Supporting Information

Photoinduced Electron Transfer from Various Aniline Derivatives to Graphene Quantum Dots

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Table of Contents

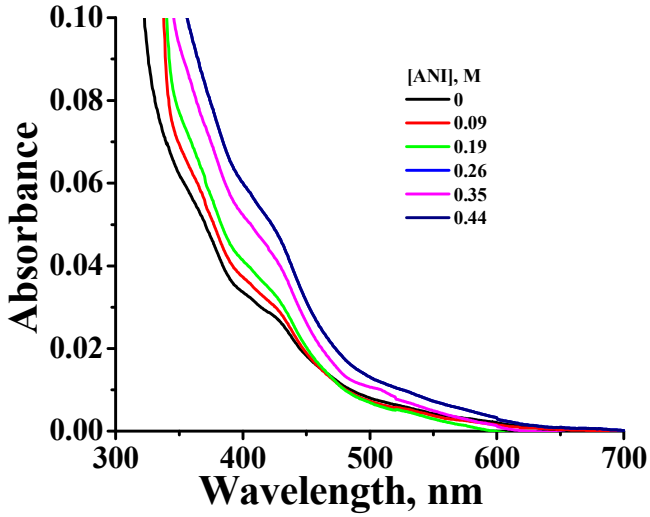

Figure S1. UV-visible absorption spectra of GQDs in DMF with increasing concentration of aniline. [GQDs]: 0.25 mg/mL and concentration of aniline is shown in inset.

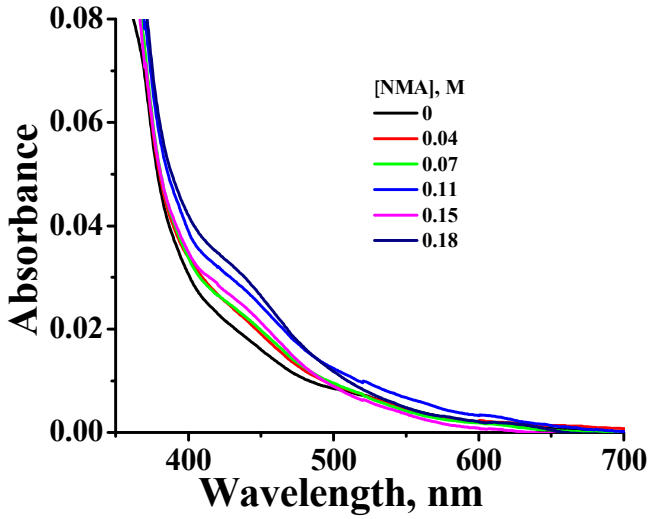

Figure S2. UV-visible absorption spectra of GQDs in DMF with increasing concentration of *N*-methylaniline. [GQDs]: 0.25 mg/mL and concentration of *N*-methylaniline is shown in inset

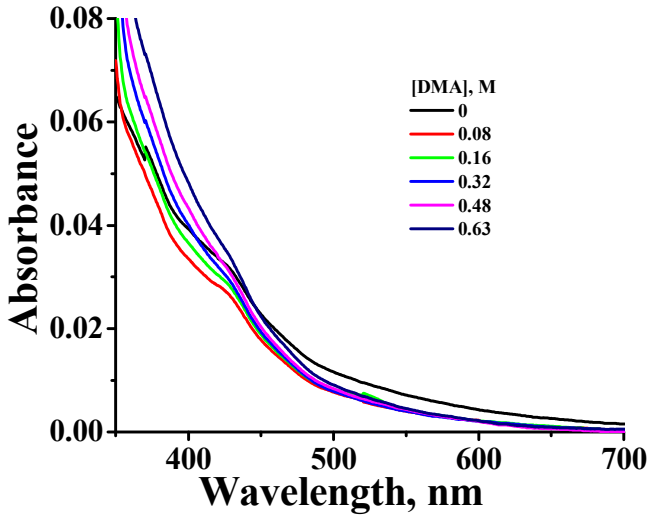

Figure S3. UV-visible absorption spectra of GQDs in DMF with increasing concentration of *N,N′*-dimethylaniline. [GQDs]: 0.25 mg/mL and concentration of *N,N′*-dimethylaniline is shown in inset.

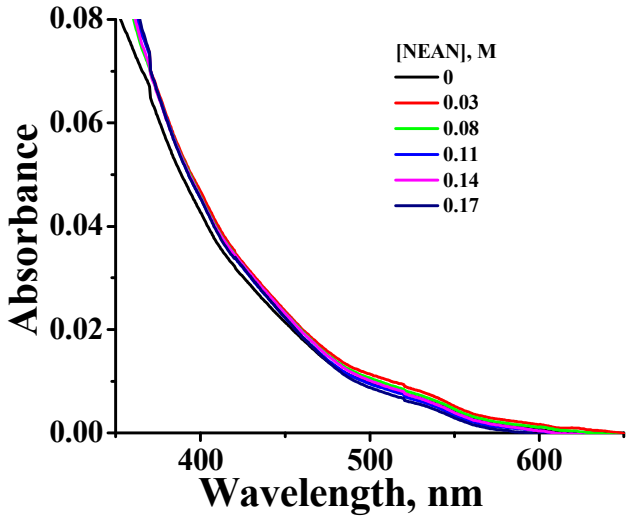

Figure S4. UV-visible absorption spectra of GQDs in DMF with increasing concentration of *N*-ethylaniline. [GQDs]: 0.25 mg/mL and concentration of *N*-ethylaniline is shown in inset

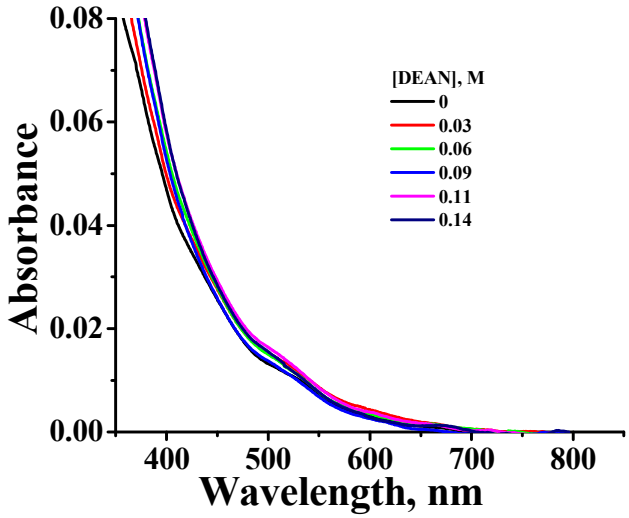

Figure S5. UV-visible absorption spectra of GQDs in DMF with increasing concentration of *N,N′*-diethylaniline. [GQDs]: 0.25 mg/mL and concentration of *N,N′*-diethylaniline is shown in inset.

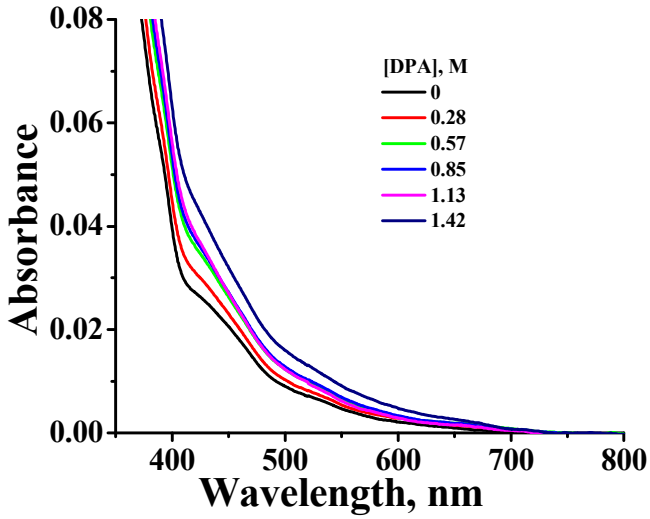

Figure S6. UV-visible absorption spectra of GQDs in DMF with increasing concentration of *N,N′*-diphenylaniline. [GQDs]: 0.25 mg/mL and concentration of *N,N′*-diphenylaniline is shown in inset.

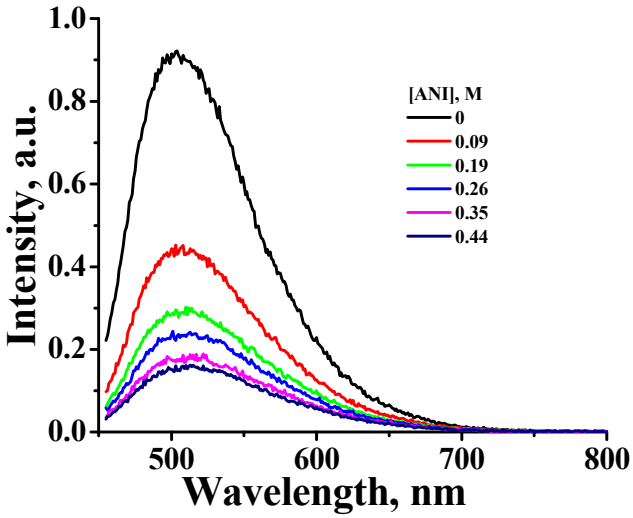

Figure S7. Steady-state luminescence spectra of GQDs in DMF with increasing concentration of aniline. [GQDs]: 0.25 mg/mL; λ_{ex}= 440 nm.

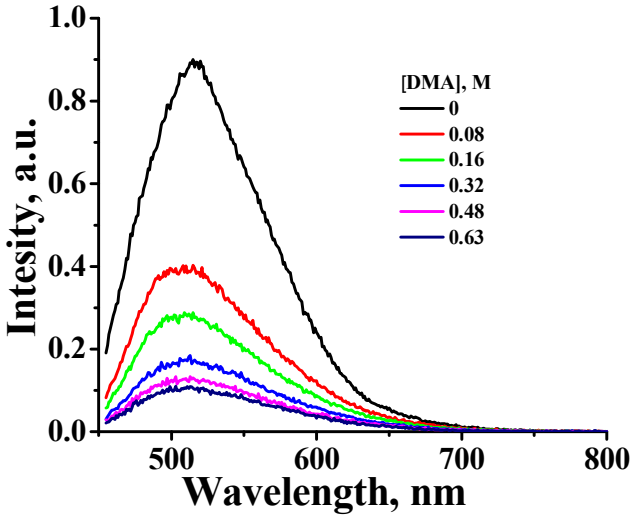

Figure S8. Steady-state luminescence spectra of GQDs in DMF with increasing concentration of *N,N′*-dimethylaniline. [GQDs]: 0.25 mg/mL; λ_{ex}= 440 nm.

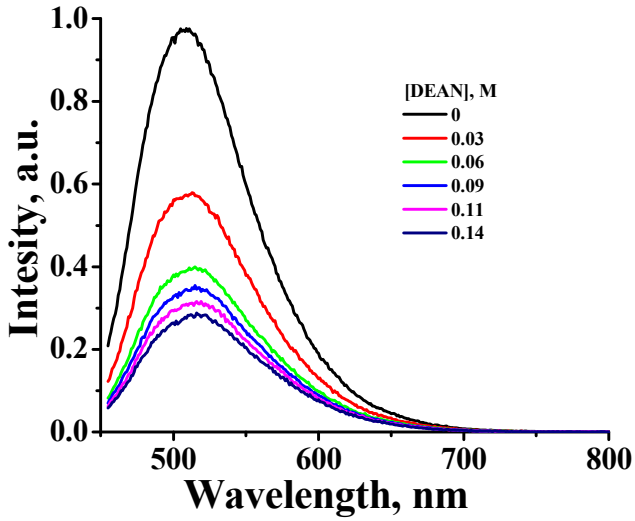

Figure S9. Steady-state luminescence spectra of GQDs in DMF with increasing concentration of *N,N′*-diethylaniline. [GQDs]: 0.25 mg/mL; λ_{ex}= 440 nm.

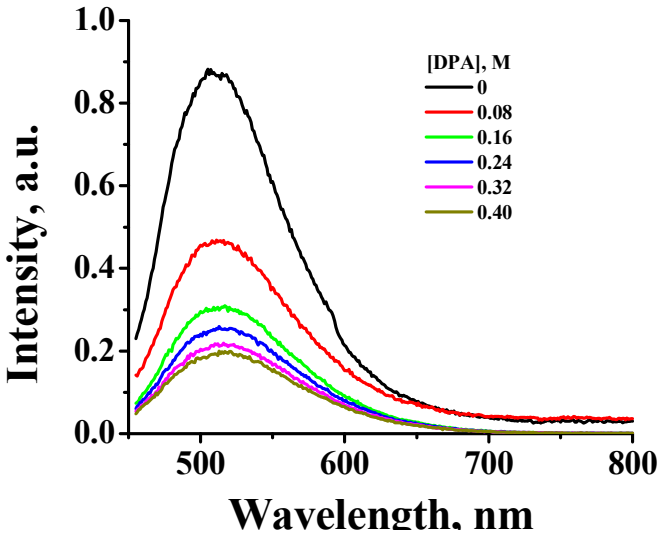

Figure S10. Steady-state luminescence spectra of GQDs in DMF with increasing concentration of *N,N′*-diphenylaniline. [GQDs]: 0.25 mg/mL; λ_{ex}= 440 nm.

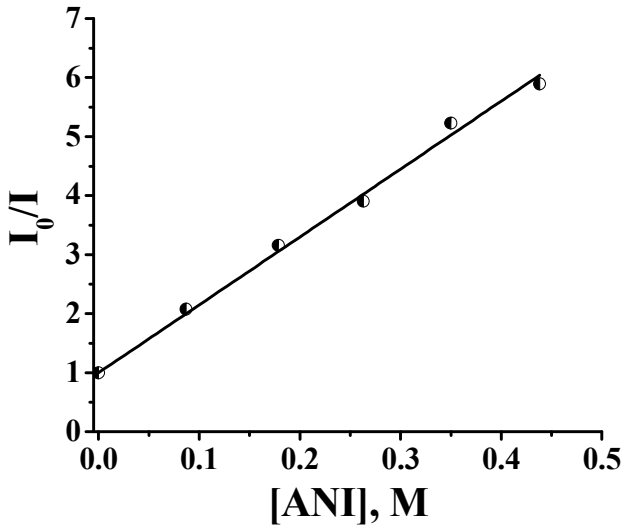

Figure S11. Stern-Volmer plot for steady-state luminescence quenching of GQDs in presence of aniline. [GQDs]: 0.25 mg/mL; λ_{ex}= 440 nm, λ_{em}= 510 nm.

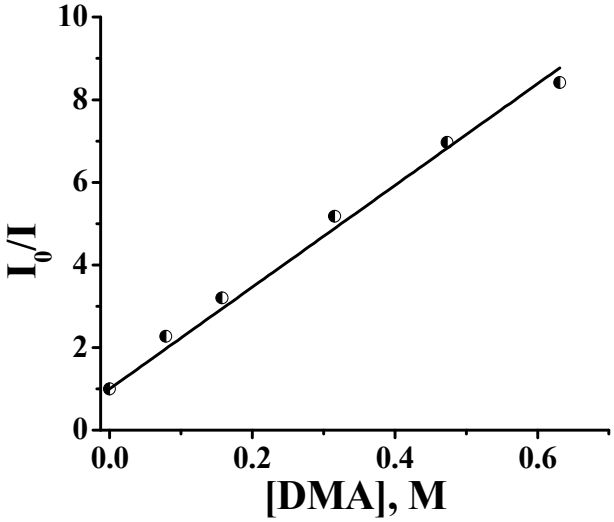

Figure S12. Stern-Volmer plot for steady-state luminescence quenching of GQDs in presence of *N,N′*-dimethylaniline. [GQDs]: 0.25 mg/mL; λ_{ex}= 440 nm, λ_{em}= 510 nm.

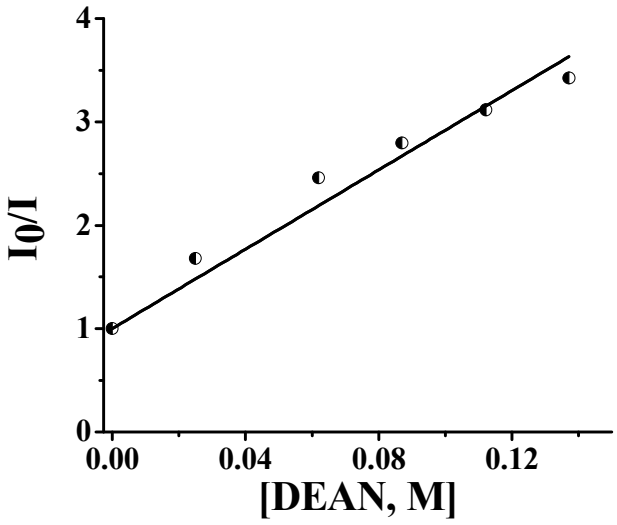

Figure S13. Stern-Volmer plot for steady-state luminescence quenching of GQDs in presence of *N,N′*-diethylaniline. [GQDs]: 0.25 mg/mL; λ_{ex}= 440 nm, λ_{em}= 510 nm.

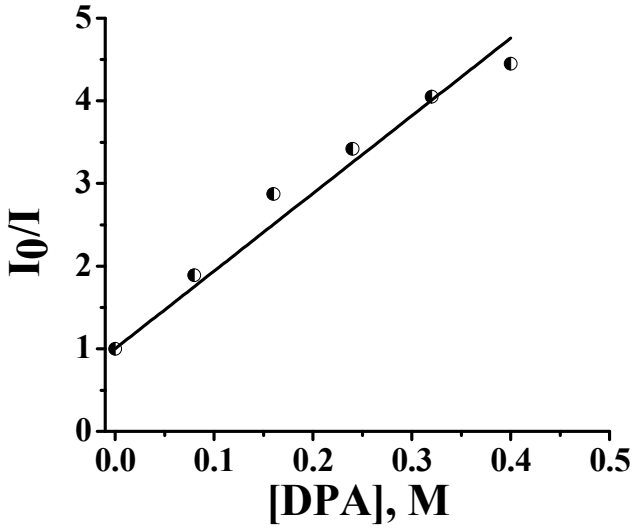

Figure S14. Stern-Volmer plot for steady-state luminescence quenching of GQDs in presence of *N,N′*-diphenylaniline. [GQDs]: 0.25 mg/mL; λ_{ex}= 440 nm, λ_{em}= 510 nm.

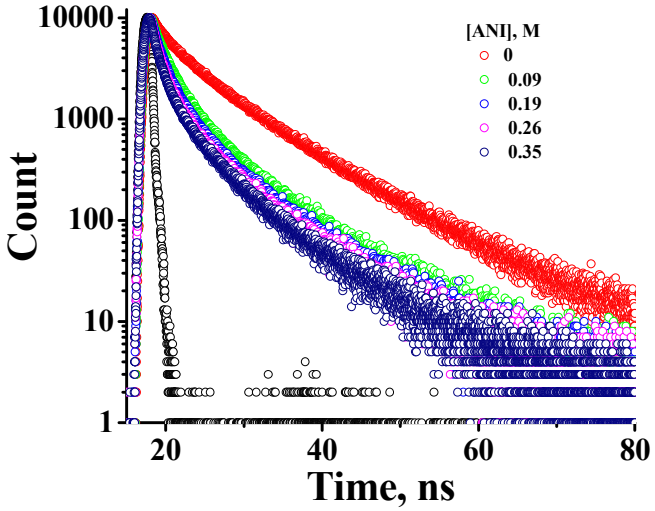

Figure S15. Time-resolve luminescence decay plot of GQDs in presence of aniline. [GQDs]: 0.25 mg/mL; λ_{ex}=444 nm, λ_{em}=510 nm.

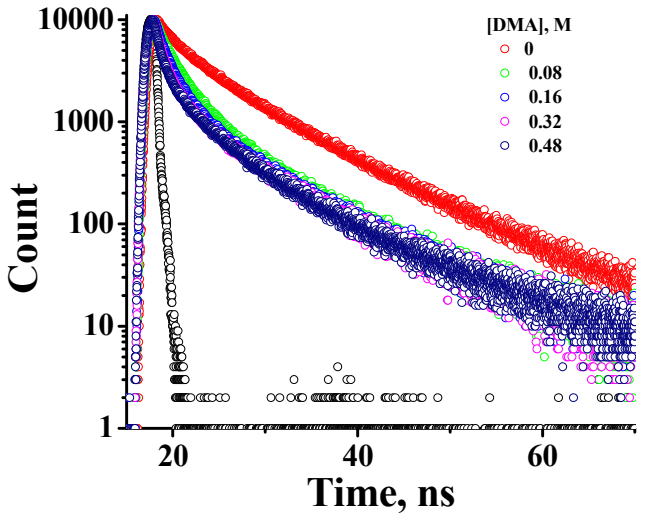

Figure S16. Time-resolve luminescence decay plot of GQDs in presence of *N,N′*-dimethylaniline. [GQDs]: 0.25 mg/mL; λ_{ex}=444 nm, λ_{em}=510 nm.

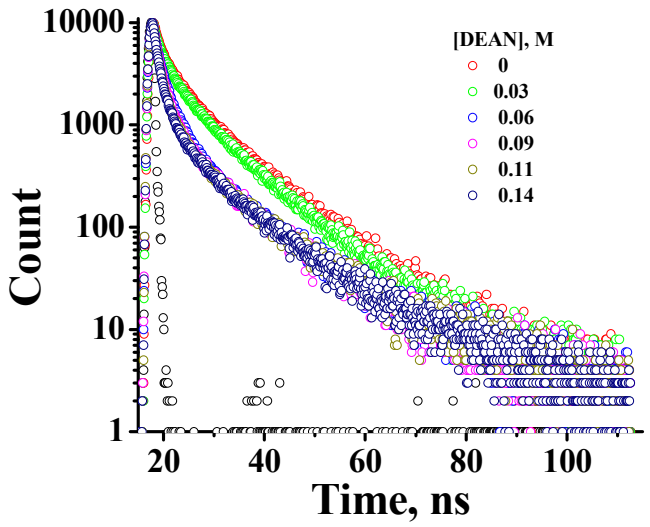

Figure S17. Time-resolve luminescence decay plot of GQDs in presence of *N,N′*-diethylaniline. [GQDs]: 0.25 mg/mL; λ_{ex}=444 nm, λ_{em}=510 nm.

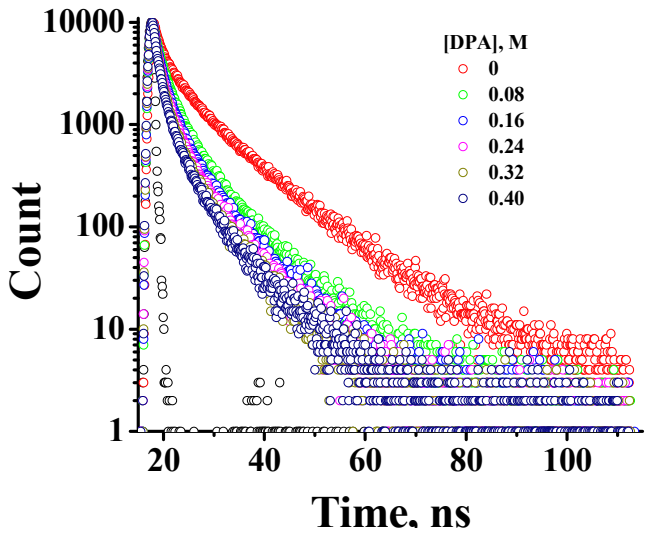

Figure S18. Time-resolve luminescence decay plot of GQDs in presence of *N,N′*-diphenylaniline. [GQDs]: 0.25 mg/mL; λ_{ex}=444 nm, λ_{em}=510 nm.

Table S1: Luminescence lifetime values of GQDs in presence of various concentrations of aniline. λ_{ex}: 444 nm, λ_{em}: 510 nm and [GQDs]: 0.25 mg/mL.

[ANI], M	τ_1 (ns) A_2 (%)	τ_2 (ns) A_3 (%)	τ_{av} (ns)	χ^2
0	4.08 (35.26)	10 (59)	8.79	1.14
0.09	2.25 (53.03)	7.56 (34.79)	5.82	1.17
0.19	1.91 (48.27)	6.97 (34.85)	5.46	1.12
0.26	1.75 (42.70)	6.45 (34.89)	5.12	1.14
0.35	1.82 (40.34)	6.5 (32.05)	5.06	1.16

Error: ± 5%; τ: lifetime; A: relative amplitude; the instrumental response function: 1.2 ns.The short lifetime component values have not shown in the table.

Table S2: Luminescence lifetime values of GQDs in presence of various concentrations of *N,N′*-dimethylaniline. λ_{ex}: 444 nm, λ_{em}: 510 nm and [GQDs]: 0.25 mg/mL.

[DMA], M	τ_1 (ns) A_2 (%)	τ_2 (ns) A_3 (%)	τ_{av} (ns)	χ^2
0	4.08 (35.26)	10 (59)	8.79	1.14
0.08	2.34 (53.05)	8.56 (36.57)	6.73	1.09
0.16	2.02 (43.56)	8.44 (38.17)	6.90	1.09
0.32	1.83 (32.83)	7.68 (41.97)	6.58	1.16
0.48	1.96 (29.11)	7.39 (42.74)	6.38	1.18

Error: ± 5%; τ: lifetime; A: relative amplitude; the instrumental response function: 1.2 ns.The short lifetime component values have not shown in the table.

Table S3: Luminescence lifetime values of GQDs in presence of various concentrations of *N,N′*-diethylaniline. λ_{ex}: 444 nm, λ_{em}: 510 nm and [GQDs]: 0.25 mg/mL.

[DEAN], M	τ_1 (ns) A_2 (%)	τ_2 (ns) A_3 (%)	τ_{av} (ns)	χ^2
0	3.32 (30.24)	10.53 (58.59)	8.79	1.08
0.03	2.65 (31.27)	9.68 (58.53)	8.74	1.11
0.06	2.22 (47.37)	9.81 (32.39)	7.76	1.19
0.09	1.73 (45.96)	8.85 (34.24)	7.26	1.25
0.11	1.88 (39.91)	10.04 (33.97)	8.34	1.17
0.14	1.52 (41.64)	9.32 (34.81)	7.93	1.29

Error: ± 5%; τ: lifetime; A: relative amplitude; the instrumental response function: 1.2 ns. The short lifetime component values have not shown in the table.

Table S4: Luminescence lifetime values of GQDs in presence of various concentrations of *N,N′*-diphenylaniline. λ_{ex}: 444 nm, λ_{em}: 510 nm and [GQDs]: 0.25 mg/mL.

[DPA], M	τ_1 (ns) A_2 (%)	τ_2 (ns) A_3 (%)	τ_{av} (ns)	χ^2
0	3.32 (30.24)	10.53 (58.59)	8.79	1.08
0.08	2.11 (48.71)	7.20 (36.26)	5.68	1.03
0.16	1.73 (47.61)	6.20 (34.78)	4.88	1.02
0.24	1.75 (46.86)	6.37 (28.81)	4.80	1.14
0.32	1.57 (46.58)	5.73 (27.91)	4.28	1.21
0.40	1.29 (46.22)	5.15 (28.90)	3.95	1.08

Error: ± 5%; τ: lifetime; A: relative amplitude; the instrumental response function: 1.2 ns.The short lifetime component values have not shown in the table.

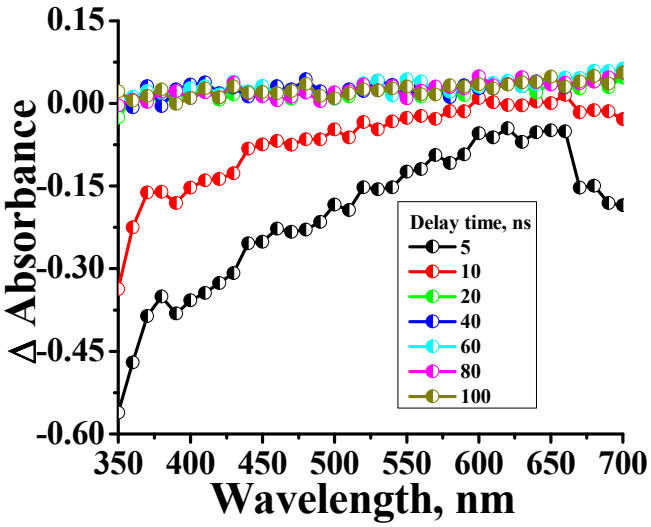

Figure S19. Transient difference absorption spectra GQDs (0.5 mg/mL) in presence of aniline. The plots are obtained at different time delay after the laser excitation. The delay times are shown in inset of each figure.

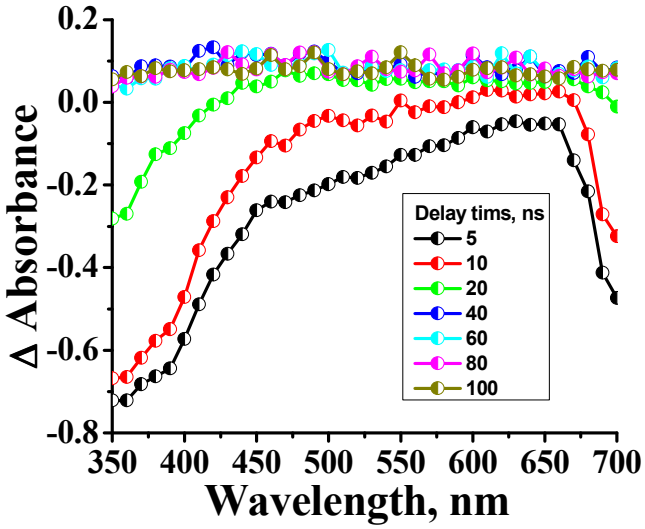

Figure S20. Transient difference absorption spectra GQDs (0.5 mg/mL) in presence of *N,N′*-dimethylaniline. The plots are obtained at different time delay after the laser excitation. The delay times are shown in inset of each figure.

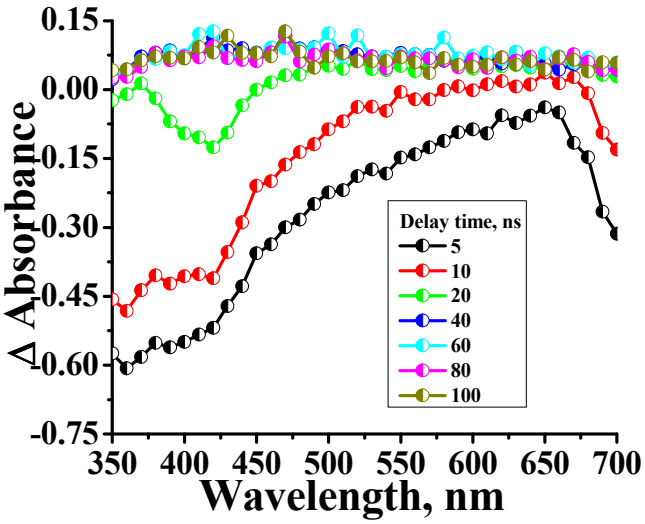

Figure S21. Transient difference absorption spectra GQDs (0.5 mg/mL) in presence of *N*-ethylaniline. The plots are obtained at different time delay after the laser excitation. The delay times are shown in inset of each figure.

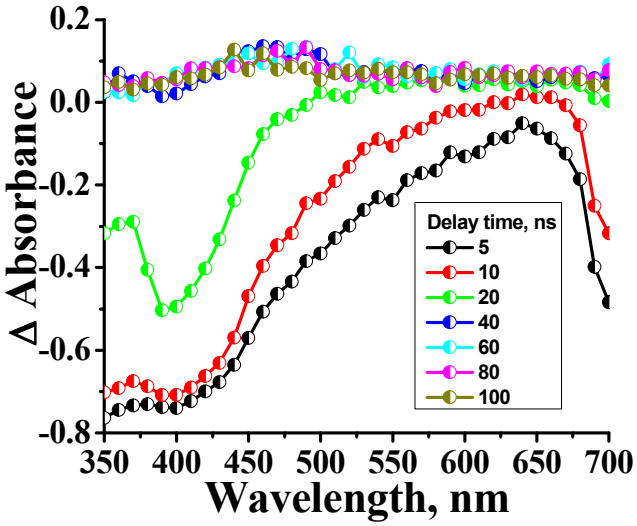

Figure S22. Transient difference absorption spectra GQDs (0.5 mg/mL) in presence of *N,N'*-diethylaniline. The plots are obtained at different time delay after the laser excitation. The delay times are shown in inset of each figure.

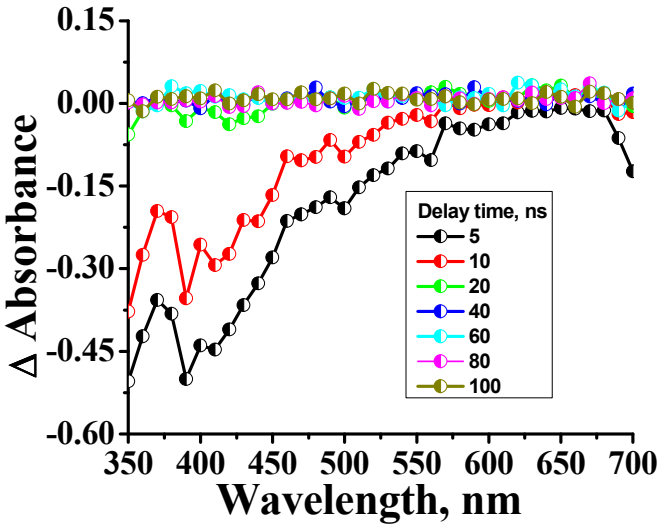

Figure S23. Transient difference absorption spectra GQDs (0.5 mg/mL) in presence of *N,N'*-diphenylaniline. The plots are obtained at different time delay after the laser excitation. The delay times are shown in inset of each figure.

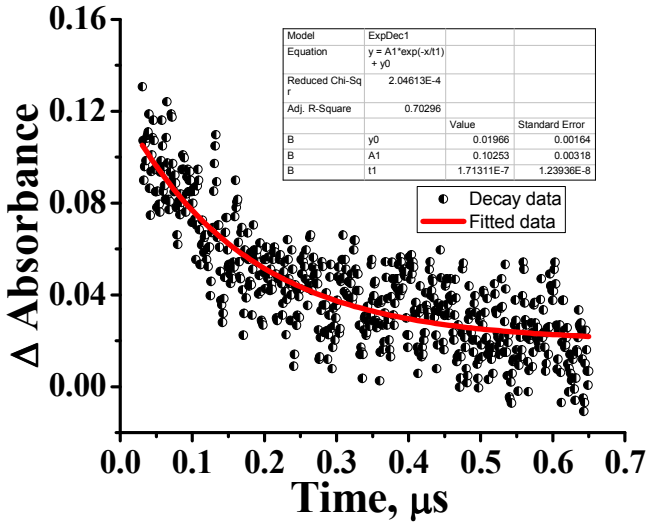

Figure S24. Transient decay trace probed at 430 nm for GQDs-NMA system in DMF.

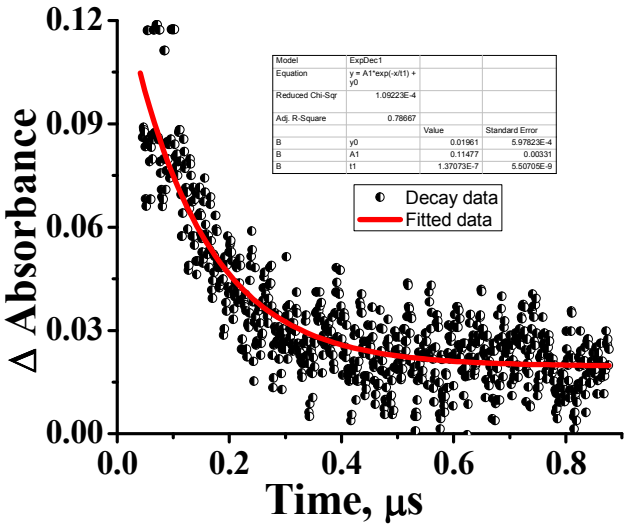

Figure S25. Transient decay trace probed at 425 nm for GQDs-NEA system in DMF.

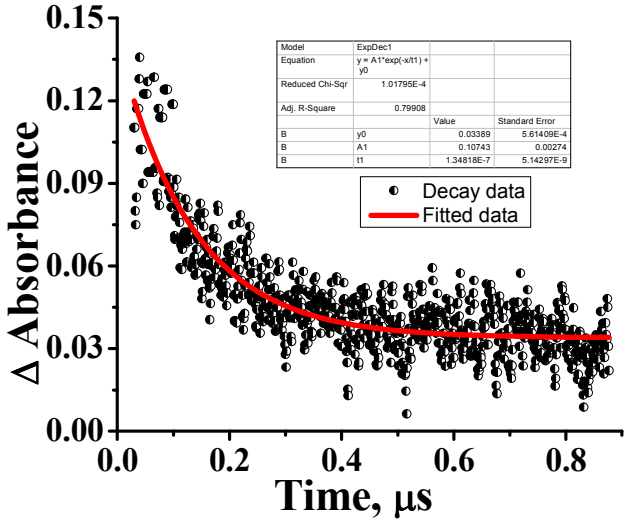

Figure S26. Transient decay trace probed at 455 nm for GQDs-DEAN system in DMF.

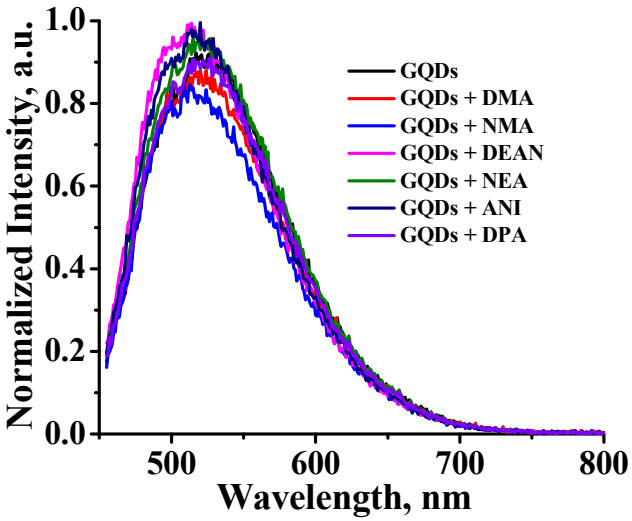

Figure S27. Steady-state luminescence spectra of GQDs in presence of various aniline derivatives at acidic pH (pH~2).