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Structural, optical spectroscopy and energy transfer features of Tb³⁺ activated (Y, Gd)F₃ nanophosphors for UV-based LEDs

Sushri Sangita Nanda¹, Priyanka Nayak¹, Santosh K. Gupta^{2,3}, N. S. Rawat^{3,4}, U. K. Goutam⁵
and S. Dash^{1,*}

¹Department of Physics and Astronomy, National Institute of Technology Rourkela, Odisha-769008, India

²Radiochemistry Division, Bhabha Atomic Research Centre, Mumbai-400085, India

³Radiological Physics and Advisory Division, Bhabha Atomic Research Centre, Mumbai-400085, India

⁴Homi Bhabha National Institute, Mumbai-400094, India

⁵Indus 2 Synchrotron Facility, Raja Ramanna Centre for Advanced Technology (RRCAT), 452013 Madhya Pradesh, India

*Corresponding Author email: dashsurya@nitrkl.ac.in, dsuryanarayan@gmail.com

Table TS1. Rietveld refinement parameters of YF₃, 0.03Tb, 0.05Tb and 0.1Tb.

Refinement Parameters	YF ₃	0.03Tb	0.05Tb	0.1Tb
a(Å)	6.290(1)	6.343(1)	6.329(2)	6.346(4)
b(Å)	6.387(1)	6.877(2)	6.848(3)	6.854(3)
c(Å)	4.468(1)	4.453(1)	4.444(1)	4.430(4)
V(Å ³)	192.198(1)	192.278(3)	192.653(6)	192.762(6)
R _p (%)	11.10	4.65	4.42	4.53
R _{wp} (%)	11.90	4.22	4.17	4.18
R _{exp} (%)	5.68	2.46	2.43	2.49
χ ²	4.40	2.96	2.94	2.81

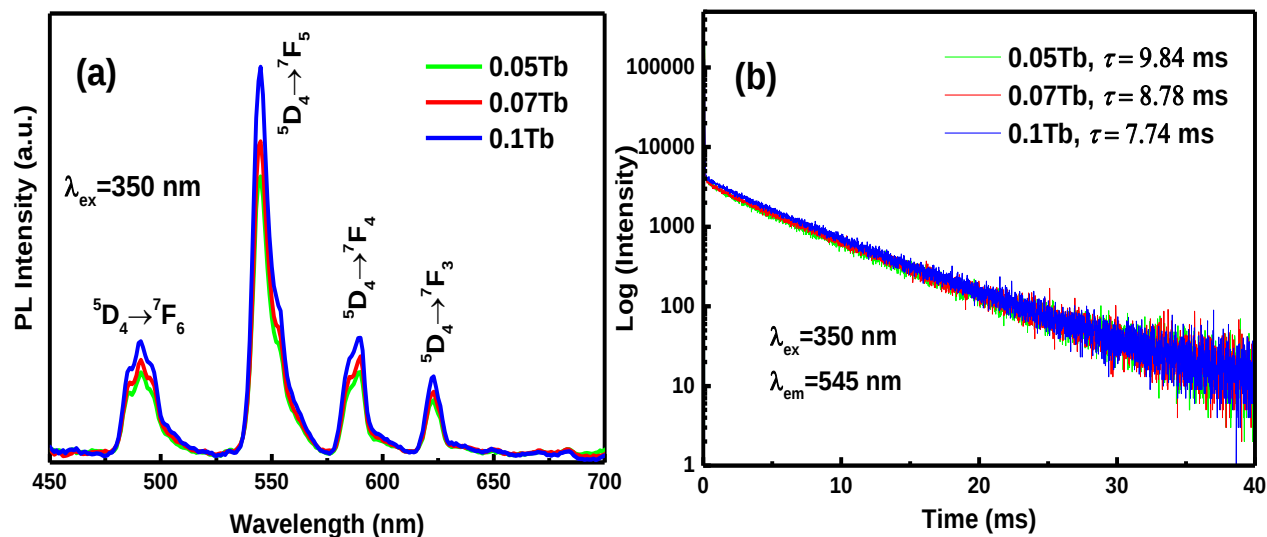


Fig. S1 (a) Emission spectra and (b) Luminescence decay curves of 0.05Tb-0.1Tb nanophosphors at 350 nm excitation.

Table TS2. Fluorescence decay time (τ), radiative (A_{rad}), nonradiative (A_{nonrad}), total (A_{total}) decay rates and quantum efficiencies (η) of 0.05Tb–0.1Tb nanophosphors at 350 nm excitation.

Sample	τ (ms)	A_{rad} (s^{-1})	A_{nonrad} (s^{-1})	A_{total} (s^{-1})	η (%)
0.05Tb	9.84	75.20	26.42	101.62	74
0.07Tb	8.78	87.69	26.20	113.89	77
0.1Tb	7.74	104.65	24.55	129.20	81

Table TS3. Chromaticity coordinates, CCT and color purity of 0.01Tb–0.1Tb nanophosphors.

Samples	Chromaticity Co-ordinates (X, Y)	CCT (K)	Color Purity (%)
0.01Tb	(0.334, 0.465)	5469	47.64
0.03Tb	(0.324, 0.528)	5682	61.45
0.05Tb	(0.316, 0.533)	5842	59.82

0.07Tb	(0.315, 0.531)	5856	59.99
0.1Tb	(0.321, 0.554)	5721	66.34