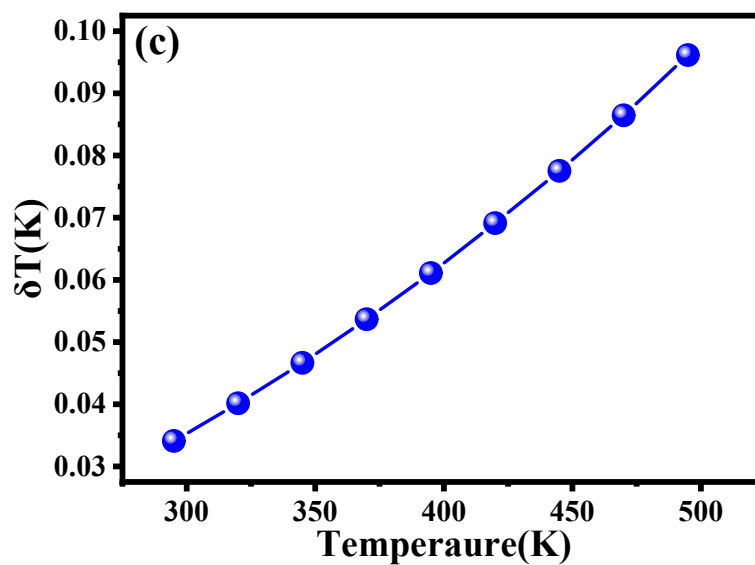
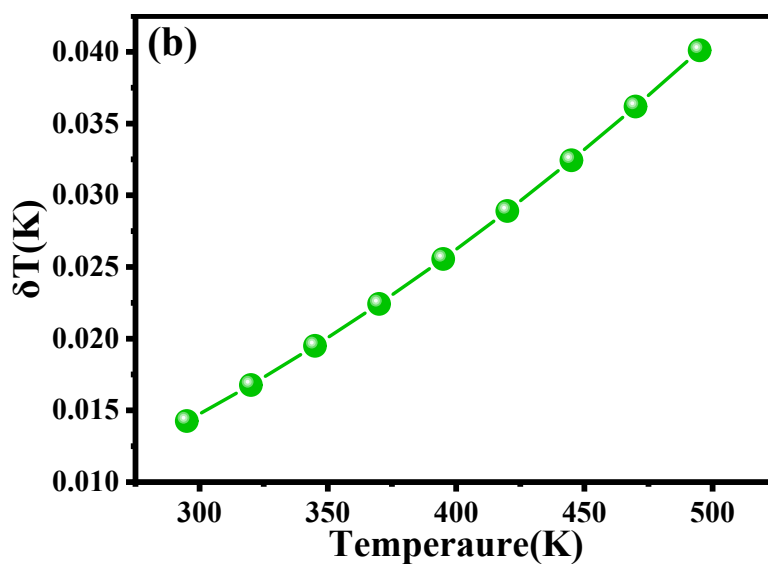
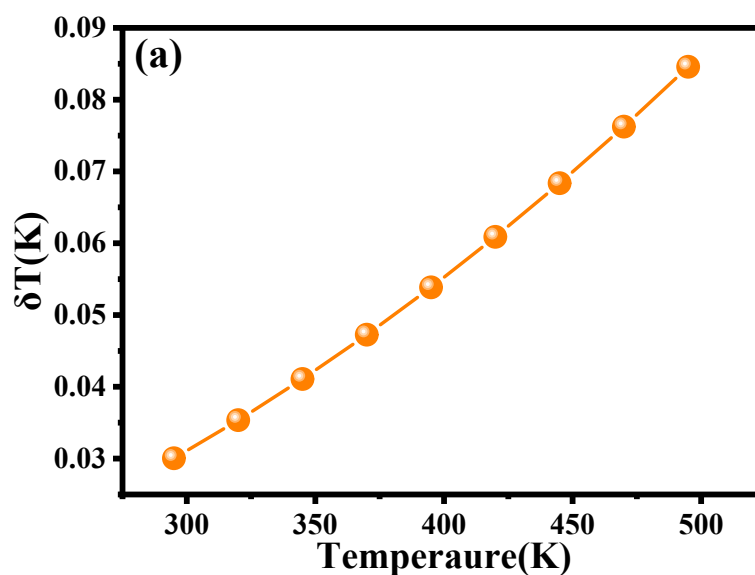


Supplementary Material 2



(a) Temperature resolution of the core-shell structure $\text{NaYF}_4: \text{Yb}^{3+}/\text{Tm}^{3+}@\text{NaYF}_4: \text{Yb}^{3+}/\text{Er}^{3+}$ nanoparticles using emission peaks 520 nm and 538 nm fluorescence intensity ratios for temperature measurement; (b) Temperature resolution of the bare core structure $\text{NaYF}_4: \text{Yb}^{3+}/\text{Tm}^{3+}$ nanoparticles using emission peaks 700 nm and 646 nm fluorescence intensity ratios for temperature measurement; (c) Temperature resolution of the bare core structure $\text{NaYF}_4: \text{Yb}^{3+}/\text{Er}^{3+}$ nanoparticles using emission peaks 520 nm and 538 nm fluorescence intensity ratios for temperature measurement.