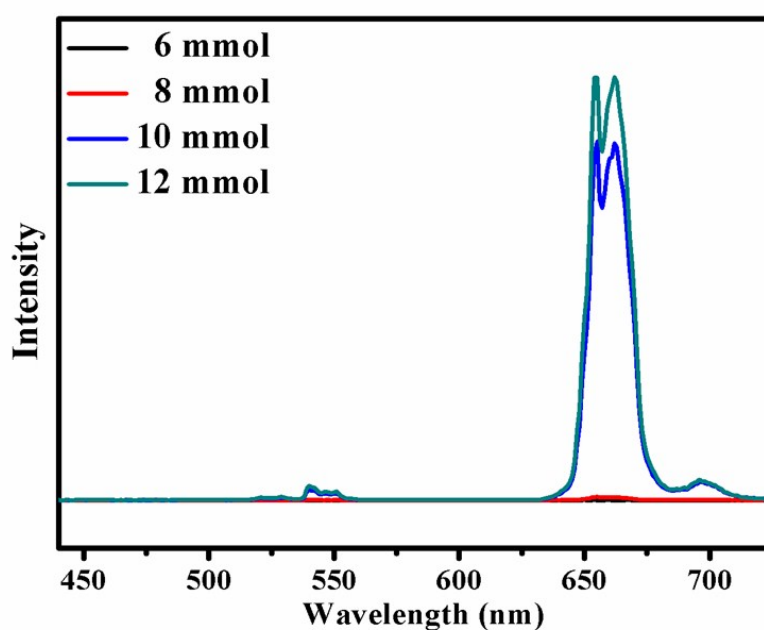


## Supporting Information

### Simultaneous realization of structure manipulation and emission enhancement in NaLuF<sub>4</sub> upconversion crystals

Hao Lin<sup>1</sup>, Dekang Xu<sup>1</sup>, Anming Li<sup>1</sup>, Dongdong Teng<sup>1</sup>, Shenghong Yang<sup>1</sup> and Yueli Zhang<sup>\*1,2</sup>



**Fig. S1** UC luminescence spectra of NaLuF<sub>4</sub>:20%Yb<sup>3+</sup>, 15%Er<sup>3+</sup>, 1%Tm<sup>3+</sup> nano/micro-crystals with different NaF contents at 180 °C for 12 h under 980 nm laser excitation.

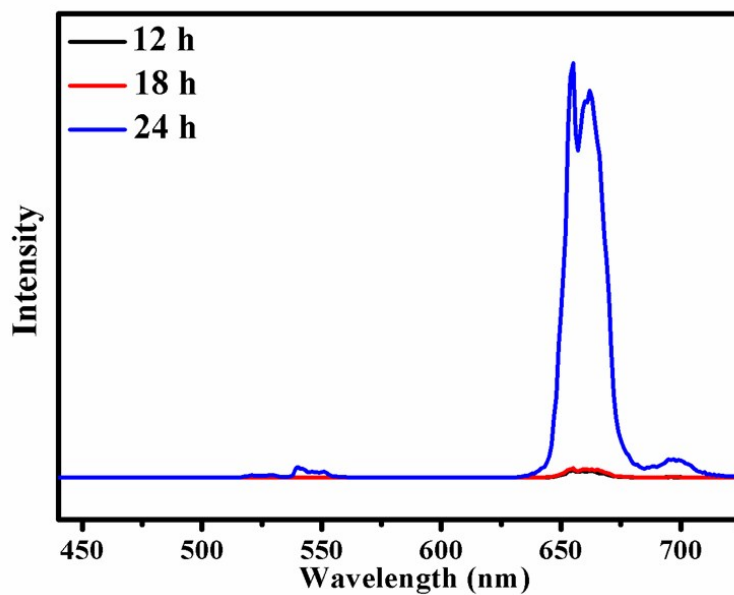
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<sup>2</sup> State Key Laboratory of Crystal Material, Shandong University, Jinan 250100, PR China.

## Supporting Information

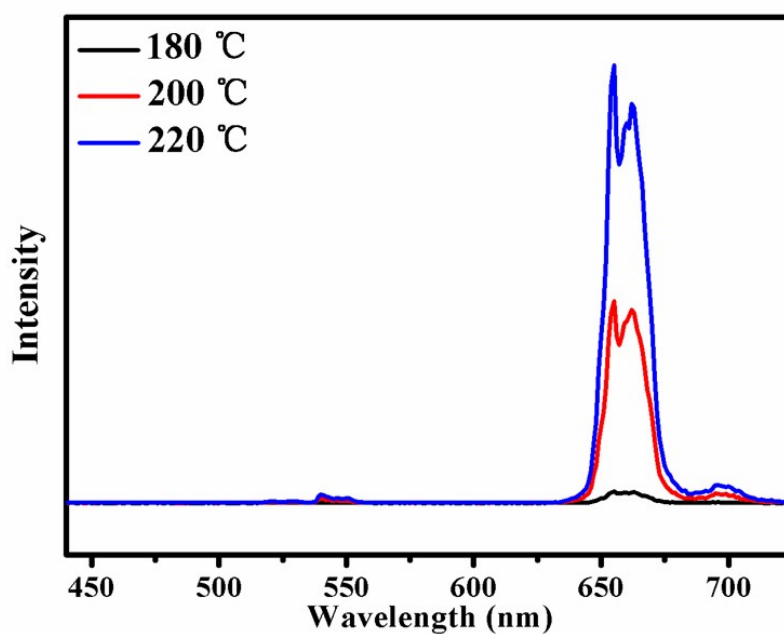
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**Fig. S2** UC luminescence spectra of  $\text{Gd}^{3+}$ -absent  $\text{NaLuF}_4:20\%\text{Yb}^{3+}, 15\%\text{Er}^{3+}, 1\%\text{Tm}^{3+}$  nano/micro-crystals synthesized by adding 8 mmol NaF at 180 °C for different reaction times under 980 nm laser excitation.

## Supporting Information

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**Fig. S3** UC luminescence spectra of Gd<sup>3+</sup>-absent NaLuF<sub>4</sub>:20%Yb<sup>3+</sup>, 15%Er<sup>3+</sup>, 1%Tm<sup>3+</sup> nano/micro-crystals synthesized by adding 8 mmol NaF at different reaction temperatures for 12 h under 980 nm laser excitation.