

Supplementary Information

A promising route for developing yellow long persistent luminescence and mechanoluminescence in $\text{CaGa}_2\text{O}_4:\text{Pr}^{3+},\text{Li}^+$

Yajie Wang ^a, Peng Feng ^a, SongSong Ding ^a, Songlu Tian ^a, Yuhua Wang ^{*a}

Y. Wang, P. Feng, S. Ding, S. Tian, Prof. Y. Wang

^a Key Laboratory for Special Function Materials and Structural Design of the Ministry of Education

National & Local Joint Engineering Laboratory for Optical Conversion Materials and Technology

School of Physical Science and Technology

Lanzhou University

Lanzhou, 730000, China.

E-mail: wyh@lzu.edu.cn

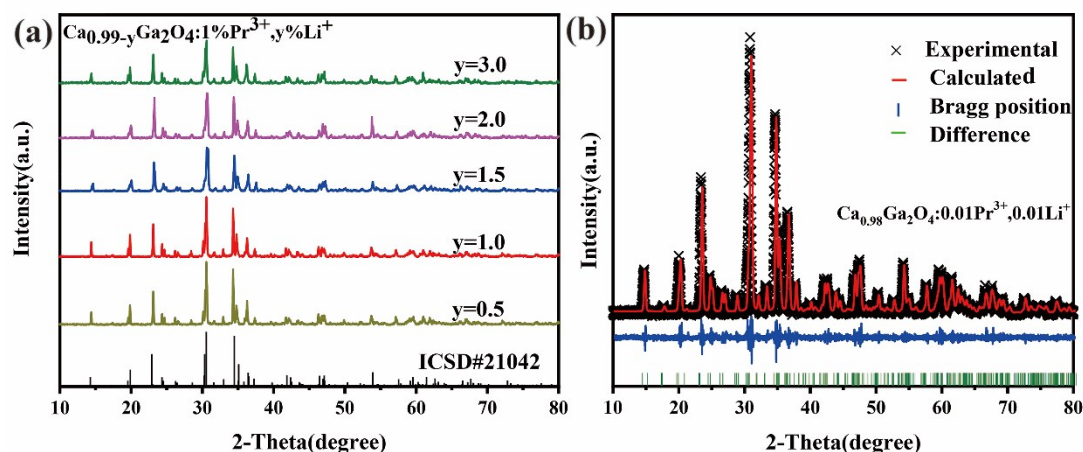


Figure S1. a) The XRD patterns of $\text{CGO}:0.01\text{Pr}^{3+},y\text{Li}^+$ ($0 \leq y \leq 0.03$). b) Rietveld refinement of $\text{CGO}:0.01\text{Pr}^{3+}, 0.01\text{Li}^+$.

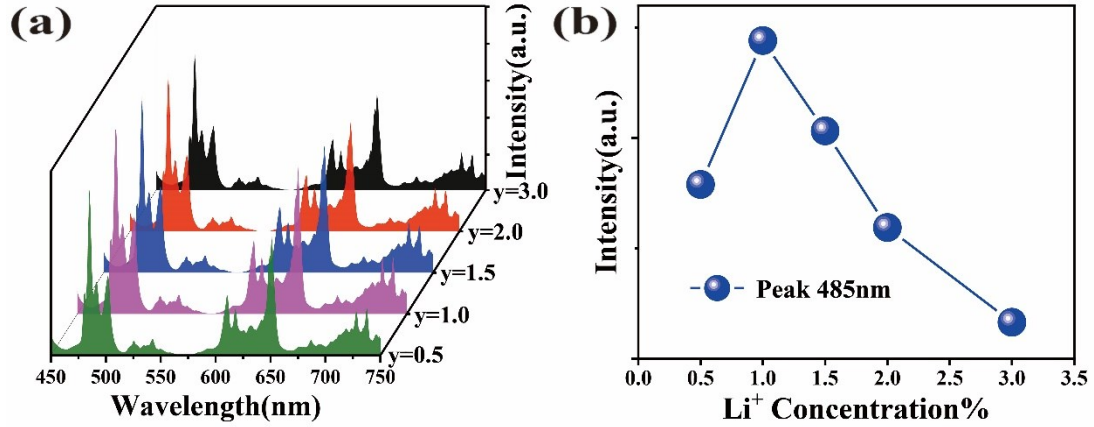


Figure S2. a) Emission spectra of CGO:0.01Pr³⁺,yLi⁺ ($0.5 \leq y \leq 0.03$), $\lambda_{\text{ex}}=442\text{nm}$. b) Peak intensity of 485nm of CGO:xPr³⁺ ($0.5 \leq y \leq 0.03$).

Table S1. Inductively Coupled Plasma Optical Emission Spectrometer (ICP-OES) results of CGO:0.01Pr³⁺,0.01Li⁺

Sample	Ca315.887	Pr525.973	Li670.791	C _{Pr}	C _{Li}
	mg/L	mg/L	mg/L	at%	at%
CGO:0.01Pr ³⁺ ,0.01Li ⁺	876.7	29.74	1.022	0.95	0.68

Table S2. The fitting data of decay curves of CGO:0.01Pr³⁺

Wavelength (nm)	A ₁	$\tau_1(\mu\text{s})$	A ₂	$\tau_2(\mu\text{s})$	$\tau^*(\mu\text{s})$	R ²
485	861.0	18.0	33.2	310.1	134.1	0.99695
651	897.7	16.9	24.4	193.5	58.3	0.99748

Table S3. CIE chromaticity coordinates of CGO:0.01Pr³⁺,0.01Li⁺ as a function of delay time after irradiation by a 254 nm lamp for 3min.

Delay time	30s	2min	5min	10min	15min
CIE coordinate	(0.405,0.437)	(0.451,0.450)	(0.458,0.455)	(0.461,0.457)	(0.462,0.458)

Table S4. CIE chromaticity coordinates of CGO:0.01Pr³⁺,yLi⁺($0.005 \leq y \leq 0.03$) measured in the 2nd minute after irradiation by a 254 nm lamp for 3min.

y	0.005	0.01	0.015	0.02	0.03
CIE coordinate	(0.462,0.464)	(0.451,0.450)	(0.425,0.408)	(0.421,0.408)	(0.421,0.405)