

Defect-assisted dynamic multicolor modulation in $\text{KLu}_3\text{F}_{10}$: Tb crystals for anti-counterfeiting

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Fluorescence life

Tri-exponential fitting can be used to analyze these lifetime decay curves well.

$$I(t) = \sum_{i=1}^3 A_i \exp(-t/\tau_i)$$

Where I is the luminous intensity at time t , τ_i represents the fluorescence lifetime of individual components with A_i as their relative weightage. The average lifetime τ_{av} is evaluated by the following formula:

$$\tau_{av} = \frac{A_1\tau_1^2 + A_2\tau_2^2 + A_3\tau_3^2}{A_1\tau_1 + A_2\tau_2 + A_3\tau_3}$$

Fig. S1-S4

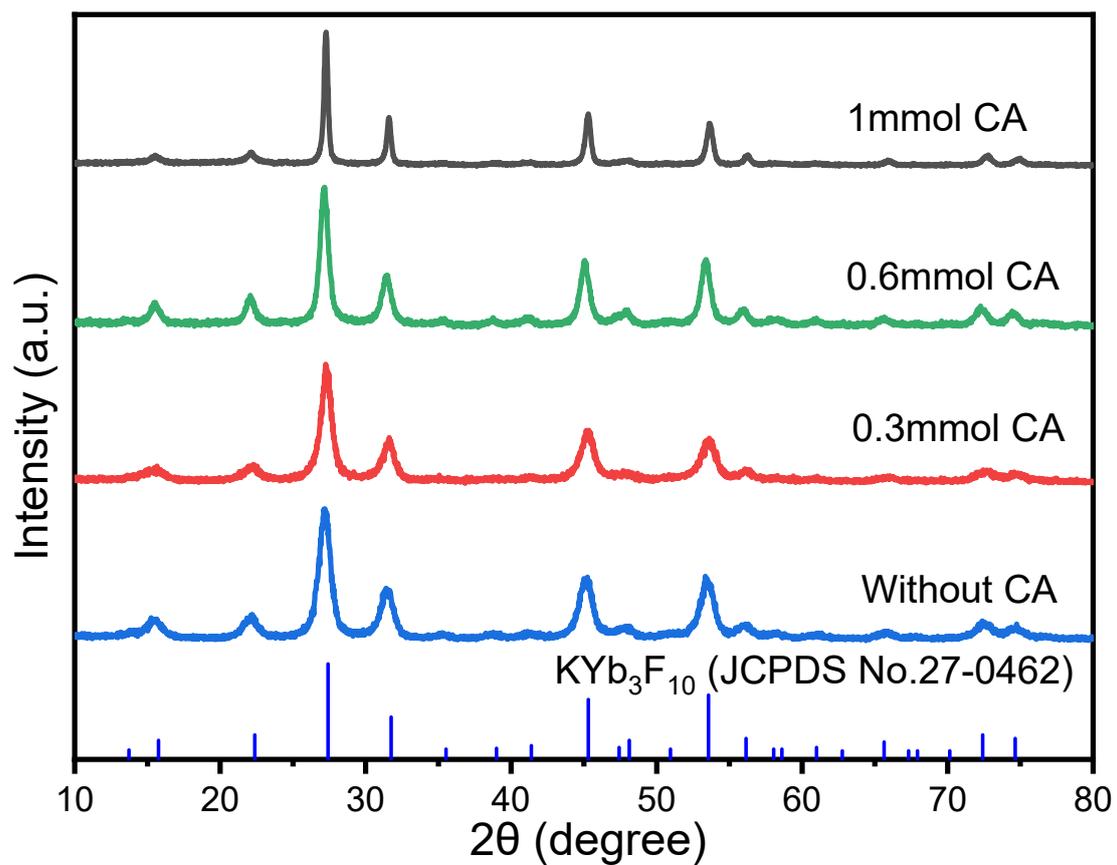


Fig. S1. XRD patterns of the $\text{KLu}_3\text{F}_{10}:15\text{Tb}$ using different molar amounts of citric acid.

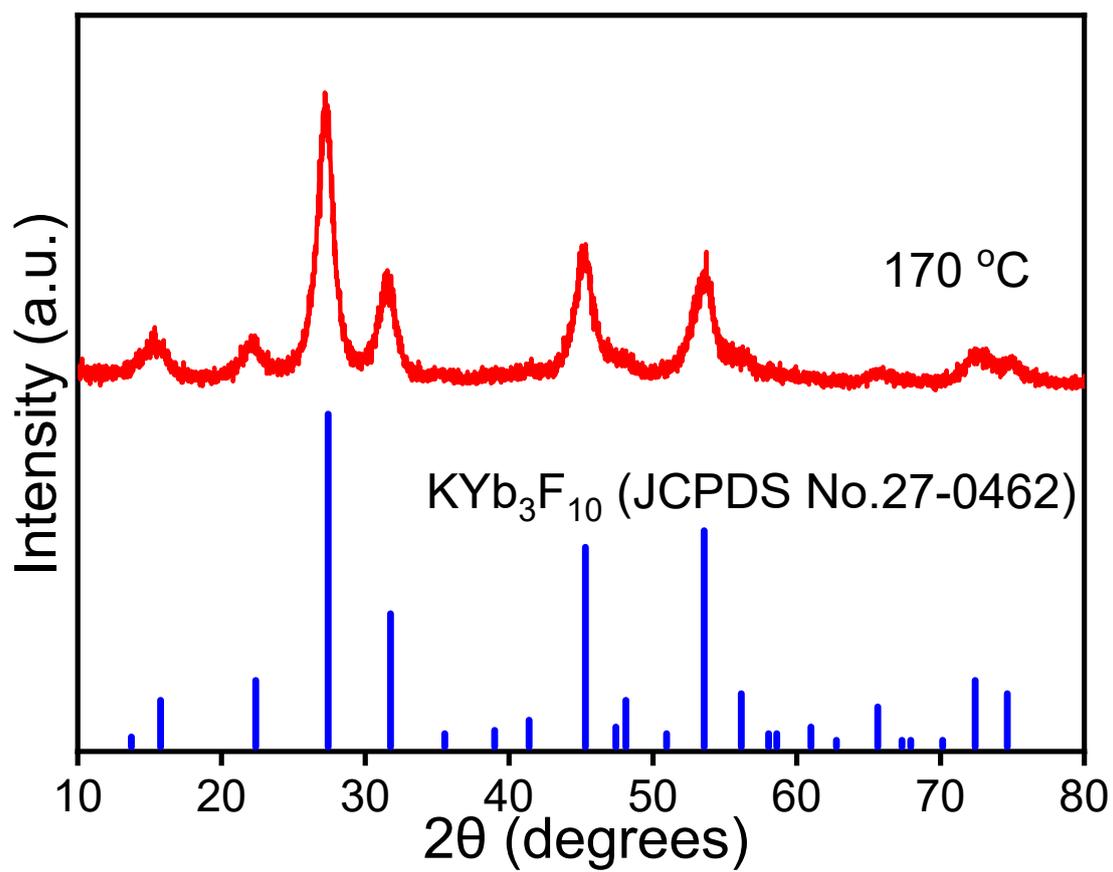


Fig. S2. XRD pattern of the $\text{KLu}_3\text{F}_{10}:15\text{Tb}$ synthesized at 170°C hydrothermal reaction temperature.

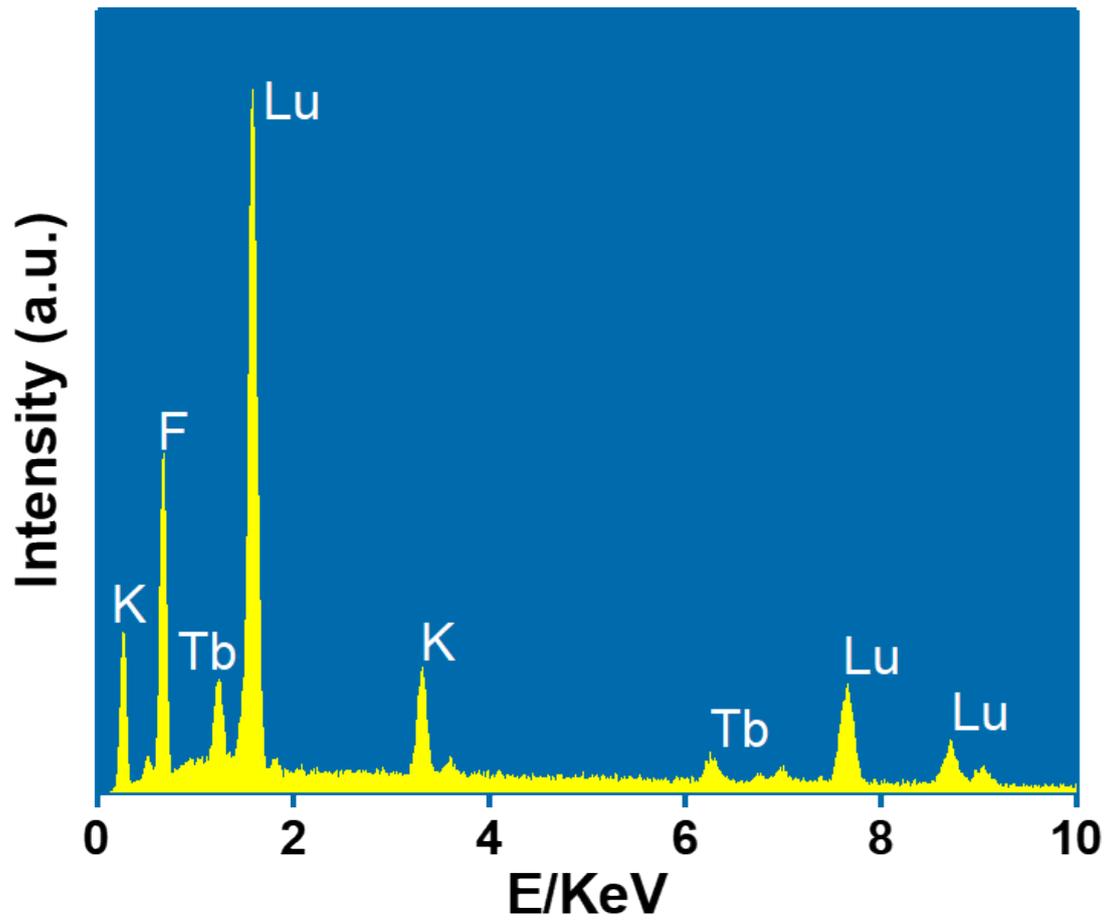


Fig. S3. EDX spectra of the $\text{KLu}_3\text{F}_{10}:15\text{Tb}$.

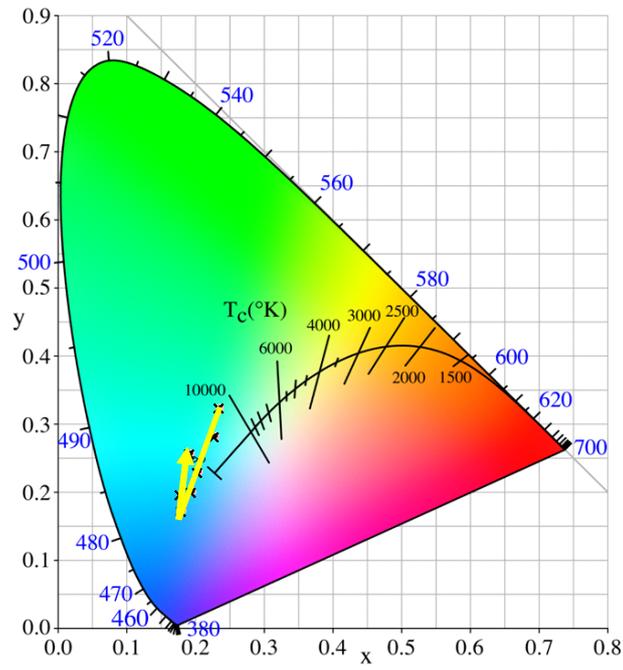


Fig. S4. CIE chromaticity diagram of the $\text{KLu}_3\text{F}_{10}:15\text{Tb}$ under UV excitation at 250 nm - 370 nm.