Supporting Information for

Amino Acid-Derived Alternating Polyampholyte Luminogen

Biswajit Saha,[a] Neha Choudhury,[a] Abhi Bhadran,[a] Kamal Bauri,[b,*] and Priyadarsi De[a,*]

[a]Polymer Research Centre and Centre for Advanced Functional Materials, Department of Chemical Sciences, Indian Institute of Science Education and Research Kolkata, Mohanpur - 741246, Nadia, West Bengal, India

[b]Department of Chemistry, Raghunathpur College, Purulia- 723133, West Bengal, India

* Corresponding Author: kamalsom98@gmail.com (K.B.); p_de@iiserkol.ac.in (P.D.)

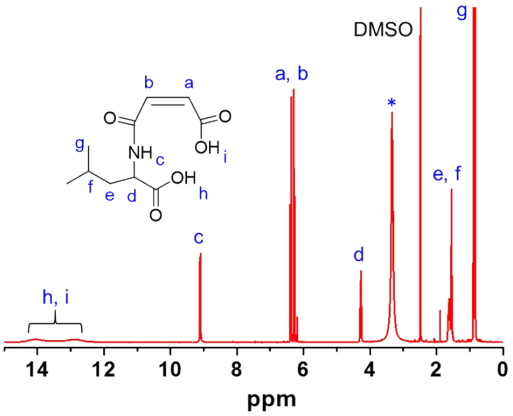


Fig. S1 ^{1}H NMR spectrum of *N*-maleamic acid-L-leucine **(1)** in DMSO-d_6.

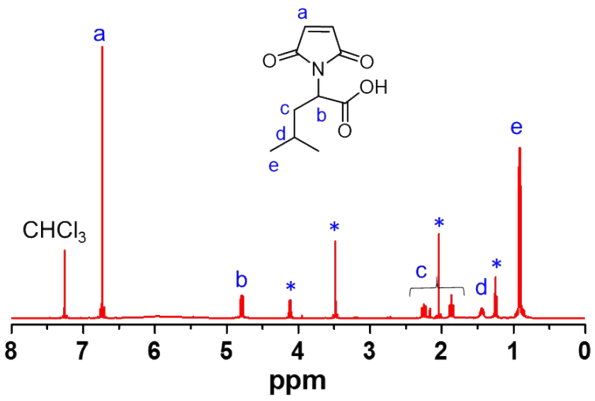


Fig. S2 ^{1}H NMR spectrum of *N*-maleoyl-L-leucine (**2**) in $CDCl_3$.

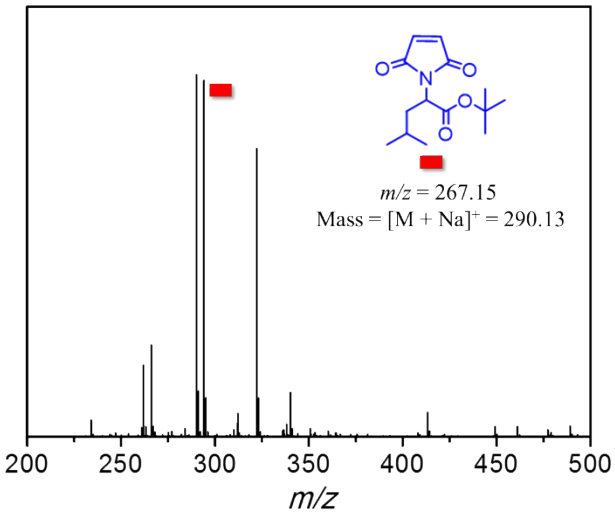


Fig. S3 ESI-MS spectrum of *N*-maleoyl-L-leucine *tert*-butyl ester (**M1**). Mass (*m*/*z*) calculated for $C_{14}H_{21}NO_4$ [**M1** + Na]$^+$ = 290.15; observed = 290.13.

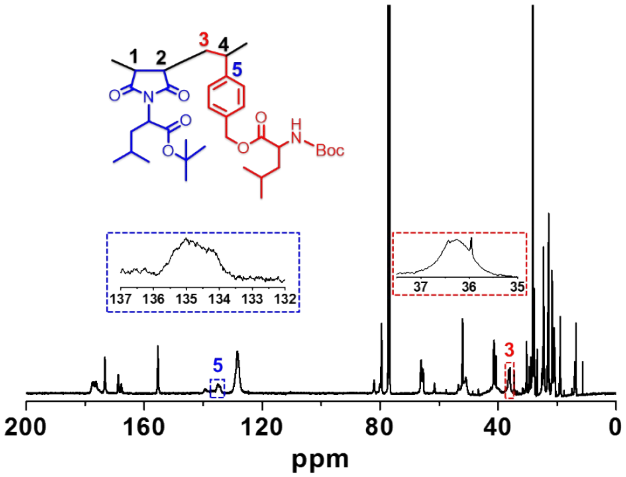


Fig. S4 ^{13}C NMR spectrum of **PP** in $CDCl_3$.

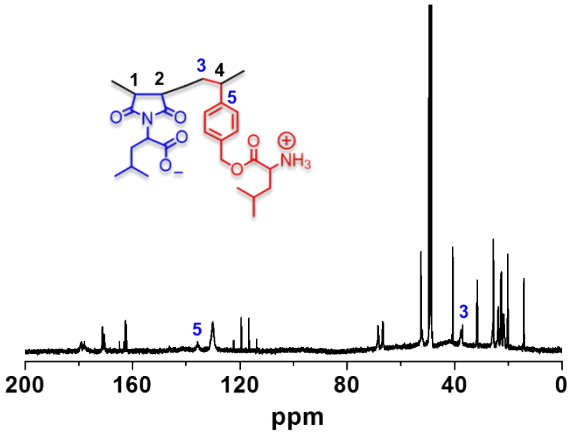


Fig. S5 ^{13}C NMR spectrum of polyampholyte **DP** in methanol-d_4.

Table S1. Solubility of **DP** in different organic solvents.[a]

Solvent	**DP**
Tetrahydrofuran (THF)	+
1,4-Dioxane	-
Acetone	-
Methanol	+
Ethanol	+
Dimethyl sulfoxide (DMSO)	+
Acetonitrile	-
Hexane	-
N,N-Dimethylformamide (DMF)	+

[a]The symbols (+) and (-) indicates soluble and insoluble, respectively.

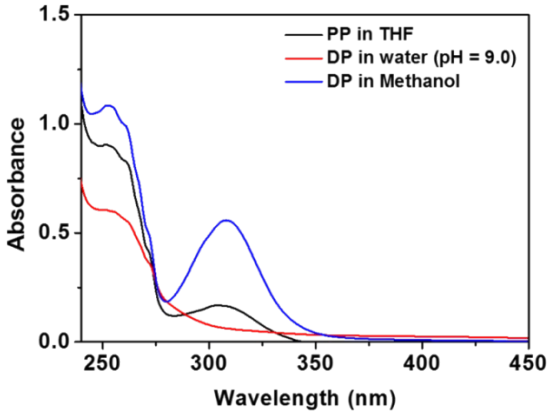


Fig. S6 UV-visible absorption spectra of **PP** and **DP** in different solvents.

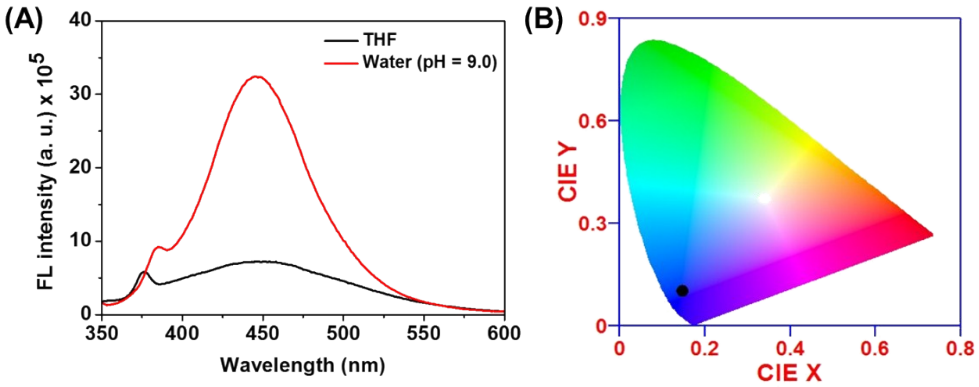
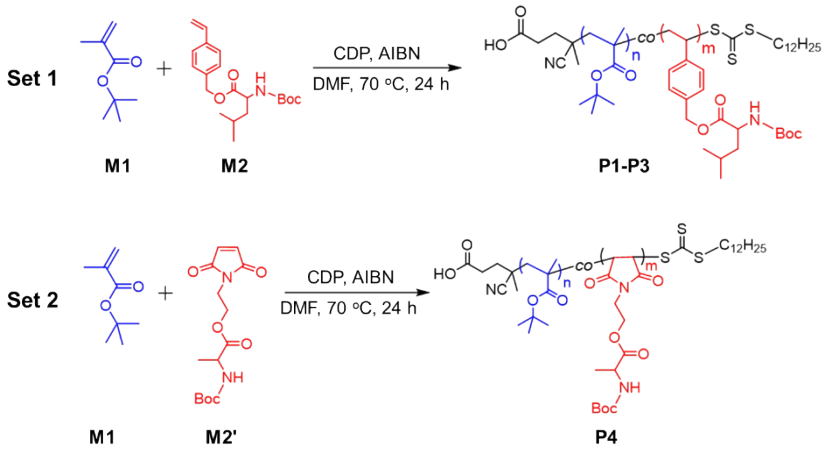


Fig. S7 (A) Photoluminescence (PL) spectra of polyampholyte **DP** in different solvents. (B) CIE 1931 chromaticity plot for color coordinate (0.147, 0.103) of **DP** in aqueous solution at pH 9.0.



Scheme S1. Synthesis of random copolymers containing acid and amine functionalities.

Table S2. Results from the synthesis of copolymers, **P1-P4** at 70 °C in DMF.

Polymer[a]	**M1** content in feed	**M2** or **M2'** content in feed	Conv.[b] (%)	**M1** content in copolymer[c]	**M2** or **M2'** content in copolymer[c]
P1	30	70	45	26	74
P2	50	50	37	41	59
P3	70	30	38	54	46
P4	50	50	27	72	28

[a][Monomer]/[CDP]/[AIBN] = 20:1:0.2; time = 24 h. [b]Determined from gravimetric analysis based on monomer feed. [c]Calculated by ^{1}H NMR from the integration ratio of the repeating unit protons to that of the polymer chain end protons.

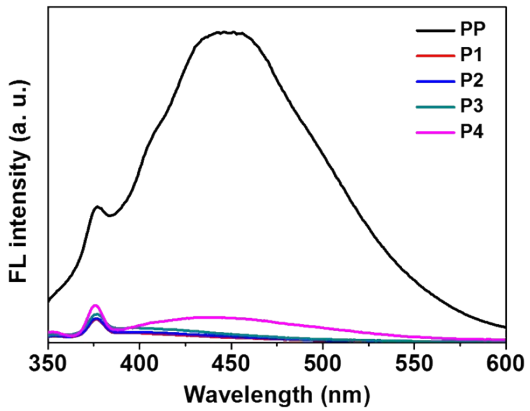


Fig. S8 Comparison of fluorescence spectra of **PP** and **P1-P4** at a concentration of 1.0 mg/mL in THF.

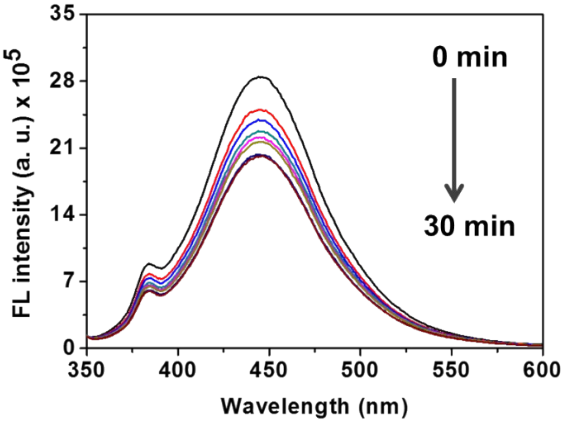


Fig. S9 Time-dependent fluorescence spectral changes of **DP** in presence of 5 μL CS_2.

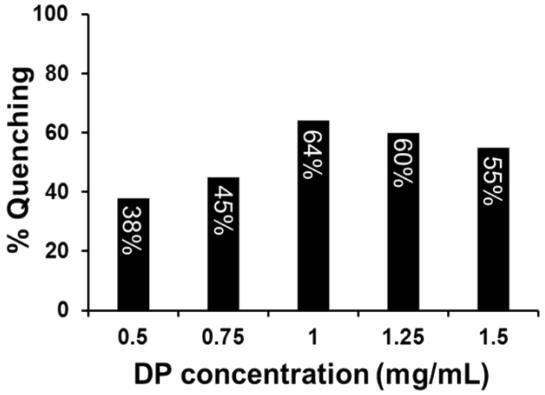


Fig. S10 Percentage of fluorescence quenching at different concentrations of **DP** in presence of 10 μL CS_2 in water.

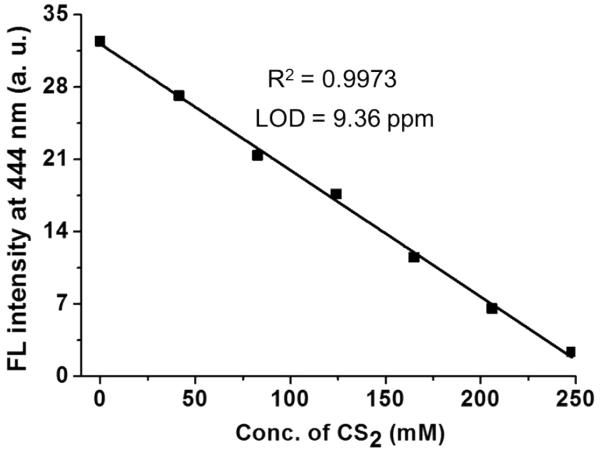


Fig. S11 Plot of luminescence intensity of **DP** *versus* CS_2 concentration.

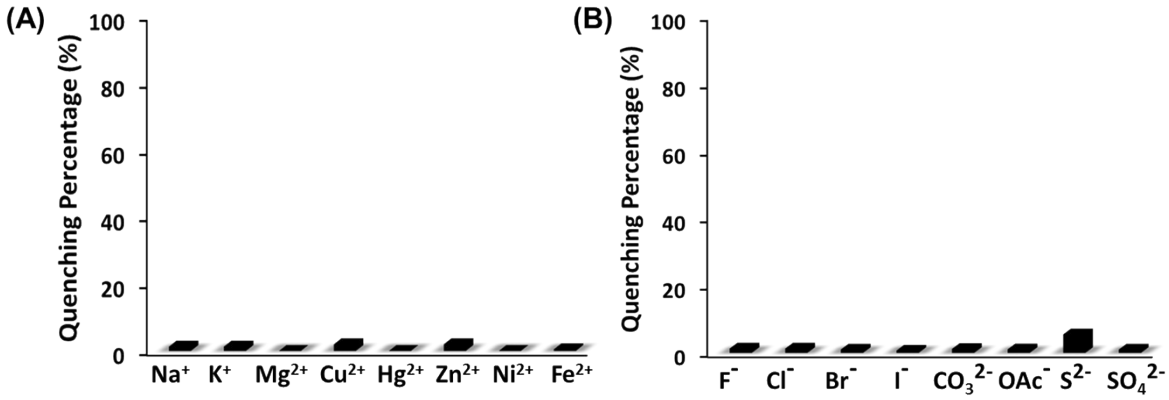


Fig. S12 Influence of various (A) metal ions and (B) anions on the fluorescence intensity of **DP** in water (pH 9.0).

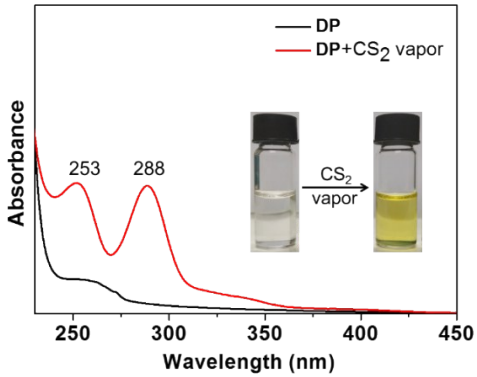


Fig. S13 UV-vis spectra of **DP** before (black line) and after (red line) exposure to CS_2.

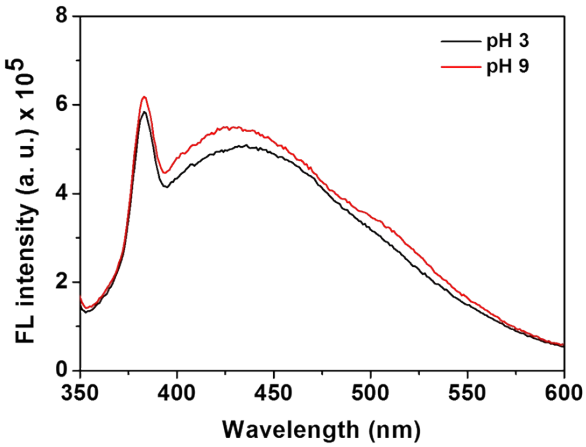


Fig. S14 Fluorescence spectra of **DP** at different pH in water.

Table S3. Fluorescence lifetime of **DP** with and without treatment with CS_2.[a]

Compound	τ_1 (ns)	τ_2 (ns)	$\langle\tau\rangle$ [b] (ns)	χ^2
DP	1.50	5.94	3.79	1.14
DP + 40 mM CS_2	1.52	6.00	3.75	1.17
DP + 250 mM CS_2	1.43	5.50	3.53	1.17
DP + 500 mM CS_2	1.34	5.08	3.08	1.13

[a]The data were fitted with a biexponential decay equation.[b] The average lifetime was calculated using the following formula: $\langle\tau\rangle = \dfrac{\alpha_1\tau_1^{\,2} + \alpha_2\tau_2^{\,2}}{\alpha_1\tau_1 + \alpha_2\tau_2}$