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Photoluminescence properties of $\text{BaSiF}_6: \text{Eu}^{3+}$, $\text{Eu}^{3+}/\text{K}^+$ and $\text{Eu}^{3+}/\text{Tb}^{3+}$ co-doped phosphors

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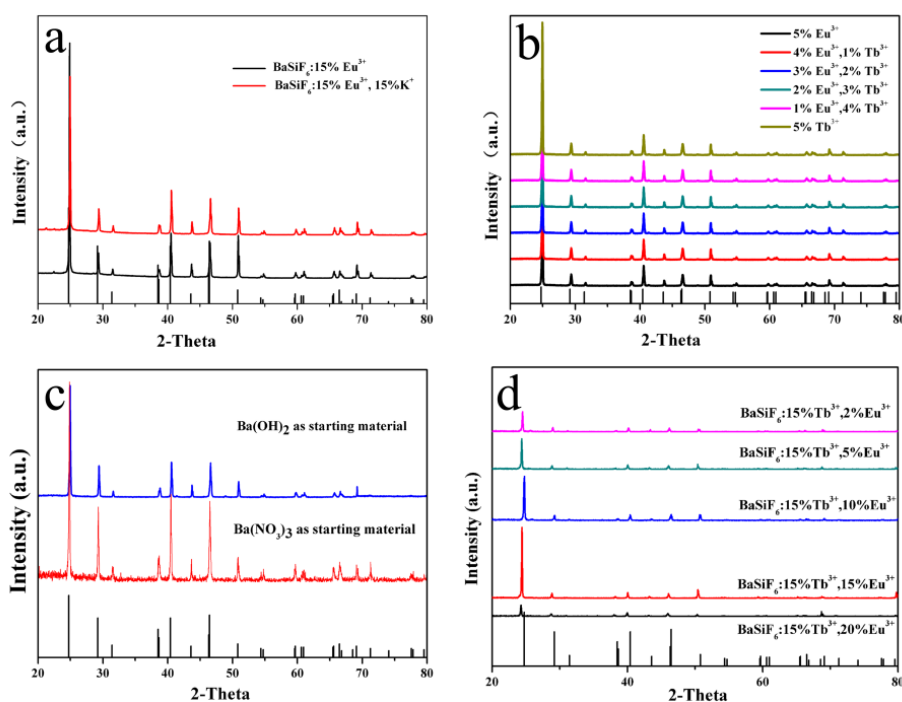


Fig. S1 XRD patterns of (a) $\text{BaSiF}_6: 15\% \text{Eu}^{3+}$ and $\text{BaSiF}_6: 15\% \text{K}^+, 15\% \text{Eu}^{3+}$ phosphors; (b) and (d) A series of Eu^{3+} and Tb^{3+} co-doped BaSiF_6 ; (c) BaSiF_6 host material synthesized with different starting material; The black vertical lines at the bottom indicate the standard XRD pattern of BaSiF_6 (JCPDS card number 15-0736).

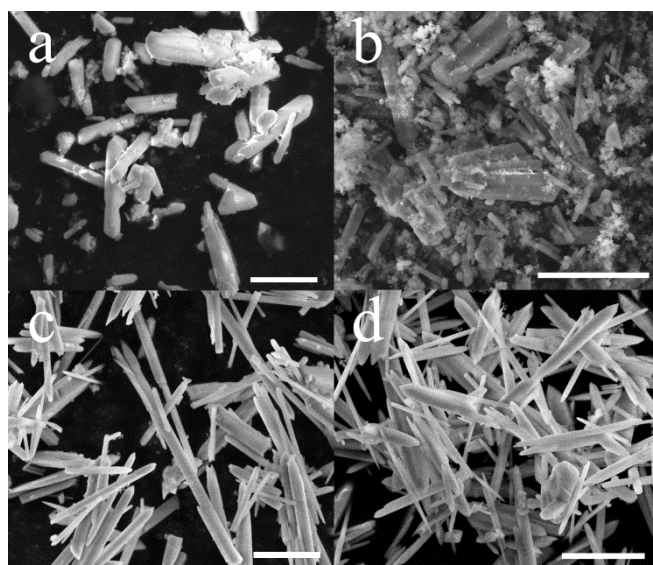


Fig. S2 SEM images of (a) $\text{BaSiF}_6: \text{K}^+, \text{Eu}^{3+}$ synthesized with $\text{Ba}(\text{OH})_2$; (b) $\text{BaSiF}_6: \text{Tb}^{3+}, \text{Eu}^{3+}$ synthesized with $\text{Ba}(\text{OH})_2$; (c) $\text{BaSiF}_6: \text{K}^+, \text{Eu}^{3+}$ synthesized with $\text{Ba}(\text{NO}_3)_3$; (d) $\text{BaSiF}_6: \text{Tb}^{3+}, \text{Eu}^{3+}$ synthesized with $\text{Ba}(\text{NO}_3)_3$. All the scale bars are $5 \mu\text{m}$.

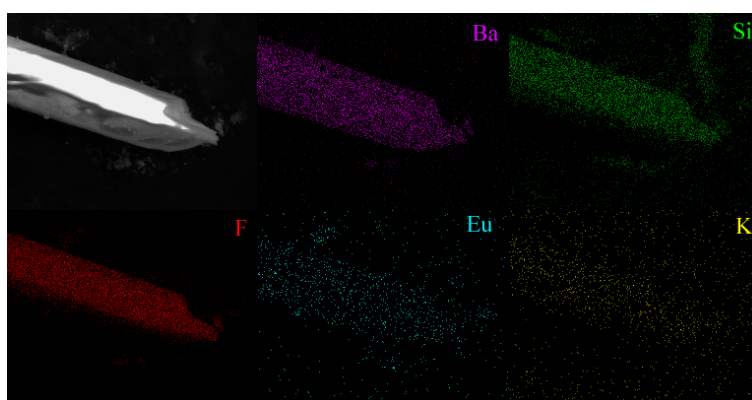


Fig. S3 SEM mapping of $\text{BaSiF}_6: 15\%\text{Eu}^{3+}, 15\%\text{K}^+$ phosphors.

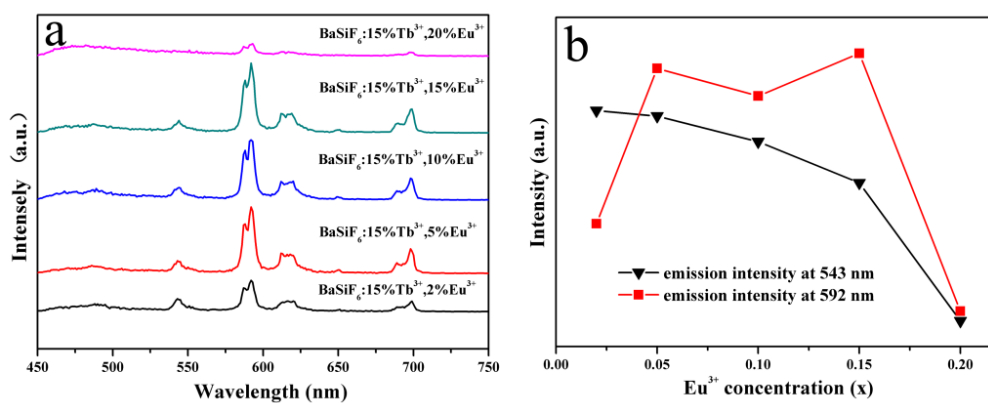


Fig. S4 (a) Emission spectra [ex=351 nm] of samples $\text{BaSiF}_6: 15\%\text{Tb}^{3+}, x\text{Eu}^{3+}$ ($x=2\%, 5\%, 10\%, 15\%, 20\%$) at room temperature; (b) Emission intensities of Tb^{3+} (black triangle) at 543 nm and Eu^{3+} (red block) at 592 nm as a function of the Eu^{3+} doping concentration in BaSiF_6 .

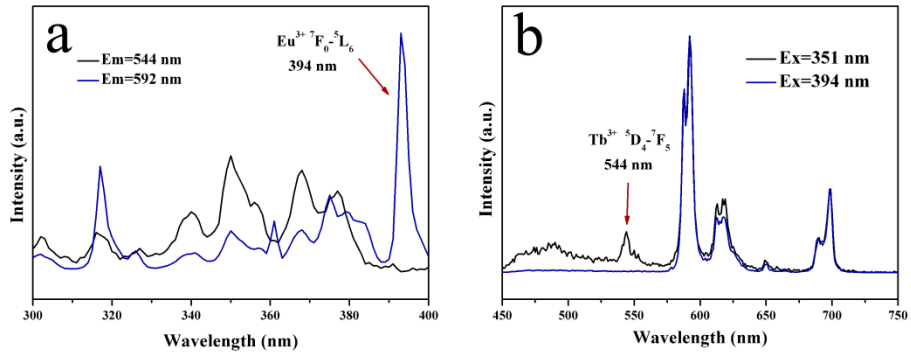


Fig. S5 (a) Excitation [black, em=544 nm; blue, em=592 nm] and (b) emission [black, ex=351 nm; blue, ex=394 nm] spectra of sample BaSiF₆:15%Tb³⁺, 15%Eu³⁺ at room temperature.

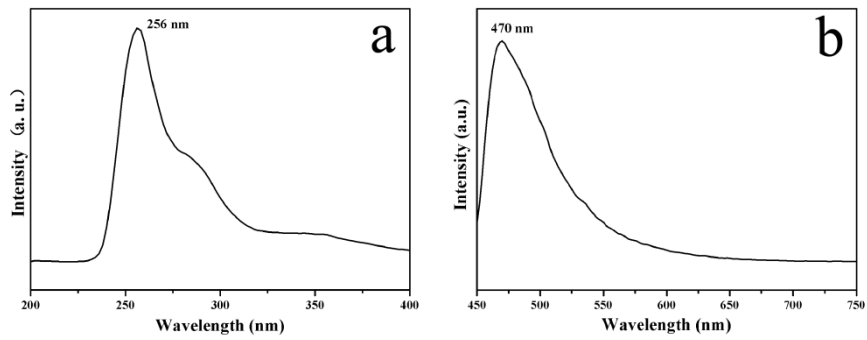


Fig. S6 PL excitation and emission spectra of BaSiF₆ host materials.

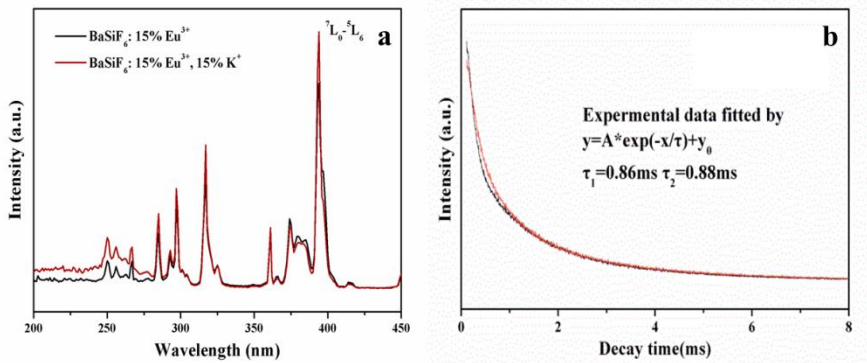


Fig. S7 PL excitation spectra (a) and decay patterns (b) of BaSiF₆: 15%Eu³⁺ and BaSiF₆: 15%Eu³⁺, 15%K⁺.

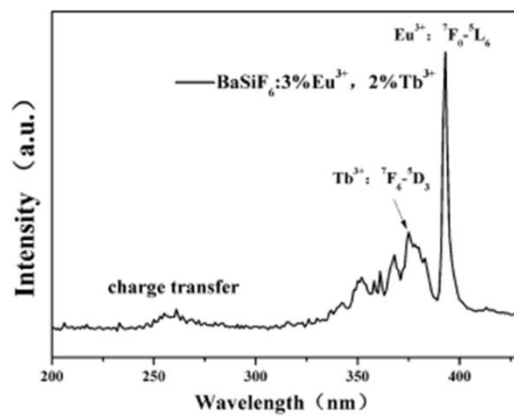


Fig. S8 PL excitation spectrum of BaSiF₆:3%Eu³⁺, 2%Tb³⁺ under 592 nm monitored.