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Long persistent composite phosphor $CaAl_2O_4:Eu^{2+}$, Nd^{3+}/ $Y_3Al_5O_{12}:Ce^{3+}$: A novel strategy to design the multicolor of persistent luminescence

Wenbo Chen Yuhua Wang* Wei Zeng, Shaochun Han, Gen Li, Haijie Guo, Yanyan Li and Qinping Qiang

Key Laboratory for Special Function Materials and Structural Design of the Ministry of Education, School of Physical Science and Technology, Lanzhou University, Lanzhou,730000, China.
E-mail: wyh@lzu.edu.cn; Fax: +86-931-8913554; Tel: +86-931-8912772

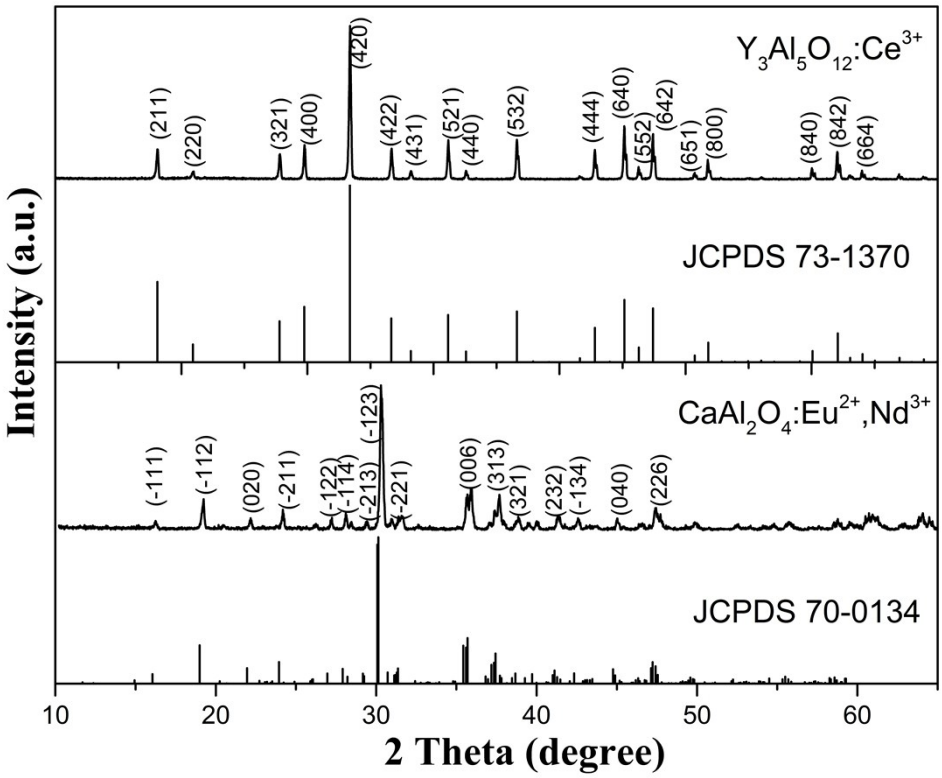

Figure S1 the typical XRD patterns of $CaAl_2O_4$:0.125 %Eu^{2+}, 0.25% Nd^{3+},

commercial $Y_3Al_5O_{12}:Ce^{3+}$ and the standard PDF cards of corresponding samples for comparison

Measurement errors of afterglow spectra

The afterglow spectra of composites are recorded after ceasing the excitation. FLS-920T fluorescence spectrophotometer collects photon from 380 to700 nm with 10nm/s. In this work, measuring an afterglow spectrum takes 37s. When testing, the afterglow intensity is a gradual decline. As shown in Figure S1, different wavelength of the photon is collected in different time. The longer wavelength, the lower intensity can be detected. Hence, the CIE coordinates of composite with varying B:Y compositions slightly shift to blue region.

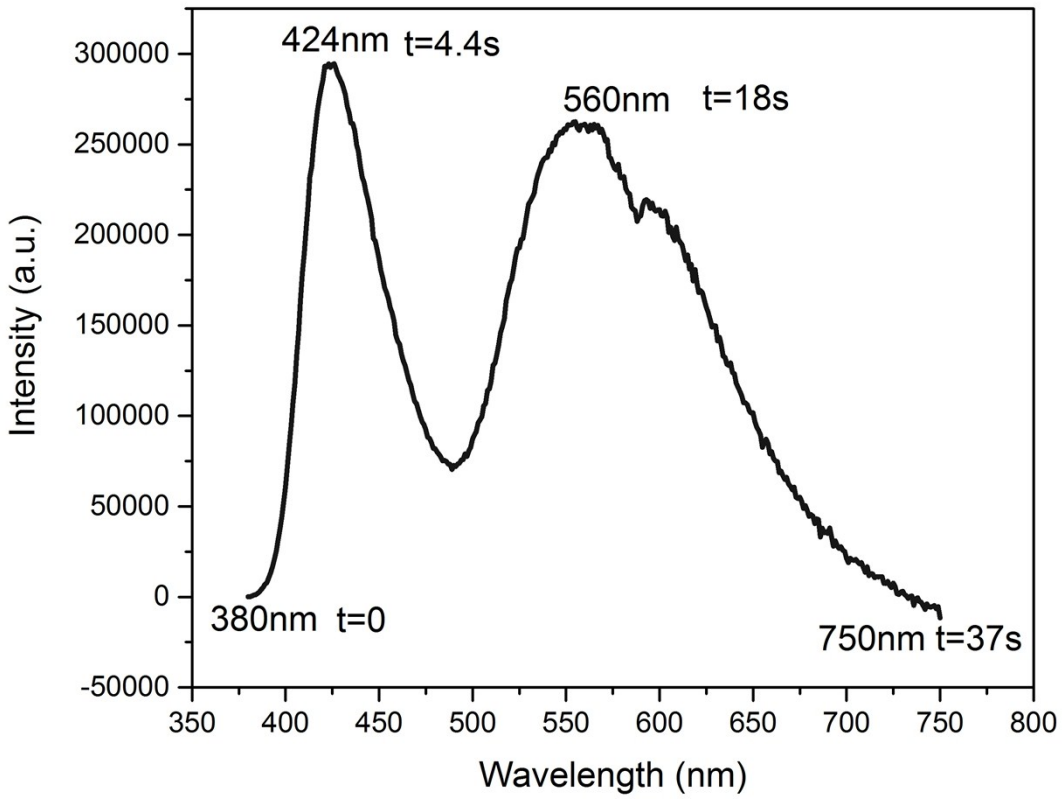

Figure S2 the afterglow spectrum of composite (B:Y=10:10)

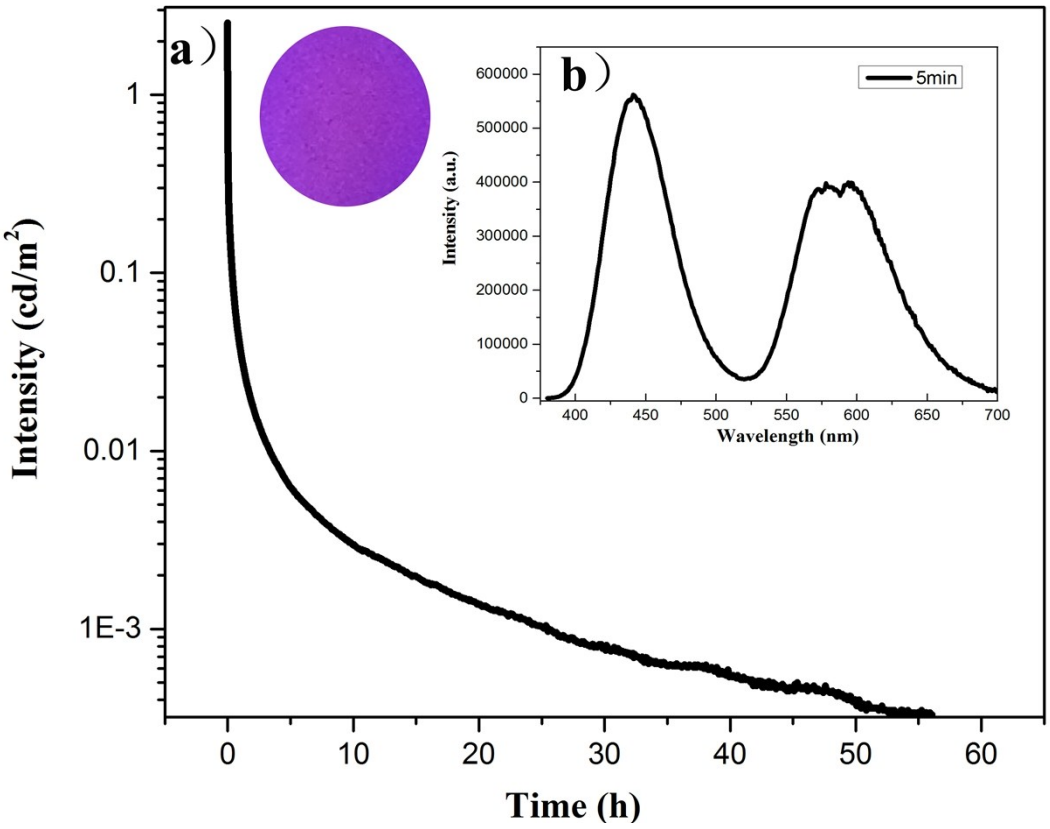

Figure S3 The afterglow performance of CA/Sr_3SiO_5:Eu^{2+} composite. a) decay cure. b) Afterglow spectrum. Insert: photo of composite was taken at 5 min after the removal of excitation.

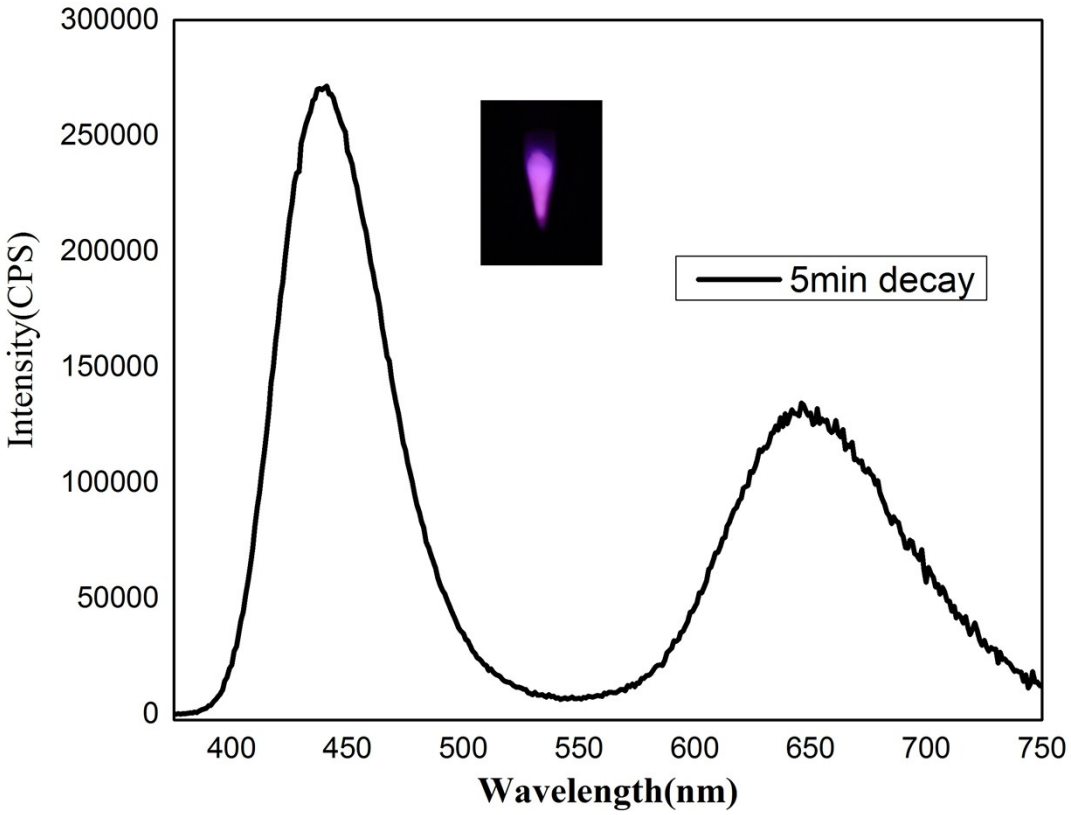

Figure S4 The afterglow spectum of CA/red phosphor. Insert: photo of composite was taken at 5 min after the removal of excitation.

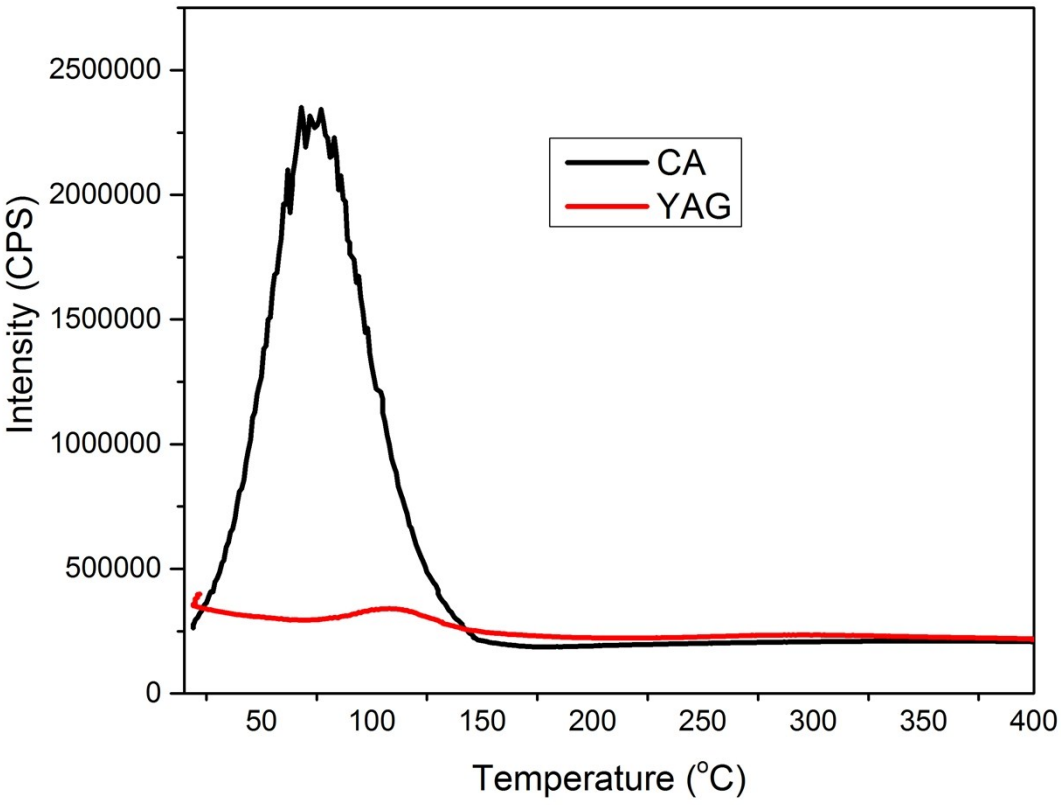

Figure S5 The thermoluminescence (TL) curve of CA and YAG.

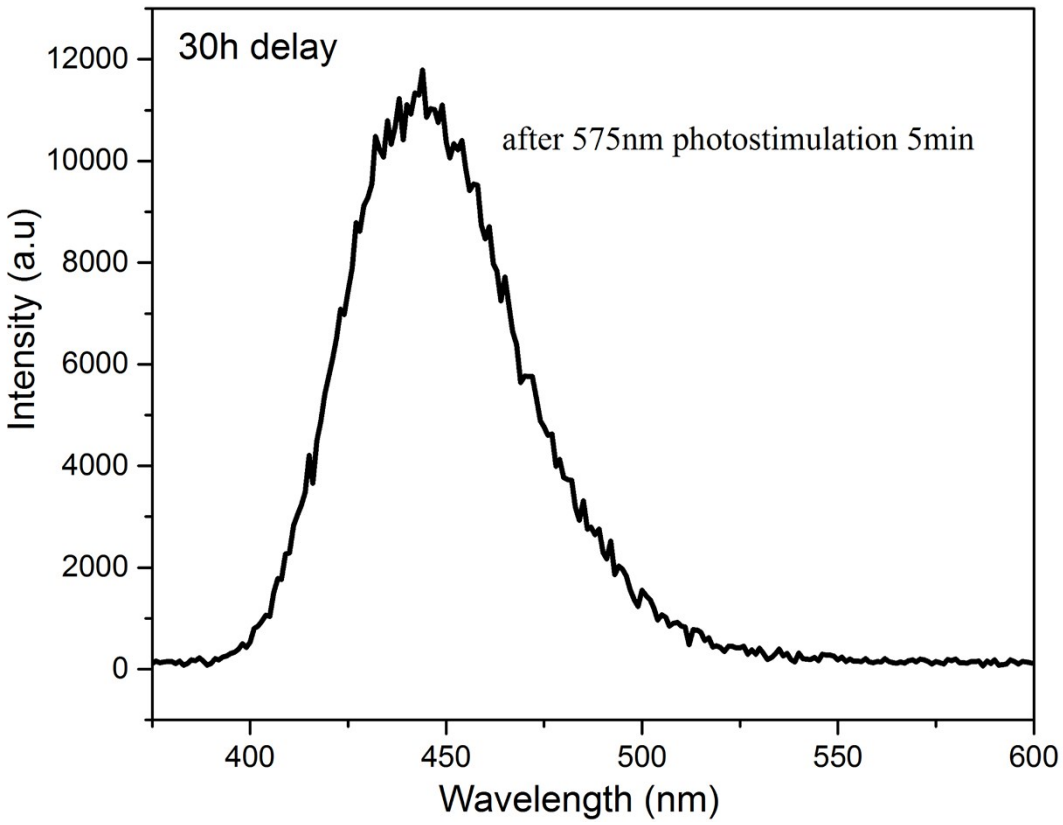

Figure S6 the LPL spectrum of CA with 30h –decayed after 575nm photostimulation