

Influence of Y³⁺, Gd³⁺, and Lu³⁺ co-doping on the phase and luminescence properties of monoclinic Eu:LaVO₄ particles

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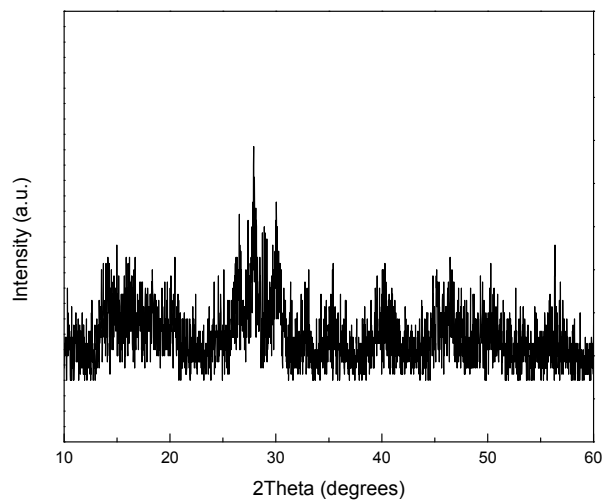


Fig. S1 XRD pattern of sample prepared for 15 minutes using 30 mL glycerol

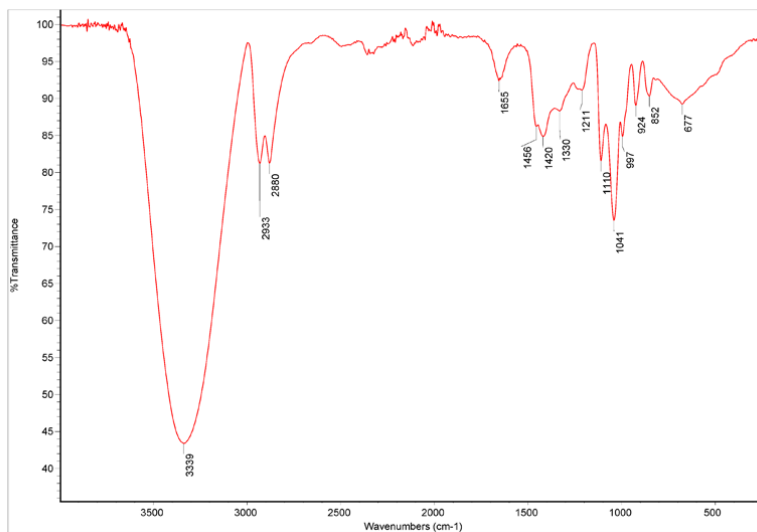


Fig. S2 DRIFTS spectrum of glycerol

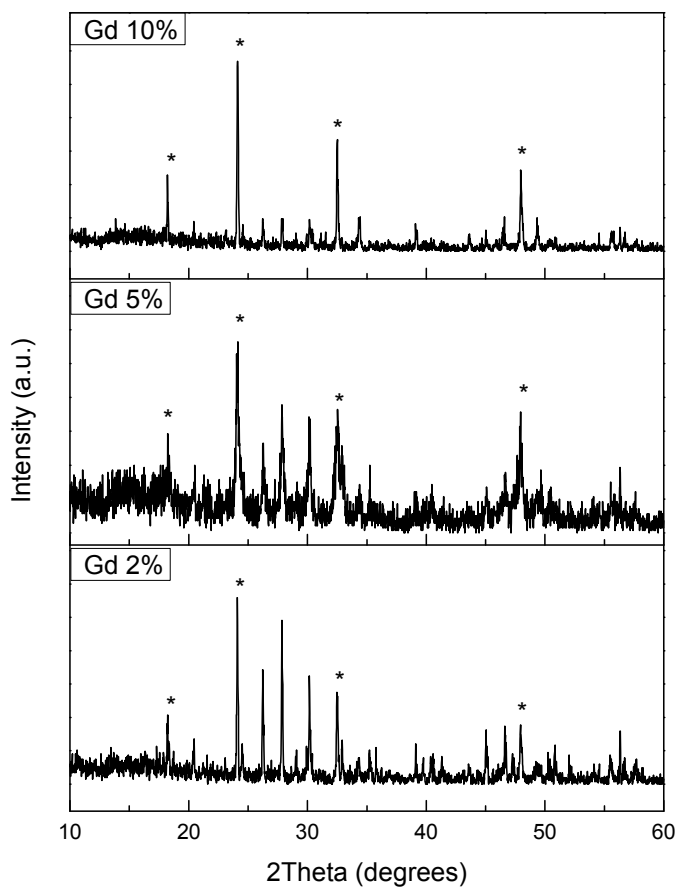


Fig. S3 XRD patterns of Eu 12.5% doped LaVO₄ with different percentages of Gd³⁺ co-doping (2, 5 and 10%). Peaks marked with a star are characteristic peaks of the tetragonal LaVO₄ phase. All other peaks can be assigned to the monoclinic LaVO₄ phase.

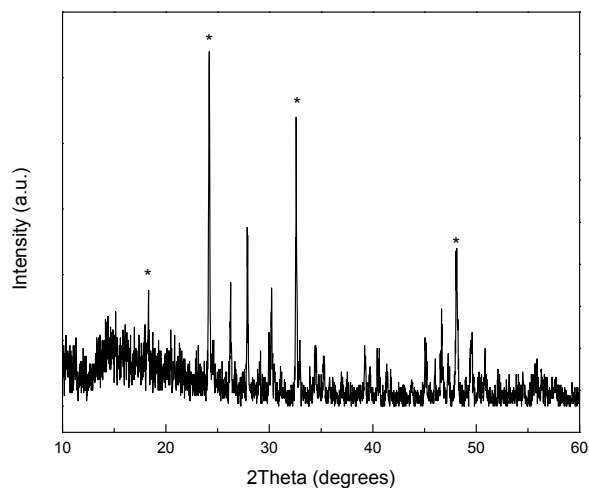


Fig. S4 XRD pattern of Eu 12.5% doped LaVO_4 with 10% Y^{3+} co-doping. Peaks marked with a star are characteristic peaks of the tetragonal LaVO_4 phase. All other peaks can be assigned to the monoclinic LaVO_4 phase.

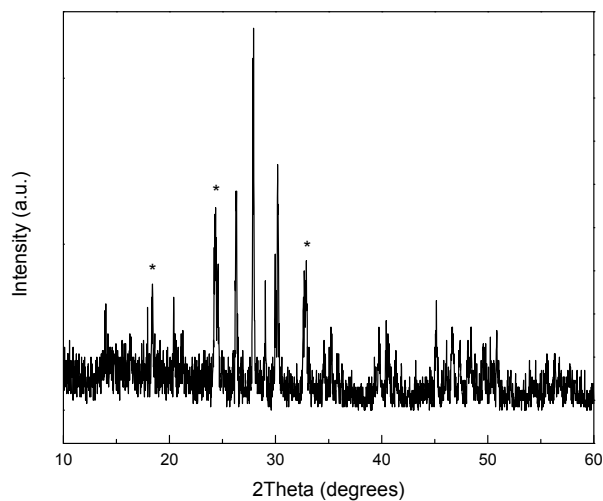


Fig. S5 XRD pattern of Eu 12.5% doped LaVO_4 with 10% Lu^{3+} co-doping. Peaks marked with a star are characteristic peaks of the tetragonal LaVO_4 phase. All other peaks can be assigned to the monoclinic LaVO_4 phase.

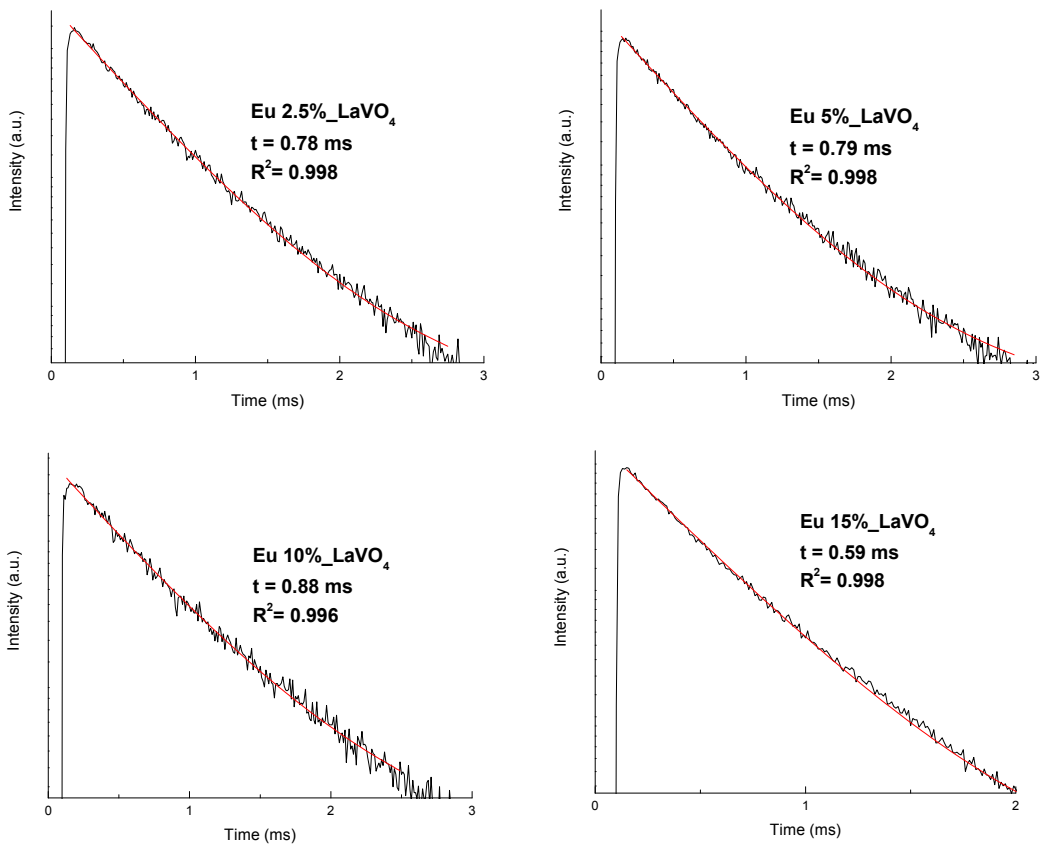


Fig. S6 Luminescence decay curves of 2.5%, 5%, 10% and 15% Eu³⁺ doped LaVO₄ samples.

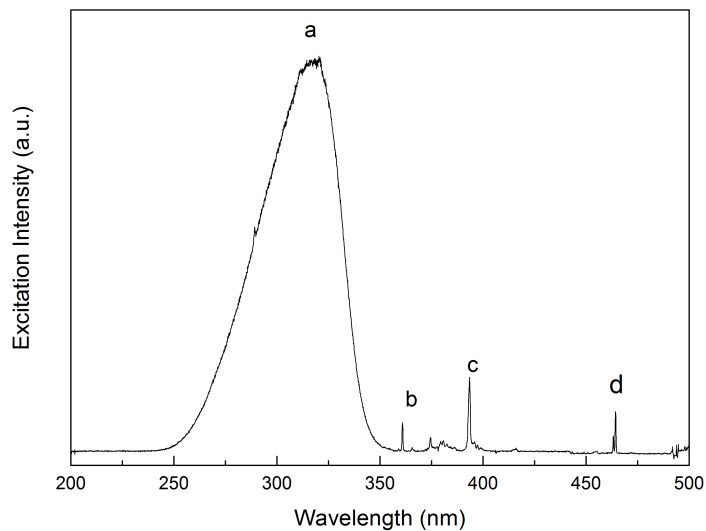


Fig. S7 Excitation spectrum (uncorrected) of Eu^{3+} 12.5% doped LaVO_4 with 10% Gd^{3+} co-doping. Peaks a-d are assigned in Table S1.

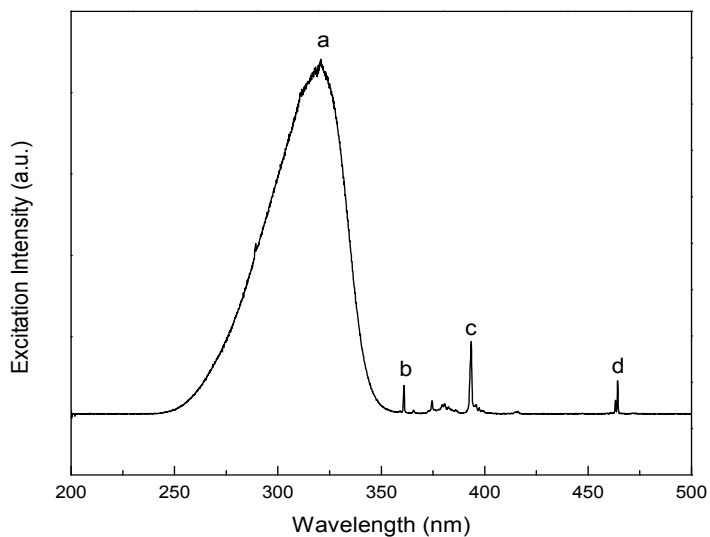


Fig. S8 Excitation spectrum (uncorrected) of Eu^{3+} 12.5% doped LaVO_4 with 10% Y^{3+} co-doping. Peaks a-d are assigned in Table S1.

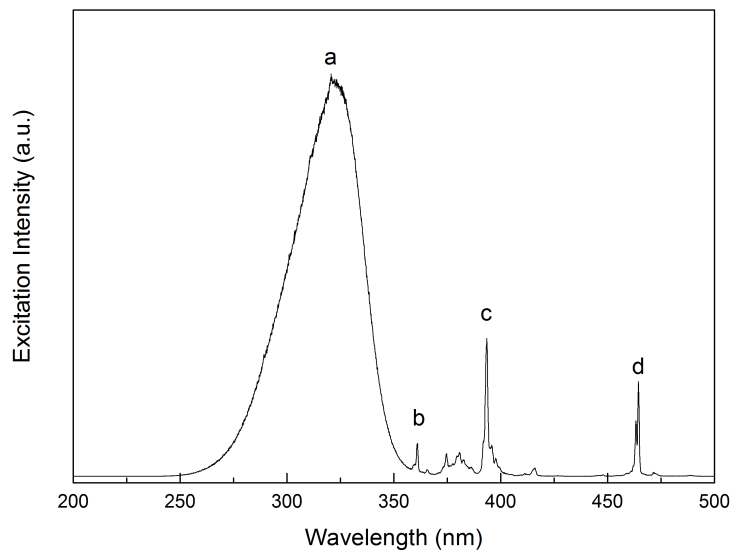


Fig. S9 Excitation spectrum (uncorrected) of Eu^{3+} 12.5% doped LaVO_4 with 10% Lu^{3+} co-doping. Peaks a-d are assigned in Table S1.

Table S1 Assignment of peaks presented in Fig. S8-S10

Peak	Wavelength (nm)	Transition
a	316	V-O CTB
b	361	$^5\text{D}_4 \leftarrow ^7\text{F}_0$
c	394	$^5\text{L}_6 \leftarrow ^7\text{F}_0$
d	464	$^5\text{D}_2 \leftarrow ^7\text{F}_0$

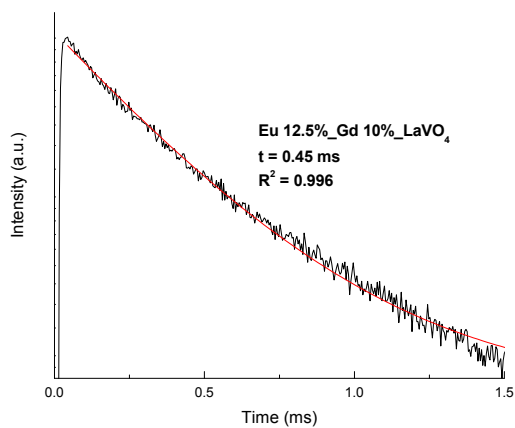
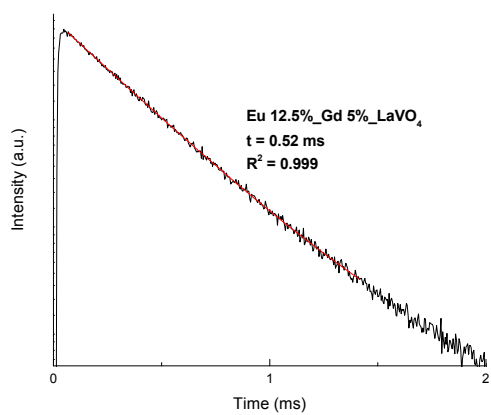
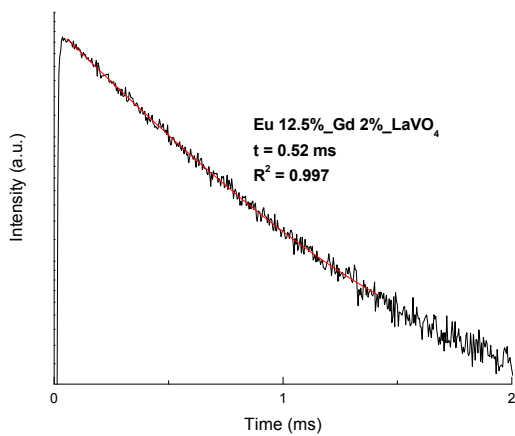


Fig. S10 Decay curves of 12.5%Eu:LaVO₄ nanoparticles doped with 2, 5 and 10% Gd³⁺ ions.

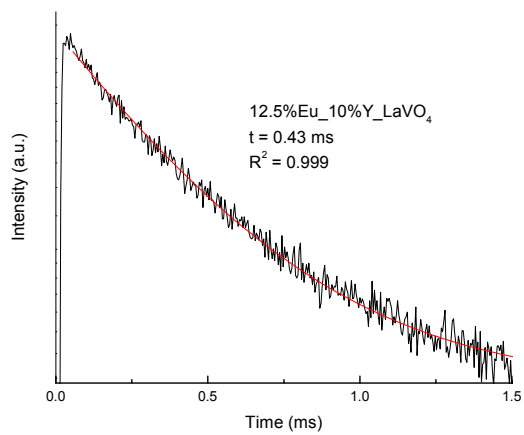
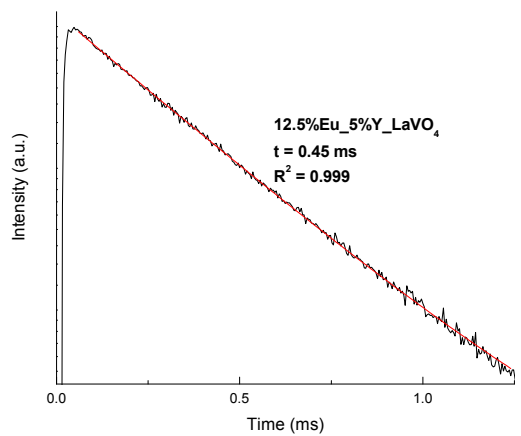
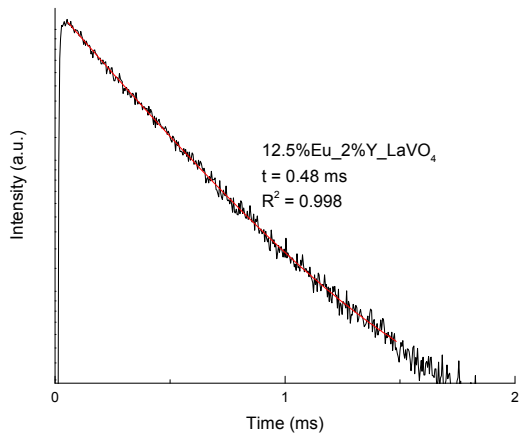


Fig. S11 Decay curves of 12.5%Eu:LaVO₄ nanoparticles doped with 2, 5 and 10% Y³⁺ ions.

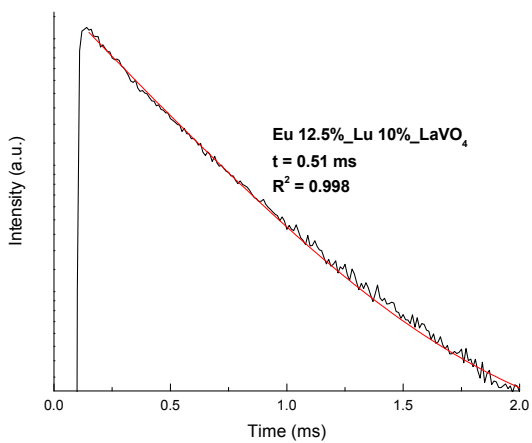
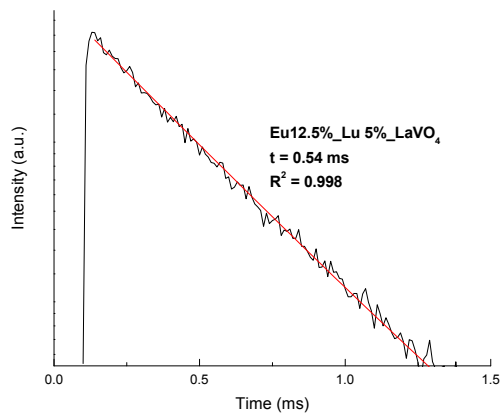
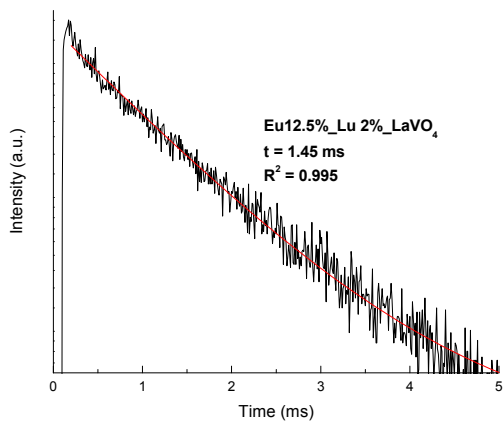


Fig. S12 Decay curves of 12.5%Eu:LaVO₄ nanoparticles doped with 2, 5 and 10% Lu³⁺ ions.

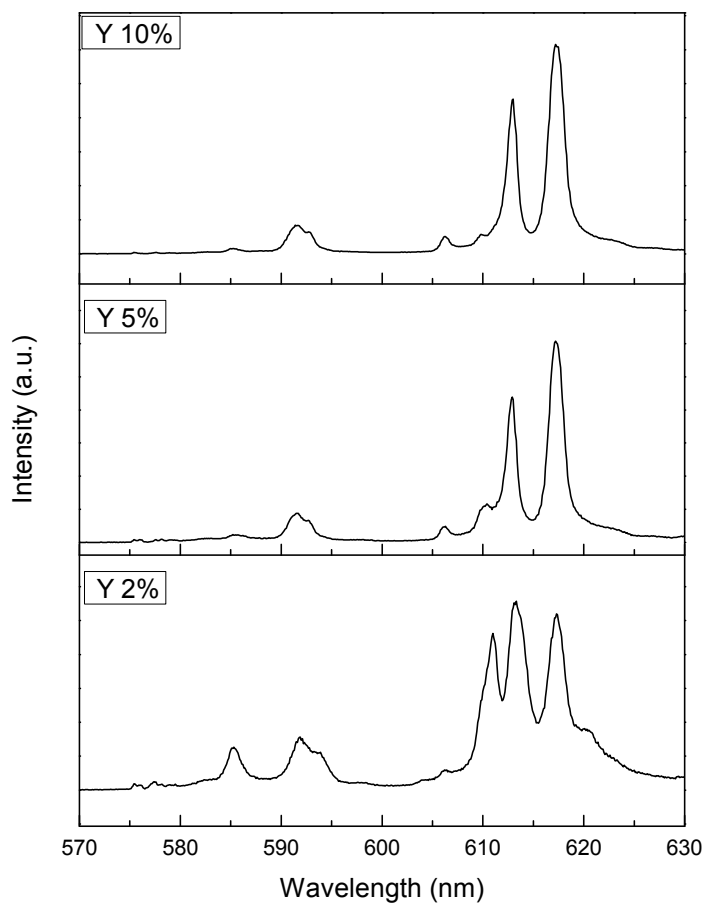


Fig. S13 High-resolution emission spectra of the 12.5%Eu:LaVO₄ materials with different Y³⁺ co-doping percentages.

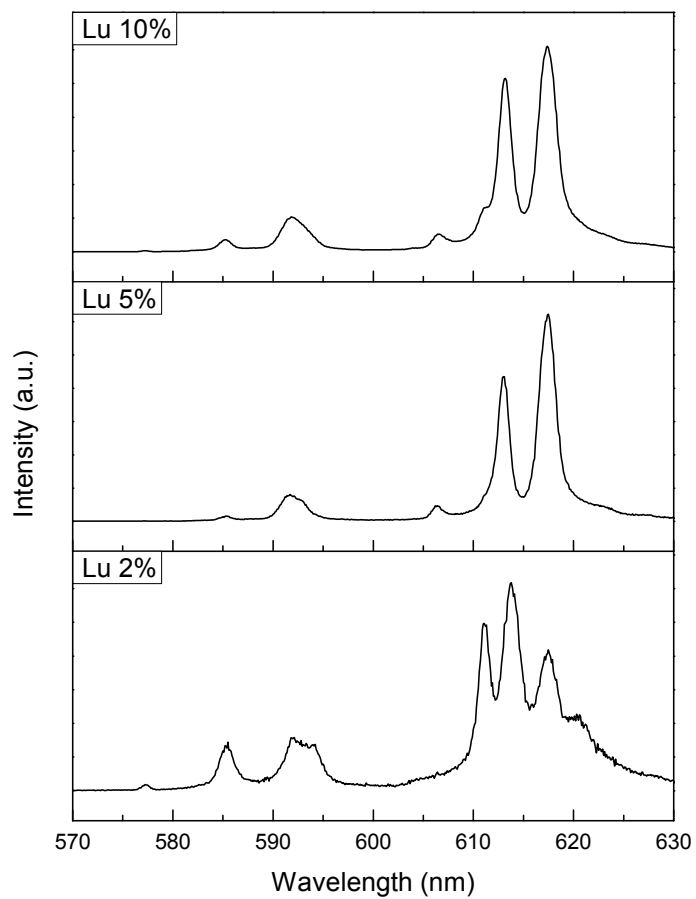


Fig. S14 High-resolution emission spectra of the 12.5%Eu:LaVO₄ materials with different Lu³⁺ co-doping percentages.

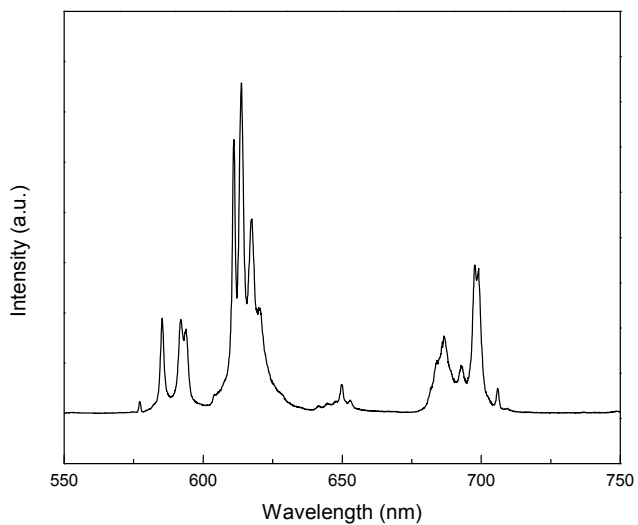


Fig. S15 Emission spectrum of 12.5%Eu:LaVO₄ nanoparticles suspended in water.

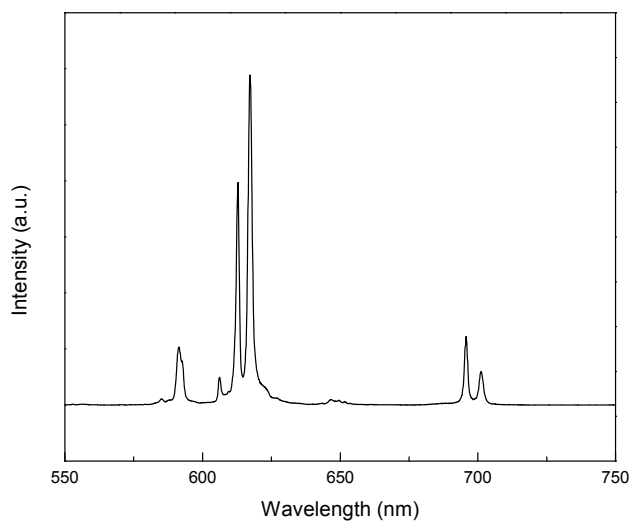


Fig. S16 Emission spectrum of 12.5%Eu_10%Gd:LaVO₄ nanoparticles suspended in water.

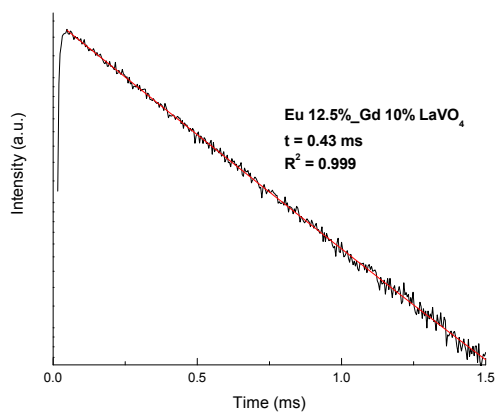
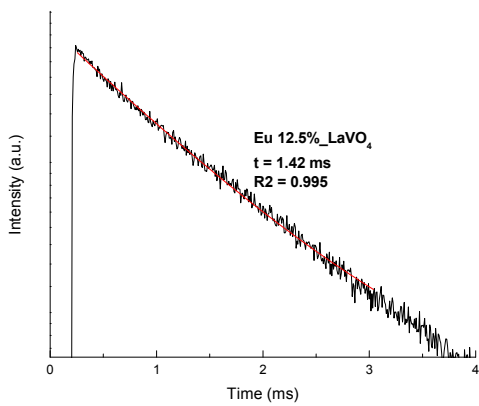


Fig. S17 Decay graphs of samples measured as colloidal suspensions.