

## Supporting Information

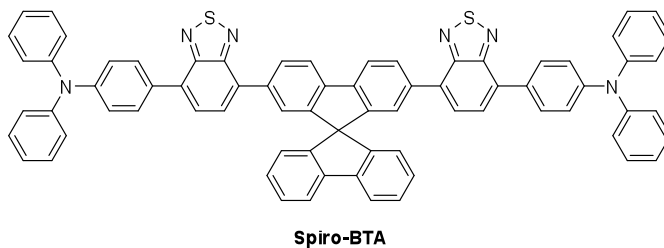
### Electrochemistry and Electrogenenerated Chemiluminescence of a Spirobifluorene-based Donor (Triphenylamine)-Acceptor (2,1,3-Benzothiadiazole) Molecule and its Organic Nanoparticles

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#### Experimental Details

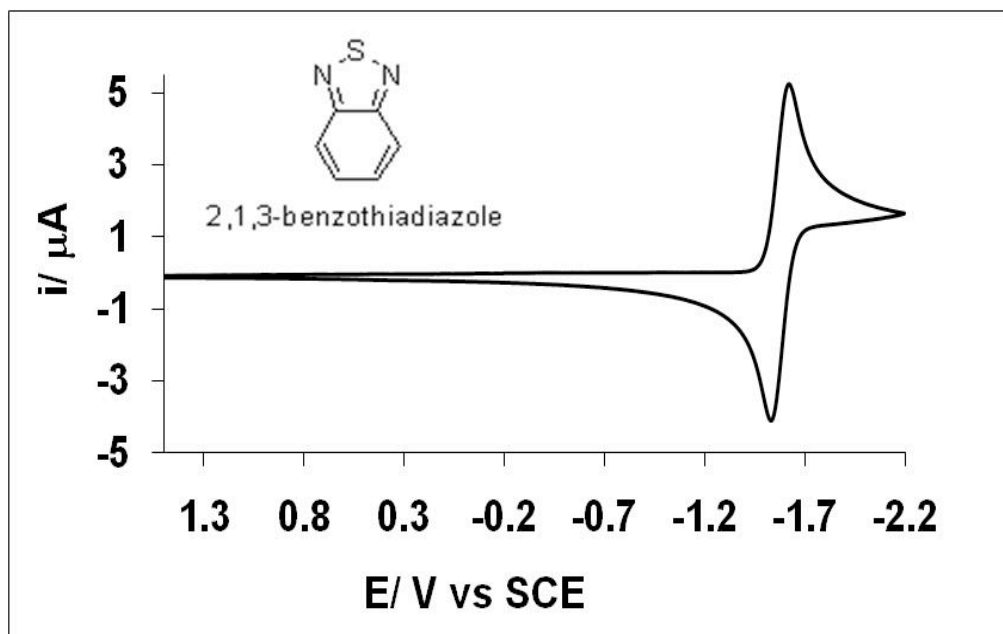


Pd(PPh<sub>3</sub>)<sub>4</sub> (81 mg, 0.07 mmol), **2** (507 mg, 0.68 mmol), and *N,N*-diphenyl-4-(4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl)aniline (**3**) (780 mg, 2.10 mmol) were added to a 50 ml two-neck flask with a septum. The flask was evacuated and back-filled with argon. Toluene (10 mL), P<sup>t</sup>Bu<sub>3</sub> (1.2 ml, 0.07 mmol, 0.05 M in toluene) and K<sub>2</sub>CO<sub>3</sub> (2.7 ml, 2.72 mmol, 1 M) were added in order by a syringe at room temperature. The reaction mixture was heated at 110 °C for 72 h. The reaction mixture was allowed to cool to room temperature, water (30 mL) was added,

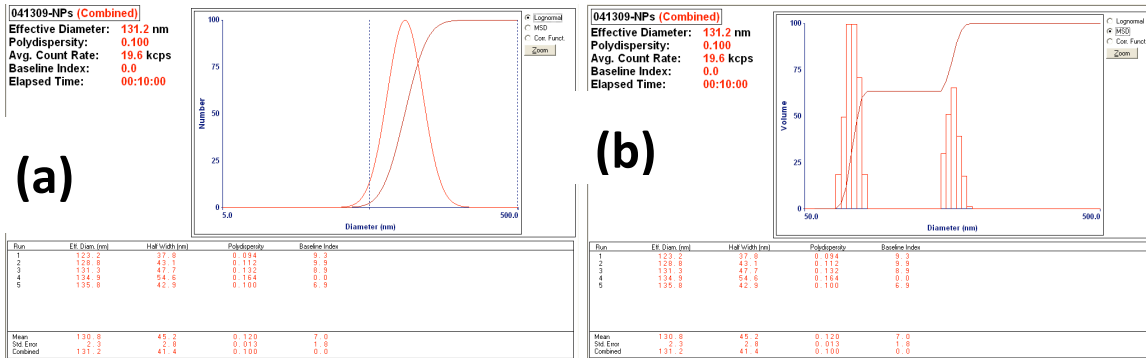
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and the mixture was extracted with  $\text{CH}_2\text{Cl}_2$  (40 mL x 3). The combined organic solution was dried over  $\text{MgSO}_4$  and concentrated in vacuum to yield 600 mg of **Spiro-BTA** (82% yield), which was purified by chromatography with silica gel ( $\text{CHCl}_3/\text{hexane}/\text{toluene} = 1/2/1$ ).

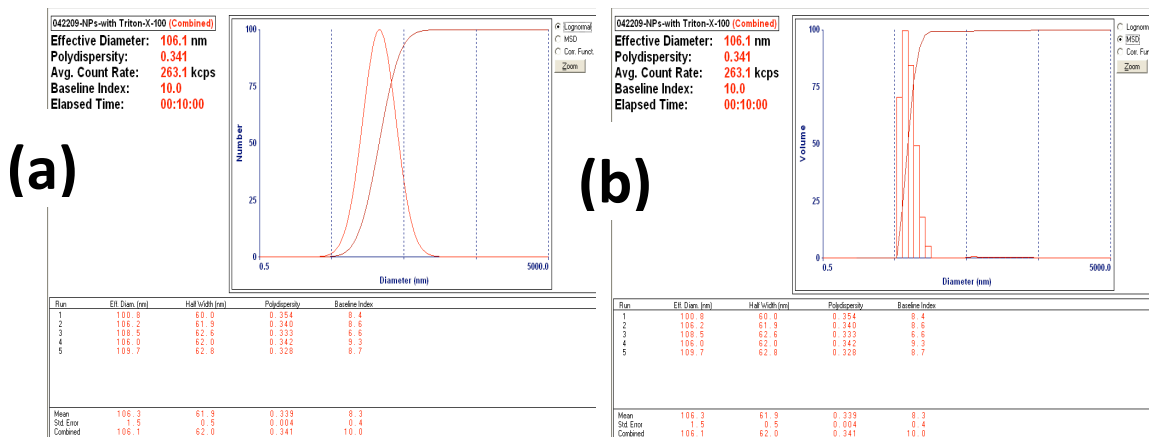
$T_g$  274 °C;  $M_p > 500$  °C (DSC);  $^1\text{H}$  ( $\text{CDCl}_3$ , 400 MHz)  $\delta$  8.21 (d,  $J = 8.0$ , 2H), 8.09 (d,  $J = 8.0$  Hz, 2H), 7.87 (d,  $J = 7.6$  Hz, 2H), 7.80 (d,  $J = 8.4$  Hz, 4H), 7.60 (d,  $J = 8.0$  Hz, 2H), 7.55 (d,  $J = 7.2$  Hz, 2H), 7.38 (t,  $J = 7.6$  Hz, 4H), 7.29 (d,  $J = 8.0$  Hz, 6H), 7.19~7.13 (m, 16H), 7.05 (t,  $J = 6.8$  Hz, 4H), 6.92 (d,  $J = 7.2$  Hz, 2H);  $^{13}\text{C}$  ( $\text{CDCl}_3$ , 100Hz)  $\delta$  154.0, 153.9, 149.8, 148.5, 148.0, 147.4, 141.8, 141.4, 137.3, 132.6, 132.3, 130.8, 129.8, 129.5, 129.3, 128.1, 127.9, 127.8, 127.0, 124.8, 124.4, 124.3, 123.3, 122.8, 120.2, 120.0; MS ( $m/z$ ,  $\text{FAB}^+$ ) 1071.3 (50), 907.1 (100); HRMS Calcd for  $\text{C}_{73}\text{H}_{46}\text{N}_6\text{S}_2$  1071.3304, found 1071.3308.



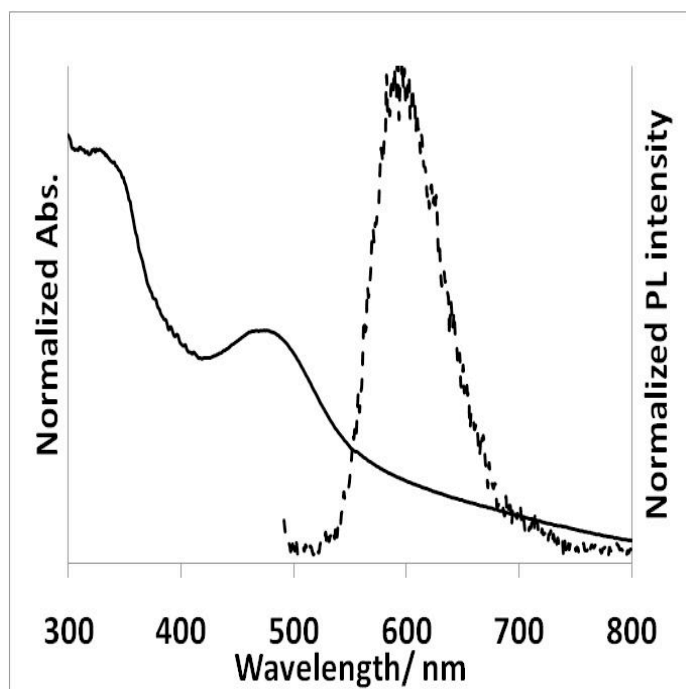
**Figure S1.** Cyclic voltammogram of 2,1,3-benzothiadiazole in MeCN, scan rate: 200 mV/s.



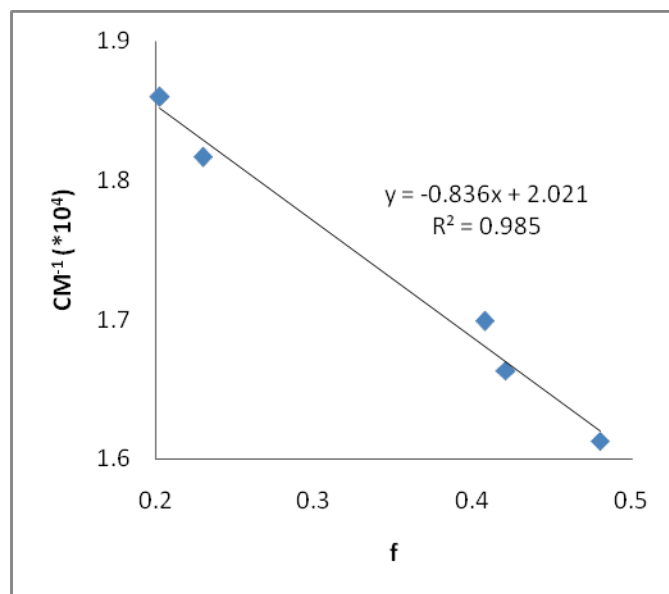
**Figure S2.** Dynamic light scattering (DLS) measurements for **Spiro-BTA NPs** (a) lognormal DLS graph (b) distribution diagram.



**Figure S3.** DLS measurements for **Spiro-BTA NPs** in the presence Triton X-100 without filtration with 0.22  $\mu\text{m}$ , (a) lognormal DLS graph (b) distribution diagram.



**Figure S4.** Absorption and photoluminescence spectra of thin film (~200 nm) of **Spiro-BTA** on glass, using 45° for PL measurement.



**Figure S5.** Lippert-mattage plot in various solvents.