Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C.

Electronic Supplementary Information

Highly luminescent nitrogen-doped carbon quantum dots as effective fluorescent probes for mercuric and iodide ions

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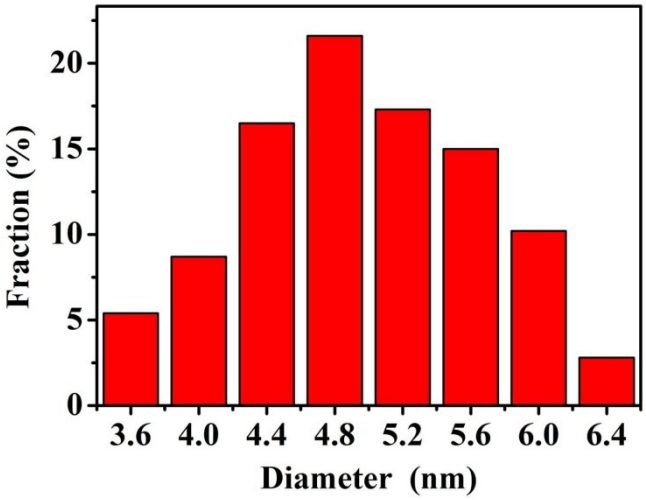

Fig. S1 The size distribution of N-CQDs.

Table S1. Elemental analysis of N-CQDs

	C (%)	H (%)	N (%)	O (%)	Composition
N-CQDs	47.8	8.0	19.0	25.2	$C_{4.0}H_{8.0}O_{1.6}N_{1.4}$

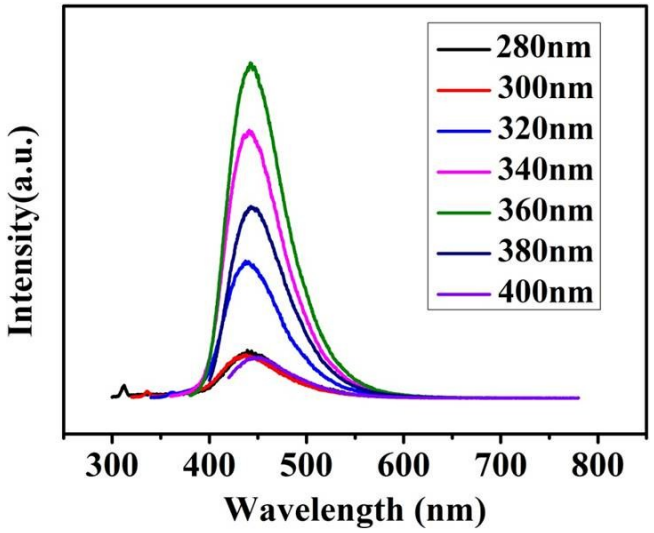

Fig. S2 Fluorescence spectra of N-CQDs. (The strongest emission was observed at 445 nm excited at 360 nm.)

QY measurements

The QY (Φ) of N-CQDs was determined with quinine sulfate (QY = 54% in 0.1 M H_2SO_4) as the reference.

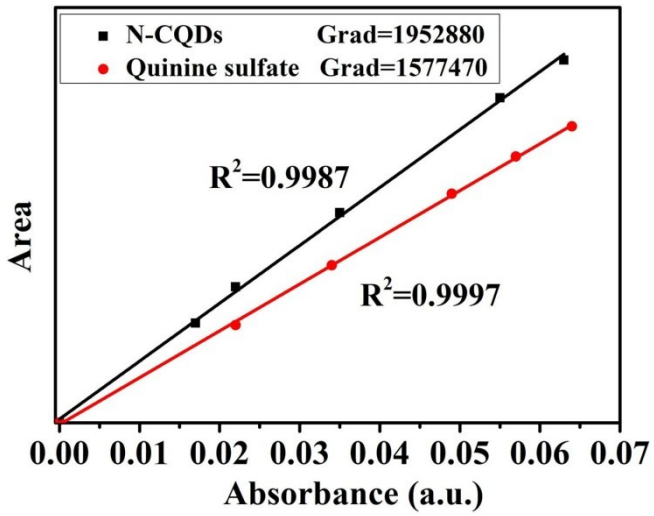

Fig. S3 The relationship between the fluorescence intensity and the absorbance of Quinine sulfate (red) and N-CQDs (black). The QY of N-CQDs was calculated to be 66.8%.

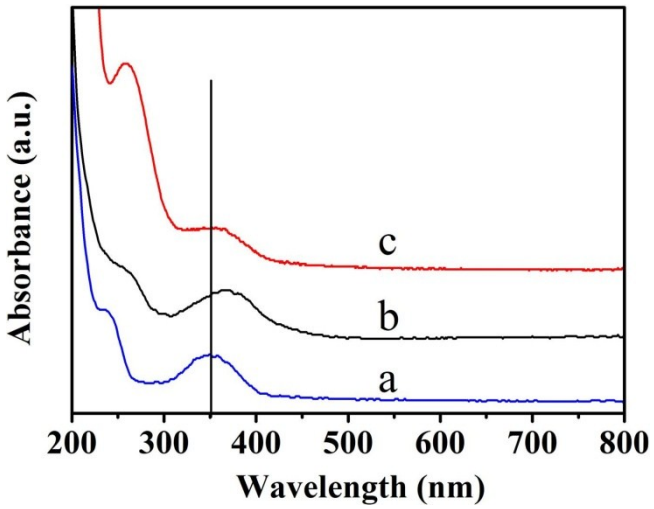

Fig. S4 UV-Vis absorption spectra of N-CQDs (a), N-CQDs-Hg^{2+} (b), and N-CQDs-Hg^{2+}-I^- (c).

Fluorescence lifetime measurements

Fluorescence lifetimes were measured by the time-correlated single-photon counting technique. Measurements were carried out at λ_{ex} = 340 nm and λ_{em} = 445 nm. The fluorescence decay curves of N-CQDs were fitted with double exponential functions.

Table S2 Fluorescence lifetimes of N-CQDs, N-CQDs in the presence of Hg^{2+}, and N-CQDs-Hg^{2+} in the presence of I^-.

system	1			2			τ_{avg} (ns)
	τ_1 (ns)	A_1	Percentage (%)	τ_2 (ns)	A_2	Percentage (%)	
N-CQDs	2.91	0.02858	4.08	15.30	0.1280	95.92	14.79
N-CQDs-Hg^{2+}	3.03	0.07432	18.69	10.10	0.0972	81.31	8.77
N-CQDs-Hg^{2+}-I^-	1.17	0.04800	2.87	14.80	0.1278	97.13	14.43

τ_1 and τ_2 refer to the short and long lifetime of N-CQDs, respectively.