Supplementary Information

Double perovskite $A_2LaNbO_6:Mn^{4+}$, Eu^{3+} (A=Ba, Ca) phosphors: Potential applications in optical temperature sensing

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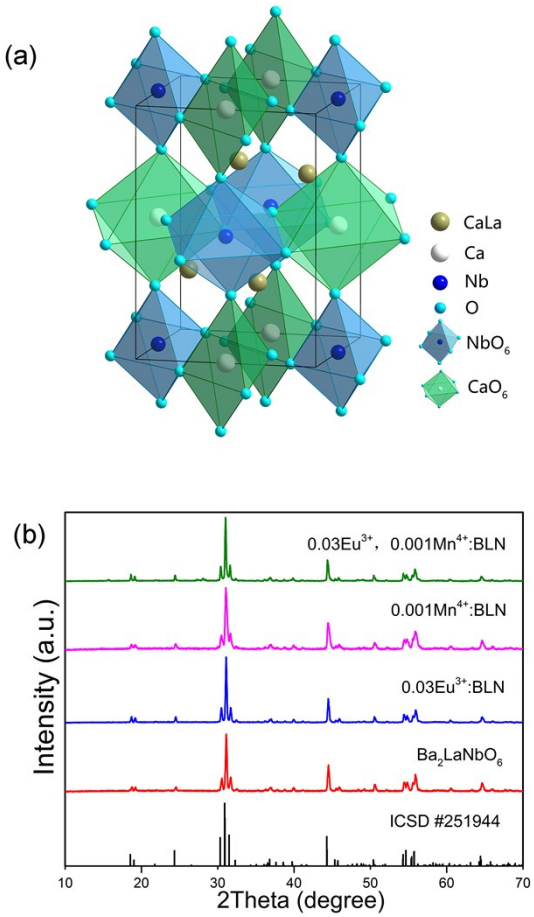

Fig.S1 (a) Unit cell structure of CLN. (b) XRD patterns of undoped CLN, CLN: Eu^{3+}, CLN: Mn^{4+} and CLN: Mn^{4+}, Eu^{3+} phosphors and the standard data of BLN (ICSD #251944)

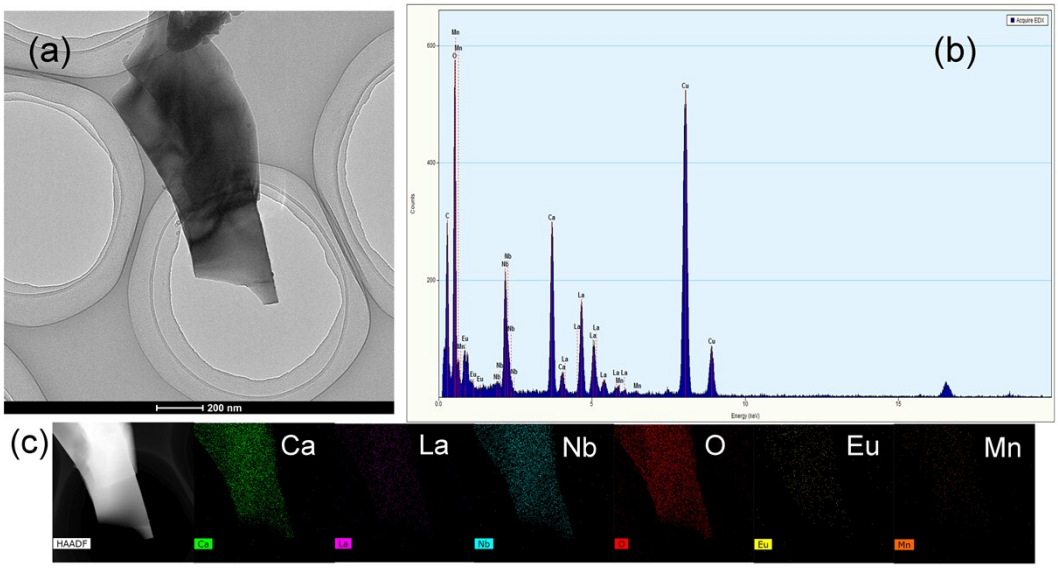

Fig.S2 TEM image (a), EDS (b) and elemental mapping (c) of CLN: Mn^{4+}, Eu^{3+} sample.

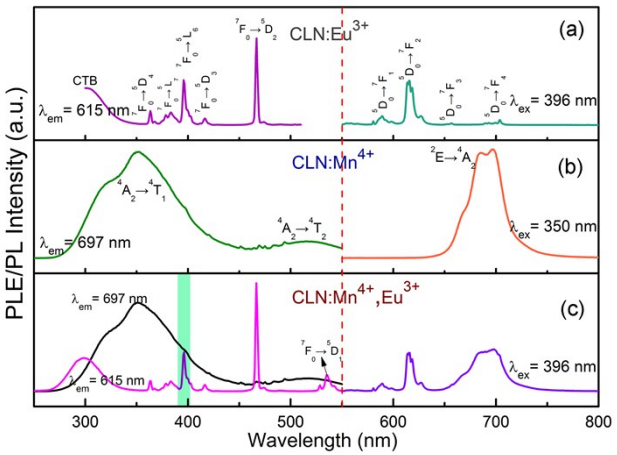

Fig.S3 Room temperature PLE and PL spectra of CLN: Eu^{3+} (a), CLN: Mn^{4+} (b) and CLN: Mn^{4+}, Eu^{3+} (c) phosphors.

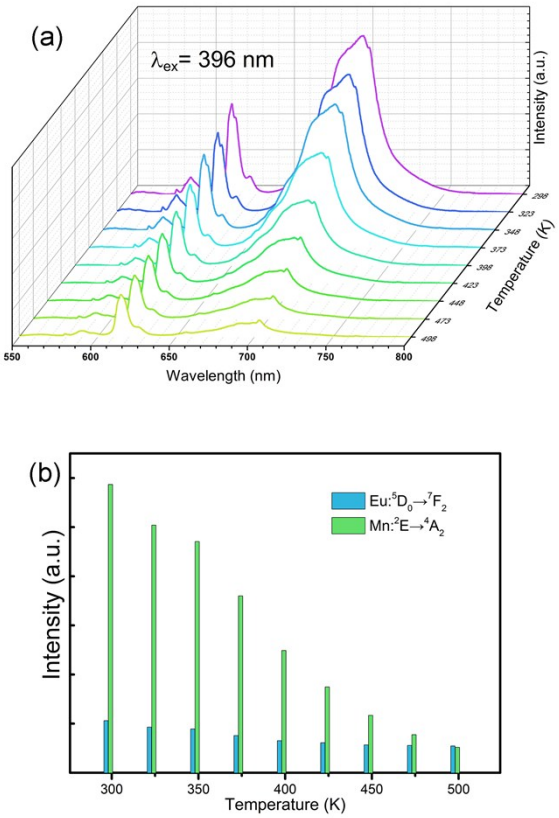

Fig.S4 Temperature-dependent PL spectra (a) and histogram of PL intensities (the integral ranges, Eu^{3+}: 603-624nm, Mn^{4+}:660-700nm) (b) of the CLN: Mn^{4+}, Eu^{3+} phosphor in the temperature range from 298K to 498K.

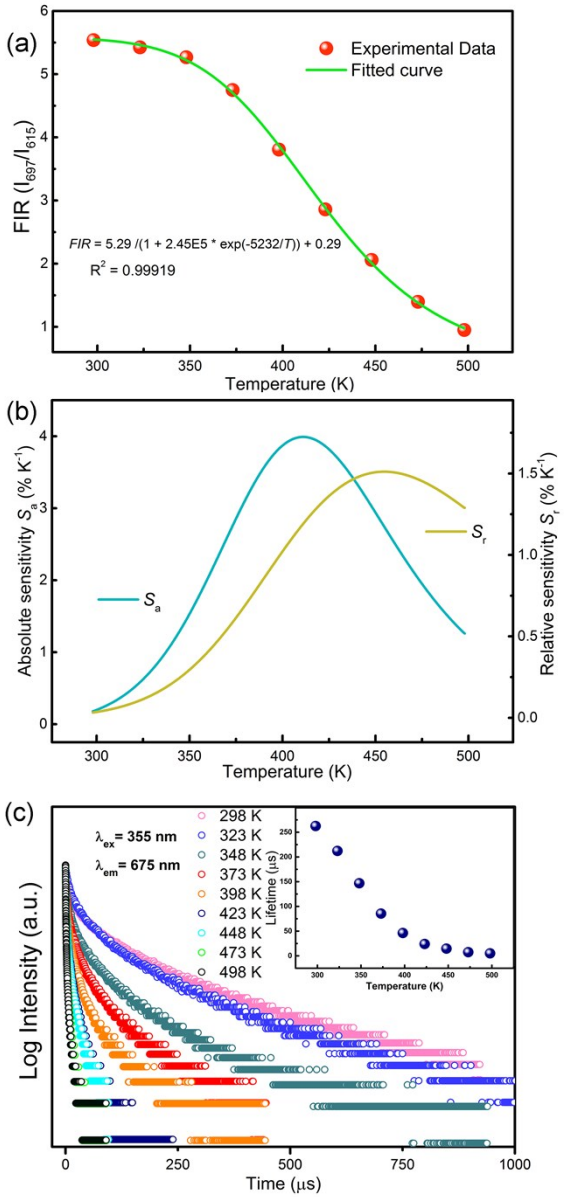

Fig.S5 Temperature-dependent FIR of 697 nm to 615 nm and the fitted curve (a), absolute sensitivity S_a (blue line) and relative sensitivity S_r (yellow line) (b), temperature-dependent Mn^{4+} decay curves (c) in CLN: Mn^{4+}, Eu^{3+} phosphor. Insets: temperature-dependent specific lifetime values.