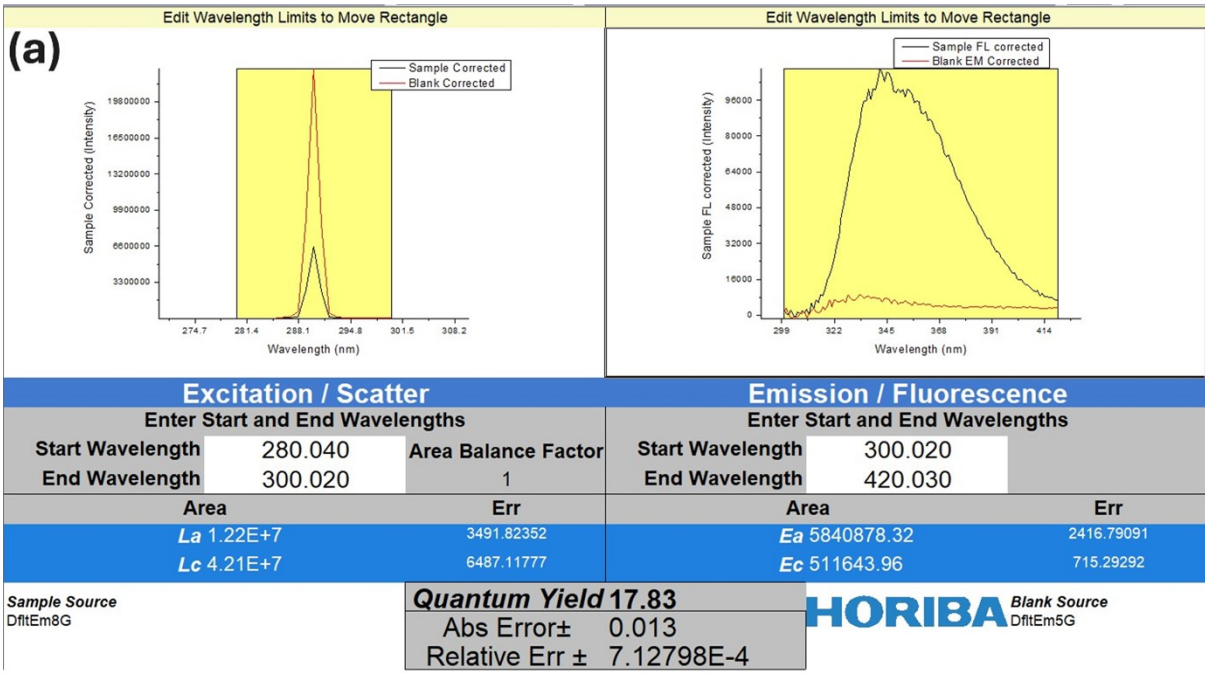


Fig. S3 A typical fitting curve using (a) mono-exponential, (b) bi-exponential, (c) tri-exponential of Ce^{3+} (5 at.%) sensitized BaF_2:Tb^{3+}(5 at.%)



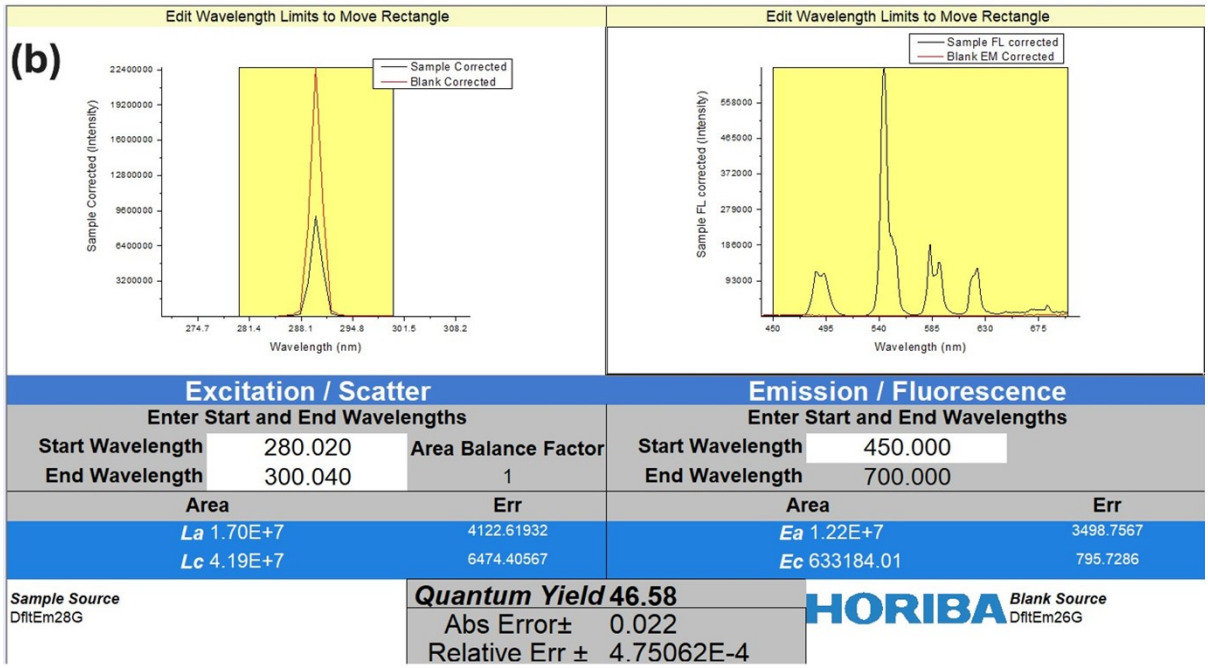


Fig. S4 Quantum yield calculation for (a) BaF_2:Ce^{3+}(5 at.%) and (b) Ce^{3+} (5 at.%) sensitized BaF_2:Tb^{3+} (5 at.%).

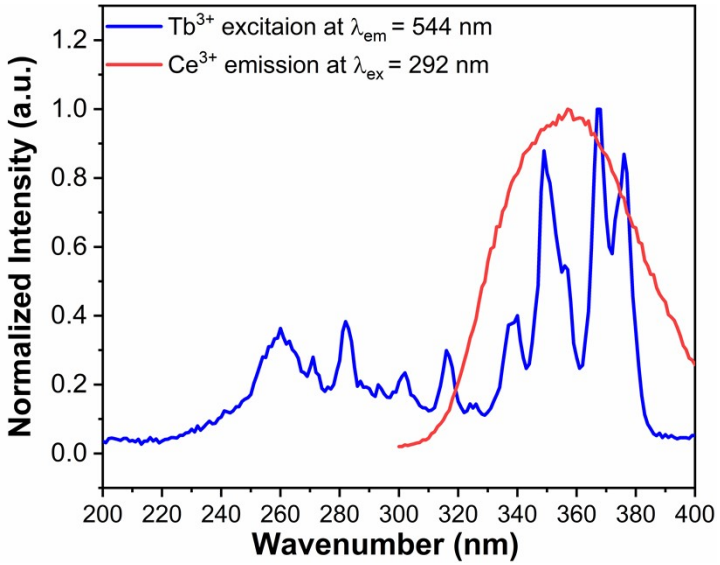


Fig. S5 Spectral overlapping between the emission of Ce^{3+} with the excitation of Tb^{3+} in Ce^{3+} (5 at.%) sensitized BaF_2:Tb^{3+} (5 at.%).

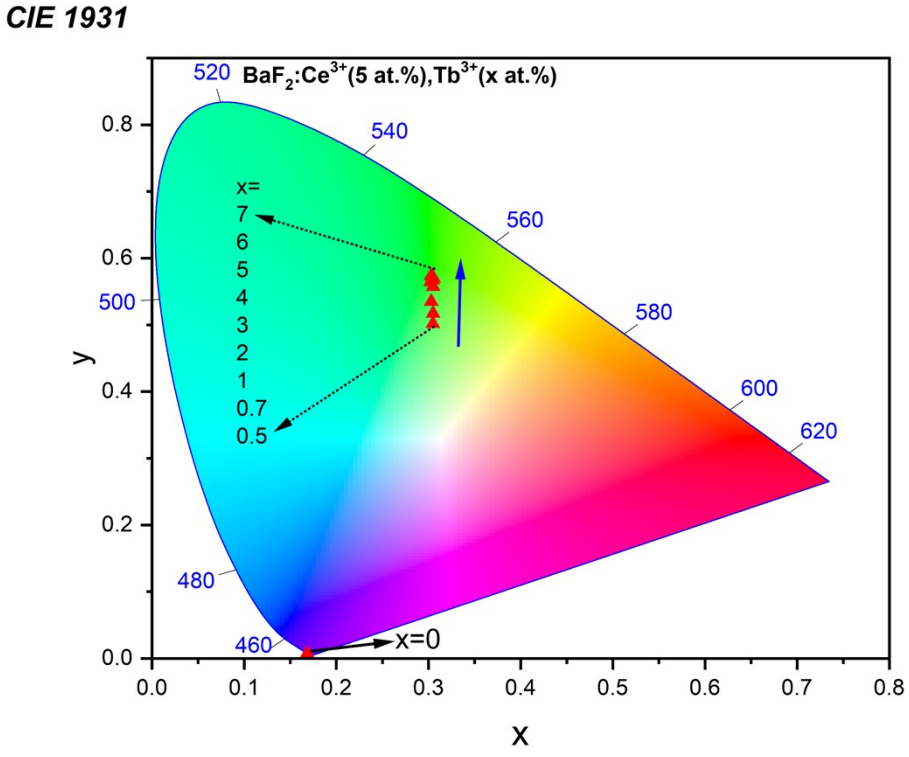


Fig. S6 CIE chromaticity colour space showing the emission colours of Ce^{3+} (5 at.%) sensitized BaF_2:Tb^{3+} (x = 0, 0.5, 0.7,1, 2, 3, 4, 5, 6, and 7 at.%).

Table. S1. Average lifetime of Ce^{3+} (5 at.%) monitored at 265±10nm and CIE coordinates Ce^{3+} (5 at.%) sensitized BaF_2:Tb^{3+} (x = 0, 0.5, 0.7,1, 2, 3, 4, 5, 6, and 7 at.%).

Tb^{3+} (at.%)	τ_{av}(ns)	CIE coordinates (x,y)
0	18±0.01	(0.17, 0.01)
0.5	15±0.01	(0.30, 0.50)
0.7	14±0.01	(0.30, 0.52)
1	12±0.01	(0.30, 0.53)
2	10±0.01	(0.31, 0.56)
3	9±0.01	(0.30, 0.56)
4	7±0.01	(0.30, 0.57)
5	6±0.01	(0.31, 0.57)
6	5±0.01	(0.30, 0.57)
7	4±0.01	(0.30, 0.57)