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Electronic Supplementary Information

Hydrothermal Synthesis of Blue-Emitting Silicon Quantum Dots for Fluorescent Detection of Hypochlorite in Tap Water

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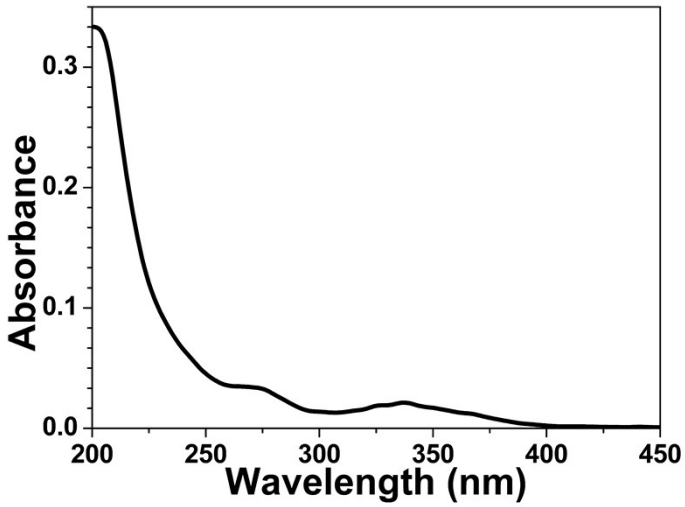

Fig. S1 UV-vis absorption spectrum of SiQDs.

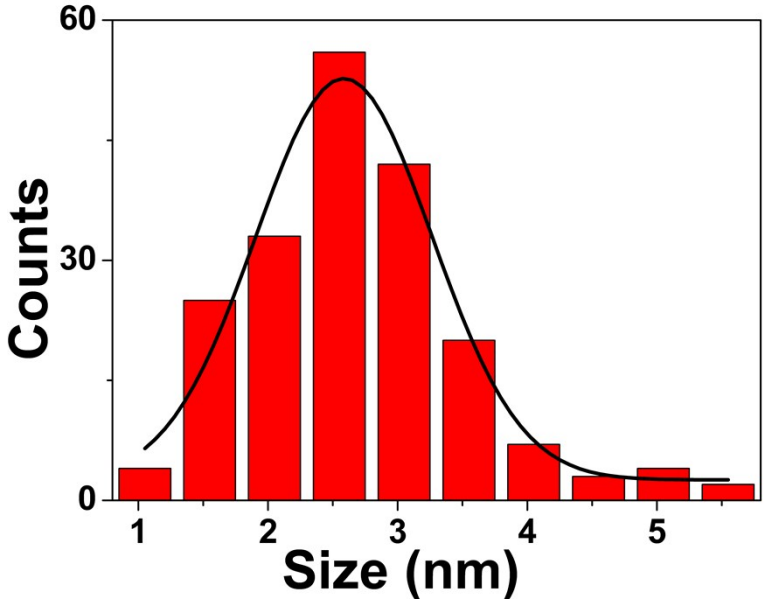

Fig. S2 The size distribution analysis of SiQDs based on TEM images.

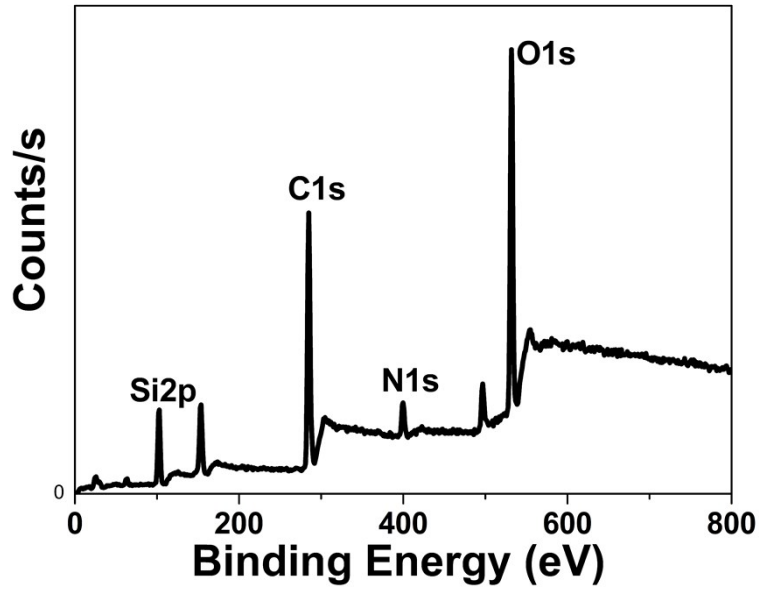

Fig. S3 XPS spectrum of SiQDs.

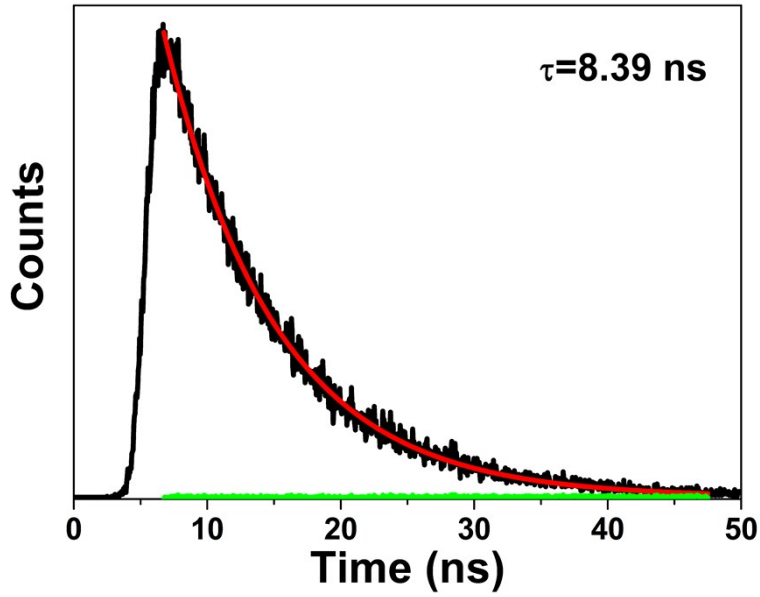

Fig. S4 Fluorescence lifetime test of SiQDs (The excitation wavelength is 345 nm, and the emission wavelength is 440 nm.).

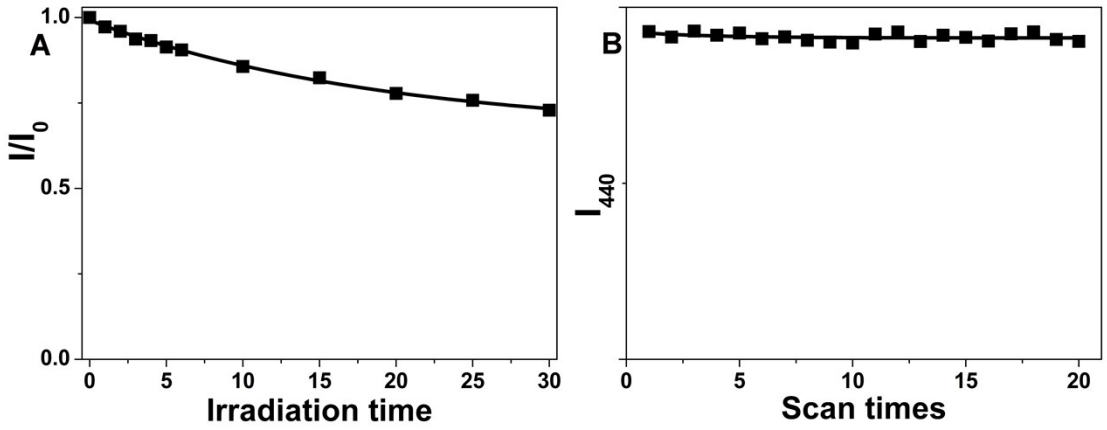

Fig. S5 (A) The plot of I/I_0 of SiQDs versus the irradiation time of the light at 365 nm, I_0 and I is the fluorescence intensity of SiQDs at the irradiation time of 0 min and other time, respectively. (B) The plot of I_{440} of SiQDs versus the scan times (performed in pH 8.0, 50 mM sodium phosphate buffer; excitation wavelength is 345 nm.).

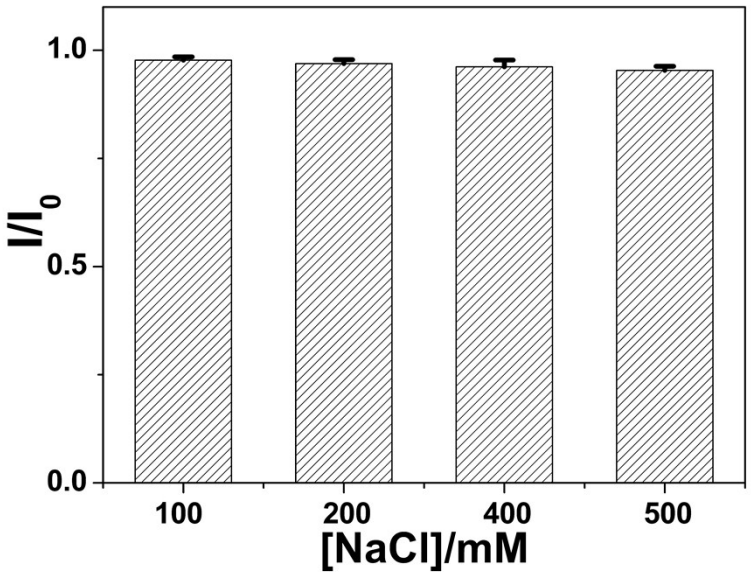

Fig. S6 The relative fluorescence intensity (I/I_0) of SiQDs versus the concentration of NaCl (performed in pH 8.0, 50 mM sodium phosphate buffer; I_0 and I are the fluorescence intensity of SiQDs in the absence and presence of NaCl; excitation wavelength is 345 nm.).

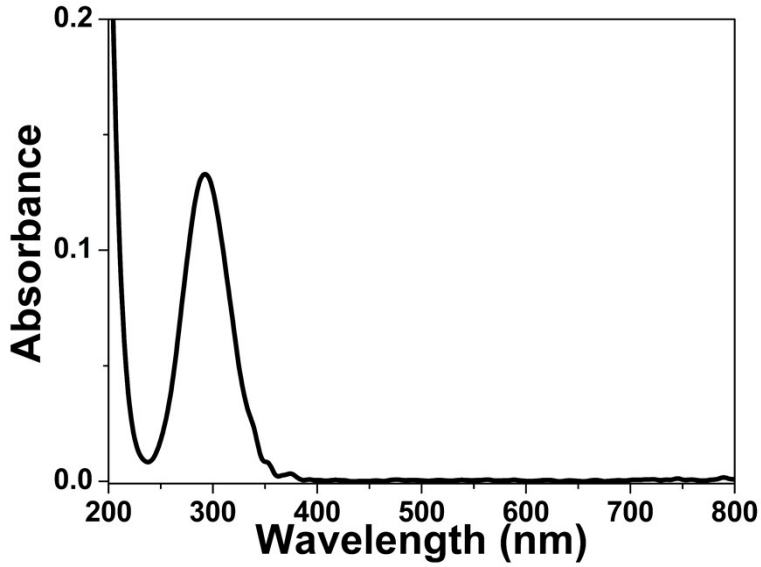

Fig. S7 UV-vis absorption spectrum of ClO^-.

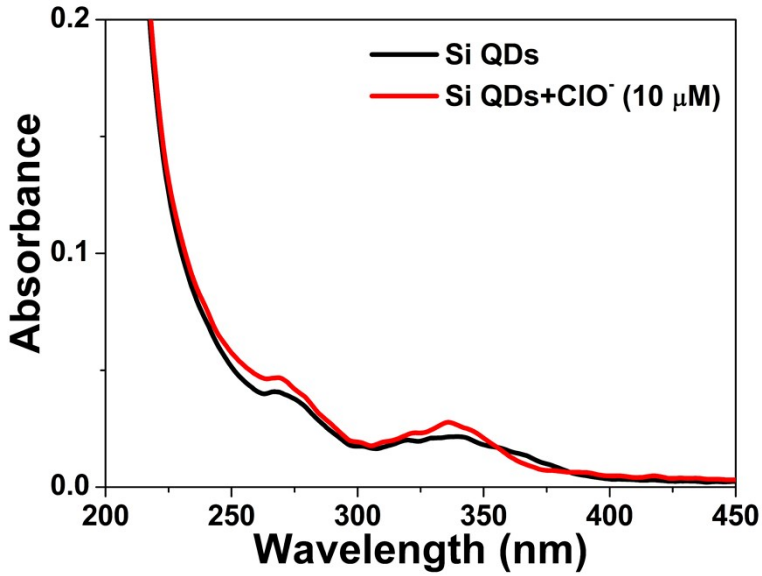

Fig. S8 UV-vis absorption spectra of SiQDs in the absence and presence of ClO^- (performed in pH 8.0, 50 mM sodium phosphate buffer; the concentration of ClO^- is 10 μM).

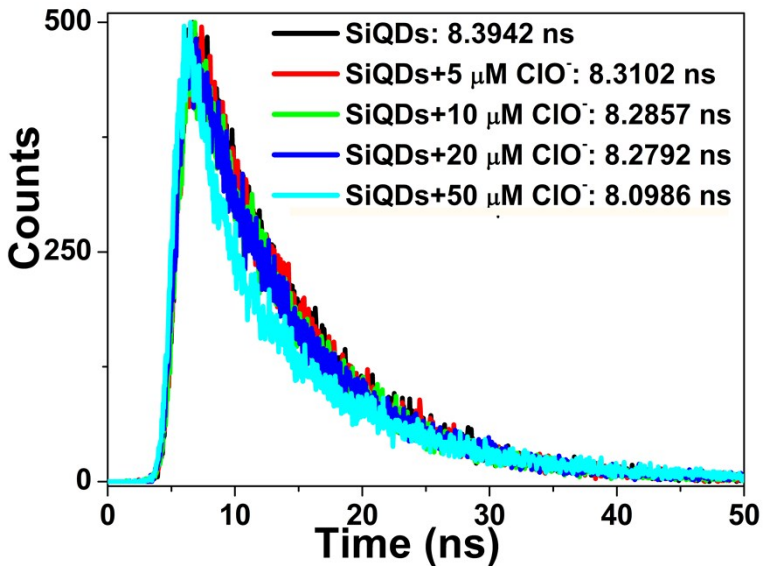

Fig. S9 Fluorescence lifetime experiments of SiQDs in the absence and presence of ClO^-.

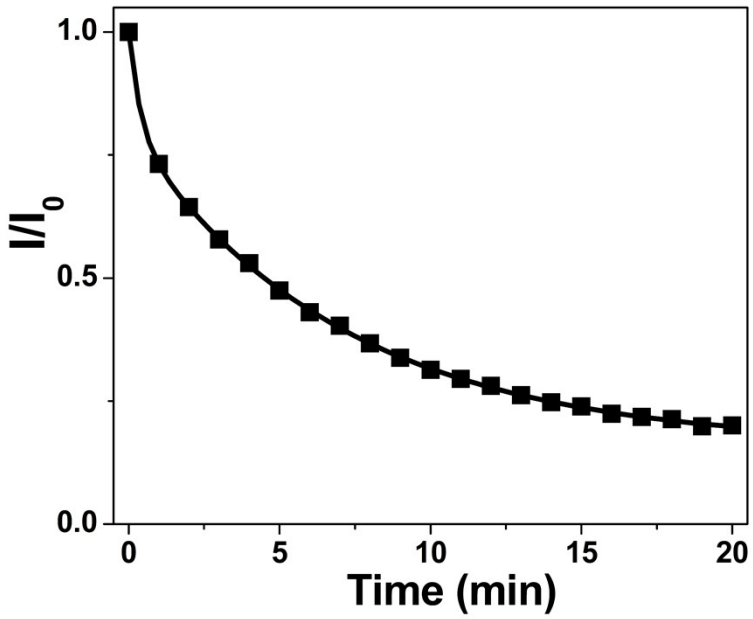

Fig. S10 The plot of I/I_0 of SiQDs versus the incubation time (performed in pH 8.0, 50 mM sodium phosphate buffer; I_0 and I are the fluorescence intensity of SiQDs at 440 nm in the absence and presence of 10 μM ClO^-; excitation wavelength is 345 nm.).

Table S1. Comparison of the proposed method with other various methods for the determination of hypochlorite.

Method	Materials	Linear range	Detection limit	References
Electrochemistry	Polymelamine-modified carbon electrode	10 μM-7 mM	5.5 μM	[1]
Chemiluminescence	Graphene quantum dots	0.5 μM-1 mM	0.3 μM	[2]
Colorimetric	Gold nanoparticles/11-mercaptoundecanoic acid	Not mentioned	0.5 μM	[3]
Colorimetric	3,3′,5,5′-tetramethyl benzidine	0-75 μM	0.05 μM	[4]
Fluorescence	2-amino-3-(pyren-1-ylmethyleneamino)maleonitrile	Not mentioned	2.83 μM	[5]
Fluorescence	Carbon dots/rhodamine B	10 μM-140 μM	4 μM	[6]
Fluorescence	Silicon quantum dots	0.01-7.5 μM	0.01 μM	This work

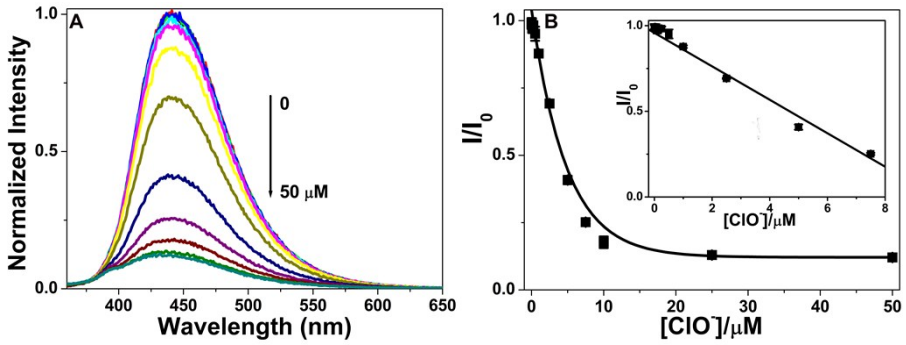

Fig. S11 (A) Fluorescence spectra of SiQDs in the presence of different concentration of ClO^- in tap water. (B) The plot of I/I_0 versus the concentration of ClO^- in tap water, the inset is the linear section of the plot (performed in pH 8.0, 50 mM sodium phosphate buffer; I_0 and I correspond to the fluorescence intensity of SiQDs at 440 nm in the absence and presence of tap water, respectively; excitation wavelength is 345 nm.).

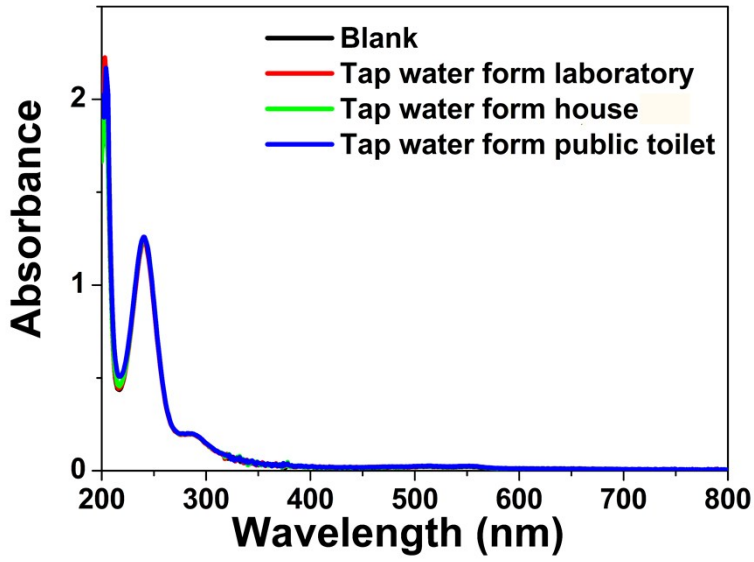

Fig. S12 UV-vis absorption of N,N-Diethyl-*p*-phenylenediamine in the absence and presence of tap water from laboratory, the house and public toilet.

Table S2. Analysis of ClO^- in water samples with SiQDs.

Samples	Added (μM)	Found (μM)	Recovery (%)	RSD (%, n=4)
Tap water 1	0	-	-	-
	0.50	0.43	86	3.5
	1.00	1.04	104	7.3
Tap water 2	0	-	-	-
	0.50	0.53	106	8.6
	1.00	1.09	109	8.8
Tap water 3	0	-	-	-
	0.50	0.41	82	7.3
	1.00	1.03	103	1.4

References

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