Electronic Supplementary Material (ESI) for RSC Advances.

Gold nanoclusters based dual-emission hollow TiO_2 microsphere for ratiometic optical thermometry

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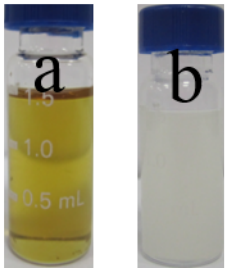

Fig S1. Photographs of resultant CDs in chloroform solution (a) and resultant CDs/TiO_2 hollow microspheres in aqueous solution (b).

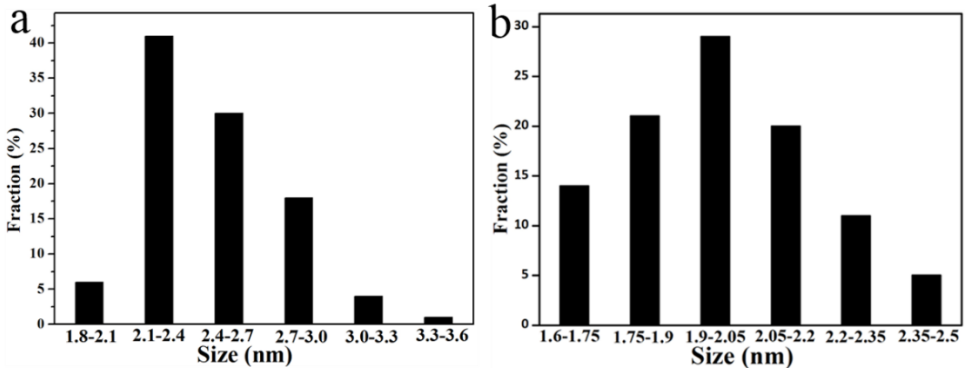

Fig S2. The size distribution of (a) CDs, the average size was 2.5 nm; (b) AuNCs, the average size was 2.1 nm

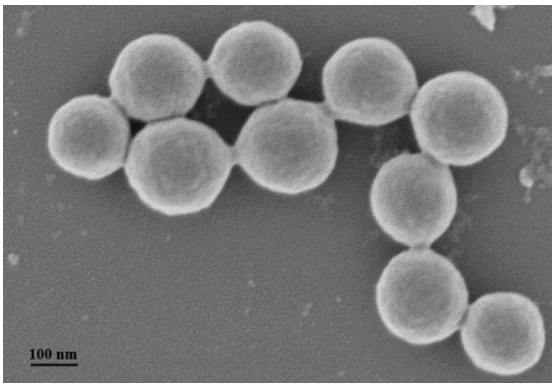

Fig S3. SEM image of resultant CDs/TiO_2 hollow microspheres

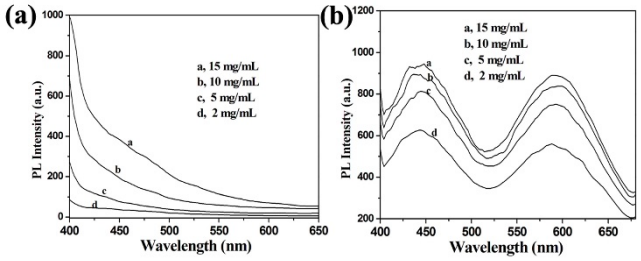

Fig S4. Fluorescence spectra of (a) TiO_2 microspheres and (b) dual-emission fluorescent hollow microspheres at various concentrations.

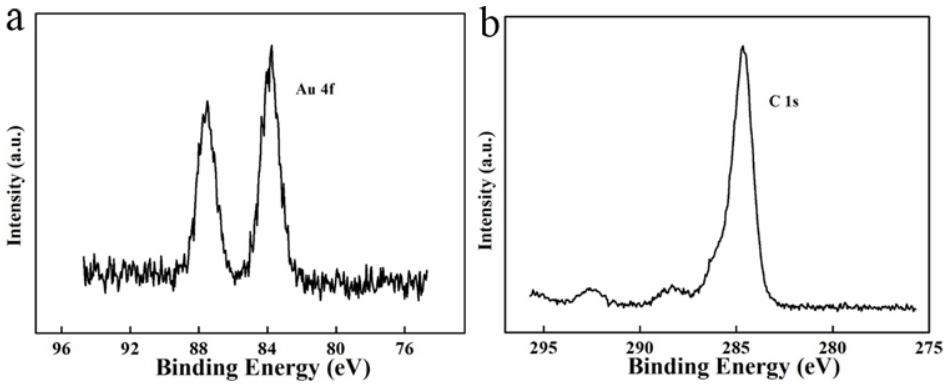

Fig S5. X–ray photoelectron spectroscopy (XPS) spectra show the binding energy of Au 4f (a) and C 1s (b) of dual-emission nanosensor.

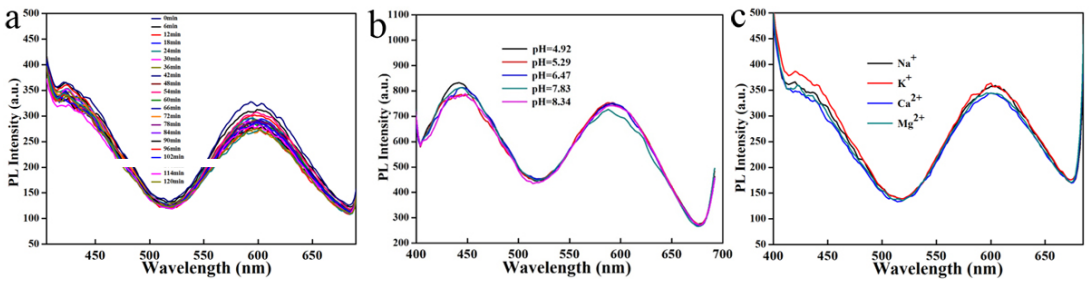

Fig S6. The fluorescent stability of dual-emission fluorescent nanosensor: a, photo-stability of as-prepared nanosensor radiated by a 450 W Xe light at various time; b, the pH stability of nanosensor in various pH values; c, the metal stability of nanosensor in various metal ions with the concentration of 200 mM.

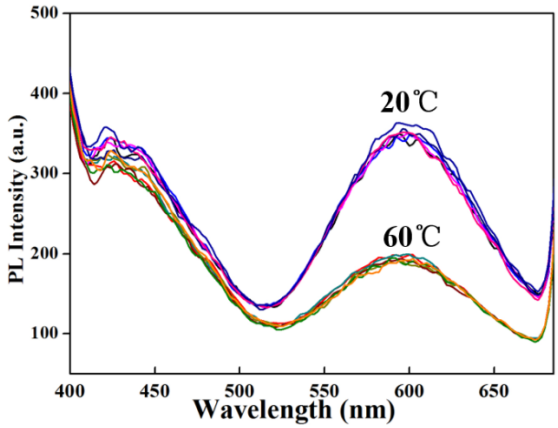

Fig S7. PL intensity upon the cyclic switching of dual-emission fluorescent nanosensor under alternating conditions between 20 °C and 60 °C.

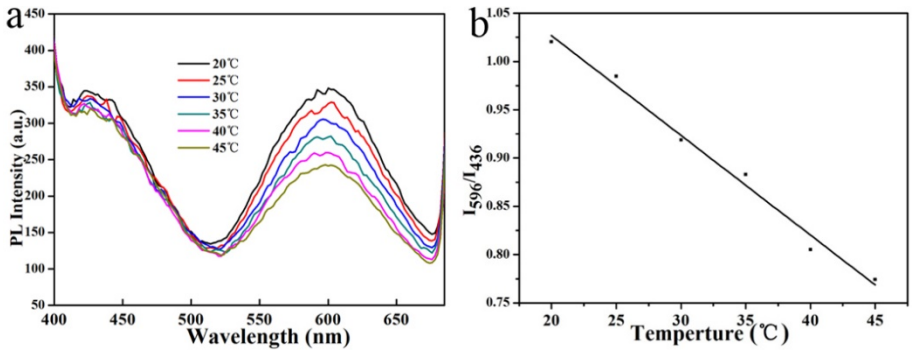

Fig S8. a, Fluorescence emission spectra of dual-emission nanosensor for various temperatures in the range 20 °C to 45 °C (top to bottom) in the PBS solution (pH=7.4); b, the ratio of the intensity at 596 nm and 436 nm (I_{596}/I_{436}) is plotted versus temperature.