# Electronic supplementary information

## High-Precision Optical Thermometry Using $Pr^{3+}$-Doped $NaCaY(MoO_4)_3$ Luminophores: A Multi-Spectral Approach to Non-Contact Temperature Sensing

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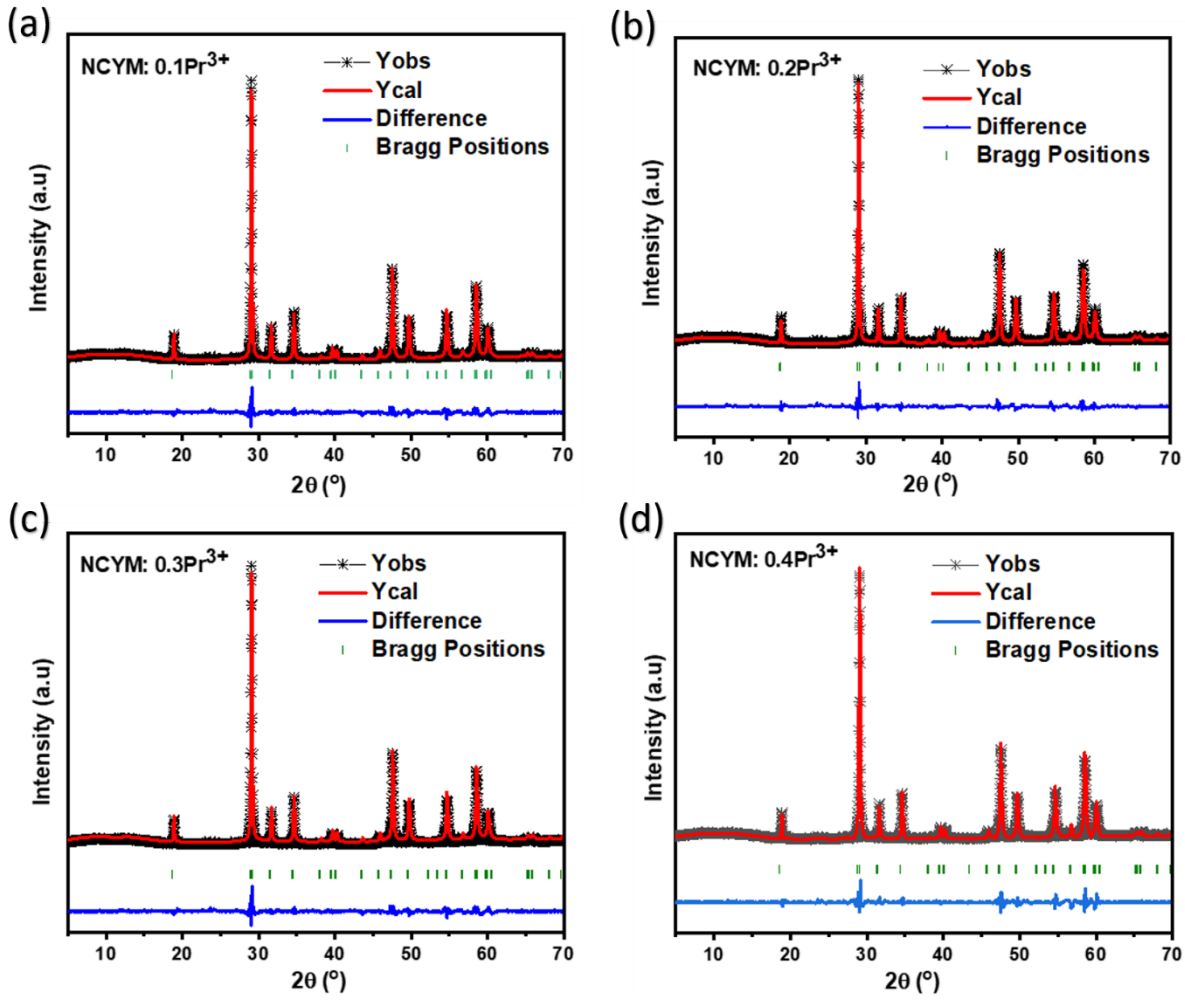
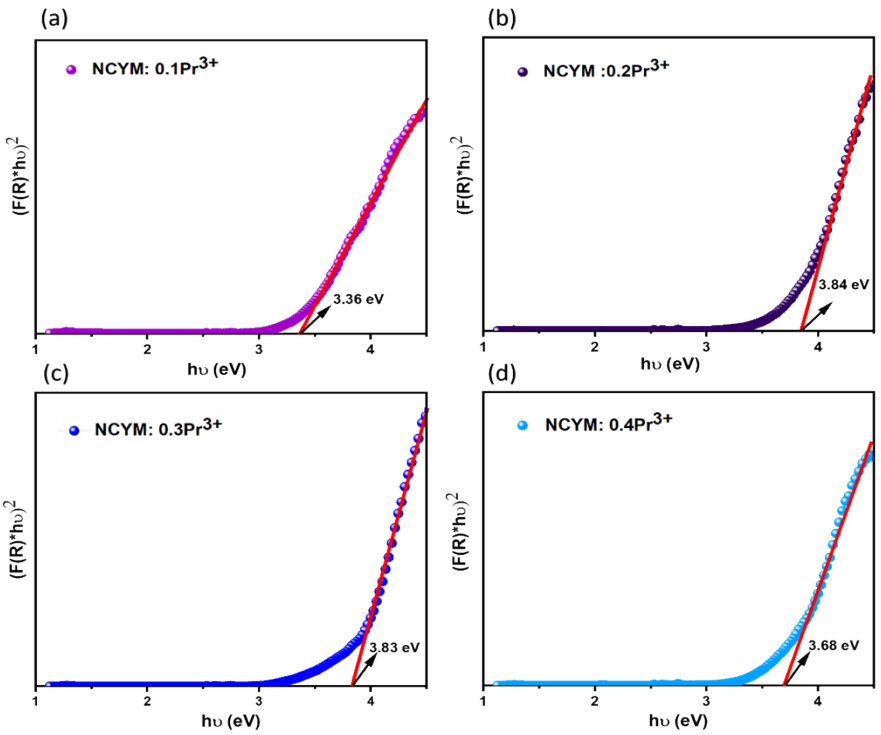
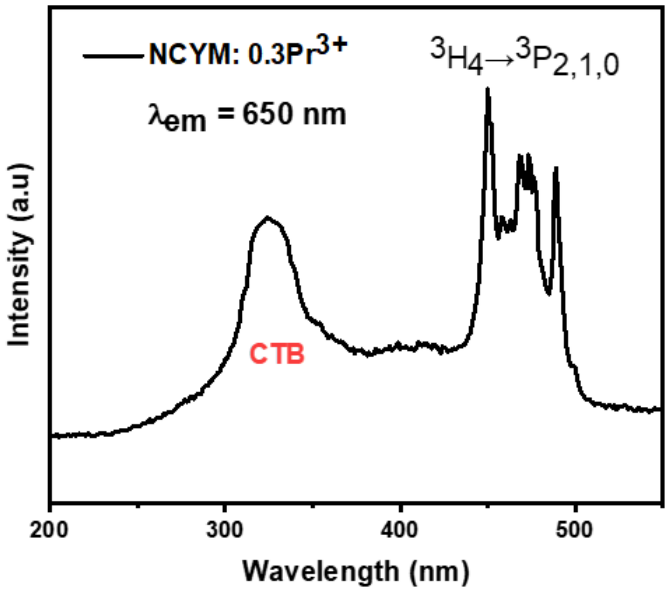


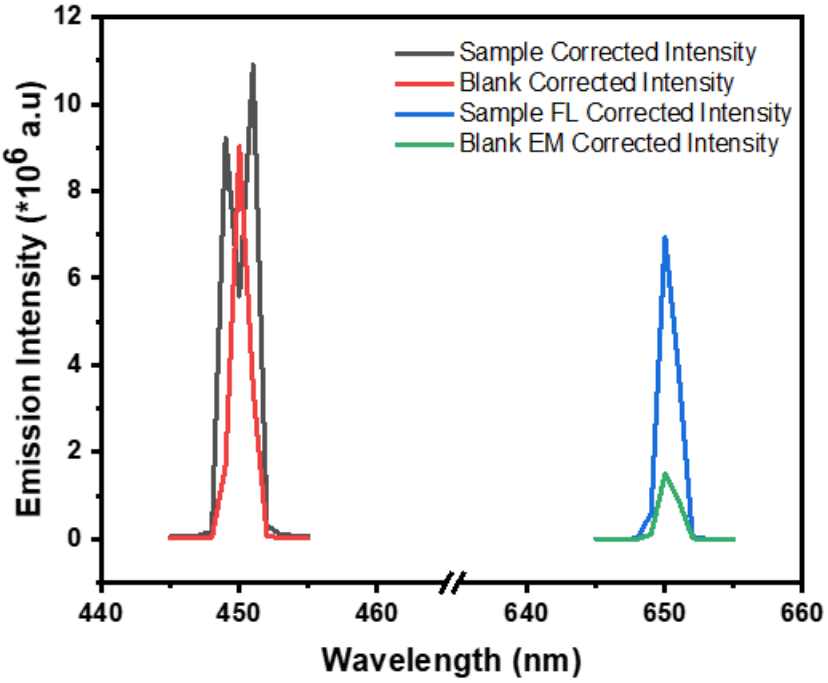

**FigureS$_1$ (a-d):** Rietveld patterns of NCYM: x$Pr^{3+}$.



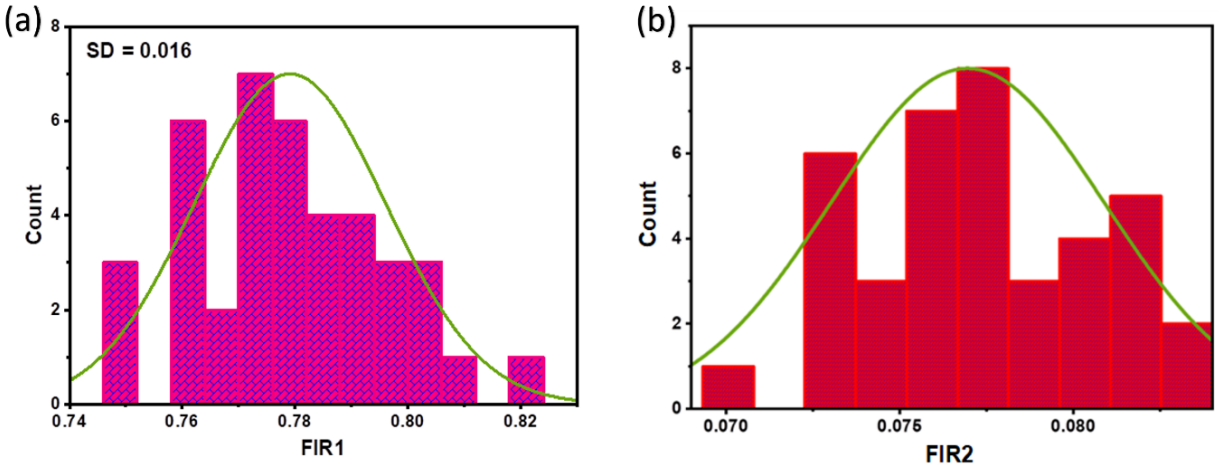

**FigureS$_2$: (a-d)** The plot of [F (R)hν]$^2$ versus (hν) of the NCYM: xPr$^{3+}$ (x= 0.1, 0.2, 0.3 and 0.4).




**FigureS$_3$:** Excitation spectrum monitored at 650 nm.




**FigureS$_4$:** absolute quantum yield of NCYM: 0.3Pr$^{3+}$.




**FigureS$_5$:** Repeatability assessment (R) (a-b) for NCYM: 0.3Pr$^{3+}$.

**TableS$_1$:** Refinement parameters of NCYM: 0.3$Pr^{3+}$ phosphor.

| **Compound** | **NCYM : 0.1$Pr^{3+}$** | **NCYM : 0.2$Pr^{3+}$** | **NCYM : 0.3$Pr^{3+}$** | **NCYM : 0.4$Pr^{3+}$** |
|---|---|---|---|---|
| Crystal system | Tetragonal | Tetragonal | Tetragonal | Tetragonal |
| Space group | $I4_1/a$ | $I4_1/a$ | $I4_1/a$ | $I4_1/a$ |
| a & b (Å) | 5.1940 | 5.1941 | 5.1942 | 5.1946 |
| c (Å) | 11.3362 | 11.3364 | 11.3365 | 11.3370 |
| $\alpha = \beta = \gamma$ | 90° | 90° | 90° | 90° |
| V (Å$^3$) | 305.82 | 305.84 | 305.85 | 305.9 |
| Rwp, % | 9.93 | 9.90 | 9.87 | 9.04 |
| $\chi$ 2 | 2.06 | 2.04 | 1.85 | 1.52 |