

Using Hydrogen Peroxide to Mediate through One-Step Hydrothermal Method for the Fast and Green Synthesis of N-CDs

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Table S1 Quantum yield of sample 1, sample 2, sample 3 and sample 4

Samples	Refractive index of solvent (<i>n</i>)	Quantum yield (<i>QY</i>)
Quinine sulfate	1.33	54.0% (known)
1 (cocoon silk +H ₂ O)	1.33	1.98%
2 (cocoon silk +H ₂ O ₂)	1.33	24.0%
3 (peptide + H ₂ O ₂)	1.33	25.1%
4 (peptide+ H ₂ O)	1.33	2.04%

Samples	QY %	D/nm	$\tau_{\text{ave.}}$ /ns
1(not adding H ₂ O ₂)	1.98	167	1.24
2 (adding H ₂ O ₂)	24.00	7.4	3.99

Table S2 Quantitative comparison of sample 1 and sample 2

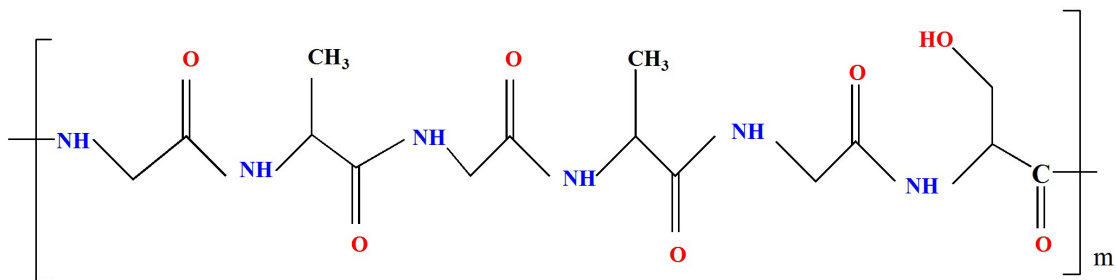


Fig. S1 The structure of precursor polymerization before carbonization

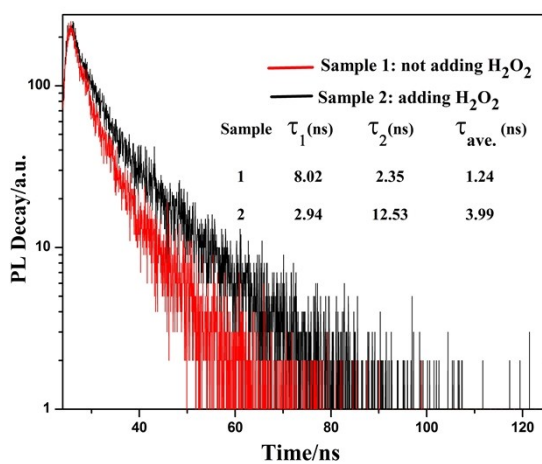


Fig. S2 PL lifetime decay curves of the sample 1 and sample 2 at room temperature when λ_{ex} = 370 nm and λ_{em} =438 nm.

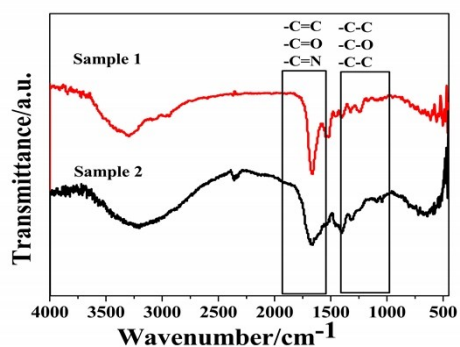


Fig. S3 The FTIR spectra of sample 1 and sample 2.

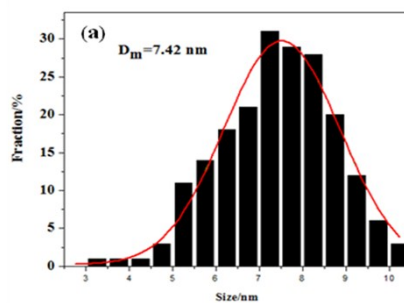


Fig. S4 The size distribution of N-CDs.

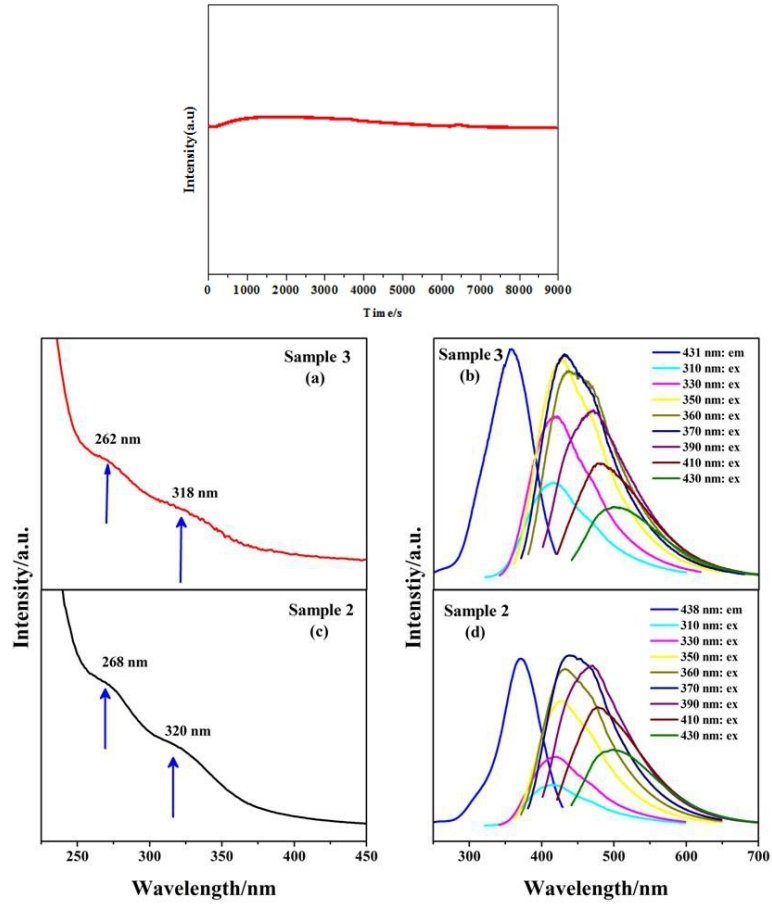


Fig. S5 stability of N-CDs solution under ultraviolet light ($\lambda_{\text{ex}} = 365 \text{ nm}$).

Fig. S6 UV-Vis absorption spectra of liquid sample 3 (a) and sample 2 (c); (b) and (d) are the PL spectra excited by different

excitation wavelengths and their best excitation spectra (blue line) at 431 nm emission and 438 nm emission of sample 3 and sample 2, respectively. The excitation wavelength was varied from 310 nm to 430 nm. Colors correspond to different excitation wavelength: cyan, magenta, yellow, dark yellow, navy, purple, wine, and olive correspond to 310, 330, 350, 360, 370, 390, 410, and 430 nm.

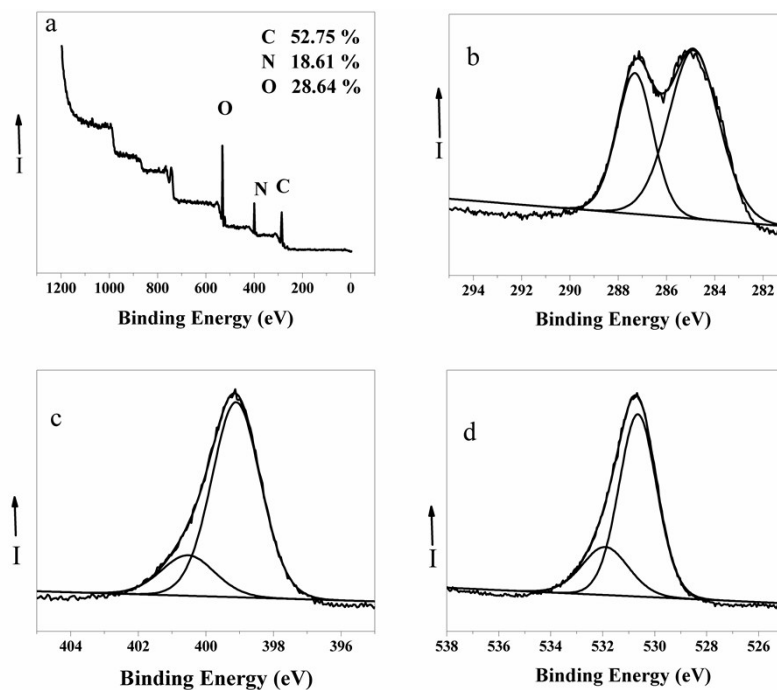


Fig. S7 XPS spectra of the N-CDs when peptide reacts with H_2O_2 (a) Survey spectrum. (b) C_{1s} spectrum. (c) N_{1s} spectrum. (d) O_{1s} spectrum.

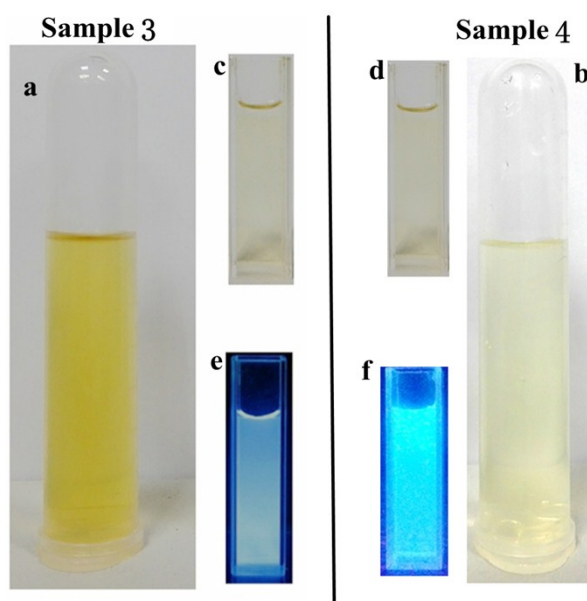


Fig. S8 As-prepared reaction products when peptide is raw material reacting with H₂O₂ (sample 3) and H₂O (sample 4) under day light and UV-light ($\lambda_{\text{ex}} = 365 \text{ nm}$).

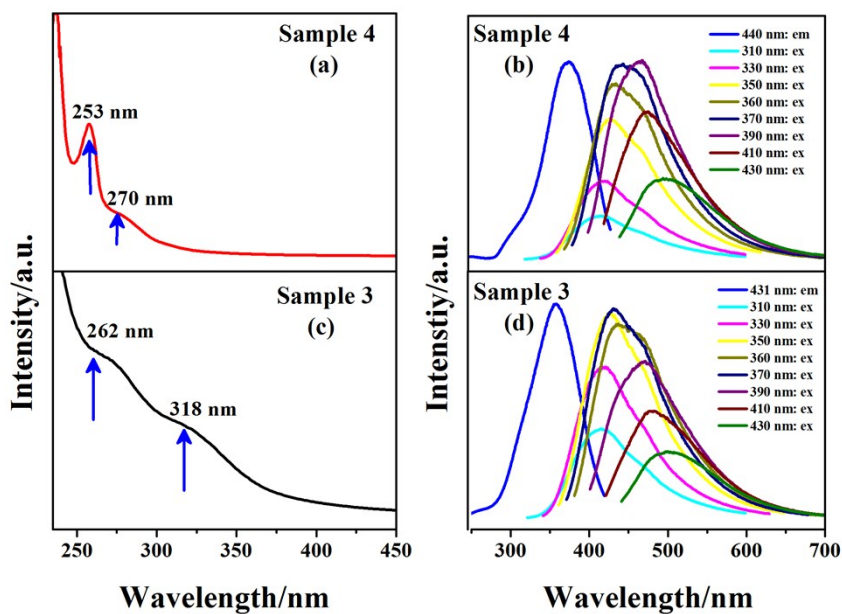


Fig. S9 UV-Vis absorption spectra of liquid sample 4 (a) and sample 3 (c); (b) and (d) are the PL spectra excited by different excitation wavelengths and their best excitation spectra (blue line) at 440 nm emission and 431 nm emission of sample 4 and sample 3, respectively. The excitation wavelength was varied from 310 nm to 430 nm. Colours correspond to different excitation wavelength: cyan, magenta, yellow, dark yellow, navy, purple, wine, and olive correspond to 310, 330, 350, 360, 370, 390, 410, and 430 nm.

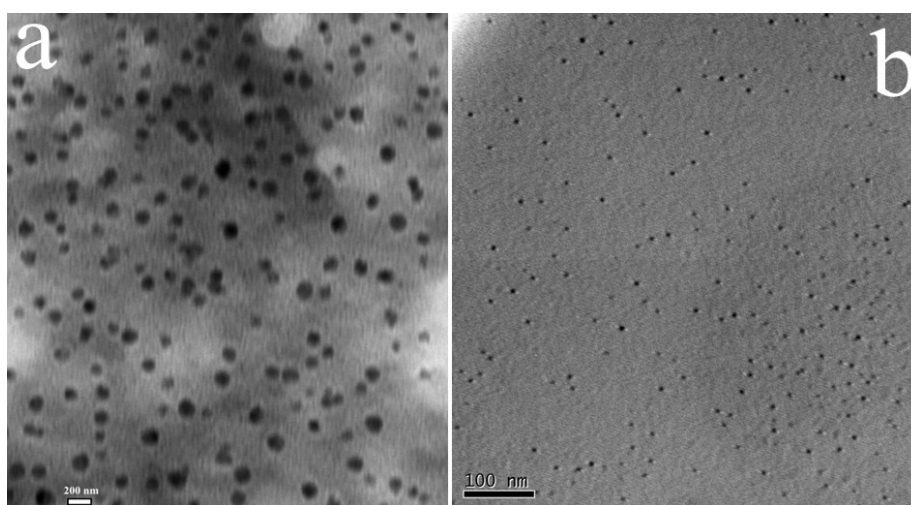


Fig. S10 (a) and (b) are the TEM images of the sample 4 and sample 3, respectively.

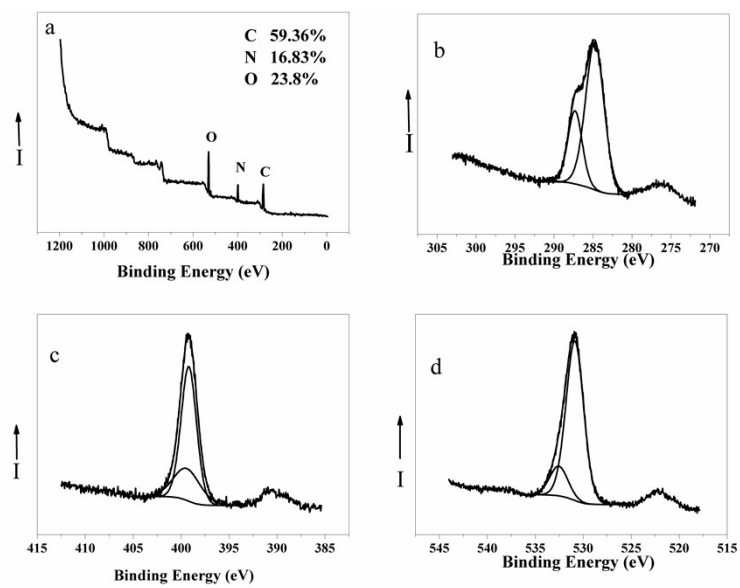


Fig. S11 XPS spectra of the nanoparticles when peptide reacts with deionized water. (a) Survey spectrum. (b) C1s spectrum. (c) N1s spectrum. (d) O1s spectrum.