

Supporting Information

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TITLE: Exceptional Modulation of Upconversion and Downconversion Near-infrared Luminescence in Tm/Yb Codoped Ferroelectric Nanocomposite by Nanoscale Engineering

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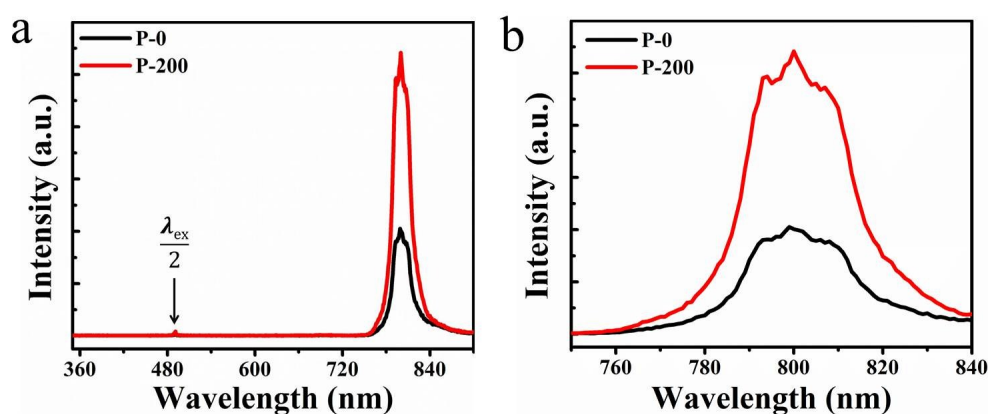


Fig. S1. (a) The whole upconversion spectra of the P-0 and P-200 samples. (b) The upconversion spectra from 750 to 840 nm of the P-0 and P-200 samples.

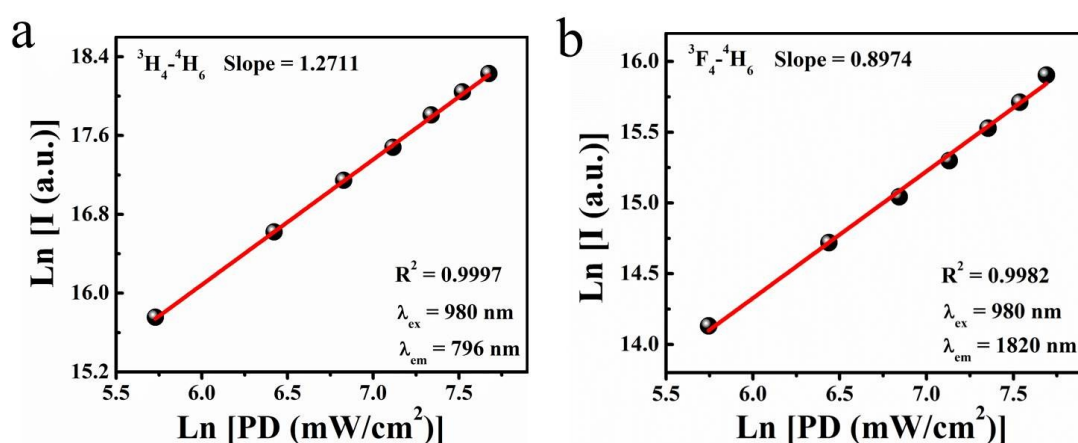


Fig. S2. (a) Double logarithmic plot of upconversion intensity of Yb³⁺/Tm³⁺ codoped sample dependent on the excitation power density after loading an electric field of 200 kV/cm. (b) Double logarithmic plot of downconversion intensity of Yb³⁺/Tm³⁺ codoped sample dependent on the excitation power density after loading an electric field of 200 kV/cm.

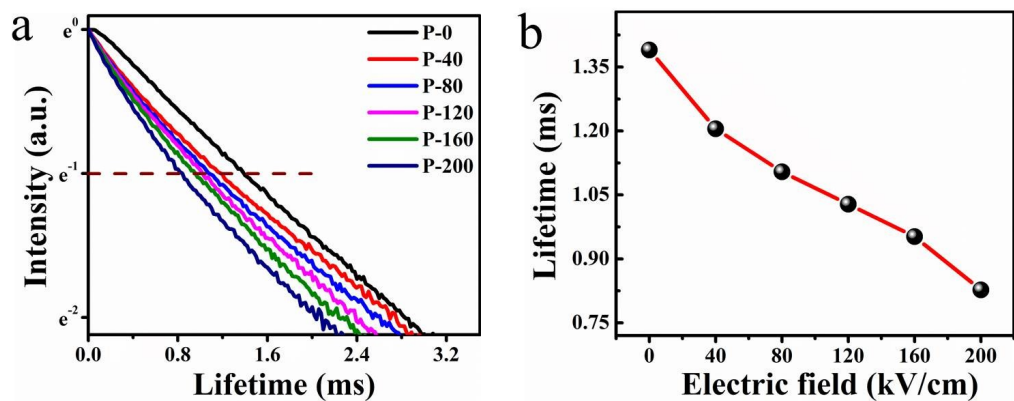


Fig. S3. (a) The measured downconversion infrared decay curves of Tm³⁺:³F₄-⁴H₆. (b) The trend of P-j lifetime relative to the elevated electric field.

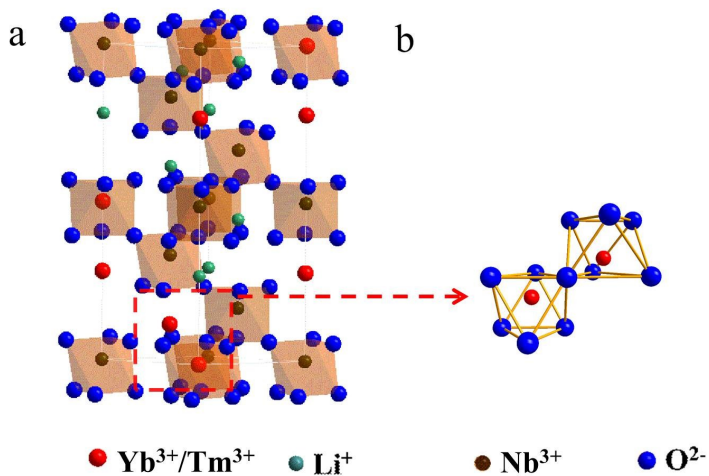


Fig. S4. (a) The schematic diagram of the lanthanide ions enters the LiNbO₃ crystal structure. (b) A partial enlargement shows the ligand field around Yb³⁺/Tm³⁺.