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Supporting Information of

Amphiphilic triphenylamine-benzothiadiazole dyes: preparation, fluorescence and aggregate behavior, and enzyme fluorescence detection

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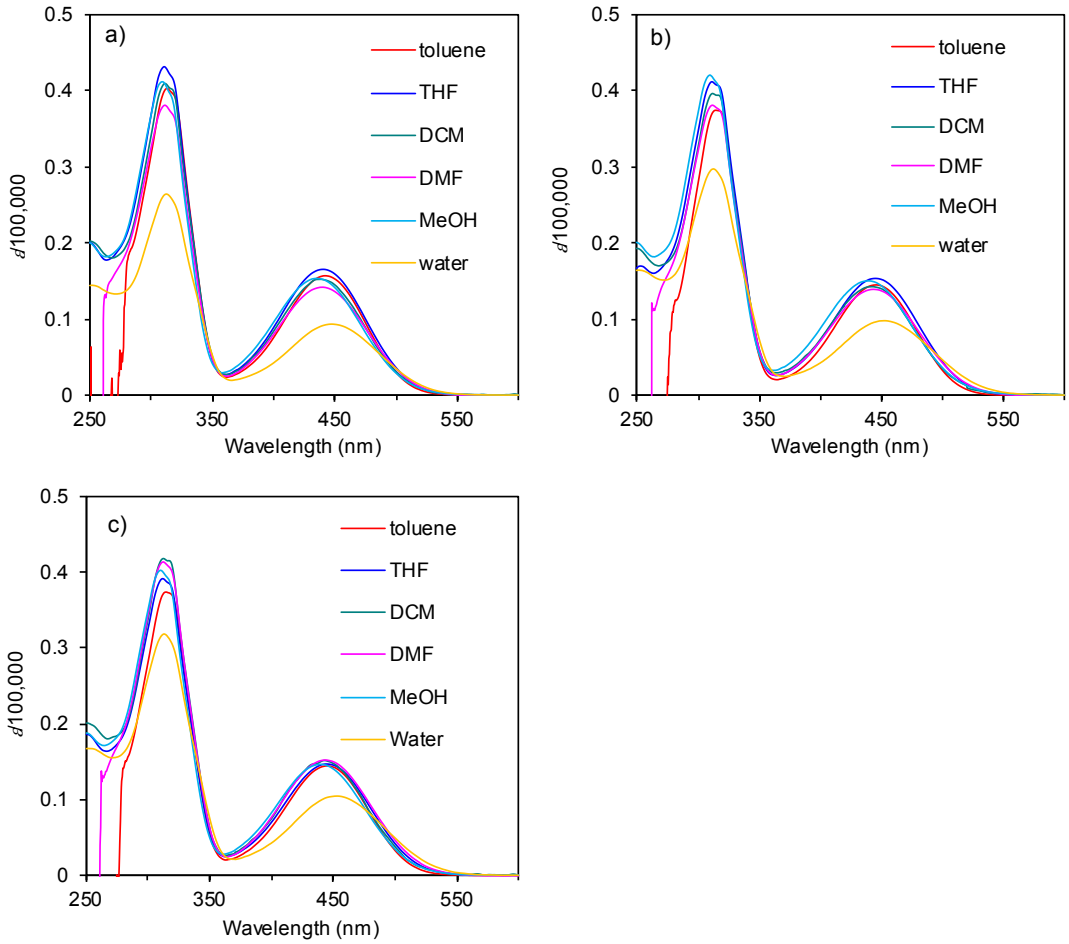


Fig. S1 UV/Vis absorption spectra of (a) **6**, (b) **11**, and (c) **13** in toluene, THF, DCM, DMF, methanol, and water at 1.0×10^{-5} M.

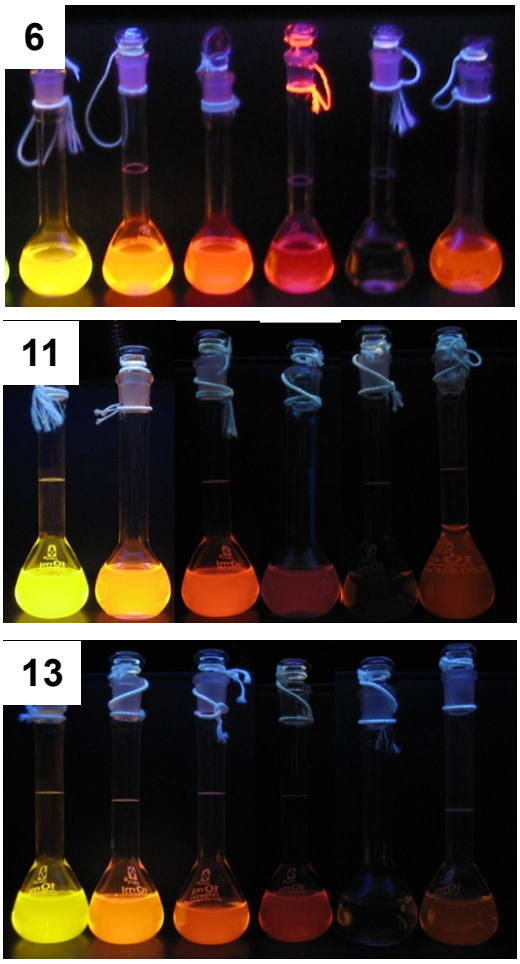


Fig. S2 Fluorescence images of **6**, **11**, and **13** in toluene, THF, DCM, DMF, methanol, and water (from left to right) (1.0×10^{-5} M) under UV light irradiation.

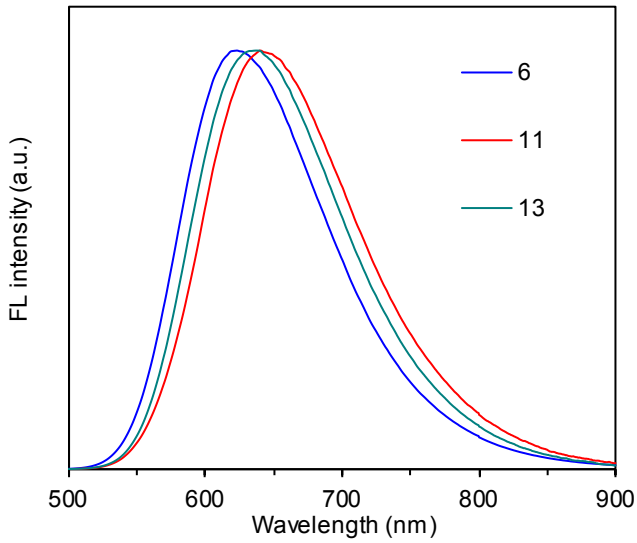


Fig. S3 Fluorescence spectra of **6**, **11**, and **13** in the bulk state excited at 440 nm.

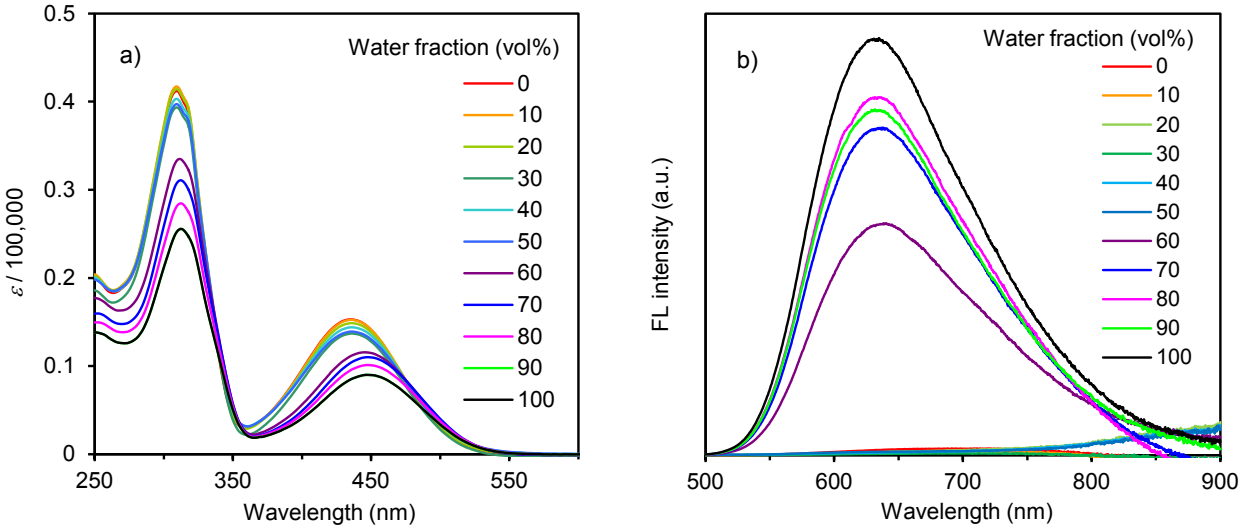


Fig. S4 (a) UV/Vis absorption and (b) fluorescence spectra (ex. 440 nm) of **6** in methanol/water (0-100% water fraction (vol%)) at 1.0×10^{-5} M.

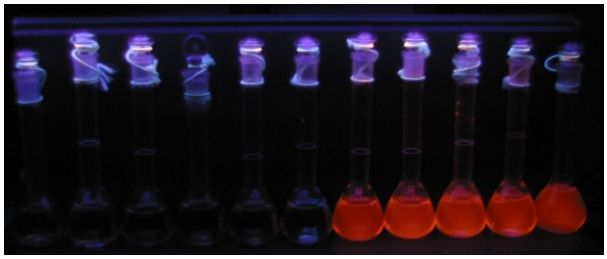


Fig. S5 Fluorescence images of **6** in methanol/water (0, 10, 20, 30, 40, 50, 60, 70, 80, 90, and 100 water fraction (vol%), from left to right) at 1.0×10^{-5} M under UV light irradiation.

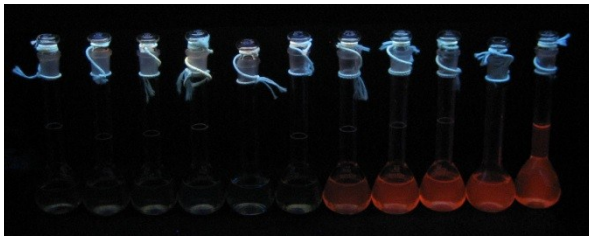


Fig. S6 Fluorescence images of **11** in methanol/water (0, 10, 20, 30, 40, 50, 60, 70, 80, 90, and 100 water fraction (vol%), from left to right) at 1.0×10^{-5} M under UV light irradiation.

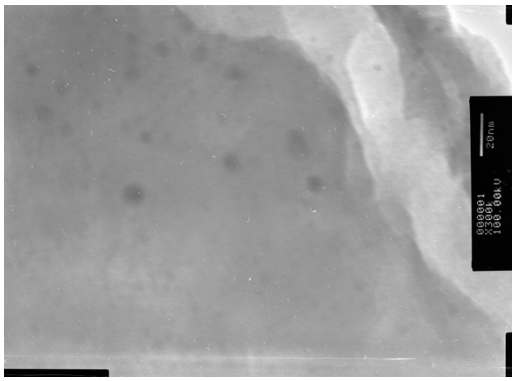


Fig. S7 TEM image of **6**. The sample was prepared by drop casting from the 1.0×10^{-5} M water solutions on carbon-coated copper grid.

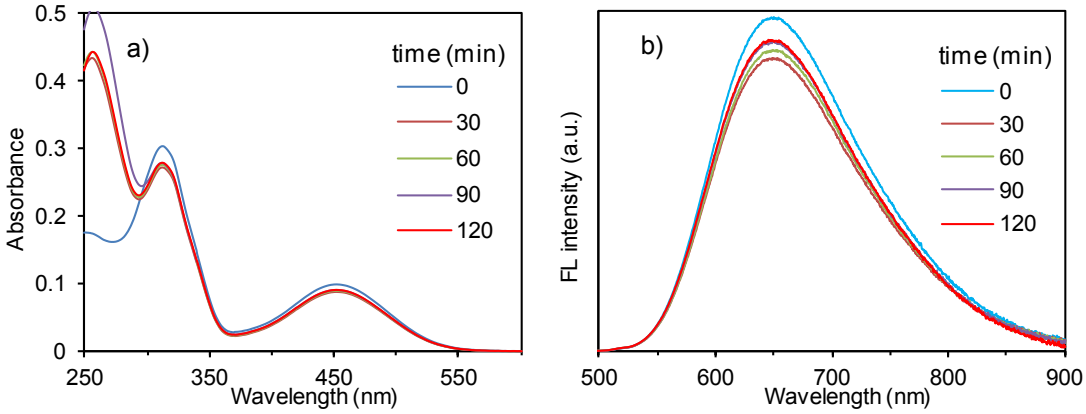


Fig. S8 (a) UV/Vis absorption (1 cm width cell) and (b) fluorescence spectra (ex. 440 nm) of **11** (1.0×10^{-5} M) in 0.04 M sodium phosphate buffer solution (pH 7.4, 37 °C) at 0, 30, 60, 90, and 120 min, after addition of *β*-galactosidase (50 U).

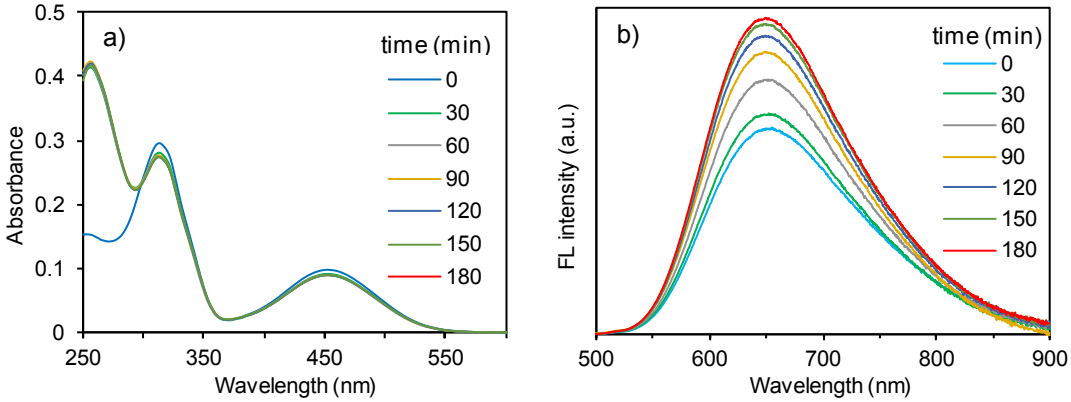


Fig. S9 (a) UV/Vis absorption (1 cm width cell) and (b) fluorescence spectra (ex. 440 nm) of **13** (1.0×10^{-5}

M) in 0.04 M sodium phosphate buffer solution (pH 7.4, 37 °C) at 0, 30, 60, 90, 120, 150, and 180 min, after addition of β-galactosidase (50 U).

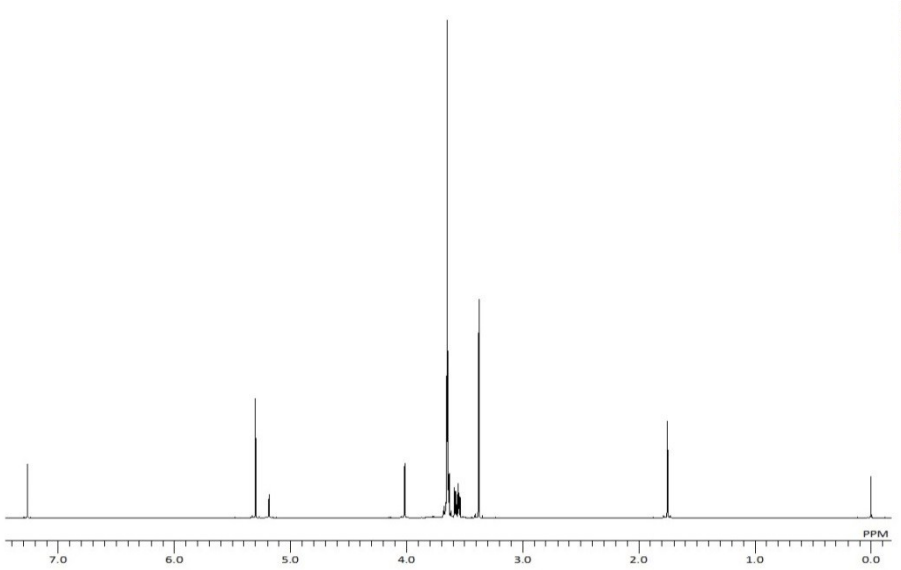
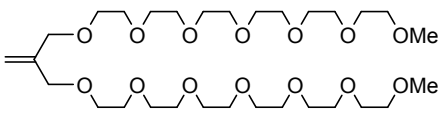


Fig. S10 ^{1}H NMR spectrum of **2** in $CDCl_3$.



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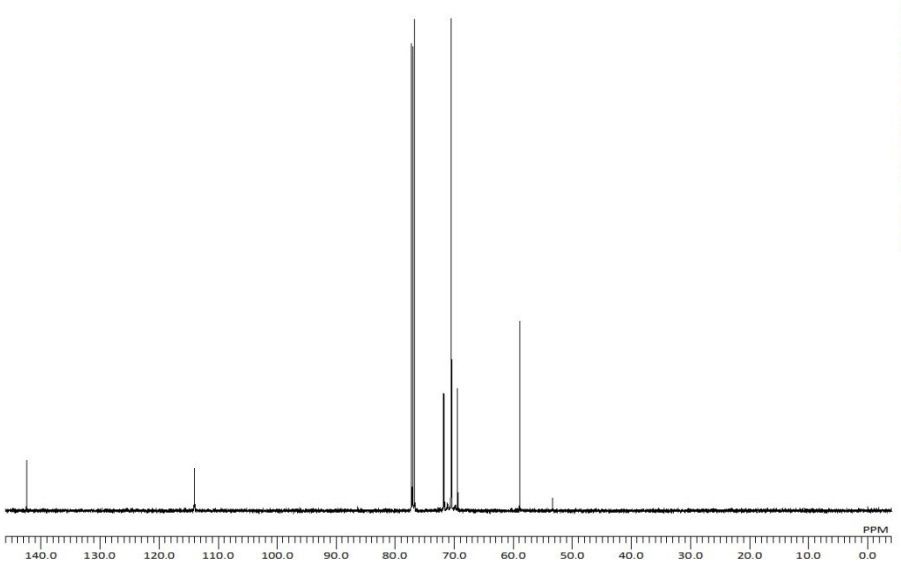


Fig. S11 ^{13}C NMR spectrum of **2** in $CDCl_3$.

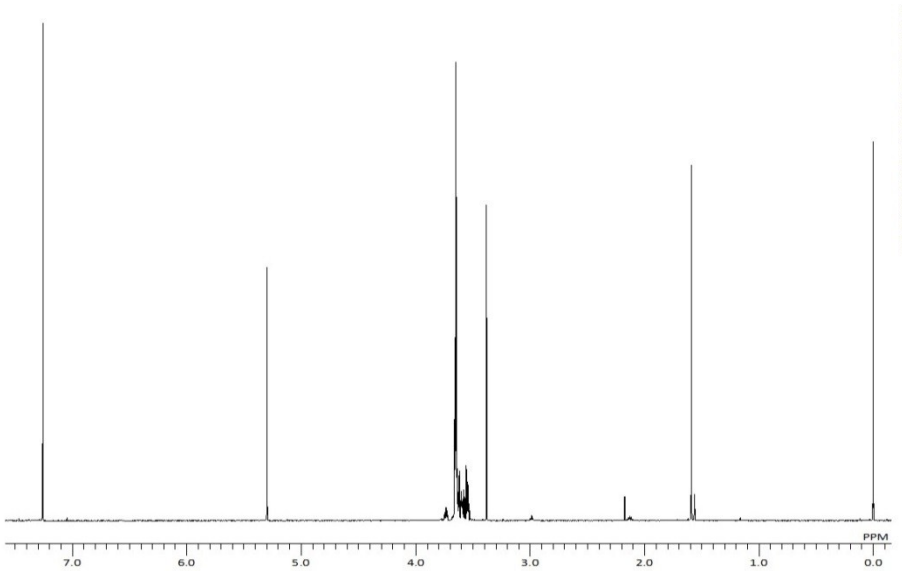
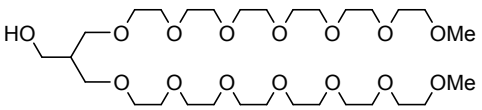


Fig. S12 ^{1}H NMR spectrum of **3** in $CDCl_3$.



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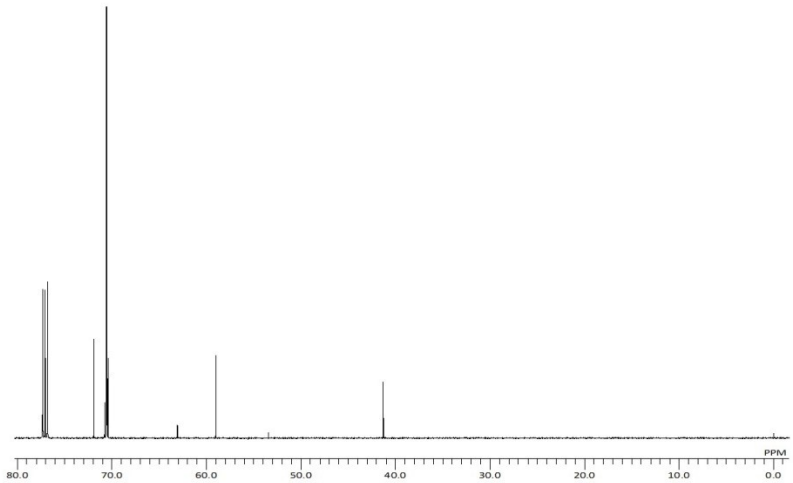


Fig. S13 ^{13}C NMR spectrum of **3** in $CDCl_3$.

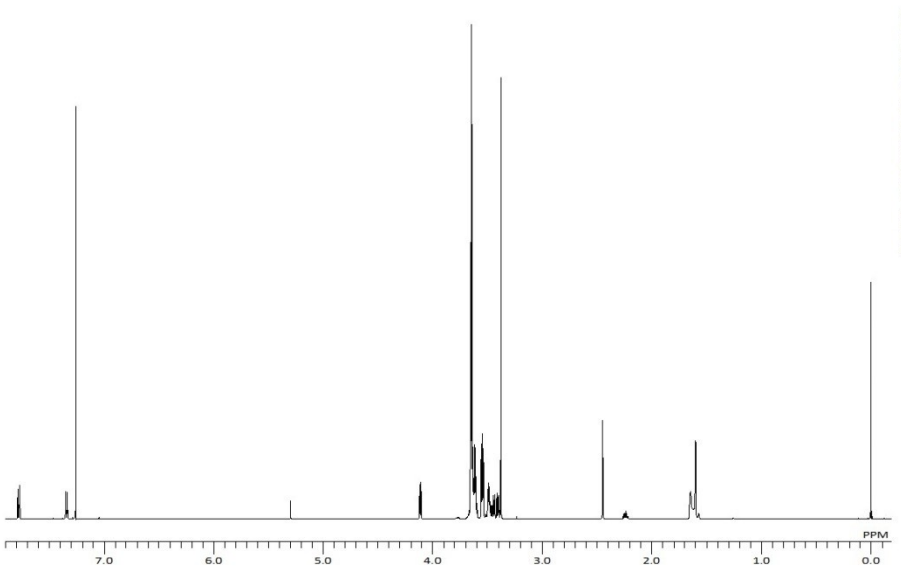
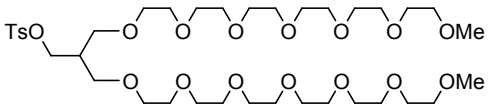


Fig. S14 ^{1}H NMR spectrum of **4** in $CDCl_3$.



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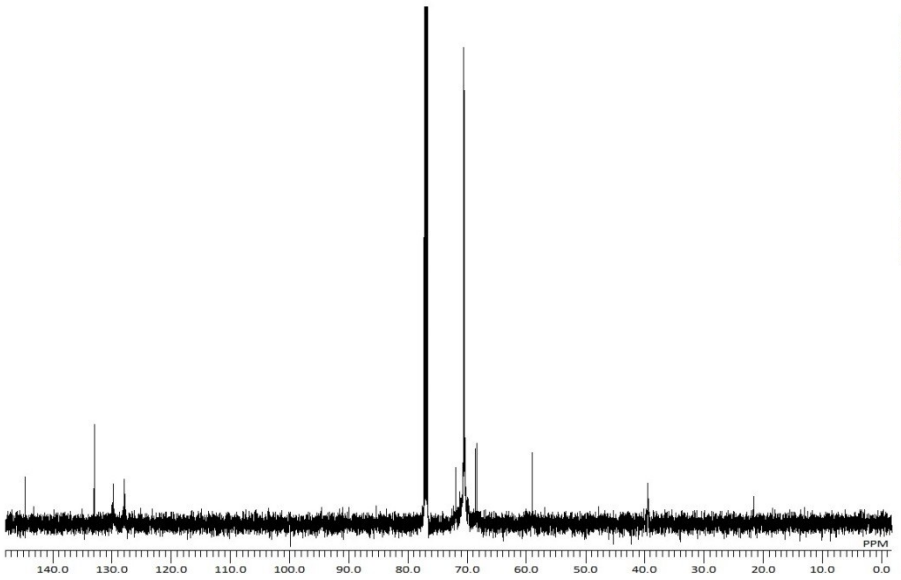


Fig. S15 ^{13}C NMR spectrum of **4** in $CDCl_3$.

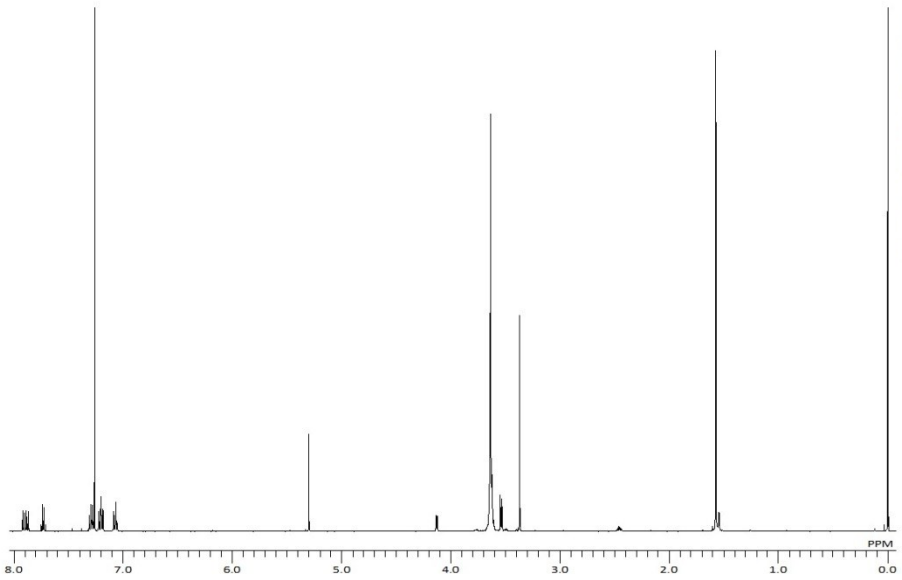
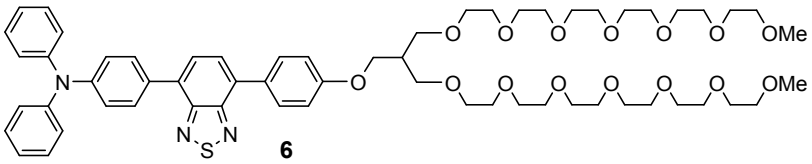


Fig. S16 ^{1}H NMR spectrum of **6** in $CDCl_3$.



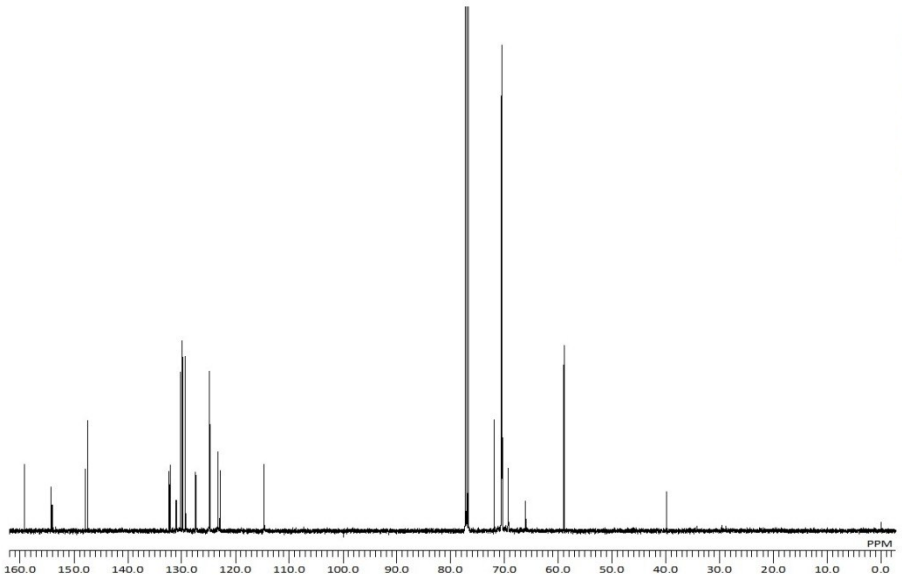


Fig. S17 ^{13}C NMR spectrum of **6** in $CDCl_3$.

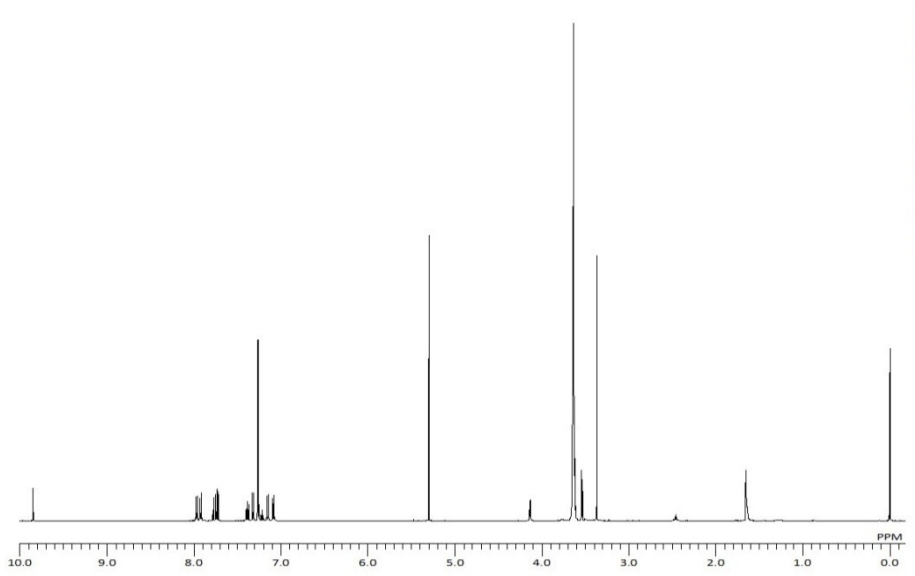
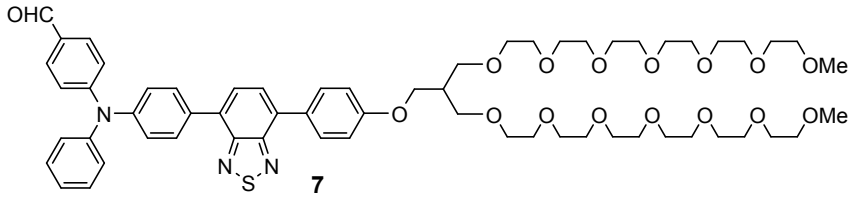


Fig. S18 ^{1}H NMR spectrum of **7** in $CDCl_3$.



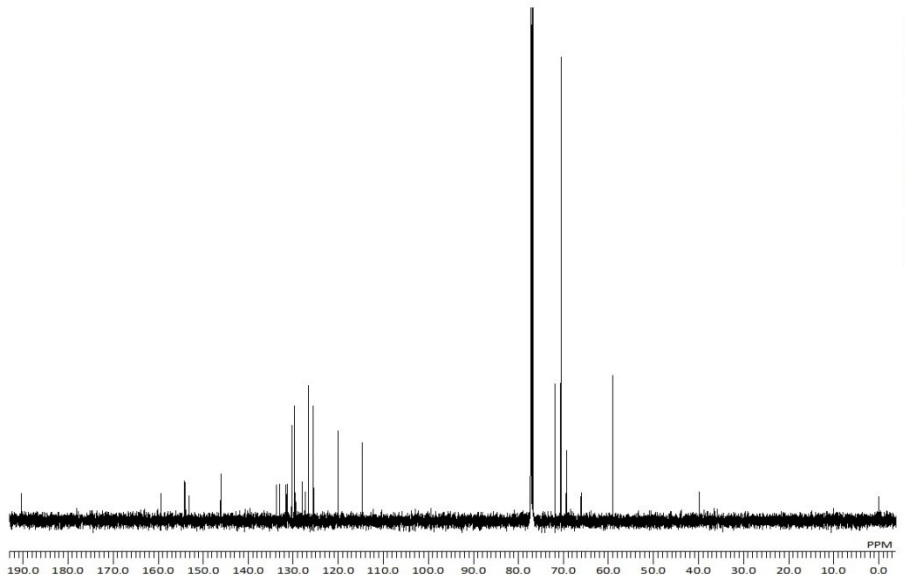


Fig. S19 ^{13}C NMR spectrum of **7** in $CDCl_3$.

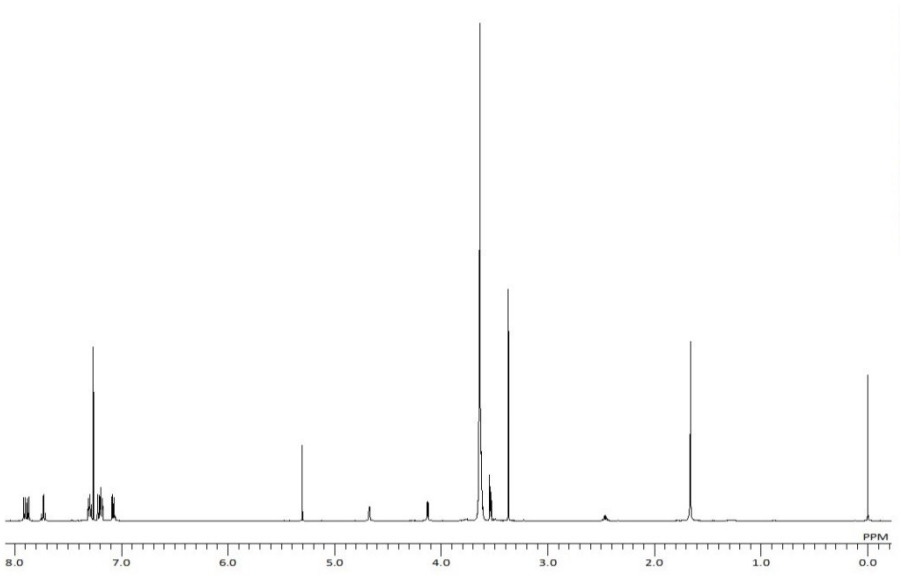
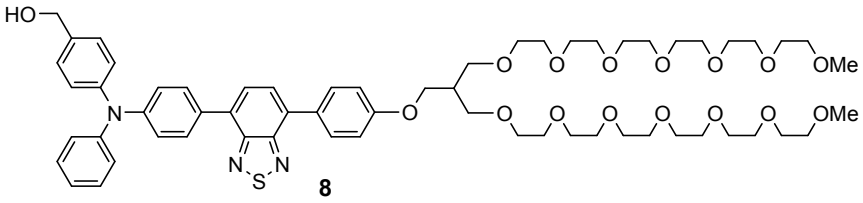


Fig. S20 ^{1}H NMR spectrum of **8** in $CDCl_3$.



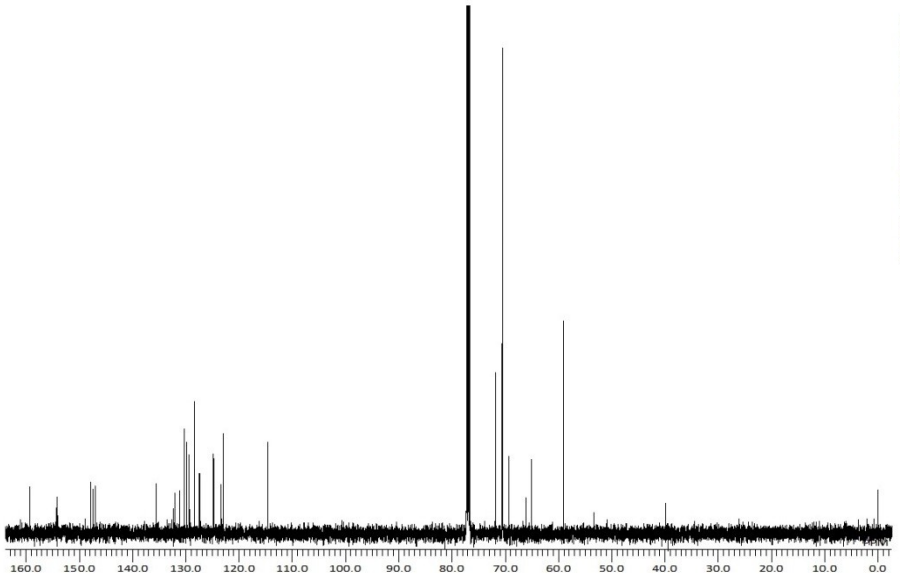


Fig. S21 ^{13}C NMR spectrum of **8** in $CDCl_3$.

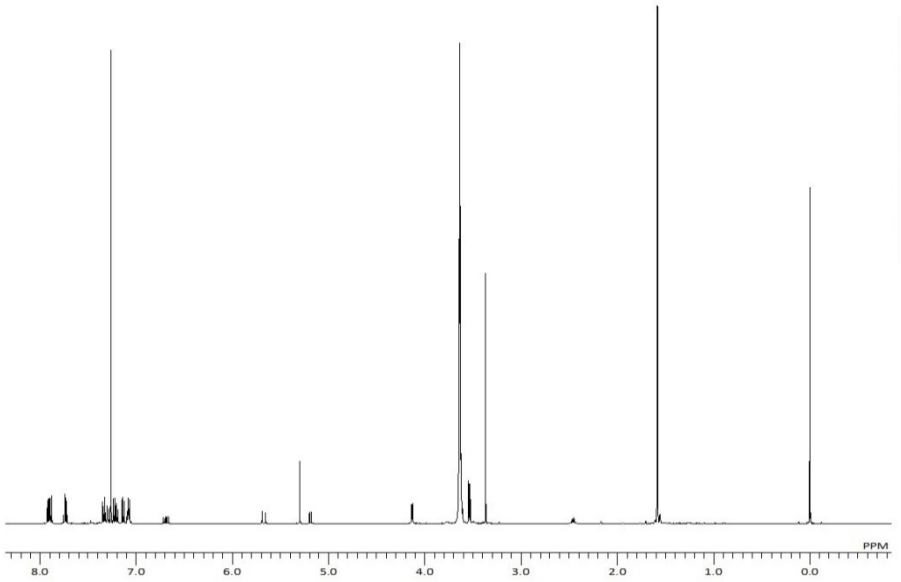
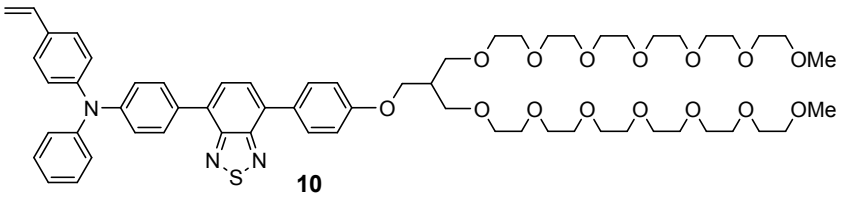


Fig. S22 ^{1}H NMR spectrum of **10** in $CDCl_3$.



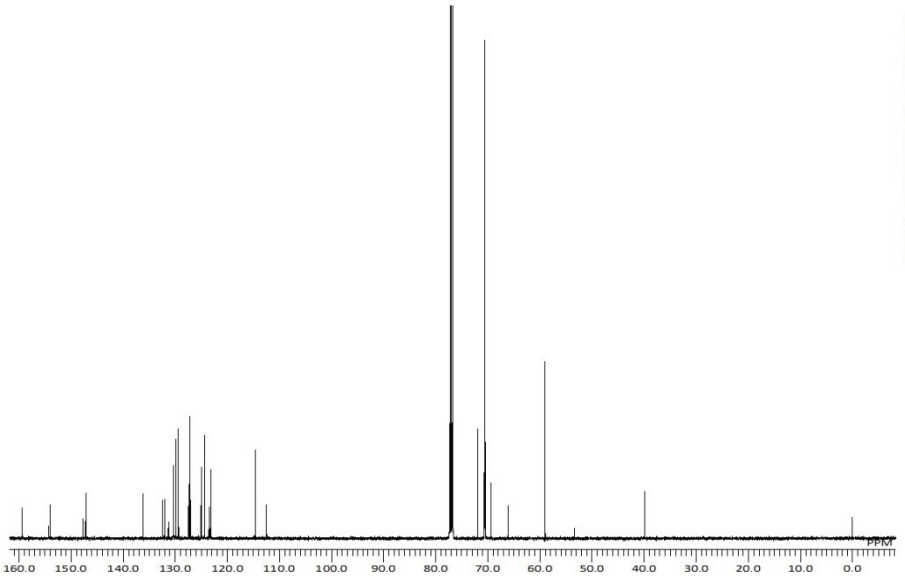


Fig. S23 ^{13}C NMR spectrum of **10** in $CDCl_3$.

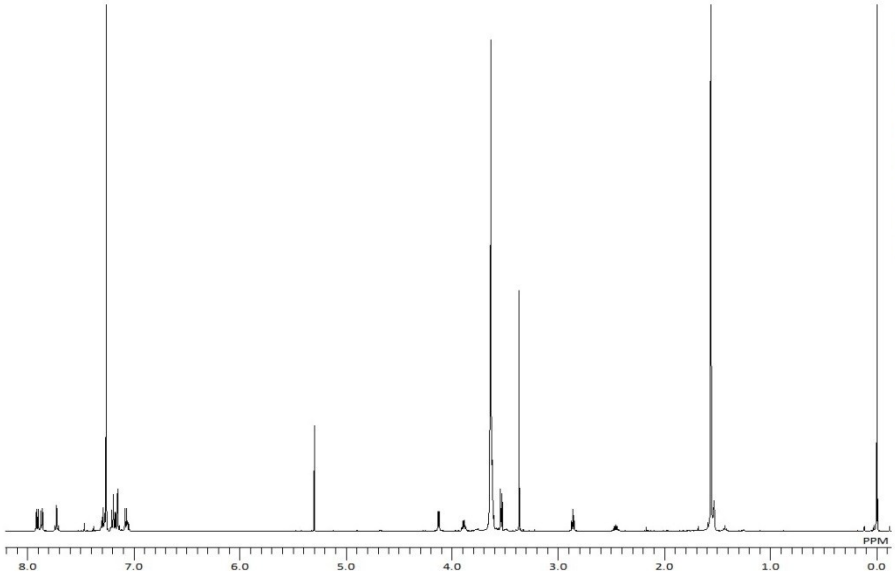
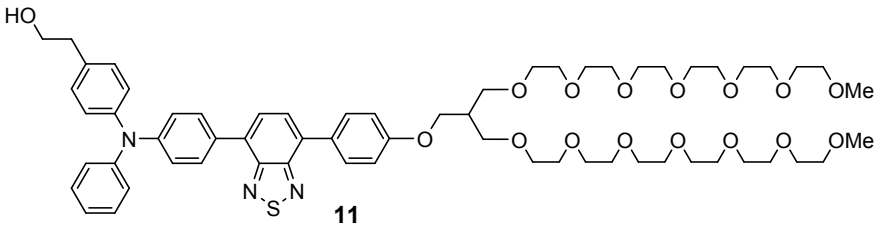


Fig. S24 ^{1}H NMR spectrum of **11** in $CDCl_3$.



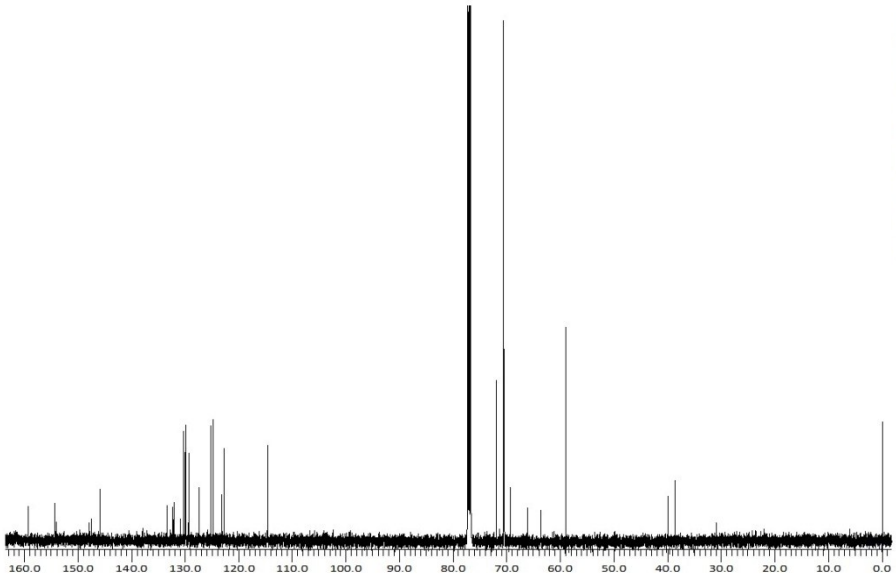


Fig. S25 ^{13}C NMR spectrum of **11** in $CDCl_3$.

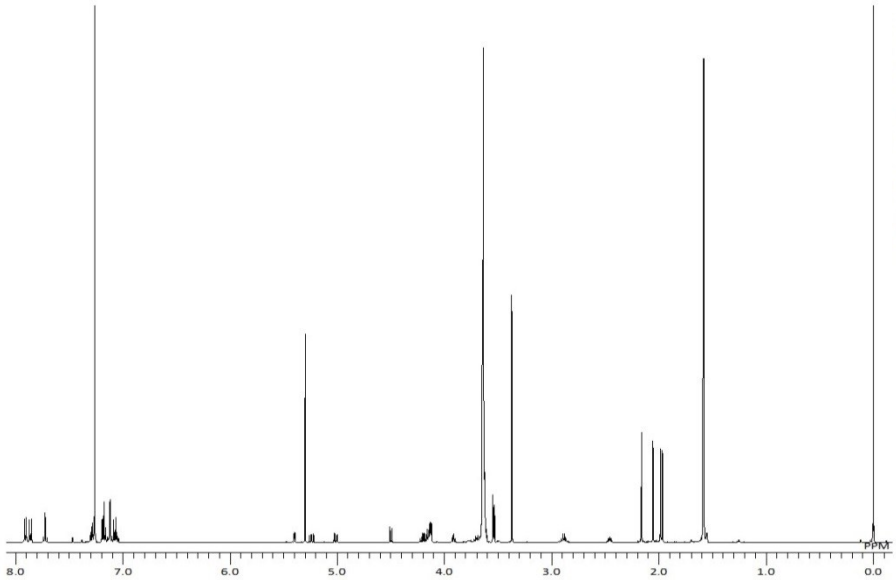
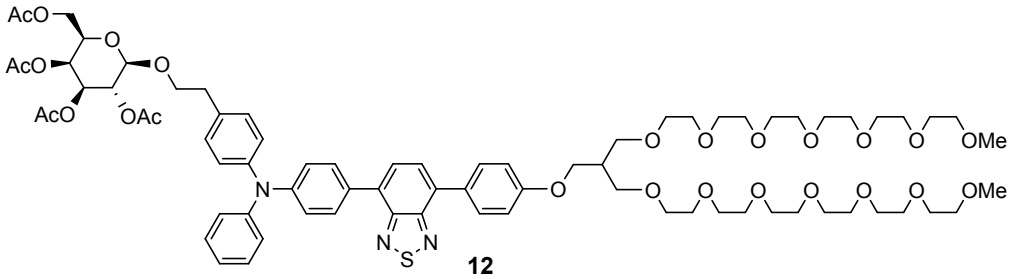


Fig. S26 ^{1}H NMR spectrum of **12** in $CDCl_3$.



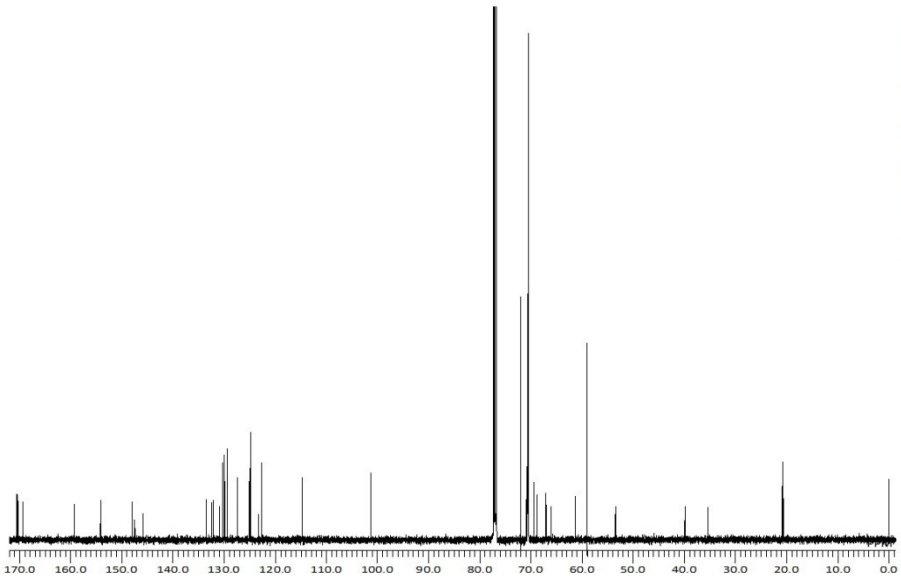


Fig. S27 ^{13}C NMR spectrum of **12** in $CDCl_3$.

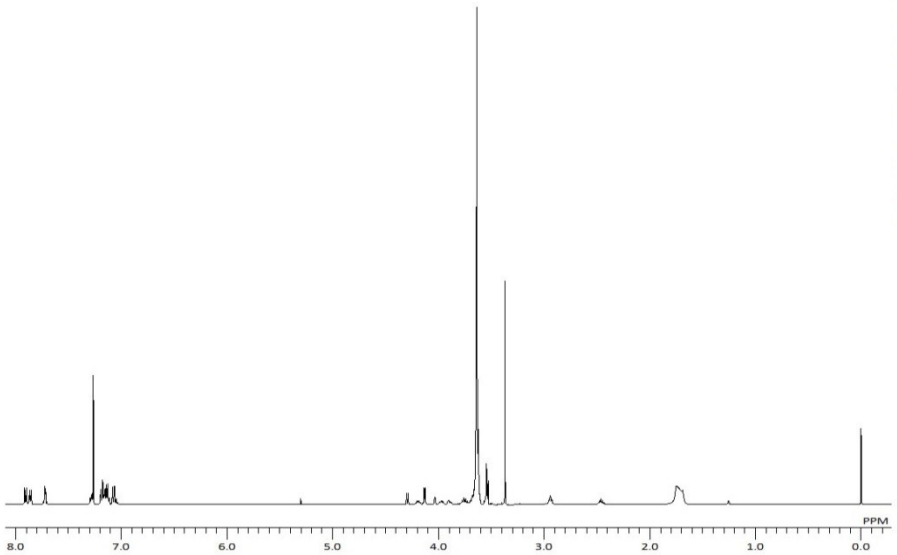
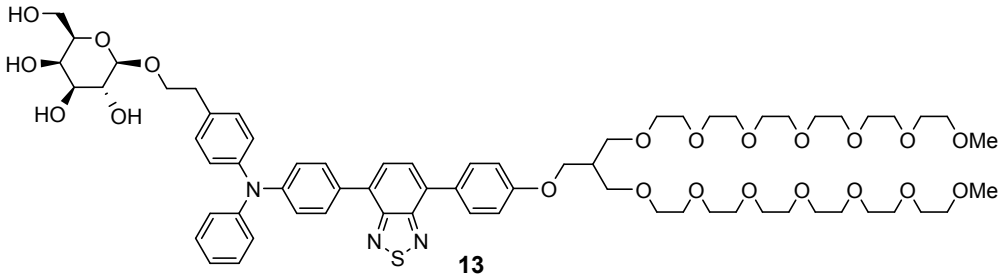


Fig. S28 ^{1}H NMR spectrum of **13** in $CDCl_3$.



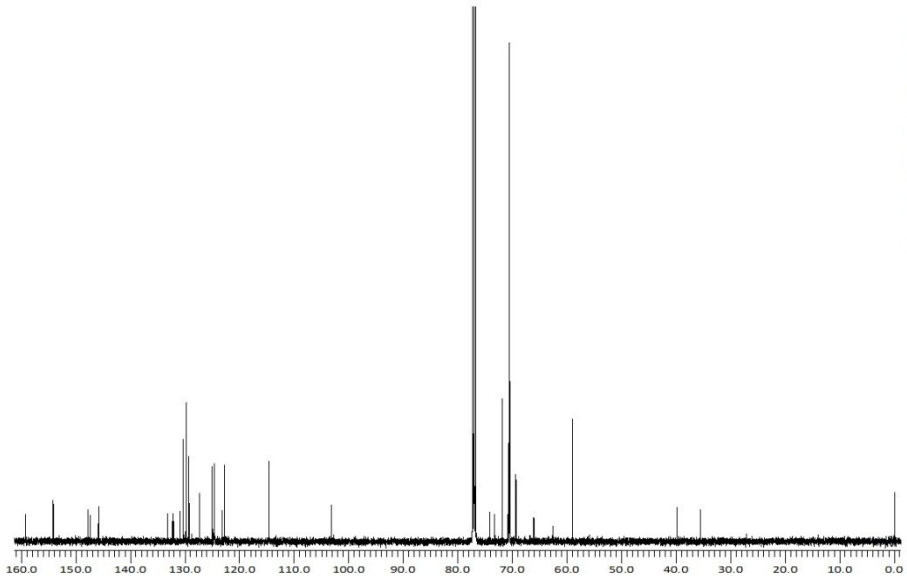


Fig. S29 ^{13}C NMR spectrum of **10** in $CDCl_3$.