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Supporting Information

Malate-aided selective crystallization and luminescence comparison of tetragonal and monoclinic $LaVO_4$:Eu nanocrystals

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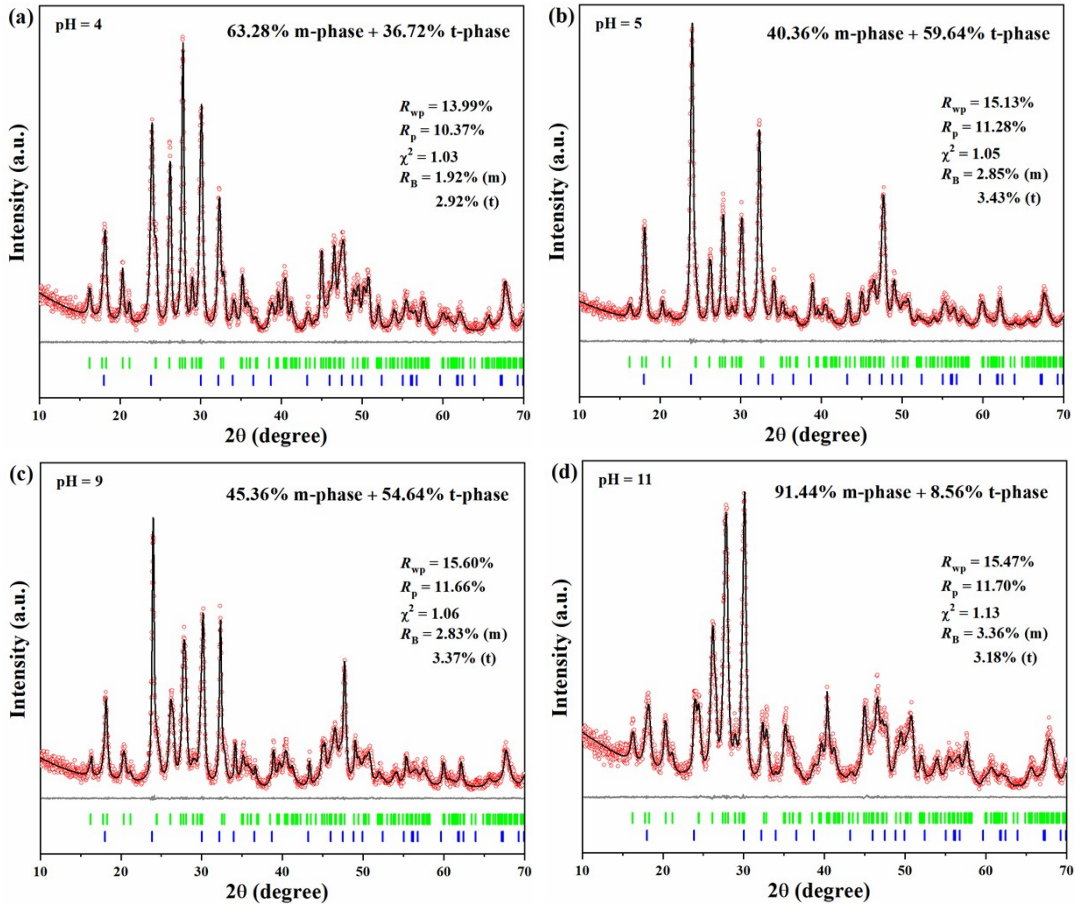

Fig. S1. Observed (red), calculated (black) and difference (gray) XRD profiles for the samples S1 (a), S2 (b), S5 (c) and S6 (d). Green and blue tick marks denote the positions of Bragg reflection for the monoclinic and tetragonal phases, respectively.

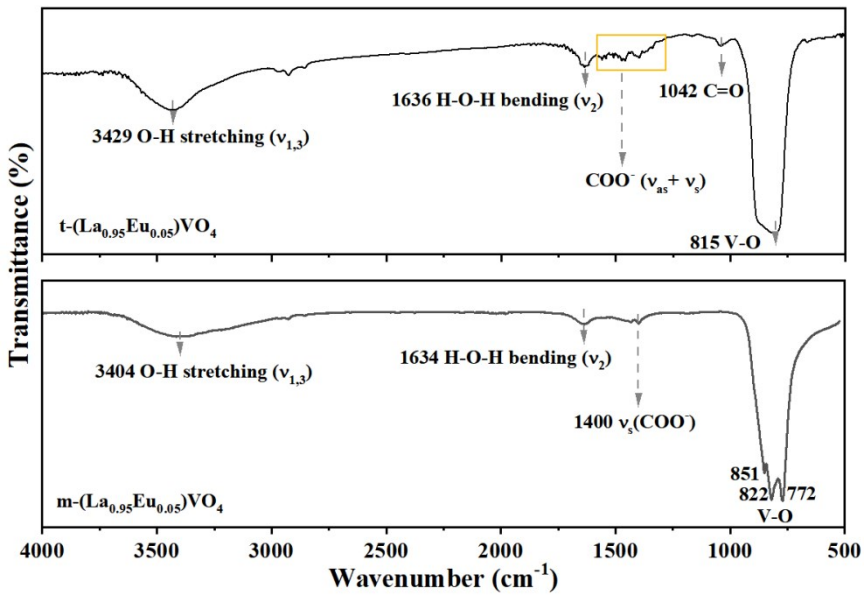

Fig. S2. FTIR spectra of samples S4 (t-phase) and S7 (m-phase).

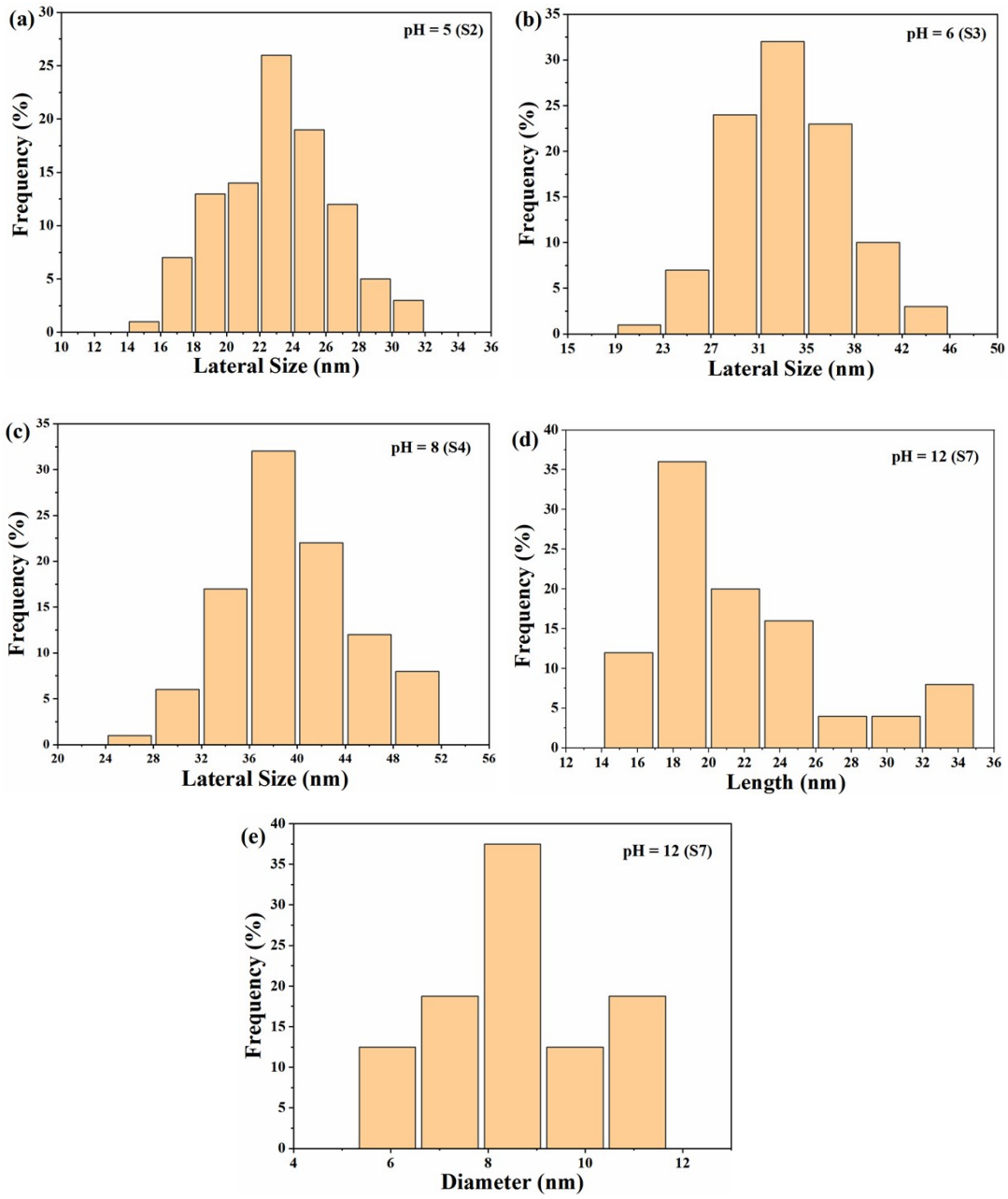

Fig. S3. The results of size analysis for the $(La_{0.95}Eu_{0.05})VO_4$ nanocrystals synthesized under different pH values.

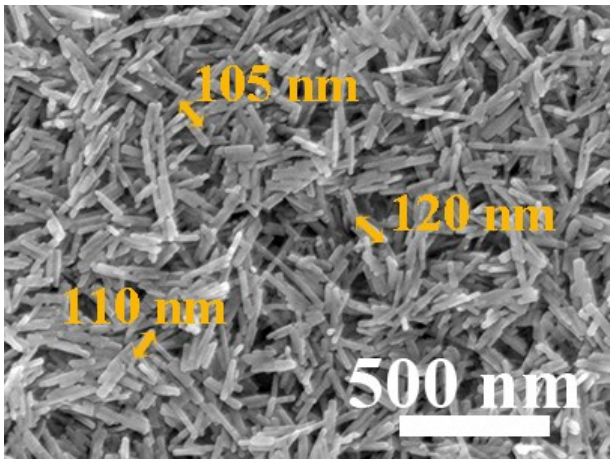

Fig. S4. SEM morphology of the m-$LaVO_4$ synthesized with the same reaction condition of sample S8.

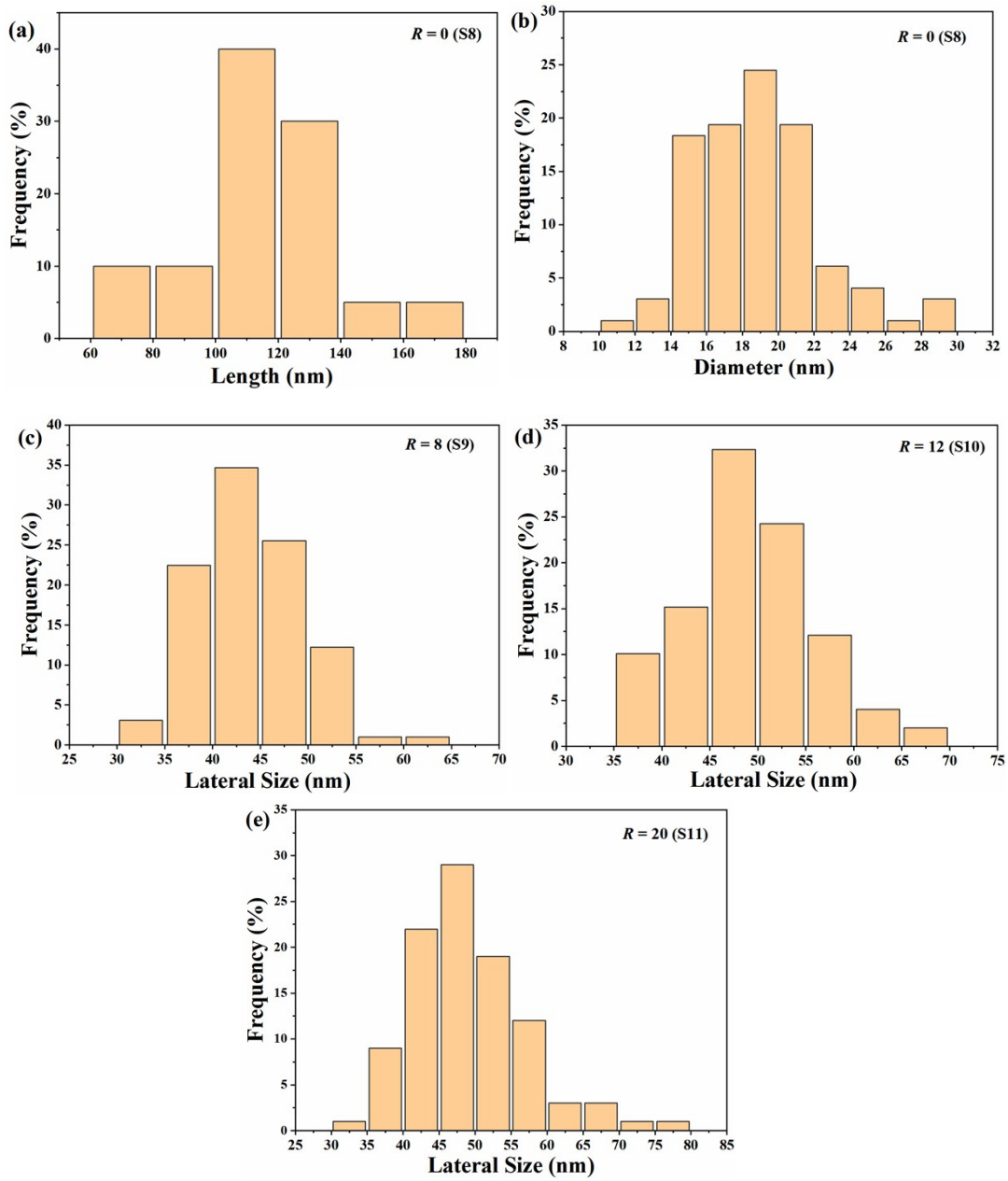

Fig. S5. The results of size analysis for the $(La_{0.95}Eu_{0.05})VO_4$ nanocrystals synthesized under different *R* values.

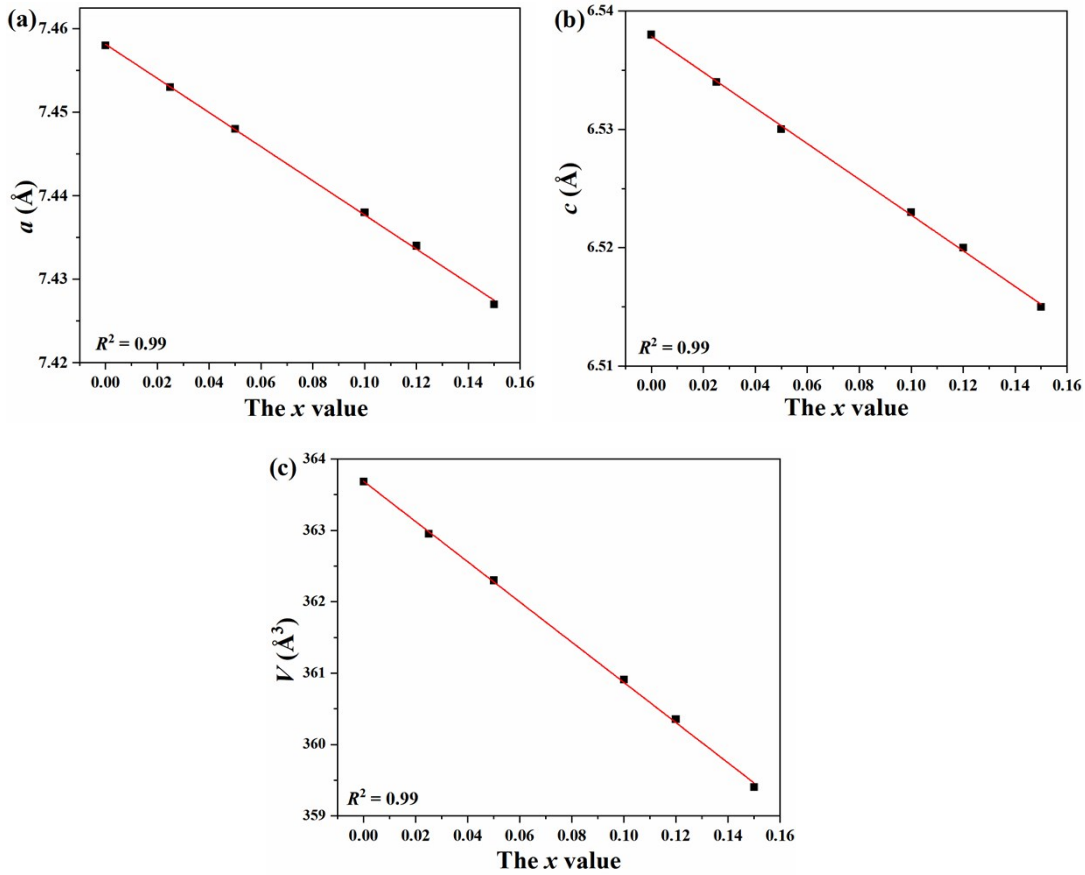

Fig. S6. Correlation of lattice constants (a, b) and cell volume (c) with the Eu^{3+} content for t-$(La_{1-x}Eu_x)VO_4$ (x = 0-0.15).

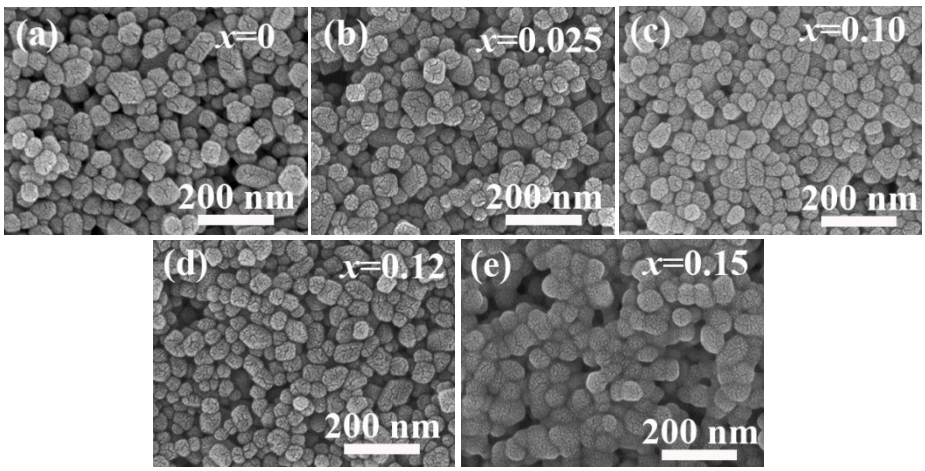

Fig. S7. SEM morphologies of the t-$(La_{1-x}Eu_x)VO_4$ (x = 0-0.15) phosphors.

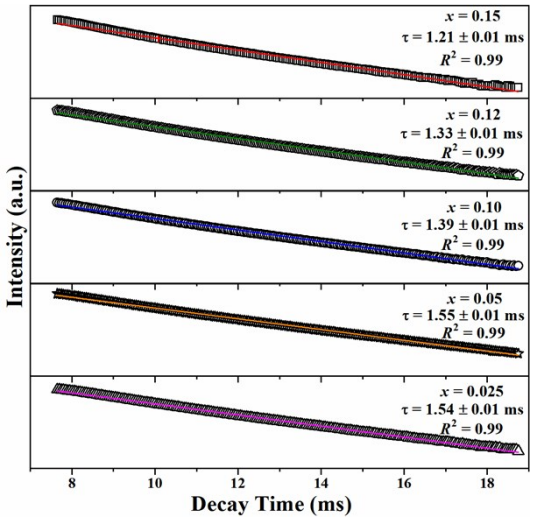

Fig. S8. Semi-log plot of the fluorescence decay data for the 620 nm Eu^{3+} emission of $(La_{1-x}Eu_x)VO_4$ (λ_{ex} = 275 nm, λ_{em} = 620 nm).

Table S1. A summary of $I_{0\text{-}J}$, lifetime τ of the 616 and 620 nm emission, the calculated $A_{0\text{-}J}$, A_{rad}, A_{nrad}, A_{total}, and η values for the $^5D_0$ level, and the experimentally determined QY_{in}, QY_{in} and *Abs* for m-$(La_{0.95}Eu_{0.05})VO_4$ (sample S7) and t-$(La_{0.95}Eu_{0.05})VO_4$ (sample S4) under 313 and 275 nm excitation, respectively.

Sample	$I_{0\text{-}1}$	$I_{0\text{-}2}$	$I_{0\text{-}3}$	$I_{0\text{-}4}$	τ	$A_{0\text{-}2}$	$A_{0\text{-}3}$	$A_{0\text{-}4}$	A_{rad}	A_{total}	A_{nrad}	η	QY_{ex}	QY_{in}	*Abs*
					ms	s^{-1}	s^{-1}	s^{-1}	s^{-1}	s^{-1}	s^{-1}	%	%	%	%
m	3807.63	15034.74	444.86	2851.66	2.28	206	6	44	306	439	132	70	8.83	9.94	88.77
t	6679.85	55663.14	1014.03	5538.03	1.53	435	8	49	542	654	112	83	22.63	25.39	89.11