Supplementary Material

Sensitive detection of cadmium ion based on a quantum dots-mediated fluorescent visualization sensor

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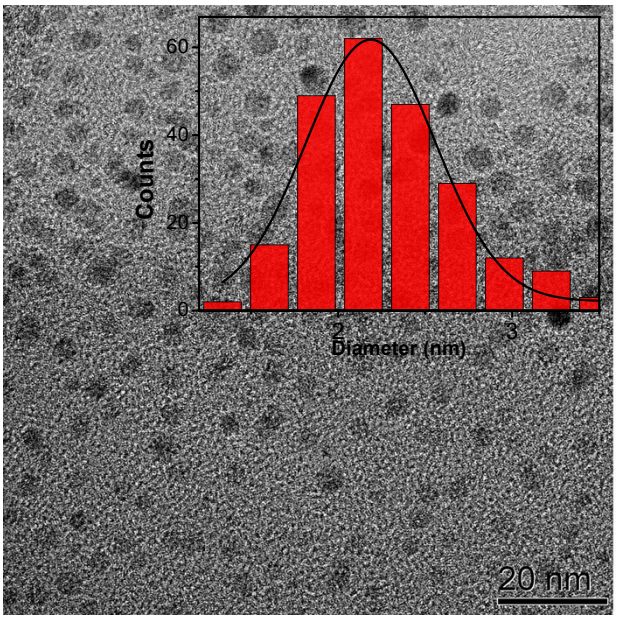

Fig. S1. TEM image of CQDs.

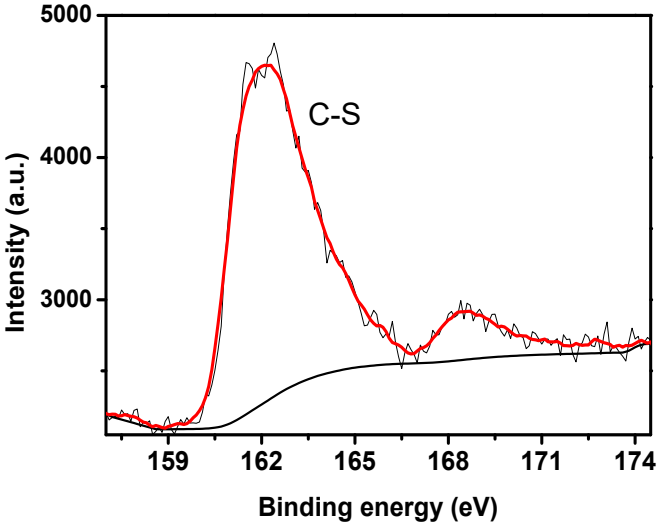

Fig. S2 High-resolution XPS spectrum of CdTe QDs in the S2p region.

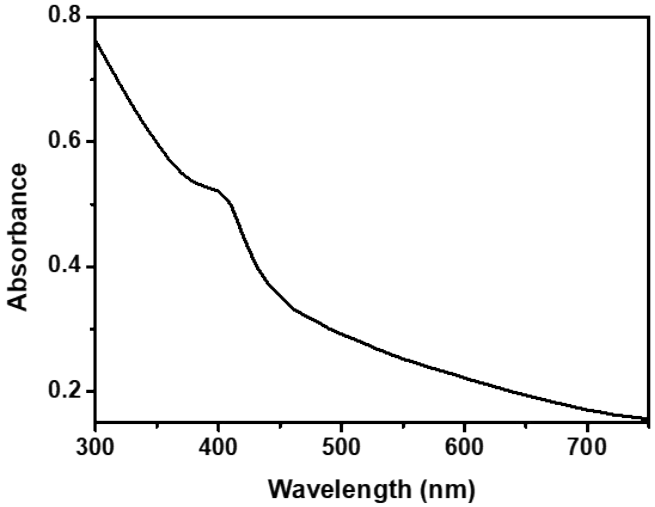

Fig. S3. UV–vis absorption spectrum of CdTe QDs.

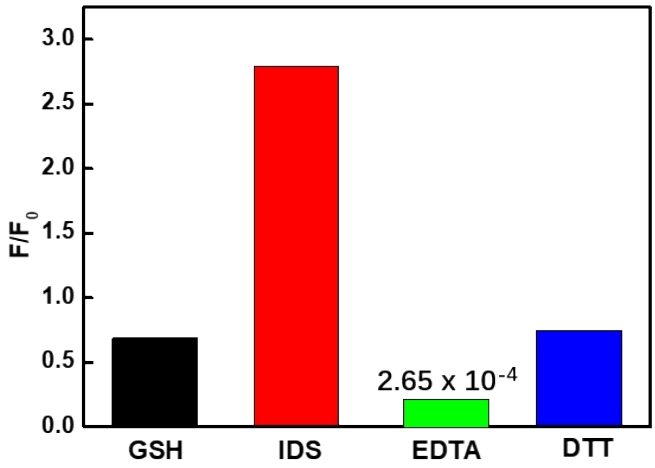

Fig. S4 The quenching effect of different quenching agents, where F_0 and F represent FL intensity of CdTe QDs in absence and presence of different species.

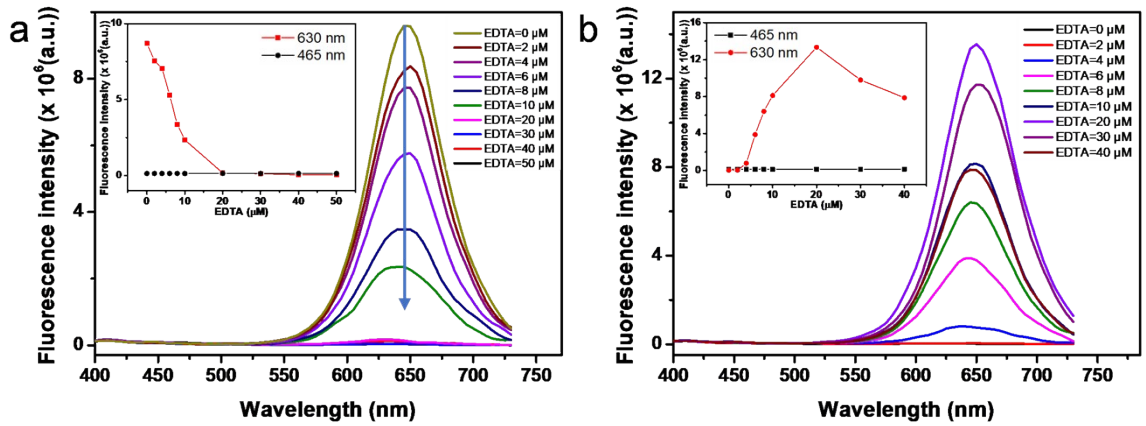

Fig. S5 The concentration effect of EDTA on the intensity of CQDs/CdTe QDs system in the absence(a) and presence(b) of Cd^{2+} (the inset showed the fluorescence intensity of CQDs(black)and CdTe QDs(red) under various concentration of EDTA).

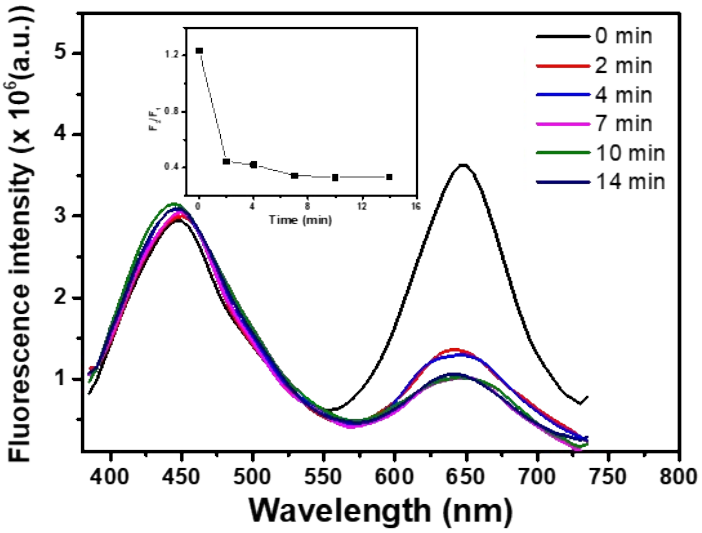

Fig. S6 Fluorescence intensity of CQDs/CdTe QDs system with EDTA (20 μM) under different etching time. The inset is the curve of F_2/F_1 versus etching time, where F_2 and F_1 represented FL intensity of CdTe QDs and CQDs, respectively.

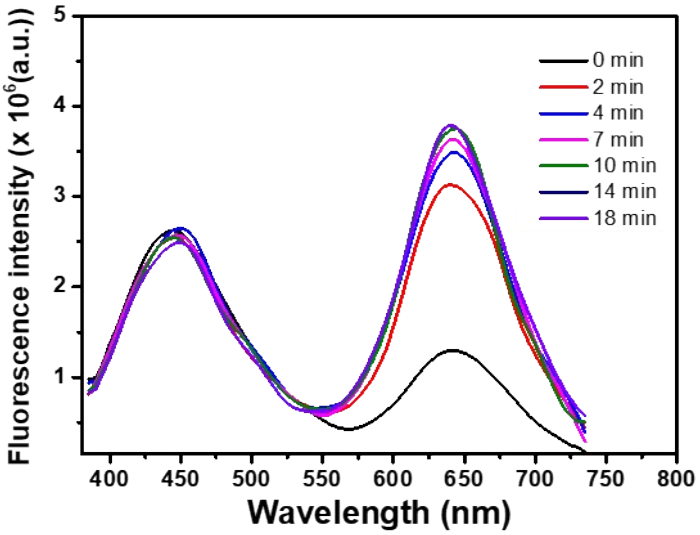

Fig. S7 Fluorescence intensity of EDTA-etched CQDs/CdTe QDs system in the presence of Cd^{2+} (10 μM) under different recovering time.

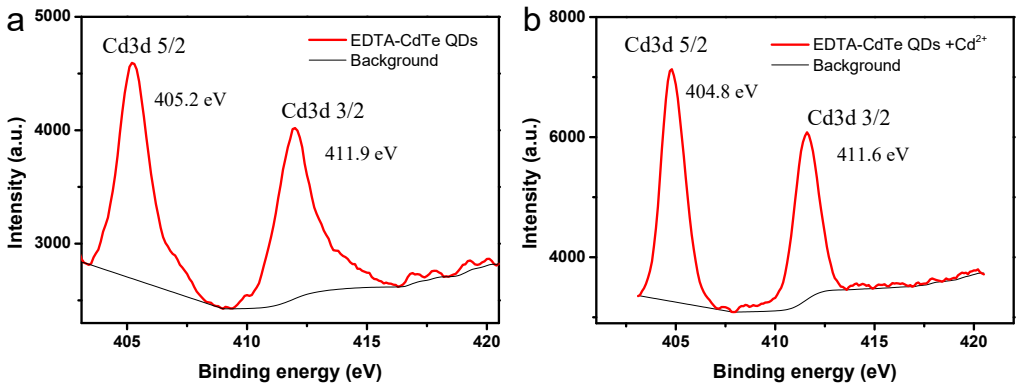

Fig. S8 The Cd 3d spectrum of EDTA-etched CdTe QDs before (a) and after (b) reacting with Cd^{2+}.

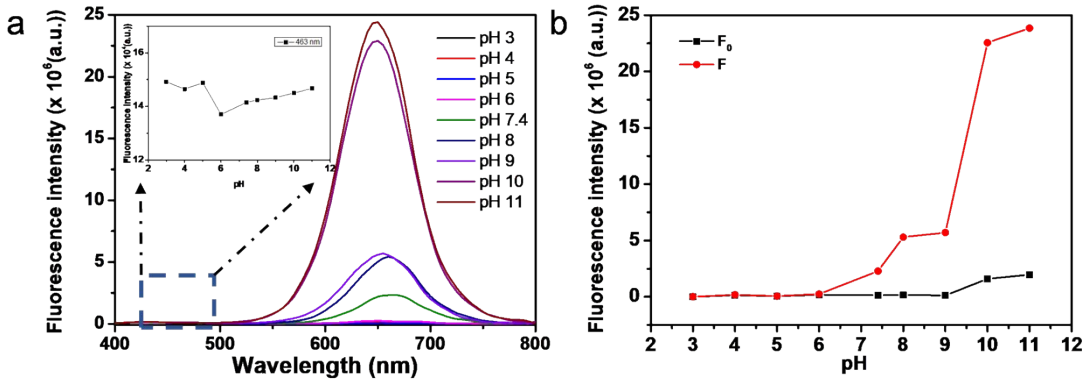

Fig. S9. (a) Fluorescence spectra of CQDs/CdTe QDs system under different pH (the inset showed the fluorescence intensity of CQDs) (b) Fluorescence intensity of CdTe QDs around 630 nm in absence(F_0) and presence(F) of Cd^{2+}.

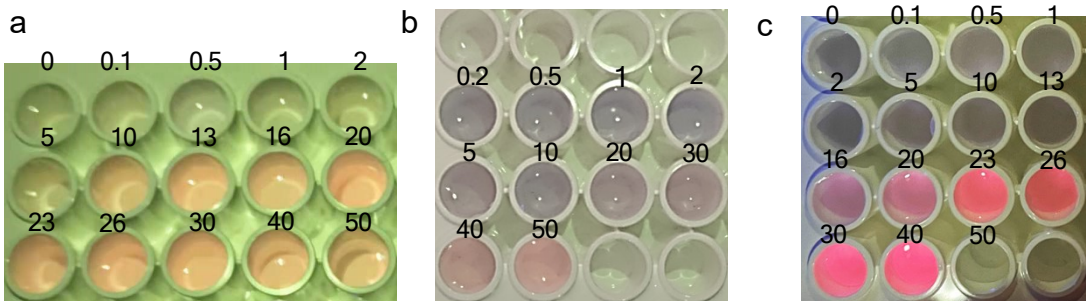

Fig. S10. Images of CQDs/CdTe QDs system under different volume ratio in the presence of different concentration of Cd^{2+} under 365 nm UV lamp (a) CQDs =0, (b) CQDs : CdTe QDs =1:1.5, (c) CQDs : CdTe QDs =1:25.

Table S1. Relative atomic percent of each element of CdTe QDs.

Name	Peak (eV)	Atomic (%)
S(2p)	162.02	17.14
C(1s)	284.99	60.54
O(1s)	351.19	1.12
Cd(3d)	404.91	18.2
Te(3d)	575.70	3.00

Table S2 Comparison of the sensing performance of some fluorescent sensors for Cd^{2+} detection.

Probe	Signal pattern	Linear range (μM)	LOD (μM)	With smartphone	Ref.
MPA–CdTe QDs	Single-emission	1.3–25	0.5	No	1
TGb–CdSe QDs	Single-emission	1.0–22	0.32	No	2
L-Cys–CdTe NPs	Single-emission	0.4–15.4	0.13	No	3
InP nanocrystals	Single-emission	0.2–10	0.11	No	4
N, P-CDs	Single-emission	0.5–12.5	0.16	No	5
CdTe@CdS QDs	Single-emission	0.05–9	0.032	No	6
GO/AuNCs	Dual-emission	0-50	0.033	Yes	7
CuNCs@SiO2- CdTe QDs	Dual-emission	0.09-18	0.01	Yes	8
CQDs/CdTe QDs	Dual-emission	0.1-23	0.018	Yes	This work

Table S3. Comparison of the sensing performance of different methods for Cd^{2+} detection.

Samples	FL method (μM)	AAS method (μM)
GBW100348	4.28	4.06

References

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