Enhanced Photoluminescence in $CaMoO_4:Eu^{3+}$ by Gd^{3+} co-doping

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Table S1 (ESI†) Peak positions of the magnetic dipole transition $^5D_0 \rightarrow {}^7F_1$ and electric dipole transition $^5D_0 \rightarrow {}^7F_2$ and their respective FWHM of ASP, 600 and 900 ^oC heated samples of Gd^{3+} (Gd^{3+} = 0, 2, 5, 7 and 10 at.%) co-doped $CaMoO_4$:Eu. λ_{exc} = 266 nm.

Gd^{3+} (at.%)	ASP		600 ^oC		900 ^oC	
	($^5D_0 \rightarrow {}^7F_1$) /w (nm)	($^5D_0 \rightarrow {}^7F_2$) /w (nm)	($^5D_0 \rightarrow {}^7F_1$) /w (nm)	($^5D_0 \rightarrow {}^7F_2$) /w (nm)	($^5D_0 \rightarrow {}^7F_1$) /w (nm)	($^5D_0 \rightarrow {}^7F_2$) /w (nm)
0	589.42/8.01	613.04/6.29	590.09/6.79	612.99/6.26	590.25/6.81	613.03/6.25
2	589.07/8.61	612.98/6.38	590.22/6.82	612.98/6.31	590.27/6.83	612.99/6.25
5	590.25/7.23	612.92/6.36	589.92/6.88	613.02/6.26	590.38/6.54	612.99/6.23
7	589.94/7.16	612.96/6.35	590.03/7.17	612.98/6.35	590.26/6.67	612.99/6.23
10	590.03/7.05	612.96/6.33	589.99/7.04	613.01/6.26	590.35/6.66	612.97/6.26

Table S2 (ESI†) Parameters obtained after mono-exponential fit to the decay data of as-prepared, 600 and 900 ^{o}C samples at 395 nm excitation.

Sample	Gd^{3+} (at.%)	I_1	τ_1 (ms)	χ^2
ASP	0	2.1416	0.4766	0.99979
	5	1.9459	0.5139	0.99969
	10	1.9807	0.4985	0.99982
600 ^{o}C	0	2.0645	0.5064	0.99983
	5	2.0363	0.5261	0.99987
	10	2.1239	0.4867	0.99991
900 ^{o}C	0	2.2791	0.46667	0.99996
	5	2.2793	0.4526	0.99988
	10	2.2999	0.4531	0.99996

Table S3 (ESI†) Radiative rate constants of Gd^{3+} co-doped $CaMoO_4$:Eu samples after mono-exponential curve fit to the luminescence decay curve under 395 excitation.

Sample	Gd^{3+} (at.%)	Radiative rate constant (x$10^3 s^{-1}$)
ASP	0	2.09
	5	1.95
	10	2.01
600 ^{o}C	0	1.97
	5	1.90
	10	2.05
900 ^{o}C	0	2.14
	5	2.21
	10	2.21

Table S4 (ESI†) Variation of CIE co-ordinates of ASP, 600 and 900 °C annealed Gd^{3+} (0, 2, 5, 7 and 10 at.%) co-doped $CaMoO_4$:Eu samples

	CIE chromaticity co-ordinates					
	ASP		600 °C		900 °C	
Gd^{3+} (at.%)	x	y	x	y	x	y
0	0.4731	0.3685	0.4726	0.3679	0.6127	0.3714
2	0.5171	0.3704	0.5171	0.3703	0.6205	0.3681
5	0.5334	0.3711	0.5331	0.3708	0.6068	0.3614
7	0.5785	0.3713	0.5785	0.3713	0.5979	0.3652
10	0.5879	0.3659	0.5879	0.3659	0.5937	0.3663

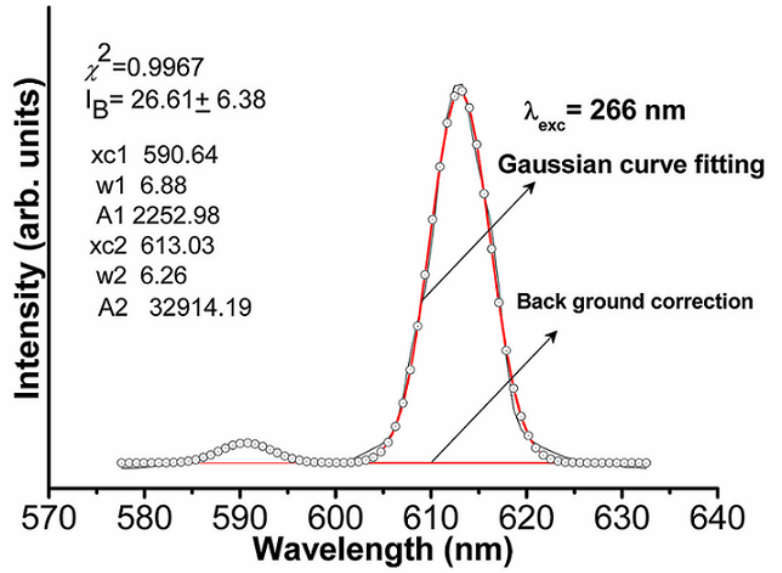

Fig. S1 (ESI†) Show the typical fitting of magnetic and electronic dipole transitions of 5 at.% Gd^{3+} co-doped $CaMoO_4$:Eu heated at 600 °C

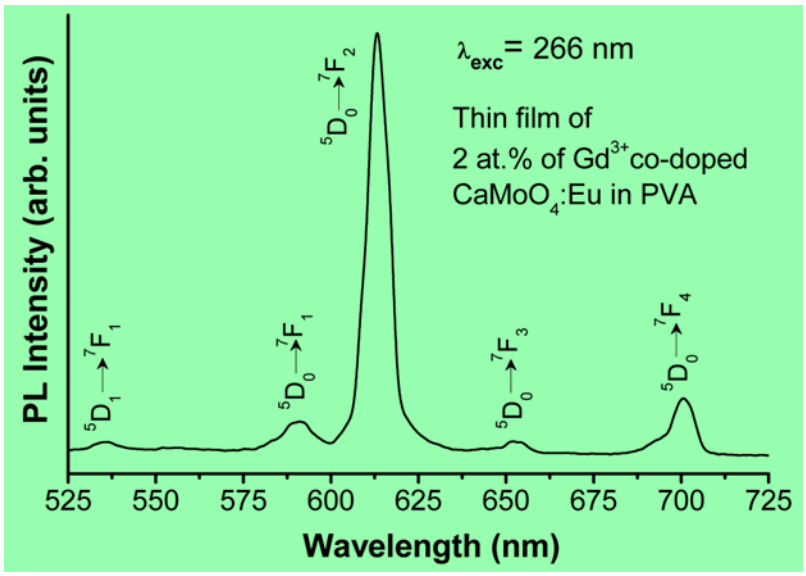

Fig. S2(ESI†) Luminescence spectra of PVA thin film of 2 at.% Gd^{3+} co-doped $CaMoO_4$:Eu nanoparticles after incorporation of re-dispersed particles at 266 nm excitation.

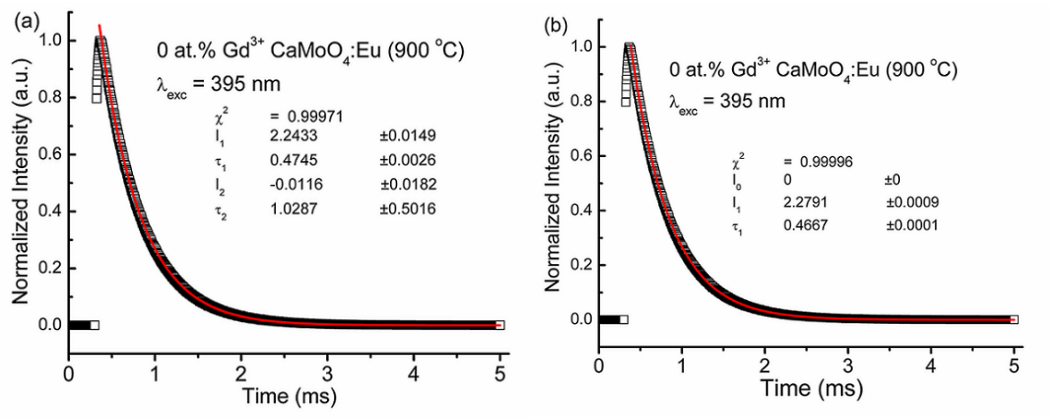

Fig. S3 (a) Bi- (b) mono-exponential curve fits to luminescence decay curve (613 nm) of 0 at. % Gd^{3+} co-doped $CaMoO_4$:Eu annealed at 900 ^oC (λ_{exc}= 395 nm).

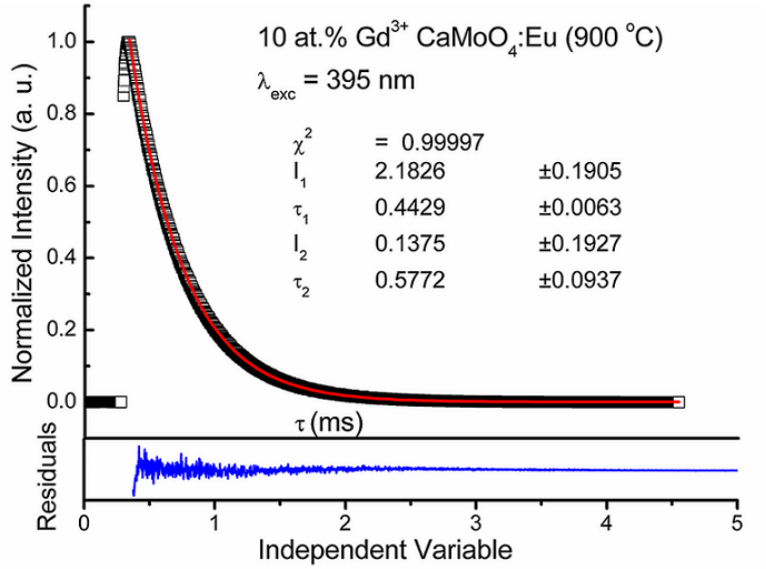

Fig. S4 Typical Bi-exponential fitting with residuals to the luminescence decay curve (613 nm) of 10 at.% Gd^{3+} co-doped $CaMoO_4$:Eu annealed at 900 ^oC (λ_{exc}= 395 nm). Bottom portion of figure show the *residual vs. Independent Variable*.