

Supporting Information

Phonon-Modulated Upconversion Luminescence Properties in Some Er³⁺ and Yb³⁺ Co-activated Oxides

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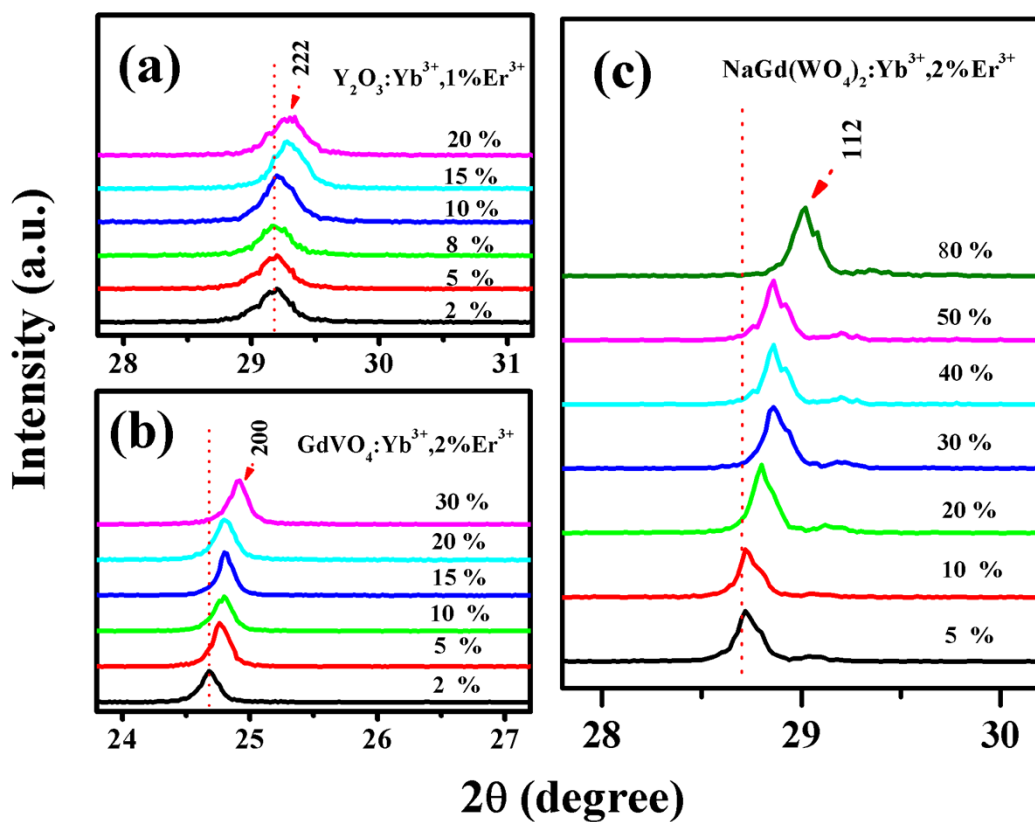


Figure S1: The magnified XRD patterns of (a) Y₂O₃ : Yb³⁺/1% Er³⁺, (b) GdVO₄ : Yb³⁺/2% Er³⁺ and (c) NaGd(WO₄)₂ : Yb³⁺/2%Er³⁺ samples at the corresponding peak position (222),(200),and (112), respectively, with different Yb³⁺ doped concentrations.

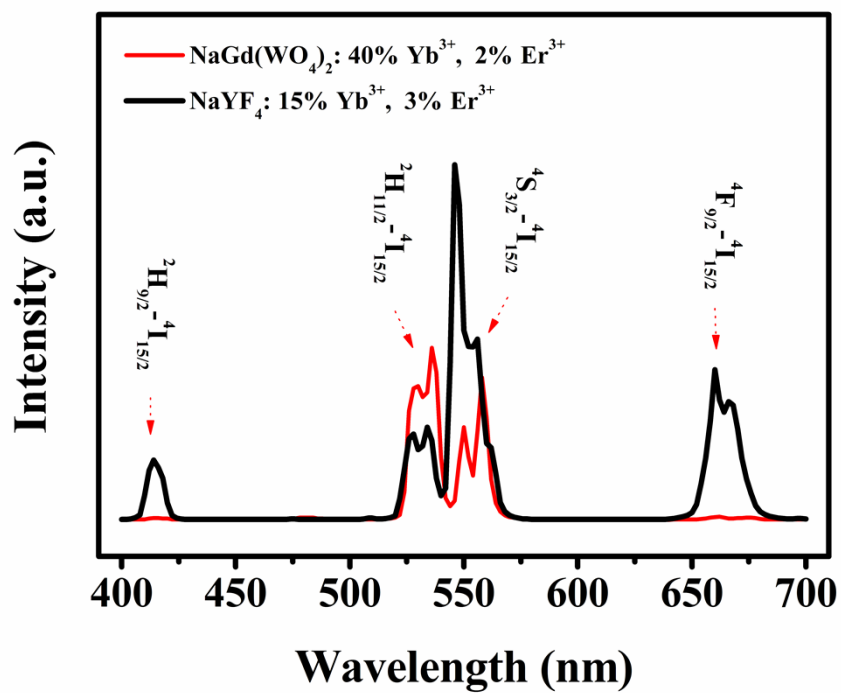


Figure S2: The typical UCL spectra of NaGd(WO₄)₂: 40% Yb³⁺/2% Er³⁺ and NaYF₄: 15% Yb³⁺/3% Er³⁺ Commercial phosphor.

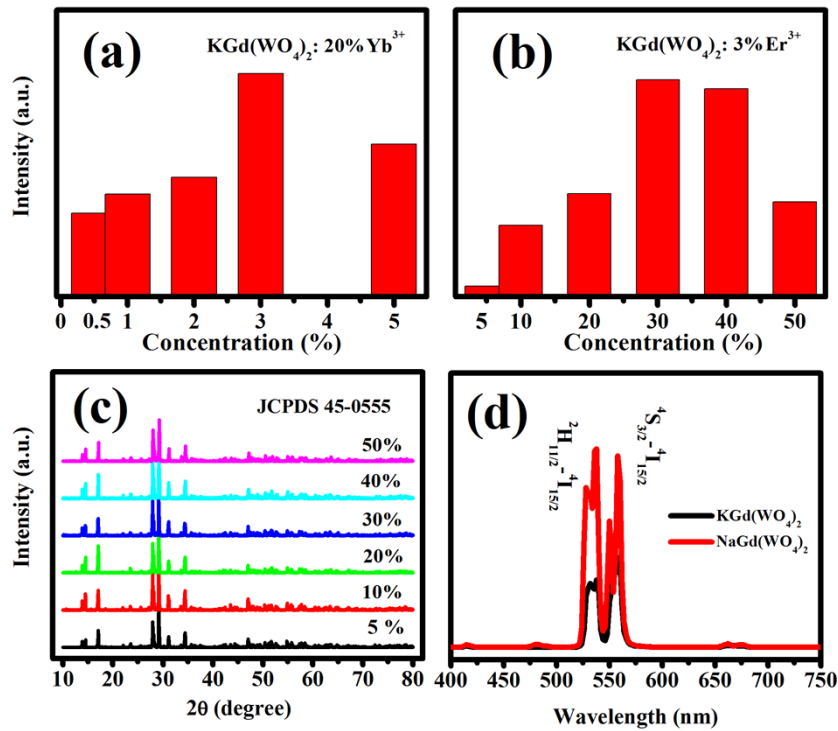


Figure S3: (a) The histogram of the integrated UCL intensity of Er^{3+} concentration-dependent UCL spectra of $\text{KGd}(\text{WO}_4)_2 : 20\% \text{Yb}^{3+} / \text{Er}^{3+}$ and (b) Yb^{3+} concentration-dependent UCL spectra of $\text{KGd}(\text{WO}_4)_2 : \text{Yb}^{3+} / 3\% \text{Er}^{3+}$. (c) Yb^{3+} concentration-dependent XRD patterns of $\text{KGd}(\text{WO}_4)_2 : \text{Yb}^{3+} / 3\% \text{Er}^{3+}$. (d) The typical UCL spectra of $\text{NaGd}(\text{WO}_4)_2 : 40\% \text{Yb}^{3+} / 2\% \text{Er}^{3+}$ and $\text{KGd}(\text{WO}_4)_2 : 30\% \text{Yb}^{3+} / 3\% \text{Er}^{3+}$.