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Supporting Information for

Demonstrating the Role of Anchoring Functionality in Interfacial Electron Transfer Dynamics in Newly Synthesized BODIPY-TiO₂ Nanostructure Composite

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1. Steady State Optical Absorption and emission of dye 1, dye 2.

Solvatochromic behaviour of both dye 1 and dye 2 in different solvent like protic solvent and aprotic solvent is studied. SI Figure 1A shows the solvent dependent normalized absorption spectra of dye 1. Dye 1 shows little hypsochromic shift with increasing solvent polarity which



SI Figure 1: Normalized steady state optical absorption (A, C) and emission spectra (B, D) of dye1 and dye 2 in different solvent respectively.

can be assigned as π - π * transition in the BODIPY system. SI Figure 1B shows normalized emission spectra of the dye 1 which shows bathochromic shift with increasing solvent polarity. Steady state optical absorption and emission spectra of dye 2 are shown in SI Figure 1 C and D, respectively. Similar to dye 1, dye 2 also showing Hypsochromic shift in absorption spectra and bathochromic shift in emission spectra.

2. Steady State Optical Absorption of Catechol, Resorcinol.

The individual solvatochromisms of catechol, resorcinol, solvatochromic behaviour of catechol and Resorcinol in different solvent are plotted in SI Figure 2 A and B, respectively. Steady state optical absorption spectrum of catechol (SI Figure 2 A) varies from 276-278 nm in all solvent. Steady state optical absorption spectra of Resorcinol (SI Figure 2 B) varies from 272-275 nm in all solvent which can be attributed to π - π * electronic transition.



SI Figure 2: Normalized steady state optical absorption spectra (A) Catechol and (B) Resorcinol in the different Solvent.

3. Steady State Optical Absorption and emission of Bare BODIPY, Phenyl substituted BODIPY and phenyl BODIPY vinyl

Solvatochromic behaviour (steady state optical absorption and luminescence) of bare BODIPY (dye C), Phenyl substituted BODIPY (dye S) and Phenyl-BODIPY Vinyl (dye V) in different solvent are plotted in SI Figure 3 A to F. Steady state optical absorption and photoluminescence spectra (SI Figure 3 A and B, respectively) of bare BODIPY varies from 491-499 nm and 504-515 nm, respectively in all solvent. Steady state optical absorption and photoluminescence spectra (SI Figure 3 C and D, respectively) of Phenyl substituted BODIPY varies from 497-503 nm and 509-517 nm, respectively in all solvent. Steady state optical absorption and photoluminescence spectra (SI Figure 3 E and F, respectively) of Phenyl BODIPY vinyl varies from 554-562 nm and 564-572 nm, respectively in all solvent. All the relevant parameters are summarized in SI Table 1.



SI Figure 3: Normalized steady state optical absorption (A, C, E) and emission (B, D, F) spectra of bare BODIPY, phenyl substituted BODIPY and phenyl BODIPY vinyl in different solvent, respectively.

We have studied solvatochromic behaviour of the bare BODIPY, phenyl substituted BODIPY and phenyl BODIPY vinyl in the different solvent such as the protic and aprotic solvent that are shown in the SI Figure 3. Similar to dye 1 and dye 2 the spectral properties of these synthesized dyes are followed. The florescence quantum yield (Φ_i) of the dye 1, dye 2, bare BODIPY, phenyl substituted BODIPY and phenyl BODIPY vinyl has been calculated with respect to the reference Rhodamin B ($\Phi_{Rh-B} = 69\%$ in methanol). Similarly the fluorescence quantum yield of the bare BODIPY and phenyl substituted BODIPY has been calculated with respect to Fluorescein molecule ($\Phi = 79\%$ in 0.1M NaOH) which has been summarized in SI Table 1. The following equation were used to determine the emission quantum yield.¹⁻²

$$\boldsymbol{\Phi}_i = \boldsymbol{\Phi}_r \frac{I_i}{I_r} \frac{\boldsymbol{O} \boldsymbol{D}_r}{\boldsymbol{O} \boldsymbol{D}_i} \frac{\eta_i^2}{\eta_r^2}$$

Where, "I" is the area under the emission plot, "OD" is the optical density at excited wavelength and " η " is the refractive index of the solvent. The superscript "i" and "r" represent measured sample and standard sample, respectively.

4. Emission Decay Trace of dye 1, dye 2, Bare BODIPY, Phenyl Substituted BODIPY and Phenyl BODIPY Vinyl:

SI Figure 4 A and B show the time resolved emission decay traces of the dye 1 and 2



SI Figure 4: Solvent dependent emission decay trace of dye 1 (A) λ_{ex} =443 nm and λ_{em} =580 nm, and dye 2 (B) λ_{ex} =443 nm and λ_{em} =570 nm. "L" stands for IRF170 ps.

molecule excited at 443 nm laser and emission measured at 580 nm and 570 nm respectively. The emission decay traces dye 1 are fitted single exponentially in aprotic polar solvent while these are fitted with multiexponentially in polar protic solvent (SI Table 1). Interestingly the excited state life time in the polar protic solvent reduce drastically which suggest increase of non-radiative relaxation through vibrational relaxation process due to hydrogen bonding. Similarly the SI Figure 5 A, B and C shows the time resolved emission decay traces of the Bare BODIPY, Phenyl substituted BODIPY and phenyl BODIPY vinyl dye molecule excited at 443 nm laser and emission measured at 500 nm, 500 nm and 570 nm respectively. The emission decay traces of Bare BODIPY, Phenyl substituted BODIPY substituted BODIPY and phenyl BODIPY and phenyl BODIPY in the emission decay traces of Bare BODIPY, Phenyl substituted BODIPY and phenyl substituted BODIPY and phenyl BODIPY in the emission decay traces of Bare BODIPY, Phenyl substituted BODIPY and phenyl BODIPY in the emission decay traces of Bare BODIPY, Phenyl substituted BODIPY and phenyl BODIPY in the emission decay traces of Bare BODIPY, Phenyl substituted BODIPY and phenyl BODIPY in the emission decay traces of Bare BODIPY, Phenyl substituted BODIPY and phenyl BODIPY in the emission decay traces of Bare BODIPY, Phenyl substituted BODIPY and phenyl BODIPY in the emission decay traces of Bare BODIPY, Phenyl substituted BODIPY and phenyl BODIPY in the emission decay traces of Bare BODIPY, Phenyl substituted BODIPY and phenyl BODIPY in the emission decay traces of Bare BODIPY, Phenyl substituted BODIPY and phenyl BODIPY in the emission decay traces of Bare BODIPY, Phenyl substituted BODIPY and phenyl BODIPY in the emission decay traces of Bare BODIPY, Phenyl substituted BODIPY and phenyl BODIPY in the emission decay traces of Bare BODIPY in the emission decay traces of Bare BODIPY in the phenyl BODIPY is phenyl bodies.



SI Figure 5: Solvent dependent emission decay trace of Bare BODIPY (C) λ_{ex} =443 nm and λ_{em} = 500 nm, phenyl substituted BODIPY λ_{ex} = 443 nm and λ_{em} = 500 and phenyl BODIPY vinyl λ_{ex} = 443 nm and λ_{em} = 570 nm. "L" stands for IRF 170 ps.

SI Table 1: Absorption (λ_{abs}) , fluorescence (λ_{em}) maxima, Stokes shifts (Δv_{st}) , quantum yield (ϕ) and radiative lifetimes (τ) of Bare BODIPY (dye C), Phenyl substituted BODIPY (dye S) and Phenyl-BODIPY Vinyl (dye V) in different dielectric (ϵ) solvent.

Solvent	nt $\lambda_{ab}(nm)$			λ _{em} (nm)		φ			τ(ns)			
	dyeC	dyeS	dye	dye	dyeS	dyeV	dyeC	dyeS	dyeV	dyeC	dyeS	dyeV
			V	C								
ACN	491	497	554	505	509	564	0.91	0.52	0.69	5.73	3.43	4.48
							± 0.04	± 0.026	± 0.03	± 0.28	± 0.17	± 0.22
CH	499	502	559	512	514	568	0.82	0.44	0.60	5.31	2.58	3.99
							± 0.032	± 0.022	± 0.03	± 0.26	± 0.13	± 0.2
EtOAc	494	498	555	506	510	565	0.89	0.63	0.72	5.55	3.48	4.38
							± 0.04	± 0.032	± 0.036	± 0.28	± 0.17	± 0.22
Toluen	500	503	563	515	517	572	0.88	0.69	0.63	5.1	3.42	3.99
e							± 0.044	± 0.034	± 0.031	± 0.25	± 0.16	± 0.2
CHCl ₃	498	502	561	512	515	572	0.86	0.7	0.64	5.5	3.6	4.36
							± 0.043	± 0.035	± 0.03	± 0.27	± 0.18	± 0.21
EtOH	495	499	556	506	510	566	0.9	0.61	0.70	5.69	3.6	4.44
							± 0.045	± 0.03	± 0.034	± 0.27	± 0.17	± 0.22
MeOH	493	498	554	506	509	565	0.90	0.53	0.70	5.8	3.4	4.48
							±0.041	± 0.022	± 0.032	± 0.3	± 0.17	± 0.24

5. Steady State Optical Absorption Measurement of the Catechol, Resorcinol, Dye 1, Dye 2 and Vinyl Catechol with NS TiO₂:

Ground state interaction of catechol, resorcinol, dye 1 and dye 2 with TiO_2 nanomaterials in the chloroform, hexane and toluene are shown in SI Figure 6. Both catechol and resorcinol form charge transfer complex with TiO_2 nanostructure in all solvents. The absorption band of the catechol appears at 276-278 nm in all solvents.



SI Figure 6: Normalized steady state optical absorption spectra of (A, C, E) catechol (a) and catechol/TiO₂ (b); (B, D, F) resorcinol (a) and resorcinol/TiO₂ (b); (G, I, K) catechol-BODIPY (dye 1 (a) and dye $1/TiO_2$ (b)); and (H, J, L) resorcinol-BODIPY (dye 2 (a) and

dye 2/TiO₂ (b)) in chloroform, hexane and toluene, respectively. Steady state optical absorption spectra of TiO₂ (c) in corresponding solvent. $[TiO_2] = 2 \text{ g } \text{L}^{-1}$.

Interestingly, in presence of TiO₂ the optical spectra shifted to red region (~450 nm) with spectral broadening. Similarly, in case of resorcinol/TiO₂ the optical absorption spectra are shifted to red region (~425 nm) in all solvent. This observation can be assigned as formation of CT complex. However, the spectral broadening and more red shifted optical absorption band is appeared in case of catechol/TiO₂ due to formation of strong five membered chelate complexes. Similar experiment has been carried out with dye 1 and dye 2 in presence of TiO₂ which are plotted in SI Figure 6 G to L. In all cases (i.e. in all solvent) we observe more red shifted CT band in case of dye $1/TiO_2$ as it has catecholate anchoring moiety.

Also the Ground state interaction of vinyl catechol with TiO_2 nanomaterials in the chloroform is shown in SI Figure 7 Vinyl catechol form charge transfer complex with TiO_2 nanostructure in chloroform solvent. The absorption band of the Vinyl catechol appears at 300 nm. Interestingly, see in presence of TiO_2 the optical spectra shifted to red region (~450 nm) with spectral broadening.



SI Figure 7: Steady state optical absorption spectra of (a) Vinyl catechol, (b) Vinyl catechol-TiO₂, (c) TiO₂ in the Chloroform. [TiO₂] = 2 g L⁻¹.

6. Charge Transfer Interaction between dye Molecules to TiO₂:

SI Figures 8 A and B show the deconvoluted optical absorption spectra of dye $1/\text{TiO}_2$ and dye $2/\text{TiO}_2$, respectively. The optical absorption spectra of dye $1/\text{TiO}_2$ (SI Figure 8 A) are deconvoluted to three Gaussian peaks having peak maxima at 563 nm, 617 nm and 697 nm. Among them first peak at 563 nm can be referred as local band (LB) of dye 1 and the other two bands 617 nm and 697 nm can be attributed to charge transfer bands (CTB) of dye

 $1/\text{TiO}_2$ which are formed through conduction band states and trap states of TiO₂ NP and dye 1 respectively. Similarly optical absorption spectra of dye $2/\text{TiO}_2$ (SI Figure 8 B) also deconvoluted to two Gaussian peaks having peak maxima at 530 nm and 669 nm. These two bands can be attributed to red shifted LB of S2 and S1 states of dye 2 on nanoparticle surface. No new CTB has been observed in dye $2/\text{TiO}_2$ system suggesting much weaker interaction in the system.



SI Figure 8: Panel A: optical absorption spectra of a) dye 1 b) $dye1/TiO_2$ in chloroform. Dashed lines are the deconvoluted optical absorption spectra of dye1/TiO₂. Panel B: optical absorption spectra of d) dye 1 e) $dye2/TiO_2$ in chloroform. Dashed lines are the deconvoluted optical absorption spectra of dye2/TiO₂.

7. Dye adsorption on the NS TiO₂ surface

Solid state UV-vis spectra is recorded and is shown in SI Figure 9. First we loaded the NS TiO_2 on the quartz surface. Then respective dye (1 and 2) was loaded through drop casted method (0.5 mM solution of respective in acetonitrile solution) followed by measured the UV-vis spectra. The solid state UV data also clearly reveals the anchoring or grafting of the dye 1 (0.15 x 10⁻⁸ mole cm⁻²) is stronger than dye 2 (0.08 x 10⁻⁸ mole cm⁻²).³



SI Figure 9: UV- Visible absorption spectrum in solid state of (A) dye 1 and (B) dye 2. In both cases TiO_2 (black line) before absorbed, TiO_2 -dye (red line) and desorbed dye on the TiO_2 (blue).

8. Excited State Dynamics of dye 1 and dye 2:

The photoexcited electron relaxes from higher excited state (S_n) to the S₁ state and finally relaxes to S₀ state depending on their excited state life time. In the present study we have seen growth of the positive signal for both the dye molecules. The kinetic trace at 750 nm of dye **1** (SI Figure 10 A) has bi-exponential growth τ_1^{g} < 100 fs (79%), $\tau_2^{g} = 2 \pm 0.1$ ps (21%), and multi-exponential decay trace with time constants $\tau_1 = 30 \pm 1.5$ ps (61%) $\tau_2 = 150 \pm 7$ ps (19%) and τ_3 > 1 ± 0.2 ns (20%). The slower growth component can be attributed to the vibrational relaxation of excited singlet state ⁴⁻⁶ The long component (> 1 ns) can be attributed to the excited singlet state life which has already been determined to be ~ 4 ns through time-resolved emission



SI Figure 10: Kinetic decay traces of (A) dye 1 at 750 nm and (B) dye 2 at 730 nm after 400 nm laser excitation in chloroform.

studies. Similarly the decay kinetics of dye **2** at 730 nm (SI Figure 10 B) also has biexponential growth $\tau_1^{g} < 100$ fs (78%), $\tau_2^{g} = 2 \pm 0.1$ ps (22%), and multi-exponential decay trace with time constants $\tau_1 = 25 \pm 1.2$ ps (53%) $\tau_2 = 250 \pm 12.5$ ps (29%) and $\tau_3 > 1 \pm 0.2$ ns (18%). The slower growth component can be attributed to the vibrational relaxation of excited singlet state.

9. Transient Absorption Spectrum (Uncorrected) of Cation Radical of dye 1 and dye 2:

To perform the transient absorption spectrum of the cation radicals for dye 1 and dye 2 molecules, one-electron oxidation reaction have been carried out in aqueous solution (99:1 water: acetonitrile mixture) bubbled with N₂O and in the presence of N₃⁻ ion. Concentrations of both the dyes have been kept *ca*. $5x10^{-5}$ mol dm⁻³. The presence of hydroxyl or azide radical allows the dye to undergo one-electron oxidation *i.e.* loss of an electron. The water

molecule is dissociated in different forms such as $(H^{\bullet}, OH^{\bullet}, e_{aq}^{-})$.



SI Figure 11: Transient absorption spectra of the cation radical at 20 μ s for (A) dye 1 and (B) dye 2 obtained from the pulse radiolysis by one-electron oxidation.

Finally the azide radicals react with the dye molecules resulting formation of azide anions and dye cations. SI Figure 11 A and B show the cationic spectra of the Dye 1 at 20 μ s and dye 2 at 20 μ s time delay after exciting with electron pulse beam, respectively. Broad transient absorption spectra in 600-750 nm regions with absorption maxima at 670 nm can be assigned at the formation of dye 1 cation radical. While the transient absorption spectra of dye 2 shows transient band in 580-650 nm region with peak maxima 615 nm can be attributed to cation radical of dye 2.

The reactions are of the pulse radiolysis study are given below:

H₂O $\vee \vee \vee \vee \vee \vee \to$ H[•], OH[•], e_{aq}^- and other related products

 $e_{aq}^{-+} N_2 O \rightarrow N_2 + O^{-}$ $O^{-} + H_2 O \rightarrow OH^{-} + OH^{-}$ $N_3^{-} + OH^{-} (or \ O^{-}) \rightarrow N3^{-} + OH^{-} (or \ O_2^{-})$ $N_3^{-} + BODIPY \rightarrow N_3^{-} + BODIPY^{+}$

10. Transmission Electron Microscope Measurements of TiO2:

TEM samples were prepared by drop-casting method. 1.0 mM toluene solution of NRs dropped on the carbon coated copper grids (200 mesh). TEM grids were allowed to dry under vacuum condition for 24 hours. It's clear from SI Figure 12 that length of the nanostructure is $\sim 14 \pm 1$ nm and width is $\sim 3 \pm 0.03$ nm.



SI Figure 12: The Transmission Electron Microscopy (TEM) images of oleic acid cap Nanostructure TiO₂ and inset shows the particle size distribution histogram.

11. X-ray diffraction of the Powder XRD measurement of TiO2:

Powder XRD measurements were carried out to understand the crystal structure of the TiO_2 Nanostructure. SI Figure 13 shows the XRD pattern of the synthesised TiO_2 nanostructure. The major peaks at 25.6, 38.11, 47.9 and 54.3 degree represent 101, 004, 200 and 211 planes of the TiO_2 nanostructure, respectively.



SI Figure 13: Powder X-ray diffraction (XRD) patterns of TiO₂ nanorod.

12. Synthesis:

(E)-3-(3,5-Dihydoroxy-1-vinyl-Benzene)-1,5,7-trimethyl-8-phenyl-4,4-

difluoroboradiazaindacene (2): 1,3,5,7-trimethyl-8-phenyl-4,4-difluoroboradiazaindacene (400 mg, 1.23 mmol) and 3,5-dihydroxy benzaldehyde (170.38 mg 1.23 mmol) was refluxed in a mixture of toluene (20 ml), Glacial Acetic acid (0.6 ml) and piperidine (0.9 ml excess). Any water formed during the reaction was removed by heating azeotropically in a dean-stark apparatus for 6 h. Crude compound was then evaporated and purified by silica gel column chromatography (DCM: EtOAc = 95:5) to get pink colour compound (80 mg, yield=14 %).¹H NMR (400 MHz, CD₃OD); 7.52 (1 H, J=15.20 Hz (CH=CH)), 7.34-7.49 (3 H, m, Ar-H), 7.28-7.26 (2 H, m), 7.14 (1H, d, 16.4 Hz (C=CH)), 6.66 (1 H, s,), 6.53, (2 H,d,1.6 Hz), 6.24 (1 H, t, j=1.6 Hz), 6.03 (1 H, s), 2.49 (3 H, s), 1.39(3 H, s), 1.36 (3H, s). ¹³C NMR (100 MHz CD₃OD): 14.63, 14.707, 14.827, 104.71, 106.82, 118.76, 119.94, 122.45, 129.47, 130.29, 130.43, 133.03, 133.91, 136.31, 137.66, 139.94, 142.20, 144.04, 144.35, 154.08, 156.56, 160.00. HR-MS: e/z (M⁺1) = 445.

Synthesis of BODIPY Core (1,3,5,7,8-Pentamethyl-4,4-difluoro-4-bora-3a,4a-diaza-sindacene): A solution of acetyl chloride (500 mg, (454 μ L), 6.4 mmol), 2,4-dimethyl-1Hpyrrole (1.22 mg (1.31 ml), 12.82 mmol) in dry CH₂Cl₂ (20 mL) were mixed at room temperature. the mixture was heated for 1 h under reflux condition. NEt₃ (4.5 mL, 32 mmol) was added into the reaction mixture at room temperature in stirring condition. A solution of BF₃- Et₂O (5 mL, 38 mmol) was added drop wise and stirred for 1 h at room temperature. The reaction mixture was washed with saturated aqueous Na₂CO₃ solution (3 X 50 mL), dried over Na₂SO₄, and then concentrated on a rotary evaporator. After that this residue was purified by column chromatography on silica with pet-ether ethyl acetate = 96:4. (Yield: 729 mg, 43%) NMR (400 MHz, CDCl₃); 6.04, (2 H, s); 2.56 (3 H, s); 2.51 (6H, s), 1.39 (6 H, s). 13C NMR (100 MHz CDCl₃) 153.56, 141.40, 140.98, 132.03, 121.21, 17.27, 16.33, 14.39 (HR-MS- M+ = 262)

Synthesis of Phenyl BODIPY Vinyl ((E)-3-Styryl-1,5,7-trimethyl-8-phenyl-4,4difluoroboradiazaindacene): 1,3,5,7-trimethyl-8-phenyl-4,4-difluoroboradiazaindacene (180 mg, 0.55mmol) and benzaldehyde (66 mg, 0.55 mmol) were refluxed in presence of the Toluene (15 ml), Acetic Acid (380 μ l) and piperidine (380 μ l) for 3 h. The water formed in this reaction mixture was removed by the azotropicaly using the dean stark apparatus, and purified by silica gel column chromatography (petether- EtOAc 95:5). Yield (64 mg, 25% yield) NMR (400 MHz, CDCl₃); 7.68 (1 H, J=16.4 Hz (CH=C)); 7.60 (2H, d, J=7.6 Hz, Ar-H); 7.50 (3H, m,); 7.32 (2H, 3, J= 8 Hz,); 7.31 (3H, d, J= 7.6 Hz,); 7.23 , (1H, J=16 Hz J=16 Hz (CH=C)); 6.61 (1H, s,) 6.01,(1H,s) ; 2.60 (3H, s); 1.43(3H, s), 1.39 (3H, s). 13C NMR (100 MHz CDCl₃) 14.38, 14.55, 14.75, 117.49, 119.19, 121.45, 127.44, 127.94, 128.15, 128.73, 128.83, 128.96, 129.11, 131.94, 135.05, 135.9, 136.52, 140.57, 142.36, 143.09, 152.51, 155.70 (HR-MS- M+ = 412)

Synthesis of 3,4-bis((tert-butyldimethylsilyl)oxy)benzaldehyde:

3,4-dihydroxy benzaldehyde (2 g, 14.49 mmol), 4-Dimethylaminopyridine (3.5 gm, 28.91mmol), Imidazole (5.91 g, 86.94 mmol) and TBDMSCl (4.37gm, 28.91 mmol) were added in DMF at the 0 °C temperature. This reaction mixture was allowed to reach at room temperature and stirred it for the overnight. After completion of the reaction 50 mL water was added then reaction mixture extracted by the diethyl ether and dried (NaSO₄). The crude compound was purified by Silica column chromatography (Petether-EtOAc 95:5) to get Compound. (3.2g yield 61%) NMR (400 MHz, CDCl₃): 9.80 7.36 (1H, d, J=8Hz); 7.35 (1H, s); 6.93 (1H, d, J=8Hz); 0.99 (18H, s); 0.24 (6H, s); 0.22 (6H,s) 13C NMR (100 MHz CDCl₃): 190.81; 153.31; 147.64; 130.70; 125.26. 120.77; 120.52; 25.83; 25.79; 18.50; 18.39; -4.05; -4.14.

Synthesis of (E)-4-(pent-1-en-1-yl) benzene-1,2-diol:

Under an inert atmosphere and 0 °C temperature Butyl Lithium (3 ml 6 mmol of 2 M solution) was added in the dry THF in stirring condition. After that drop by drop solution of the 3,4-bis (tert-butyldimethylsilyl) oxy) benzaldehyde (2 g 5.45 mmol) in THF was added in the reaction mixture at 0 °C. After completion of 1 h, 20 ml saturated solution of NH₄Cl was added into the reaction mixture and the product was extracted by the DCM (30 ml X 3)-resulting yellowish oily Crude product was obtained. This crude product was dissolved in

pyridine (30 ml) for the further reaction. The solution of the POCl₃ (5.45 mmol) in dry pyridine (20 ml) was added drop by drop in the reaction mixture under an inert atmosphere at room temperature with stirring for 1 h. To remove pyridine and excess POCl₃ the reaction mixture was evaporated in rotory evaporator and mixed with crushed ice, respectively. The reaction mixture was extracted in chloroform solution and the crude oil product in dry THF (20 mL) used directly for further reaction. A solution of TBAF (2.85 g ml 10.91 mmol in the 10 ml dry THF) was added into the reaction mixture drop wise at 0 °C in an inert atmosphere. After 40 minutes the 20 ml of water was added in the reaction mixture and it was extracted by the DCM (25ml X 3) and dried NaSO₄. The crude product was purified by the silica column chromatography (petether –EtOAc 85:15). The colourless solution was obtained (Yield 100 mg, % yield =10%) NMR (500 MHz, CDCl₃) 6.88 (1 H, d, J = 8Hz); 9.77 (1 H, s) 6.6 (1 H, d, J = 8 Hz); 6.23 (1 H, d, J =16 Hz); 6.02 (1 H, m (CH=CH-CH2-)); 5.64 (2 H for OH broad); 2.14 (2H, m); 1.46 (2H, m); .0.93 (3H, t) 13C NMR (125 MHz CDCl₃ 143.56; 142.58; 131.69; 129.23; 129.12; 119.11; 115.41; 112.61; 35.00; 22.60; 13.70) (HR-MS- M+1 = 179)





13 B. ¹HNMR of Bare Bodipy in CDCl₃:



13 C. ¹HNMR of ((E)-3-Styryl-1,5,7-trimethyl-8-phenyl-4,4-difluoroboradiaza-indacene) in CDCl₃:







13 E. ¹HNMR (E)-4-(pent-1-en-1-yl)benzene-1,2-diol in CDCl₃:



14 A. ¹³CNMR of Bodipy dye 2 in CD₃OD:



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14 C. ¹³CNMR of ((E)-3-Styryl-1,5,7-trimethyl-8-phenyl-4,4-difluoroboradiazaindacene) in CDCl₃:



14 D. ¹³CNMR ,4-bis((tert-butyldimethylsilyl)oxy)benzaldehyde in CDCl₃:



14 E. ¹³CNMR (E)-4-(pent-1-en-1-yl) benzene-1,2-diol in CDCl₃:



15 A. HRMS Mass Spectrum of dye 2:



15 B. HRMS Mass Spectrum of Bare BODIPY:



15 C. HRMS Mass spectrum of((E)-3-Styryl-1,5,7-trimethyl-8-phenyl-4,4-

difluoroboradiaza-indacene) in CDCl3:





15 D. HRMS Mass Spectrum of (E)-4-(pent-1-en-1-yl)benzene-1,2-diol:









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