Electronic Supplementary Material (ESI) for ChemComm.

Supporting Information

A Near Infrared Luminescent Metal−Organic Framework for Temperature Sensing in Physiological Range

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1. Materials and characterization.

All reagents and solvents are commercially available and were used as received without further purification. H_2BDC-F_4 was purchased from J&K Chemicals (Shanghai, China). All other reagents were purchased from Sinopharm Chemical Reagent Co., Ltd. (Shanghai, China).

Thermogravimetric analyses (TGA) were carried out on a Netzsch TG209F3 heated from room temperature to 600°C under nitrogen atmosphere with a heating rate of 10 °C· min^{-1}. Inductively coupled plasma spectroscopy (ICP) was performed on a Thermo IRIS Intrepid II XSP spectrometer. The scanning electron microscopy (SEM) images were recorded using a field-emission scanning electron microscopy (FE-SEM, Hitachi S4800). Powder X-ray diffraction (PXRD) patterns were collected in the 2θ = 5° -50° range on an X'Pert PRO diffractometer with Cu Kα (λ = 1.542 Å) radiation at room temperature. The emission spectra for the samples were recorded by a Hitachi F4600 fluorescence spectrometer using 808 nm laser as the light source. The temperature-dependent emission spectra were recorded by a Hitachi F4600 fluorescence spectrometer with a PolyScience Temperature Control Solution PD07R-20.

2. Characterization Results

Table S1. The molar ratio of the starting Nd/Yb salt and that in the synthesized product calculated by ICP analysis

sample	The molar ratio of the starting Nd/Yb salt	The Nd/Yb ratios calculated by ICP analysis
$Nd_{0.577}Yb_{0.423}BDC-F_4$	0.55:0.45	0.577:0.423

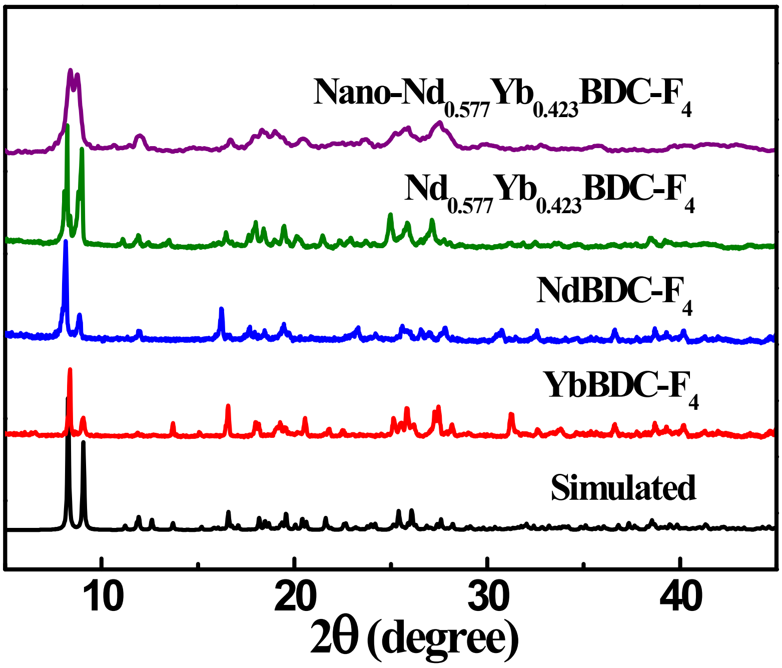


Fig. S1 PXRD patterns of the coordination polymers **NdBDC-F_4**, **YbBDC-F_4**, **$Nd_{0.577}Yb_{0.423}$BDC-F_4** and **Nano-$Nd_{0.577}Yb_{0.423}$BDC-F_4**

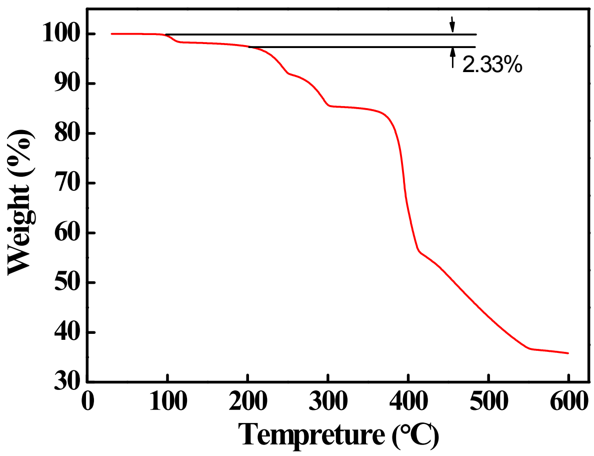
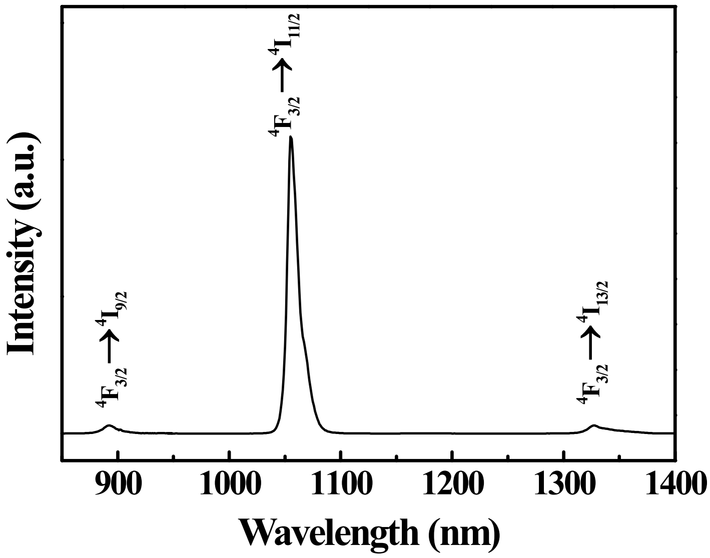
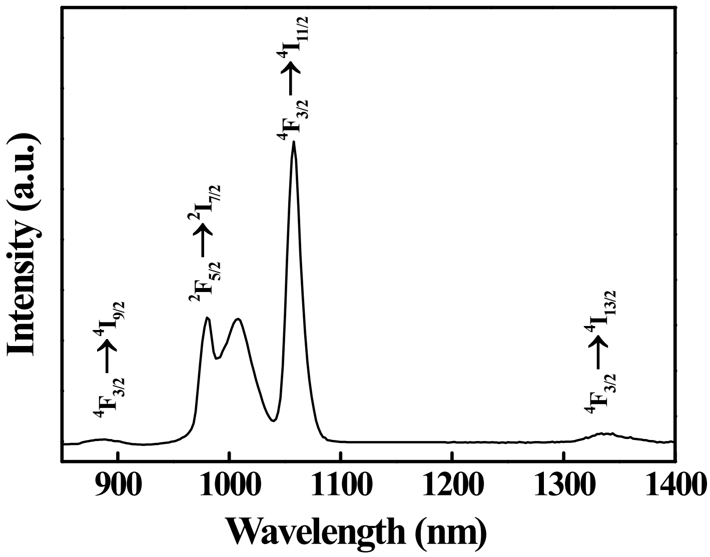


Fig. S2 TGA curve of **YbBDC-F_4**

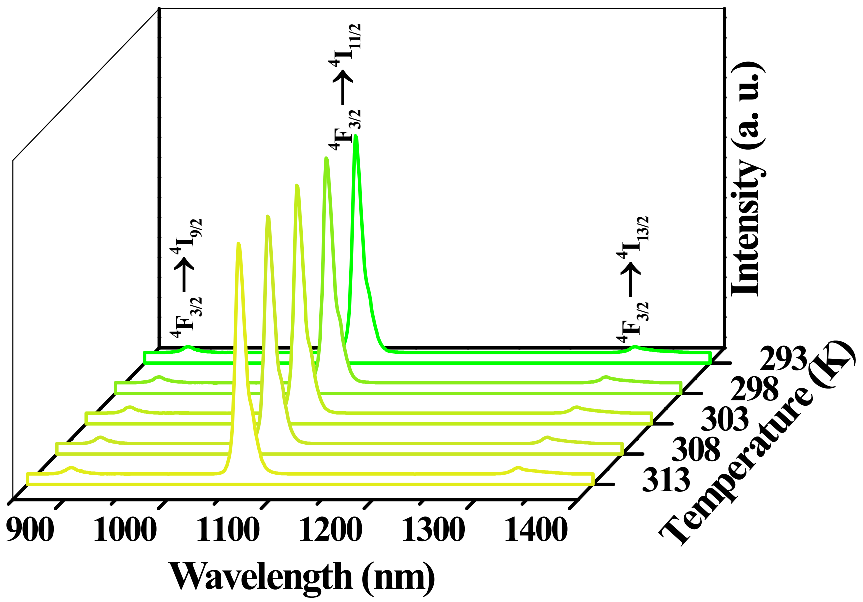


(a)

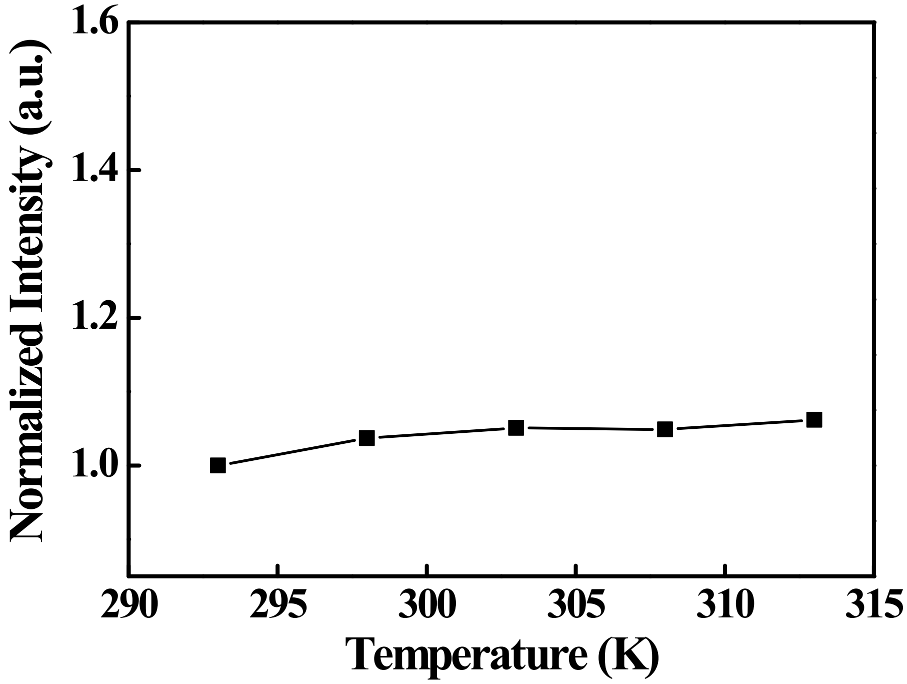


(b)

Fig. S3 Emission spectra of **$NdBDC\text{-}F_4$** (a) and **$Nd_{0.577}Yb_{0.423}BDC\text{-}F_4$** (b) at room temperature excited at 808 nm



(a)



(b)

Fig. S4 (a) Emission spectra of **NdBDC-F$_4$** recorded between 293 and 313 K excited at 808 nm; (b) Temperature-dependent intensity of the $^4F_{3/2}\rightarrow{}^4I_{11/2}$ transition of **NdBDC-F$_4$**

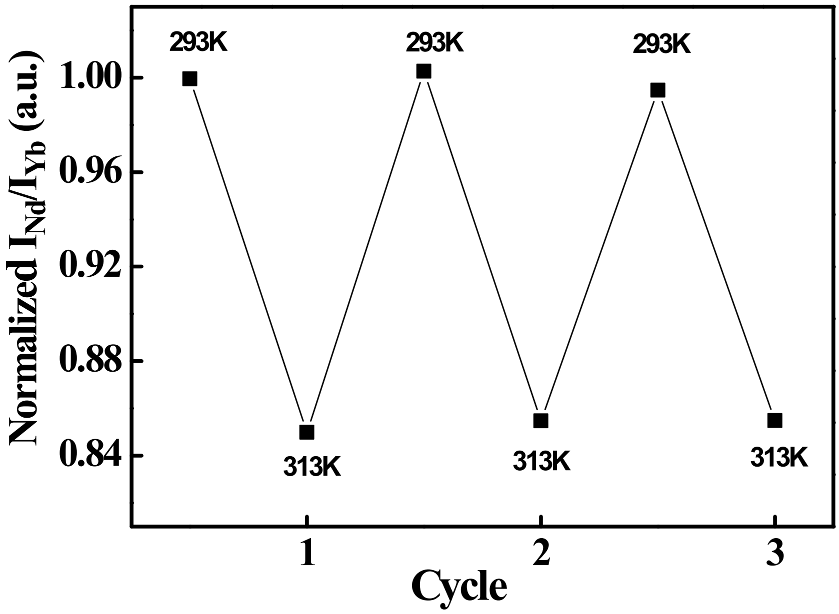


Fig. S5 The normalized intensity ratio of Nd^{3+} (1060 nm) to Yb^{3+} (980 nm) for **$Nd_{0.577}Yb_{0.423}$BDC-F_4** in cycles of heating and cooling

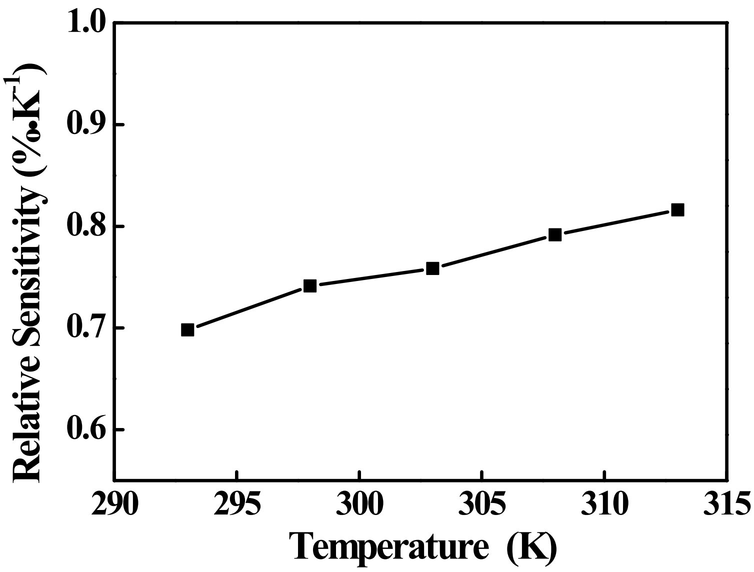
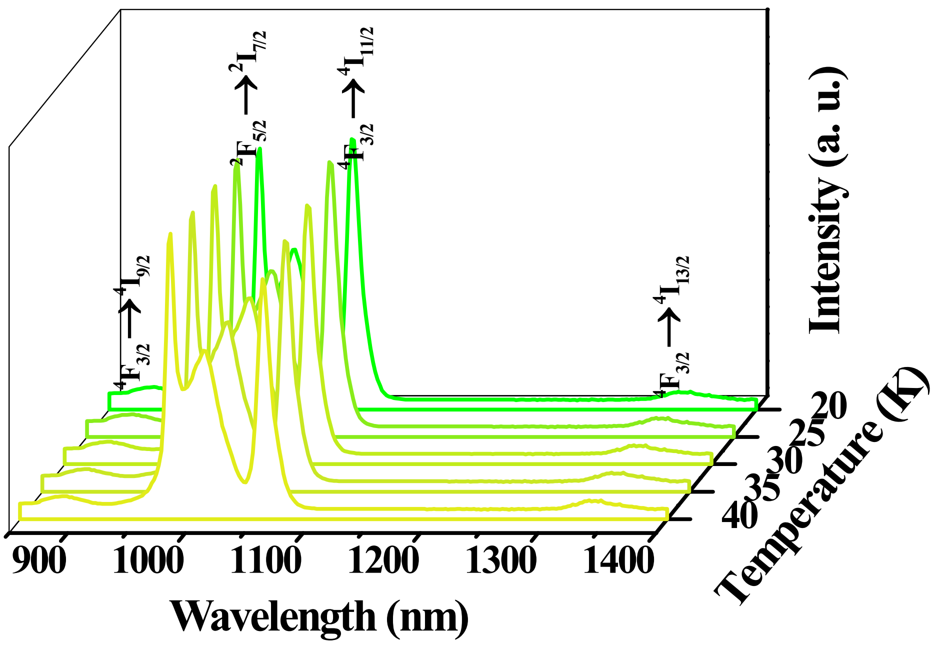
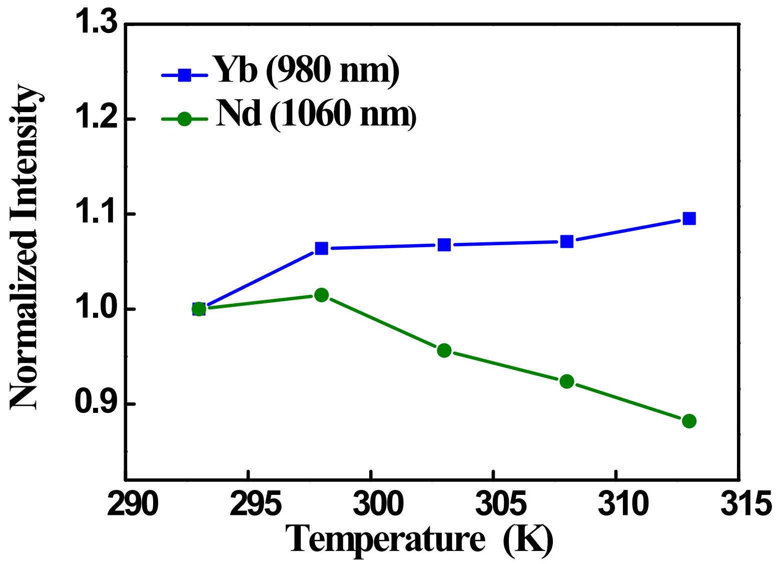


Fig. S6 Relative sensitivity of **$Nd_{0.577}Yb_{0.423}$BDC-F_4**



(a)



(b)

Fig. S7 (a) Emission spectra of nano-particles of $\mathbf{Nd_{0.577}Yb_{0.423}BDC\text{-}F_4}$ between 293 and 313 K excited at 808 nm; (b) Temperature-dependent intensity of the $^4F_{3/2} \rightarrow {}^4I_{11/2}$ transition of nano-particles of $\mathbf{Nd_{0.577}Yb_{0.423}BDC\text{-}F_4}$

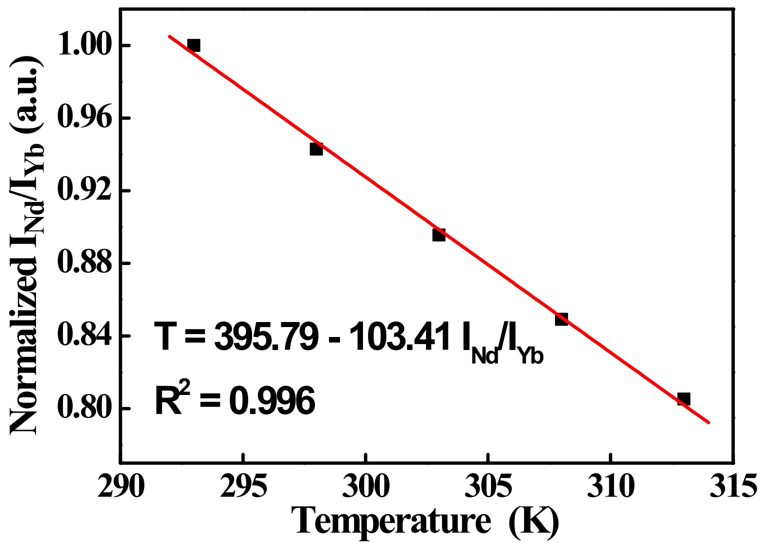


Fig. S8 Temperature-dependent intensity ratio of Nd^{3+} (1060 nm) to Yb^{3+} (980 nm) and the fitted curve for nano-particles of $\mathbf{Nd_{0.577}Yb_{0.423}BDC\text{-}F_4}$.

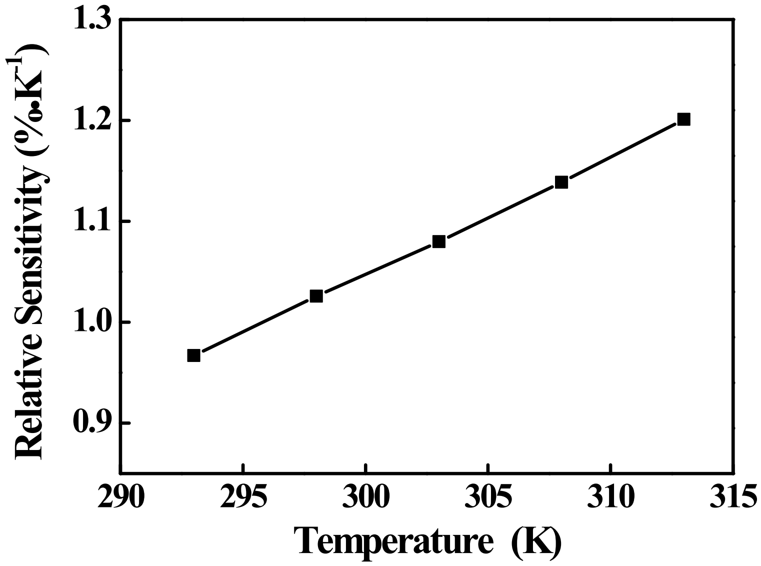


Fig. S9 Relative sensitivity for nano-particles of $\mathbf{Nd_{0.577}Yb_{0.423}BDC\text{-}F_4}$.

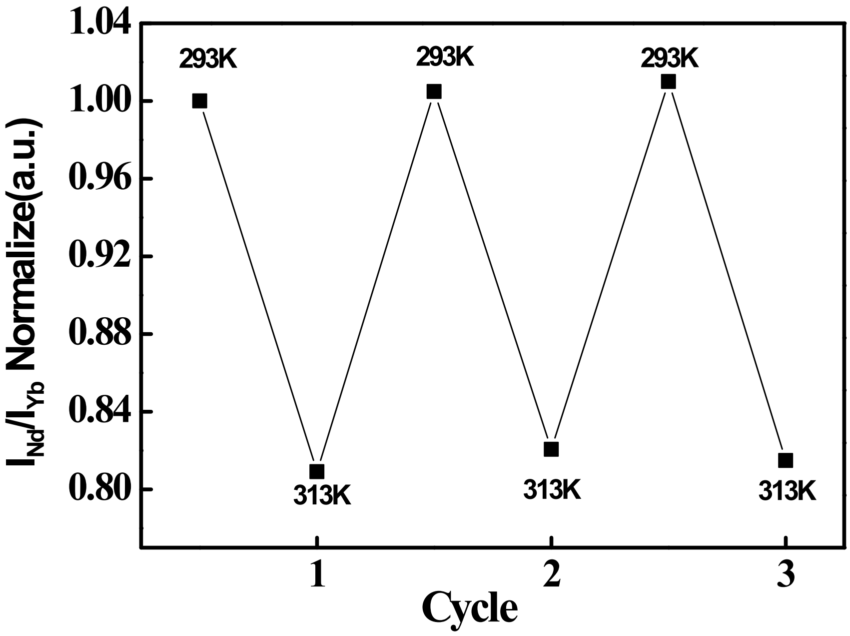


Fig. S10 The normalized intensity ratio of Nd^{3+} (1060 nm) to Yb^{3+} (980 nm) for nano-particles of **$Nd_{0.577}Yb_{0.423}$BDC-F_4** in cycles of heating and cooling