Supporting information

Novel synthesis of positively charged N,S-doped carbon dots as efficient fluorescent probe for L-aspartic acid sensing

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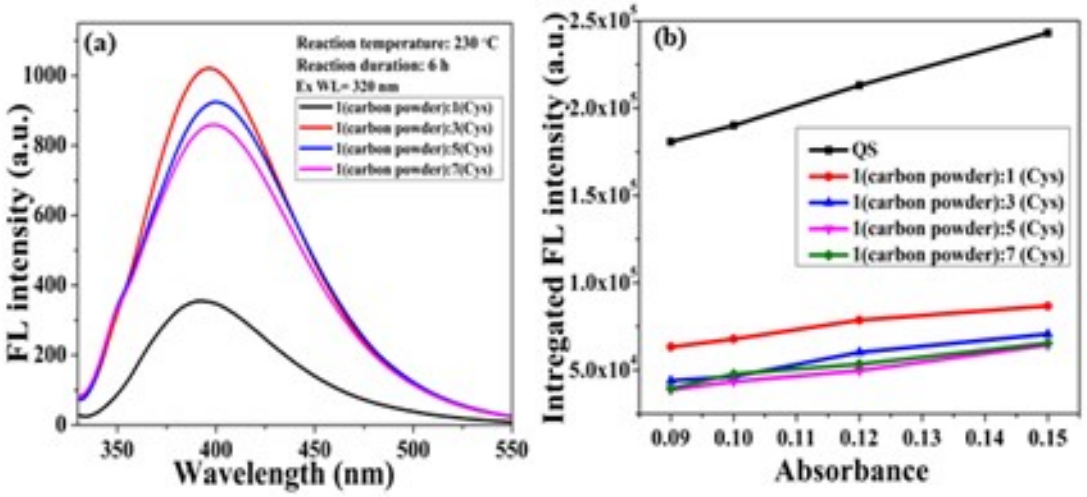

Figure S1 (a) Combined FL emission spectra at 320 nm of excitation wavelength and **(b)** FLQY plots for the N,S-CDs synthesized at different stoichiometric ratios of the precursors at 230 °C for 6 h of reaction duration.

Table S1: FLQY of CDs obtained by the reaction of different stoichiometric ratios of precursors with QS as reference.

Sample	Gradient	ϕ_x (%)	R^2
Quinine sulphate	1000000		0.99
1(carbon powder):1(Cys)	394132	21.28%	0.97
1(carbon powder):3(Cys)	465579	25.14%	0.97
1(carbon powder):5(Cys)	418295	22.58%	0.99
1(carbon powder):7(Cys)	405944	21.92%	0.98

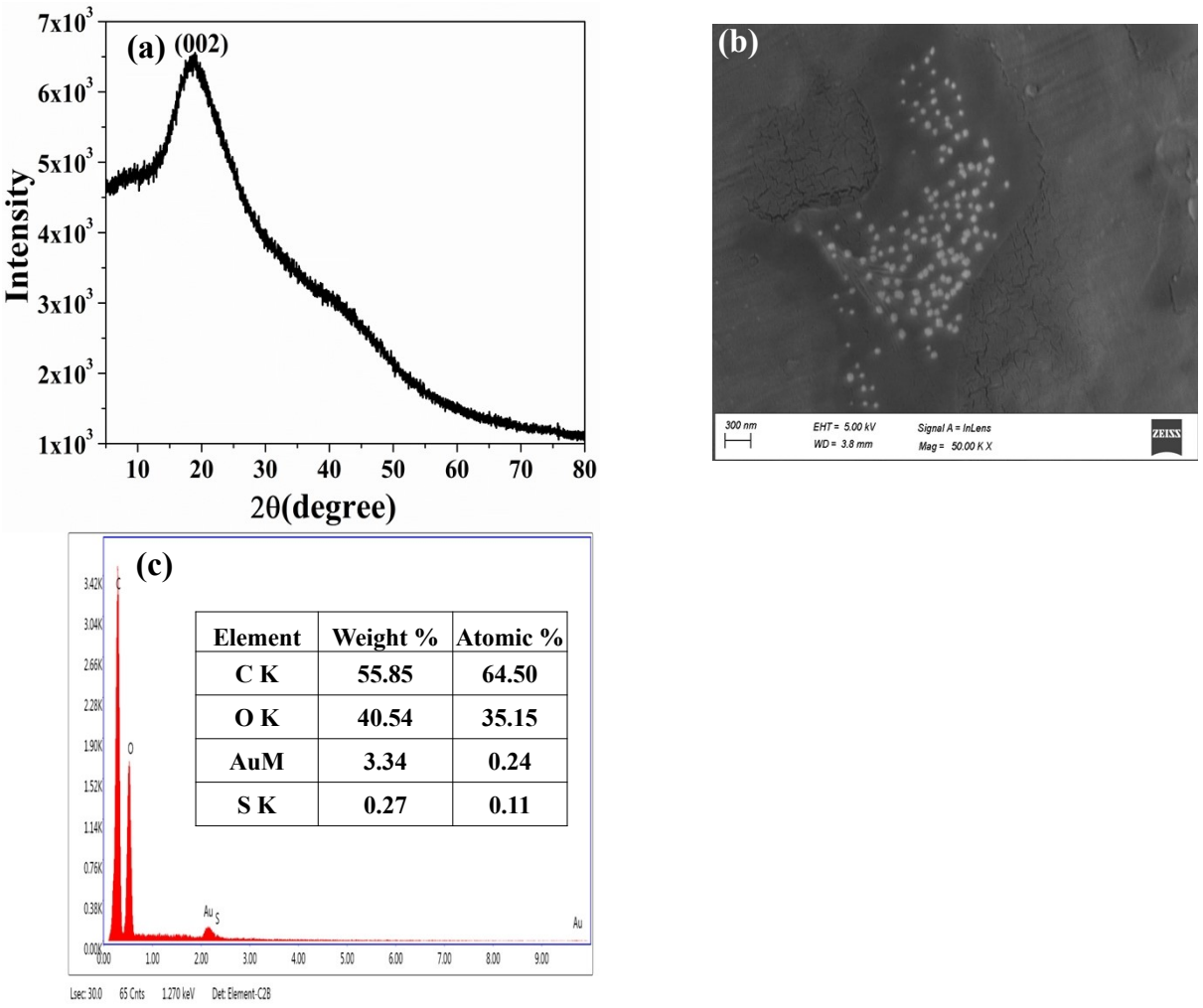

Figure S2 (a) PXRD pattern **(b)** FESEM image and **(c)** EDX spectrum for carbon powder respectively.

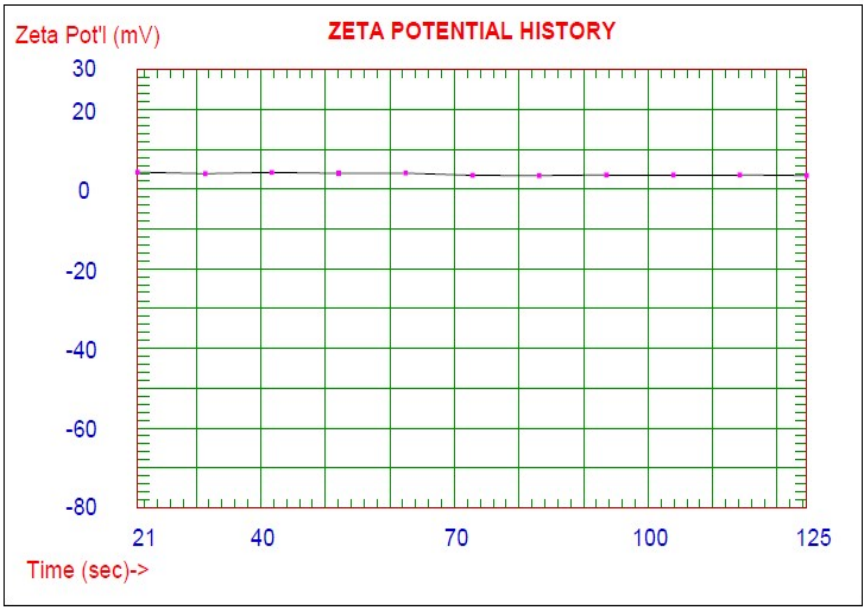

Figure S3: Zeta potential analysis of N,S-CDs

Figure S4: (a) FESEM image of the region of N,S-CDs chosen for elemental mapping **(b)** overall mapping and mapping for **(c)**carbon **(d)**nitrogen **(e)**oxygen and **(f)** sulfur respectively.

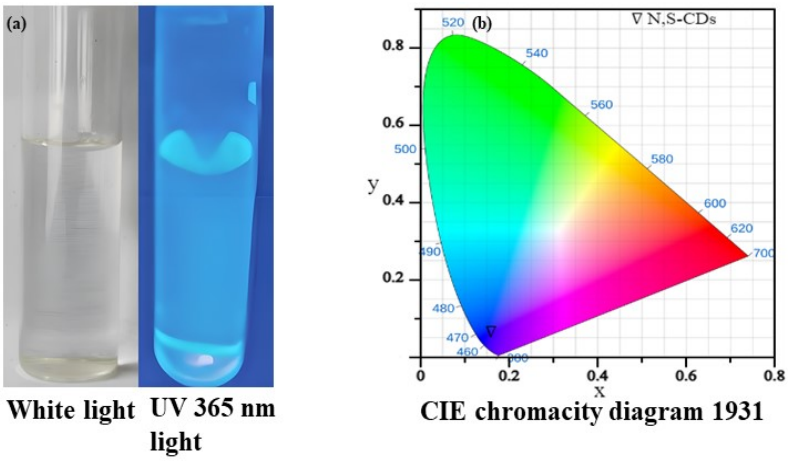

Figure S5: (a) Photographic image under white light and UV 365 nm light and **(b)**CIE chromacity diagram 1931 for N,S-CDs respectively.

The dilute aqueous solution of N,S-CDs is colorless when viewed under white light and blue when observed under UV light of wavelength 365 nm.

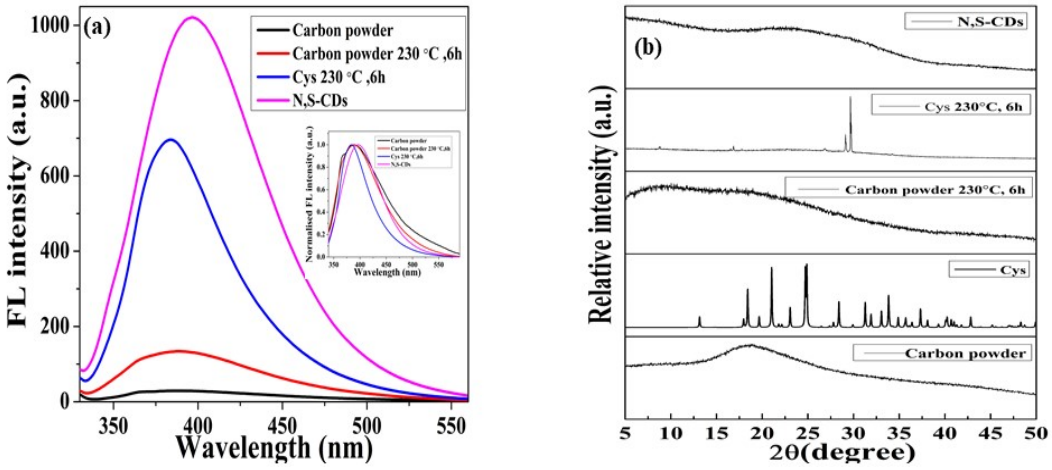

Figure S6: (a) FL emission spectra for carbon powder; carbon powder 230 °C, 6h; Cys 230 °C,6 h and N,S-CDs at 320 nm of excitation wavelength (inset: the corresponding normalized FL spectra showing the shift in emission center) and **(b)** PXRD pattern for carbon powder; Cys (simulated), carbon powder 230 °C, 6h; Cys 230 °C, 6 h and N,S-CDs respectively.

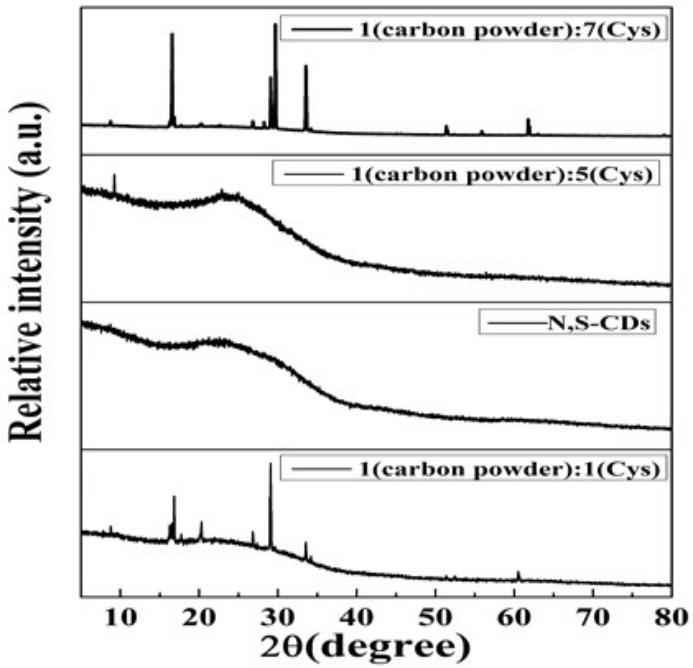

Figure S7: PXRD pattern of the products obtained through hydrothermal treatment of carbon powder and Cys at different stoichiometric ratios for 6 h at 230 °C.

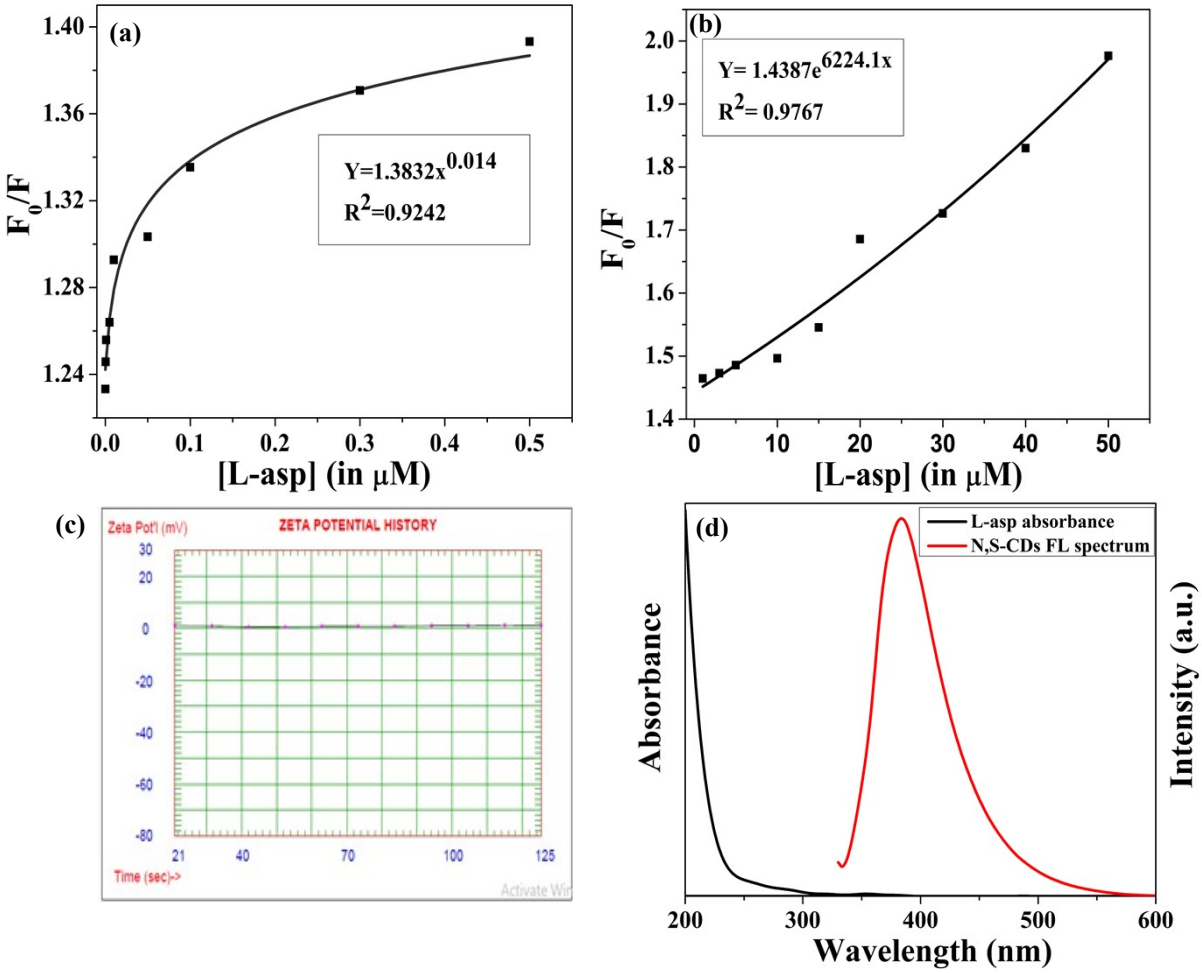

Figure S8: F_0/F vs [L-asp] plot for L-asp concentration range of **(a)**0.0001 µMto 0.5 µM and**(b)** 1µM to 50 µM **(c)**Zeta potential of N,S-CDs-L-asp system **(d)** UV -visible absorbance spectrum of L-asp and FL emission spectrum of N,S-CDs respectively.

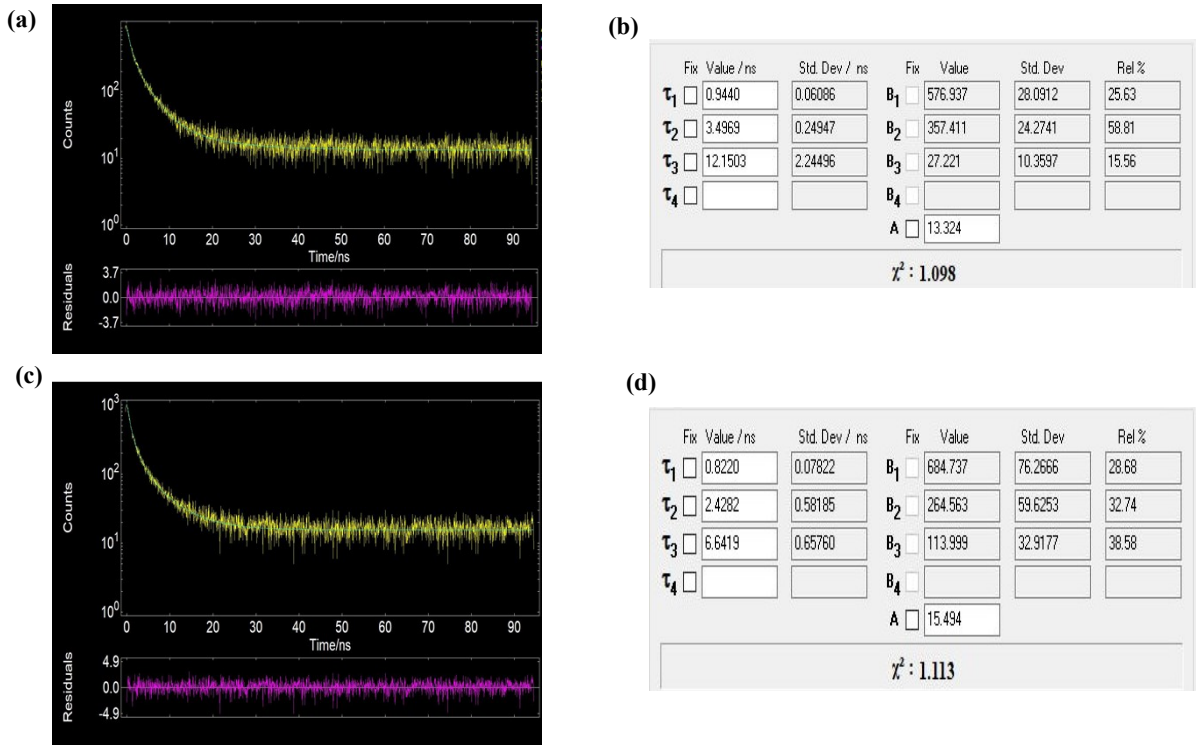

Figure S9: FL lifetime fitting graphs for (a) N,S-CDs and (c) N,S-CDs-L-asp system and the corresponding fitting parameters for (b) N,S-CDs and (d) N,S-CDs-L-asp respectively.