

**Enhancing the temperature sensitivity of Cr³⁺ emissions by
modification of the host composition for fluorescent thermometry
applications**

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Table S1 Refined crystallographic data of LnAB:0.12Cr³⁺

| Phosphor | GdAB | YAB | LuAB | (Lu _{0.6} Al _{0.4})AB |
|----------------------|--------|--------|--------|--|
| Space group | | | R 32 | |
| a (Å) | 9.3072 | 9.2879 | 9.2691 | 9.2690 |
| b (Å) | 9.3072 | 9.2879 | 9.2691 | 9.2690 |
| c (Å) | 7.2658 | 7.2406 | 7.2083 | 7.2080 |
| V (Å ³) | 545.07 | 540.93 | 536.35 | 536.31 |
| R _w p (%) | 5.13 | 9.36 | 9.80 | 11.2 |
| R _p (%) | 3.64 | 7.78 | 7.82 | 9.63 |

Table S2 Al-O bond lengths in LnAB:0.12Cr³⁺

| Phosphor | Al-O1 (Å) | Al-O1 (Å) | Al-O2 (Å) | Al-O2 (Å) | Al-O3 (Å) | Al-O3 (Å) | Average (Å) |
|--|--------------|--------------|--------------|--------------|--------------|--------------|----------------|
| GdAB | 1.9300 | 1.9300 | 1.9833 | 1.9833 | 1.8640 | 1.8640 | 1.9258 |
| YAB | 1.9157 | 1.9157 | 1.9586 | 1.9586 | 1.8565 | 1.8565 | 1.9102 |
| LuAB | 1.8794 | 1.8794 | 1.9480 | 1.9480 | 1.7572 | 1.7572 | 1.8615 |
| (Lu _{0.6} Al _{0.4}) AB | 1.8583 | 1.8583 | 1.9830 | 1.9830 | 1.7249 | 1.7249 | 1.8554 |

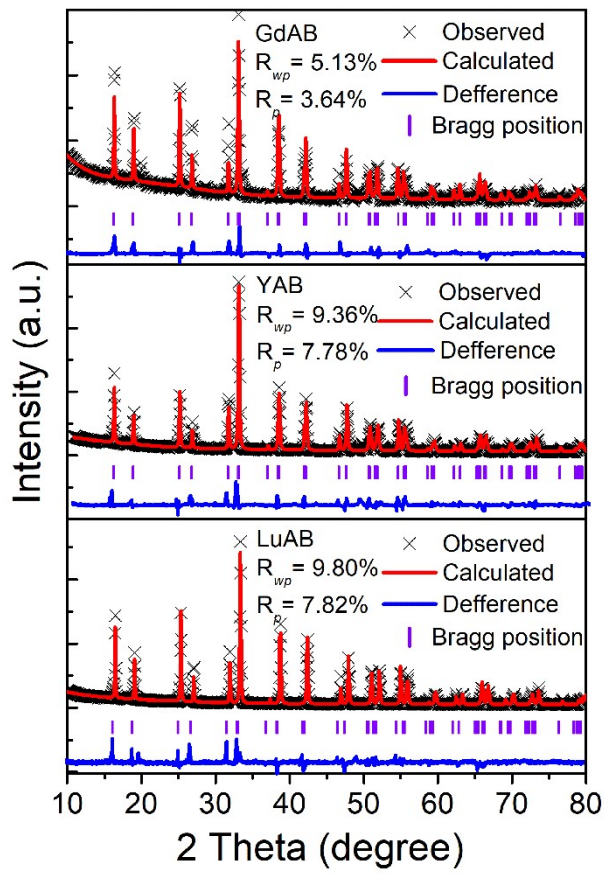


Fig. S1. Rietveld refinements of XRD patterns of LnAB:0.12Cr³⁺.

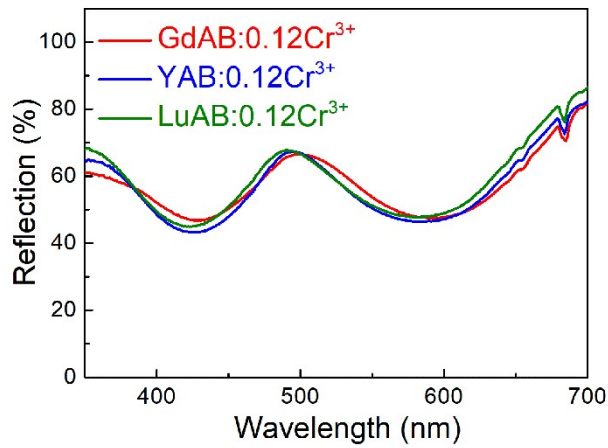


Fig. S2. Diffuse reflection spectra of LnAB:0.12Cr³⁺.

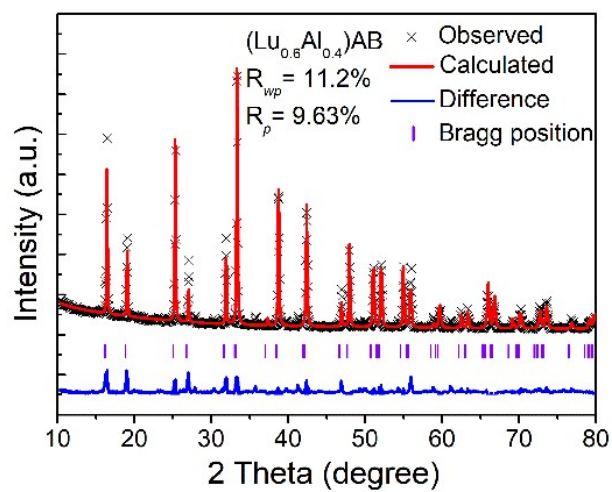


Fig. S3. Rietveld refinement of XRD pattern of $(\text{Lu}_{0.6}\text{Al}_{0.4})\text{AB}:0.12\text{Cr}^{3+}$.

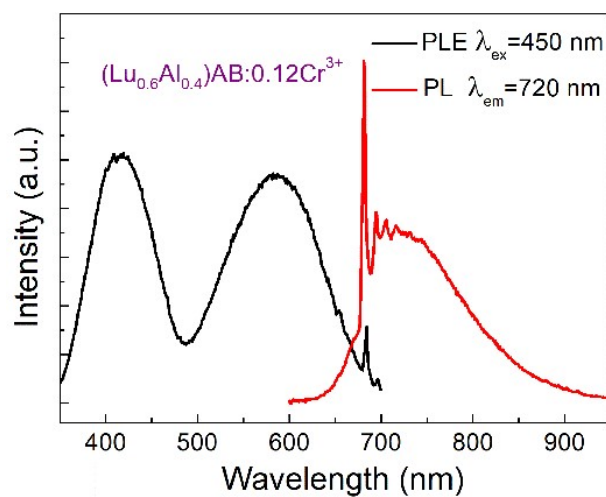


Fig. S4. PLE and PL spectra of $(\text{Lu}_{0.6}\text{Al}_{0.4})\text{AB}:0.12\text{Cr}^{3+}$.