

Electronic Supplementary Information (ESI)

A new and efficient red phosphor for solid-state lighting:



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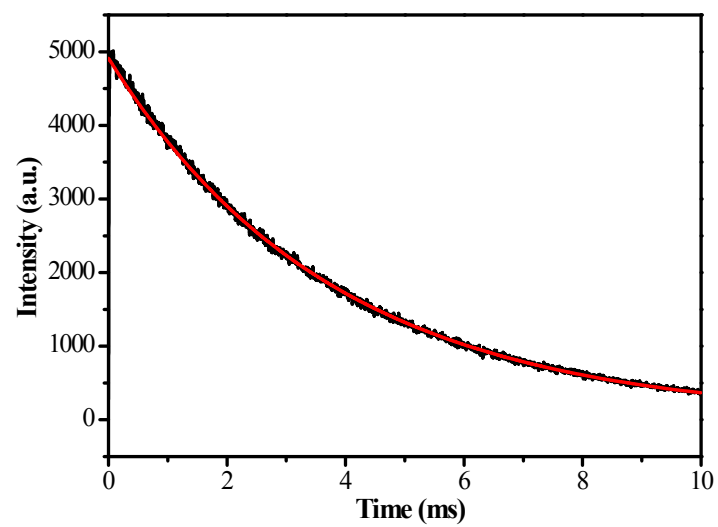


Fig. S1 Decay curve of the Mn⁴⁺ emission in Cs₂TiF₆:Mn⁴⁺ ($\lambda_{\text{ex}} = 474$ nm, $\lambda_{\text{em}} = 632$ nm).

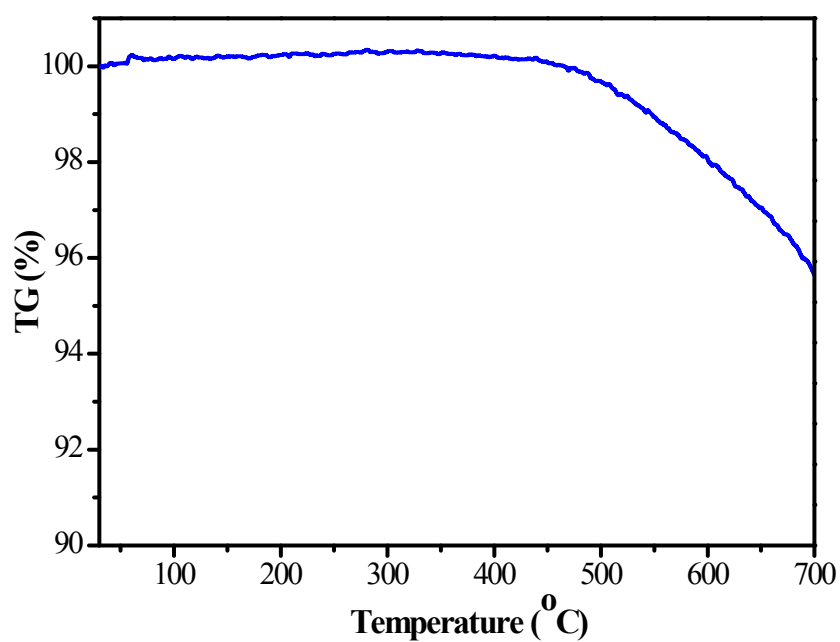


Fig. S2 Thermogravimetrics (TG) curve of the Cs₂TiF₆:Mn⁴⁺ red phosphor under N₂ atmosphere. The thermal stability is investigated from PerkinElmer STA 8000 at a heating rate of 10 K/min.

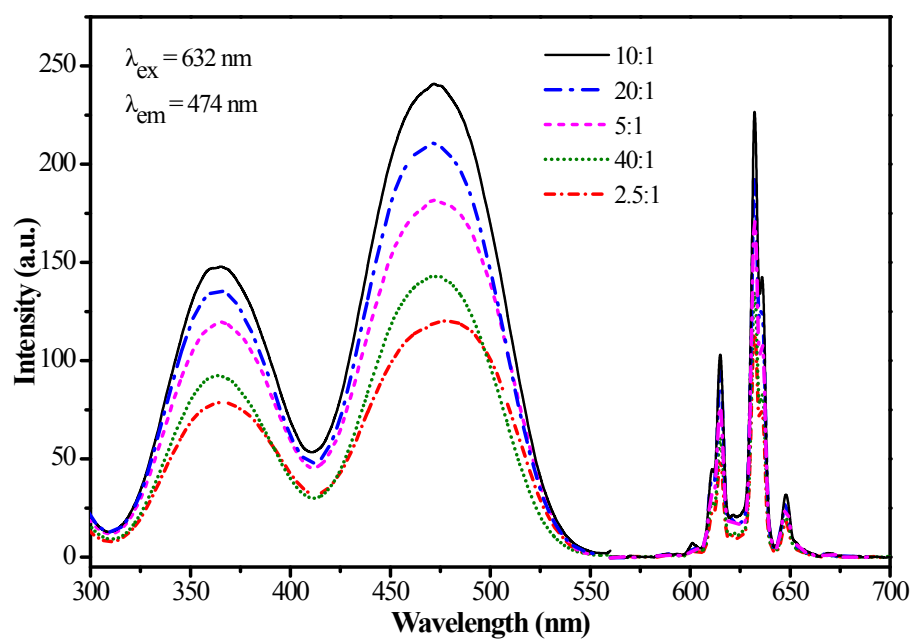


Fig. S3 The excitation and emission spectra of $\text{Cs}_2\text{TiF}_6:\text{Mn}^{4+}$ red phosphors obtained from different molar ratio between TiO_2 and K_2MnF_6 .

Tab. S1: Important LED photoelectric parameters with different amount of $\text{Cs}_2\text{TiF}_6\text{:Mn}^{4+}$ phosphor under a current of 20 mA

Device	Phosphor	CTFM (w/%)	T_c (K)	Ra	CIE (x, y)	Luminous Efficacy (lm/W)
i	YAG	0	6620	73.9	(0.313, 0.314)	153.3
ii	YAG + CTFM	5	5052	74.7	(0.343, 0.341)	148.8
iii	YAG + CTFM	10	4650	75.8	(0.356, 0.363)	143.2
iv	YAG + CTFM	15	4020	77.5	(0.378, 0.370)	136.5
v	YAG + CTFM	20	3540	78.8	(0.401, 0.382)	130.4
vi	YAG + CTFM	25	3272	80.1	(0.415, 0.389)	124.6