Electronic Supplementary Material (ESI) for New Journal of Chemistry.

Supporting Information

Amine functionalization of *N*,*N*,*N*′,*N*′-tetramethyl-*p*-phenylenediamine applicable to electrosynthesis a wide range of *p*-phenylenediamines in green conditions

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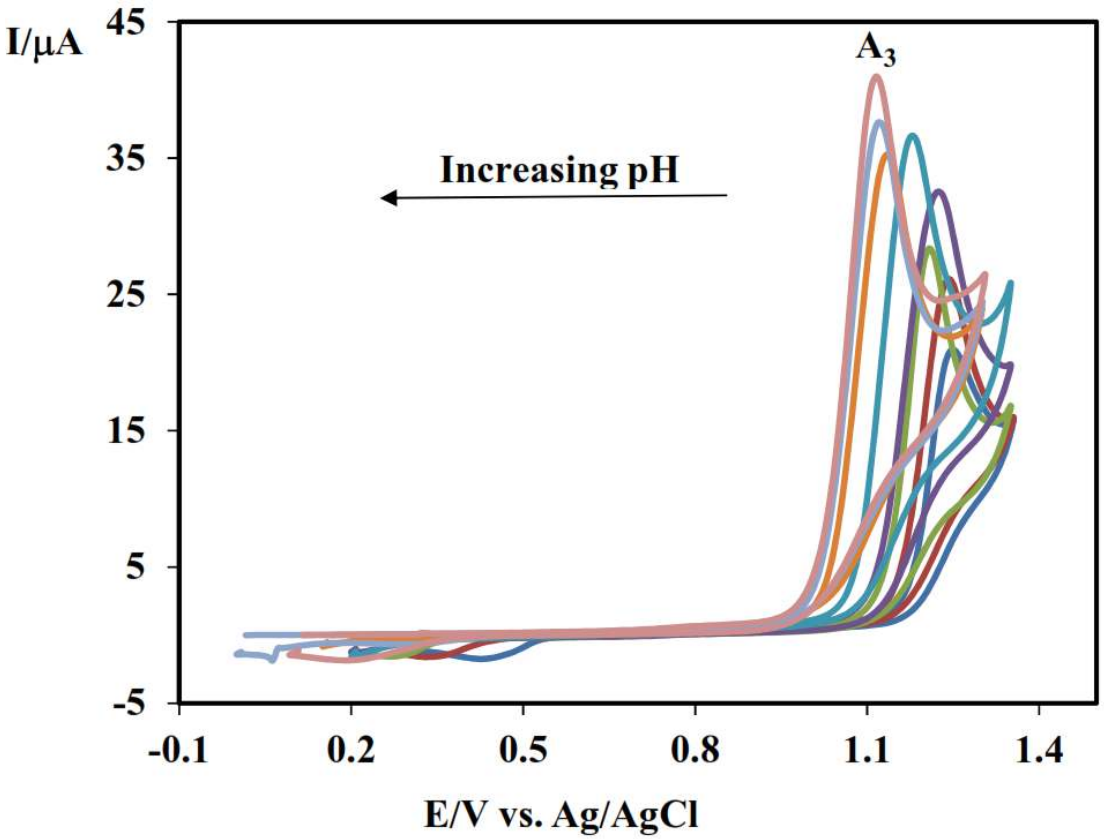

Fig. S1. Cyclic voltammograms of 0.4 mM **1** toward positive going scan in ethanol/ buffered solutions (1 ml ethanol/9 ml buffer) with various pH values; Scan rate: 100 mV s^{-1}.

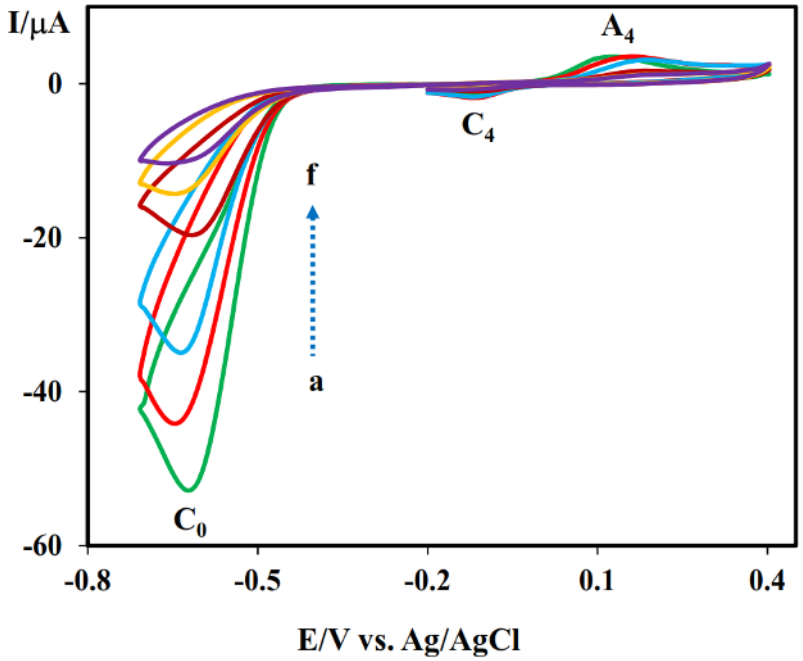

Fig. S2. Cyclic voltammograms of 0.125 mmol of **1** in the presence of 0.125 mmol **4-TSA** in ethanol/acetate buffered solutions (0.2 M, pH = 5.0) (20 mL ethanol/60 mL buffer solution), (a) to (f): progress of electrolysis.

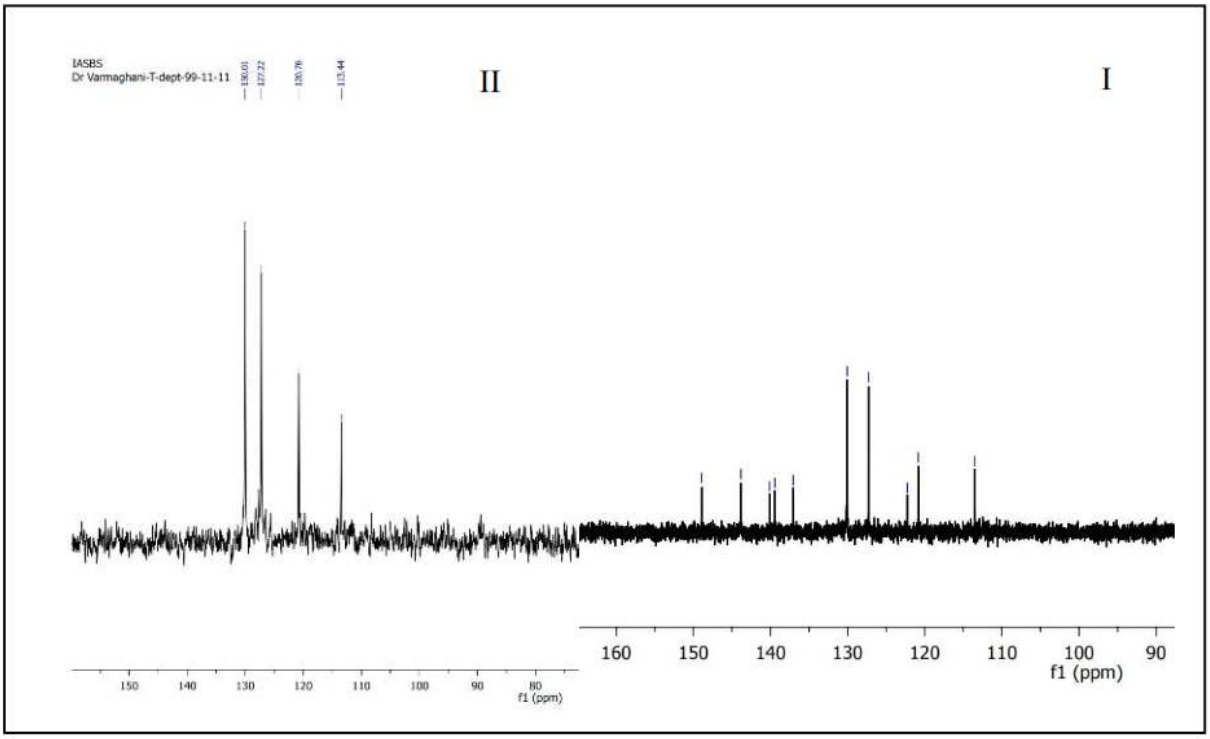

Fig. S3. I: ^{13}C NMR and II: DEPT 135^{o} ^{13}CNMR spectra of **2a**

Atomic Number	Atom type	Charge
1	C	-0.09478
2	C	-0.00915
3	C	0.153914
4	C	-0.12924
5	C	0.067916
6	C	-0.40797
7	H	0.216627
8	H	0.256257
9	H	0.228252
10	N	0.244173
11	N	-0.33294
12	N	0.123167
13	N	-0.31512
14	O	0.261419
15	O	0.231905
16	C	-0.48314
17	C	-0.44068
18	C	-0.38849
19	H	0.192497
20	H	0.272697
21	H	0.231077
22	H	0.172979
23	H	0.27697
24	H	0.225565
25	H	0.327888
26	H	0.343031
27	H	0.287113
28	H	0.261173
29	H	0.226884

Fig. S4: Calculated natural charge of each atom in $ADPM_{ox}$

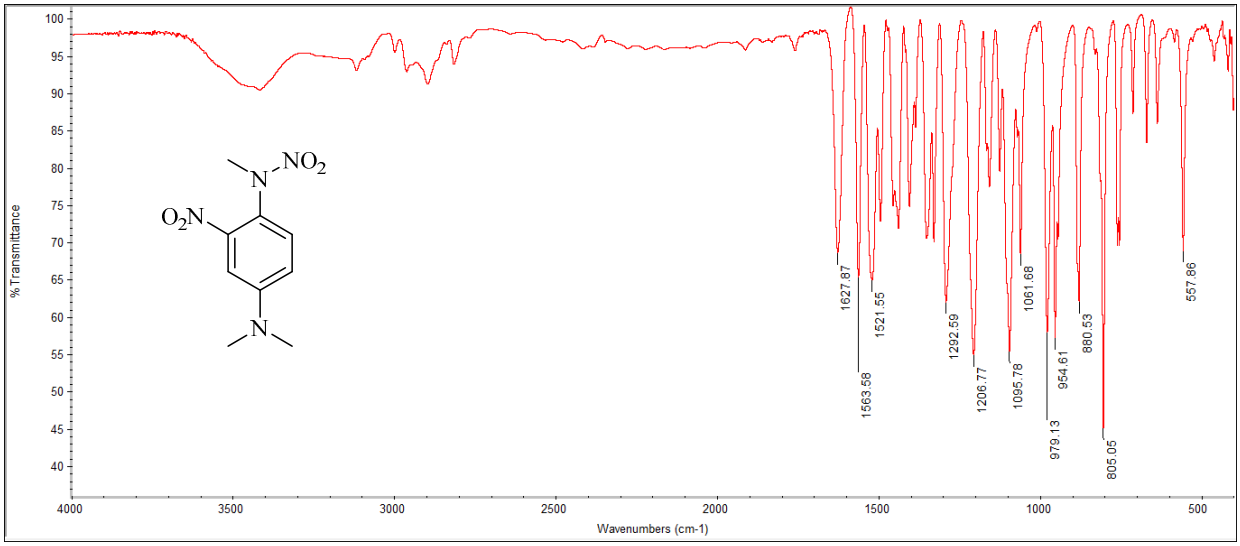

Figure S5. FT-IR spectrum of NDPM

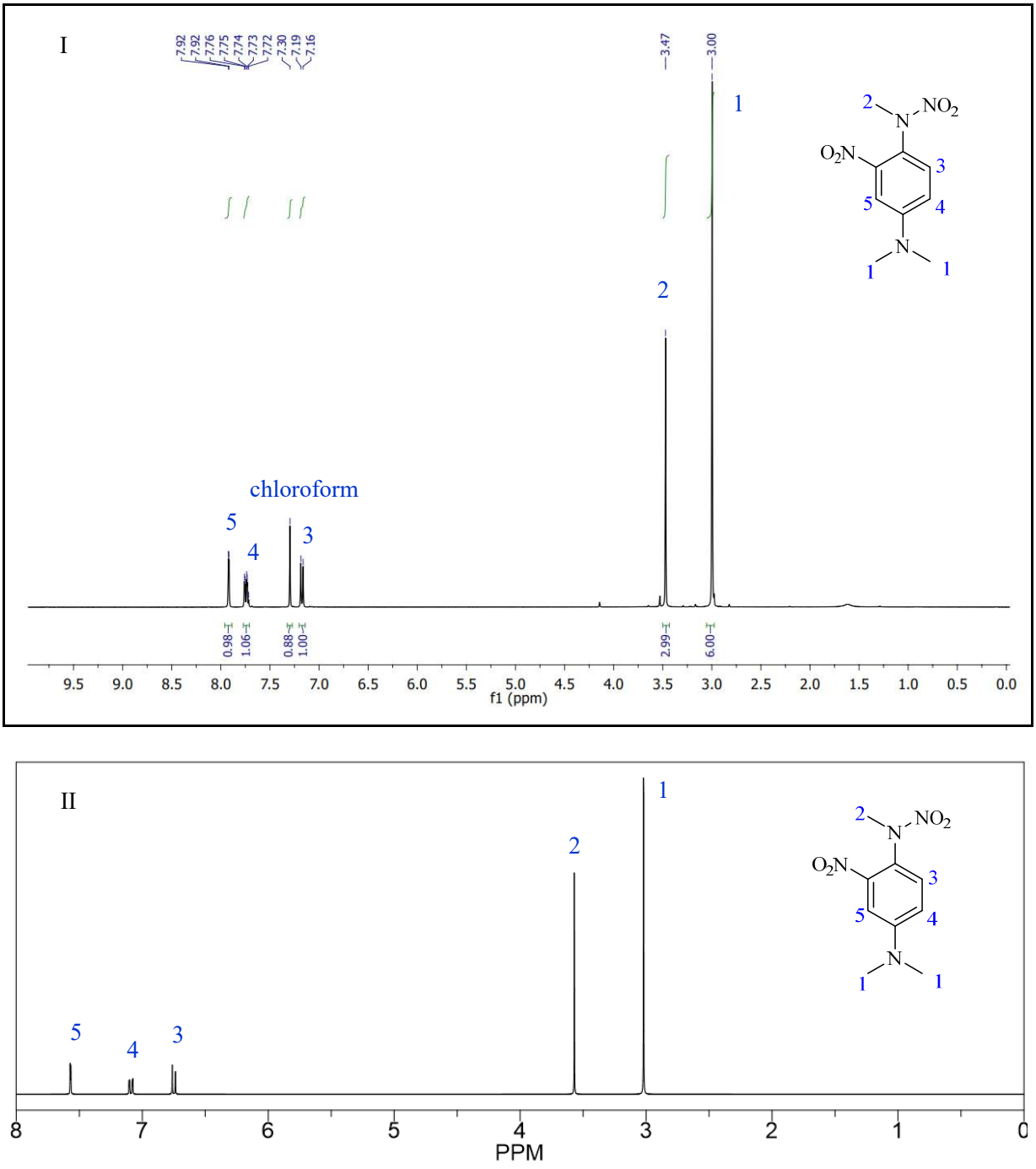

Figure S6. I: Experimental and II: simulated ^{1}H NMR spectra of NDPM

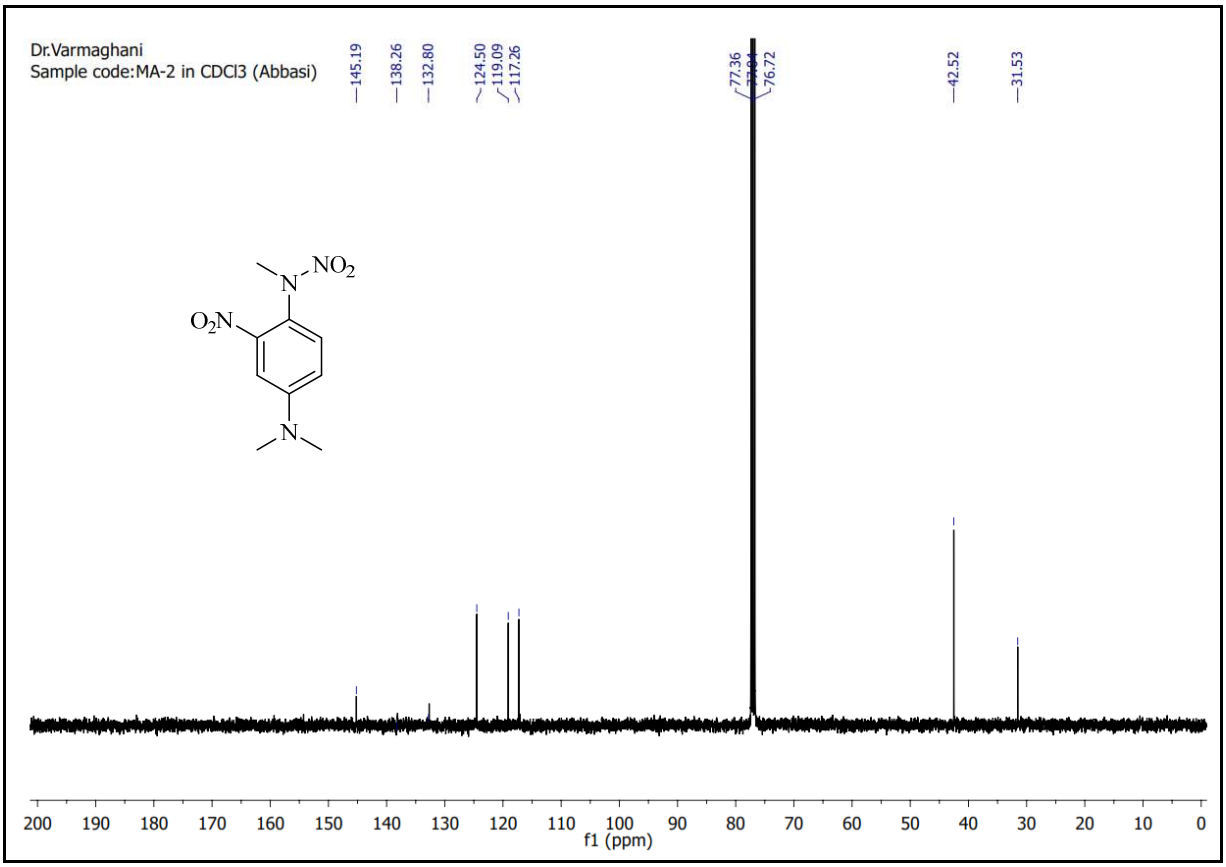

Figure S7. ^{13}C NMR spectrum of NDPM

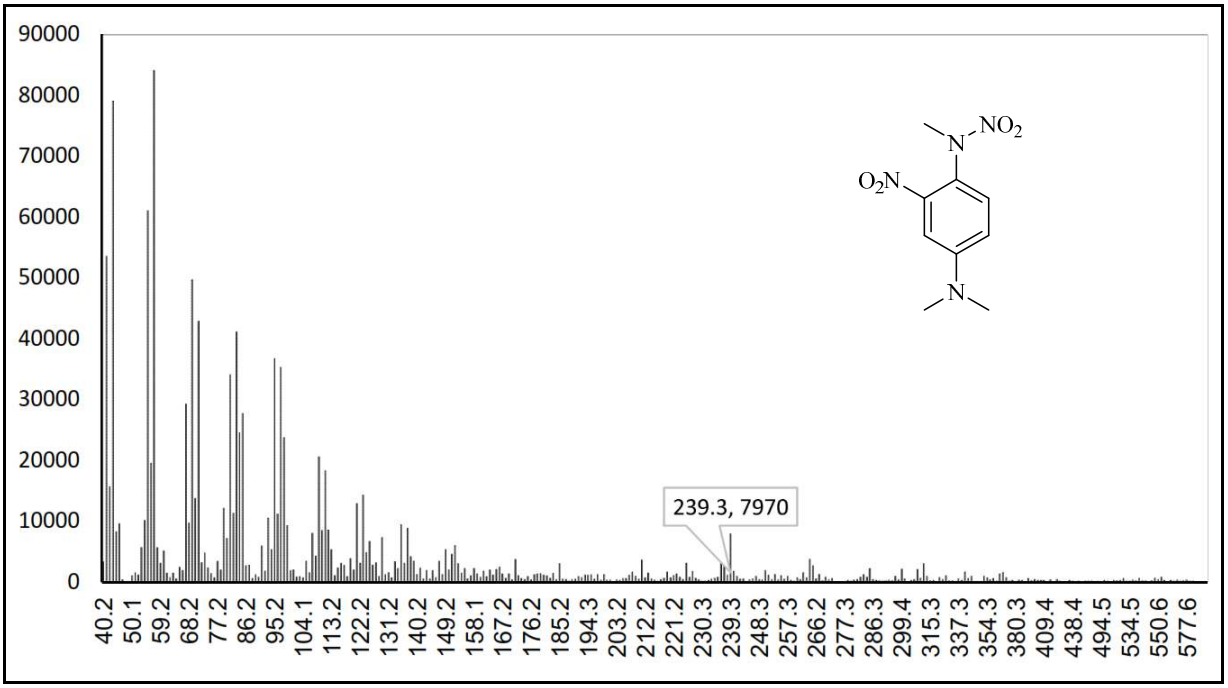

Figure S8. Mass spectrum of NDPM

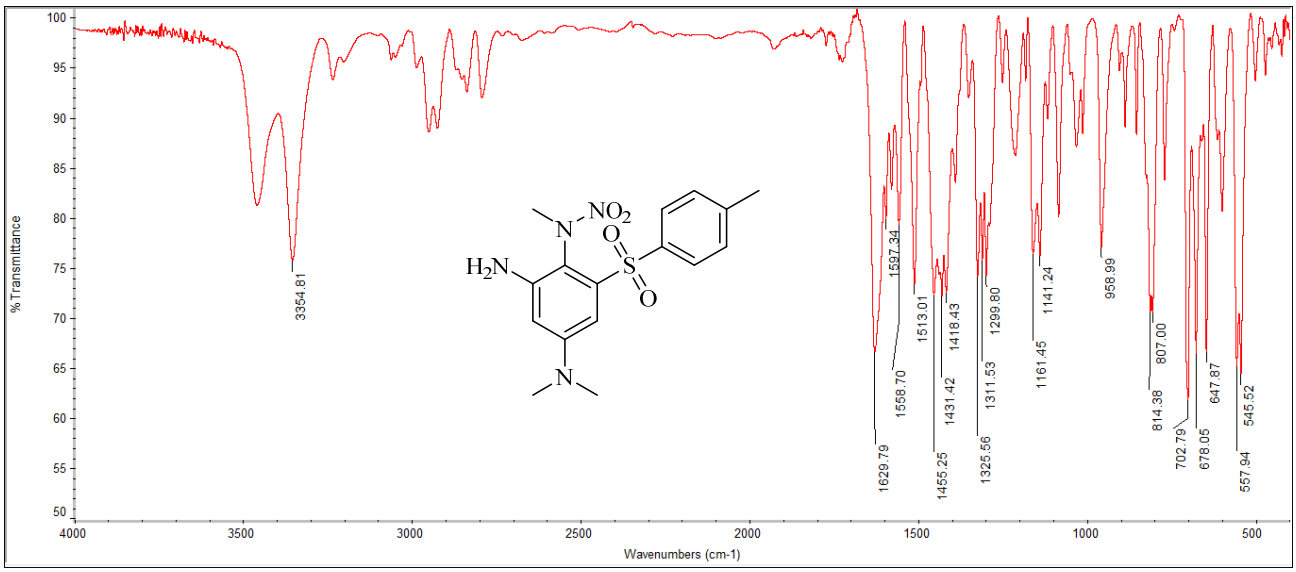

Figure S9. FT-IR spectrum of **2a**

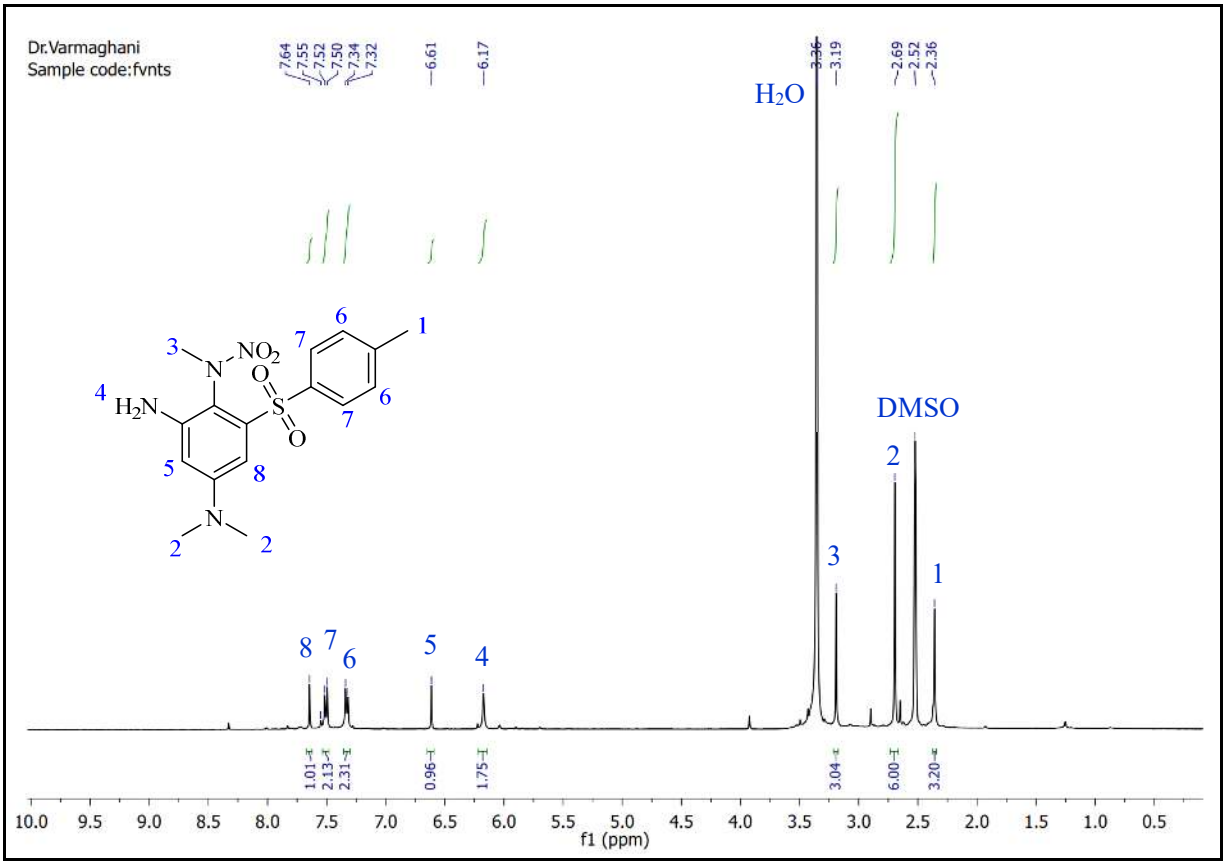

Figure S10. ^{1}H NMR spectrum of **2a**

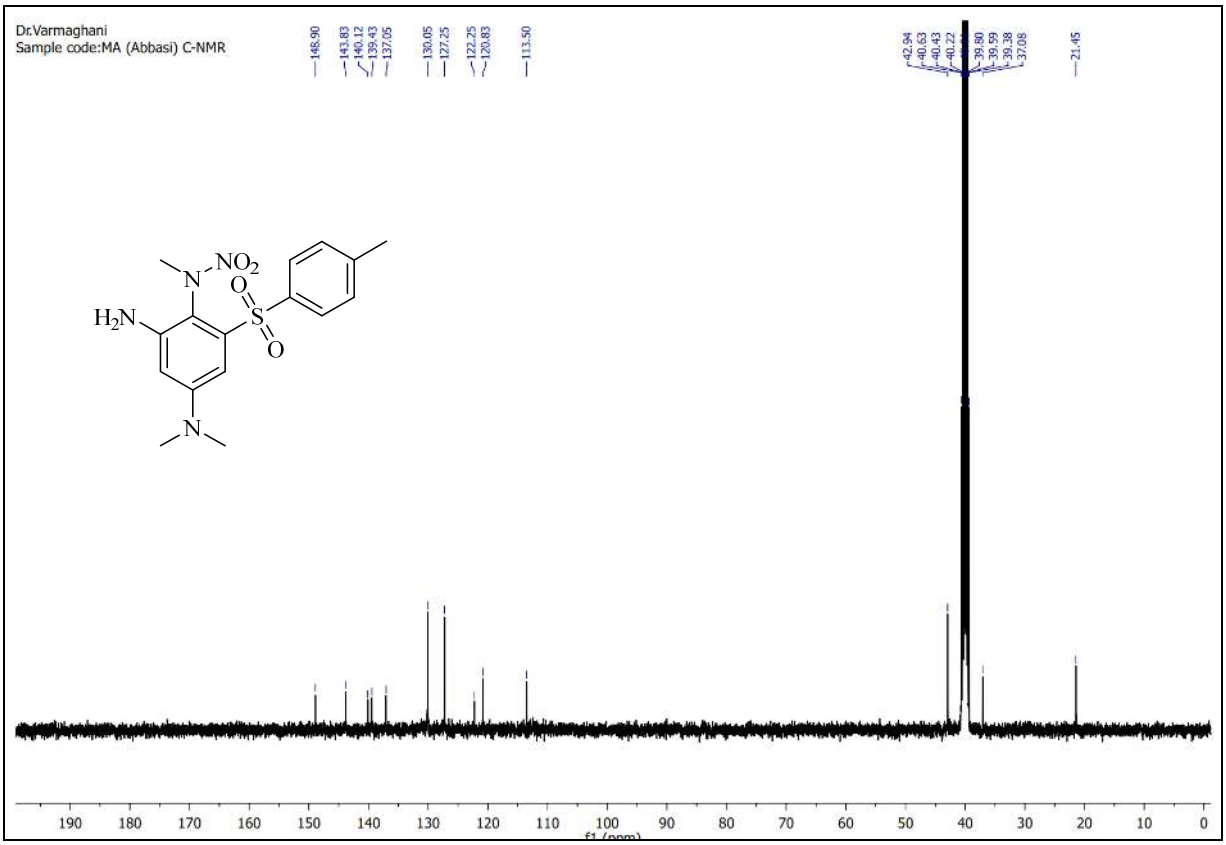

Figure S11. ^{13}C NMR spectrum of **2a**

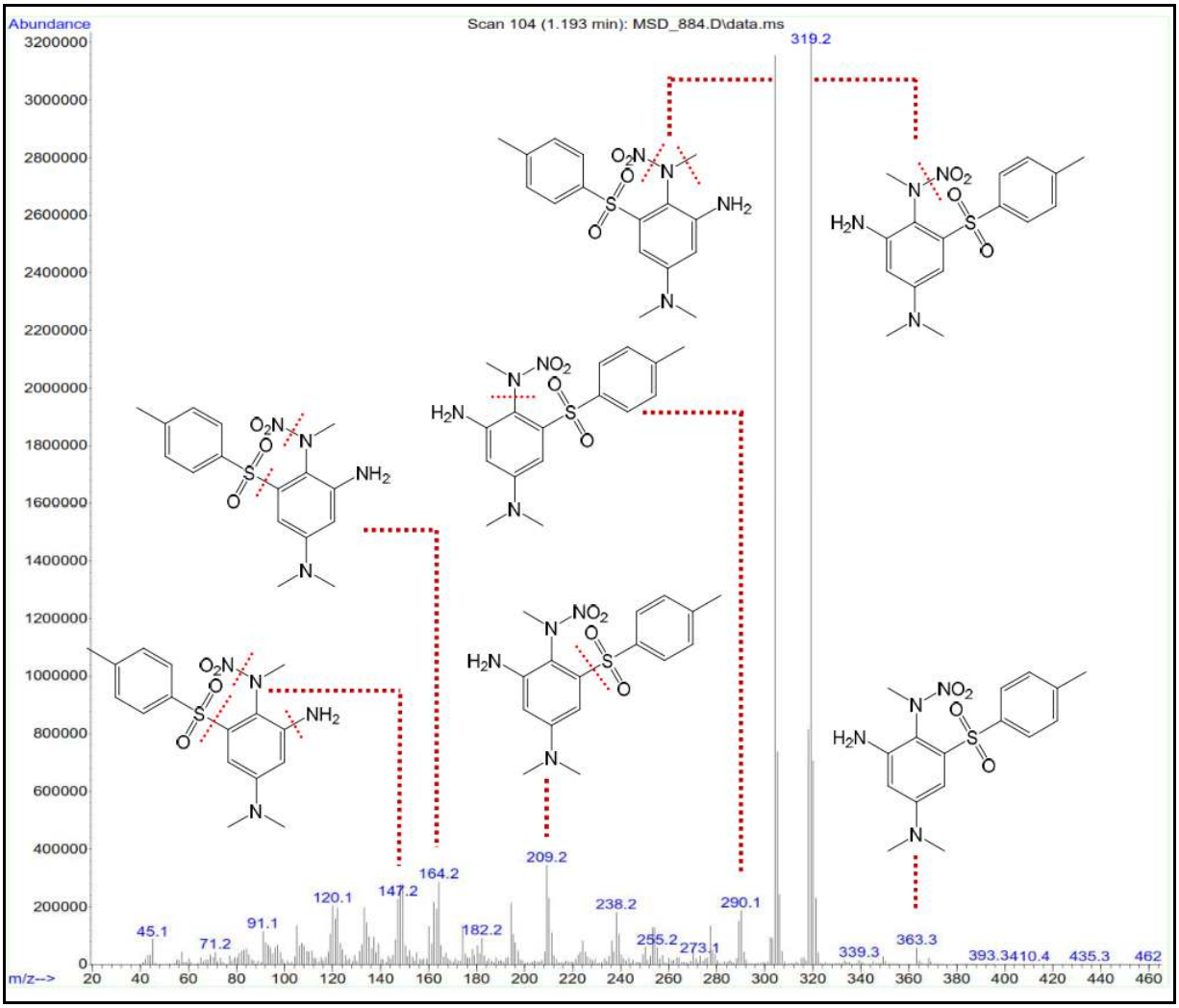

Figure S12. Mass spectrum of **2a**

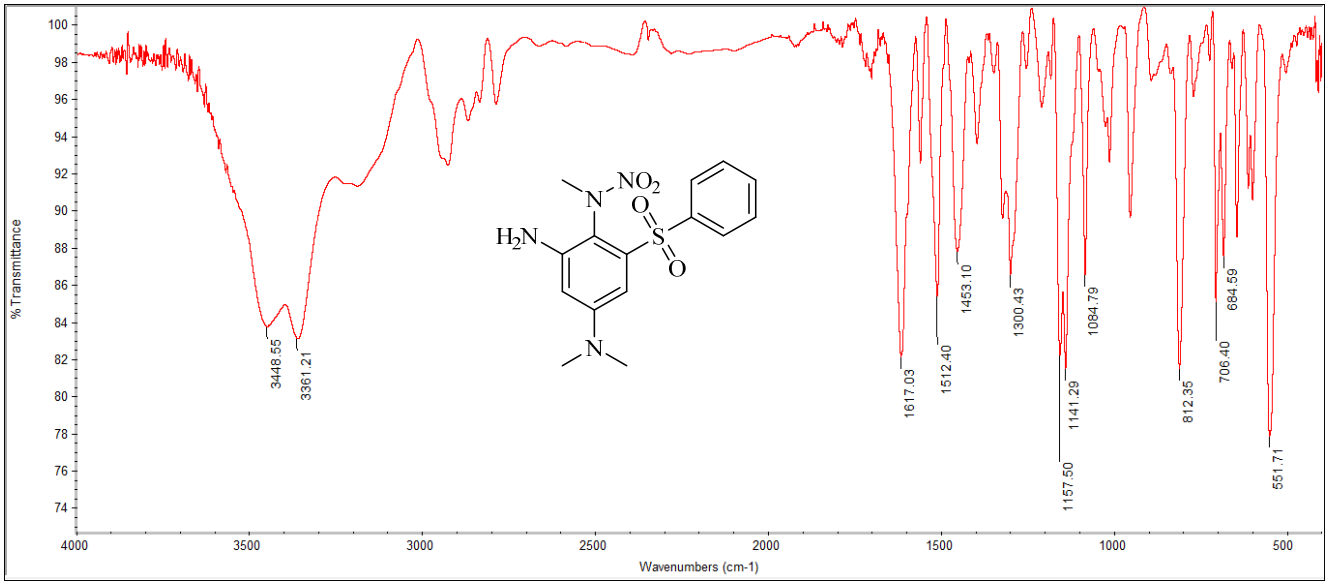

Figure S13. FT-IR spectrum of **2b**

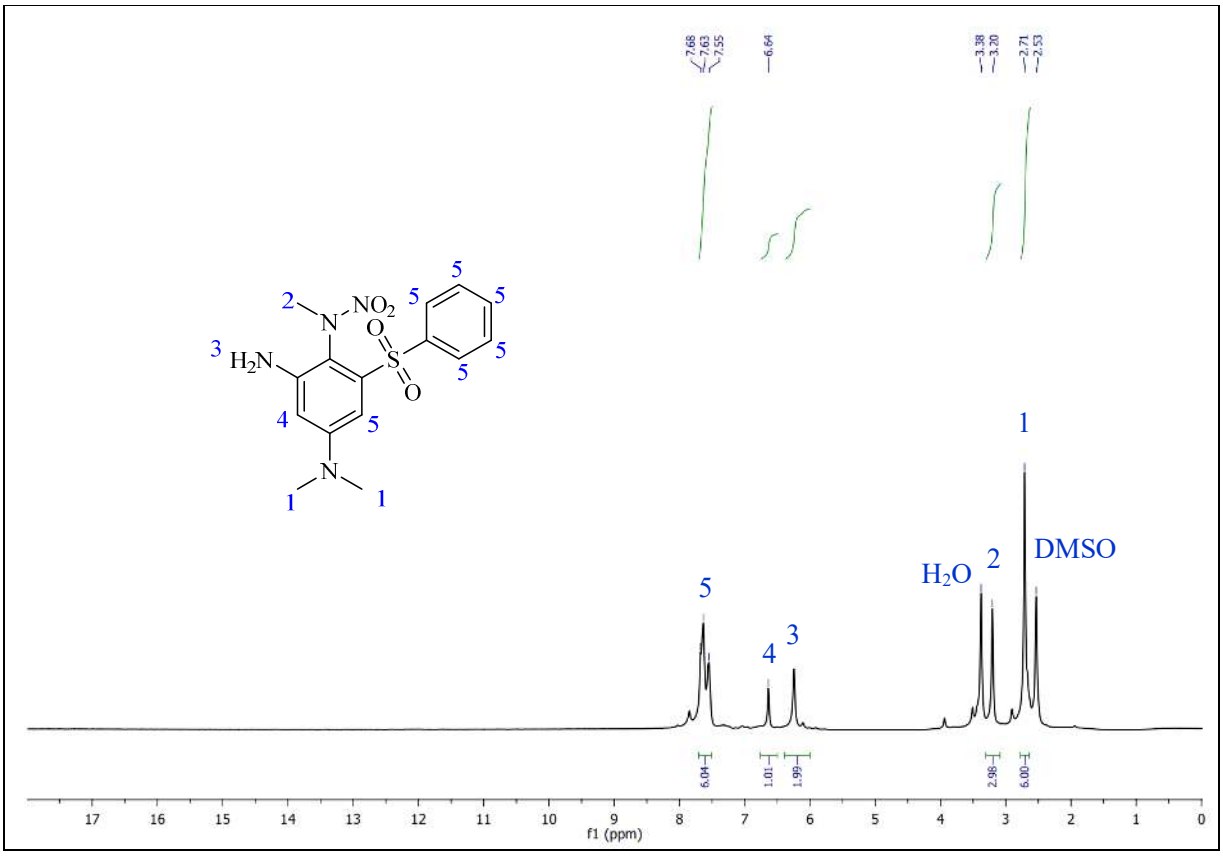

Figure S14. ^{1}H NMR spectrum of **2b**

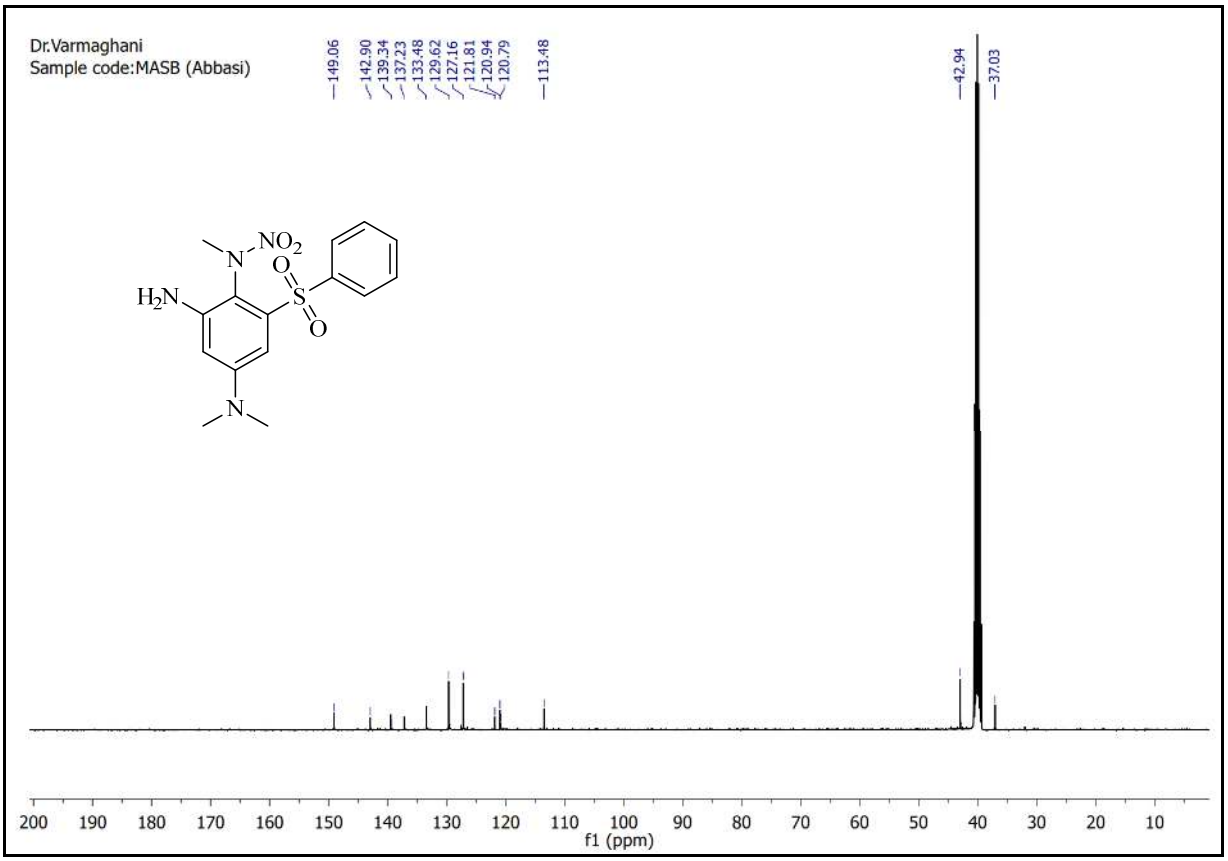

Figure S15. ^{13}C NMR spectrum of **2b**

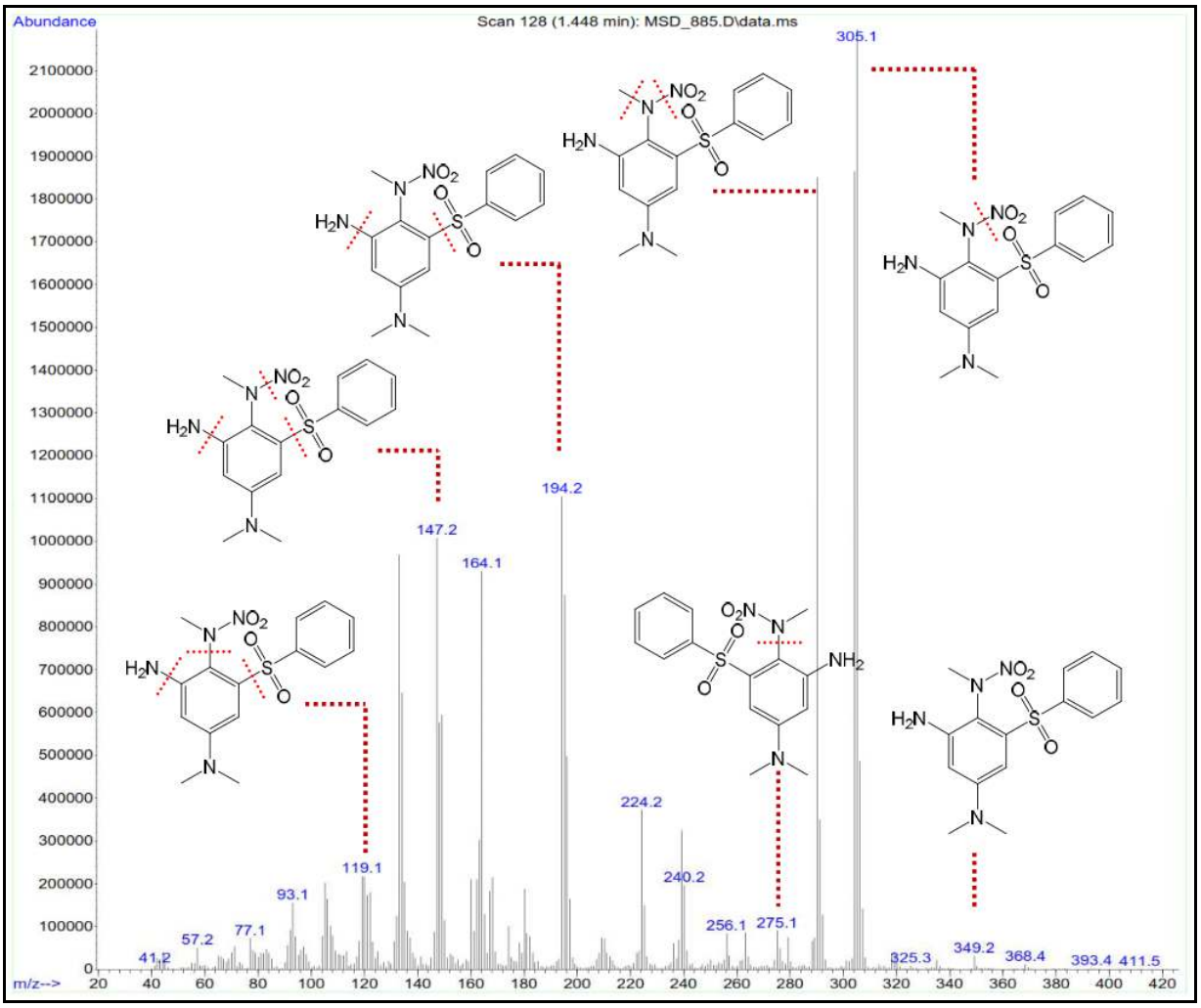

Figure S16. Mass spectrum of **2b**

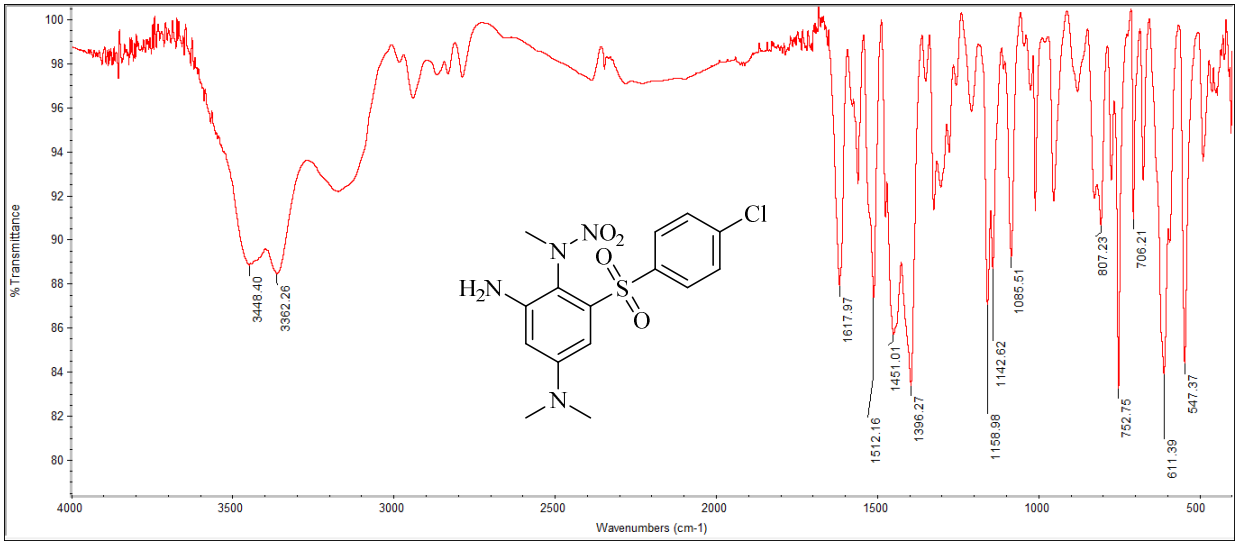

Figure S17.FT-IR spectrum of **2c**

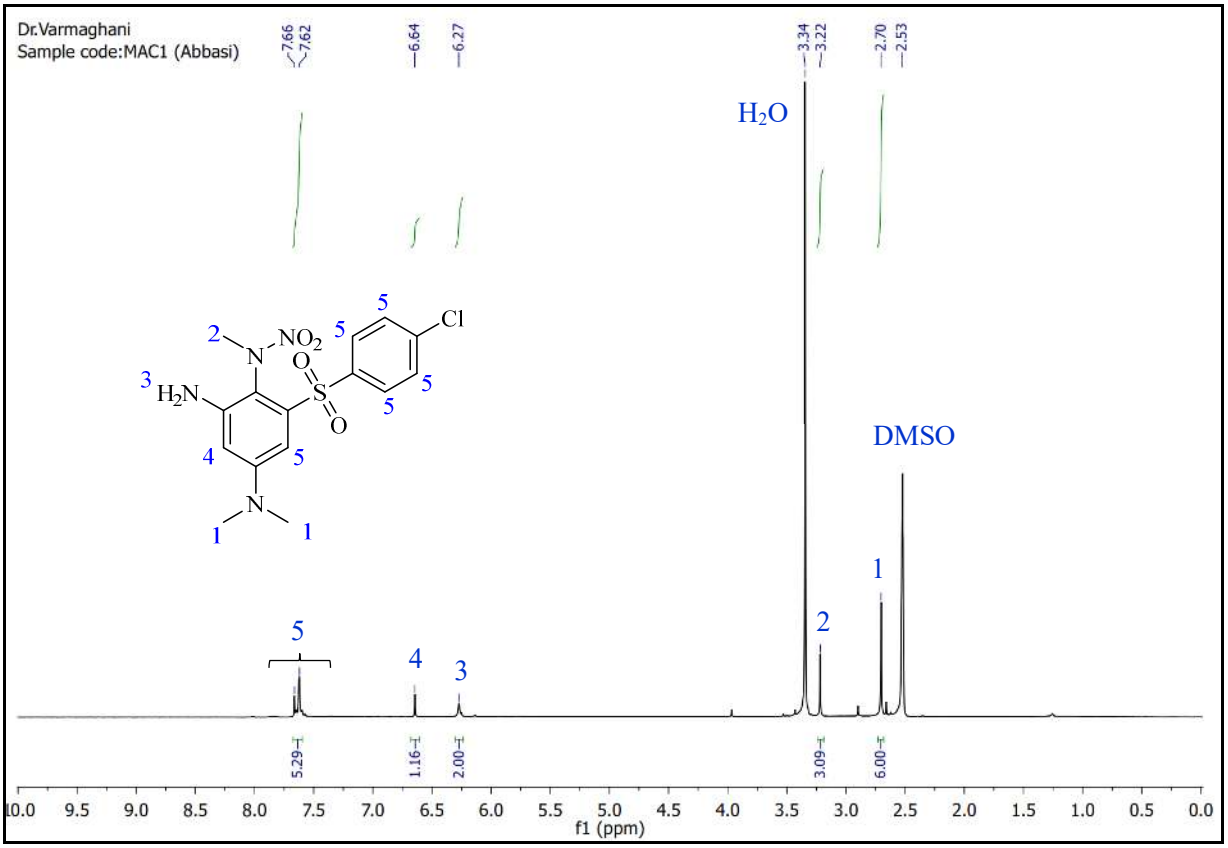

Figure S18. ^{1}H NMR spectrum of **2c**

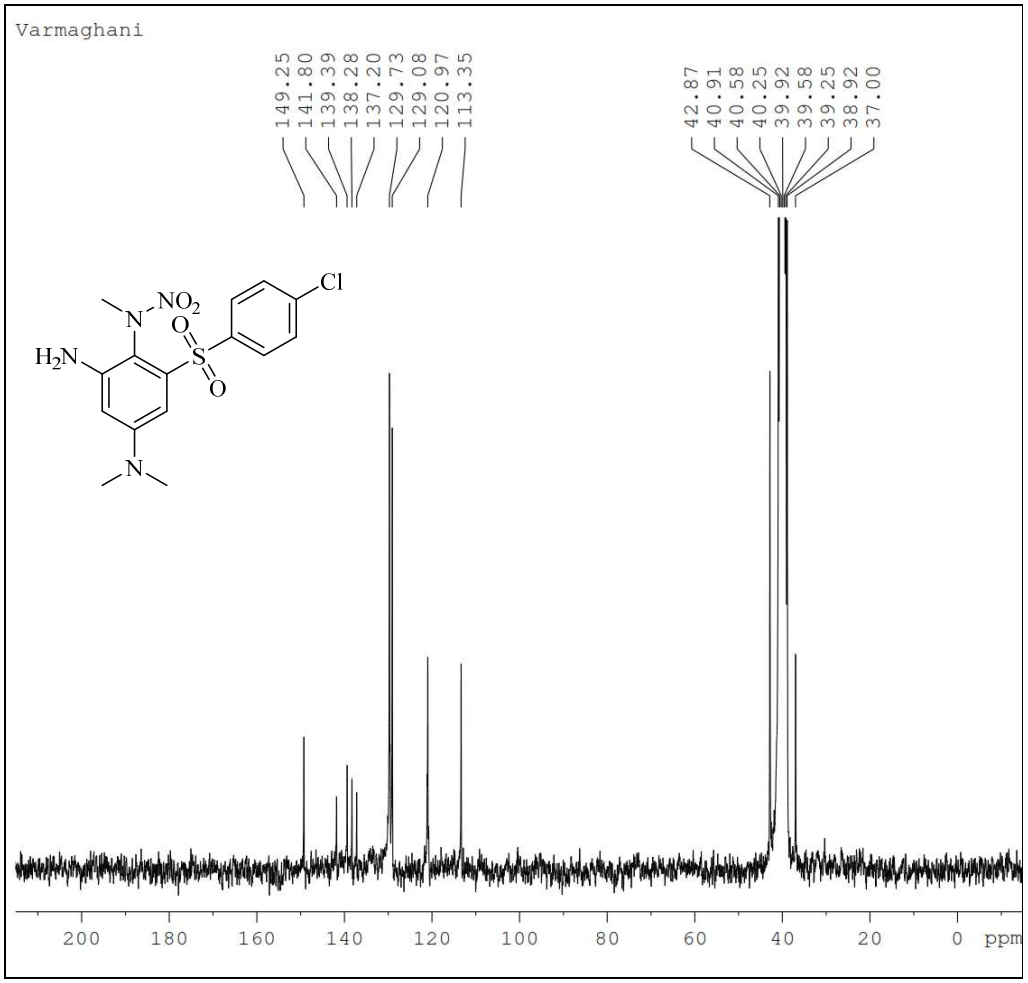

Figure S19.^{13}C NMR spectrum of **2c**

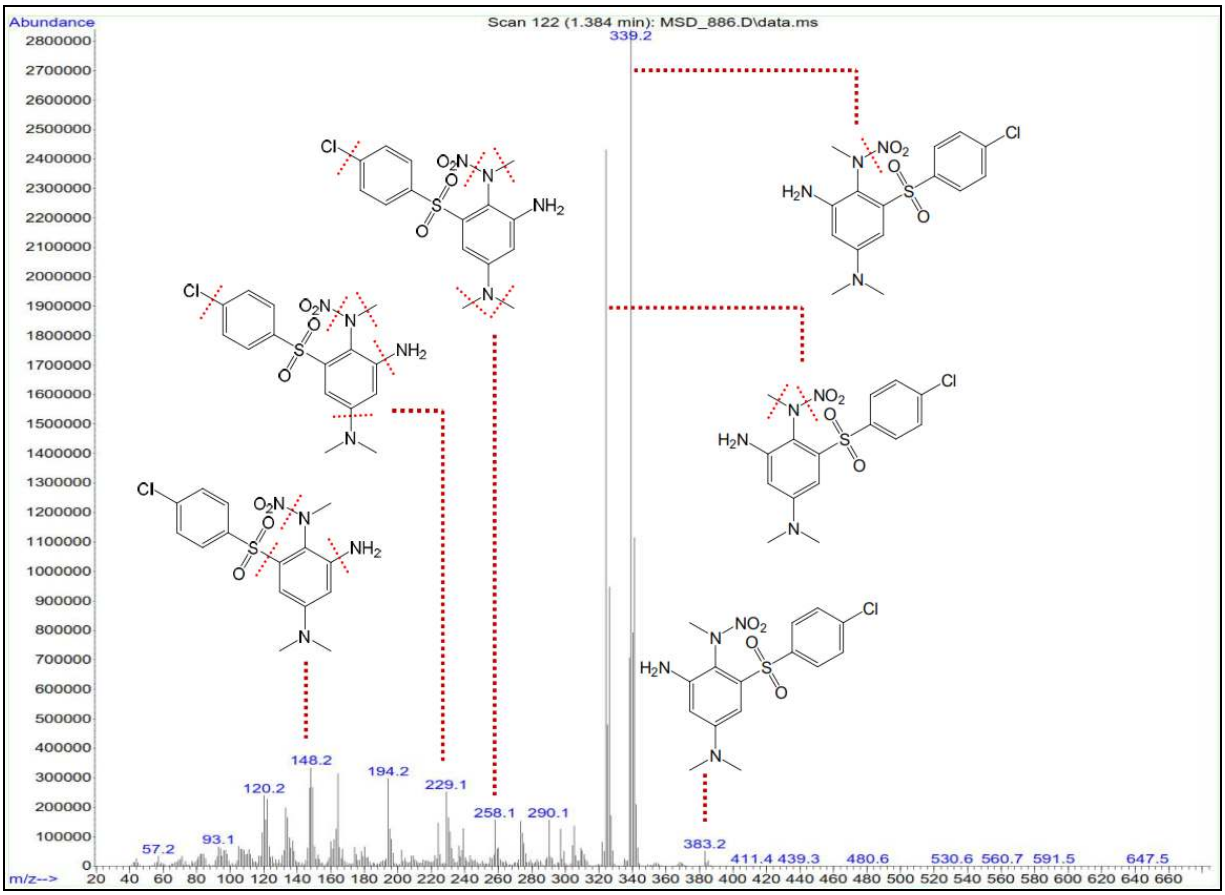

Figure S20. Mass spectrum of **2c**