

Supporting Information

Hierarchical bundles structure of β -NaLuF₄: facile synthesis, shape evolution, and luminescent properties

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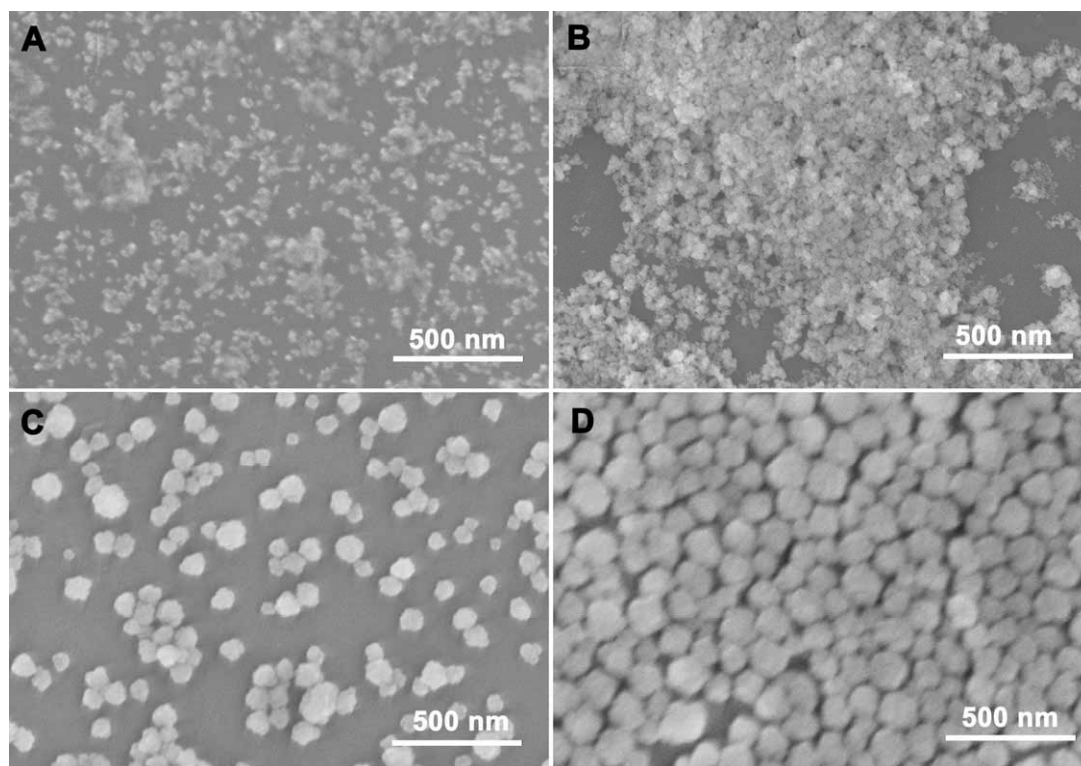


Fig. S1 SEM image of the lutetium precursors prepared using 0.18 g urea at 90 °C for different reaction time: (A) 20 min; (B) 40 min; (C) 1 h; and (D) 2 h.

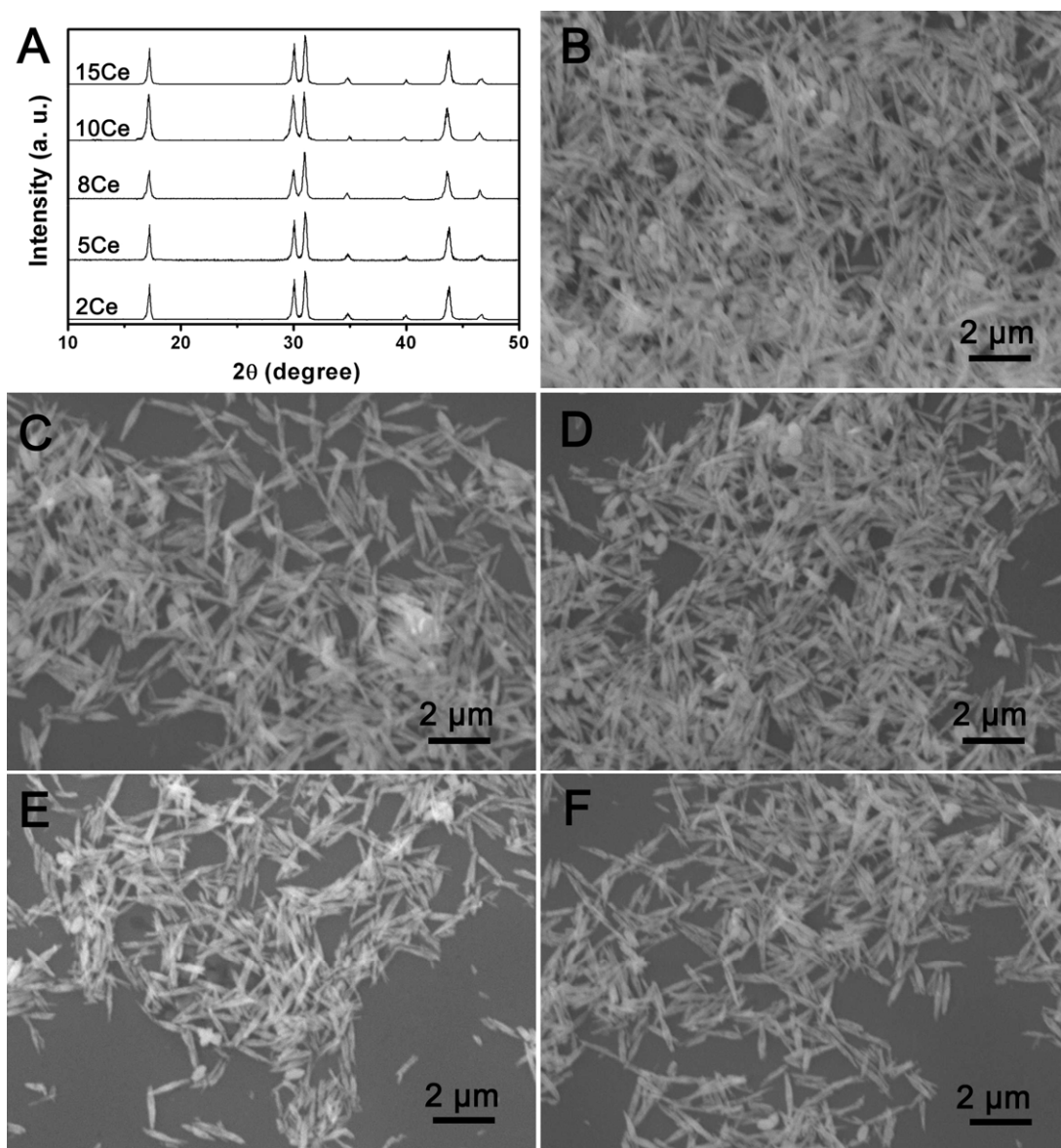


Fig. S2 (A) XRD and SEM image of the NaLuF₄ crystals codoped with 5mmol% Tb³⁺ and (B) 2mmol% Ce³⁺, (C) 5mmol% Ce³⁺, (D) 8mmol% Ce³⁺, (E) 10mmol% Ce³⁺, (F) 15mmol% Ce³⁺.

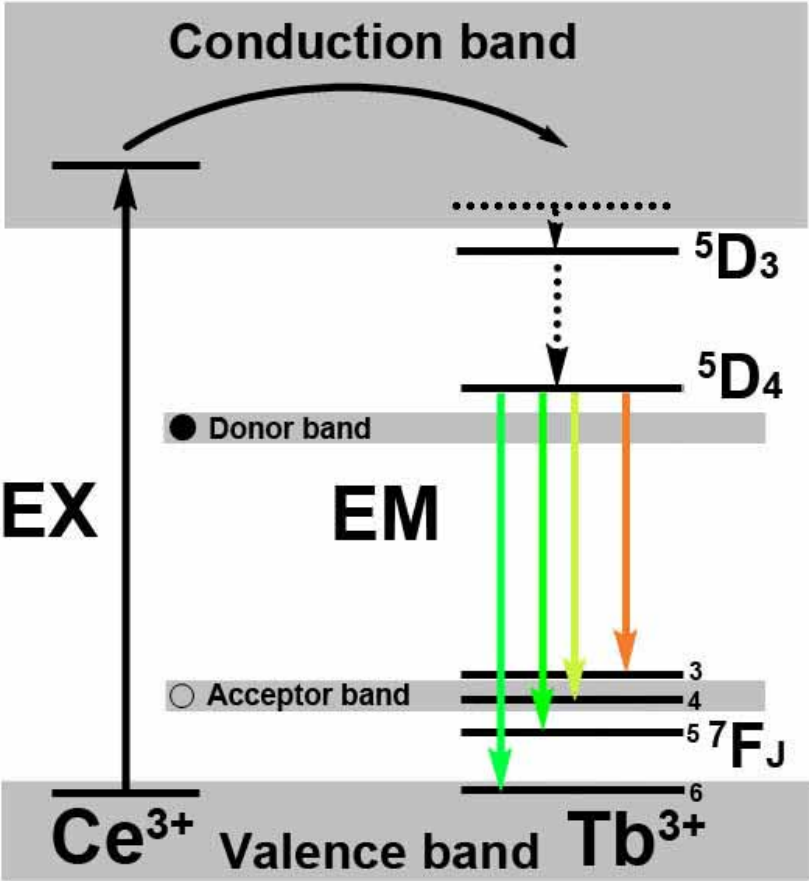


Fig. S3 Simplified energy-level diagram and energy transfer mechanism for NaLuF₄:Ce³⁺, Tb³⁺.

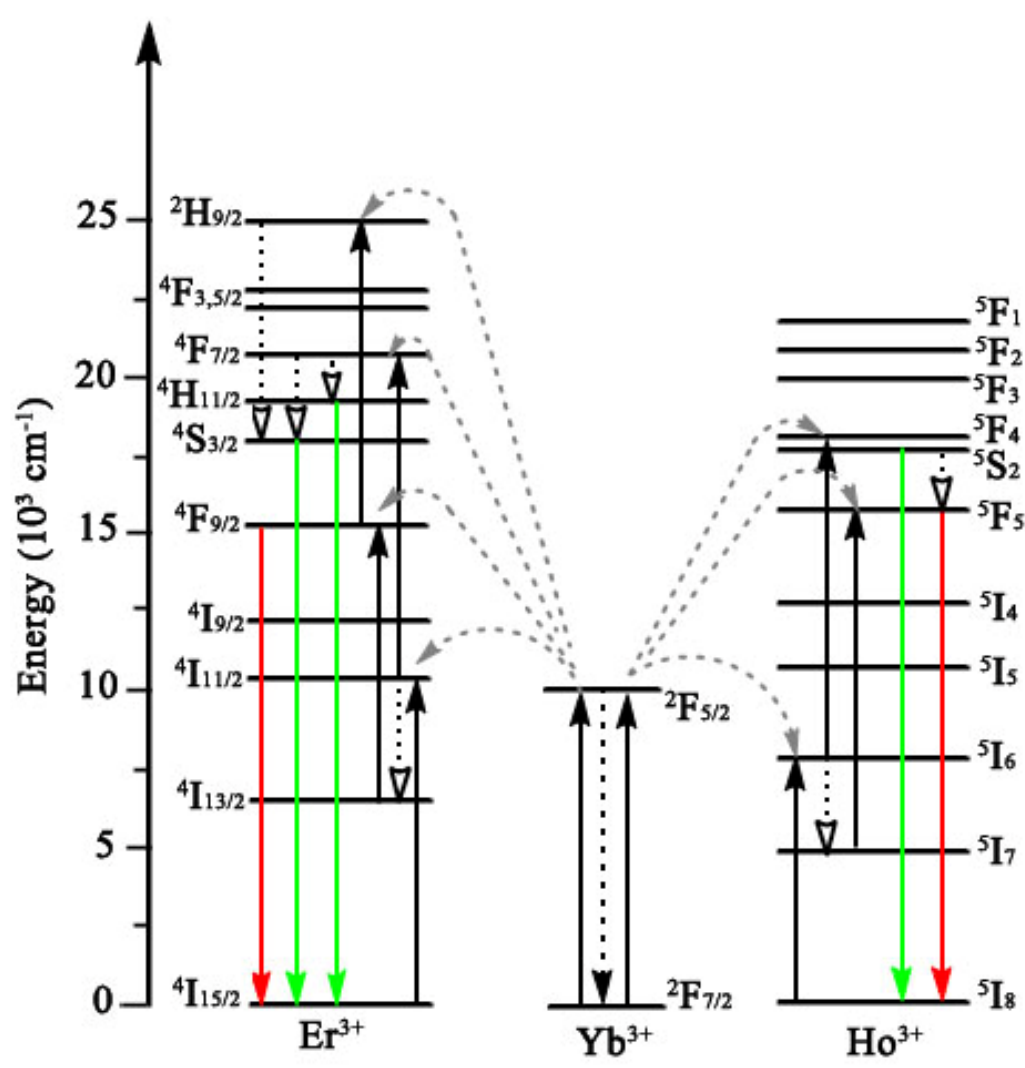


Fig. S4 Simplified energy-level diagram for $\text{NaLuF}_4:\text{Yb}^{3+},\text{Er}^{3+}$ and $\text{NaLuF}_4:\text{Yb}^{3+},\text{Ho}^{3+}$.