# Electronic Supplementary Information

# A single nanofluorophore "turn on" probe for highly sensitive visual determination of environmental fluoride ions

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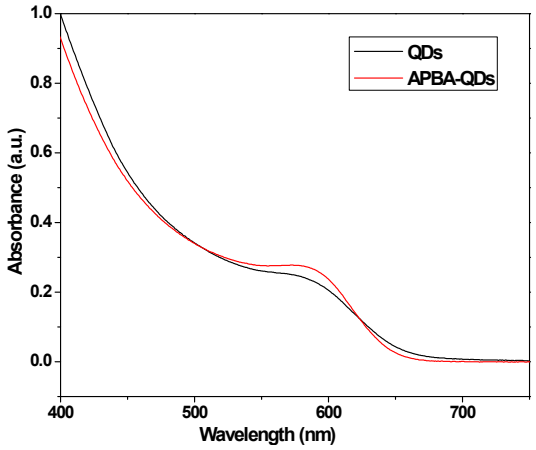


**Fig. S1** Absorption spectra of CdTe QDs (black) and APBA-QDs (red). Solution were prepared in 10 mM PBS buffer (pH=7.4).

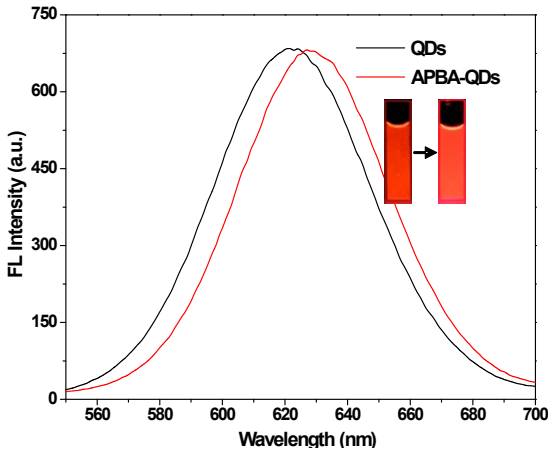


**Fig. S2** The fluorescence emission spectra of CdTe QDs (black) and APBA-QDs (red). Inset photographs of CdTe QDs (left) and APBA modified QDs (right) in aqueous solution were taken under a 365 nm UV lamp.

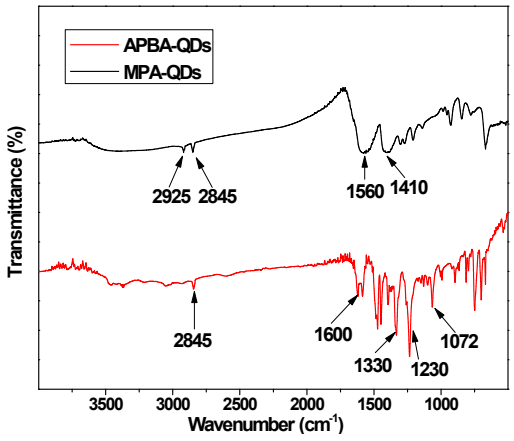


**Fig. S3** The FT-IR spectra of MPA-QDs (black) and APBA-QDs (red).

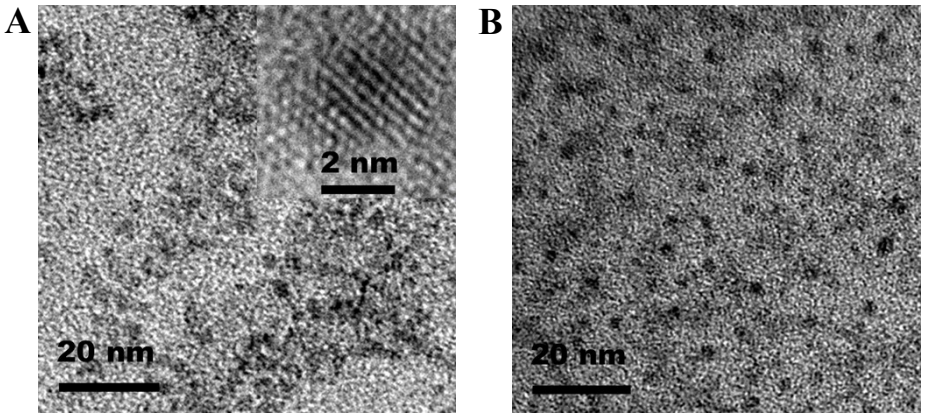


**Fig. S4** TEM images of (A) the QDs (inset: the corresponding HR-TEM image) and (B) the modified completely nanoprobe.

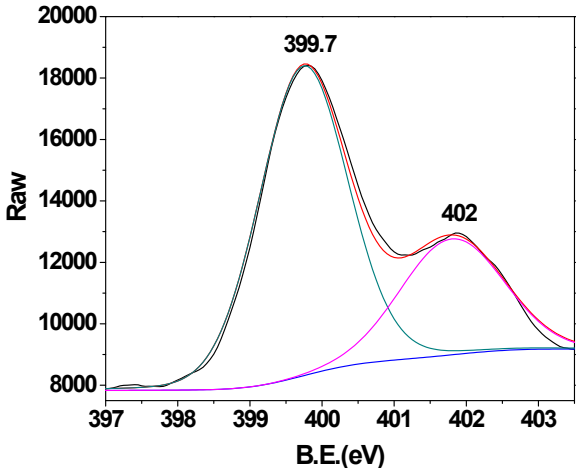


**Fig. S5** XPS spectrum of the as-prepared APBA modified CdTe QDs. In detail, 399.7 and 402 eV were attributed to N 1s binding energies of N-C and N-H of amide groups, respectively.

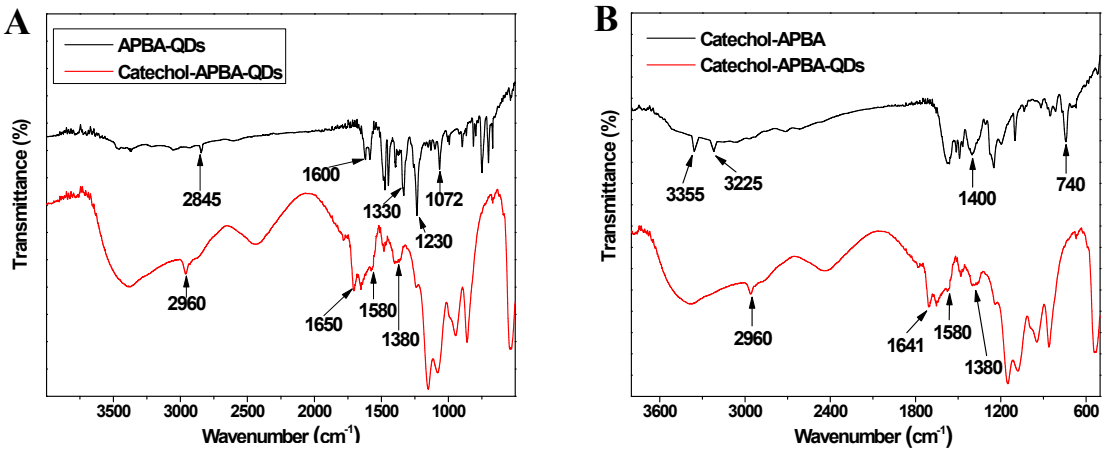


**Fig. S6** (A) The FR-IT spectrum of APBA-QDs (black) and catechol-APBA-QDs (red). (B) The FR-IT spectrum of catechol-APBA (black) and catechol-APBA-QDs (red).

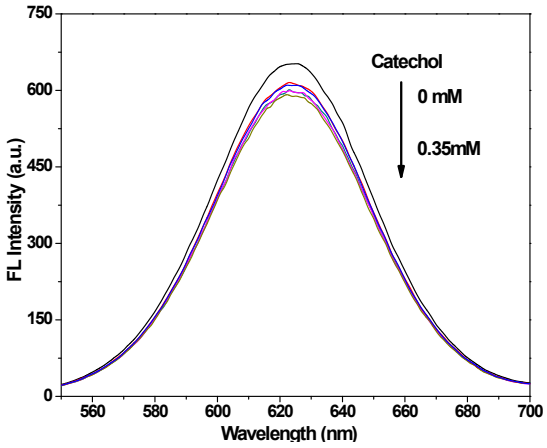


**Fig. S7** The fluorescence spectra of the unmodified CdTe QDs solution with the addition of catechol.

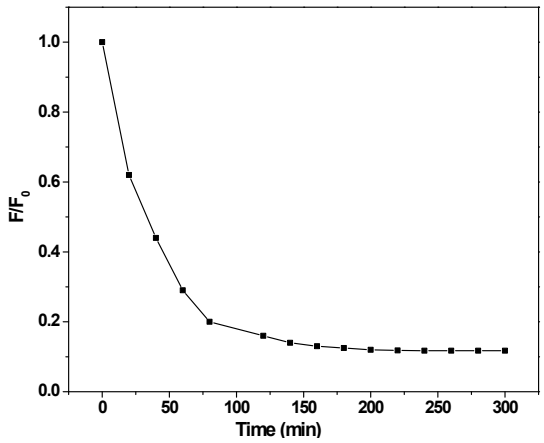


**Fig. S8** The kinetics of fluorescence quenching of the APBA-QDs aqueous solution. The fluorescence quenching efficiency ($F/F_0$) of APBA-QDs via time with addition of 0.35 mM catechol (relative fluorescence intensities are represented as $F/F_0$, while $F_0$ and F correspond to the fluorescence intensity before and after the addition of catechol, respectively).

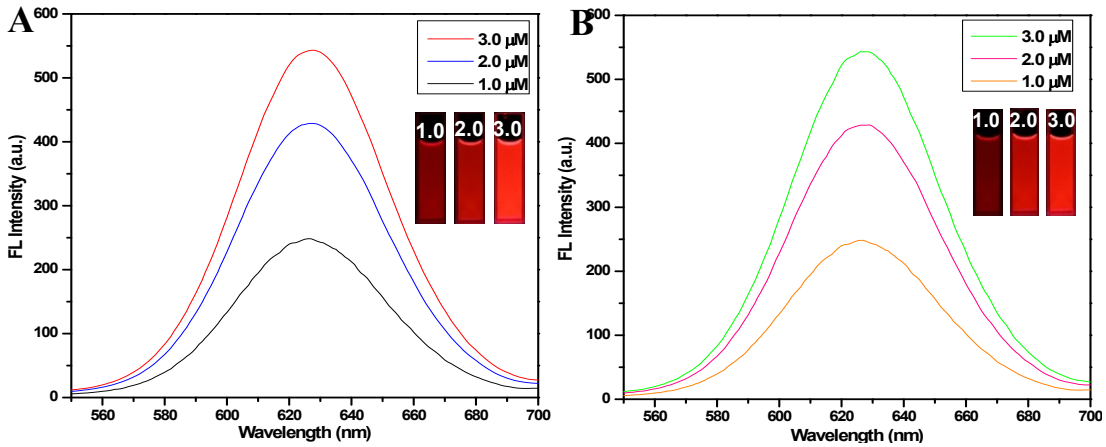


**Fig. S9** The fluorescence spectra of the nanoprobe with the addition of the lap water (A) and lake water (B) which spiked with $F^-$ (1.0 μM, 2.0 μM, 3.0 μM). The inset photographs, corresponding to the three different concentrations of $F^-$, were taken under a 365 nm UV lamp.