Supplementary Information

Rhodium-catalyzed regioselective decarboxylative hydroselenation and hydrothiolation of vinyl benzoxazinanones

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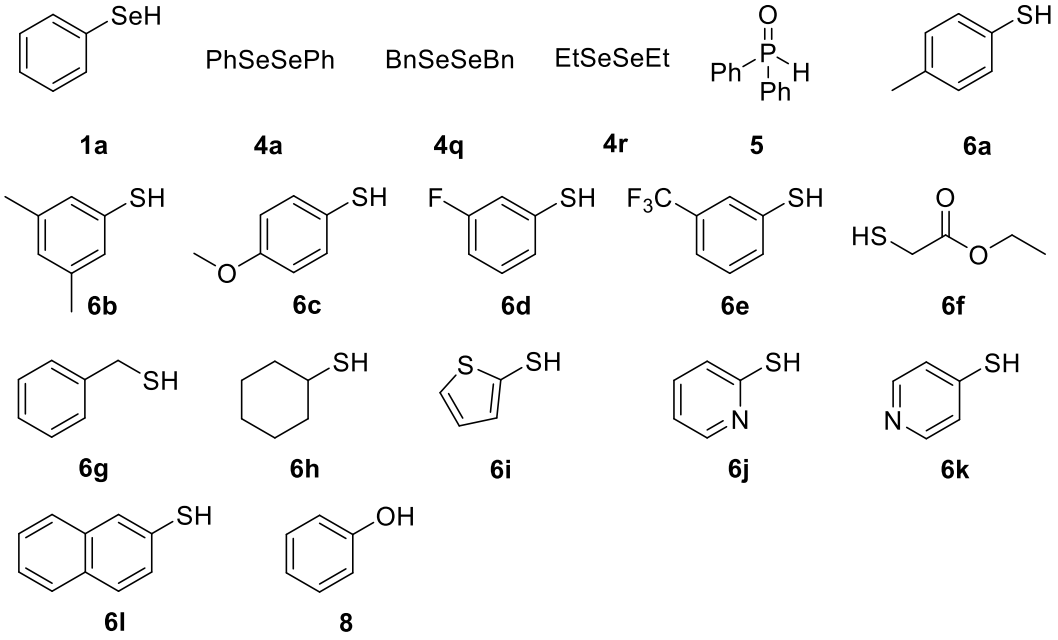
1. General Experiment Information

Unless otherwise noted, all chemicals of commercial grade were used without further purification. Benzeneselenol (**1a**), diselenides (**4a**, **4q**, and **4r**), diphenylphosphine oxide (**5**), thiols (**6a**–**6l**), and phenol (**8**) were commercially available. Anhydrous solvents (DMF, toluene, THF, and CH_3CN) were purchased from Innochem Reagents (Beijing) and used without further purification.

Commercially available materials



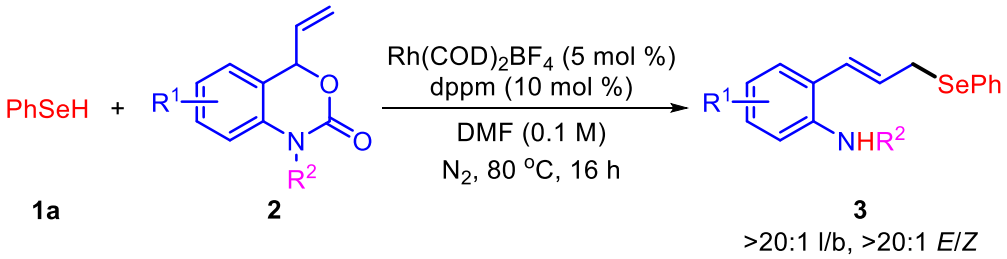
Organic solvent was concentrated under reduced pressure on a EYELA rotary evaporator (Japan). Analytical thin layer chromatography (TLC) was performed on 0.25 mm silica gel plates (purchased from Qingdao Haiyang Chemical, China), and the products were visualized with the UV light at 254 nm and 365 nm. Column chromatography was performed on silica gel 200−300 mesh (purchased from Qingdao Haiyang Chemical, China). High-resolution mass spectra (HRMS) using electrospray ionization (ESI) as the ion source was carried out by LC−MSD TOF using a column of C18 (rapid resolution, 3.5 μm, 2.1 mm × 30 mm) at a flow of 0.40 mL/min.

Deuterated solvents ($CDCl_3$ and DMSO-d_6) were purchased from Innochem Reagents (Beijing). ^{1}H NMR spectra were recorded on the Bruker Ascend^{TM} 400 with 400 MHz frequencies, and ^{13}C NMR spectra were recorded on the Bruker Ascend^{TM}

400 with 100 MHz frequencies. Chemical shifts are given in ppm and coupling constants in Hertz (Hz). ^{1}H spectra were calibrated in relation to the reference measurement of TMS (0.000 ppm) or the residual solvent signal of $CDCl_3$ (7.260 ppm). ^{13}C spectra were calibrated in relation to $CDCl_3$ (77.10 ppm). The following abbreviations were used for ^{1}H NMR spectra to indicate the signal multiplicities: br (broad), s (singlet), d (doublet), t (triplet), q (quartet), and m (multiplets) as well as combinations of them.

2. General Procedures

(1) General Procedure A for the Synthesis of Allyl Selenides (3aa–3ai)

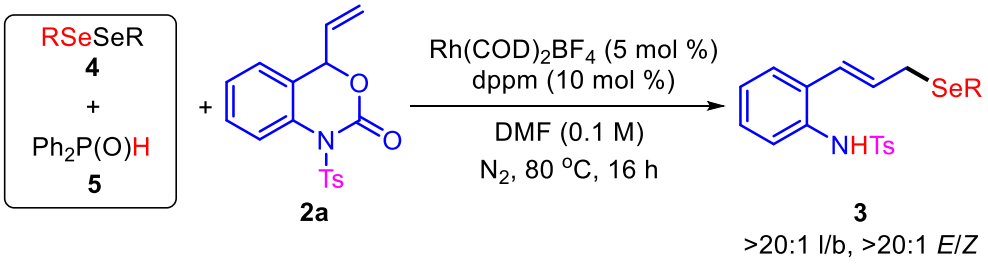


1a **2** **3**

>20:1 l/b, >20:1 *E*/*Z*

To an oven-dried sealed tube (10 mL) equipped with a stirrer bar in the glove box (filled with N_2) was added $Rh(COD)_2BF_4$ (4.1 mg, 0.01 mmol, 5 mol %), dppm (7.7 mg, 0.02 mmol, 10 mol %), benzeneselenol **1a** (31.4 mg, 0.2 mmol, 1.0 equiv), and vinyl benzoxazinanone **2** (0.3 mmol, 1.5 equiv). Then anhydrous DMF (2.0 mL, 0.1 M) was added. The tube was sealed and removed from the glove box. The mixture was stirred at room temperature for 15 min, and then heated at 80 ℃ for 16 h using a Heidolph MR Hei-Tec heating magnetic stirrer (Heidolph Instruments, Germany). Upon completion, H_2O (6 mL) was added to the reaction mixture. The aqueous phase was extracted with EtOAc (3 × 6 mL). The combined organic layers were dried over Na_2SO_4, filtered and concentrated in vacuo. The residue was purified by silica gel chromatography (*n*-hexane/EtOAc) to afford the desired product **3**.

(2) General Procedure B for the Synthesis of Allyl Selenides (3aa–3ra)



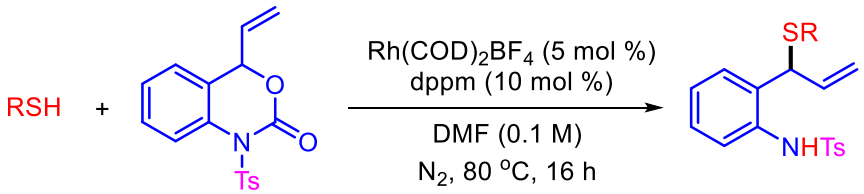
2a **3**

>20:1 l/b, >20:1 *E*/*Z*

To an oven-dried sealed tube (10 mL) equipped with a stirrer bar in the glove box (filled with N_2) was added $Rh(COD)_2BF_4$ (4.1 mg, 0.01 mmol, 5 mol %), dppm (7.7 mg, 0.02 mmol, 10 mol %), diselenide **4** (0.2 mmol, 1.0 equiv), diphenylphosphine oxide **5** (60.7 mg, 0.3 mmol, 1.5 equiv), and vinyl benzoxazinanone **2a** (98.8 mg, 0.3 mmol, 1.5 equiv). Then anhydrous DMF (2.0 mL, 0.1 M) was added. The tube was

sealed and removed from the glove box. The mixture was stirred at room temperature for 15 min, and then heated at 80 ℃ for 16 h using a Heidolph MR Hei-Tec heating magnetic stirrer (Heidolph Instruments, Germany). Upon completion, H_2O (6 mL) was added to the reaction mixture. The aqueous phase was extracted with EtOAc (3 × 6 mL). The combined organic layers were dried over Na_2SO_4, filtered and concentrated in vacuo. The residue was purified by silica gel chromatography (*n*-hexane/EtOAc) to afford the desired product **3**.

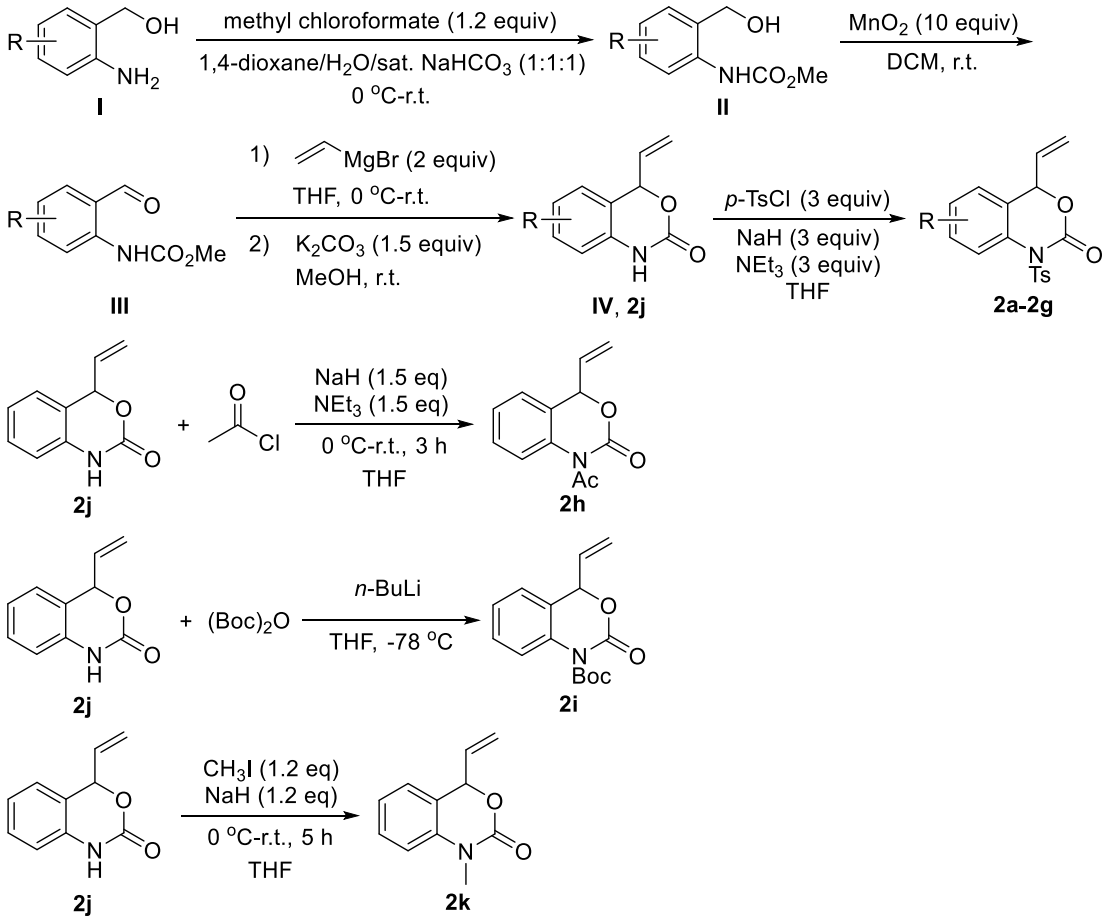
(3) General Procedure C for the Synthesis of Allyl Sulfides (7aa–7ia)



6 **2a** **7**

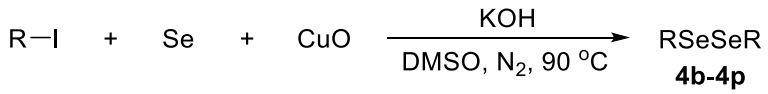
To an oven-dried sealed tube (10 mL) equipped with a stirrer bar in the glove box (filled with N_2) was added $Rh(COD)_2BF_4$ (4.1 mg, 0.01 mmol, 5 mol %), dppm (7.7 mg, 0.02 mmol, 10 mol %), thiol **6** (0.2 mmol, 1.0 equiv), and vinyl benzoxazinanone **2a** (98.8 mg, 0.3 mmol, 1.5 equiv). Then anhydrous DMF (2.0 mL, 0.1 M) was added. The tube was sealed and removed from the glove box. The mixture was stirred at room temperature for 15 min, and then heated at 80 ℃ for 16 h using a Heidolph MR Hei-Tec heating magnetic stirrer (Heidolph Instruments, Germany). Upon completion, H_2O (6 mL) was added to the reaction mixture. The aqueous phase was extracted with EtOAc (3 ×6 mL). The combined organic layers were dried over Na_2SO_4, filtered and concentrated in vacuo. The residue was purified by silica gel chromatography (*n*-hexane/EtOAc) to afford the desired product **7**.

(4) Preparation of Vinyl Benzoxazinanones (2a–2k)



Vinyl benzoxazinanones (**2a**−**2g**, **2h**, **2j**, and **2k**) were prepared according to our previous report.[1] **2i** was prepared according to the literature procedure.[2]

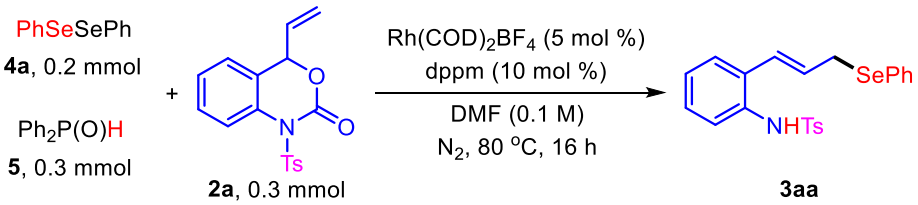
(5) Preparation of Diselenides (4b−4p)



Diselenides were prepared according to the literature procedure.[3] To a stirred solution of Se^0 metal (8 mmol, 2 equiv) and iodides (4 mmol, 1 equiv) in dry DMSO (8.0 mL) was added CuO nanoparticles (10 mol %) followed by KOH (2 equiv) under nitrogen atmosphere. The reaction mixture was then stirred at 90 ℃ for 4 h. After the reaction was complete, the reaction mixture was allowed to cool to room temperature, then extracted three times with EtOAc (3 × 20 mL). The combined organic layers were washed with saturated sodium carbonate, dried over anhydrous Na_2SO_4, filtered and evaporated in vacuo. The residue was purified by column chromatography on silica gel (*n*-hexane/EtOAc) to afford the desired product.

(6) Reaction Optimization

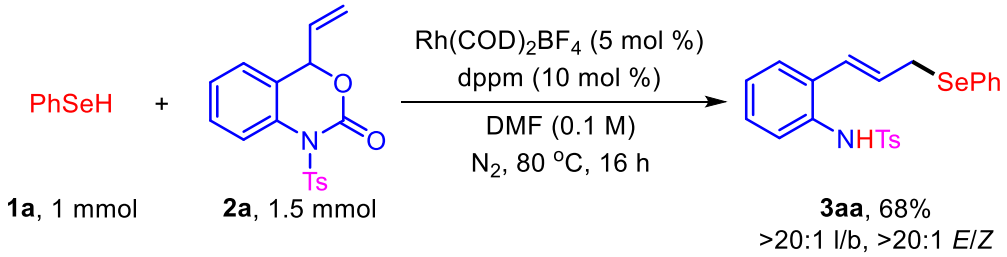
Table 1. Optimization of the Reaction Conditions using PhSeSePh and $Ph_2P(O)H$[a]



Entry	Rh cat.	Ligand	Solvent	*T* (°C)	yield[b] (%)
1	$Rh(COD)_2BF_4$	dppm	DMF	80	73
2	$Rh(COD)_2BF_4$	dppm	DCE	80	45
3	$Rh(COD)_2BF_4$	dppm	toluene	80	49

[a]Unless otherwise noted, all reactions were performed with diphenyl diselenide **4a** (0.2 mmol, 1.0 equiv), diphenylphosphine oxide **5** (0.3 mmol, 1.5 equiv), **2a** (0.3 mmol, 1.5 equiv), $Rh(COD)_2BF_4$ (5 mol %), and dppm (10 mol %) under a N_2 atmosphere in anhydrous solvent (2.0 mL, 0.1 M) at 80 ℃ for 16 h. [b]Isolated yield.

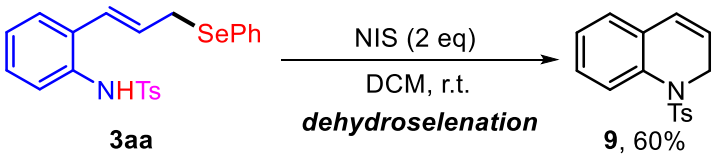
(7) Scale-Up Synthesis of 3aa



To an oven-dried sealed tube (35 mL) equipped with a stirrer bar in the glove box (filled with N_2) was added $Rh(COD)_2BF_4$ (20.3 mg, 0.05 mmol, 5 mol %), dppm (38.4 mg, 0.1 mmol, 10 mol %), benzeneselenol **1a** (157.1 mg, 1 mmol, 1.0 equiv), and 1-tosyl-4-vinyl-1,4-dihydro-2*H*-benzo[*d*][1,3]oxazin-2-one **2a** (494.1 mg, 1.5 mmol, 1.5 equiv). Then anhydrous DMF (10 mL, 0.1 M) was added. The tube was sealed and removed from the glove box. The mixture was stirred at room temperature for 15 min, and then heated at 80 ℃ for 16 h using a Heidolph MR Hei-Tec heating magnetic stirrer (Heidolph Instruments, Germany). Upon completion, H_2O (30 mL) was added to the reaction mixture. The aqueous phase was extracted with EtOAc (3 × 30 mL). The combined organic layers were dried over Na_2SO_4, filtered and concentrated in vacuo. The residue was purified by silica gel chromatography

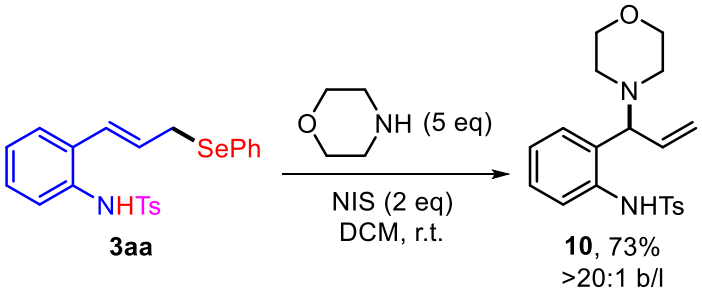
(*n*-hexane/EtOAc = 50:1) to afford the desired product **3aa** as a white solid, 301 mg (68%), l/b > 20:1.

(8) Synthesis of 9



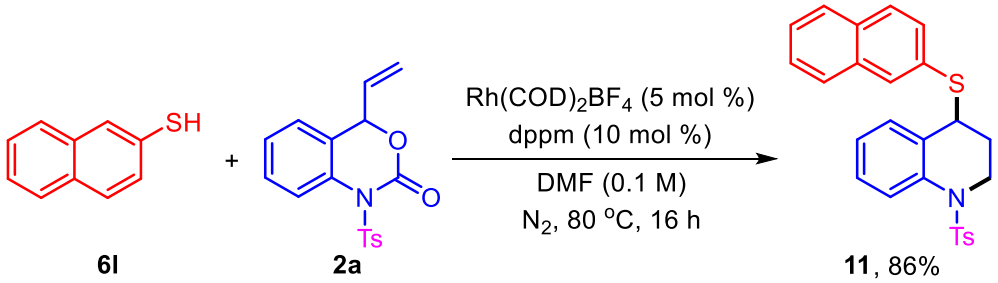
To a solution of **3aa** (44.2 mg, 0.1 mmol, 1 equiv) in CH_2Cl_2 (1.0 mL) was added NIS (45.0 mg, 0.2 mmol, 2 equiv) under air. The resulting mixture was stirred at room temperature for 0.5 h, then the mixture was concentrated under reduced pressure. The residue was purified by column chromatography on silica gel (*n*-hexane/EtOAc = 50:1) to give the product **9** as a white solid, 17.0 mg (60%).

(9) Synthesis of 10



To a solution of **3aa** (88.4 mg, 0.2 mmol, 1 equiv) in CH_2Cl_2 (3 mL) was sequentially added morpholine (87.1 mg, 1 mmol, 5 equiv) and NIS (90.0 mg, 0.4 mmol, 2 equiv) under air. The resulting mixture was stirred at room temperature for 15 min. Upon completion, H_2O (15 mL) was added. The mixture was extracted with DCM (3 × 15 mL). The combined organic phases were washed with brine (30 mL), dried over Na_2SO_4, filtered, and concentrated in vacuo. The residue was purified by silica gel chromatography (*n*-hexane/EtOAc = 15:1) to afford the desired product **10** as a colorless oil, 54.4 mg (73%), b/l > 20:1.

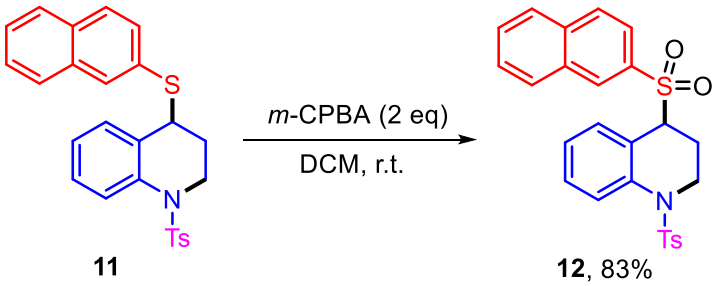
(10) Synthesis of 11



6l **2a** **11**, 86%

The product **11** was prepared according to the General Procedure **C**. To an oven-dried sealed tube (10 mL) equipped with a stirrer bar in the glove box (filled with N_2) was added $Rh(COD)_2BF_4$ (4.1 mg, 0.01 mmol, 5 mol %), dppm (7.7 mg, 0.02 mmol, 10 mol %), naphthalene-2-thiol **6l** (32.1 mg, 0.2 mmol, 1.0 equiv), and 1-tosyl-4-vinyl-1,4-dihydro-2*H*-benzo[*d*][1,3]oxazin-2-one **2a** (98.8 mg, 0.3 mmol, 1.5 equiv). Then anhydrous DMF (2.0 mL, 0.1 M) was added. The tube was sealed and removed from the glove box. The mixture was stirred at room temperature for 15 min, and then heated at 80 ℃ for 16 h using a Heidolph MR Hei-Tec heating magnetic stirrer (Heidolph Instruments, Germany). Upon completion, H_2O (6 mL) was added to the reaction mixture. The aqueous phase was extracted with EtOAc (3 × 6 mL). The combined organic layers were dried over Na_2SO_4, filtered and concentrated in vacuo. The residue was purified by silica gel chromatography (*n*-hexane/EtOAc = 40:1) to afford the desired product **11** as a colorless oil, 76.6 mg (86%).

(11) Synthesis of 12



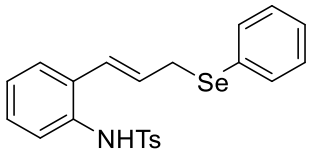
11 **12**, 83%

To a tube equipped with magnetic stirrer bar, **11** (0.1 mmol, 44.6 mg, 1 equiv), *m*-CPBA (0.2 mmol, 34.5 mg, 2 equiv), and DCM (5 mL) were added at room temperature. The reaction mixture was stirred at room temperature for 3 h and then saturated $NaHCO_3$ (10 mL) was added. The resulting mixture was extracted with DCM (3 × 10 mL). The combined organic layers were dried over Na_2SO_4, filtered and

concentrated under reduced pressure. The residue was purified by silica gel chromatography (*n*-hexane/EtOAc = 30:1-15:1) to afford the desired product **12** as a colorless oil, 39.6 mg (83%).

3. Characterization of Materials

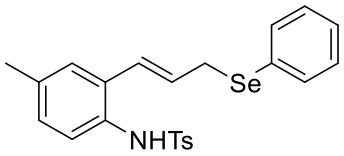
(*E*)-4-methyl-*N*-(2-(3-(phenylselanyl)prop-1-en-1-yl)phenyl)benzenesulfonamide (3aa)



3aa

According to the General Procedure **A**, the product **3aa** was obtained as a white solid after silica gel chromatography (*n*-hexane/EtOAc = 50:1), 67.3 mg (76%), l/b > 20:1. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.42-7.46 (m, 4H), 7.21-7.27 (m, 4H), 7.07-7.13 (m, 4H), 7.00-7.03 (m, 1H), 5.89-5.96 (m, 2H), 5.63 (d, J = 15.6 Hz, 1H), 3.41 (d, J = 7.6 Hz, 2H), 2.30 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 143.9, 136.7, 134.7, 133.1, 131.7, 130.3, 129.7, 129.29, 129.25, 128.4, 128.1, 127.19, 127.16, 126.4, 125.9, 125.2, 30.7, 21.6; HRMS (ESI-TOF) calcd for $C_{22}H_{22}NO_2SSe$ $[M+H]^+$ (444.0536), found 444.0537.

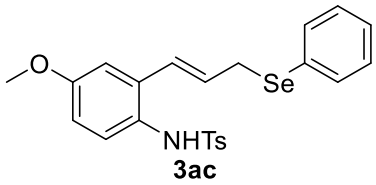
(*E*)-4-methyl-*N*-(4-methyl-2-(3-(phenylselanyl)prop-1-en-1-yl)phenyl)benzenesulfonamide (3ab)



3ab

According to the General Procedure **A**, the product **3ab** was obtained as a white solid after silica gel chromatography (*n*-hexane/EtOAc = 50:1), 61.2 mg (67%), l/b > 20:1. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.49-7.52 (m, 4H), 7.32-7.40 (m, 3H), 7.20 (d, J = 8.0 Hz, 2H), 7.15 (d, J = 8.0 Hz, 1H), 6.96-7.01 (m, 2H), 5.94-6.02 (m, 1H), 5.69 (br s, 1H), 5.59 (d, J = 15.6 Hz, 1H), 3.45 (dd, J = 7.6 Hz, 0.8 Hz, 2H), 2.39 (s, 3H), 2.26 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 143.8, 136.8, 136.5, 134.7, 132.0, 130.4, 129.7, 129.6, 129.3, 129.2, 128.1, 127.5, 127.2, 126.1, 126.0, 30.8, 21.7, 21.1; HRMS (ESI-TOF) calcd for $C_{23}H_{24}NO_2SSe$ $[M+H]^+$ (458.0693), found 458.0690.

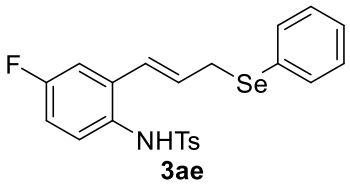
(*E*)-*N*-(4-methoxy-2-(3-(phenylselanyl)prop-1-en-1-yl)phenyl)-4-methylbenzenesulfonamide (3ac)



3ac

According to the General Procedure **A**, the product **3ac** was obtained as a light-yellow solid after silica gel chromatography (*n*-hexane/EtOAc = 40:1), 43.5 mg (46%), l/b > 20:1. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.46-7.51 (m, 4H), 7.32-7.40 (m, 3H), 7.20 (d, *J* = 8.0 Hz, 2H), 7.13 (d, *J* = 8.4 Hz, 1H), 6.70-6.74 (m, 2H), 5.95-6.03 (m, 1H), 5.55-5.59 (m, 2H), 3.77 (s, 3H), 3.43 (dd, *J* = 7.6 Hz, 0.8 Hz, 2H), 2.39 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 158.5, 143.7, 136.7, 134.8, 134.6, 129.7, 129.6, 129.4, 129.2, 128.9, 128.1, 127.3, 126.3, 125.7, 113.9, 111.5, 55.5, 30.7, 21.7; HRMS (ESI-TOF) calcd for $C_{23}H_{24}NO_3SSe$ $[M+H]^+$ (474.0642), found 474.0644.

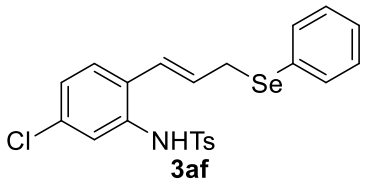
(*E*)-*N*-(4-fluoro-2-(3-(phenylselanyl)prop-1-en-1-yl)phenyl)-4-methylbenzenesulfonamide (3ae)



3ae

According to the General Procedure **A**, the product **3ae** was obtained as a white solid after silica gel chromatography (*n*-hexane/EtOAc = 50:1), 46.0 mg (50%), l/b > 20:1. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.40-7.44 (m, 4H), 7.25-7.33 (m, 3H), 7.13-7.19 (m, 3H), 6.76-6.85 (m, 2H), 5.89-5.97 (m, 1H), 5.64 (br s, 1H), 5.49 (d, *J* = 15.6 Hz, 1H), 3.36 (d, *J* = 7.6 Hz, 2H), 2.32 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 161.2 (d, *J* = 244.8 Hz), 144.0, 136.4, 134.8, 134.7, 131.0, 129.7, 129.2, 129.1, 128.7 (d, *J* = 2.8 Hz), 128.6 (d, *J* = 8.8 Hz), 128.2, 127.1, 125.0 (d, *J* = 1.6 Hz), 115.2 (d, *J* = 22.6 Hz), 113.2 (d, *J* = 23.2 Hz), 30.5, 21.6; HRMS (ESI-TOF) calcd for $C_{22}H_{21}FNO_2SSe$ $[M+H]^+$ (462.0442), found 462.0437.

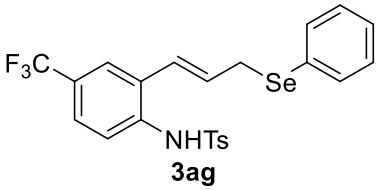
(*E*)-*N*-(5-chloro-2-(3-(phenylselanyl)prop-1-en-1-yl)phenyl)-4-methylbenzenesulfonamide (3af)



3af

According to the General Procedure **A**, the product **3af** was obtained as a colorless oil after silica gel chromatography (*n*-hexane/EtOAc = 40:1), 71.5 mg (75%), l/b > 20:1. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.49-7.55 (m, 4H), 7.33-7.41 (m, 4H), 7.23 (d, J = 8.0 Hz, 2H), 7.04-7.10 (m, 2H), 5.93-6.01 (m, 1H), 5.80 (br s, 1H), 5.50 (d, J = 15.6 Hz, 1H), 3.46 (dd, J = 8.0 Hz, 0.8 Hz, 2H), 2.40 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 144.2, 136.4, 134.9, 134.1, 133.8, 131.1, 129.8, 129.6, 129.3, 129.1, 128.4, 128.2, 127.2, 126.4, 124.7, 124.5, 30.7, 21.7; HRMS (ESI-TOF) calcd for $C_{22}H_{21}ClNO_2SSe$ $[M+H]^+$ (478.0147), found 478.0149.

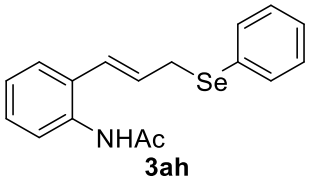
(*E*)-4-methyl-*N*-(2-(3-(phenylselanyl)prop-1-en-1-yl)-4-(trifluoromethyl)phenyl)benzenesulfonamide (3ag)



3ag

According to the General Procedure **A**, the product **3ag** was obtained as a light-yellow oil after silica gel chromatography (*n*-hexane/EtOAc = 50:1), 63.3 mg (62%), l/b > 20:1. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.52-7.57 (m, 4H), 7.46 (d, J = 8.4 Hz, 1H), 7.35-7.40 (m, 5H), 7.24 (d, J = 8.0 Hz, 2H), 6.02-6.09 (m, 2H), 5.60 (d, J = 15.2 Hz, 1H), 3.51 (dd, J = 8.0 Hz, 0.8 Hz, 2H), 2.40 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 144.4, 136.4, 135.0, 132.7, 131.6, 130.6, 129.9, 129.4, 128.9, 128.4, 127.6 (q, J = 32.4 Hz), 127.1, 125.1 (q, J = 3.7 Hz), 124.7 (q, J = 3.7 Hz), 124.3, 123.9 (q, J = 270.5 Hz), 123.1, 30.4, 21.7; HRMS (ESI-TOF) calcd for $C_{23}H_{21}F_3NO_2SSe$ $[M+H]^+$ (512.0410), found 512.0414.

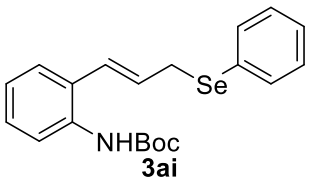
(*E*)-*N*-(2-(3-(phenylselanyl)prop-1-en-1-yl)phenyl)acetamide (3ah)



3ah

According to the General Procedure **A**, the product **3ah** was obtained as a light-yellow oil after silica gel chromatography (*n*-hexane/EtOAc = 20:1), 38.3 mg (58%), l/b > 20:1. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.69 (d, J = 8.0 Hz, 1H), 7.46-7.48 (m, 2H), 7.14-7.23 (m, 5H), 7.01-7.04 (m, 1H), 6.59 (br s, 1H), 6.11-6.19 (m, 1H), 6.06 (d, J = 15.6 Hz, 1H), 3.60 (d, J = 6.8 Hz, 2H), 2.01 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 168.3, 134.8, 134.2, 130.2, 129.4, 129.3, 129.1, 128.2, 127.8, 127.1, 126.5, 125.4, 123.9, 30.9, 24.4; HRMS (ESI-TOF) calcd for $C_{17}H_{18}NOSe$ $[M+H]^+$ (332.0554), found 332.0546.

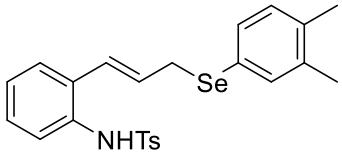
***tert*-butyl (*E*)-(2-(3-(phenylselanyl)prop-1-en-1-yl)phenyl)carbamate (3ai)**



3ai

According to the General Procedure **A**, the product **3ai** was obtained as a colorless oil after silica gel chromatography (*n*-hexane/EtOAc = 80:1), 56.7 mg (73%), l/b > 20:1. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.65 (d, J = 7.6 Hz, 1H), 7.46-7.48 (m, 2H), 7.10-7.23 (m, 5H), 6.91-6.95 (m, 1H), 6.04-6.14 (m, 2H), 5.89 (br s, 1H), 3.59 (d, J = 6.4 Hz, 2H), 1.46 (s, 9H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 153.1, 134.9, 134.8, 129.8, 129.3, 129.1, 128.2, 127.9, 127.1, 126.6, 124.0, 121.9, 80.6, 31.0, 28.5; HRMS (ESI-TOF) calcd for $C_{20}H_{24}NO_2Se$ $[M+H]^+$ (390.0972), found 390.0964.

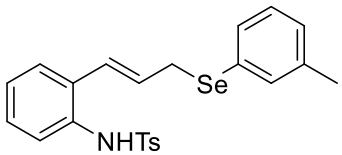
(*E*)-*N*-(2-(3-((3,4-dimethylphenyl)selanyl)prop-1-en-1-yl)phenyl)-4-methylbenzen esulfonamide (3ba)



3ba

According to the General Procedure **B**, the product **3ba** was obtained as a light-yellow oil after silica gel chromatography (*n*-hexane/EtOAc = 50:1), 65.9 mg (70%), l/b > 20:1. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.38-7.40 (m, 2H), 7.25 (dd, J = 8.0 Hz, 1.2 Hz, 1H), 7.22 (s, 1H), 7.07-7.17 (m, 5H), 7.00-7.05 (m, 2H), 5.86-5.94 (m, 1H), 5.78 (br s, 1H), 5.44 (d, J = 15.2 Hz, 1H), 3.32 (dd, J = 8.0 Hz, 1.2 Hz, 2H), 2.29 (s, 3H), 2.23 (s, 3H), 2.18 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 143.8, 137.9, 137.3, 136.7, 136.6, 133.0, 132.8, 131.8, 130.5, 129.6, 128.3, 127.11, 127.08, 126.5, 125.52, 125.46, 31.0, 21.6, 19.7, 19.6; HRMS (ESI-TOF) calcd for $C_{24}H_{26}NO_2SSe$ $[M+H]^+$ (472.0849), found 472.0848.

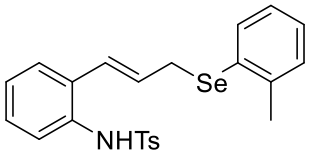
(*E*)-4-methyl-*N*-(2-(3-(*m*-tolylselanyl)prop-1-en-1-yl)phenyl)benzenesulfonamide (3ca)



3ca

According to the General Procedure **B**, the product **3ca** was obtained as a white solid after silica gel chromatography (*n*-hexane/EtOAc = 50:1), 70.3 mg (77%), l/b > 20:1. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.44 (d, J = 8.0 Hz, 2H), 7.22-7.26 (m, 3H), 7.06-7.17 (m, 6H), 7.00-7.04 (m, 1H), 5.88-5.96 (m, 2H), 5.63 (d, J = 15.6 Hz, 1H), 3.40 (dd, J = 8.0 Hz, 0.8 Hz, 2H), 2.30 (s, 3H), 2.26 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 143.9, 139.1, 136.7, 135.5, 133.1, 131.7, 131.6, 130.4, 129.6, 129.04, 129.00, 128.96, 128.3, 127.2, 126.4, 125.8, 125.2, 30.7, 21.6, 21.3; HRMS (ESI-TOF) calcd for $C_{23}H_{24}NO_2SSe$ $[M+H]^+$ (458.0693), found 458.0690.

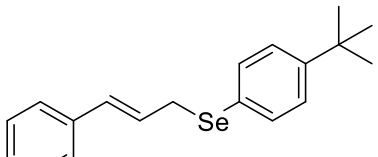
(*E*)-4-methyl-*N*-(2-(3-(*o*-tolylselanyl)prop-1-en-1-yl)phenyl)benzenesulfonamide (3da)



3da

According to the General Procedure **B**, the product **3da** was obtained as a white solid after silica gel chromatography (*n*-hexane/EtOAc = 50:1), 69.4 mg (76%), l/b > 20:1. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.44 (d, J = 8.4 Hz, 2H), 7.39 (d, J = 7.6 Hz, 1H), 7.20-7.27 (m, 3H), 7.08-7.16 (m, 5H), 7.01-7.04 (m, 1H), 5.88-5.96 (m, 1H), 5.81 (br s, 1H), 5.58 (d, J = 15.2 Hz, 1H), 3.37 (d, J = 7.6 Hz, 2H), 2.35 (s, 3H), 2.31 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 143.9, 141.1, 136.8, 134.8, 133.1, 131.8, 130.4, 130.3, 130.0, 129.7, 128.4, 127.2, 127.1, 126.61, 126.55, 125.9, 125.5, 29.7, 22.8, 21.7; HRMS (ESI-TOF) calcd for $C_{23}H_{24}NO_2SSe$ $[M+H]^+$ (458.0693), found 458.0690.

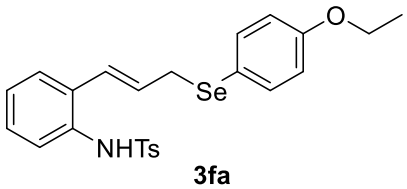
(*E*)-*N*-(2-(3-((4-(*tert*-butyl)phenyl)selanyl)prop-1-en-1-yl)phenyl)-4-methylbenzenesulfonamide (3ea)



3ea

According to the General Procedure **B**, the product **3ea** was obtained as a colorless oil after silica gel chromatography (*n*-hexane/EtOAc = 60:1), 67.8 mg (68%), l/b > 20:1. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.46-7.48 (m, 2H), 7.33-7.36 (m, 2H), 7.21-7.27 (m, 3H), 7.08-7.16 (m, 4H), 7.00-7.05 (m, 1H), 6.07 (br s, 1H), 5.87-5.95 (m, 1H), 5.77 (d, J = 15.2 Hz, 1H), 3.41 (dd, J = 8.0 Hz, 0.8 Hz, 2H), 2.30 (s, 3H), 1.24 (s, 9H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 151.2, 143.9, 136.7, 134.2, 133.0, 131.9, 130.4, 129.7, 128.3, 127.3, 127.24, 127.15, 126.5, 126.4, 126.0, 125.4, 34.7, 31.3, 30.4, 21.6; HRMS (ESI-TOF) calcd for $C_{26}H_{30}NO_2SSe$ $[M+H]^+$ (500.1162), found 500.1163.

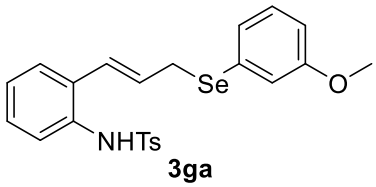
(*E*)-*N*-(2-(3-((4-ethoxyphenyl)selanyl)prop-1-en-1-yl)phenyl)-4-methylbenzenesulfonamide (3fa)



3fa

According to the General Procedure **B**, the product **3fa** was obtained as a white solid after silica gel chromatography (*n*-hexane/EtOAc = 40:1), 68.1 mg (70%), l/b > 20:1. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.42-7.46 (m, 2H), 7.34-7.38 (m, 2H), 7.22 (d, *J* = 8.0 Hz, 1H), 7.11-7.13 (m, 3H), 7.06-7.09 (m, 1H), 7.00-7.04 (m, 1H), 6.77-6.81 (m, 2H), 5.86-5.94 (m, 2H), 5.51 (d, *J* = 15.6 Hz, 1H), 4.00 (q, *J* = 6.8 Hz, 2H), 3.31 (d, *J* = 7.6 Hz, 2H), 2.31 (s, 3H), 1.35 (t, *J* = 6.8 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 159.4, 143.9, 137.4, 136.8, 133.1, 131.7, 130.6, 129.7, 128.3, 127.2, 126.4, 125.7, 125.1, 118.7, 115.4, 63.6, 31.5, 21.6, 14.9; HRMS (ESI-TOF) calcd for $C_{24}H_{26}NO_3SSe$ $[M+H]^+$ (488.0799), found 488.0804.

(*E*)-*N*-(2-(3-((3-methoxyphenyl)selanyl)prop-1-en-1-yl)phenyl)-4-methylbenzenes ulfonamide (3ga)

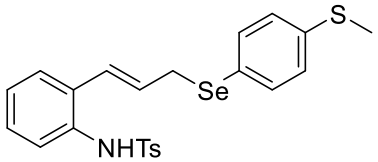


3ga

According to the General Procedure **B**, the product **3ga** was obtained as a light-yellow oil after silica gel chromatography (*n*-hexane/EtOAc = 40:1), 79.4 mg (84%), l/b > 20:1. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.44-7.46 (m, 2H), 7.23 (dd, *J* = 8.0 Hz, 1.2 Hz, 1H), 7.07-7.18 (m, 5H), 7.03 (dd, *J* = 7.2 Hz, 1.2 Hz, 1H), 6.97-7.01 (m, 2H), 6.81 (ddd, *J* = 8.0 Hz, 2.4 Hz, 0.8 Hz, 1H), 6.00 (br s, 1H), 5.89-5.97 (m, 1H), 5.65 (d, *J* = 15.2 Hz, 1H), 3.73 (s, 3H), 3.40 (dd, *J* = 7.6 Hz, 0.8 Hz, 2H), 2.30 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 159.8, 143.8, 136.8, 133.1, 131.9, 130.3, 130.2, 130.0, 129.7, 128.4, 127.17, 127.15, 126.5, 126.0, 125.6, 120.3, 113.3, 55.4, 30.7, 21.6; HRMS (ESI-TOF) calcd for $C_{23}H_{24}NO_3SSe$ $[M+H]^+$ (474.0642), found 474.0640.

(*E*)-4-methyl-*N*-(2-(3-((4-(methylthio)phenyl)selanyl)prop-1-en-1-yl)phenyl)benze

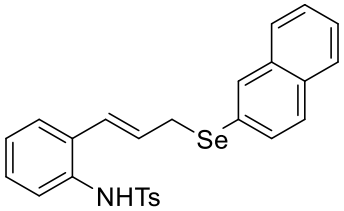
nesulfonamide (3ha)



3ha

According to the General Procedure **B**, the product **3ha** was obtained as a light-yellow solid after silica gel chromatography (*n*-hexane/EtOAc = 40:1), 85.0 mg (87%), l/b > 20:1. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.48 (d, J = 8.4 Hz, 2H), 7.33-7.35 (m, 2H), 7.01-7.18 (m, 8H), 5.89-5.96 (m, 2H), 5.75 (d, J = 15.6 Hz, 1H), 3.40 (dd, J = 8.0 Hz, 0.8 Hz, 2H), 2.43 (s, 3H), 2.31 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 143.9, 139.2, 136.7, 135.3, 133.1, 131.9, 130.3, 129.7, 128.4, 127.3, 127.2, 126.8, 126.5, 126.1, 125.1, 124.9, 30.9, 21.7, 15.5; HRMS (ESI-TOF) calcd for $C_{23}H_{24}NO_2S_2Se$ $[M+H]^+$ (490.0414), found 490.0412.

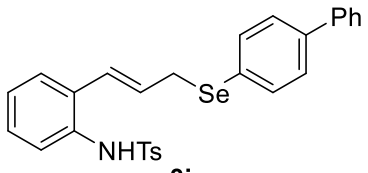
(*E*)-4-methyl-*N*-(2-(3-(naphthalen-2-ylselanyl)prop-1-en-1-yl)phenyl)benzenesulfonamide (3ia)



3ia

According to the General Procedure **B**, the product **3ia** was obtained as a light-yellow oil after silica gel chromatography (*n*-hexane/EtOAc = 50:1), 70.9 mg (72%), l/b > 20:1. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.92 (s, 1H), 7.76-7.79 (m, 1H), 7.73 (d, J = 8.4 Hz, 1H), 7.67-7.69 (m, 1H), 7.50 (dd, J = 8.4 Hz, 1.6 Hz, 1H), 7.40-7.44 (m, 2H), 7.37 (d, J = 8.4 Hz, 2H), 7.10-7.13 (m, 2H), 6.97-7.07 (m, 4H), 5.94-6.00 (m, 1H), 5.90 (br s, 1H), 5.84 (d, J = 15.6 Hz, 1H), 3.53 (d, J = 7.2 Hz, 2H), 2.28 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 143.8, 136.7, 133.9, 133.4, 133.1, 132.6, 131.7, 131.1, 130.3, 129.6, 128.6, 128.3, 128.1, 127.4, 127.2, 126.8, 126.5, 126.4, 126.2, 125.0, 30.5, 21.6; HRMS (ESI-TOF) calcd for $C_{26}H_{24}NO_2SSe$ $[M+H]^+$ (494.0693), found 494.0695.

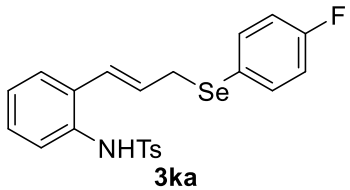
(*E*)-*N*-(2-(3-([1,1'-biphenyl]-4-ylselanyl)prop-1-en-1-yl)phenyl)-4-methylbenzenesulfonamide (3ja)



3ja

According to the General Procedure **B**, the product **3ja** was obtained as a light-yellow oil after silica gel chromatography (*n*-hexane/EtOAc = 50:1), 85.0 mg (82%), l/b > 20:1. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.44-7.54 (m, 8H), 7.35-7.39 (m, 2H), 7.26-7.30 (m, 1H), 7.14-7.16 (m, 2H), 7.00-7.10 (m, 4H), 6.07 (br s, 1H), 5.90-6.01 (m, 2H), 3.50 (d, J = 6.4 Hz, 2H), 2.28 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 143.9, 140.7, 140.3, 136.7, 134.6, 133.1, 131.9, 130.3, 129.7, 128.9, 128.4, 127.9, 127.7, 127.3, 127.22, 127.15, 126.5, 126.3, 125.0, 30.5, 21.6; HRMS (ESI-TOF) calcd for $C_{28}H_{26}NO_2SSe$ $[M+H]^+$ (520.0849), found 520.0853.

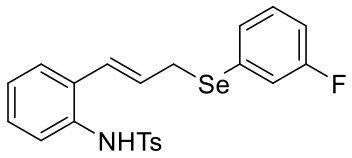
(*E*)-*N*-(2-(3-((4-fluorophenyl)selanyl)prop-1-en-1-yl)phenyl)-4-methylbenzenesulfonamide (3ka)



3ka

According to the General Procedure **B**, the product **3ka** was obtained as a light-yellow oil after silica gel chromatography (*n*-hexane/EtOAc = 50:1), 70.0 mg (76%), l/b > 20:1. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.48-7.51 (m, 2H), 7.39-7.44 (m, 2H), 7.13-7.17 (m, 4H), 7.01-7.10 (m, 2H), 6.90-6.96 (m, 2H), 6.09 (br s, 1H), 5.90-5.97 (m, 1H), 5.86 (d, J = 15.6 Hz, 1H), 3.42 (d, J = 7.2 Hz, 2H), 2.32 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 162.8 (d, J = 246.7 Hz), 144.0, 136.9 (d, J = 7.9 Hz), 136.6, 133.1, 131.7, 130.3, 129.7, 128.4, 127.3, 127.2, 126.4, 126.3, 124.8, 123.7 (d, J = 3.3 Hz), 116.5 (d, J = 21.4 Hz), 31.2, 21.6; HRMS (ESI-TOF) calcd for $C_{22}H_{21}FNO_2SSe$ $[M+H]^+$ (462.0442), found 462.0443.

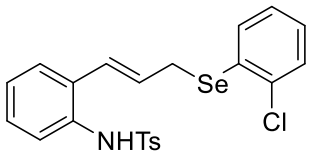
(*E*)-*N*-(2-(3-((3-fluorophenyl)selanyl)prop-1-en-1-yl)phenyl)-4-methylbenzenesulfonamide (3la)



3la

According to the General Procedure **B**, the product **3la** was obtained as a light-yellow oil after silica gel chromatography (*n*-hexane/EtOAc = 50:1), 74.6 mg (81%), l/b > 20:1. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.49 (d, J = 8.4 Hz, 2H), 7.18-7.25 (m, 3H), 7.01-7.15 (m, 6H), 6.91-6.96 (m, 1H), 6.04 (br s, 1H), 5.88-5.99 (m, 2H), 3.48 (d, J = 6.8 Hz, 2H), 2.31 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 162.6 (d, J = 248.4 Hz), 144.0, 136.7, 133.2, 131.7, 131.3 (d, J = 6.7 Hz), 130.5 (d, J = 8.0 Hz), 129.9, 129.7, 129.4 (d, J = 3.1 Hz), 128.5, 127.28, 127.25, 126.6 (d, J = 2.4 Hz), 125.1, 120.6 (d, J = 21.7 Hz), 114.8 (d, J = 20.9 Hz), 30.6, 21.6; HRMS (ESI-TOF) calcd for $C_{22}H_{21}FNO_2SSe$ $[M+H]^+$ (462.0442), found 462.0440.

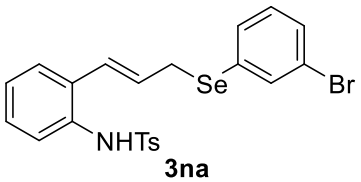
(*E*)-*N*-(2-(3-((2-chlorophenyl)selanyl)prop-1-en-1-yl)phenyl)-4-methylbenzenesulfonamide (3ma)



3ma

According to the General Procedure **B**, the product **3ma** was obtained as a light-yellow solid after silica gel chromatography (*n*-hexane/EtOAc = 50:1), 80.1 mg (84%), l/b > 20:1. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.47 (d, J = 8.0 Hz, 2H), 7.37-7.40 (m, 2H), 7.08-7.22 (m, 7H), 7.01-7.05 (m, 1H), 5.85-5.99 (m, 3H), 3.53 (d, J = 7.2 Hz, 2H), 2.32 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 144.0, 137.0, 136.6, 134.2, 133.1, 131.9, 130.1, 129.9, 129.8, 129.6, 128.9, 128.5, 127.4, 127.3, 127.2, 126.9, 126.6, 125.5, 29.2, 21.7; HRMS (ESI-TOF) calcd for $C_{22}H_{21}ClNO_2SSe$ $[M+H]^+$ (478.0147), found 478.0146.

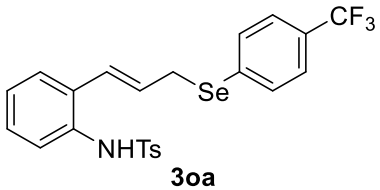
(*E*)-*N*-(2-(3-((3-bromophenyl)selanyl)prop-1-en-1-yl)phenyl)-4-methylbenzenesulfonamide (3na)



3na

According to the General Procedure **B**, the product **3na** was obtained as a light-yellow oil after silica gel chromatography (*n*-hexane/EtOAc = 50:1), 70.0 mg (67%), l/b > 20:1. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.57-7.58 (m, 1H), 7.49 (d, J = 8.4 Hz, 2H), 7.33-7.37 (m, 2H), 7.17-7.19 (m, 1H), 7.02-7.15 (m, 6H), 6.11 (br s, 1H), 5.87-5.99 (m, 2H), 3.47 (d, J = 6.8 Hz, 2H), 2.31 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 143.9, 136.7, 136.4, 133.1, 132.4, 131.8, 131.5, 130.9, 130.6, 129.74, 129.72, 128.5, 127.3, 126.7, 126.6, 125.3, 122.9, 30.7, 21.7; HRMS (ESI-TOF) calcd for $C_{22}H_{21}BrNO_2SSe$ $[M+H]^+$ (521.9642), found 521.9643.

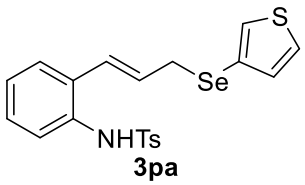
(*E*)-4-methyl-*N*-(2-(3-((4-(trifluoromethyl)phenyl)selanyl)prop-1-en-1-yl)phenyl)benzenesulfonamide (3oa)



3oa

According to the General Procedure **B**, the product **3oa** was obtained as a white solid after silica gel chromatography (*n*-hexane/EtOAc = 50:1), 62.3 mg (61%), l/b > 20:1. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.49-7.53 (m, 4H), 7.44 (d, J = 8.0 Hz, 2H), 7.13-7.18 (m, 3H), 7.02-7.11 (m, 3H), 6.28 (br s, 1H), 6.24 (d, J = 15.6 Hz, 1H), 5.95-6.03 (m, 1H), 3.59 (dd, J = 7.6 Hz, 0.8 Hz, 2H), 2.32 (d, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 144.0, 136.6, 135.3 (q, J = 1.2 Hz), 133.1, 132.6, 132.0, 129.7, 129.321 (q, J = 32.4 Hz), 129.315, 128.6, 127.4, 127.3, 127.2, 126.7, 125.9 (q, J = 3.6 Hz), 125.2, 124.1 (q, J = 270.3 Hz), 29.9, 21.6; HRMS (ESI-TOF) calcd for $C_{23}H_{21}F_3NO_2SSe$ $[M+H]^+$ (512.0410), found 512.0406.

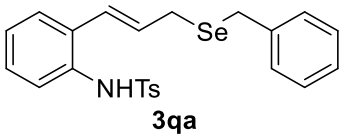
(*E*)-4-methyl-*N*-(2-(3-(thiophen-3-ylselanyl)prop-1-en-1-yl)phenyl)benzenesulfonamide (3pa)



3pa

According to the General Procedure **B**, the product **3pa** was obtained as a light-yellow oil after silica gel chromatography (*n*-hexane/EtOAc = 40:1), 75.3 mg (84%), l/b > 20:1. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.49 (d, J = 8.4 Hz, 2H), 7.32 (dd, J = 4.8 Hz, 3.2 Hz, 1H), 7.27 (dd, J = 3.2 Hz, 1.2 Hz, 1H), 7.23 (dd, J = 8.0 Hz, 1.2 Hz, 1H), 7.07-7.15 (m, 4H), 7.01-7.05 (m, 2H), 6.03 (br s, 1H), 5.88-5.95 (m, 1H), 5.64 (d, J = 15.6 Hz, 1H), 3.33 (dd, J = 7.6 Hz, 0.8 Hz, 2H), 2.31 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 143.9, 136.8, 133.19, 133.15, 131.6, 130.5, 129.8, 129.7, 128.4, 127.2, 126.8, 126.4, 126.0, 125.0, 122.3, 31.2, 21.7; HRMS (ESI-TOF) calcd for $C_{20}H_{20}NO_2S_2Se$ $[M+H]^+$ (450.0101), found 450.0099.

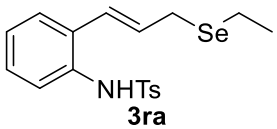
(*E*)-*N*-(2-(3-(benzylselanyl)prop-1-en-1-yl)phenyl)-4-methylbenzenesulfonamide (3qa)



3qa

According to the General Procedure **B**, the product **3qa** was obtained as a light-yellow oil after silica gel chromatography (*n*-hexane/EtOAc = 50:1), 59.3 mg (65%), l/b > 20:1. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.51 (d, J = 8.4 Hz, 2H), 7.07-7.27 (m, 11H), 6.43 (s, 1H), 6.14 (d, J = 15.6 Hz, 1H), 5.91-5.99 (m, 1H), 3.64 (s, 2H), 3.10 (d, J = 7.2 Hz, 2H), 2.26 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 143.9, 139.2, 136.5, 132.9, 132.3, 130.7, 129.7, 129.1, 128.7, 128.3, 127.3, 127.0, 126.9, 126.8, 125.6, 27.2, 25.9, 21.6; HRMS (ESI-TOF) calcd for $C_{23}H_{24}NO_2SSe$ $[M+H]^+$ (458.0693), found 458.0692.

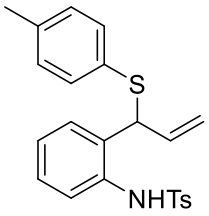
(*E*)-*N*-(2-(3-(ethylselanyl)prop-1-en-1-yl)phenyl)-4-methylbenzenesulfonamide (3ra)



3ra

According to the General Procedure **B**, the product **3ra** was obtained as a white solid after silica gel chromatography (*n*-hexane/EtOAc = 50:1), 51.3 mg (65%), l/b > 20:1. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.54 (d, J = 8.0 Hz, 2H), 7.27-7.29 (m, 1H), 7.14-7.17 (m, 3H), 7.05-7.12 (m, 2H), 6.34 (br s, 1H), 6.11 (d, J = 15.6 Hz, 1H), 5.94-6.02 (m, 1H), 3.17 (d, J = 7.6 Hz, 2H), 2.43 (q, J = 7.6 Hz, 2H), 2.32 (s, 3H), 1.31 (t, J = 7.6 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 144.0, 136.6, 133.0, 132.3, 131.1, 129.7, 128.3, 127.3, 127.1, 126.8, 125.4, 125.2, 25.0, 21.7, 17.1, 15.7; HRMS (ESI-TOF) calcd for $C_{18}H_{22}NO_2SSe$ $[M+H]^+$ (396.0536), found 396.0532.

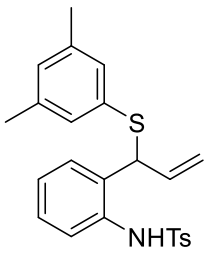
4-methyl-*N*-(2-(1-(*p*-tolylthio)allyl)phenyl)benzenesulfonamide (7aa)



7aa

According to the General Procedure **C**, the product **7aa** was obtained as a colorless oil after silica gel chromatography (*n*-hexane/EtOAc = 50:1), 74.5 mg (91%), b/l > 20:1. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.54 (d, J = 8.4 Hz, 2H), 7.37 (d, J = 7.6 Hz, 1H), 7.29 (br s, 1H), 7.03-7.18 (m, 7H), 7.00 (d, J = 8.0 Hz, 2H), 5.83-5.92 (m, 1H), 4.96 (dt, J = 10.0 Hz, 1.2 Hz, 1H), 4.61 (dt, J = 16.8 Hz, 1.2 Hz, 1H), 4.18 (d, J = 8.0 Hz, 1H), 2.30 (s, 3H), 2.26 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 143.9, 138.6, 137.2, 135.0, 134.6, 133.7, 132.7, 129.8, 129.7, 129.3, 128.7, 128.5, 127.2, 126.4, 125.7, 117.6, 53.0, 21.6, 21.3; HRMS (ESI-TOF) calcd for $C_{23}H_{24}NO_2S_2$ $[M+H]^+$ (410.1248), found 410.1240.

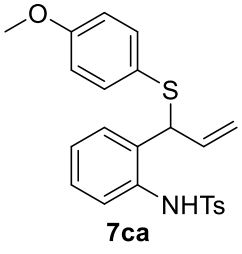
***N*-(2-(1-((3,5-dimethylphenyl)thio)allyl)phenyl)-4-methylbenzenesulfonamide (7ba)**



7ba

According to the General Procedure **C**, the product **7ba** was obtained as a colorless oil after silica gel chromatography (*n*-hexane/EtOAc = 50:1), 70.3 mg (83%), b/l > 20:1. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.60 (d, J = 8.4 Hz, 2H), 7.46 (d, J = 8.0 Hz, 1H), 7.30 (br s, 1H), 7.22-7.27 (m, 1H), 7.20 (d, J = 8.0 Hz, 2H), 7.12 (s, 1H), 7.11 (s, 1H), 6.87-6.90 (m, 3H), 5.88-5.97 (m, 1H), 5.05 (d, J = 10.4 Hz, 1H), 4.72 (d, J = 16.8 Hz, 1H), 4.25 (d, J = 7.6 Hz, 1H), 2.37 (s, 3H), 2.26 (s, 6H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 143.8, 138.7, 137.2, 135.0, 134.7, 132.7, 132.5, 130.6, 130.0, 129.7, 128.7, 128.6, 127.1, 126.3, 125.8, 117.6, 52.4, 21.6, 21.2; HRMS (ESI-TOF) calcd for $C_{24}H_{26}NO_2S_2$ $[M+H]^+$ (424.1405), found 424.1401.

***N*-(2-(1-((4-methoxyphenyl)thio)allyl)phenyl)-4-methylbenzenesulfonamide (7ca)**

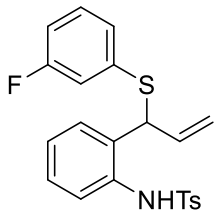


7ca

According to the General Procedure **C**, the product **7ca** was obtained as a colorless oil after silica gel chromatography (*n*-hexane/EtOAc = 40:1), 68.9 mg (81%), b/l > 20:1. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.54 (d, J = 8.4 Hz, 2H), 7.36-7.38 (m, 2H), 7.11-7.18 (m, 5H), 6.99-7.04 (m, 2H), 6.70-6.74 (m, 2H), 5.85-5.93 (m, 1H), 4.94 (d, J = 10.4 Hz, 1H), 4.55 (dt, J = 16.8 Hz, 1.2 Hz, 1H), 4.08 (d, J = 8.0 Hz, 1H), 3.73 (s, 3H), 2.29 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 160.3, 143.9, 137.1, 136.3, 135.0, 134.7, 132.6, 129.7, 128.6, 128.5, 127.2, 126.3, 125.6, 123.2, 117.4, 114.6, 55.4, 53.9, 21.6;

HRMS (ESI-TOF) calcd for $C_{23}H_{24}NO_3S_2$ $[M+H]^+$ (426.1198), found 426.1191.

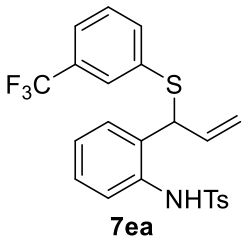
_N_-(2-(1-((3-fluorophenyl)thio)allyl)phenyl)-4-methylbenzenesulfonamide (7da)



7da

According to the General Procedure **C**, the product **7da** was obtained as a light-yellow oil after silica gel chromatography (*n*-hexane/EtOAc = 50:1), 68.6 mg (83%), b/l = 12:1. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.53-7.56 (m, 2H), 7.35 (dd, J = 8.0 Hz, 1.2 Hz, 1H), 7.06-7.21 (m, 6H), 7.02 (br s, 1H), 6.94-6.97 (m, 1H), 6.85-6.90 (m, 1H), 6.79-6.82 (m, 1H), 5.83-5.91 (m, 1H), 5.04 (dt, J = 10.0 Hz, 0.8 Hz, 1H), 4.75 (dt, J = 16.8 Hz, 1.2 Hz, 1H), 4.36 (d, J = 7.6 Hz, 1H), 2.31 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 162.6 (d, J = 247.5 Hz), 144.1, 137.1, 135.8 (d, J = 7.6 Hz), 134.7, 134.5, 132.5, 130.3 (d, J = 8.5 Hz), 129.8, 129.0, 128.7, 127.7 (d, J = 3.0 Hz), 127.2, 126.8, 126.4, 118.8 (d, J = 22.4 Hz), 118.2, 114.9 (d, J = 21.0 Hz), 51.8, 21.6; HRMS (ESI-TOF) calcd for $C_{22}H_{21}FNO_2S_2$ $[M+H]^+$ (414.0998), found 414.1006.

4-methyl-_N_-(2-(1-((3-(trifluoromethyl)phenyl)thio)allyl)phenyl)benzenesulfonamide (7ea)

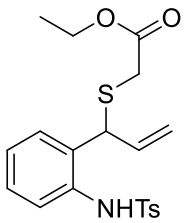


7ea

According to the General Procedure **C**, the product **7ea** was obtained as a light-yellow oil after silica gel chromatography (*n*-hexane/EtOAc = 50:1), 79.7 mg (86%), b/l = 13:1. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.60 (d, J = 8.0 Hz, 2H), 7.50 (d, J = 7.6 Hz, 1H), 7.36-7.44 (m, 4H), 7.21-7.28 (m, 3H), 7.13-7.17 (m, 2H), 7.07 (br s, 1H), 5.89-5.98 (m, 1H), 5.10 (d, J = 10.4 Hz, 1H), 4.78 (d, J = 16.8 Hz, 1H), 4.46 (d, J = 7.6 Hz, 1H),

2.37 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 144.1, 137.0, 135.5, 135.0, 134.5, 134.4, 132.5, 131.3 (q, J = 32.3 Hz), 129.8, 129.4, 129.0, 128.8 (q, J = 3.7 Hz), 128.7, 127.2, 126.9, 126.6, 124.5 (q, J = 3.7 Hz), 123.7 (q, J = 270.9 Hz), 118.3, 51.8, 21.5; HRMS (ESI-TOF) calcd for $C_{23}H_{21}F_3NO_2S_2$ $[M+H]^+$ (464.0966), found 464.0959.

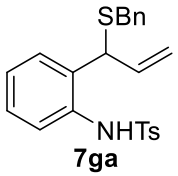
ethyl 2-((1-(2-((4-methylphenyl)sulfonamido)phenyl)allyl)thio)acetate (7fa)



7fa

According to the General Procedure **C**, the product **7fa** was obtained as a light-yellow oil after silica gel chromatography (*n*-hexane/EtOAc = 50:1), 64.1 mg (79%), b/l = 18:1. ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.11 (br s, 1H), 7.61-7.63 (m, 3H), 7.26-7.30 (m, 1H), 7.12-7.20 (m, 4H), 5.81-5.90 (m, 1H), 5.11 (d, J = 10.0 Hz, 1H), 4.72 (d, J = 16.8 Hz, 1H), 4.28-4.40 (m, 2H), 4.11 (d, J = 8.4 Hz, 1H), 3.15 (d, J = 16.4 Hz, 1H), 3.06 (d, J = 16.8 Hz, 1H), 2.36 (s, 3H), 1.35 (t, J = 7.2 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 171.2, 143.5, 137.1, 135.1, 133.8, 131.6, 129.4, 128.8, 127.4, 127.3, 126.1, 125.9, 117.8, 62.3, 47.3, 33.0, 21.5, 14.3; HRMS (ESI-TOF) calcd for $C_{20}H_{24}NO_4S_2$ $[M+H]^+$ (406.1147), found 406.1142.

***N*-(2-(1-(benzylthio)allyl)phenyl)-4-methylbenzenesulfonamide (7ga)**

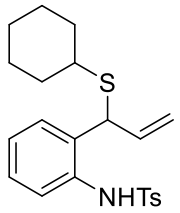


7ga

According to the General Procedure **C**, the product **7ga** was obtained as a light-yellow oil after silica gel chromatography (*n*-hexane/EtOAc = 50:1), 55.7 mg (68%), b/l = 6:1. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.55 (d, J = 8.0 Hz, 1H), 7.46-7.49 (m, 2H), 7.38-7.42 (m, 1H), 7.32 (d, J = 7.2 Hz, 2H), 7.22-7.28 (m, 1H), 7.11-7.14 (m, 4H),

7.03-7.06 (m, 3H), 5.84-5.93 (m, 1H), 5.17 (d, J = 10.0 Hz, 1H), 4.66 (d, J = 16.8 Hz, 1H), 3.52-3.66 (m, 3H), 2.32 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 143.5, 137.8, 136.6, 134.7, 134.6, 131.8, 129.4, 129.3, 128.9, 128.7, 128.0, 127.7, 127.0, 126.2, 125.7, 118.0, 46.3, 35.9, 21.5; HRMS (ESI-TOF) calcd for $C_{23}H_{24}NO_2S_2$ $[M+H]^+$ (410.1248), found 410.1243.

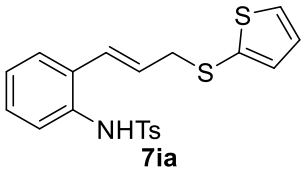
_N_-(2-(1-(cyclohexylthio)allyl)phenyl)-4-methylbenzenesulfonamide (7ha)



7ha

According to the General Procedure **C**, the product **7ha** was obtained as a colorless oil after silica gel chromatography (*n*-hexane/EtOAc = 60:1), 38.6 mg (48%), b/l = 2:1. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.72 (br s, 1H), 7.62 (d, J = 8.0 Hz, 2H), 7.47 (d, J = 8.0 Hz, 1H), 7.22-7.26 (m, 3H), 7.10-7.18 (m, 2H), 5.90-5.98 (m, 1H), 5.10 (d, J = 10.0 Hz, 1H), 4.78 (d, J = 16.8 Hz, 1H), 4.03 (d, J = 8.4 Hz, 1H), 2.45-2.51 (m, 1H), 2.39 (s, 3H), 1.70-1.93 (m, 4H), 1.26-1.45 (m, 6H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 143.8, 137.3, 135.6, 134.9, 132.1, 129.7, 128.6, 128.2, 127.1, 126.0, 125.0, 117.0, 46.9, 43.4, 33.6, 32.9, 26.0, 25.8, 25.7, 21.6; HRMS (ESI-TOF) calcd for $C_{22}H_{28}NO_2S_2$ $[M+H]^+$ (402.1561), found 402.1558.

(*E*)-4-methyl-*N*-(2-(3-(thiophen-2-ylthio)prop-1-en-1-yl)phenyl)benzenesulfonamide (7ia)

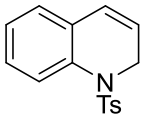


7ia

According to the General Procedure **C**, the product **7ia** was obtained as a light-yellow oil after silica gel chromatography (*n*-hexane/EtOAc = 50:1), 49.8 mg (62%), l/b >

20:1. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.45-7.47 (m, 2H), 7.41 (dd, J = 5.2 Hz, 1.2 Hz, 1H), 7.27-7.29 (m, 1H), 7.11-7.15 (m, 4H), 7.03-7.06 (m, 2H), 6.99 (dd, J = 5.2 Hz, 3.2 Hz, 1H), 5.93 (br s, 1H), 5.76-5.84 (m, 1H), 5.59 (d, J = 15.6 Hz, 1H), 3.28 (dd, J = 7.6 Hz, 1.2 Hz, 1H), 2.31 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 143.9, 136.7, 135.4, 133.28, 133.26, 131.6, 130.6, 129.7, 129.4, 128.6, 127.9, 127.5, 127.4, 127.2, 126.5, 125.1, 41.8, 21.7; HRMS (ESI-TOF) calcd for $C_{20}H_{20}NO_2S_3$ $[M+H]^+$ (402.0656), found 402.0653.

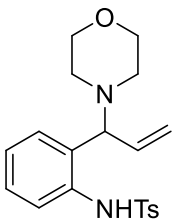
1-tosyl-1,2-dihydroquinoline (9)



9

The product **9**, which is a known compound,[4] was obtained as a white solid after silica gel chromatography (*n*-hexane/EtOAc = 50:1), 17.0 mg (60%). ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.70 (d, J = 8.0 Hz, 1H), 7.25-7.31 (m, 3H), 7.16-7.20 (m, 1H), 7.07 (d, J = 7.6 Hz, 2H), 6.93 (dd, J = 7.6 Hz, 1.2 Hz, 1H), 6.03 (d, J = 9.6 Hz, 1H), 5.58 (dt, J = 9.6 Hz, 4.0 Hz, 1H), 4.44 (dd, J = 4.0 Hz, 1.6 Hz, 2H), 2.34 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 143.4, 136.4, 135.0, 129.6, 129.1, 128.1, 127.4, 126.9, 126.7, 126.5, 126.0, 124.0, 45.5, 21.6.

4-methyl-*N*-(2-(1-morpholinoallyl)phenyl)benzenesulfonamide (10)

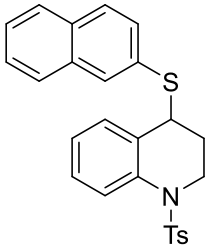


10

The product **10** was obtained as a colorless oil after silica gel chromatography (*n*-hexane/EtOAc = 15:1), 54.4 mg (73%), b/l > 20:1. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.32 (br s, 1H), 7.77 (d, J = 7.6 Hz, 2H), 7.48 (d, J = 8.0 Hz, 1H), 7.26 (d, J = 8.0 Hz, 2H), 7.17-7.21 (m, 1H), 6.93-7.01 (m, 2H), 5.71 (dt, J = 16.8 Hz, 10.0 Hz, 1H),

5.07-5.13 (m, 2H), 3.71-3.81 (m, 4H), 3.63 (d, J = 9.2 Hz, 1H), 2.47-2.62 (m, 2H), 2.39 (s, 3H), 2.32-2.39 (m, 2H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 143.7, 137.9, 136.8, 134.2, 129.7, 129.6, 128.6, 127.6, 127.0, 123.7, 119.6, 119.1, 74.9, 67.0, 51.0, 21.6; HRMS (ESI-TOF) calcd for $C_{20}H_{25}N_2O_3S$ $[M+H]^+$ (373.1586), found 373.1582.

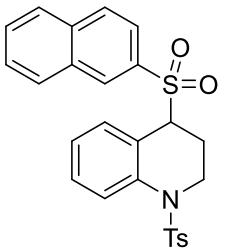
4-(naphthalen-2-ylthio)-1-tosyl-1,2,3,4-tetrahydroquinoline (11)



11

According to the General Procedure **C**, the product **11** was obtained as a colorless oil after silica gel chromatography (*n*-hexane/EtOAc = 40:1), 76.6 mg (86%). ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.88 (d, J = 8.0 Hz, 1H), 7.77 (d, J = 8.4 Hz, 1H), 7.63 (d, J = 8.4 Hz, 1H), 7.50-7.54 (m, 1H), 7.41-7.46 (m, 2H), 7.36-7.38 (m, 1H), 7.14-7.26 (m, 5H), 7.08 (s, 1H), 6.78 (d, J = 8.0 Hz, 2H), 3.92-3.99 (m, 1H), 3.58 (dd, J = 15.6 Hz, 7.6 Hz, 1H), 3.29 (dd, J = 15.6 Hz, 4.0 Hz, 1H), 2.60 (dd, J = 14.4 Hz, 5.2 Hz, 1H), 2.45 (dd, J = 14.4 Hz, 10.4 Hz, 1H), 2.16 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 143.5, 137.0, 136.4, 134.7, 134.3, 133.2, 131.7, 131.0, 130.8, 129.5, 128.9, 128.6, 128.0, 127.6, 127.1, 127.0, 126.8, 124.7, 123.8, 121.3, 52.2, 40.8, 37.4, 21.4; HRMS (ESI-TOF) calcd for $C_{26}H_{24}NO_2S_2$ $[M+H]^+$ (446.1248), found 446.1245.

4-(naphthalen-2-ylsulfonyl)-1-tosyl-1,2,3,4-tetrahydroquinoline (12)



12

The product **12** was obtained as a colorless oil after silica gel chromatography (*n*-hexane/EtOAc = 30:1-15:1), 39.6 mg (83%). ^{1}H NMR (400 MHz, $CDCl_3$) δ

7.94-7.98 (m, 2H), 7.86-7.88 (m, 1H), 7.67-7.72 (m, 3H), 7.64 (d, *J* = 8.4 Hz, 2H), 7.35-7.37 (m, 1H), 7.22-7.25 (m, 3H), 7.14-7.18 (m, 3H), 3.67-3.82 (m, 2H), 3.28 (dd, *J* = 14.8 Hz, 8.4 Hz, 1H), 3.07-3.15 (m, 2H), 2.16 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 143.9, 137.0, 135.6, 135.4, 134.5, 134.4, 132.4, 130.9, 130.3, 129.7, 129.5, 129.3, 129.1, 128.4, 128.1, 127.5, 127.3, 127.2, 123.8, 117.0, 61.6, 30.7, 29.3, 21.4; HRMS (ESI-TOF) calcd for $C_{26}H_{24}NO_4S_2$ $[M+H]^+$ (478.1147), found 478.1142.

4. References

[1] Zhao, J.; Yang, W.-J.; Lu, Y.-Y.; Teng, Y.; Lu, S.-C.; Li, H.-S. *Org. Chem. Front.* **2024**, *11*, 5495.

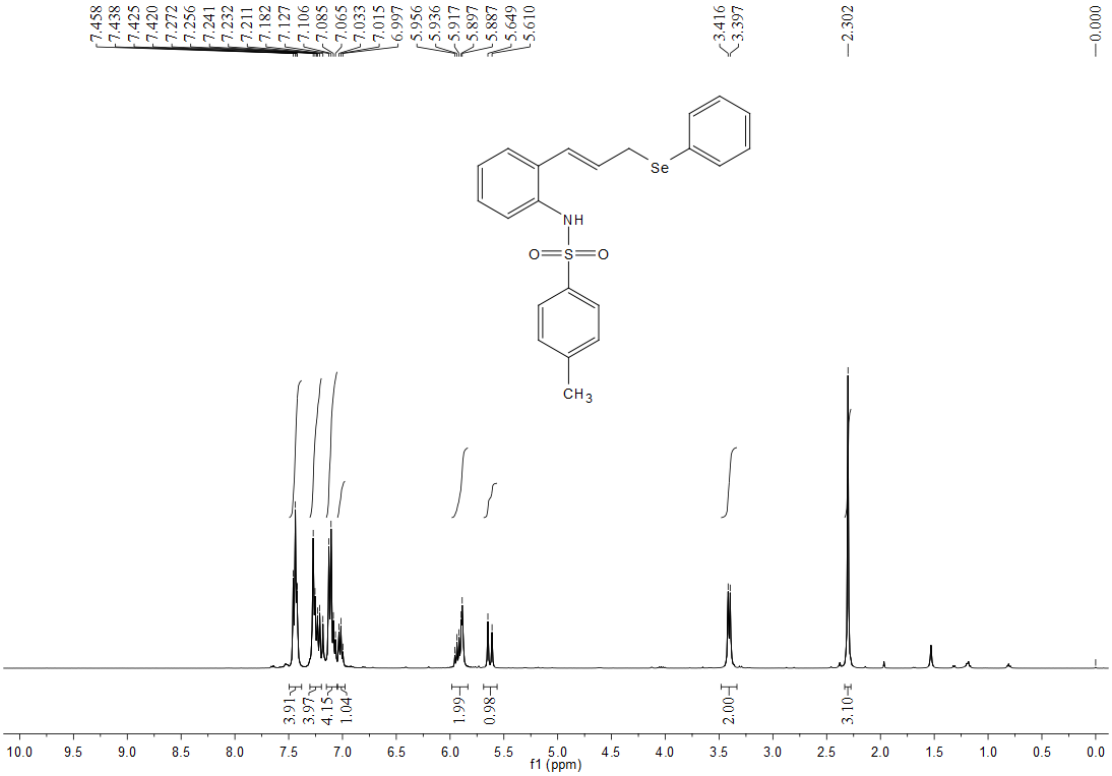
[2] Tucker, Z. D.; Hill, H. M.; Smith, A. L.; Ashfeld, B. L. *Org. Lett*. **2020**, *22*, 6605.

[3] (a) Zhou, P.; Jiao, H.; Niu, K.; Song, H.; Liu, Y.; Wang, Q. *ACS Sustainable Chem. Eng.* **2023**, *11*, 2607. (b) Li, S.; Yang, Q.; Bian, Z.; Wang, J. *Org. Lett*. **2020**, *22*, 2781.

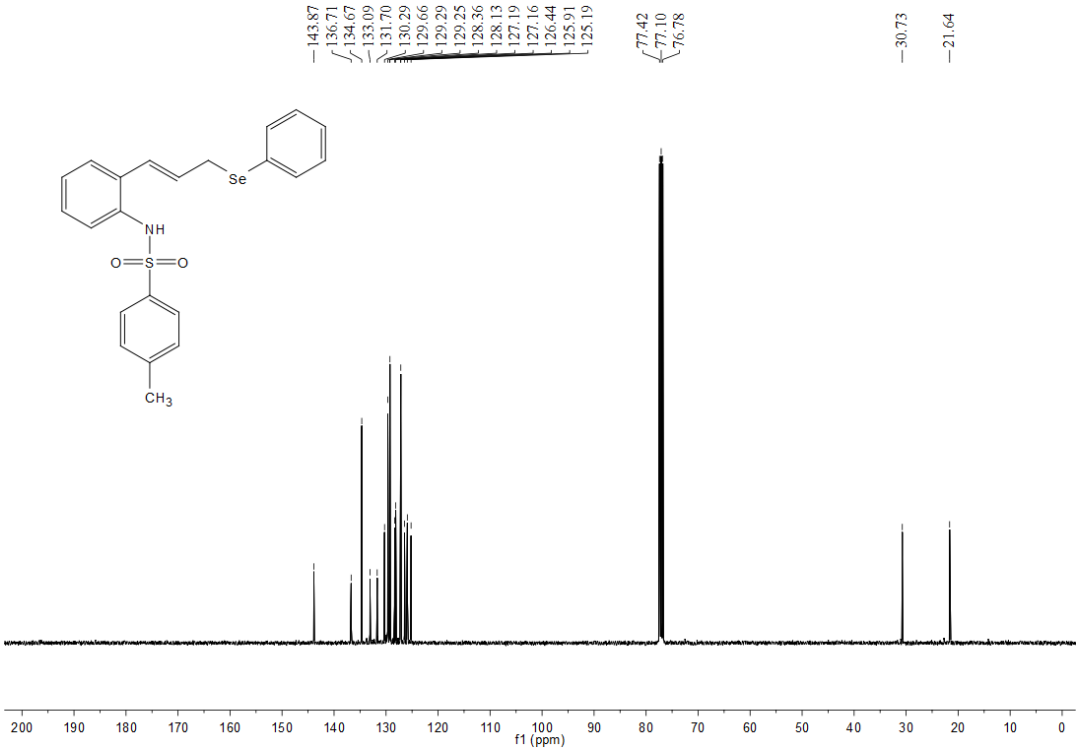
[4] Tiwari, V. K.; Pawar, G. G.; Das, R.; Adhikary, A.; Kapur, M. *Org. Lett.* **2013**, *15*, 3310.

5. Copies of NMR Spectra

(*E*)-4-methyl-*N*-(2-(3-(phenylselanyl)prop-1-en-1-yl)phenyl)benzenesulfonamide (3aa)

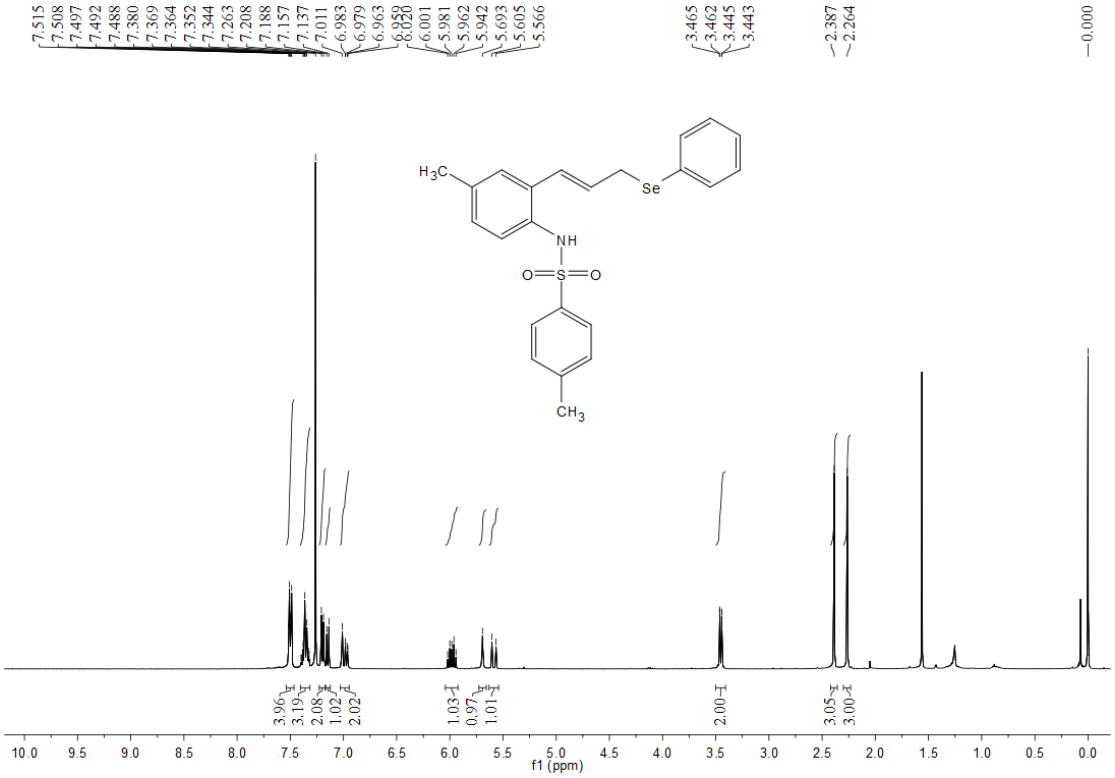


^{1}H NMR (400 MHz, $CDCl_3$) of **3aa**

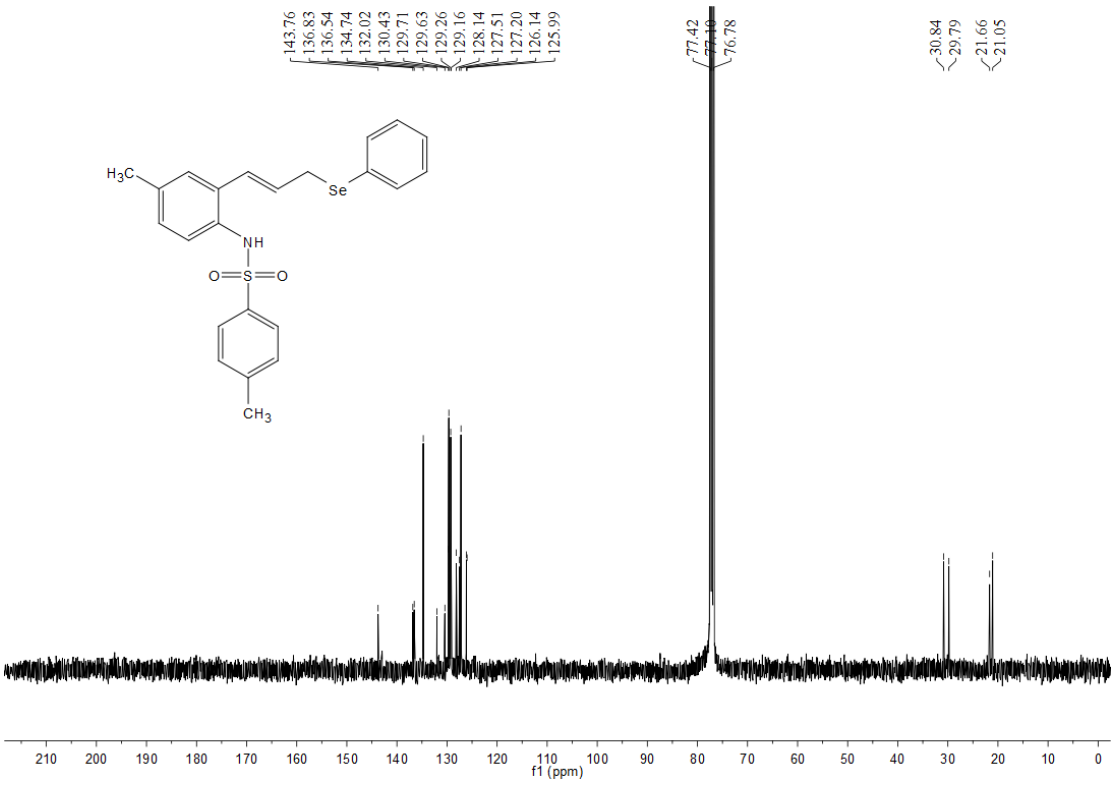


^{13}C NMR (100 MHz, $CDCl_3$) of **3aa**

(*E*)-4-methyl-*N*-(4-methyl-2-(3-(phenylselanyl)prop-1-en-1-yl)phenyl)benzenesulfonamide (3ab)

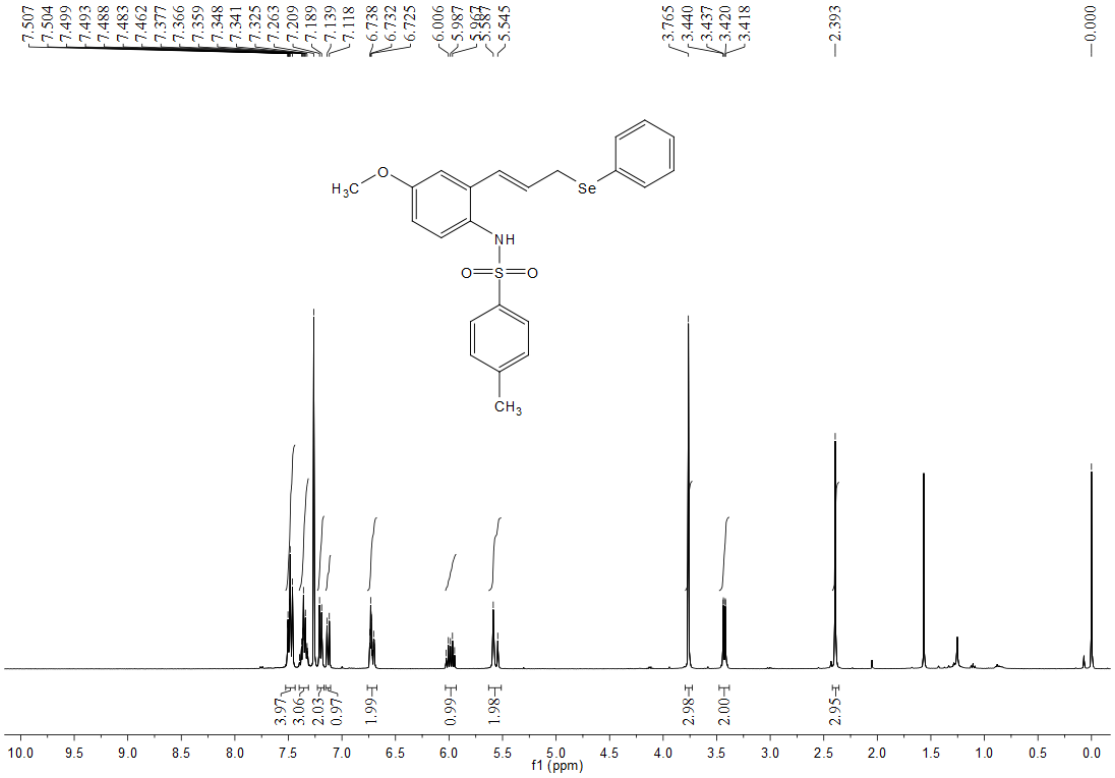


^{1}H NMR (400 MHz, $CDCl_3$) of **3ab**

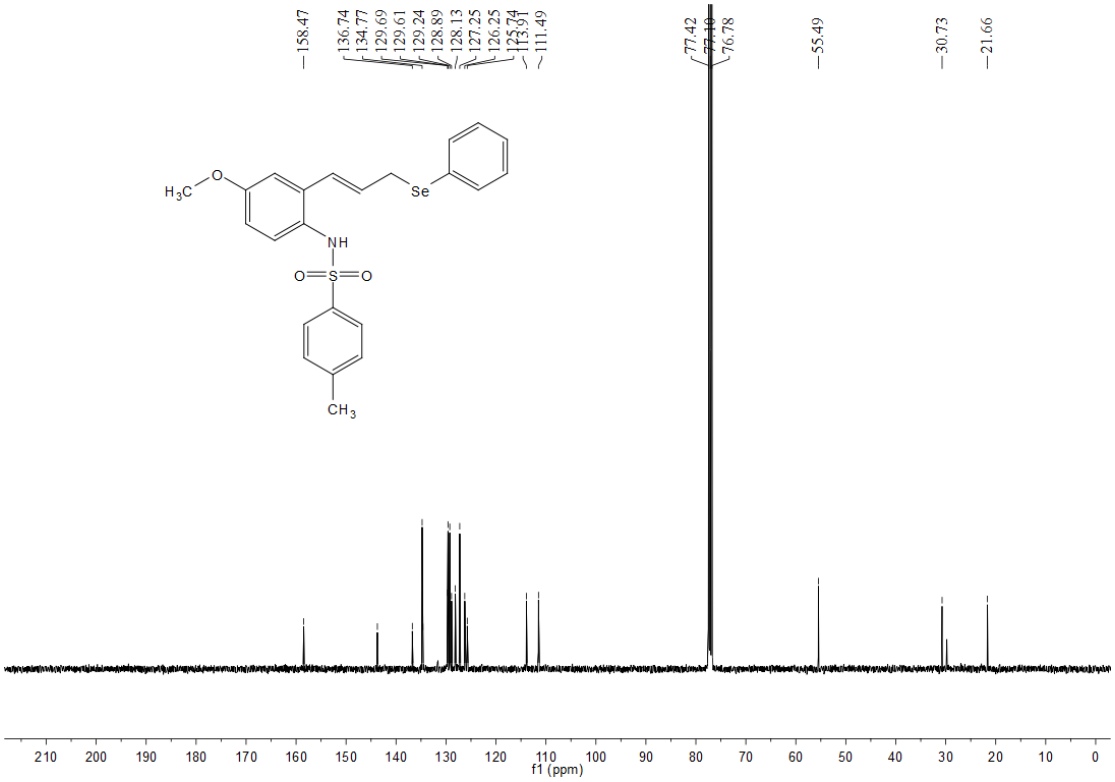


^{13}C NMR (100 MHz, $CDCl_3$) of **3ab**

(*E*)-*N*-(4-methoxy-2-(3-(phenylselanyl)prop-1-en-1-yl)phenyl)-4-methylbenzenesulfonamide (3ac)

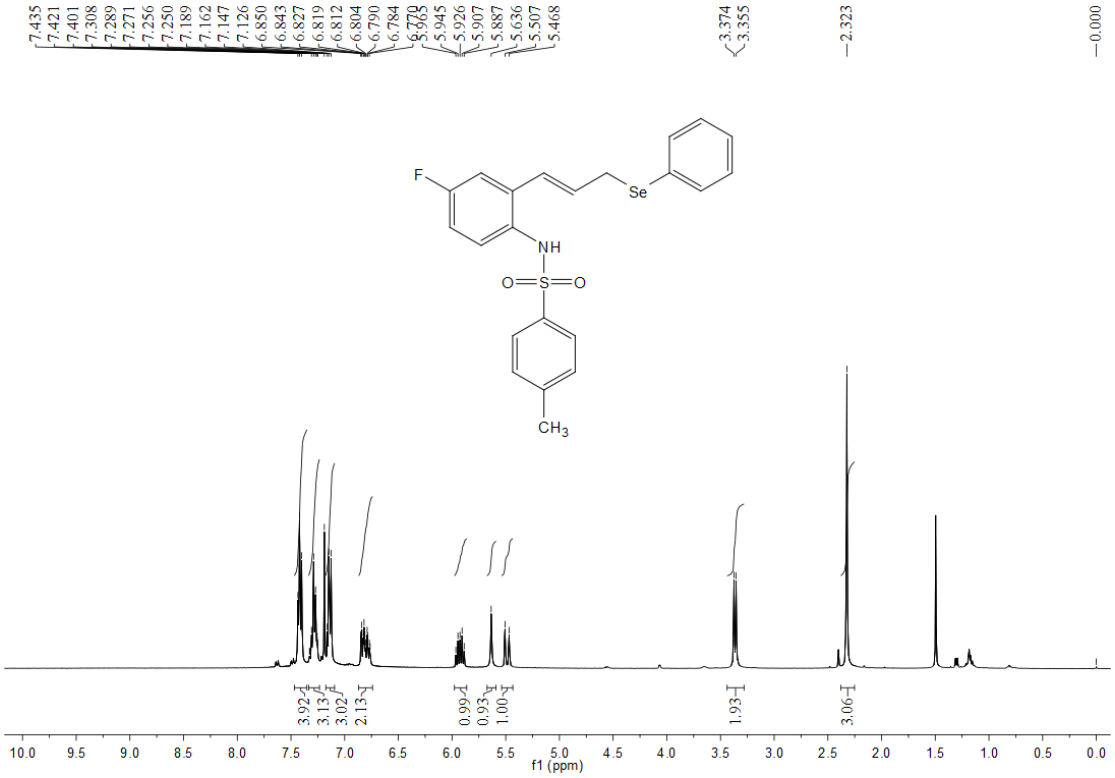


^{1}H NMR (400 MHz, $CDCl_3$) of **3ac**

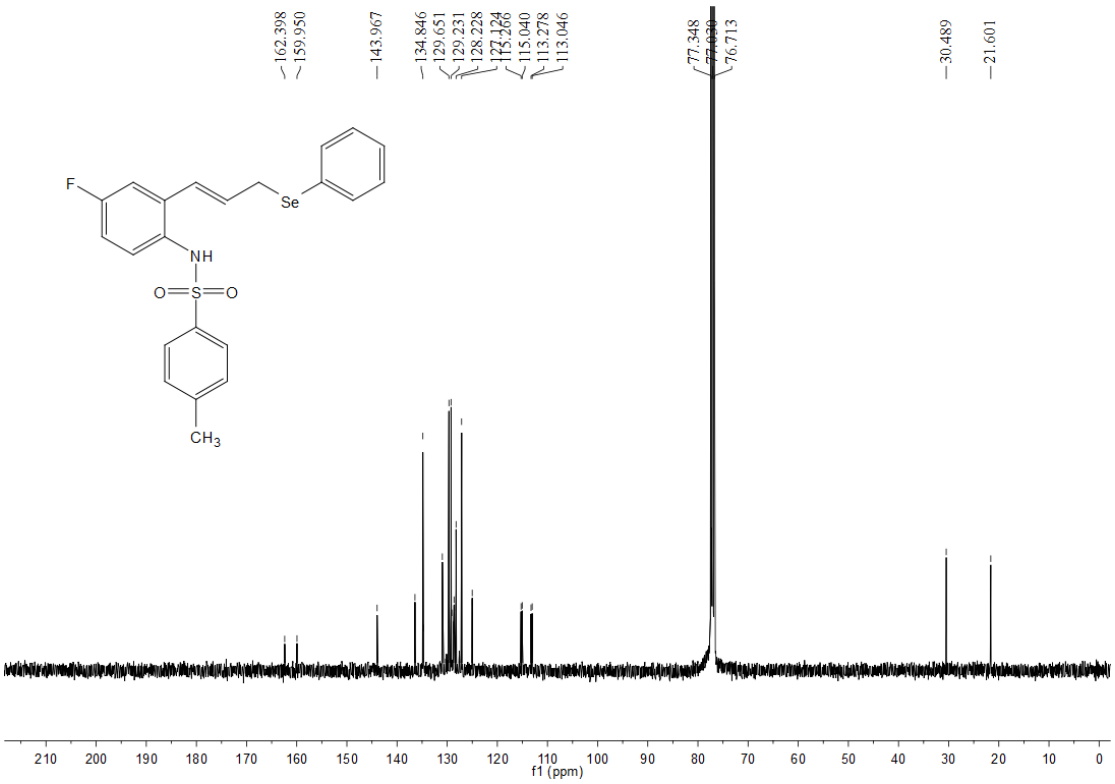


^{13}C NMR (100 MHz, $CDCl_3$) of **3ac**

(*E*)-*N*-(4-fluoro-2-(3-(phenylselanyl)prop-1-en-1-yl)phenyl)-4-methylbenzenesulfonamide (3ae)

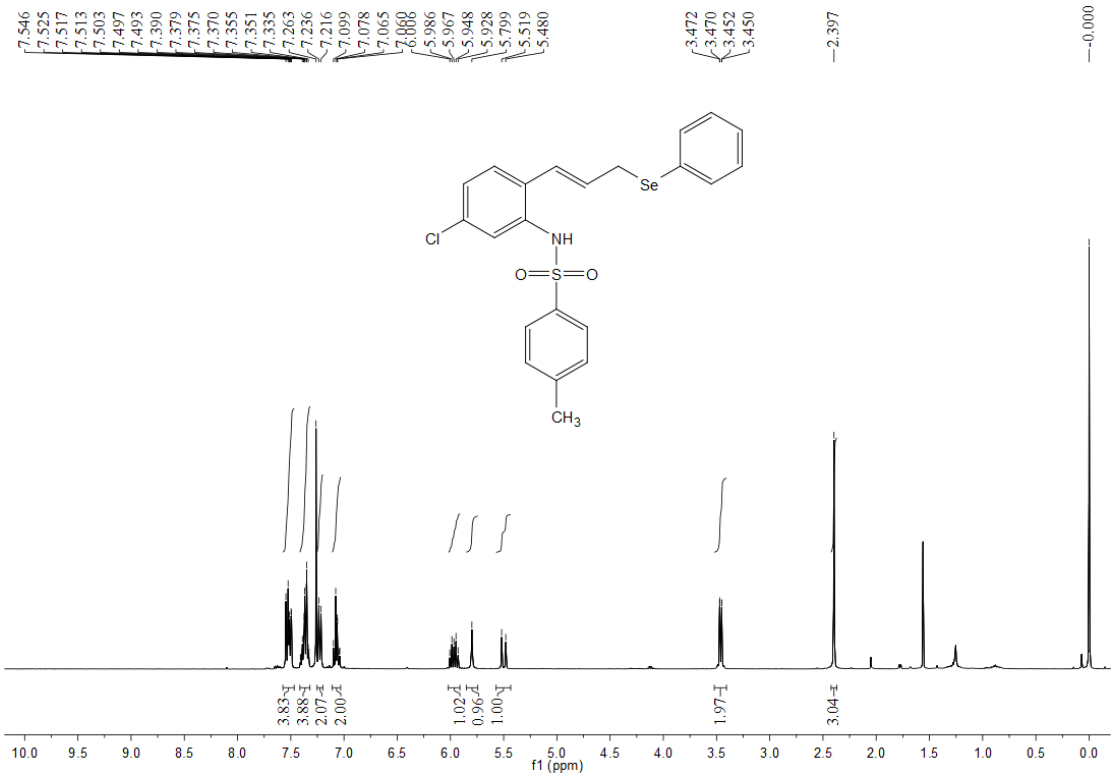


^{1}H NMR (400 MHz, $CDCl_3$) of **3ae**

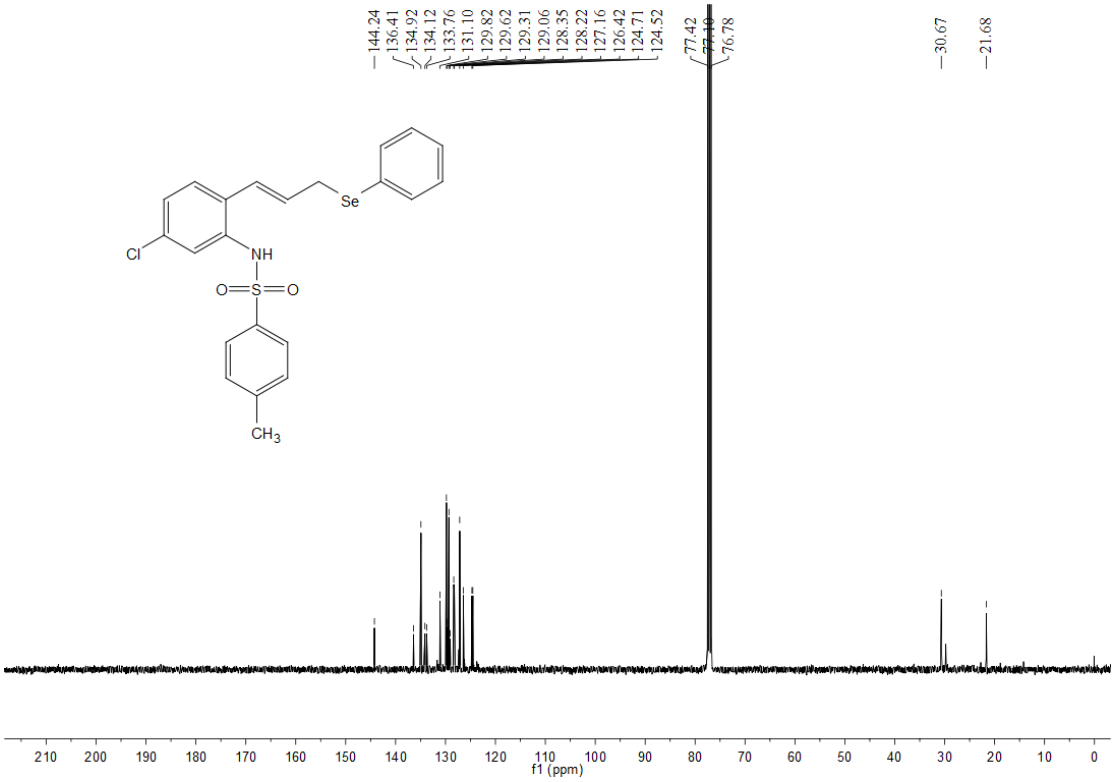


^{13}C NMR (100 MHz, $CDCl_3$) of **3ae**

(*E*)-*N*-(5-chloro-2-(3-(phenylselanyl)prop-1-en-1-yl)phenyl)-4-methylbenzenesulfonamide (3af)

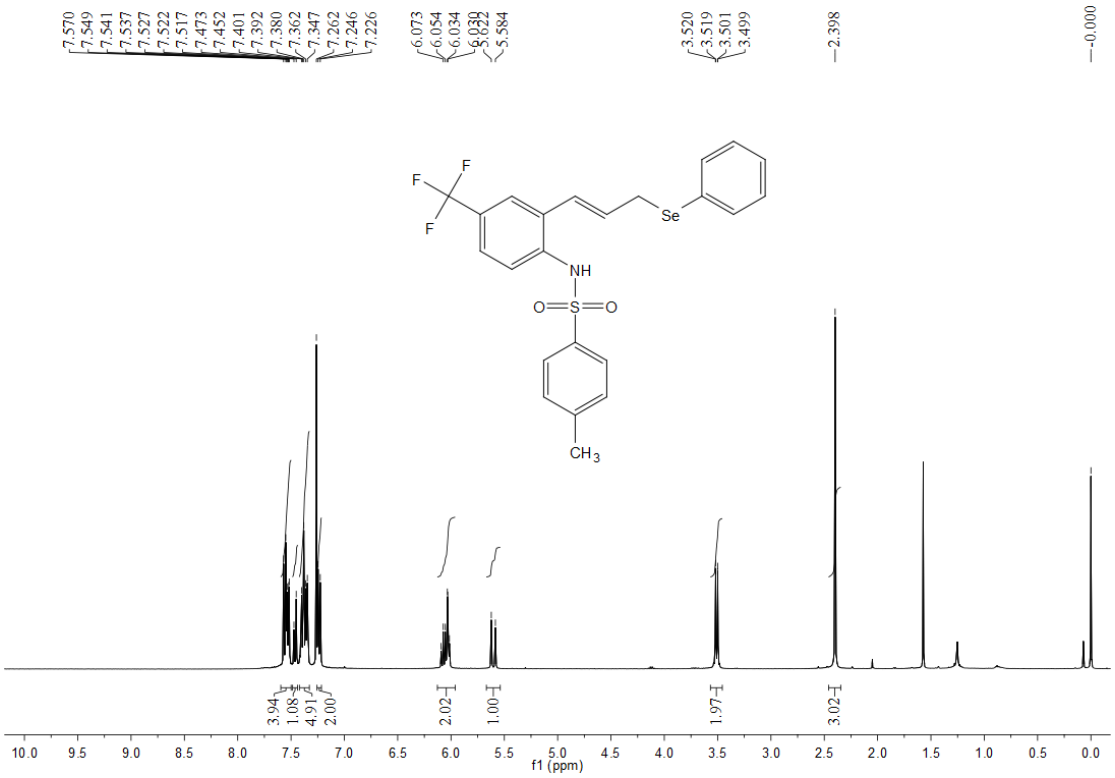


^{1}H NMR (400 MHz, $CDCl_3$) of **3af**

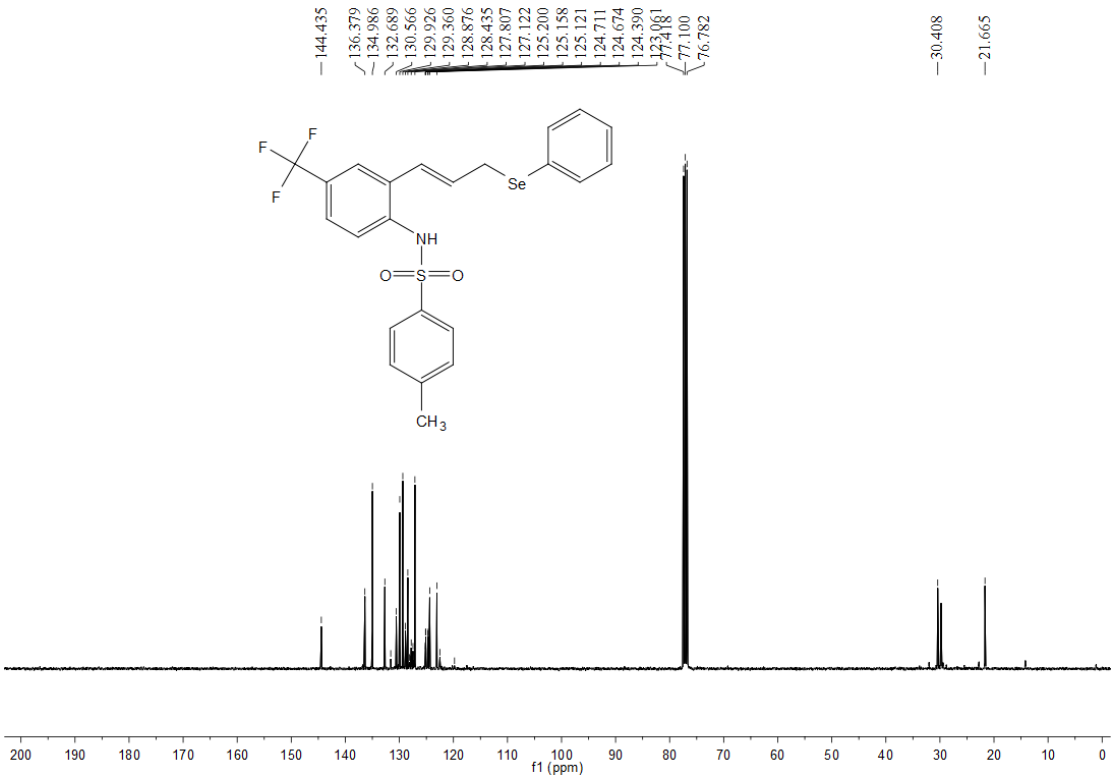


^{13}C NMR (100 MHz, $CDCl_3$) of **3af**

(*E*)-4-methyl-*N*-(2-(3-(phenylselanyl)prop-1-en-1-yl)-4-(trifluoromethyl)phenyl)benzenesulfonamide (3ag)

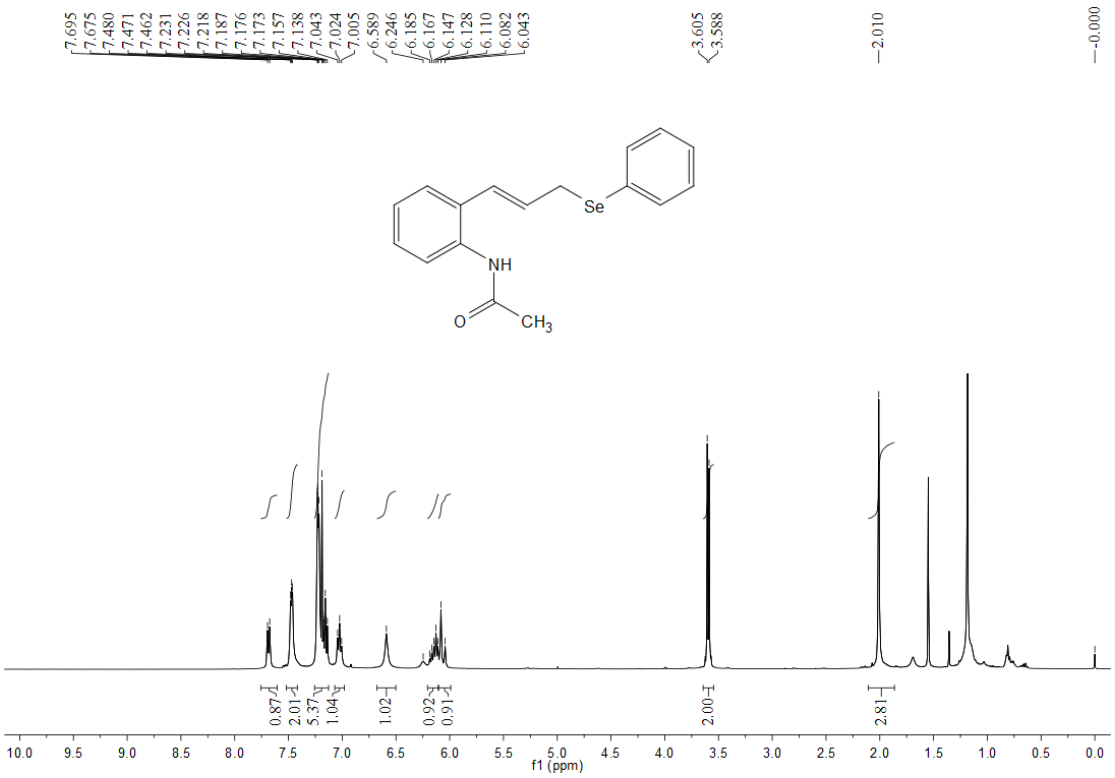


^{1}H NMR (400 MHz, $CDCl_3$) of **3ag**

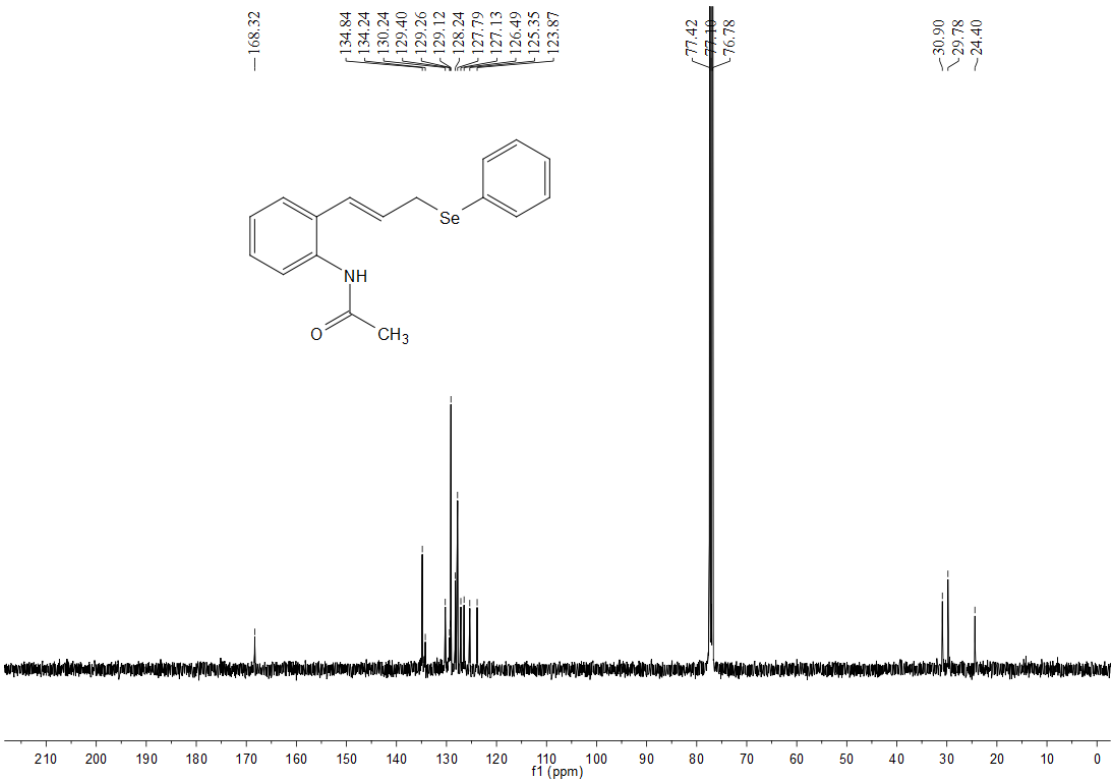


^{13}C NMR (100 MHz, $CDCl_3$) of **3ag**

(*E*)-*N*-(2-(3-(phenylselanyl)prop-1-en-1-yl)phenyl)acetamide (3ah)

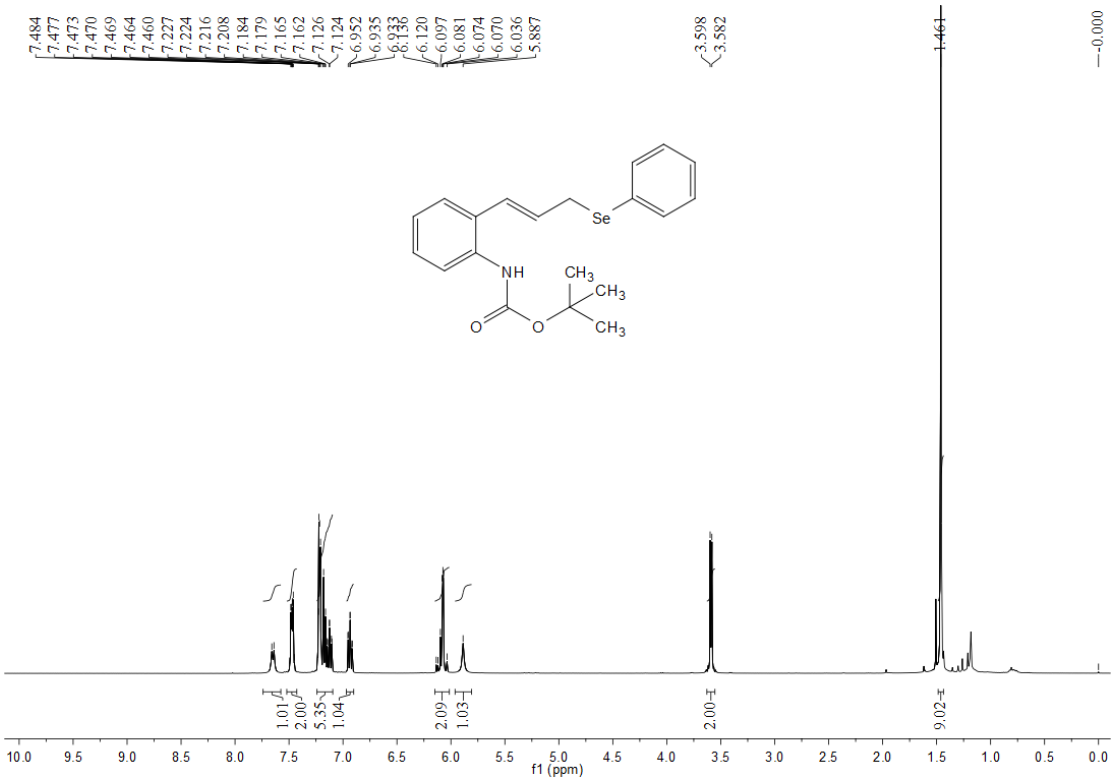


^{1}H NMR (400 MHz, $CDCl_3$) of **3ah**

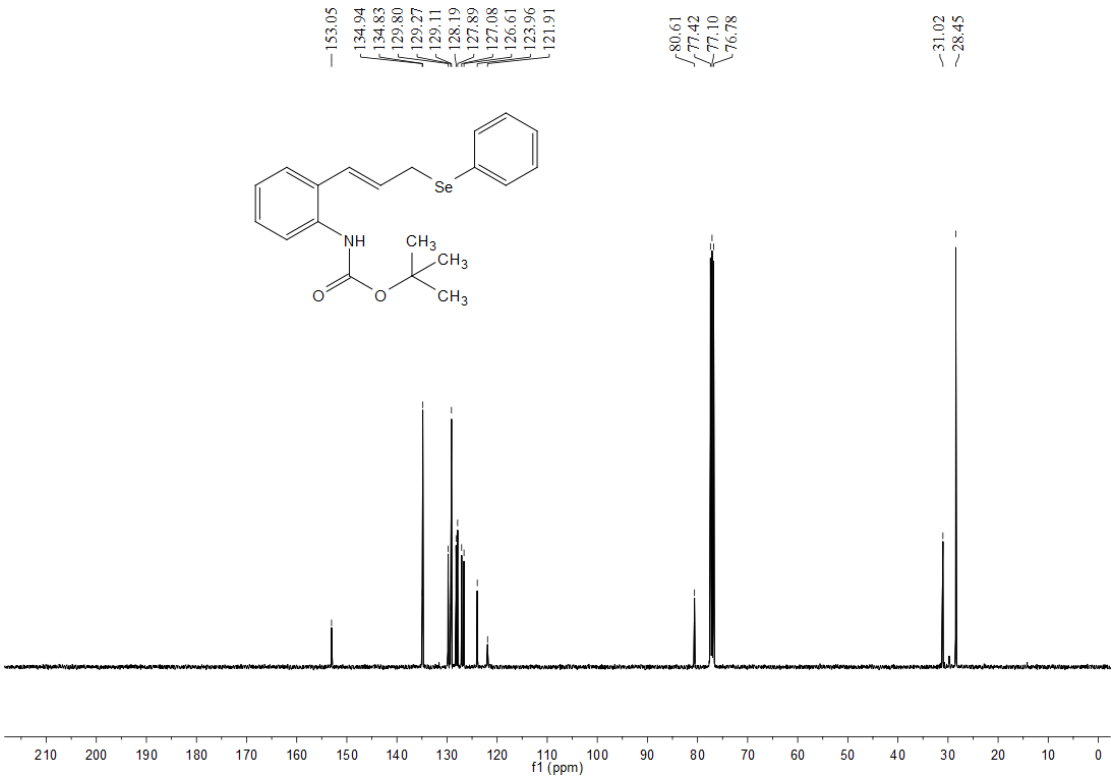


^{13}C NMR (100 MHz, $CDCl_3$) of **3ah**

***tert*-butyl (*E*)-(2-(3-(phenylselanyl)prop-1-en-1-yl)phenyl)carbamate (3ai)**

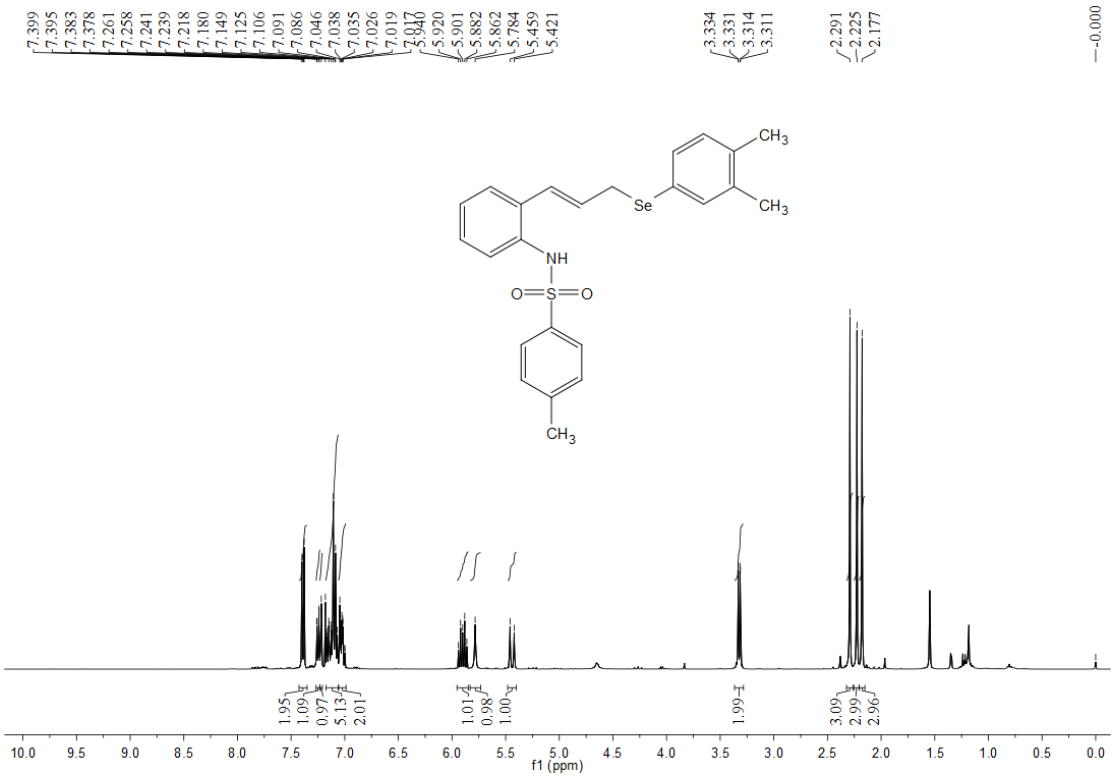


^{1}H NMR (400 MHz, $CDCl_3$) of **3ai**

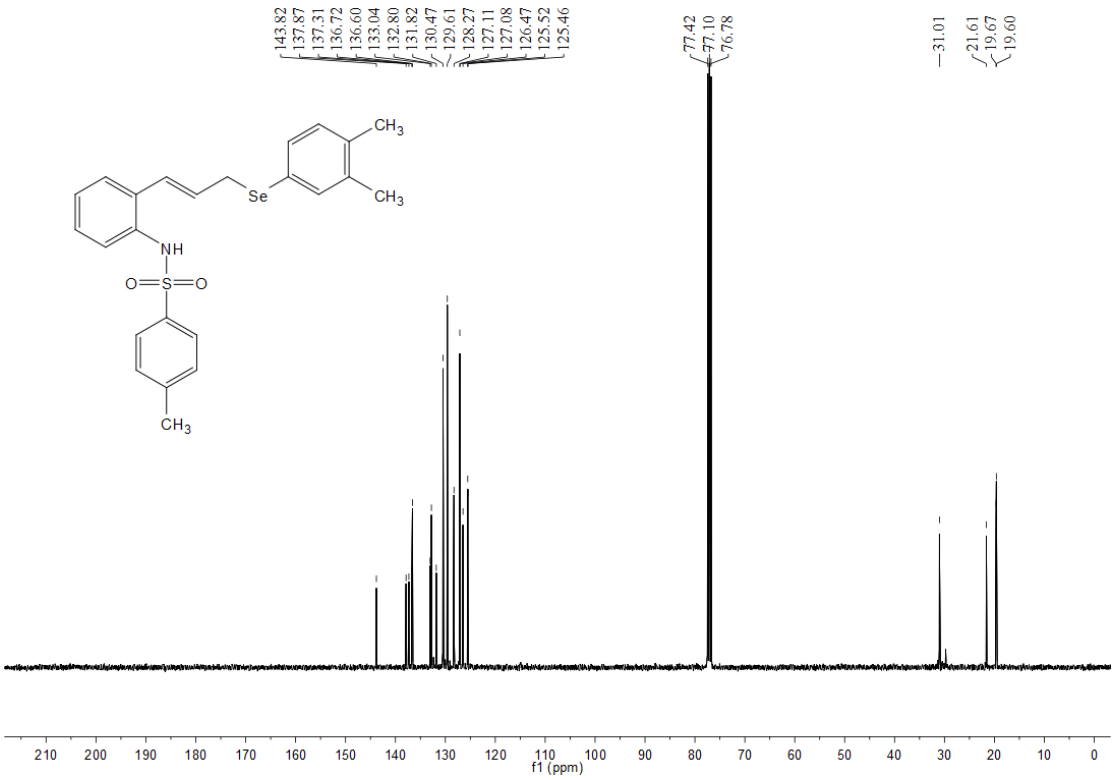


^{13}C NMR (100 MHz, $CDCl_3$) of **3ai**

(*E*)-*N*-(2-(3-((3,4-dimethylphenyl)selanyl)prop-1-en-1-yl)phenyl)-4-methylbenzenesulfonamide (3ba)

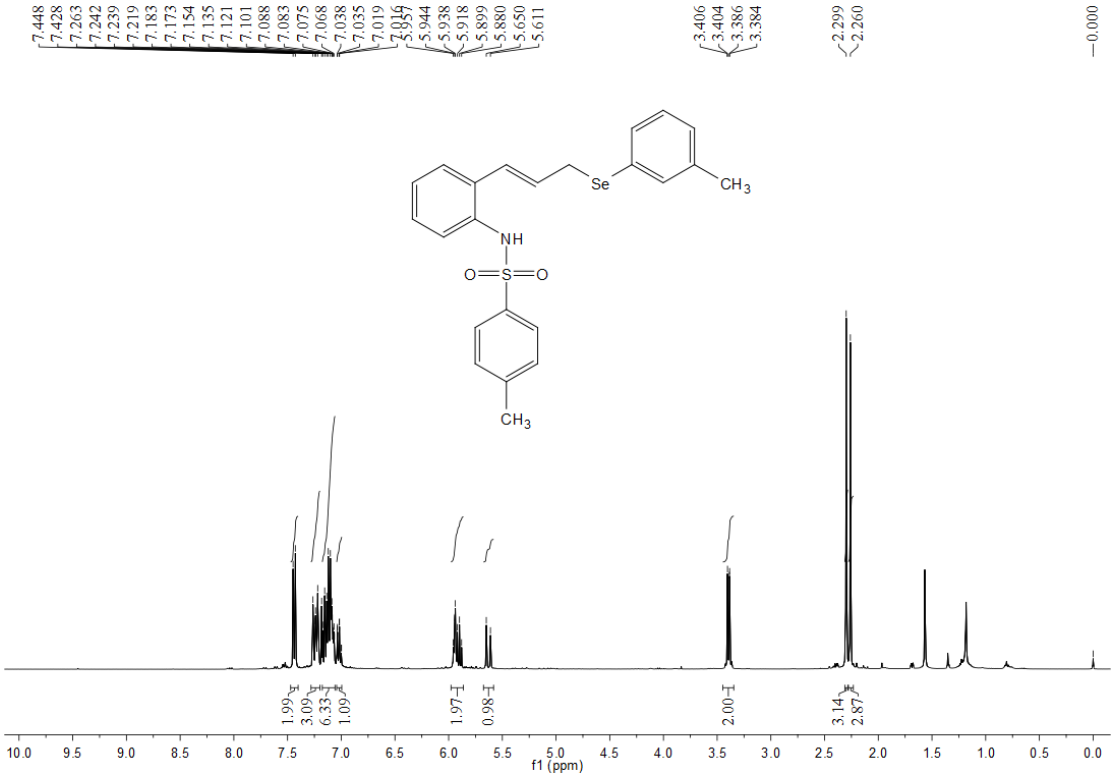


^{1}H NMR (400 MHz, $CDCl_3$) of **3ba**

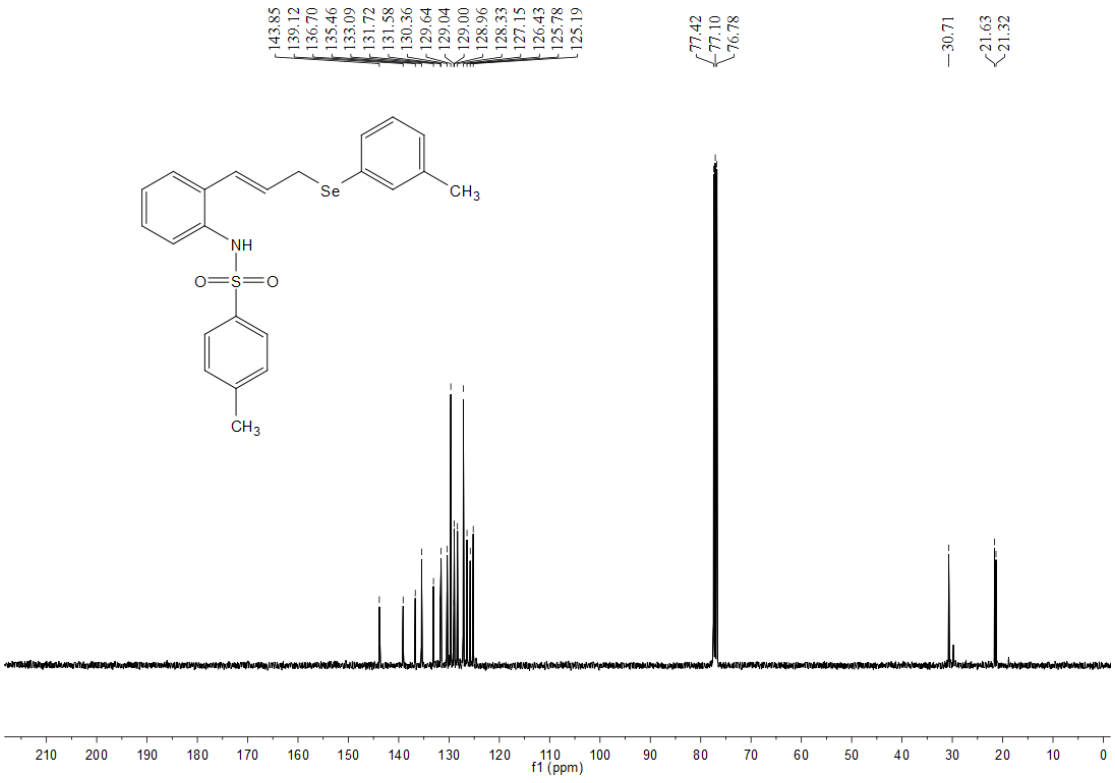


^{13}C NMR (100 MHz, $CDCl_3$) of **3ba**

(*E*)-4-methyl-*N*-(2-(3-(*m*-tolylselanyl)prop-1-en-1-yl)phenyl)benzenesulfonamide (3ca)

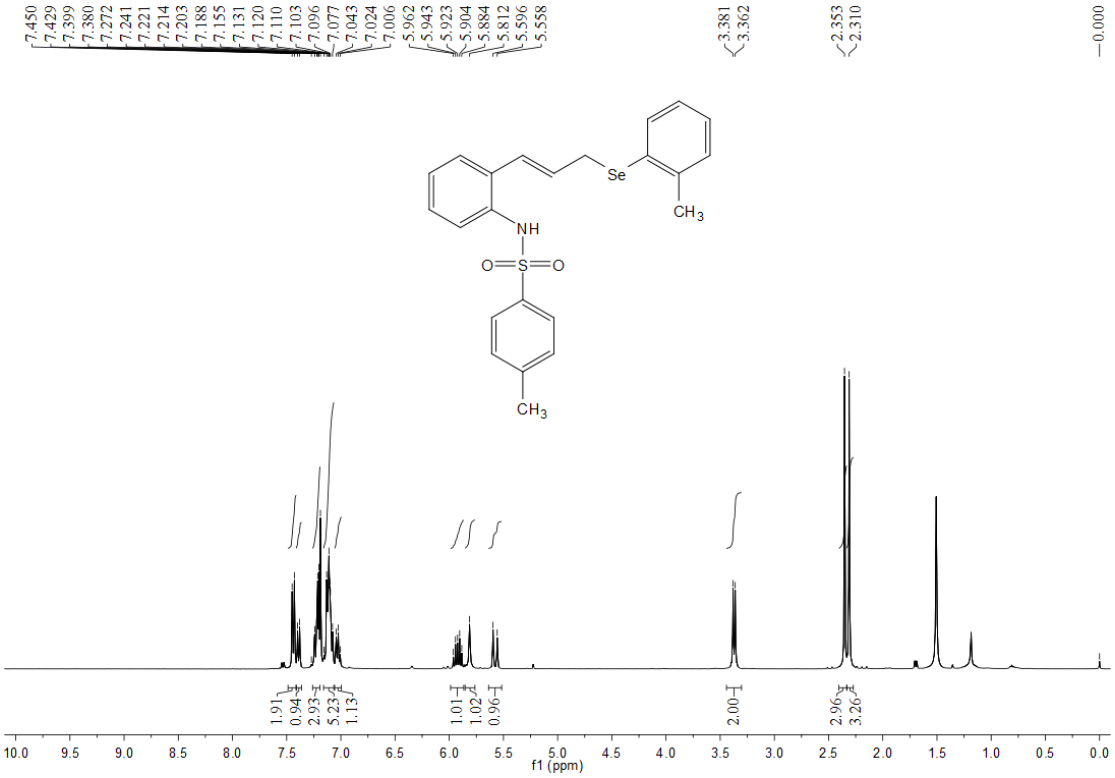


^{1}H NMR (400 MHz, $CDCl_3$) of **3ca**

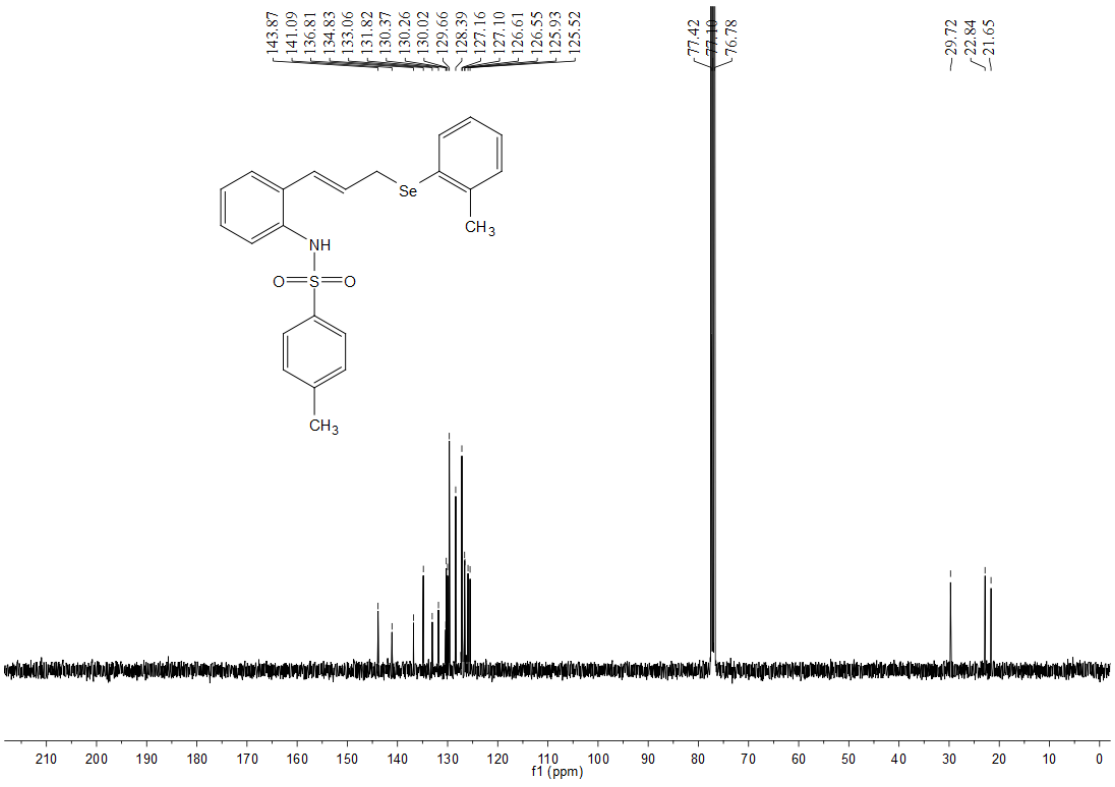


^{13}C NMR (100 MHz, $CDCl_3$) of **3ca**

(*E*)-4-methyl-*N*-(2-(3-(*o*-tolylselanyl)prop-1-en-1-yl)phenyl)benzenesulfonamide (3da)

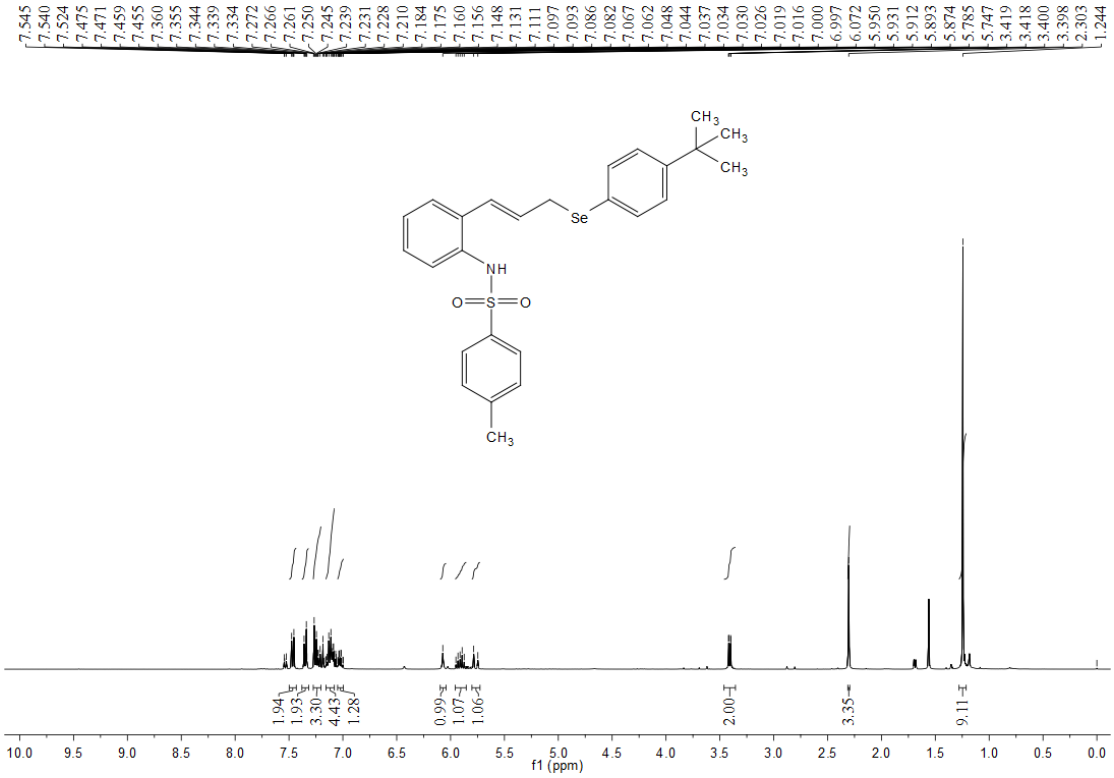


^{1}H NMR (400 MHz, $CDCl_3$) of **3da**

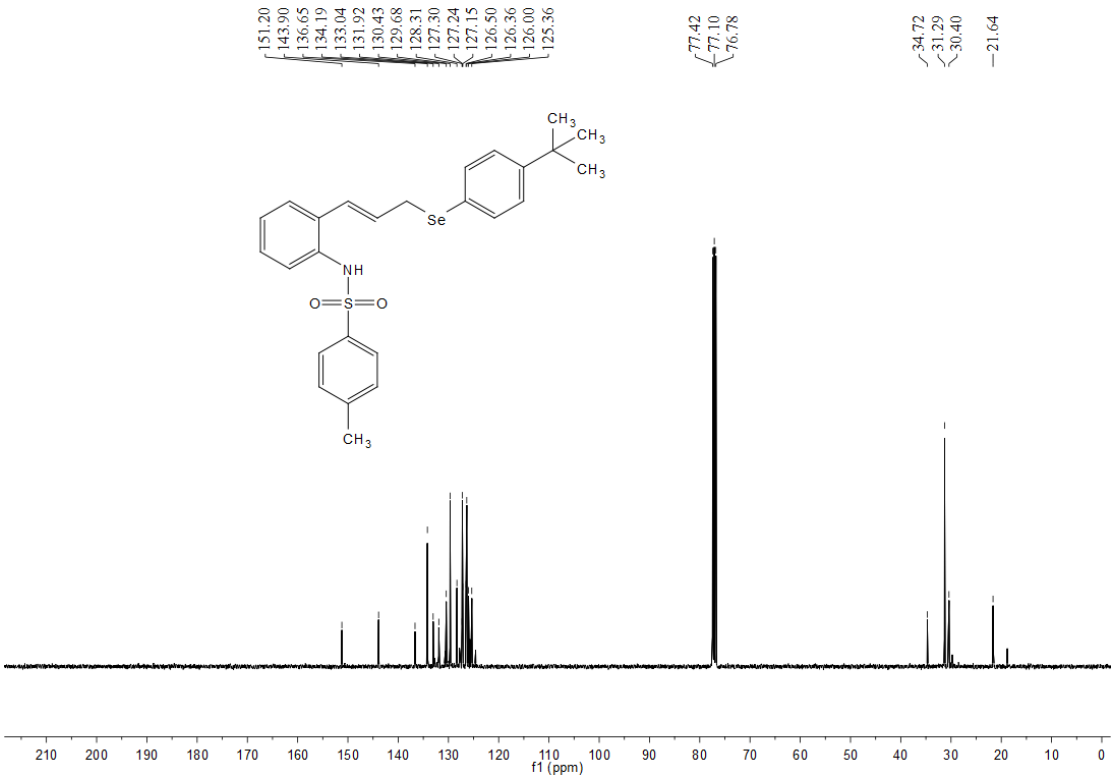


^{13}C NMR (100 MHz, $CDCl_3$) of **3da**

(*E*)-*N*-(2-(3-((4-(*tert*-butyl)phenyl)selanyl)prop-1-en-1-yl)phenyl)-4-methylbenzen esulfonamide (3ea)

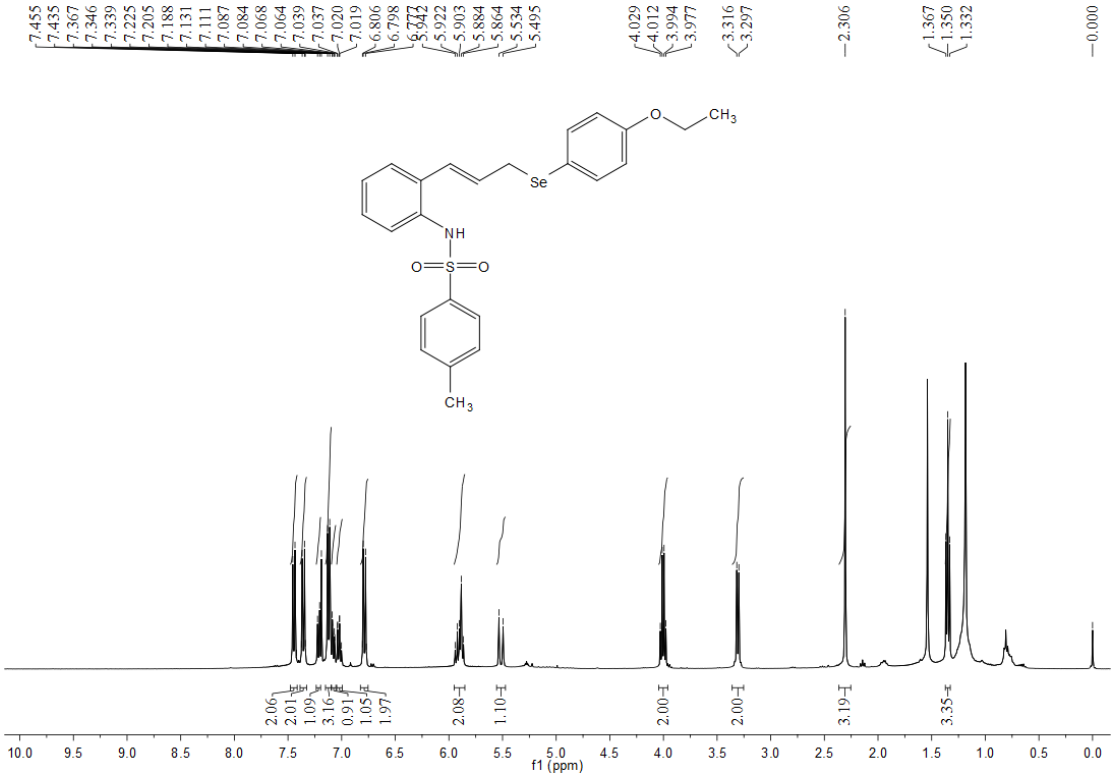


^{1}H NMR (400 MHz, $CDCl_3$) of **3ea**

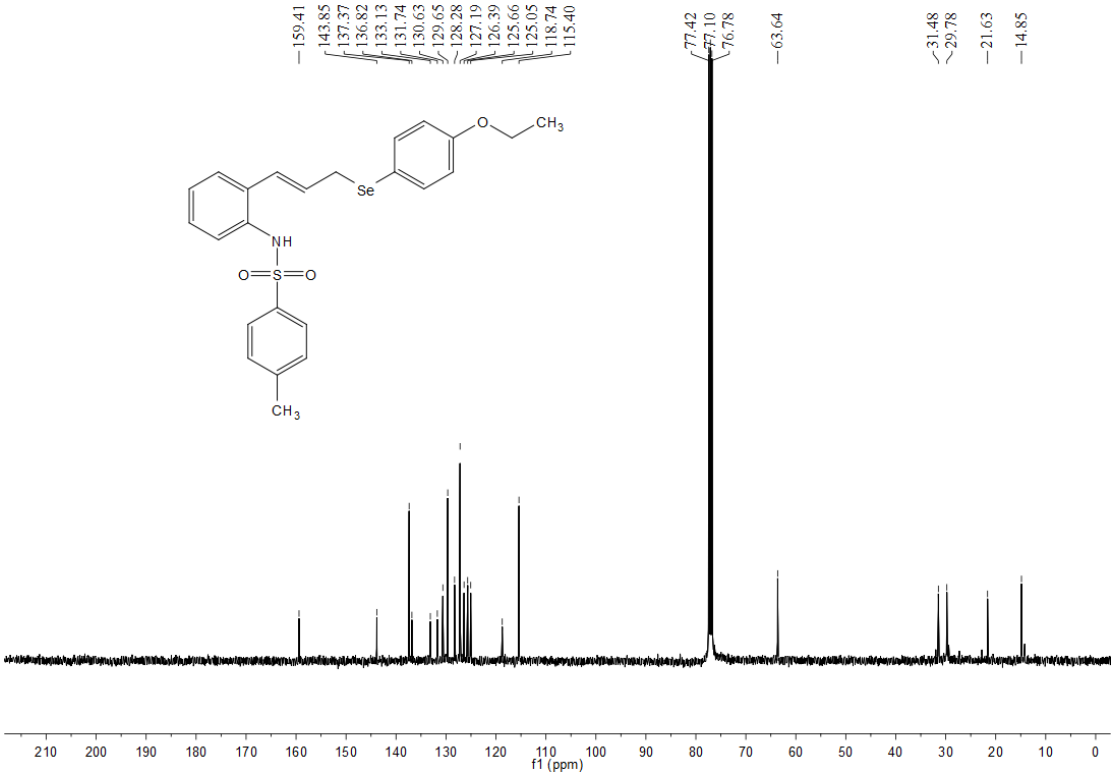


^{13}C NMR (100 MHz, $CDCl_3$) of **3ea**

(*E*)-*N*-(2-(3-((4-ethoxyphenyl)selanyl)prop-1-en-1-yl)phenyl)-4-methylbenzenesulfonamide (3fa)

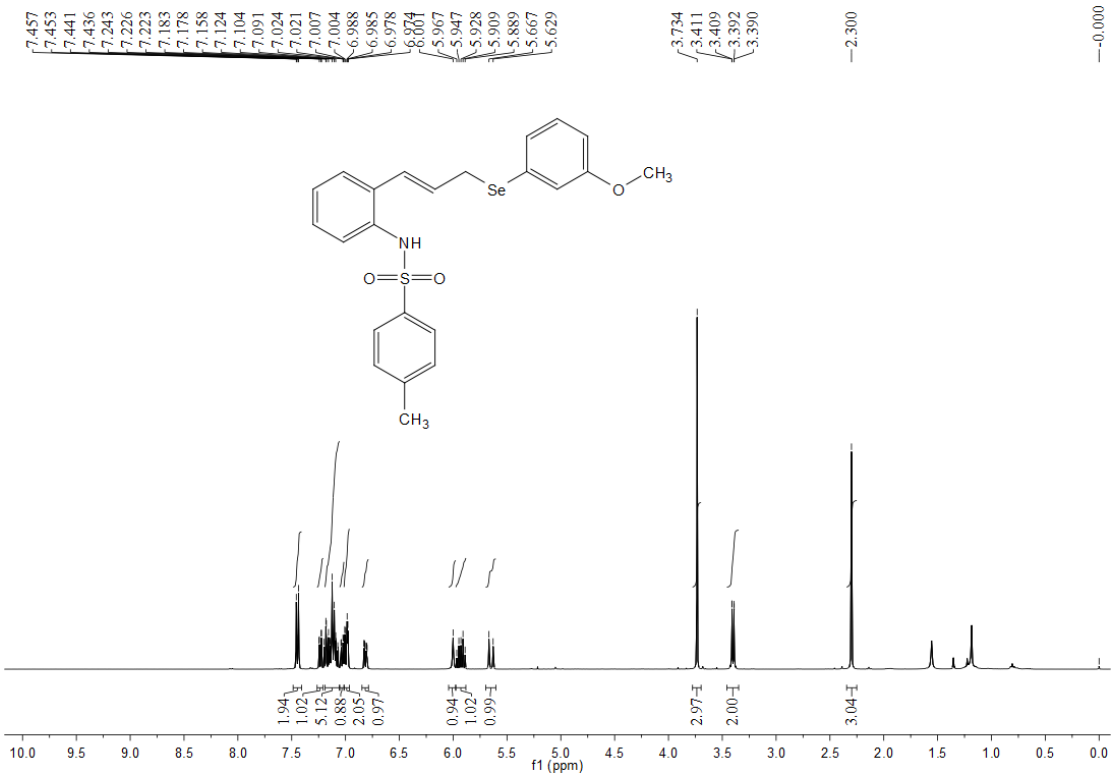


^{1}H NMR (400 MHz, $CDCl_3$) of **3fa**

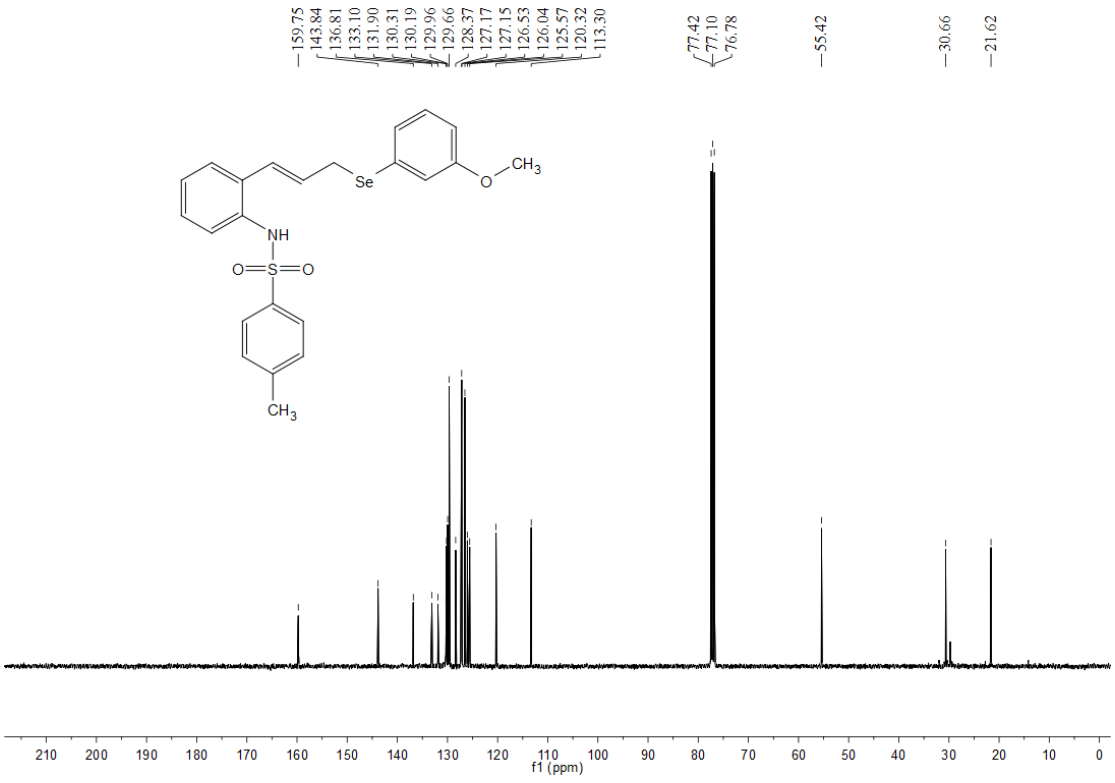


^{13}C NMR (100 MHz, $CDCl_3$) of **3fa**

(*E*)-*N*-(2-(3-((3-methoxyphenyl)selanyl)prop-1-en-1-yl)phenyl)-4-methylbenzenesulfonamide (3ga)

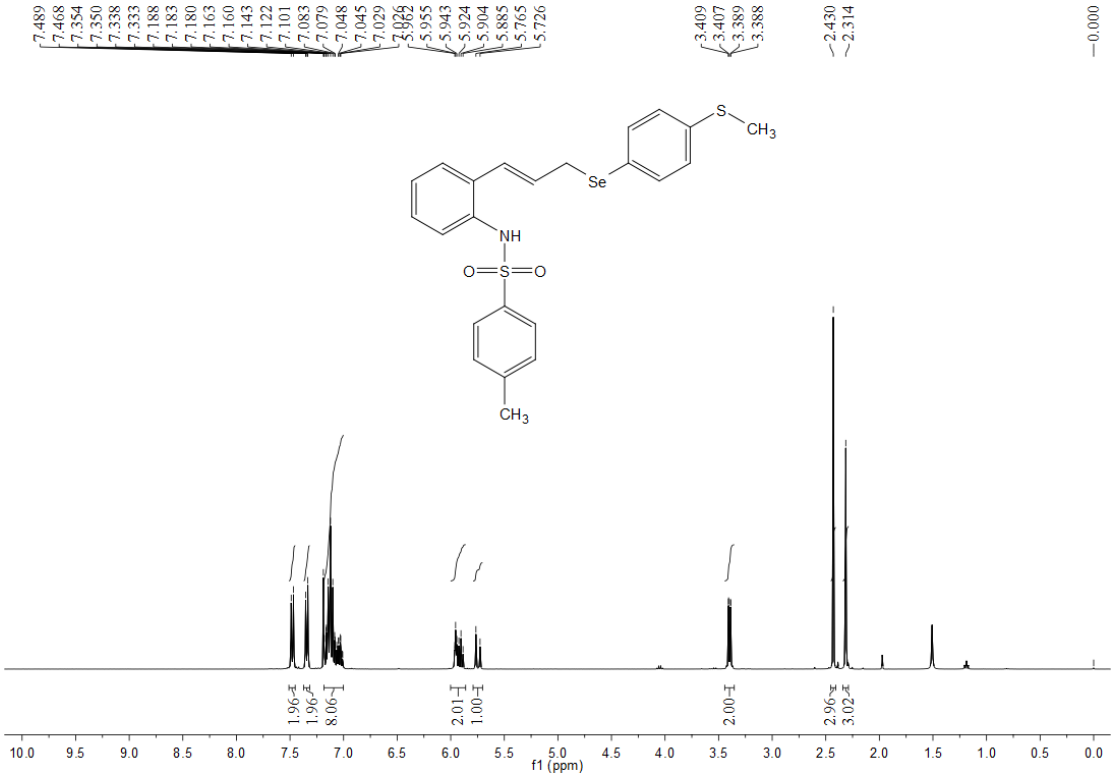


^{1}H NMR (400 MHz, $CDCl_3$) of **3ga**

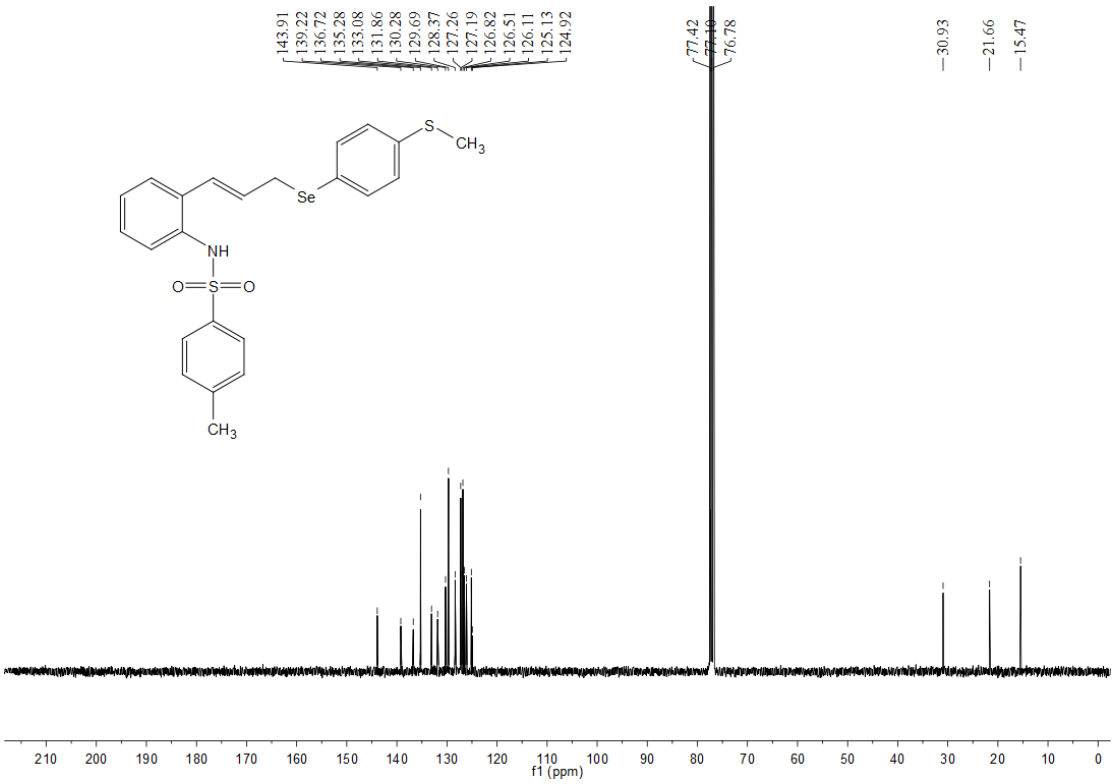


^{13}C NMR (100 MHz, $CDCl_3$) of **3ga**

(*E*)-4-methyl-*N*-(2-(3-((4-(methylthio)phenyl)selanyl)prop-1-en-1-yl)phenyl)benzenesulfonamide (3ha)

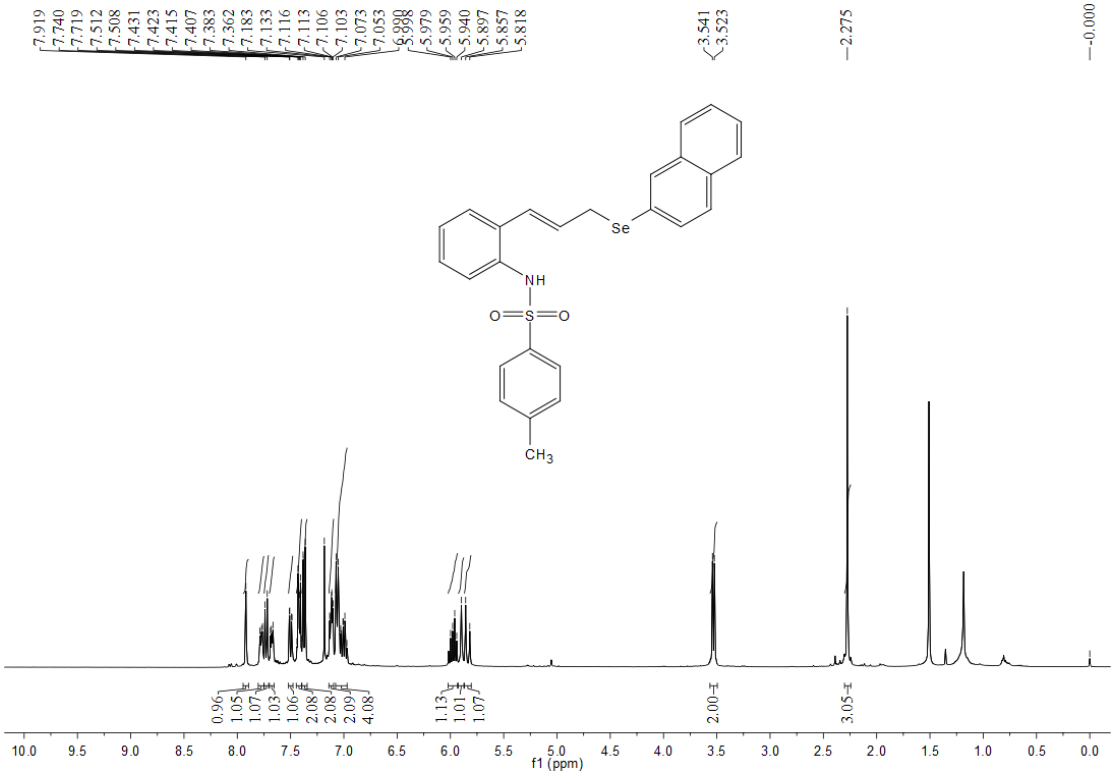


^{1}H NMR (400 MHz, $CDCl_3$) of **3ha**

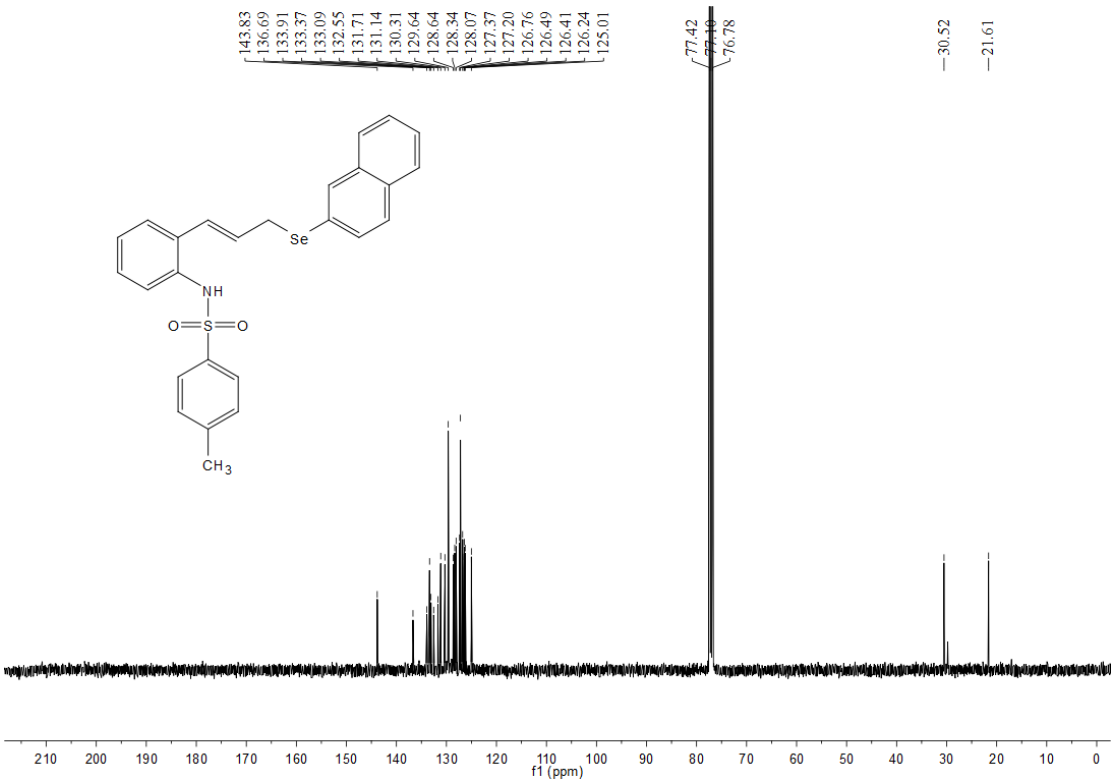


^{13}C NMR (100 MHz, $CDCl_3$) of **3ha**

(*E*)-4-methyl-*N*-(2-(3-(naphthalen-2-ylselanyl)prop-1-en-1-yl)phenyl)benzenesulfonamide (3ia)

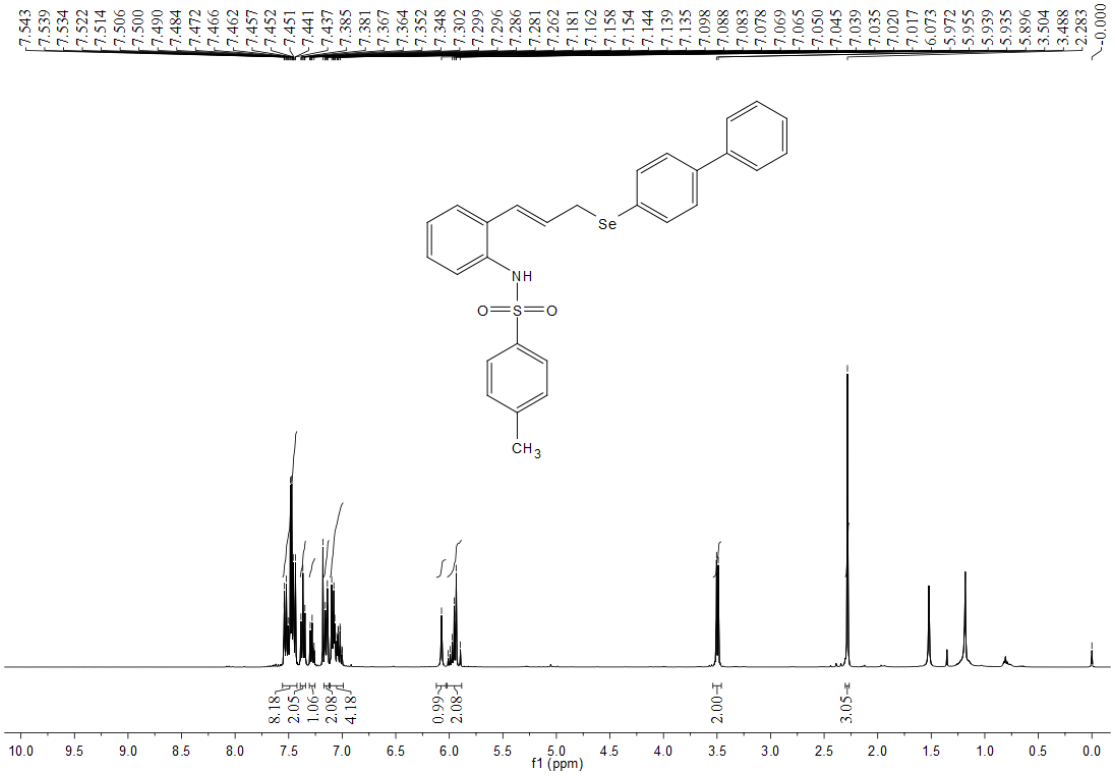


^{1}H NMR (400 MHz, $CDCl_3$) of **3ia**

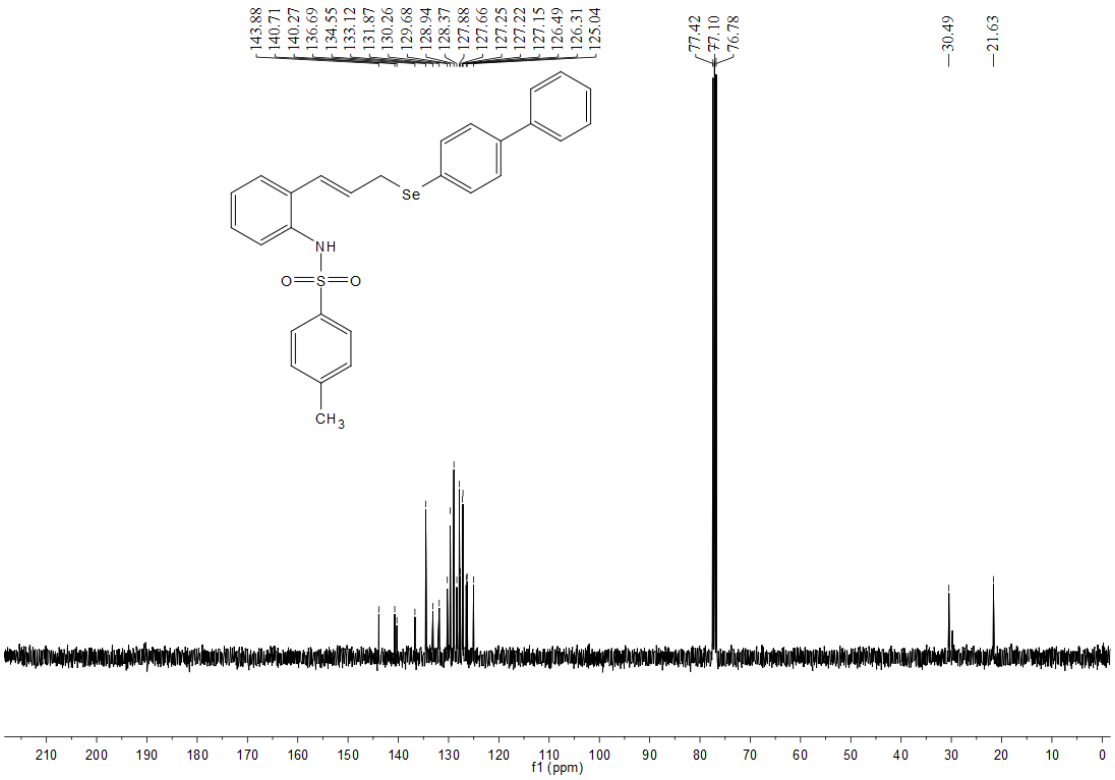


^{13}C NMR (100 MHz, $CDCl_3$) of **3ia**

(*E*)-*N*-(2-(3-([1,1'-biphenyl]-4-ylselanyl)prop-1-en-1-yl)phenyl)-4-methylbenzenesulfonamide (3ja)

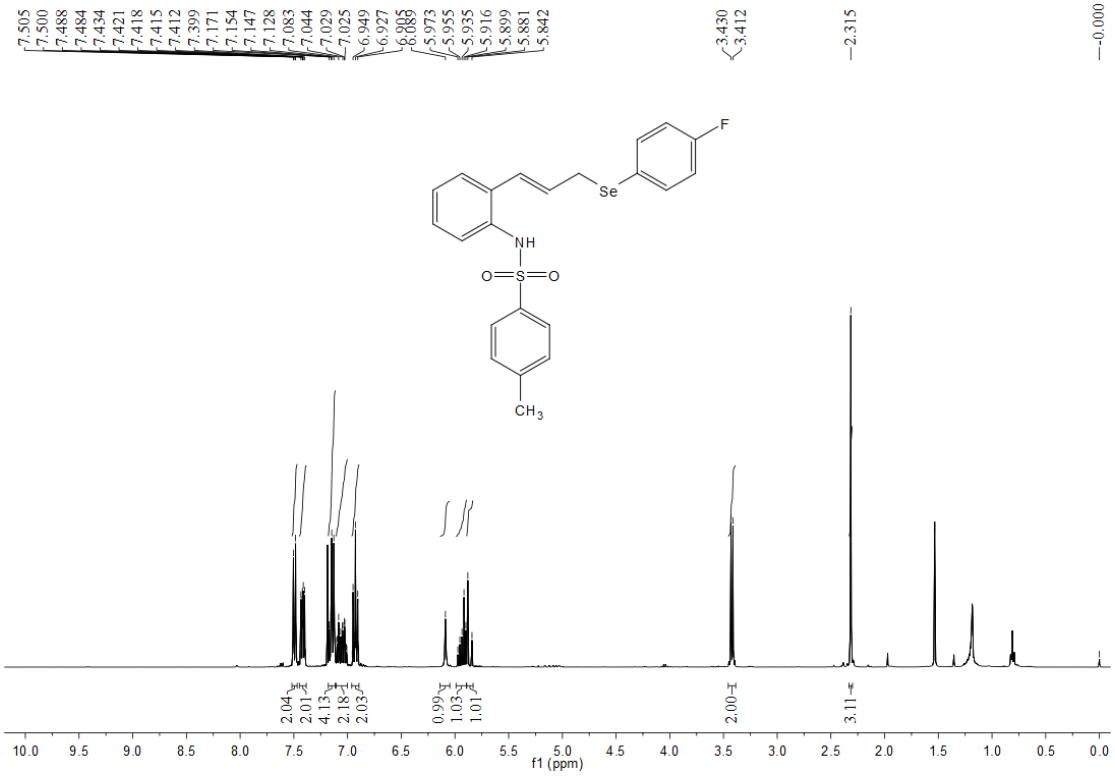


^{1}H NMR (400 MHz, $CDCl_3$) of **3ja**

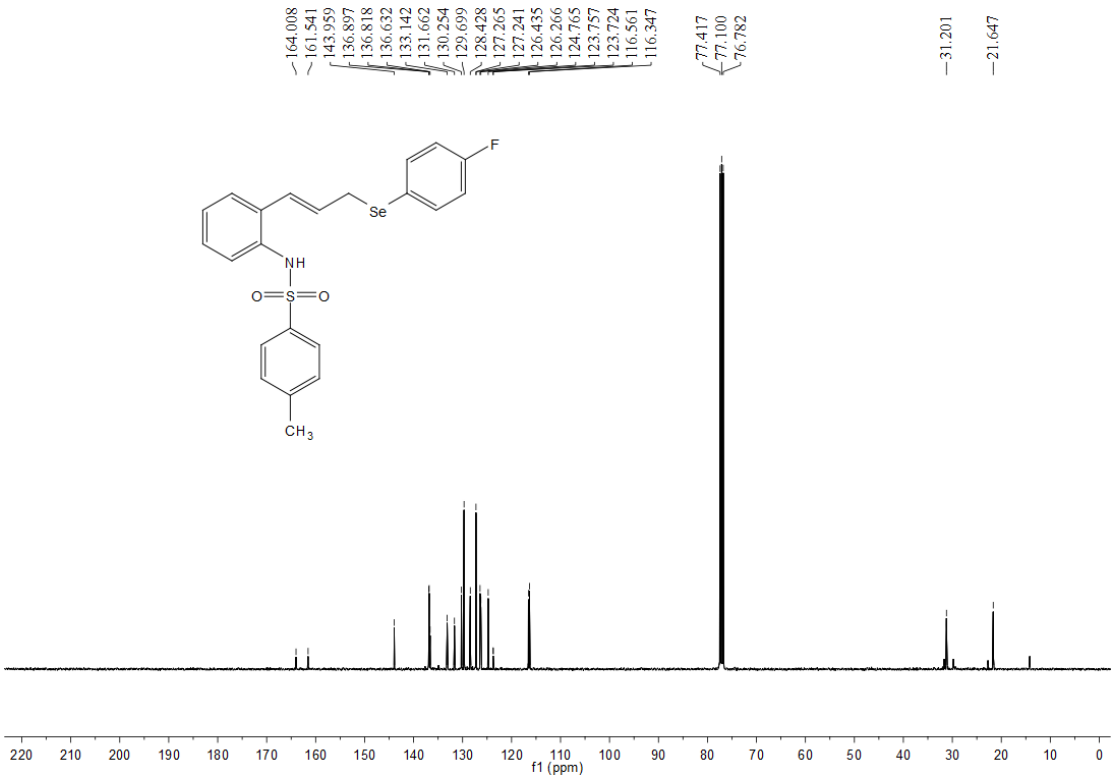


^{13}C NMR (100 MHz, $CDCl_3$) of **3ja**

(*E*)-*N*-(2-(3-((4-fluorophenyl)selanyl)prop-1-en-1-yl)phenyl)-4-methylbenzenesulfonamide (3ka)

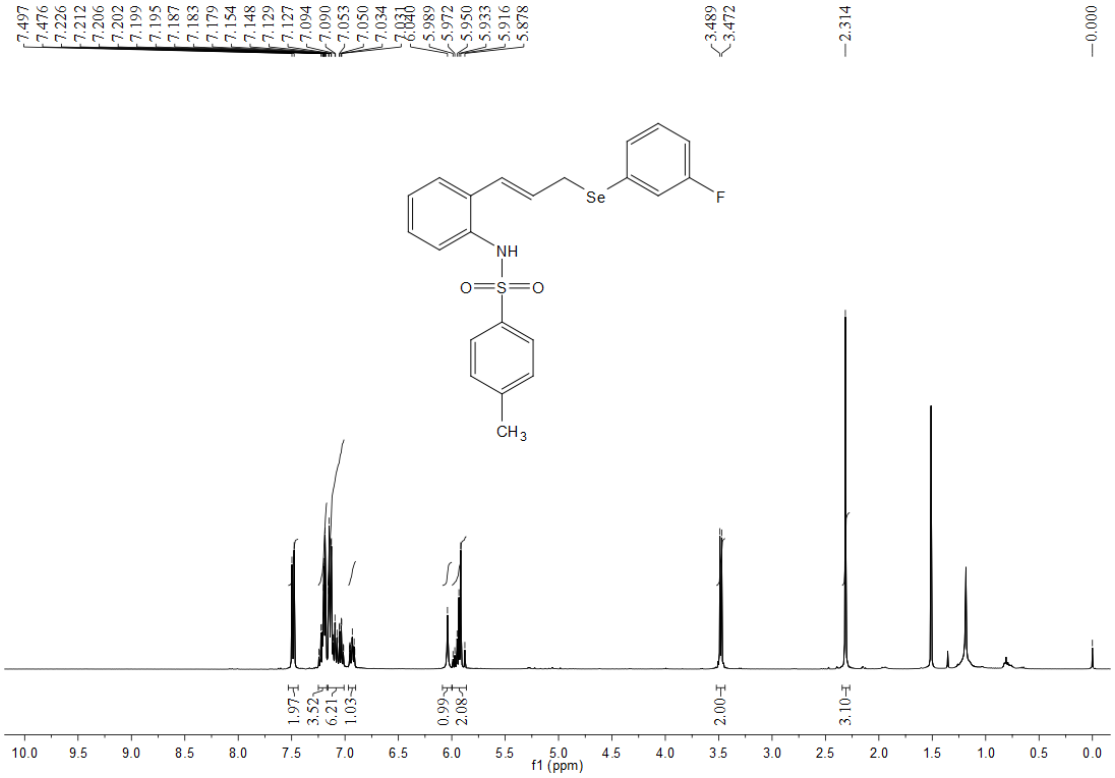


^{1}H NMR (400 MHz, $CDCl_3$) of **3ka**

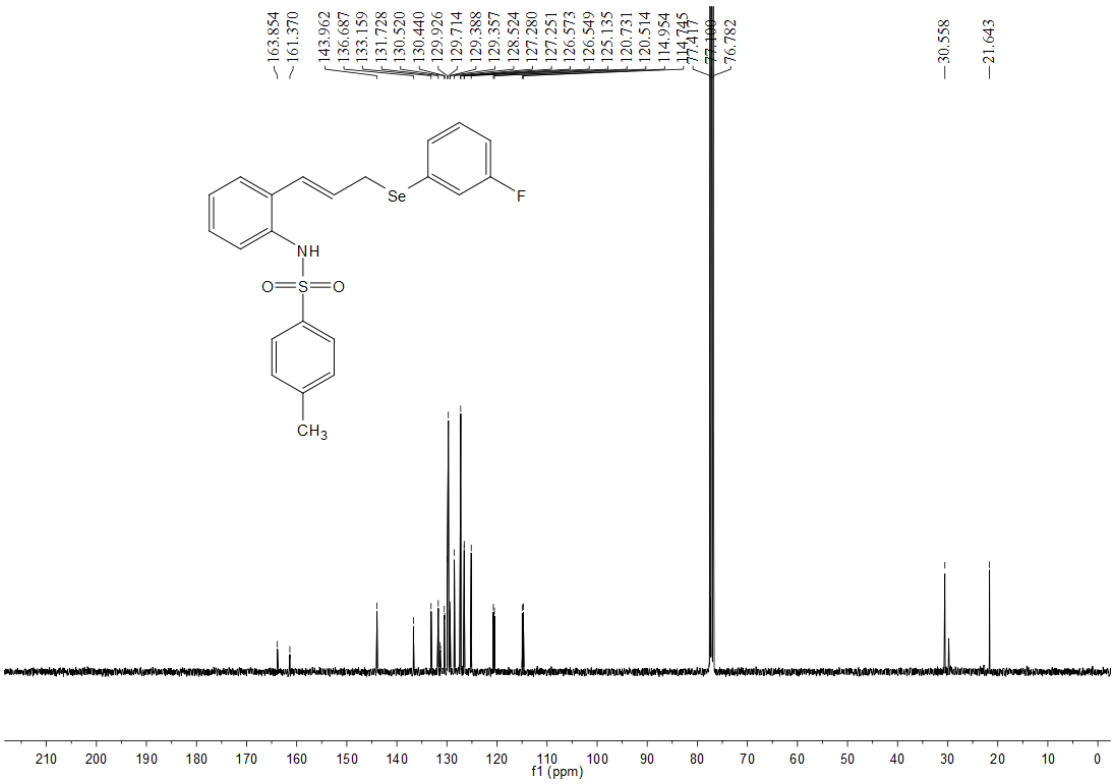


^{13}C NMR (100 MHz, $CDCl_3$) of **3ka**

(*E*)-*N*-(2-(3-((3-fluorophenyl)selanyl)prop-1-en-1-yl)phenyl)-4-methylbenzenesulfonamide (3la)

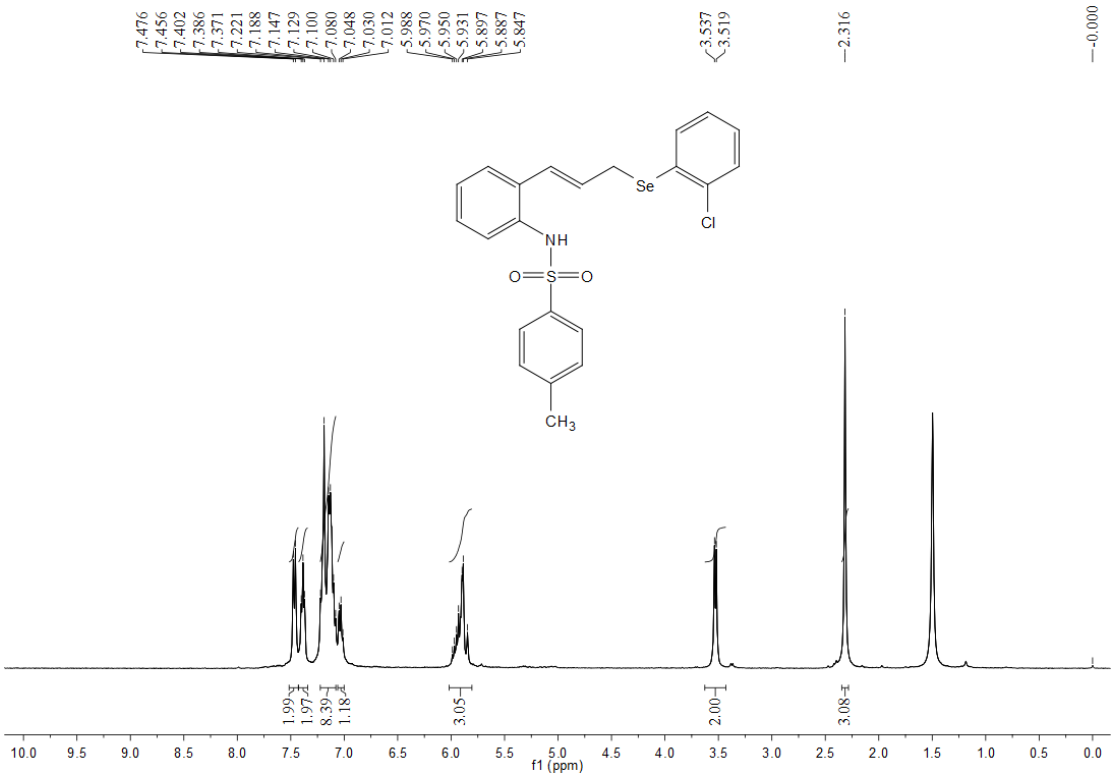


^{1}H NMR (400 MHz, $CDCl_3$) of **3la**

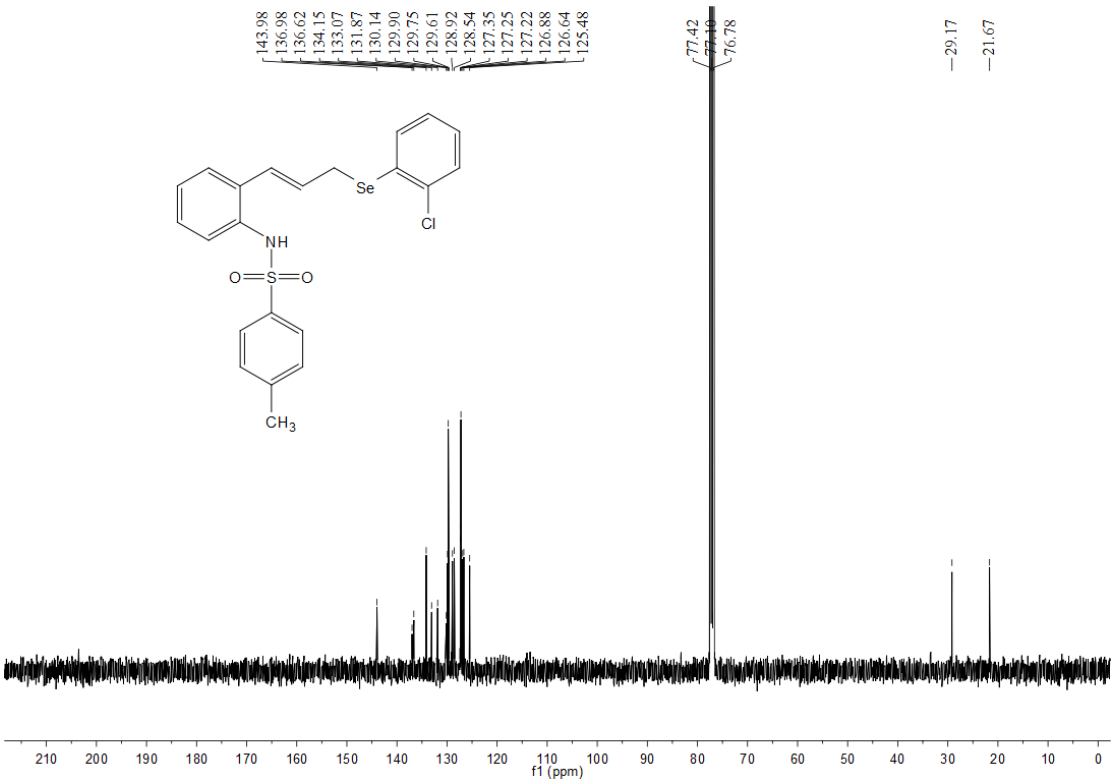


^{13}C NMR (100 MHz, $CDCl_3$) of **3la**

(*E*)-*N*-(2-(3-((2-chlorophenyl)selanyl)prop-1-en-1-yl)phenyl)-4-methylbenzenesulfonamide (3ma)

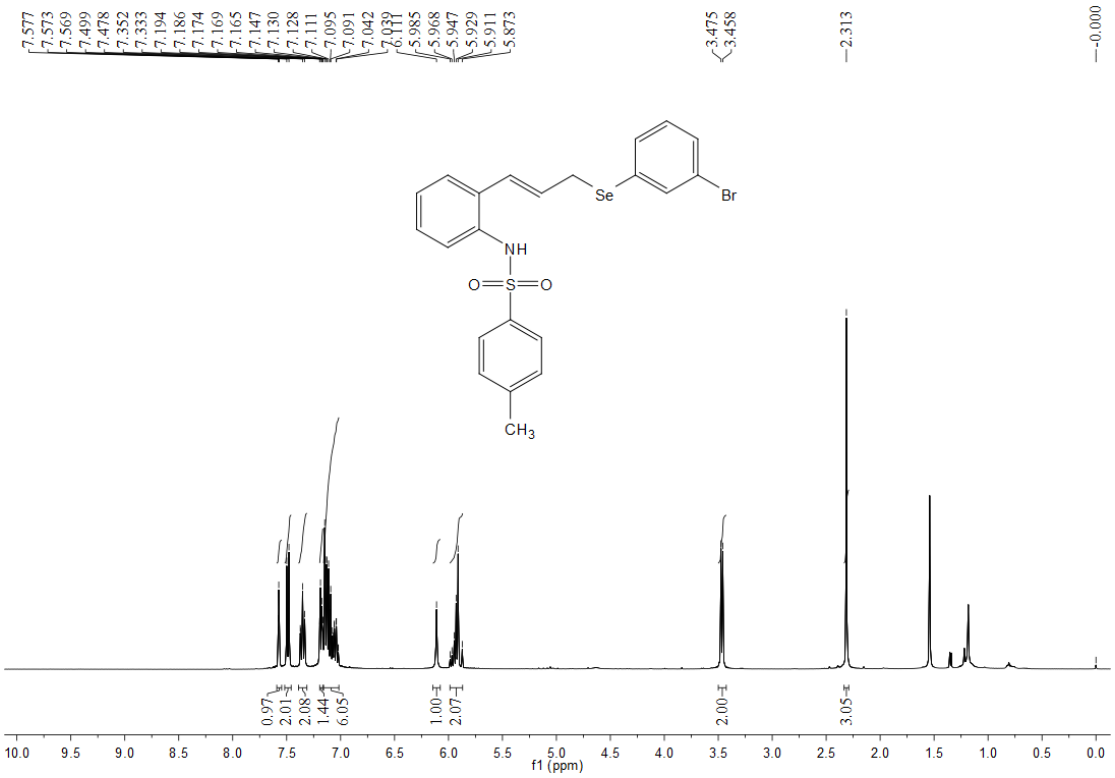


^{1}H NMR (400 MHz, $CDCl_3$) of **3ma**

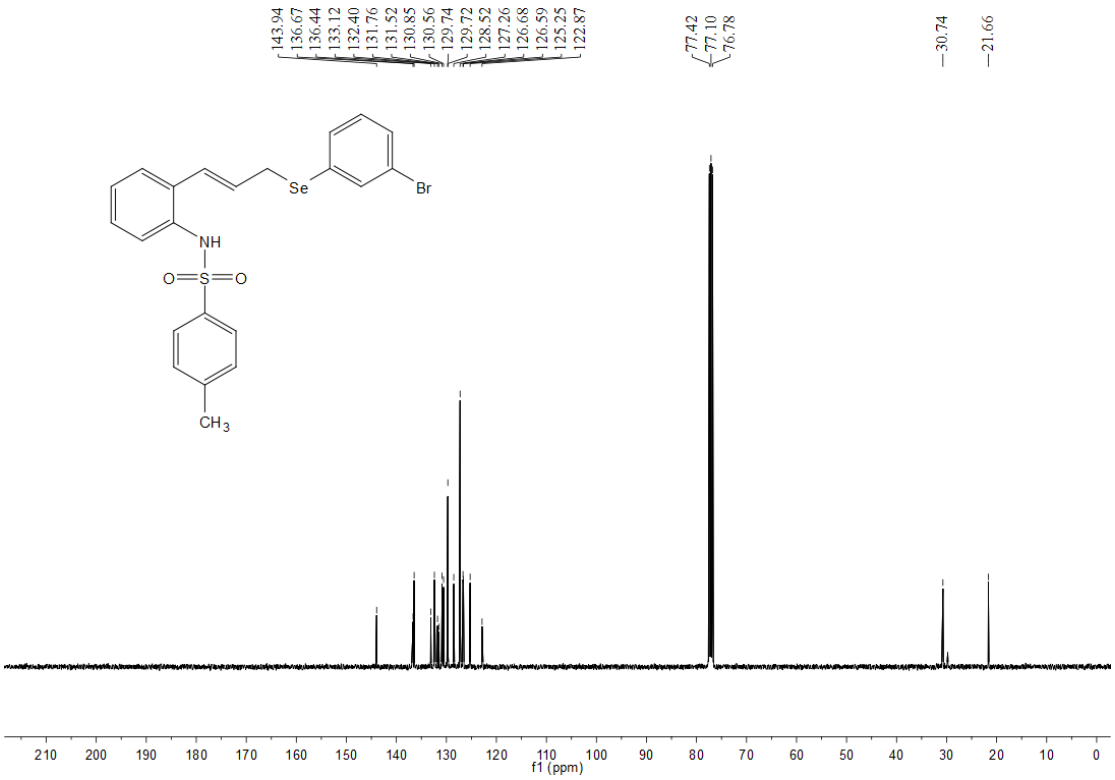


^{13}C NMR (100 MHz, $CDCl_3$) of **3ma**

(*E*)-*N*-(2-(3-((3-bromophenyl)selanyl)prop-1-en-1-yl)phenyl)-4-methylbenzenesulfonamide (3na)

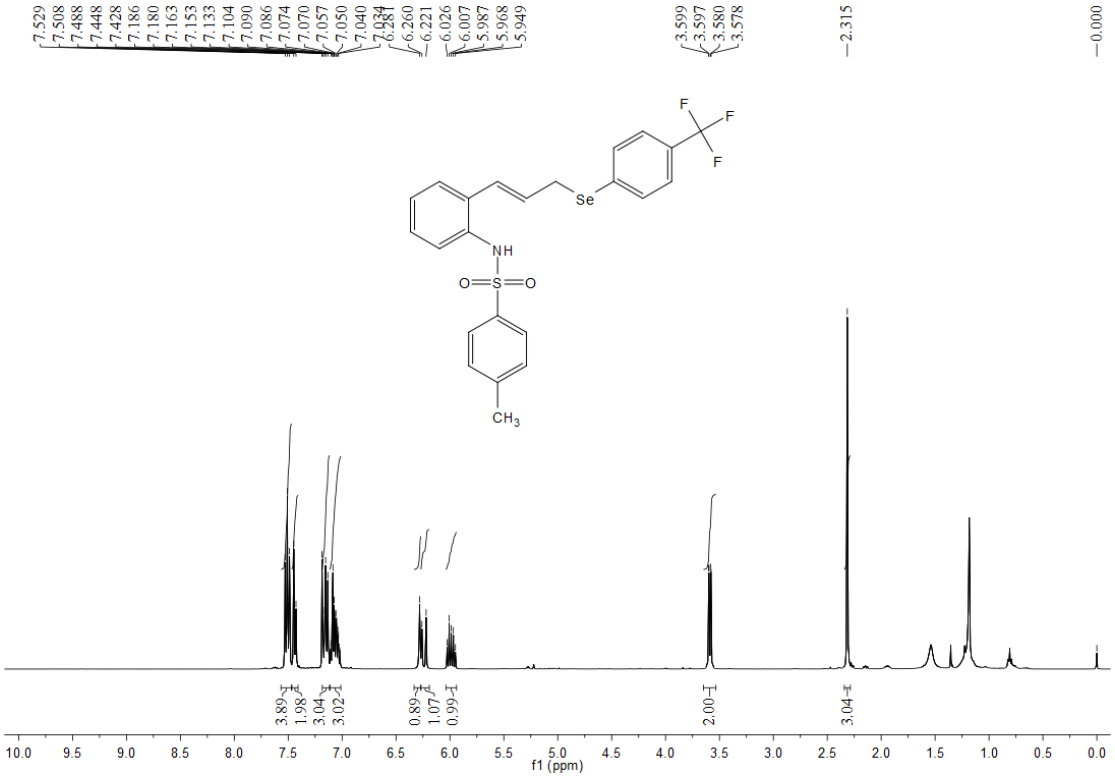


^{1}H NMR (400 MHz, $CDCl_3$) of **3na**

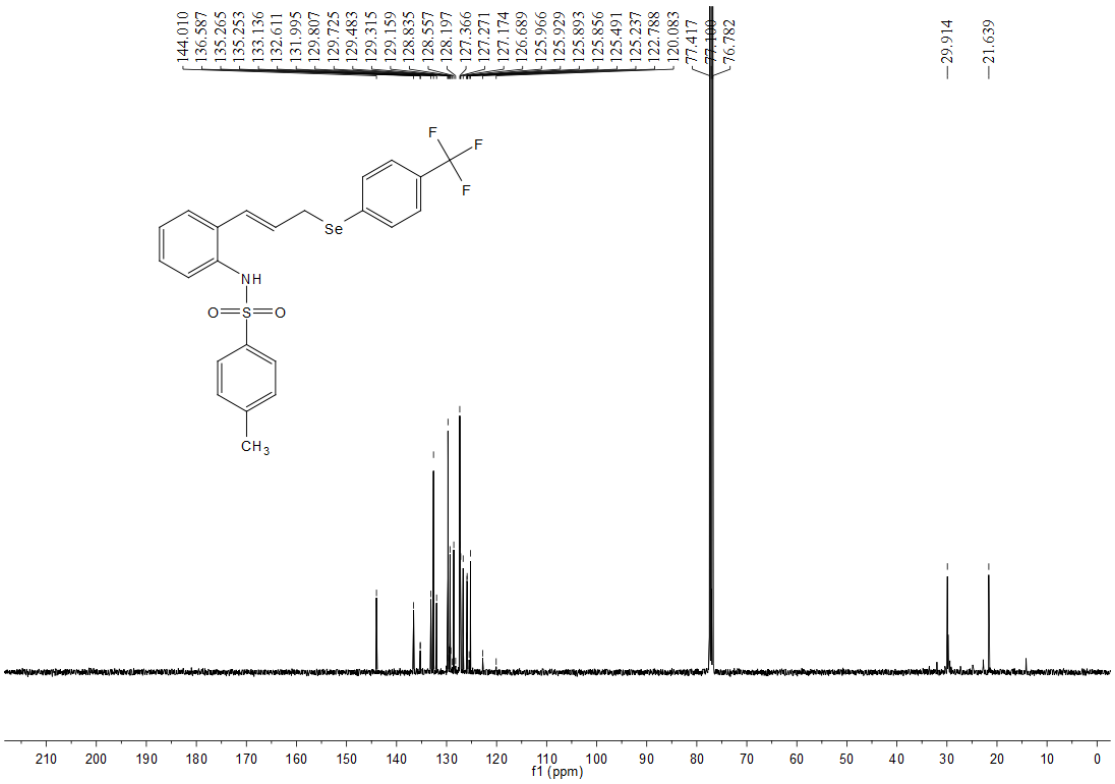


^{13}C NMR (100 MHz, $CDCl_3$) of **3na**

(*E*)-4-methyl-*N*-(2-(3-((4-(trifluoromethyl)phenyl)selanyl)prop-1-en-1-yl)phenyl) benzenesulfonamide (3oa)

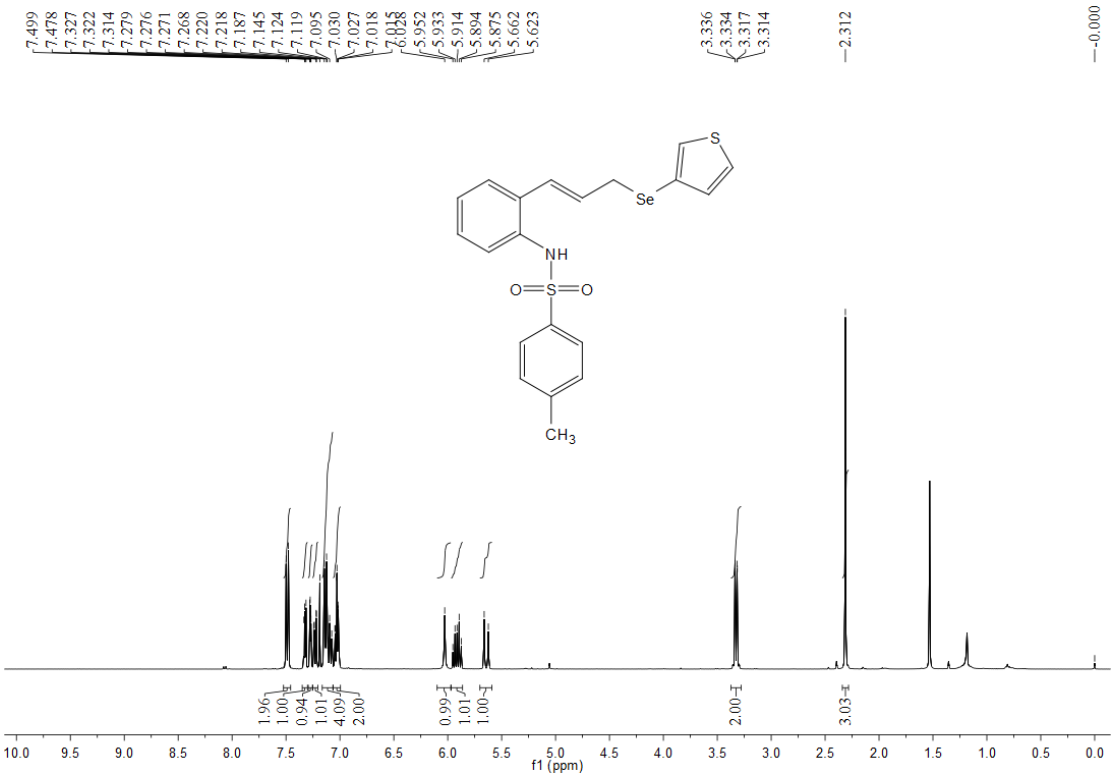


^{1}H NMR (400 MHz, $CDCl_3$) of **3oa**

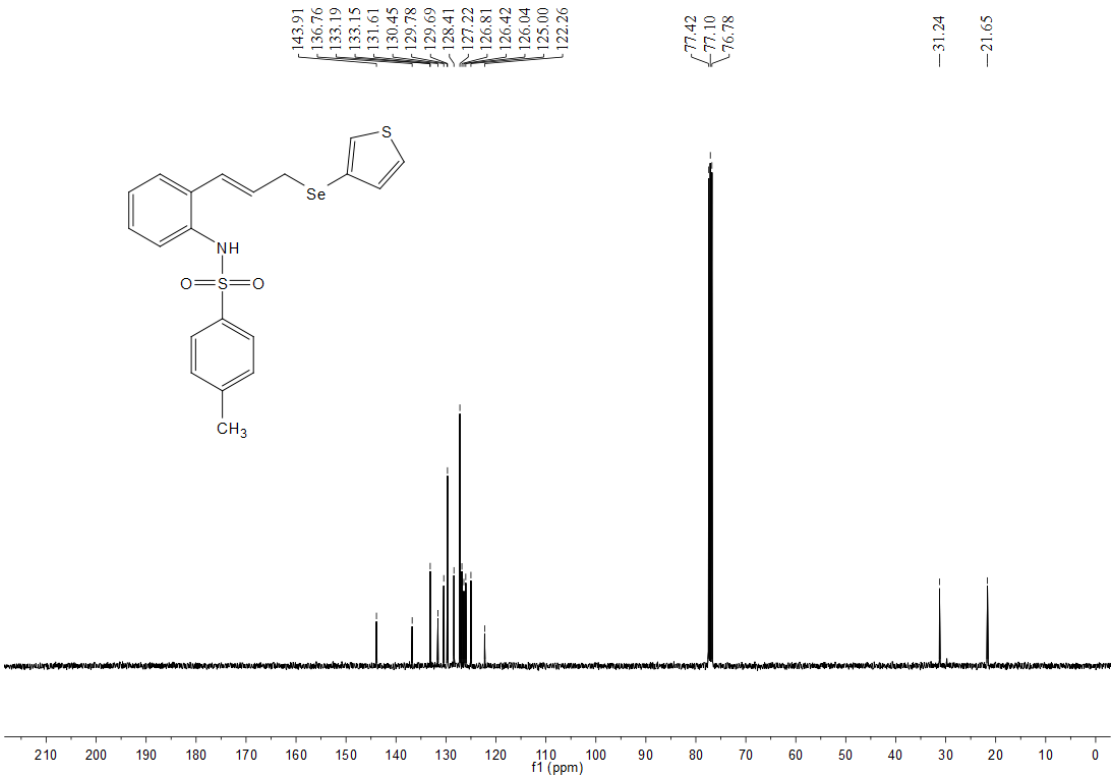


^{13}C NMR (100 MHz, $CDCl_3$) of **3oa**

(*E*)-4-methyl-*N*-(2-(3-(thiophen-3-ylselanyl)prop-1-en-1-yl)phenyl)benzenesulfonamide (3pa)

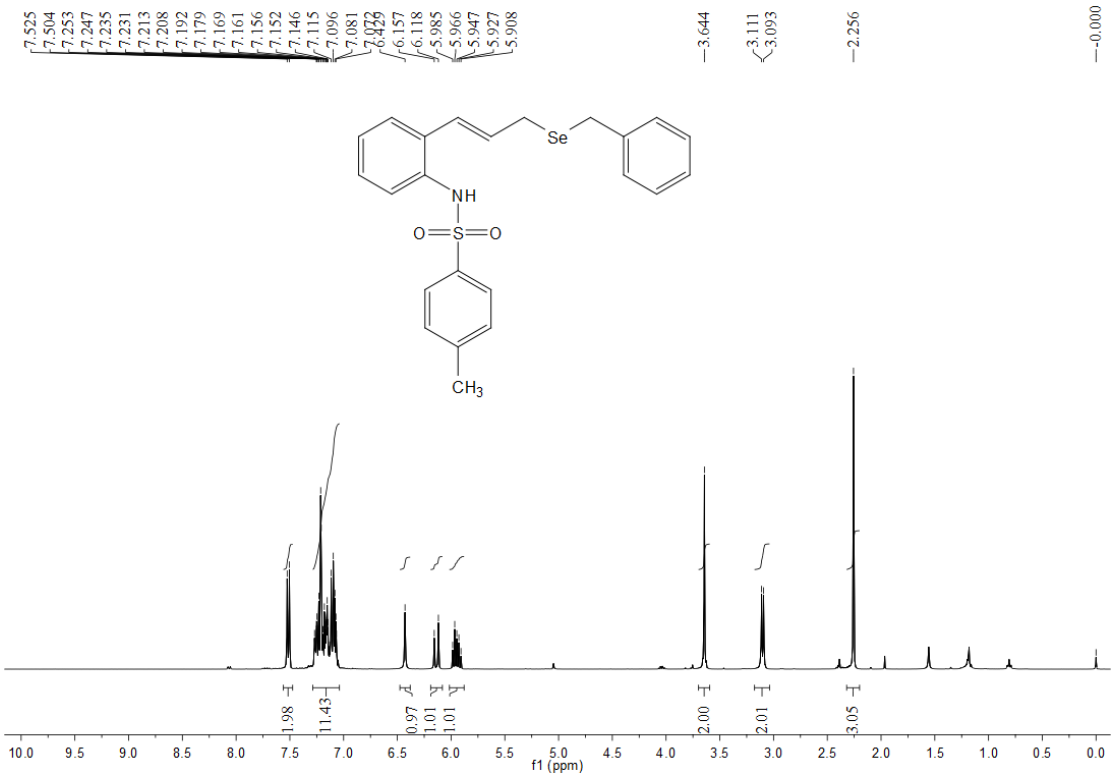


^{1}H NMR (400 MHz, $CDCl_3$) of **3pa**

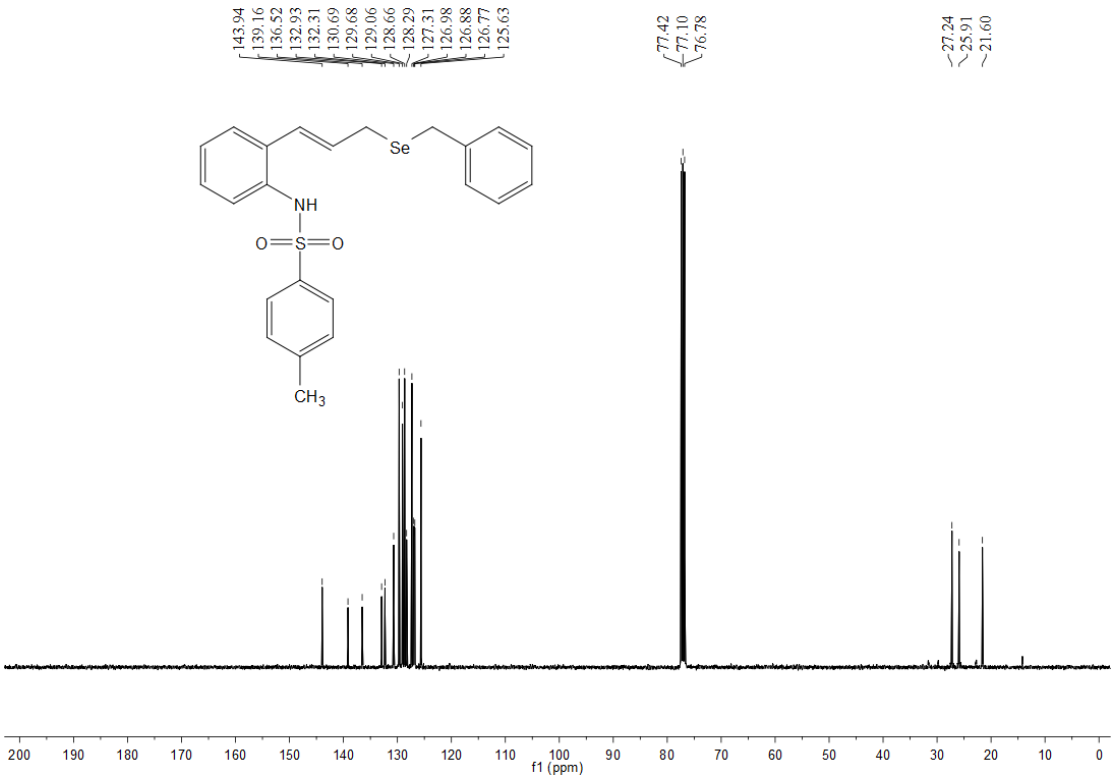


^{13}C NMR (100 MHz, $CDCl_3$) of **3pa**

(*E*)-*N*-(2-(3-(benzylselanyl)prop-1-en-1-yl)phenyl)-4-methylbenzenesulfonamide (3qa)

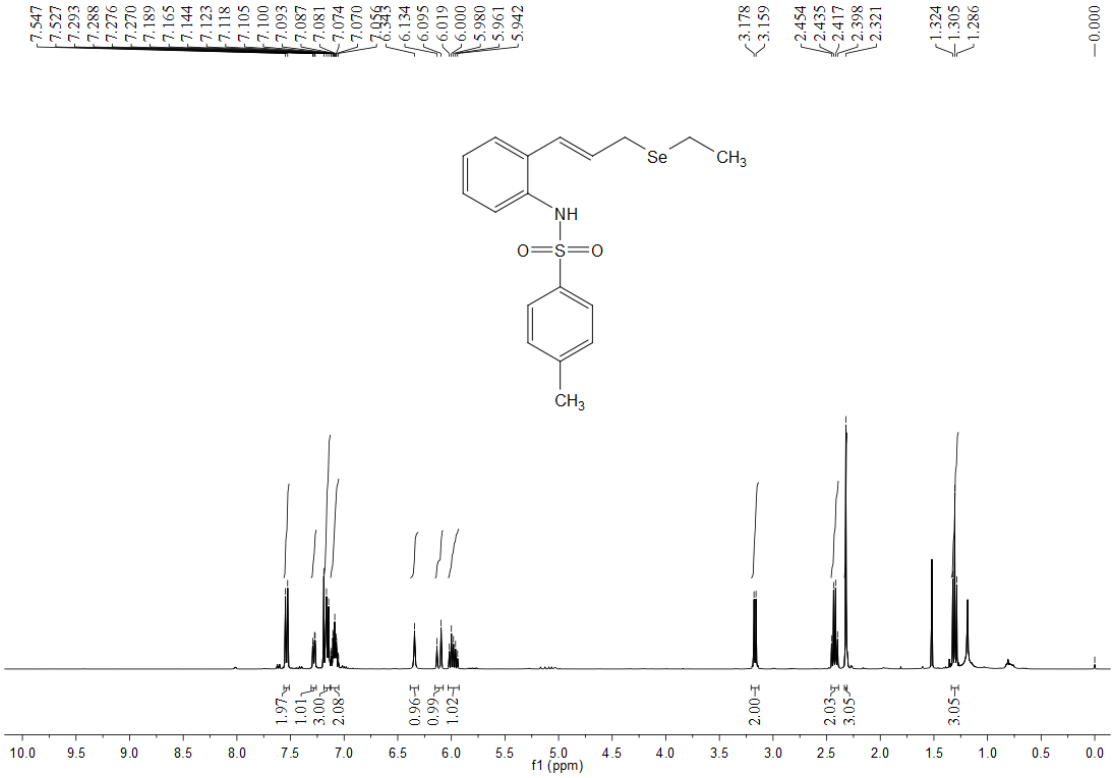


^{1}H NMR (400 MHz, $CDCl_3$) of **3qa**

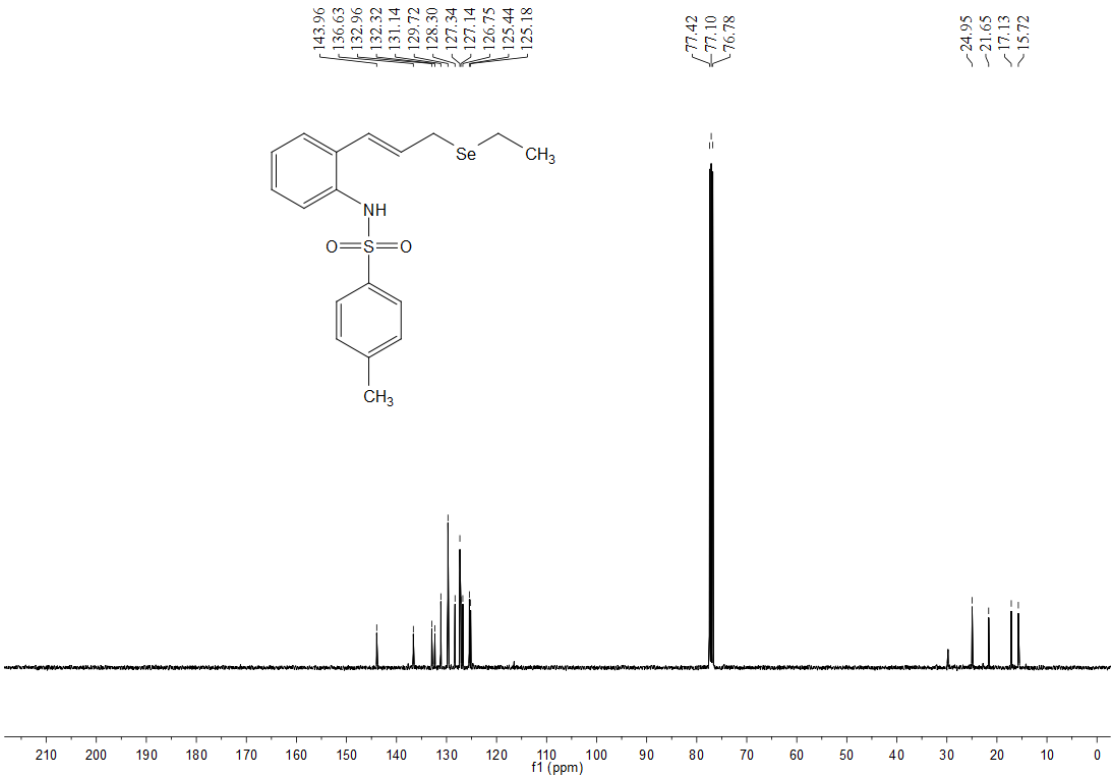


^{13}C NMR (100 MHz, $CDCl_3$) of **3qa**

(*E*)-*N*-(2-(3-(ethylselanyl)prop-1-en-1-yl)phenyl)-4-methylbenzenesulfonamide (3ra)

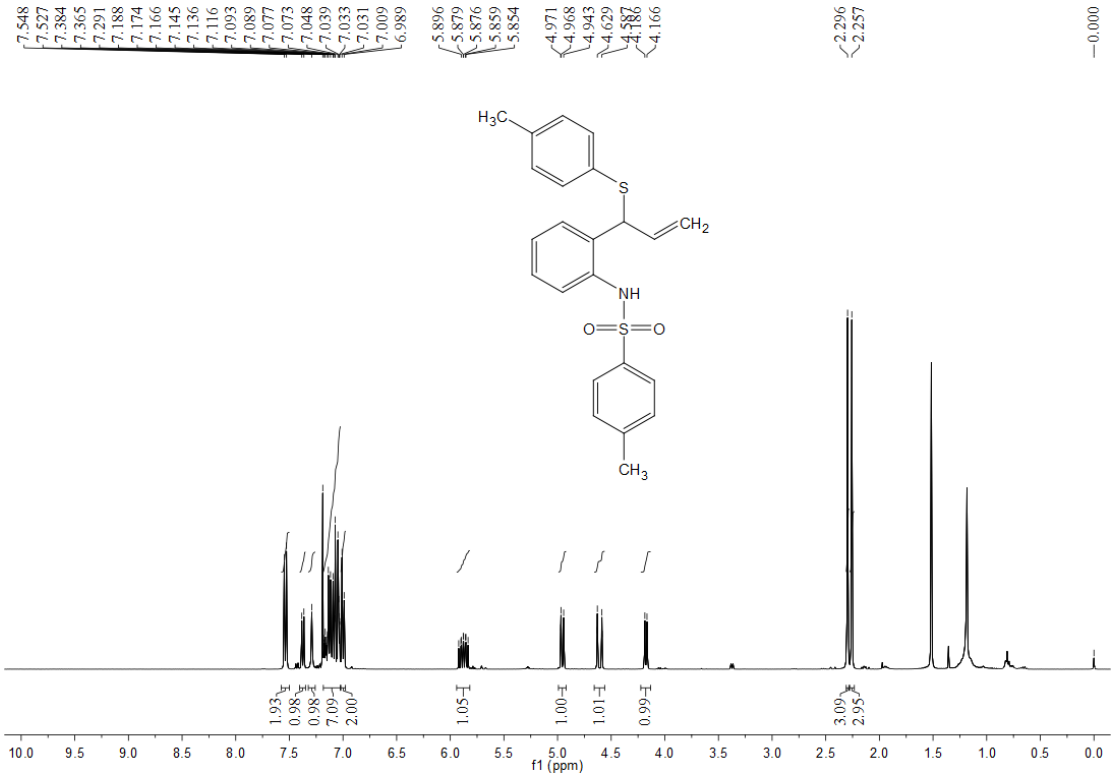


^{1}H NMR (400 MHz, $CDCl_3$) of **3ra**

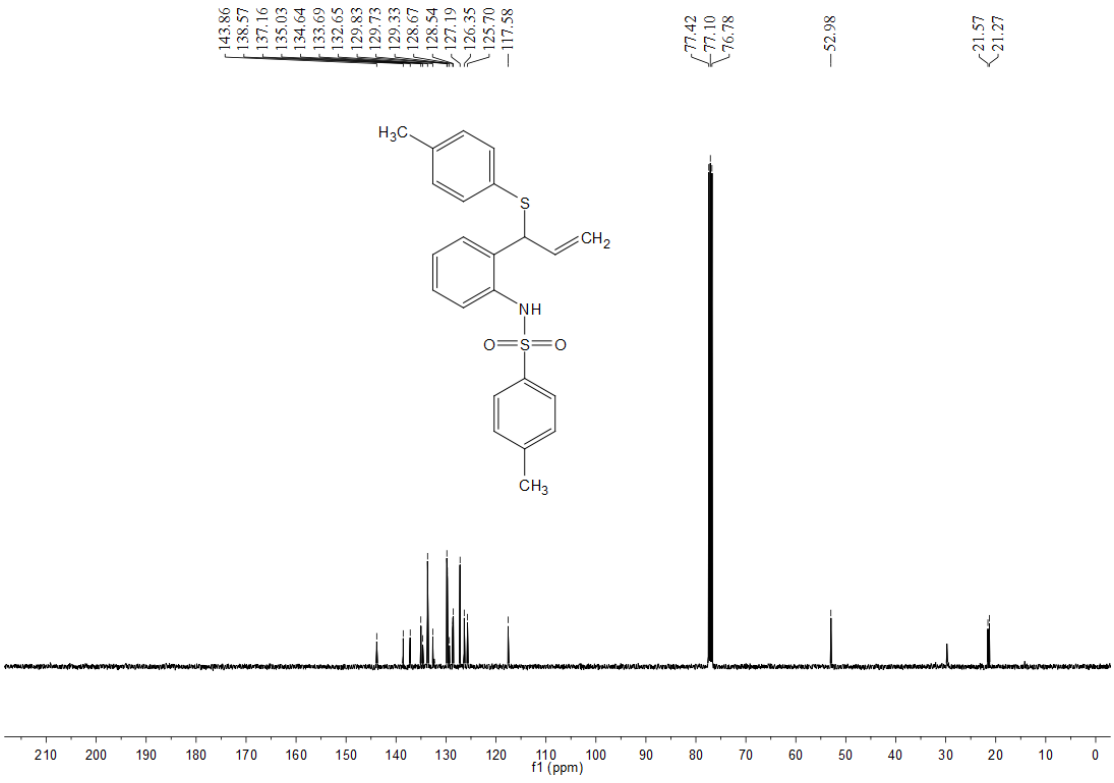


^{13}C NMR (100 MHz, $CDCl_3$) of **3ra**

4-methyl-*N*-(2-(1-(*p*-tolylthio)allyl)phenyl)benzenesulfonamide (7aa)

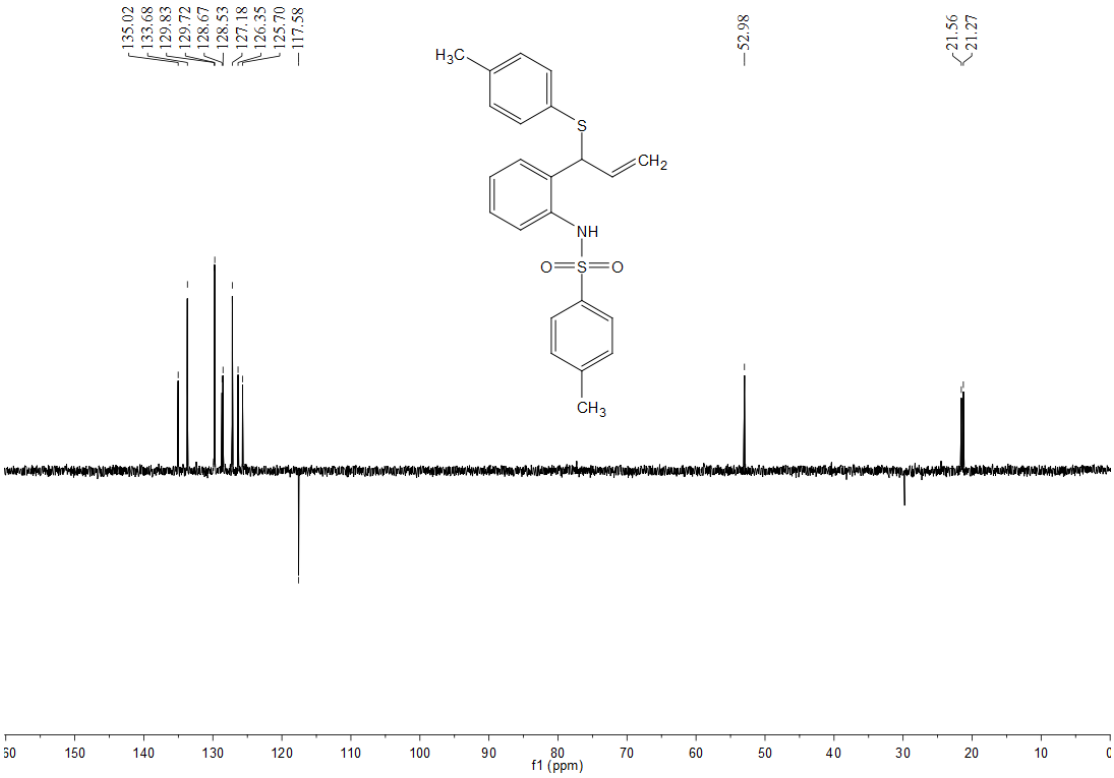


^{1}H NMR (400 MHz, $CDCl_3$) of **7aa**

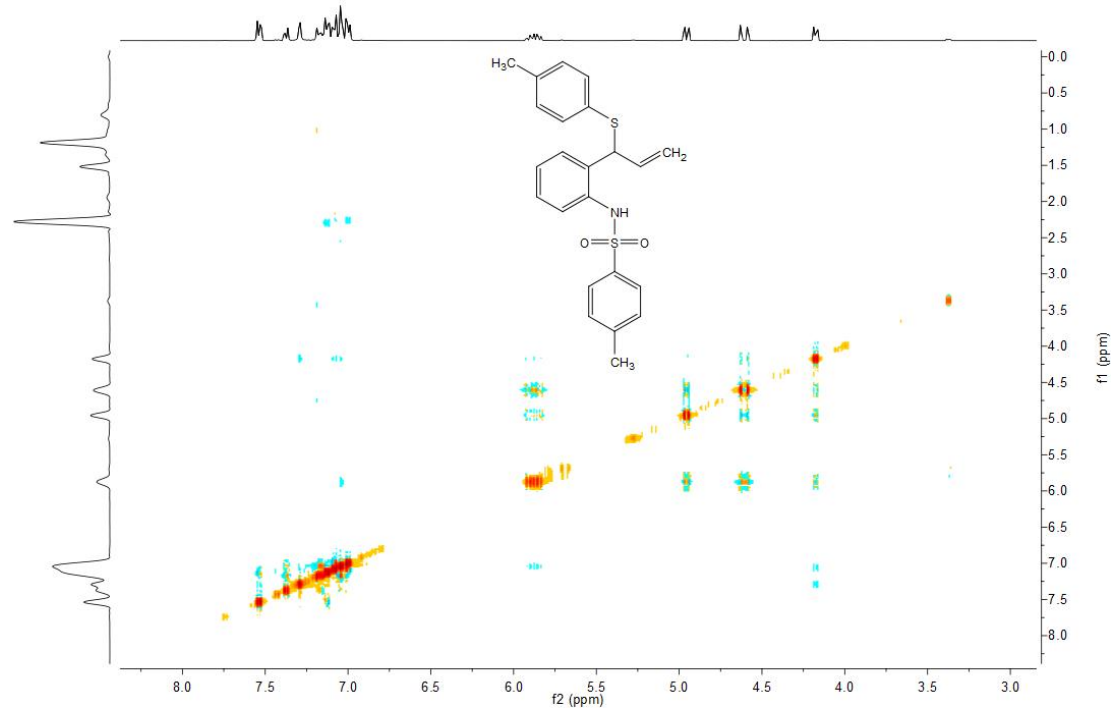


^{13}C NMR (100 MHz, $CDCl_3$) of **7aa**

4-methyl-*N*-(2-(1-(*p*-tolylthio)allyl)phenyl)benzenesulfonamide (7aa)

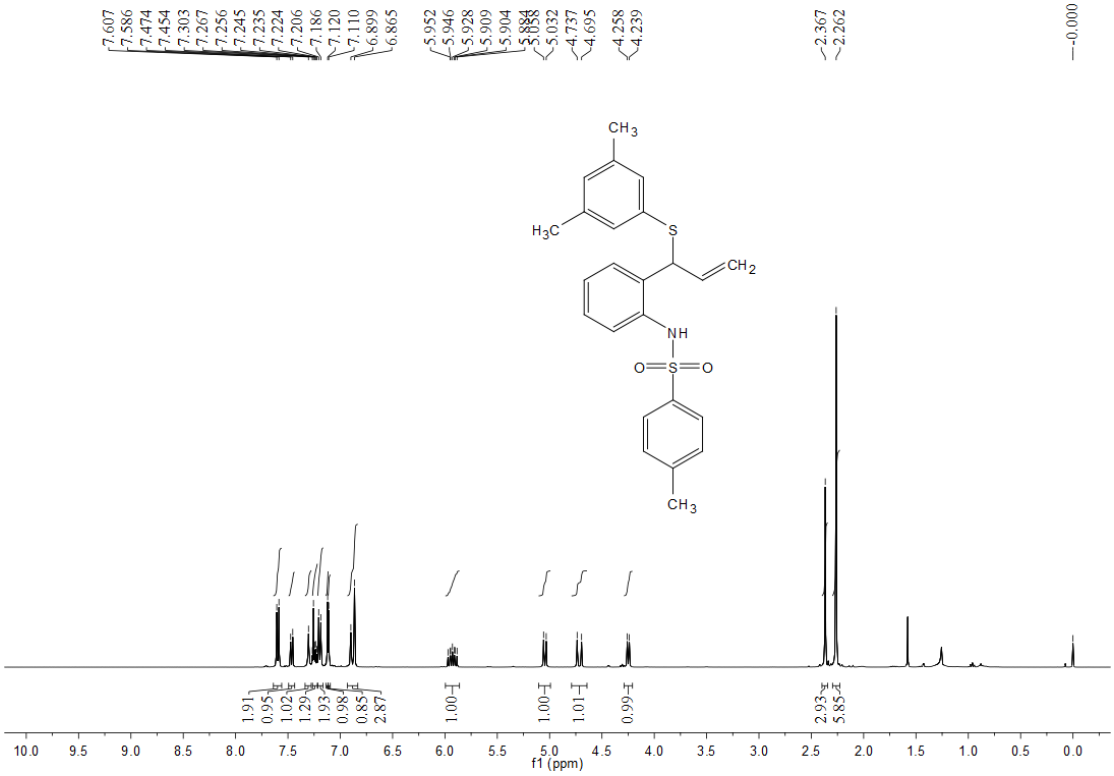


DEPT135 of **7aa**

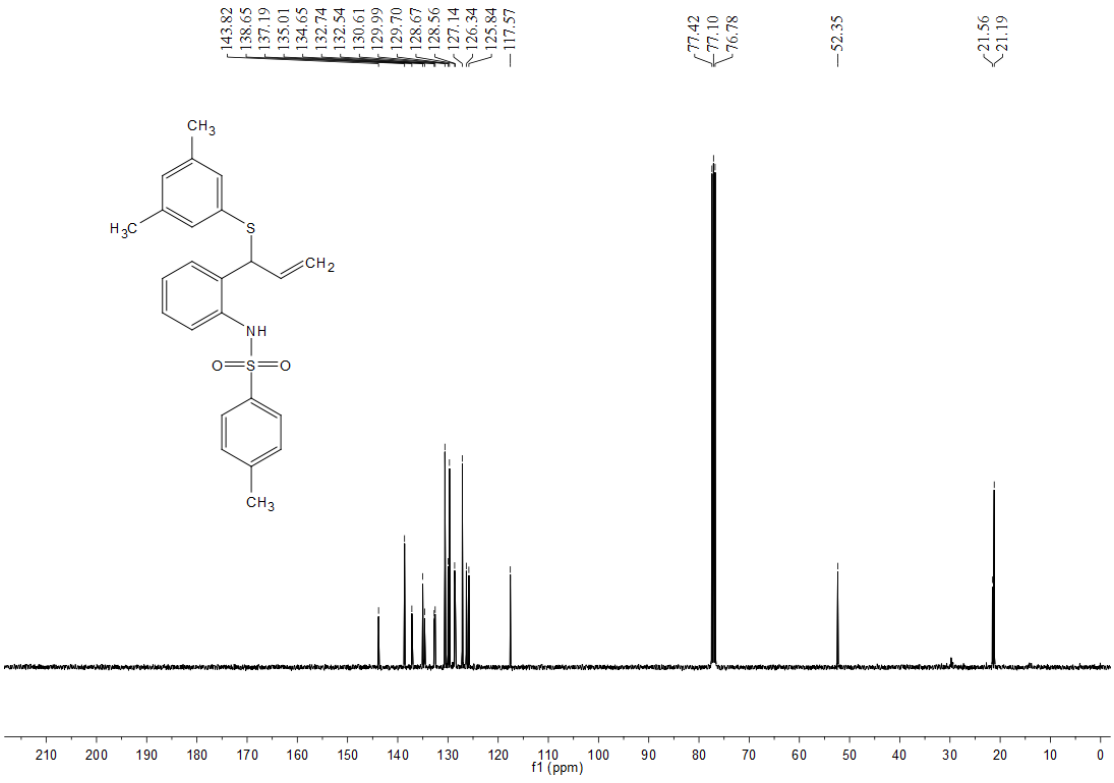


NOESY of **7aa**

***N*-(2-(1-((3,5-dimethylphenyl)thio)allyl)phenyl)-4-methylbenzenesulfonamide (7ba)**

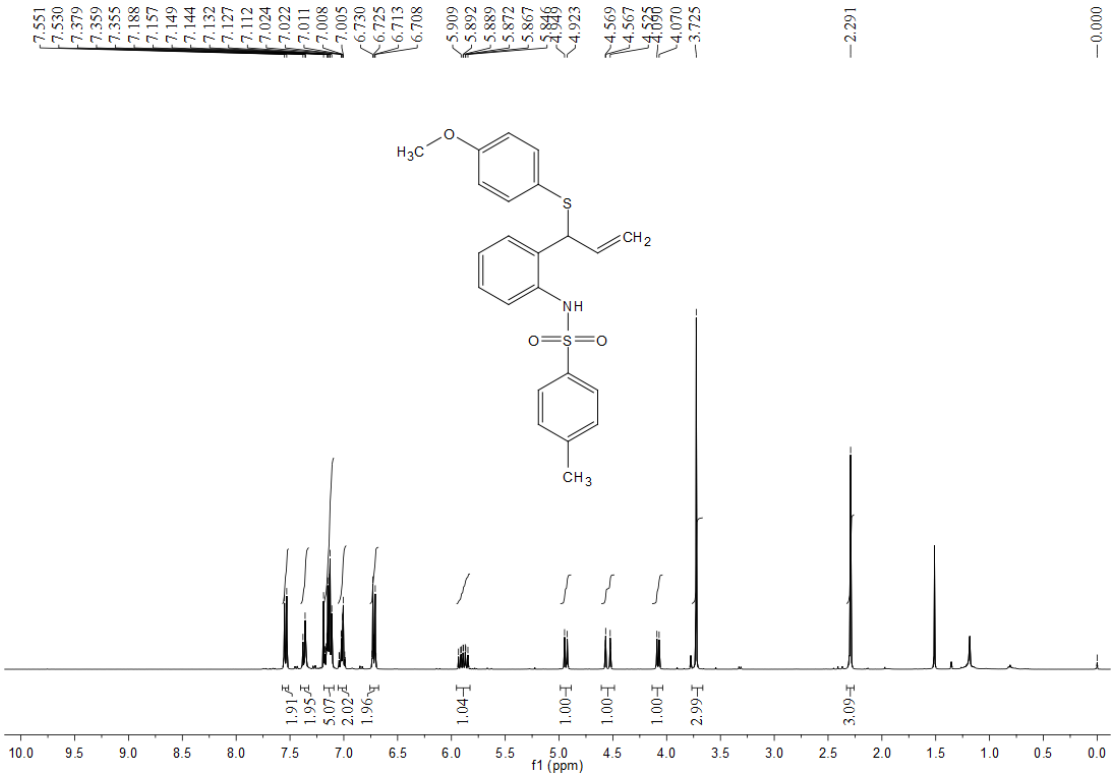


^{1}H NMR (400 MHz, $CDCl_3$) of **7ba**

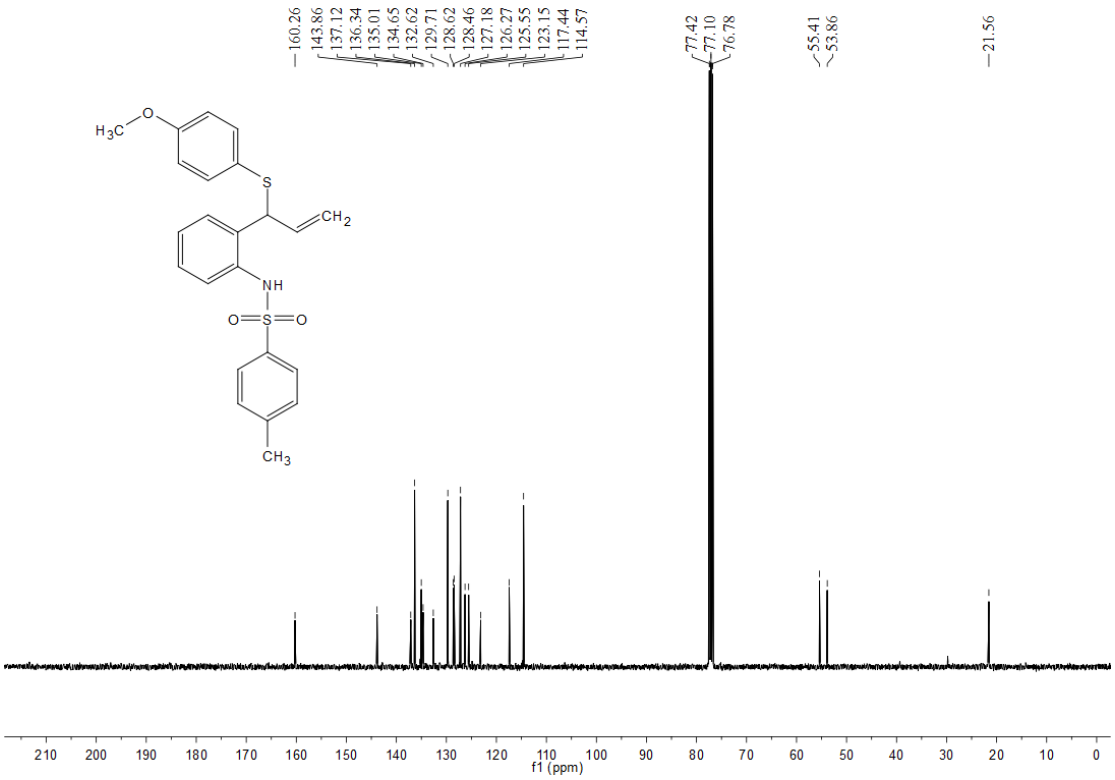


^{13}C NMR (100 MHz, $CDCl_3$) of **7ba**

N-(2-(1-((4-methoxyphenyl)thio)allyl)phenyl)-4-methylbenzenesulfonamide (7ca)

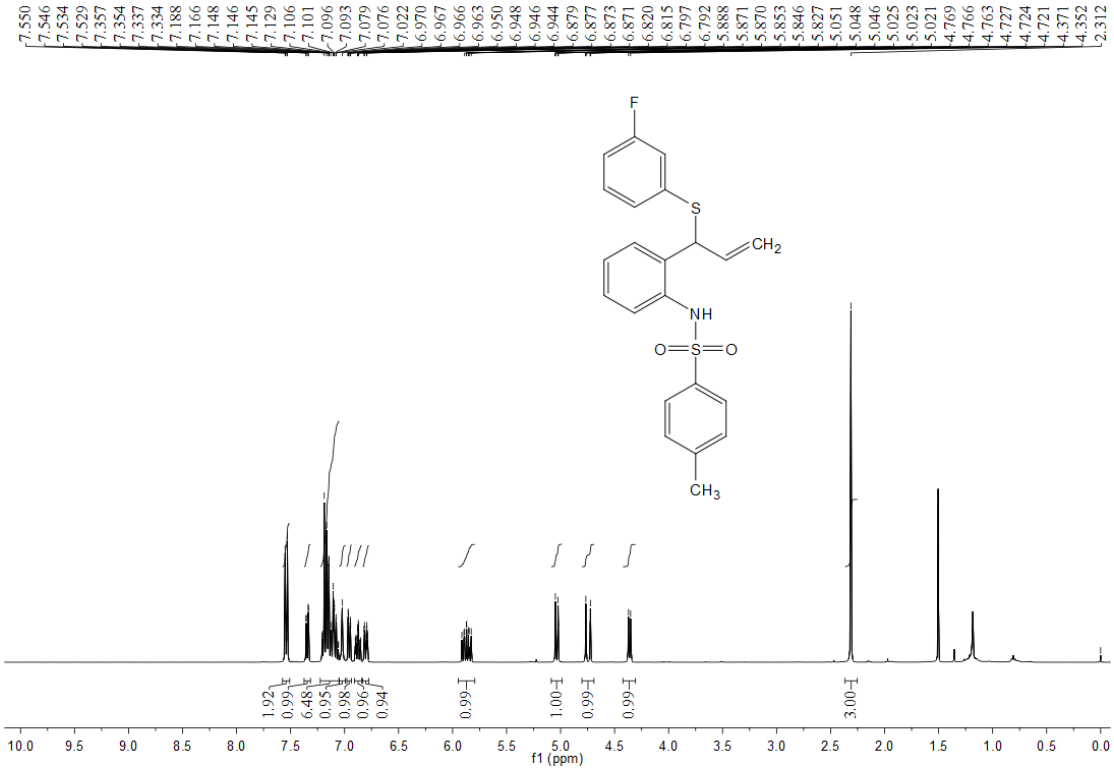


^{1}H NMR (400 MHz, $CDCl_3$) of **7ca**

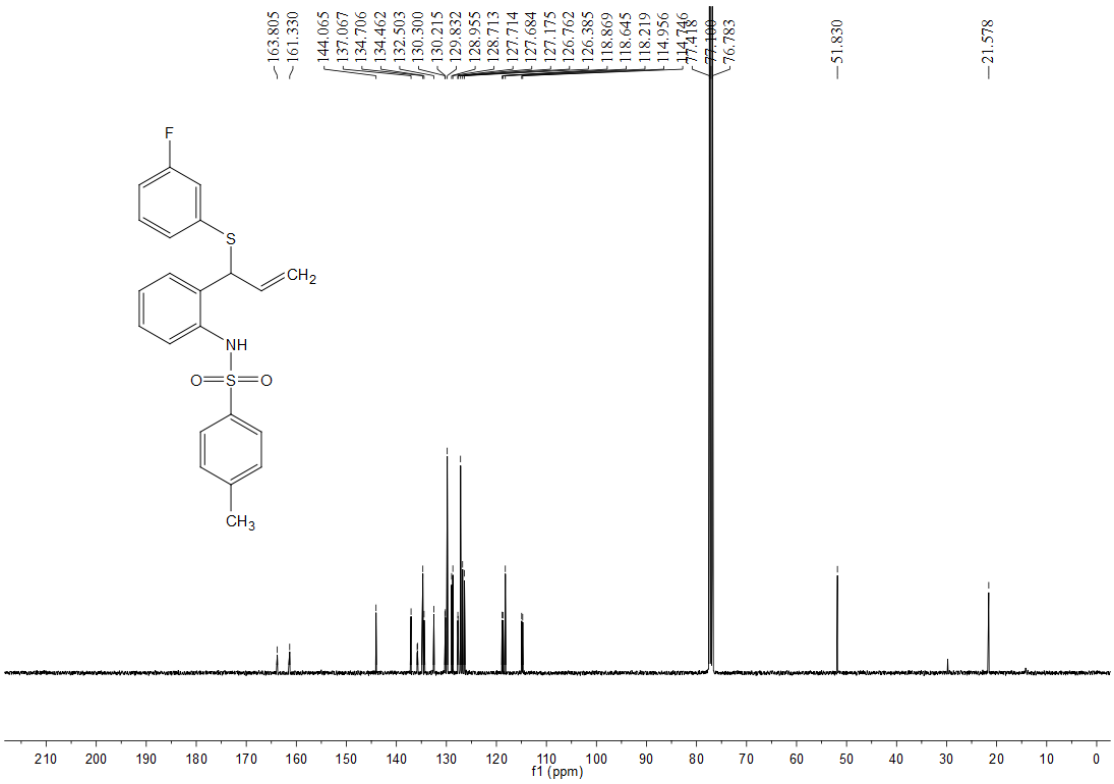


^{13}C NMR (100 MHz, $CDCl_3$) of **7ca**

***N*-(2-(1-((3-fluorophenyl)thio)allyl)phenyl)-4-methylbenzenesulfonamide (7da)**

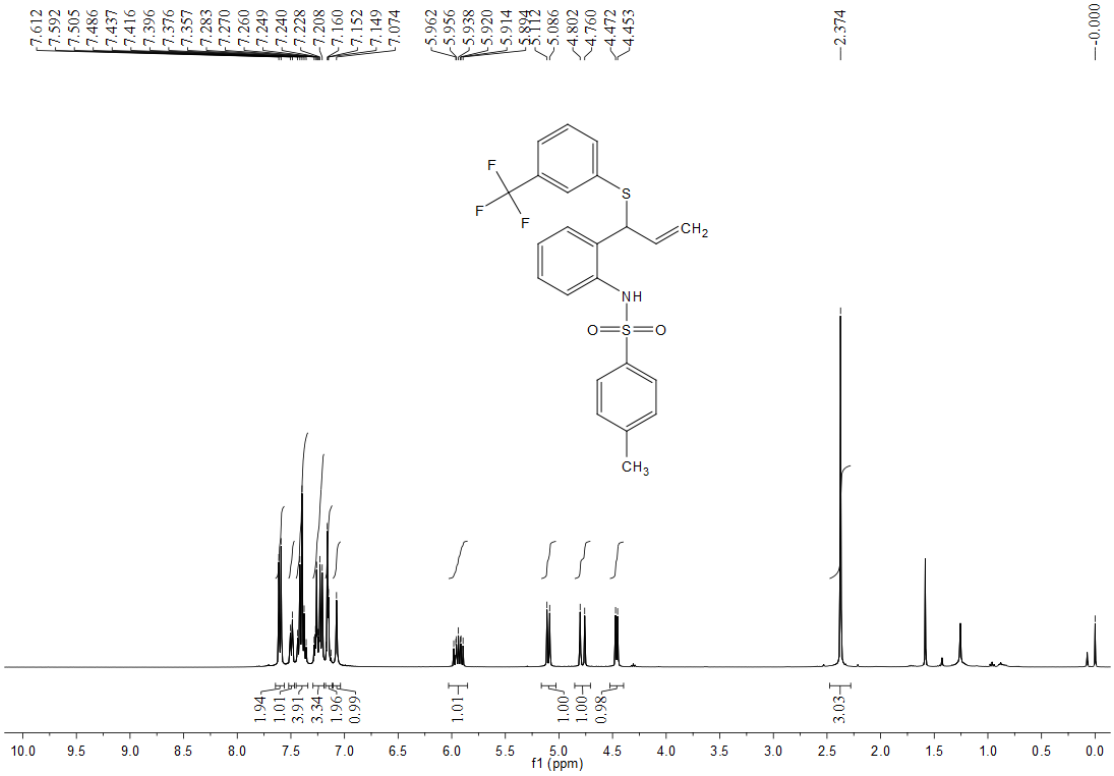


^{1}H NMR (400 MHz, $CDCl_3$) of **7da**

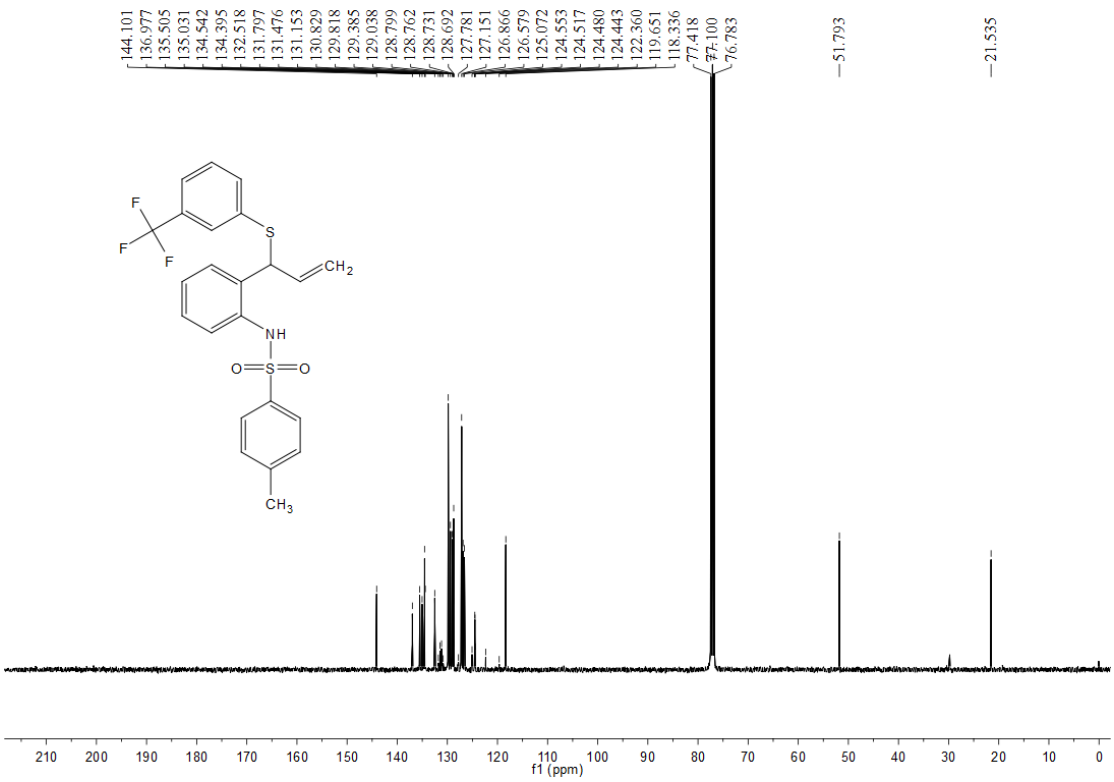


^{13}C NMR (100 MHz, $CDCl_3$) of **7da**

4-methyl-*N*-(2-(1-((3-(trifluoromethyl)phenyl)thio)allyl)phenyl)benzenesulfonamide (7ea)

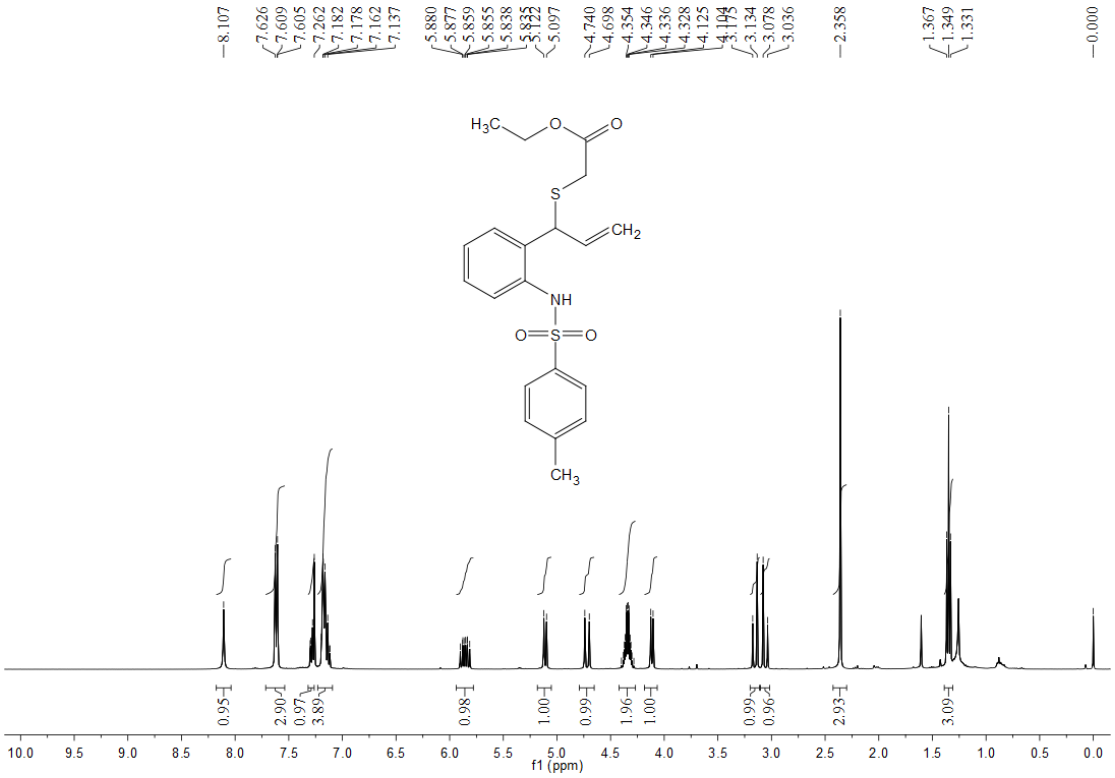


^{1}H NMR (400 MHz, $CDCl_3$) of **7ea**

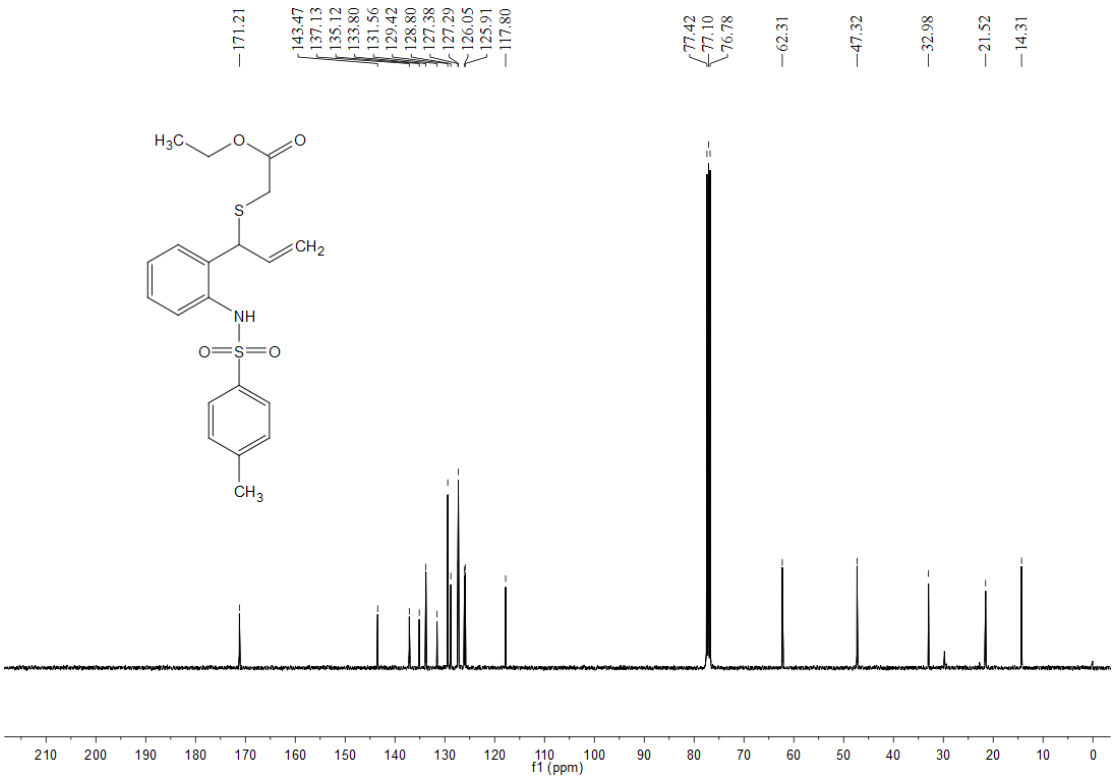


^{13}C NMR (100 MHz, $CDCl_3$) of **7ea**

ethyl 2-((1-(2-((4-methylphenyl)sulfonamido)phenyl)allyl)thio)acetate (7fa)

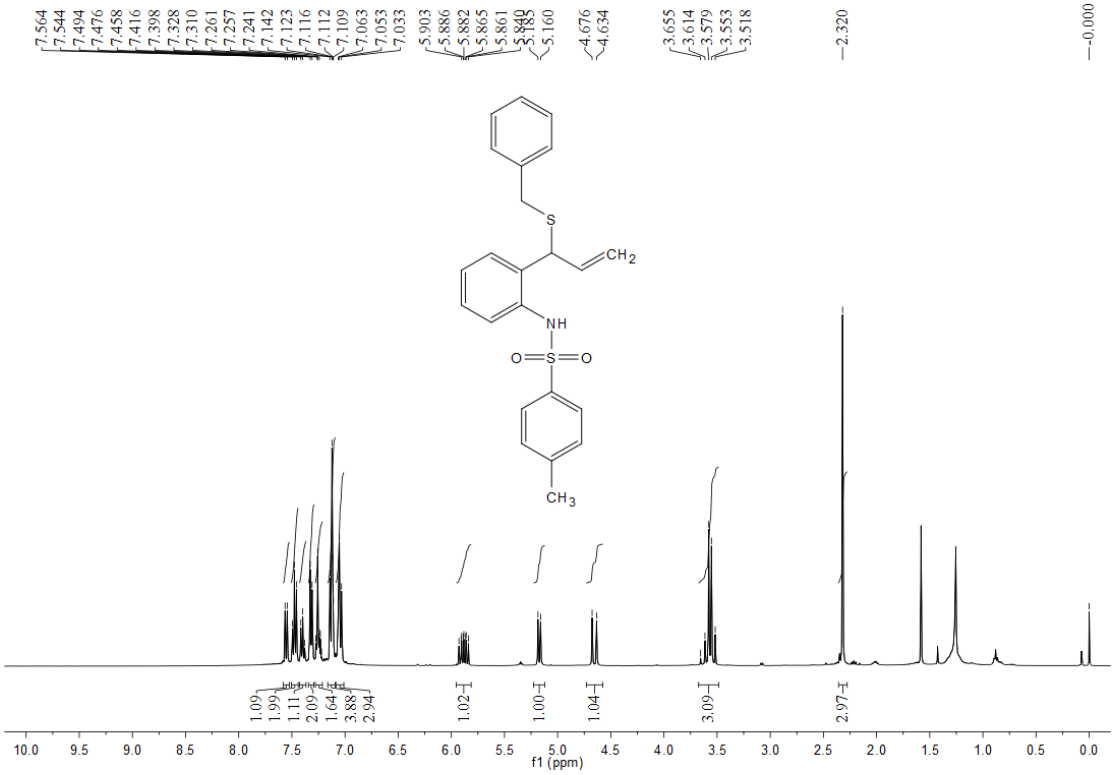


^{1}H NMR (400 MHz, $CDCl_3$) of **7fa**

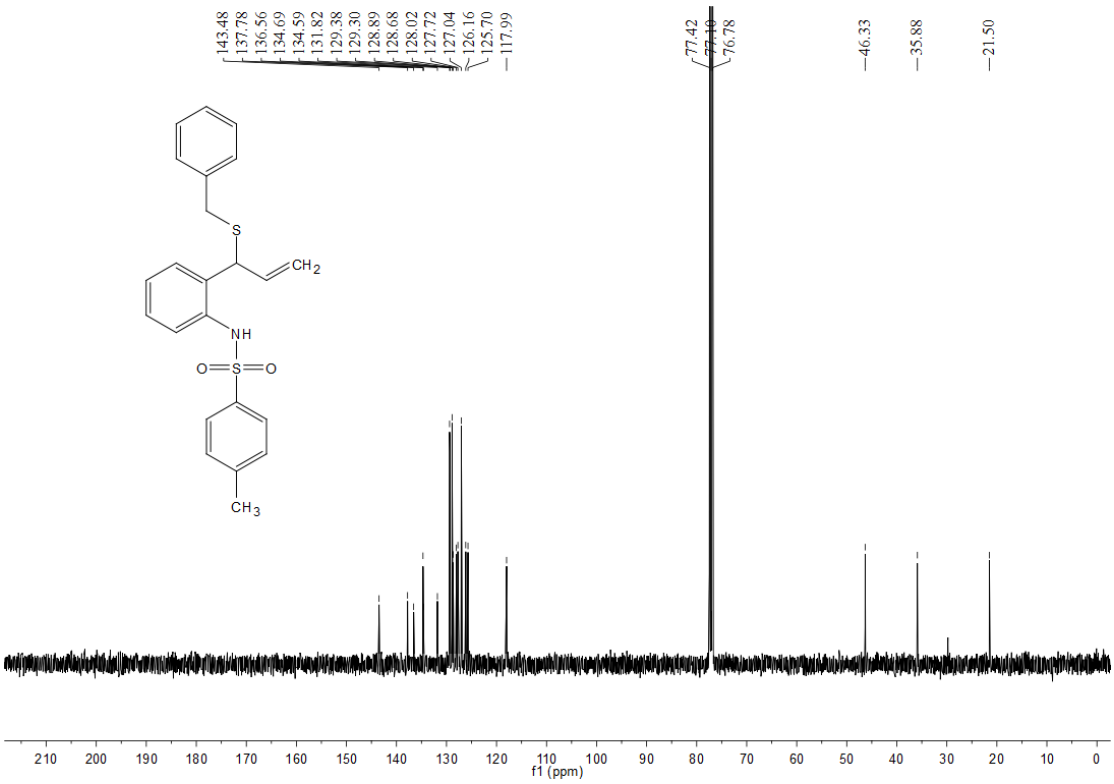


^{13}C NMR (100 MHz, $CDCl_3$) of **7fa**

***N*-(2-(1-(benzylthio)allyl)phenyl)-4-methylbenzenesulfonamide (7ga)**

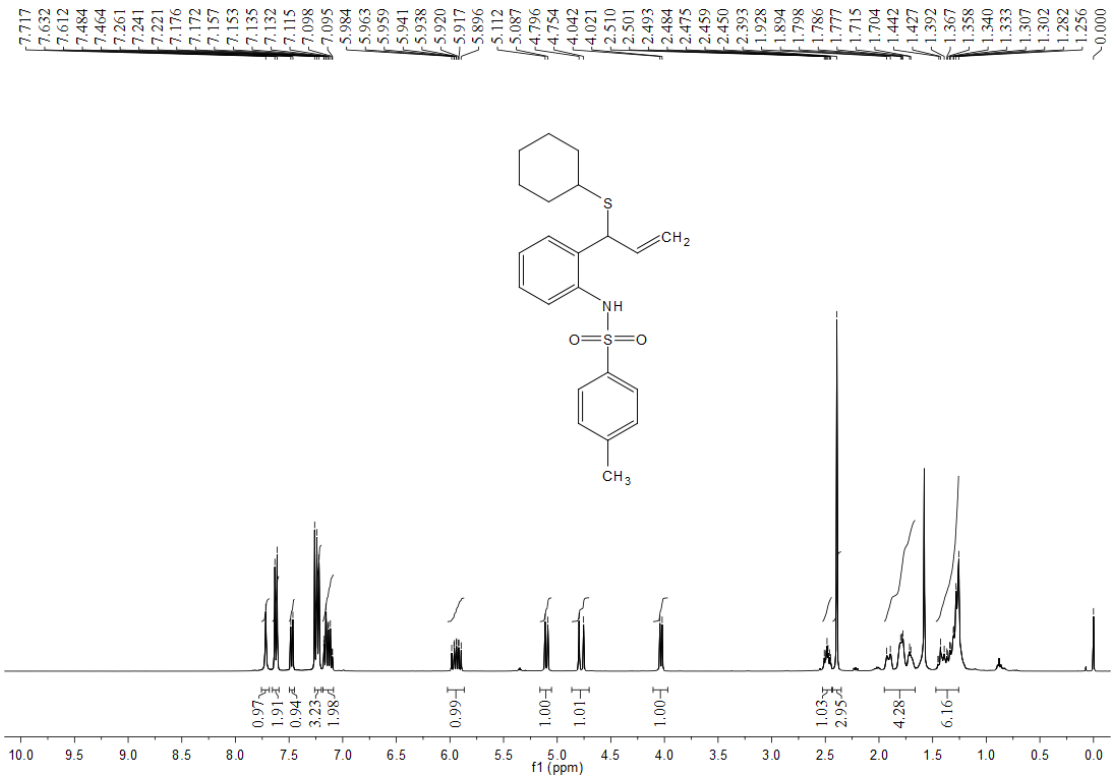


^{1}H NMR (400 MHz, $CDCl_3$) of **7ga**

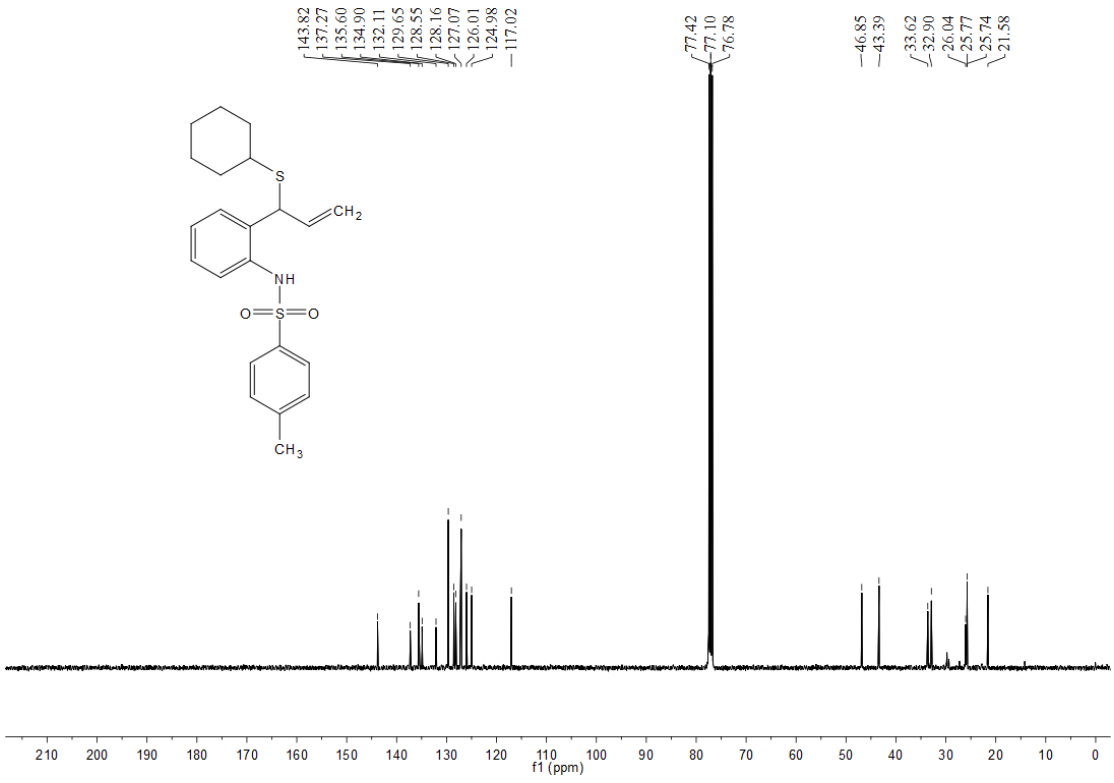


^{13}C NMR (100 MHz, $CDCl_3$) of **7ga**

***N*-(2-(1-(cyclohexylthio)allyl)phenyl)-4-methylbenzenesulfonamide (7ha)**

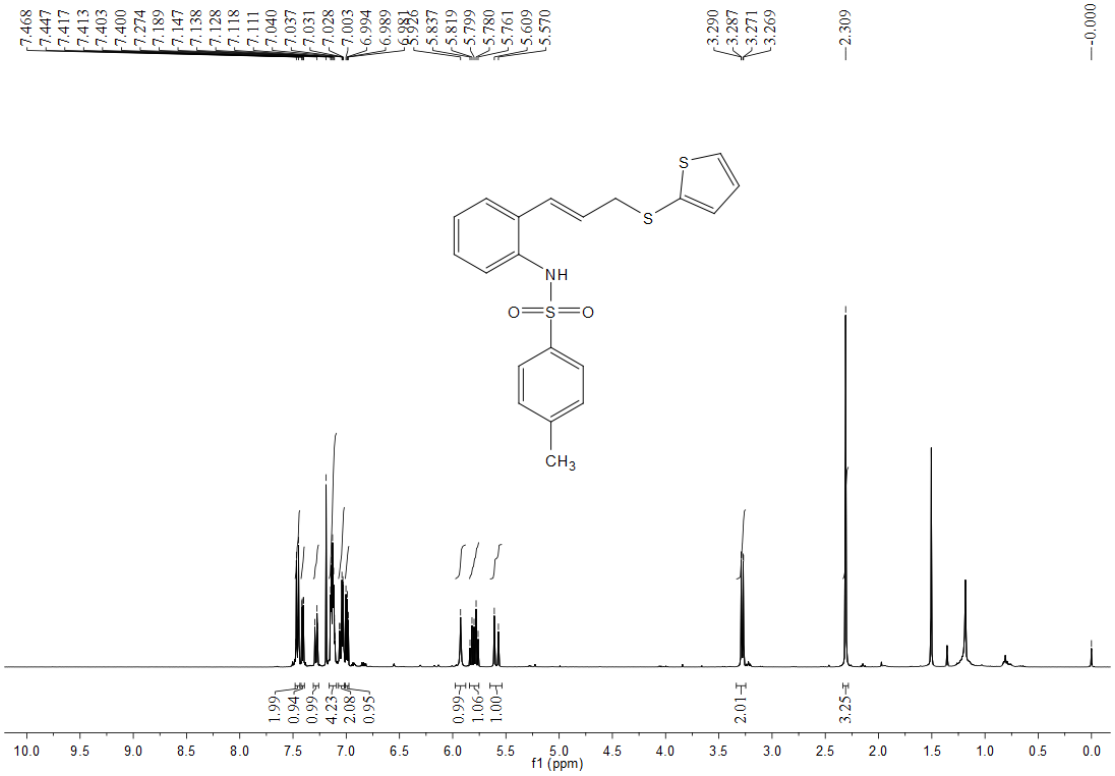


^{1}H NMR (400 MHz, $CDCl_3$) of **7ha**

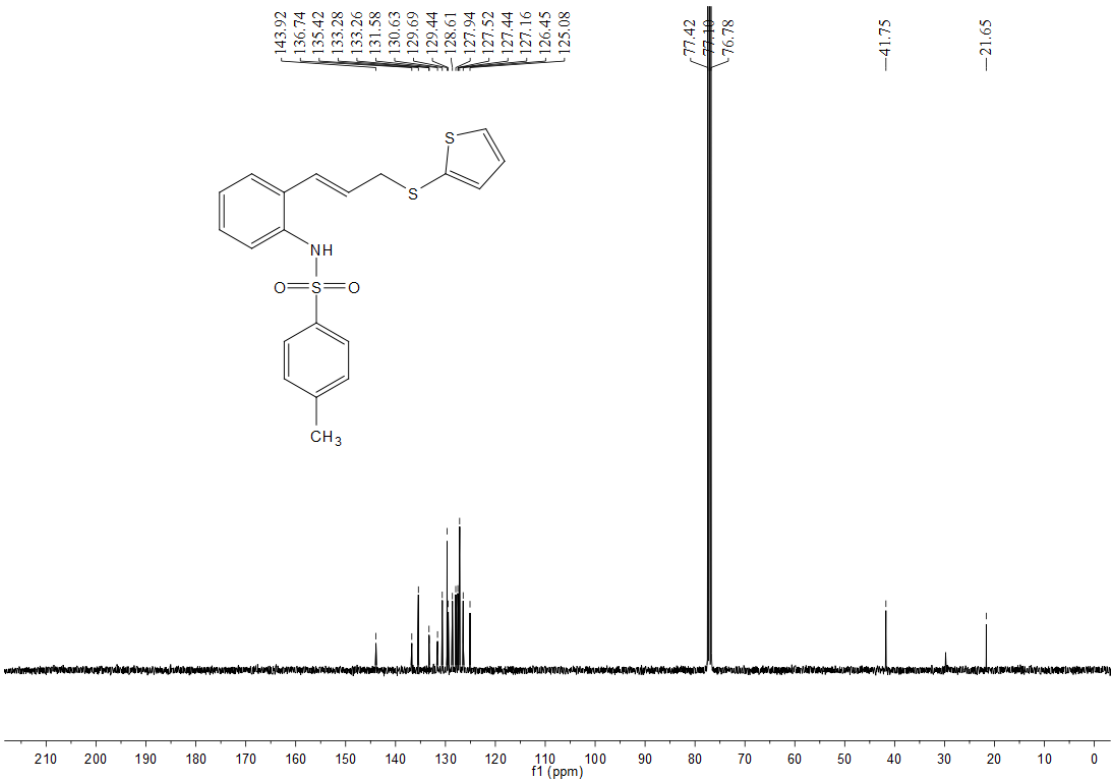


^{13}C NMR (100 MHz, $CDCl_3$) of **7ha**

(*E*)-4-methyl-*N*-(2-(3-(thiophen-2-ylthio)prop-1-en-1-yl)phenyl)benzenesulfonamide (7ia)

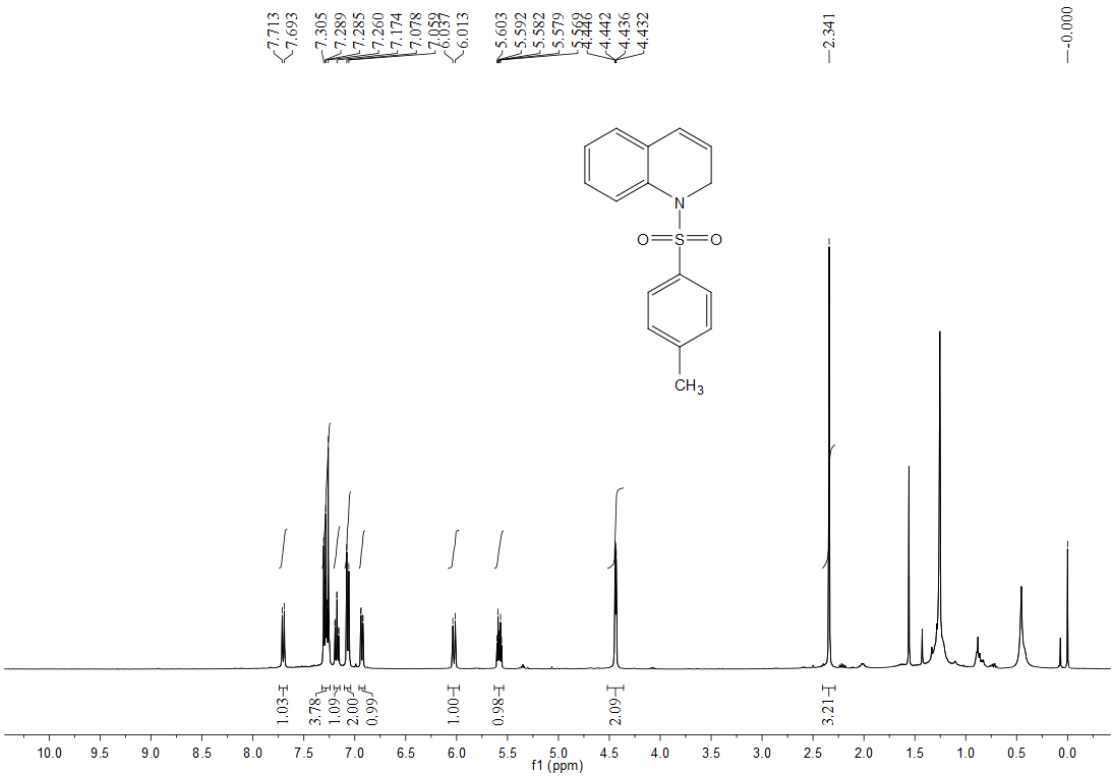


^{1}H NMR (400 MHz, $CDCl_3$) of **7ia**

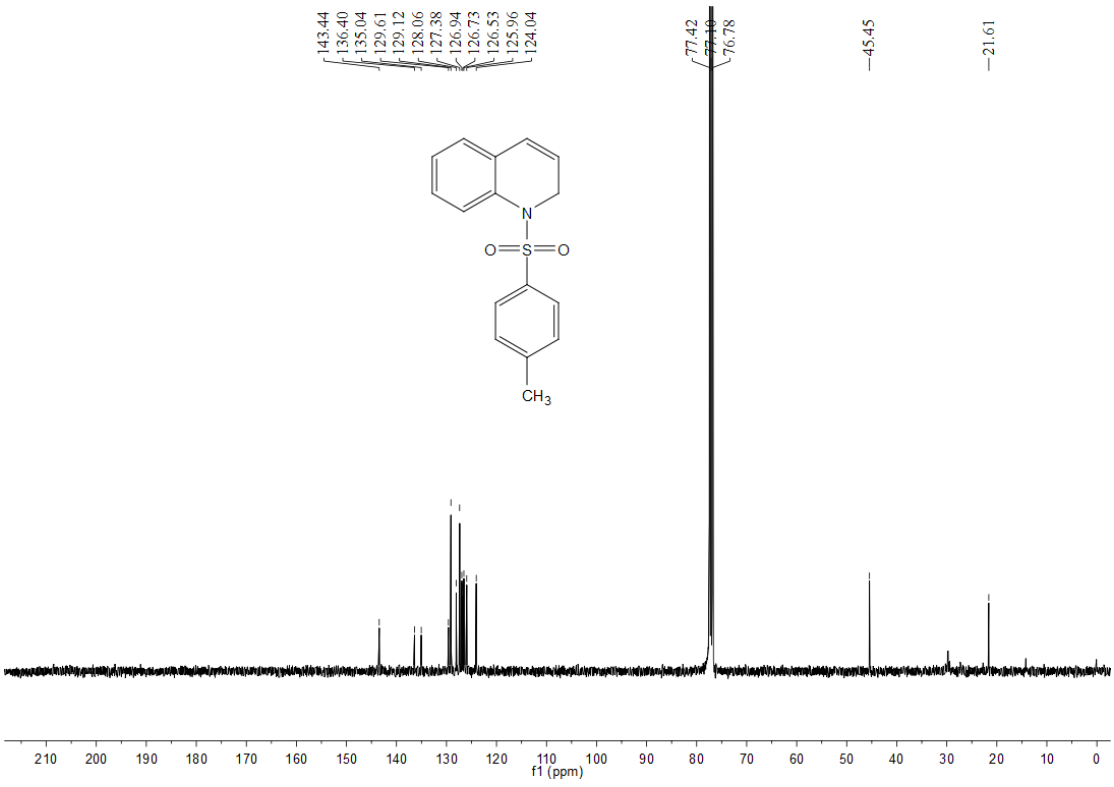


^{13}C NMR (100 MHz, $CDCl_3$) of **7ia**

1-tosyl-1,2-dihydroquinoline (9)

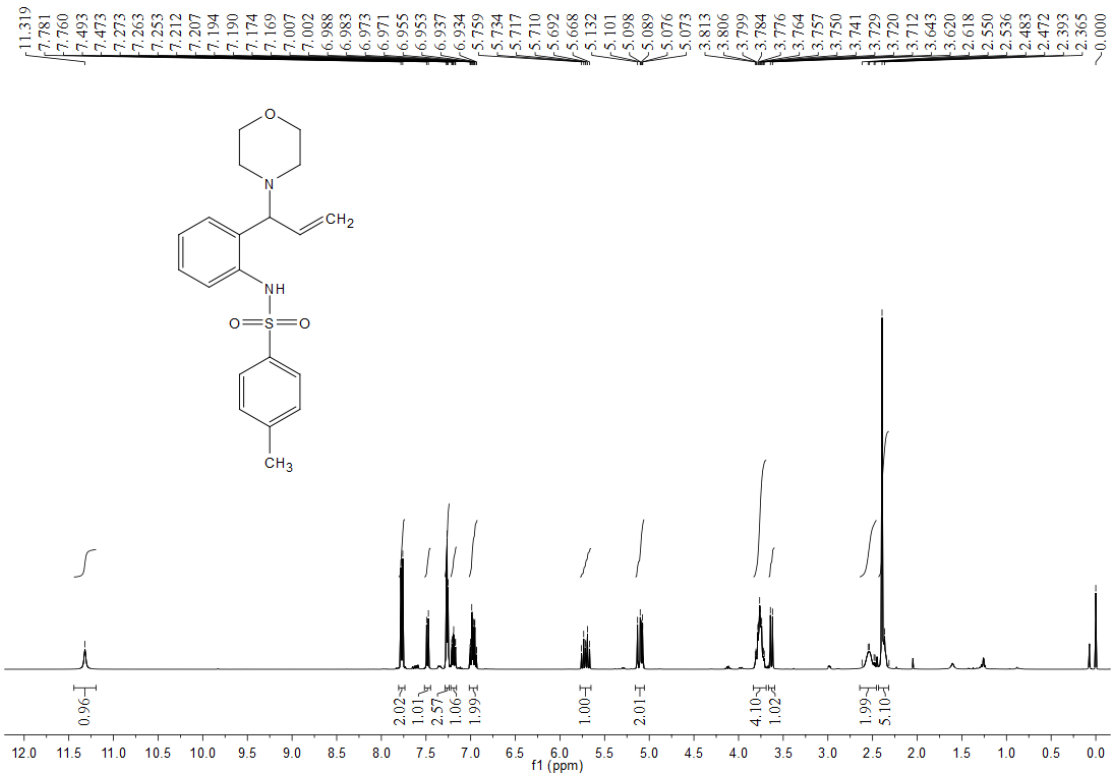


^{1}H NMR (400 MHz, $CDCl_3$) of **9**

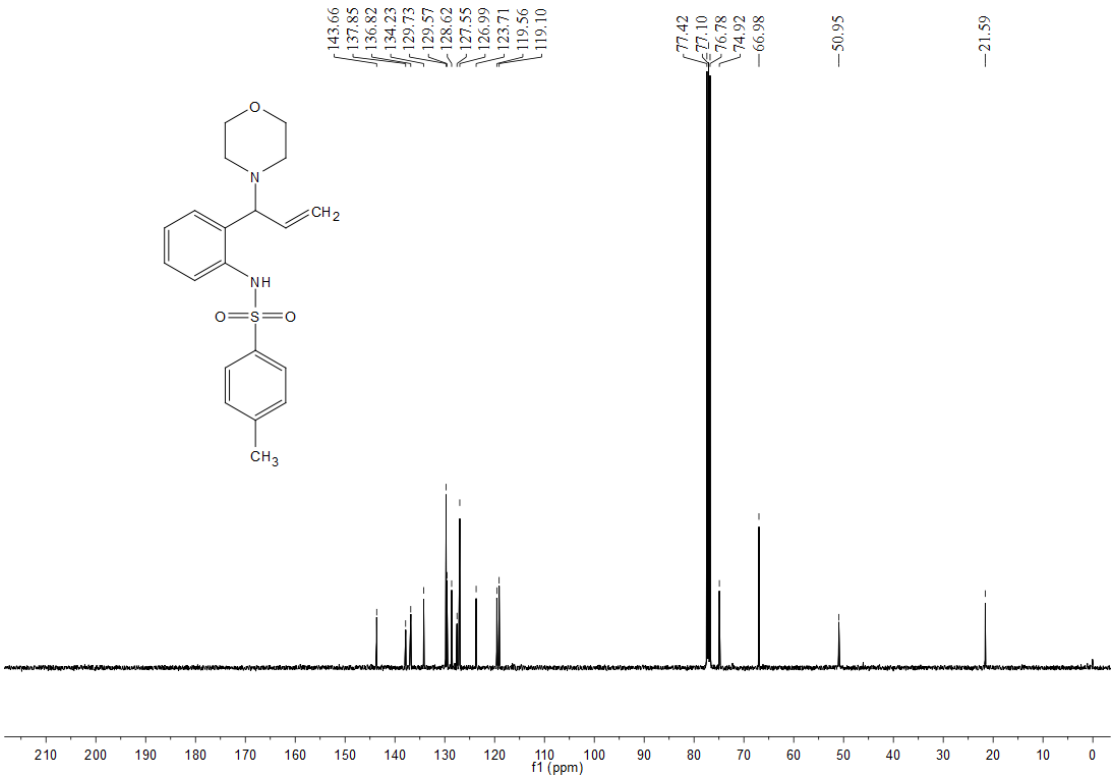


^{13}C NMR (100 MHz, $CDCl_3$) of **9**

4-methyl-*N*-(2-(1-morpholinoallyl)phenyl)benzenesulfonamide (10)

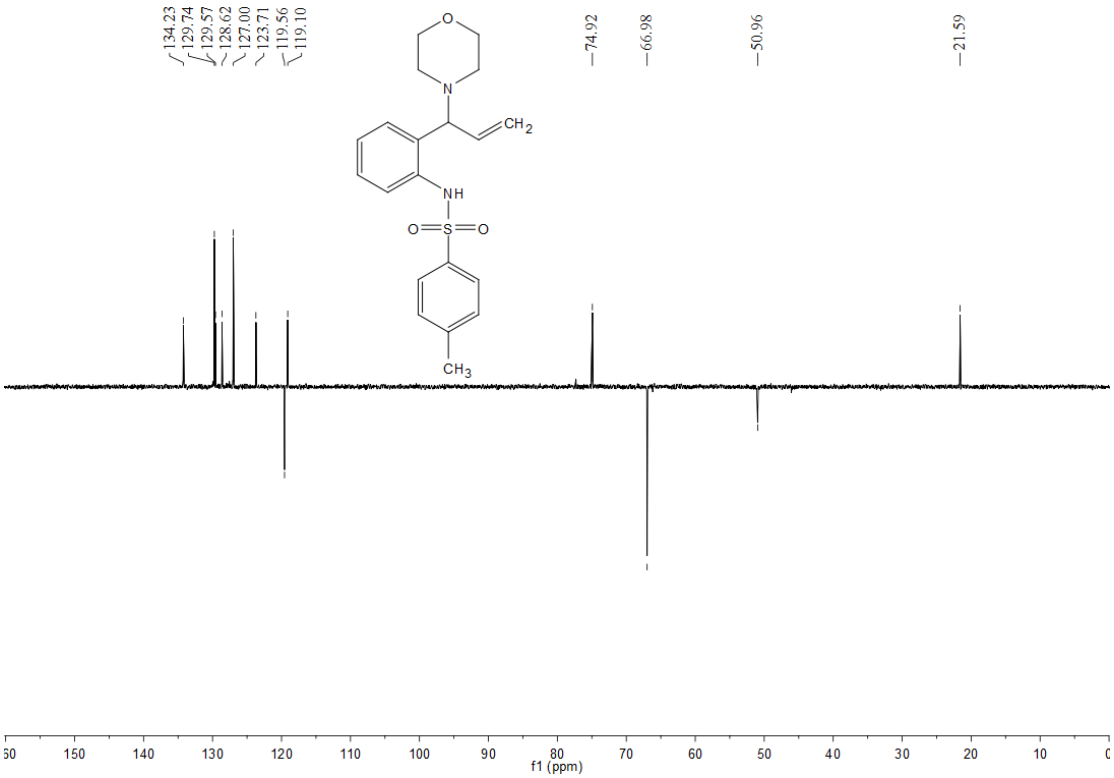


^{1}H NMR (400 MHz, $CDCl_3$) of **10**

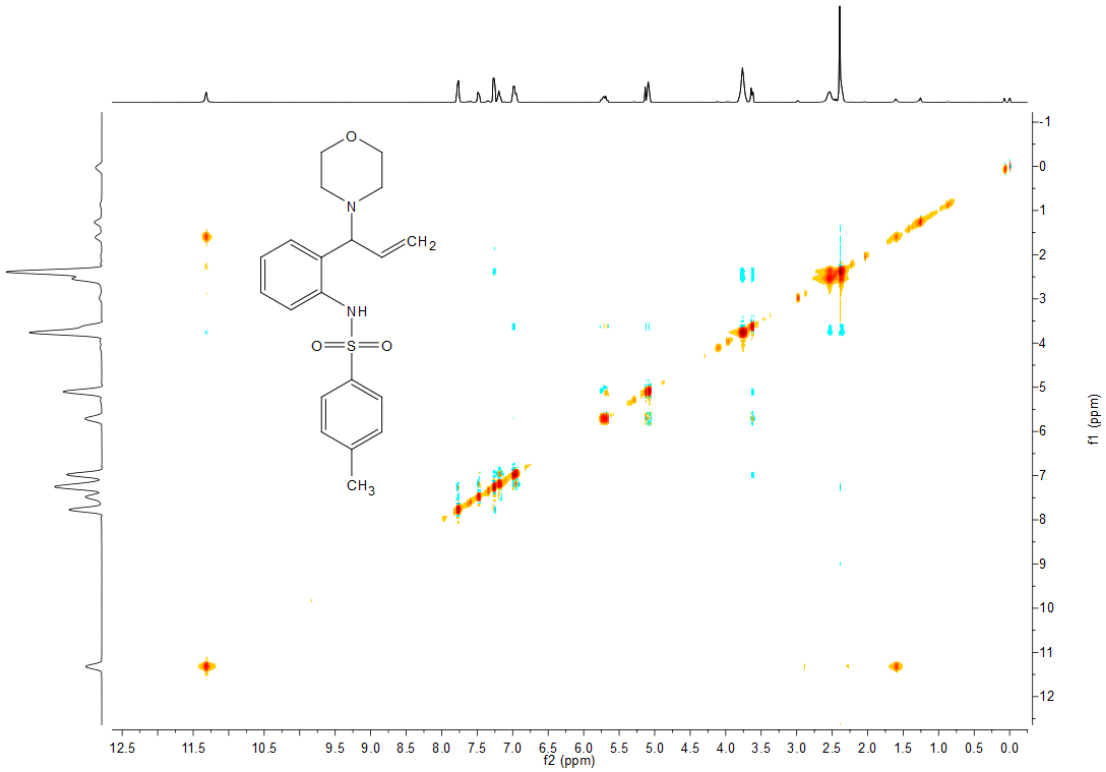


^{13}C NMR (100 MHz, $CDCl_3$) of **10**

4-methyl-*N*-(2-(1-morpholinoallyl)phenyl)benzenesulfonamide (10)

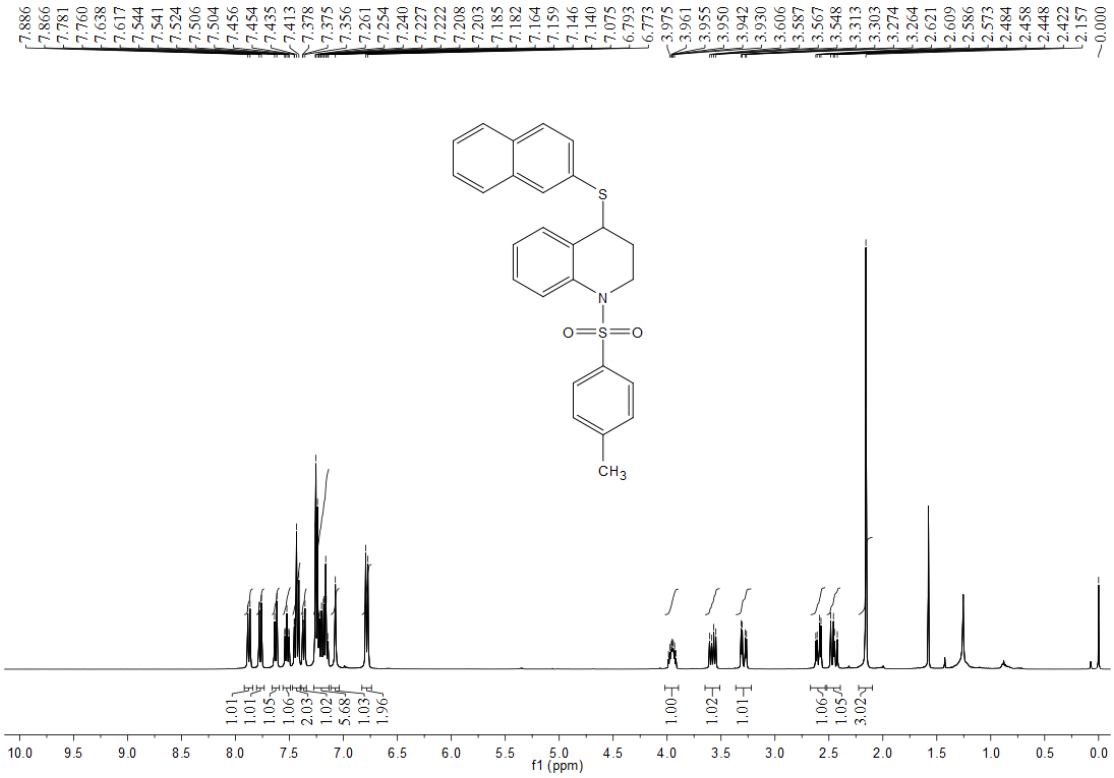


DEPT135 of **10**

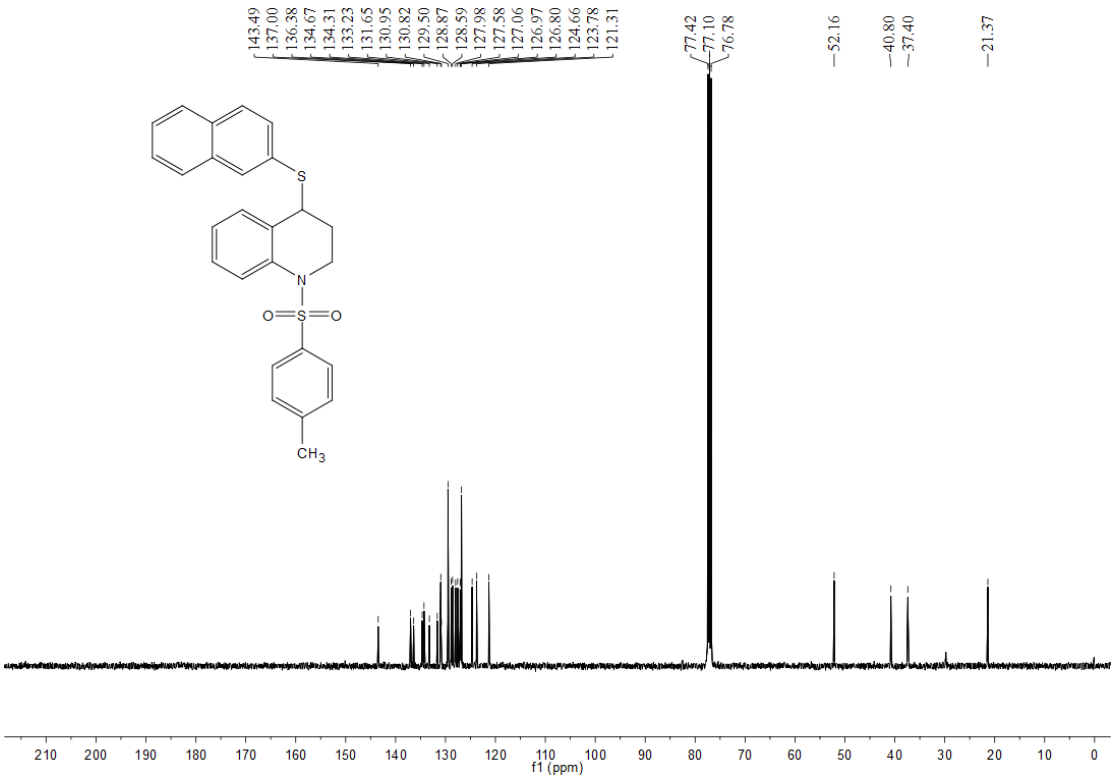


NOESY of **10**

4-(naphthalen-2-ylthio)-1-tosyl-1,2,3,4-tetrahydroquinoline (11)

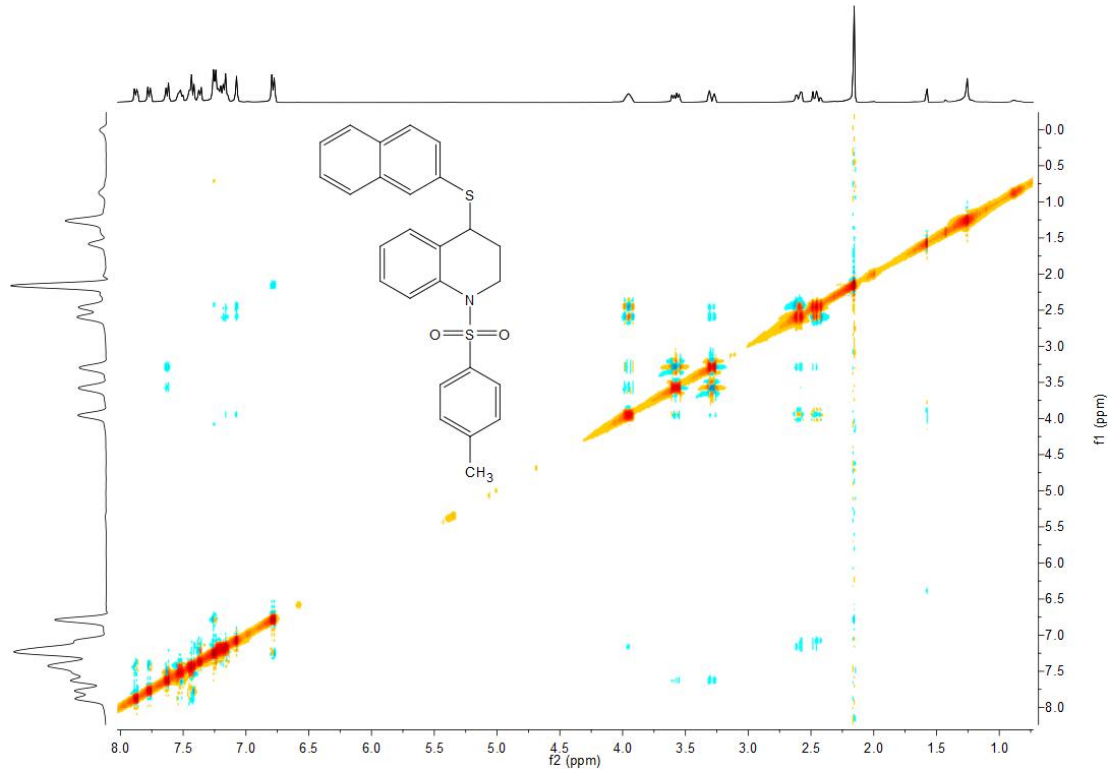


^{1}H NMR (400 MHz, $CDCl_3$) of **11**

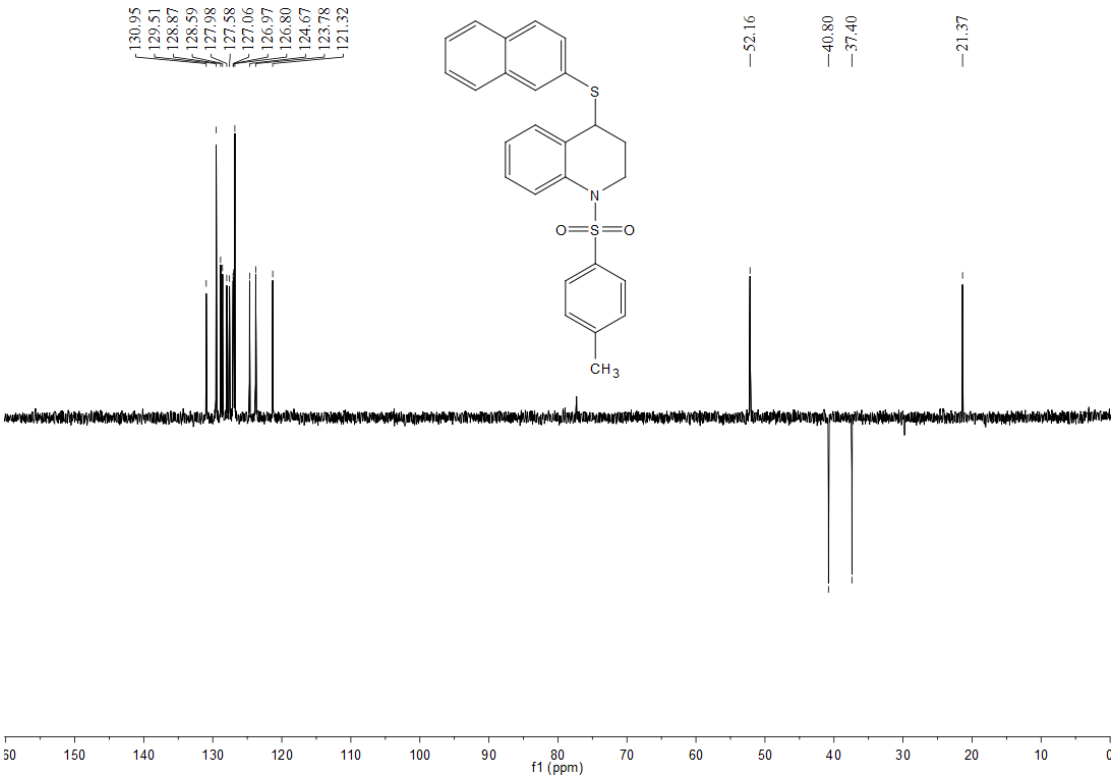


^{13}C NMR (100 MHz, $CDCl_3$) of **11**

4-(naphthalen-2-ylthio)-1-tosyl-1,2,3,4-tetrahydroquinoline (11)

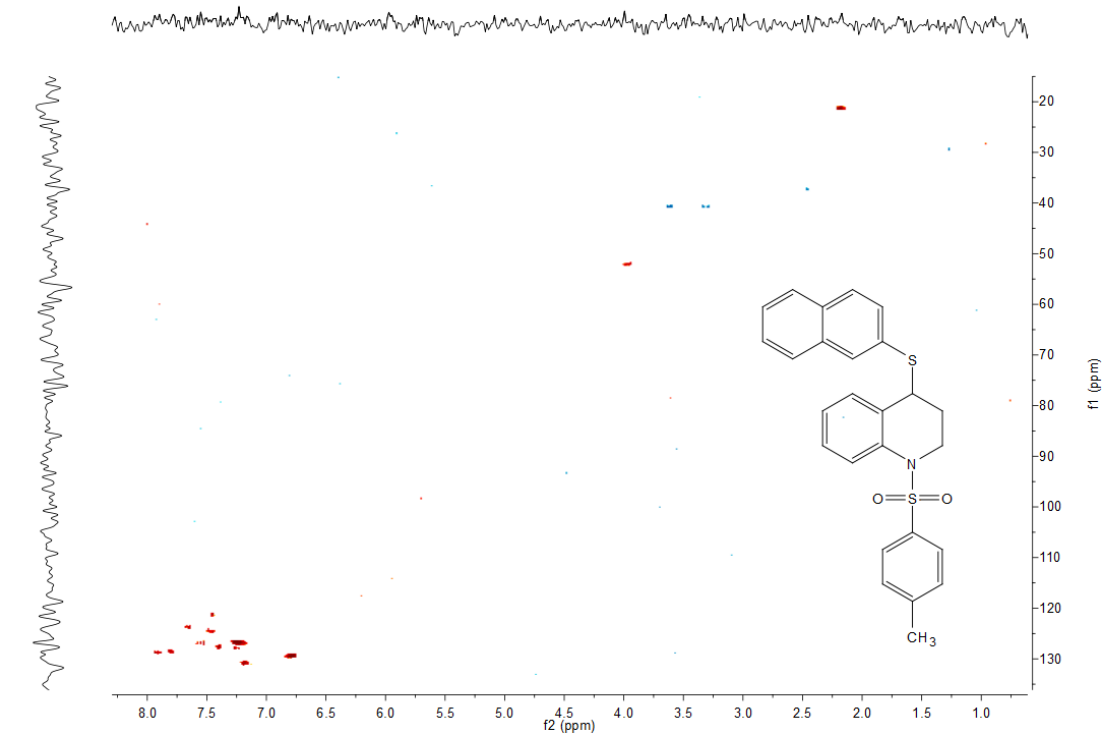


NOESY of **11**

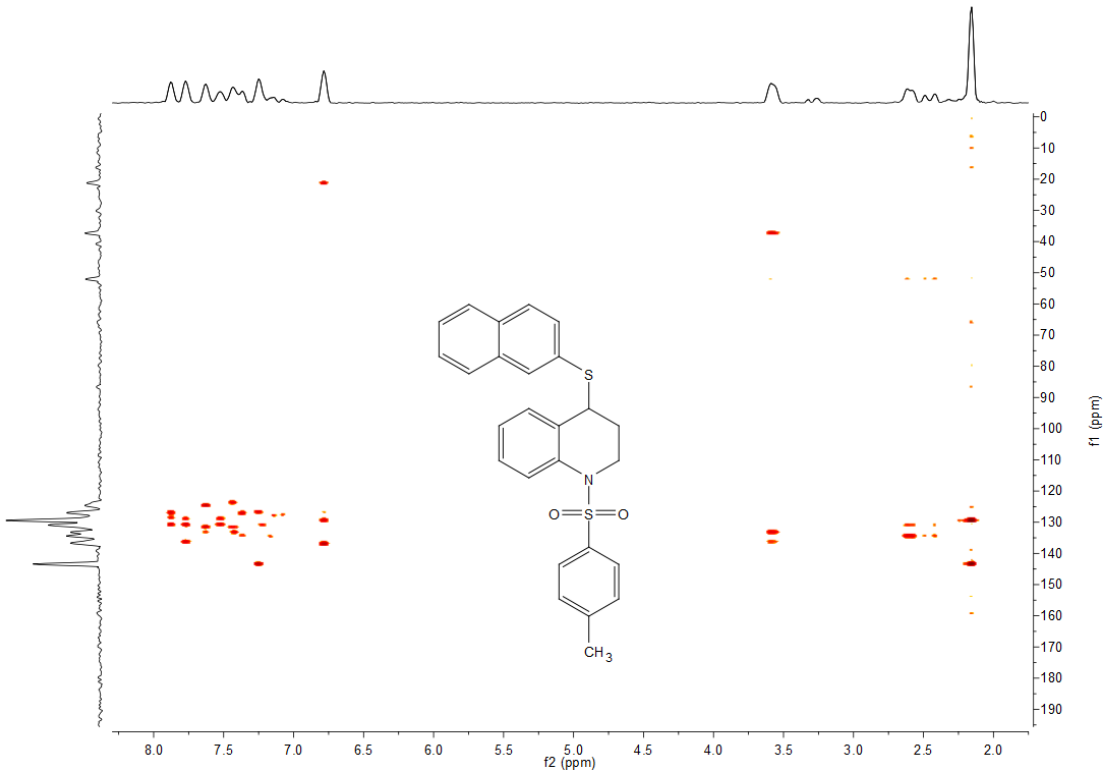


DEPT135 of **11**

4-(naphthalen-2-ylthio)-1-tosyl-1,2,3,4-tetrahydroquinoline (11)

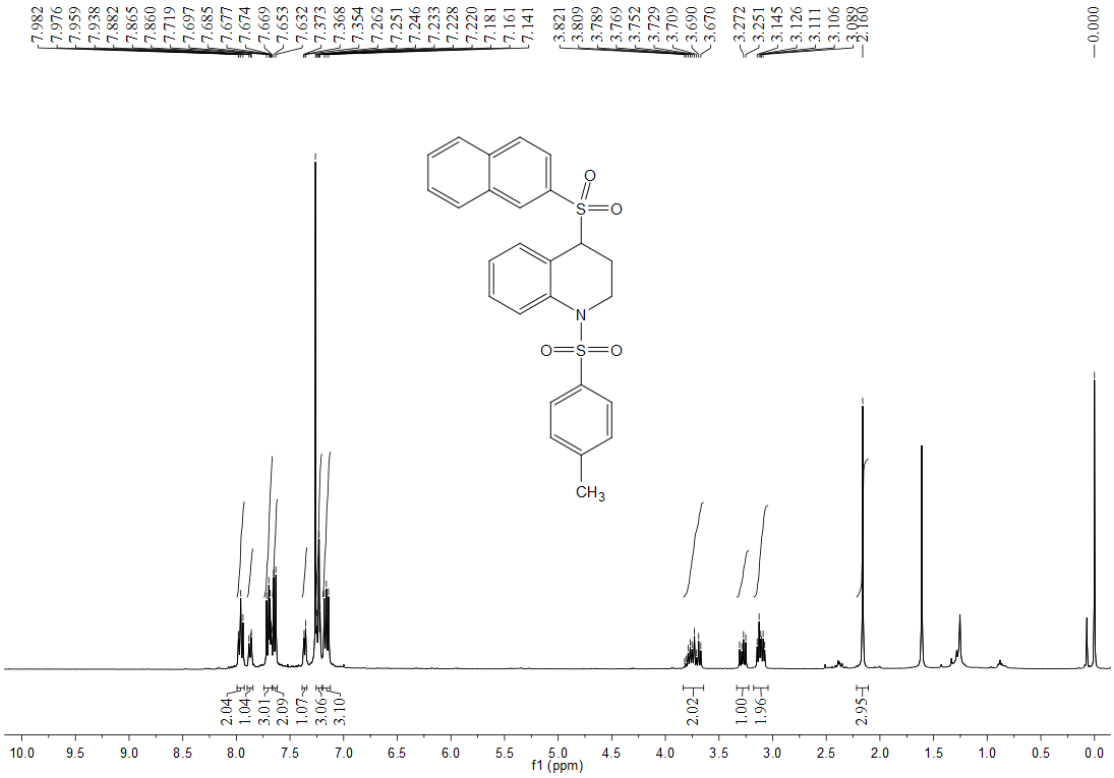


HSQC of **11**

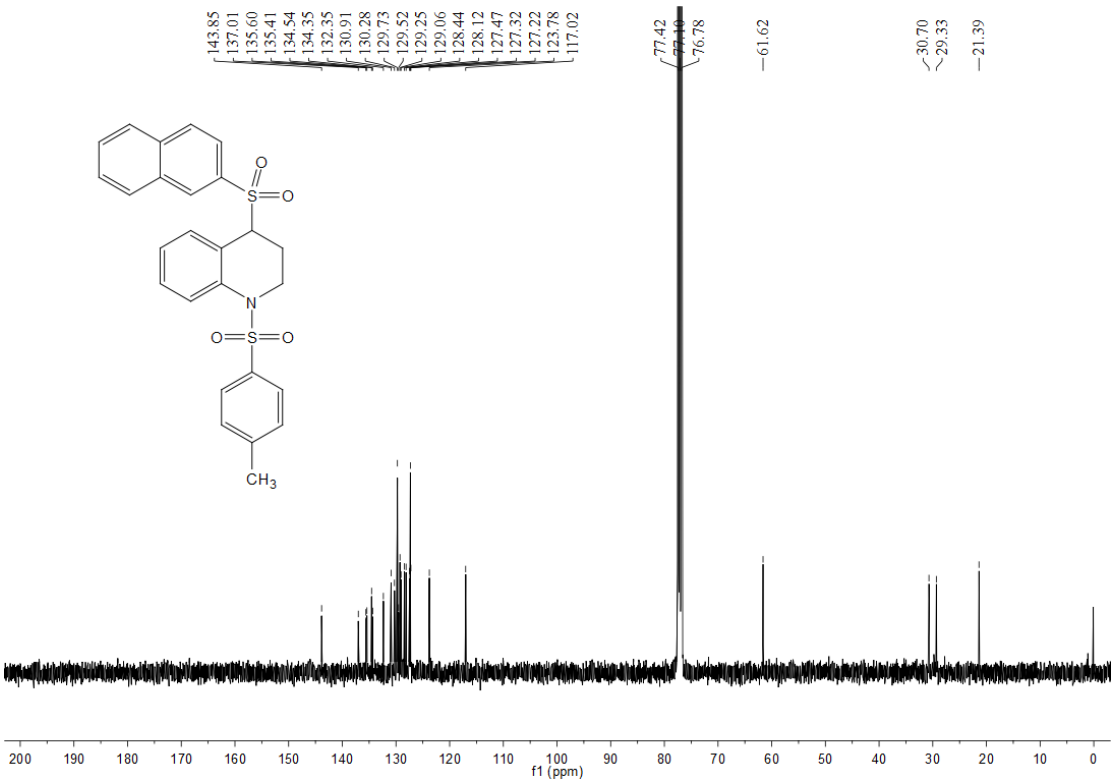


HMBC of **11**

4-(naphthalen-2-ylsulfonyl)-1-tosyl-1,2,3,4-tetrahydroquinoline (12)



^{1}H NMR (400 MHz, $CDCl_3$) of **12**



^{13}C NMR (100 MHz, $CDCl_3$) of **12**