Electronic Supporting Information

Eu$^{3+}$ Activated Sr$_3$ZnTaO$_9$ Single-Component White Light Phosphor: Emission Intensity Enhancement and Color Rendering Improvement

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(a) Sintering temperature (°C)

Wt %

Sintering temperature (°C)

Cubic
Trigonal

(a) 1100              1200              1300              1400

(b) 180000

1100 °C

R_{exp}: 1.65%
R_{wp}: 3.91%
R_{p}: 3.07%
GOF: 2.37

Intensity (Counts)

2Theta (Degrees)

(c) 250000

1200 °C

R_{exp}: 1.65%
R_{wp}: 4.3%
R_{p}: 3.30%
GOF: 2.6

Intensity (Counts)

2Theta (Degrees)
Figure S1. (a) Results of quantitative refinements of SZT obtained at 1100 °C – 1400 °C temperature range. Corresponding refinement plots at: (b) 1100 °C, (c) 1200 °C, (c) 1300 °C and (d) 1400 °C, respectively.
Figure S2. Lifetimes of $^5D_0 \rightarrow ^7F_2$ emission under 464 nm excitation of SZT: xEu$^{3+}$ (1% $\leq x \leq 20\%$).
(a) 1% Eu$^{3+}$
- $R_{wp}$: 2.45%
- $R_p$: 4.39%
- $R_i$: 3.34%
- GOF: 1.79

(b) 3% Eu$^{3+}$
- $R_{wp}$: 2.55%
- $R_p$: 4.51%
- $R_i$: 3.34%
- GOF: 1.77

(c) 5% Eu$^{3+}$
- $R_{wp}$: 2.75%
- $R_p$: 5.29%
- $R_i$: 3.58%
- GOF: 1.93
Figure S3. Quantitative Rietveld refinements of SZT: xEu$^{3+}$ (a) x = 1%, (b) x = 3%, (c) x = 5%, (d) x = 7% and (e) x = 10%.