Electronic Supplementary Material (ESI) for Inorganic Chemistry Frontiers.

Supporting Information

Achieving ultrasensitive temperature sensing through non-thermally coupled energy levels to overcome energy gap constraint

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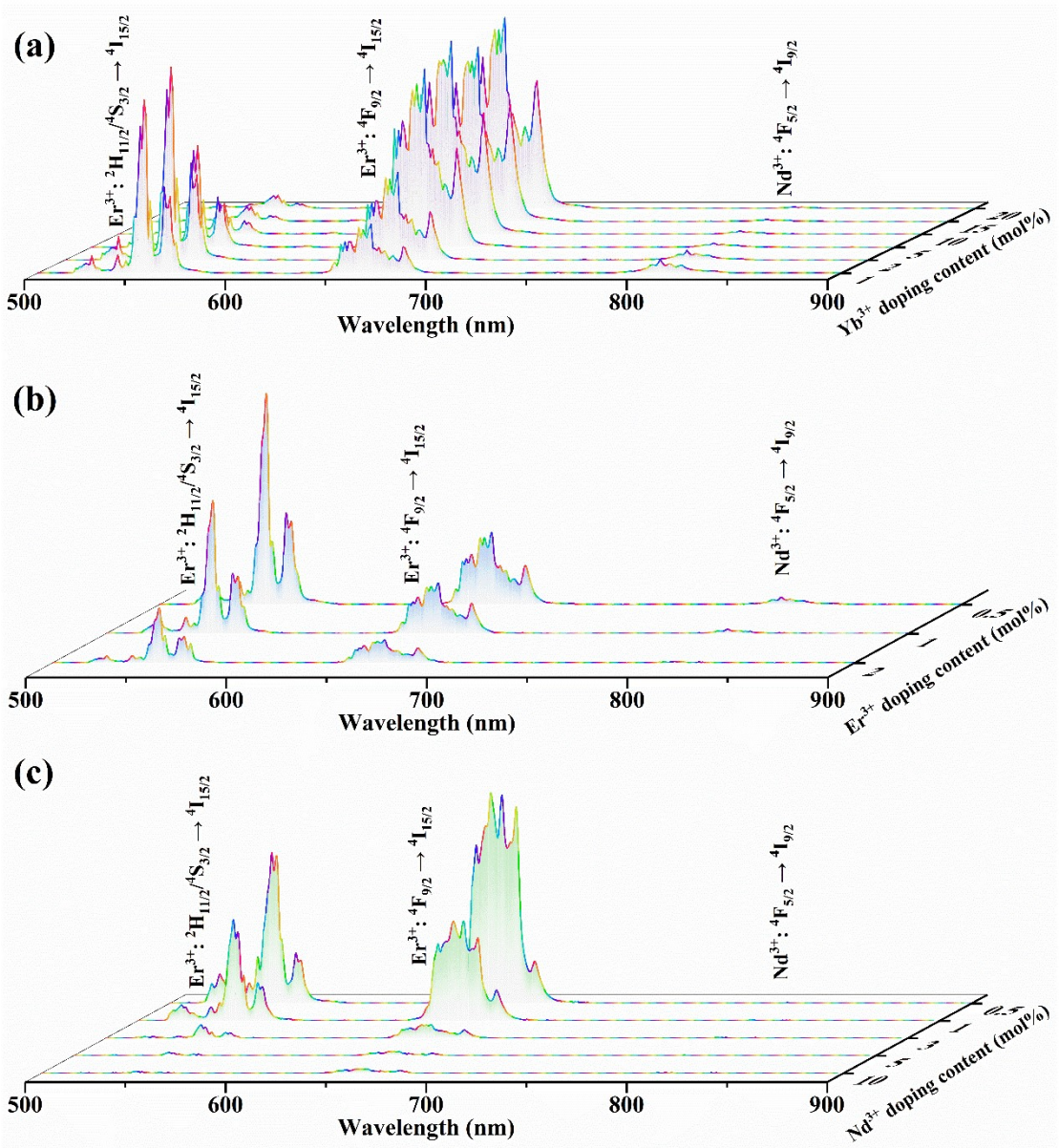

Figure S1 PL spectra of (a) $CaSc_2O_4$: x% Yb^{3+}/0.5% Er^{3+}/3% Nd^{3+} (x = 1, 2, 5, 10, 15, 20), (b) $CaSc_2O_4$: 2% Yb^{3+}/y% Er^{3+}/3% Nd^{3+} (y = 0.5, 1, 2) and (c) $CaSc_2O_4$: 5% Yb^{3+}/0.5% Er^{3+}/z% Nd^{3+} (z = 0.5, 1, 3, 5, 10) under the excitation of 980 nm wavelength.

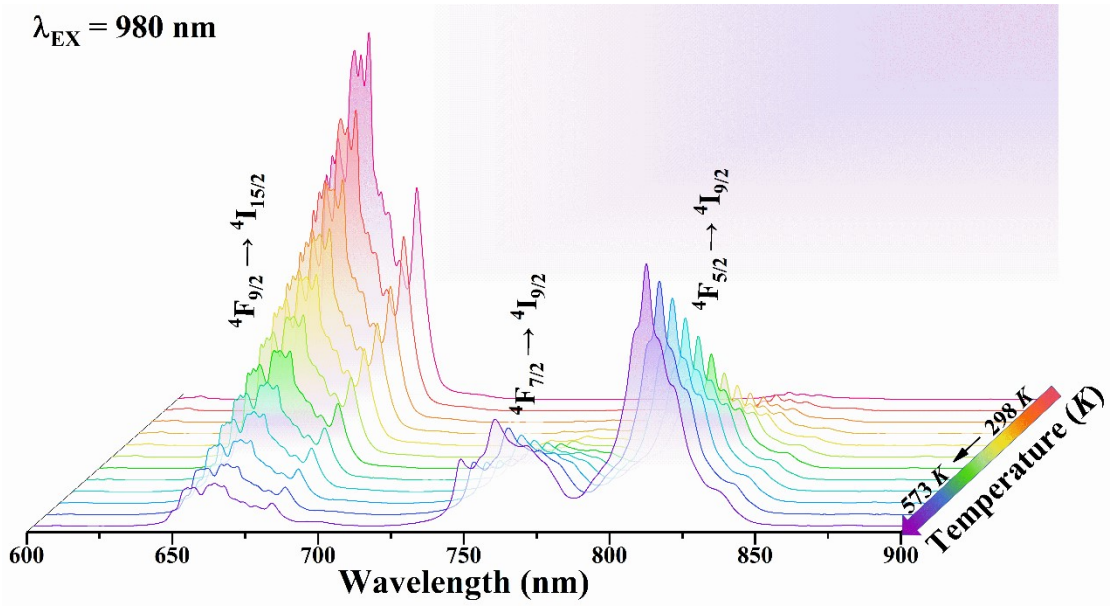

Figure S2 Temperature dependent red and NIR emission in CSO excited by 980 nm wavelength.

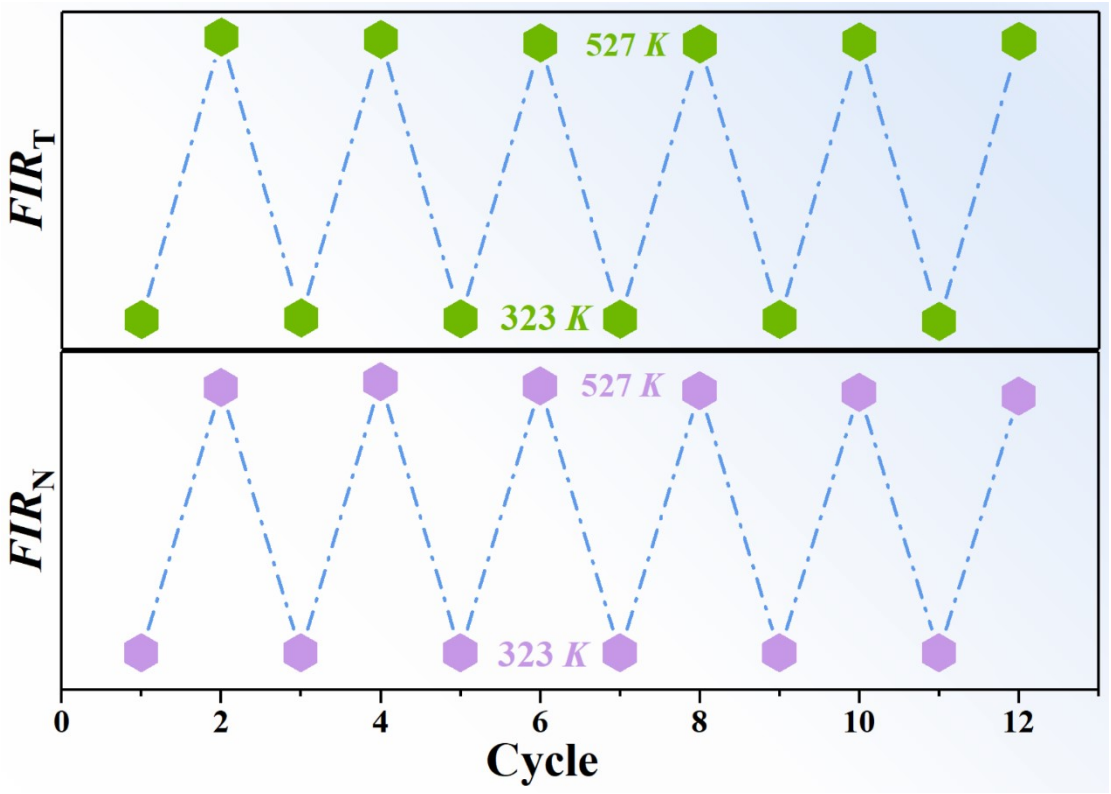

Figure S3 The repeatability of FIR_T- and FIR_N-based optical thermometer.