Electronic Supplementary Material (ESI) for Analyst
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Electronic Supplementary Information

Reaction-based fluorometric analysis of *N*-bromosuccinimide by oxidative deprotection of dithiane

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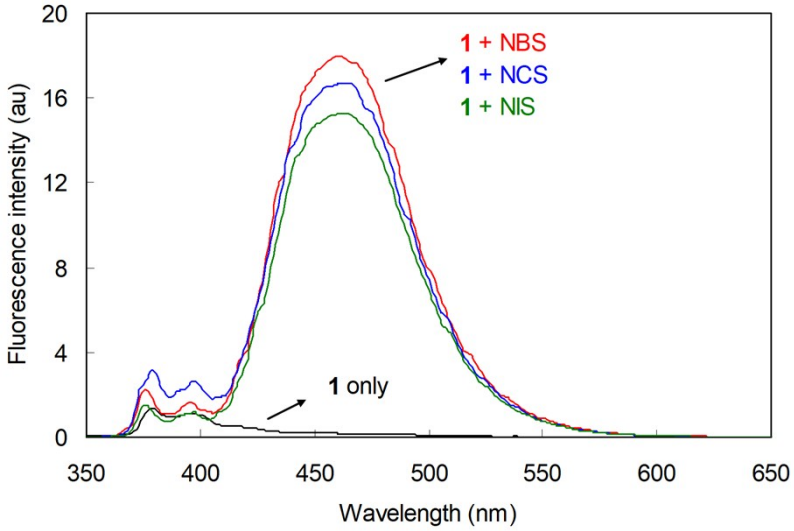

Fig. S1. Fluorescence spectra of probe **1** in the presence of NCS, NBS, and NIS. [**1**] = 5.0 × 10^{-6} M, [*N*-halosuccinimide] = 5.0 × 10^{-5} M, [EDTA] = 1.0 × 10^{-4} M in a mixture of acetate buffer (pH 4.76, 20 mM) and acetonitrile (1:1, *v*/*v*). λ_{ex} = 340 nm.

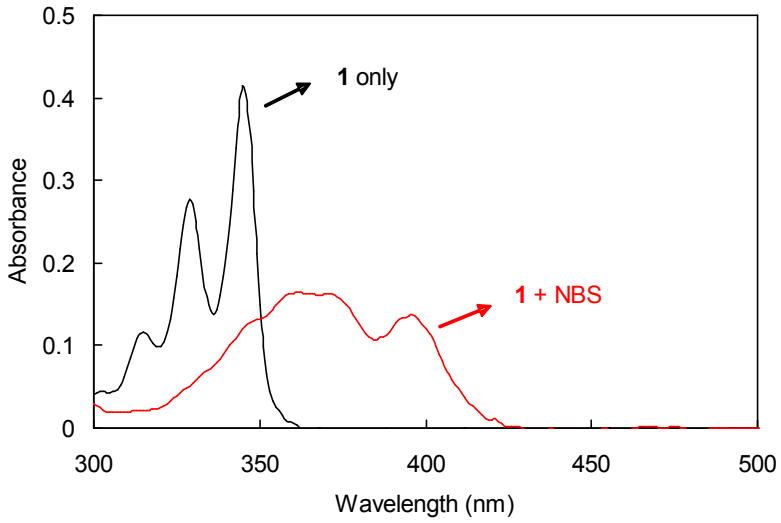

Fig. S2. UV–vis spectra of probe **1** in the absence and presence of NBS. [**1**] = 1.0 × 10^{-5} M, [NBS] = 1.0 × 10^{-4} M, [EDTA] = 2.0 × 10^{-4} M in a mixture of acetate buffer (pH 4.76, 20 mM) and acetonitrile (1:1, *v*/*v*).

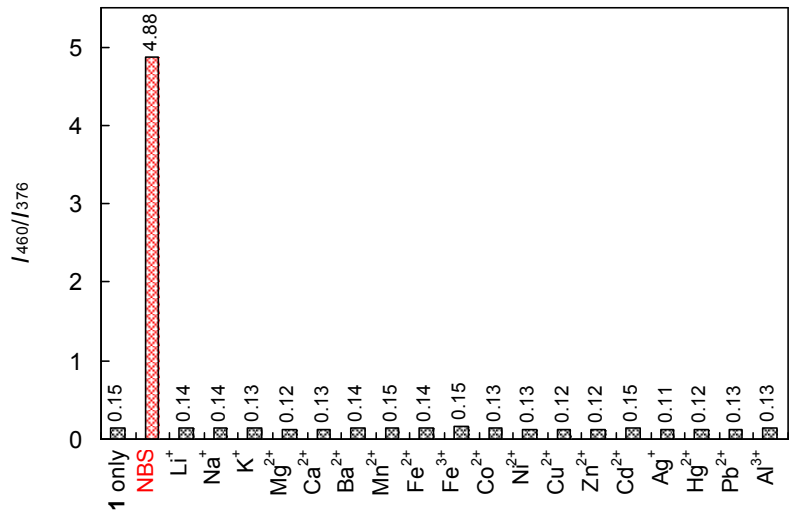

Fig. S3. Ratiometric NBS-selective signaling of probe **1** expressed by the fluorescence intensity ratio (I_{460}/I_{376}) at 460 nm and 376 nm. [**1**] = 5.0 × 10^{-6} M, [NBS] = [M^{n+}] = 5.0 × 10^{-5} M, [EDTA] = 1.0 × 10^{-4} M in a mixture of acetate buffer (pH 4.76, 20 mM) and acetonitrile (1:1, *v*/*v*). λ_{ex} = 340 nm.

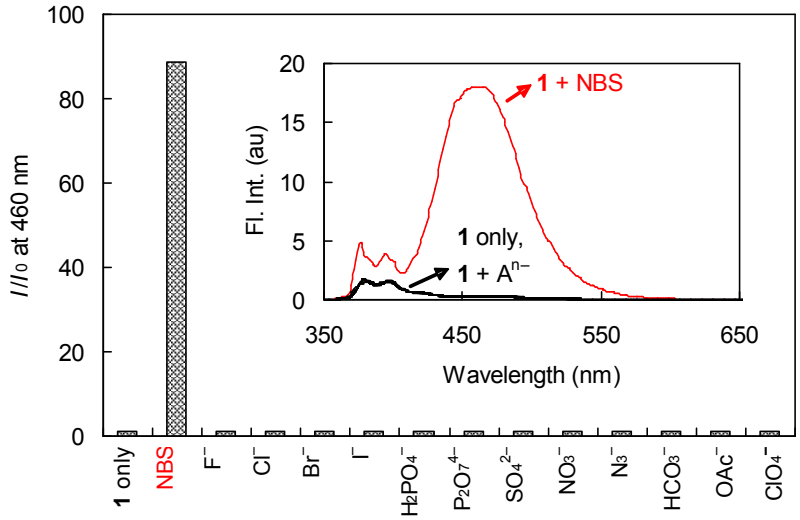

Fig. S4. NBS-selective signaling of probe **1** expressed by the fluorescence intensity ratio (I/I_0) at 460 nm. [**1**] = 5.0 × 10^{-6} M, [NBS] = [A^{n-}] = 5.0 × 10^{-5} M, [EDTA] = 1.0 × 10^{-4} M in a mixture of acetate buffer (pH 4.76, 20 mM) and acetonitrile (1:1, *v*/*v*). λ_{ex} = 340 nm.

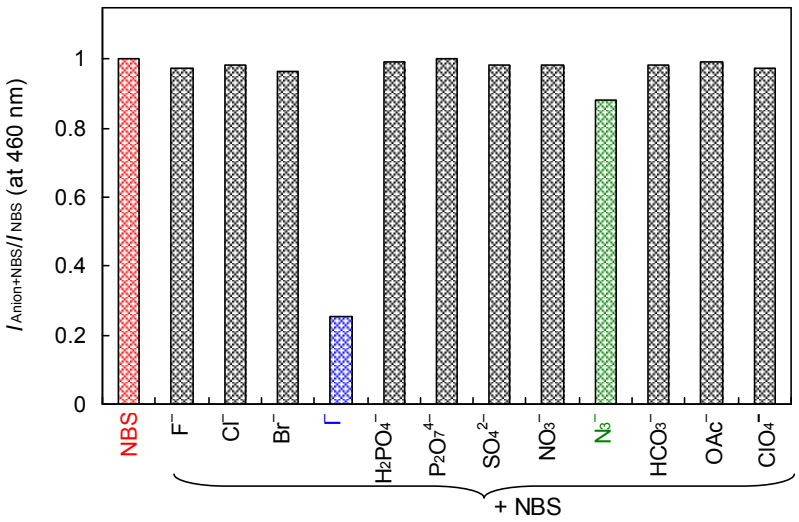

Fig. S5. Effect of the presence of background anions on the NBS signaling of probe **1** as expressed by the fluorescence intensity ratio ($I_{(Anion+NBS)}/I_{NBS}$) at 460 nm. [**1**] = 5.0×10^{-6} M, [NBS] = [A^{n-}] = 5.0×10^{-5} M, [EDTA] = 1.0×10^{-4} M in a mixture of acetate buffer (pH 4.76, 20 mM) and acetonitrile (1:1, *v*/*v*). λ_{ex} = 340 nm. Significantly reduced responses for iodide (highlighted in blue) and N_3^- (highlighted in green) were due to the consumption of NBS by the relevant redox reactions.

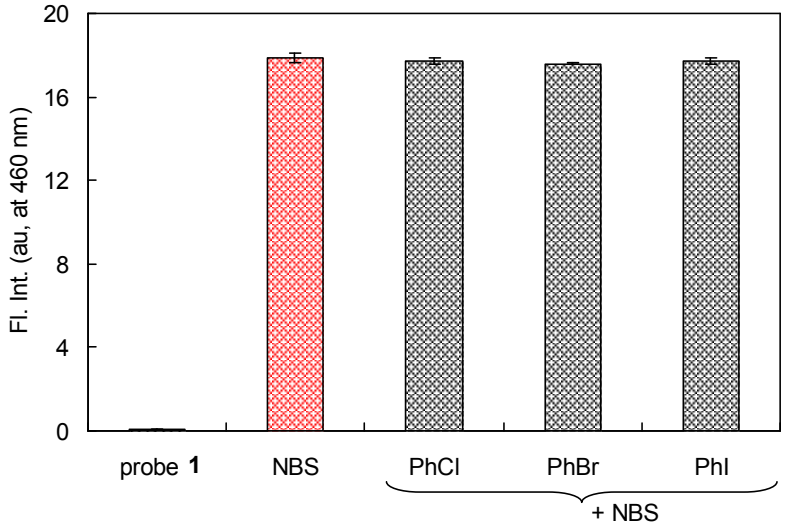

Fig. S6. NBS signaling of probe **1** in the presence of background aromatic halides as expressed by the fluorescence intensity at 460 nm. [**1**] = 5.0×10^{-6} M, [NBS] = [aromatic halides] = 5.0×10^{-5} M, [EDTA] = 1.0×10^{-4} M in a mixture of acetate buffer (pH 4.76, 20 mM) and acetonitrile (1:1, *v*/*v*). λ_{ex} = 340 nm.

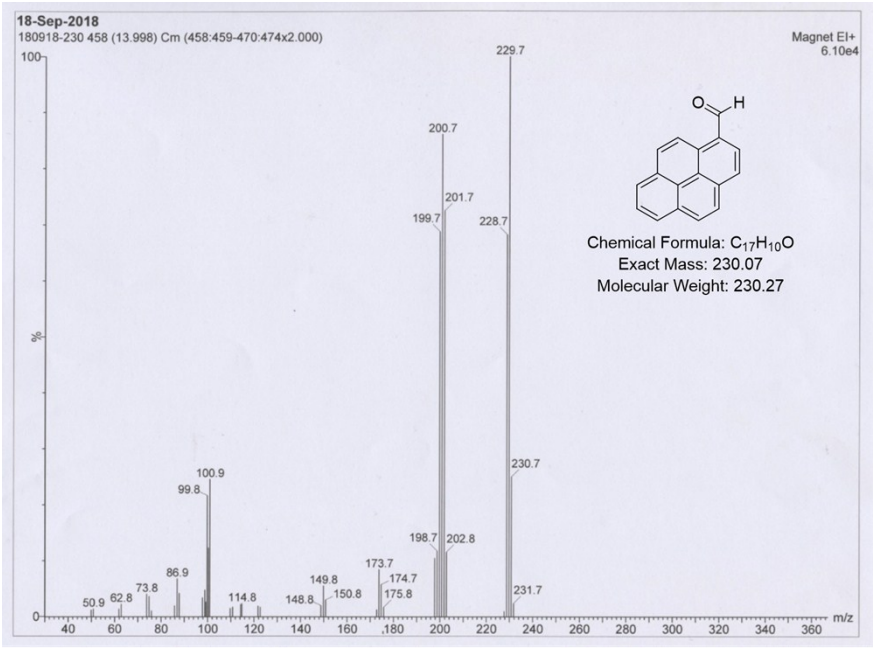

Fig. S7. Mass spectrum of the NBS-signaling product of probe **1**.

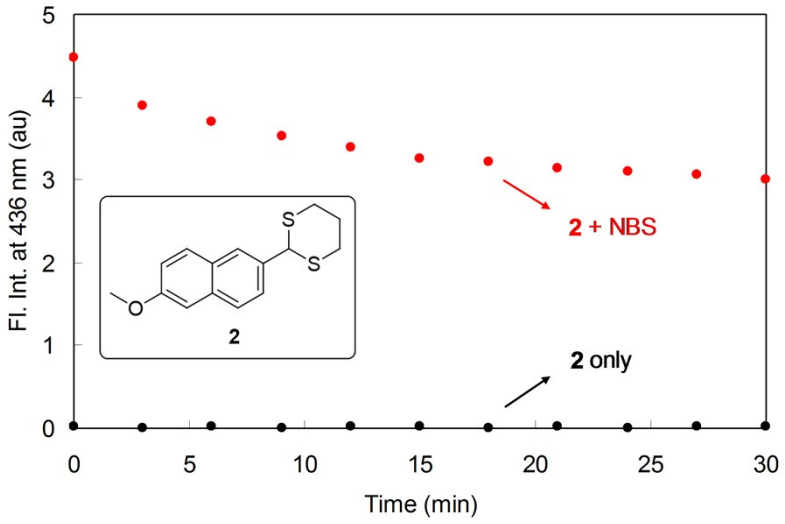

Fig. S8. Time-course plot of NBS signaling by probe **2** expressed by the fluorescence intensity change at 436 nm. [**2**] = 5.0×10^{-6} M, [NBS] = 5.0×10^{-5} M, [EDTA] = 1.0×10^{-4} M in a mixture of acetate buffer (pH 4.76, 20 mM) and acetonitrile (1:1, *v*/*v*). λ_{ex} = 323 nm.

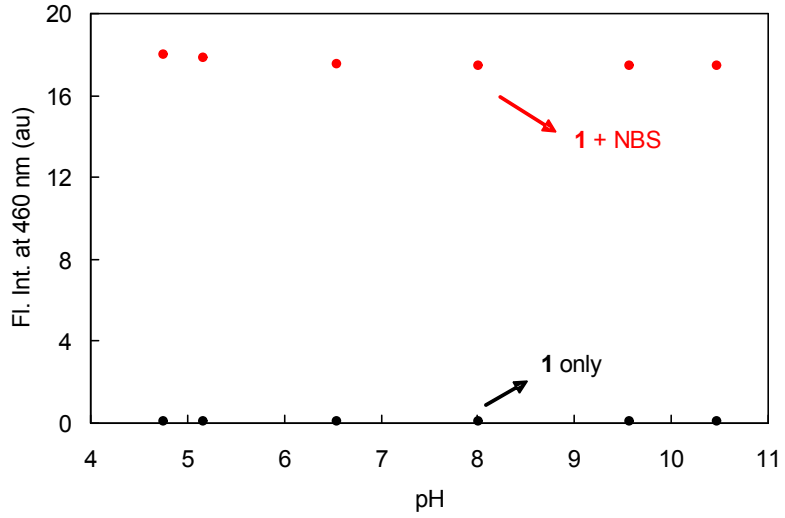

Fig. S9. Effect of pH on the NBS signaling of probe **1** monitored by the changes in fluorescence intensity at 460 nm. [**1**] = 5.0×10^{-6} M, [NBS] = 5.0×10^{-5} M, [EDTA] = 1.0×10^{-4} M in a mixture of acetate buffer (pH 4.76, 20 mM) containing varying amounts of 0.1 M NaOH and acetonitrile (1:1, *v*/*v*). λ_{ex} = 340 nm.

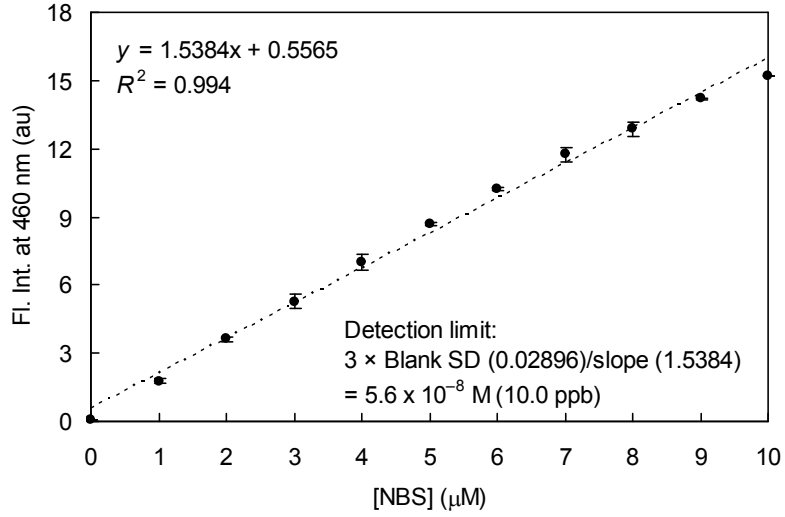

Fig. S10. Changes in fluorescence intensity at 460 nm of probe **1** as a function of NBS concentration. [**1**] = 5.0×10^{-6} M, [NBS] = 0–1.0×10^{-5} M, [EDTA] = 1.0×10^{-4} M in a mixture of acetate buffer (pH 4.76, 20 mM) and acetonitrile (1:1, *v*/*v*). λ_{ex} = 340 nm.

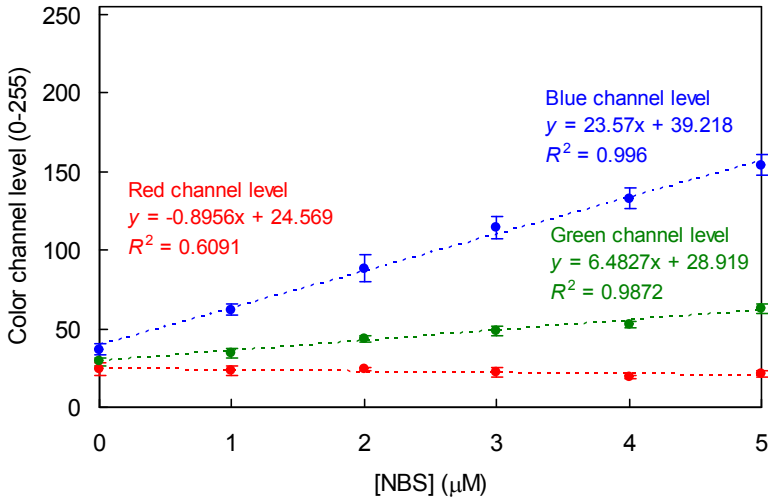

Fig. S11. Plots of the red, green, and blue channel levels of signal images obtained using a smartphone under 365 nm UV LED illumination as a function of NBS concentration. [**1**] = 5.0 × 10^{-6} M, [NBS] = 0–5.0 × 10^{-6} M, [EDTA] = 1.0 × 10^{-4} M in a mixture of acetate buffer (pH 4.76, 20 mM) and acetonitrile (1:1, *v*/*v*). λ_{ex} = 340 nm.

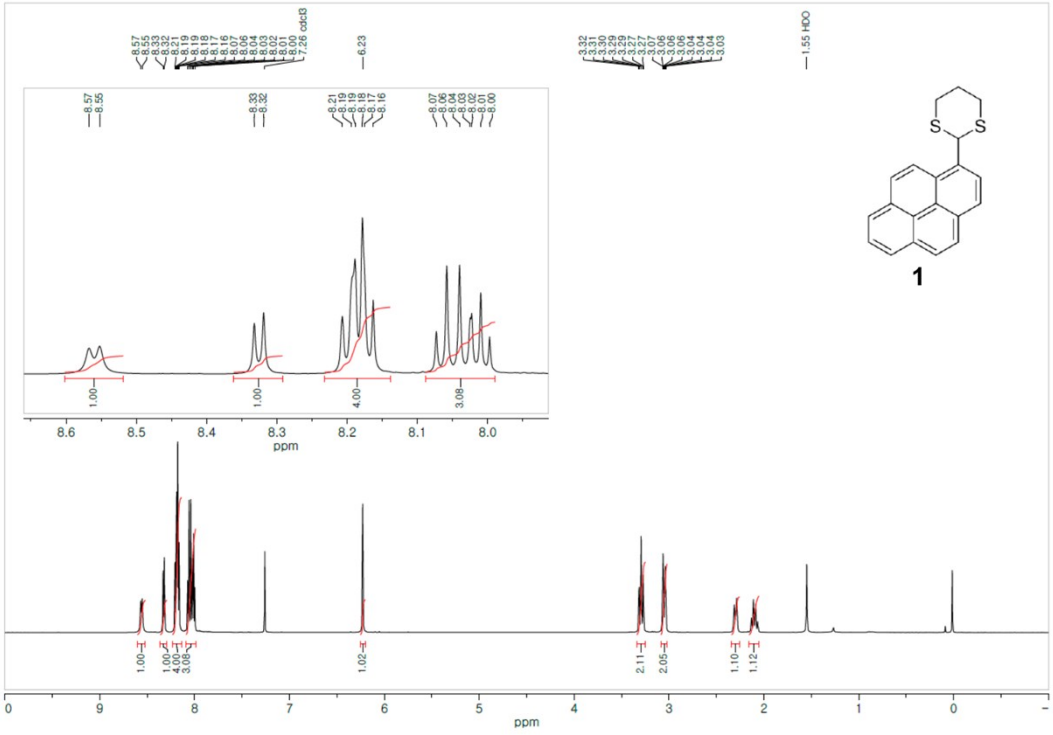

Fig. S12. ^{1}H NMR spectrum of probe **1** in $CDCl_3$ (600 MHz).

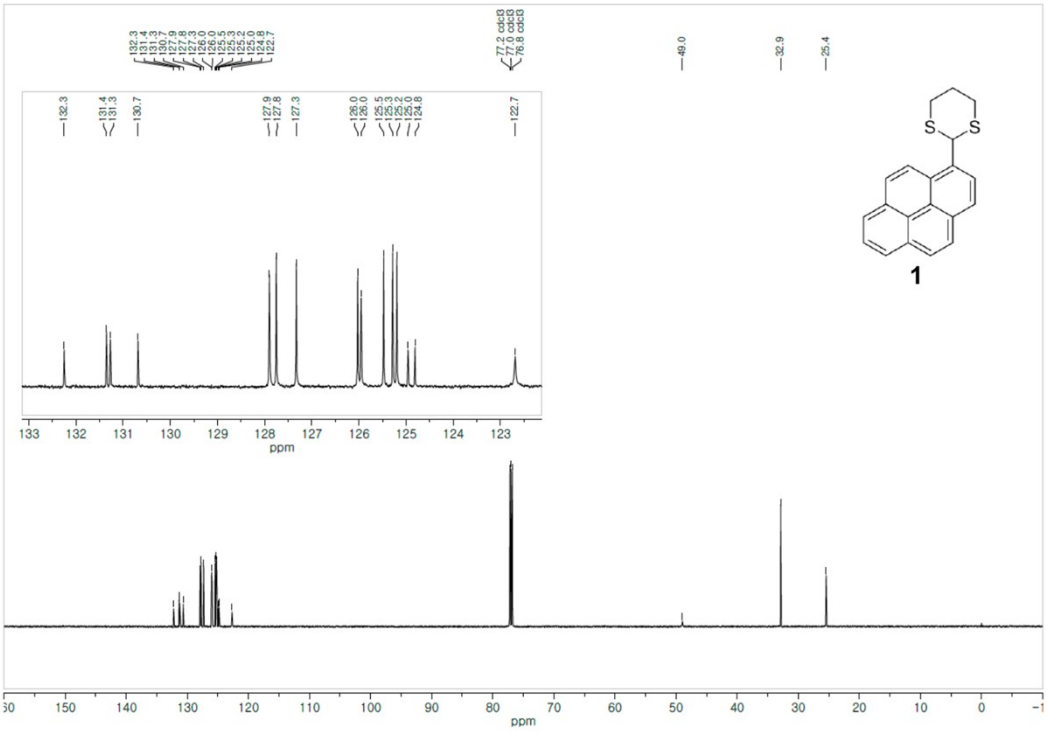

Fig. S13. ^{13}C NMR spectrum of probe **1** in $CDCl_3$ (150 MHz).

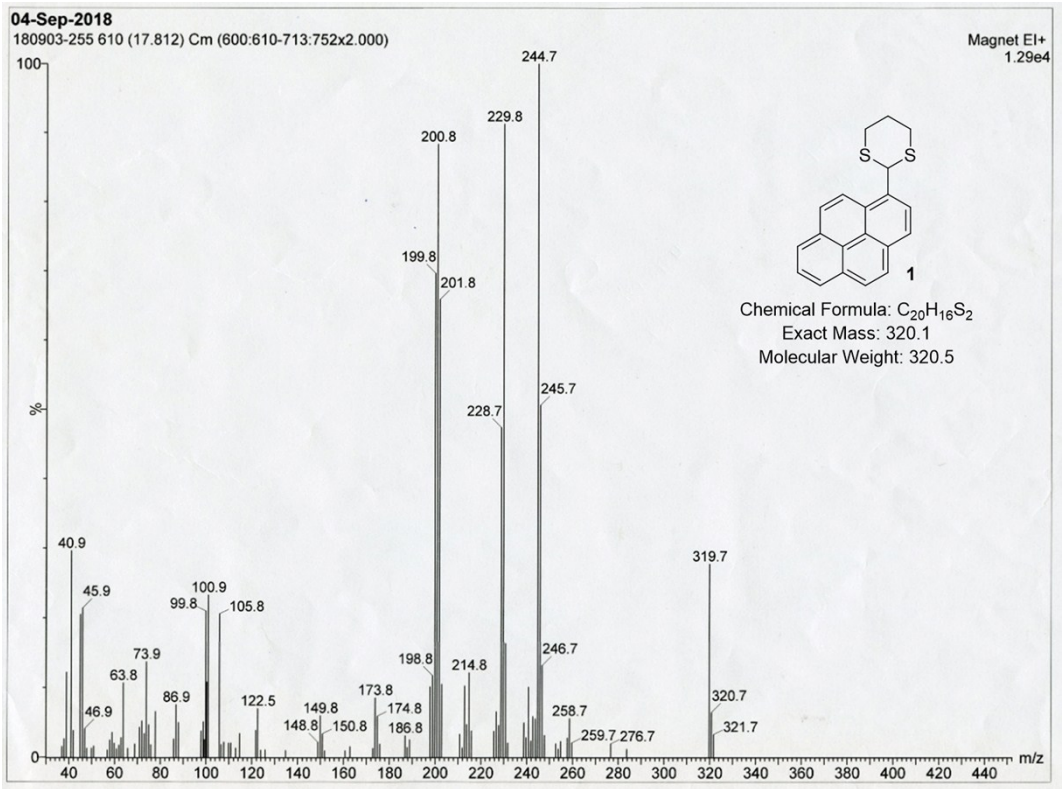

Fig. S14. Electron ionization mass spectrum of probe **1**.

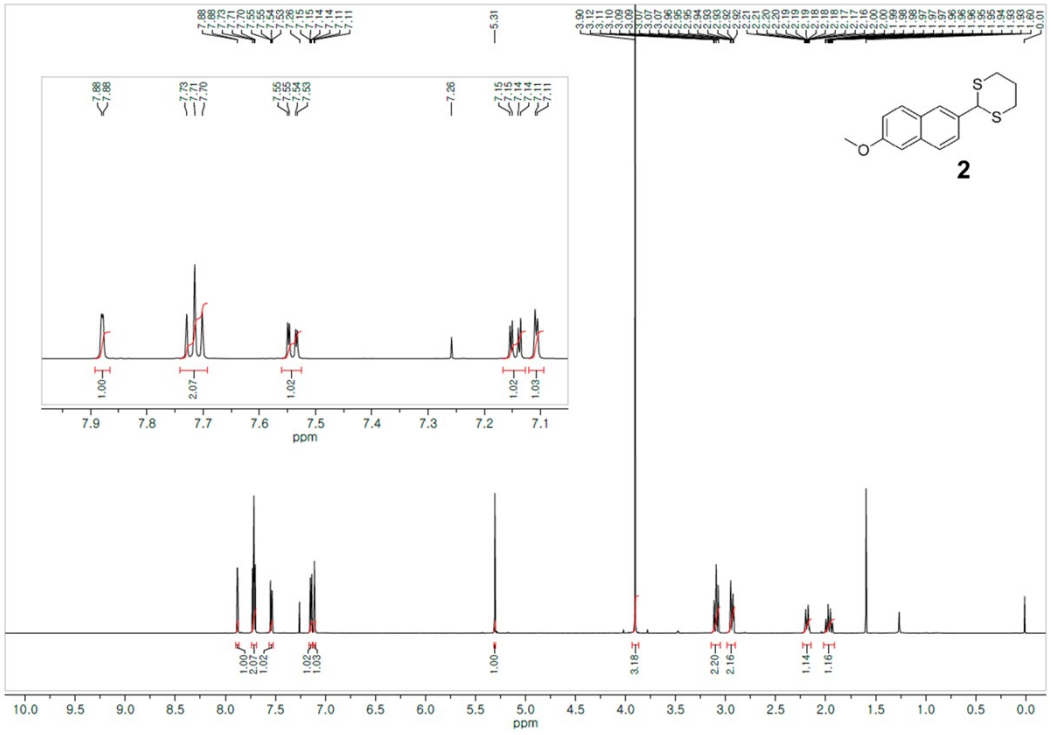

Fig. S15. ^{1}H NMR spectrum of probe **2** in $CDCl_3$ (600 MHz).

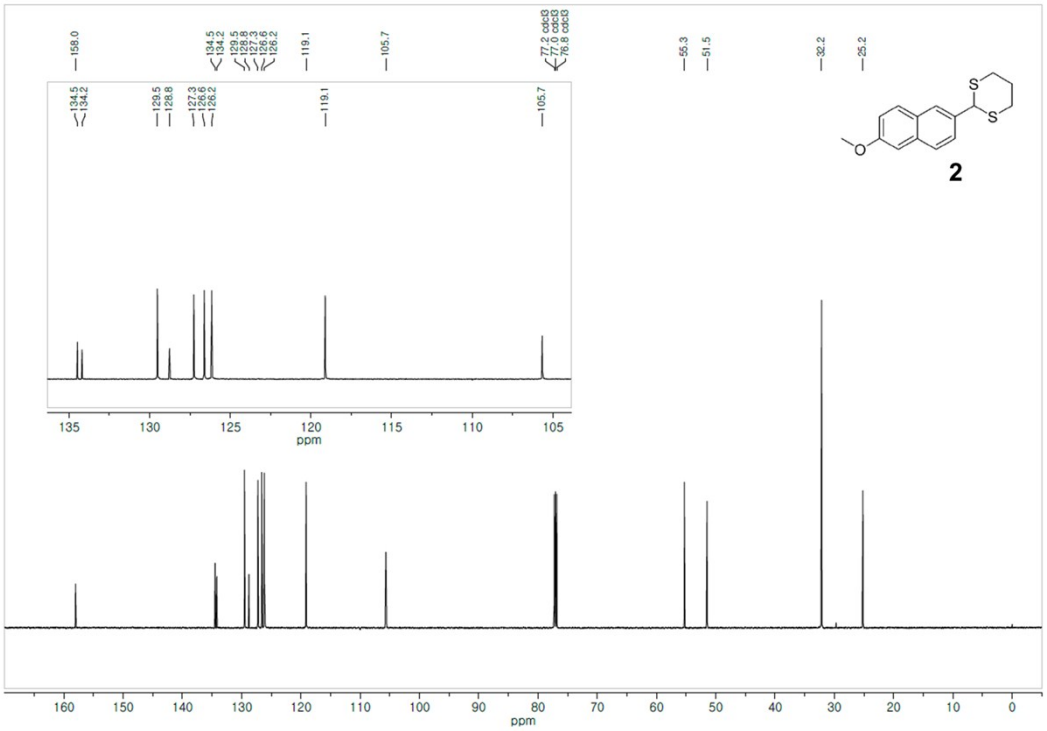

Fig. S16. ^{13}C NMR spectrum of probe **2** in $CDCl_3$ (150 MHz).

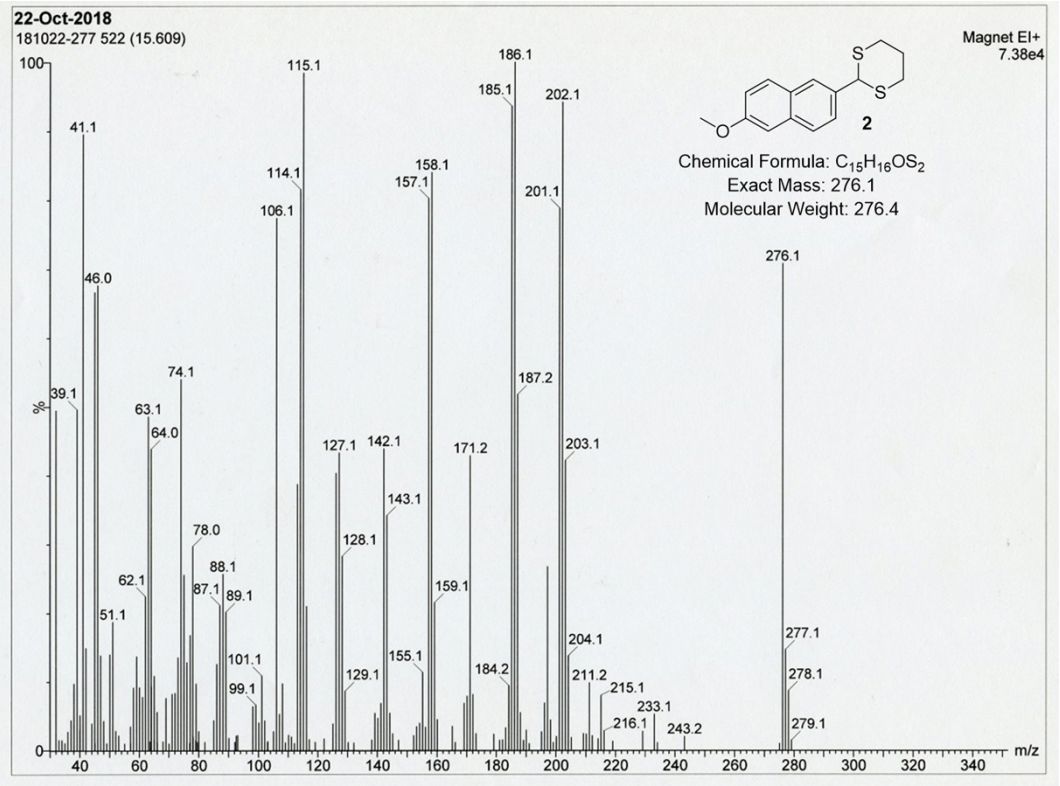

Fig. S17. Electron ionization mass spectrum of probe **2**.