Supporting Information

Fluorescence Imaging of Hypochlorous Acid and Peroxynitrite in Vitro and in Vivo with Emission Wavelength Beyond 750 nm

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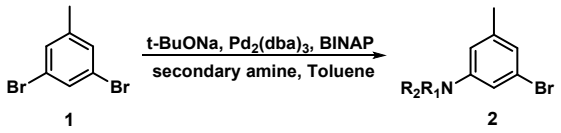
Experimental Section

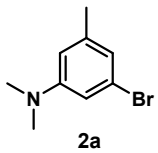
1. General information and methods

All reagents and solvents were purchased from commercial sources and were of the highest grade. LysoTracker Green DND-26 and MitoTracker Green FM were purchased from Invitrogen (USA). Cy7, Nintedanib (OFEV) and Aminoguanidine hemisulfate salt (AG) were purchased from Innochem (China). Bleomycin Hydrochloride was purchased from Zhejiang Hisun Pharmaceutical Co., Ltd. Solvents were dried according to standard procedures. All reactions were magnetically stirred and monitored by thin-layer chromatography (TLC). Flash chromatography (FC) was performed using silica gel 60 (100-200 mesh). Absorption spectra were taken on a Varian Carry 4000 spectrophotometer. Fluorescence spectra were taken on Hitachi F-7000 fluorescence spectrometer. The ^{1}H NMR and ^{13}C NMR spectra were recorded at 600 and 150 MHz, respectively. The following abbreviations were used to explain the multiplicities: s = singlet; d = doublet; t = triplet; q = quartet; m = multiplet; br = broad. High resolution mass spectra were obtained on a Thermo Scientific Q Exactive mass spectrometer. For living cell fluorescence imaging assays, the images were acquired by Ceiss LMS 880 + Airyscan confocal microscope. The living animal imaging assays were performed in a Bruker In Vivo FX Pro small animal optical imaging system with an excitation filter of 690 nm and an emission filter of 750 nm.

2. Synthetic Procedures

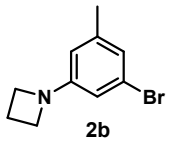


General Procedure for Synthesis of Compounds 2*:* 2,5-dibromotoluene **1** (16 g, 64 mmol), secondary amine (32 mmol), $Pd_2(dba)_3$ (732 mg, 1.6 mmol), BINAP (996 mg, 1.6 mmol) and sodium *tert*-butoxide (3.68 g, 38.4 mmol) were dissolved in anhydrous toluene (120 mL) and stirred at 110 ^oC for 1 h. The reaction mixture was then filtered through Celite and the solvent was removed under reduced pressure. The products were purified with silica gel chromatography.



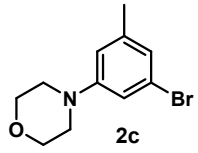
2a

2a was purified with silica gel chromatography (petroleum ether/CH_2Cl_2/ethyl acetate = 100/10/1) to afford a colorless liquid (5.07 g, 74%). ^1H NMR (600 MHz, $CDCl_3$) δ 6.70 (d, J = 6 Hz, 2H), 6.46 (s, 1H), 2.95 (s, 6H), 2.30 2.30 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 151.554, 140.38, 123.15, 120.05, 112.42, 111.76, 40.47, 21.66; ESI-MS $[M+H]^+$: calcd for 214.0231, Found 214.0225.



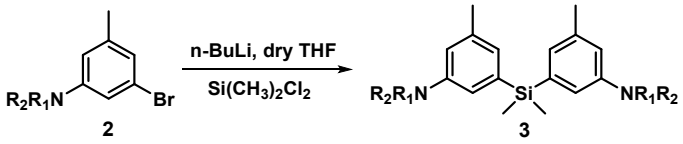
2b

2b was purified with silica gel chromatography (petroleum ether/CH_2Cl_2/ethyl acetate = 100/10/1) to afford a white solid (5.70 g, 78%). ^1H NMR (600 MHz, $CDCl_3$) δ 6.70 (s, 1H), 6.41 (s, 1H), 6.18 (s, 1H), 3.39 (t, J = 7.2 Hz, 4H), 2.39 (t, J = 6.6 Hz, 2H), 2.27 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 153.07, 140.49, 122.80, 122.80, 120.94, 111.41, 110.66, 52.35, 21.38,16.88; ESI-MS $[M+H]^+$: calcd for 226.0231, Found 226.0224.

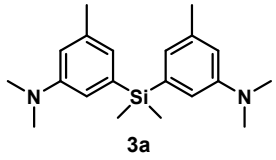


2c

2c was purified with silica gel chromatography (petroleum ether/CH_2Cl_2/ethyl acetate = 20/1/1) to afford a light yellow solid (6.02 g, 73%). ^1H NMR (600 MHz, $CDCl_3$) δ 6.89 (s, 2H), 6.66 (s, 1H), 3.88 (s, 4H), 3.16 (s, 4H), 2.30 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 152.39, 140.597, 123.53, 123.06, 115.71, 115.02, 66.78, 49.03, 21.55; ESI-MS $[M+H]^+$: calcd for 256.0337, Found 256.0328.

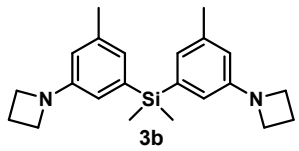


General Procedure for Synthesis of Compounds 3: **2** (23.5 mmol) was dissolved in dry THF (60 mL) and stirred at –78 °C under nitrogen. *n*-BuLi (9.4 mL, 2.5 M in *n*-hexane, 23.5 mmol) was slowly added to the solution for 30 min and stirred for further 2 h at the same temperature. Dichlorodimethylsilane (1.18 mL, 9.72 mmol) was then added to the reaction mixture at –78 °C and stirred at room temperature overnight. The mixture was quenched with 1N HCl aqueous solution (50 mL) and extracted with ethyl acetate (3×50 mL), and the organic phase was washed with saturated $NaHCO_3$ aqueous solution, water and brine, dried over Na_2SO_4, filtered and evaporated to obtain crude **3**, which was purified by flash column chromatography.



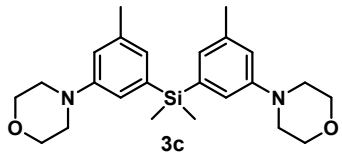
3a

3a was isolated by flash column chromatography (petroleum ether /ethyl acetate = 80/1) to afford a colorless liquid (0.965 g, 74%). ^{1}H NMR (600 MHz, $CDCl_3$) δ 6.79 (d, *J* = 12.6 Hz, 4H), 6.61 (s, 2H), 2.94 (s, 12H), 2.33 (s, 6H), 0.53 (s, 6H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 150.10, 138.90, 137.94, 123.70, 115.79, 114.53, 40.83, 21.90, -2.01; ESI-MS $[M+H]^+$: calcd for 327.2256, Found 327.2250.



3b

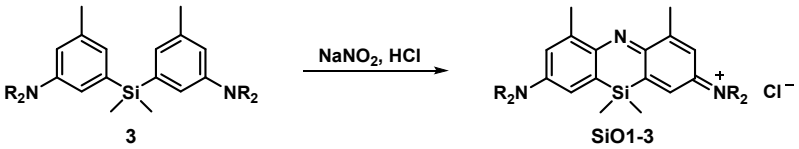
3b was isolated by flash column chromatography (petroleum ether/CH_2Cl_2 = 4/1) to afford a white solid (0.981 g, 70%). ^{1}H NMR (600 MHz, $CDCl_3$) δ 6.76 (s, 2H), 6.46 (s, 2H), 6.31 (s, 2H), 3.88 (t, *J* = 7.2 Hz, 8H), 3.15 (m, 8H), 2.30 (s, 6H), 0.50 (s, 6H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 151.66, 138.78, 137.81, 124.29, 114.13, 113.01, 56.54, 21.67, 17.07, 2.08; ESI-MS $[M+H]^+$: calcd for 351.2256, Found 351.2249.



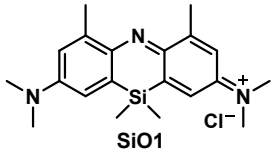
3c

3c was isolated by flash column chromatography (petroleum ether/CH_2Cl_2/ethyl acetate = 5/1/1) to afford a colorless liquid (1.48 g, 90%). ^{1}H NMR (600 MHz, $CDCl_3$) δ 6.91 (d, *J* = 13.2 Hz, 4H), 6.77 (s, 2H), 3.87 (s, 8H), 3.15 (s, 8H), 2.337 (s, 6H), 0.53 (s, 6H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 150.74, 139.06, 138.02, 126.96, 118.82, 117.54, 67.01, 49.63, 21.79, 2.11; ESI-MS $[M+H]^+$: calcd for 411.2468,

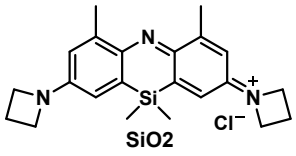
Found 411.2459.



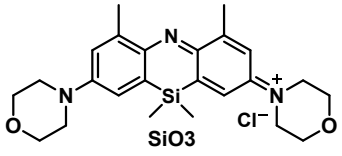
General Procedure for Synthesis of Compound SiO1-3. **3** (8.79 mmol) was dissolved in ethanol (60 mL) and cooled to 0 °C, then the $NaNO_2$ (0.745 g, 10.8 mmol in 10 mL of water) was added dropwise within 10 min. After stirring for 10 min, the solution of con. HCl (3 mL) in 20 ml water was slowly added at 0 °C. The reaction solution was then returned to room temperature and stirred overnight. The mixture was extracted with CH_2Cl_2 (3 × 50 mL) and dried over anhydrous Na_2SO_4, and the combined organic phase was removed under reduced pressure. The product was isolated by flash column chromatography.



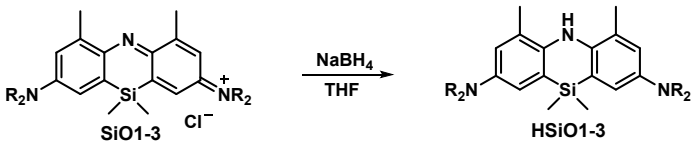
SiO1 was isolated by flash column chromatography (CH_2Cl_2/ethanol = 20/1) to afford a dark green solid (56 g, 15%). ^{1}H NMR (600 MHz, CD_3OD) δ 7.32 (d, J = 7.2 Hz, 2H), 7.03 (s, 2H), 3.46 (s, 12H), 2.57 (s, 6H), 0.50 (s, 6H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 155.33, 153.19, 143.43, 139.33, 121.94, 116.29, 40.215, 18.67, -2.65; ESI-MS $[M]^+$: calcd for 338.2047, Found 338.2047.



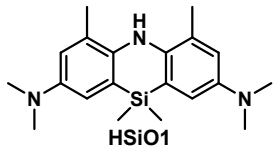
SiO2 was isolated by flash column chromatography (CH_2Cl_2/ethanol = 20/1) to afford a dark green solid (119 mg, 30%). ^{1}H NMR (600 MHz, $CDCl_3$) δ 7.54 (s, 2H), 6.95 (s, 2H), 3.95 (s, 14H), 2.57 (s, 8H), 0.50 (s, 6H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 155.33, 153.19, 143.43, 139.33, 121.94, 116.29, 40.215, 18.67, -2.65; ESI-MS $[M]^+$: calcd for 362.2047, Found 362.2045.



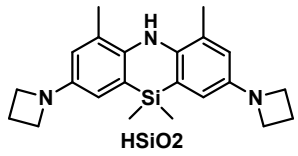
SiO3 was isolated by flash column chromatography (CH_2Cl_2/ethanol = 10/1) to afford a dark green solid (57 mg, 12.5%). ^{1}H NMR (600 MHz, $CDCl_3$) δ 7.54 (s, 2H), 6.95 (s, 2H), 3.95 (s, 14H), 2.57 (s, 8H), 0.56 (s, 6H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 154.77, 154.10, 145.02, 140.94, 123.28, 116.29, 66.83, 48.61, 20.18, -0.84; ESI-MS $[M]^+$: calcd for 422.2258, Found 422.2254.



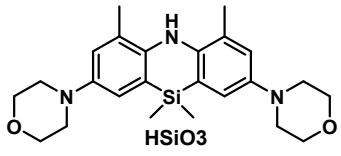
General Procedure for Synthesis of Compound HSiO1-3*:* The solution of **SiO1-3** (0.2 mmol) in 5 mL THF was cooled to 0 °C. $NaBH_4$ (15 mg, 0.4 mmol) was then added in portions to the solution. After stirring at room temperature for 10 min, saturated aq. $NaHCO_3$ (10 mL) was added and then the mixture was extracted with CH_2Cl_2 (3 × 10 mL). After washed with saturated aq. $NaHCO_3$, water and brine, the organic phase was dried over anhydrous Na_2SO_4, and then filtered and evaporated under reduced pressure. The product was isolated by flash column chromatography.



HSiO1 was isolated by flash column chromatography to afford a light brown solid (31 mg, 46%). ^{1}H NMR (600 MHz, DMSO-*d*6) δ 679 (s, 2H), 6.70 (s, 2H), 6.13 (s, 1H), 2.81 (s, 12H), 2.31 (s, 6H), 0.36 (s, 6H); ^{13}C NMR (150 MHz, DMSO-*d*6) δ 144.22, 136.91, 129.97, 123.05, 119.40, 115.80, 41.80, 18.21, 1.01; ESI-MS $[M+H]^+$: calcd for 340.2209, Found 340.2202.



HSiO2 was isolated by flash column chromatography to afford a light brown solid (30 mg, 41%). ^{1}H NMR (600 MHz, DMSO-*d*6) δ 6.41 (s, 2H), 6.36 (s, 2H), 6.01 (s, 1H), 3.73 (t, J = 6 Hz, 8H), 2.77 (s, 6H), 2.26 (t, J = 6.6 Hz, 4H), 0.32 (s, 6H); ^{13}C NMR (150 MHz, DMSO-*d*6) δ 145.63, 136.97, 123.09, 116.98, 115.54, 113.45, 52.99, 29.71, 18.05, 0.934; ESI-MS $[M+H]^+$: calcd for 364.2209, Found 364.2200.



HSiO3 was isolated by flash column chromatography to afford a light brown solid (60 mg, 71%). ^{1}H NMR (600 MHz, $CDCl_3$) δ 7.28 (s, 2H), 6.94 (s, 2H), 6.17 (s, 1H), 3.91 (s, 8H), 3.12 (s, 8H), 2.36 (s, 6H), 0.45 (s, 6H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 144.07, 138.92, 122.30, 121.82, 119.67, 116.44, 67.18, 51.140, 18.10, 0.515; ESI-MS $[M+H]^+$: calcd for 424.2420, Found 424.2411.

3. Preparation of the test solution

A stock solution of **SiO1-3** and **HSiO1-3** (2 mM) were prepared in CH_3CN, which were then diluted to the corresponding concentration with PBS buffer (20 mM, pH 7.4). Hypochlorite solution (ClO^-) was prepared by the dilution of commercial NaClO solution in deionized water, and the concentration of ClO^- was determined by measuring the absorption of the solution at 292 nm (The extinction coefficient of ClO^- in deionized water is 350 M^{-1} cm^{-1} at 292 nm). Peroxynitrite solution ($ONOO^-$) was synthesized according to literature report,[1] and the concentration of $ONOO^-$ was determined by measuring the absorption of the solution at 302 nm (The extinction coefficient of $ONOO^-$ solution in 0.1 M NaOH is 1,670 M^{-1} cm^{-1} at 302 nm). Hydrogen peroxide solution (H_2O_2) was prepared by the dilution of commercial H_2O_2 solution in deionized water. Superoxide solution ($O_2^{\cdot-}$) was generated from xanthine/xanthine oxidase system (Xanthine oxidase was first dissolved in the probe solution, and then xanthine in 1.6 M NaOH was added, which was stirred at 25 °C for 1 h). Hydroxyl radical (OH·) was generated *in situ* by adding Fe(II) to 10 eq of H_2O_2 (Fenton reaction), and the concentration of OH· was equal to the Fe(II) concentration. Singlet oxygen ($^1O_2$) was generated *in situ* by addition ClO^- solution to 10 eq of H_2O_2 solution. Nitric oxide (NO·) was generated from commercial NOC-9. The aqueous solutions of anions were freshly prepared from their sodium salts in deionized water, and the aqueous solutions of cations were freshly prepared from their chloride salts in deionized water.

4. Quantum yield determination

Fluorescence quantum yields of **SiO1-3** were determined in PBS with Cy5.5 (Φ_f = 0.23 in PBS) as standard. The quantum yield was calculated using Eq.1:

$$\emptyset_{sam} = \emptyset_{ref}\left(\frac{F_{sam}}{F_{ref}}\right)\left(\frac{\eta_{sam}}{\eta_{ref}}\right)^2\left(\frac{Abs_{ref}}{Abs_{sam}}\right) \quad \text{(Eq.1)}$$

Where Abs_{ref} and Abs_{sam} are the absorbance of the reference and sample solution at the reference excitation wavelength, F_{ref} and F_{sam} are the corresponding integrated fluorescence intensity, and η_{sam} and η_{ref} are the solvent refractive indexes of sample and reference, respectively. Absorbance of sample and reference at their respective excitation wavelengths was controlled to be lower than 0.05.

5. Photobleaching Assays

The photobleaching assays were carried out by continuously irradiating the PBS solution of sample by a 1000 W Xe lamp. The PBS solutions of the samples (2 μM) were placed in square cross section quartz cells (1×1 cm), and the distance between the cells and the lamp was 10 cm. The fluorescence spectra changes of **SiO1-3**, Cy5.5 and Cy7 were monitored as a function of time.

6. Cell culture and fluorescence imaging

All cell lines were purchased from GeneFull Biotech co., Ltd (China). Raw 264.7 cells were grown in RPMI 1640 medium and HeLa cells were grown in Dulbecco's Modified Eagle's Medium (DMEM) supplemented with 10 % FBS (Fetal Bovine Serum), 100 U/mL sodium penicillin G and 100 μg/mL streptomycin at 37 ºC in humidified environment of 5% CO_2. Cells were plated on glass bottom cell culture dish (30 mm) and allowed to adhere for 12 hours. Before experiments, cells were washed with PBS 3 times. Then, the cells were treated with 10 μM **SiO1-3** or **HSiO3** in PBS for indicated timescales in different experiments. After washed with PBS 3 times, these cells were imaged under confocal microscope. Emission was collected at 650–750 nm (λ_{ex} = 633 nm).

7. Cyotoxicity assays.

The CCK–8 cell proliferation assay was applied to investigate the cytotoxicity of **SiO3** and **HSiO3**. Briefly, the growth adherent HeLa cells were digested into cell suspensions. Cells were seeded at a density of 5.0×10^3 cells per well into a 96–well plate and incubated with 100 μL of culture media overnight for cell attachment. Then, the stock solution of **SiO3** or **HSiO3** (2 mM) in CH_3CN was added, and the final concentrations were kept from 0 to 10 μM and 0 to 200 μM for further incubation with 24 h. Six replicate wells were used for each control and test concentration. Subsequently, cells were washed twice with PBS and incubated with fresh medium containing 10 μL CCK–8 for 0.5 h. The absorbance at 450 nm was measured by

iMark^{TM} *Microplate Absorbance Reader*. Cell viability (%) = ($A_{with\ probe}-A_{blank}$ / $A_{control}-A_{blank}$) × 100%.

8. Subcellular localization

HeLa cells were grown in DMEM (High glucose) supplemented with 10 % FBS (Fetal Bovine Serum), 100 U/mL sodium penicillin G and 100 μg/mL streptomycin at 37 ºC in humidified environment of 5% CO_2. Cells were plated on glass bottom cell culture dish (30 mm) and allowed to adhere for 12 hours. Before experiments, HeLa cells were washed with phosphate buffer saline (PBS) 3 times. Then, the cells were costained with **SiO1-3** (10 μM, 10 min) and LysoTracker Green DND-26 (50 nM, 10 min), or Mito Tracker Green (0.2 μM, 10 min) in PBS at 37 °C. After washed with PBS 3 times, fluorescence images were performed. Emission was collected at 650–750 nm for **SiO1-3** (λ_{ex} = 633 nm) and at 493–598 nm for both LysoTracker Green DND-26 and MitoTracker Green FM (λ_{ex} = 488 nm).

9. Imaging HClO/ONOO$^-$ in living cells using HSiO3

To image endogenous HClO/ONOO$^-$, Raw 264.7 macrophage cells were pretreated with LPS (1 μg/mL)/IFN-γ (50 ng/mL) in DMEM medium for 12 h. Then, the cells were washed three times with PBS, and incubated with **HSiO3** (10 μM) for 10 min. After washing three times with PBS, the fluorescence imaging were performed. For the inhibition assay, the cells were pretreated with LPS (1 μg/mL)/IFN-γ (50 ng/mL) for 12 h in the presence of AG (5 mM) or MPO inhibitor ABAH (200 μM) in DMEM medium, respectively. Then, the cells were washed three times with PBS, and then incubated with **HSiO3** (10 μM) for 10 min. After washed with PBS 3 times, the imaging assays were performed.

10. Imaging HClO/ONOO$^-$ in inflamed mouse models

Male BALB/c nude mice (6-8 weeks old) were obtained from Beijing Virtal River Laboratory Animal Technology Co., Ltd. All the animal experiments were carried out in accordance with the relevant laws and guidelines issued by the Ethical Committee of Shanxi University. The living animal imaging assays were performed in a Bruker

In Vivo FX Pro small animal optical imaging system with an excitation filter of 690 nm and an emission filter of 750 nm. For imaging exogenous HClO/$ONOO^-$, the mice were first i.p. injected with **HSiO3** (1 mM, 300 μL) for 15 min, and then i.p. injected with NaClO (2 mM, 300 μL) and SIN-1 (2 mM, 300 μL) for 15 min, respectively. For imaging endogenous HClO/$ONOO^-$, the mouse was first i.p. injected with LPS (1 mg/mL, 300 μL) for 24 h, and then i.p. injected with **HSiO3** (1 mM, 300 mL) for 15 min.

11. Imaging HClO/$ONOO^-$ in Bleomycin-induced Pulmonary fibrosis and evaluating therapeutic effect of AG and OFEV

Male mice (C57BL/6, 8-10 weeks old) were purchased from Beijing Virtal River Laboratory Animal Technology Co., Ltd. All the animal experiments were carried out in accordance with the relevant laws and guidelines issued by the Ethical Committee of Shanxi University. The mice were randomly divided into four groups: control group, BLM group, AG-treated group and OFEV-treated group (three mice in each). Details are described below: (1) The mice in the control group received a single dose of saline (100 μL) by intratracheal installation; (2) The mice in the BLM group received a single dose of BLM (3 mg/kg, 100 μL) by intratracheal instillation; (3) The mice in the AG-treated group received a single dose of BLM (3 mg/kg, 100 μL) by intratracheal instillation, followed by daily i.p. injection of AG (20 mg/kg/day); (4) The mice in the OFEV-treated group received a single dose of BLM (3 mg/kg, 100 μL) by intratracheal instillation, followed by daily gavage of OFEV for 12 days starting from the third day after the administration of BLM. At day 15, the lung tissues from a mouse in each group were collected for hematoxylin and eosin (HE) and Masson staining.

12. Supplementary Spectra

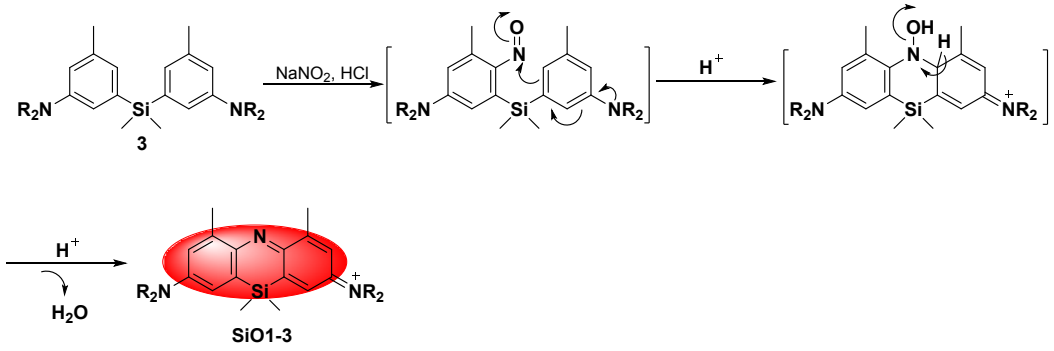


Figure S1. Proposed reaction mechanism for synthesis of **SiO1-3** from **3**.

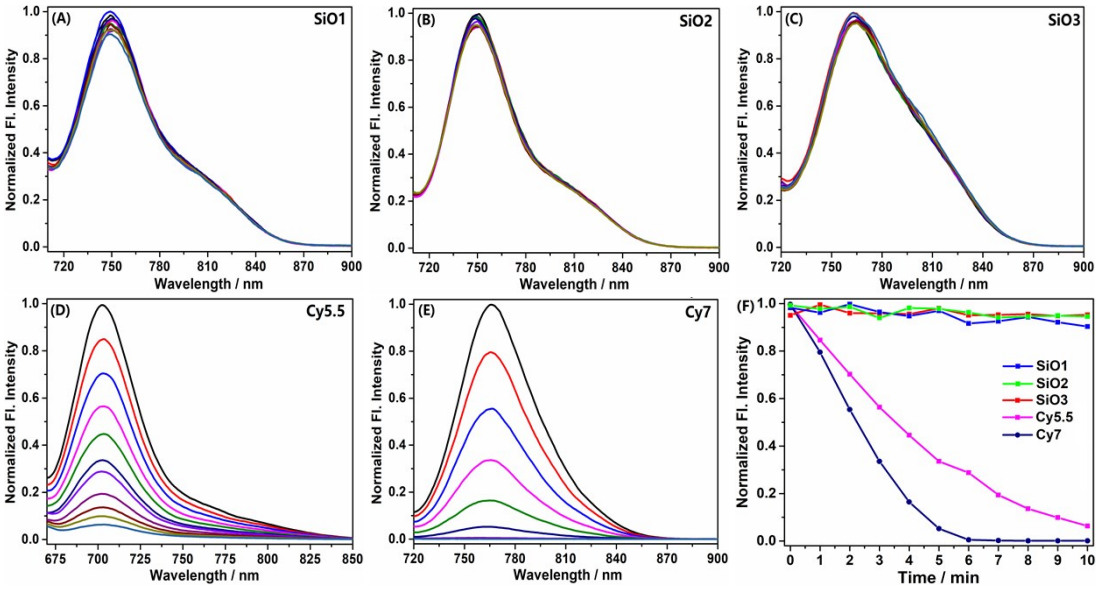


Figure S2. Photostability comparison of Si-oxazines **SiO1-3** with commercial NIR dyes Cy5.5 and Cy7. (A-E) Normalized fluorescence spectra changes of **SiO1-3**, Cy5.5 and Cy7 in PBS (20 mM, pH 7.4) continuously excited by a 1000 W Xe lamp for 10 min. (F) Time-dependent fluorescence intensity changes in A-E.

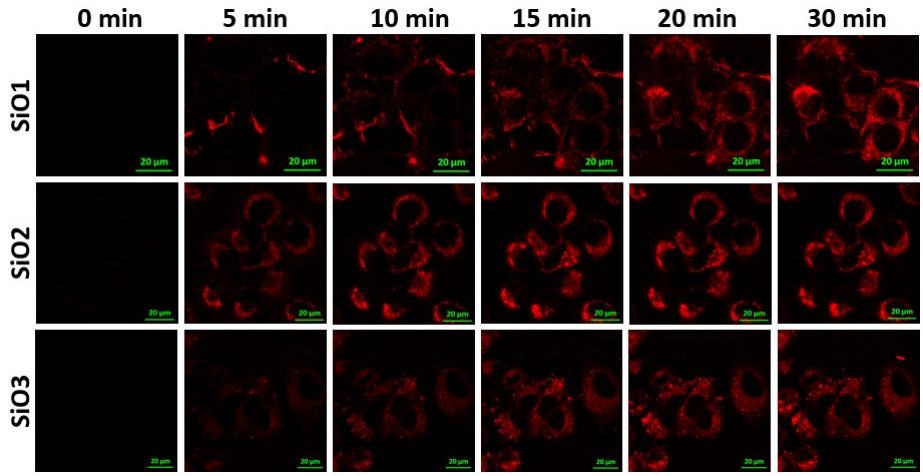


Figure S3. Fluorescence images of HeLa cells incubated with **SiO1-3** (10 μM) for 30 min, respectively. The images were obtained in the indicated time point. Emission was collected at 650–750 nm (λ_{ex} = 633 nm). Scale bar: 20 μm.

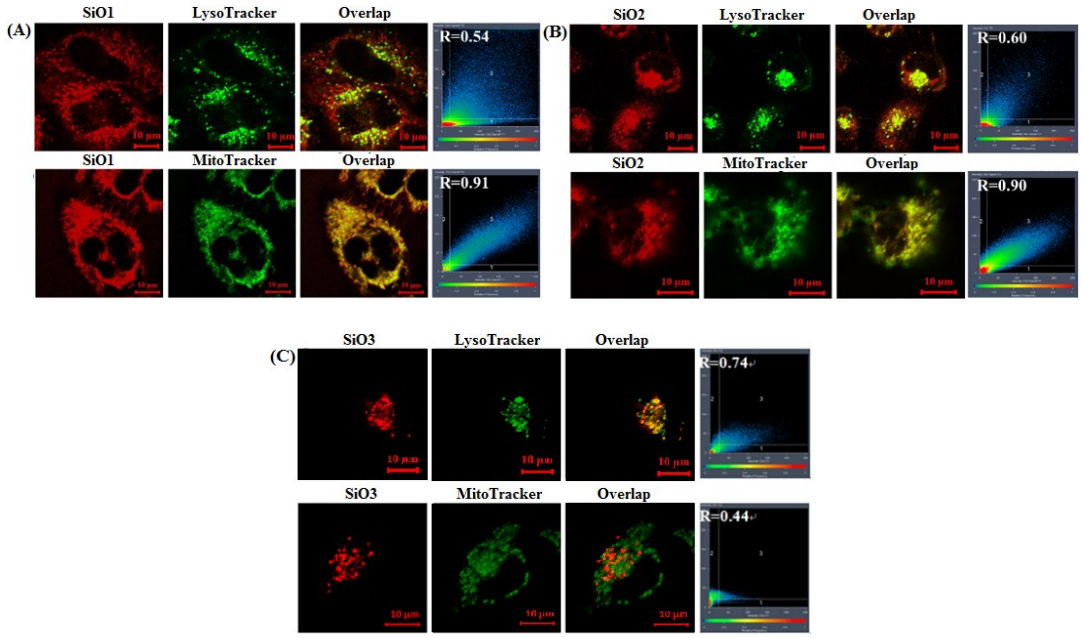


Figure S4. Fluorescence images of HeLa cells co-stained with **SiO1-3** (10 μM, 20 min) and LysoTracker Green DND-26 (50 nM, 10 min) or MitoTracker Green FM (0.2 μM, 10 min), respectively. For **SiO1-3**, images were obtained from band path of 650-750 nm (λ_{ex} = 633 nm). For LysoTracker or MitoTracker, images were obtained from band path of 493-598 nm (λ_{ex} = 488 nm). Scale bar: 10 μm. Note that, the co-staining assays revealed that **SiO1**/**SiO2** accumulated preferentially in mitochondria, whereas **SiO3** was mainly located in lysosomes presumably due to the existence of the lysosome-targetable morpholine groups.

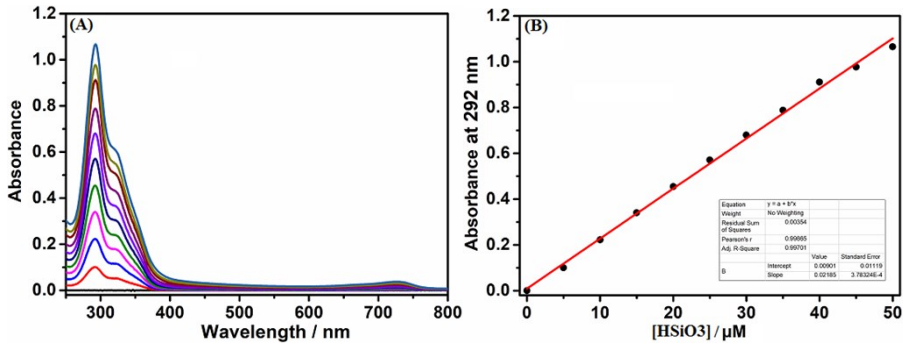


Figure S5. The concentration-dependent absorption spectra change of **HSiO3** (as a representative) (A) and corresponding absorption intensity changes at 292 nm (B) in pure PBS (20 mM, pH = 7.4).

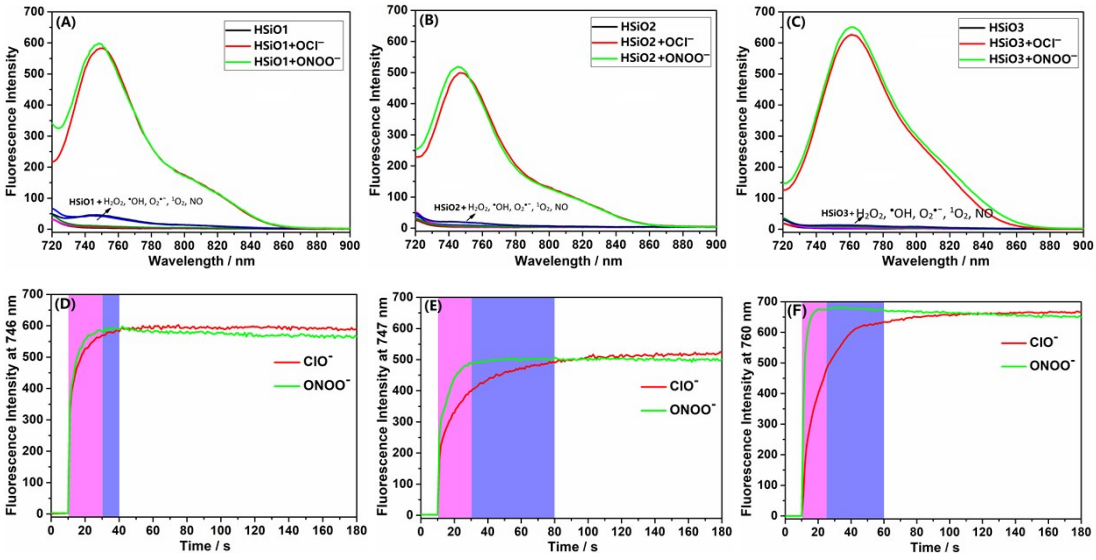


Figure S6. (A-C) Fluorescence spectra changes of **HSiO1-3** (2 μM) upon treated with various ROS and RNS, including H_2O_2 (4 μM), $^{\bullet}OH$ (4 μM), $O_2^{\bullet-}$ (4 μM), $^1O_2$ (4 μM), NO (4 μM), ClO^- (4 μM), $ONOO^-$ (4 μM), for 1 min. (D-F) Time-dependent fluorescence intensity changes of **HSiO1-3** after treated with ClO^- and $ONOO^-$. λ_{ex} = 700 nm and λ_{em} = 760 nm. Slits: 10/10 nm, voltage: 800 V.

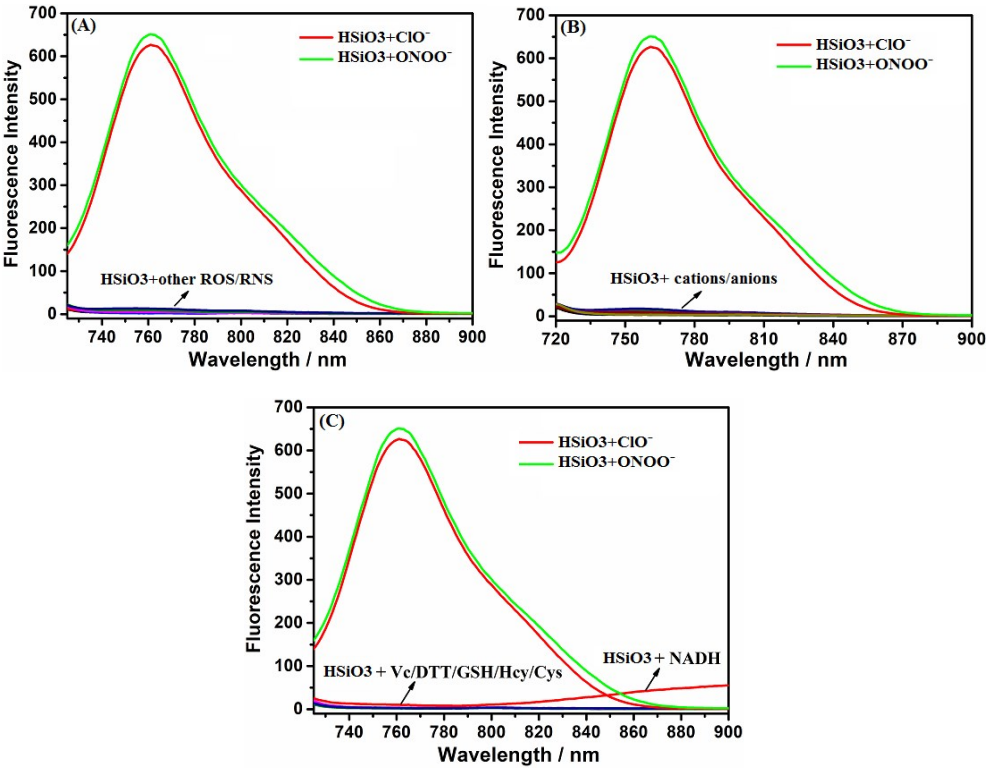


Figure S7. Fluorescence spectra of **HSiO3** (2 μM) upon treated with 4 μM ROS/RNS including H_2O_2, $HO^{\bullet}$, $O_2^{\bullet-}$, $^1O_2$, NO, ClO^-, and $ONOO^-$ (A), 0.2 mM biologically related cations and anions including Ca^{2+} , Na^+, AcO^-, Cl^-, NO_3^-, NO_2^-, HCO_3^-, HSO_3^-, HS^- (B), and 0.2 mM biologically related reductants including NADH, Vc, DTT, GSH, Hcy, Cys (C). Condition: PBS buffer (20 mM, pH 7.4); 25 ^oC; Slits: 10/10 nm; λ_{ex} = 700 nm; λ_{em} = 760 nm.

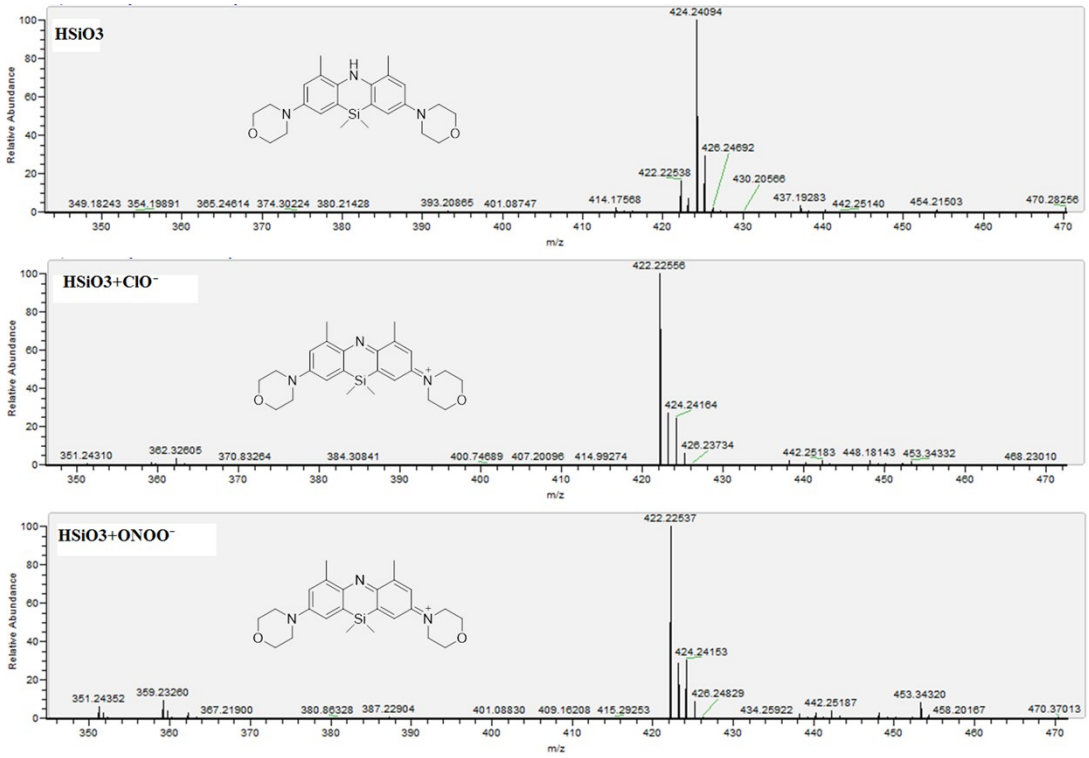


Figure S8. HRMS charts of **HSiO3**, **HSiO3**+HClO, and **HSiO3**+ONOO⁻.

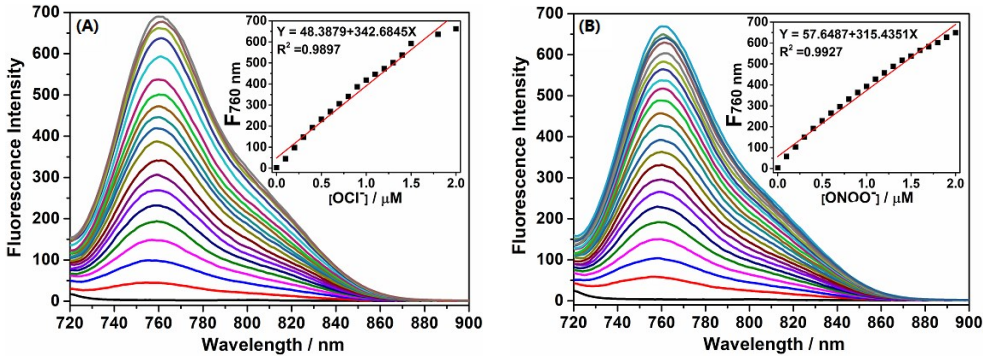


Figure S9. Fluorescence spectra changes of **HSiO3** (2 μM) treated with the increasing amount of ClO^- (A) and $ONOO^-$ (B), respectively. Conditions: PBS buffer (20 mM, pH 7.4); λ_{ex} = 700 nm and λ_{em} = 760 nm; Slits: 10/10 nm.

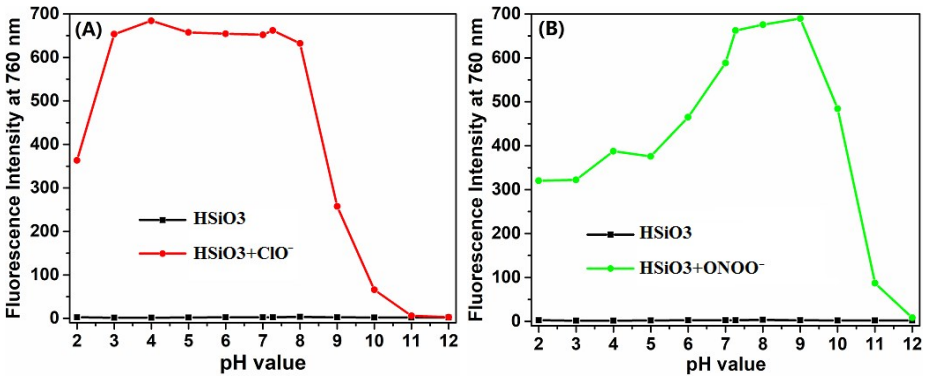


Figure S10. Fluorescence intensity changes of **HSiO3** (2 μM) at 760 nm in the absence and presence of 2 equiv of ClO^- (A) or $ONOO^-$ (B) as a function of pH values. Slits: 10/10 nm; λ_{ex} = 700 nm; λ_{em} = 760 nm; T = 25 °C.

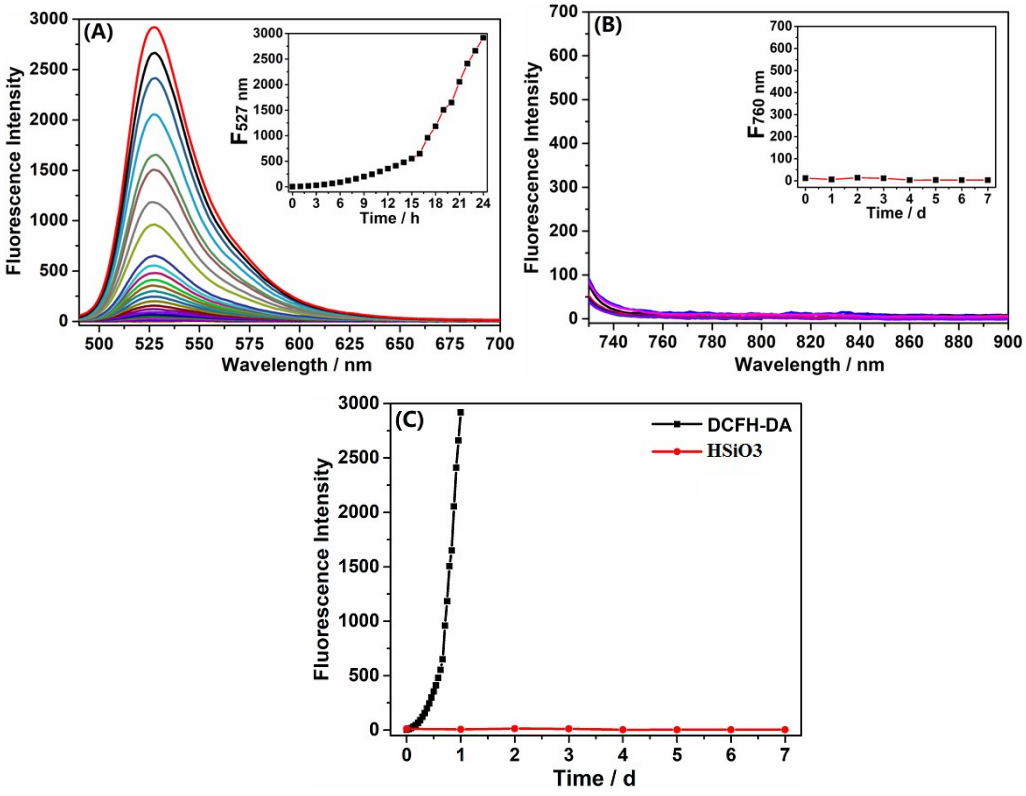


Figure S11. Time-dependent fluorescence spectra changes of DCFH-DA (2 μM) (A) and **HSiO3** (2 μM) (B), respectively, in PBS (20 mM, pH 7.4) at 25 °C as well as corresponding fluorescence intensity changes (C). For **HSiO3**, λ_{ex} = 700 nm, λ_{em} = 760 nm, Slits: 10/10 nm; for DCFH-DA, λ_{ex} = 460 nm, λ_{em} = 527 nm, Slits: 5/10 nm.

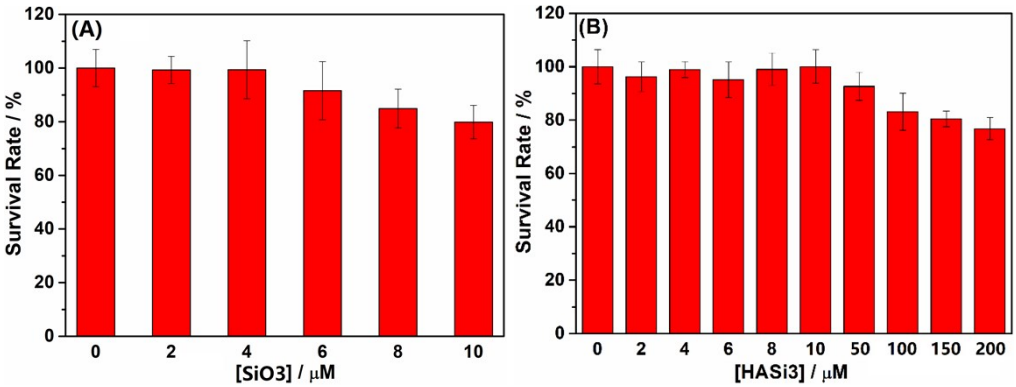


Figure S12. Percentage of viable HeLa cells treated with indicated concentrations of **SiO3** (A) and **HSiO3** (B) for 24 hours. Data were obtained by CCK8 assays.

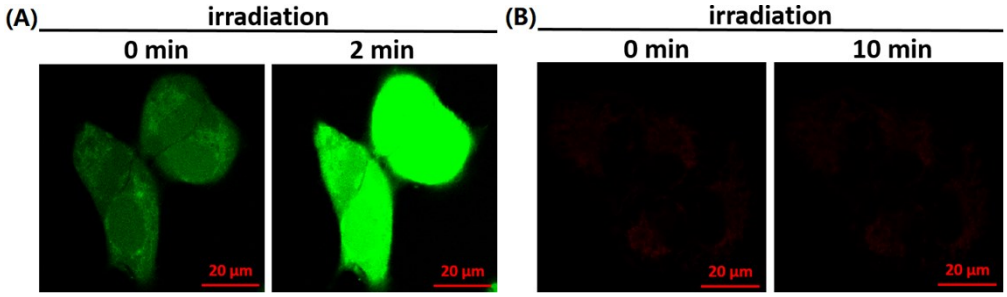


Figure S13. Photostability evaluation of DCFH-DA and **HSiO3** in HeLa cells. (A) Fluorescence images of the DCFH-DA-loaded HeLa cells (10 μM, 10 min) before and after the continuous laser irradiation at 488 nm for 2 min. (B) Fluorescence images of the **HSiO3**-loaded HeLa cells (10 μM, 10 min) before and after the continuous laser irradiation at 633 nm for 10 min.

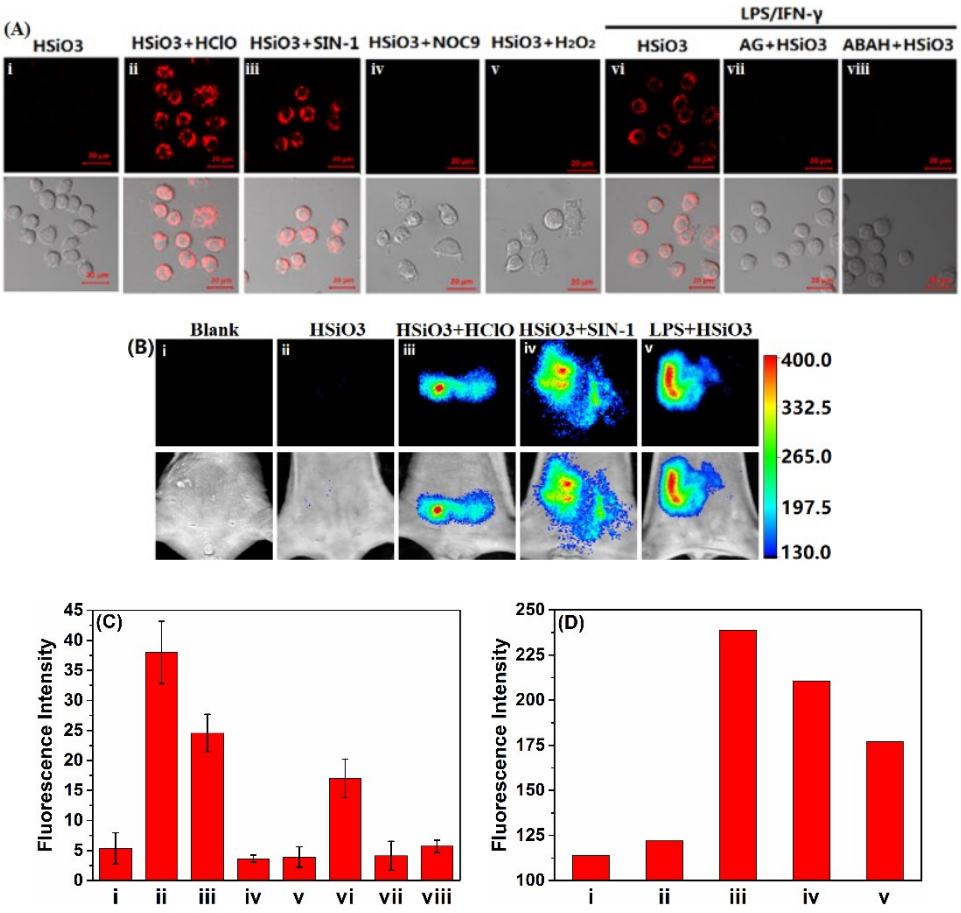


Figure S14. (A) Fluorescence images of RAW264.7 cells under different conditions. (i) **HSiO3** (10 μM, 10 min)-loaded cells; (ii-v) **HSiO3**-loaded cells treated with 200 μM of HClO, SIN-1, NOC-9, and H_2O_2, respectively; (vi–viii) Cells pretreated with LPS (1 μg/mL)/IFN-γ (50 ng/mL) for 12 h in the absence and presence of AG (5 mM) and ABAH (200 μM), and then treated with **HSiO3** (10 μM). Emission was collected at 650–750 nm (λ_{ex} = 633 nm). Scale bar: 20 μm. (B) Fluorescence images of BALB/c nude mice under different conditions. (i) Blank; (ii) Mouse injected i.p. with **HSiO3** (300 μL, 1 mM); (iii,iv) Mouse injected i.p. with **HSiO3** (300 μL, 1 mM) and then with HClO (300 μL, 2 mM) and SIN-1 (300 μL, 2 mM), respectively; (v) Mouse injected i.p. with LPS (1 mg/ml, 300 μL) for 24 h and then with **HSiO3** (300 μL, 1 mM). An excitation filter of 690 nm and an emission filter of 750 nm were used. (C) Quantification bars for images in (A). (D) Quantification bars for images in (B).

13. NMR and MS Spectra

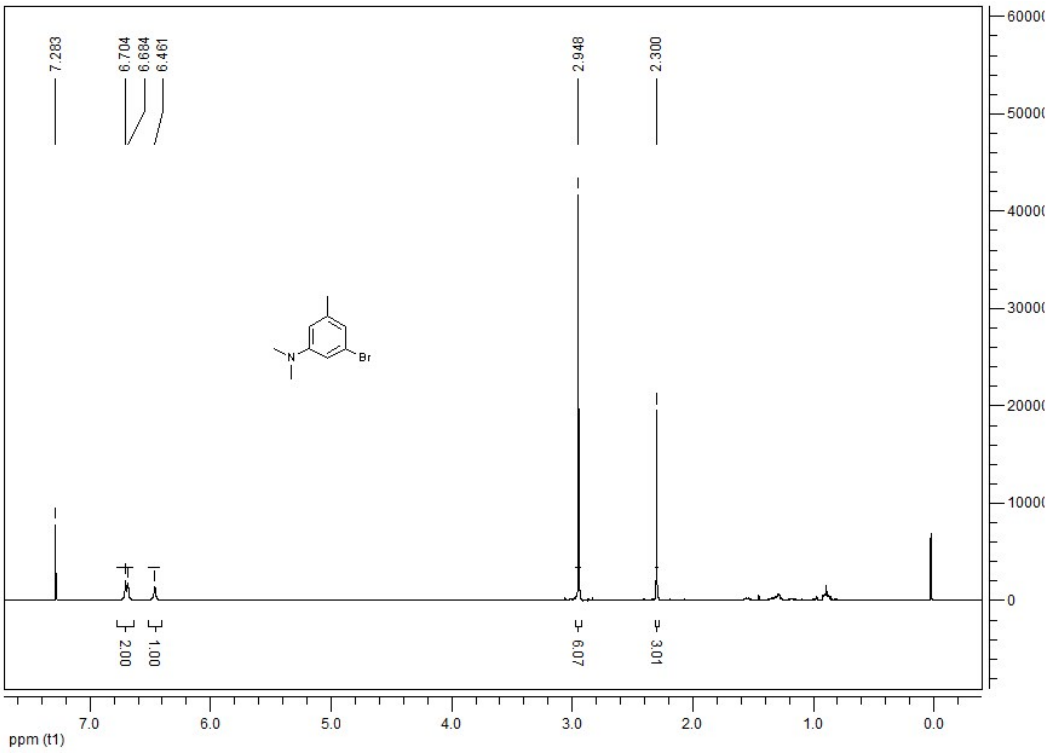


Figure S15. ^{1}H NMR chart of compound **2a** (600 MHz, $CDCl_3$)**.**

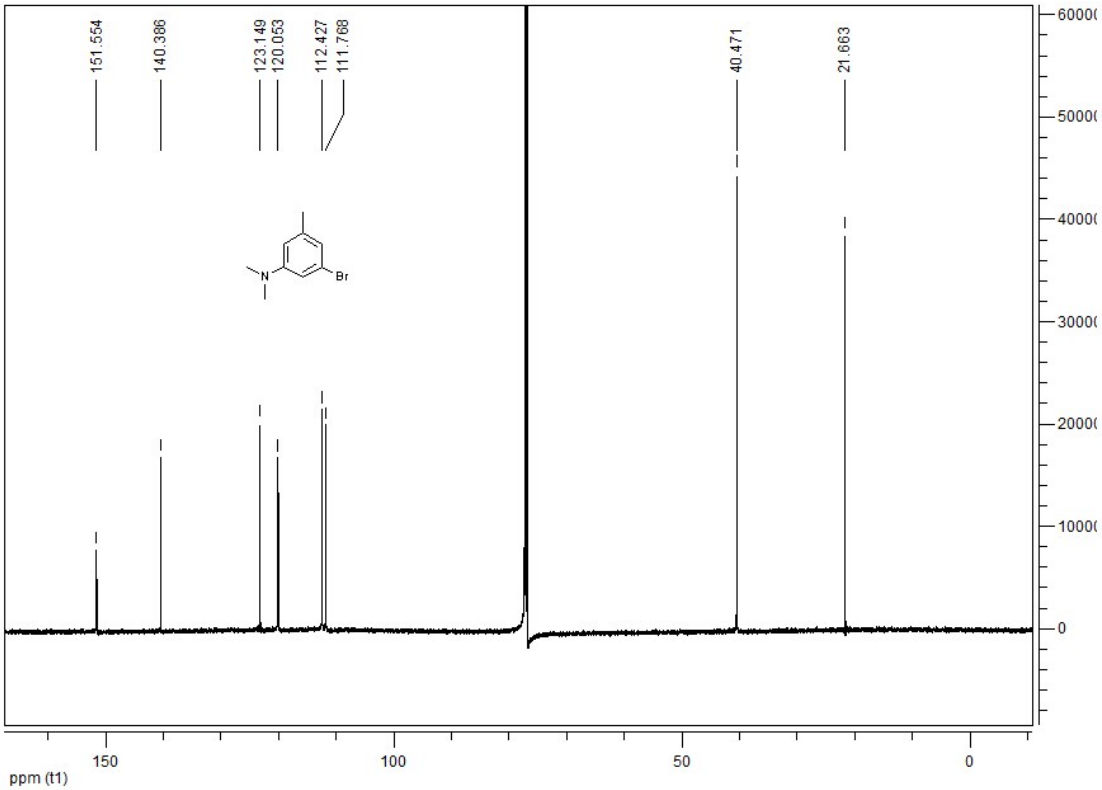


Figure S16. ^{13}C NMR chart of compound **2a** (150 MHz, $CDCl_3$).

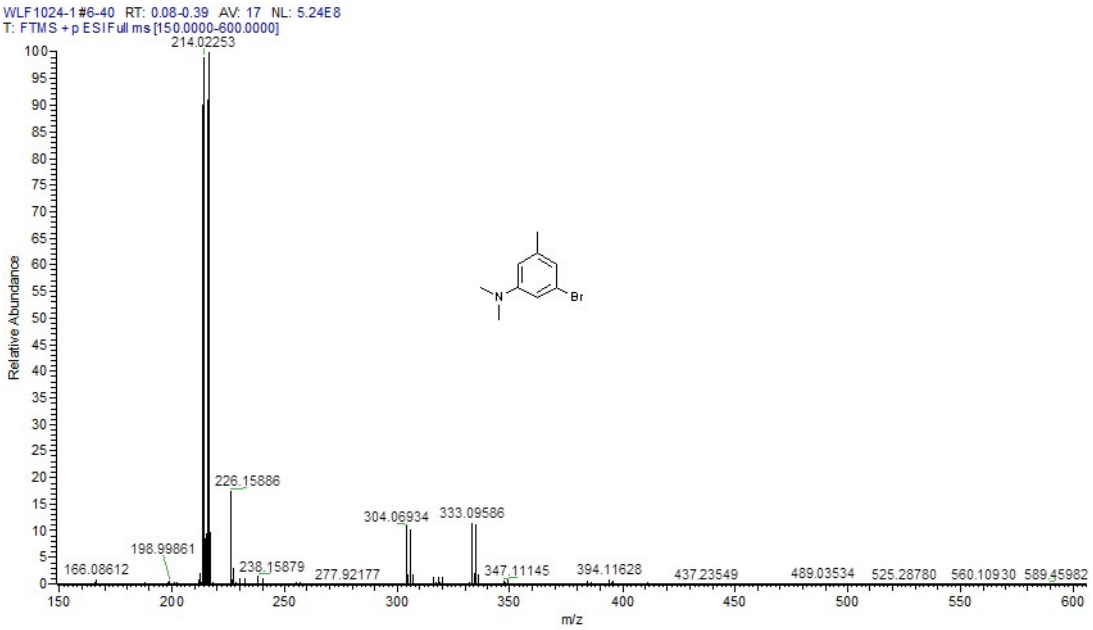


Figure S17. HRMS chart of compound **2a**.

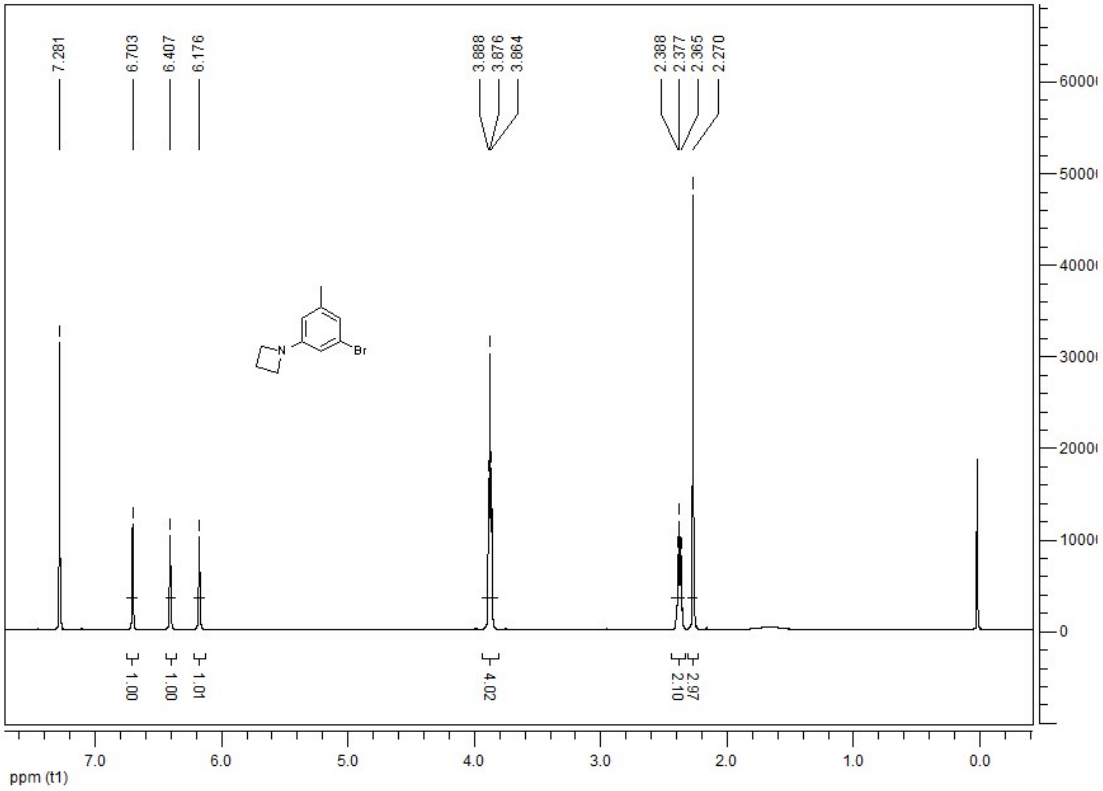


Figure S18. ^{1}H NMR chart of compound **2b** (600 MHz, $CDCl_3$)**.**

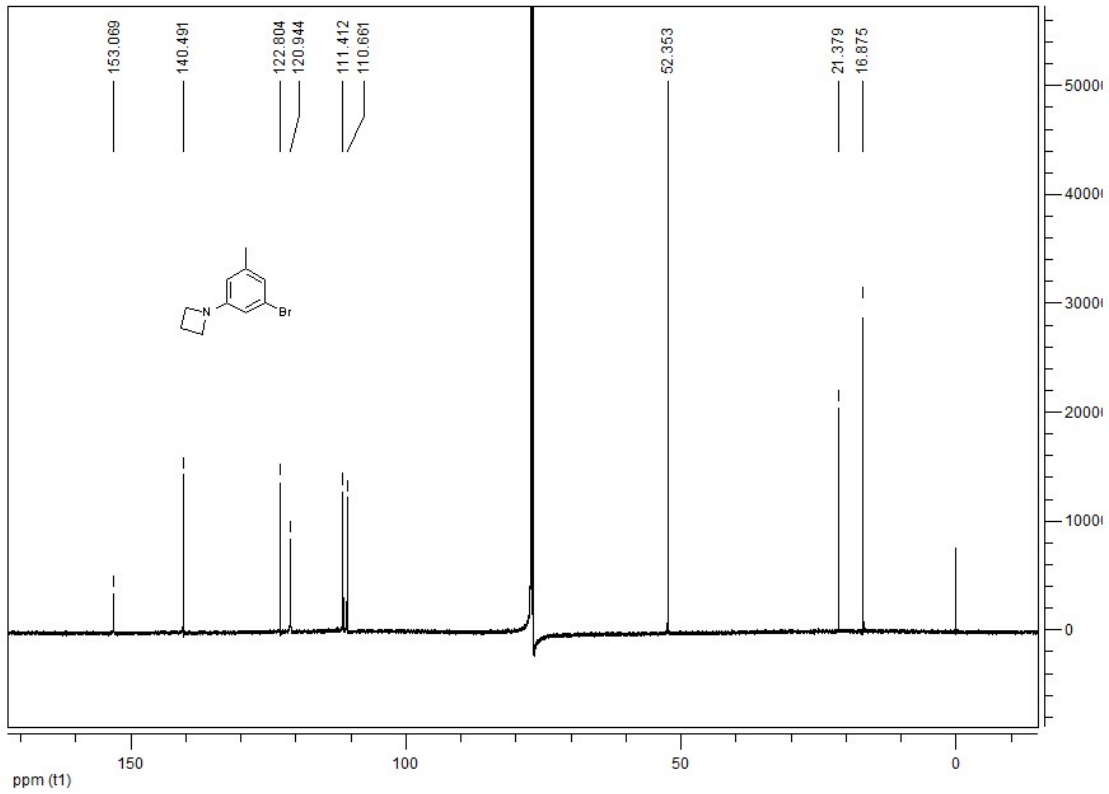


Figure S19. ^{13}C NMR chart of compound **2b** (150 MHz, $CDCl_3$).

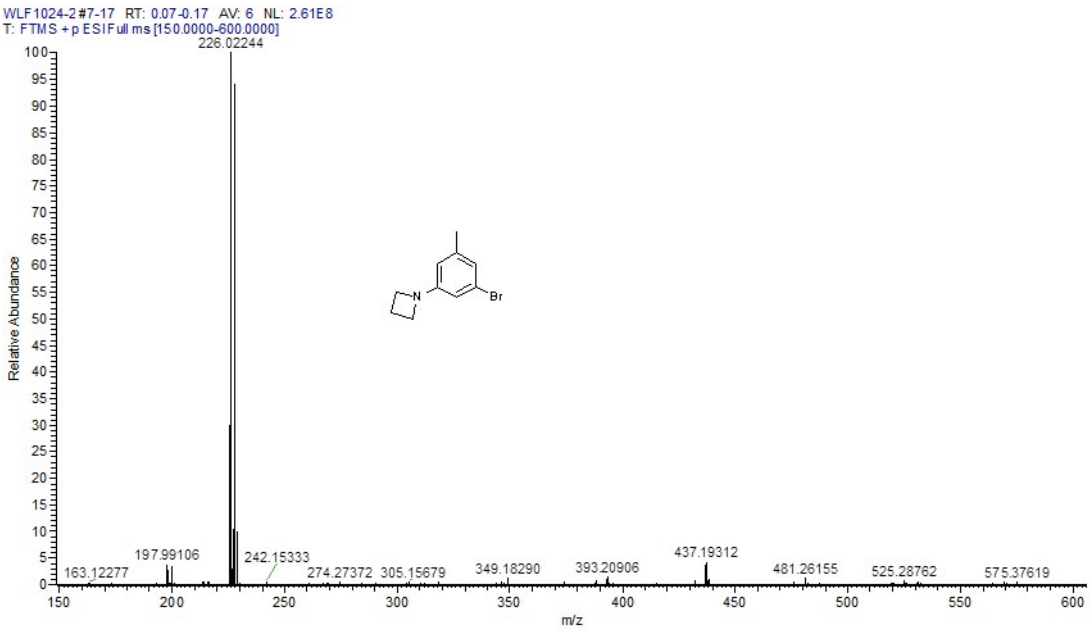


Figure S20. HRMS chart of compound **2b**.

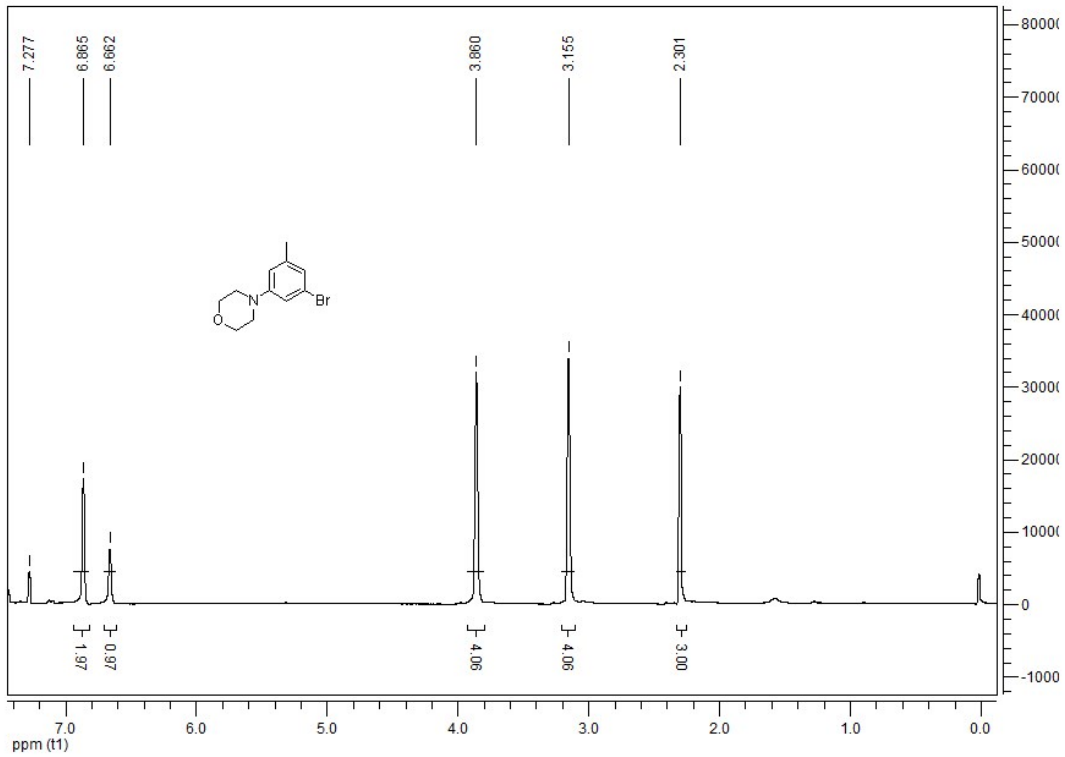


Figure S21. ^{1}H NMR chart of compound **2c** (600 MHz, $CDCl_3$)**.**

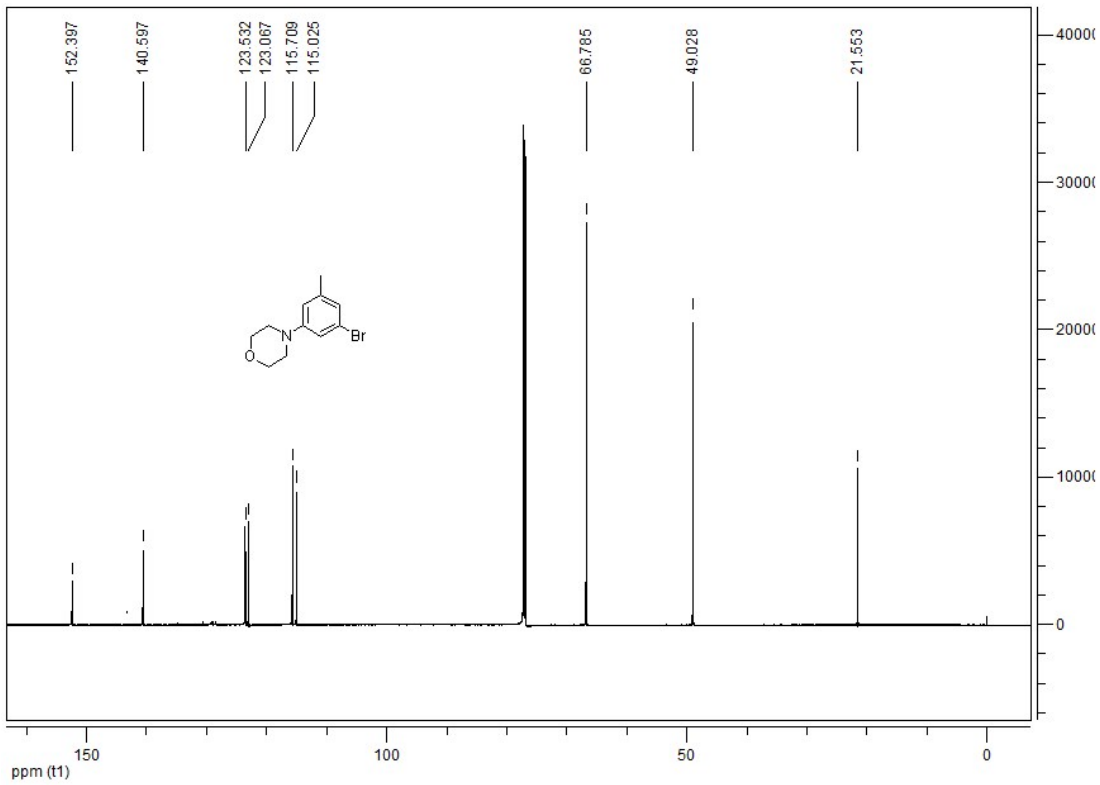


Figure S22. ^{13}C NMR chart of compound **2c** (150 MHz, $CDCl_3$).

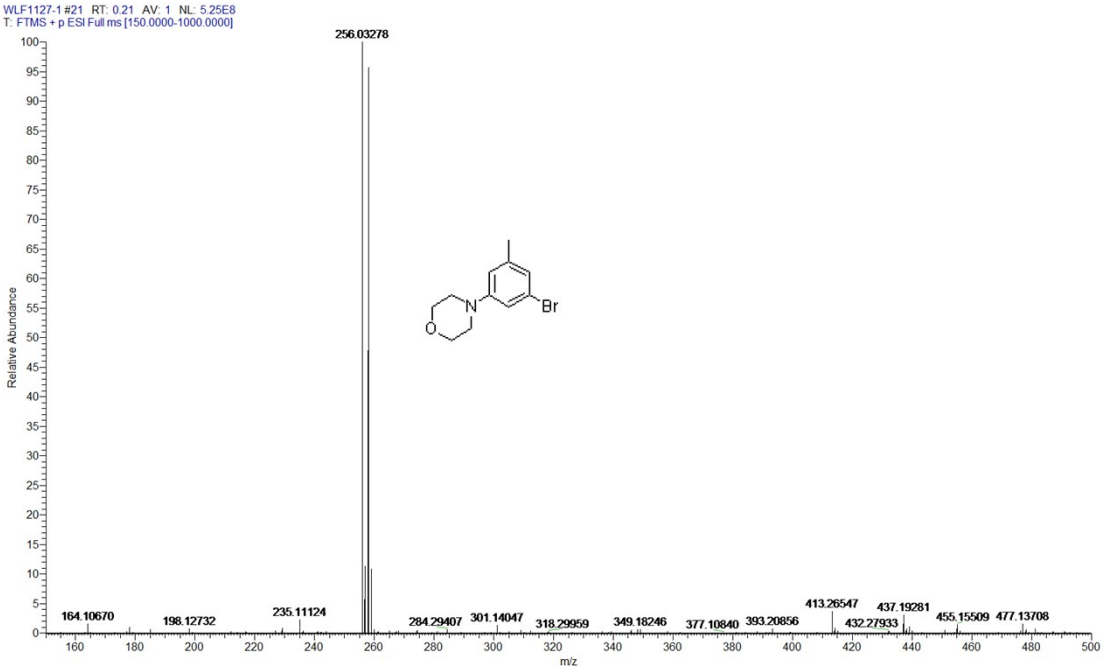


Figure S23. HRMS chart of compound **2c**.

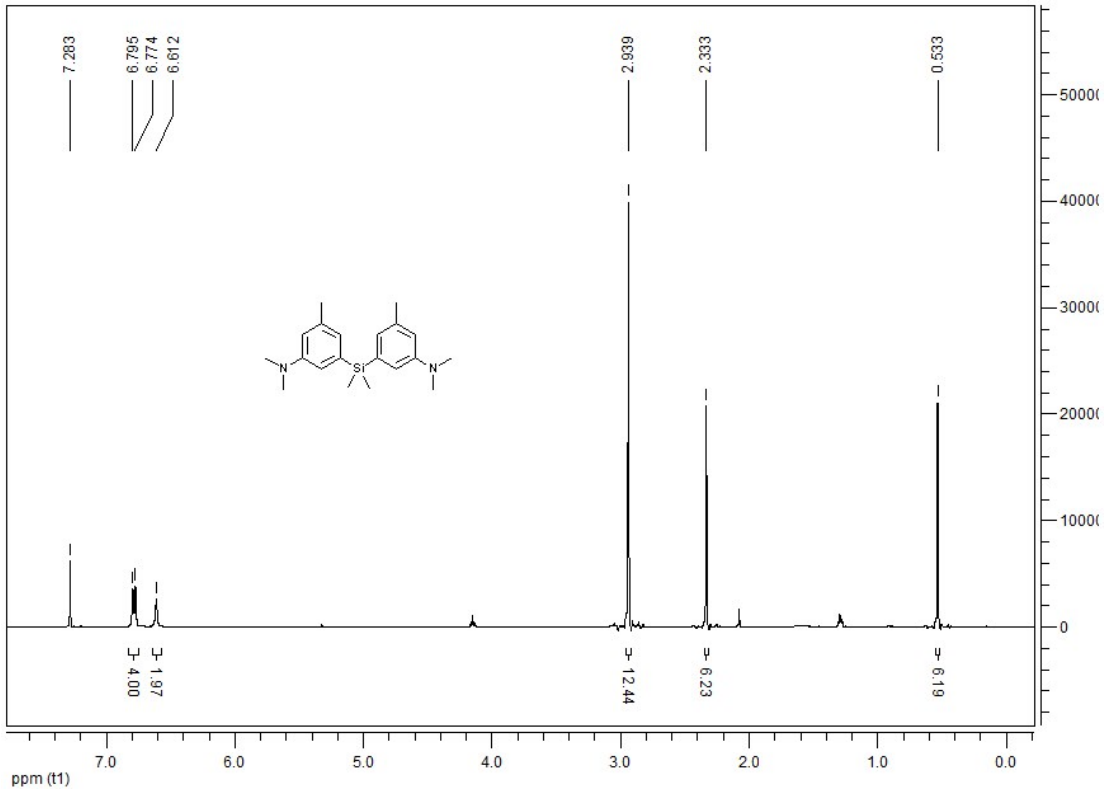


Figure S24. ^{1}H NMR chart of compound **3a** (600 MHz, $CDCl_3$)**.**

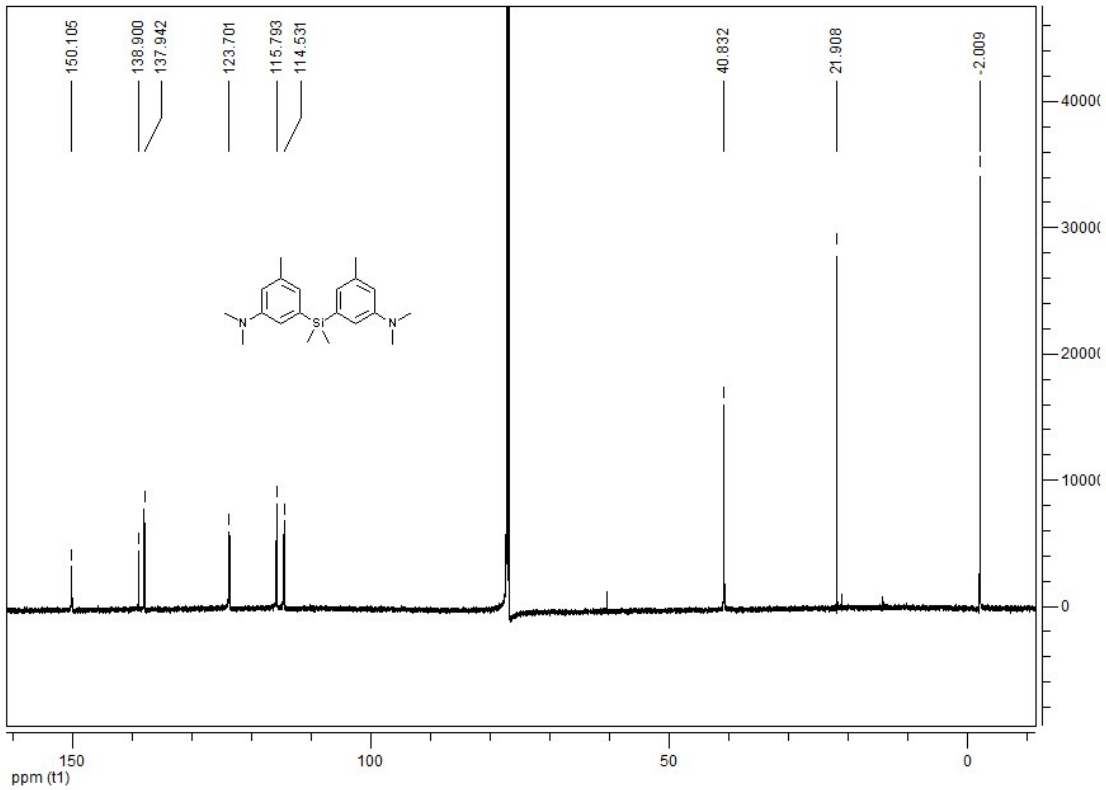


Figure S25. ^{13}C NMR chart of compound **3a** (150 MHz, $CDCl_3$).

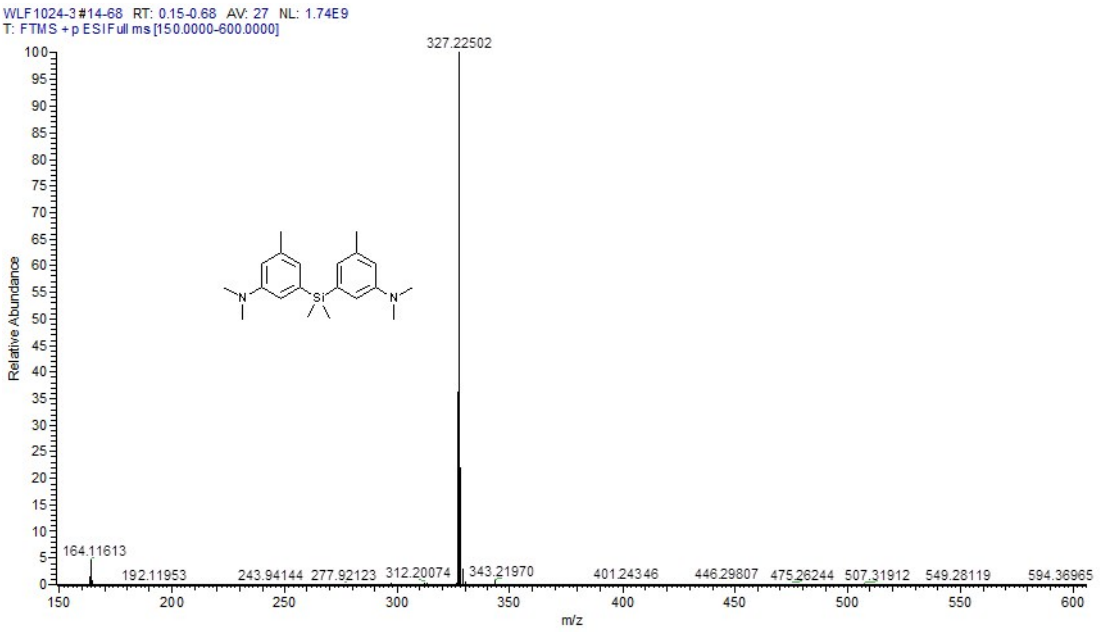


Figure S26. HRMS chart of compound **3a**.

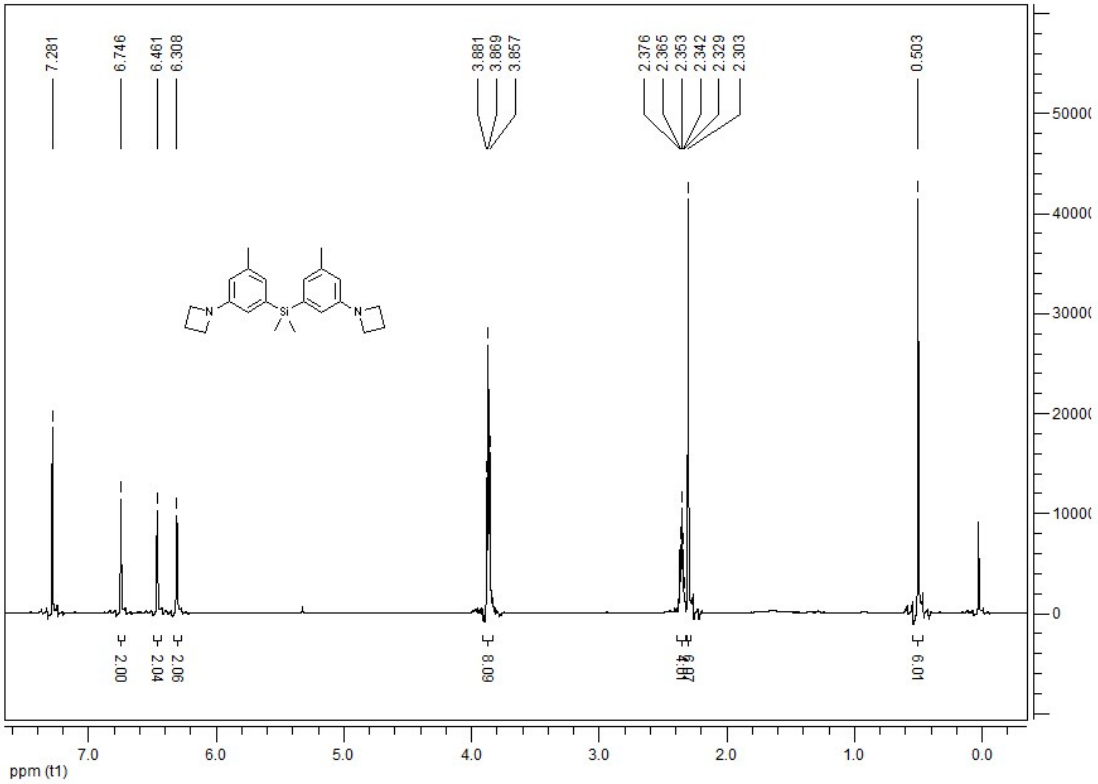


Figure S27. ^{1}H NMR chart of compound **3b** (600 MHz, $CDCl_3$)**.**

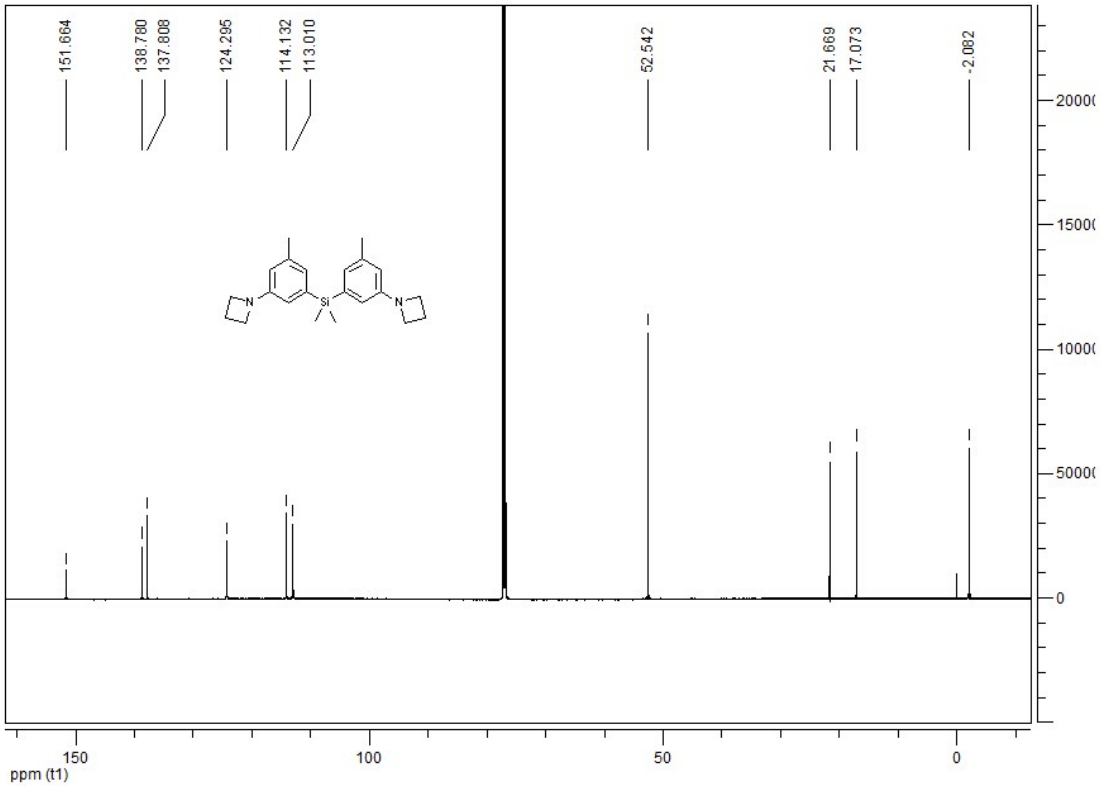


Figure S28. ^{13}C NMR chart of compound **3b** (150 MHz, $CDCl_3$).

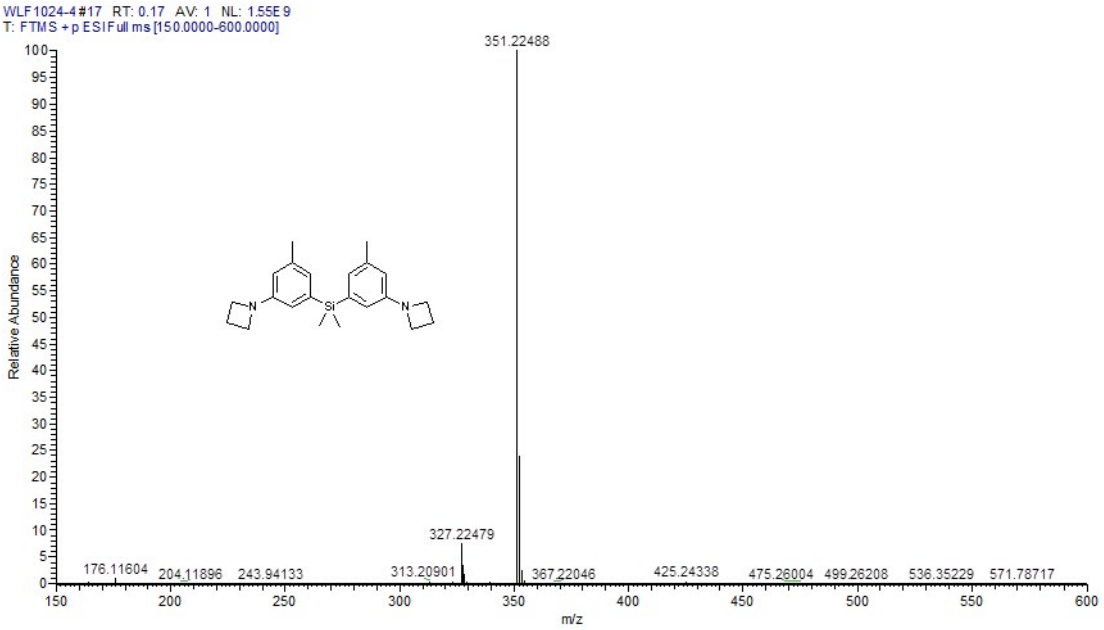


Figure S29. HRMS chart of compound **3b**.

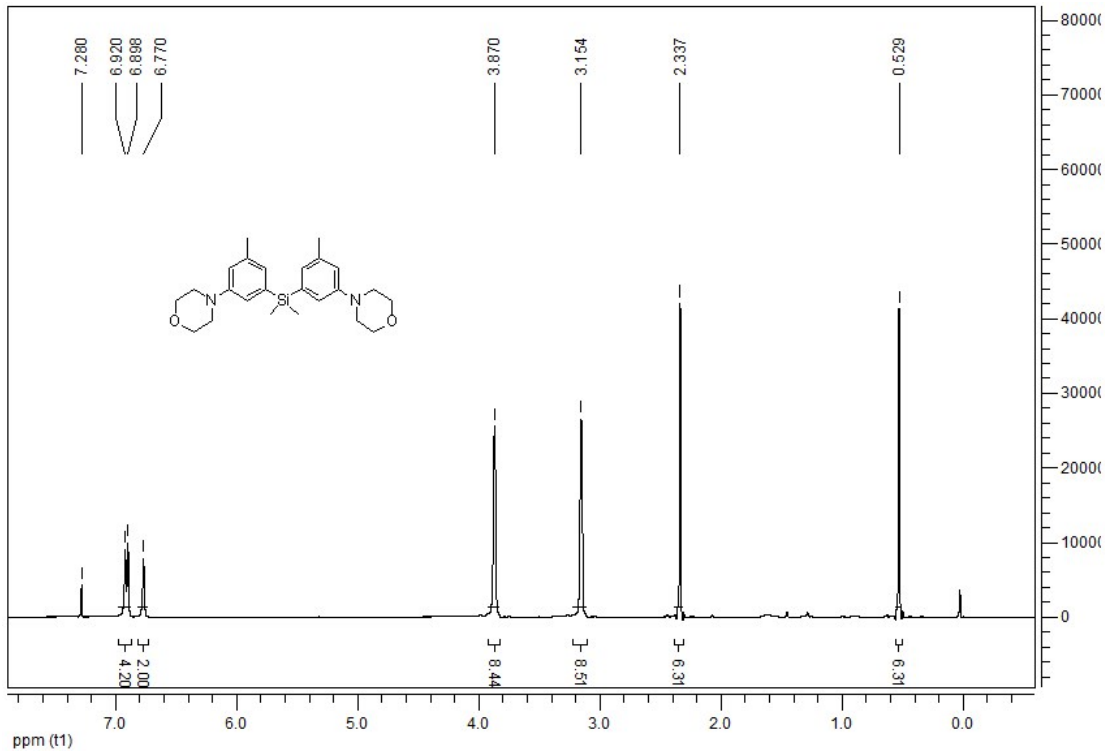


Figure S30. ^{1}H NMR chart of compound **3c** (600 MHz, $CDCl_3$)**.**

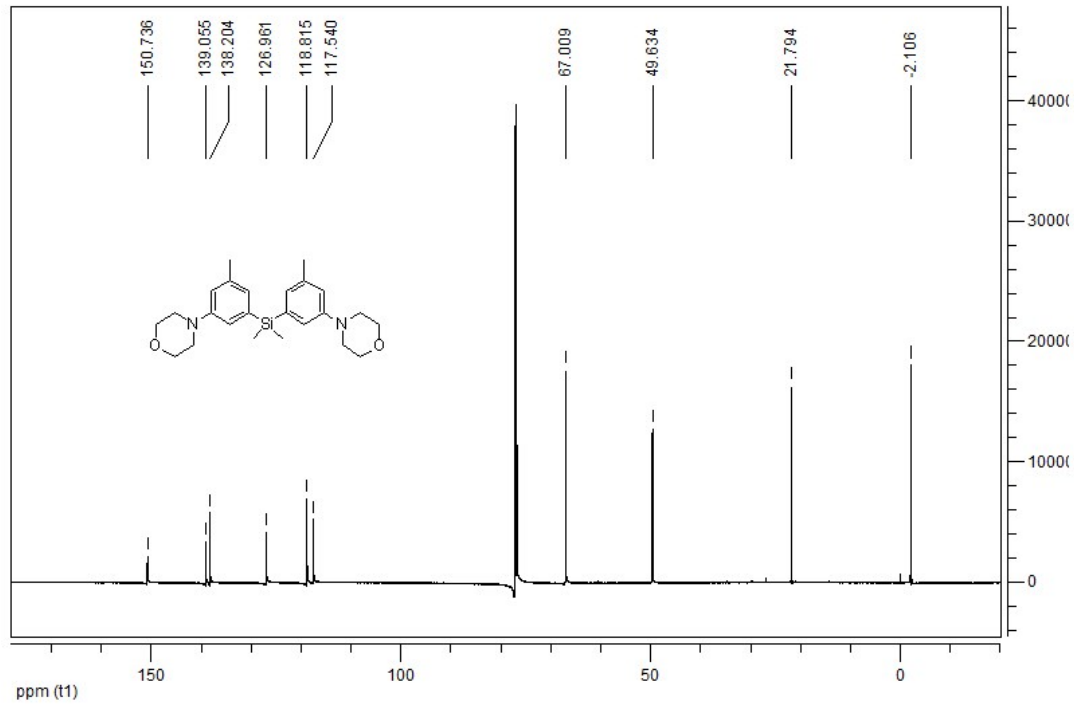


Figure S31. ^{13}C NMR chart of compound **3c** (150 MHz, $CDCl_3$).

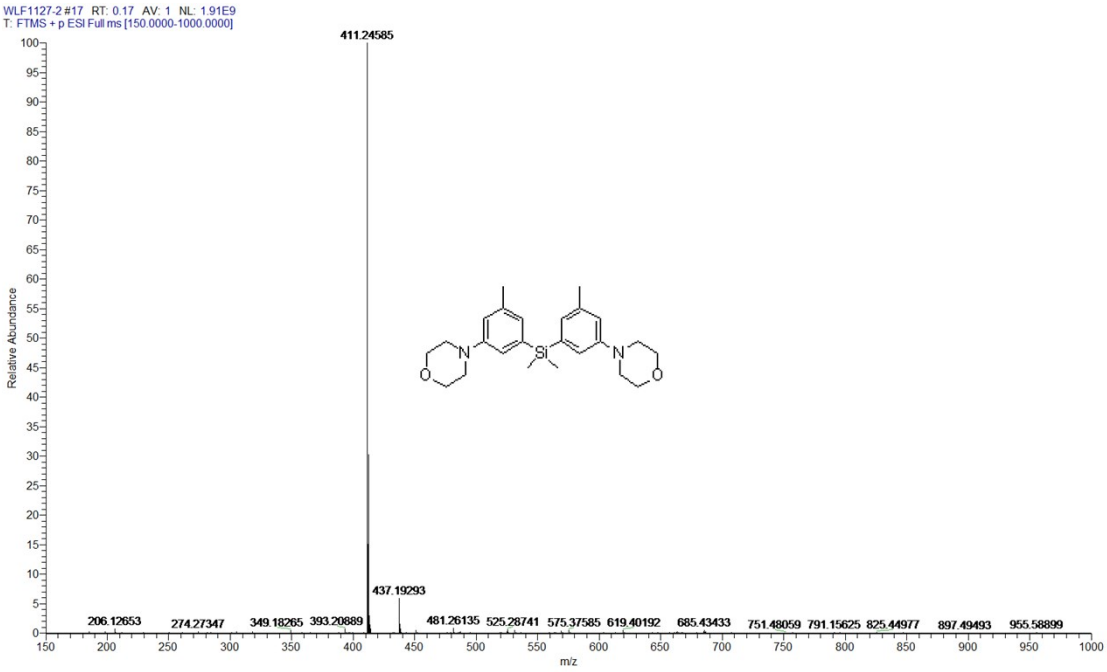


Figure S32. HRMS chart of compound **3c**.

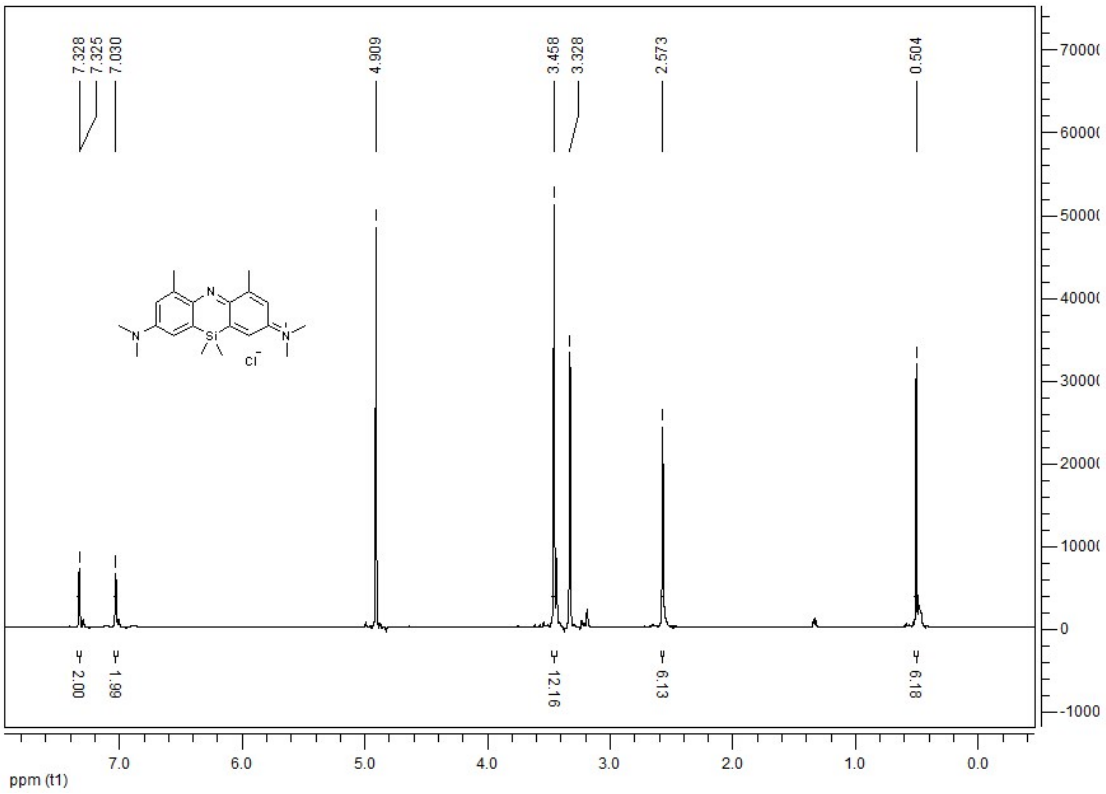


Figure S33. ^{1}H NMR chart of compound **SiO1** (600 MHz, CD_3OD).

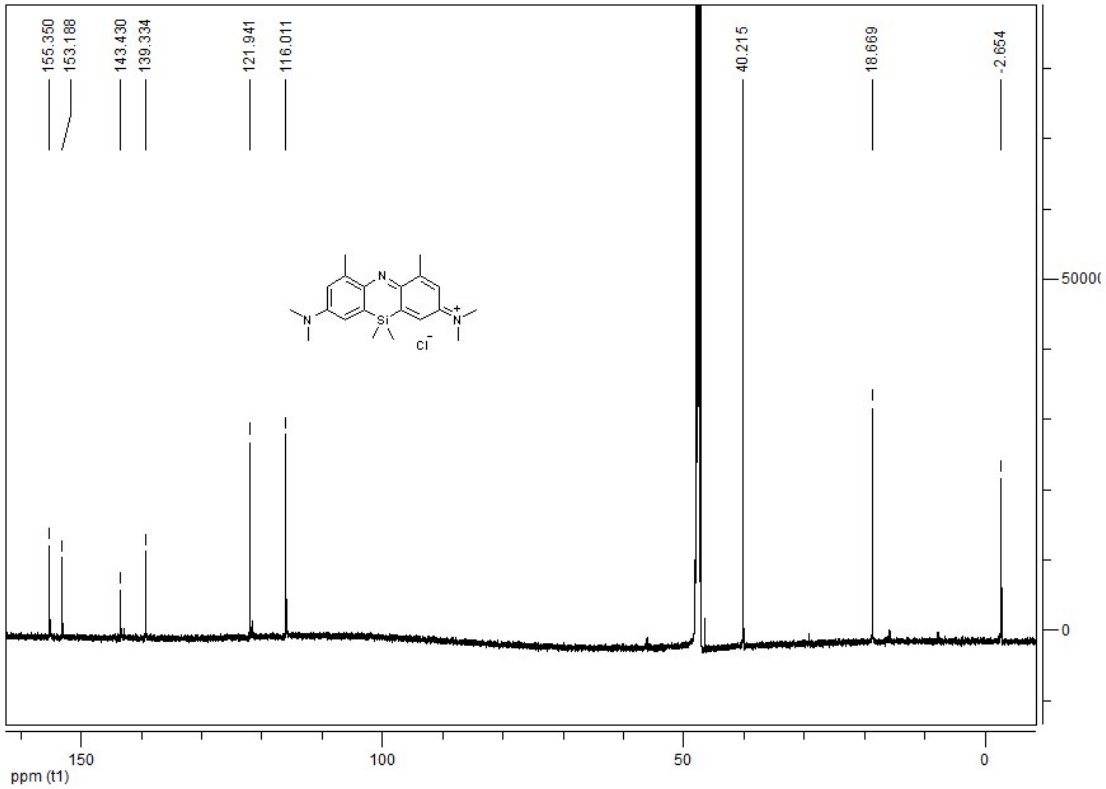


Figure S34. ^{13}C NMR chart of compound **SiO1** (150 MHz, CD_3OD).

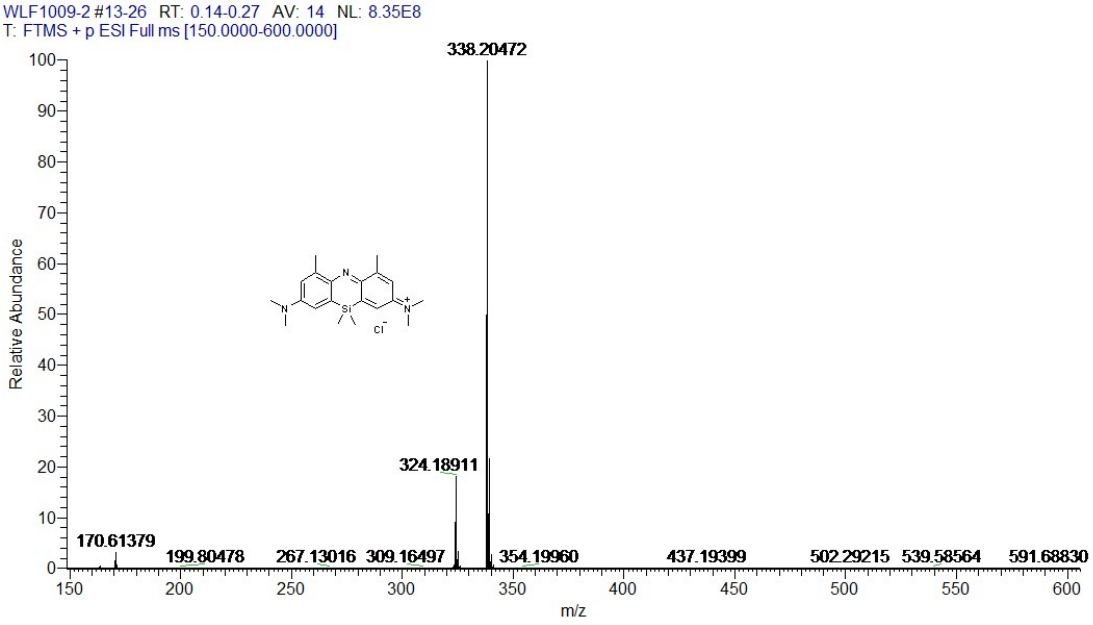


Figure S35. HRMS chart of compound **SiO1**.

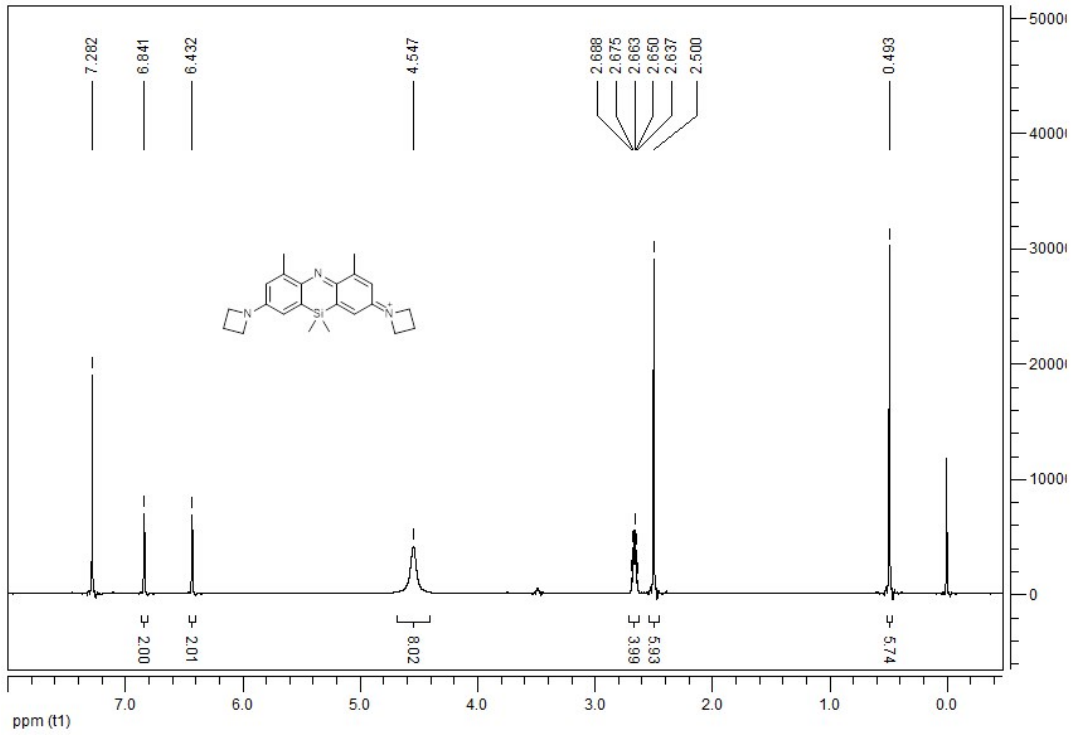


Figure S36. ^{1}H NMR chart of compound **SiO2** (600 MHz, $CDCl_3$) **.**

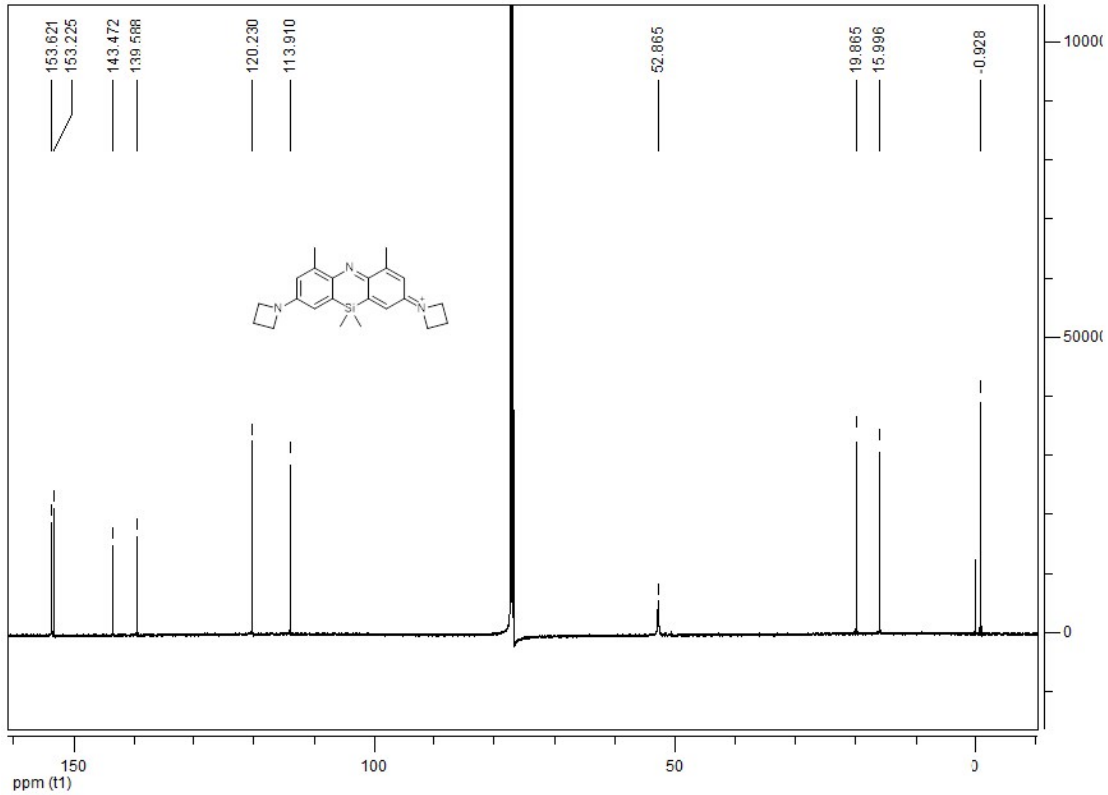


Figure S37. ^{13}C NMR chart of compound **SiO2** (150 MHz, $CDCl_3$).

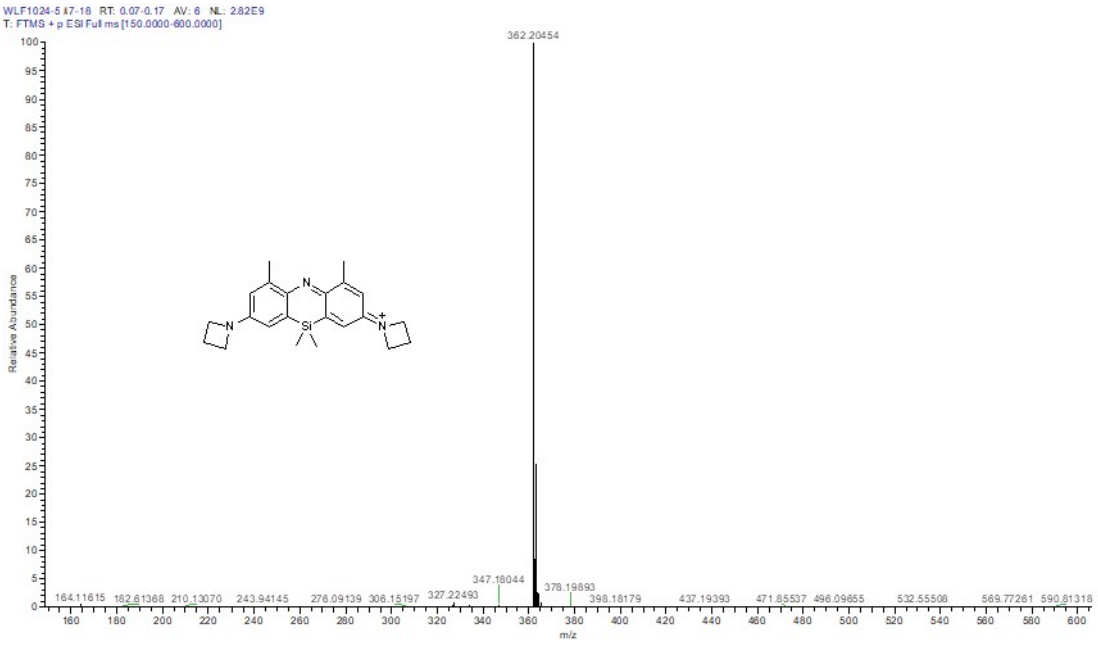


Figure S38. HRMS chart of compound **SiO2**.

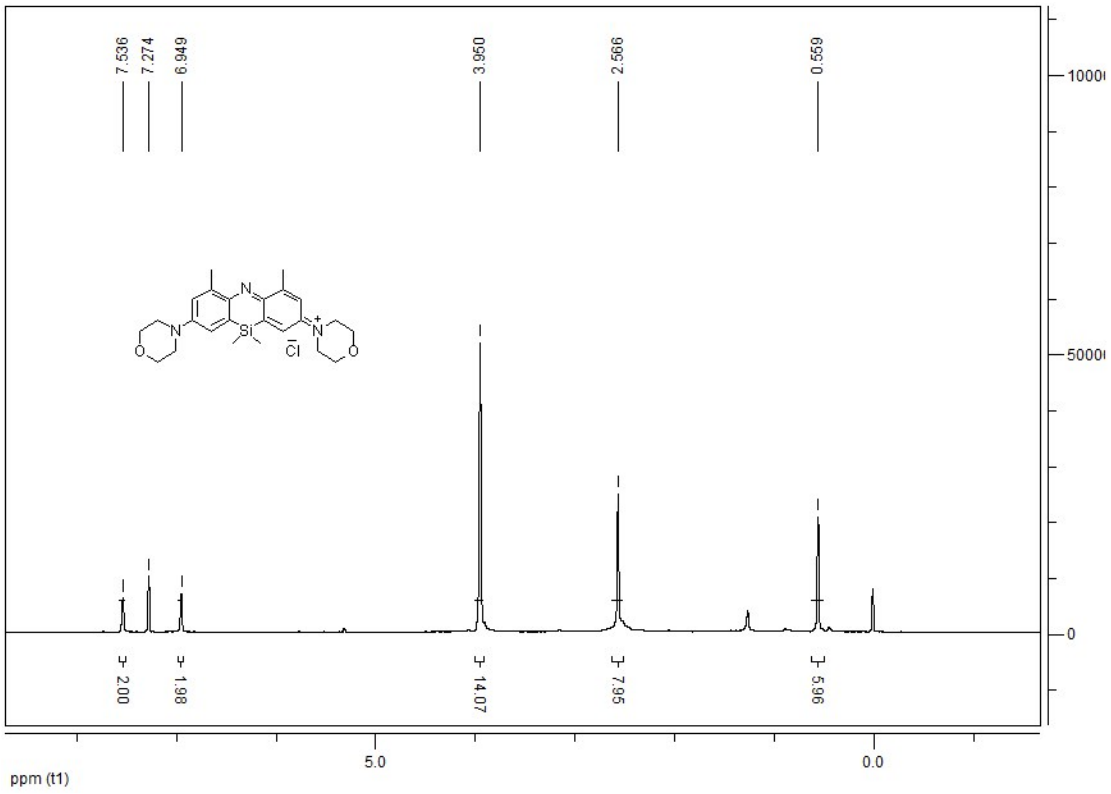


Figure S39. ^{1}H NMR chart of compound **SiO3** (600 MHz, $CDCl_3$) **.**

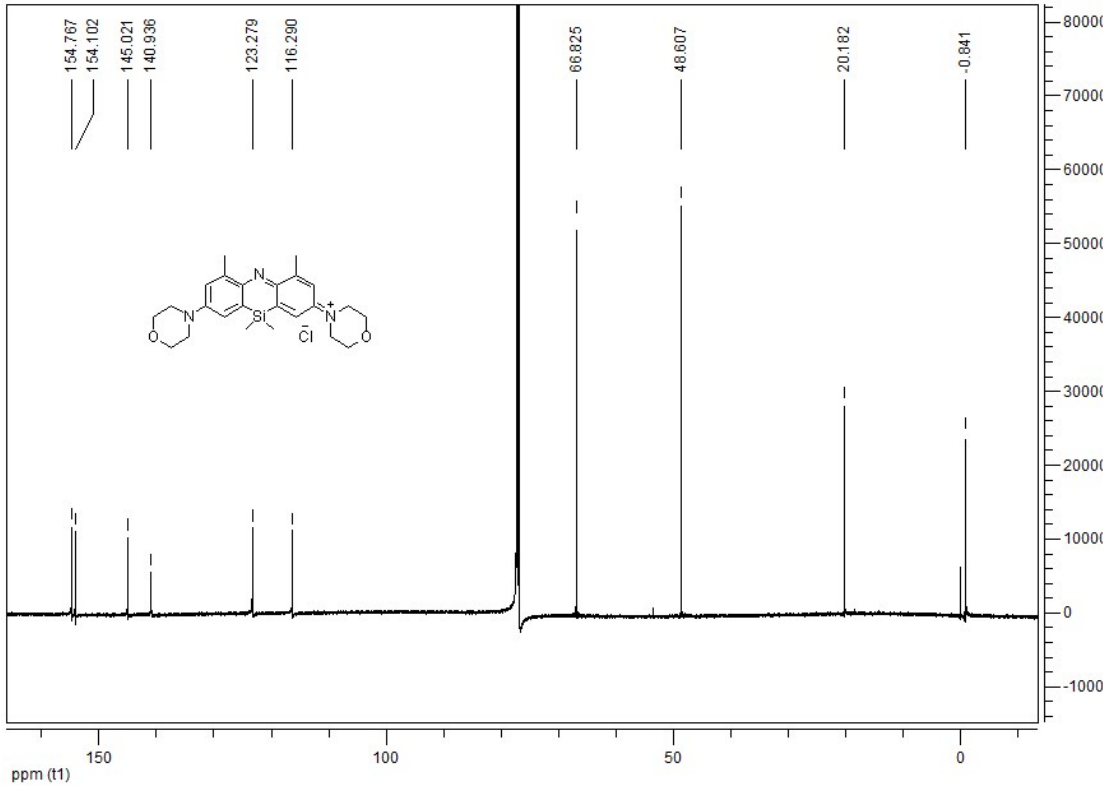


Figure S40. ^{13}C NMR chart of compound **SiO3** (150 MHz, $CDCl_3$).

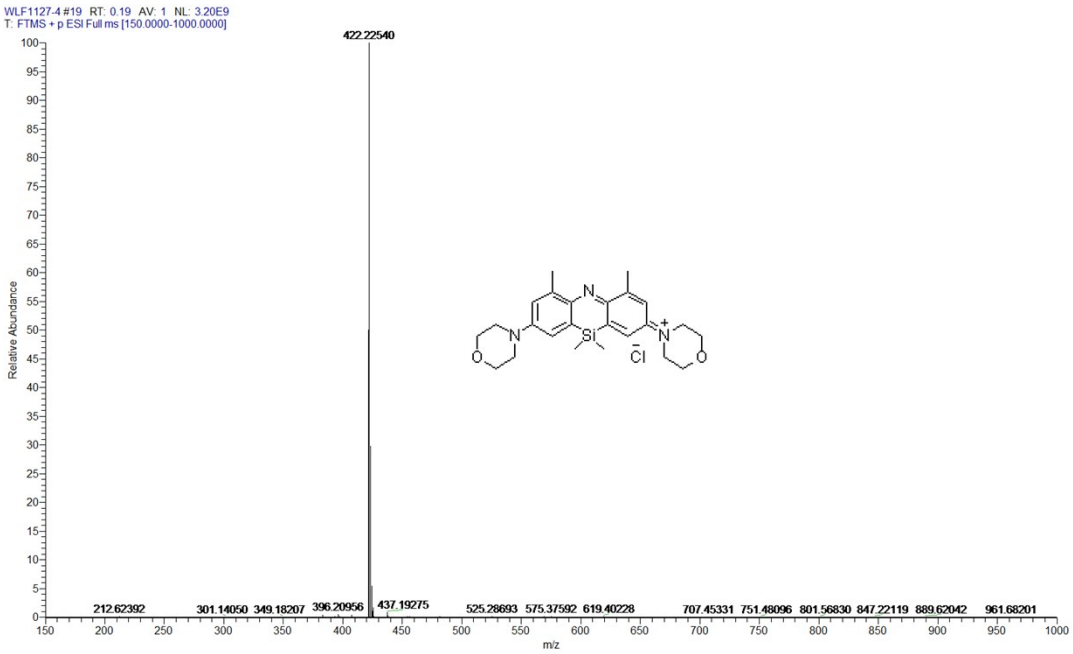


Figure S41. HRMS chart of compound **SiO3**.

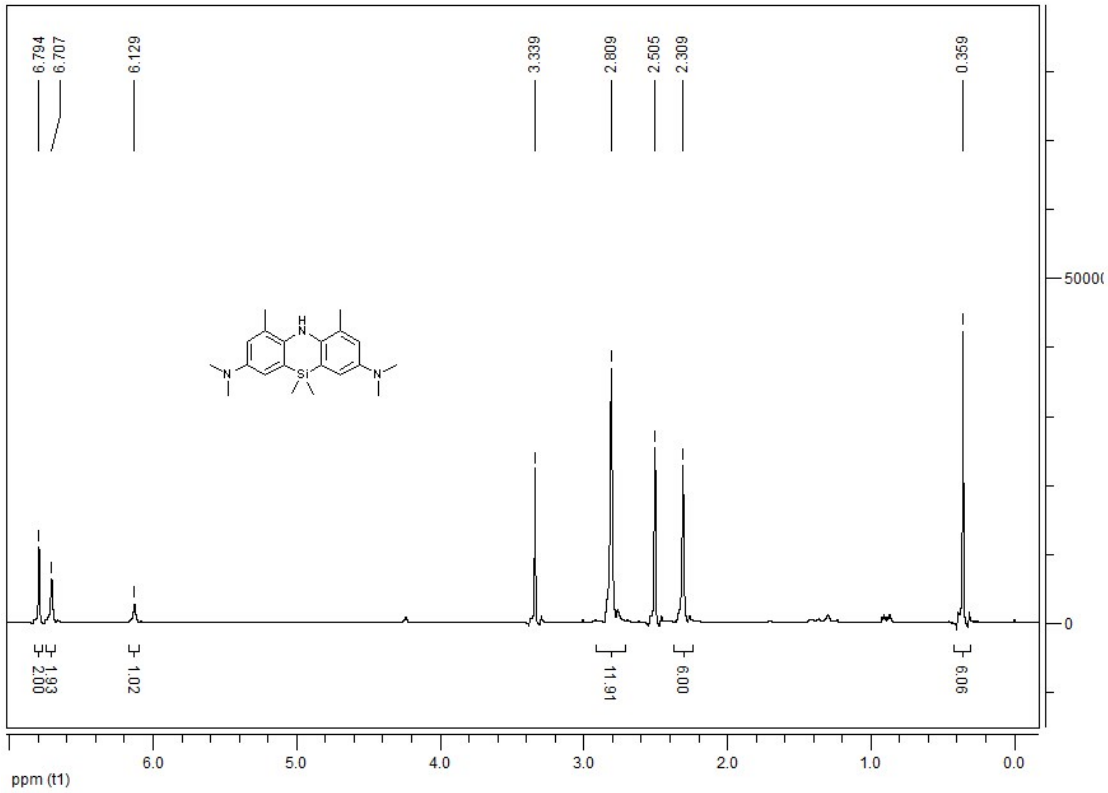


Figure S42. ^{1}H NMR chart of compound **HSiO1** (600 MHz, DMSO-*d*6)**.**

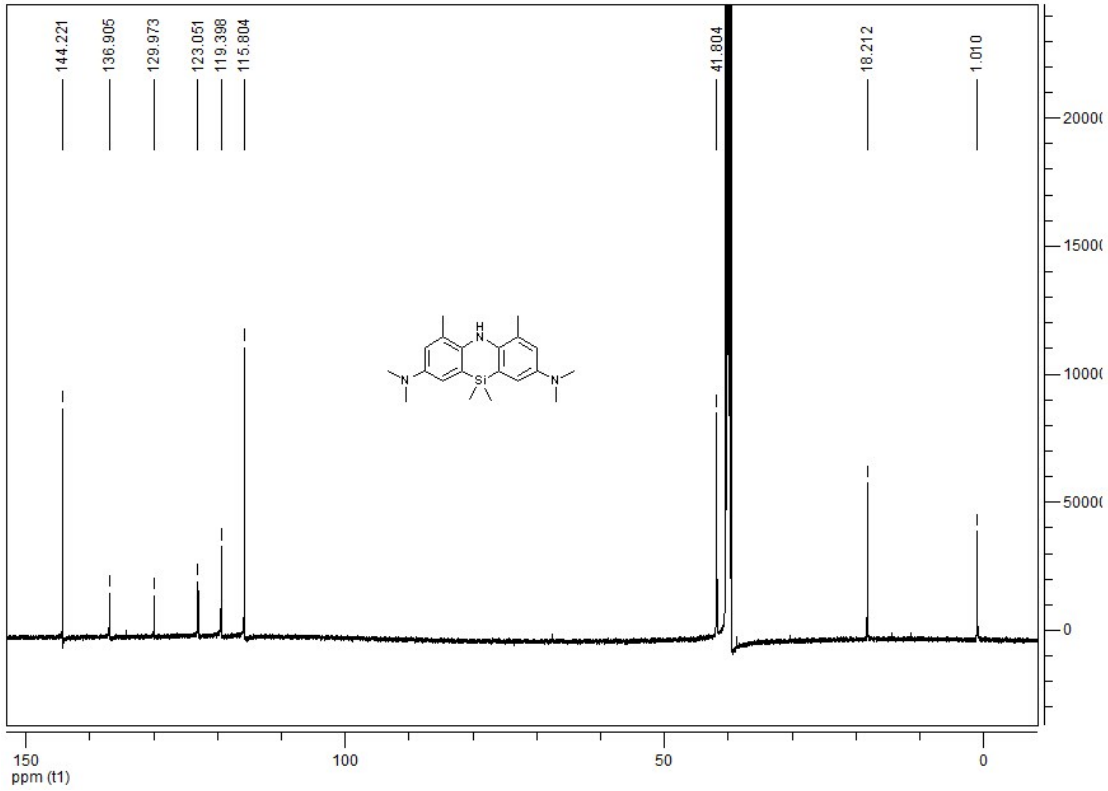


Figure S43. ^{13}C NMR chart of compound **HSiO1** (150 MHz, DMSO-*d*6).

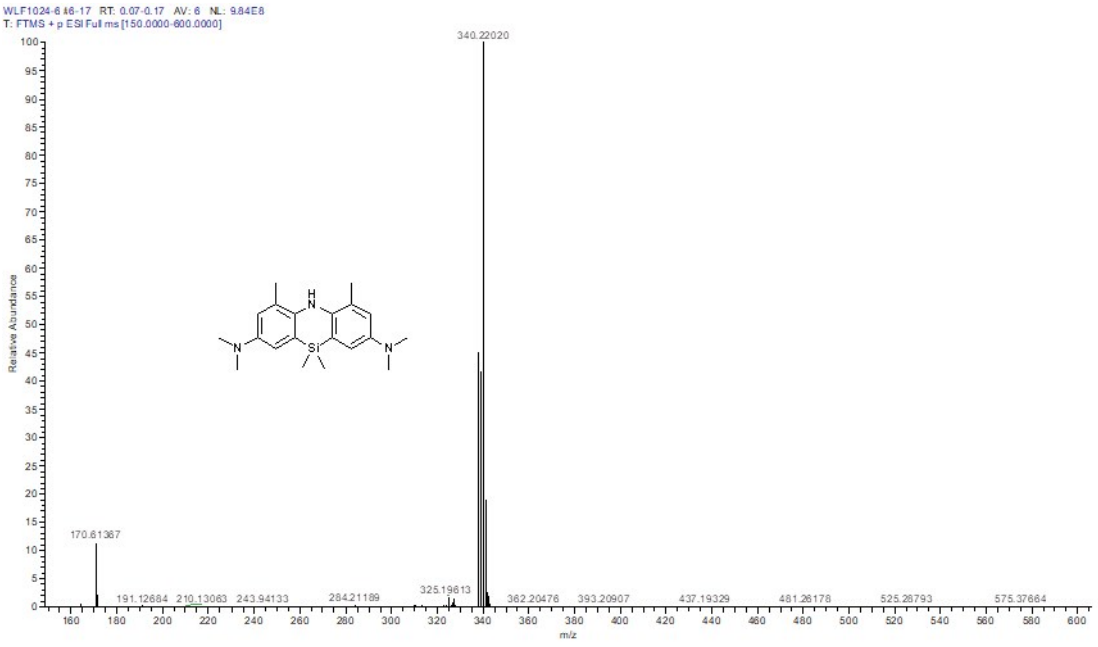


Figure S44. HRMS chart of compound **HSiO1**.

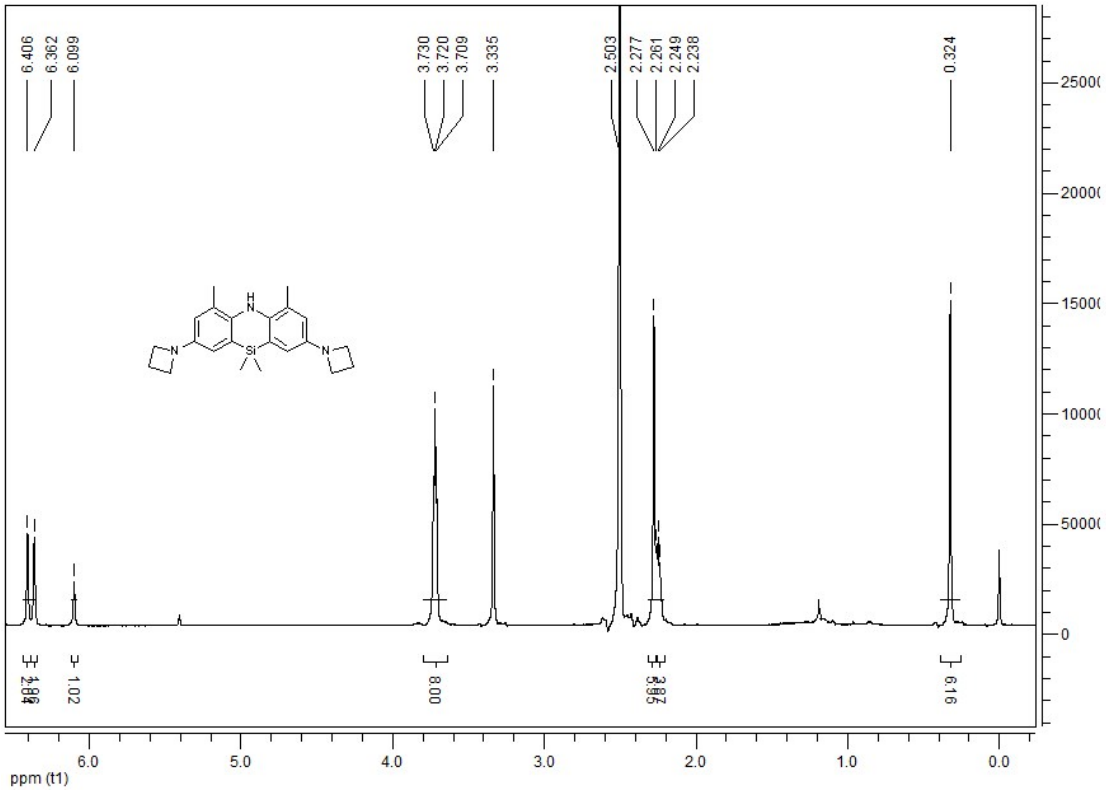


Figure S45. ^{1}H NMR chart of compound **HSiO2** (600 MHz, DMSO-*d*6)**.**

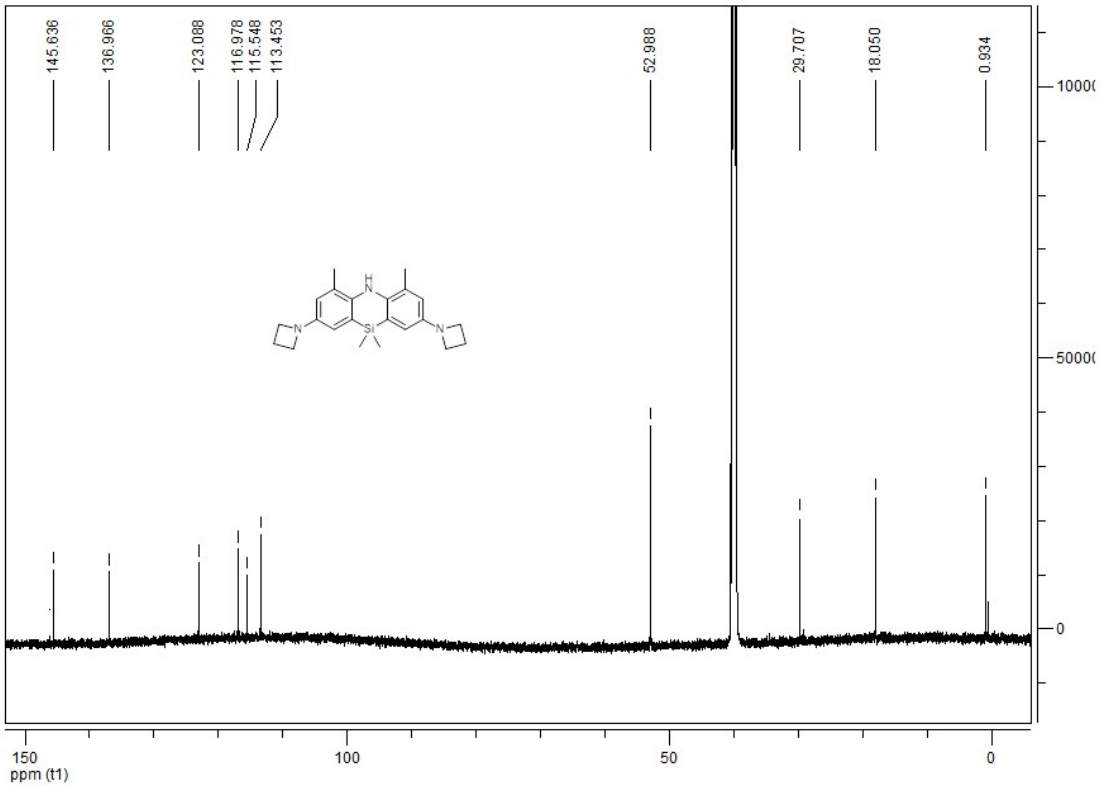


Figure S46. ^{13}C NMR chart of compound **HSiO2** (150 MHz, DMSO-*d*6).

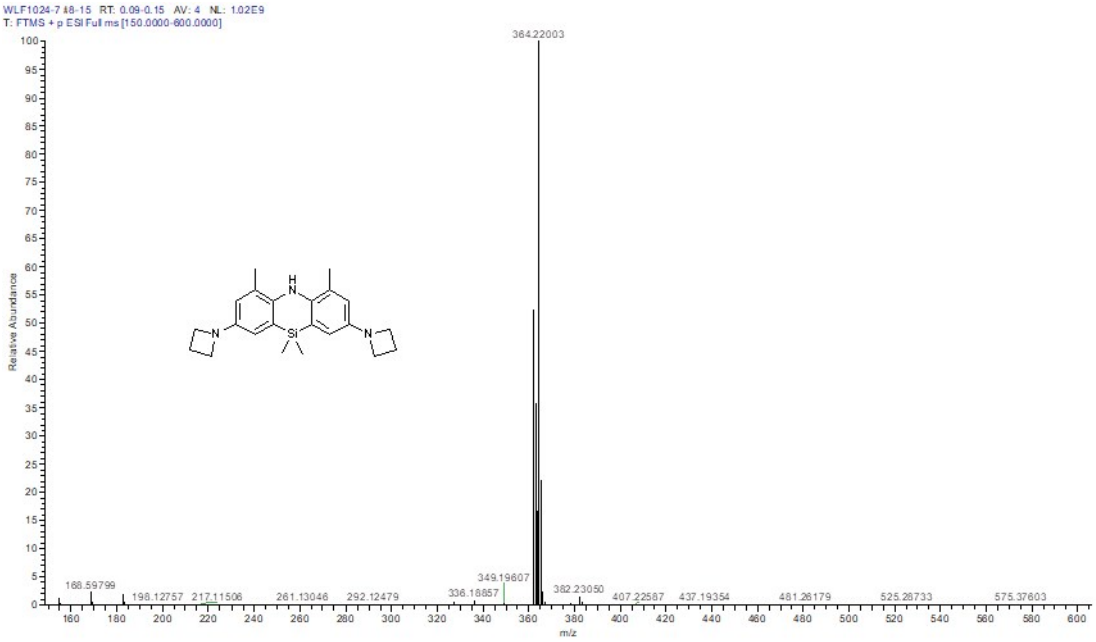


Figure S47. HRMS chart of compound **HSiO2**.

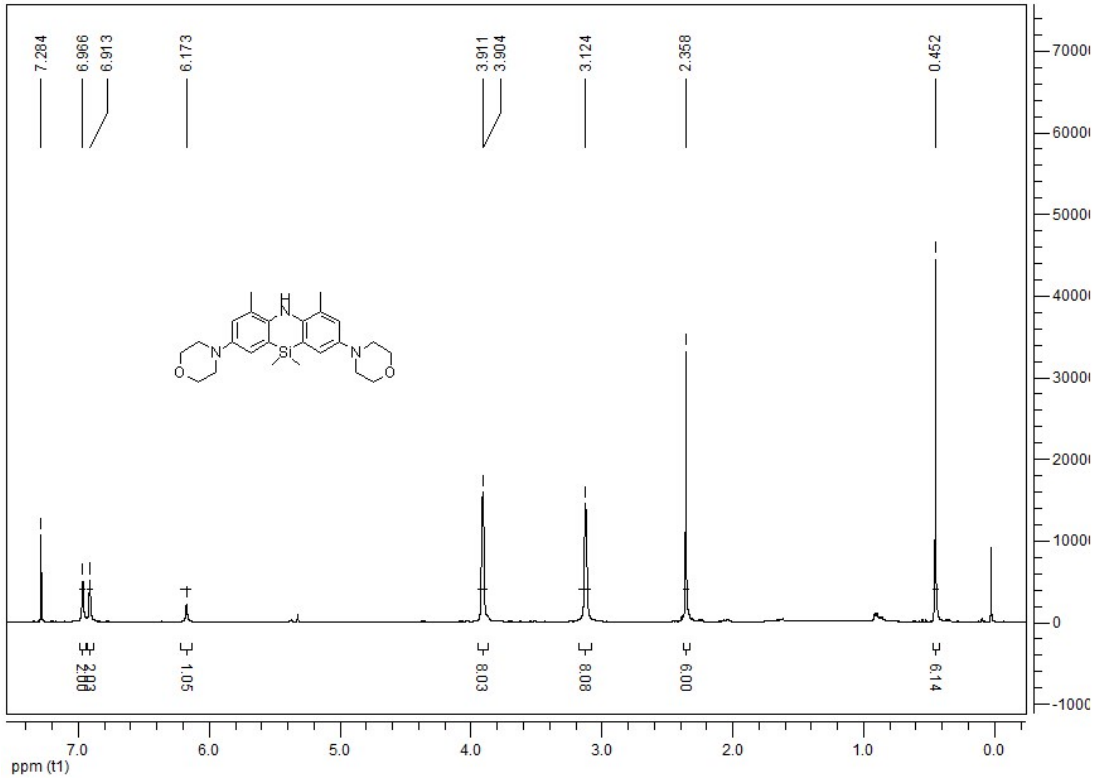


Figure S48. ^{1}H NMR chart of compound **HSiO3** (600 MHz, $CDCl_3$)**.**

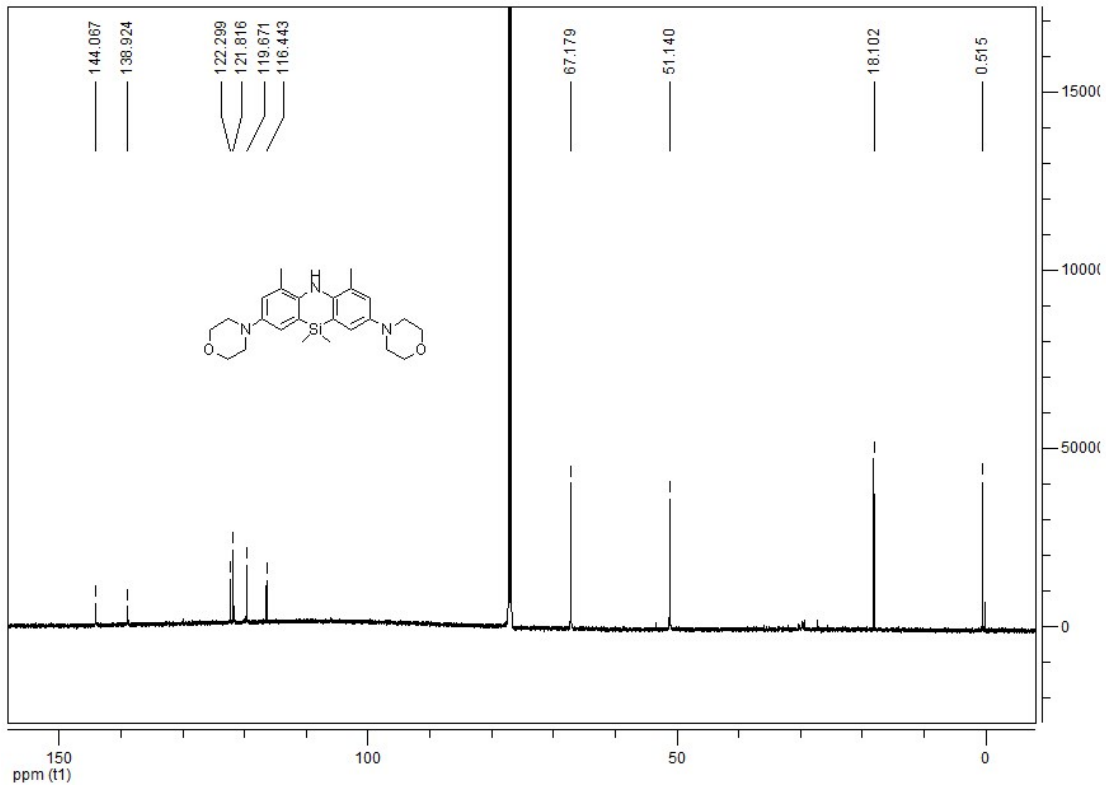


Figure S49. ^{13}C NMR chart of compound **HSiO3** (150 MHz, $CDCl_3$).

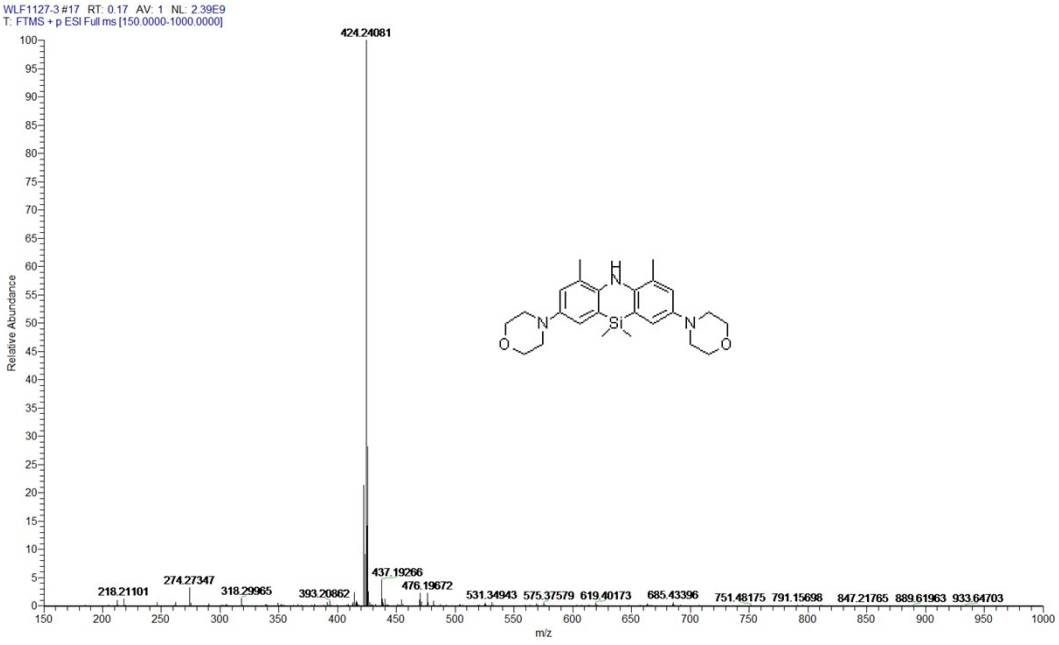


Figure S50. HRMS chart of compound **HSiO3**.

14. References

[1] R.M. Uppu, W.A. Pryor, Synthesis of peroxynitrite in a two-phase system using isoamyl nitrite and hydrogen peroxide, *Anal. Biochem*. **1996**, 236, 242-249.