

## Supporting information

Molten salt synthesis of octahedral  $\text{LiYF}_4:\text{Yb}^{3+}/\text{Ln}^{3+}$  ( $\text{Ln} = \text{Er}, \text{Tm}, \text{Ho}$ ) microcrystals with multicolor upconversion luminescence

Mingye Ding, Chunhua Lu\*, Linhai Cao, Wenjuan Huang, Yaru Ni, Zhongzi Xu\*

State Key Laboratory of Materials-orient Chemical Engineering, College of Materials Science and Engineering, Nanjing University of Technology, Nanjing 210009, PR China

E-mail: [chhlu@njut.edu.cn](mailto:chhlu@njut.edu.cn), [xzz@njut.edu.cn](mailto:xzz@njut.edu.cn)

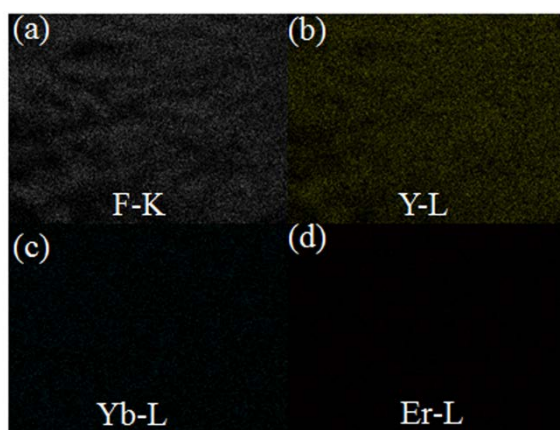


Fig. S1 EDS mappings of the as-prepared  $\text{LiYF}_4:20\% \text{Yb}^{3+}, 2\% \text{Er}^{3+}$  microoctahedrons, indicating spatial distribution of F (white), Y (yellow), Yb (blue), and Er (red), respectively.

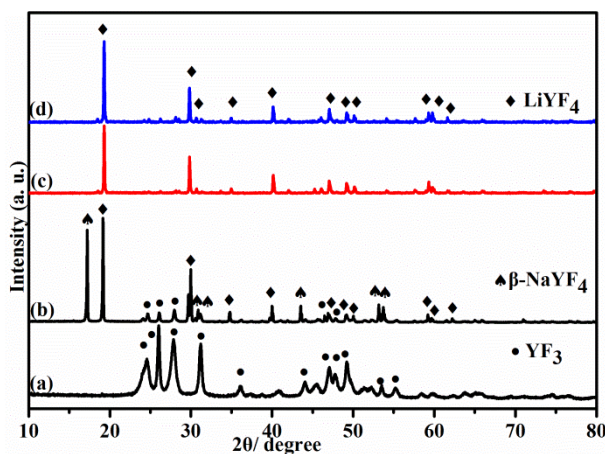


Fig. S2 XRD patterns of  $\text{LiYF}_4:20\% \text{Yb}^{3+}, 1\% \text{Tm}^{3+}$  synthesized at  $400^\circ\text{C}$  for reaction time of (a) 10 min, (b) 30 min, (c) 2 h, (d) 4 h.

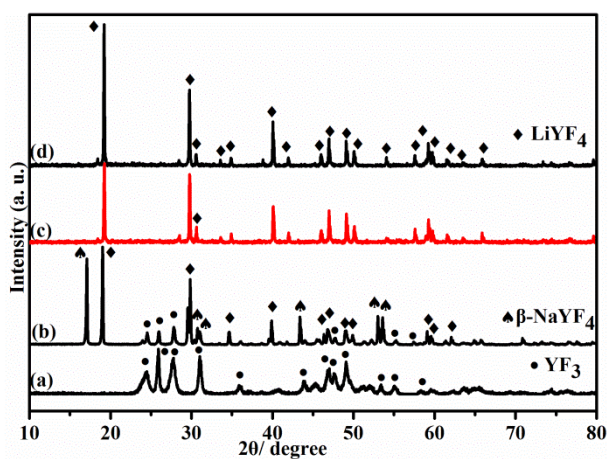


Fig. S3 XRD patterns of LiYF<sub>4</sub>:20% Yb<sup>3+</sup>, 2% Ho<sup>3+</sup> synthesized at 400 °C for reaction time of (a) 10 min, (b) 30 min, (c) 2 h, (d) 4 h.

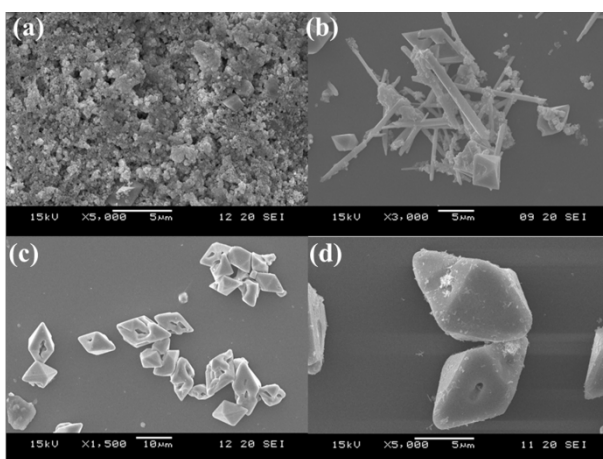


Fig. S4 SEM images of LiYF<sub>4</sub>:20% Yb<sup>3+</sup>, 1% Tm<sup>3+</sup> synthesized at 400 °C for reaction time of (a) 10 min, (b) 30 min, (c) 2 h, (d) 4 h.

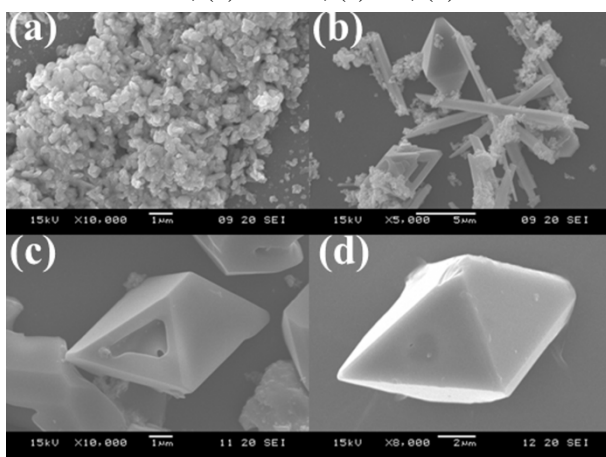


Fig. S5 SEM images of LiYF<sub>4</sub>:20% Yb<sup>3+</sup>, 2% Ho<sup>3+</sup> synthesized at 400 °C for reaction time of (a) 10 min, (b) 30 min, (c) 2 h, (d) 4 h.