Supporting Information

A ratiometric fluorescence nanosensor for highly selective and sensitive detection of selenite

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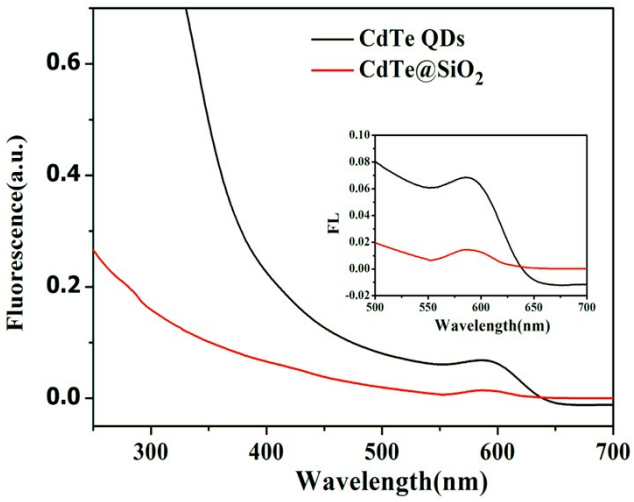

Fig. S1 Absorption spectra of CdTe QDs and CdTe@SiO_2. Inset: the enlarged drawing between 500-700nm. The measurements were operated in 6:4 isopropanol/H_2O solutions.

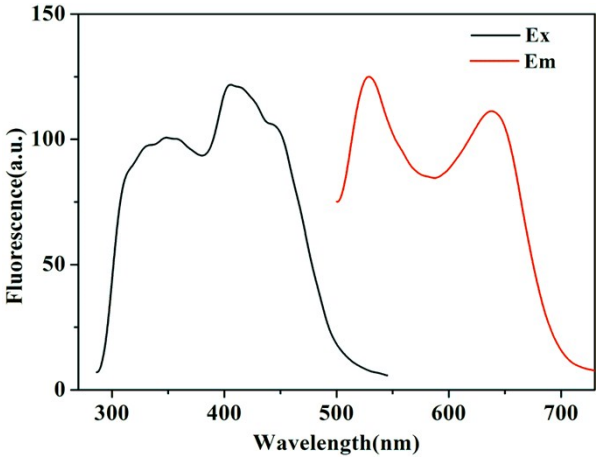

Fig. S2 Excitation spectrum of Se-DAB (black line) and the emission spectrum of Se-nanosensor (red line), excited at 415nm. The measurements were operated in 6:4 isopropanol/H_2O solutions.

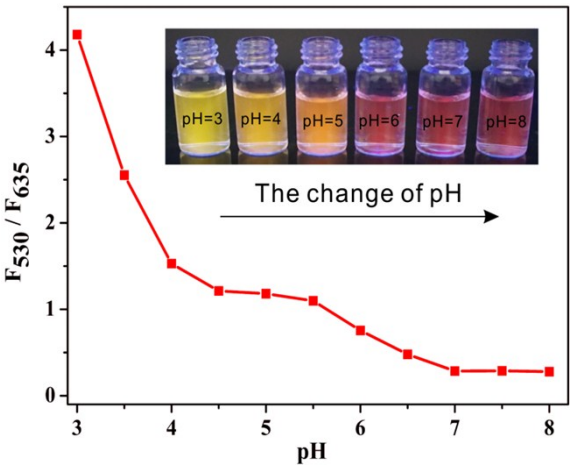

Fig. 3 The effect of different pH on the fluorescence intensity ratio of the Se-nanosensor. The inset images are their corresponding fluorescence images taken under a UV lamp (365 nm).

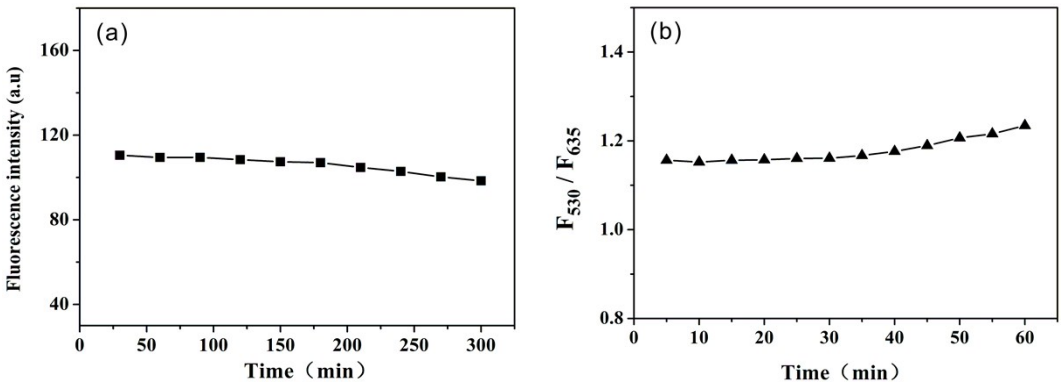

Fig. S4 (a) The stability of the DAB-CdTe@SiO_2 QDs nanosensor in the acetic acid-sodium acetate buffer solution (pH=4.5, 0.02M). (b) Fluorescence intensity ratio (F_{530}/F_{635}) of the nanosensor under consecutive irradiation for 60 min. The measurements were operated in 6:4 isopropanol/H_2O solutions.

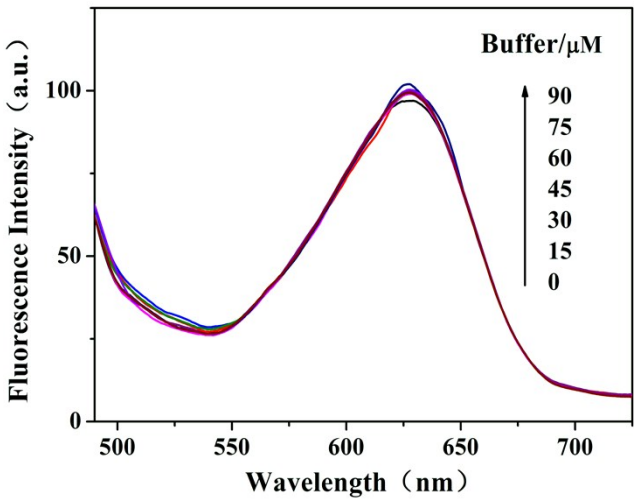

Fig. S5 The fluorescence response of the ratiometric nanosensor upon the addition of different concentration of acetic acid-sodium acetate buffer solution.

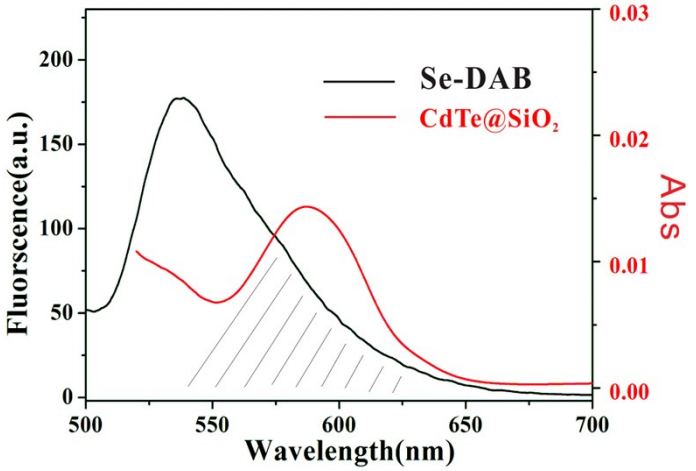

Fig. S6 Absorption spectrum of CdTe@SiO_2 QDs (red line) and emission spectrum of Se-DAB (black line), excited at 415nm. The measurements were operated in 6:4 isopropanol/H_2O solutions.

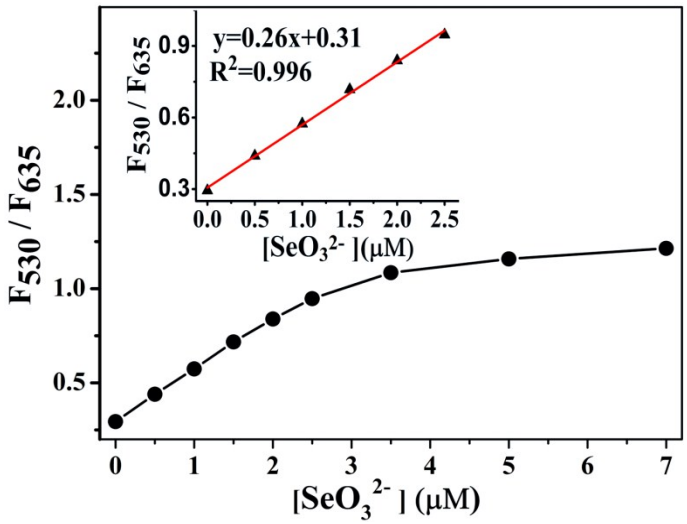

Fig. S7 Plot of fluorescence intensity ratio of F_{530}/F_{635} versus the concentration of SeO_3^{2-}. Inset: linearity of the F_{530}/F_{635} with respect to the SeO_3^{2-} concentration over the range of 0-2.5μM.

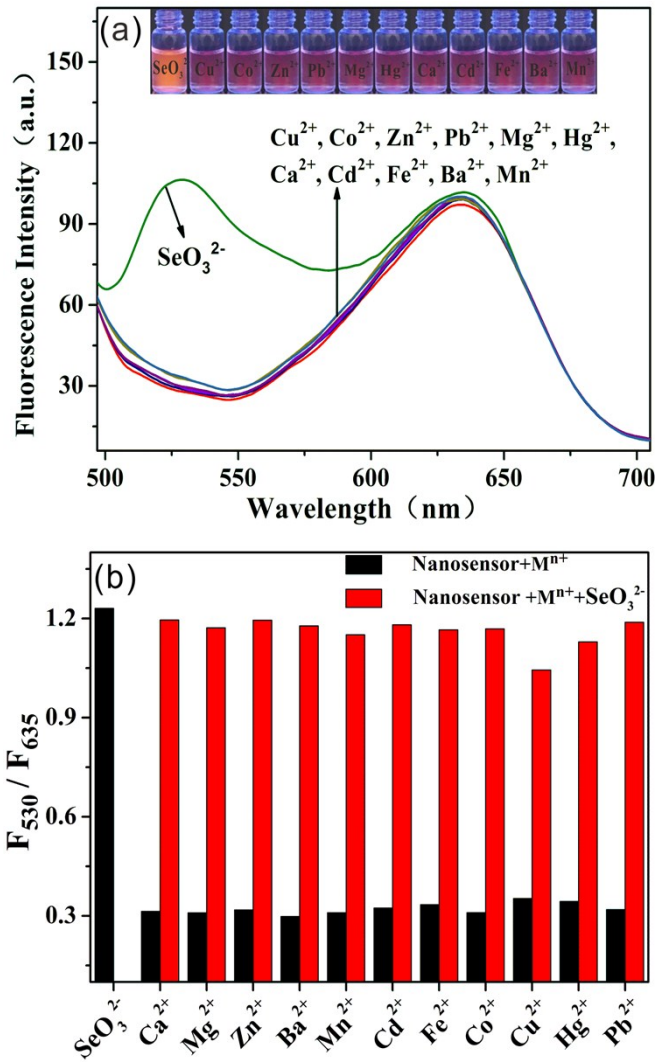

Fig. S8 (a) Fluorescence response of the ratiometric nanosensor to different metal ions (10μM for all ions, excitation at 415nm). The inset images were taken under a 365nm UV lamp. (b) The selectivity of the ratiometric nanosensor to various common metal ions. The black bars represent addition of different metal ions at 10μM, and the red bars represent the change of emission occurred following the subsequent addition of 10μM of Se (IV) to the above solutions

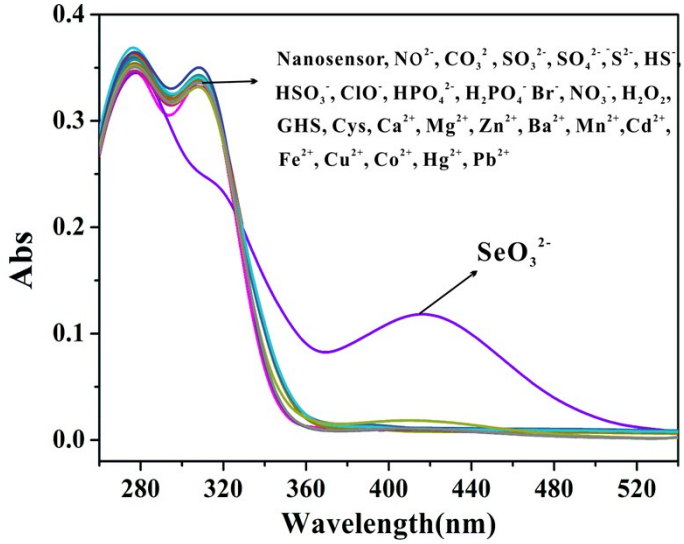

Fig. S9 Absorption spectra of nanosensor with various interference substances (3 μM) in isopropanol and water (v/v = 6/4).

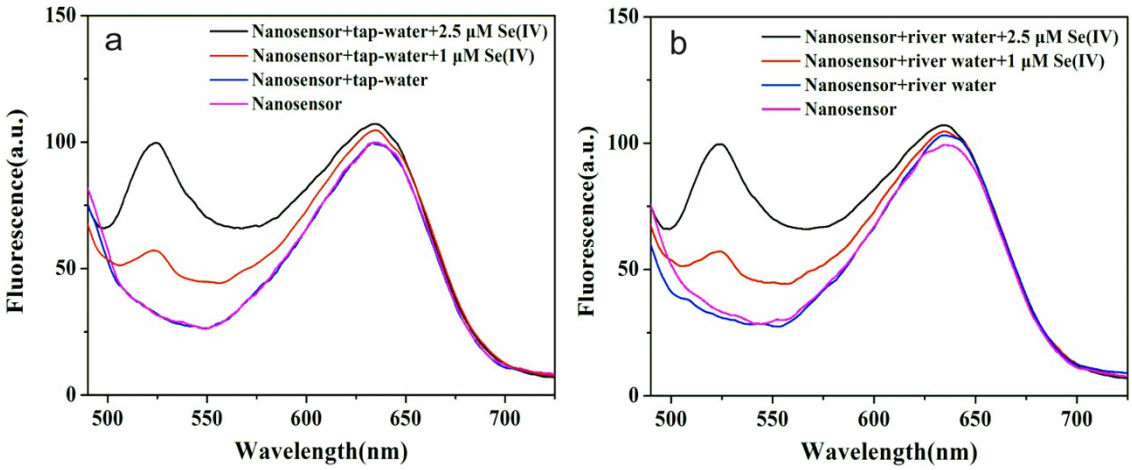

Fig. S10 (a) The fluorescence spectra of the recovery test in tap water. (b) The fluorescence spectra of the recovery test in Yangtze River water.