Supporting Information
for

Ion-induced FRET On-Off in fluorescent calix[4]arene

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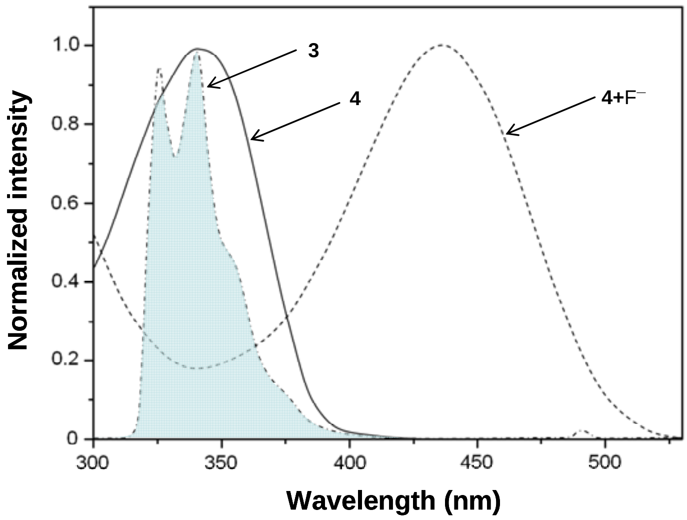

Figure S1. Spectral overlap of **3** (FRET donor) and **4** (FRET acceptor). Grayish band is for the emission of **3** excited at 245 nm (naphthalene). Solid line is for the absorption of **4.** Dotted line is for the absorption of **4**+F^{-} which was treated with 100 eq of $TBA^{+}F^{-}$ in CH_3CN.

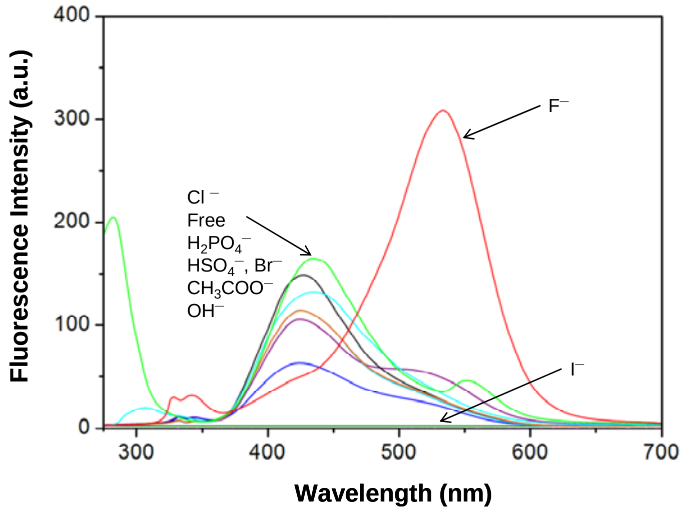

Figure S2. Fluorescence spectra of **1** (6.0 μM) upon addition of TBA^+ salts of OH^-, F^-, Cl^-, Br^-, I^-, CH_3COO^-, HSO_4^-, and $H_2PO_4^-$ (0.6 mM) in CH_3CN with an excitation at 245 nm.

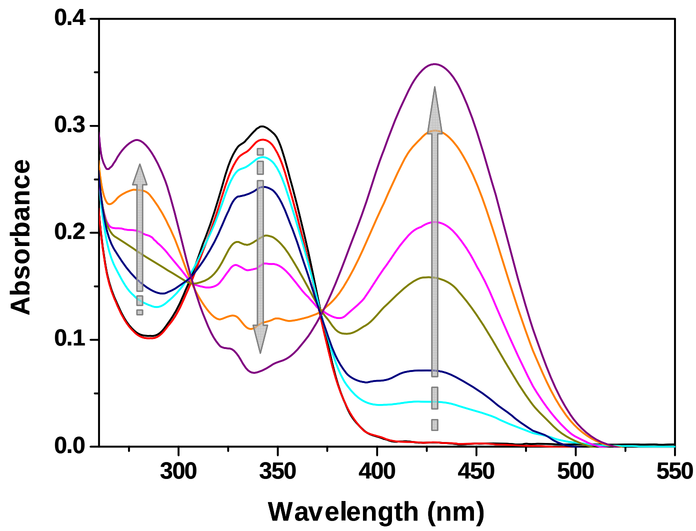

Figure S3. Absorption spectra of **1** (20.0 μM) upon addition of various concentrations (0, 5, 10, 20, 50, 60, 100, 400 eq) of TBA^+ F^- in CH_3CN.

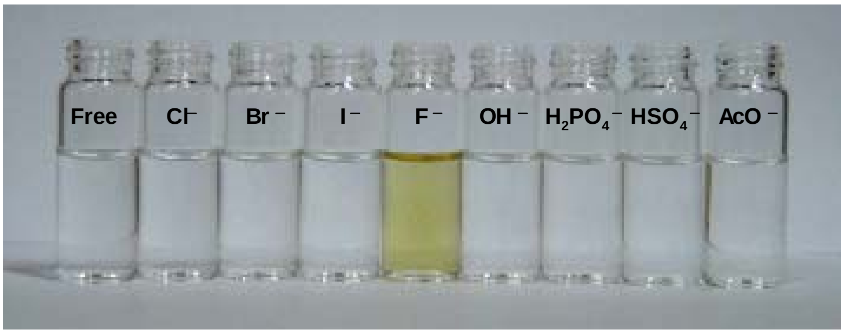

Figure S4. Visual color changes of **1** with 20 eq of F^{-} in CH_3CN.

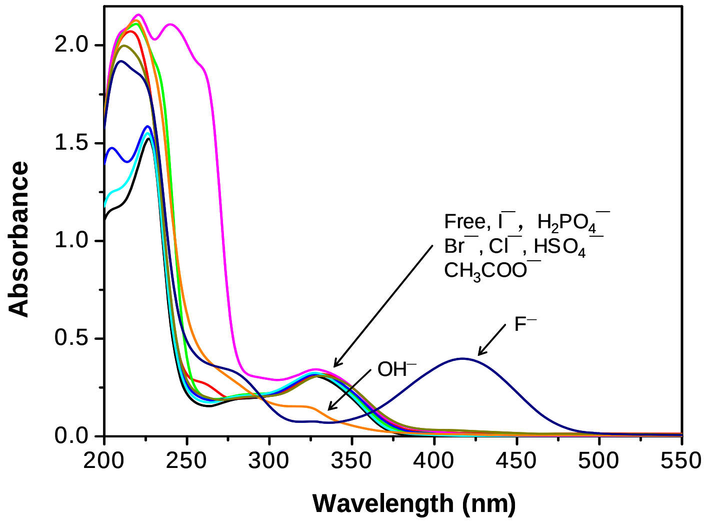

Figure S5. Absorption spectra of **5** (20.0 μM) upon addition of TBA^{+} salts of F^{-}, Cl^{-}, Br^{-}, I^{-}, CH_3COO^{-}, OH^{-}, HSO_4^{-}, and $H_2PO_4^{-}$ (10.0 mM) in CH_3CN.

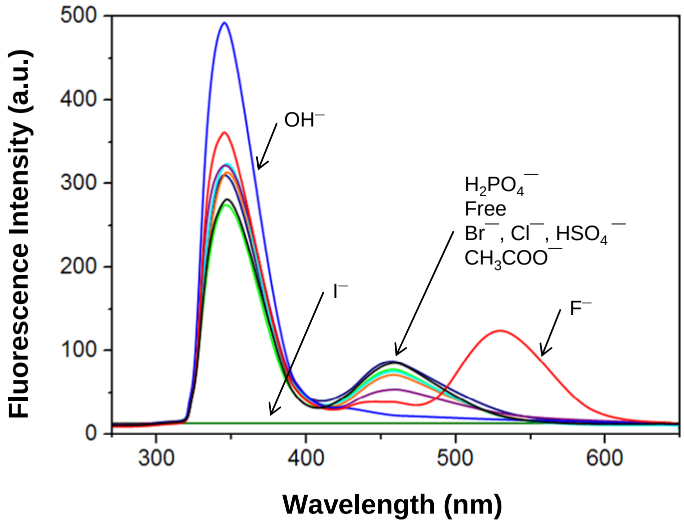

Figure S6. Fluorescence spectra of **5** (6.0 μM) upon addition of TBA^+ salts of OH^-, F^-, Cl^-, Br^-, I^-, CH_3COO^-, HSO_4^-, and $H_2PO_4^-$ (0.6 mM) in CH_3CN with an excitation at 245 nm.

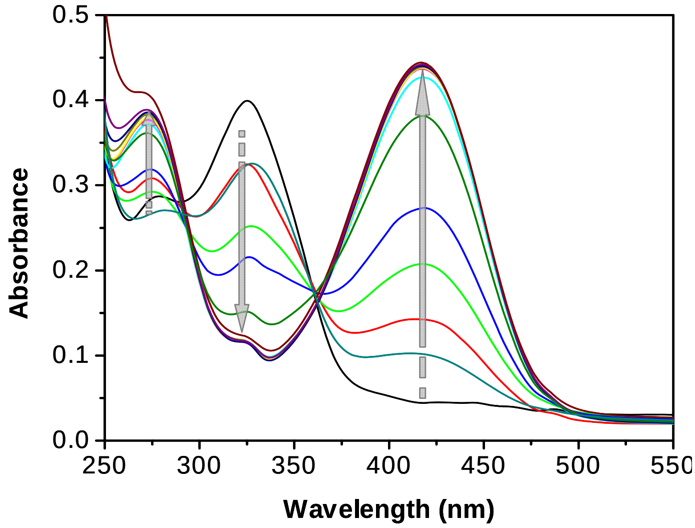

Figure S7. Absorption spectra of **5** (20.0 μM) upon addition of various concentrations (0, 5, 10, 20, 30, 60, 80, 90, 100, 150, 200, 400 eq) of TBA^+ F^- in CH_3CN.

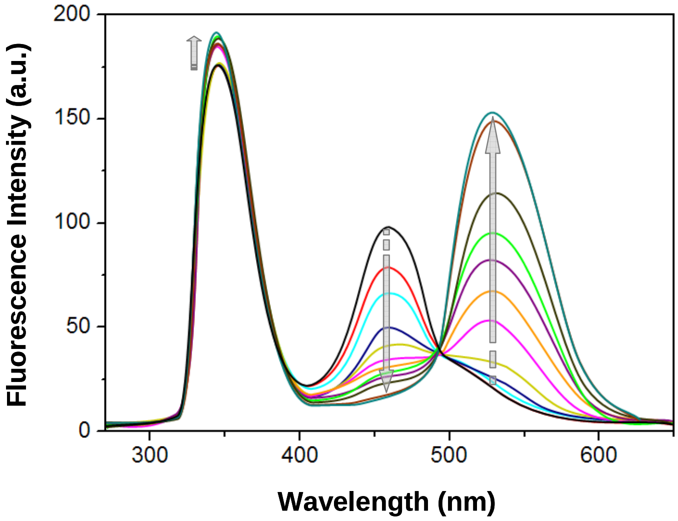

Figure S8. Fluorescence spectra of **5** (6.0 μM) upon addition of various concentrations (0, 5, 6, 7, 10, 20, 30, 60, 80, 100, 200, 400 eq) of TBA^+ $F^−$ in CH_3CN with an excitation at 245 nm.

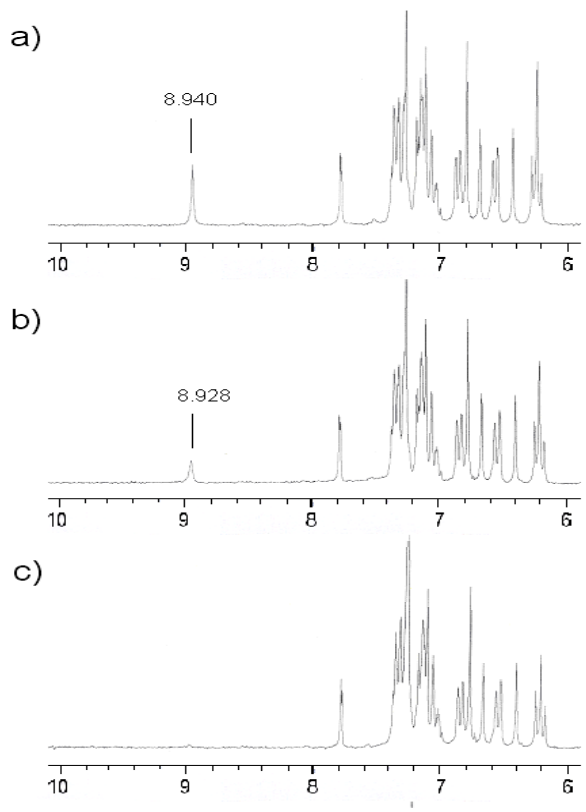

Figure S9. Partial ^1H NMR spectra of the ligand **1** (8.0 mM) in the absence and presence of fluoride ion in $CDCl_3$. a) 0 eq b) 0.1 eq and c) 0.58 eq.

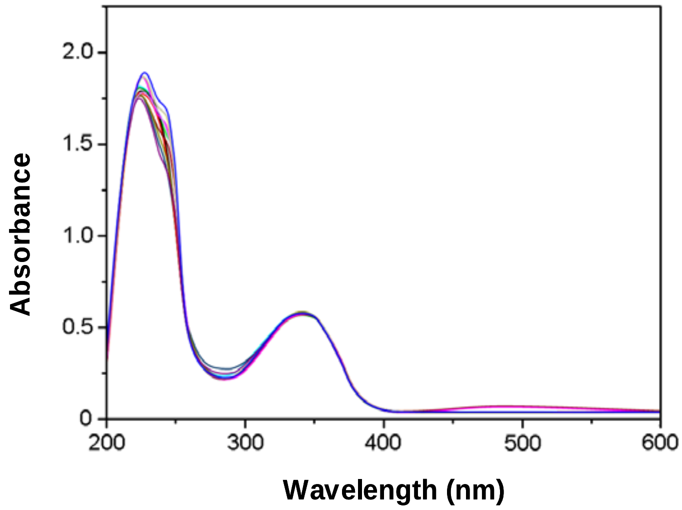

Figure S10. Absorption spectra of **1** (20.0 μM) upon addition of ClO_4^- salts of Li^+, Na^+, K^+, Cs^+, Zn^{2+}, Ag^+, Ba^{2+}, Ca^{2+}, Cd^{2+}, Co^{2+}, Mg^{2+}, Pb^{2+}, Sr^{2+}, Al^{3+} (10.0 mM) in CH_3CN.

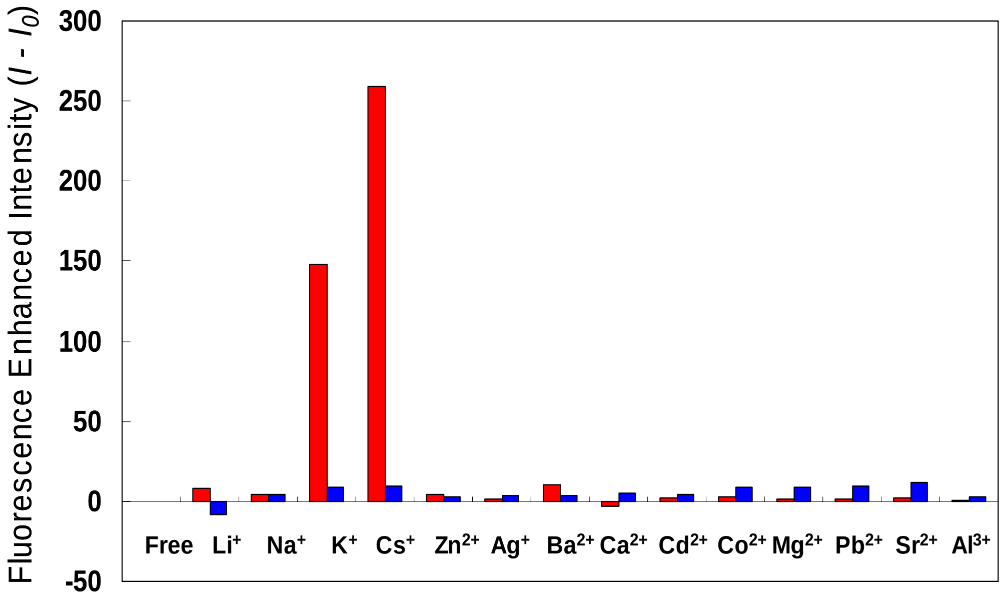

Figure S11. Fluorescence enhanced intensity of **1** (6.0 μM, red) and **5** (6.0 μM, blue) upon addition of various metal ions (3.0 mM) in CH_3CN with an excitation at 245 nm.

NMR of 1.

^{1}H NMR ($CDCl_3$, 400 MHz): δ 8.95 (s, 1 H), 7.77 (s, 1 H), 7.35 (m, 4 H), 7.17 (m, 3 H), 7.11 (m, 2 H), 6.84 (m, 2 H), 6.78 (s, 2 H), 6.56 (d, 1 H, *J* = 7.52 Hz), 4.93 (s, 2 H), 4.48 (d, 2 H, *J* = 12.88 Hz), 4.43 (m, 2 H), 4.26~4.12 (m, 8 H), 3.99~3.93 (m, 8 H), 3.75 (m, 4 H), 3.22 (d, 2 H, *J* = 12.92 Hz). ^{13}C NMR ($CDCl_3$, 125 MHz): 168, 166, 159, 156, 155, 153, 148, 142, 141, 136, 133, 129, 123, 117, 115, 114, 107, 73, 71, 70, 68, 67, 38, 31, 30 ppm.

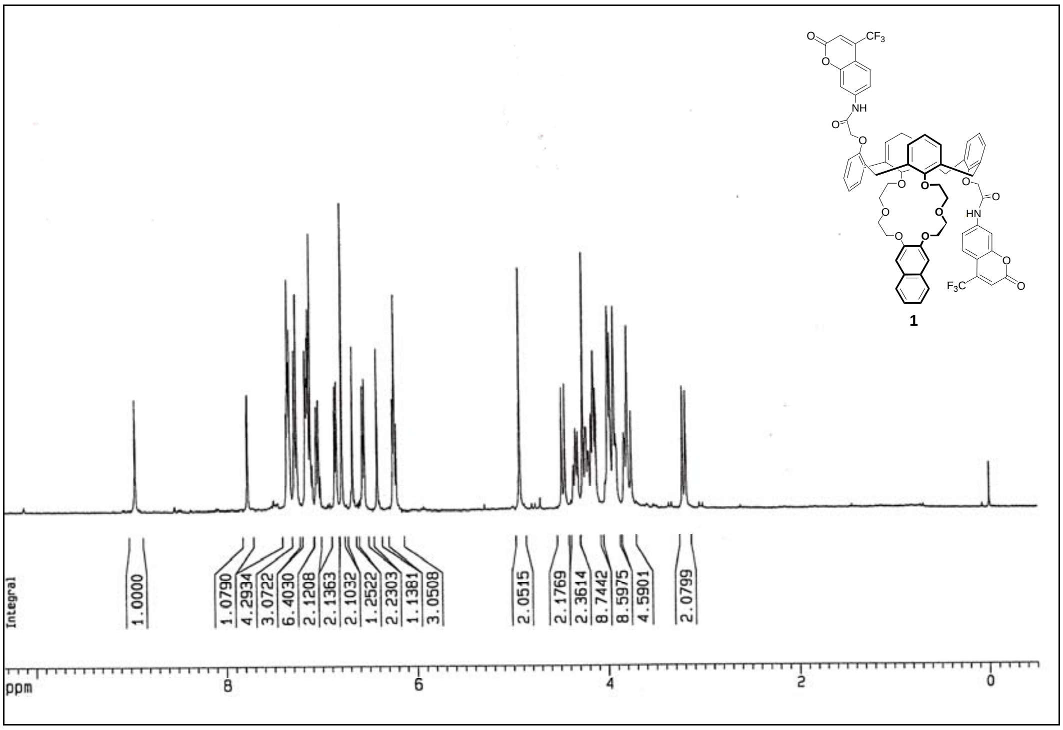

Figure S12. ^{1}H NMR ($CDCl_3$, 400 MHz) spectrum of compound **1**.

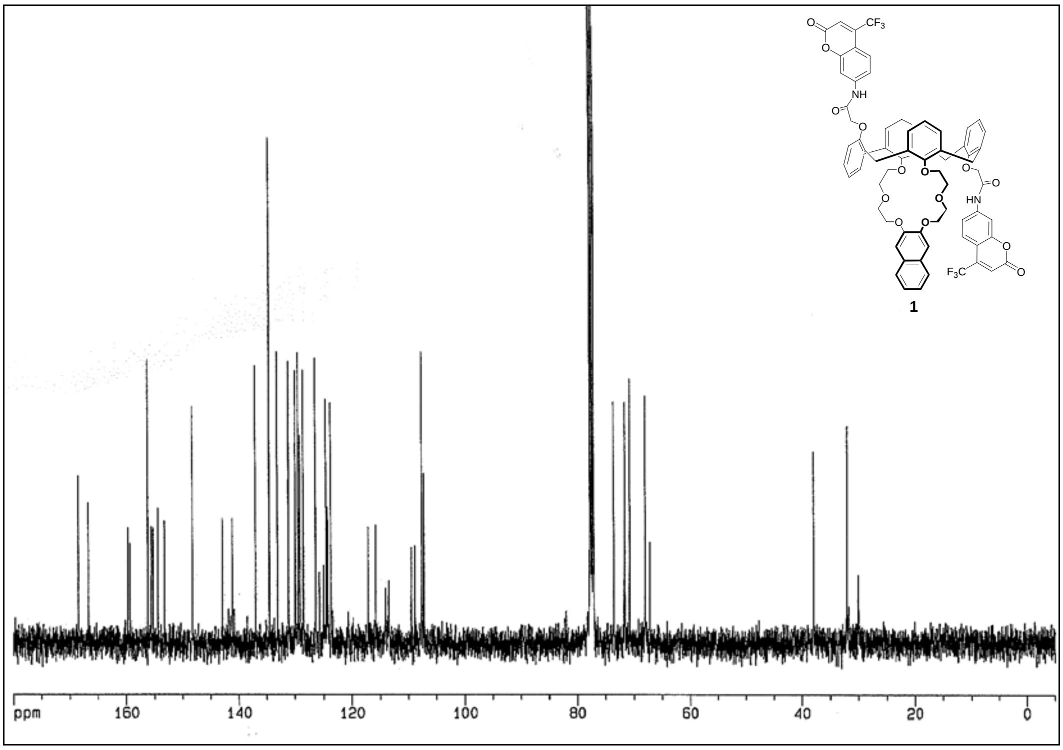

Figure S13. ^{13}C NMR ($CDCl_3$, 125 MHz) spectrum of compound **1**.

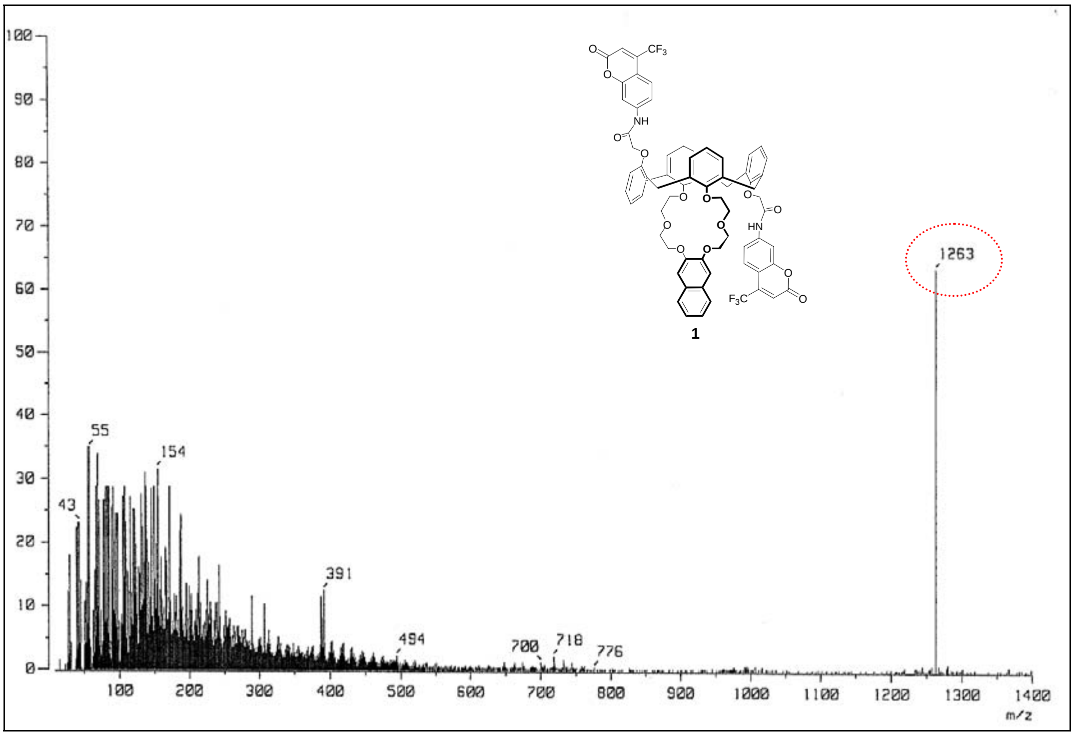

Figure S14. Mass spectrum of compound **1**.

NMR of 5.

[1]H NMR ($CDCl_3$, 200 MHz): δ 8.59 (s, 1 H), 7.95 (s, 1 H), 7.85~7.62 (m, 4 H), 7.60~7.27(m, 3 H), 7.15 (m, 2 H), 6.91 (m, 4 H), 6.78 (s, 1 H), 4.58 (s, 2 H), 4.75(t, 2 H), 4.19 (t, 2 H), 4.00~3.98 (m, 4 H). [13]C NMR ($CDCl_3$, 50 MHz): 166, 158, 156, 155, 154, 150, 141.1, 141.0, 134, 129, 127, 123, 118, 116, 115, 109, 107, 106, 69, 68, 67, 67 ppm.

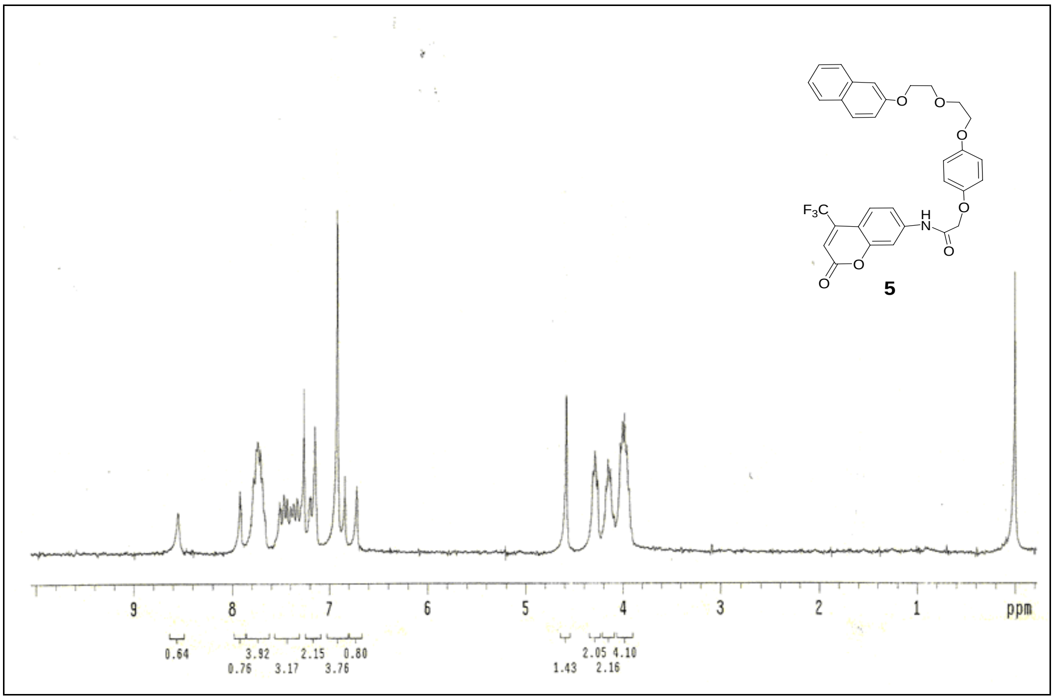

Figure S15. [1]H NMR ($CDCl_3$, 200 MHz) spectrum of compound **5**.

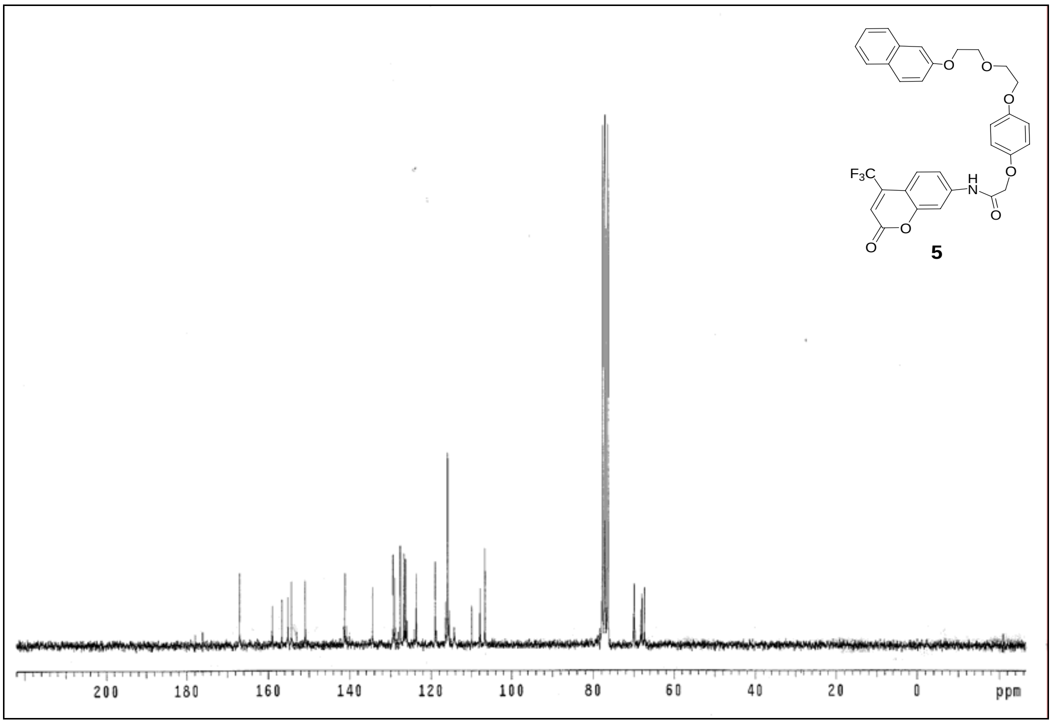

Figure S16. ^{13}C NMR ($CDCl_3$, 50 MHz) spectrum of compound **5**.

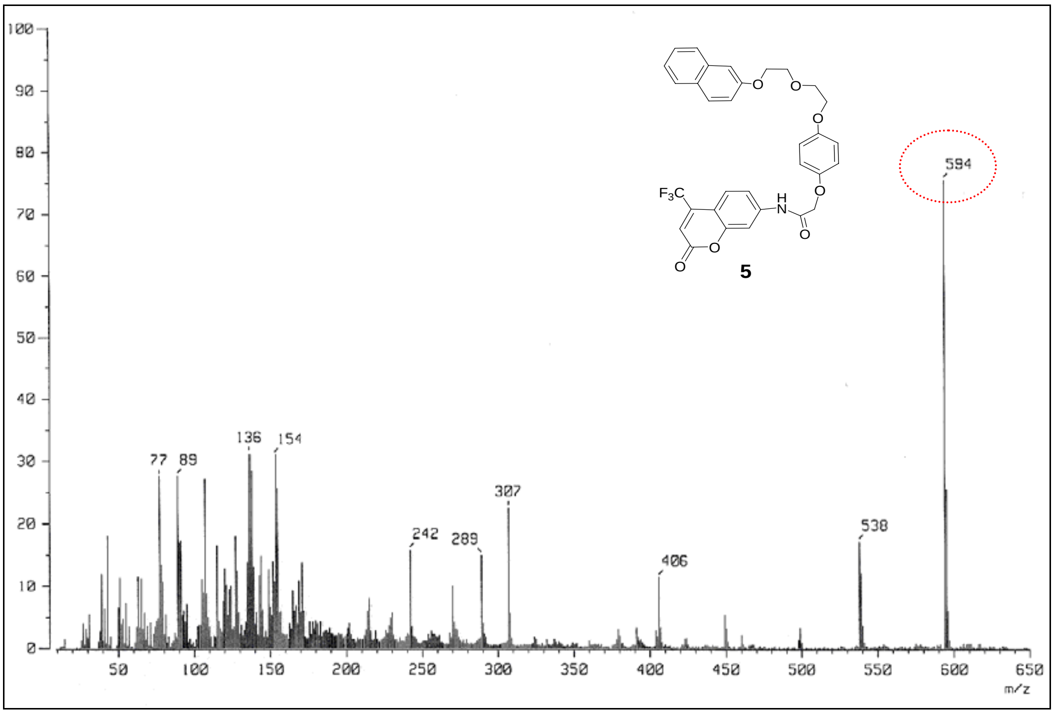

Figure S17. Mass spectrum of compound **5**.

NMR of 7.

^{1}H NMR ($CDCl_3$, 200 MHz): δ 7.82~7.69 (m, 3 H), 7.56~7.25 (m, 2 H), 7.143 (m, 2 H), 6.84~6.75 (m, 4 H), 4.62 (s, 1 H), 4.72 (t, 2 H), 4.11 (t, 2 H), 4.02~3.91 (m, 4 H). ^{13}C NMR ($CDCl_3$, 50 MHz): 157, 150, 134, 129, 127, 124, 118, 117, 105, 69 ppm.

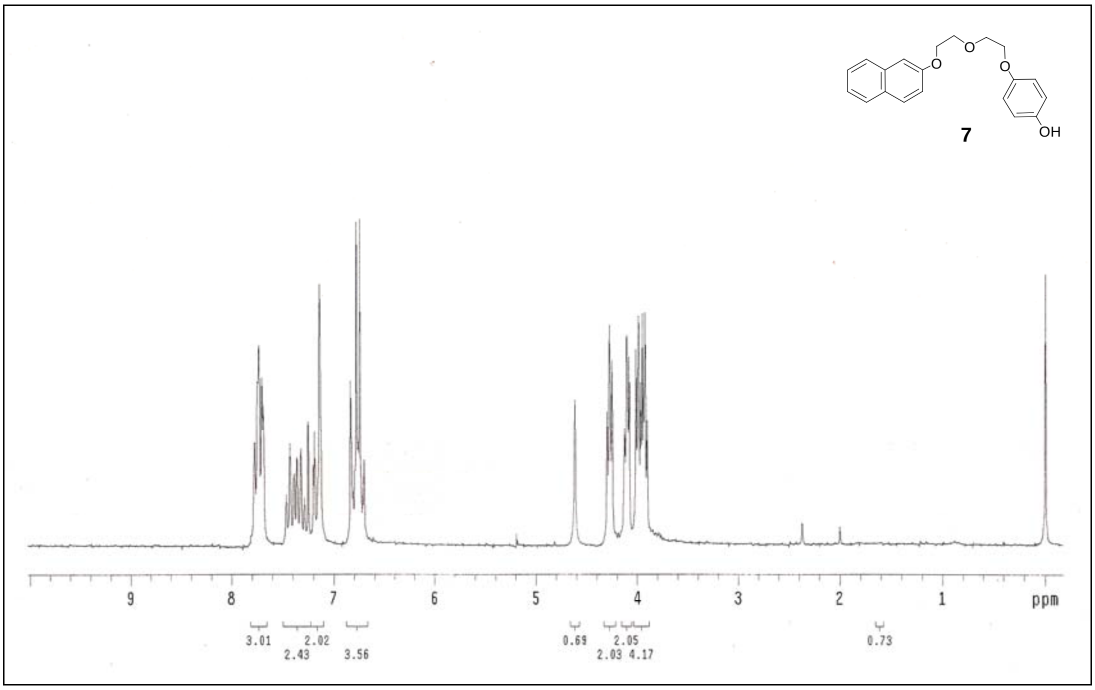

Figure S18. ^{1}H NMR ($CDCl_3$, 200 MHz) spectrum of compound **7**.

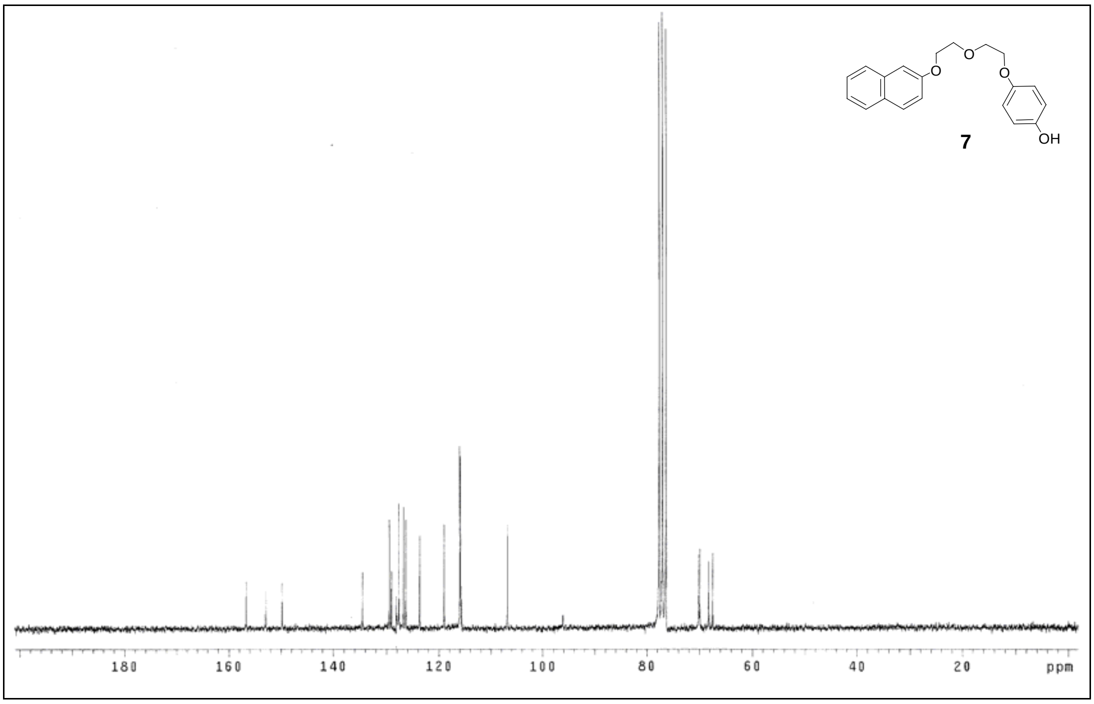

Figure S19. ^{13}C NMR ($CDCl_3$, 50 MHz) spectrum of compound **7**.