

Supporting information

Synthesis and photochemical properties of BODIPY-functionalized silica nanoparticle for imaging Cu²⁺ in living cells

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Table S1 The lifetime of **1** and **1**-Cu complex in organic-water (V/V, 1:1) solvents

Solvent	Monitored wavelength h/ nm	τ_1 /ns	τ_2 /ns
1 in ethanol/H ₂ O	580	1.03±0.00 (96.70%)	4.04±0.17 (3.30%)
	590	1.07±0.00 (97.71%)	4.95±0.29 (2.29%)
	600	1.05±0.00 (97.39%)	4.37±0.23 (2.61%)
1 in acetonitrile/H ₂ O	580	0.50±0.00 (87.43%)	3.44±0.03 (12.57%)
	590	0.51±0.00 (90.18%)	3.40±0.03 (9.82%)
	600	0.49±0.00 (90.29%)	3.35±0.04 (9.71%)
1 in tetrahydrofuran/H ₂ O	580	0.81±0.00 (88.62%)	3.15±0.05 (11.38%)
	590	0.82±0.00 (91.76%)	3.25±0.06 (8.24%)
	600	0.83±0.00 (92.69%)	3.56±0.07 (7.31%)
1 -Cu in ethanol/H ₂ O	580	1.06±0.01 (70.42%)	3.54±0.03 (29.58%)
	590	1.10±0.01 (74.80%)	3.69±0.03 (25.20%)
	600	1.08±0.01 (75.58%)	3.58±0.04 (24.42%)

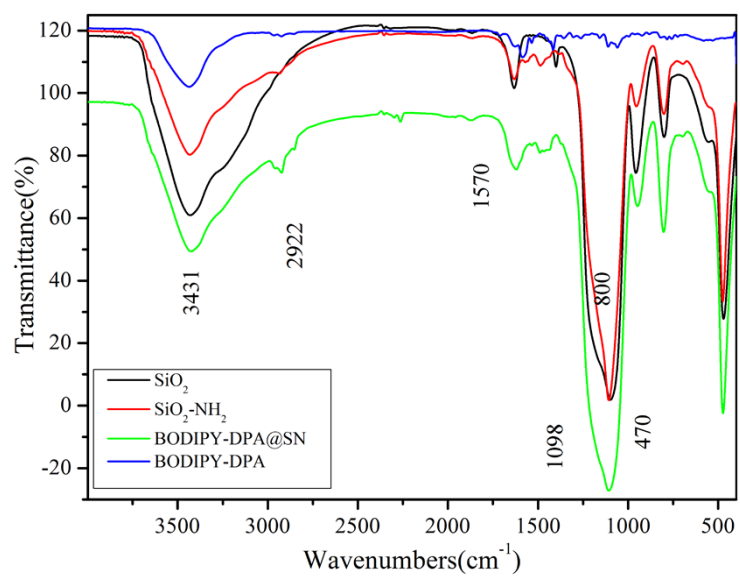


Figure S1 Infrared spectrum of SN, SN-NH₂, BODIPY-DPA and BODIPY-DPA@SN.

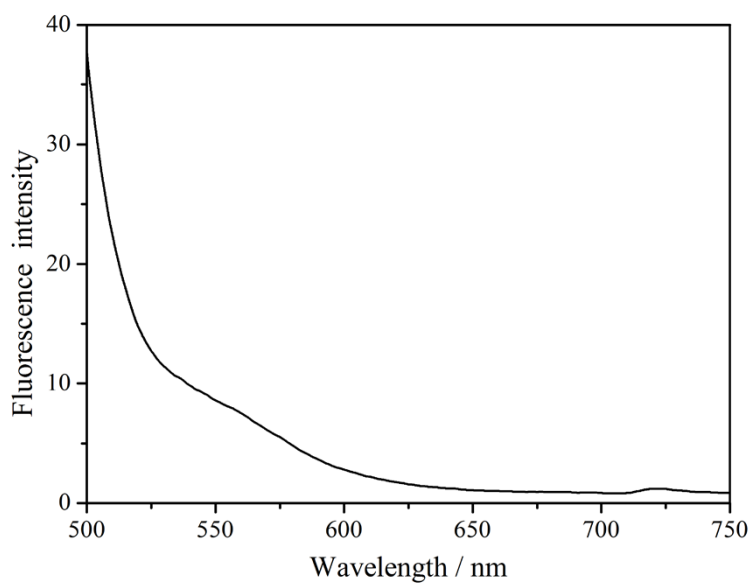


Figure S2 Absorption of silica nanoparticles (SN) in ethanol /water (V/V, 1:1) solvent.

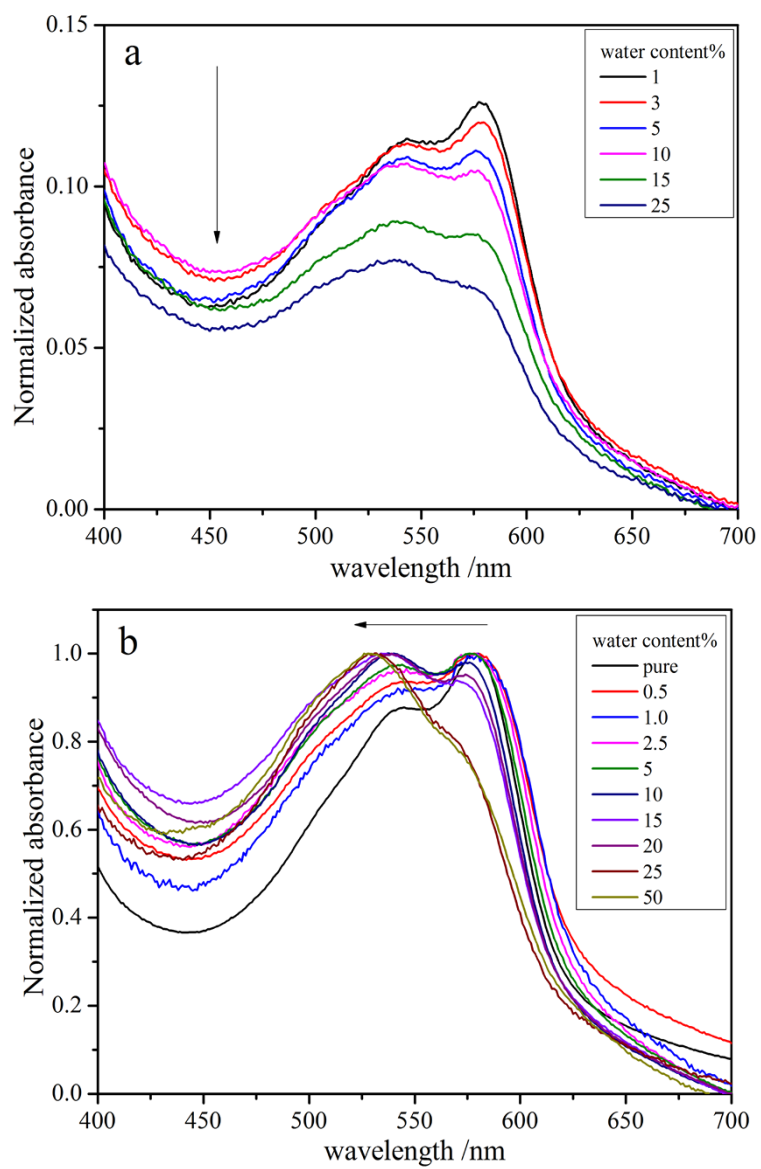


Figure S3 (a) Absorption and (b) normalized absorption spectra of **1** in ethanol solution as a function of water content.

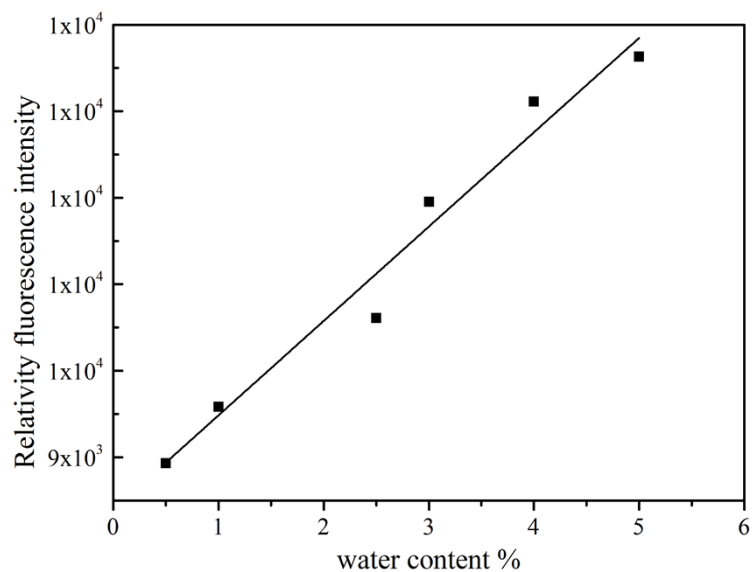


Figure S4 The linear relationship of the fluorescence intensity and the water content within the range 0–5% (v/v) in ethanol solution. The excitation wavelength is 590 nm and the data was obtained from part of the spectra of Fig. 4, $R^2 = 0.96401$.

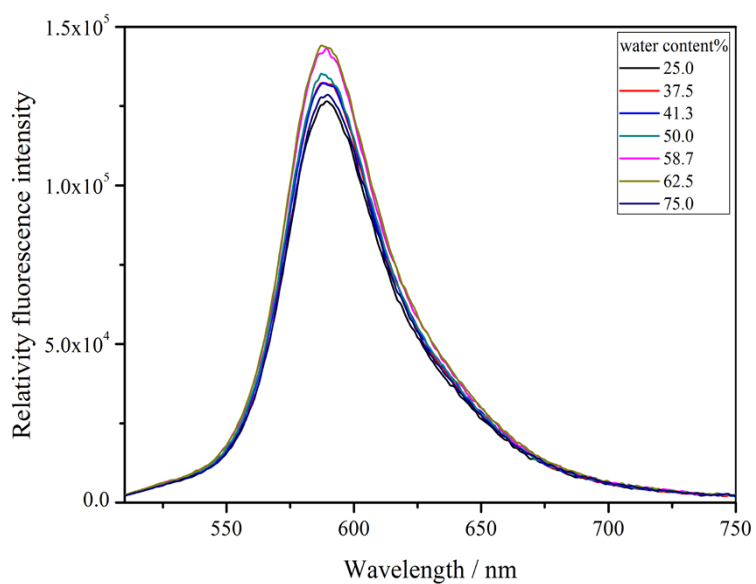


Figure S5 Fluorescence spectra of **1** with different water content (25-75%) in ethanol /water solutions. The excitation wavelength $\lambda_{\text{ex}} = 480$ nm.

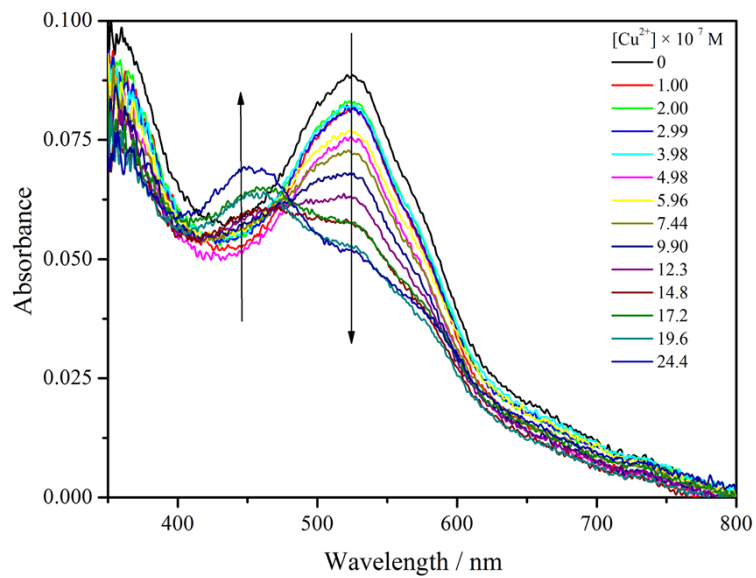


Figure S6 Absorption spectra of **1** (50 mg/L) in ethanol/water (1/1, V/V) solution as a function of $[\text{Cu}^{2+}]$.

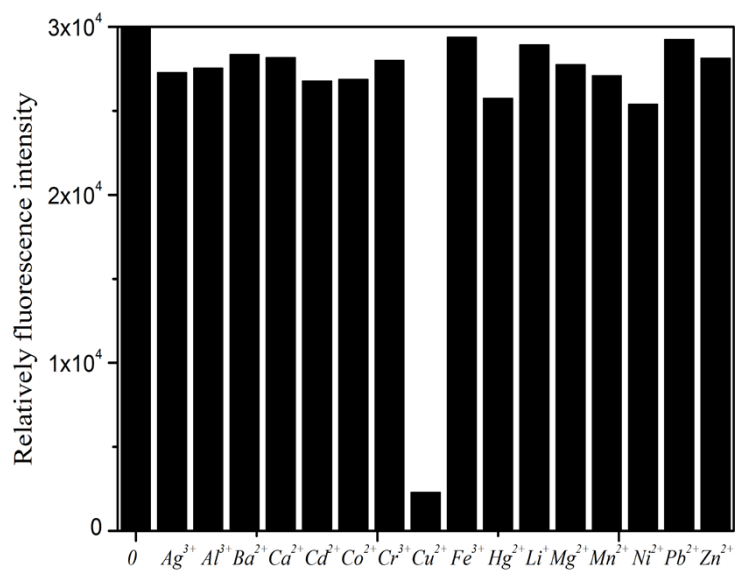


Figure S7 Fluorescence intensity of **1** (50 mg/L) with several metal ions (2 μM) in ethanol/water (1/1, V/V) solution.

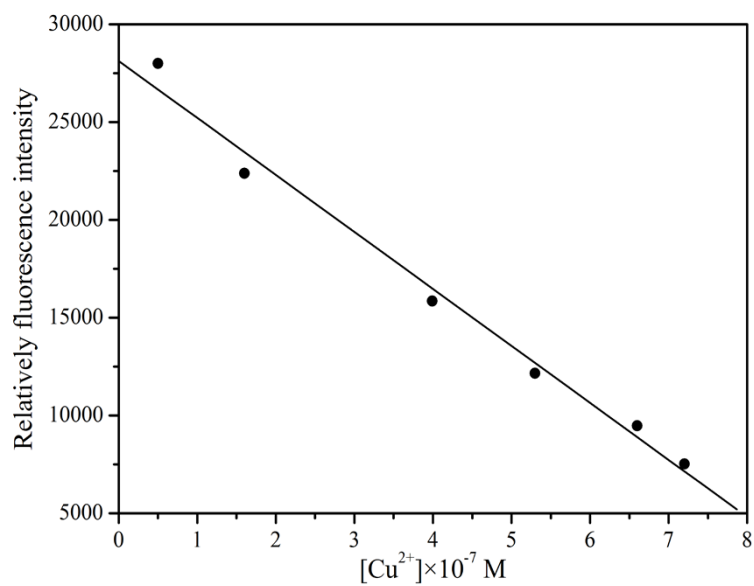


Figure S8 The linear relationship of fluorescence intensity and the concentration of Cu^{2+} (0.05–0.72 μM). In ethanol/water (1/1, V/V) solution, and $\lambda_{\text{ex}} = 590 \text{ nm}$.

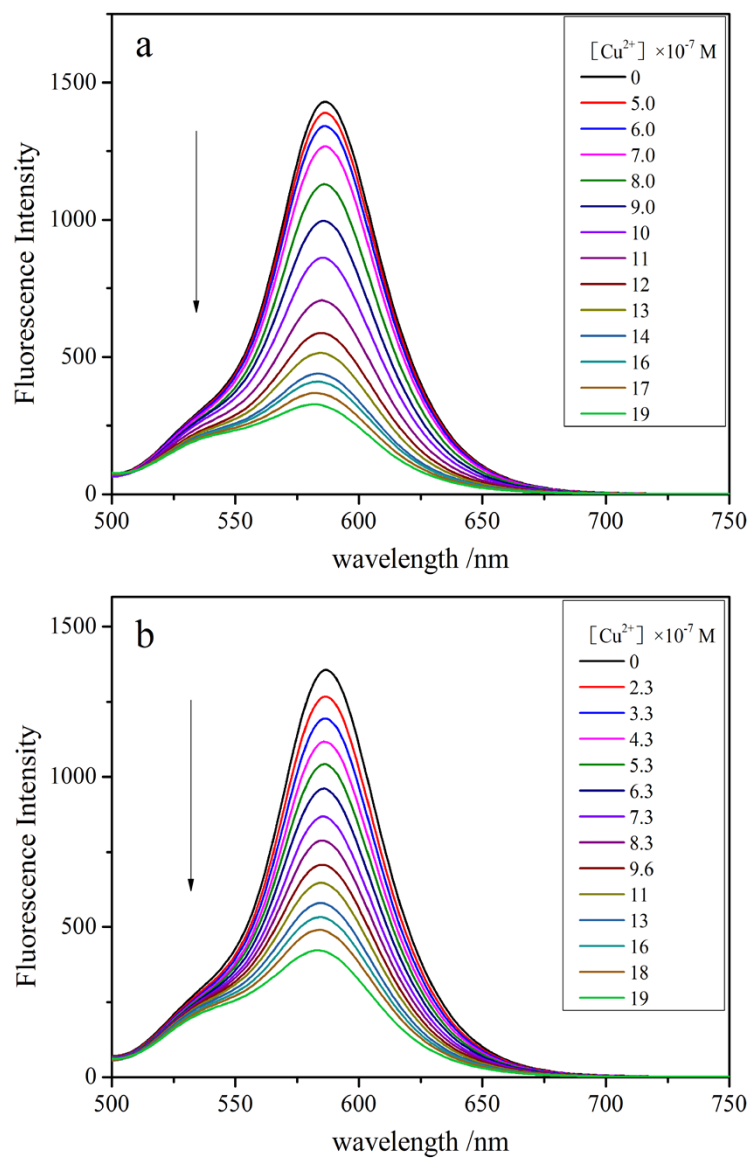


Figure S9 Fluorescence spectra of **1** as a function of (a) CuCl_2 and (b) $\text{Cu}(\text{NO}_3)_2$ concentration in ethanol/water (1/1, V/V) solution.

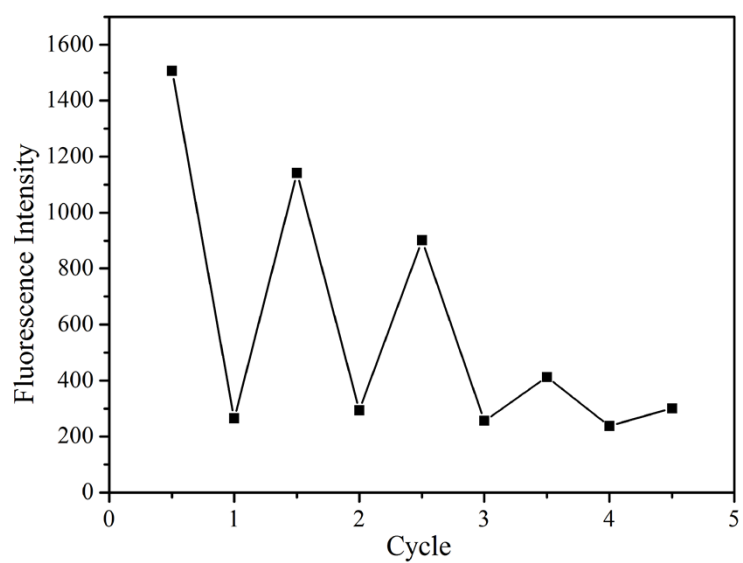


Figure S10 Fluorescence spectra of **1** with the addition of Cu^{2+} and Na_2S in ethanol/water (1/1, V/V) solution.

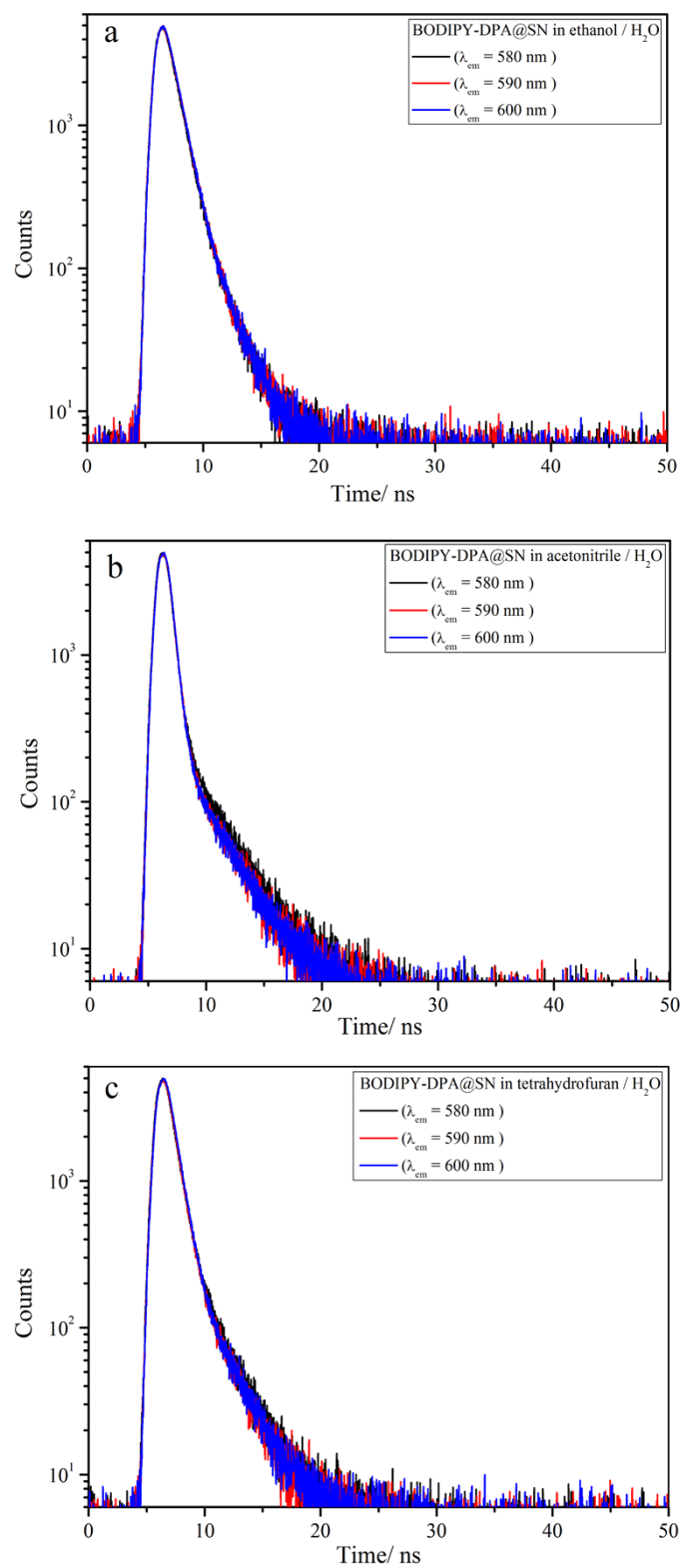
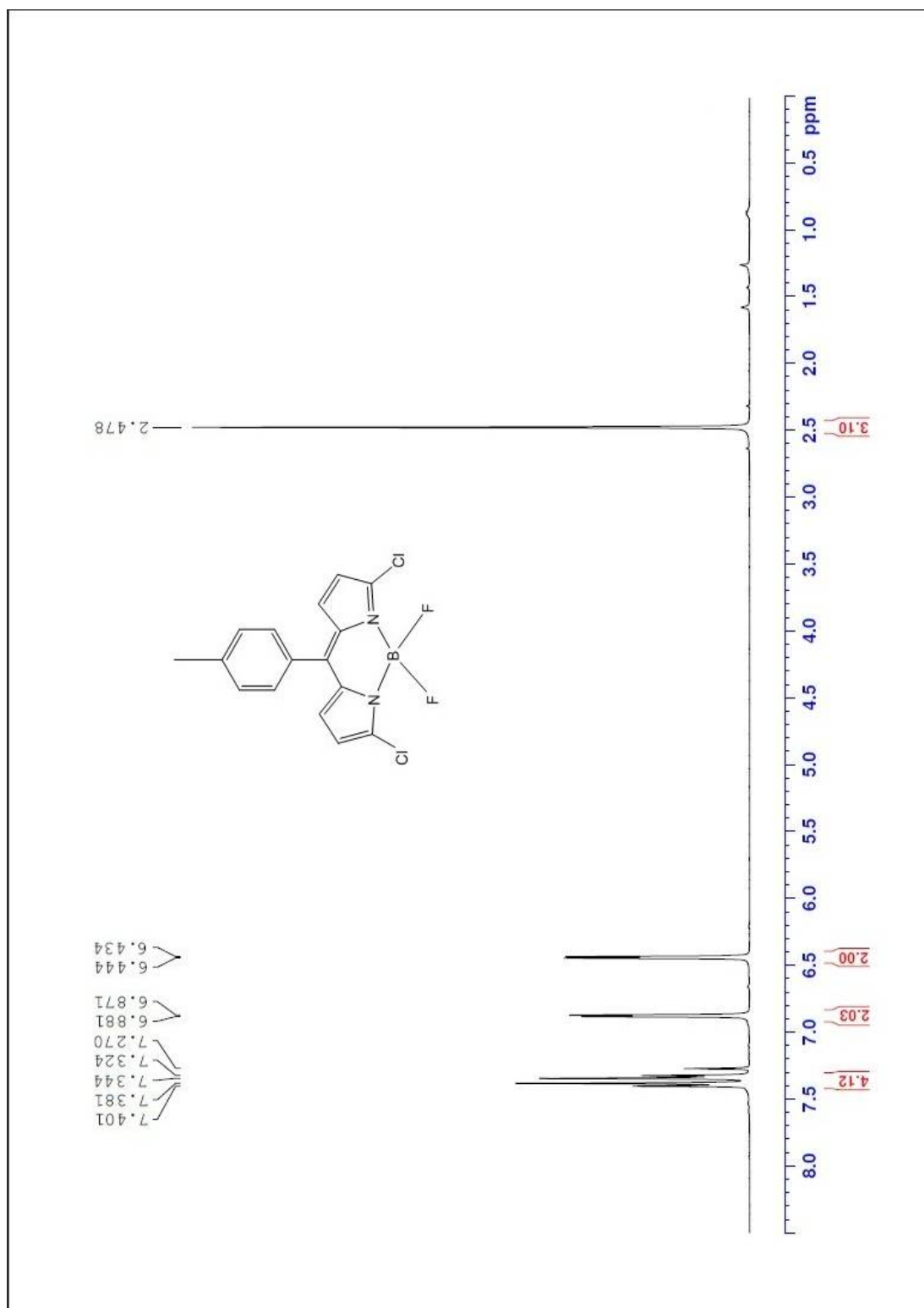
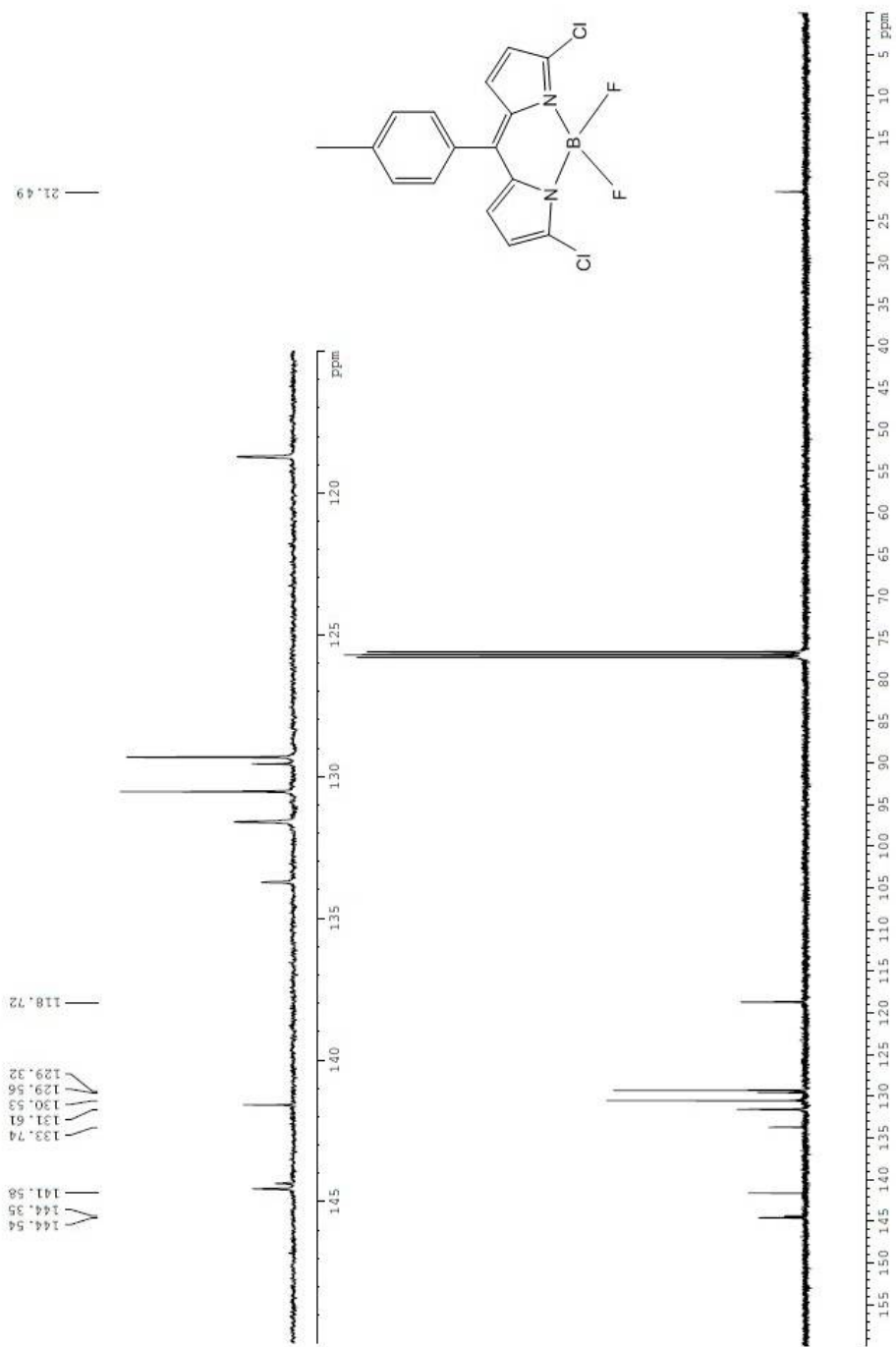


Figure S11 Fluorescence decay curves of **1** in (a) ethanol/water (1/1, V/V), (b) acetonitrile/water (1/1, V/V) and (c) tetrahydrofuran/water (1/1, V/V) (λ_{em} = 580 -600 nm) solutions excited at 480 nm.

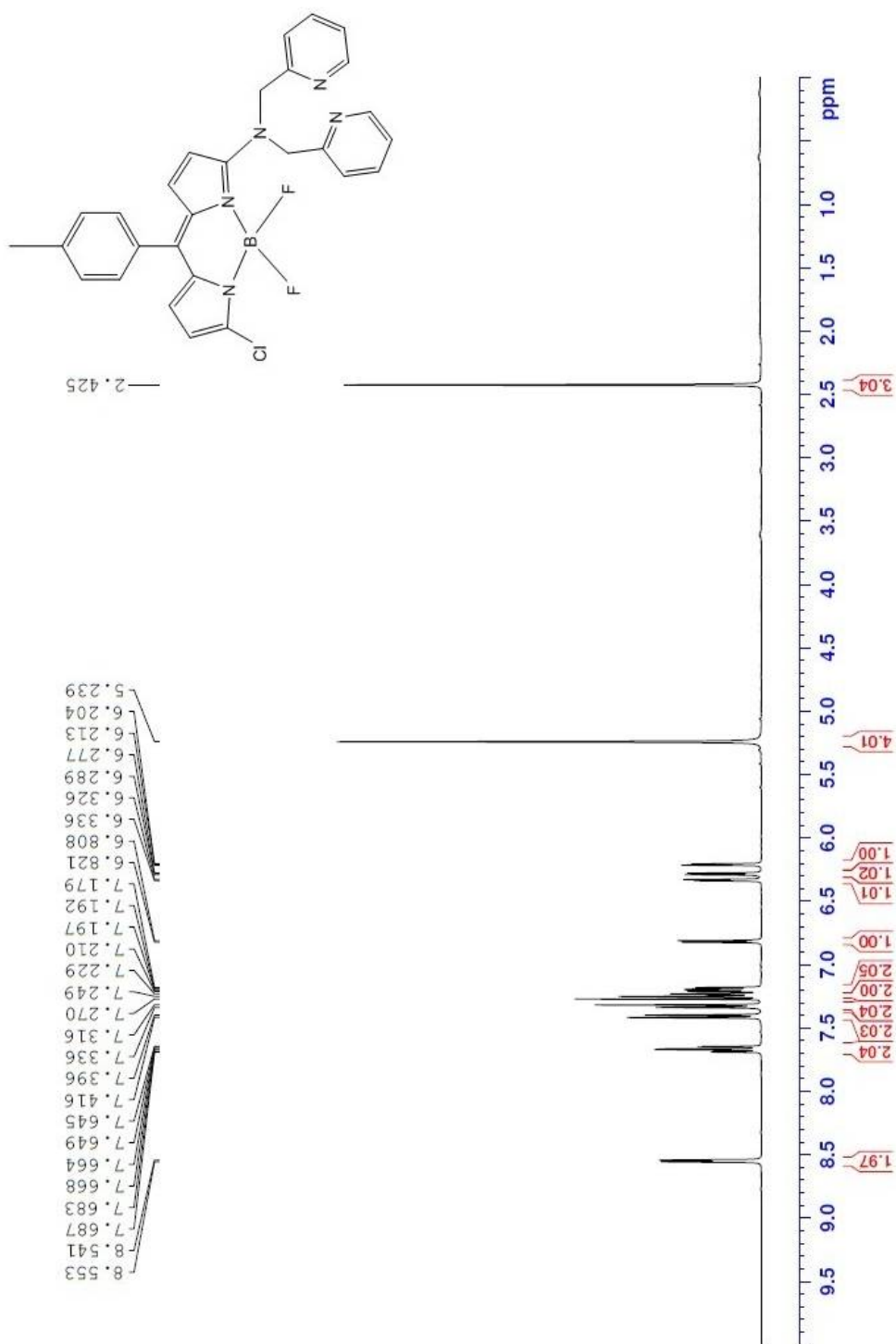
¹H NMR (CDCl₃, 400 MHz) spectrum of 3,5-Dichloro-8-(4-tolyl)-4,4-difluoro-4-bora-3a,4a-diaza-s-indacene



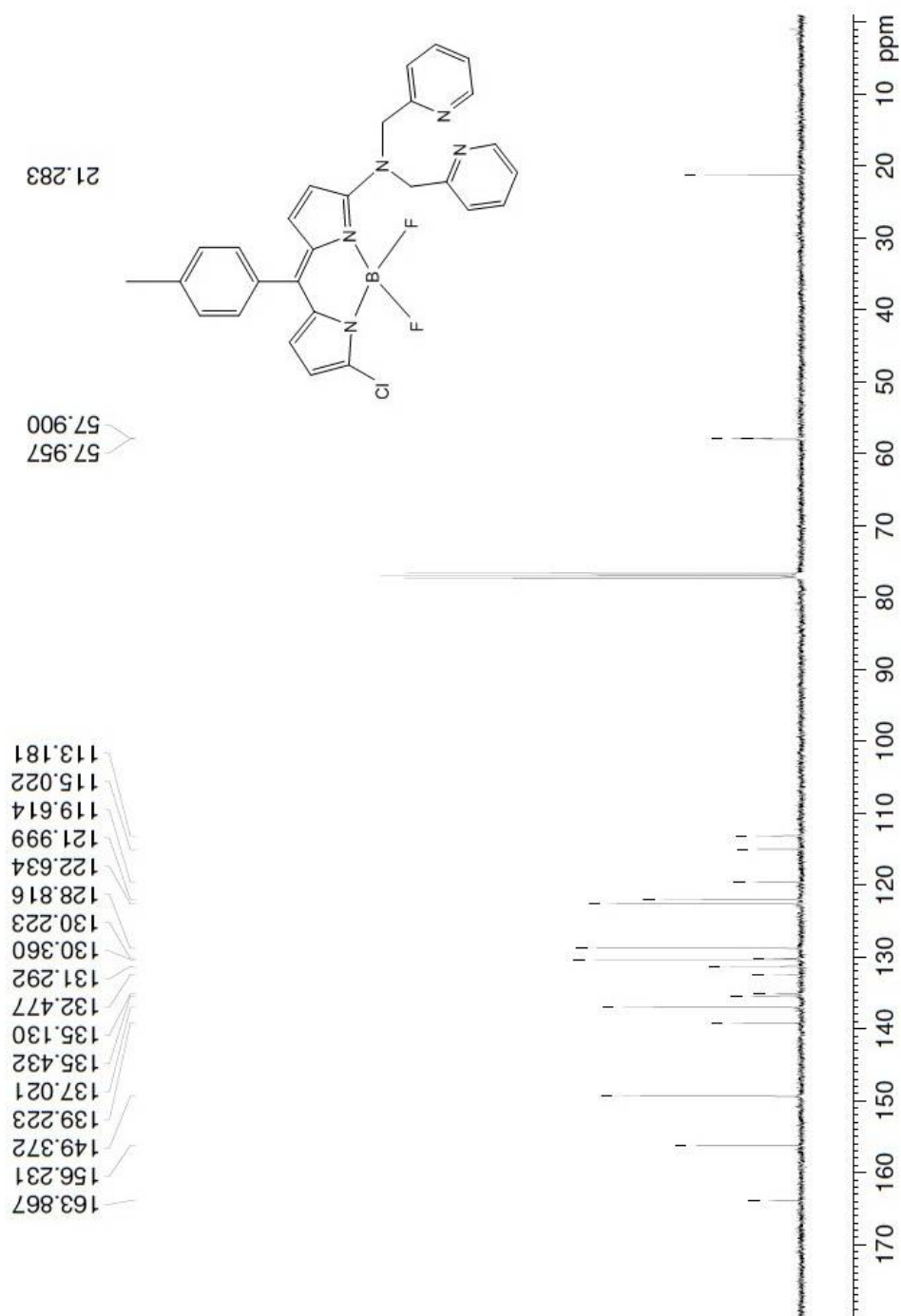
¹³C NMR (CDCl₃, 100 MHz) spectrum of 3,5-Dichloro-8-(4-tolyl)-4,4-difluoro-4-bora-3a,4a-diaza-s-indacene



^1H NMR (CDCl_3 , 400 MHz) spectrum of BODIPY-DPA



¹³C NMR (CDCl₃, 100 MHz) spectrum of BODIPY-DPA



MS Spectrum of BODIPY-DPA (1+ H⁺)

Generic Display Report

Analysis Info

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Method LOWmass.m
Sample Name M=513
Comment

Acquisition Date 3/20/2012 10:26:45

Operator ESQ6K
Instrument esquire6000

