[Supporting Information]

Influence of citrate on phase transformation and photoluminescence properties in LaPO$_4$ and LaPO$_4$: Eu

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Fig. S1 XRD pattern of the CePO$_4$ prepared with different citrate concentration at 100 °C: (a) 0, (b) 0.2, (c) 0.5, (d) 1.0, (e) 1.2, (f) 1.5 (g) 2.0, (h) 3.0 mmol.

Fig. S2. The XRD patterns of the LaPO$_4$ prepared at different reaction temperatures: (a) 100°C, (b) 150°C, (c) 170 °C.
Fig. S3 XRD patterns of the LaPO₄ prepared with different pH values at 100 °C: (a) pH=1.0, (b) pH=5.0, (c) pH=7.0, (d) pH=9.0.

Fig. S4 XRD patterns of the LaPO₄ prepared with different pH values at 170 °C: (a) pH=1.0, (b) pH=2.0, (c) pH=3.0, (d) pH=5.0, (e) pH=9.0.
Fig. S5 XRD pattern of the LaPO$_4$:Eu with different citrate concentration: (a) 0, (b) 0.8, (c) 3.0 mmol.

Fig. S6 EDX spectrum of the monoclinic phase LaPO$_4$:Eu prepared with citrate-induced.
Fig. S7 Excitation spectra of LaPO$_4$:Eu with different phase: (a) hexagonal phase prepared without citrate, (b) monoclinic phase prepared with citrate-induced, (c) hexagonal phase prepared with citrate-induced.

Fig. S8 The photoluminescence fitting curves of LaPO$_4$:Eu with different phase: (a) hexagonal phase prepared without citrate, (b) monoclinic phase prepared with citrate-induced, (c) hexagonal phase prepared with citrate-induced.