

Green light emissive LaSr₂AlO₅:Er³⁺ nanocrystalline material for solid state lighting: Crystal phase refinement, down-conversion photoluminescence with high thermal stability

Pawan Kumar^a, Devender Singh^{a*} and Harish Kumar^b

^aDepartment of Chemistry, Maharshi Dayanand University, Rohtak-124001, India.

^bDepartment of Chemistry, School of Chemical Sciences, Central University of Haryana, Mahendergarh-123031, India.

Electronic Supporting Information

$$R_p = \frac{\sum |I_0 - I_c|}{\sum I_c} \quad \text{S1}$$

$$R_{WP} = \left(\frac{M}{\sum w I_0^2} \right)^{1/2} \quad \text{S2}$$

$$M = \sum w (I_0 - I_c)^2 \quad \text{S3}$$

$$\chi^2 = \frac{M}{N_{obs} - N_{var}} \quad \text{S4}$$

$$x = \frac{X}{X + Y + Z} \quad y = \frac{Y}{X + Y + Z}$$

S5

$$u' = \frac{4x}{-2x + 12y + 3} \quad v' = \frac{9y}{-2x + 12y + 3}$$

S6

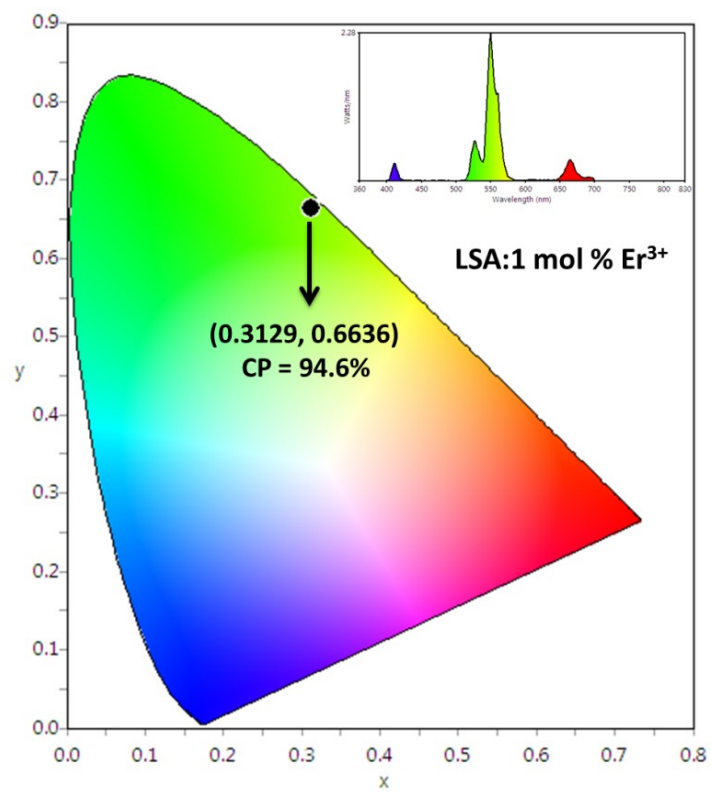


Fig. S1 CIE 1931 profile of $\text{La}_{0.99}\text{Sr}_2\text{AlO}_5:1 \text{ mol \% Er}^{3+}$ nanophosphor.

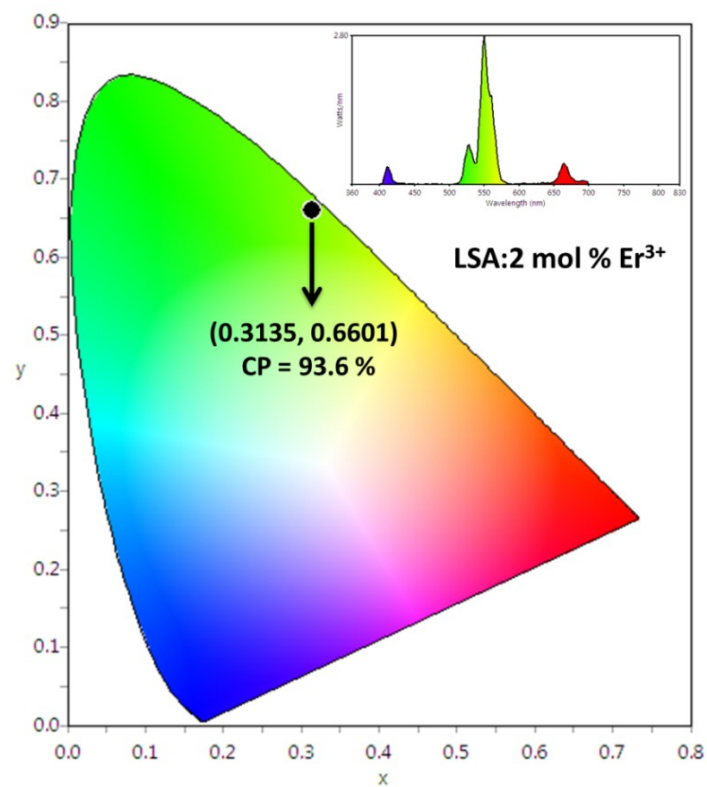


Fig. S2 CIE 1931 profile of La_{0.98}Sr₂AlO₅:2 mol % Er³⁺ nanophosphor.

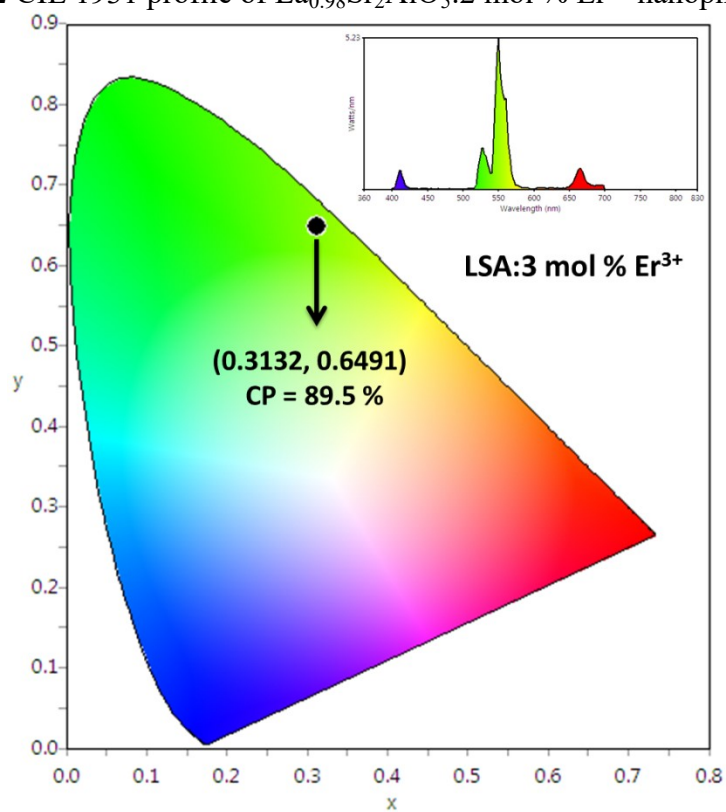


Fig. S3 CIE 1931 profile of La_{0.97}Sr₂AlO₅:3 mol % Er³⁺ nanophosphor.

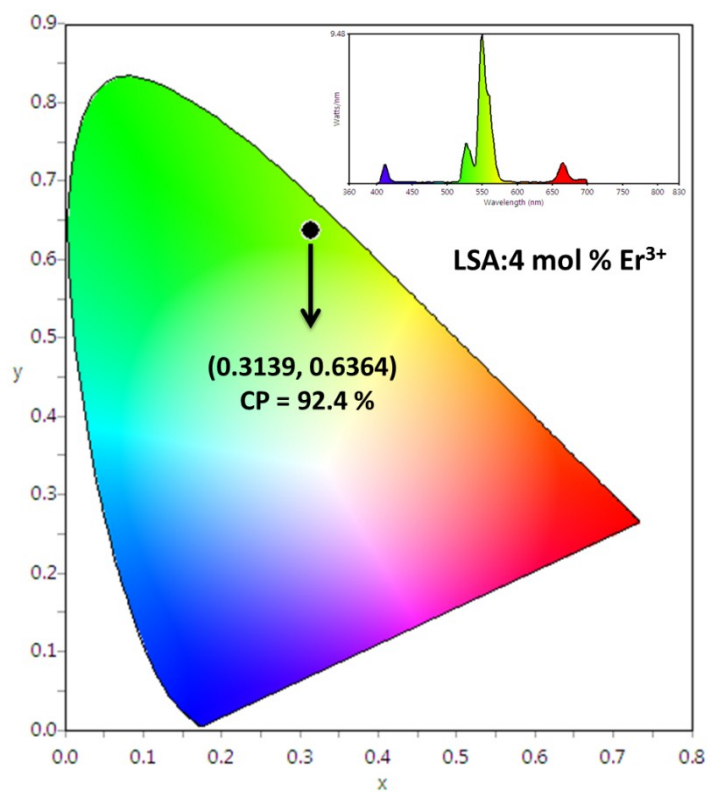


Fig. S4 CIE 1931 profile of La_{0.96}Sr₂AlO₅:4 mol % Er³⁺ nanophosphor.

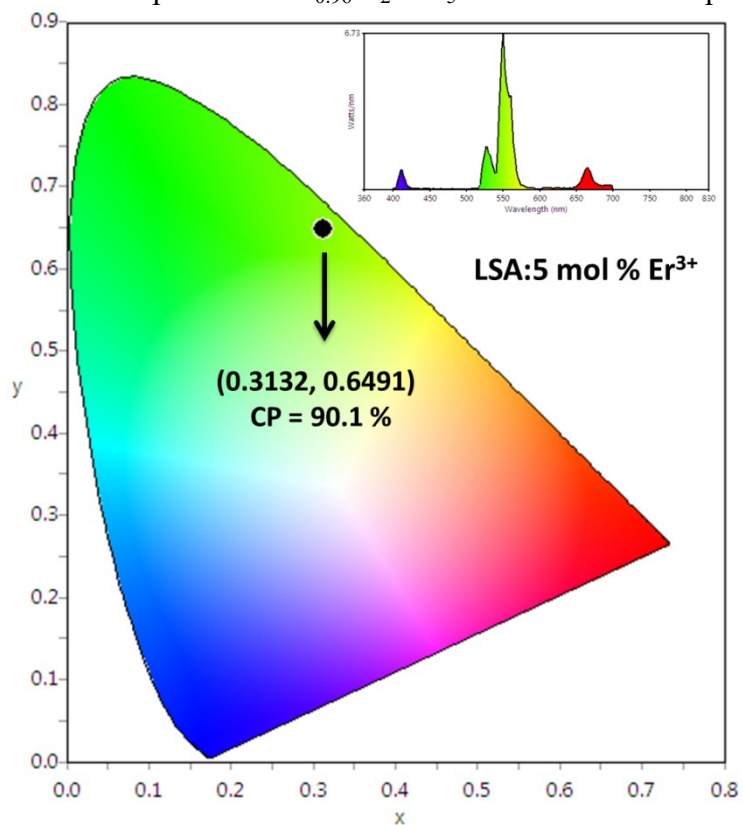


Fig. S5 CIE 1931 profile of La_{0.95}Sr₂AlO₅:5 mol % Er³⁺ nanophosphor.

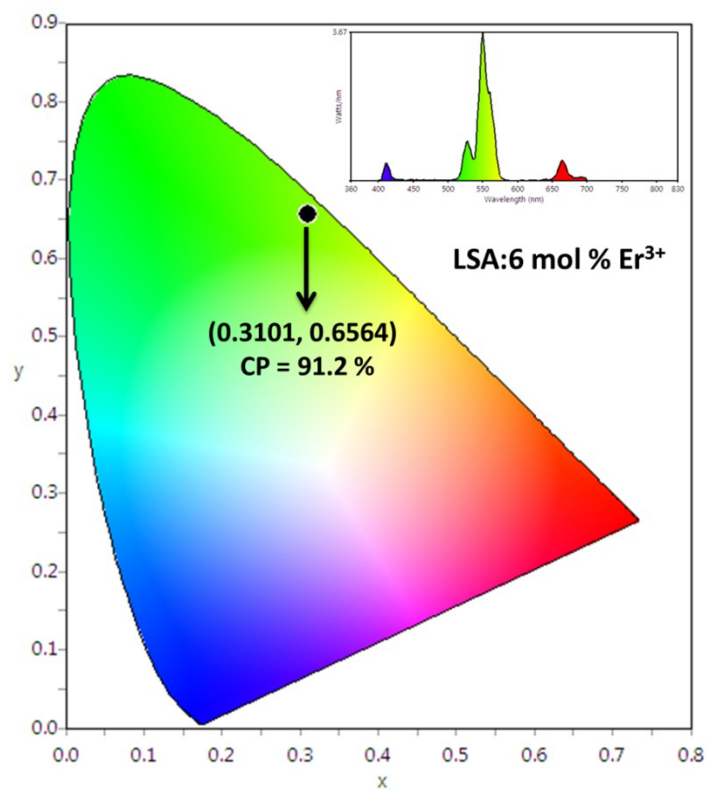


Fig. S6 CIE 1931 profile of La_{0.94}Sr₂AlO₅:6 mol % Er³⁺ nanophosphor.

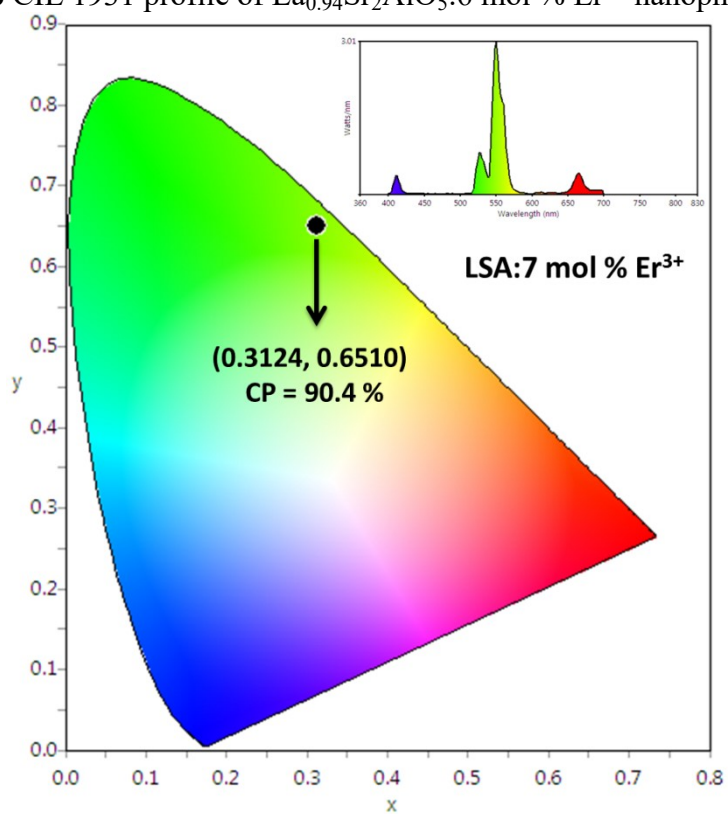


Fig. S7 CIE 1931 profile of La_{0.93}Sr₂AlO₅:7 mol % Er³⁺ nanophosphor.

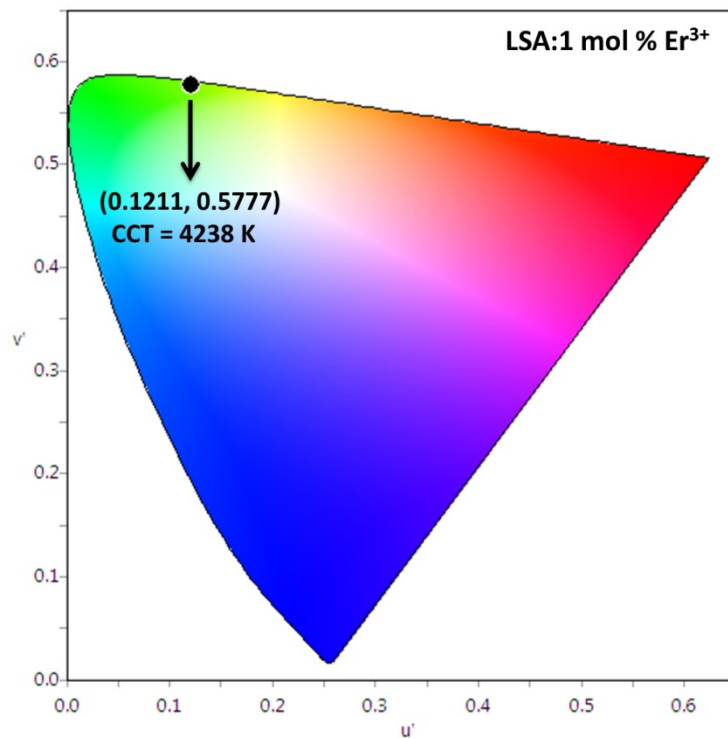


Fig. S8 CIE 1976 profile of La_{0.99}Sr₂AlO₅:1 mol % Er³⁺ nanophosphor.

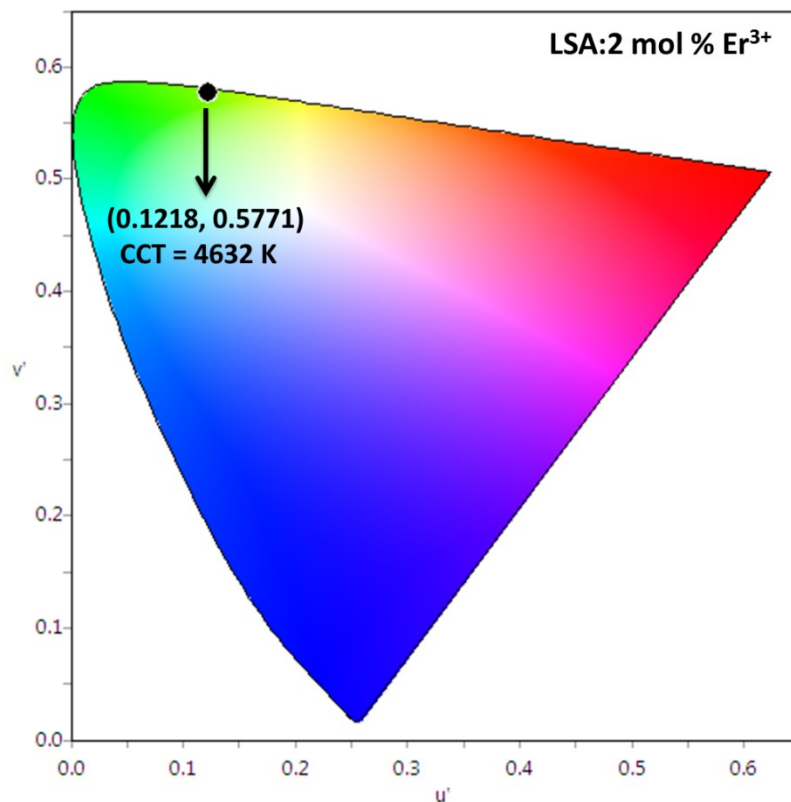


Fig. S9 CIE 1976 profile of La_{0.98}Sr₂AlO₅:2 mol % Er³⁺ nanophosphor.

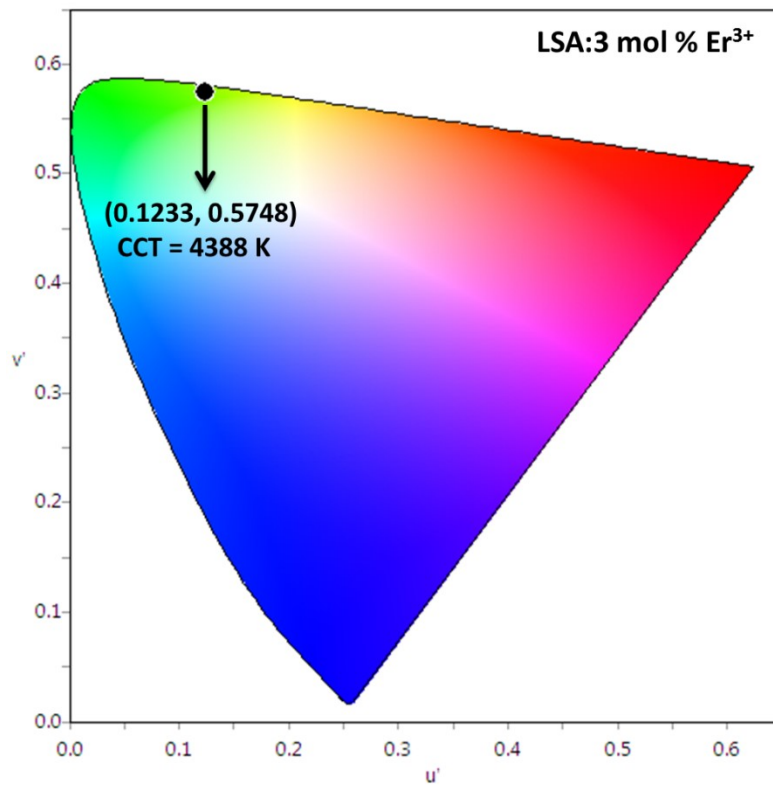


Fig. S10 CIE 1976 profile of $\text{La}_{0.97}\text{Sr}_2\text{AlO}_5:3 \text{ mol \% Er}^{3+}$ nanophosphor.

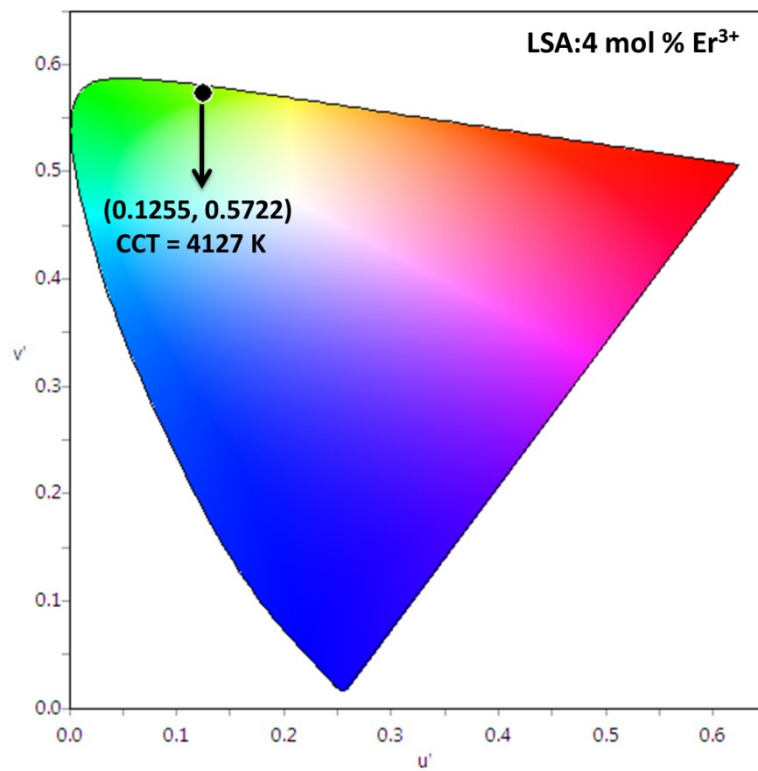


Fig. S11 CIE 1976 profile of $\text{La}_{0.96}\text{Sr}_2\text{AlO}_5:4 \text{ mol \% Er}^{3+}$ nanophosphor.

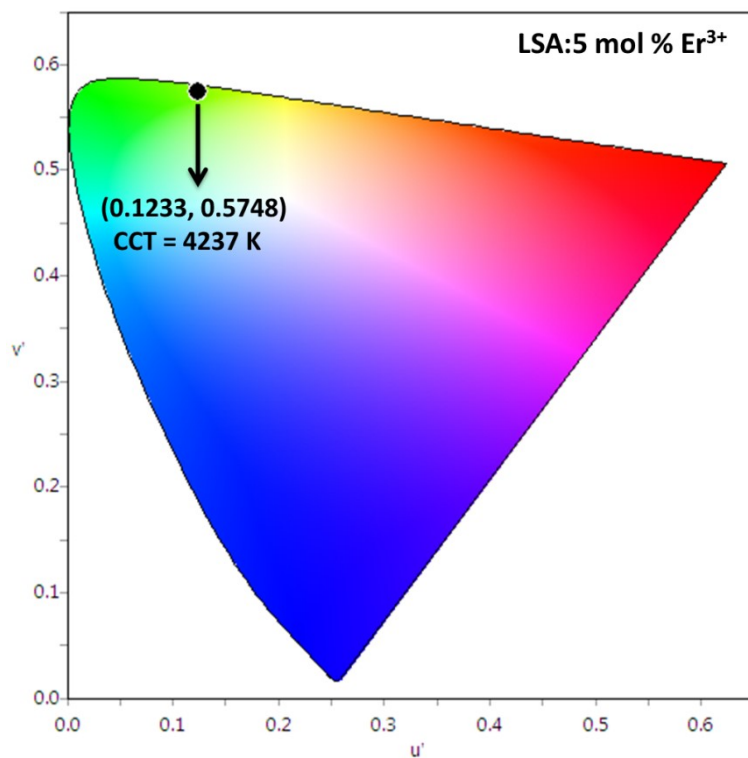


Fig. S12 CIE 1976 profile of La_{0.95}Sr₂AlO₅:5 mol % Er³⁺ nanophosphor.

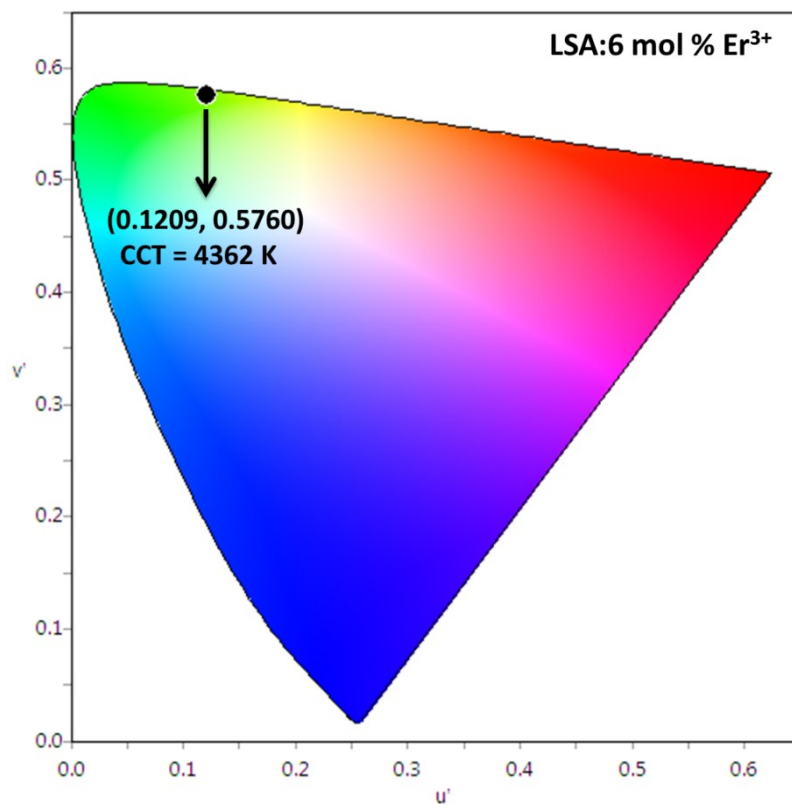


Fig. S13 CIE 1976 profile of La_{0.94}Sr₂AlO₅:6 mol % Er³⁺ nanophosphor.

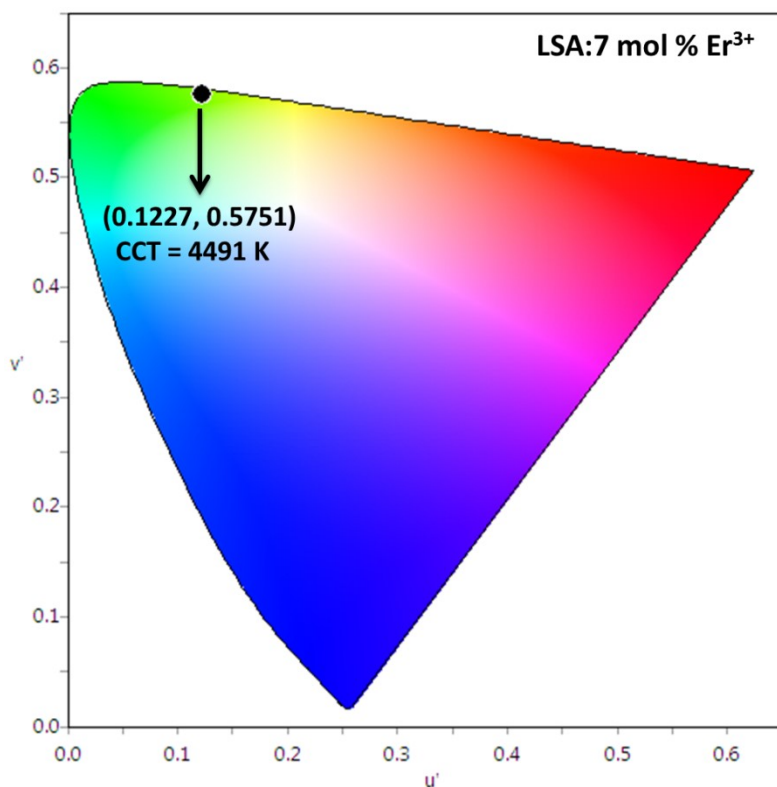


Fig. S14 CIE 1976 profile of $\text{La}_{0.93}\text{Sr}_2\text{AlO}_5:7 \text{ mol \% Er}^{3+}$ nanophosphor.

Table S1 The atomistic and corresponding isotropic dislocation factors of $\text{LaSr}_2\text{AlO}_5$ host.

Atom	x	y	z	W_{yck}	U	Occ.	Sym.
La(1)	0.18215	0.66971	0.00000	8h	0.006	0.500	m.2 m
Sr(2)	0.18215	0.66971	0.00000	8h	0.006	0.500	m.2 m
Sr(3)	0.00000	0.00000	0.25000	4a	0.006	1.000	422
Al(4)	0.00000	0.50000	0.25000	4b	0.009	1.000	-42m
O(5)	0.00000	0.00000	0.00000	4c	0.012	1.000	4/m..
O(6)	0.14343	0.64343	0.64207	16l	0.012	1.000	..m