ESI (Electronic Supplementary Information)

Intriguing cysteine induced improvement of emissive property of carbon dots with sensing applications

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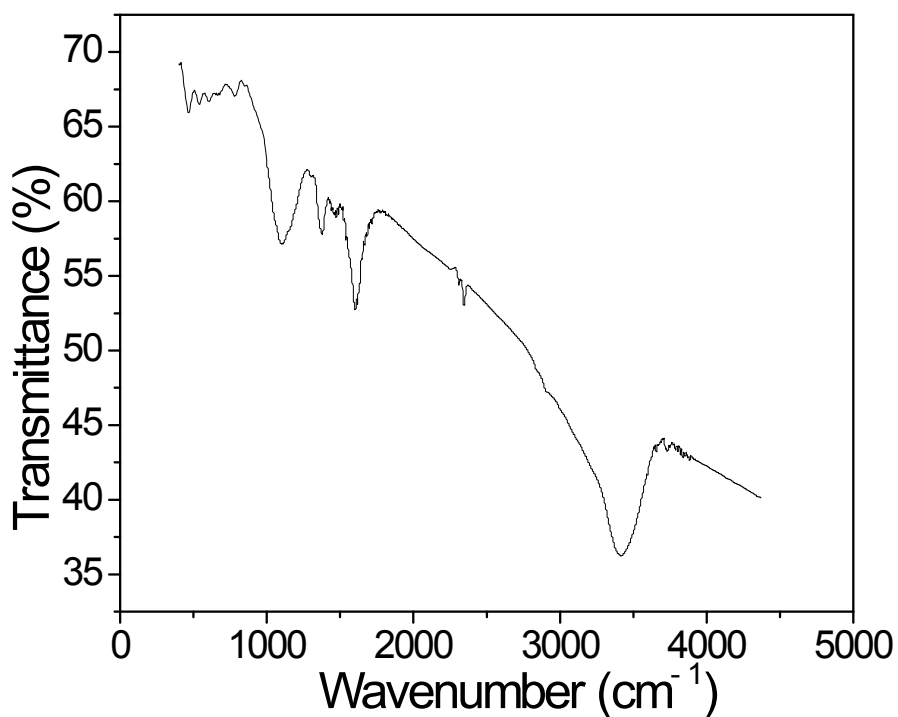*Corresponding author. E-mail: tpal@chem.iitkgp.ernet.in
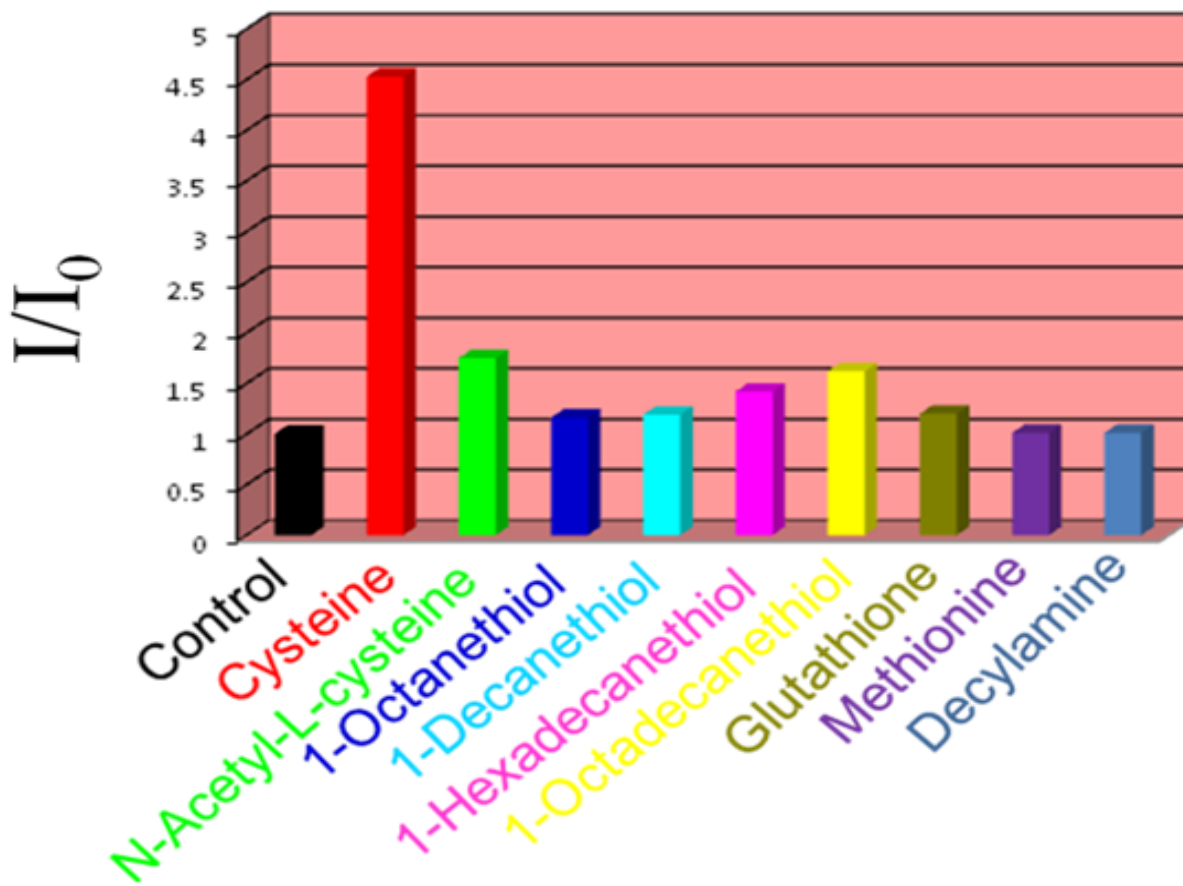
Figure S1: FT-IR spectrum of alkaline DA-Cys solution.

Figure S2: Bar diagram showing the effect of different compounds on the alkaline DA solution. Condition: $[DA] = 4 \times 10^{-5}$ M, pH = 12, [Thiol/ Decylamine/Glutathion/ NAC] = 1.6 $\times 10^{-4}$ M, λ_{ex} = 266 nm.
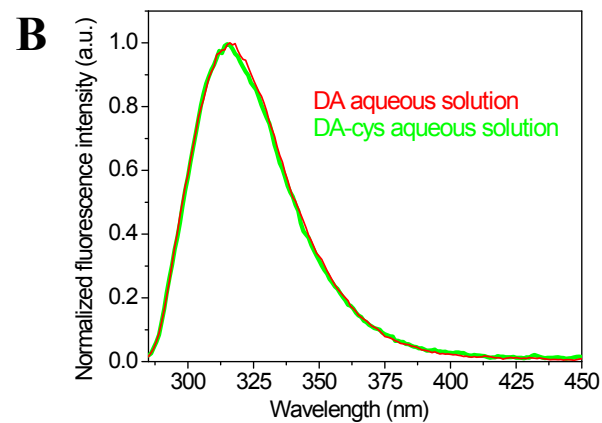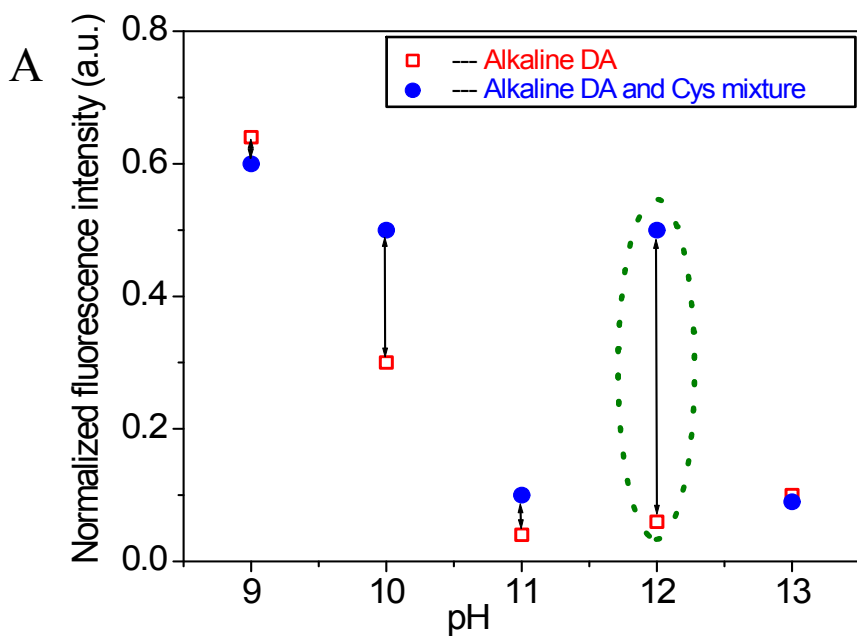
Figure S3: (A) Difference in fluorescence intensity before (points in red) and after (points in blue) addition of Cys in alkaline DA at different alkaline pH. (B) Fluorescence spectral profile of aqueous DA and aqueous DA-Cys system.

Condition: $[DA] = 4x\ 10^{-5}\ M$, $[Cys] = 1.6x10^{-4}\ M$, $\lambda_{ex} = 266$ nm.
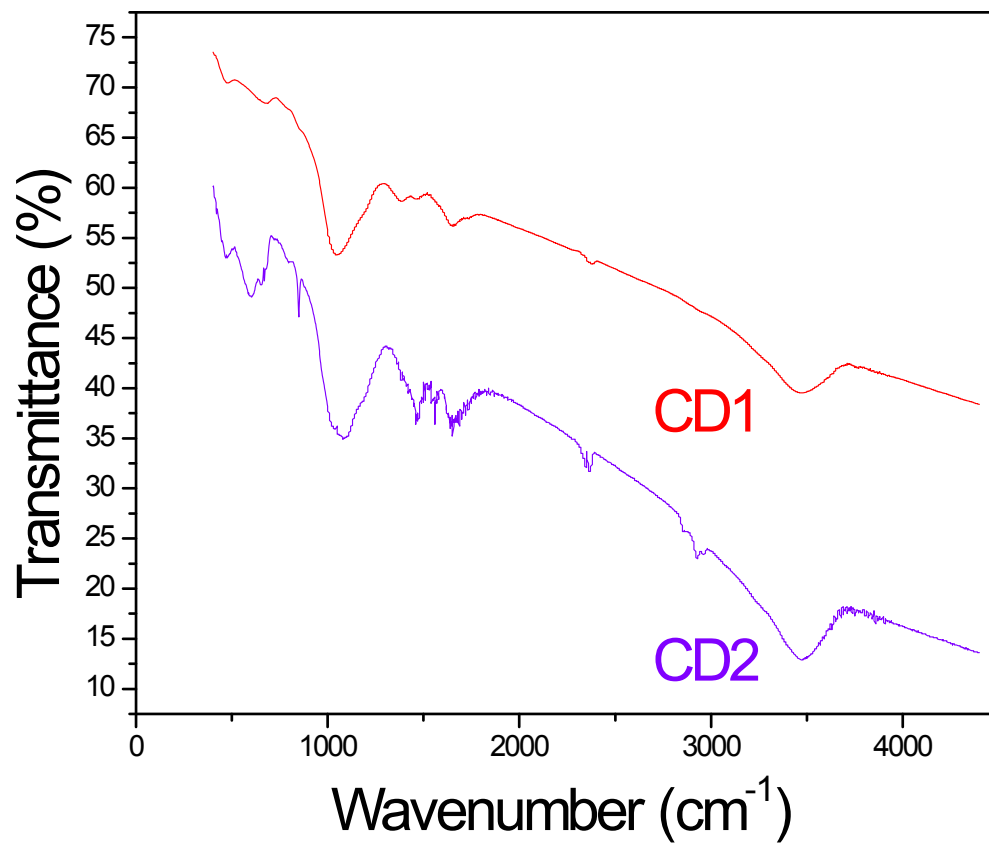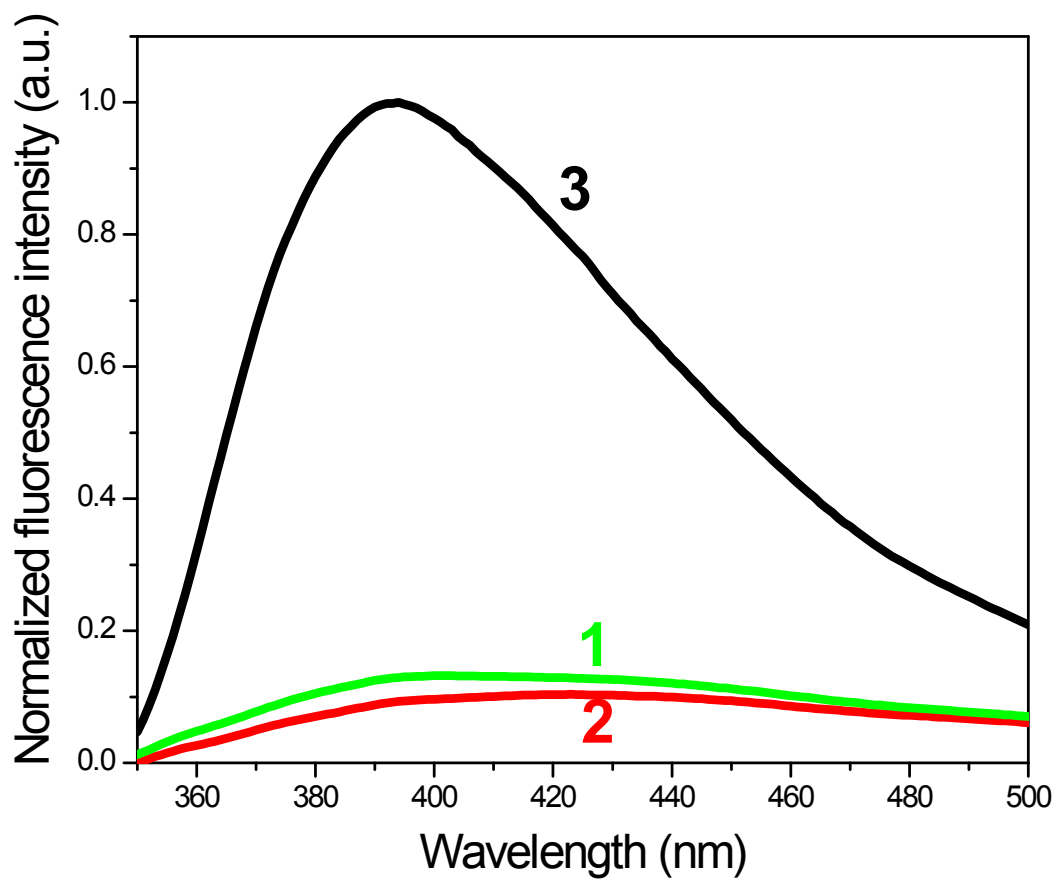
Figure S4: FT-IR spectra of CD1 and CD2.

Figure S5: Fluorescence spectral profile of CD1 (1), cys in CD1 (2), CD2 (3).

Condition: [DA] = 4×10^{-5} M, [cys] = 1.6×10^{-4} M, pH = 12, λ_{ex} =320 nm.
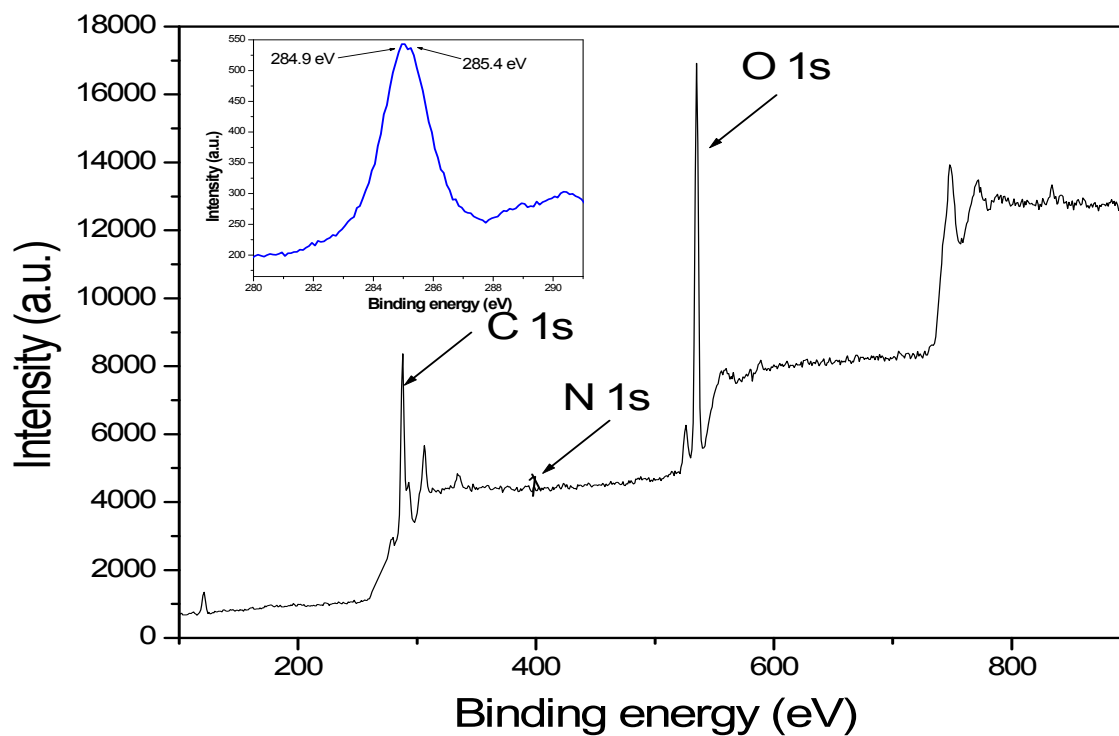
Figure S6: Wide range XPS spectra and narrow range XPS spectra (inset) for the element carbon of CD1 solution under freeze-dried conditions.
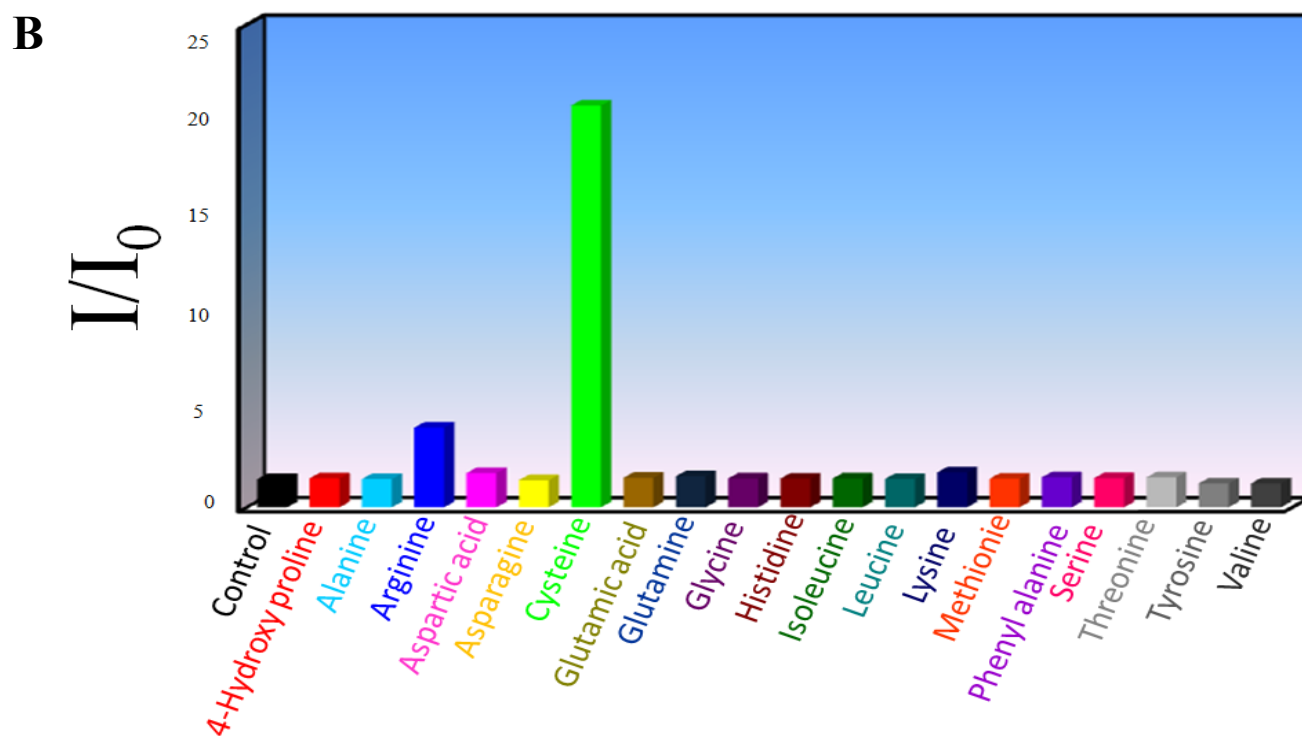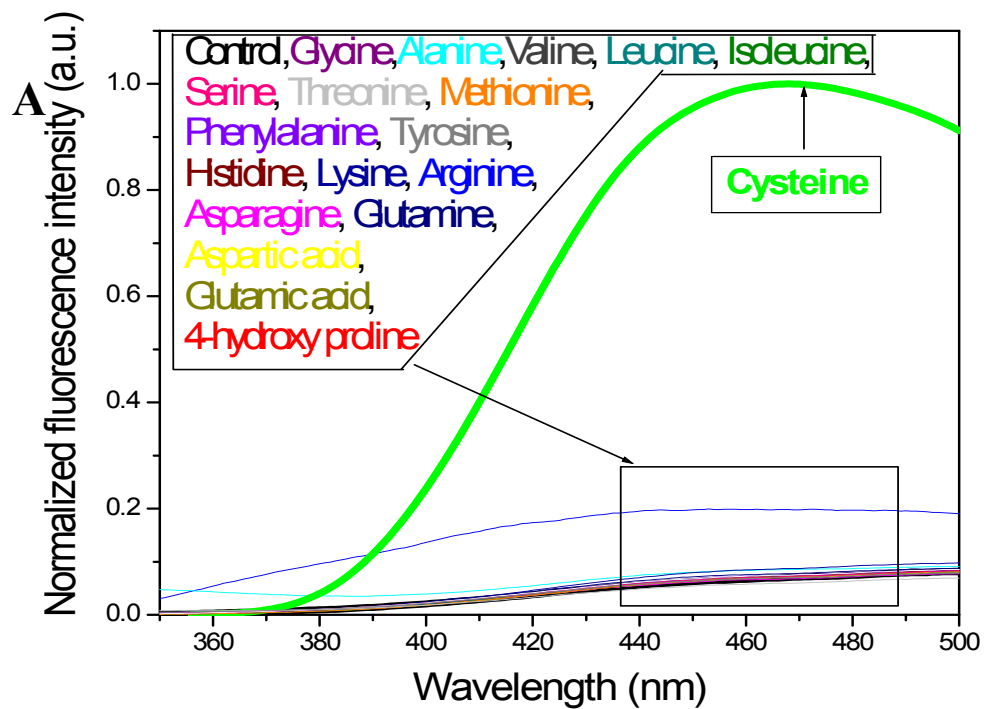
Figure S7: (A) Fluorescence spectral profile and (B) bar diagram showing the effect of different amino acids on the alkaline L-DOPA solution.

Condition: [L-DOPA] = 4×10^{-5} M, [amino acid] = 1.6×10^{-4} M, pH = 12, λ_{ex} = 266 nm.
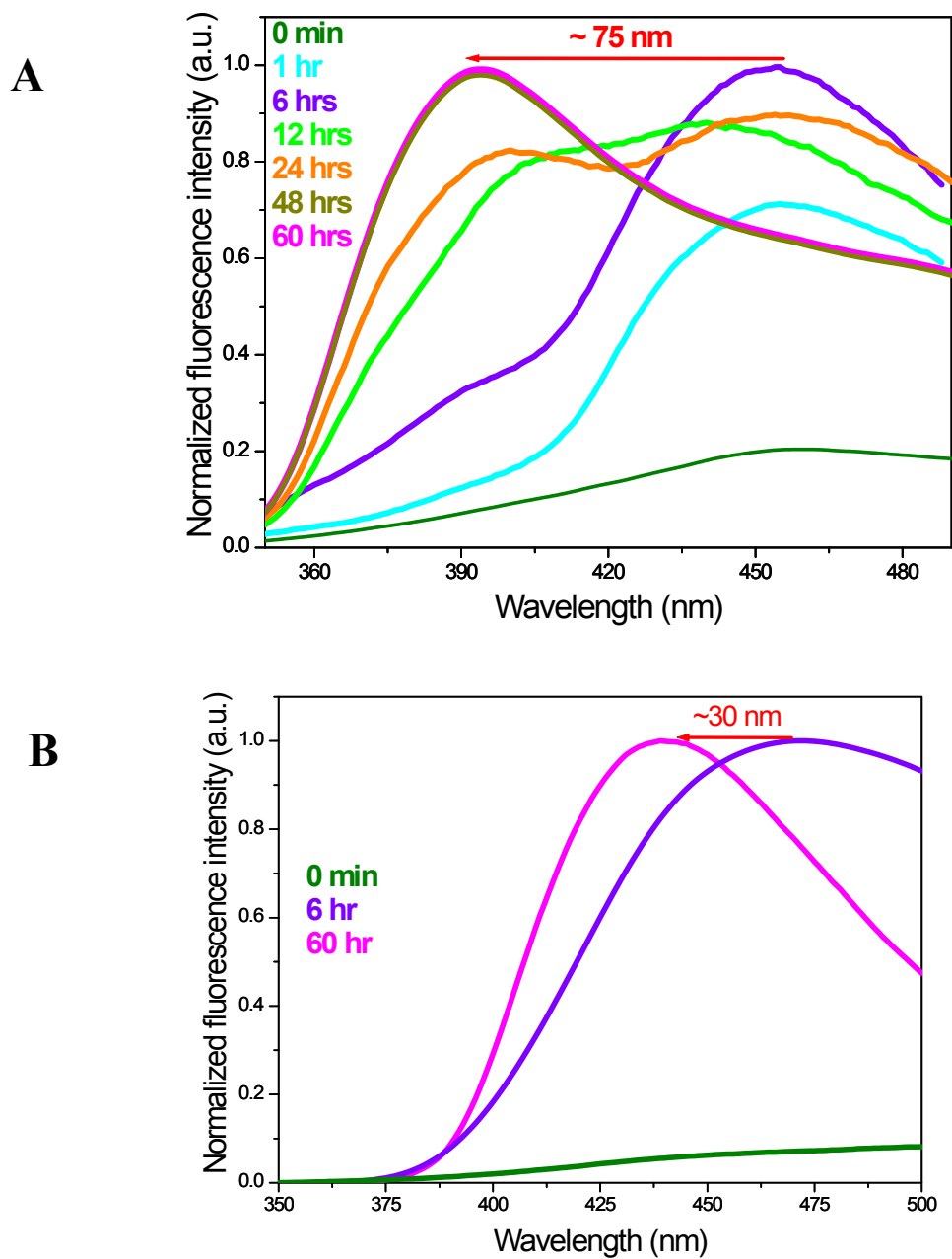
Figure S8: (A) Fluorescence spectral profile showing the shift of emission maxima of alkaline DA-cys solution. (B) Fluorescence spectral profile showing the shift of emission maxima of alkaline L-DOPA-cys solution.

Condition: [L-DOPA/DA] = 4×10^{-5} M, [amino acid] = 1.6×10^{-4} M, pH = 12, λ_{ex} = 266 nm.
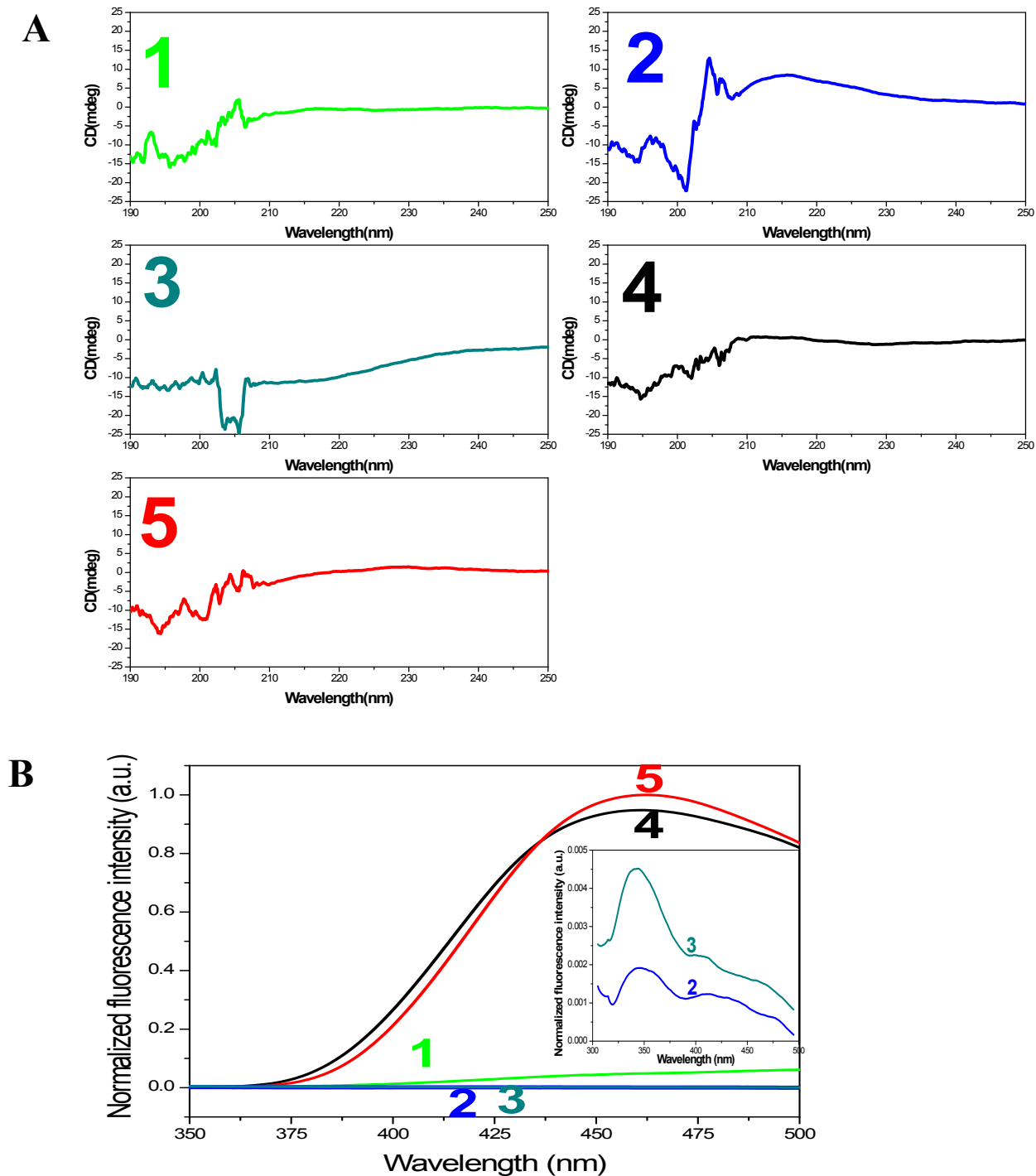
Figure S9: (A) Circular dichroism spectral profile and (B) Fluorescence spectral profile of alkaline L-DOPA (1), alkaline L-Cys (2), alkaline D-Cys (3), alkaline L-DOPA L-cys solution (4), and alkaline L-DOPA D-Cys solution (5). Inset of (B) shows the fluorescence spectral profile of alkaline L-Cys (2), and alkaline D-Cys (3)

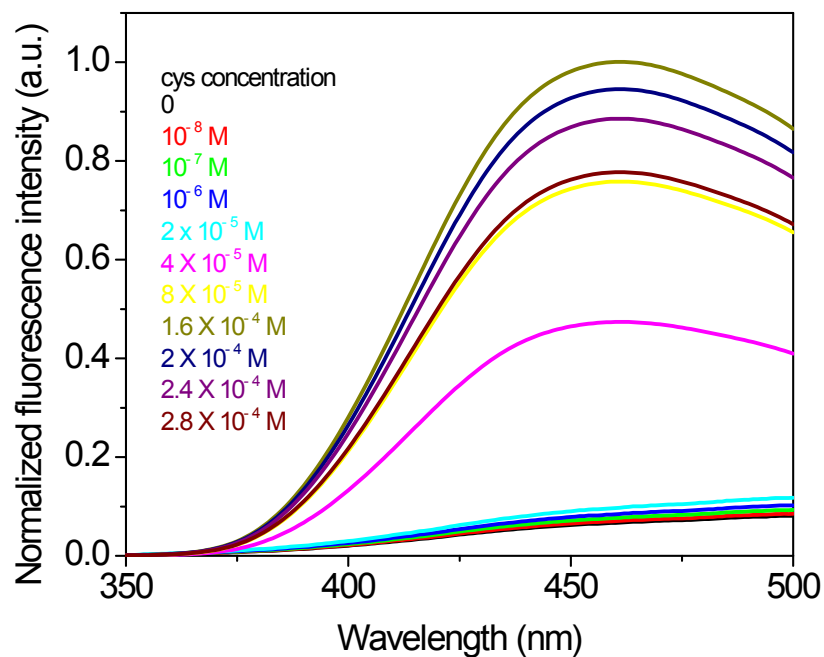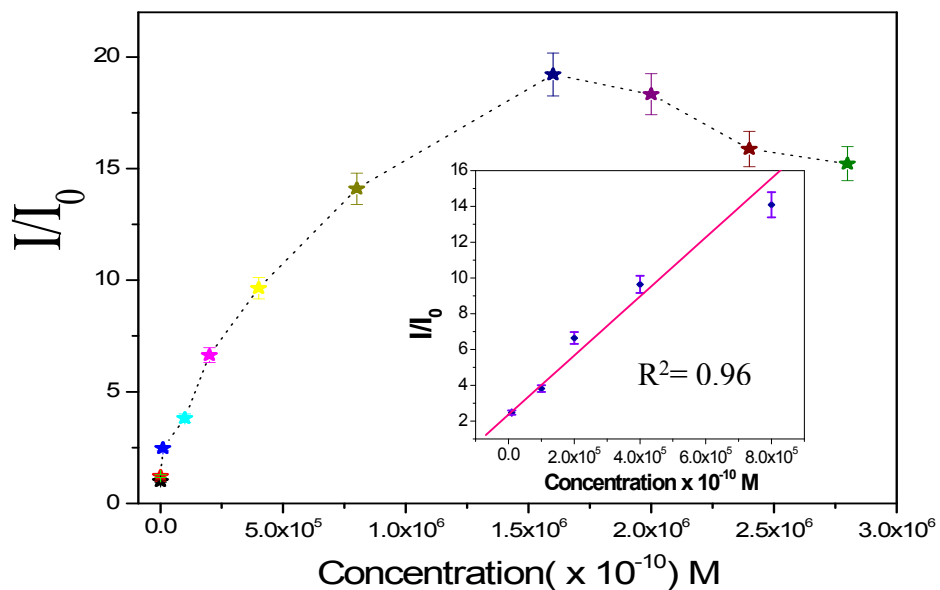Condition: [L-DOPA] = 4×10^{-5} M, [D-/L- Cys] = 1.6×10^{-4} M, pH = 12, λ_{ex} = 266 nm.

Figure S10: (A) Fluorescence spectral profile and (B) Relative fluorescence intensity as a function of [Cys] at fixed [L-DOPA] of 4×10^{-5} M (I_0 and I are the fluorescence intensity without and with Cys, respectively),

Condition: [L-DOPA] = 4×10^{-5} M, pH =12, λ_{em} = 266 nm.