Electronic Supplementary Material (ESI) for RSC Advances.

Supporting Information

Blue Light Emitting Self-healable Graphene Quantum Dots Embedded Hydrogels

Sagar Biswas, Dnyaneshwar B. Rasale and Apurba K. Das*

Discipline of Chemistry, Indian Institute of Technology Indore, Indore, 452020, India

E-mail: apurba.das@iiti.ac.in

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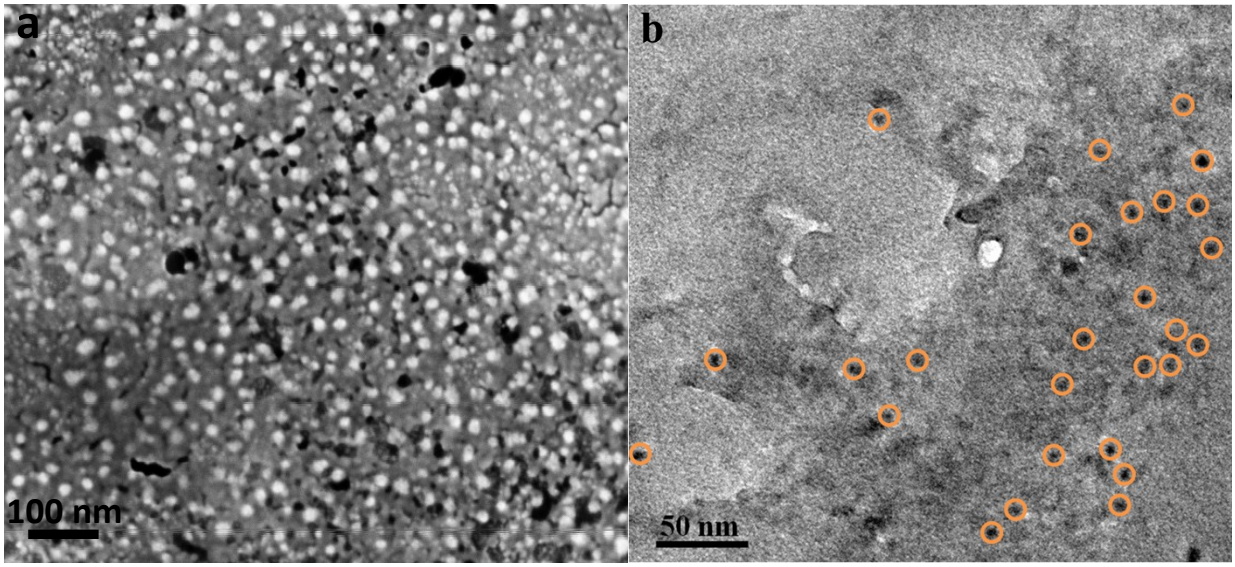

Fig. S1. (a) SEM and (b) TEM images of GQDs show dots are separated and well distributed.

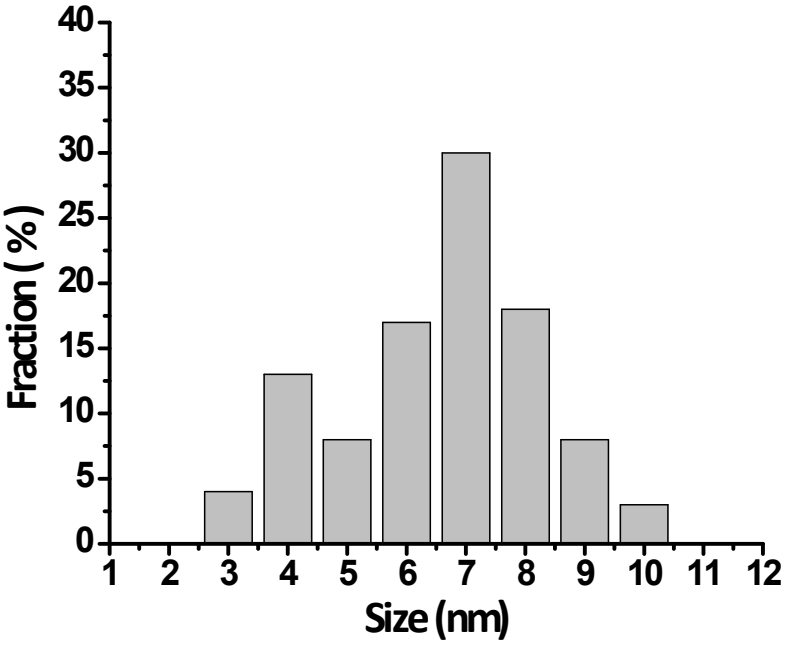

Fig. S2. Size distribution profile of GQDs according to TEM image shows the average size of GQDs are nearly about 7-8 nm.

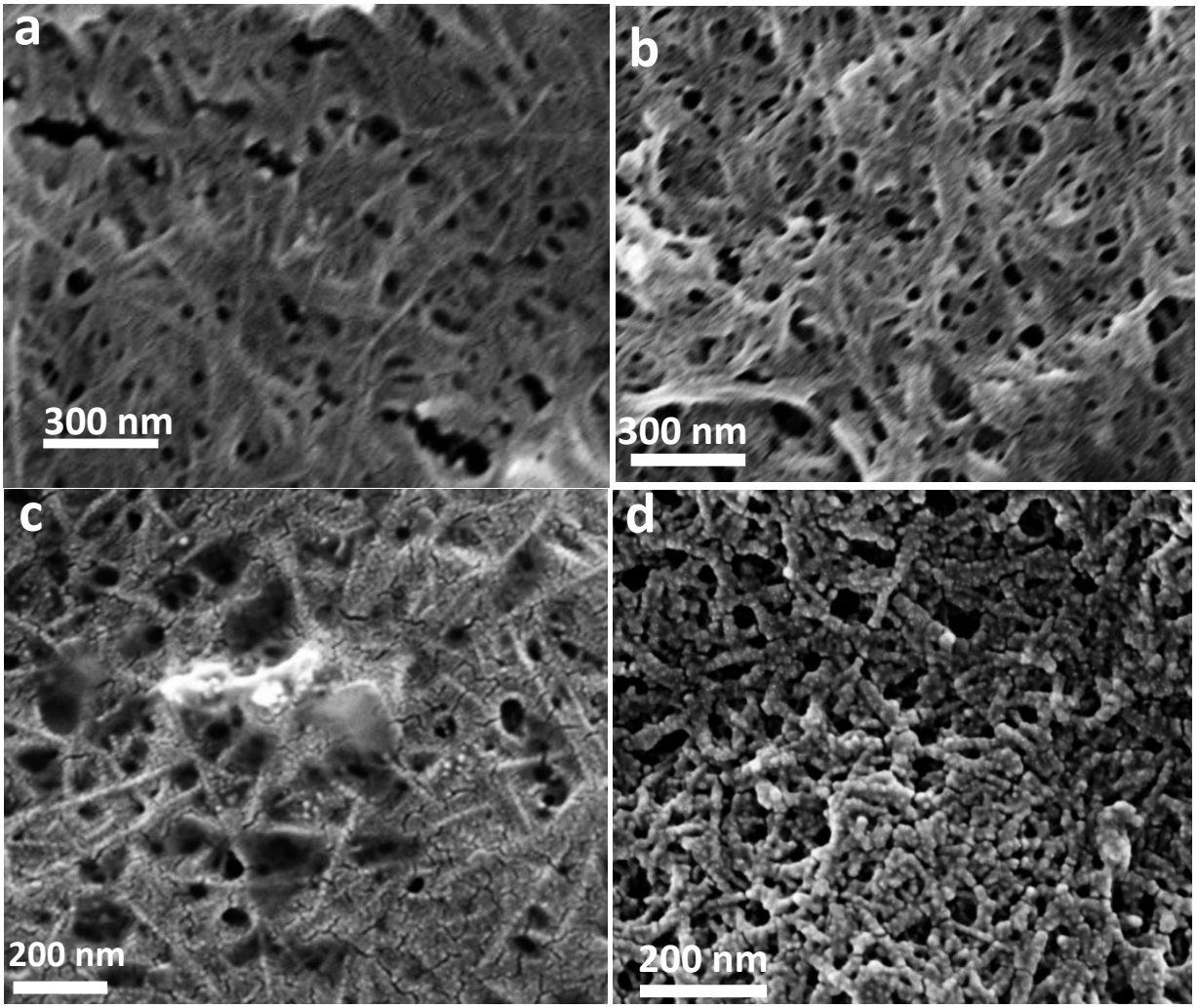

Fig. S3. SEM image of Gel-F (a) shows nanofibrillar network. (b) SEM image of Gel-Y shows nanofibrillar network. (c) describe the GQDs decorated morphology by the SEM image of GQD-F(10 mmol L^{-1} of Amoc-F-OH with 0.5 mg mL^{-1} GQDs) and (d) SEM image shows GQDs deposited fiber of GQD-Y (10 mmol L^{-1} of Amoc-Y-OH with 0.5 mg mL^{-1} GQDs).

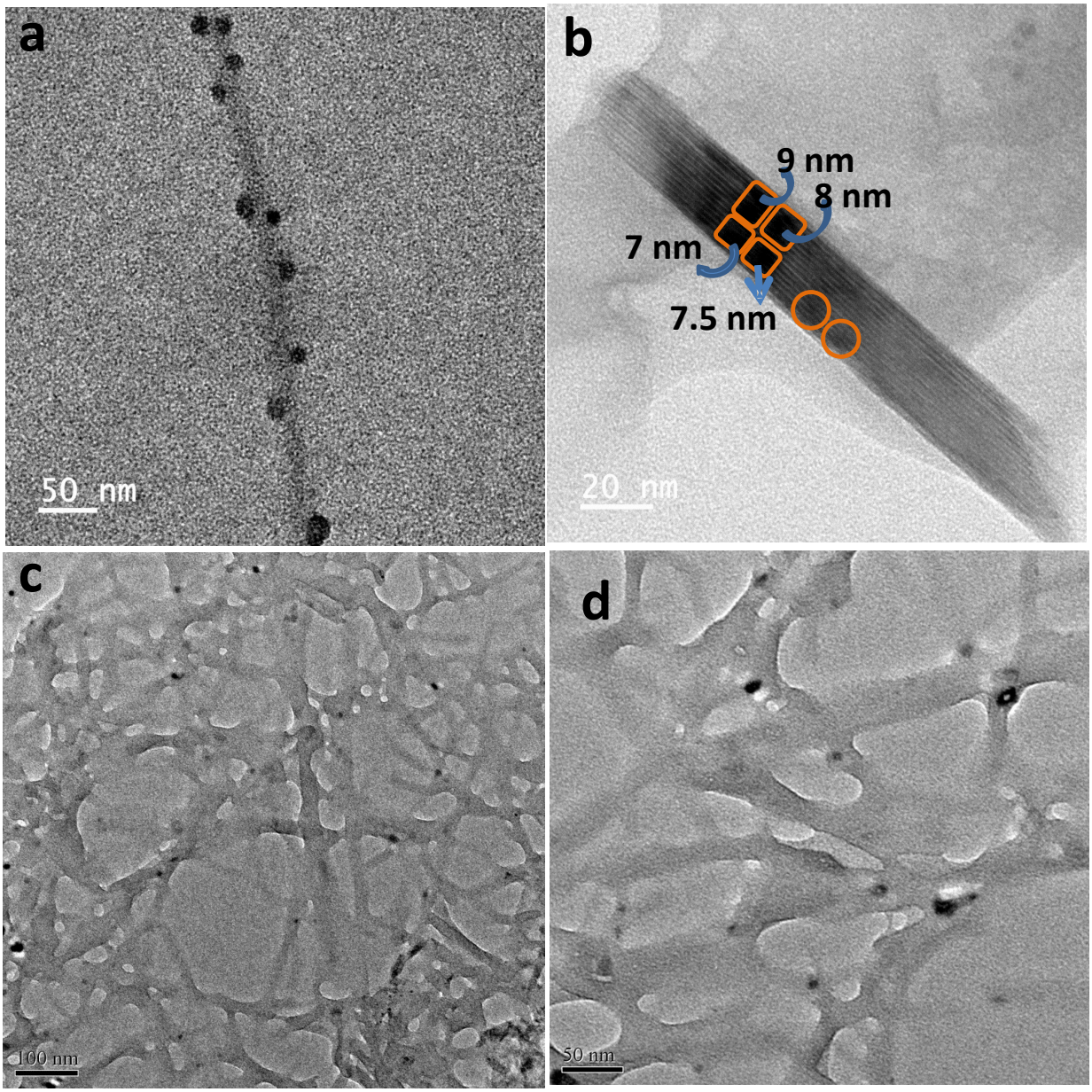

Fig. S4. TEM image of GQD-F (10 mmol L^{-1} of Amoc-F-OH with 0.5 mg mL^{-1} GQDs) depicts graphene quantum dots are embedded on fibril (a) And at higher magnification it was shown the size of the decorated GQDs are mostly 7-9 nm. (c), (d) TEM images of GQD-Y (10 mmol L^{-1} of Amoc-Y-OH with 0.5 mg mL^{-1} GQDs) shows random distribution of GQDs on the fibril.

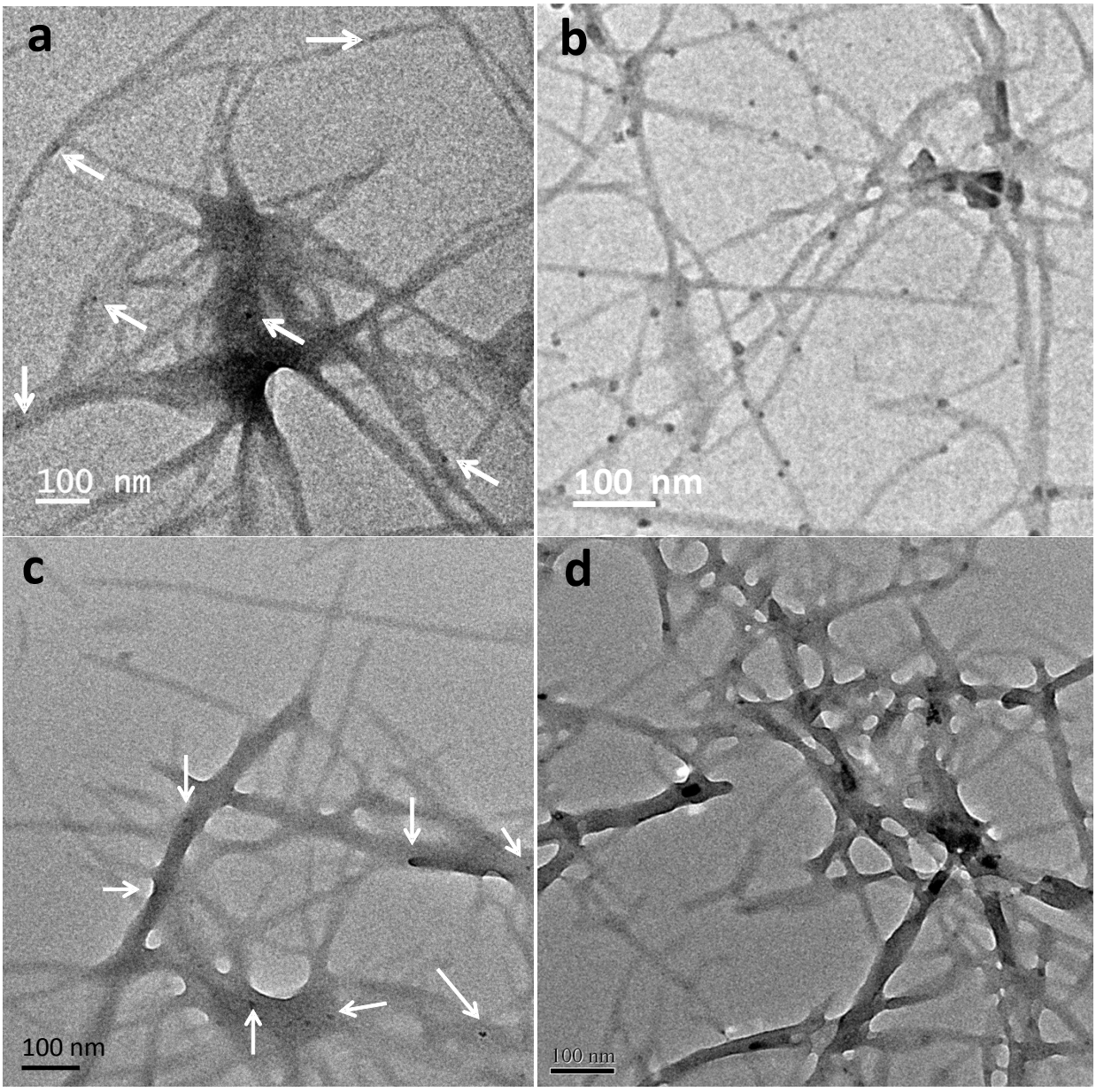

Fig. S5. (a) and (b) represent the TEM images at different concentration of GQDs in GQD-F (10 mmol L^{-1} of Amoc-F-OH). (a) corresponds to 0.3 mg mL^{-1} of GQDs which shows less amount of GQDs are deposited on the fibril whereas (b) shows more number of GQDs are deposited on the fiber with 0.7 mg mL^{-1} of GQDs. (c) and (d) shows the TEM images for GQD-Y with 0.3 mg mL^{-1} and 0.7 mg mL^{-1} of GQDs respectively. (c) and (d) also showed similar observation as like (a) and (b).

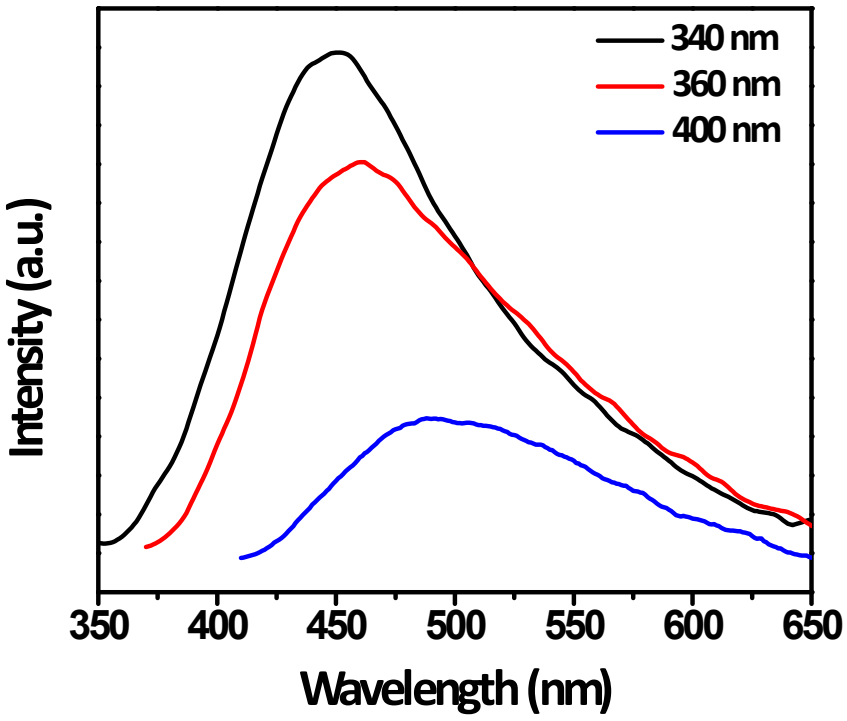

Fig. S6. (a) is the excitation wavelength dependent emission spectra of GQDs.

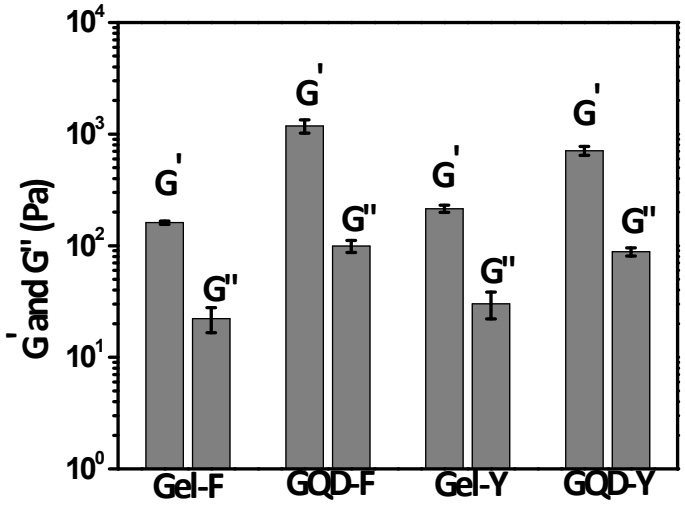

Fig. S7. Rheological properties of hydrogels formed using different Amoc-amino acids or composites. All data is from a frequency sweep at 0.1% strain, with values recorded at 10 rad s^{-1}.

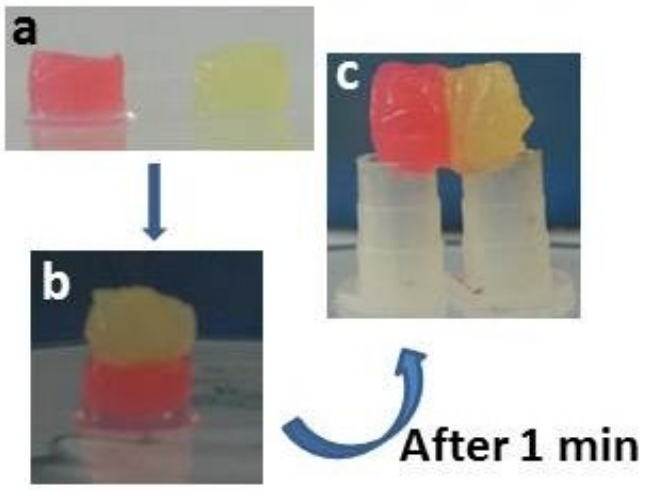

Fig. S8. (a), (b) and (c) represent the self-healing property of the gel GQD-Y.

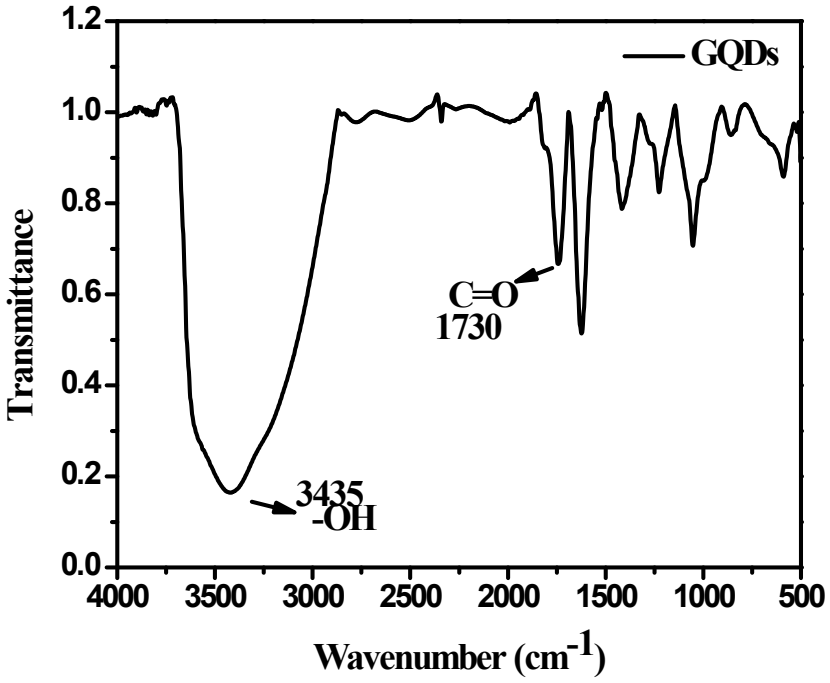

Fig. S9. FTIR spectrum of synthesized GQDs.

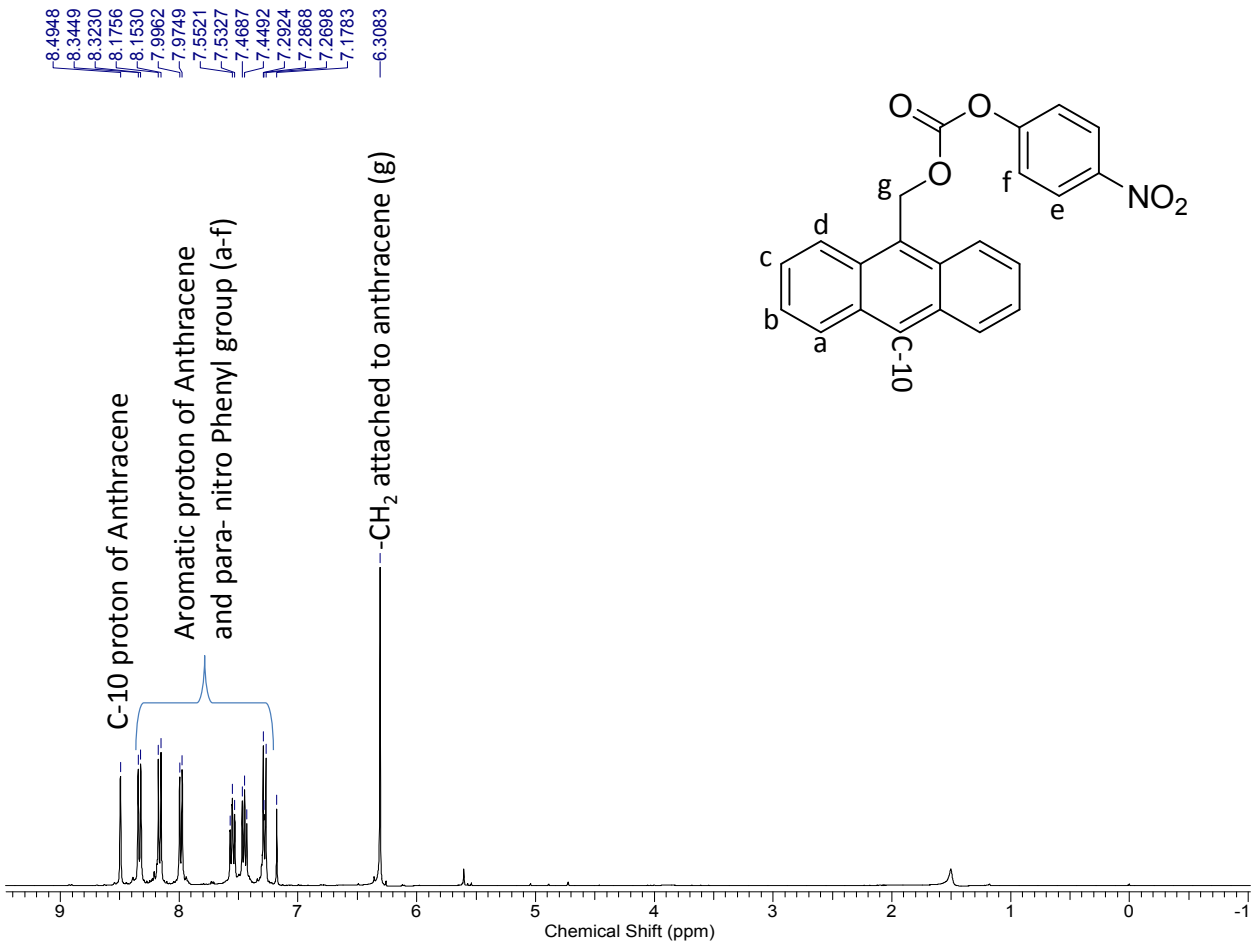

Fig. S10. ^{1}H-NMR spectrum of anthracen-9-ylmethyl (4-nitrophenyl) carbonate **3** in $CDCl_3$.

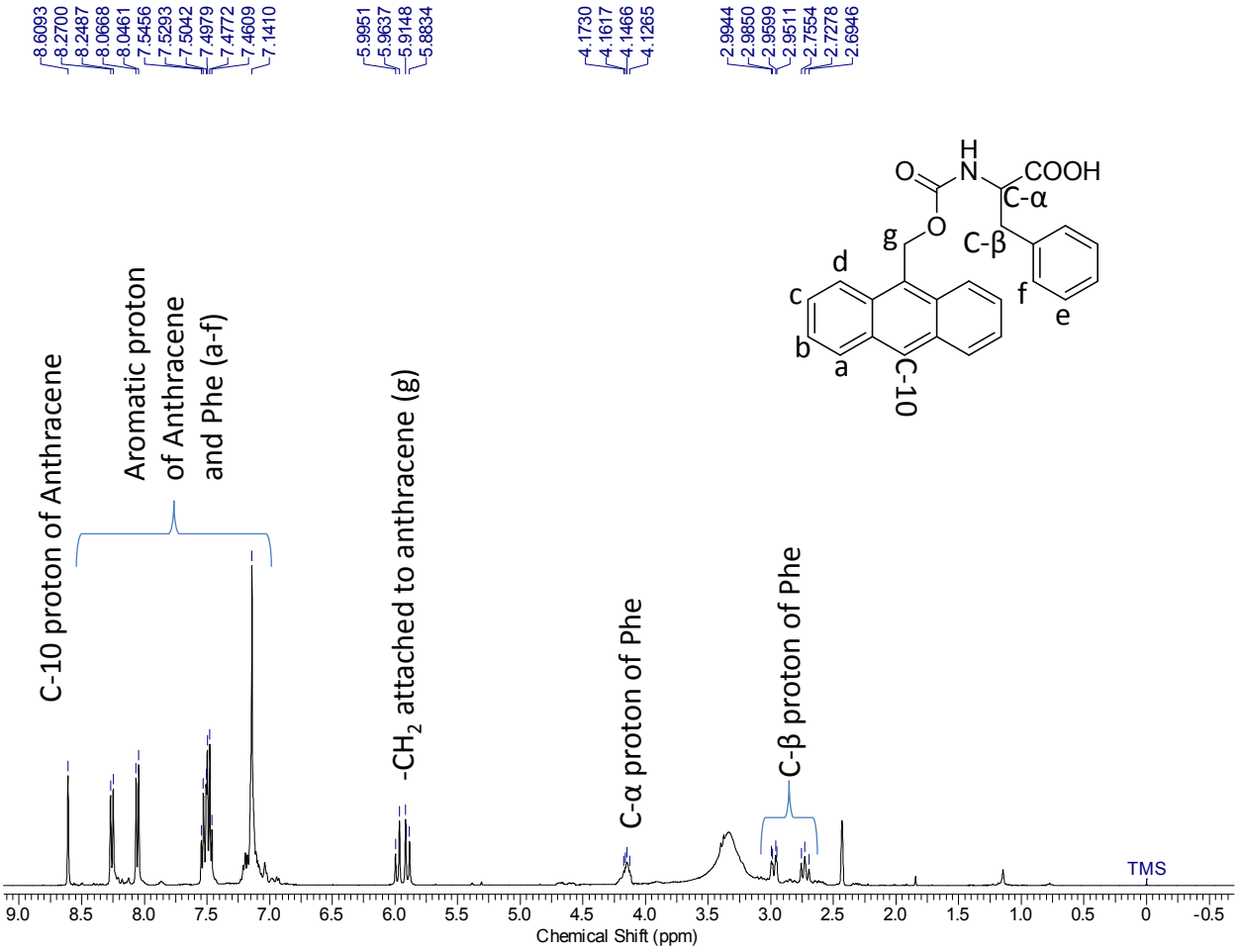

Fig. S11. ^{1}H-NMR spectrum of Amoc-Phe-OH **(1)** in DMSO-d_6.

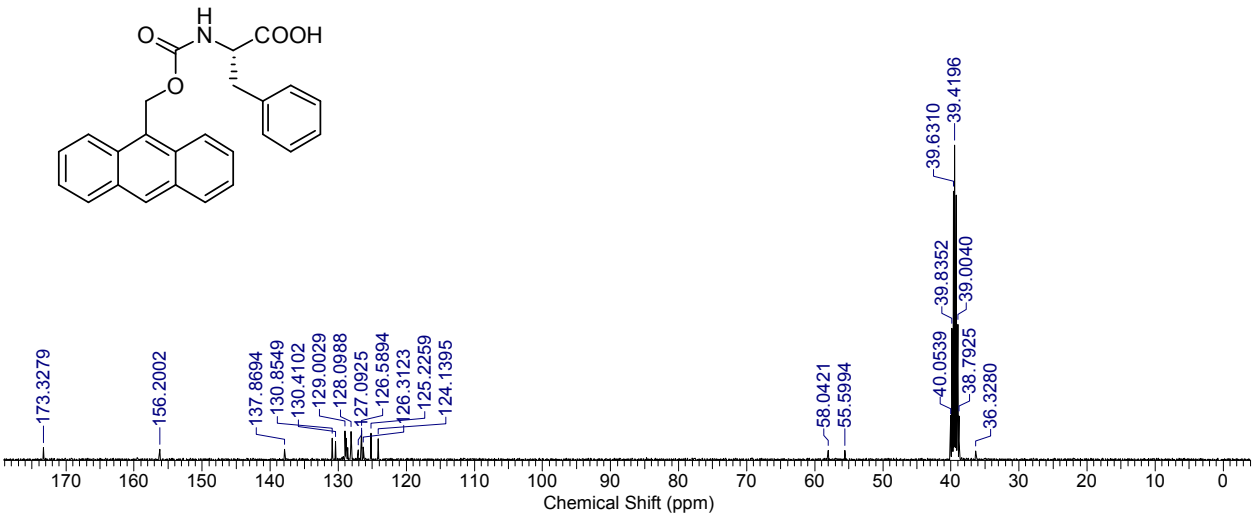

Fig. S12. ^{13}C-NMR spectrum of Amoc-Phe-OH (**1**) in DMSO-d_6.

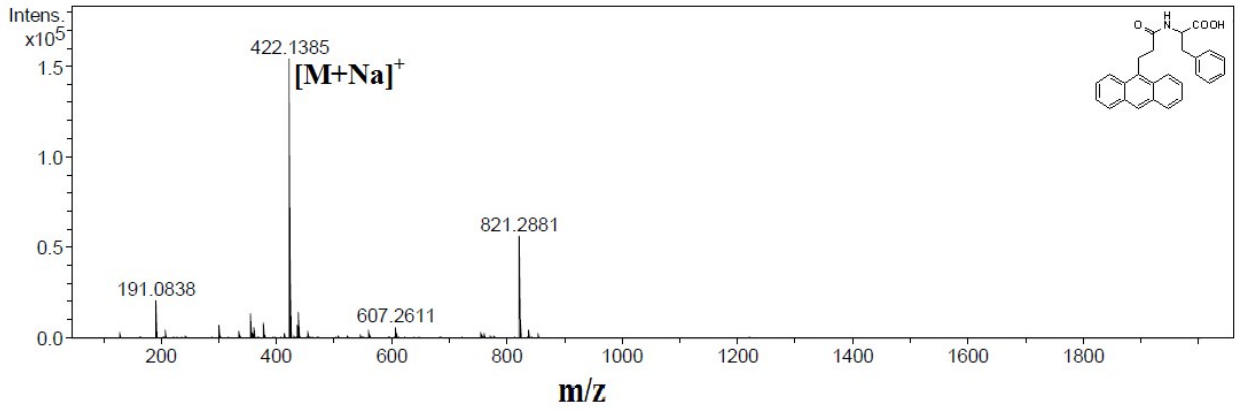

Fig. S13. ESI-MS spectrum of Amoc-F-OH (**1**).

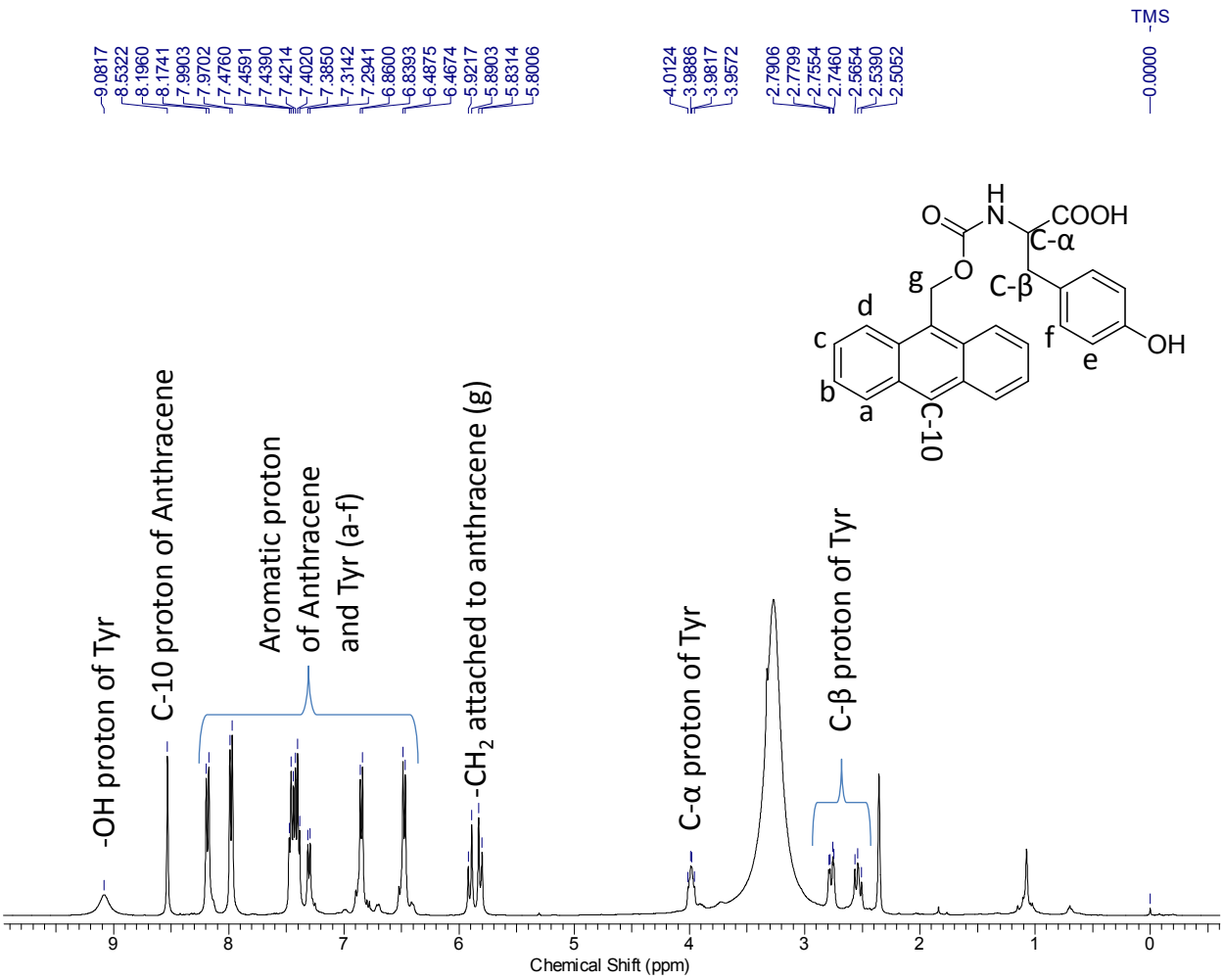

Fig. S14. ^{1}H-NMR spectrum of Amoc-Tyr-OH (**2**) in DMSO-d_6.

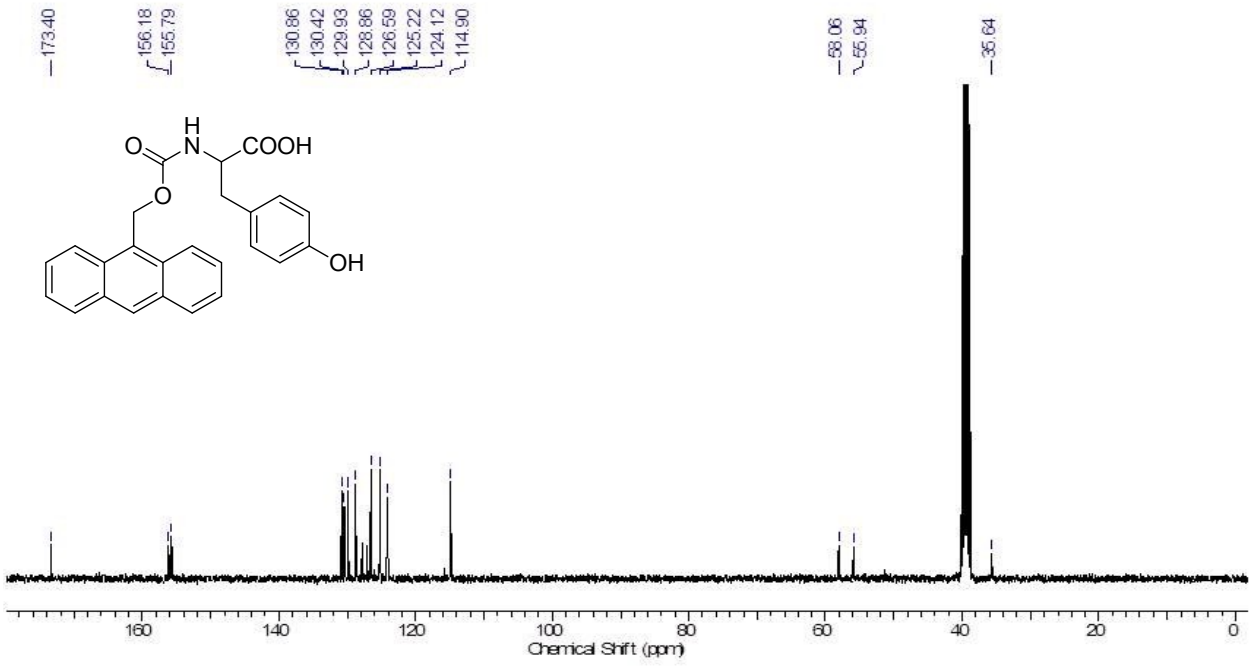

Fig. S15. ^{13}C-NMR spectrum of Amoc-Tyr-OH (**2**) in DMSO-d_6.

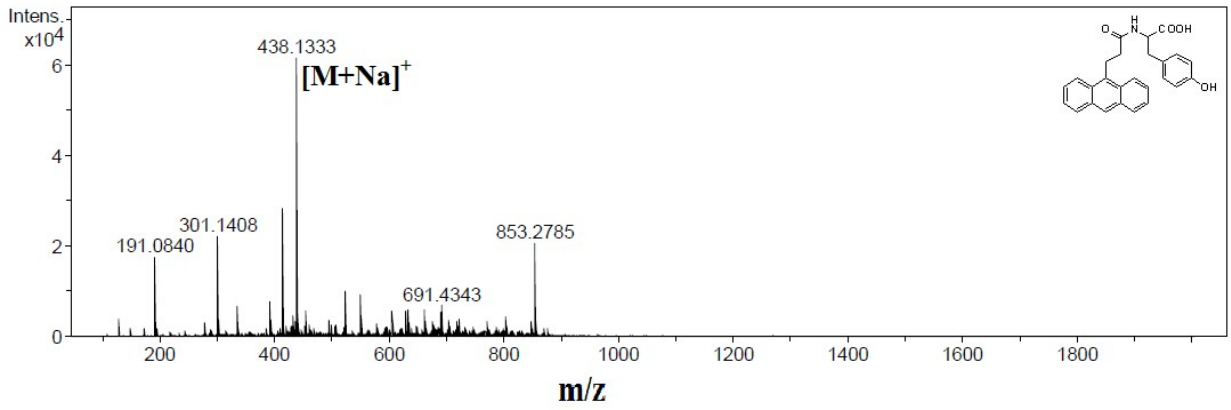

Fig. S16. ESI-MS spectrum of Amoc-Y-OH (**2**).