SUPPLEMENTARY INFORMATION

Synthesis and application of a new class of *D–π–A* type charge transfer probe containing imidazole – naphthalene units for detection of F^- and CO_2

Ramesh C. Gupta, Rashid Ali, Syed S. Razi, Priyanka Srivastava, Sushil K. Dwivedi and

Arvind Misra*

Department of Chemistry, Institute of Science, Banaras Hindu University, Varanasi – 221 005 UP INDIA

arvindmisra2003@yahoo.com;amisra@bhu.ac.in

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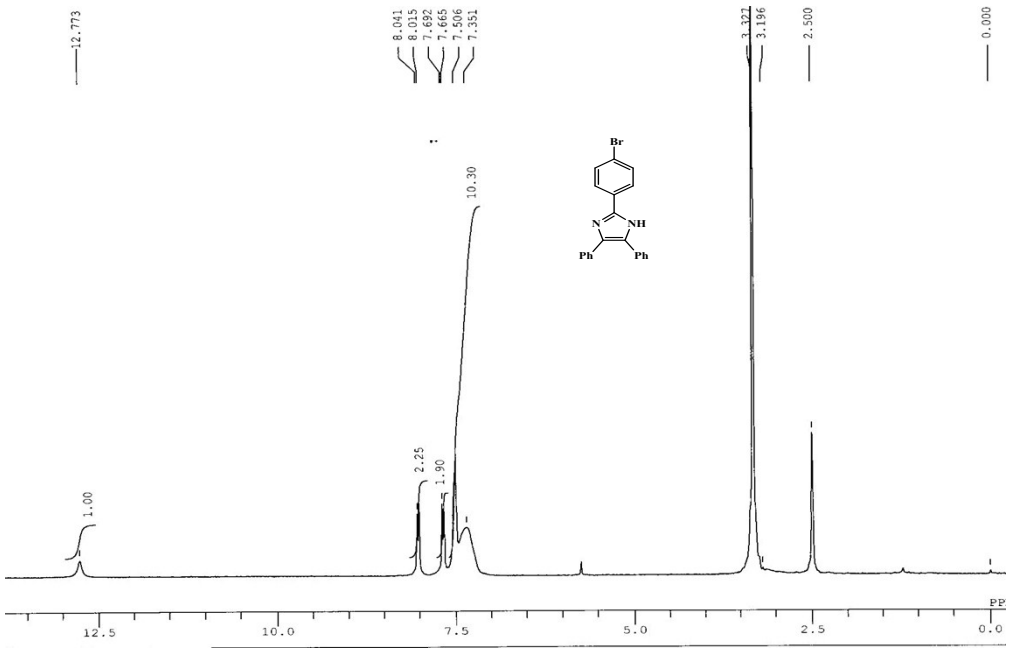

Figure S1: ^{1}H NMR spectrum of **1** in DMSO-d_6.

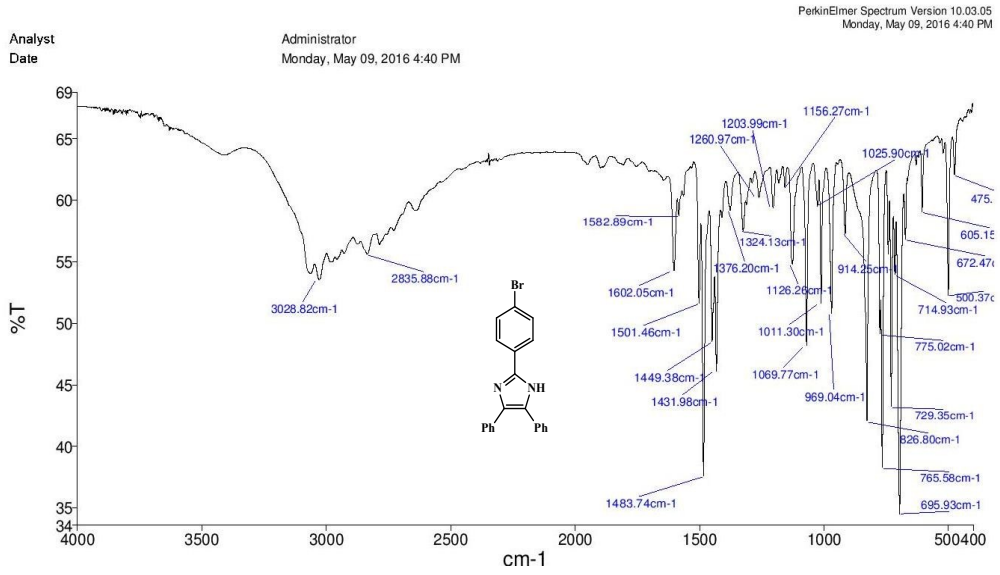

Figure S2: FT-IR spectrum of **1**.

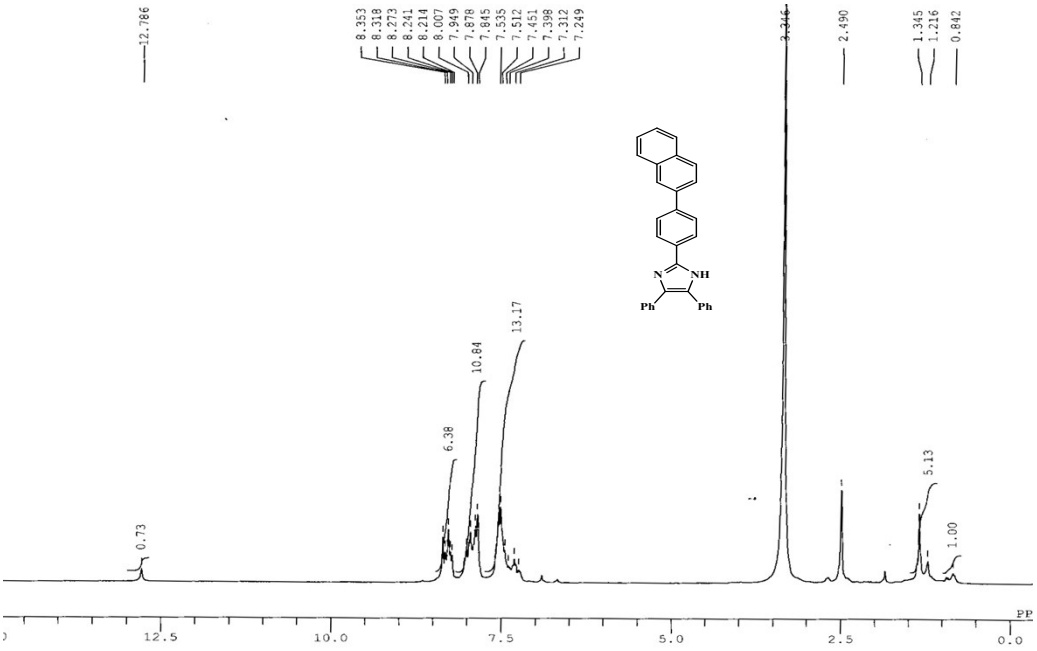

Figure S3: ^{1}H NMR spectrum of **3** in DMSO-d_6.

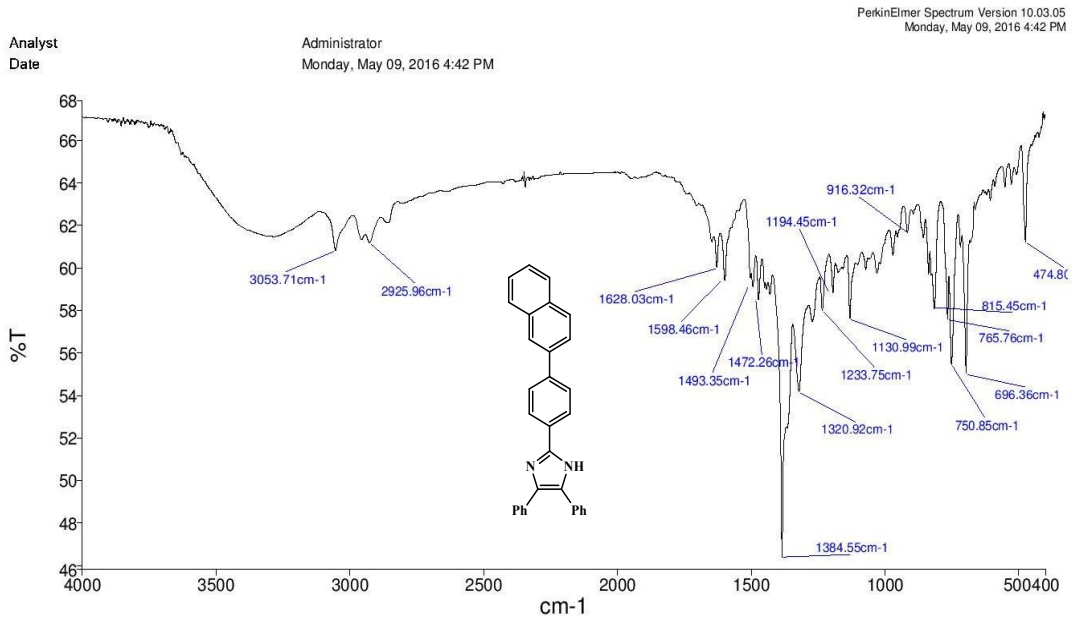

Figure S4: FT-IR spectrum of **3**.

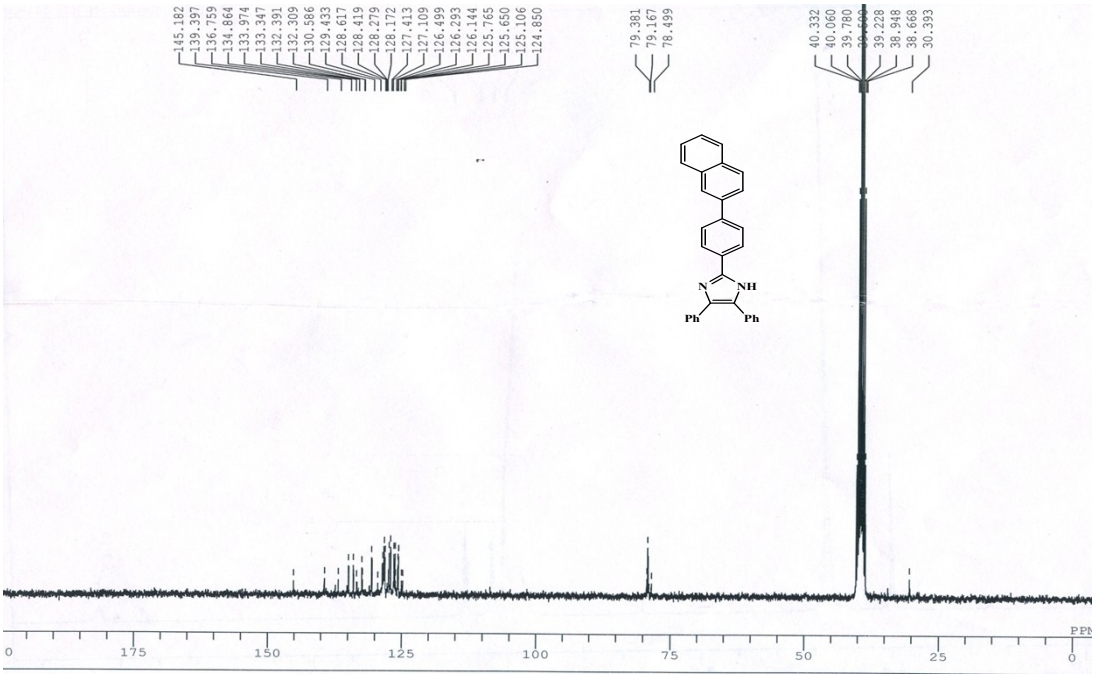

Figure S5: ^{13}C NMR spectrum of **3** in DMSO-d_6.

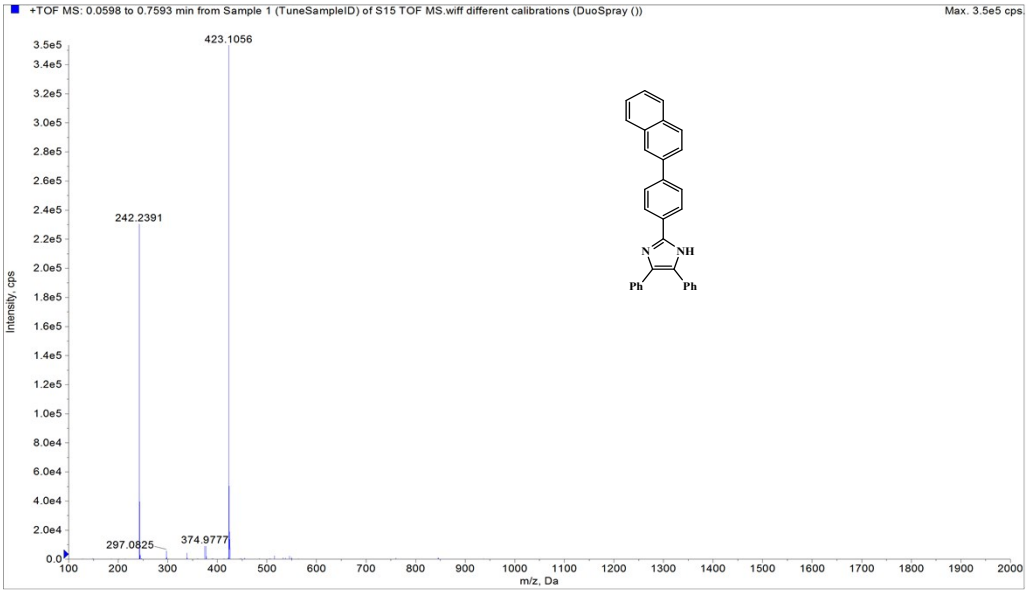

Figure S6: ESI-MS spectrum of **3.**

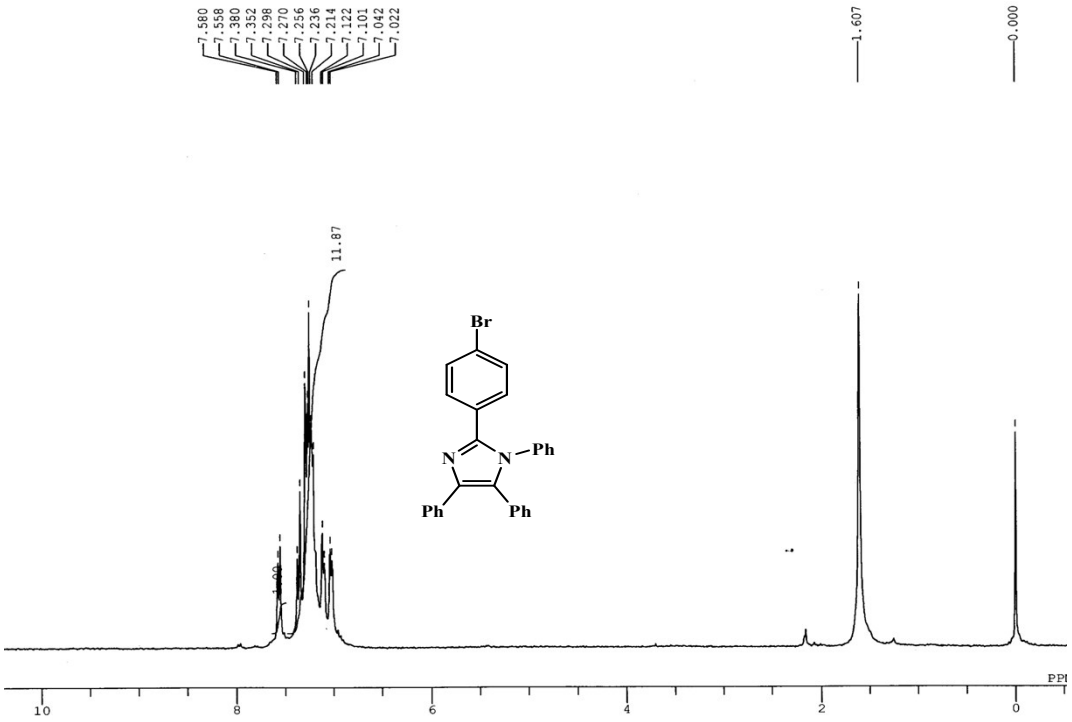

Figure S7: ^{1}H NMR spectrum of **2** in DMSO-$d_{6.}$

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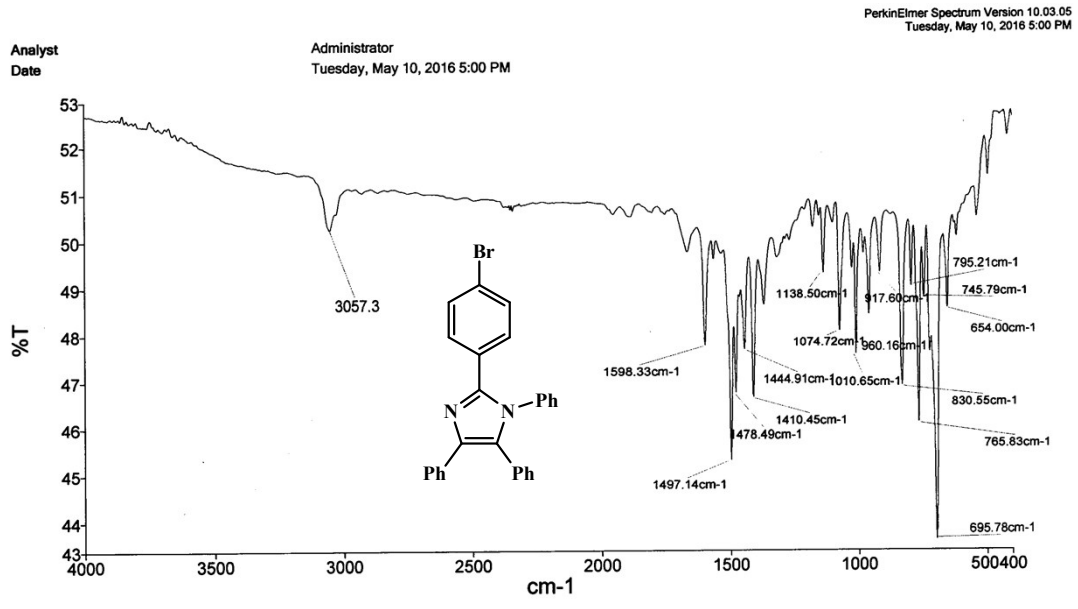

Figure S8: FT-IR spectrum of **2**.

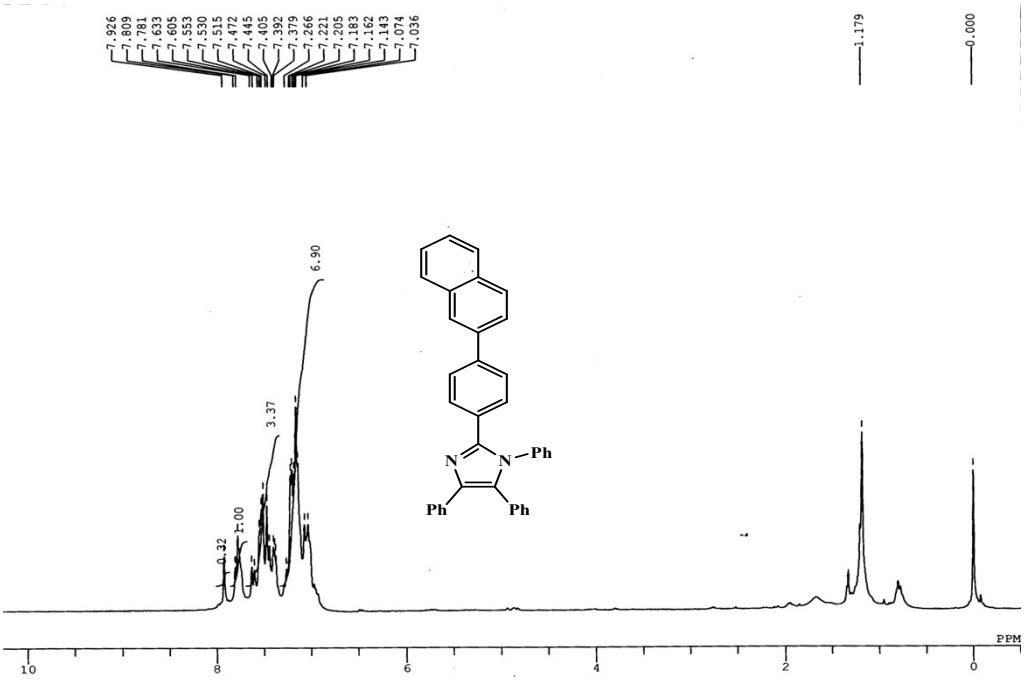

Figure S9: ^{1}H NMR spectrum of **4** in DMSO-d_6.

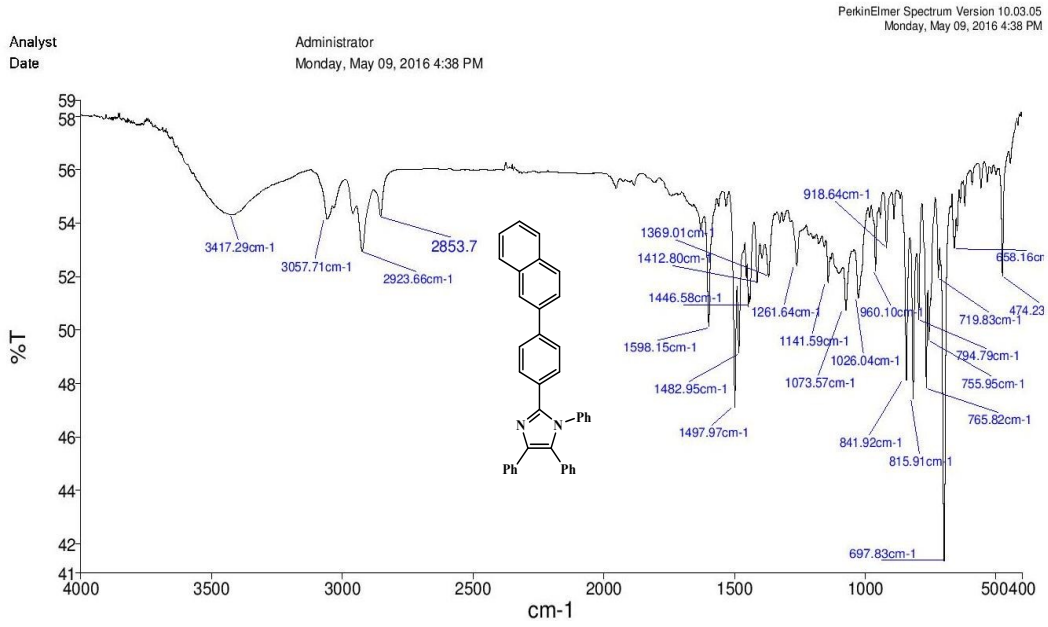

Figure S10: FT-IR spectrum of **4**.

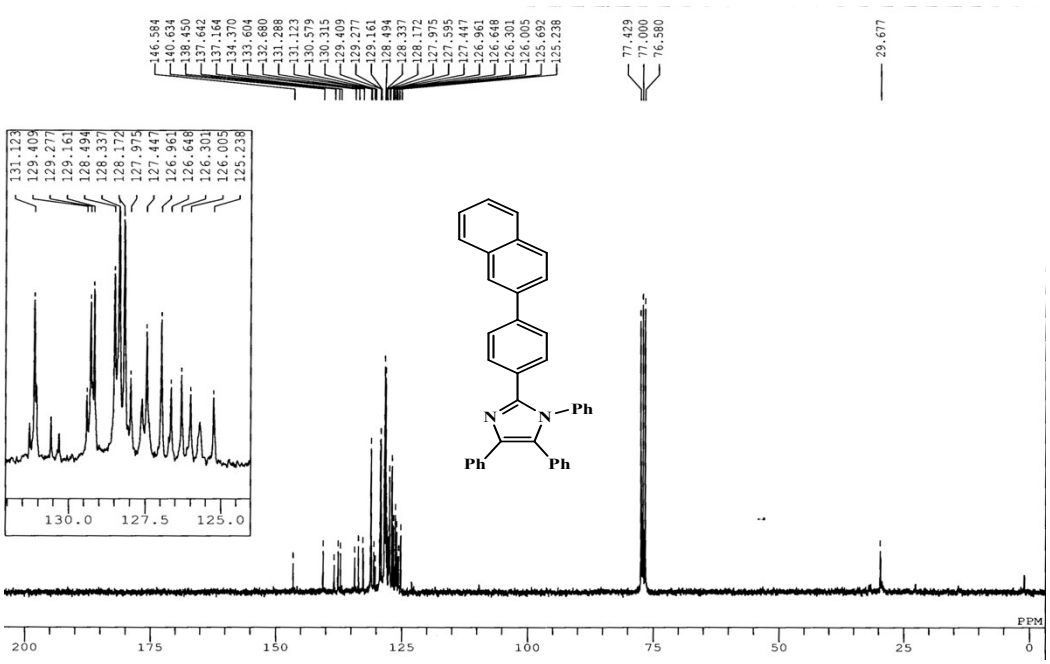

Figure S11: ^{13}C NMR spectrum of **4** in DMSO-d_6.

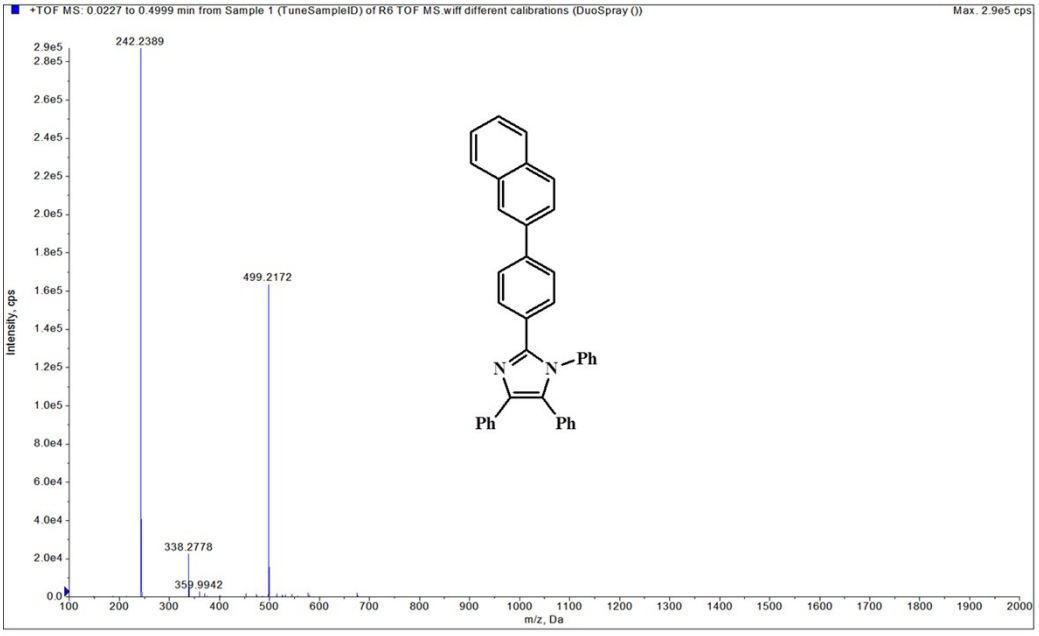

Figure S12: ESI-MS spectrum of **4.**

Table-S13: Photophysical properties of **3**

S.N.	Entry	λ_{max} (nm)	Molar absorptivity $\varepsilon = M^{-1}cm^{-1}$	λ_{em} (nm)	Stoke's Shift $\Delta\bar{\upsilon}$ (nm)	Quantum yield Φ
1.	Benzene	338	2.59×10^4	423	85	0.644
2.	Dioxane	337	2.50×10^4	420	83	0.650
3.	THF	338	2.81×10^4	426	88	0.610
4.	DCM	335	3.02×10^4	431	96	0.633
5.	ACN	325	3.17×10^4	438	113	0.557
6.	EtOH	325	2.72×10^4	426	101	0.604
7.	DMSO	340	3.46×10^4	448	108	0.585

Table-S14: Photophysical properties of **4**

S.N.	Entry	λ_{max} (nm)	Molar absorptivity $\varepsilon = M^{-1}cm^{-1}$	λ_{em} (nm)	Stoke's Shift $\Delta\bar{\upsilon}$ (nm)	Quantum yield Φ
1.	Benzene	323	3.33×10^4	408	85	0.573
2.	Dioxane	323	3.33×10^4	410	87	0.714
3.	THF	324	3.23×10^4	413	89	0.726
4.	DCM	322	4.55×10^4	420	98	0.503
5.	ACN	321	4.02×10^4	426	105	0.547
6.	EtOH	313	3.46×10^4	411	98	0.686
7.	DMSO	326	3.16×10^4	433	107	0.768

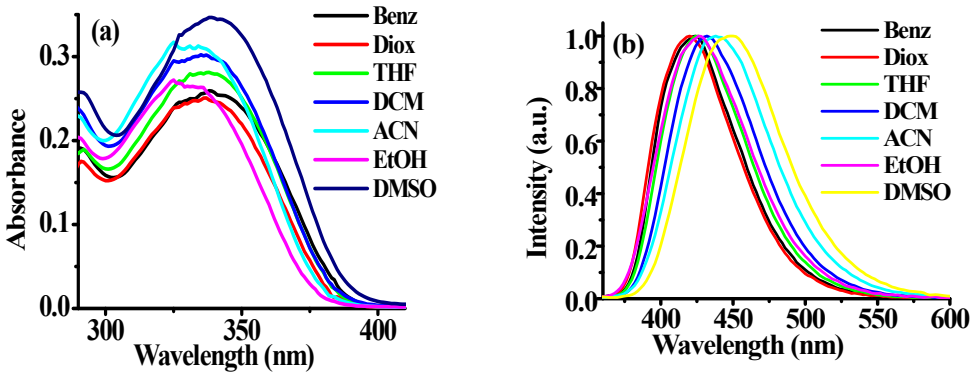

Figure S15: (a) Absorption and (b) Normalised Emission spectra of probe **3** in different solvents.

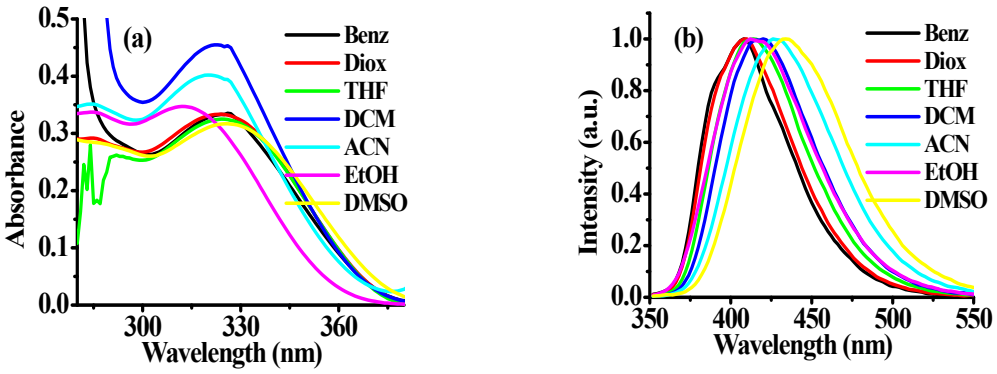

Figure S16: (a) Absorption and (b) Normalized Emission spectra of probe **4** in different solvents.

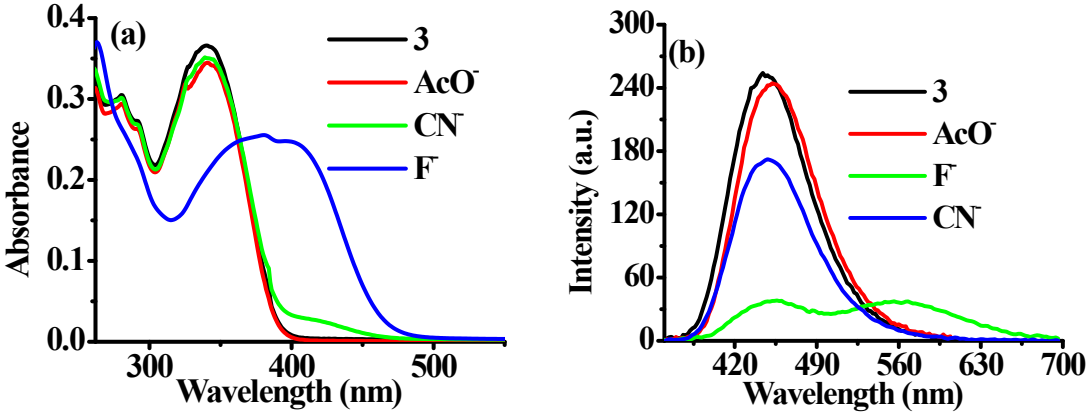

Figure S17: (a) Absorption (10μM) and (b) emission spectra of **3** (10 μM)upon interaction with CN^-, AcO^- and F^- anions (150.0 equiv) in DMSO.

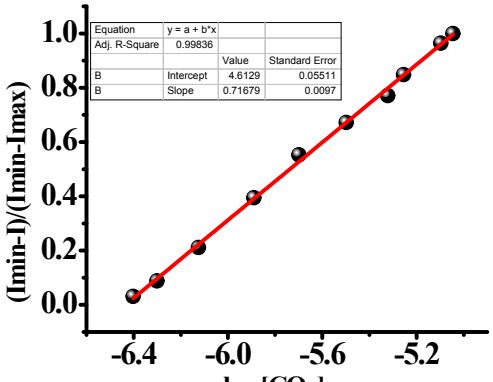

Figure S18: Fluorescence intensity change of **3**+F^- system (10 μM, λex = 340 nm) upon bubbling with different concentration of CO_2 gas.

Calculation of limit of detection of CO_2 : The detection limit of **3+F^-** system for CO_2 was estimated from plot of normalized fluorescence change of **3+F-** system with CO_2 verses Log [CO_2] using equation (4)[1,2] and found to be 3.67 x 10^{-7} M.

$$10^{-[\text{Slope / Intercept}]} \quad \text{.....(4)}$$

1. Shortreed, M.; Kopelman, R.; Kuhn, M.; Hoyland, B. *Anal. Chem.* **1996,** 68, 1414-1418.

2. Kim, M. H.; Jang, H. H.; Yi, S.; Chang S.-K.; Han, M. S. *Chem. Commun.* **2009**, 4838-4840.