

Hydrothermal synthesis of $\text{Ba}_3\text{Sc}_2\text{F}_{12}:\text{Yb}^{3+}$, Ln^{3+} ($\text{Ln} = \text{Er}$, Ho , Tm) crystals and their up conversion white light emission

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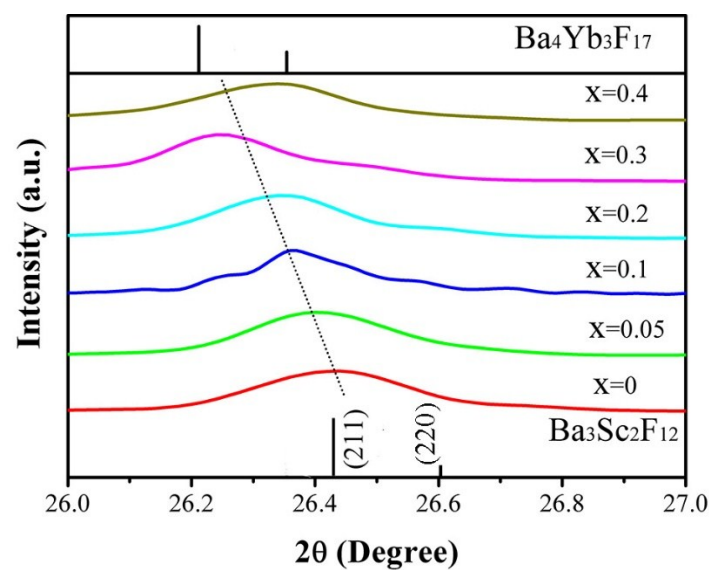


Figure S1 XRD patterns of $\text{Ba}_3\text{Sc}_{2(0.995-x)}\text{F}_{12}:\text{2xYb}^{3+}$, 0.01Er^{3+} crystals ($x = 0, 0.05, 0.1, 0.2, 0.3$ and 0.4) in the range of $2\theta = 26^\circ - 27^\circ$.

Table S1 Refined cell parameters in $\text{Ba}_3\text{Sc}_{2(0.995-x)}\text{F}_{12}: 2x\text{Yb}^{3+}, 0.01\text{Er}^{3+}$ crystals.

Sample	a(Å)	c(Å)	vol(Å ³)	syngony	space group
$\text{Ba}_3\text{Sc}_2\text{F}_{12}$ (pdf card)	9.482	5.58700	502.32	Tetragonal	P4/mbm(127)
X=0	9.46168	5.58396	499.89	Tetragonal	P4/mbm(127)
X=0.05	9.46306	5.58295	499.95	Tetragonal	P4/mbm(127)
X=0.1	9.45888	5.59758	500.82	Tetragonal	P4/mbm(127)
X=0.2	9.47699	5.59915	502.88	Tetragonal	P4/mbm(127)
X=0.3	9.50354	5.61470	507.10	Tetragonal	P4/mbm(127)
X=0.4	9.48912	5.60457	504.65	Tetragonal	P4/mbm(127)

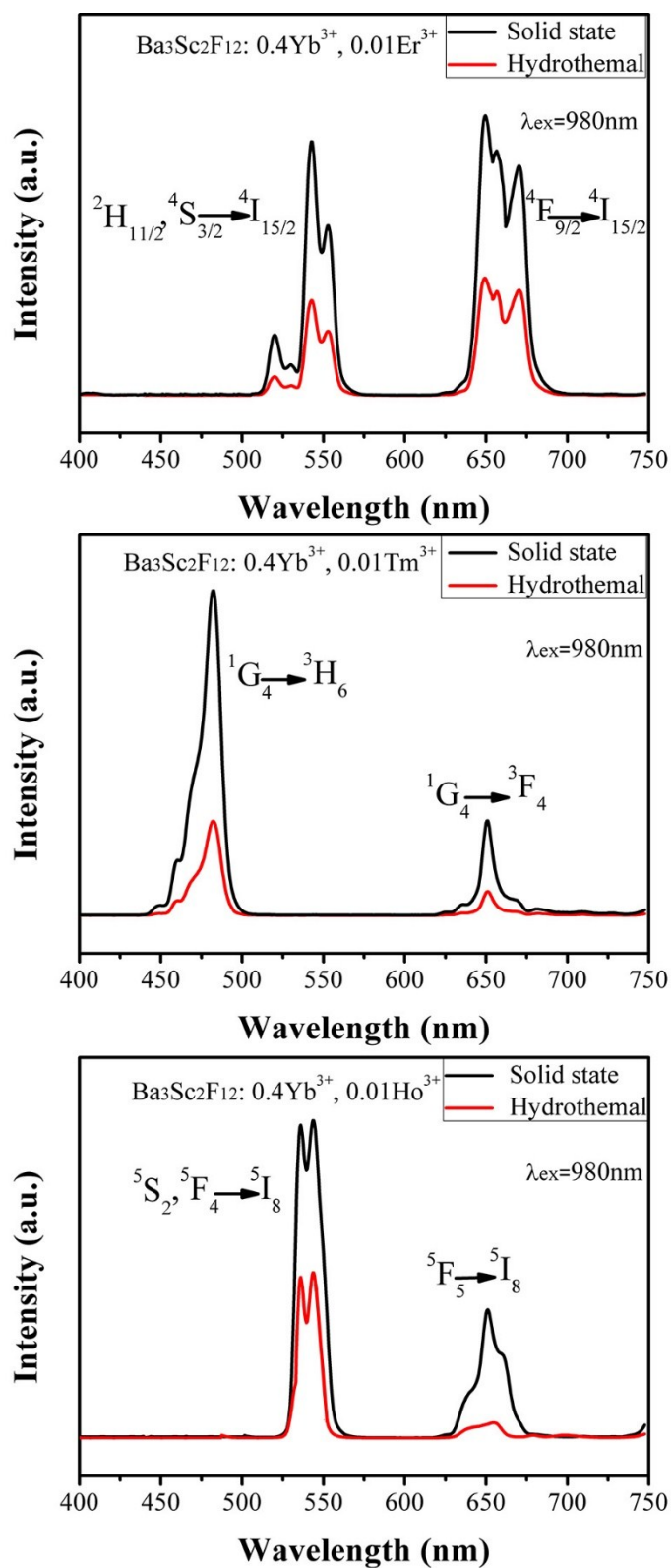


Fig. S2 The comparison of UC performance of $\text{Ba}_2\text{Sc}_2\text{F}_{12}: 0.4\text{Yb}^{3+}/0.01\text{Ln}^{3+}$ ($\text{Ln} = \text{Er}, \text{Tm}$ and Ho) between hydrothermal and solid state route under 980 nm excitation with power density of $3\text{W}/\text{cm}^2$.