

Supplementary Material

1. Impact of various modification agents introduced during hydrothermal preparation on the quantum yield of carbon dots derived from fish scales.

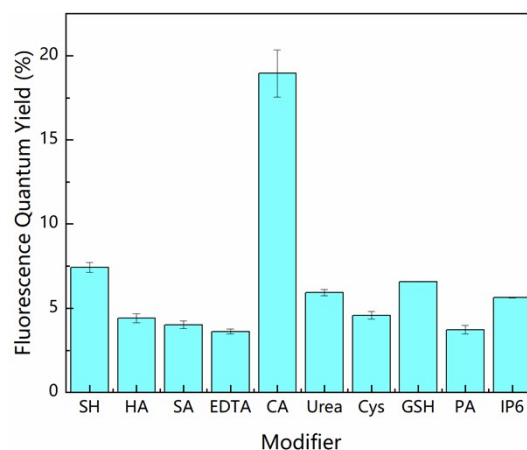


Figure S1. The varying influence of different modifiers on the quantum yield of CDs derived from fish scales via the hydrothermal process.

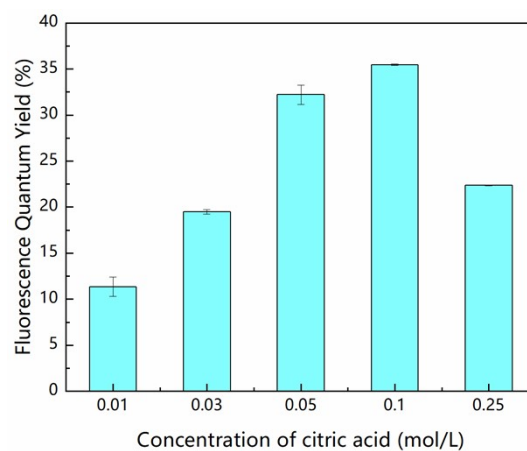


Figure S2. Effects of different concentrations of citric acid on the quantum yield of CDs derived from fish scales.

2. Photoluminescence decay spectrum of CDs-FS/CA aqueous solution

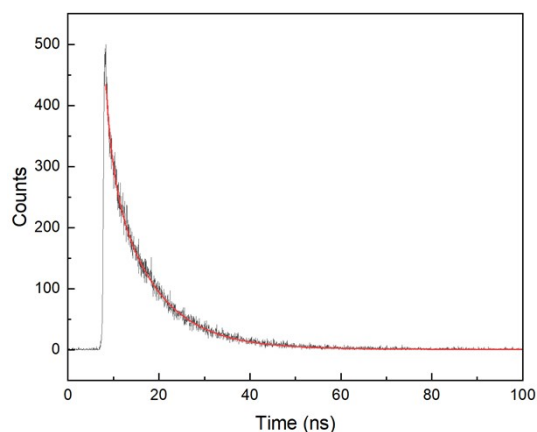


Figure S3. Photoluminescence decay spectrum of CDs-FS/CA aqueous solution

3. Size distribution histograms of different carbon dots obtained from TEM image measurements.

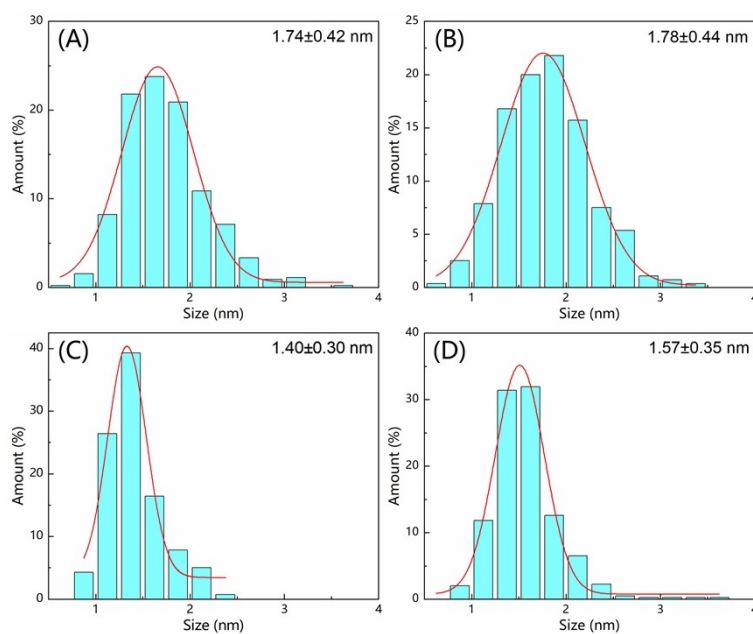


Figure S4. Size distribution histogram of CDs-FSP/CA and different control CDs samples.

(A) CDs-FS; (B) CDs-CA; (C) CDs-FS/CA; (D) CDs-FSP/CA.

4. XPS full spectra of different carbon dots.

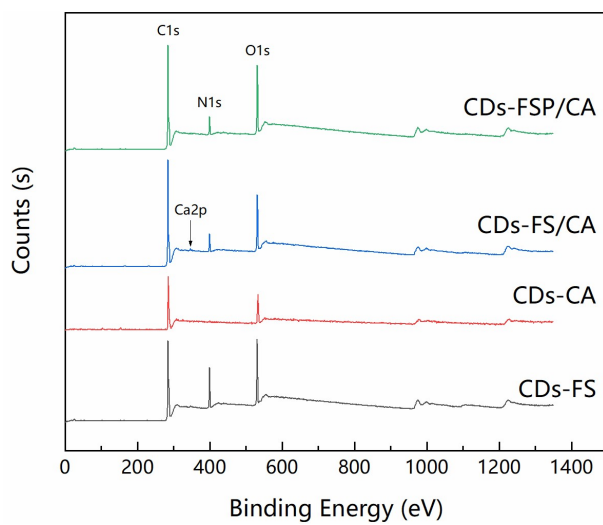


Figure S5. XPS full spectra of CD_s-FSP/CA and different control CD_s samples.

5. Measurement and Calculation of the Method Detection Limit (MDL) and Method Quantification Limit (MQL) for CDs-FS/CA

Table S1. Measurement results of MDL and MQL for CDs-FS/CA

	X1	X2	X3	X4	X5	X6	X7	Average	Standard Deviation
Detection Amount (nmol/L)	13.75	12.56	11.81	12.65	10.61	11.78	11.99	12.16	0.97
Recovery Rate (%)	110.9	101.3	95.2	102.0	85.6	95.0	96.7	98.1	7.8

$MDL = t_{0.99} \times 0.97 = 3.0$ nmol/L, $t_{0.99} = 3.143$ is the confidence factor;

$MQL = MDL \times 0.33 = 9.9$ nmol/L