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Supporting Information

Luminescent S-doped carbon dots: An emergent architecture for multimodal applications

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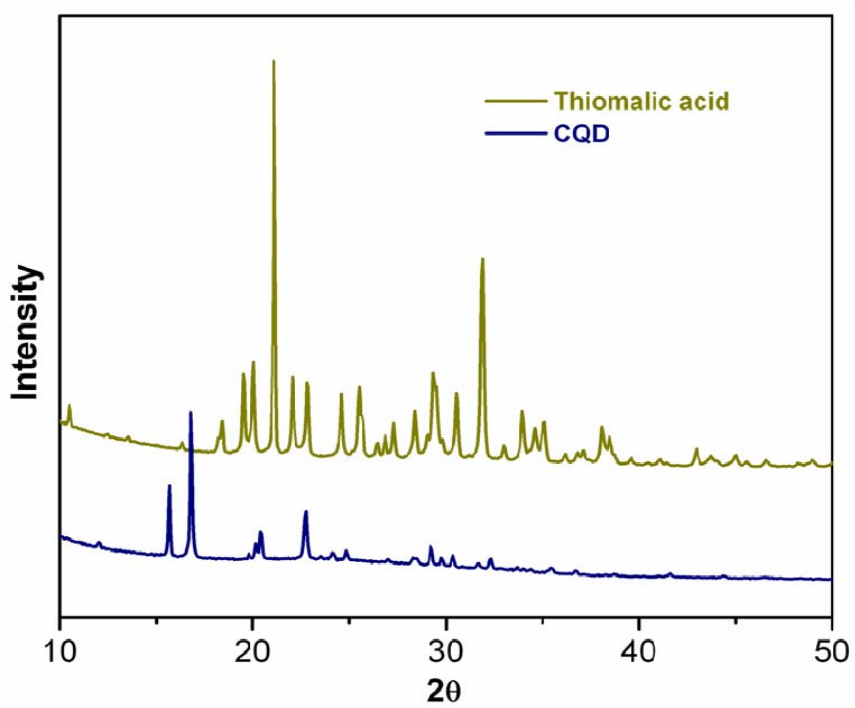

Figure S1. X-ray diffraction patterns of thiomalic acid and CQD.

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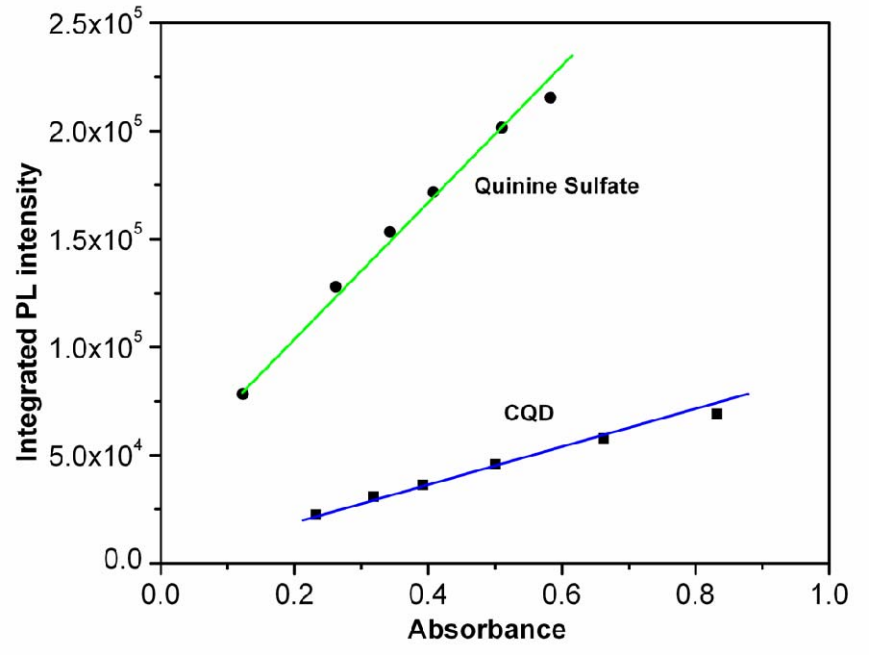

Figure S2. Plot of integrated PL intensity versus the corresponding absorbance for (a) quinine sulphate and (b) CQD.

The quantum yield of CQD was calculated by measuring the integrated PL intensity in aqueous dispersion (refractive index η= 1.33) against quinine sulphate in 0.1(M) H_2SO_4 (refractive index η= 1.33) as a standard one having quantum yield of 54%.

$$\Phi_C = \Phi_{QS} \times (I_C/I_{QS}) \times (\eta_C^2/\eta_{QS}^2)$$

Where, Φ, I and η represented the quantum yield, slope of integrated PL intensity and refractive index respectively. The suffix QS and C denoted quinine sulphate and CQD respectively.

Substrate	Slope of integrated PL intensity	Refractive index	Quantum yield
Quinine sulphate	403862.308	1.33	54%
CQD	87897.90	1.33	x

$$\Phi_C\,(x) = 54 \times (87897.90/403862.308) \times (1.33^2/1.33^2)\ \%$$

$$= \mathbf{11.8\ \%}$$

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Table 1 Quantum yields at different excitation wavelengths.

Serial no.	Excitation Wavelength	Quantum Yield
1.	320	3.04%
2.	330	7.85%
3.	340	11.80%
4.	350	7.21%
5.	360	2.82%
6.	370	1.21%
7.	380	0.77%

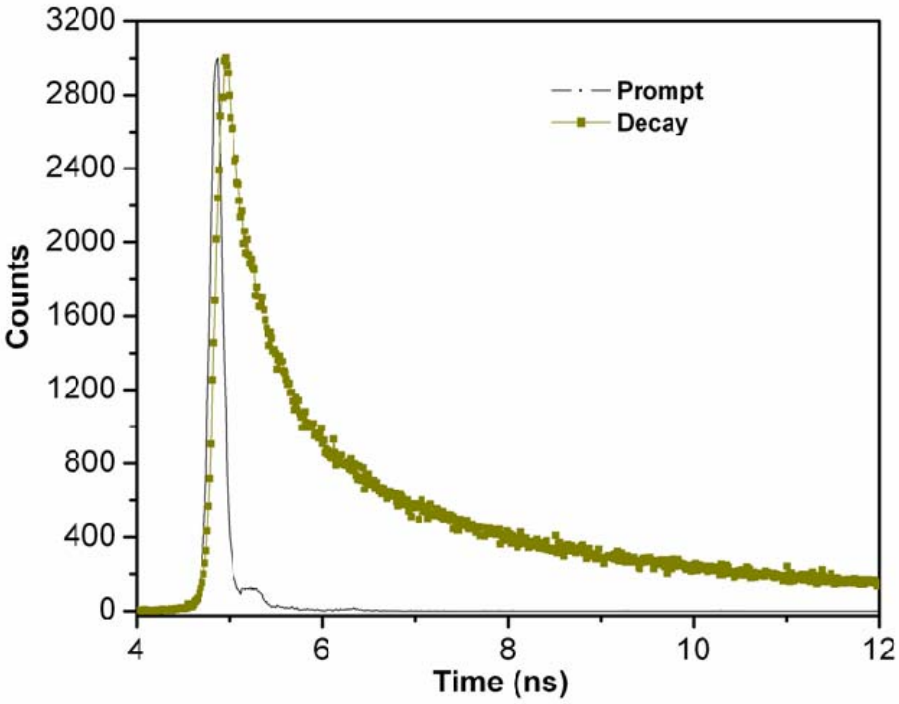

Figure S3. Decay curve and TCSPC lifetime profile of the CQD.

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Table 2 Tabular representation of TCSPC lifetime measurements

a_1	τ_1 (ns)	a_2	τ_2 (ns)	a_3	τ_3 (ns)	τ_{av} (ns)	χ^2
0.2123	1.78	0.084	6.8	0.704	0.29	1.15	1.01

Average lifetime (τ_{av}) was calculated by solving the following equation:

$$\tau_{av} = a_1\tau_1 + a_2\tau_2 + a_3\tau_3$$

where τ_1, τ_2, τ_3 were the first, second and third component of the decay time of CQD and a_1, a_2, a_3 were the corresponding relative weightings of these components respectively.

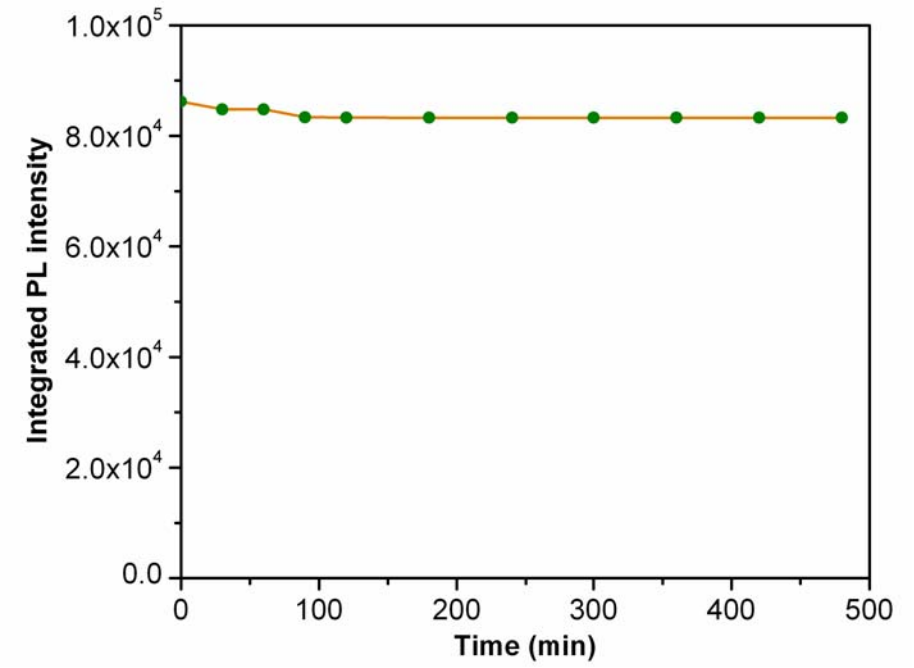

Figure S4. Dependence of integrated PL intensity against time revealed the well photostability of CQDs.

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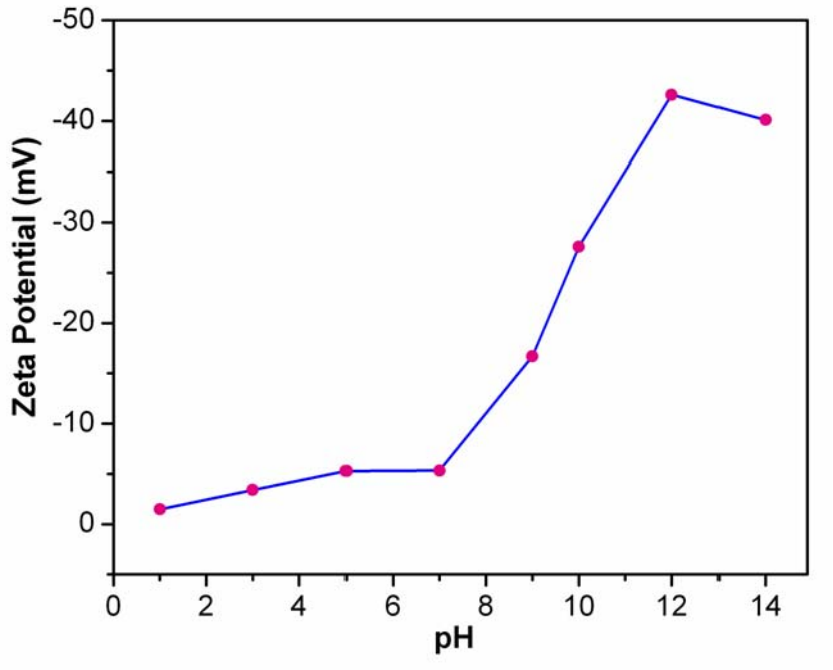

Figure S5. Zeta potentials of CQD as a function of pH.

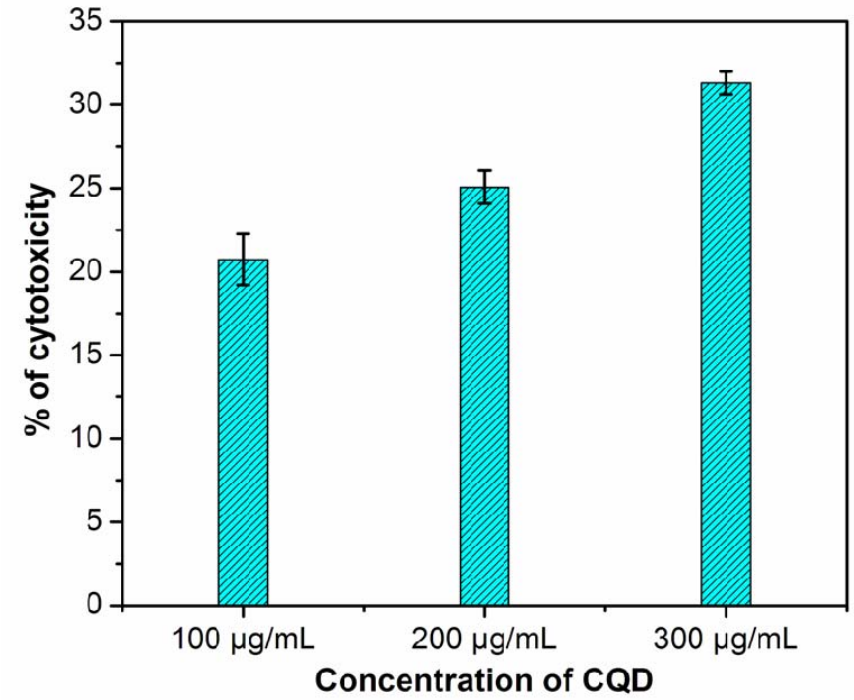

Figure S6. Plot of percentage of cytotoxicity against the concentration of CQDs by LDH assay.