Electronic Supplementary Material (ESI) for CrystEngComm.
This journal is © The Royal Society of Chemistry 2020

Supporting Information

Hydrothermal synthesis and tunable up-conversion white luminescence properties of $KSc(MoO_4)_2:Ln^{3+}$ (Ln = Yb, Er, Tm and Ho) crystals

Yini Mao,[a] Li Jiang,[a] Pengfei Xian,[a] Qiongfen Fu,[a] Shanshan Hu*[a] and Jun Yang*[a]

[a]School of Chemistry and Chemical Engineering, Southwest University, Chongqing 400715, China.

E-mail: hushan3@swu.edu.cn and jyang@swu.edu.cn

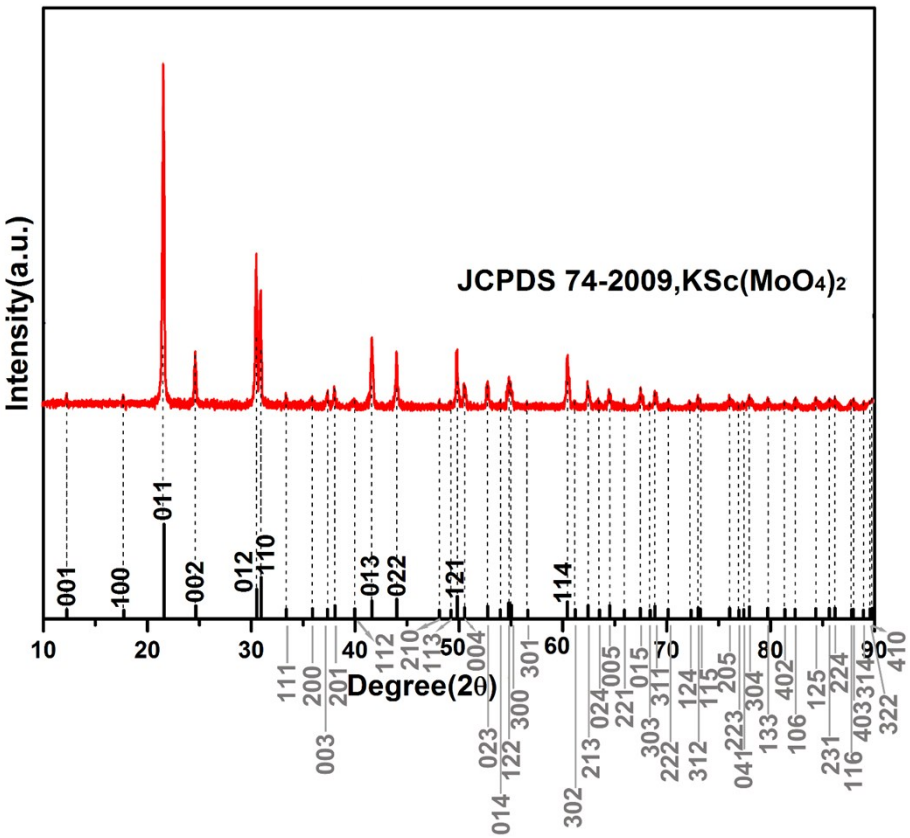

Fig. S1 XRD pattern of the obtained $KSc(MoO_4)_2$ crystal.

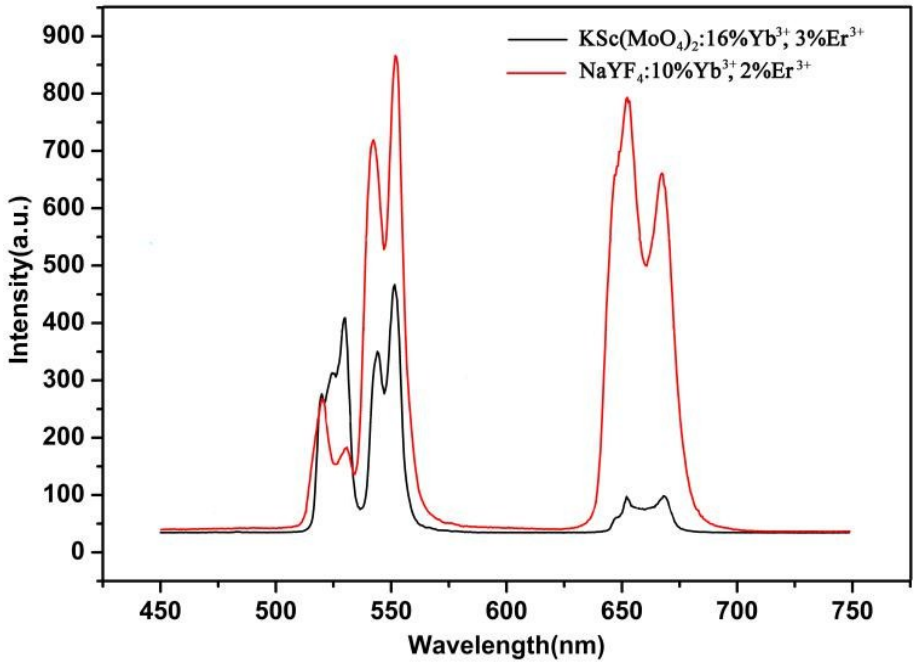

Fig. S2 Up-conversion spectra of $NaYF_4$:10%Yb^{3+},2%Er^{3+} and $KSc(MoO_4)_2$:16%Yb^{3+},3%Er^{3+} phosphors under the excitation of 980 nm near-infrared light.

We first synthesized the $NaYF_4$:10%Yb^{3+},2%Er^{3+} sample according to the literature,[63] and then carried out a comparative analysis based on this. The following figure shows the relative luminous intensity of the $KSc(MoO_4)_2$: 16%Yb^{3+}, 3%Er^{3+} and $NaYF_4$:10%Yb^{3+},2%Er^{3+}phosphors under 980 nm NIR excitation, in which the pump power of the laser was maintained at 0.944 W (I = 1.5 A) during the test. Both phosphors were synthesized by a simple and gentle hydrothermal method. It can be seen from the figure that there is a difference in the luminous intensity of the two phosphors and the difference can be quantified by calculating the integrated intensity of the UC spectra of the two phosphors. The calculation results are shown as below: $I_{KSc(MoO4)2}/I_{NaYF4}$ = 0.547 in the green light region (510 ~ 580 nm, $^2H_{11/2}/^4S_{3/2}\rightarrow{}^4I_{15/2}$ transitions of Er^{3+}), $I_{KSc(MoO4)2}/I_{NaYF4}$ = 0.121 in the red light region (620 ~ 700 nm, $^4F_{9/2}\rightarrow{}^4I_{15/2}$ transition of Er^{3+}) and $I_{KSc(MoO4)2}/I_{NaYF4}$ = 0.339 in the whole region (510 ~ 700 nm), respectively.

63 Y. X. Guo, J. Wei, Y. L. Liu, T. T. Yang, Z. Xu, J Mater Sci: Mater Electron, 2018, 29, 2463–2470.