

Supporting Information

Identifying and utilizing optical properties in $\text{CaSrNb}_2\text{O}_7$: Pr^{3+} phosphor at low temperature

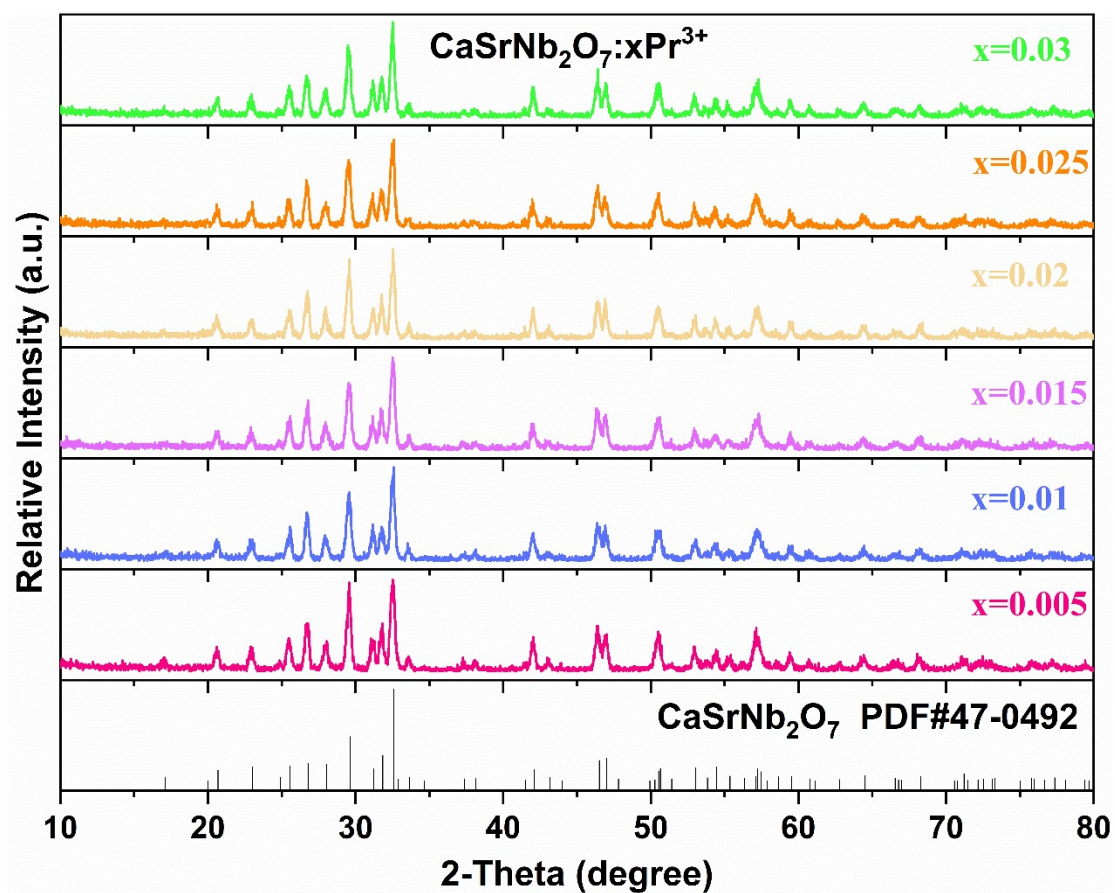


Figure S1. XRD patterns of $\text{CaSrNb}_2\text{O}_7$: $x\text{Pr}^{3+}$ ($x=0, 0.005, 0.01, 0.015, 0.02, 0.025, 0.03$).

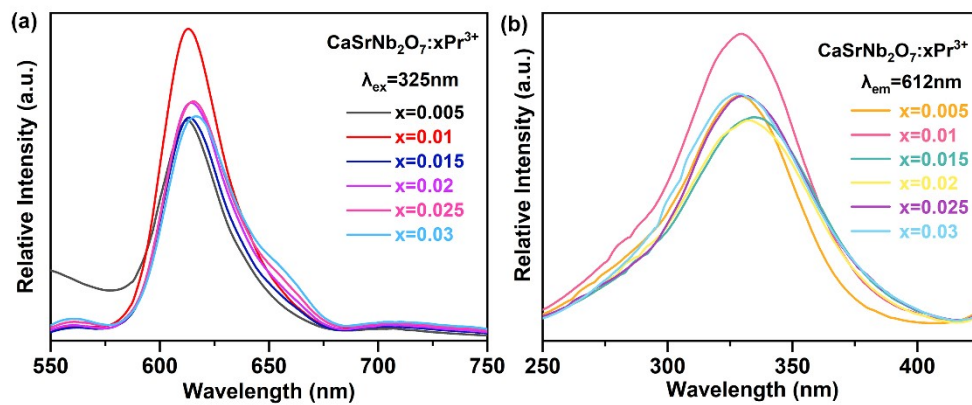


Fig. S2. The PL and PLE spectra of $\text{CaSrNb}_2\text{O}_7:\text{xPr}^{3+}$ under 325 nm, 612nm, respectively.

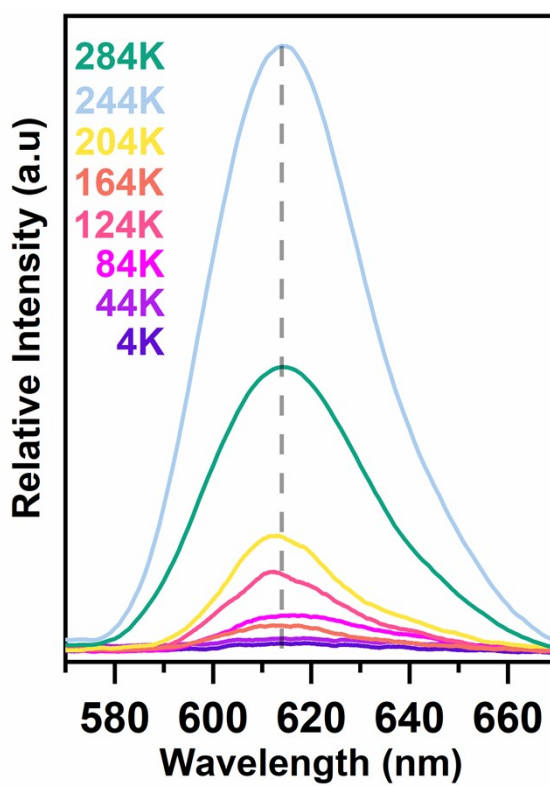


Figure S3. Temperature-dependent LPL spectra of $\text{CaSrNb}_2\text{O}_7:\text{Pr}^{3+}$.

Table S1 Rietveld refinement and lattice parameters of the CaSrNb₂O₇: 0.01Pr³⁺ sample

Formula	CaSrNb ₂ O ₇ : 0.01Pr ³⁺
Crystal system	orthorhombic
Space group	Cmc21
a (Å)	3.933(1)
b(Å)	26.726(7)
c (Å)	5.683(4)
Z	4
Volume(Å ³)	597.36(50)
R _p (%)	7.91%
R _{wp} (%)	10.59%
χ^2	4.602

Table S2 The calculated CIE(x,y) values for CaSrNb₂O₇: Pr³⁺ and CaSrNb₂O₇

Temperature	CIE (CaSrNb ₂ O ₇ :Pr ³⁺)	CIE (CaSrNb ₂ O ₇)
4K	(0.2788,0.2884)	(0.2037,0.2647)
44K	(0.2877,0.2894)	(0.2069,0.2709)
84K	(0.3422,0.3014)	(0.2191,0.2860)
124K	(0.4543,0.3105)	(0.2487,0.2891)
164K	(0.5131,0.3123)	(0.2711,0.2645)
204K	(0.5447,0.3167)	(0.2735,0.2469)
244K	(0.5755,0.3229)	(0.2740,0.2417)
284K	(0.5943,0.3263)	(0.2764,0.2421)