SUPPORTING INFORMATION

Synthesis, Electrochemistry and Electrogenerated Chemiluminescence of Azide-BTA, a D-A-π-A-D species with Benzothiadiazole and N,N-diphenylaniline, and its Nanoparticles

Jungdon Suk[a], Jian-Zhang Cheng[b], Ken-Tsung Wong[b*], and Allen J. Bard[a*]

[a] *Center for Electrochemistry and Department of Chemistry and Biochemistry, The University of Texas at Austin, Austin, Texas 78712.*

[b]*Department of Chemistry, National Taiwan University, 10617 Taipei, Taiwan*

Contents

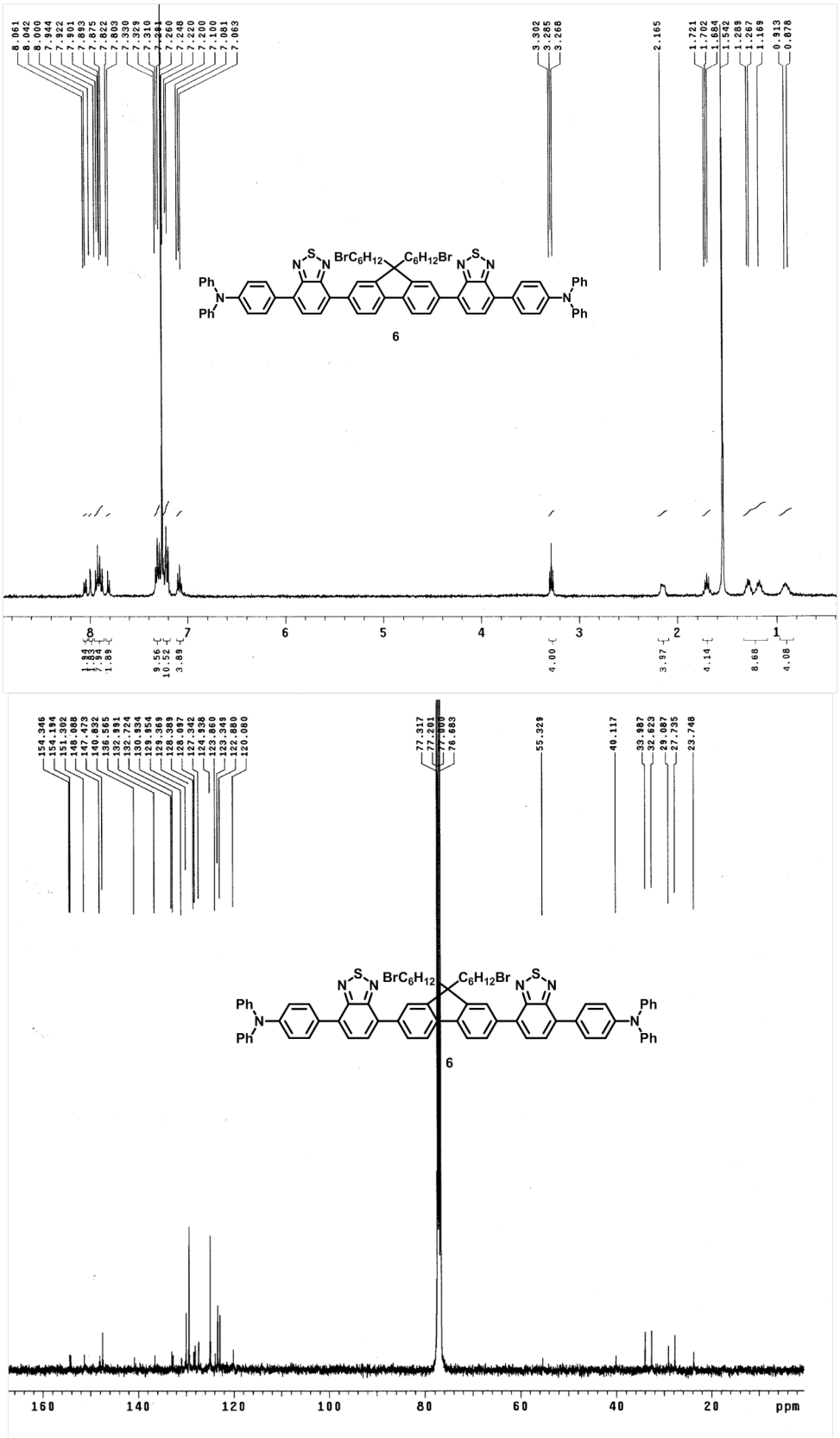

Figure S1. ^{1}H and ^{13}C NMR Spectra of **(3)**.

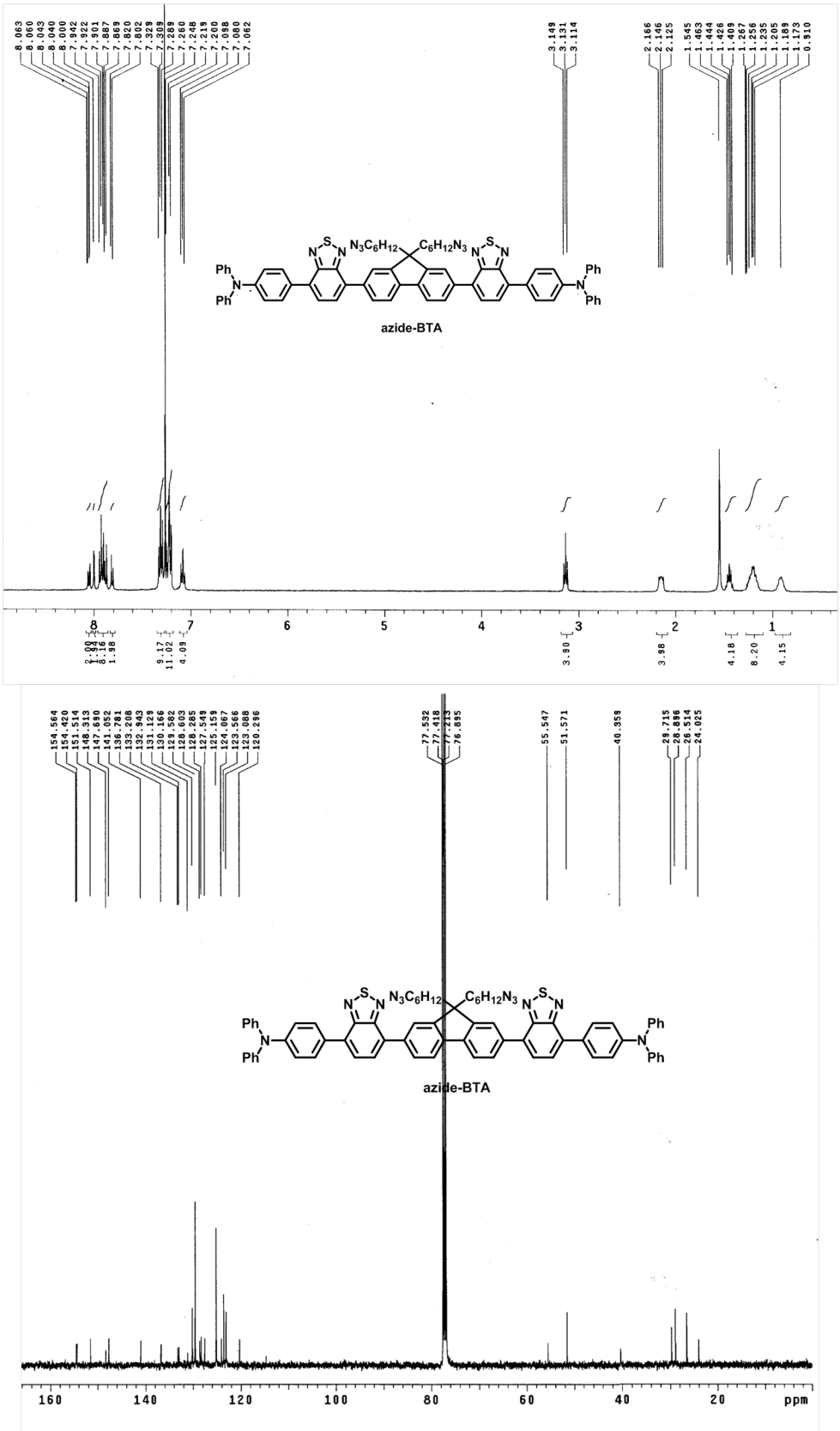

Figure S2. ^{1}H and ^{13}C NMR Spectra of **Azide-BTA**.

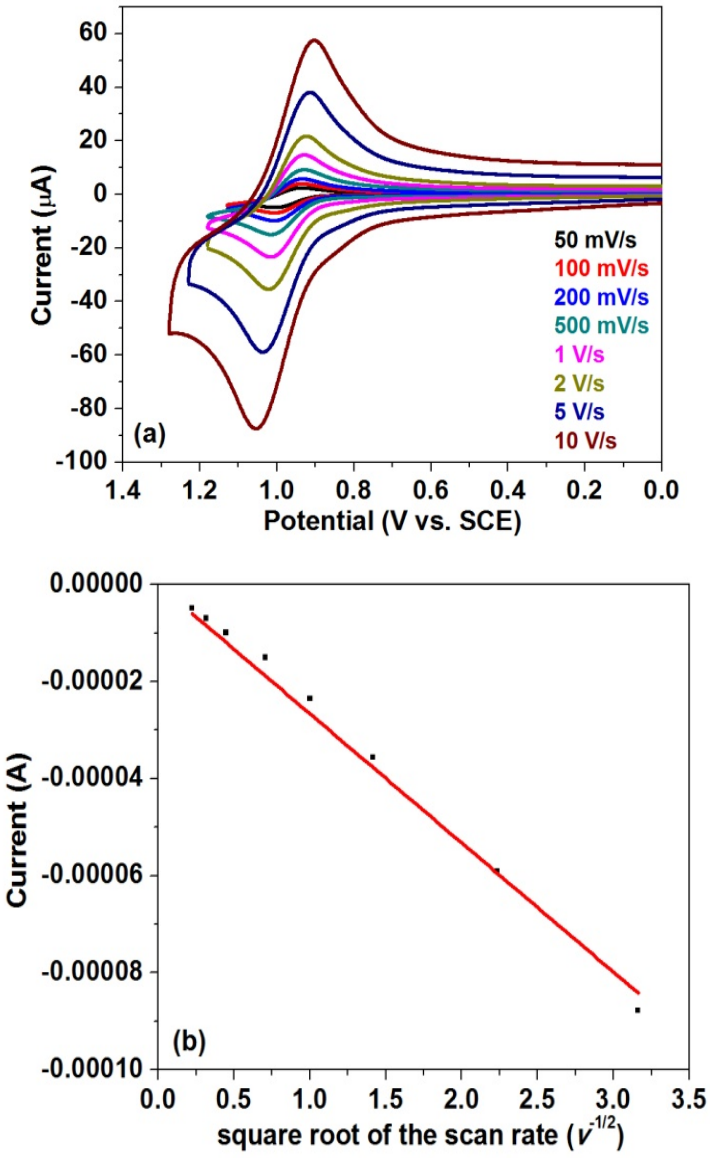

Figure S3. (a) Oxidation CV of 0.5 mM **Azide-BTA** in 1:1 Bz: MeCN at various scan rates. (b) Oxidation peak current versus the square root of the scan rate ($v^{1/2}$).

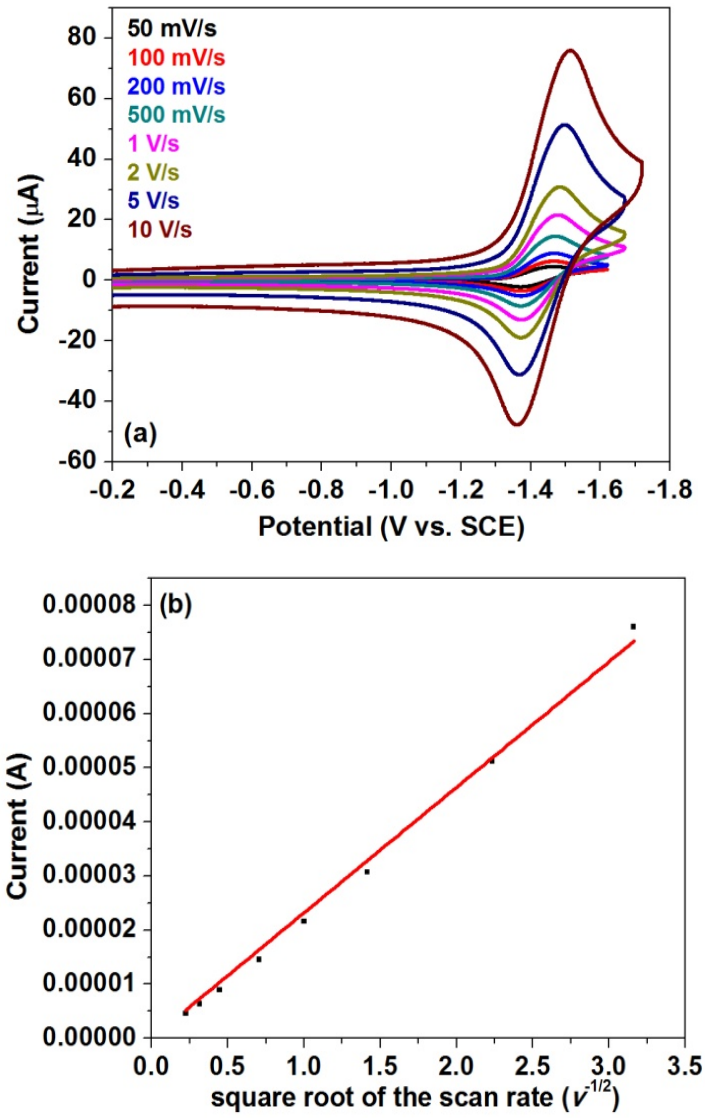

Figure S4. (a) Reduction CV of 0.5 mM **Azide-BTA** in 1:1 Bz:MeCN at various scan rates. (b) Reduction peak current versus the square root of the scan rate ($v^{1/2}$).

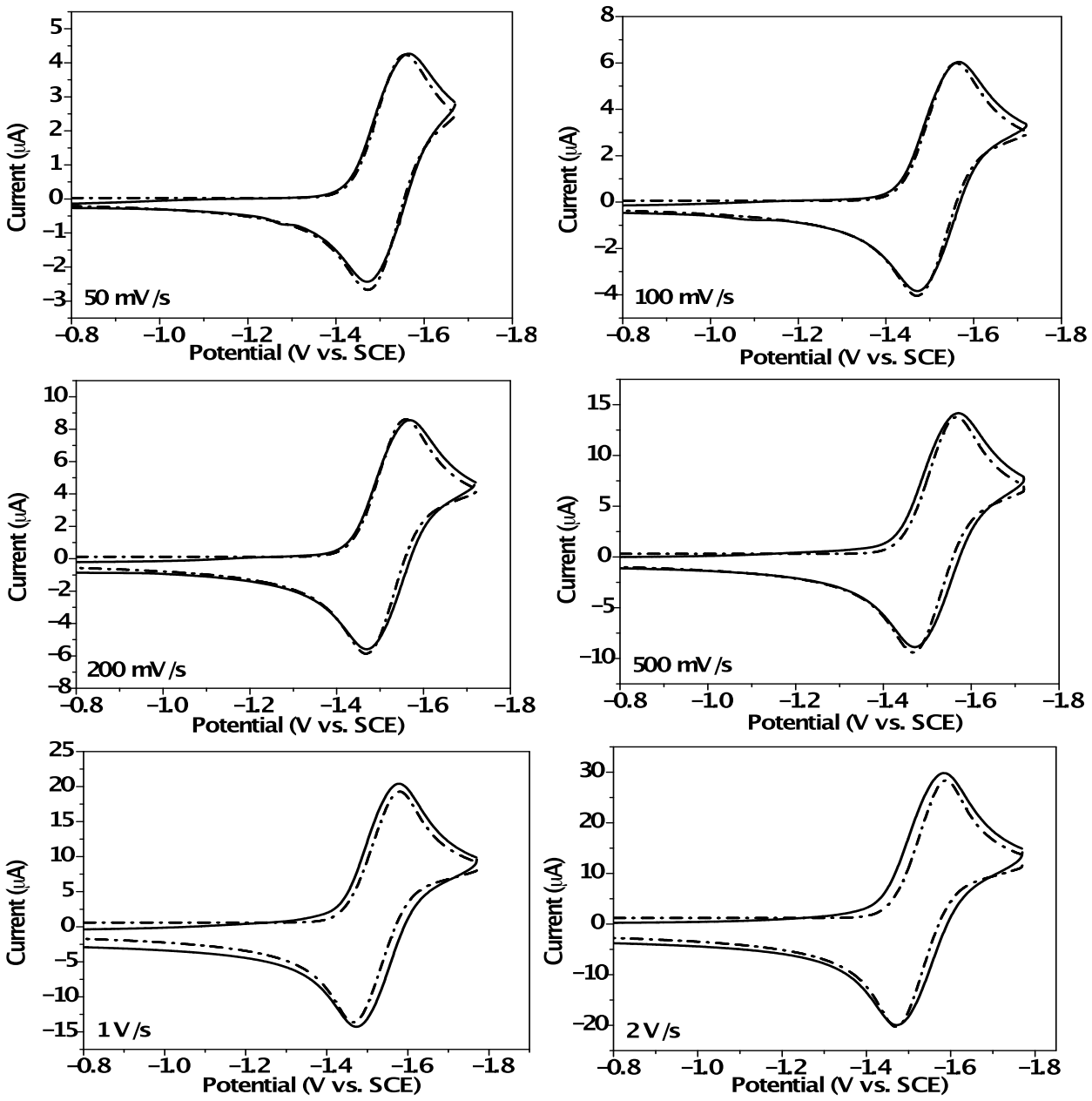

Figure S5. Experimental (solid line) and simulated cyclic voltammograms 0.5 mM **Azide-BTA** reduction with scan rate from 50 mV/s to 2 V/s. Simulation mechanism involves two, one-electron reductions and is corrected for uncompensated resistance, R_u (1200 Ω) and double layer capacitance, C_d (600 μF): $E°_{1,\,red}$=-1.44 V, $E°_{2,\,red}$=-1.49 V vs. SCE, $k° \geq 10^4$ cm/s, α= 0

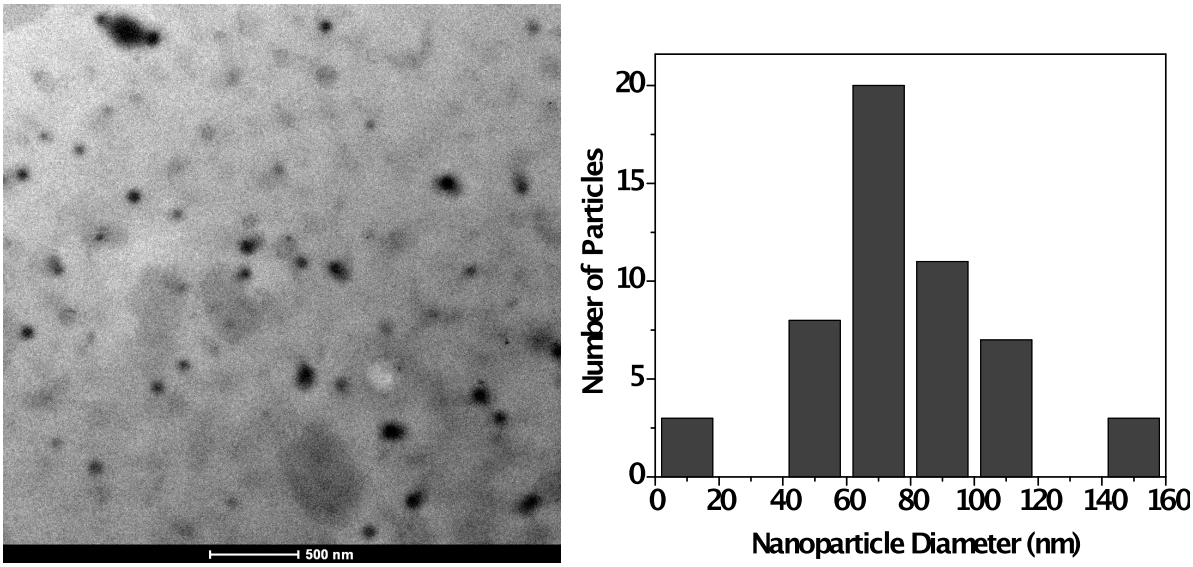

Figure S6. (Left) TEM Image of organic NPs of **Azide-BTA** synthesized by injecting 800 μL of **Azide-BTA**/THF (5×10^{-5} M) to 10 mL of R.T. water under vigorous stirring by 50 μL microsyringe. (Right) Histogram of size distribution of NPs. Average size of NPs is 80 ± 30 nm.

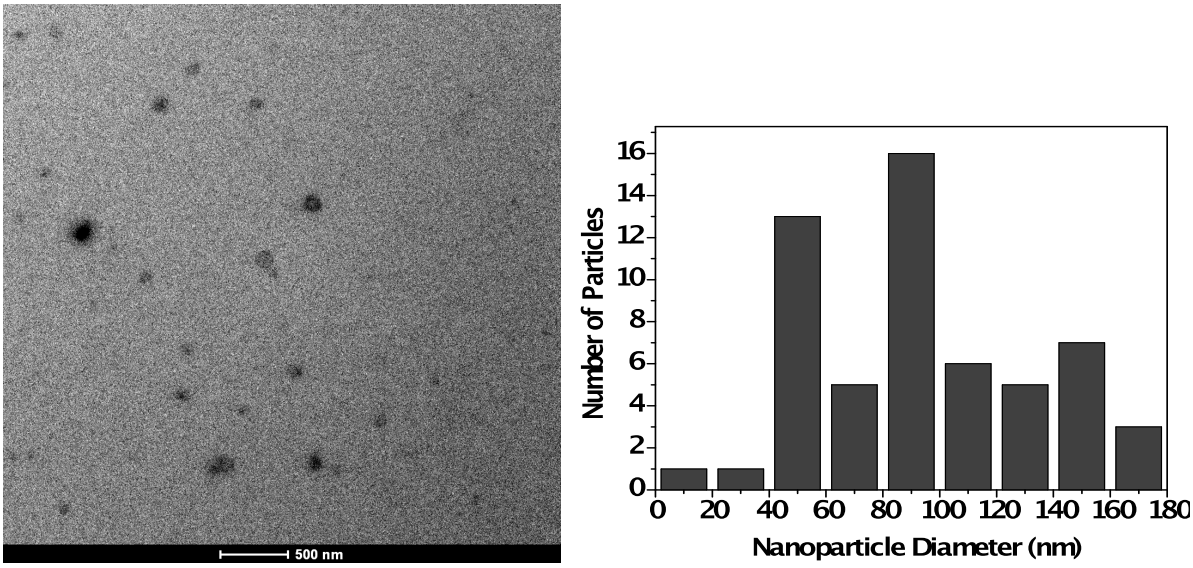

Figure S7. (Left) TEM Image of organic NPs of **Azide-BTA** prepared with 800 μL of **Azide-BTA**/THF (5×10^{-3} M) to 10 mL of deionized water (in room temperature) under vigorous stirring by 50 μL microsyringe. (Right) Histogram of size distribution of NPs. Average size of NPs is 95 ± 38 nm.

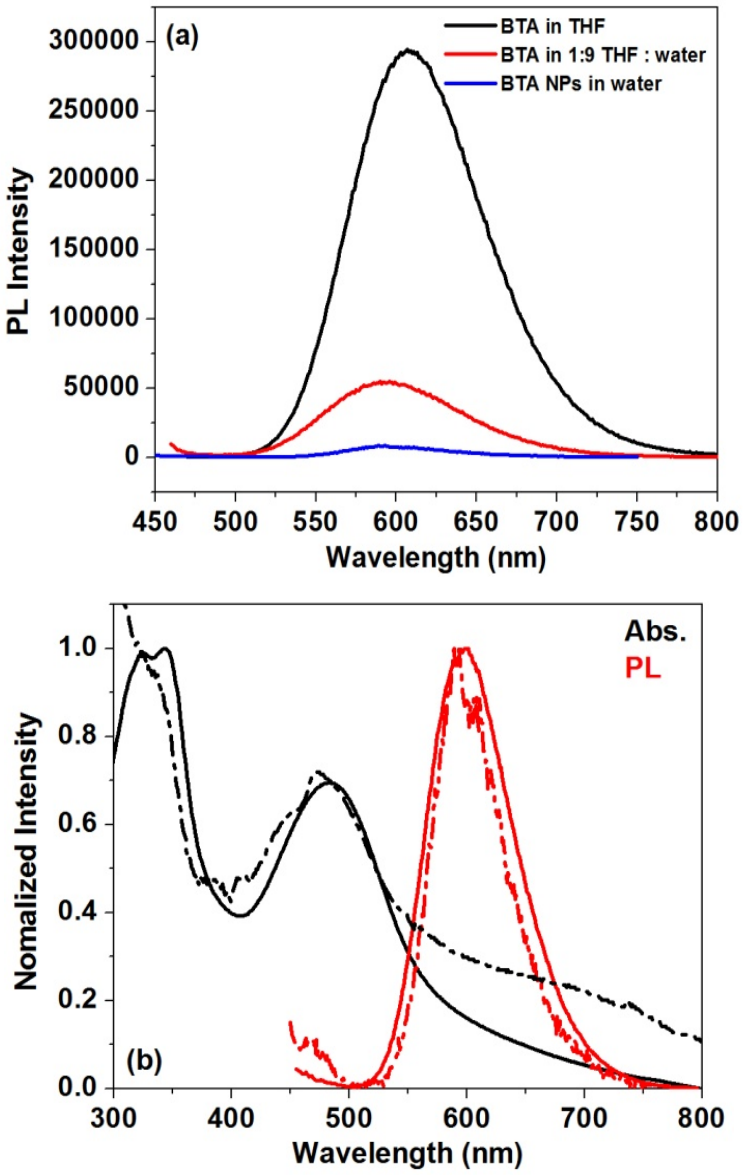

Figure S8. (a) Spectra of fluorescence of **Azide-BTA** as a function of the water fractions in THF. (b) Spectra of absorbance (black) and fluorescence (red) of **Azide-BTA** NPs in water with different sizes: (solid line) 20 nm NPs (dotted line) 3 nm NPs. Emission spectra were excited at the absorption maxima (450 nm).

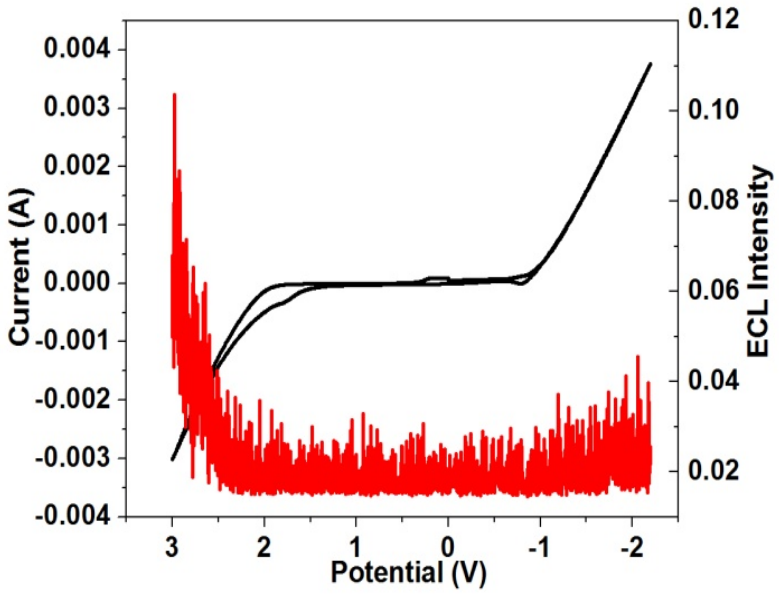

Figure S9. CV of **Azide-BTA** NPs in water with 0.1 M $NaClO_4$ at a scan rate of 100 mV/s. WE: Pt disk, CE: Pt coil, RE: Ag/AgCl.

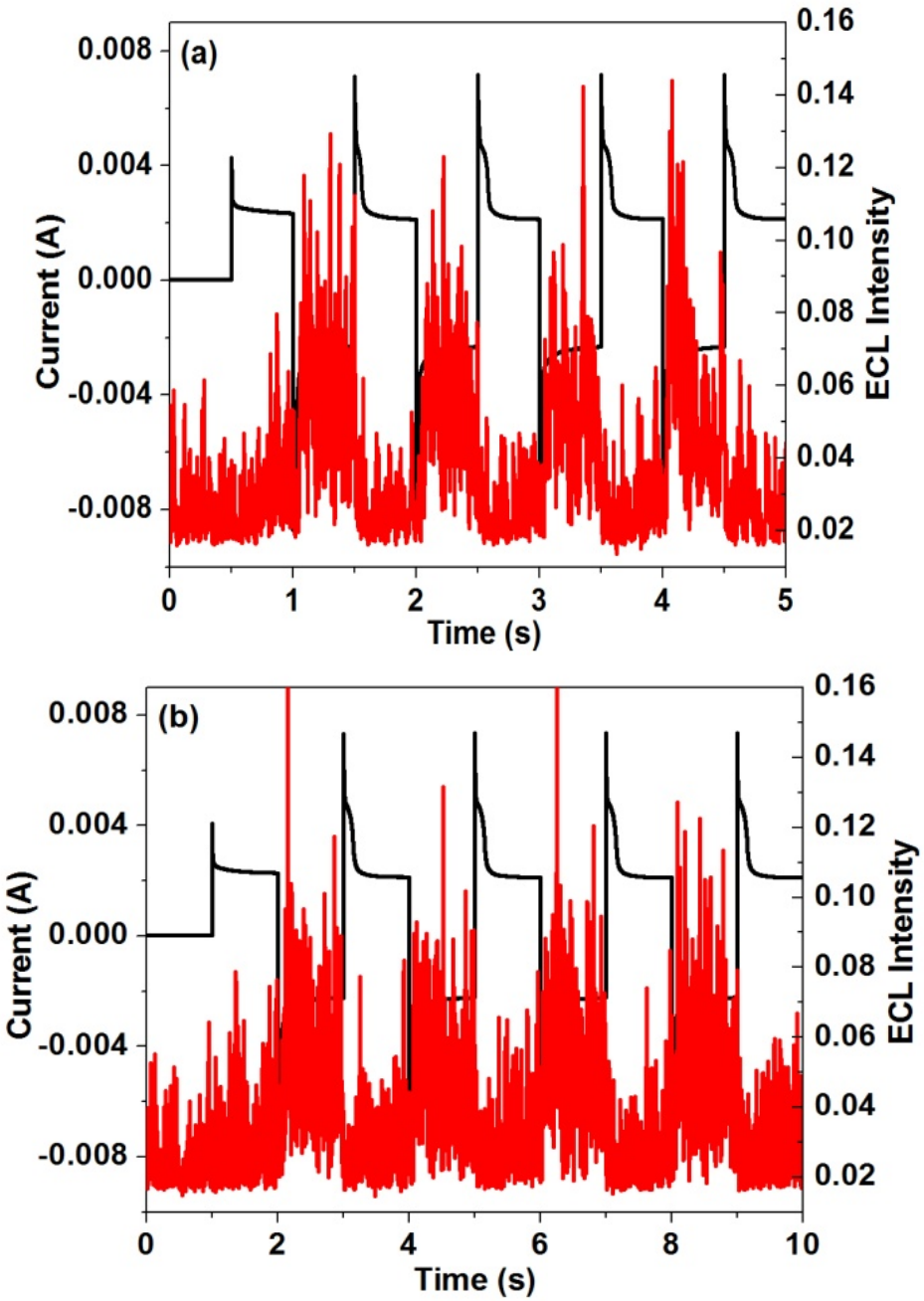

Figure S10. Transient ECL experiment, electrochemical current (black line) and ECL intensity (red line) for **Azide-BTA** NPs in water with 0.1 M $NaClO_4$. Sampling time: 1 ms, pulsing pattern: from -2 V to 2.7 V, pulse width is (a) 0.5 s (b) 1 s.