

Supporting Information

Color tunable $\text{Ca}_8\text{ZnM}(\text{PO}_4)_7$ (M = Lu/Tb, Lu/Eu, Tb/Eu) phosphors: luminescence, energy transfer and thermal stability studies for n-UV white LEDs

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Table S1 Structural parameters of CZLP, CZTP, CZTP:0.5Eu³⁺ and CZEP at room temperature

Material	CZLP	CZTP	CZTP:0.5Eu ³⁺	CZEP
Space group	R3c	R3c	R3c	R3c
Molecules (Z)	6	6	6	6
a, Å	10.357(39)	10.37348(29)	10.37767(21)	10.37852(24)
c, Å	37.01(32)	37.12557(90)	37.15141(93)	37.16041(81)
V, Å ³	3438.33(39)	3459.81(21)	3465.02(17)	3466.43(17)
Rwp, %	5.50	6.16	5.98	8.21
Rp, %	3.64	4.21	4.23	5.35
GOF	2.82	2.76	2.67	3.36

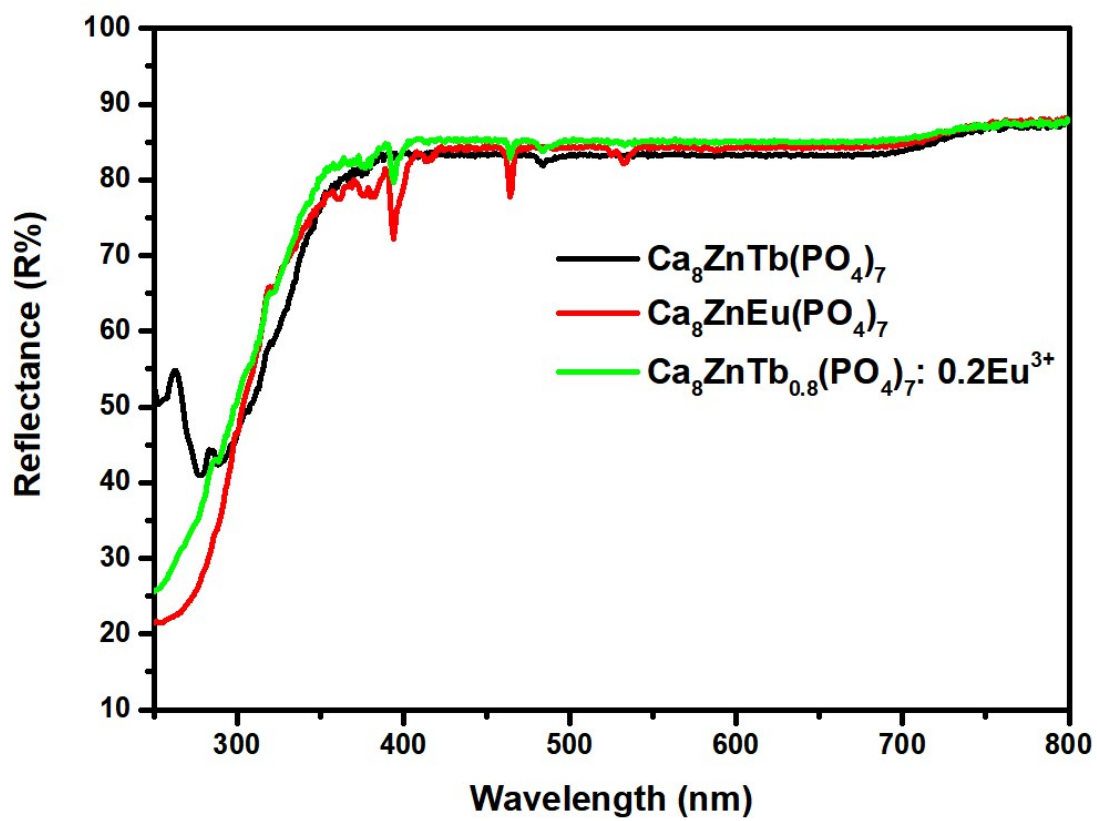


Fig. S1 Diffused reflectance spectra of CZTP, CZEP and CZTP: 0.2Eu³⁺

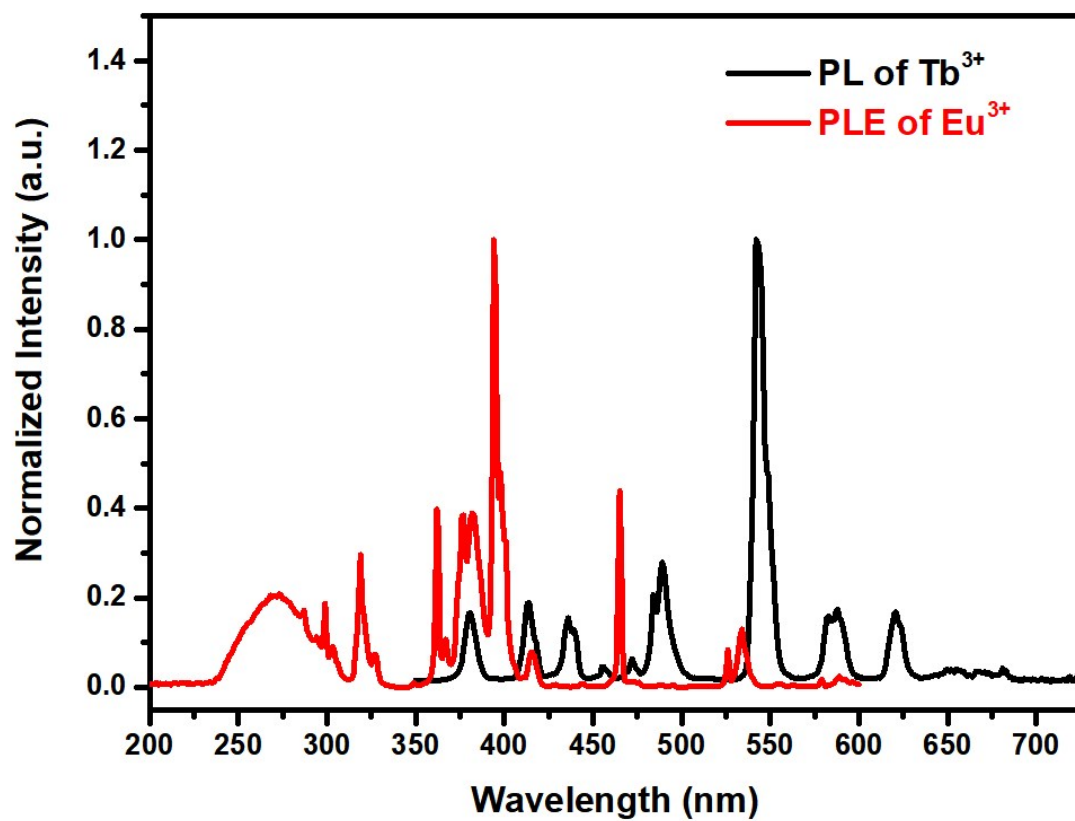


Fig. S2 Normalized emission spectrum CZLP: 0.1Tb³⁺ of and excitation spectrum of CZEP

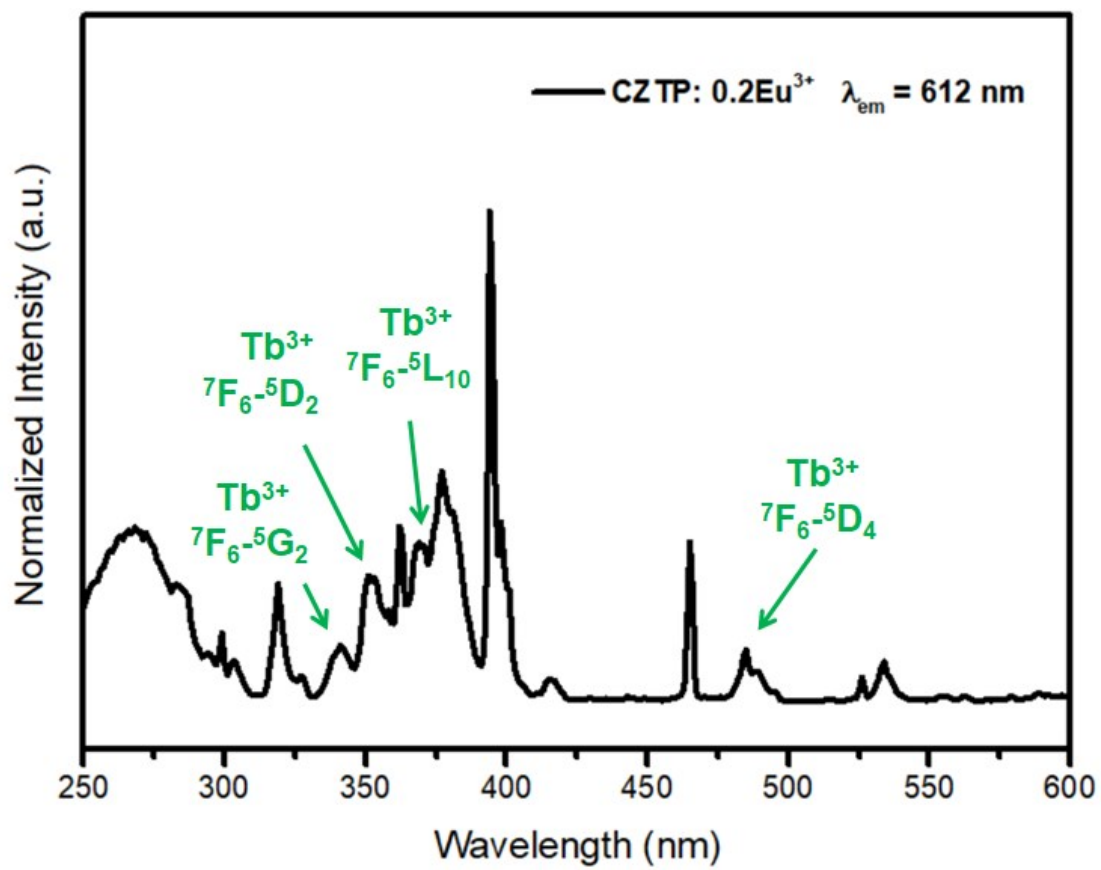


Fig. S3 The excitation spectrum of CZTP: 0.2Eu³⁺ monitored at 612 nm

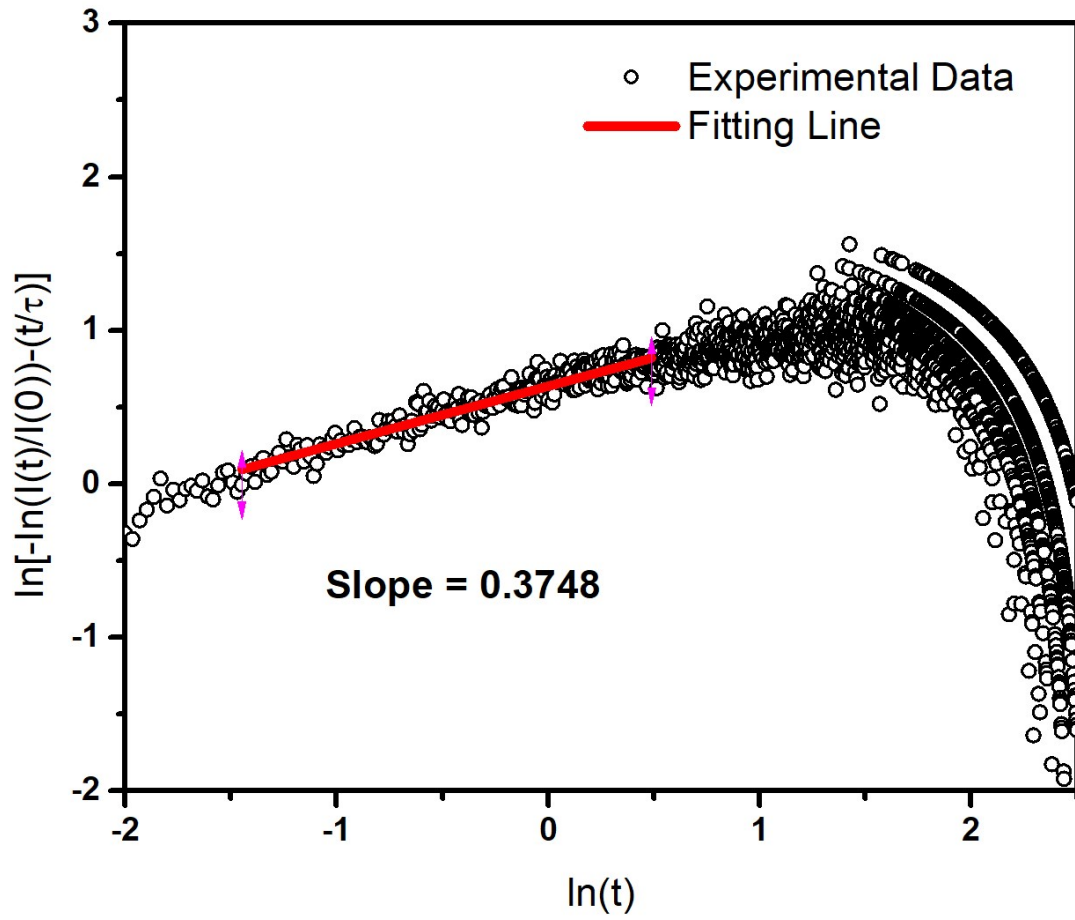


Fig. S4 The fitting line of CZTP: 0.80Eu³⁺ decay curve with Inokuti-Hirayama model

Table S2 CIE coordinates of CZTP:0.2Eu³⁺ from 300 to 500 K

Temperature (K)	CIE (x, y)
300	(0.4854, 0.4718)
325	(0.4910, 0.4681)
350	(0.4954, 0.4647)
375	(0.4983, 0.4627)
400	(0.5010, 0.4608)
425	(0.5027, 0.4595)
450	(0.5047, 0.4581)
475	(0.5057, 0.4572)
500	(0.5063, 0.4566)

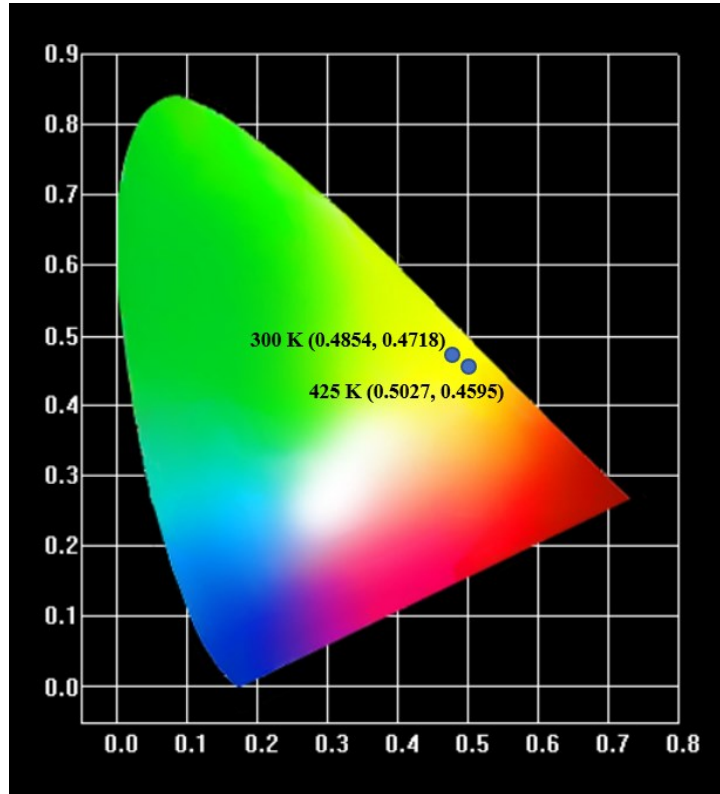


Fig. S5 CIE diagram of CZTP:0.2Eu³⁺ at 300 K and 425 K