Supporting Information

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

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Experimental Details

Pd(PPh₃)₄ (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'Bu₃ (1.2 ml, 0.07 mmol, 0.05 M in toluene) and K₂CO₃ (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 CH$_2$Cl$_2$ (40 mL x 3). The combined organic solution was dried over MgSO$_4$ and concentrated in vacuum to yield 600 mg of **Spiro-BTA** (82% yield), which was purified by chromatography with silica gel (CHCl$_3$/hexane/toluene = 1/2/1).

T$_g$ 274 °C; M$_p$ > 500 °C (DSC); $^1$H (CDCl$_3$, 400 MHz) δ 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); $^{13}$C (CDCl$_3$, 100Hz) δ 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, FAB$^+$) 1071.3 (50), 907.1 (100); HRMS Calcd for C$_{73}$H$_{46}$N$_6$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 µm, (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.