

Supporting Information

Catalyst-free direct C-H selenoxylation of (hetero)arenes

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1. General Information

¹H NMR spectra were recorded on Agilent 400 MHz and Bruker 600 MHz spectrometers. ¹H NMR spectra are reported as follows: chemical shift in ppm (δ) relative to the chemical shift of CDCl₃ at 7.26 ppm, multiplicities (s = singlet, d = doublet, t = triplet, q = quartet, m = multiplet, and br = broadened), and coupling constants (Hz). ¹³C NMR spectra were recorded on Agilent 400 (100 MHz), Bruker Nuclear Ascend 600 (151 MHz) spectrometers with complete proton decoupling, and chemical shift reported in ppm (δ) relative to the central line for CDCl₃ at 77 ppm. Selenium-77 nuclear magnetic resonance spectra (⁷⁷Se NMR) were obtained at 114 MHz on Bruker Nuclear Ascend 600 spectrometer. The chemical shifts are reported in ppm, referenced to diphenyl diselenide as the external reference. High resolution mass spectra were obtained on a Thermo Scientific LTQ Orbitrap XL and Thermo Scientific DS II mass spectrometers. Single crystal data were collected at 100 K on a Rigaku Oxford Diffraction Supernova Dual Source, Cu at Zero equipped with an AtlasS2 CCD using Cu Kα radiation. Flash column chromatography was performed on silica gel (particle size 200–400 mesh ASTM). Analytical thin-layer chromatography (TLC) was carried out using commercial silica gel plates, and spots were detected with UV light (254 nm). Unless otherwise specified, all reagents and solvents were obtained from commercial suppliers and used without further purification. Indole derivatives were synthesized following the reported literatures.^{1,2}

2. General experimental procedure

General Procedure A: Preparation of Seleninic Acids³

A solution of the diaryl diselenide (2.0 mmol, 1.0 equiv) in dichloromethane (10.0 mL, 0.2 M) was prepared in a round-bottomed flask and cooled to 0 °C in an ice bath. With constant stirring, aqueous hydrogen peroxide (30% w/w, 0.6 mL, 3.0 equiv) was then introduced dropwise. The mixture was maintained at 0 °C, during which the initial yellow color dissipated and a white precipitate formed, with stirring continued until the suspension was complete and the starting material was fully consumed as judged by the disappearance of the yellow color. The volatile components were subsequently removed using a rotary evaporator, with explicit caution against using a high-vacuum pump due to the potential for explosion. The resulting solid was thoroughly washed with hexanes and dried under vacuum to afford the benzeneseleninic acid derivative as a white solid, which was used immediately in the subsequent reaction.

General Procedure B: Catalyst-free Direct C-H Selenoxylation of (Hetero)arenes

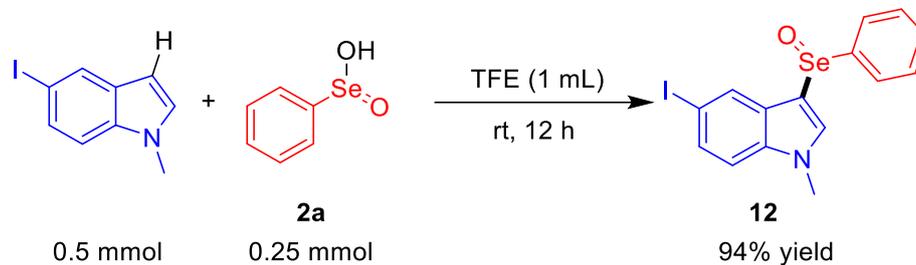
To a 10 ml round bottom flask equipped with a magnetic stir bar was added (hetero)arene (**1**) (0.5 mmol, 2.0 equiv), arylseleninic acid (**2**) (0.25 mmol, 1.0 equiv) and TFE (1.0 mL, 0.25 M). Then stirring under room temperature for 2 hours. The reaction mixture was evaporated under vacuum, and the crude compounds were purified by column chromatography on silica gel.

General Procedure C: Gram-Scale Synthesis of **12**

To a 100 ml round bottom flask equipped with a magnetic stir bar was added as added 5-iodo-1-methyl-1*H*-indole (2.6 g, 10.0 mmol, 2.0 equiv), benzeneseleninic acid (0.95 g, 5.0 mmol, 1.0 equiv) and TFE (20 mL, 0.25 M). Then stirring under room temperature for 2 hours. The reaction mixture was evaporated under vacuum, and the crude compounds were purified by column chromatography using DCM/MeOH (10:1) as eluent to give product **12** in 93% yield (1.99 g, 4.7 mmol), as White solid.

3. X-ray crystallographic data of 12

The compound for X-ray crystallography of **12** is obtained using the template reaction as shown in Scheme S1. The sample for X-ray crystallography is prepared by slowly evaporation of CH₂Cl₂ at room temperature.



Scheme S1. Synthetic route for compound **12**.

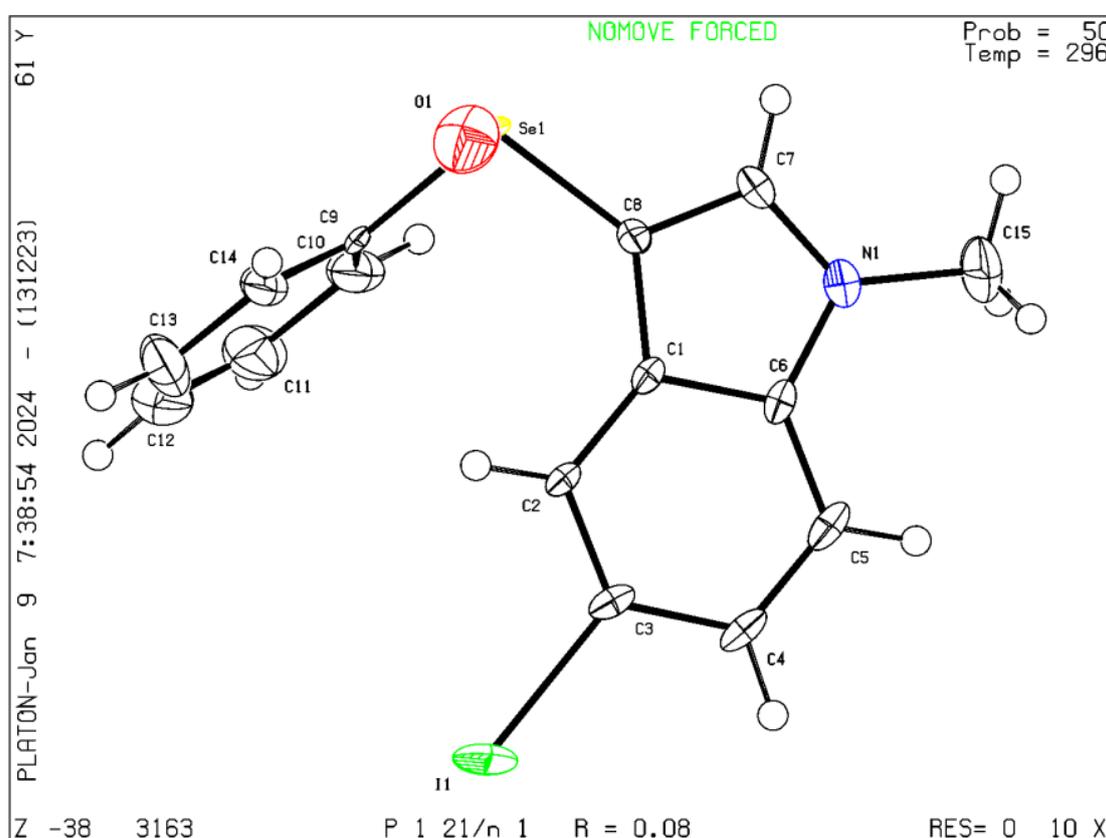


Figure S1. ORTEP diagram of **12** with thermal ellipsoids shown at 50% probability. The structure of **12** was determined by the X-ray diffraction. Recrystallized from dichloromethane and hexane. Further information can be found in the CIF file. This crystal was deposited in the Cambridge Crystallographic Data Centre and assigned as CCDC 2339565.

Table S1 Crystal data and structure refinement for 12 (CCDC: 2339565).

Identification code	12
Empirical formula	C ₁₅ H ₁₂ INOSe
Formula weight	428.12
Temperature/K	295.53(10)

Crystal system	monoclinic
Space group	P2 ₁ /n
a/Å	8.21500(17)
b/Å	18.6047(3)
c/Å	10.31540(18)
α/°	90
β/°	110.984(2)
γ/°	90
Volume/Å ³	1472.02(5)
Z	4
ρ _{calc} /cm ³	1.932
μ/mm ⁻¹	19.846
F(000)	816.0
Crystal size/mm ³	0.14 × 0.12 × 0.1
Radiation	Cu Kα (λ = 1.54184)
2θ range for data collection/°	9.508 to 133.196
Index ranges	-9 ≤ h ≤ 9, -21 ≤ k ≤ 22, -12 ≤ l ≤ 12
Reflections collected	9157
Independent reflections	2600 [R _{int} = 0.0847, R _{sigma} = 0.0658]
Data/restraints/parameters	2600/143/174
Goodness-of-fit on F ²	1.077
Final R indexes [I >= 2σ (I)]	R ₁ = 0.0798, wR ₂ = 0.1987
Final R indexes [all data]	R ₁ = 0.0811, wR ₂ = 0.2014
Largest diff. peak/hole / e Å ⁻³	1.10/-1.07

Crystal structure determination of 12

Crystal Data for C₁₅H₁₂INOSe (*M* = 428.12 g/mol): monoclinic, space group P2₁/n (no. 14), *a* = 8.21500(17) Å, *b* = 18.6047(3) Å, *c* = 10.31540(18) Å, β = 110.984(2)°, *V* = 1472.02(5) Å³, *Z* = 4, *T* = 295.53(10) K, μ(Cu Kα) = 19.846 mm⁻¹, *D*_{calc} = 1.932 g/cm³, 9157 reflections measured (9.508° ≤ 2θ ≤ 133.196°), 2600 unique (*R*_{int} = 0.0847, *R*_{sigma} = 0.0658) which were used in all calculations. The final *R*₁ was 0.0798 (*I* > 2σ(*I*)) and *wR*₂ was 0.2014 (all data).

Table S2 Fractional Atomic Coordinates (×10⁴) and Equivalent Isotropic Displacement Parameters (Å²×10³) for 12. U_{eq} is defined as 1/3 of the trace of the orthogonised U_{ij} tensor.

Atom	<i>x</i>	<i>y</i>	<i>z</i>	U(eq)
I1	2428.8(8)	1668.4(3)	8666.9(5)	50.1(4)
Se1	3596.0(7)	4695.3(3)	5951.6(5)	21.4(4)
O1	5672(6)	4635(3)	7022(6)	44.9(13)
N1	2454(7)	3051(3)	3214(5)	30.7(10)
C1	2792(7)	3101(3)	5493(6)	20.6(10)

Table S2 Fractional Atomic Coordinates ($\times 10^4$) and Equivalent Isotropic Displacement Parameters ($\text{\AA}^2 \times 10^3$) for 12. U_{eq} is defined as 1/3 of the trace of the orthogonalised U_{IJ} tensor.

Atom	x	y	z	U(eq)
C2	2790(7)	2818(3)	6747(6)	23.3(10)
C3	2468(8)	2101(3)	6801(6)	28.8(12)
C4	2156(9)	1628(4)	5667(8)	35.4(14)
C5	2131(9)	1911(4)	4401(7)	33.8(13)
C6	2429(7)	2637(3)	4329(6)	24.0(10)
C7	2809(8)	3736(4)	3631(6)	29.4(12)
C8	3010(7)	3809(3)	5015(5)	23.3(11)
C9	2364(7)	4546(3)	7206(5)	17.1(9)
C10	583(7)	4463(4)	6696(7)	30.6(12)
C11	-283(10)	4360(5)	7651(9)	46.1(16)
C12	688(12)	4341(5)	9056(9)	51.3(17)
C13	2460(13)	4439(5)	9544(8)	52.3(19)
C14	3326(9)	4538(4)	8613(6)	30.6(13)
C15	2239(11)	2759(5)	1847(7)	48.7(19)

Table S3 Anisotropic Displacement Parameters ($\text{\AA}^2 \times 10^3$) for 12. The anisotropic displacement factor exponent takes the form: $-2\pi^2[\text{h}^2\text{a}^2U_{11}+2\text{hka}*\text{b}*\text{U}_{12}+\dots]$.

Atom	U_{11}	U_{22}	U_{33}	U_{23}	U_{13}	U_{12}
I1	95.2(6)	20.4(4)	41.2(5)	14.54(17)	32.1(3)	-3.5(2)
Se1	40.3(5)	5.9(5)	26.8(5)	-0.58(19)	22.7(3)	-4.82(19)
O1	33(2)	47(4)	55(3)	-11(2)	16(2)	-11.5(19)
N1	50(3)	25(2)	22(2)	-4.5(16)	20.6(18)	-2.9(19)
C1	35(2)	10(2)	20.3(19)	-2.2(15)	14.3(17)	2.6(17)
C2	44(3)	8(2)	21(2)	-2.2(17)	15.9(18)	-0.2(18)
C3	51(3)	9(2)	31(2)	-0.6(18)	19(2)	-1.4(19)
C4	62(4)	10(3)	40(3)	-8.1(19)	25(2)	-6(2)
C5	57(3)	14(2)	34(3)	-11.1(19)	20(2)	-5(2)
C6	40(2)	15(2)	22.9(19)	-6.1(16)	17.2(17)	0.9(17)
C7	52(3)	24(3)	23(2)	-0.2(17)	26(2)	-3(2)
C8	43(3)	14(2)	21(2)	2.7(17)	21.5(18)	4.9(19)
C9	34.3(19)	5(2)	20.0(19)	-3.0(16)	19.0(15)	-1.1(16)
C10	33(2)	25(3)	39(3)	7(2)	18.7(18)	0.5(19)
C11	53(3)	40(5)	62(3)	4(3)	41(2)	-2(3)
C12	78(3)	34(4)	59(3)	0(3)	45(2)	-9(3)
C13	83(3)	55(6)	32(3)	-11(3)	36(3)	-23(3)
C14	48(3)	24(3)	21.5(19)	-2.0(19)	14.7(17)	-13(2)
C15	77(4)	47(5)	28(3)	-15(3)	27(3)	-12(4)

Table S4 Bond Lengths for 12.

Atom	Atom	Length/Å	Atom	Atom	Length/Å
I1	C3	2.097(6)	C3	C4	1.413(9)
Se1	O1	1.671(5)	C4	C5	1.401(10)
Se1	C8	1.885(6)	C5	C6	1.379(10)
Se1	C9	1.928(5)	C7	C8	1.383(8)
N1	C6	1.392(8)	C9	C10	1.374(8)
N1	C7	1.343(9)	C9	C14	1.382(8)
N1	C15	1.461(8)	C10	C11	1.419(10)
C1	C2	1.397(8)	C11	C12	1.382(13)
C1	C6	1.421(8)	C12	C13	1.371(13)
C1	C8	1.440(8)	C13	C14	1.398(10)
C2	C3	1.364(9)			

Table S5 Bond Angles for 12.

Atom	Atom	Atom	Angle/°	Atom	Atom	Atom	Angle/°
O1	Se1	C8	107.0(3)	N1	C6	C1	107.5(6)
O1	Se1	C9	101.8(3)	C5	C6	N1	130.0(6)
C8	Se1	C9	96.8(2)	C5	C6	C1	122.5(6)
C6	N1	C15	124.0(6)	N1	C7	C8	110.8(6)
C7	N1	C6	109.0(5)	C1	C8	Se1	131.7(4)
C7	N1	C15	126.9(6)	C7	C8	Se1	121.9(5)
C2	C1	C6	119.0(6)	C7	C8	C1	106.3(5)
C2	C1	C8	134.7(5)	C10	C9	Se1	120.1(4)
C6	C1	C8	106.3(5)	C10	C9	C14	122.1(5)
C3	C2	C1	118.0(6)	C14	C9	Se1	117.8(4)
C2	C3	I1	118.6(5)	C9	C10	C11	118.6(6)
C2	C3	C4	123.8(6)	C12	C11	C10	119.1(7)
C4	C3	I1	117.5(5)	C13	C12	C11	121.3(7)
C5	C4	C3	118.3(6)	C12	C13	C14	120.0(7)
C6	C5	C4	118.3(6)	C9	C14	C13	118.8(6)

Table S6 Torsion Angles for 12.

A	B	C	D	Angle/°	A	B	C	D	Angle/°
I1	C3	C4	C5	178.3(5)	C6	C1	C8	Se1	-177.3(4)
Se1	C9	C10	C11	-179.4(6)	C6	C1	C8	C7	-1.2(6)

Table S6 Torsion Angles for 12.

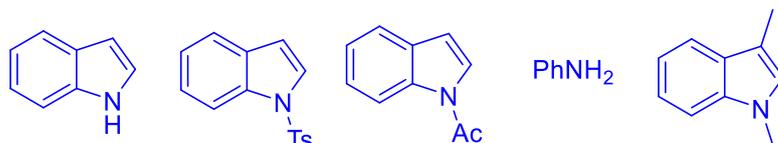
A	B	C	D	Angle/°	A	B	C	D	Angle/°
Se1	C9	C14	C13	179.3(6)	C7	N1	C6	C1	0.0(7)
O1	Se1	C8	C1	68.7(6)	C7	N1	C6	C5	-179.7(7)
O1	Se1	C8	C7	-107.0(5)	C8	C1	C2	C3	177.6(6)
N1	C7	C8	Se1	177.8(4)	C8	C1	C6	N1	0.7(6)
N1	C7	C8	C1	1.2(7)	C8	C1	C6	C5	-179.6(6)
C1	C2	C3	I1	-179.3(4)	C9	Se1	C8	C1	-35.9(6)
C1	C2	C3	C4	0.7(10)	C9	Se1	C8	C7	148.4(5)
C2	C1	C6	N1	178.1(5)	C9	C10	C11	C12	-0.6(12)
C2	C1	C6	C5	-2.2(9)	C10	C9	C14	C13	0.3(11)
C2	C1	C8	Se1	6.0(10)	C10	C11	C12	C13	1.9(14)
C2	C1	C8	C7	-177.9(6)	C11	C12	C13	C14	-2.1(15)
C2	C3	C4	C5	-1.6(11)	C12	C13	C14	C9	0.9(13)
C3	C4	C5	C6	0.6(10)	C14	C9	C10	C11	-0.5(10)
C4	C5	C6	N1	-179.1(6)	C15	N1	C6	C1	176.3(6)
C4	C5	C6	C1	1.3(10)	C15	N1	C6	C5	-3.4(11)
C6	N1	C7	C8	-0.7(7)	C15	N1	C7	C8	-176.9(6)
C6	C1	C2	C3	1.2(8)					

Table S7 Hydrogen Atom Coordinates ($\text{\AA} \times 10^4$) and Isotropic Displacement Parameters ($\text{\AA}^2 \times 10^3$) for 12.

Atom	x	y	z	U(eq)
H2	3001.56	3109.75	7522.66	28
H4	1971.14	1140.14	5758.17	42
H5	1919	1616.58	3629.19	41
H7	2905.85	4110.93	3066.86	35
H10	-40.33	4473.15	5745.43	37
H11	-1488.42	4307.17	7334.82	55
H12	128.96	4259.19	9682.67	62
H13	3085.09	4438.67	10494.73	63
H14	4529.75	4598.52	8934.41	37
H15A	3016.1	2359.68	1952	73
H15B	2500.8	3124.4	1294.69	73
H15C	1057.35	2600.29	1396.93	73

4. Unsuccessful Substrates

Nucleophiles:



Seleninic acid:

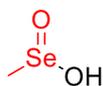
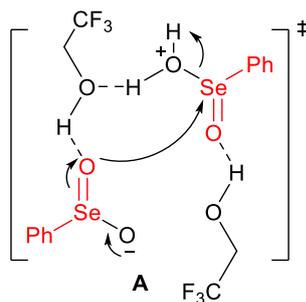
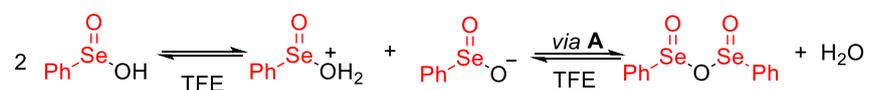


Figure S2. Selected unsuccessful substrates.

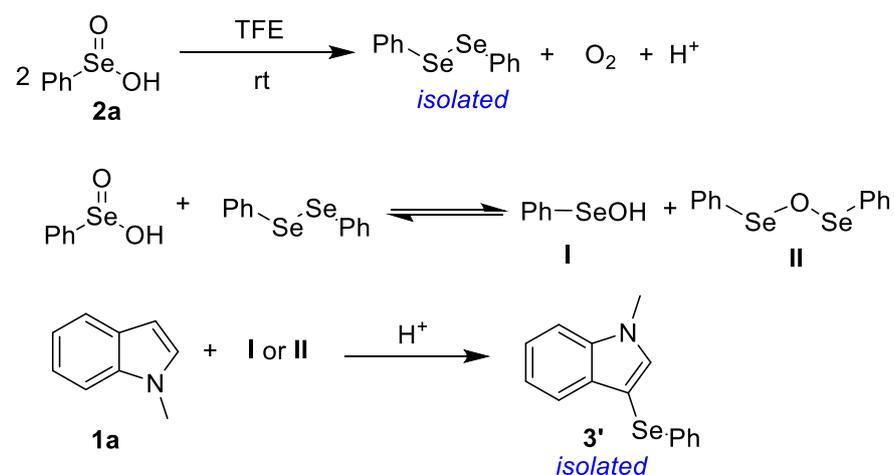
Attempts to extend the reaction to other substrates and reagents met with limited success. The reaction with *N*-H indole resulted in a complex mixture, and the use of *N*-Ac and *N*-Ts indoles was also unsuccessful, affording 1,2-diphenyldiselenane instead (in 35% and 85% yields, respectively). Notably, the C3-substituted indole, 1,3-dimethyl-1*H*-indole, was exclusively converted to the C2-selenylated adduct in 93% yield, with no selenoxygenation observed. Furthermore, employing methylseleninic acid in place of benzeneseleninic acid afforded 1-methyl-3-(methylselanyl)-1*H*-indole (22% yield) instead of the desired product. Finally, the reaction resulted in the concomitant formation of 4-(phenylselanyl)aniline from the aniline nucleophile in 47% yield, instead of the desired product.

5. Proposed role of TFE and pathway to byproduct

a) proposed role of TFE



b) proposed pathway to byproduct



Scheme S2. Proposed mechanism to illustrate the role of TFE and the route to byproduct.

6. NMR of benzeneseleninic acid and reaction mixture

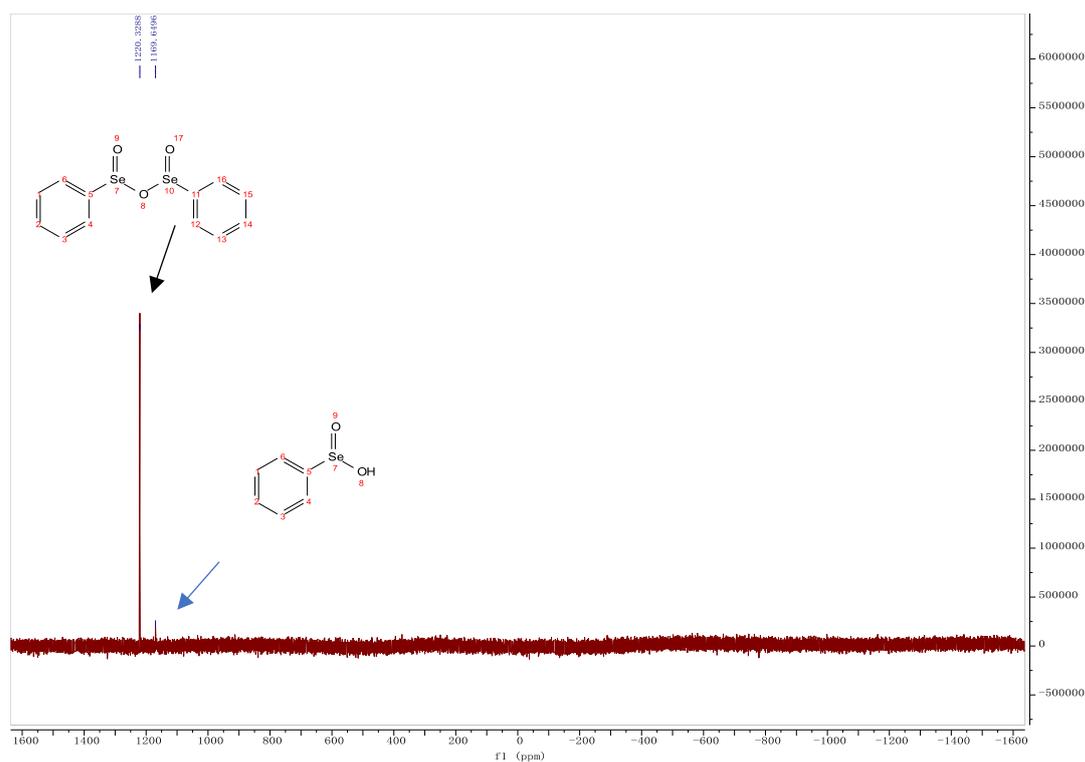


Figure 177. ^{77}Se NMR spectrum of **2a** in CD_3OD after stirring for 2 h. phenylseleninic anhydride: 1220 ppm, phenylseleninic acid: 1169 ppm.

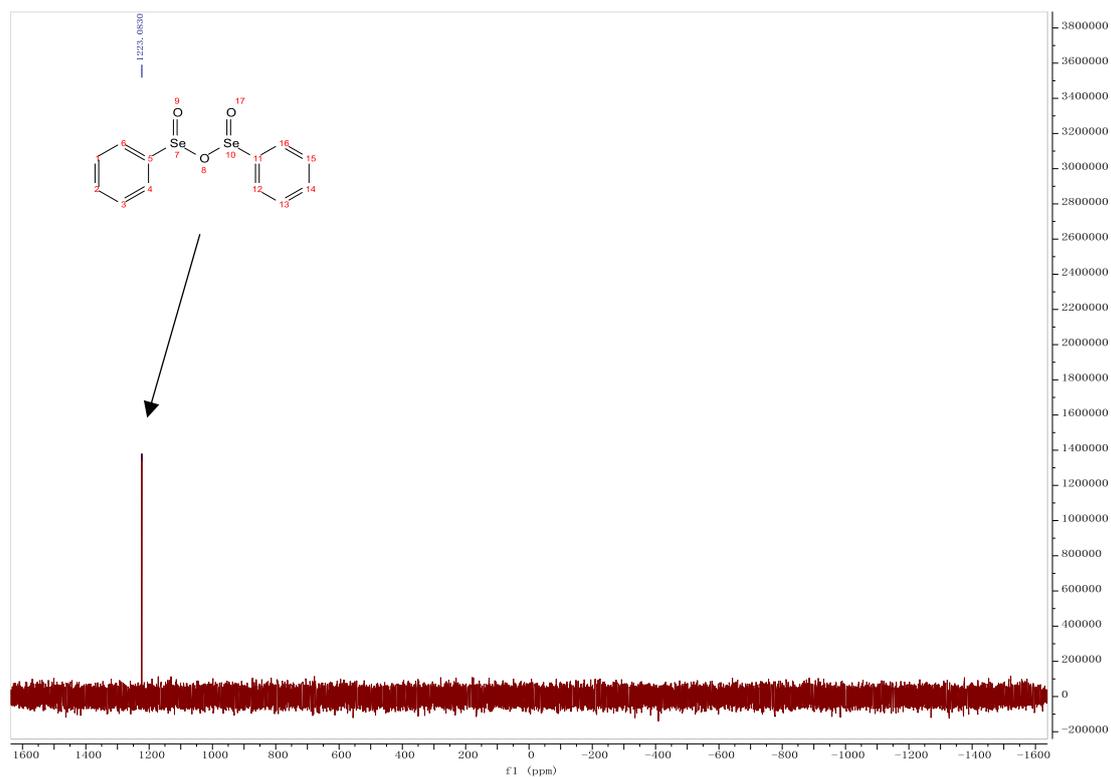


Figure S178. ^{77}Se NMR spectrum of **2a**: stirring in TFE for 2 h, followed by dilution with CD_3OD : phenylseleninic anhydride: 1220 ppm.

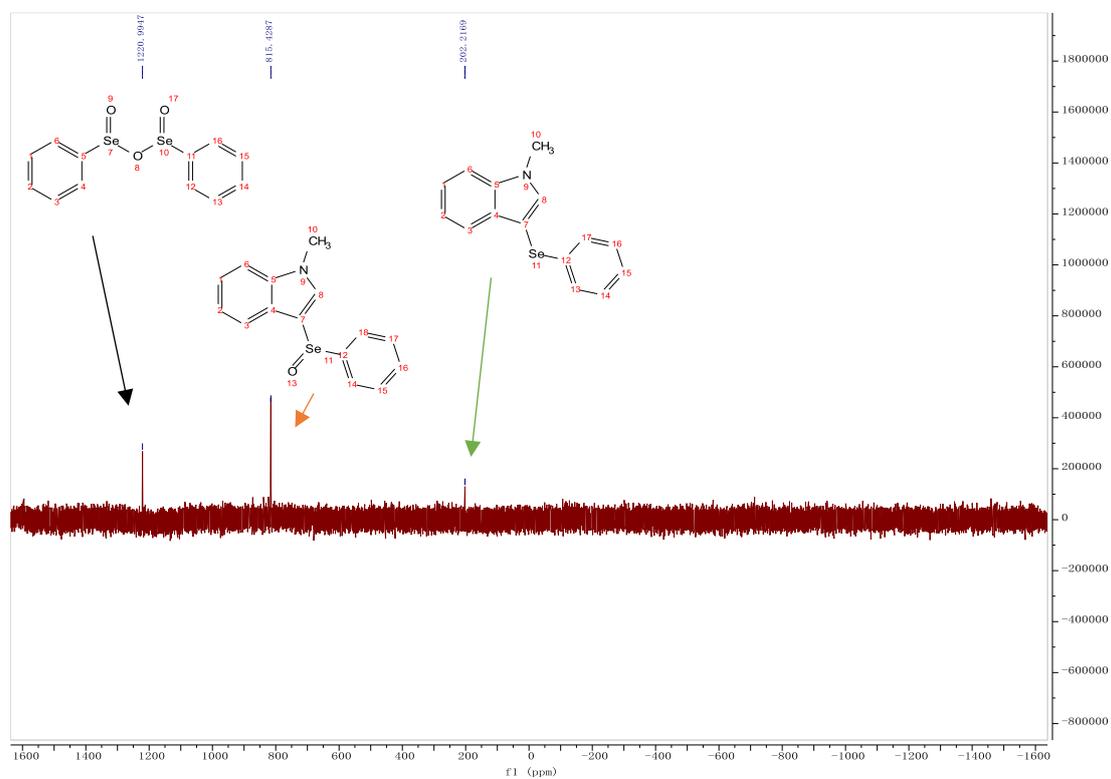


Figure S179. ^{77}Se NMR spectrum of the reaction mixture: **2a** (0.25 mmol) and **1a** (0.125 mmol) stirred in TFE for 2 h, followed by dilution with CD_3OD : phenylseleninic anhydride: 1220 ppm, **3**: 815 ppm, **3'**: 202 ppm.

7. Analytical data of starting substrates and products

4-methylbenzeneseleninic acid (2b)

White solid (284.3 mg, 70% yield). ^1H NMR (600 MHz, CD_3OD) δ 7.73 (d, J = 8.0 Hz, 2H), 7.44 (d, J = 7.9 Hz, 2H), 2.42 (s, 3H). $^{13}\text{C}\{^1\text{H}\}$ NMR (151 MHz, CD_3OD) δ 144.9, 142.7, 131.1, 127.4, 22.8. The data are in accordance with the literature.⁴

2-methylbenzeneseleninic acid (2c)

White solid (215.3 mg, 53% yield). ^1H NMR (600 MHz, CD_3OD) δ 7.96 (d, J = 7.7 Hz, 1H), 7.52 (t, J = 8.2 Hz, 1H), 7.47 (t, J = 7.5 Hz, 1H), 7.37 (d, J = 7.5 Hz, 1H), 2.56 (s, 3H). $^{13}\text{C}\{^1\text{H}\}$ NMR (151 MHz, CD_3OD) δ 143.7, 139.1, 133.8, 132.3, 127.4, 125.9, 18.91. HRMS (ESI) calcd for $\text{C}_7\text{H}_9\text{O}_2\text{Se}^+$ m/z $[\text{M} + \text{H}]^+$: 204.9764; found: 204.9768.

4-ethylbenzeneseleninic acid (2d)

White solid (277.9 mg, 64% yield). ^1H NMR (600 MHz, CD_3OD) δ 7.76 (d, J = 8.0 Hz, 2H), 7.48 (d, J = 8.0 Hz, 2H), 2.74 (q, J = 7.6 Hz, 2H), 1.26 (t, J = 7.7 Hz, 3H). $^{13}\text{C}\{^1\text{H}\}$ NMR (151 MHz, CD_3OD) δ 151.1, 143.0, 123.0, 127.6, 29.8, 15.8. HRMS (ESI) calcd for $\text{C}_8\text{H}_{11}\text{O}_2\text{Se}^+$ m/z $[\text{M} + \text{H}]^+$: 218.9924; found: 218.9927.

4-methoxybenzeneseleninic acid (2e)

White solid (315.5 mg, 72% yield). ^1H NMR (600 MHz, CD_3OD) δ 7.79 (d, J = 8.6 Hz, 2H), 7.16 (d, J = 8.6 Hz, 2H), 3.88 (s, 3H). $^{13}\text{C}\{^1\text{H}\}$ NMR (151 MHz, CD_3OD) δ 164.9, 136.7, 129.4, 115.9, 56.2. The data are in accordance with the literature.⁴

3,4,5-trimethoxybenzeneseleninic acid (2f)

White solid (318.2 mg, 57% yield). ^1H NMR (600 MHz, CD_3OD) δ 7.18 (s, 2H), 3.91 (s, 6H), 3.81 (s, 3H). $^{13}\text{C}\{^1\text{H}\}$ NMR (151 MHz, CD_3OD) δ 155.3, 142.7, 140.4, 104.6, 61.2, 56.9. HRMS (ESI) calcd for $\text{C}_9\text{H}_{13}\text{O}_5\text{Se}^+$ m/z $[\text{M} + \text{H}]^+$: 280.9930; found: 280.9928.

4-fluorobenzeneseleninic acid (2g)

White solid (194.6 mg, 47% yield). ^1H NMR (600 MHz, CD_3OD) δ 7.94 (t, J = 6.9 Hz, 2H), 7.40 (t, J = 8.7 Hz, 2H). $^{13}\text{C}\{^1\text{H}\}$ NMR (151 MHz, CD_3OD) δ 166.7 (d, J = 251.8 Hz), 141.7, 130.2 (d, J = 9.1 Hz), 117.5 (d, J = 22.8 Hz). ^{19}F NMR (565 MHz, CDCl_3) δ -104.3. HRMS (ESI) calcd for $\text{C}_6\text{H}_6\text{O}_2\text{SeF}^+$ m/z $[\text{M} + \text{H}]^+$: 208.9517; found: 208.9521.

4-chlorobenzeneseleninic acid (2h)

White solid (330.8 mg, 74% yield). ^1H NMR (600 MHz, CD_3OD) δ 7.85 (d, J = 8.2 Hz, 2H), 7.64 (d, J = 8.2 Hz, 2H). $^{13}\text{C}\{^1\text{H}\}$ NMR (151 MHz, CD_3OD) δ 144.7, 139.9, 130.6, 129.2. HRMS (ESI) calcd for $\text{C}_6\text{H}_6\text{O}_2\text{ClSe}^+$ m/z $[\text{M} + \text{H}]^+$: 224.9222; found: 224.9224.

4-bromobenzeneseleninic acid (2i)

White solid (380.5 mg, 71% yield). ^1H NMR (600 MHz, CD_3OD) δ 7.81 (d, J = 8.6 Hz, 2H), 7.77 (d, J = 8.6 Hz, 2H). $^{13}\text{C}\{^1\text{H}\}$ NMR (151 MHz, CD_3OD) δ 145.3, 133.6, 129.3, 128.3. HRMS (ESI) calcd for $\text{C}_6\text{H}_6\text{O}_2\text{SeBr}^+$ m/z $[\text{M} + \text{H}]^+$: 268.8716; found: 268.8719.

2-bromobenzeneseleninic acid (2j)

White solid (332.3 mg, 62% yield). ^1H NMR (600 MHz, CD_3OD) δ 7.96 (d, J = 7.8 Hz, 1H), 7.71 (d, J = 7.9 Hz, 1H), 7.65 (t, J = 7.5 Hz, 1H), 7.54 (t, J = 6.9 Hz, 1H). $^{13}\text{C}\{^1\text{H}\}$ NMR (151 MHz, CD_3OD) δ 145.4, 135.4, 134.4, 129.0, 128.5, 123.4. HRMS (ESI) calcd for $\text{C}_6\text{H}_6\text{O}_2\text{SeBr}^+$ m/z $[\text{M} +$

H]⁺: 268.8716; found: 268.8718.

1-methyl-3-(phenylselanyl)-1H-indole (3')

¹H NMR (600 MHz, CDCl₃) δ 7.63 (d, *J* = 7.5 Hz, 1H), 7.34 (d, *J* = 8.7 Hz, 1H), 7.29 – 7.25 (m, 2H), 7.24 – 7.20 (m, 2H), 7.17 (d, *J* = 8.0 Hz, 1H), 7.12 – 7.04 (m, 3H), 3.77 (s, 3H). ¹³C{¹H} NMR (151 MHz, CDCl₃) δ 137.6, 135.7, 134.3, 130.8, 129.0, 128.7, 125.6, 122.5, 120.6, 120.5, 109.6, 96.1, 33.1. The data are in accordance with the literature.⁵

1-methyl-3-(phenylseleninyl)-1H-indole (3)

Purified by flash column chromatography (silica gel), [DCM /MeOH = 10:1 (v/v)] to give **3** as a white solid (69.5 mg, 92%); ¹H NMR (400 MHz, CDCl₃) δ 7.75 – 7.63 (m, 2H), 7.45 – 7.32 (m, 4H), 7.30 (s, 1H), 7.20 (d, *J* = 8.3 Hz, 1H), 7.14 (t, *J* = 7.7 Hz, 1H), 7.00 (t, *J* = 7.6 Hz, 1H), 3.61 (s, 3H). ¹³C{¹H} NMR (100 MHz, CDCl₃) δ 141.0, 137.5, 132.3, 130.8, 129.4, 126.6, 125.8, 123.1, 121.2, 119.4, 112.5, 110.1, 33.3. ⁷⁷Se NMR (114 MHz, CDCl₃) δ 823.6. HRMS (ESI) calcd for C₁₅H₁₄NOSe⁺ *m/z* [M + H]⁺: 304.0241; found: 304.0244.

1,4-dimethyl-3-(phenylseleninyl)-1H-indole (4)

Purified by flash column chromatography (silica gel), [DCM /MeOH = 10:1 (v/v)] to give **4** as a white solid (69.6 mg, 88%); ¹H NMR (400 MHz, CDCl₃) δ 7.75 – 7.70 (m, 2H), 7.46 – 7.42 (m, 3H), 7.29 (s, 1H), 7.16 (d, *J* = 4.1 Hz, 2H), 6.97 – 6.92 (m, 1H), 3.71 (s, 3H), 2.62 (s, 3H). ¹³C{¹H} NMR (100 MHz, CDCl₃) δ 142.9, 137.7, 132.0, 131.0, 129.9, 129.5, 127.0, 125.9, 123.2, 122.4, 113.9, 108.0, 33.5, 21.4. ⁷⁷Se NMR (114 MHz, CDCl₃) δ 847.3. HRMS (ESI) calcd for C₁₆H₁₆NOSe⁺ *m/z* [M + H]⁺: 318.0397; found: 318.0405.

4-fluoro-1-methyl-3-(phenylseleninyl)-1H-indole (5)

Purified by flash column chromatography (silica gel), [DCM /MeOH = 10:1 (v/v)] to give **5** as a white solid (69.7 mg, 87%); ¹H NMR (600 MHz, CDCl₃) δ 7.79 (dd, *J* = 7.8, 1.8 Hz, 2H), 7.45 – 7.38 (m, 3H), 7.36 (s, 1H), 7.18 – 7.11 (m, 1H), 7.07 (d, *J* = 8.3 Hz, 1H), 6.85 – 6.79 (m, 1H), 3.72 (s, 3H). ¹³C{¹H} NMR (150 MHz, CDCl₃) δ 155.7 (d, *J* = 247.3 Hz), 143.2, 140.2 (d, *J* = 11.4 Hz), 131.0, 130.9, 129.4, 126.3, 123.5 (d, *J* = 7.5 Hz), 115.1 (d, *J* = 22.0 Hz), 111.8, 106.5 (d, *J* = 3.5 Hz), 106.1 (d, *J* = 18.2 Hz). 33.8. ¹⁹F NMR (565 MHz, CDCl₃) δ -118.6. ⁷⁷Se NMR (114 MHz, CDCl₃) δ 834.2. HRMS (ESI) calcd for C₁₅H₁₃NOFSe⁺ *m/z* [M + H]⁺: 322.0146; found: 322.0149.

4-bromo-1-methyl-3-(phenylseleninyl)-1H-indole (6)

Purified by flash column chromatography (silica gel), [DCM /MeOH = 10:1 (v/v)] to give **6** as a white solid (77.2 mg, 81%); ¹H NMR (400 MHz, CDCl₃) δ 7.76 (dd, *J* = 6.8, 3.4 Hz, 2H), 7.60 (s, 1H), 7.37 (t, *J* = 2.8 Hz, 3H), 7.30 – 7.22 (m, 2H), 7.07 (t, *J* = 8.0 Hz, 1H), 3.72 (s, 3H). ¹³C{¹H} NMR (100 MHz, CDCl₃) δ 144.3, 138.6, 132.4, 130.9, 129.4, 127.0, 126.3, 124.3, 123.7, 114.2, 113.0, 109.6, 33.8. ⁷⁷Se NMR (114 MHz, CDCl₃) δ 830.4. HRMS (ESI) calcd for C₁₅H₁₂BrNOSe⁺ *m/z* [M + H]⁺: 381.9346; found: 381.9349.

1,5-dimethyl-3-(phenylseleninyl)-1H-indole (7)

Purified by flash column chromatography (silica gel), [DCM /MeOH = 10:1 (v/v)] to give **7** as a white solid (70.4 mg, 89%); ¹H NMR (400 MHz, CDCl₃) δ 7.78 (dd, *J* = 5.7, 3.6 Hz, 2H), 7.50 – 7.42 (m, 3H), 7.32 – 7.23 (m, 2H), 7.19 (d, *J* = 8.4 Hz, 1H), 7.09 – 7.02 (m, 1H), 3.72 (s, 3H), 2.32 (s, 3H). ¹³C{¹H} NMR (100 MHz, CDCl₃) δ 141.2, 135.9, 132.1, 130.8, 130.8, 129.4, 126.7, 126.2,

125.8, 124.8, 119.0, 109.8, 33.4, 21.3. ^{77}Se NMR (114 MHz, CDCl_3) δ 830.8. HRMS (ESI) calcd for $\text{C}_{16}\text{H}_{16}\text{NOSe}^+$ m/z $[\text{M} + \text{H}]^+$: 318.0397; found: 318.0393.

5-methoxy-1-methyl-3-(phenylseleninyl)-1H-indole (8)

Purified by flash column chromatography (silica gel), [DCM /MeOH = 10:1 (v/v)] to give **8** as a white solid (66.5 mg, 80%); ^1H NMR (400 MHz, CDCl_3) δ 7.79 (d, J = 8.0 Hz, 2H), 7.48 – 7.42 (m, 3H), 7.29 (s, 1H), 7.15 (d, J = 9.0 Hz, 1H), 6.83 (d, J = 10.6 Hz, 1H), 6.78 (s, 1H), 3.68 (s, 3H), 3.61 (s, 3H). $^{13}\text{C}\{^1\text{H}\}$ NMR (100 MHz, CDCl_3) δ 155.1, 140.7, 132.6, 132.6, 130.8, 129.3, 126.7, 126.5, 113.8, 112.0, 110.9, 100.6, 55.5, 33.5. ^{77}Se NMR (114 MHz, CDCl_3) δ 823.2. HRMS (ESI) calcd for $\text{C}_{16}\text{H}_{16}\text{NO}_2\text{Se}^+$ m/z $[\text{M} + \text{H}]^+$: 334.0346; found: 334.0343.

5-fluoro-1-methyl-3-(phenylseleninyl)-1H-indole (9)

Purified by flash column chromatography (silica gel), [DCM /MeOH = 10:1 (v/v)] to give **9** as a white solid (68.9 mg, 86%); ^1H NMR (400 MHz, CDCl_3) δ 7.75 – 7.71 (m, 2H), 7.49 – 7.35 (m, 4H), 7.18 – 7.13 (m, 1H), 7.05 (d, J = 8.8 Hz, 1H), 6.92 – 6.88 (m, 1H), 3.68 (s, 3H). $^{13}\text{C}\{^1\text{H}\}$ NMR (100 MHz, CDCl_3) δ 158.4 (d, J = 237.7 Hz), 140.8, 134.2, 133.6, 131.0, 129.4, 126.5, 126.2 (d, J = 10.8 Hz), 112.5 (d, J = 5.5 Hz), 111.7 (d, J = 26.5 Hz), 111.1 (d, J = 9.9 Hz), 104.8 (d, J = 25.1 Hz), 33.6. ^{19}F NMR (376 MHz, CDCl_3) δ -121.6. ^{77}Se NMR (114 MHz, CDCl_3) δ 838.0. HRMS (ESI) calcd for $\text{C}_{15}\text{H}_{13}\text{NOSeF}^+$ m/z $[\text{M} + \text{H}]^+$: 322.0146; found: 322.0153.

6-chloro-1-methyl-3-(phenylseleninyl)-1H-indole (10)

Purified by flash column chromatography (silica gel), [DCM /MeOH = 10:1 (v/v)] to give **10** as a white solid (75.8 mg, 90%); ^1H NMR (400 MHz, CDCl_3) δ 7.47 (d, J = 5.0 Hz, 2H), 7.20 – 7.13 (m, 4H), 7.08 (s, 1H), 6.87 (q, J = 8.8 Hz, 2H), 3.42 (s, 3H). $^{13}\text{C}\{^1\text{H}\}$ NMR (100 MHz, CDCl_3) δ 140.8, 136.0, 133.2, 131.1, 129.5, 127.1, 126.8, 126.5, 123.6, 118.9, 112.4, 111.2, 33.5. ^{77}Se NMR (114 MHz, CDCl_3) δ 812.2. HRMS (ESI) calcd for $\text{C}_{15}\text{H}_{13}\text{NOClSe}^+$ m/z $[\text{M} + \text{H}]^+$: 337.9851; found: 337.9857.

5-bromo-1-methyl-3-(phenylseleninyl)-1H-indole (11)

Purified by flash column chromatography (silica gel), [DCM /MeOH = 10:1 (v/v)] to give **11** as a white solid (83.9 mg, 88%); ^1H NMR (400 MHz, CDCl_3) δ 7.74 (d, J = 9.3 Hz, 2H), 7.58 (s, 1H), 7.45 (d, J = 5.4 Hz, 3H), 7.33 (s, 1H), 7.25 (d, J = 9.0 Hz, 1H), 7.12 (d, J = 8.8 Hz, 1H), 3.70 (s, 3H). $^{13}\text{C}\{^1\text{H}\}$ NMR (100 MHz, CDCl_3) δ 140.7, 136.2, 133.1, 131.1, 129.5, 127.4, 126.5, 126.2, 122.0, 114.7, 112.3, 111.7, 33.5. ^{77}Se NMR (114 MHz, CDCl_3) δ 825.6. HRMS (ESI) calcd for $\text{C}_{15}\text{H}_{13}\text{NOSeBr}^+$ m/z $[\text{M} + \text{H}]^+$: 381.9346; found: 381.9341.

6-iodo-1-methyl-3-(phenylseleninyl)-1H-indole (12)

Purified by flash column chromatography (silica gel), [DCM /MeOH = 10:1 (v/v)] to give **12** as a white solid (100.6 mg, 94%); ^1H NMR (400 MHz, CDCl_3) δ 7.54 (s, 1H), 7.52 – 7.47 (m, 2H), 7.23 – 7.16 (m, 3H), 7.03 (s, 1H), 6.99 (s, 1H), 6.79 (d, J = 8.7 Hz, 1H), 3.46 (s, 3H). $^{13}\text{C}\{^1\text{H}\}$ NMR (100 MHz, CDCl_3) δ 140.9, 136.2, 132.7, 131.7, 131.2, 129.6, 128.3, 126.6, 112.1, 83.9, 33.6. ^{77}Se NMR (114 MHz, CDCl_3) δ 824.1. HRMS (ESI) calcd for $\text{C}_{15}\text{H}_{12}\text{NOSeINa}^+$ m/z $[\text{M} + \text{Na}]^+$: 451.9026; found: 451.9031.

1-methyl-5-nitro-3-(phenylseleninyl)-1H-indole (13)

Purified by flash column chromatography (silica gel), [DCM /MeOH = 10:1 (v/v)] to give **13** as a white solid (39.1 mg, 45%); ¹H NMR (400 MHz, CDCl₃) δ 8.30 (s, 1H), 7.96 (d, *J* = 8.9 Hz, 1H), 7.80 – 7.76 (m, 2H), 7.68 (s, 1H), 7.56 (d, *J* = 8.9 Hz, 1H), 7.53 – 7.48 (m, 3H), 3.91 (s, 3H). ¹³C{¹H} NMR (100 MHz, CDCl₃) δ 143.4, 140.9, 137.0, 136.5, 131.5, 130.6, 129.8, 126.6, 119.9, 117.9, 113.7, 107.2, 34.0. ⁷⁷Se NMR (114 MHz, CDCl₃) δ 818.3. HRMS (ESI) calcd for C₁₅H₁₂N₂NaO₃Se⁺ *m/z* [M + Na]⁺: 370.9906; found: 370.9901.

1,2-dimethyl-3-(phenylseleninyl)-1H-indole (14)

Purified by flash column chromatography (silica gel), [DCM /MeOH = 10:1 (v/v)] to give **14** as a white solid (68.8 mg, 87%); ¹H NMR (400 MHz, CDCl₃) δ 7.77 – 7.71 (m, 2H), 7.43 (d, *J* = 6.8 Hz, 3H), 7.31 (d, *J* = 8.0 Hz, 1H), 7.24 (d, *J* = 8.5 Hz, 1H), 7.14 (t, *J* = 7.7 Hz, 1H), 6.97 (t, *J* = 7.5 Hz, 1H), 3.63 (d, *J* = 2.2 Hz, 3H), 2.58 (d, *J* = 2.3 Hz, 3H). ⁷⁷Se NMR (114 MHz, CDCl₃) δ 820.8. ¹³C{¹H} NMR (100 MHz, CDCl₃) δ 141.7, 140.9, 137.2, 130.4, 129.3, 126.7, 125.7, 122.3, 121.2, 119.0, 109.4, 29.8, 11.6. HRMS (ESI) calcd for C₁₆H₁₆NOSe⁺ *m/z* [M + H]⁺: 318.0397; found: 318.0400.

5-methoxy-1,2-dimethyl-3-(phenylseleninyl)-1H-indole (15)

Purified by flash column chromatography (silica gel), [DCM /MeOH = 10:1 (v/v)] to give **15** as a white solid (77.1 mg, 89%); ¹H NMR (600 MHz, CDCl₃) δ 7.73 (d, *J* = 7.5 Hz, 2H), 7.42 – 7.31 (m, 3H), 7.04 (d, *J* = 8.9 Hz, 2H), 6.69 (d, *J* = 11.3 Hz, 1H), 6.60 (s, 1H), 3.50 (s, 3H), 3.49 (s, 3H), 2.50 (s, 3H). ¹³C{¹H} NMR (150 MHz, CDCl₃) δ 154.8, 141.7, 140.7, 132.1, 130.3, 129.1, 126.7, 126.1, 112.3, 110.1, 108.9, 100.6, 55.3, 29.7, 11.5. ⁷⁷Se NMR (114 MHz, CDCl₃) δ 818.5. HRMS (ESI) calcd for C₁₇H₁₈NO₂Se⁺ *m/z* [M + H]⁺: 348.0503; found: 348.0508.

6-fluoro-1-methyl-3-(phenylseleninyl)-1H-indole (16)

Purified by flash column chromatography (silica gel), [DCM /MeOH = 10:1 (v/v)] to give **16** as a white solid (66.4 mg, 83%); ¹H NMR (400 MHz, CDCl₃) δ 7.77 (d, *J* = 5.2 Hz, 2H), 7.49 – 7.44 (m, 3H), 7.36 (d, *J* = 12.8 Hz, 2H), 6.97 (d, *J* = 9.3 Hz, 1H), 6.82 (t, *J* = 9.1 Hz, 1H), 3.71 (s, 3H). ¹³C{¹H} NMR (100 MHz, CDCl₃) δ 160.2 (d, *J* = 241.0 Hz), 137.9 (d, *J* = 11.9 Hz), 132.7 (d, *J* = 3.2 Hz), 131.0, 129.4, 126.6, 122.2, 120.6 (d, *J* = 10.1 Hz), 113.1, 110.2 (d, *J* = 24.8 Hz), 96.7 (d, *J* = 26.4 Hz), 33.5. ¹⁹F NMR (376 MHz, CDCl₃) δ -117.9. ⁷⁷Se NMR (114 MHz, CDCl₃) δ 825.4. HRMS (ESI) calcd for C₁₅H₁₃NOSeF⁺ *m/z* [M + H]⁺: 322.0146; found: 322.0143.

1-methyl-3-(phenylseleninyl)-1H-indole-6-carbaldehyde (17)

Purified by flash column chromatography (silica gel), [DCM /MeOH = 10:1 (v/v)] to give **17** as a white solid (66.1 mg, 80%); ¹H NMR (400 MHz, CDCl₃) δ 9.99 (s, 1H), 7.85 (s, 1H), 7.80 – 7.74 (m, 2H), 7.60 (s, 1H), 7.58 (s, 2H), 7.53 – 7.43 (m, 3H), 3.84 (s, 3H). ¹³C{¹H} NMR (100 MHz, CDCl₃) δ 191.9, 140.7, 137.3, 135.8, 131.7, 131.2, 130.8, 129.6, 126.5, 122.6, 119.9, 113.8, 112.4, 33.7. ⁷⁷Se NMR (114 MHz, CDCl₃) δ 822.7. HRMS (ESI) calcd for C₁₆H₁₃NO₂NaSe⁺ *m/z* [M + H]⁺: 354.0009; found: 354.0016.

methyl 1-methyl-3-(phenylseleninyl)-1H-indole-6-carboxylate (18)

Purified by flash column chromatography (silica gel), [DCM /MeOH = 10:1 (v/v)] to give **18** as a white solid (63.9 mg, 71%); ¹H NMR (400 MHz, CDCl₃) δ 8.02 (s, 1H), 7.77 – 7.69 (m, 3H), 7.51 – 7.40 (m, 5H), 3.85 (s, 3H), 3.77 (s, 3H); ¹³C{¹H} NMR (100 MHz, CDCl₃) δ 167.3, 140.9, 137.0, 134.8, 131.0, 129.5, 129.4, 126.5, 124.8, 122.1, 119.1, 113.5, 112.5, 52.1, 33.6. ⁷⁷Se NMR (114 MHz, CDCl₃) δ 824.3. HRMS (ESI) calcd for C₁₇H₁₆NO₃Se⁺ m/z [M + H]⁺: 362.0295; found: 362.0291.

1-methyl-3-(phenylseleninyl)-1H-indole-6-carbonitrile (19)

Purified by flash column chromatography (silica gel), [DCM /MeOH = 10:1 (v/v)] to give **19** as a white solid (50.7 mg, 62%); ¹H NMR (400 MHz, CDCl₃) δ 7.49 – 7.40 (m, 2H), 7.33 (s, 1H), 7.29 (s, 1H), 7.23 (d, *J* = 8.3 Hz, 1H), 7.19 – 7.11 (m, 3H), 7.00 – 6.91 (m, 1H), 3.50 (s, 3H). ¹³C{¹H} NMR (100 MHz, CDCl₃) δ 140.6, 136.6, 135.4, 131.2, 129.6, 128.9, 126.4, 123.9, 120.5, 119.7, 115.1, 114.0, 105.8, 33.7. ⁷⁷Se NMR (114 MHz, CDCl₃) δ 824.8. HRMS (ESI) calcd for C₁₆H₁₃N₂OSe⁺ m/z [M + H]⁺: 329.0193; found: 329.0185.

1-methyl-6-nitro-3-(phenylseleninyl)-1H-indole (20)

Purified by flash column chromatography (silica gel), [DCM /MeOH = 10:1 (v/v)] to give **20** as a white solid (43.4 mg, 50%); ¹H NMR (400 MHz, CDCl₃) δ 8.30 (s, 1H), 7.97 (d, *J* = 6.8 Hz, 1H), 7.78 (m, 2H), 7.68 (s, 1H), 7.56 (d, *J* = 8.9 Hz, 1H), 7.53 – 7.48 (m, 3H), 3.91 (s, 3H). ¹³C{¹H} NMR (100 MHz, CDCl₃) δ 144.0, 140.6, 137.0, 136.5, 131.5, 130.6, 129.8, 126.6, 119.9, 116.7, 114.4, 107.2, 34.0. ⁷⁷Se NMR (114 MHz, CDCl₃) δ 826.2. HRMS (ESI) calcd for C₁₅H₁₂N₂O₃NaSe⁺ m/z [M + H]⁺: 370.9911; found: 370.9915.

1-methyl-3-(phenylseleninyl)-6-(trifluoromethyl)-1H-indole (21)

Purified by flash column chromatography (silica gel), [DCM /MeOH = 10:1 (v/v)] to give **21** as a white solid (59.2 mg, 64%); ¹H NMR (400 MHz, CDCl₃) δ 7.52 – 7.46 (m, 2H), 7.33 – 7.23 (m, 3H), 7.20 – 7.15 (m, 3H), 7.01 (d, *J* = 8.5 Hz, 1H), 3.51 (s, 3H). ¹³C{¹H} NMR (101 MHz, CDCl₃) δ 140.8, 136.6, 134.5, 131.2, 129.6, 128.2, 126.5, 125.3 (q, *J* = 31.9 Hz), 123.6 (q, *J* = 271.5 Hz), 120.1, 117.9 (d, *J* = 3.5 Hz), 113.5, 107.8 (q, *J* = 4.4 Hz), 34.0. ¹⁹F NMR (376 MHz, CDCl₃) δ -60.2. ⁷⁷Se NMR (114 MHz, CDCl₃) δ 825.4. HRMS (ESI) calcd for C₁₆H₁₂NONaSeF₃⁺ m/z [M + H]⁺: 393.9934; found: 393.9941.

1,7-dimethyl-3-(phenylseleninyl)-1H-indole (22)

Purified by flash column chromatography (silica gel), [DCM /MeOH = 10:1 (v/v)] to give **22** as a white solid (72.7 mg, 92%); ¹H NMR (600 MHz, CDCl₃) δ 7.75 (d, *J* = 9.5 Hz, 2H), 7.41 (d, *J* = 7.2 Hz, 3H), 7.31 (d, *J* = 7.7 Hz, 1H), 7.23 (s, 1H), 6.93 – 6.85 (m, 2H), 3.91 (s, 3H), 2.62 (s, 3H). ¹³C{¹H} NMR (150 MHz, CDCl₃) δ 141.3, 136.2, 133.4, 130.7, 129.3, 127.0, 126.5, 125.6, 122.1, 121.4, 117.4, 112.4, 37.3, 19.4. ⁷⁷Se NMR (114 MHz, CDCl₃) δ 822.9. HRMS (ESI) calcd for C₁₆H₁₆NOSe⁺ m/z [M + H]⁺: 318.0397; found: 318.0404.

7-methoxy-1-methyl-3-(phenylseleninyl)-1H-indole (23)

Purified by flash column chromatography (silica gel), [DCM /MeOH = 10:1 (v/v)] to give **23** as a white solid (48.2 mg, 58%); ¹H NMR (400 MHz, CDCl₃) δ 7.78 – 7.74 (m, 2H), 7.47 – 7.42 (m,

3H), 7.22 (s, 1H), 7.04 (d, $J = 8.1$ Hz, 1H), 6.95 (t, $J = 8.0$ Hz, 1H), 6.59 (d, $J = 7.8$ Hz, 1H), 4.00 (s, 3H), 3.85 (s, 3H). $^{13}\text{C}\{^1\text{H}\}$ NMR (101 MHz, CDCl_3) δ 148.0, 141.3, 132.8, 130.8, 129.3, 128.3, 127.3, 126.7, 122.0, 112.6, 111.8, 103.6, 55.4, 37.3. ^{77}Se NMR (114 MHz, CDCl_3) δ 820.8. HRMS (ESI) calcd for $\text{C}_{16}\text{H}_{16}\text{NO}_2\text{Se}^+$ m/z $[\text{M} + \text{H}]^+$: 334.0346; found: 334.0348.

1-isopropyl-3-(phenylseleninyl)-1H-indole (24)

Purified by flash column chromatography (silica gel), [DCM /MeOH = 10:1 (v/v)] to give **24** as a white solid (54.5 mg, 66%); ^1H NMR (400 MHz, CDCl_3) δ 7.78 (d, $J = 4.7$ Hz, 2H), 7.60 (s, 1H), 7.49 – 7.33 (m, 5H), 7.20 (t, $J = 7.7$ Hz, 1H), 7.04 (t, $J = 7.6$ Hz, 1H), 4.63 (hept, $J = 6.7$ Hz, 1H), 1.50 (d, $J = 6.8$ Hz, 3H), 1.48 (d, $J = 6.8$ Hz, 3H). $^{13}\text{C}\{^1\text{H}\}$ NMR (100 MHz, CDCl_3) δ 141.2, 136.6, 130.9, 129.4, 127.5, 126.8, 126.0, 122.9, 121.2, 119.6, 112.7, 110.4, 48.0, 22.7, 22.6. ^{77}Se NMR (114 MHz, CDCl_3) δ 825.3. HRMS (ESI) calcd for $\text{C}_{17}\text{H}_{18}\text{NOSe}^+$ m/z $[\text{M} + \text{H}]^+$: 332.0554; found: 332.0558.

1-allyl-3-(phenylseleninyl)-1H-indole (25)

Purified by flash column chromatography (silica gel), [DCM /MeOH = 10:1 (v/v)] to give **25** as a white solid (56.6 mg, 69%); ^1H NMR (400 MHz, CDCl_3) δ 7.50 (dd, $J = 7.4, 2.3$ Hz, 2H), 7.17 (d, $J = 5.3$ Hz, 5H), 7.02 (d, $J = 8.3$ Hz, 1H), 6.92 (t, $J = 7.7$ Hz, 1H), 6.78 (t, $J = 7.6$ Hz, 1H), 5.63 (ddt, $J = 15.9, 10.5, 5.6$ Hz, 1H), 4.93 (d, $J = 10.2$ Hz, 1H), 4.81 (d, $J = 17.1$ Hz, 1H), 4.43 – 4.37 (m, 2H). $^{13}\text{C}\{^1\text{H}\}$ NMR (100 MHz, CDCl_3) δ 141.1, 137.0, 132.0, 131.2, 130.9, 129.4, 126.7, 126.0, 123.2, 121.4, 119.6, 118.6, 113.2, 110.5, 49.37. ^{77}Se NMR (114 MHz, CDCl_3) δ 825.8. HRMS (ESI) calcd for $\text{C}_{17}\text{H}_{16}\text{NOSe}^+$ m/z $[\text{M} + \text{H}]^+$: 330.0397; found: 330.0403.

1-benzyl-3-(phenylseleninyl)-1H-indole (26)

Purified by flash column chromatography (silica gel), [DCM /MeOH = 10:1 (v/v)] to give **26** as a white solid (66.2 mg, 70%); ^1H NMR (600 MHz, CDCl_3) δ 7.81 (dd, $J = 6.9, 2.7$ Hz, 2H), 7.51 – 7.48 (m, 2H), 7.48 – 7.40 (m, 3H), 7.30 – 7.23 (m, 4H), 7.20 – 7.14 (m, 1H), 7.09 (d, $J = 5.9$ Hz, 2H), 7.08 – 7.04 (m, 1H), 5.24 (s, 2H). $^{13}\text{C}\{^1\text{H}\}$ NMR (150 MHz, CDCl_3) δ 141.1, 137.1, 135.7, 131.5, 130.8, 129.3, 128.8, 128.0, 126.9, 126.6, 126.0, 123.2, 121.3, 119.6, 113.4, 110.6, 50.5. ^{77}Se NMR (114 MHz, CDCl_3) δ 826.2. HRMS (ESI) calcd for $\text{C}_{21}\text{H}_{18}\text{NOSe}^+$ m/z $[\text{M} + \text{H}]^+$: 380.0554; found: 380.0550.

1-(pent-2-yn-1-yl)-3-(phenylseleninyl)-1H-indole (27)

Purified by flash column chromatography (silica gel), [DCM /MeOH = 10:1 (v/v)] to give **27** as a white solid (61.1 mg, 69%); ^1H NMR (400 MHz, CDCl_3) δ 7.83 – 7.77 (m, 2H), 7.60 (s, 1H), 7.48 – 7.43 (m, 4H), 7.38 (d, $J = 8.3$ Hz, 1H), 7.23 (t, $J = 7.9$ Hz, 1H), 7.08 (t, $J = 7.7$ Hz, 1H), 4.80 (s, 2H), 2.23 – 2.13 (m, 2H), 1.10 (t, $J = 7.6$ Hz, 3H). $^{13}\text{C}\{^1\text{H}\}$ NMR (100 MHz, CDCl_3) δ 141.0, 136.6, 130.9, 130.8, 129.4, 126.7, 126.2, 123.2, 121.5, 119.7, 113.3, 110.3, 88.9, 71.8, 36.9, 13.5, 12.3. ^{77}Se NMR (114 MHz, CDCl_3) δ 826.6. HRMS (ESI) calcd for $\text{C}_{19}\text{H}_{18}\text{NOSe}^+$ m/z $[\text{M} + \text{H}]^+$: 356.0554; found: 356.0557.

1-phenyl-3-(phenylseleninyl)-1H-indole (28)

Purified by flash column chromatography (silica gel), [DCM /MeOH = 10:1 (v/v)] to give **28** as a white solid (85.6 mg, 94%); ¹H NMR (400 MHz, CDCl₃) δ 7.86 (d, *J* = 5.1 Hz, 2H), 7.62 (s, 1H), 7.56 (d, *J* = 8.0 Hz, 1H), 7.44 (m, 9H), 7.21 (t, *J* = 7.8 Hz, 1H), 7.12 (t, *J* = 7.6 Hz, 1H). ⁷⁷Se NMR (114 MHz, CDCl₃) δ 816.3. ¹³C{¹H} NMR (100 MHz, CDCl₃) δ 140.8, 138.2, 137.1, 131.0, 129.8, 129.5, 127.8, 126.7, 126.3, 124.7, 123.9, 122.0, 119.7, 115.7, 111.3. HRMS (ESI) calcd for C₂₀H₁₆NOSe⁺ m/z [M + H]⁺: 366.0397; found: 366.0404.

1-ethyl-2-methyl-3-(phenylseleninyl)-1*H*-indole (29)

Purified by flash column chromatography (silica gel), [DCM /MeOH = 10:1 (v/v)] to give **29** as a white solid (75.1 mg, 91%); ¹H NMR (400 MHz, CDCl₃) δ 7.77 – 7.71 (m, 2H), 7.54 – 7.35 (m, 3H), 7.30 (d, *J* = 8.0 Hz, 1H), 7.25 (d, *J* = 8.2 Hz, 1H), 7.13 (t, *J* = 7.7 Hz, 1H), 6.96 (t, *J* = 7.5 Hz, 1H), 4.10 (q, *J* = 7.4 Hz, 2H), 2.59 (s, 3H), 1.32 (t, *J* = 7.1 Hz, 3H). ¹³C{¹H} NMR (100 MHz, CDCl₃) δ 140.9, 140.9, 136.1, 130.4, 129.3, 126.7, 125.9, 122.2, 121.1, 119.2, 109.5, 109.4, 38.28, 14.96, 11.42. ⁷⁷Se NMR (114 MHz, CDCl₃) δ 820.4. HRMS (ESI) calcd for C₁₇H₁₈NOSe⁺ m/z [M + H]⁺: 332.0554; found: 332.0556.

1-ethyl-2-phenyl-3-(phenylseleninyl)-1*H*-indole (30)

Purified by flash column chromatography (silica gel), [DCM /MeOH = 10:1 (v/v)] to give **30** as a white solid (93.2 mg, 95%); ¹H NMR (400 MHz, CDCl₃) δ 7.74 (d, *J* = 5.7 Hz, 2H), 7.56 – 7.51 (m, 5H), 7.48 – 7.33 (m, 5H), 7.21 (t, *J* = 7.8 Hz, 1H), 7.01 (t, *J* = 7.5 Hz, 1H), 4.09 (q, *J* = 7.3 Hz, 2H), 1.27 (t, *J* = 7.3 Hz, 3H). ¹³C{¹H} NMR (100 MHz, CDCl₃) δ 144.9, 140.9, 136.6, 130.7, 130.4, 129.8, 129.4, 129.2, 128.9, 126.7, 125.6, 123.2, 121.5, 120.3, 110.3, 39.1, 18.2. ⁷⁷Se NMR (114 MHz, CDCl₃) δ 832.6. HRMS (ESI) calcd for C₂₂H₂₀NOSe⁺ m/z [M + H]⁺: 394.0712; found: 394.0710.

1-benzyl-3-(phenylseleninyl)-1*H*-indole-6-carboxylic acid (31)

Purified by flash column chromatography (silica gel), [DCM /MeOH = 10:1 (v/v)] to give **31** as a white solid (101.4 mg, 96%); ¹H NMR (400 MHz, CDCl₃) δ 12.57 (s, 1H), 8.04 (s, 1H), 7.66 (t, *J* = 8.2 Hz, 3H), 7.44 – 7.34 (m, 5H), 7.35 – 7.23 (m, 4H), 7.06 (s, 1H), 5.28 (s, 2H). ¹³C{¹H} NMR (100 MHz, CDCl₃) δ 166.7, 139.1, 136.5, 136.1, 132.6, 131.3, 129.7, 128.7, 128.5, 128.2, 128.1, 126.6, 124.7, 122.1, 118.2, 115.3, 111.9, 66.5. ⁷⁷Se NMR (114 MHz, CDCl₃) δ 814.7. HRMS (ESI) calcd for C₂₂H₁₈NO₃Se⁺ m/z [M + H]⁺: 424.0452; found: 424.0459.

2-methoxy-5-(phenylseleninyl)thiophene (32)

Purified by flash column chromatography (silica gel), [DCM /MeOH = 10:1 (v/v)] to give **32** as a white solid (69.9 mg, 98%); ¹H NMR (400 MHz, CDCl₃) δ 7.47 – 7.40 (m, 2H), 7.20 – 7.15 (m, 3H), 6.90 (d, *J* = 4.1 Hz, 1H), 5.84 (d, *J* = 4.1 Hz, 1H), 3.50 (s, 3H). ¹³C{¹H} NMR (100 MHz, CDCl₃) δ 172.5, 141.9, 132.2, 131.4, 129.5, 127.5, 126.0, 104.7, 60.5. ⁷⁷Se NMR (114 MHz, CDCl₃) δ 859.0. HR-MS (ESI) m/z calcd for C₁₁H₁₁O₂SSe⁺, [M+H]⁺: 286.9645, found: 286.9651.

3-methoxy-2-(phenylseleninyl)thiophene (33)

Purified by flash column chromatography (silica gel), [DCM /MeOH = 10:1 (v/v)] to give **33** as a white solid (50.6 mg, 71%); ¹H NMR (600 MHz, CDCl₃) δ 7.76 – 7.72 (m, 2H), 7.49 – 7.40 (m,

3H), 7.37 (d, $J = 5.4$ Hz, 1H), 6.76 (d, $J = 5.5$ Hz, 1H), 3.86 (s, 3H). $^{13}\text{C}\{^1\text{H}\}$ NMR (151 MHz, CDCl_3) δ 160.6, 141.7, 131.4, 129.5, 129.1, 126.4, 119.2, 115.2, 58.6. ^{77}Se NMR (114 MHz, CDCl_3) δ 836.8. HR-MS (ESI) m/z calcd for $\text{C}_{11}\text{H}_{11}\text{O}_2\text{SSe}^+$, $[\text{M}+\text{H}]^+$: 286.9645, found: 286.9651.

5-(phenylseleninyl)-2,3-dihydrothieno[3,4-*b*][1,4]dioxine (34)

Purified by flash column chromatography (silica gel), [DCM /MeOH = 10:1 (v/v)] to give **34** as a white solid (44.6 mg, 57%); ^1H NMR (400 MHz, CDCl_3) δ 7.79 (dd, $J = 6.7, 3.1$ Hz, 2H), 7.52 – 7.47 (m, 3H), 6.55 (s, 1H), 4.27 (d, $J = 3.5$ Hz, 2H), 4.18 (d, $J = 3.1$ Hz, 2H). $^{13}\text{C}\{^1\text{H}\}$ NMR (100 MHz, CDCl_3) δ 144.8, 141.2, 140.5, 131.5, 129.4, 126.4, 106.8, 65.2, 64.3. ^{77}Se NMR (114 MHz, CDCl_3) δ 838.0. HR-MS (ESI) m/z calcd for $\text{C}_{12}\text{H}_{10}\text{O}_3\text{NaSSe}^+$, $[\text{M}+\text{Na}]^+$: 336.9414, found: 336.9421.

1,3,5-trimethoxy-2-(phenylseleninyl)benzene (35)

Purified by flash column chromatography (silica gel), [DCM /MeOH = 10:1 (v/v)] to give **35** as a white solid (72.9 mg, 86%); ^1H NMR (400 MHz, CDCl_3) δ 7.65 (d, $J = 7.0$ Hz, 2H), 7.42 – 7.30 (m, 3H), 5.99 (s, 2H), 3.75 (s, 3H), 3.60 (s, 6H). $^{13}\text{C}\{^1\text{H}\}$ NMR (100 MHz, CDCl_3) δ 165.0, 161.8, 141.6, 129.7, 128.9, 128.6, 126.1, 110.6, 91.24, 55.9, 55.5. ^{77}Se NMR (114 MHz, CDCl_3) δ 838.6. HR-MS (ESI) m/z calcd for $\text{C}_{15}\text{H}_{17}\text{O}_4\text{Se}^+$, $[\text{M}+\text{H}]^+$: 341.0292, found: 341.0291.

***N*-methyl-4-(phenylseleninyl)aniline (36)**

Purified by flash column chromatography (silica gel), [DCM /MeOH = 10:1 (v/v)] to give **36** as a white solid (43.8 mg, 63%); ^1H NMR (600 MHz, CDCl_3) δ 7.50 – 7.45 (m, 2H), 7.35 – 7.28 (m, 2H), 7.23 – 7.19 (m, 2H), 7.18 – 7.13 (m, 1H), 6.61 – 6.55 (m, 2H), 4.29 – 3.38 (br, 1H), 2.86 (s, 3H). $^{13}\text{C}\{^1\text{H}\}$ NMR (151 MHz, CDCl_3) δ 149.6, 137.4, 134.7, 129.8, 129.1, 125.9, 114.6, 113.4, 30.6. ^{77}Se NMR (114 MHz, CDCl_3) δ 858.0. HR-MS (ESI) m/z calcd for $\text{C}_{13}\text{H}_{14}\text{NOSe}^+$, $[\text{M}+\text{H}]^+$: 280.0236, found: 280.0231.

1-methyl-3-(*p*-tolylseleninyl)-1*H*-indole (37)

Purified by flash column chromatography (silica gel), [DCM /MeOH = 10:1 (v/v)] to give **37** as a white solid (51.4 mg, 65%); ^1H NMR (600 MHz, CDCl_3) δ 7.58 (d, $J = 8.4$ Hz, 2H), 7.42 (d, $J = 8.0$ Hz, 1H), 7.24 (s, 1H), 7.14 (dd, $J = 8.3, 5.0$ Hz, 3H), 7.12 – 7.07 (m, 1H), 6.99 – 6.94 (m, 1H), 3.53 (s, 3H), 2.23 (s, 3H). $^{13}\text{C}\{^1\text{H}\}$ NMR (150 MHz, CDCl_3) δ 140.7, 137.6, 137.2, 131.7, 129.7, 126.2, 125.5, 122.6, 120.7, 119.1, 112.6, 109.7, 32.8, 20.9. ^{77}Se NMR (114 MHz, CDCl_3) δ 822.7. HR-MS (ESI) m/z calcd for $\text{C}_{16}\text{H}_{16}\text{NOSe}^+$, $[\text{M}+\text{H}]^+$: 318.0397, found: 318.0402.

1-methyl-3-(*o*-tolylseleninyl)-1*H*-indole (38)

Purified by flash column chromatography (silica gel), [DCM /MeOH = 10:1 (v/v)] to give **38** as a white solid (54.6 mg, 69%); ^1H NMR (600 MHz, CDCl_3) δ 8.25 – 8.21 (m, 1H), 7.46 – 7.40 (m, 1H), 7.40 – 7.32 (m, 1H), 7.29 – 7.22 (m, 1H), 7.17 – 6.93 (m, 5H), 3.51 (s, 3H), 2.14 (s, 3H). $^{13}\text{C}\{^1\text{H}\}$ NMR (150 MHz, CDCl_3) δ 138.8, 136.9, 136.3, 131.6, 130.5, 130.3, 126.6, 125.9, 125.2, 122.6, 120.8, 118.8, 111.6, 109.7, 32.8, 19.0. ^{77}Se NMR (114 MHz, CDCl_3) δ 790.8. HR-MS (ESI) m/z calcd for $\text{C}_{16}\text{H}_{16}\text{NOSe}^+$, $[\text{M}+\text{H}]^+$: 318.0397, found: 318.0401.

3-((4-ethylphenyl)seleninyl)-1-methyl-1H-indole (39)

Purified by flash column chromatography (silica gel), [DCM /MeOH = 10:1 (v/v)] to give **39** as a white solid (42.1 mg, 51%); ¹H NMR (600 MHz, CDCl₃) δ 7.58 (d, *J* = 8.7 Hz, 2H), 7.40 (d, *J* = 8.1 Hz, 1H), 7.23 (s, 1H), 7.18 – 7.10 (m, 3H), 7.08 (d, *J* = 8.3 Hz, 1H), 6.97 – 6.92 (m, 1H), 3.54 (s, 3H), 2.52 (q, *J* = 7.6 Hz, 2H), 1.08 (t, *J* = 8.3 Hz, 3H). ¹³C{¹H} NMR (150 MHz, CDCl₃) δ 147.1, 138.0, 137.3, 131.8, 128.6, 126.4, 125.7, 122.7, 120.8, 119.3, 112.8, 109.8, 32.9, 28.3, 15.0. ⁷⁷Se NMR (114 MHz, CDCl₃) δ 823.6. HR-MS (ESI) *m/z* calcd for C₁₇H₁₈NOSe⁺, [M+H]⁺: 332.0554, found: 332.0557.

3-((4-methoxyphenyl)seleninyl)-1-methyl-1H-indole (40)

Purified by flash column chromatography (silica gel), [DCM /MeOH = 10:1 (v/v)] to give **40** as a white solid (54.0 mg, 65%); ¹H NMR (600 MHz, CDCl₃) δ 7.52 – 7.48 (m, 2H), 7.32 (d, *J* = 7.7 Hz, 1H), 7.17 (s, 1H), 7.12 – 6.94 (m, 2H), 6.87 (d, *J* = 7.2 Hz, 1H), 6.76 – 6.73 (m, 2H), 3.51 (s, 3H), 3.42 (s, 3H). ¹³C{¹H} NMR (150 MHz, CDCl₃) δ 161.1, 137.0, 131.5, 127.6, 126.9, 125.3, 122.4, 120.4, 118.9, 114.3, 112.4, 109.6, 54.7, 32.5. ⁷⁷Se NMR (114 MHz, CDCl₃) δ 821.1. HRMS (ESI) *m/z* calcd for C₁₆H₁₆NO₂Se⁺, [M+H]⁺: 334.0346, found: 334.0349.

1-methyl-3-((3,4,5-trimethoxyphenyl)seleninyl)-1H-indole (41)

Purified by flash column chromatography (silica gel), [DCM /MeOH = 10:1 (v/v)] to give **41** as a white solid (74.5 mg, 76%); ¹H NMR (600 MHz, CDCl₃) δ 7.54 (d, *J* = 7.0 Hz, 1H), 7.32 (s, 1H), 7.29 (d, *J* = 8.3 Hz, 1H), 7.23 (t, *J* = 7.4 Hz, 1H), 7.10 (t, *J* = 8.1 Hz, 1H), 7.02 (s, 2H), 3.82 (s, 3H), 3.81 (s, 6H), 3.73 (s, 3H). ¹³C{¹H} NMR (150 MHz, CDCl₃) δ 153.6, 140.0, 137.6, 135.2, 132.1, 126.0, 123.2, 121.4, 119.4, 113.1, 110.2, 103.5, 60.9, 56.4, 33.3. ⁷⁷Se NMR (114 MHz, CDCl₃) δ 825.8. HR-MS (ESI) *m/z* calcd for C₁₈H₂₀NO₄Se⁺, [M+H]⁺: 394.0558, found: 394.0562.

3-((4-fluorophenyl)seleninyl)-1-methyl-1H-indole (42)

Purified by flash column chromatography (silica gel), [DCM /MeOH = 10:1 (v/v)] to give **42** as a white solid (42.4 mg, 53%); ¹H NMR (400 MHz, CDCl₃) δ 7.82 – 7.75 (m, 2H), 7.43 (m, 2H), 7.34 (d, *J* = 8.3 Hz, 1H), 7.26 (t, *J* = 7.6 Hz, 1H), 7.21 – 7.14 (m, 2H), 7.10 (t, *J* = 7.6 Hz, 1H), 3.80 (s, 3H). ¹³C{¹H} NMR (100 MHz, CDCl₃) δ 164.3 (d, *J* = 251.2 Hz), 137.6, 136.3, 132.1, 128.9 (d, *J* = 8.7 Hz), 125.8, 123.3, 121.4, 119.4, 116.7 (d, *J* = 22.2 Hz), 110.2, 33.4. ¹⁹F NMR (375 MHz, CDCl₃) δ -108.5. ⁷⁷Se NMR (114 MHz, CDCl₃) δ 825.5. HR-MS (ESI) *m/z* calcd for C₁₅H₁₃NOSeF⁺, [M+H]⁺: 322.0146, found: 322.0152.

3-((4-chlorophenyl)seleninyl)-1-methyl-1H-indole (43)

Purified by flash column chromatography (silica gel), [DCM /MeOH = 10:1 (v/v)] to give **43** as a white solid (53.0 mg, 63%); ¹H NMR (400 MHz, CDCl₃) δ 7.68 (d, *J* = 10.5 Hz, 2H), 7.44 – 7.34 (m, 4H), 7.28 (d, *J* = 8.3 Hz, 1H), 7.21 (t, *J* = 8.2 Hz, 1H), 7.06 (t, *J* = 8.1 Hz, 1H), 3.73 (s, 3H). ¹³C{¹H} NMR (100 MHz, CDCl₃) δ 139.5, 137.6, 137.2, 132.2, 129.6, 128.1, 125.7, 123.3, 121.5, 119.4, 110.2, 33.46. ⁷⁷Se NMR (114 MHz, CDCl₃) δ 824.3. HR-MS (ESI) *m/z* calcd for C₁₅H₁₃NOCiSe⁺, [M+H]⁺: 337.9851, found: 337.9857.

3-((4-bromophenyl)seleninyl)-1-methyl-1H-indole (44)

Purified by flash column chromatography (silica gel), [DCM /MeOH = 10:1 (v/v)] to give **44** as a white solid (81.0 mg, 85%); ^1H NMR (400 MHz, CDCl_3) δ 7.62 (d, J = 8.1 Hz, 2H), 7.54 (d, J = 8.0 Hz, 2H), 7.42 (d, J = 8.1 Hz, 1H), 7.35 (s, 1H), 7.28 (d, J = 8.3 Hz, 1H), 7.21 (t, J = 7.7 Hz, 1H), 7.06 (t, J = 7.4 Hz, 1H), 3.73 (s, 3H). $^{13}\text{C}\{^1\text{H}\}$ NMR (100 MHz, CDCl_3) δ 140.2, 137.6, 132.5, 132.2, 128.3, 125.7, 125.5, 123.3, 121.5, 119.4, 110.2, 33.4. ^{77}Se NMR (114 MHz, CDCl_3) δ 824.7. HR-MS (ESI) m/z calcd for $\text{C}_{15}\text{H}_{13}\text{NOSeBr}^+$, $[\text{M}+\text{H}]^+$: 381.9346, found: 381.9351.

3-((2-bromophenyl)seleninyl)-1-methyl-1H-indole (45)

Purified by flash column chromatography (silica gel), [DCM /MeOH = 10:1 (v/v)] to give **45** as a white solid (54.3 mg, 57%); ^1H NMR (400 MHz, CDCl_3) δ 8.28 (d, J = 7.9 Hz, 1H), 7.68 (d, J = 8.0 Hz, 1H), 7.61 – 7.52 (m, 1H), 7.44 (d, J = 8.0 Hz, 1H), 7.35 – 7.16 (m, 4H), 7.11 (t, J = 7.5 Hz, 1H), 3.70 (s, 3H). $^{13}\text{C}\{^1\text{H}\}$ NMR (100 MHz, CDCl_3) δ 141.5, 137.1, 132.8, 132.5, 132.0, 128.3, 128.1, 126.3, 123.0, 122.4, 121.3, 119.6, 112.2, 110.1, 33.4. ^{77}Se NMR (114 MHz, CDCl_3) δ 826.3. HR-MS (ESI) m/z calcd for $\text{C}_{15}\text{H}_{13}\text{NOSeBr}^+$, $[\text{M}+\text{H}]^+$: 381.9346, found: 381.9351.

(1-methyl-3-(phenylseleninyl)-1H-indol-5-yl)methyl(2S)-2-(4-isobutylphenyl)propanoate (46)

Purified by flash column chromatography (silica gel), [DCM /MeOH = 10:1 (v/v)] to give **46** as a white solid (87.2 mg, 67%); ^1H NMR (400 MHz, CDCl_3) δ 7.82 – 7.75 (m, 2H), 7.49 – 7.44 (m, 3H), 7.43 – 7.36 (m, 2H), 7.20 – 7.14 (m, 3H), 7.08 – 7.02 (m, 2H), 6.98 (d, J = 8.5 Hz, 1H), 5.17 (s, 2H), 3.76 – 3.62 (m, 4H), 2.42 (d, J = 7.1 Hz, 2H), 1.82 (hept, J = 13.6, 6.8 Hz, 1H), 1.47 (d, J = 7.2 Hz, 3H), 0.88 (d, J = 6.7 Hz, 6H). $^{13}\text{C}\{^1\text{H}\}$ NMR (100 MHz, CDCl_3) δ 174.4, 140.5, 137.6, 137.5, 132.6, 131.3, 130.9, 129.4, 129.3, 127.23, 126.6, 125.7, 121.5, 121.4, 119.5, 109.8, 109.7, 66.6, 45.1, 44.9, 33.3, 30.1, 22.3, 18.5, 18.4. ^{77}Se NMR (114 MHz, CDCl_3) δ 820.8. HR-MS (ESI) m/z calcd for $\text{C}_{29}\text{H}_{32}\text{NO}_3\text{Se}^+$, $[\text{M}+\text{H}]^+$: 522.1547, found: 522.1554.

5-methoxy-1-methyl-2-phenyl-3-(phenylseleninyl)-1H-indole (47)

Purified by flash column chromatography (silica gel), [DCM /MeOH = 10:1 (v/v)] to give **47** as a white solid (88.8 mg, 87%); ^1H NMR (600 MHz, CDCl_3) δ 7.79 – 7.74 (m, 2H), 7.54 – 7.52 (m, 5H), 7.47 – 7.37 (m, 3H), 7.20 (d, J = 8.9 Hz, 1H), 6.84 (dd, J = 8.9, 2.5 Hz, 1H), 6.72 (d, J = 2.5 Hz, 1H), 3.60 (s, 3H), 3.53 (s, 3H). $^{13}\text{C}\{^1\text{H}\}$ NMR (150 MHz, CDCl_3) δ 155.2, 145.6, 140.7, 132.9, 130.9, 130.4, 129.8, 129.2, 128.9, 126.9, 126.0, 114.0, 111.1, 110.9, 101.2, 55.5, 31.2. ^{77}Se NMR (114 MHz, CDCl_3) δ 858.4. HR-MS (ESI) m/z calcd for $\text{C}_{22}\text{H}_{20}\text{NO}_2\text{Se}^+$, $[\text{M}+\text{H}]^+$: 410.0654, found: 410.0658.

5-chloro-1,2-dimethyl-3-((3,4,5-trimethoxyphenyl)seleninyl)-1H-indole (48)

Purified by flash column chromatography (silica gel), [DCM /MeOH = 10:1 (v/v)] to give **48** as a white solid (82.6 mg, 75%); ^1H NMR (600 MHz, CDCl_3) δ 7.24 (m, 1H), 6.93 (d, J = 8.7 Hz, 1H), 6.85 (m, 3H), 3.68 (s, 3H), 3.66 (s, 6H), 3.41 (s, 3H), 2.41 (s, 3H). $^{13}\text{C}\{^1\text{H}\}$ NMR (150 MHz, CDCl_3) δ 153.7, 142.3, 139.7, 135.3, 134.8, 126.3, 126.2, 122.0, 118.1, 110.3, 109.0, 103.2, 60.5, 56.1, 29.6, 11.3. ^{77}Se NMR (114 MHz, CDCl_3) δ 844.2. HR-MS (ESI) m/z calcd for $\text{C}_{19}\text{H}_{21}\text{NO}_4\text{ClSe}^+$, $[\text{M}+\text{H}]^+$: 442.0324, found: 442.0328.

1,3-dimethyl-2-(phenylselanyl)-1H-indole (49)

Purified by flash column chromatography (silica gel), [PE /EA = 10:1 (v/v)] to give **49** as a white solid (69.8 mg, 93%); ¹H NMR (600 MHz, CDCl₃) δ 7.54 (d, *J* = 7.9 Hz, 1H), 7.21 (d, *J* = 8.2 Hz, 1H), 7.19 – 7.15 (m, 1H), 7.08 – 6.98 (m, 6H), 3.63 (s, 3H), 2.39 (s, 3H). ¹³C{¹H} NMR (151 MHz, CDCl₃) δ 138.4, 132.7, 129.4, 128.8, 127.7, 126.2, 123.0, 122.9, 119.8, 119.5, 119.1, 109.8, 31.5, 11.1. ⁷⁷Se NMR (114 MHz, CDCl₃) δ 219.5. The data are in accordance with the literature.⁶

1,2-diphenyldiselane (50)

Purified by flash column chromatography (silica gel), [Hexane] to give **50** as a white solid (33.2 mg, 85%); ¹H NMR (600 MHz, CDCl₃) δ 7.64 (d, *J* = 8.0 Hz, 4H), 7.32 – 7.27 (m, 6H). ¹³C{¹H} NMR (151 MHz, CDCl₃) δ 131.6, 131.0, 129.2, 127.8. The data are in accordance with the literature.⁷

4-(phenylselanyl)aniline (51)

Purified by flash column chromatography (silica gel), [DCM /MeOH = 20:1 (v/v)] to give **51** as a colorless oil (29.2 mg, 75%); ¹H NMR (600 MHz, CDCl₃) δ 7.42 (d, *J* = 8.4 Hz, 2H), 7.31 (d, *J* = 8.4 Hz, 2H), 7.20 (t, *J* = 7.9 Hz, 2H), 7.17 (d, *J* = 6.7 Hz, 1H), 6.64 (d, *J* = 8.1 Hz, 2H), 3.85-3.65 (br, 2H). ¹³C{¹H} NMR (151 MHz, CDCl₃) δ 146.9, 137.1, 134.1, 130.2, 129.1, 126.1, 116.5, 116.0. The data are in accordance with the literature.⁸

1-methyl-3-(methytselanyl)-1H-indole (52)

Purified by flash column chromatography (silica gel), [DCM /MeOH = 20:1 (v/v)] to give **51** as a colorless oil (29.2 mg, 75%); ¹H NMR (600 MHz, CDCl₃) δ 7.73 (d, *J* = 7.9 Hz, 1H), 7.34 (d, *J* = 8.4 Hz, 1H), 7.31 – 7.25 (m, 1H), 7.24 – 7.18 (m, 2H), 3.80 (s, 3H), 2.18 (s, 3H). ¹³C{¹H} NMR (151 MHz, CDCl₃) δ 137.3, 133.7, 130.4, 122.2, 120.2, 119.9, 109.5, 32.8, 9.6. The data are in accordance with the literature.⁹

8. References

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9. ^1H NMR, ^{13}C NMR, ^{19}F and ^{77}Se NMR spectra of products

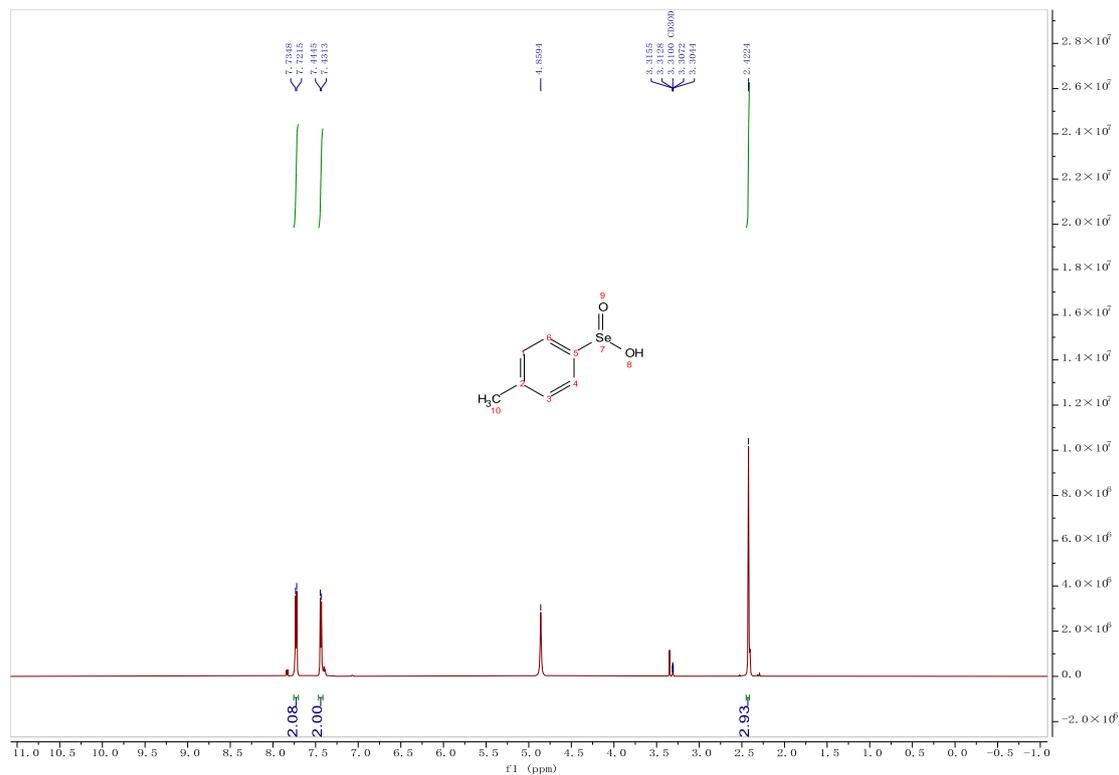


Figure S3. ^1H NMR Spectra of **2b** (600 MHz, CD_3OD)

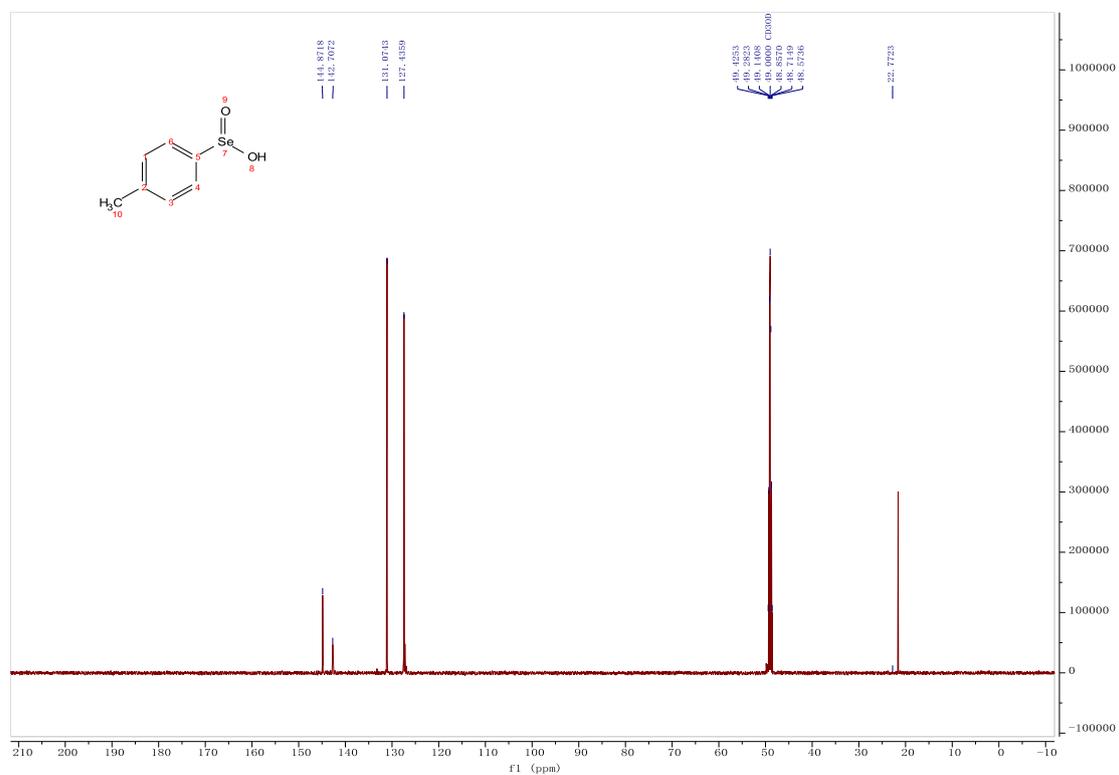


Figure S4. $^{13}\text{C}\{^1\text{H}\}$ NMR Spectra of **2b** (151 MHz, CD_3OD)

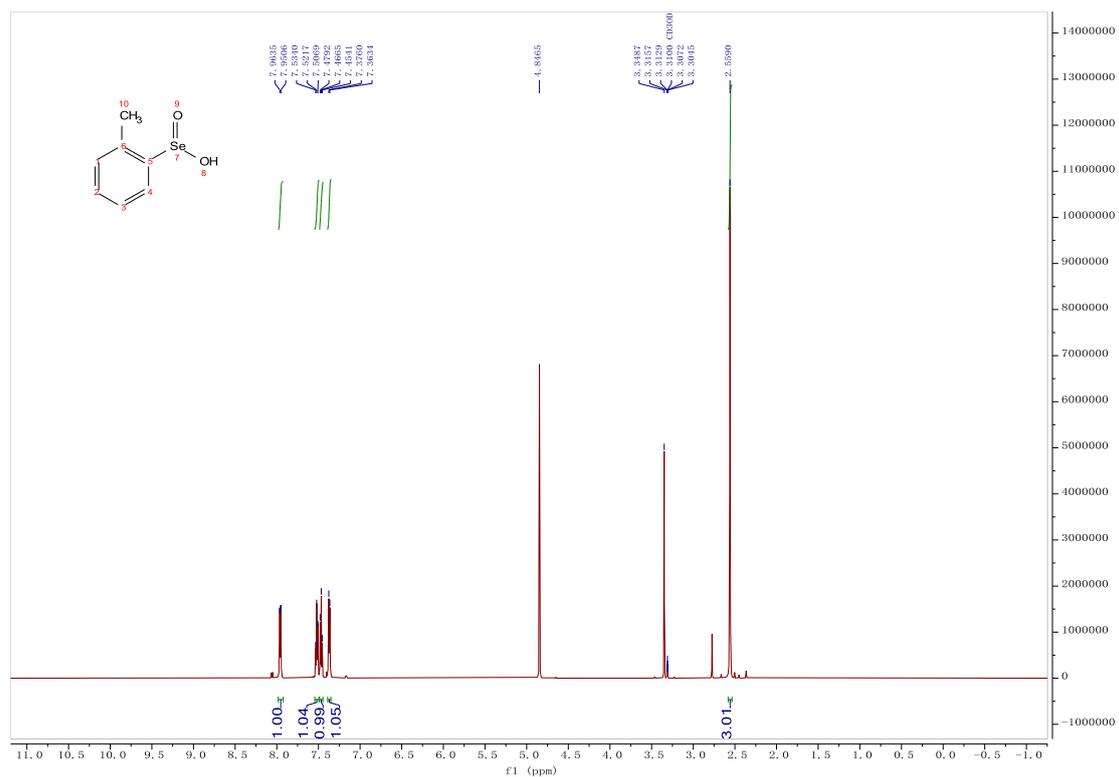


Figure S5. ¹H NMR Spectra of 2c (600 MHz, CD₃OD)

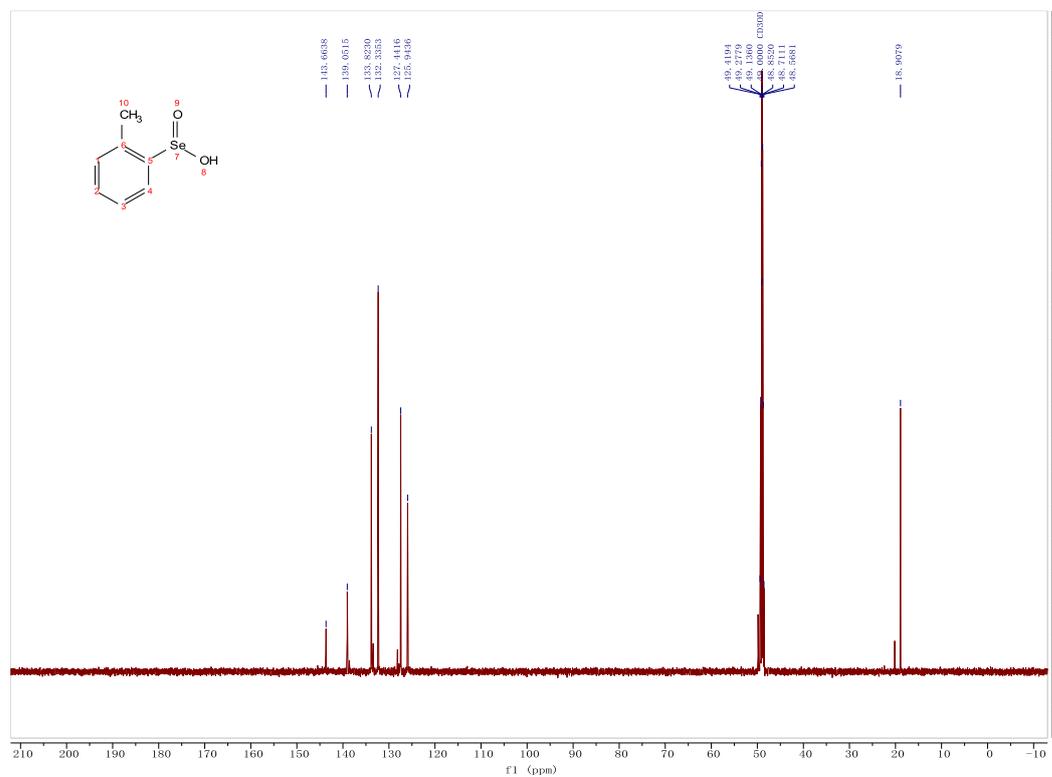


Figure S6. ¹³C{¹H} NMR Spectra of 2c (151 MHz, CD₃OD)

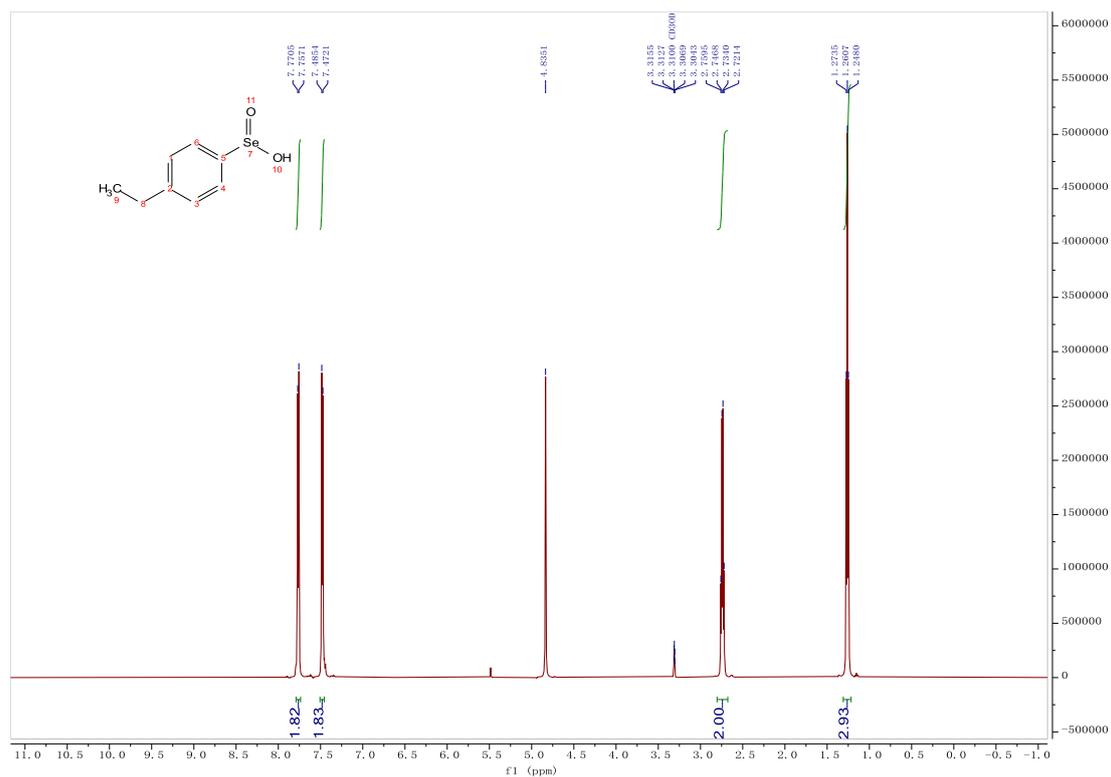


Figure S7. ¹H NMR Spectra of **2d** (600 MHz, CD₃OD)

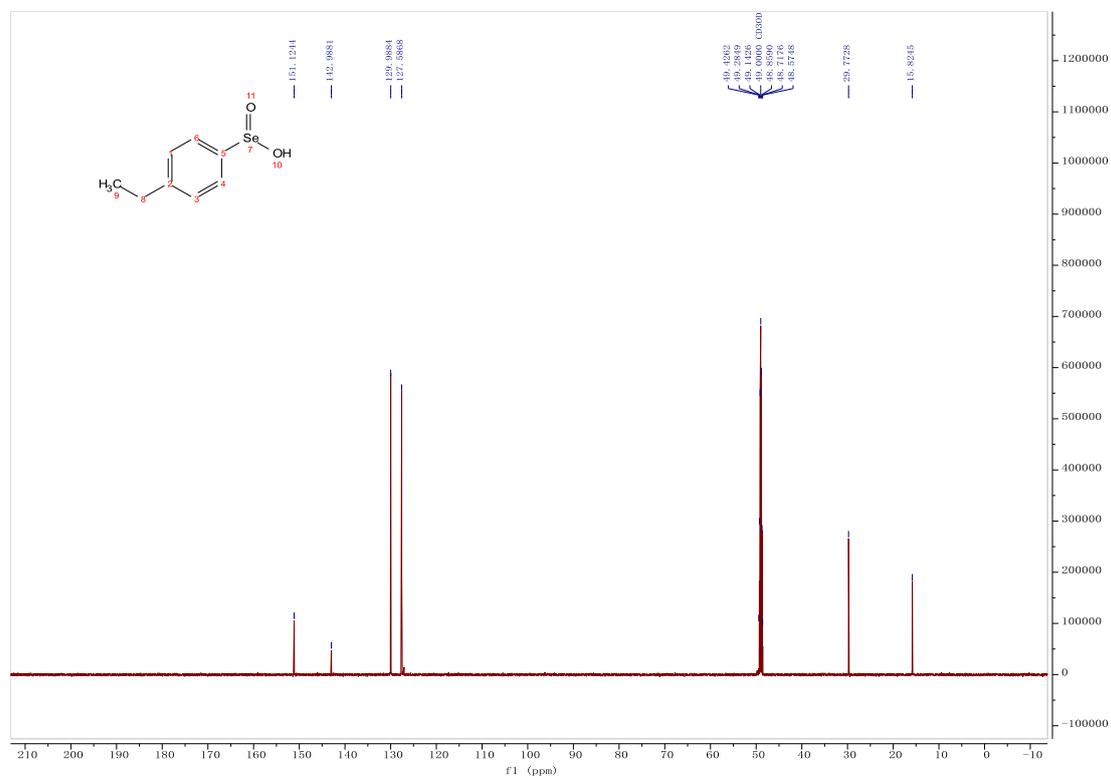


Figure S8. ¹³C{¹H} NMR Spectra of **2d** (151 MHz, CD₃OD)

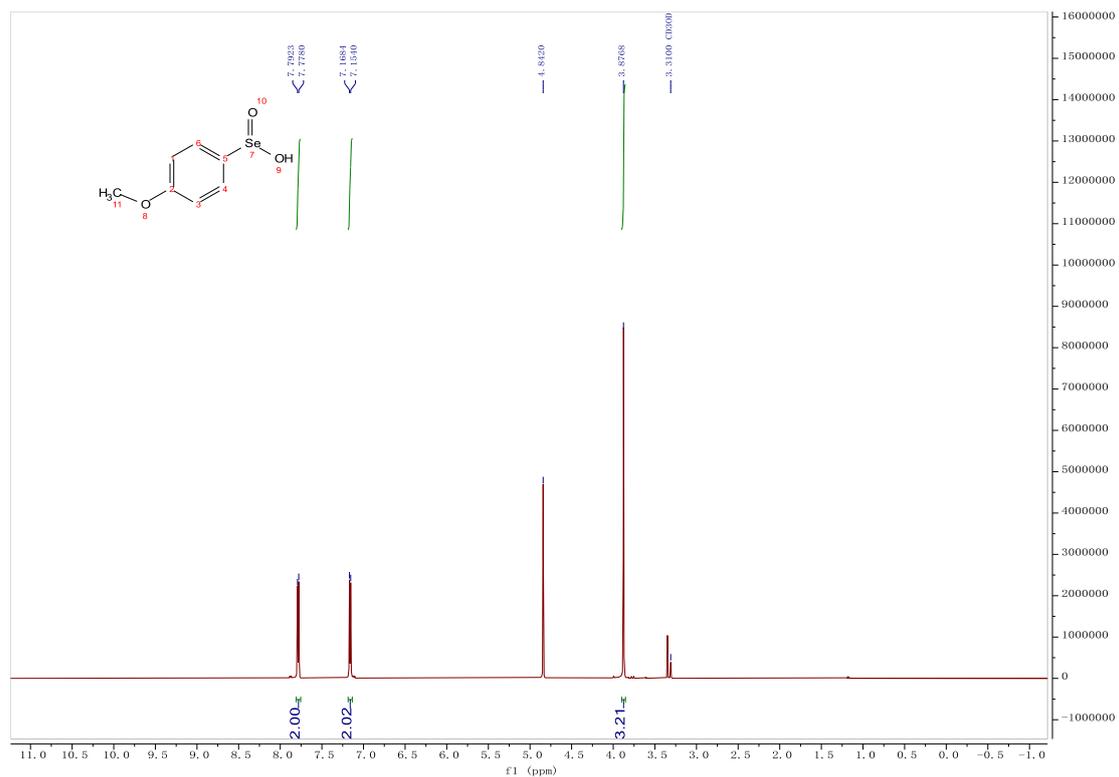


Figure S9. ^1H NMR Spectra of **2e** (600 MHz, CD_3OD)

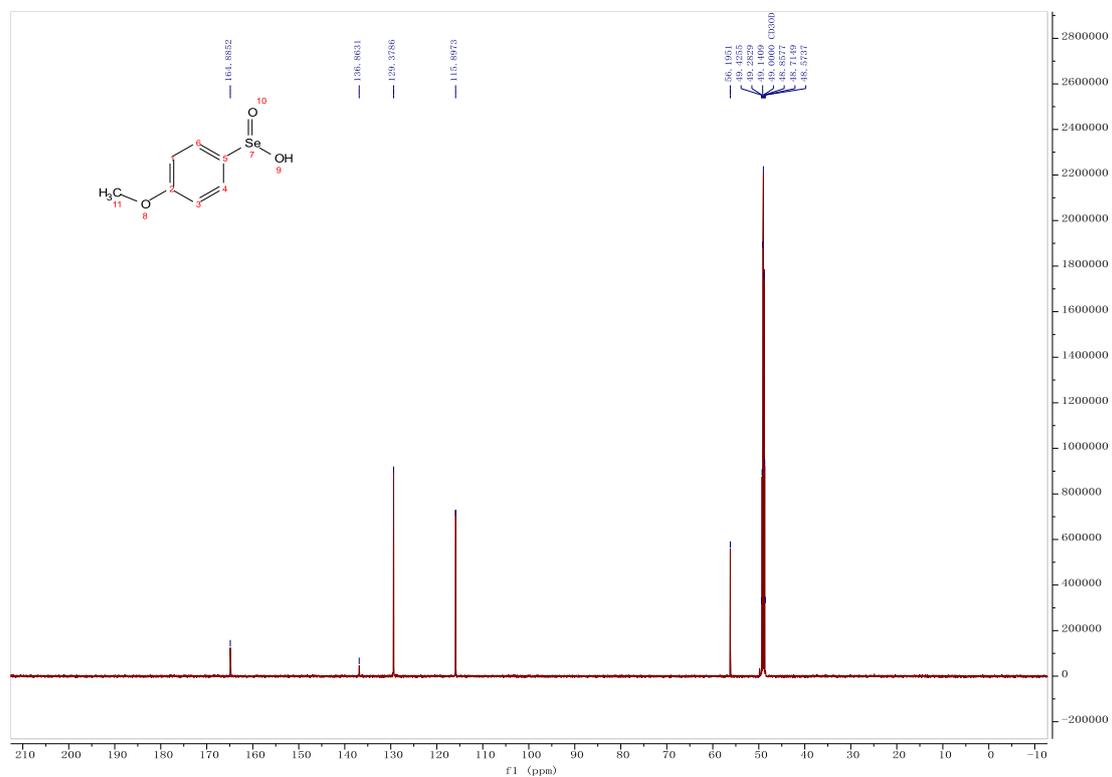
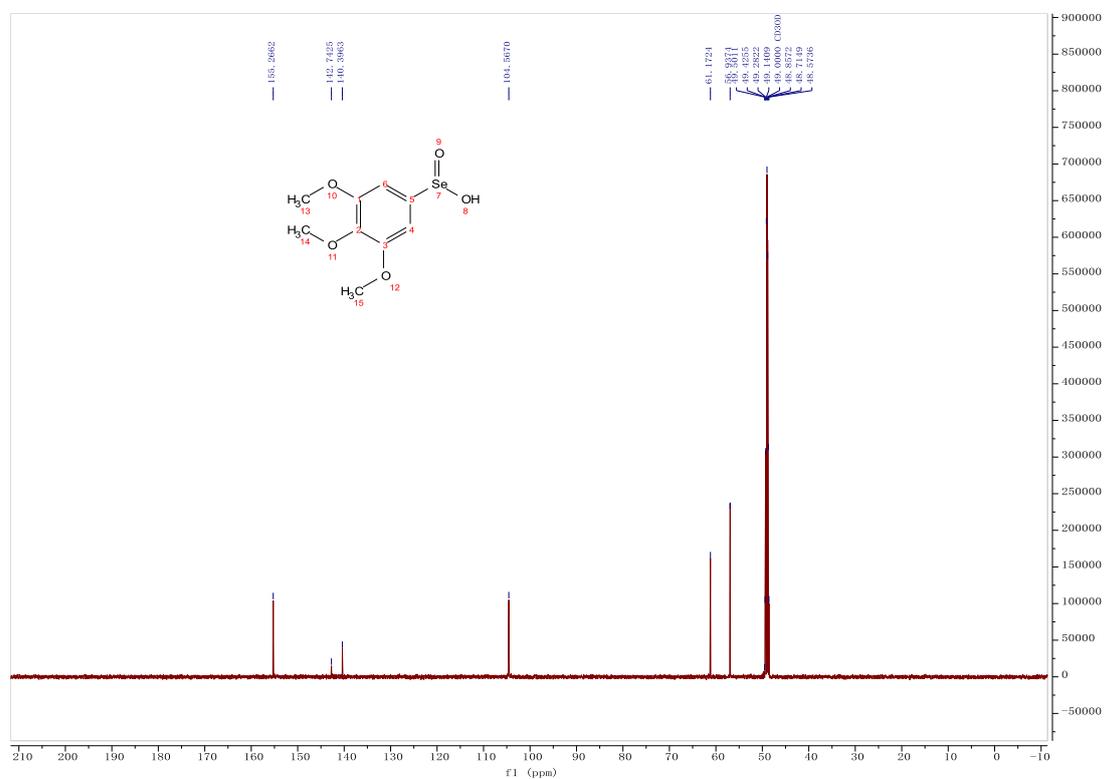
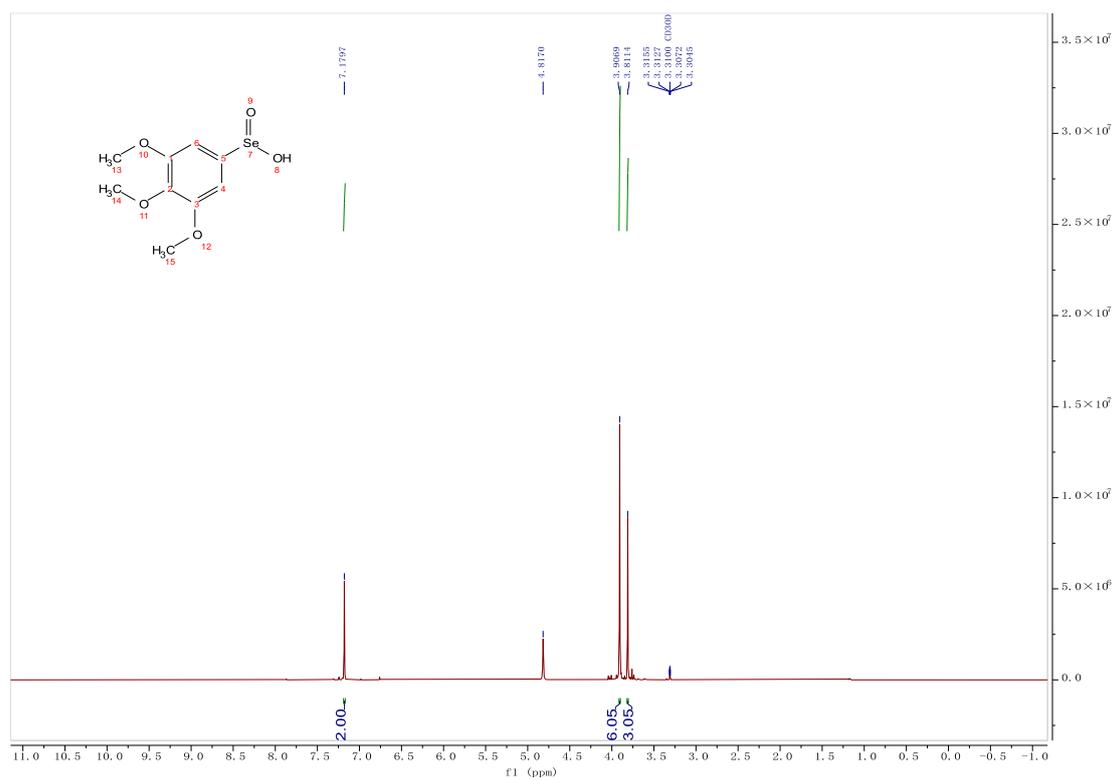


Figure S10. $^{13}\text{C}\{^1\text{H}\}$ NMR Spectra of **2e** (151 MHz, CD_3OD)



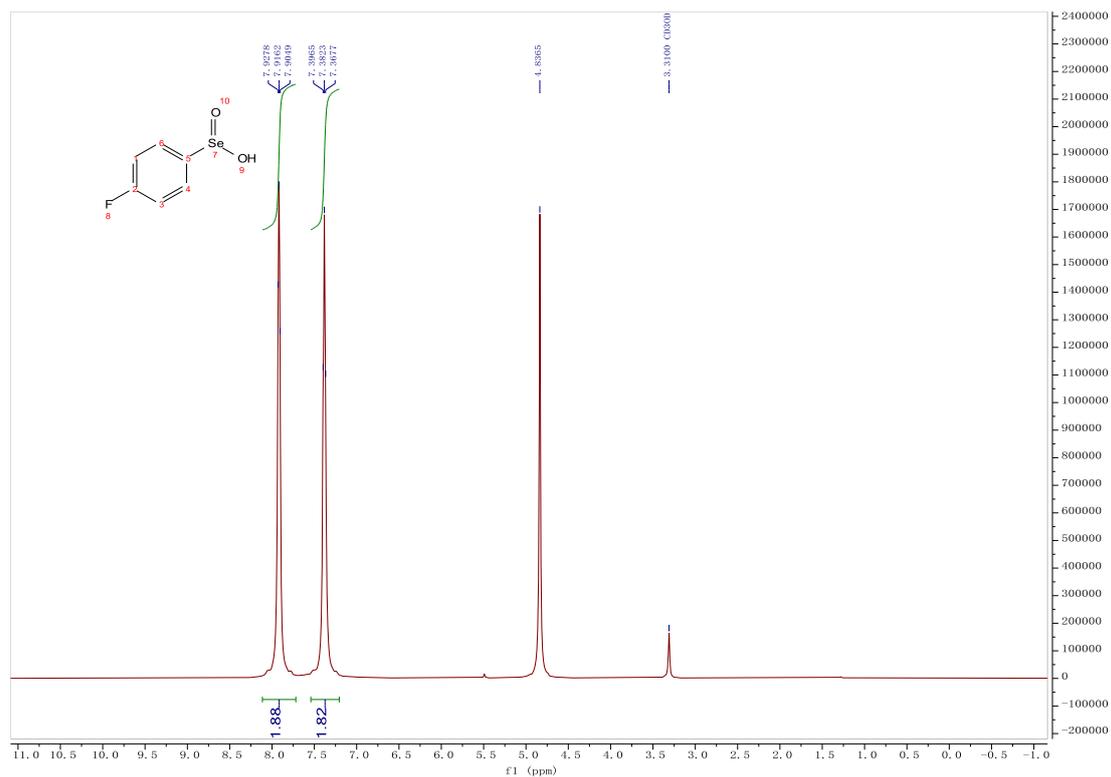


Figure S13. ^1H NMR Spectra of **2g** (600 MHz, CD_3OD)

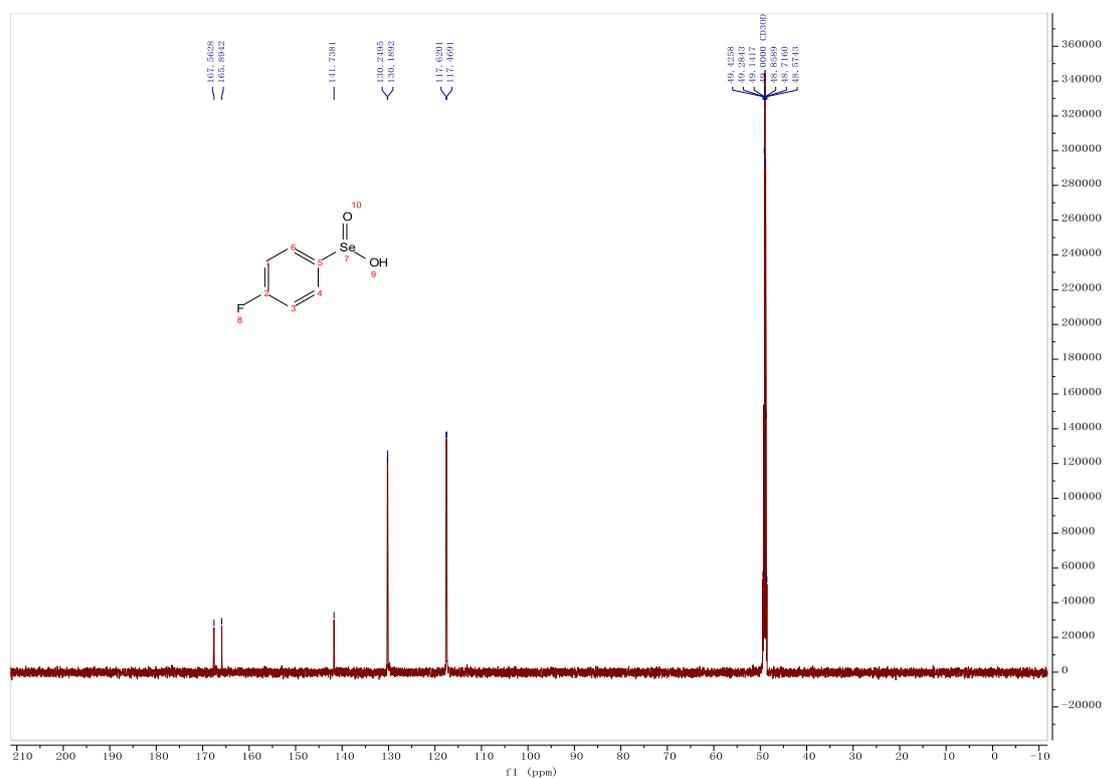


Figure S14. $^{13}\text{C}\{^1\text{H}\}$ NMR Spectra of **2g** (151 MHz, CD_3OD)

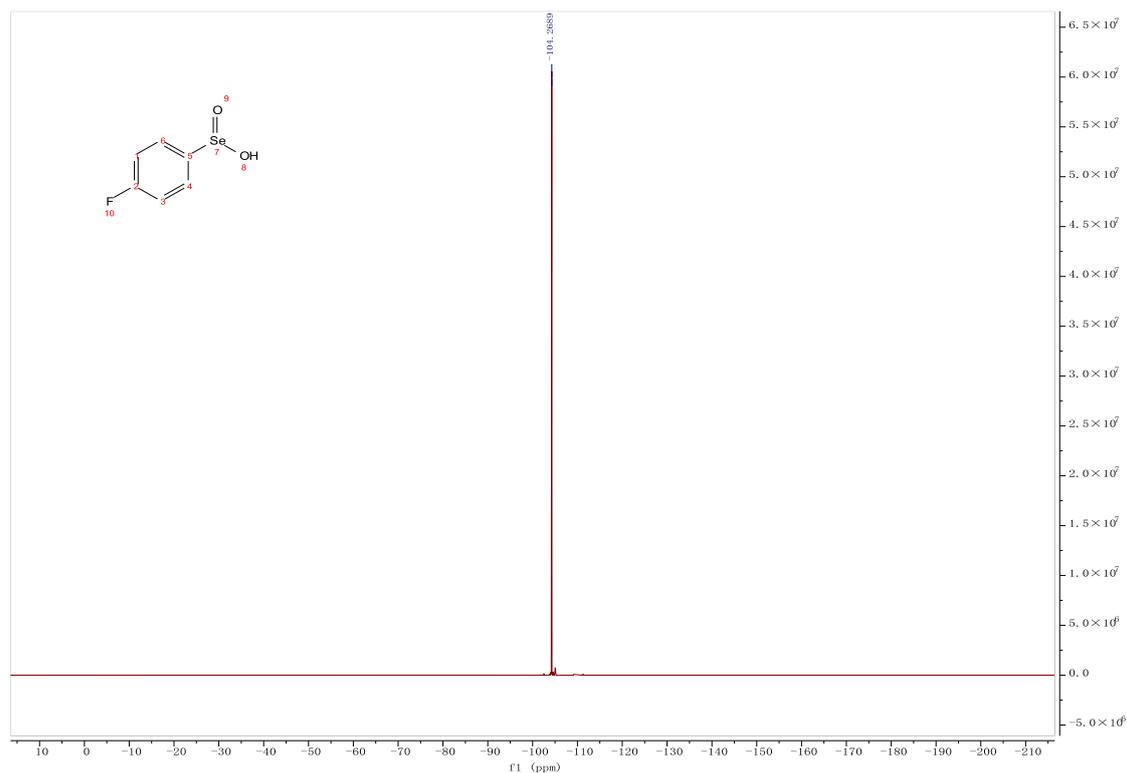


Figure S15. ^{19}F NMR spectrum of **2g** (565 MHz, CD_3OD)

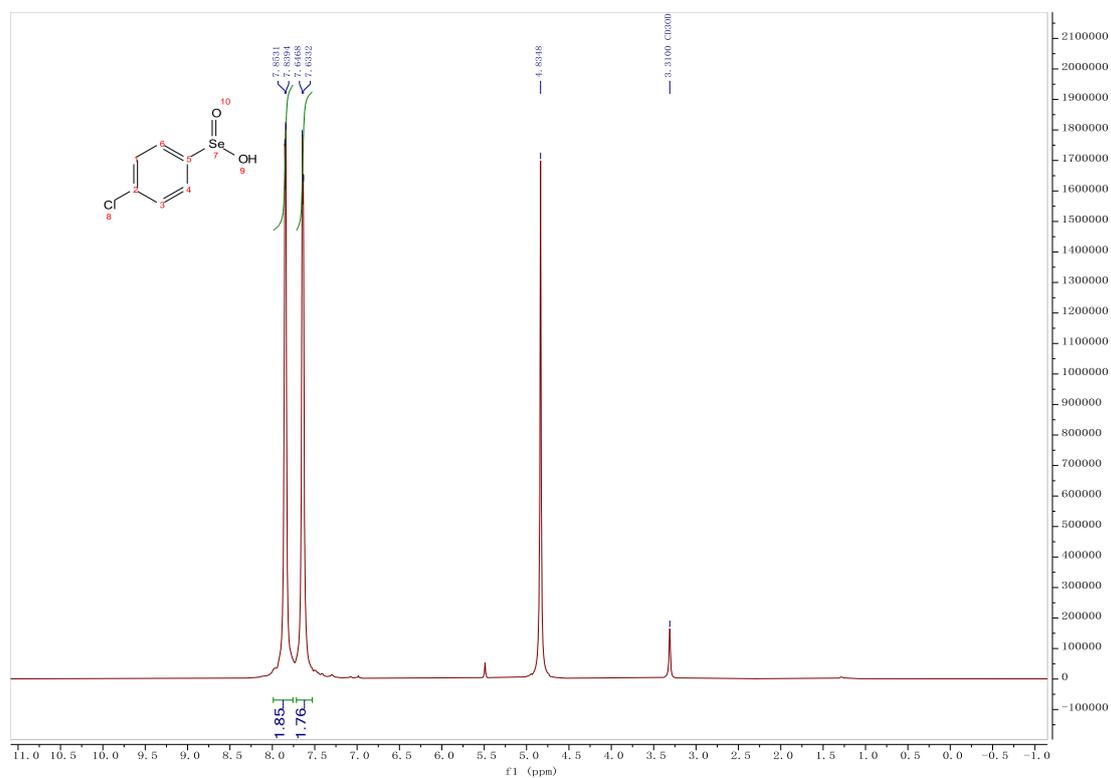


Figure S16. ^1H NMR Spectra of **2h** (600 MHz, CD_3OD)

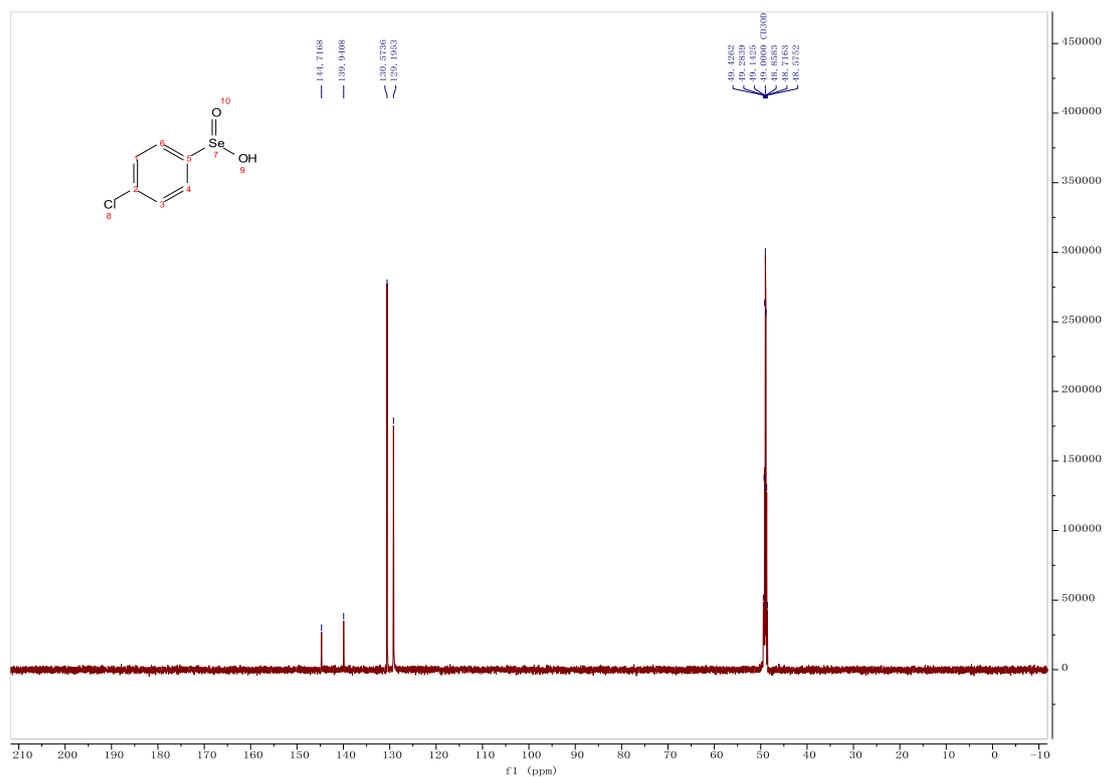


Figure S17. $^{13}\text{C}\{^1\text{H}\}$ NMR Spectra of **2h** (151 MHz, CD_3OD)

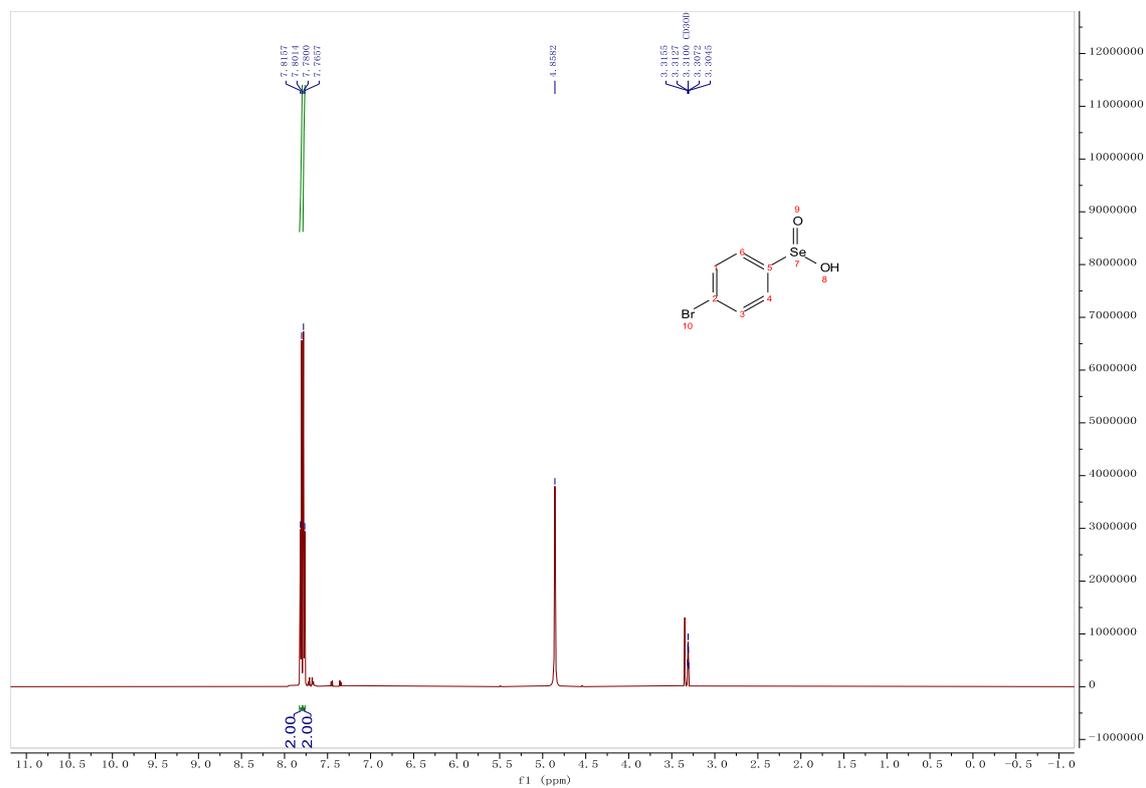


Figure S18. ^1H NMR Spectra of **2i** (600 MHz, CD_3OD)

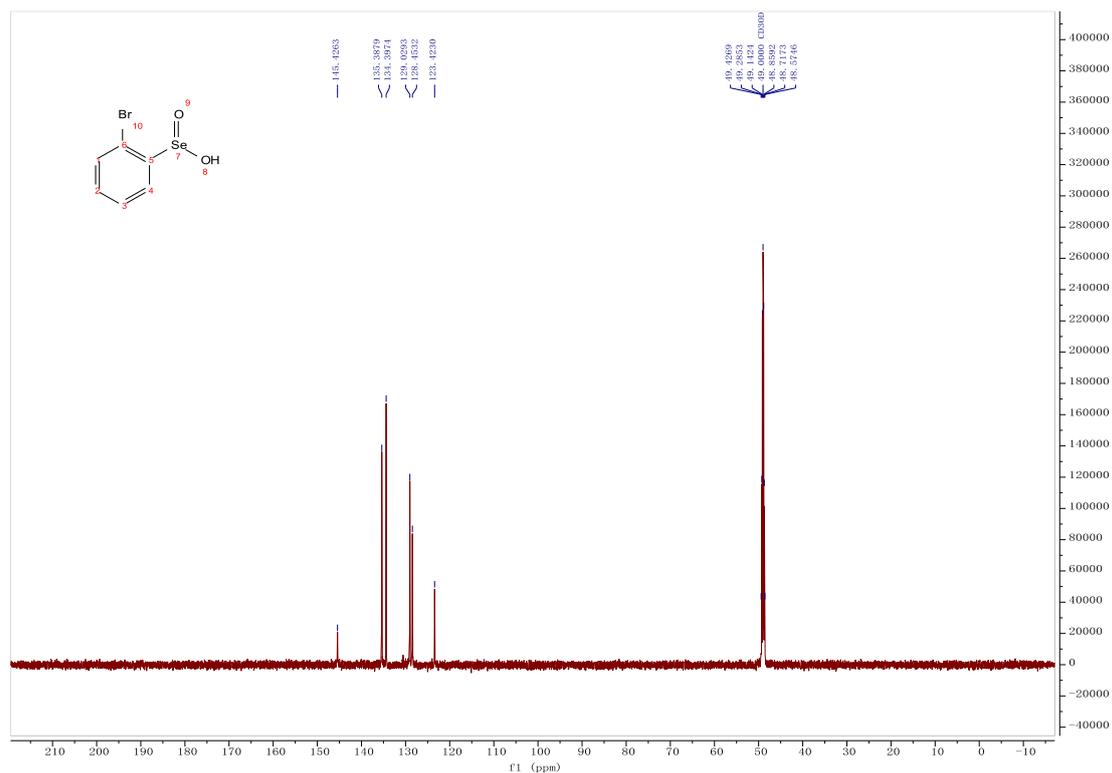


Figure S21. $^{13}\text{C}\{^1\text{H}\}$ NMR Spectra of **2j** (151 MHz, CD_3OD)

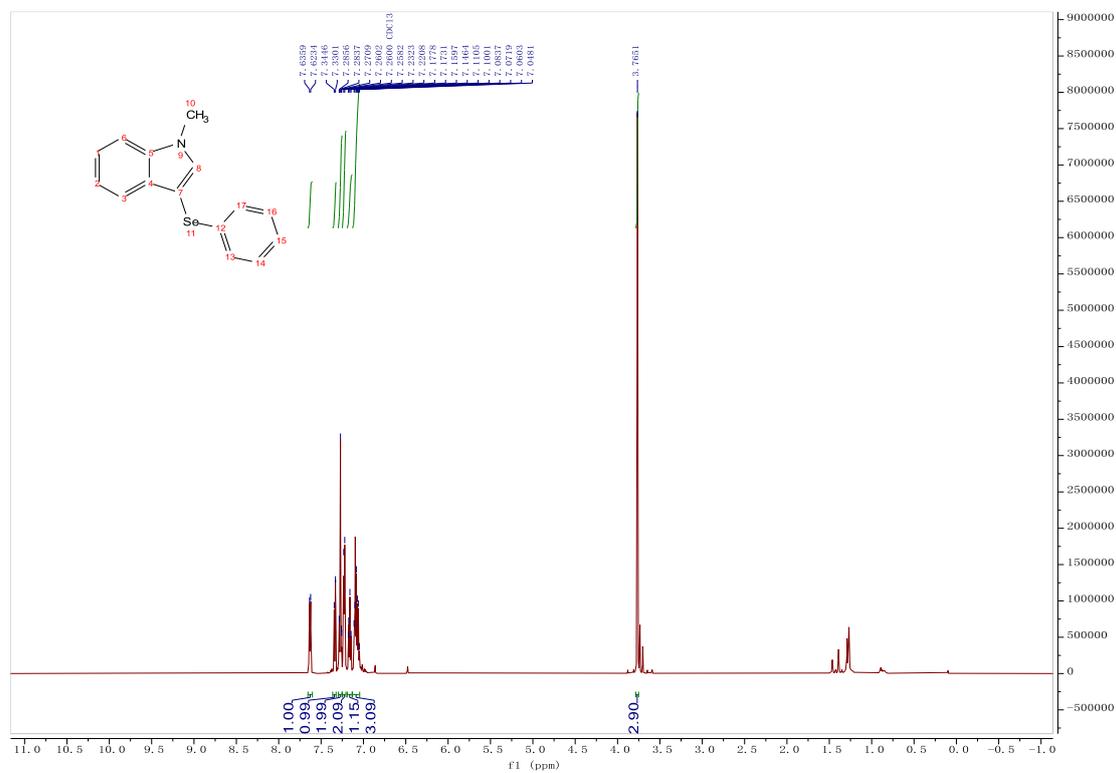


Figure S22. ^1H NMR Spectra of **3'** (600 MHz, CD_3OD)

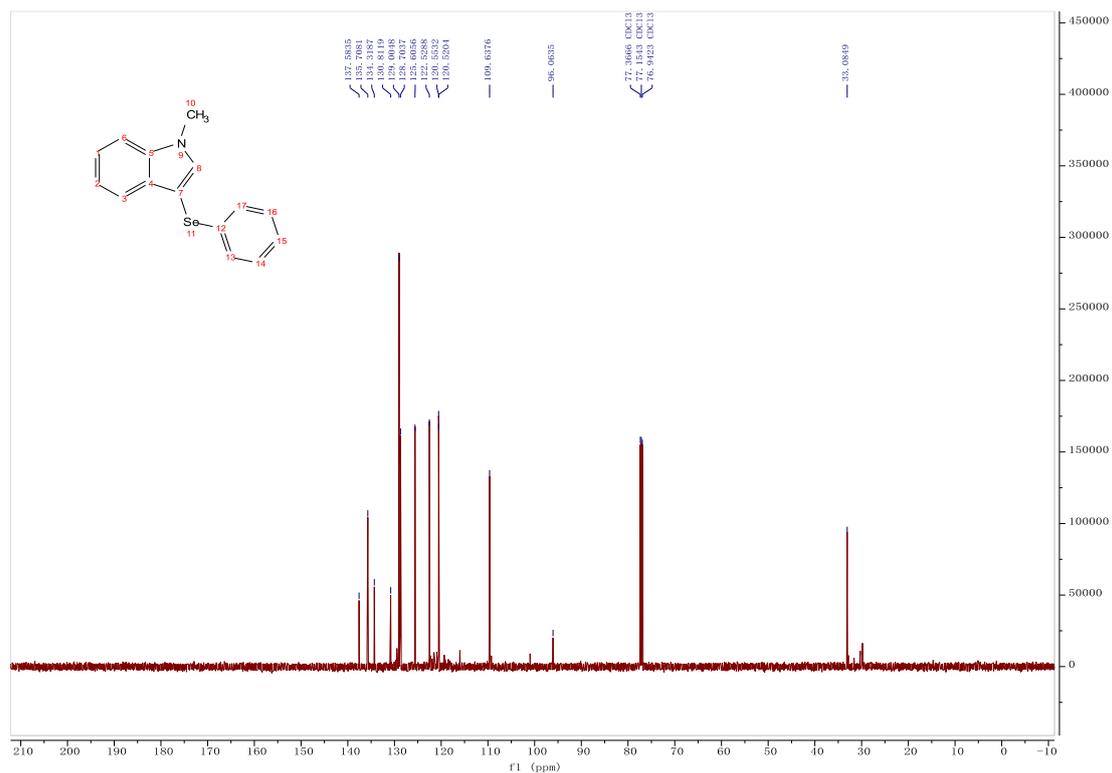


Figure S23. $^{13}\text{C}\{^1\text{H}\}$ NMR Spectra of **3'** (151 MHz, CDCl_3)

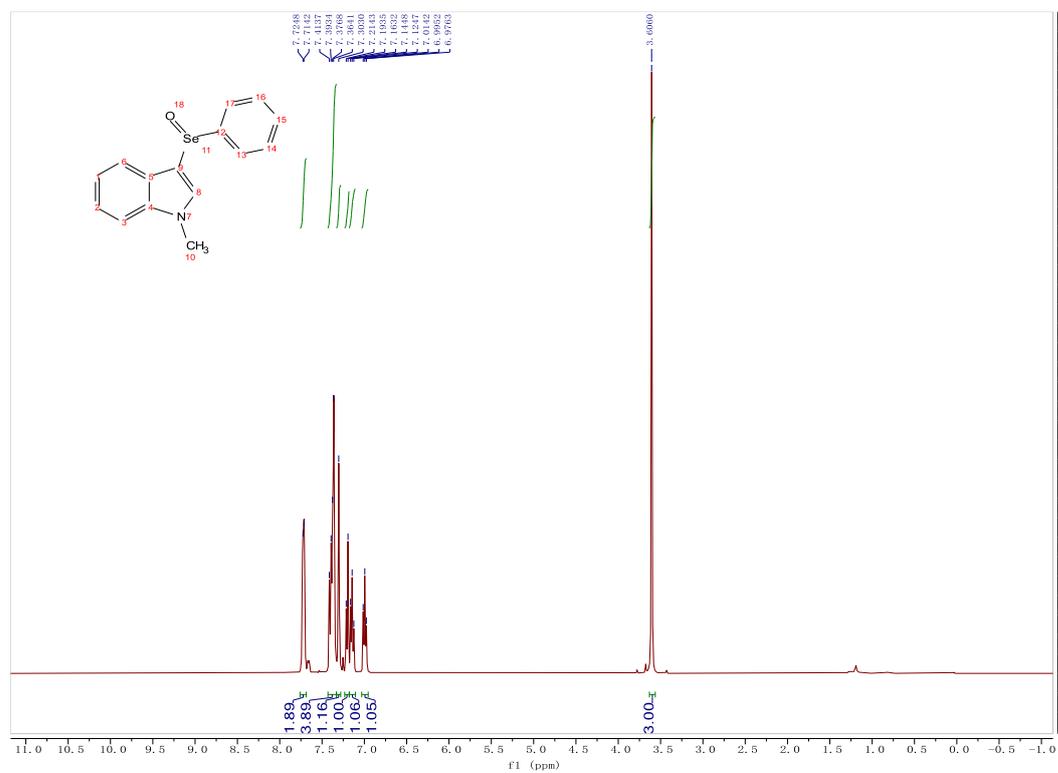


Figure S24. ^1H NMR Spectra of **3** (400 MHz, CDCl_3)

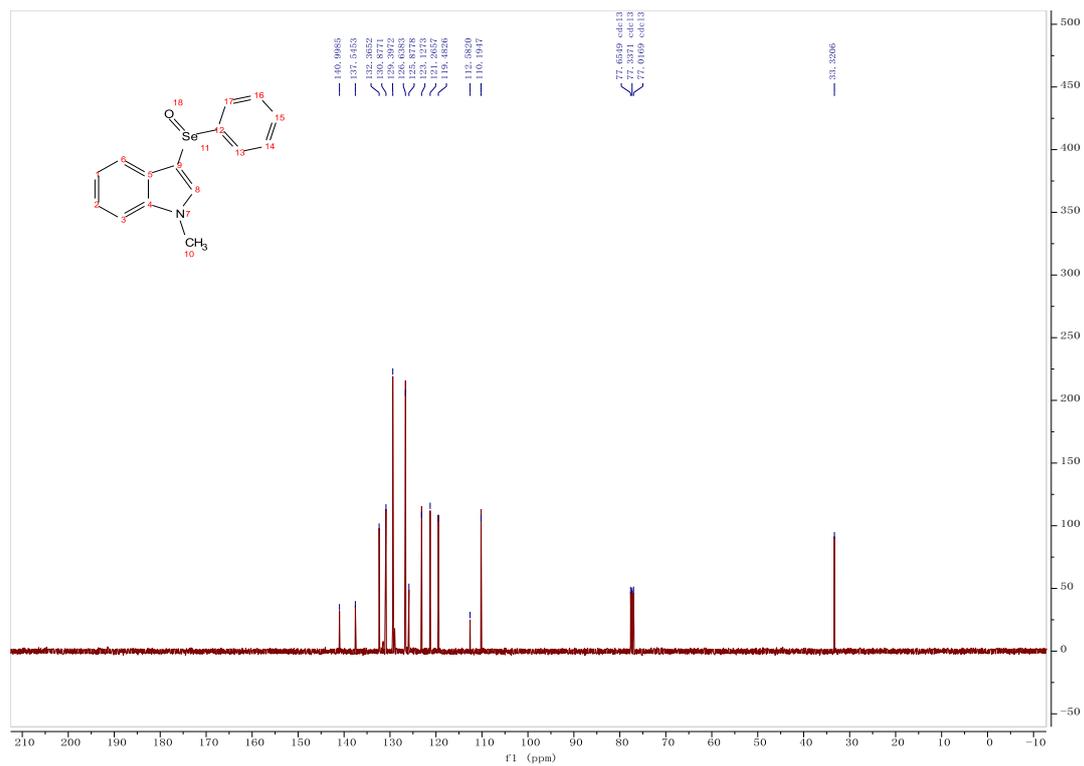


Figure S25. $^{13}\text{C}\{^1\text{H}\}$ NMR Spectra of **3** (100 MHz, CDCl_3)

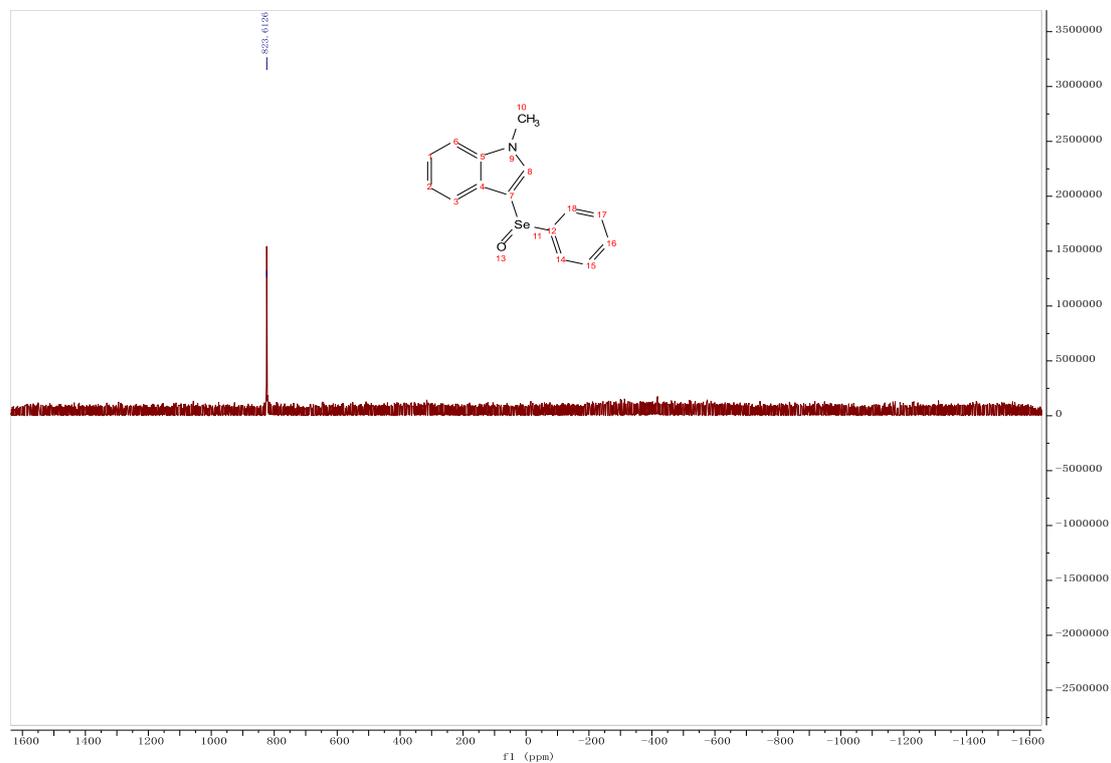


Figure S26. ^{77}Se NMR Spectra of **3** (114 MHz, CDCl_3)

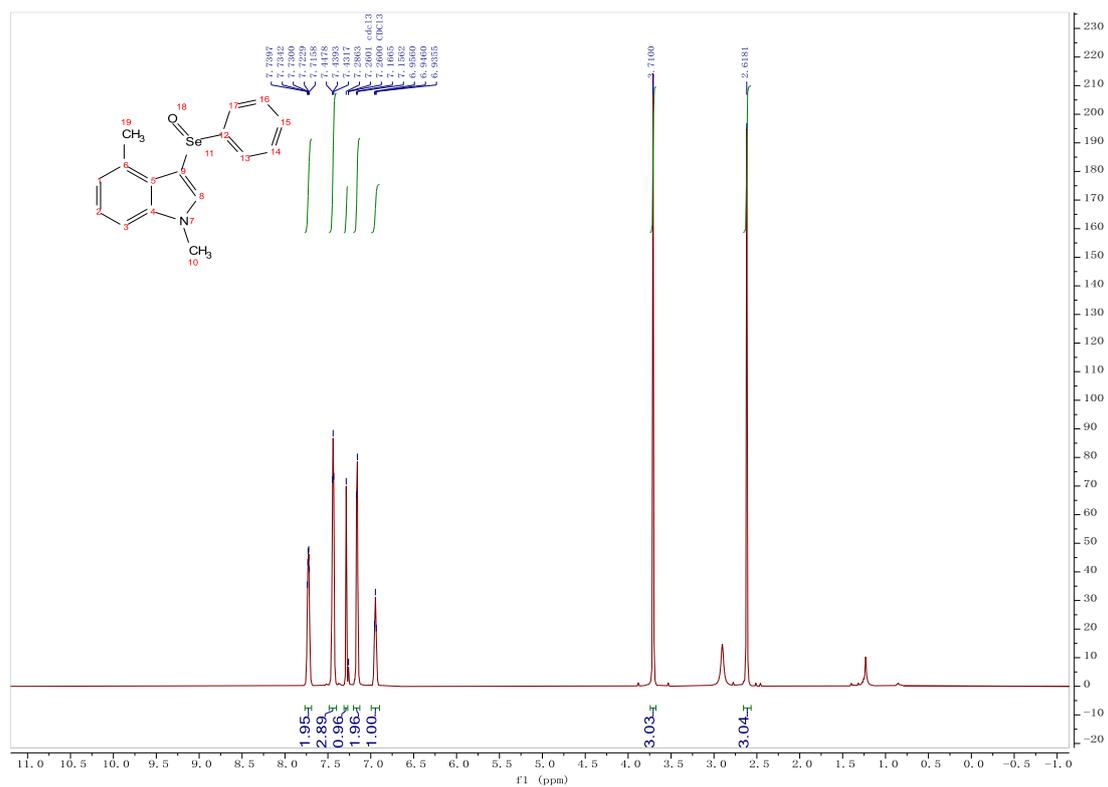


Figure 27. ^1H NMR Spectra of **4** (400 MHz, CDCl_3)

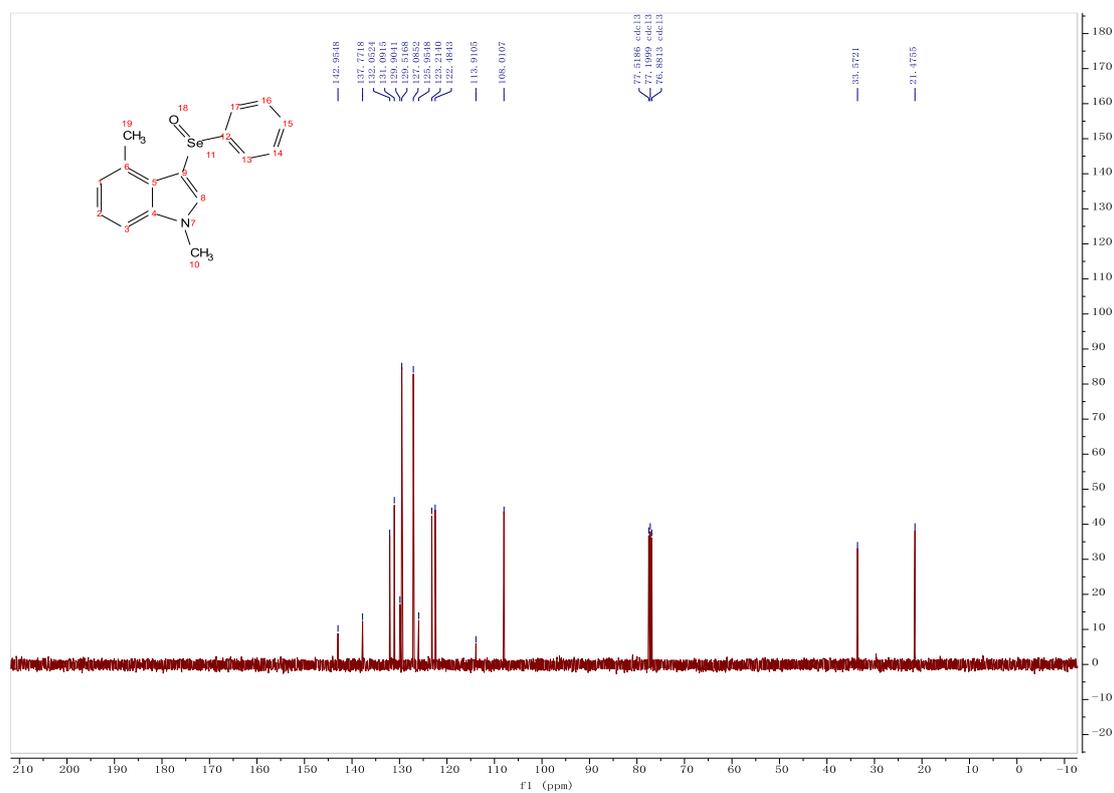


Figure S28. $^{13}\text{C}\{^1\text{H}\}$ NMR Spectra of **4** (100 MHz, CDCl_3)

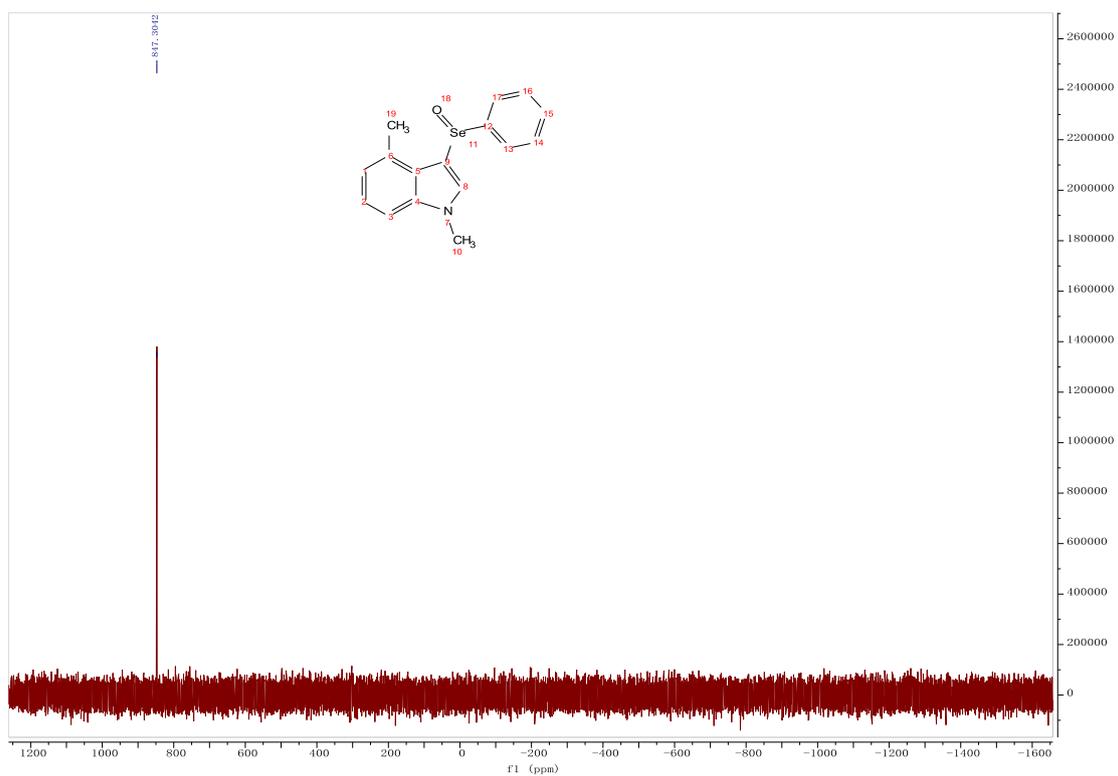


Figure S29. ⁷⁷Se NMR Spectra of **4** (400 MHz, CDCl₃)

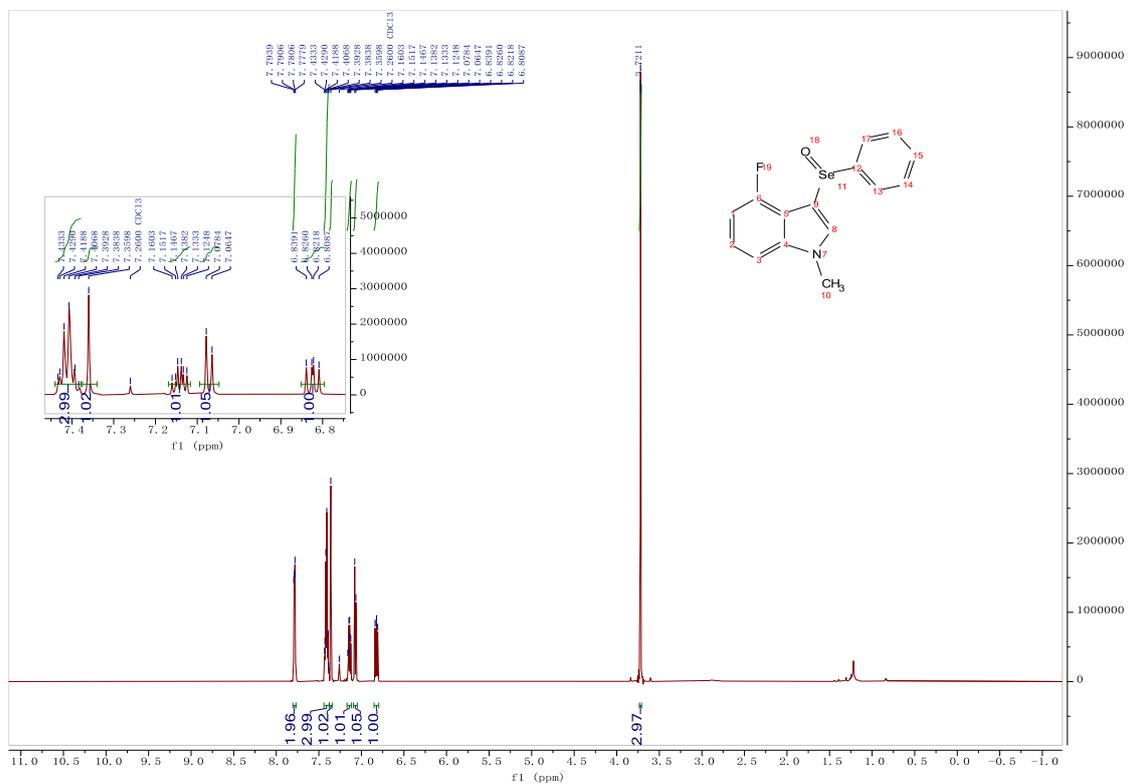


Figure S30. ¹H NMR Spectra of **5** (600 MHz, CDCl₃)

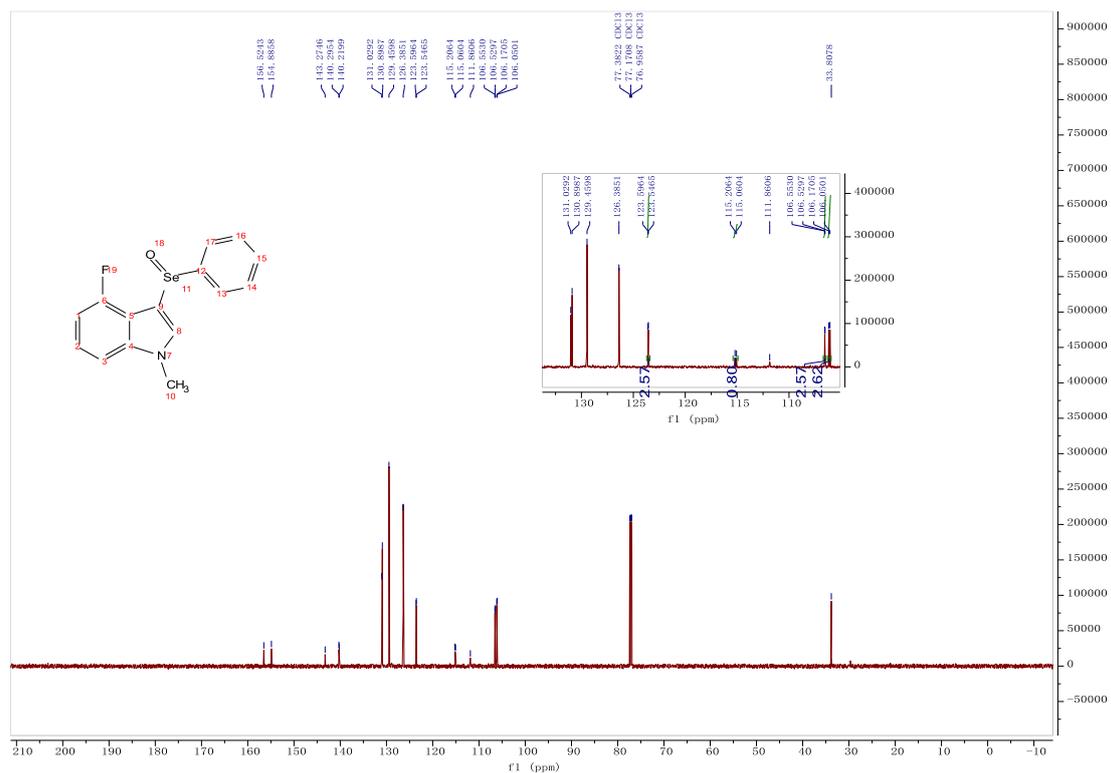


Figure S31. $^{13}\text{C}\{^1\text{H}\}$ NMR Spectra of **5** (150 MHz, CDCl_3)

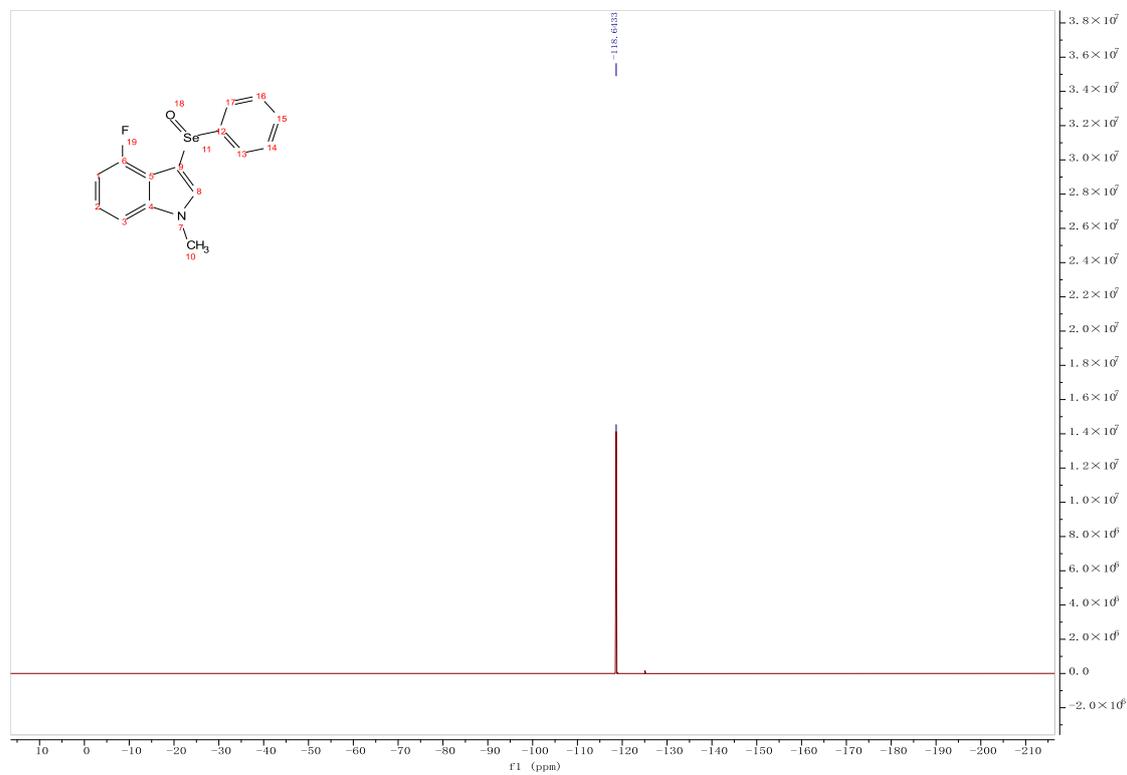


Figure S32. ^{19}F NMR spectrum of **5** (565 MHz, CDCl_3)

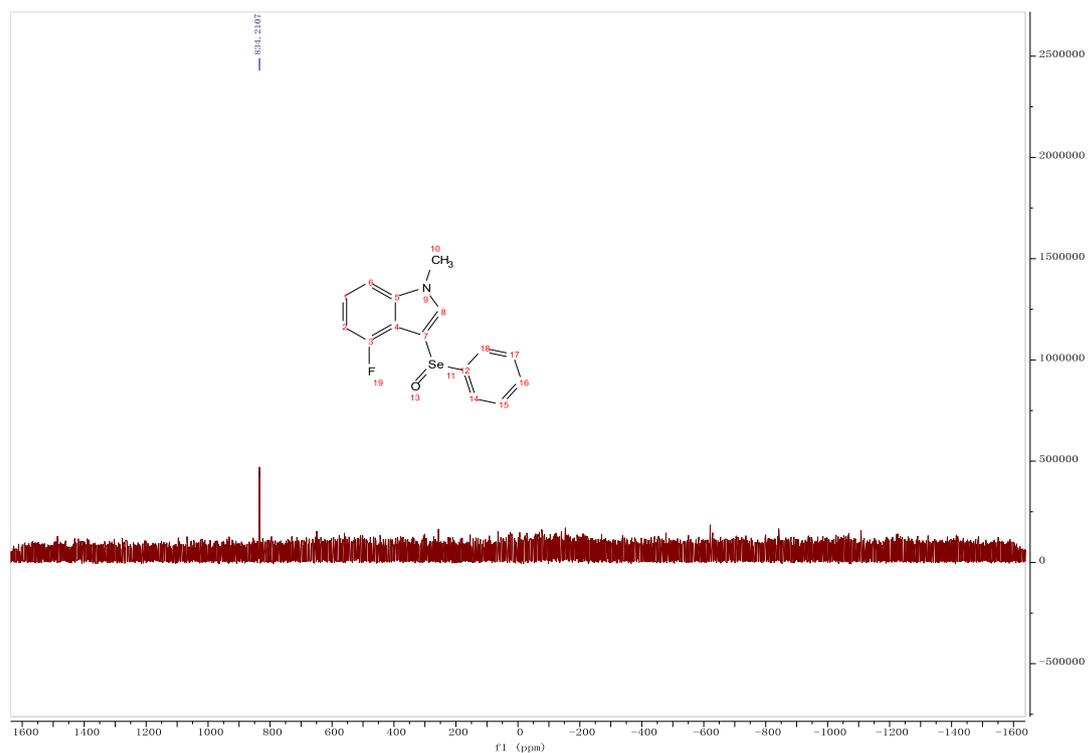


Figure S33. ^{77}Se NMR spectrum of **5** (114 MHz, CDCl_3)

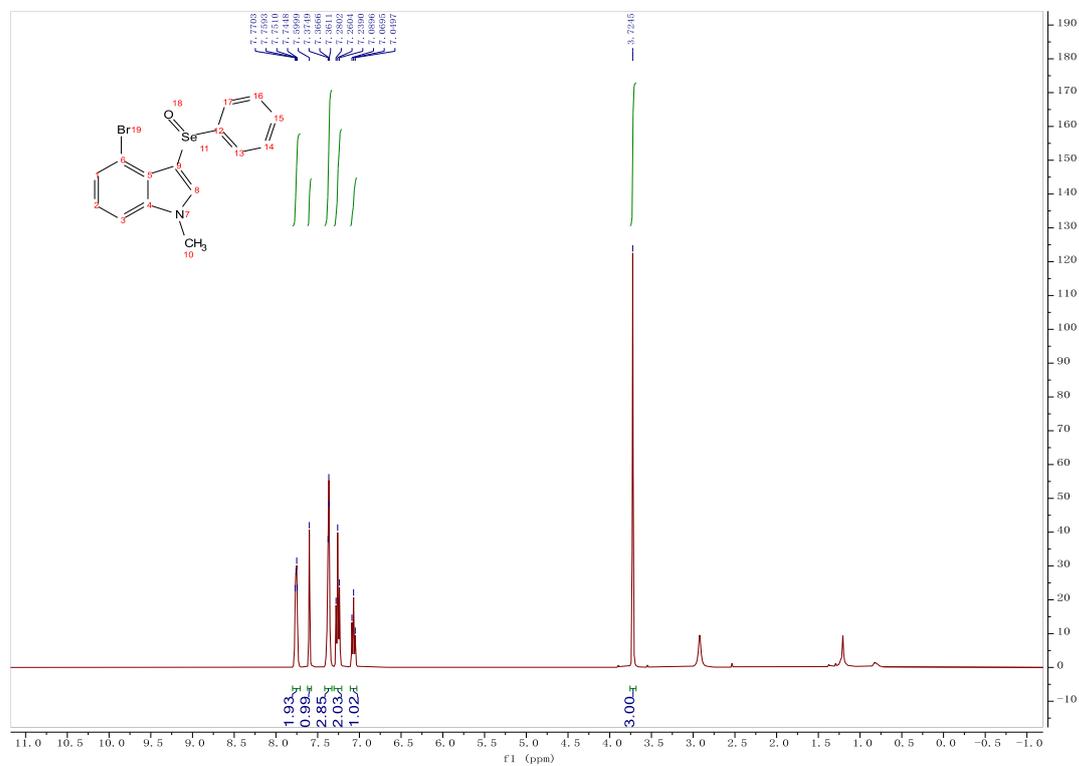


Figure S34. ^1H NMR Spectra of **6** (400 MHz, CDCl_3)

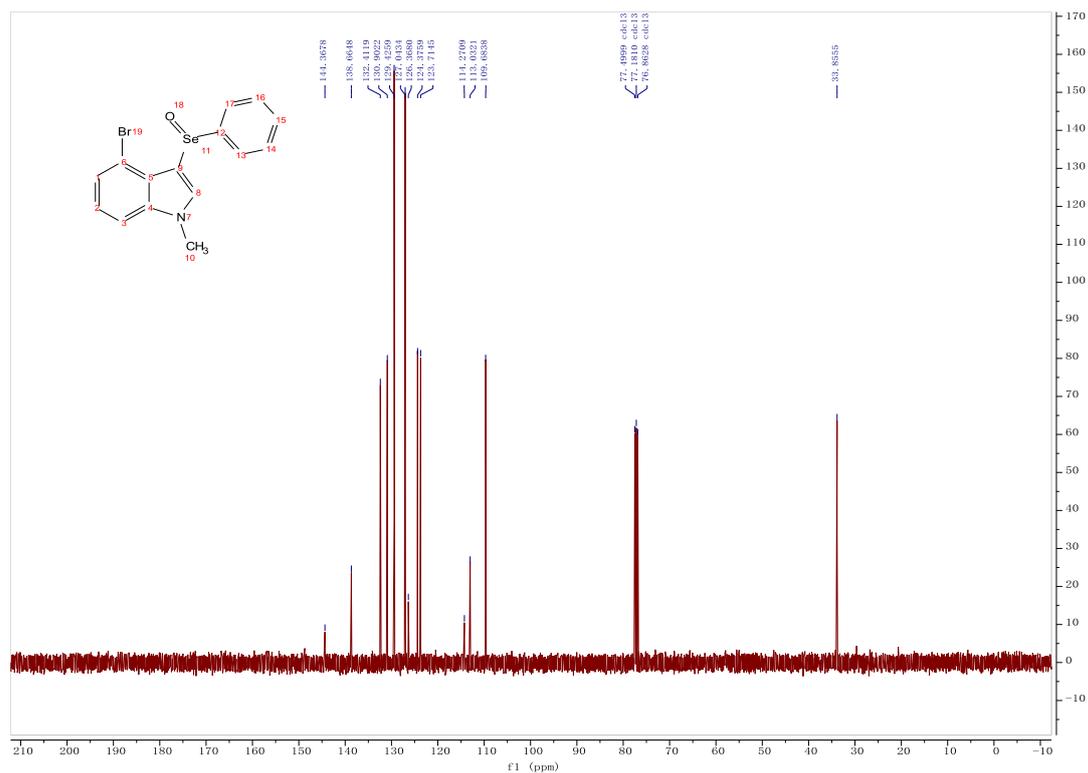


Figure S35. $^{13}\text{C}\{^1\text{H}\}$ NMR Spectra of **6** (100 MHz, CDCl_3)

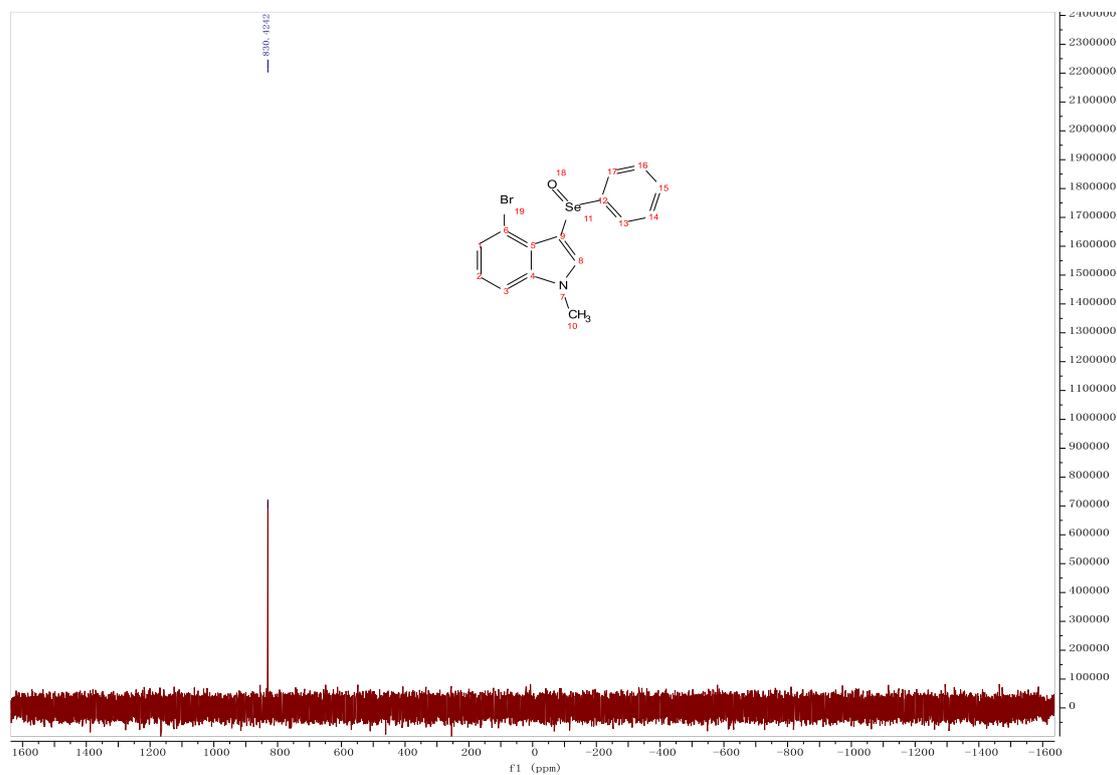


Figure S36. ^{77}Se NMR spectrum of **6** (114 MHz, CDCl_3)

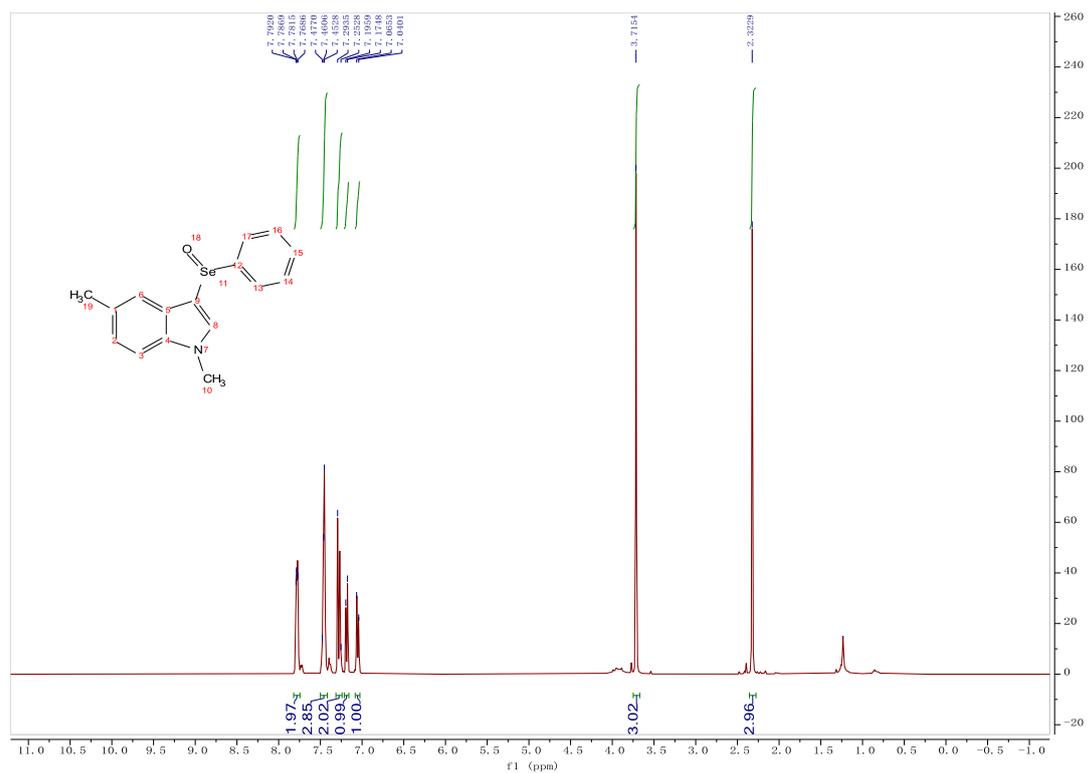


Figure S37. ^1H NMR Spectra of 7 (400 MHz, CDCl_3)

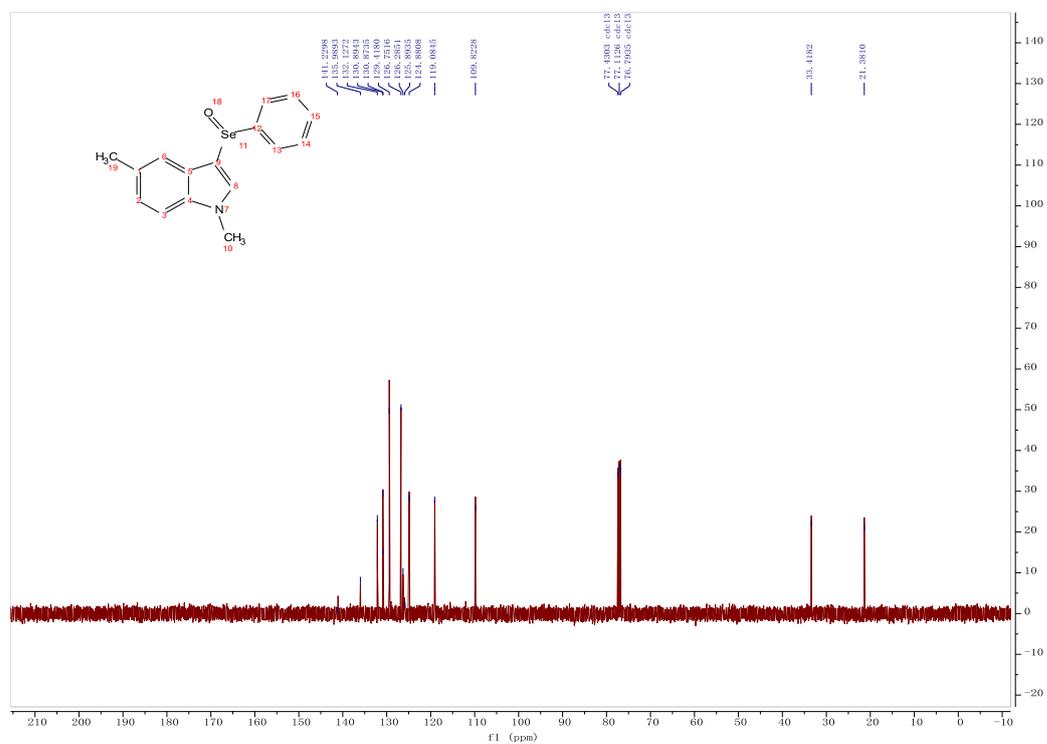


Figure S38. $^{13}\text{C}\{^1\text{H}\}$ NMR Spectra of 7 (100 MHz, CDCl_3)

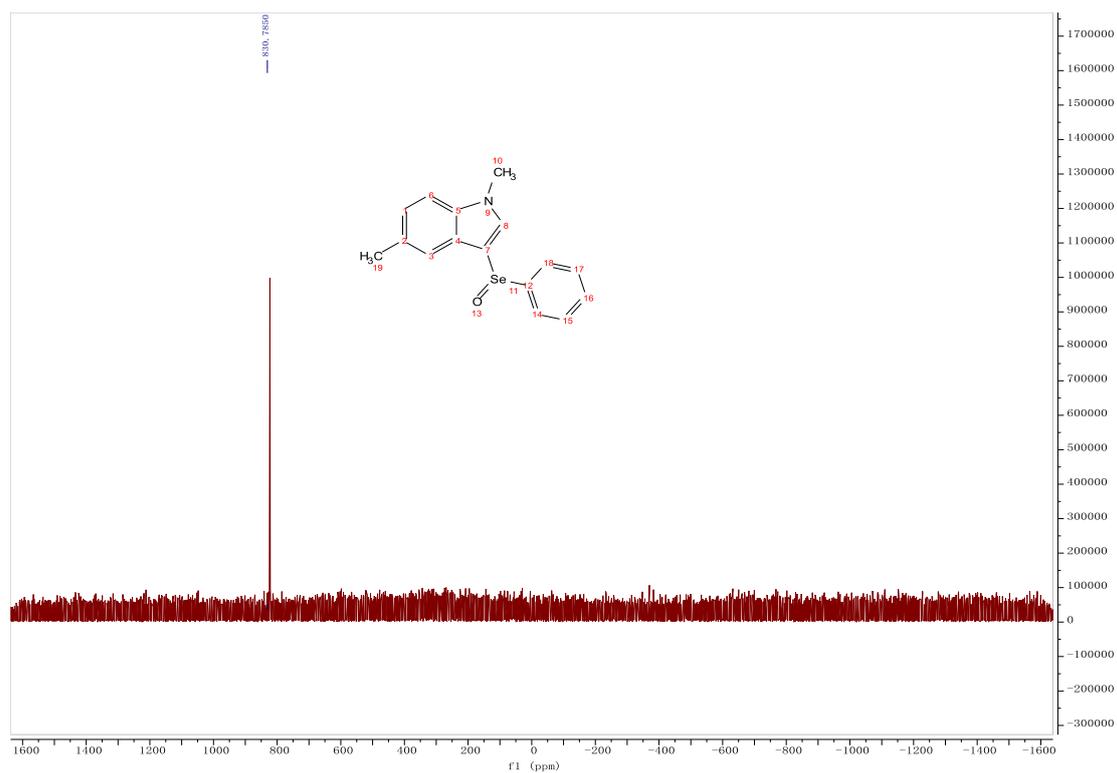


Figure S40. ^{77}Se NMR spectrum of **7** (114 MHz, CDCl_3)

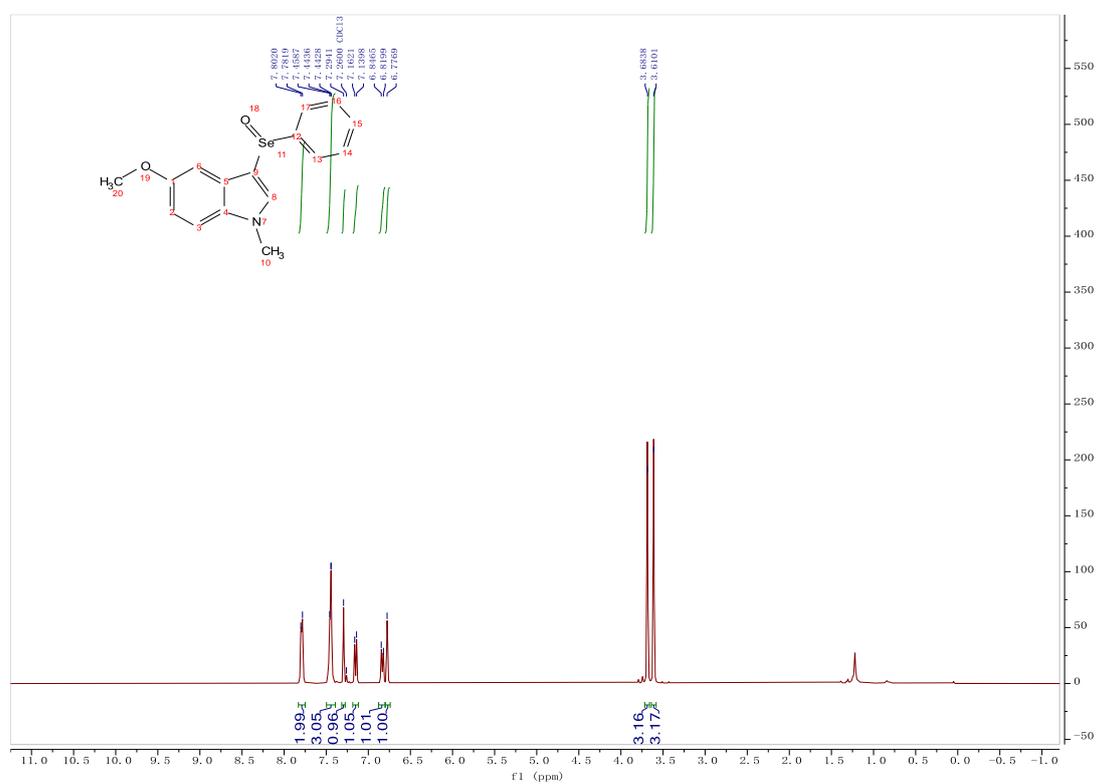


Figure S41. ^1H NMR Spectra of **8** (400 MHz, CDCl_3)

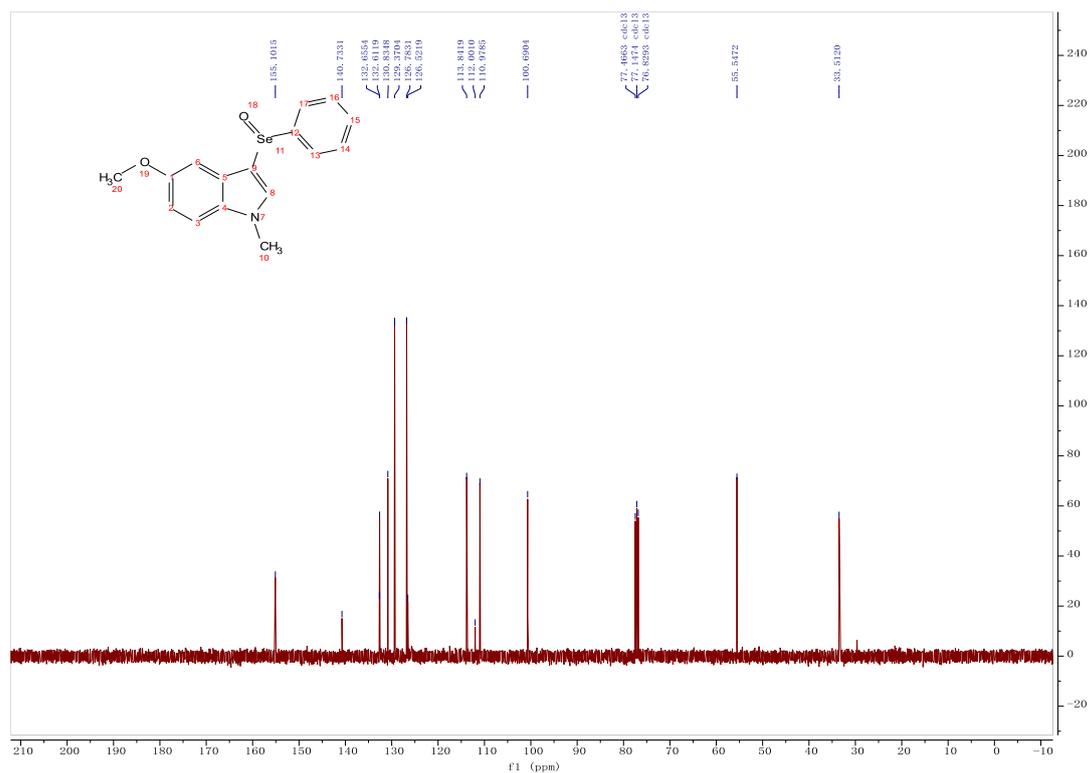


Figure S42. $^{13}\text{C}\{^1\text{H}\}$ NMR Spectra of **8** (100 MHz, CDCl_3)

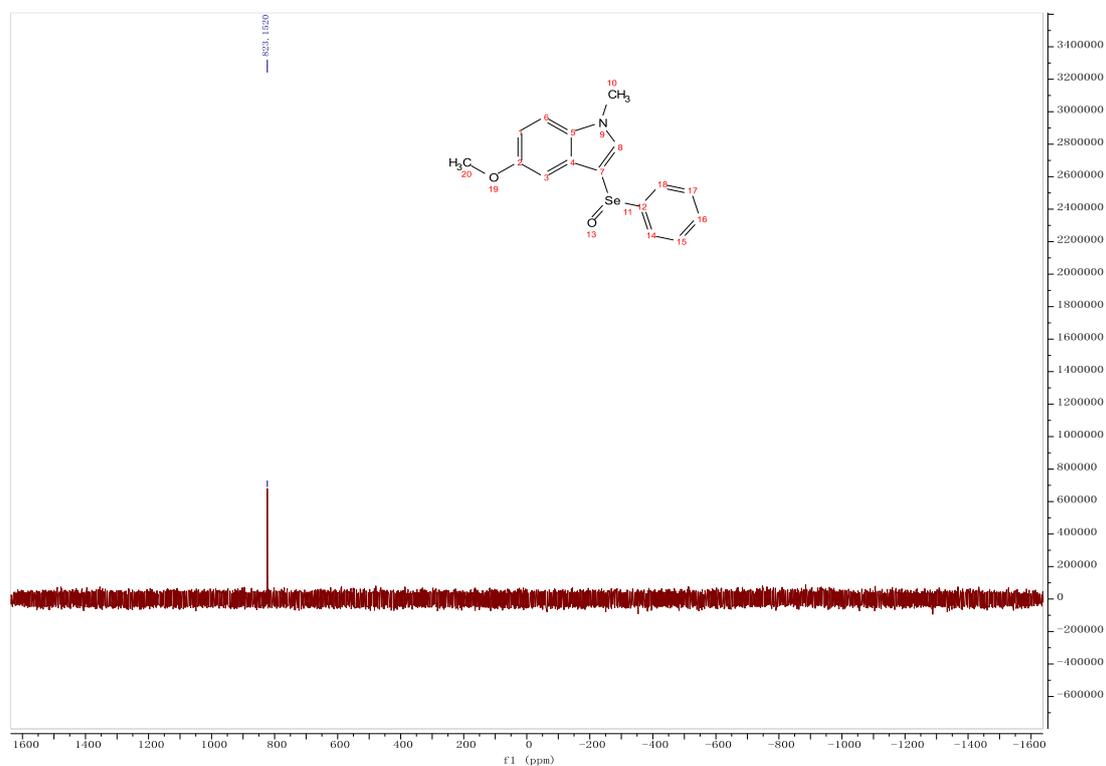


Figure S43. ^{77}Se NMR spectrum of **8** (114 MHz, CDCl_3)

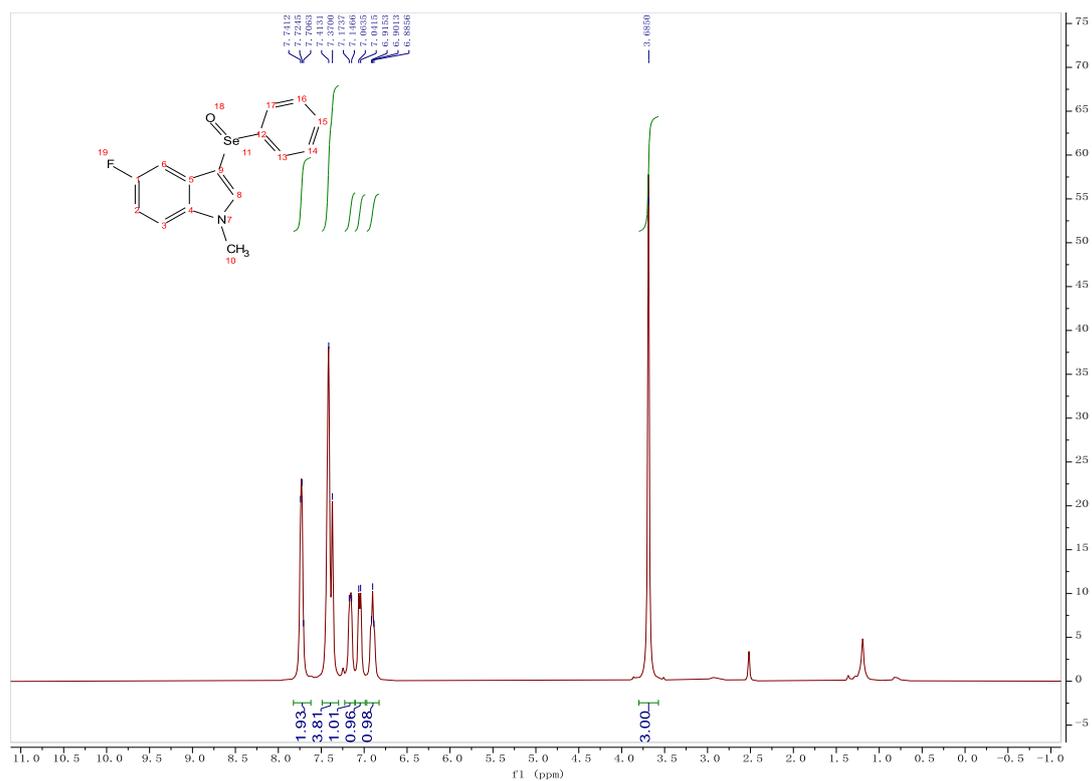


Figure S44. ^1H NMR Spectra of **9** (400 MHz, CDCl_3)

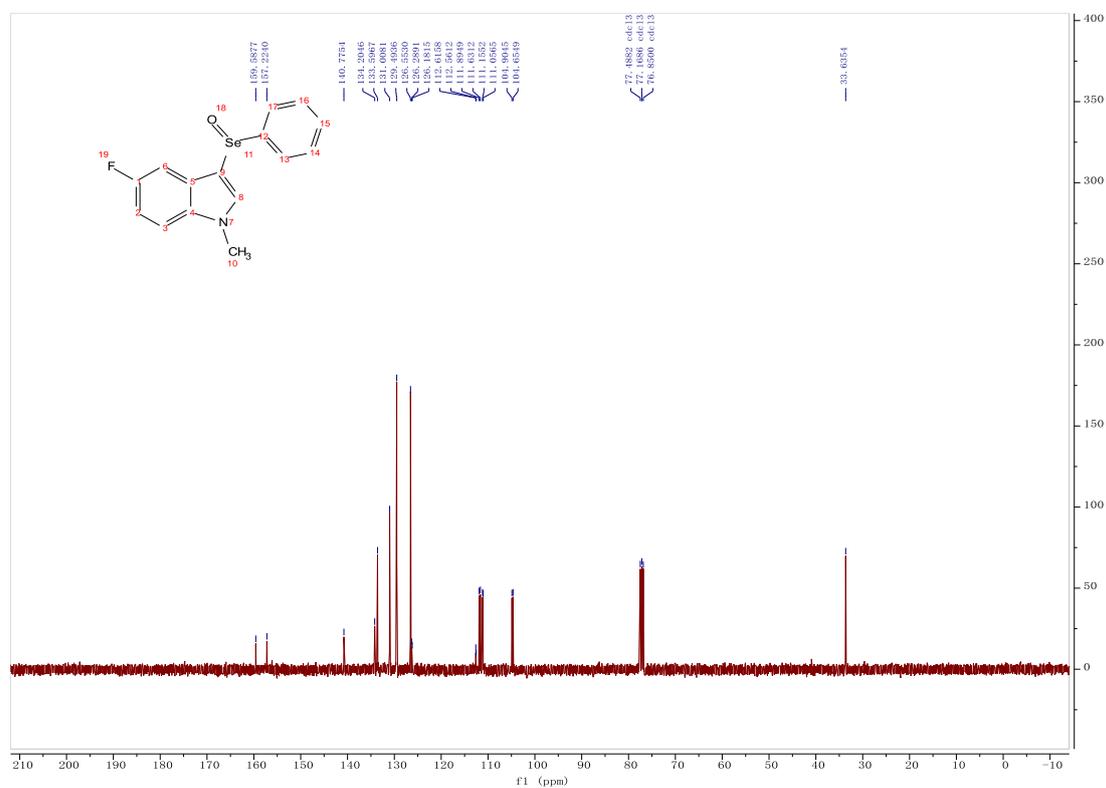


Figure S45. $^{13}\text{C}\{^1\text{H}\}$ NMR Spectra of **9** (100 MHz, CDCl_3)

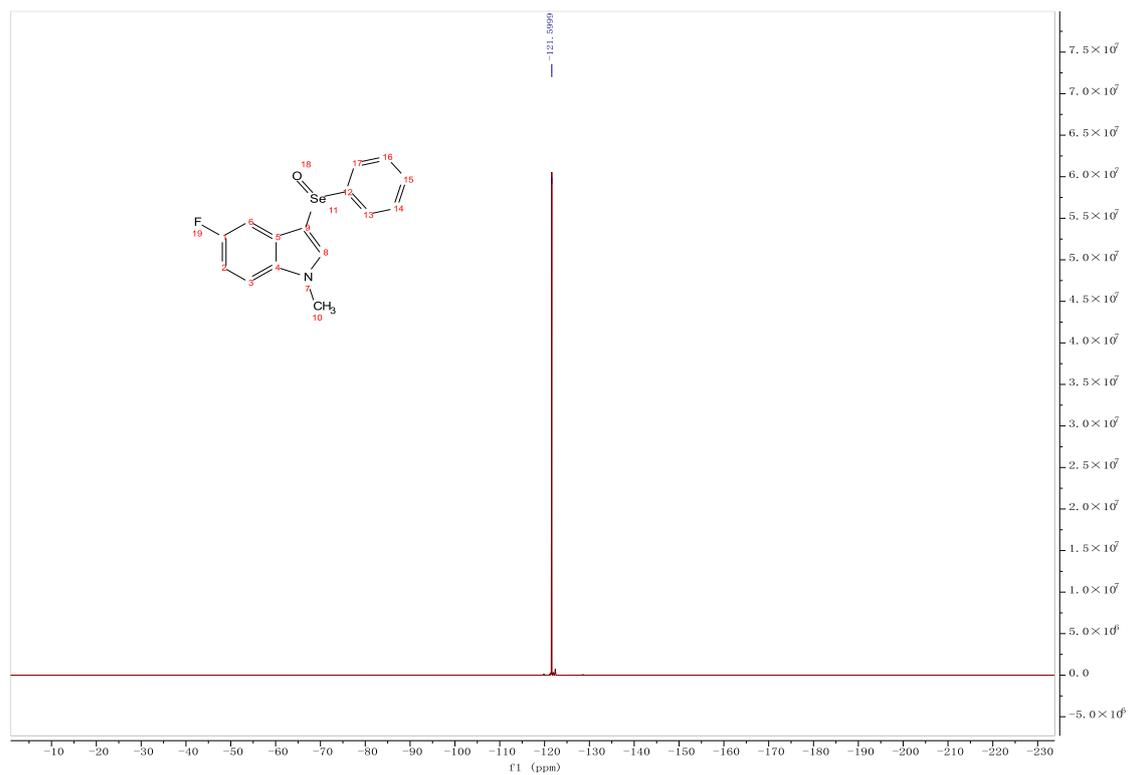


Figure S46. ^{19}F NMR spectrum of **9** (375 MHz, CDCl_3)

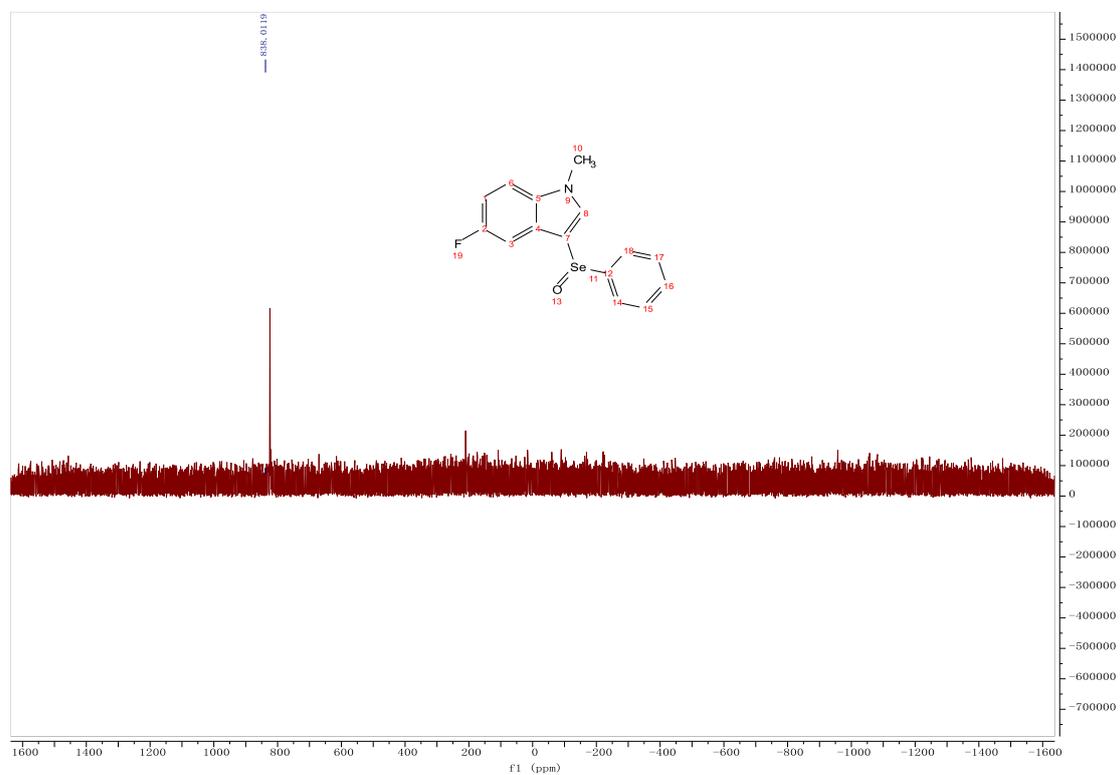


Figure S47. ^{77}Se NMR spectrum of **9** (114 MHz, CDCl_3)

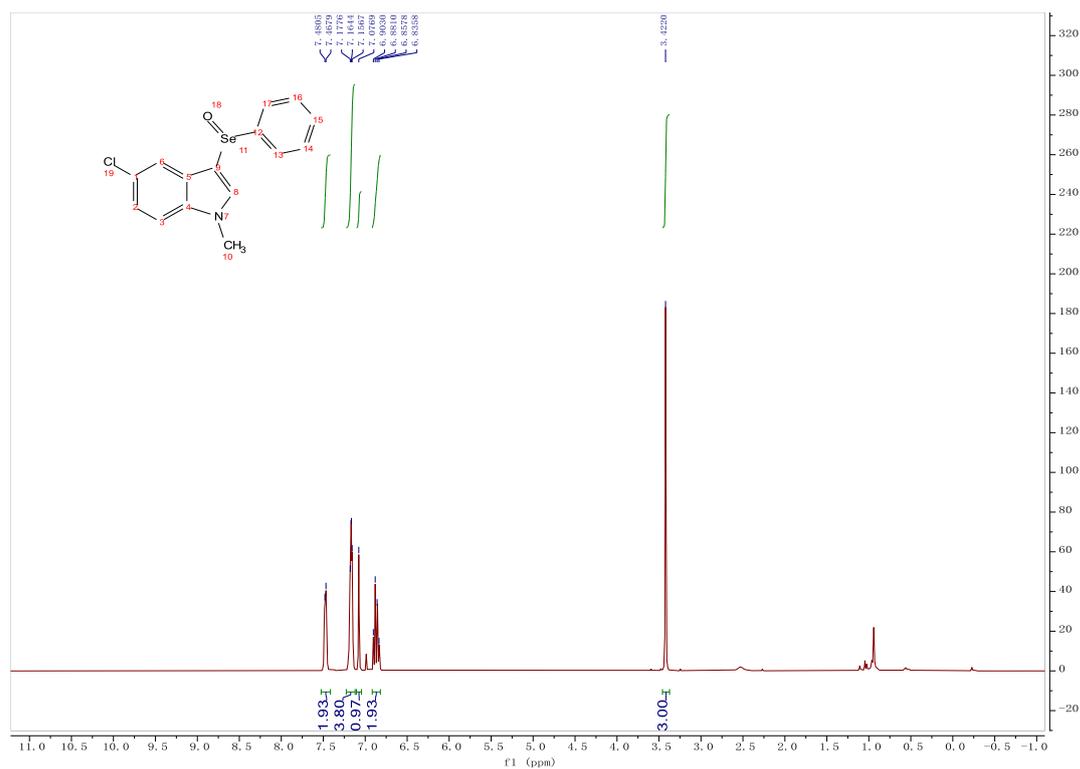


Figure S48. ^1H NMR Spectra of **10** (400 MHz, CDCl_3)

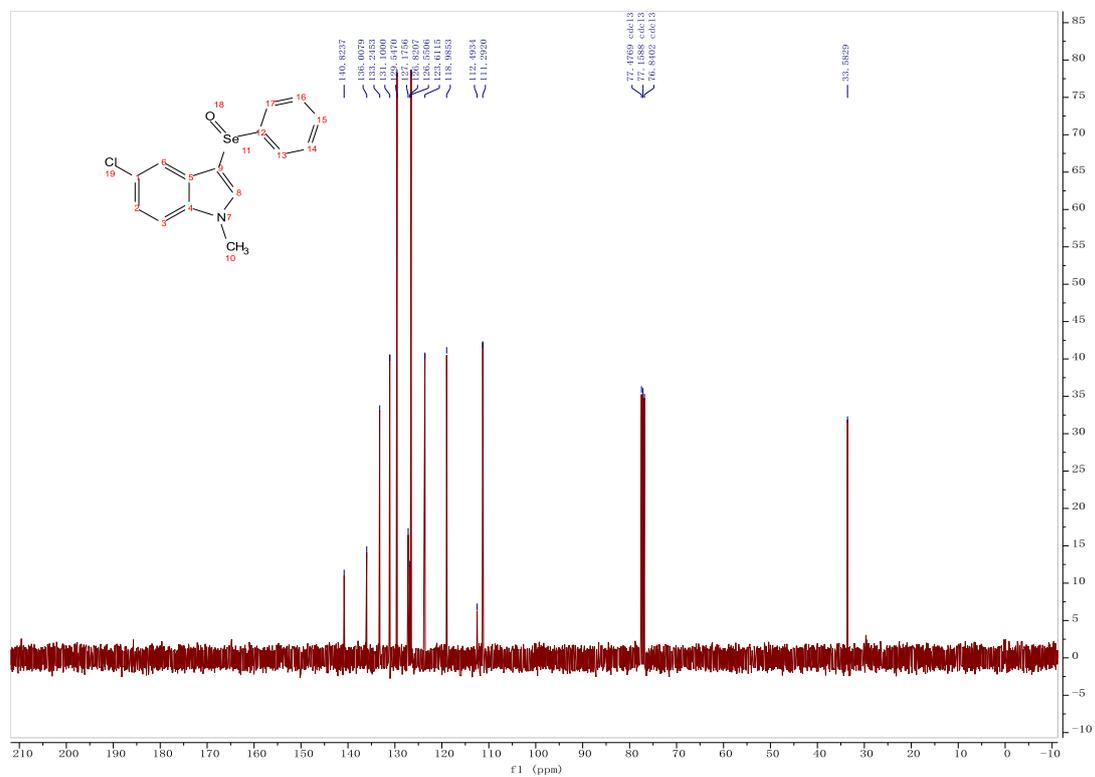


Figure S49. $^{13}\text{C}\{^1\text{H}\}$ NMR Spectra of **10** (100 MHz, CDCl_3)

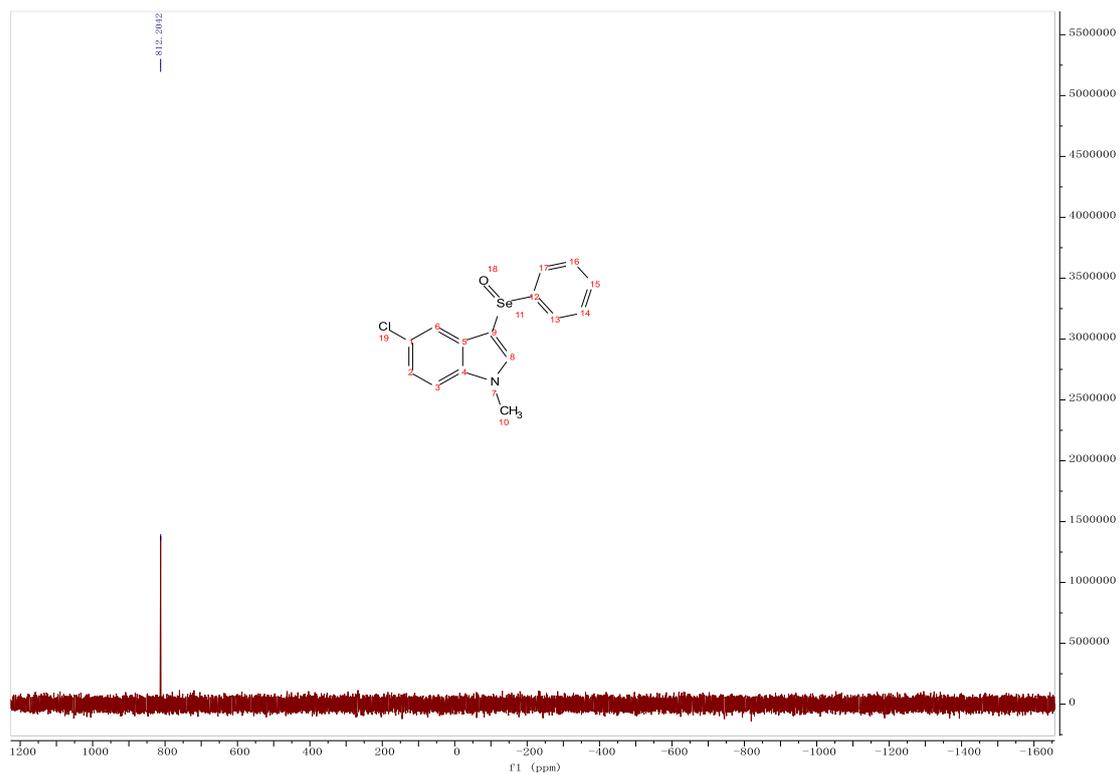


Figure S50. ⁷⁷Se NMR Spectra of **10** (114 MHz, CDCl₃)

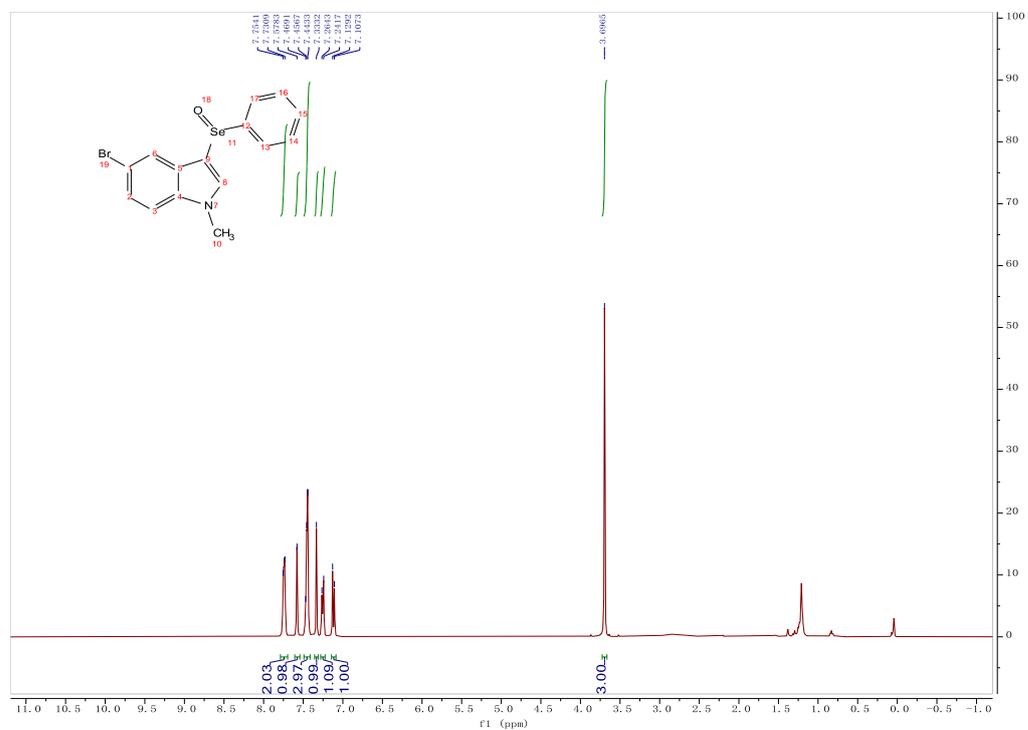


Figure S51. ¹H NMR Spectra of **11** (400 MHz, CDCl₃)

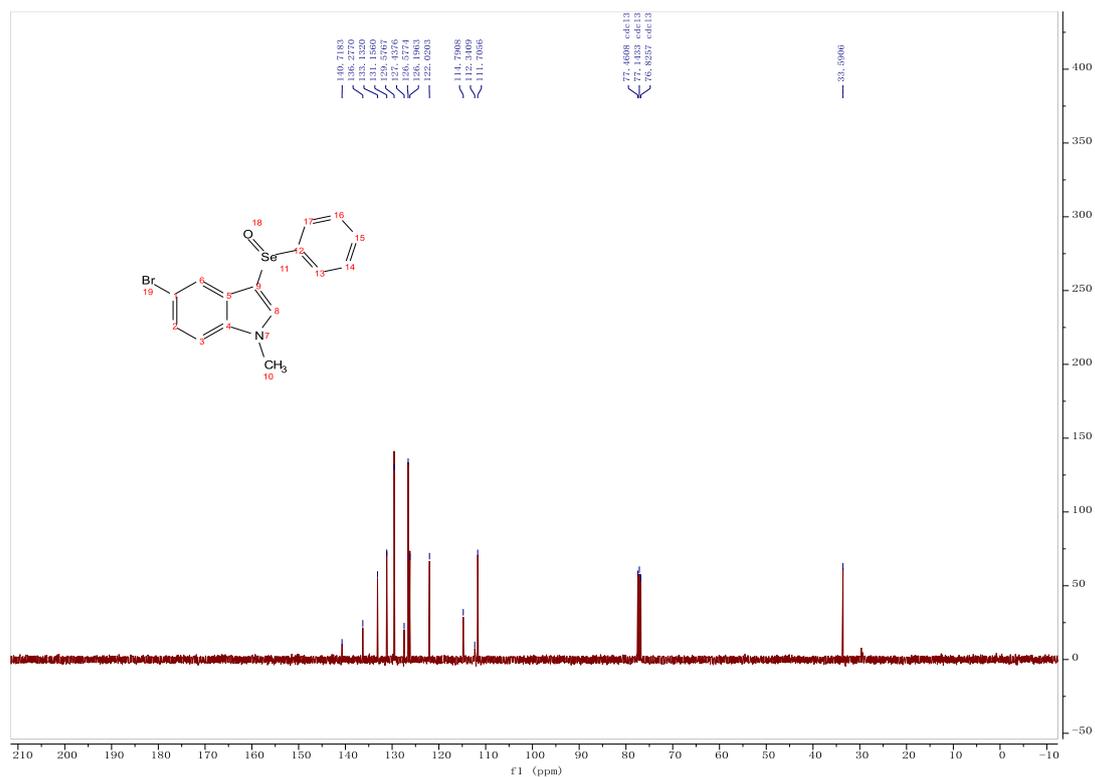


Figure S52. $^{13}\text{C}\{^1\text{H}\}$ NMR Spectra of **11** (100 MHz, CDCl_3)

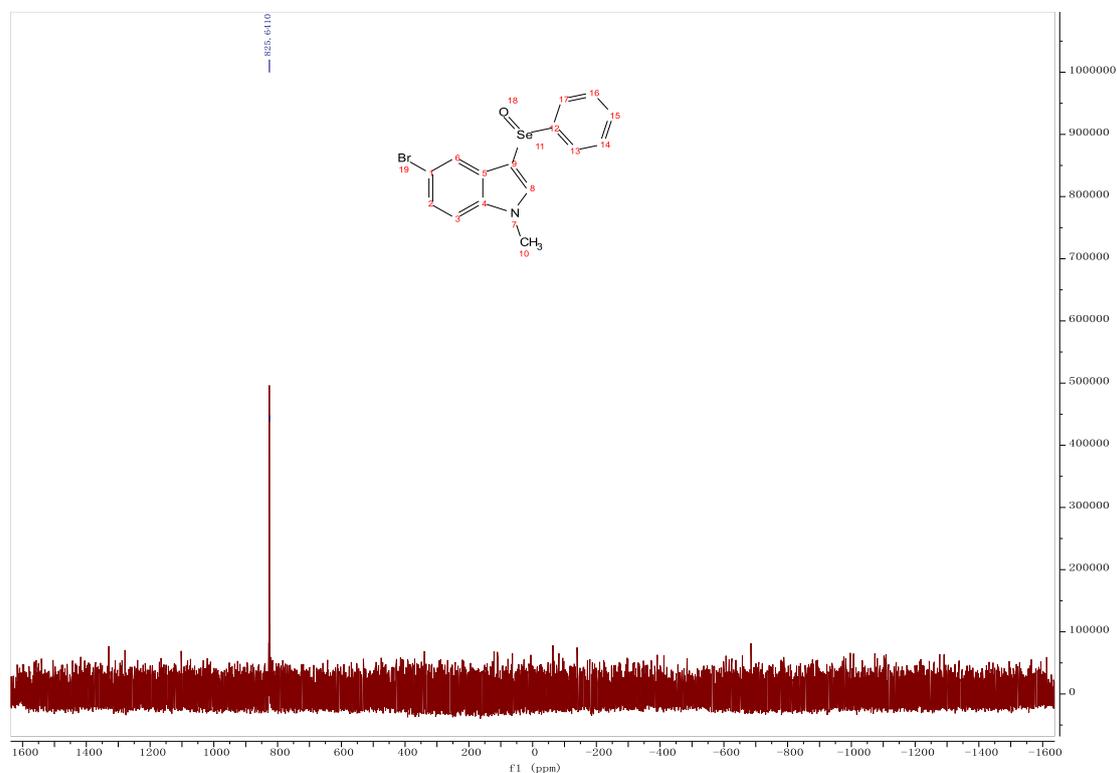


Figure S53. ^{77}Se NMR Spectra of **11** (114 MHz, CDCl_3)

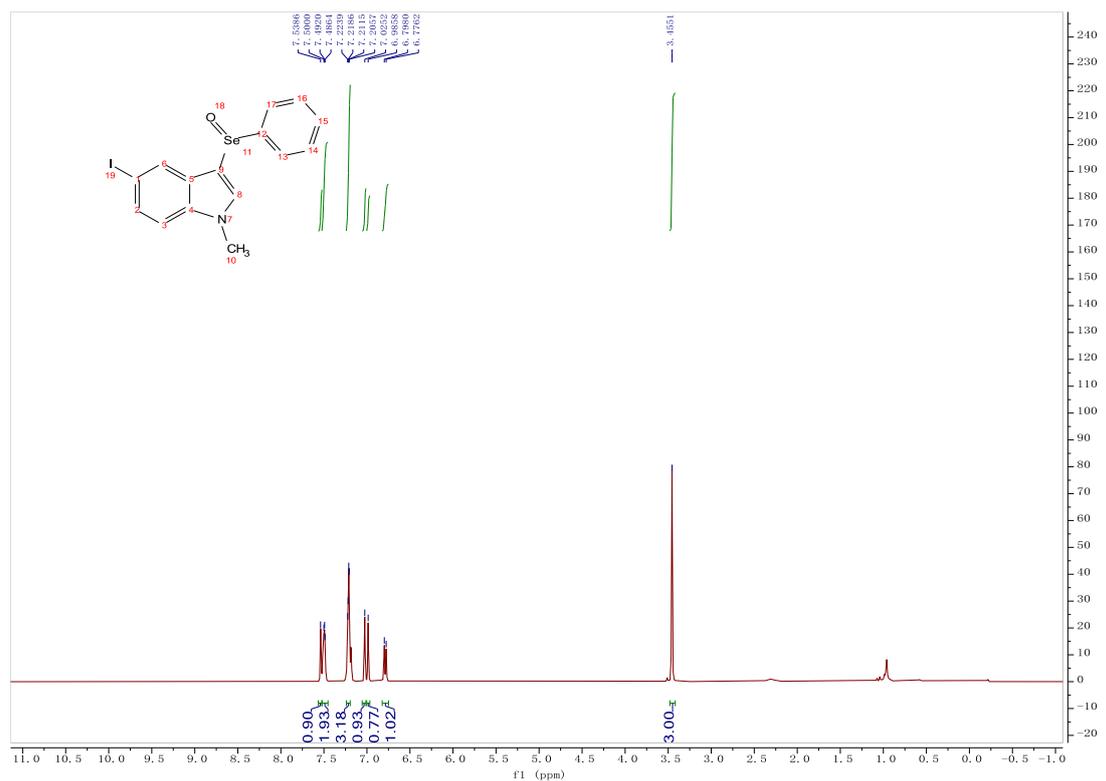


Figure S54. ^1H NMR Spectra of **12** (400 MHz, CDCl_3)

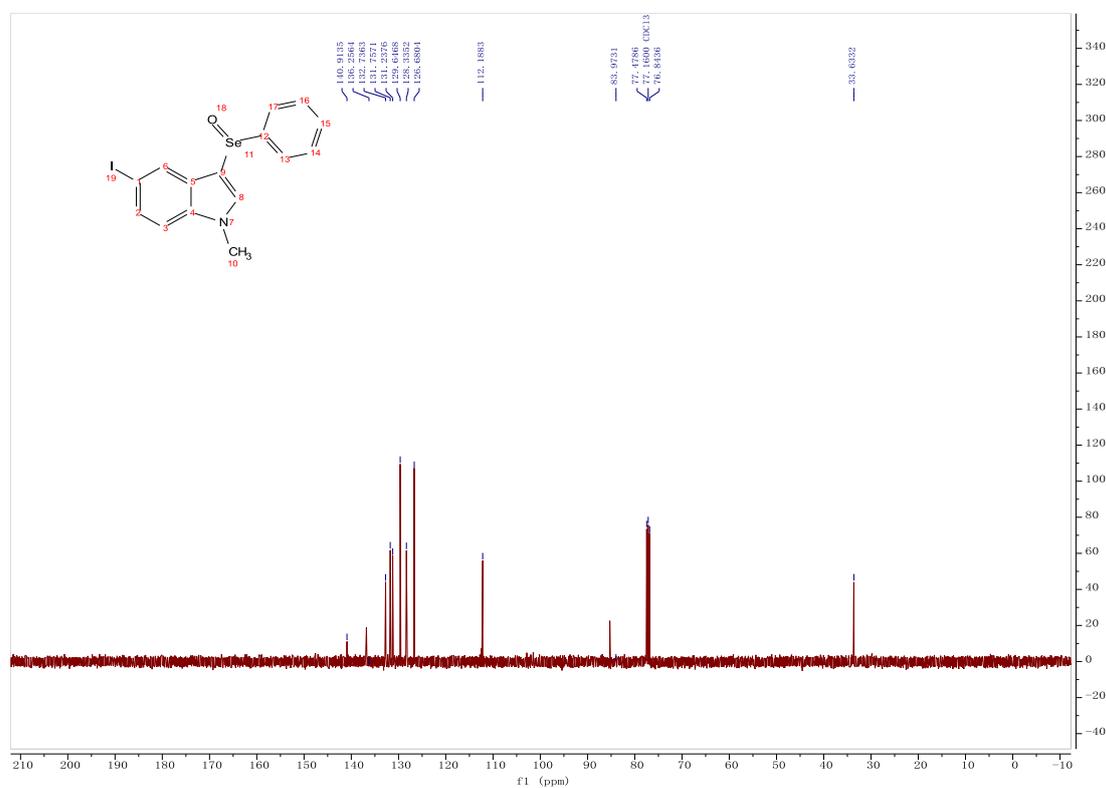


Figure S55. $^{13}\text{C}\{^1\text{H}\}$ NMR Spectra of **12** (100 MHz, CDCl_3)

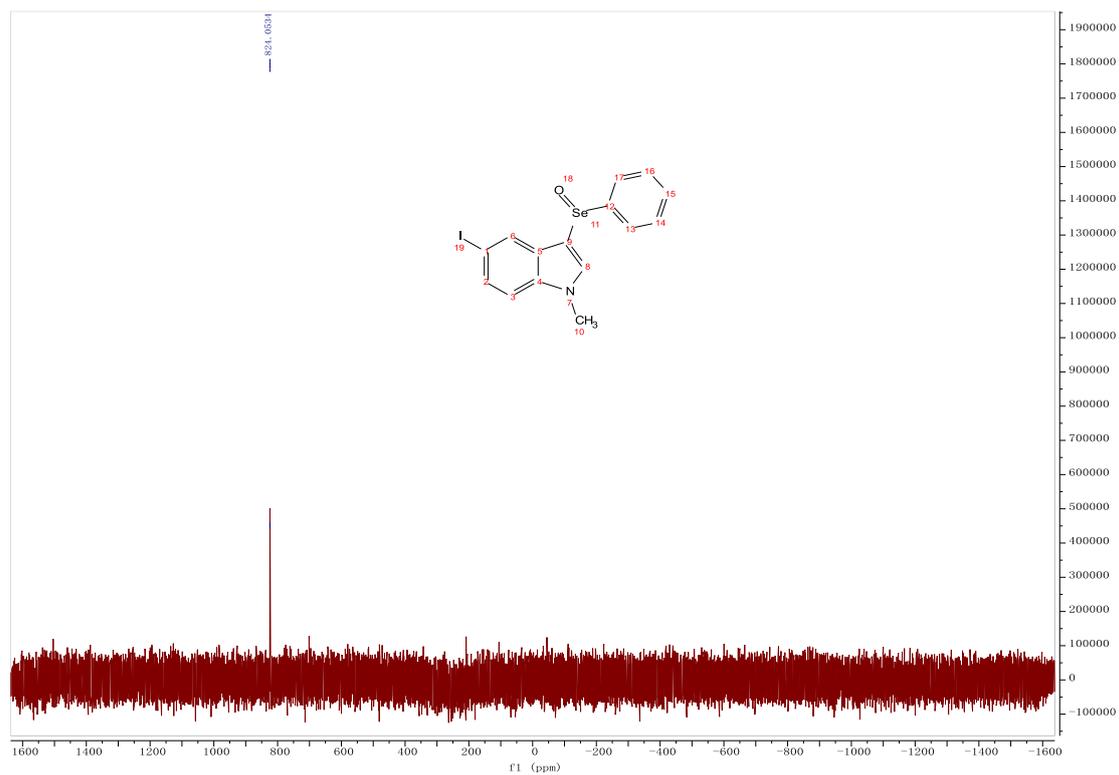


Figure S56. ^{77}Se NMR Spectra of **12** (114 MHz, CDCl_3)

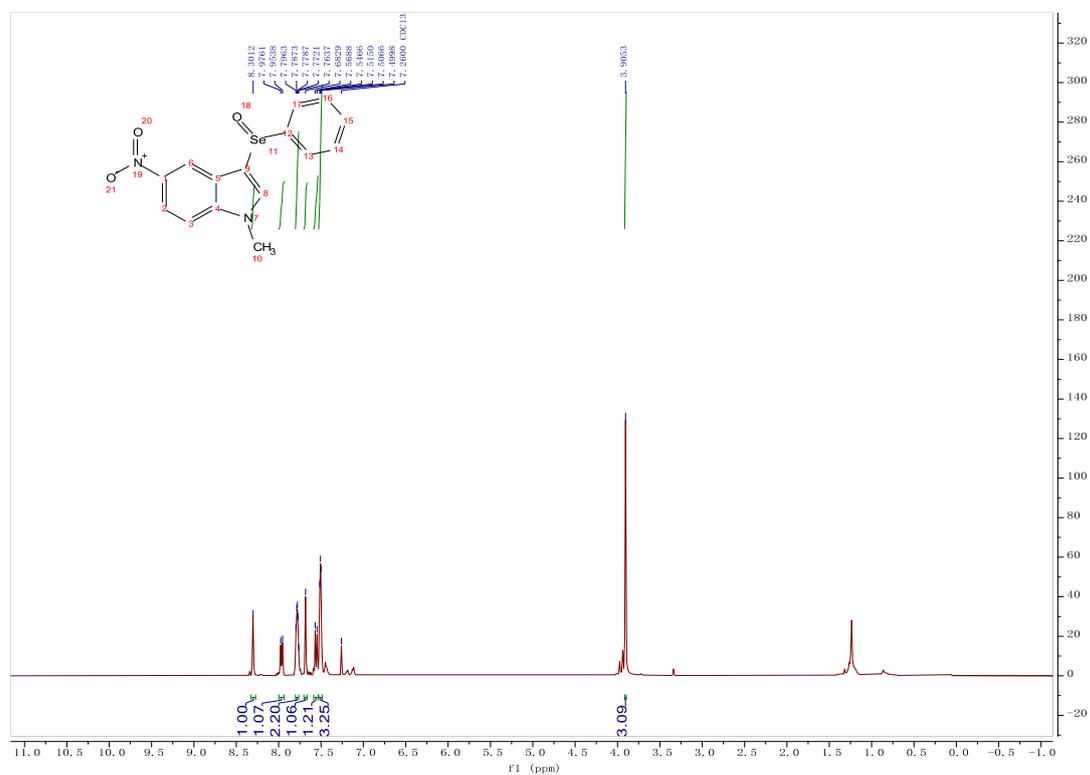


Figure S57. ^1H NMR Spectra of **13** (400 MHz, CDCl_3)

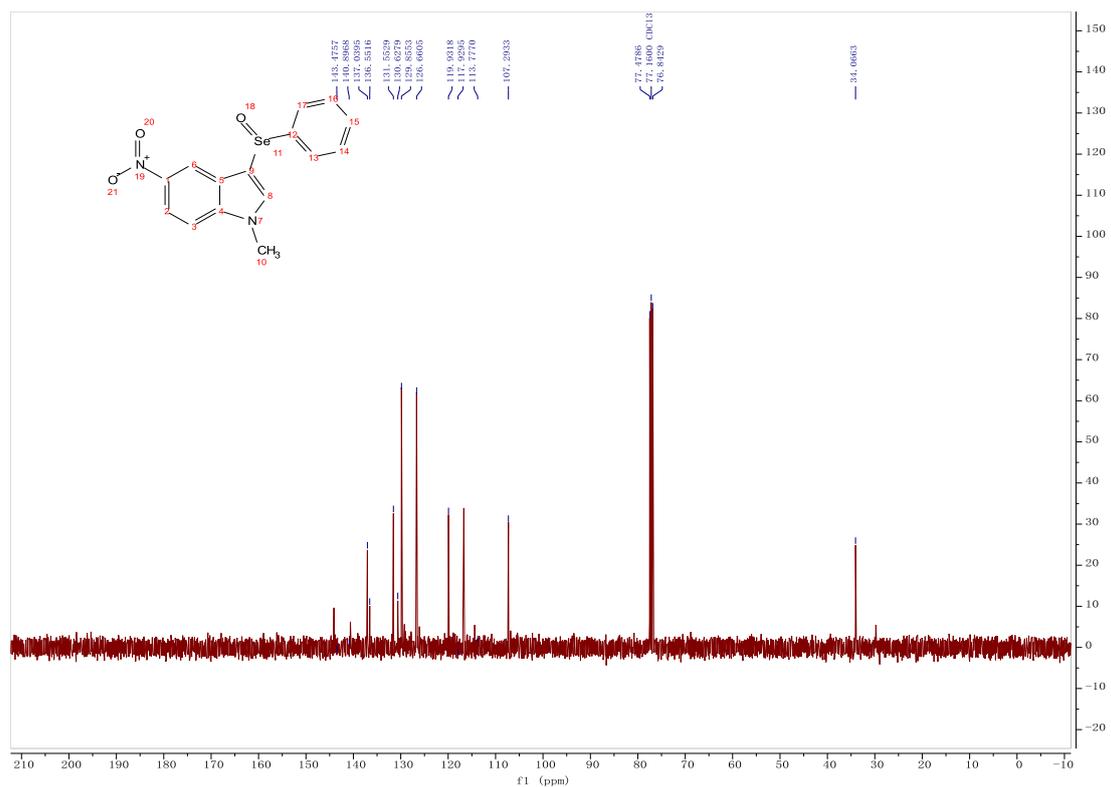


Figure S58. $^{13}\text{C}\{^1\text{H}\}$ NMR Spectra of **13** (100 MHz, CDCl₃)

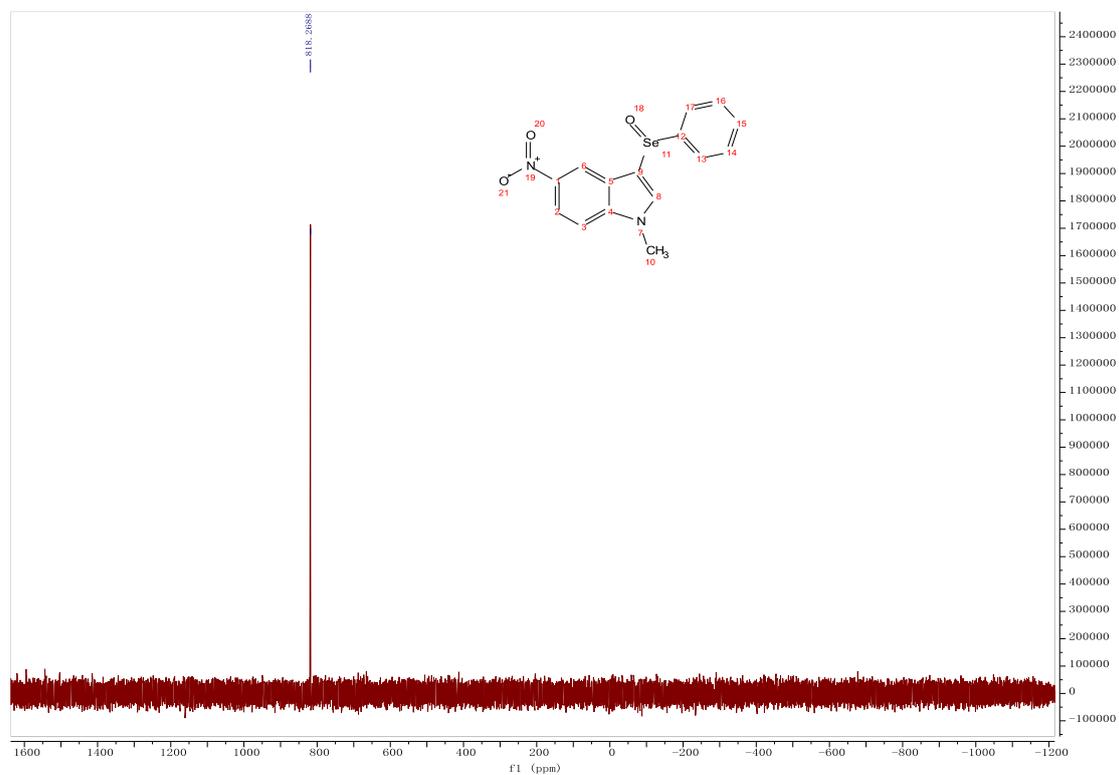


Figure S59. ^{77}Se NMR Spectra of **13** (114 MHz, CDCl₃)

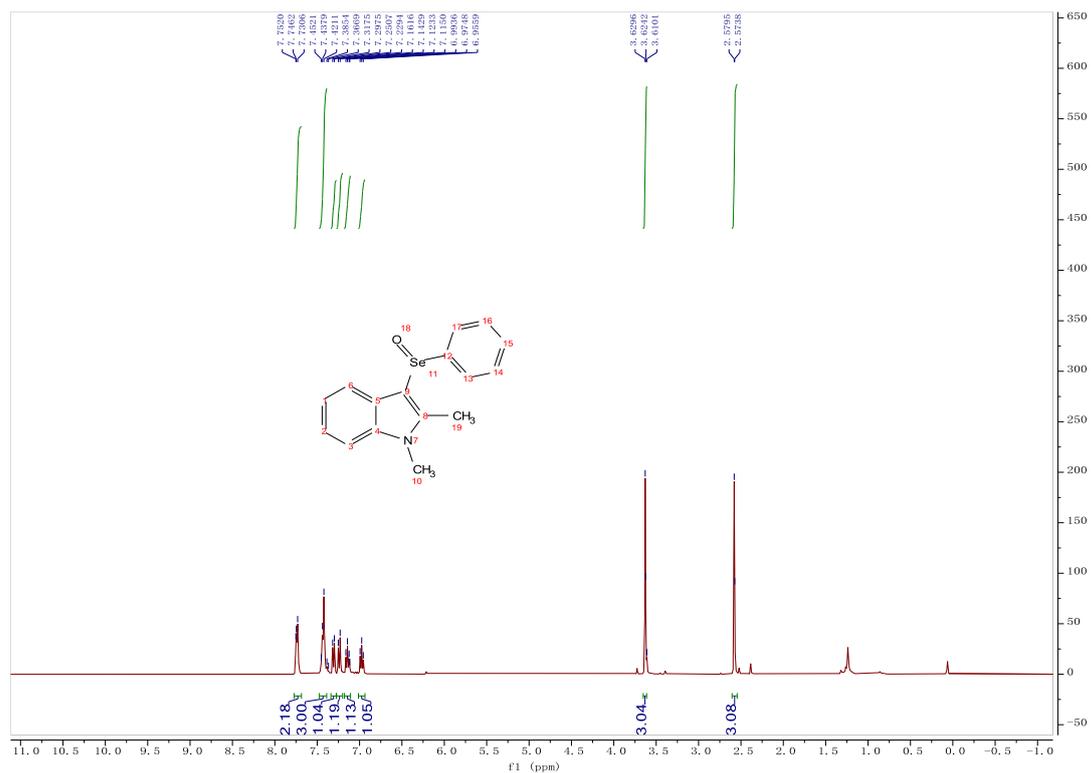


Figure S60. ¹H NMR Spectra of **14** (400 MHz, CDCl₃)

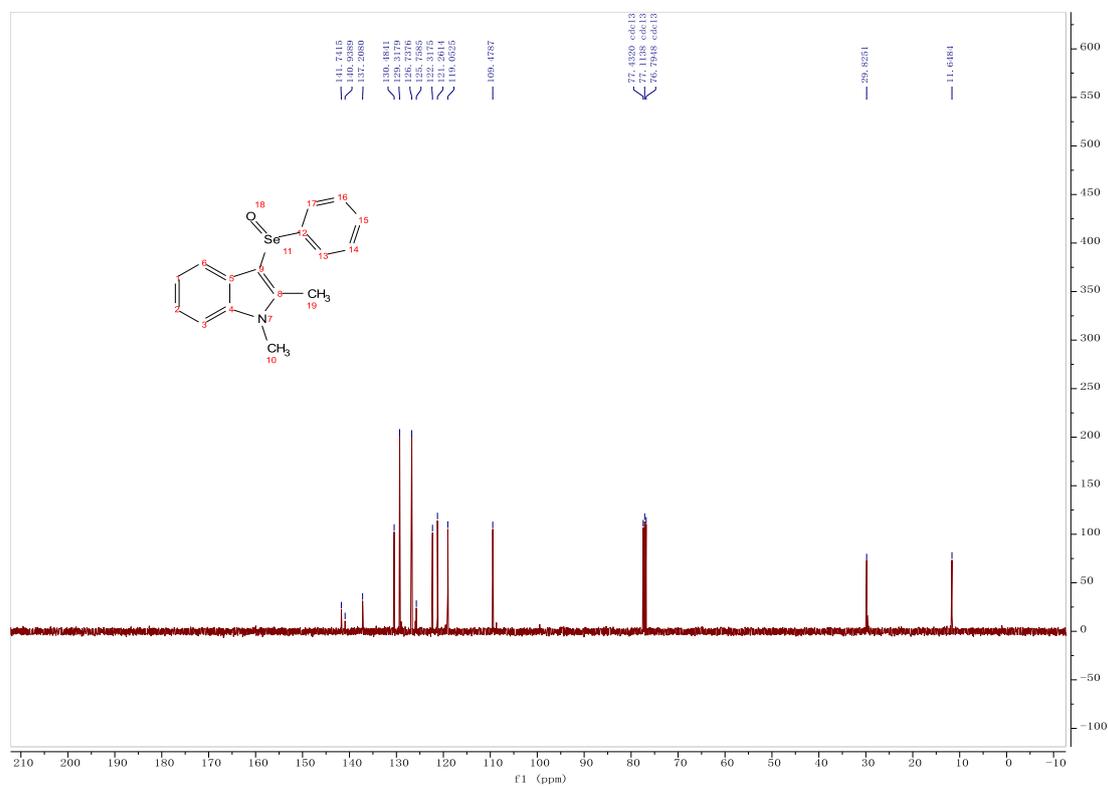


Figure S61. ¹³C{¹H} NMR Spectra of **14** (100 MHz, CDCl₃)

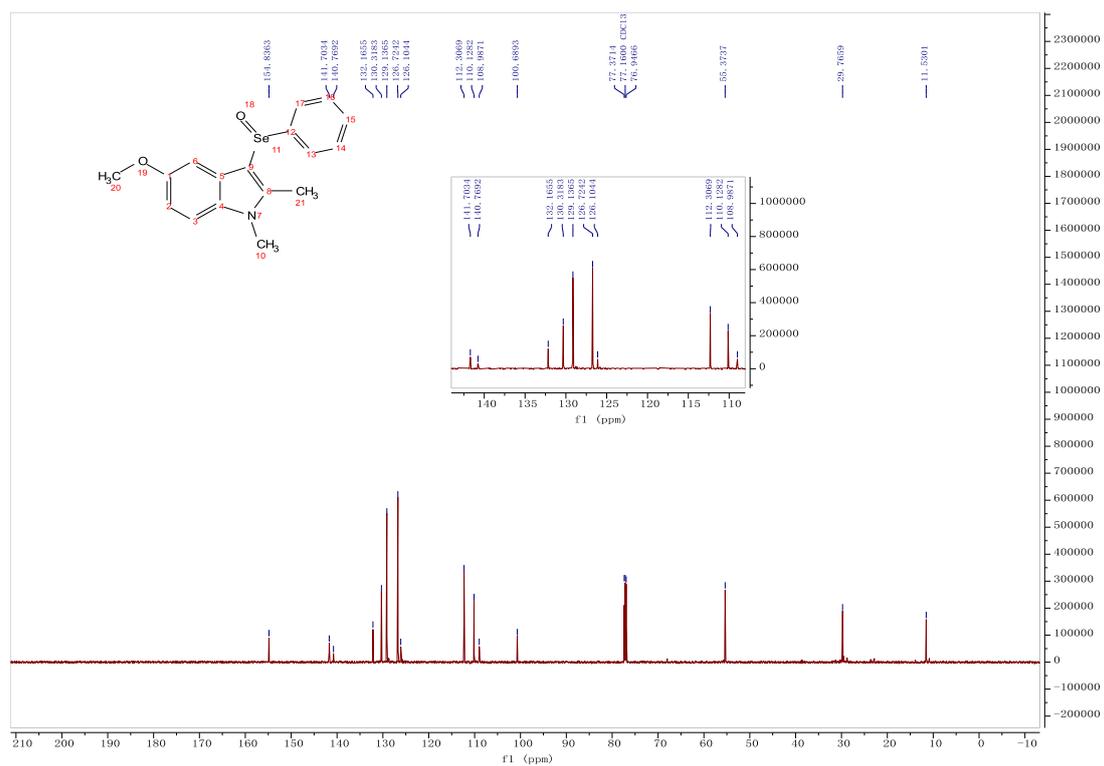


Figure S64. $^{13}\text{C}\{^1\text{H}\}$ NMR Spectra of **15** (100 MHz, CDCl_3)

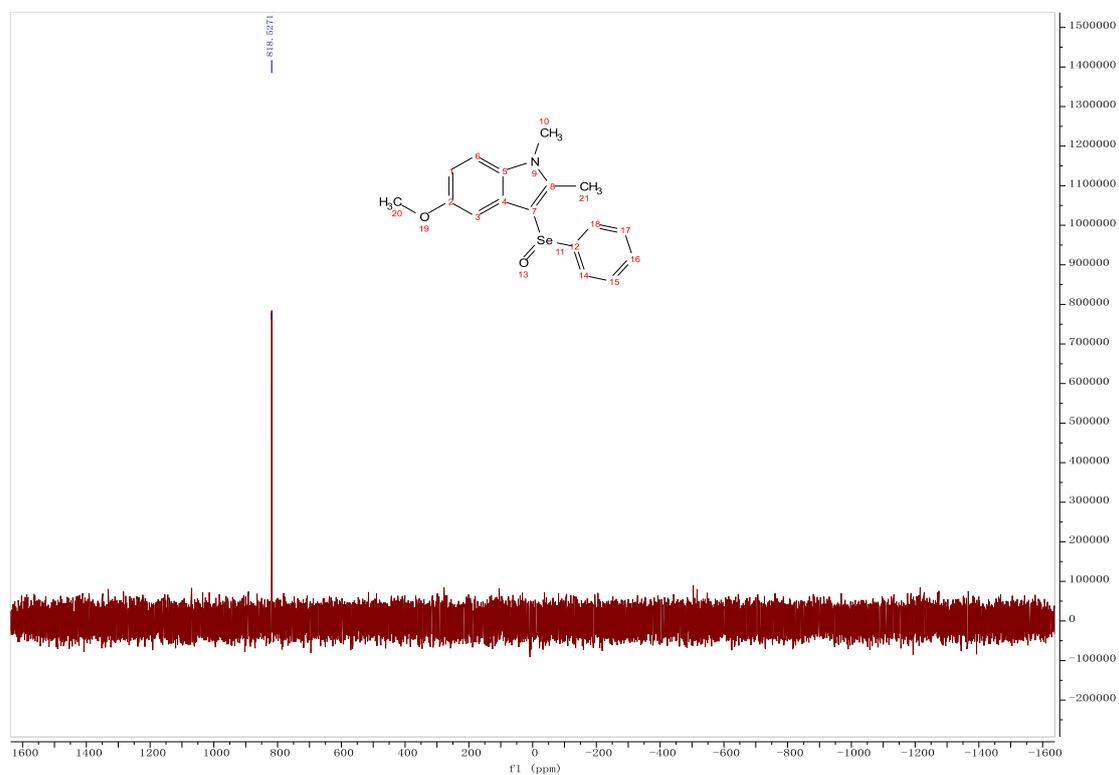


Figure S65. ^{77}Se NMR Spectra of **15** (114 MHz, CDCl_3)

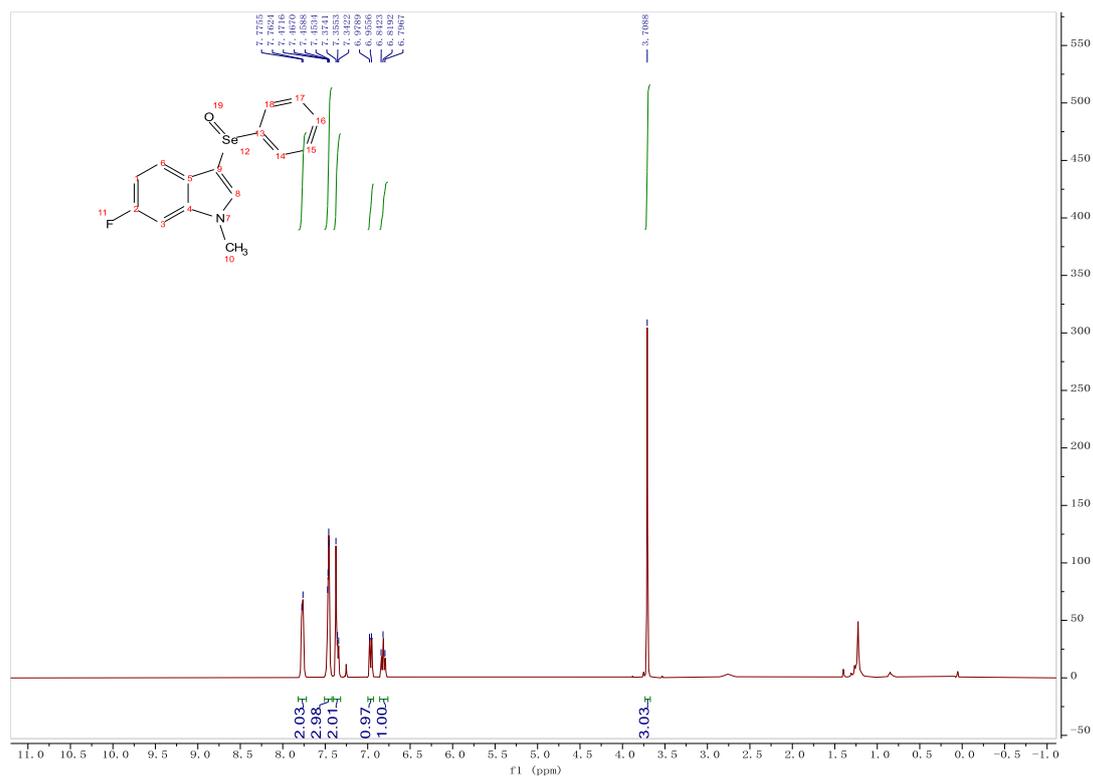


Figure S66. ^1H NMR Spectra of **16** (400 MHz, CDCl_3)

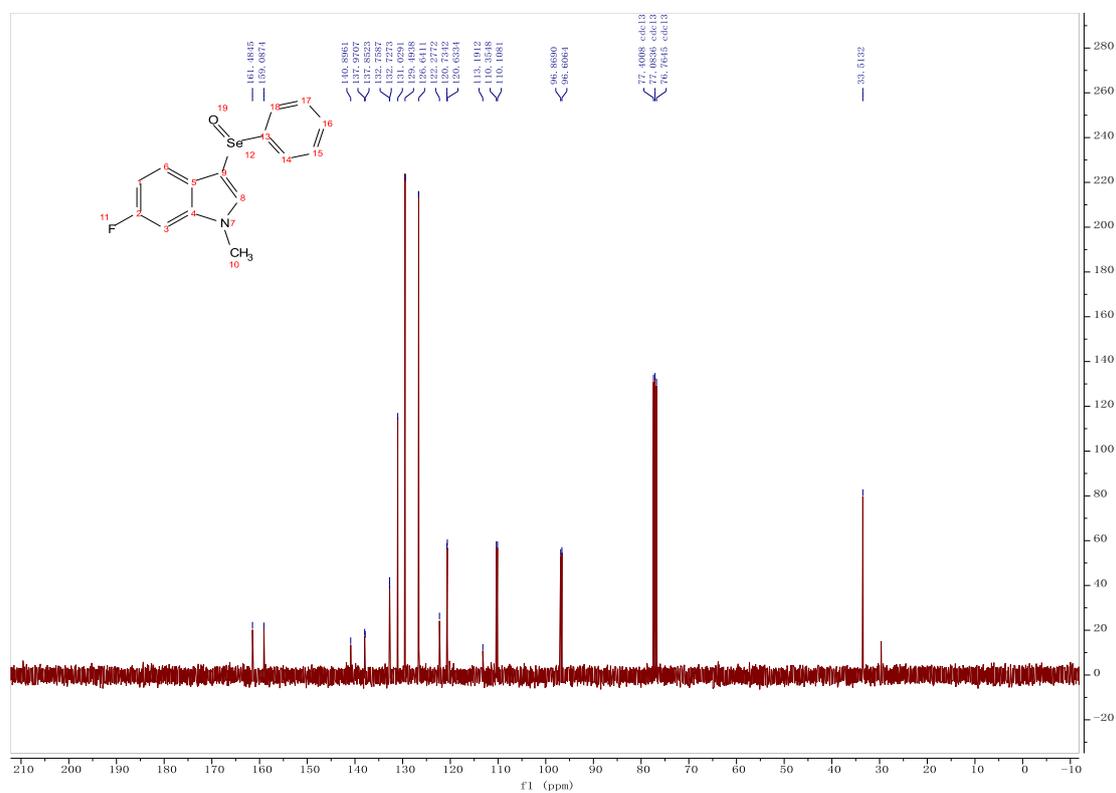


Figure S67. $^{13}\text{C}\{^1\text{H}\}$ NMR Spectra of **16** (100 MHz, CDCl_3)

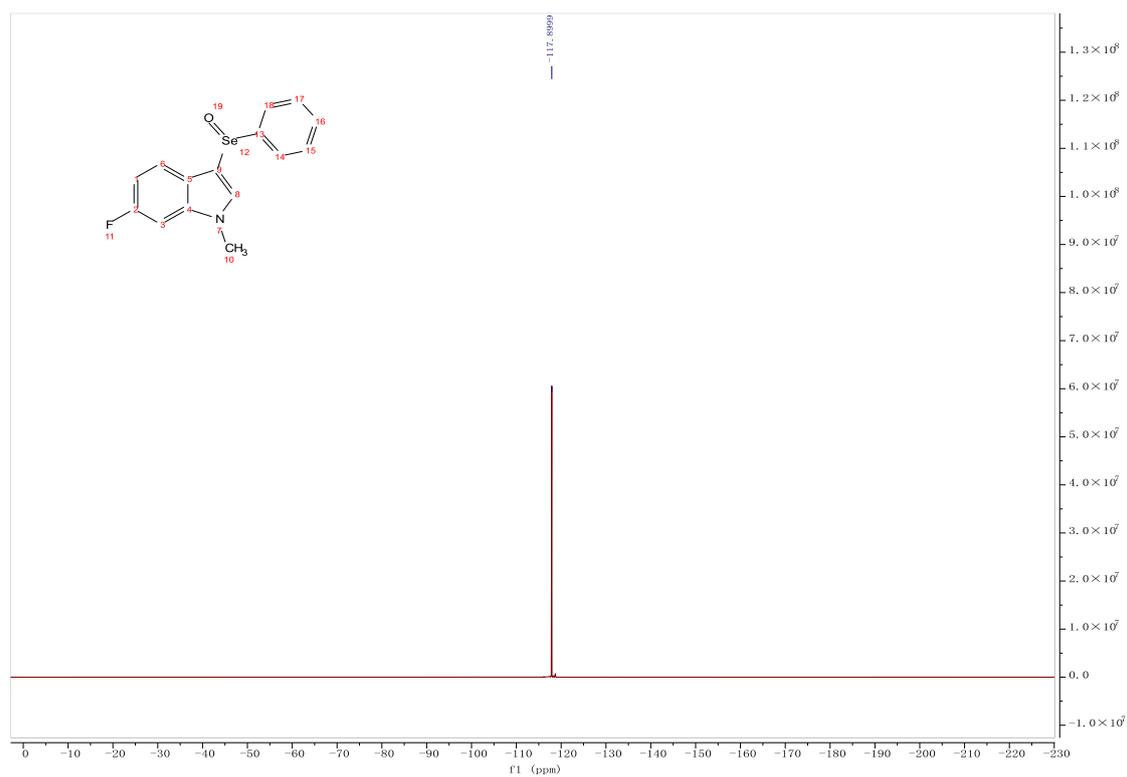


Figure S68. ^{19}F NMR spectrum of **16** (376 MHz, CDCl_3)

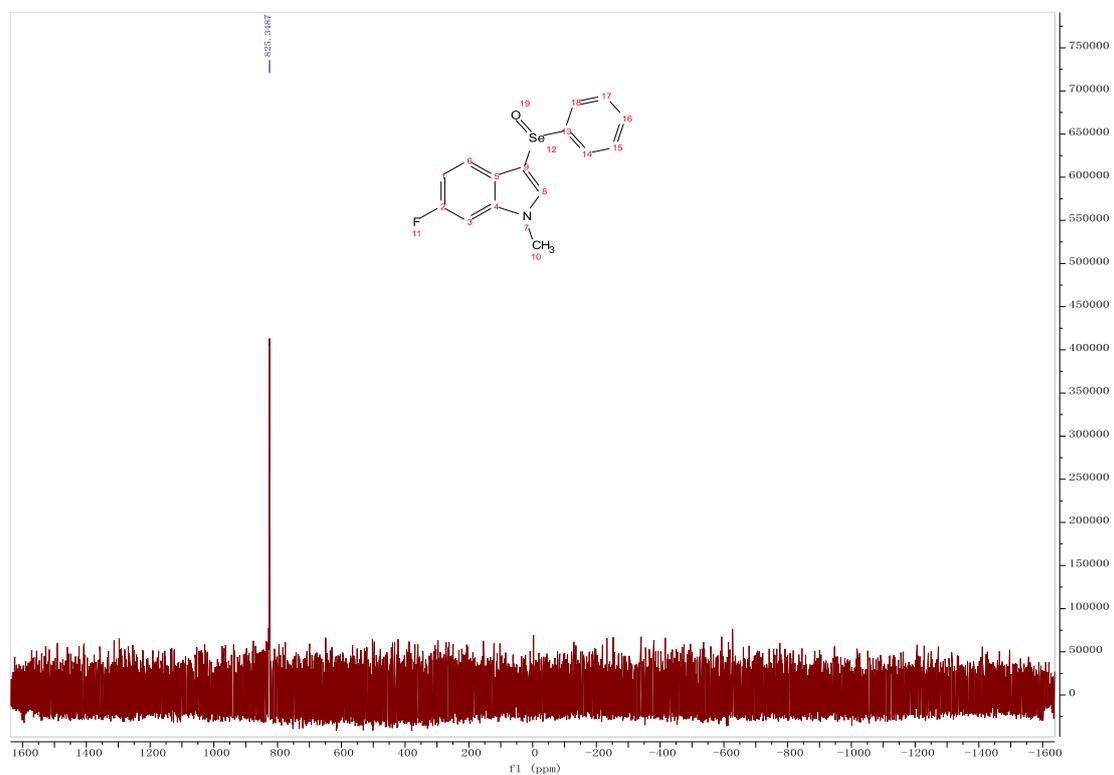


Figure S69. ^{77}Se NMR Spectra of **16** (114 MHz, CDCl_3)

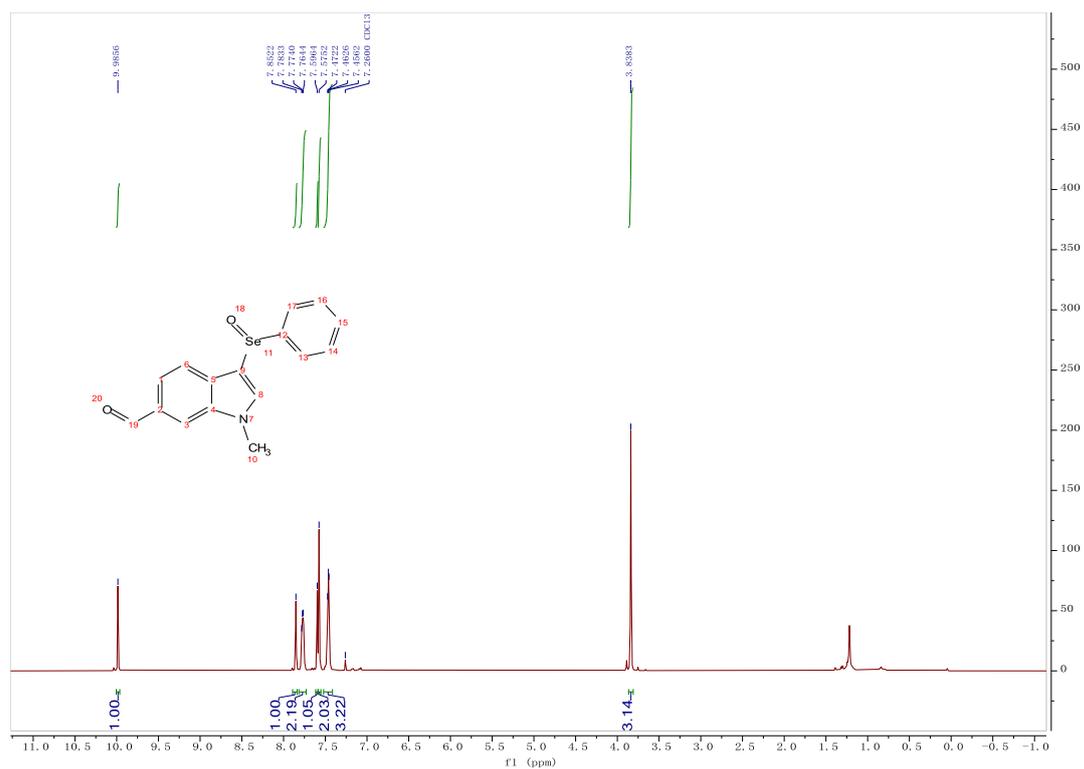


Figure S70. ^1H NMR Spectra of 17 (400 MHz, CDCl_3)

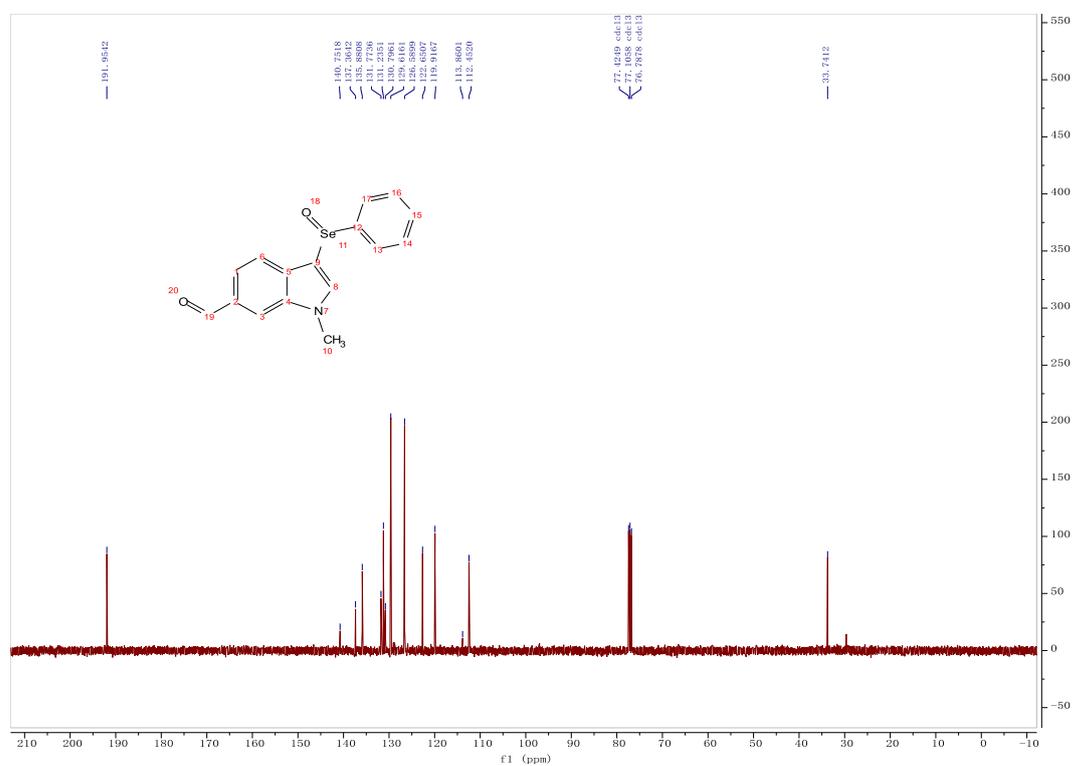


Figure S71. $^{13}\text{C}\{^1\text{H}\}$ NMR Spectra of 17 (100 MHz, CDCl_3)

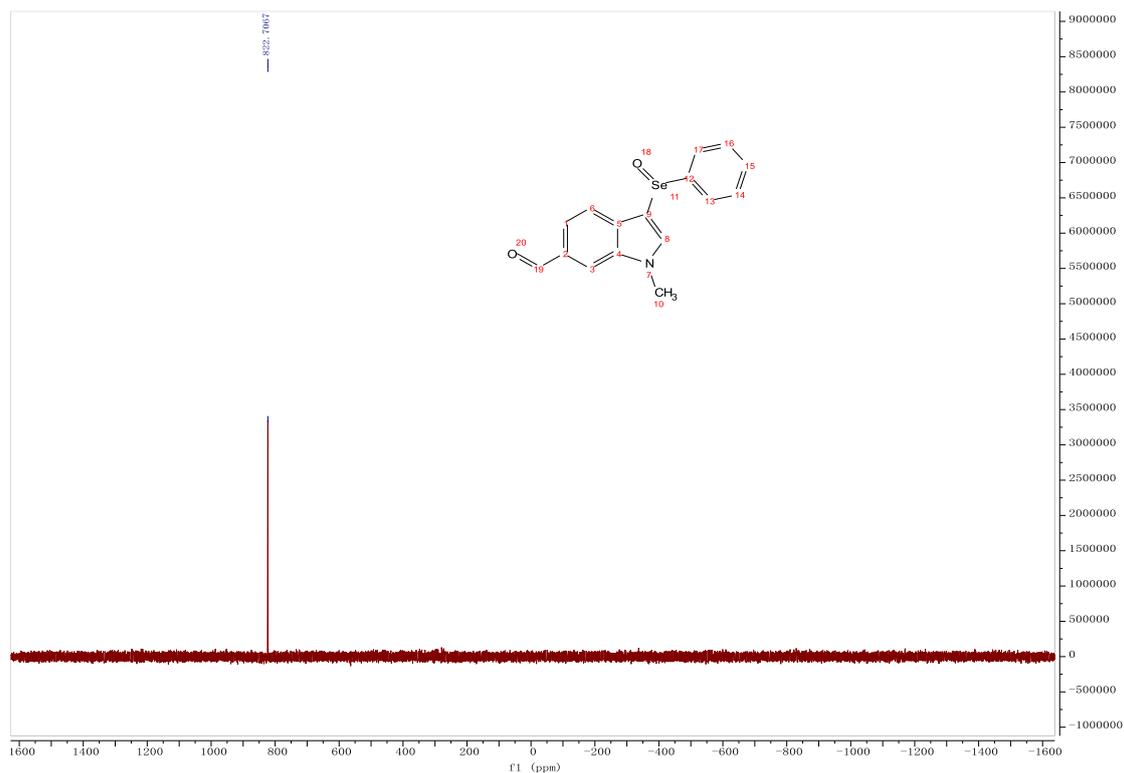


Figure S72. ^{77}Se NMR Spectra of **17** (114 MHz, CDCl_3)

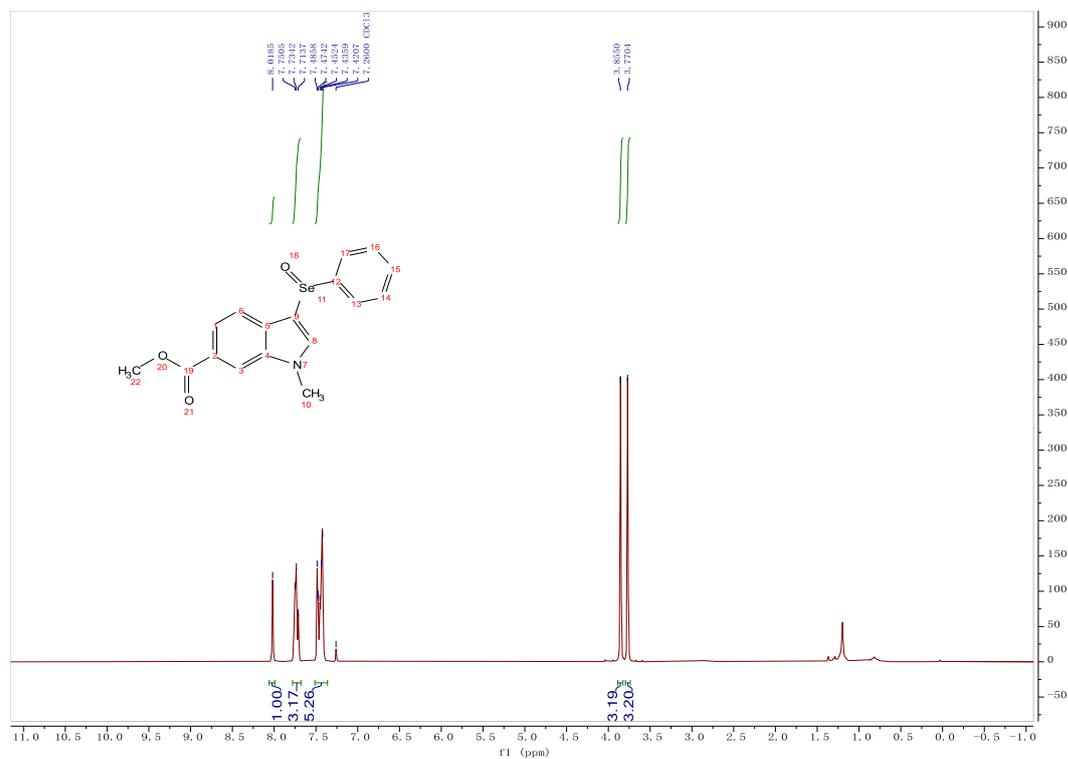


Figure S73. ^1H NMR Spectra of **18** (400 MHz, CDCl_3)

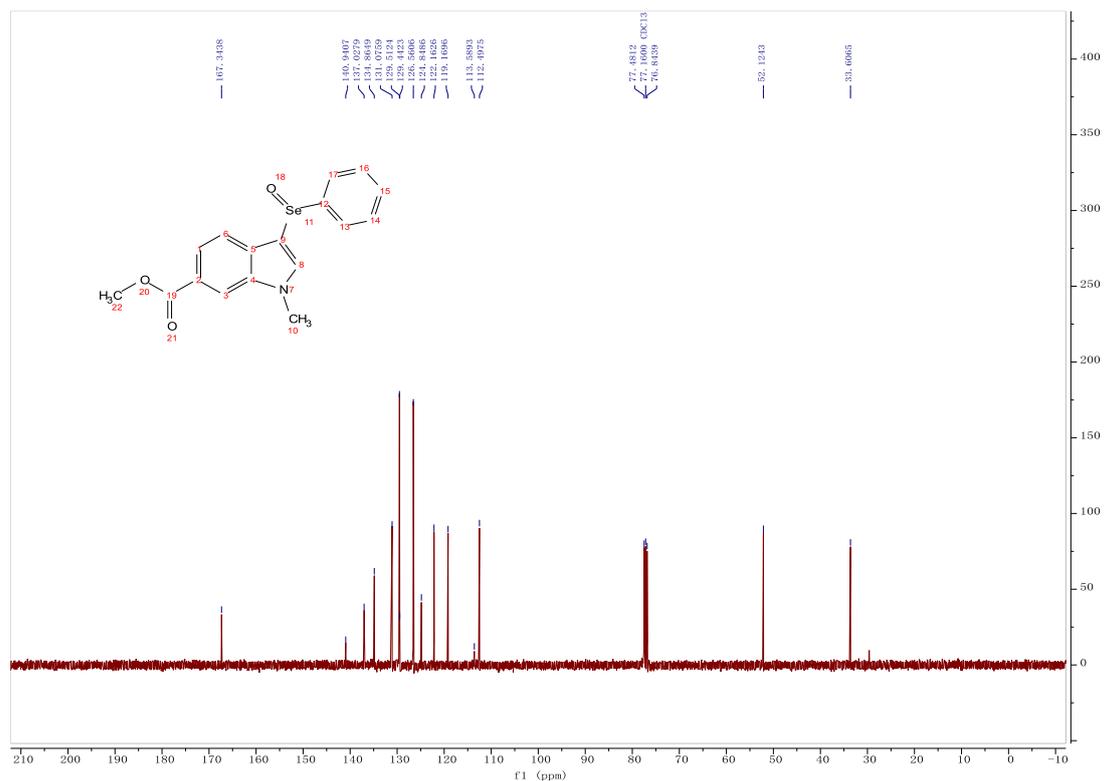


Figure S74. $^{13}\text{C}\{^1\text{H}\}$ NMR Spectra of **18** (100 MHz, CDCl₃)

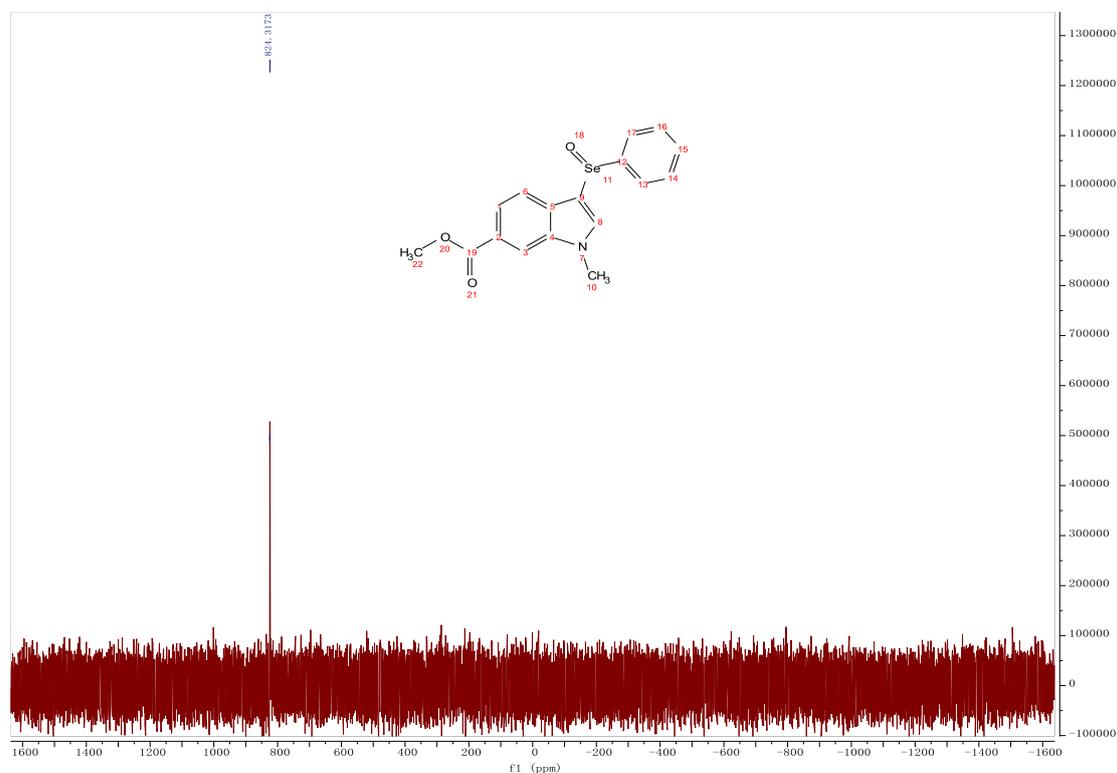


Figure S75. ^{77}Se NMR Spectra of **18** (114 MHz, CDCl₃)

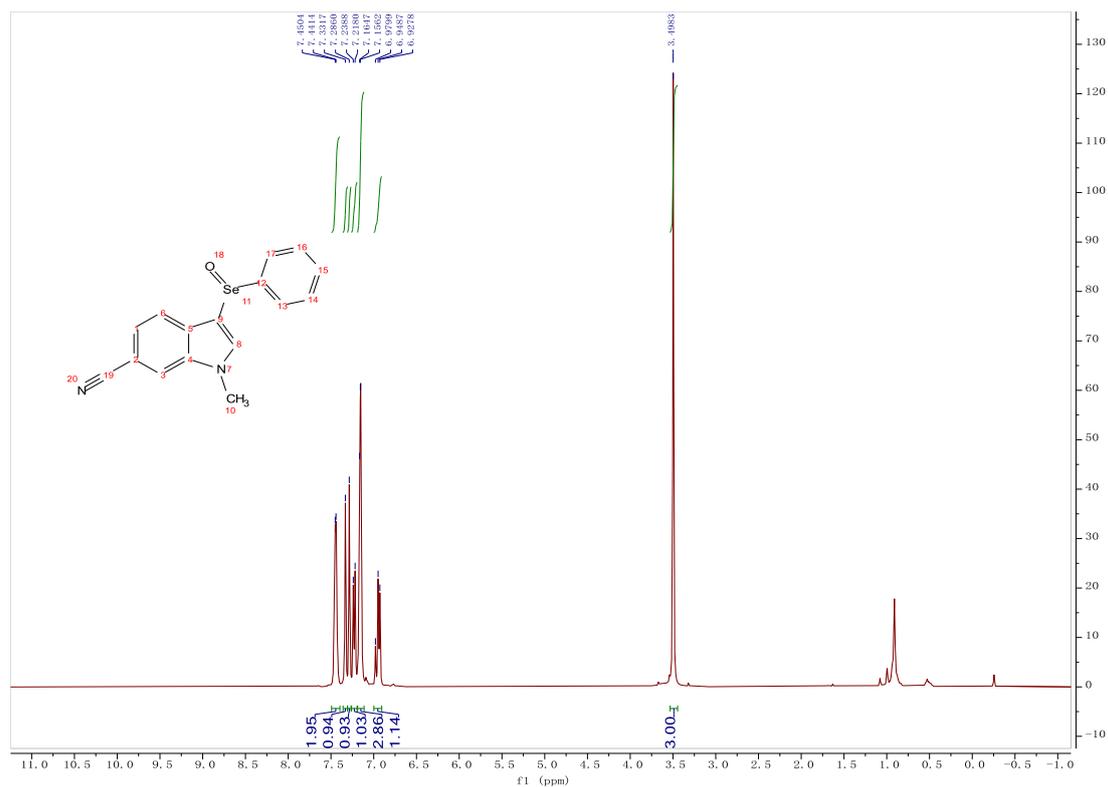


Figure S76. ^1H NMR Spectra of **19** (400 MHz, CDCl_3)

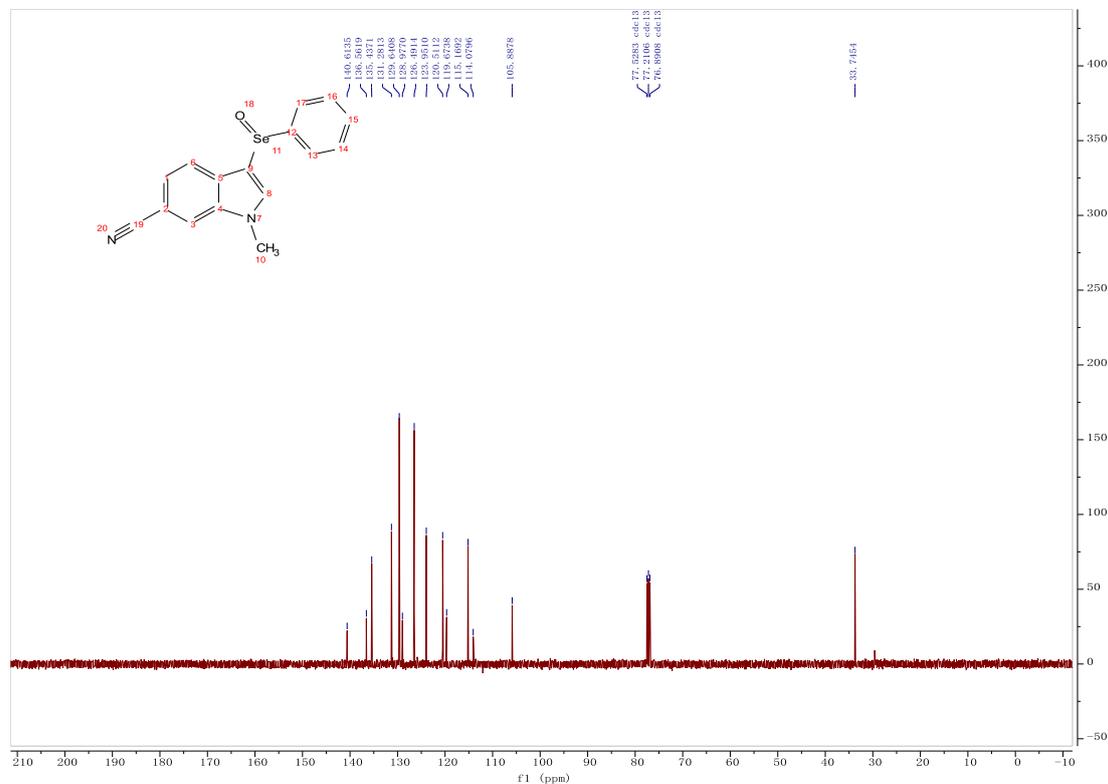


Figure S77. $^{13}\text{C}\{^1\text{H}\}$ NMR Spectra of **19** (100 MHz, CDCl_3)

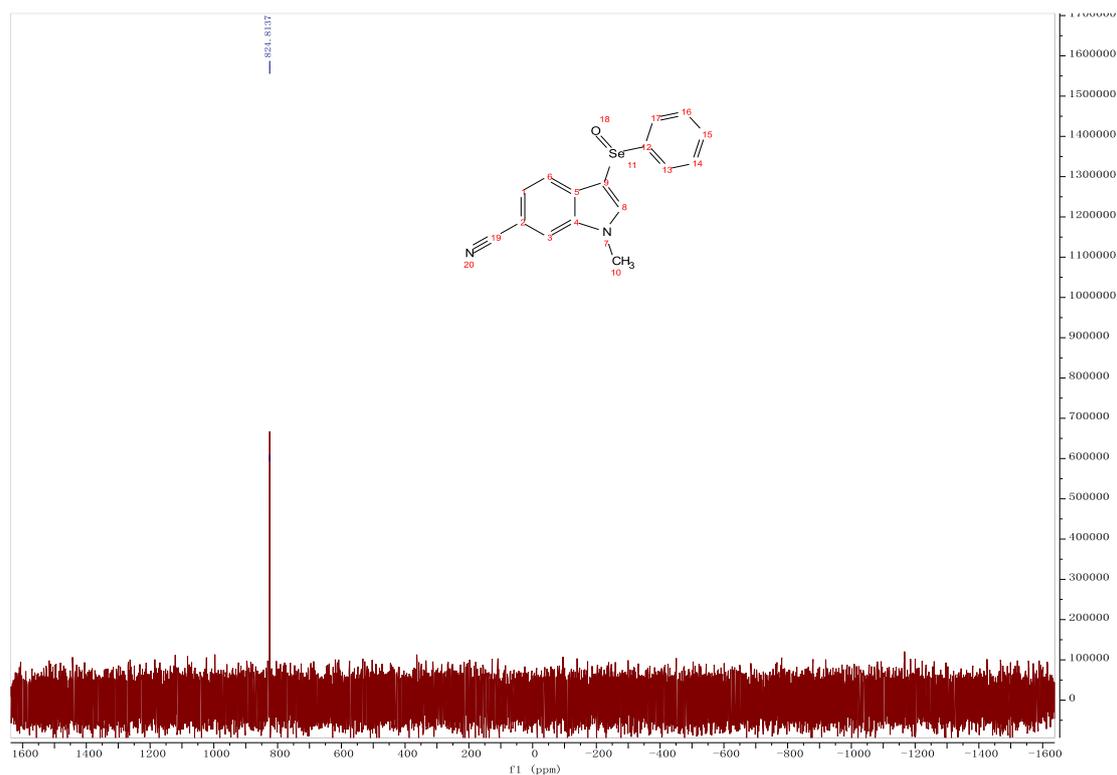


Figure S78. ^{77}Se NMR Spectra of **19** (114 MHz, CDCl_3)

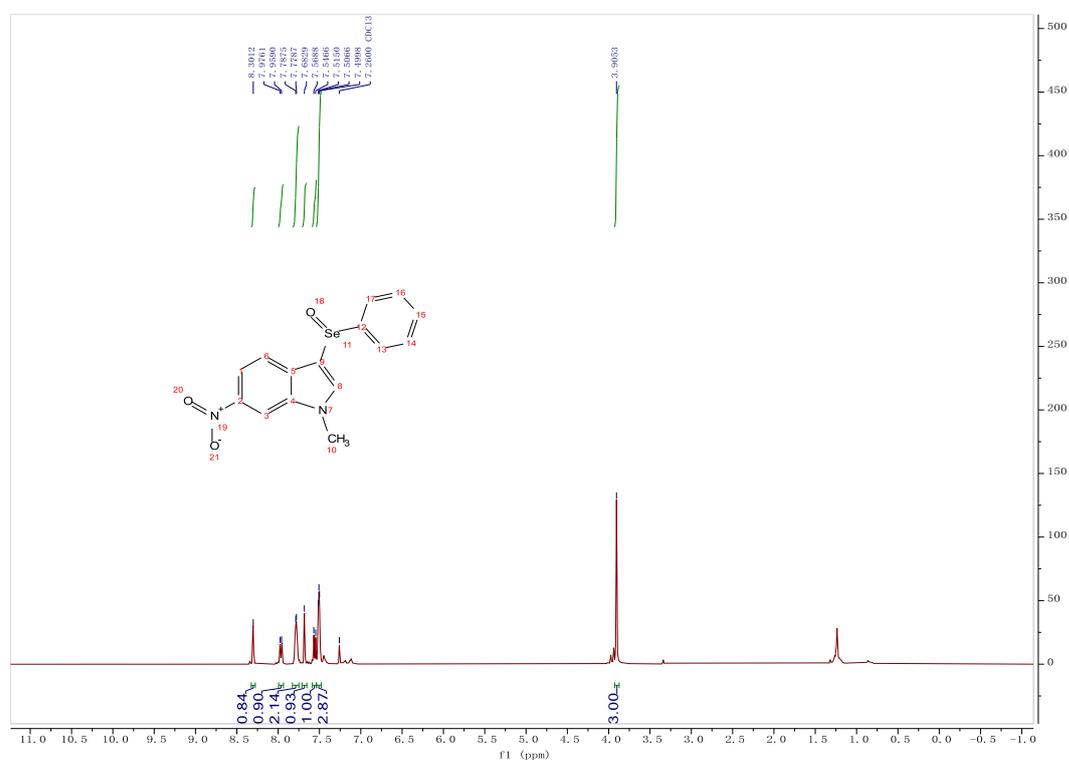


Figure S79. ^1H NMR Spectra of **20** (400 MHz, CDCl_3)

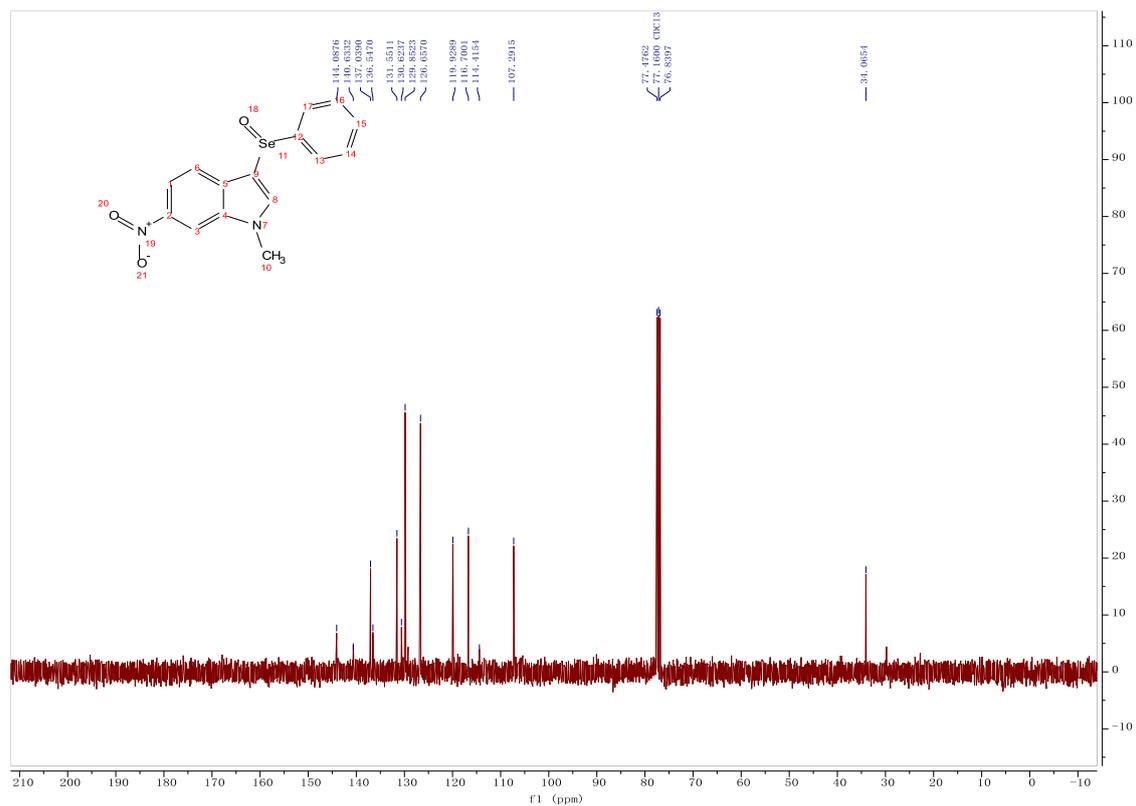


Figure S80. $^{13}\text{C}\{^1\text{H}\}$ NMR Spectra of **20** (100 MHz, CDCl_3)

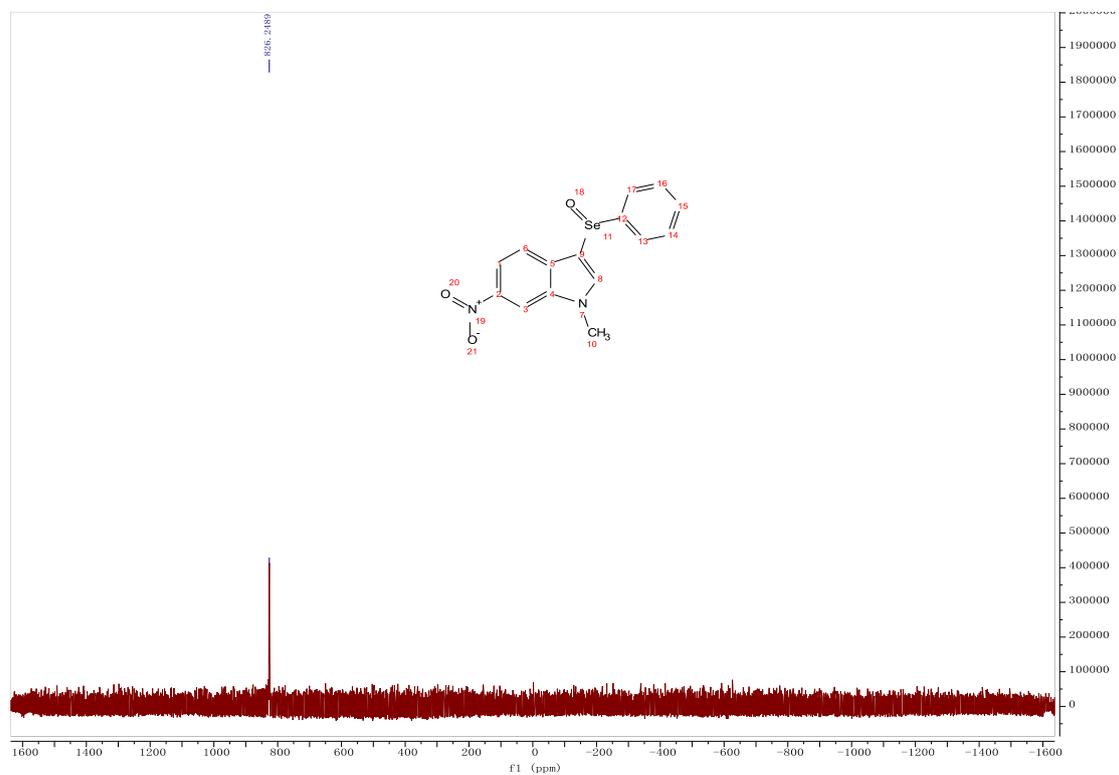


Figure S81. ^{77}Se NMR spectrum of **20** (114 MHz, CDCl_3)

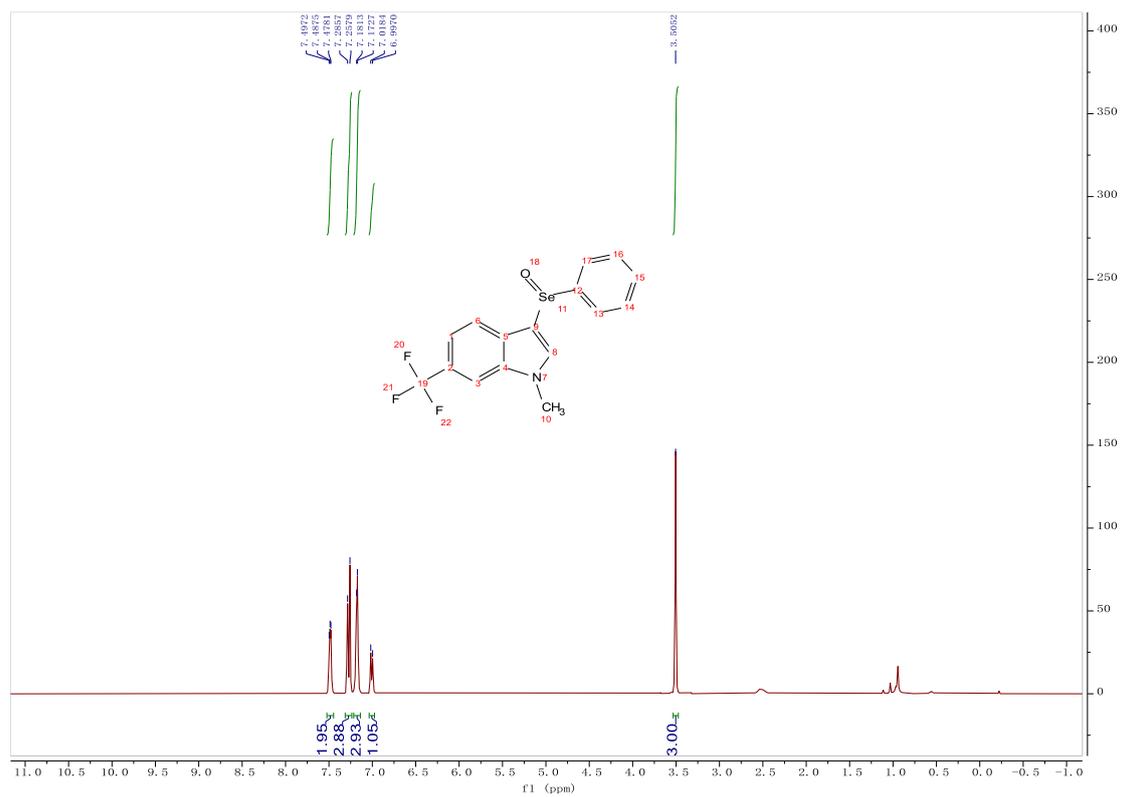


Figure S82. ^1H NMR Spectra of **21** (400 MHz, CDCl_3)

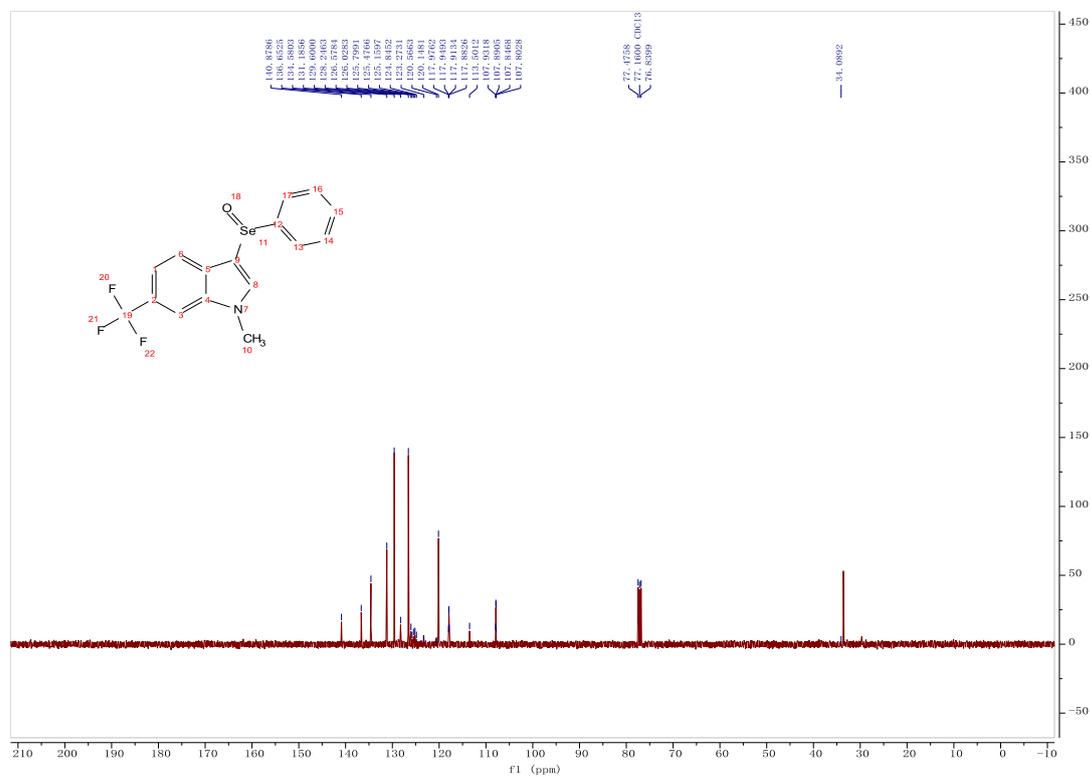


Figure S83. $^{13}\text{C}\{^1\text{H}\}$ NMR Spectra of **21** (100 MHz, CDCl_3)

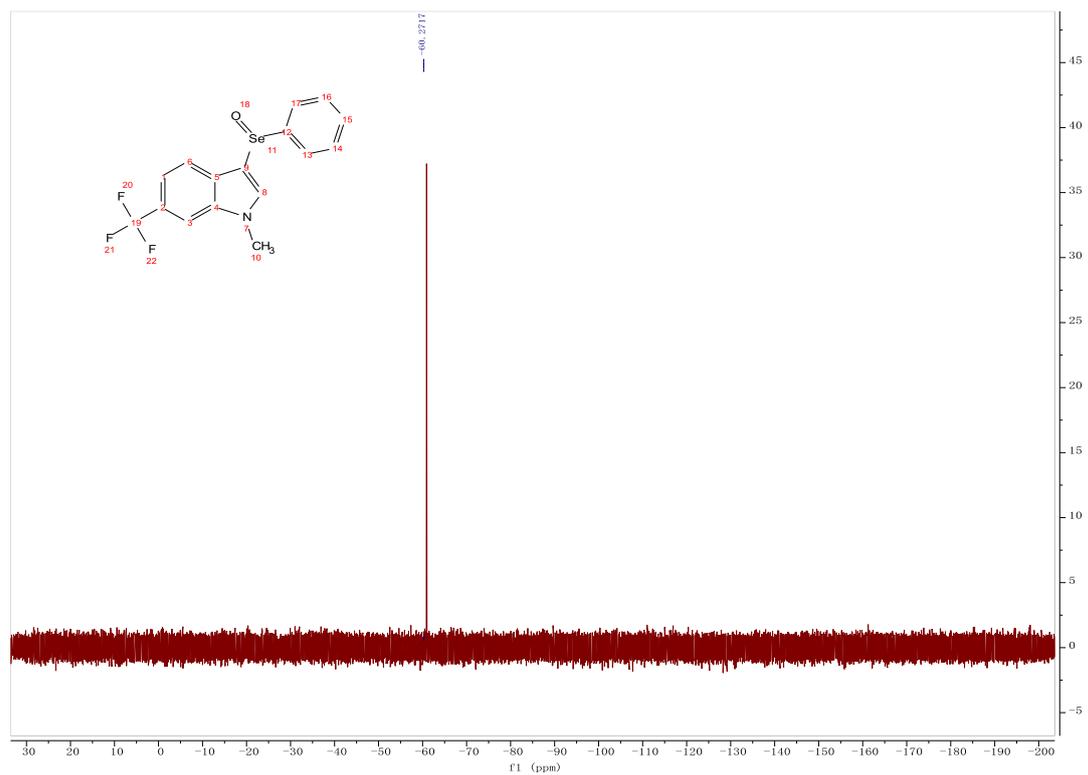


Figure S84. ^{19}F NMR spectrum of **21** (376 MHz, CDCl_3)

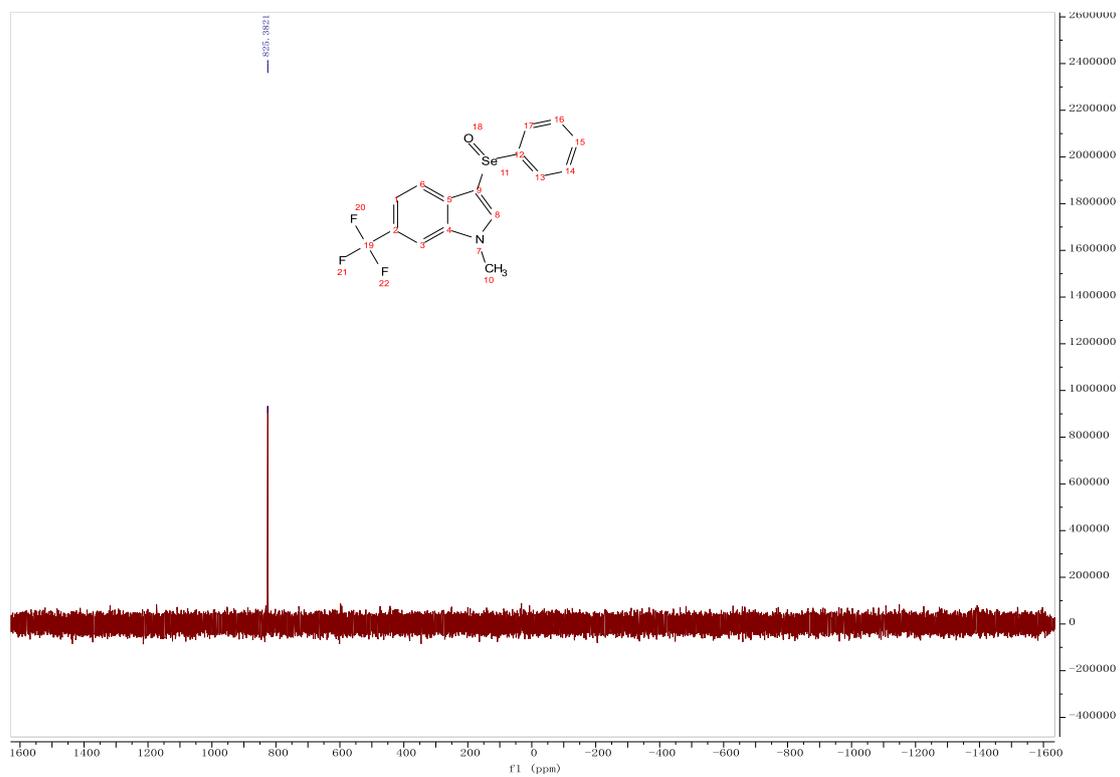


Figure S85. ^{77}Se NMR spectrum of **21** (114 MHz, CDCl_3)

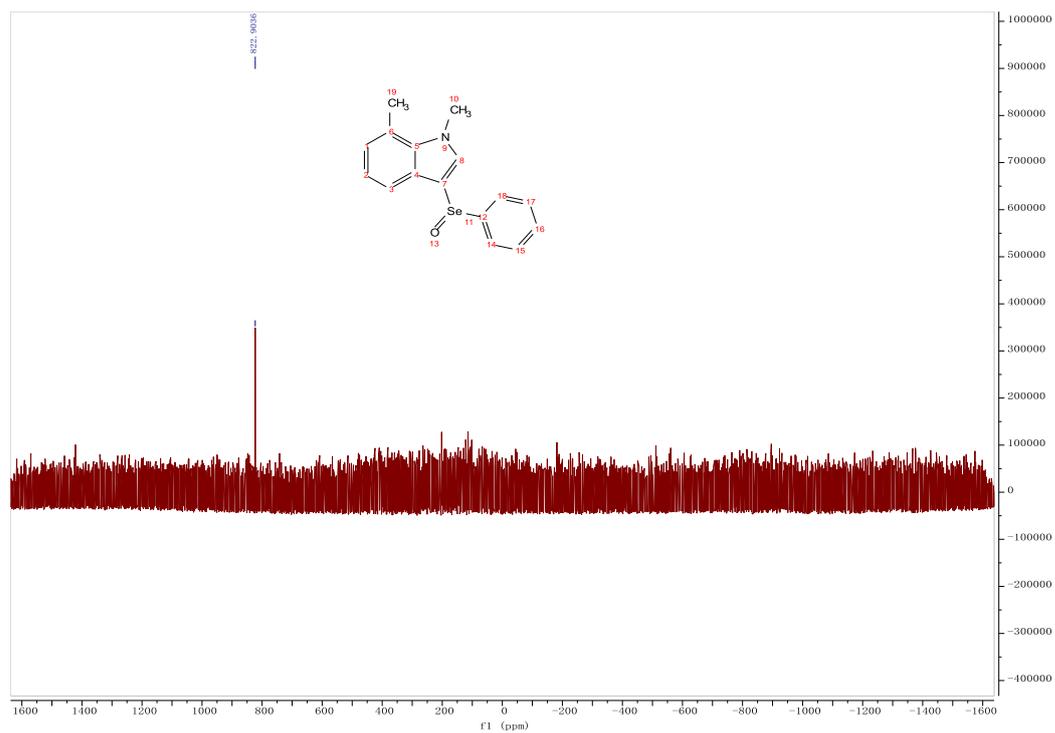


Figure S88. ^{77}Se NMR Spectra of **22** (114 MHz, CDCl_3)

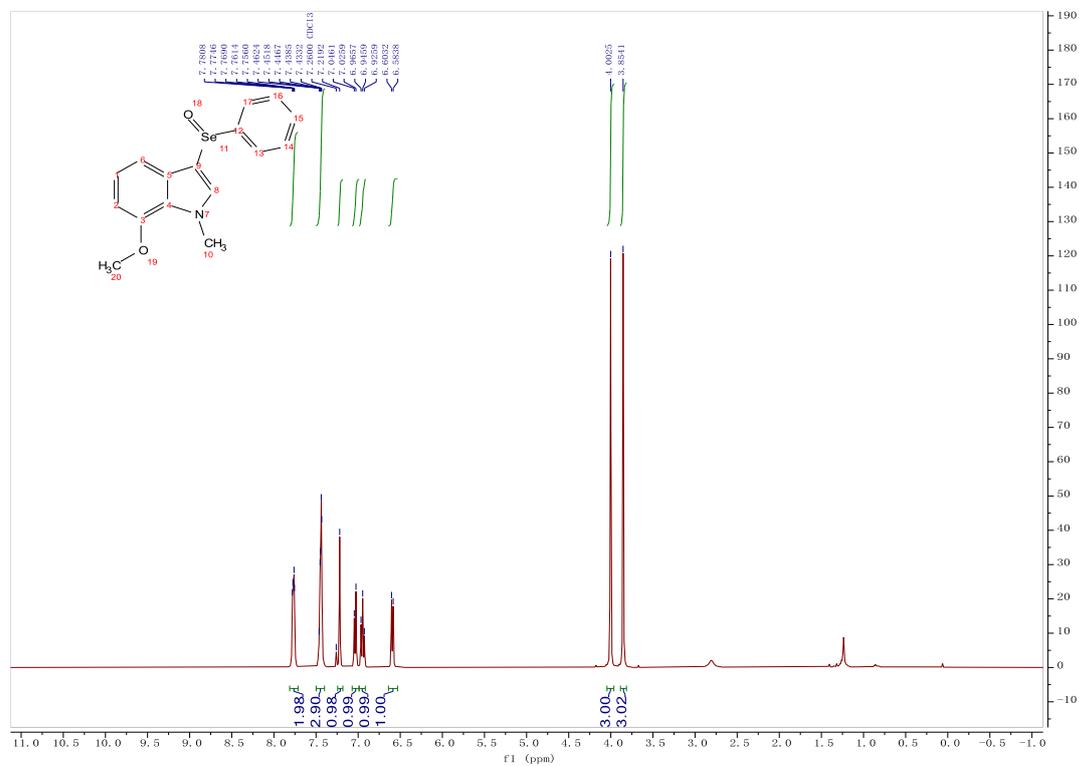


Figure S89. ^1H NMR Spectra of **23** (400 MHz, CDCl_3)

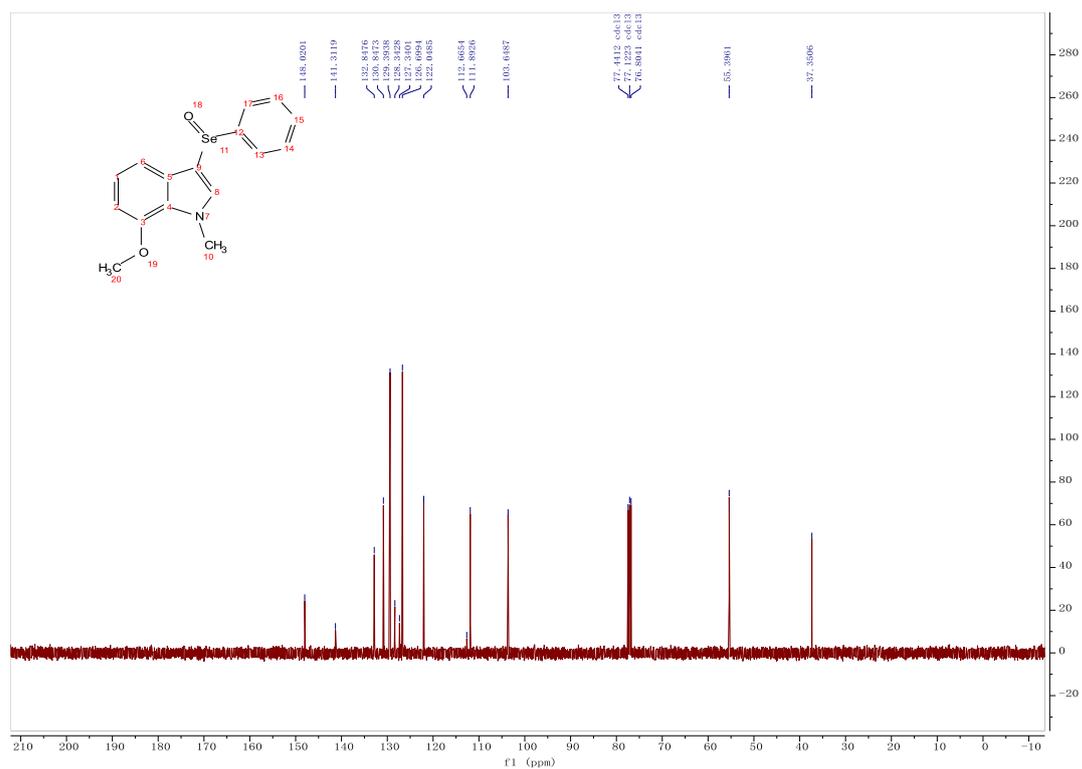


Figure S90. ¹³C{¹H} NMR Spectra of **23** (100 MHz, CDCl₃)

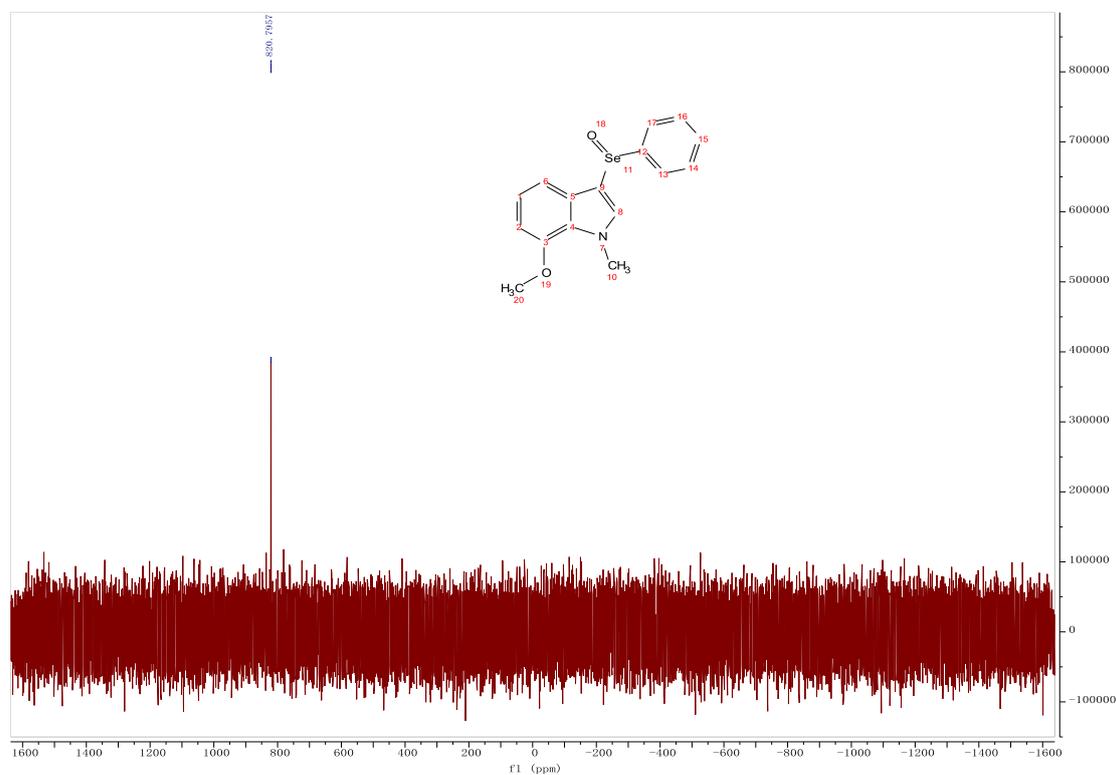


Figure S91. ⁷⁷Se NMR Spectra of **23** (114 MHz, CDCl₃)

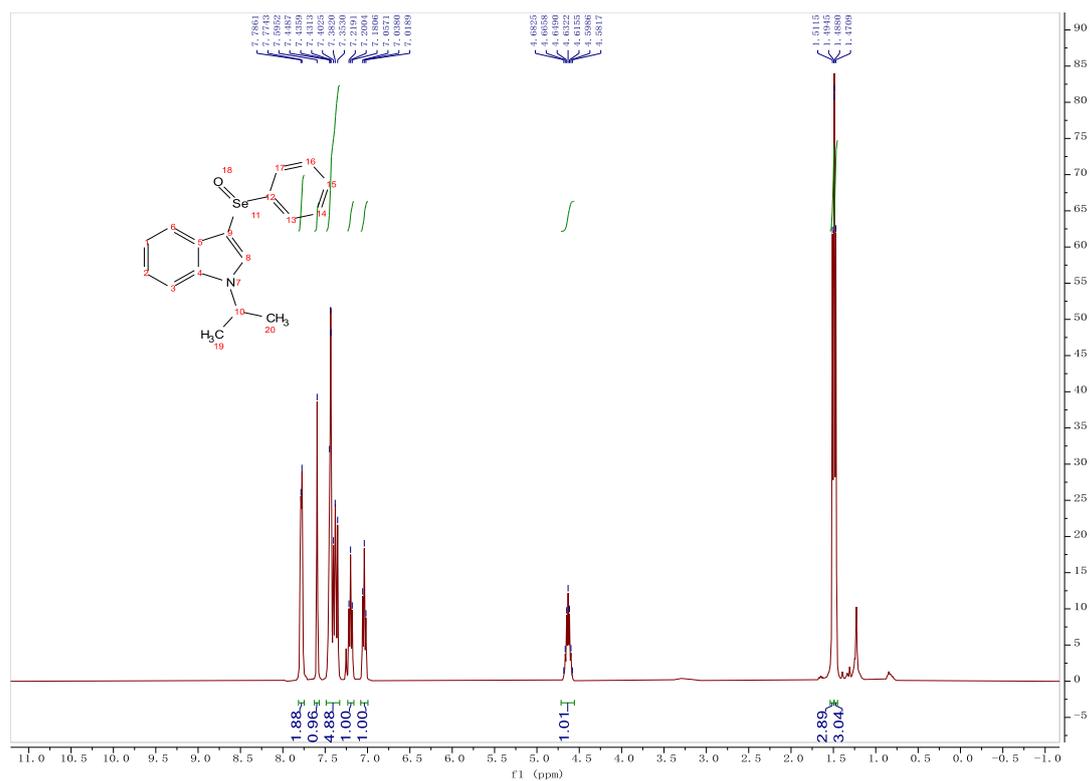


Figure S92. ¹H NMR Spectra of **24** (400 MHz, CDCl₃)

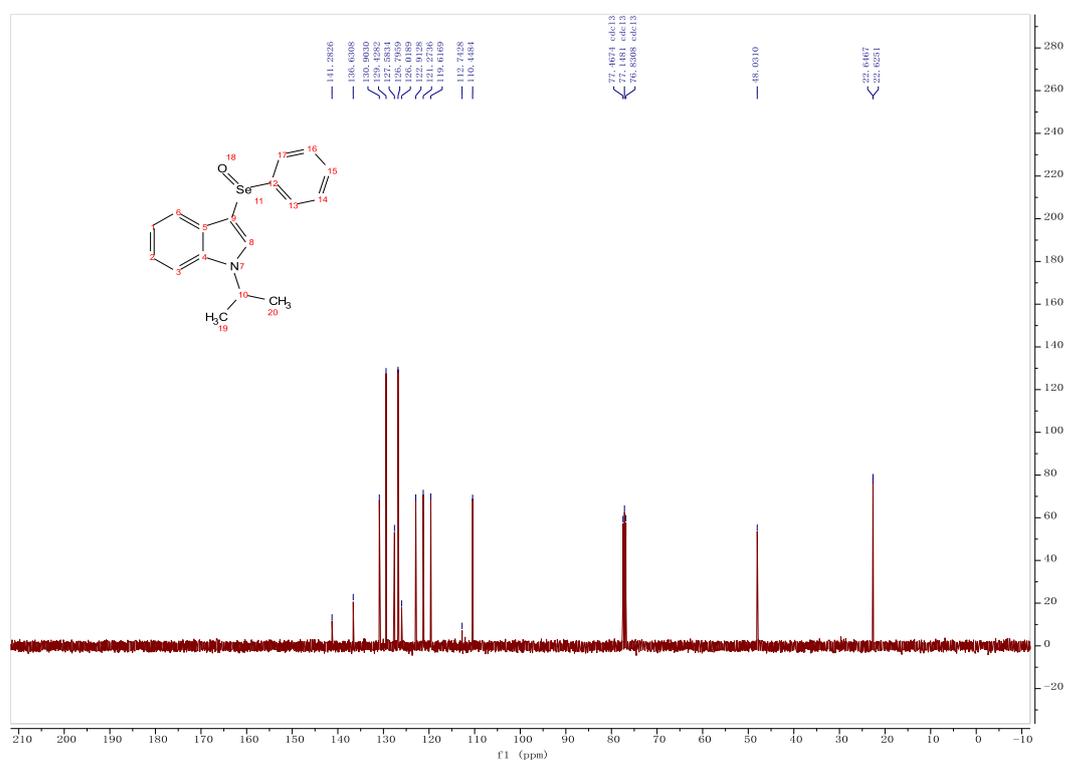


Figure S93. ¹³C {¹H} NMR Spectra of **24** (100 MHz, CDCl₃)

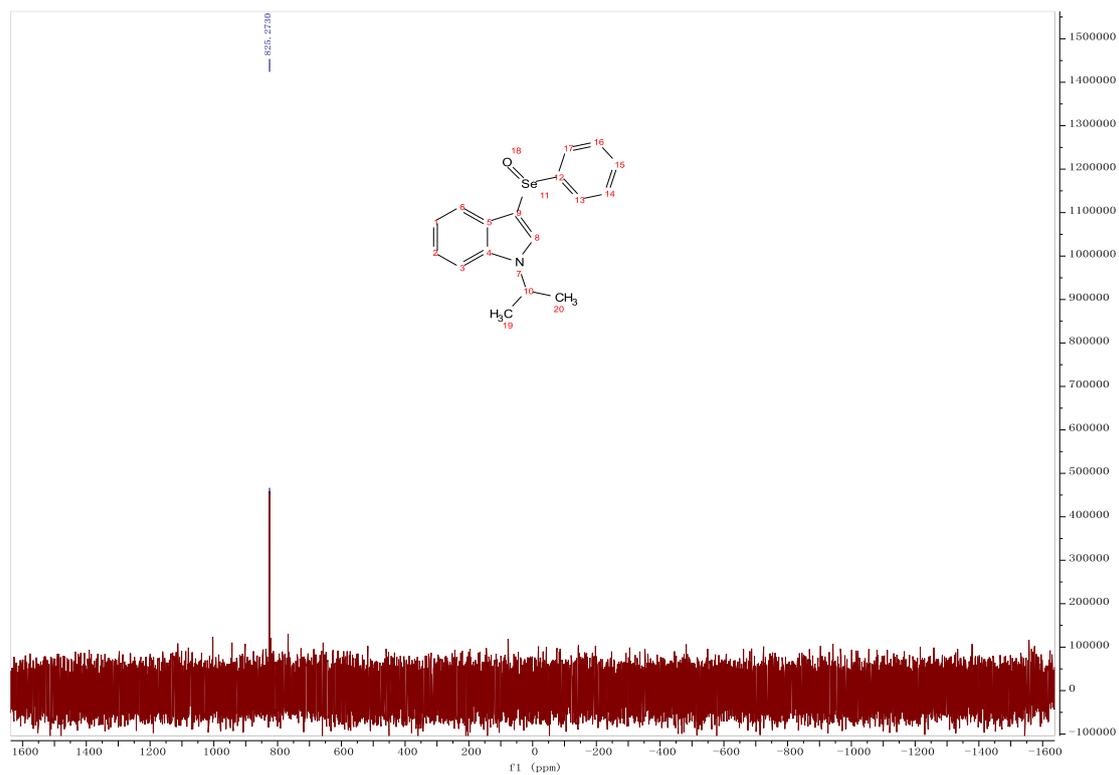


Figure S94. ^{77}Se NMR Spectra of **24** (114 MHz, CDCl_3)

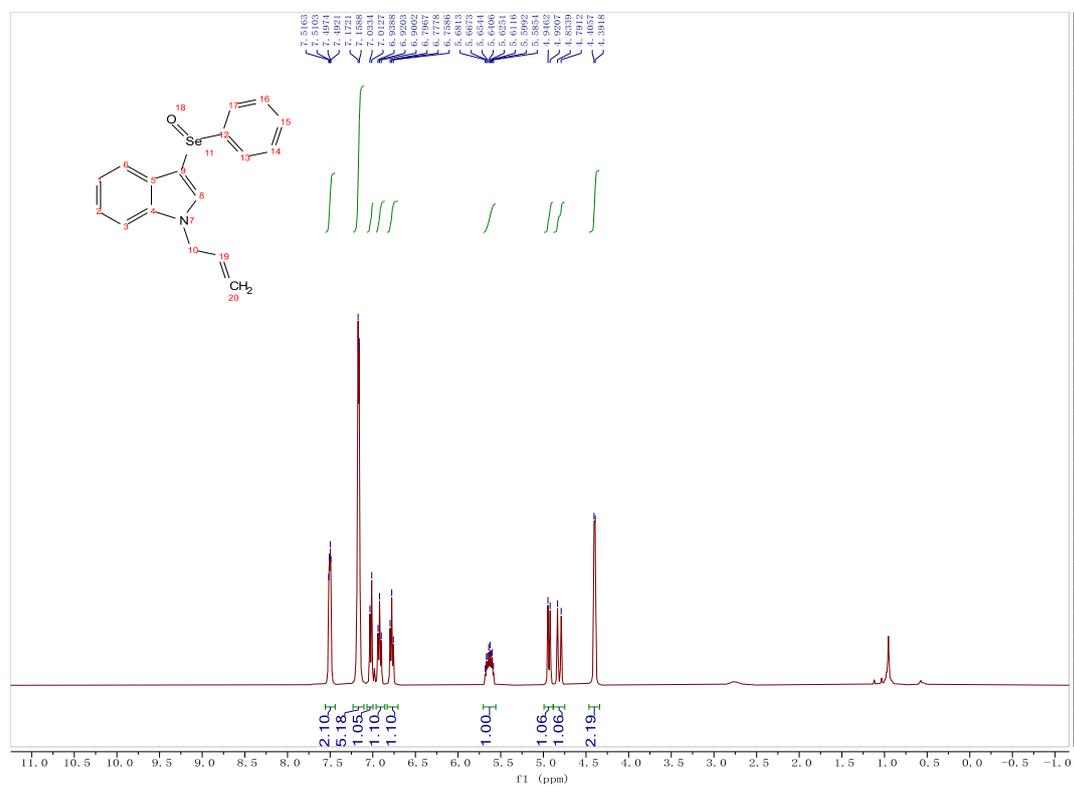


Figure S95. ^1H NMR Spectra of **25** (400 MHz, CDCl_3)

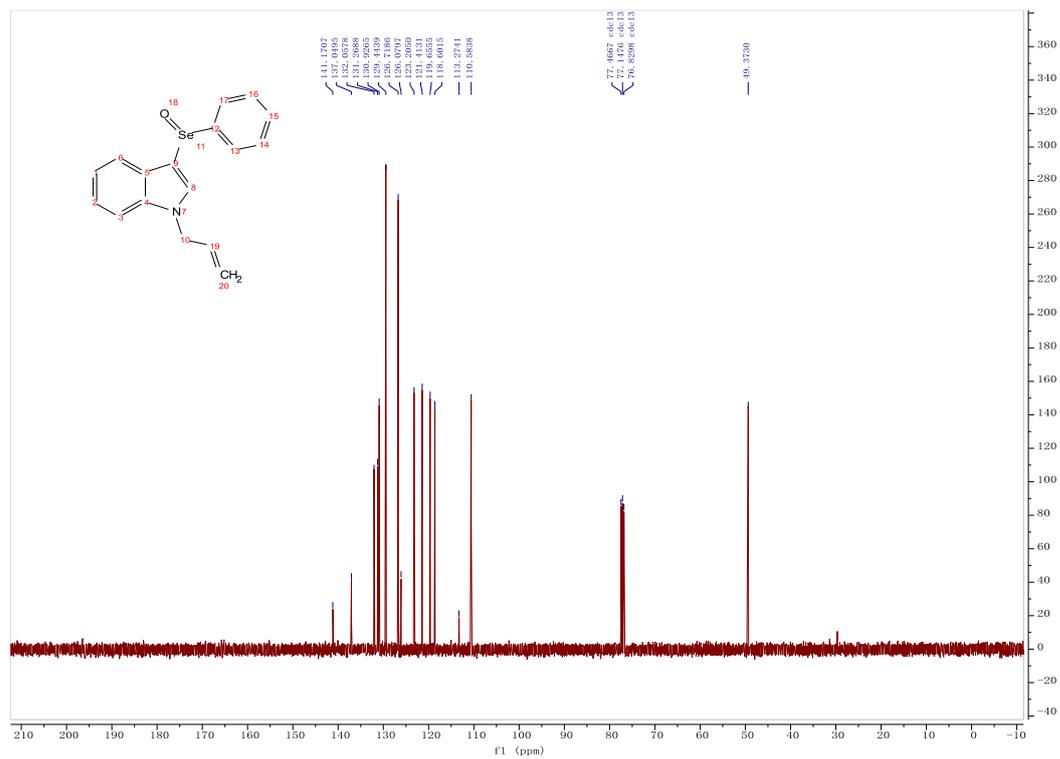


Figure S96. $^{13}\text{C}\{^1\text{H}\}$ NMR Spectra of **25** (100 MHz, CDCl_3)

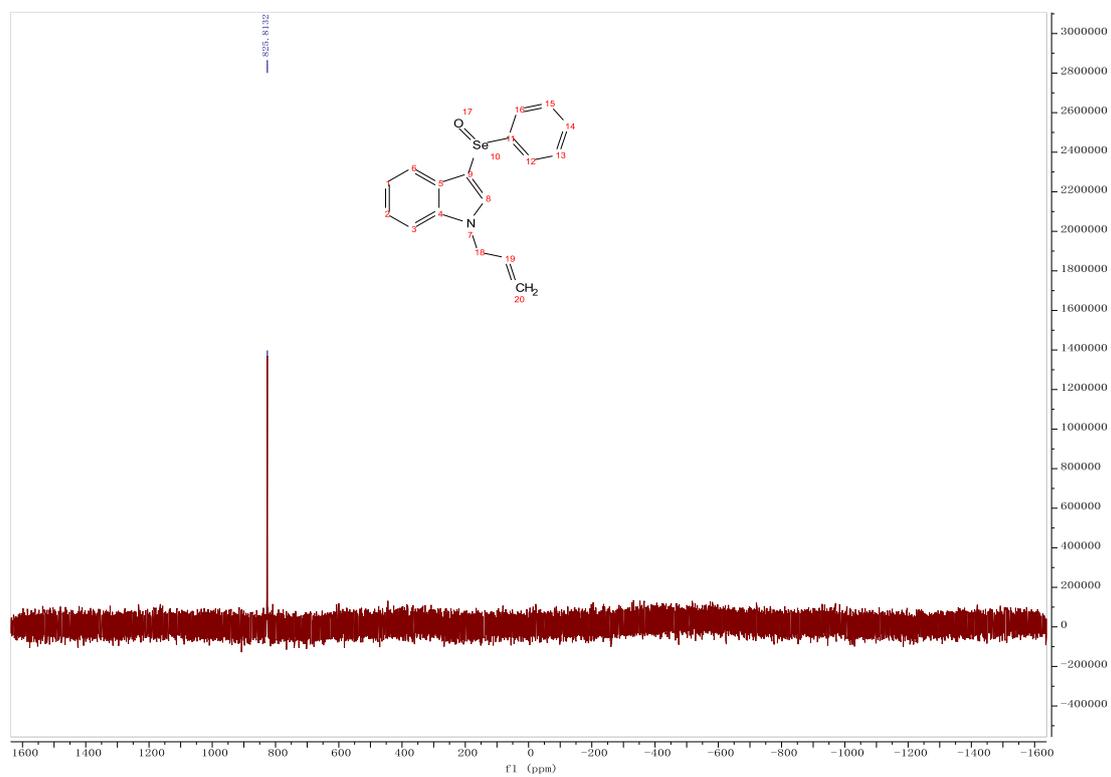


Figure S97. ^{77}Se NMR Spectra of **25** (114 MHz, CDCl_3)

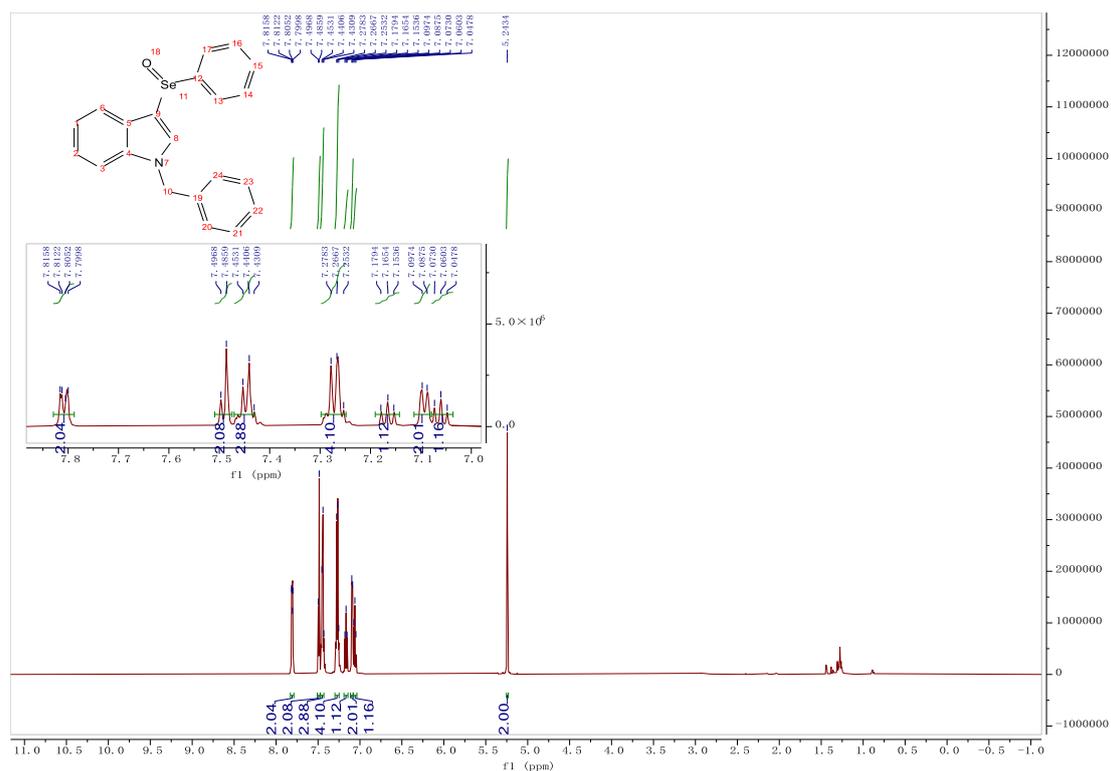


Figure S98. ^1H NMR Spectra of **26** (600 MHz, CDCl_3)

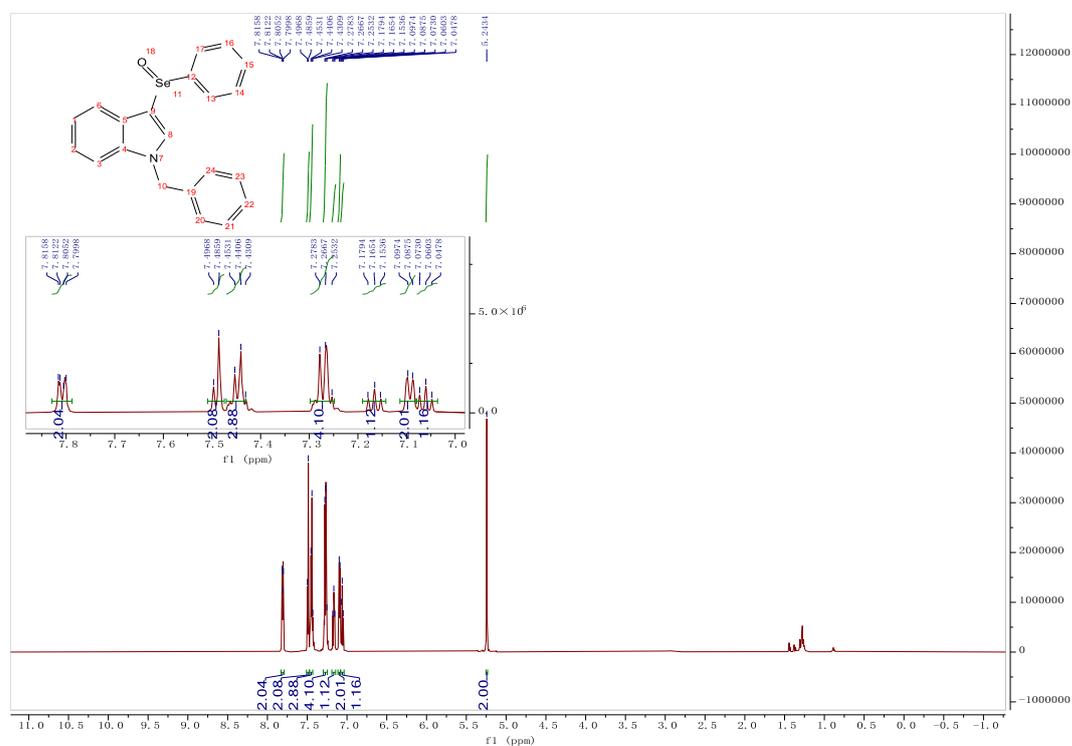


Figure S99. $^{13}\text{C}\{^1\text{H}\}$ NMR Spectra of **26** (150 MHz, CDCl_3)

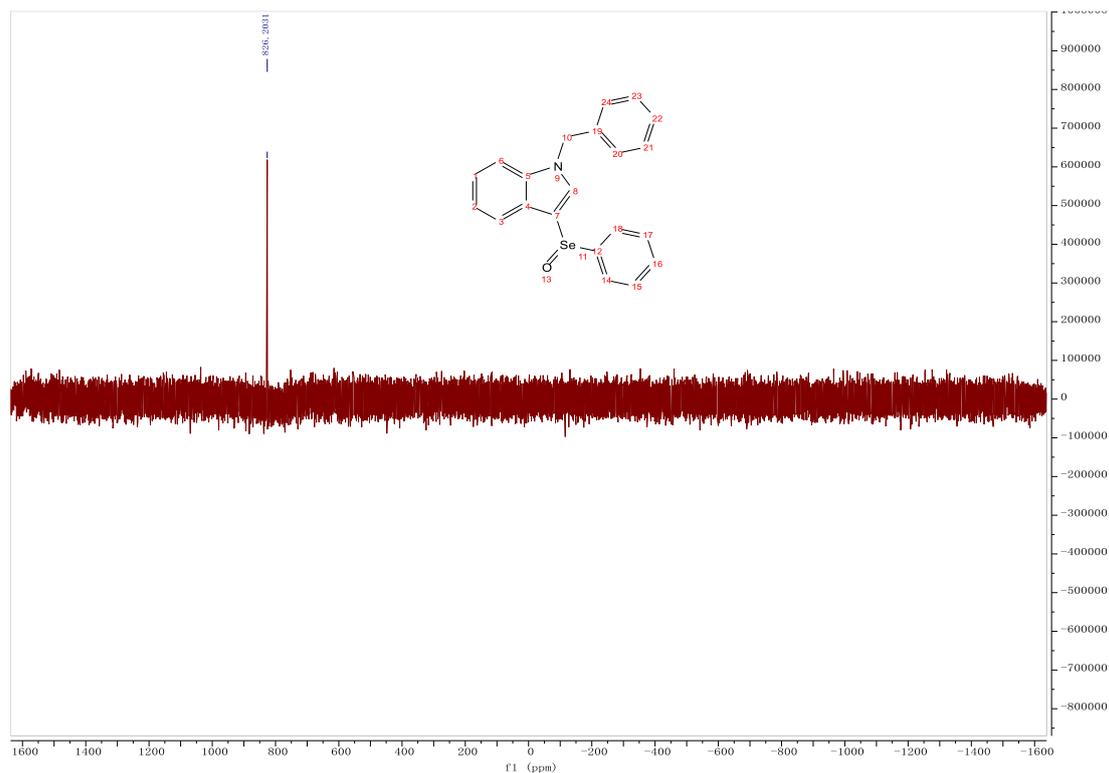


Figure S100. ^{77}Se NMR spectrum of 26 (114 MHz, CDCl_3)

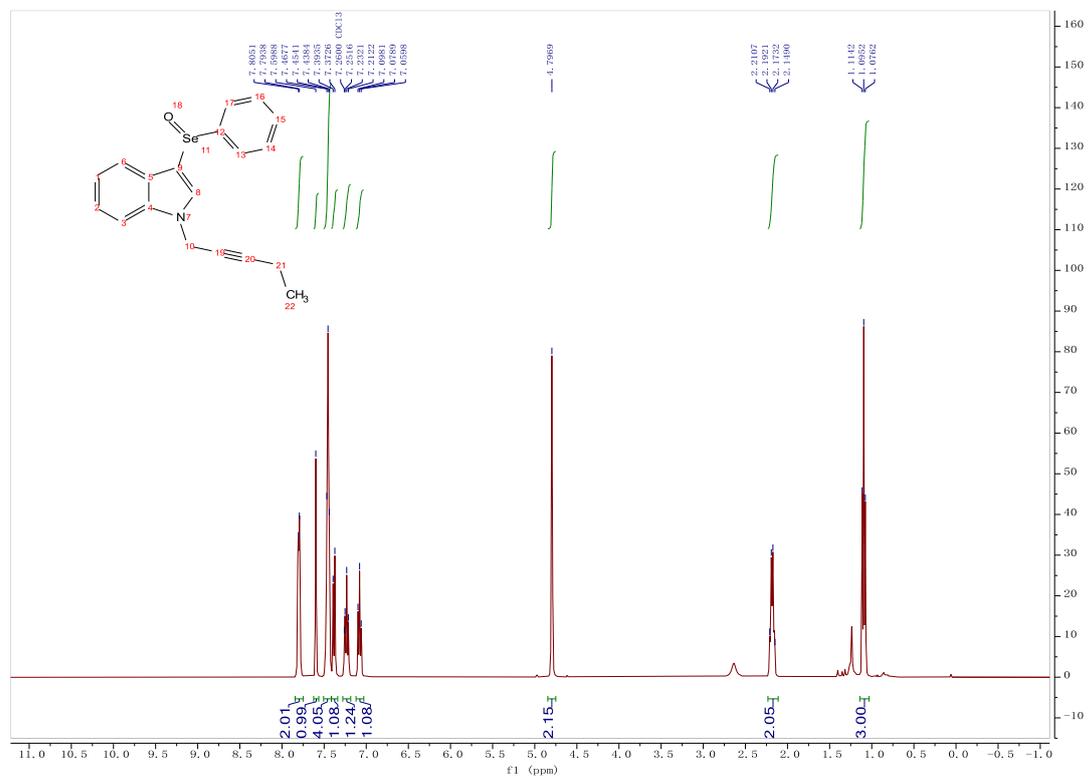


Figure S101. ^1H NMR Spectra of 27 (400 MHz, CDCl_3)

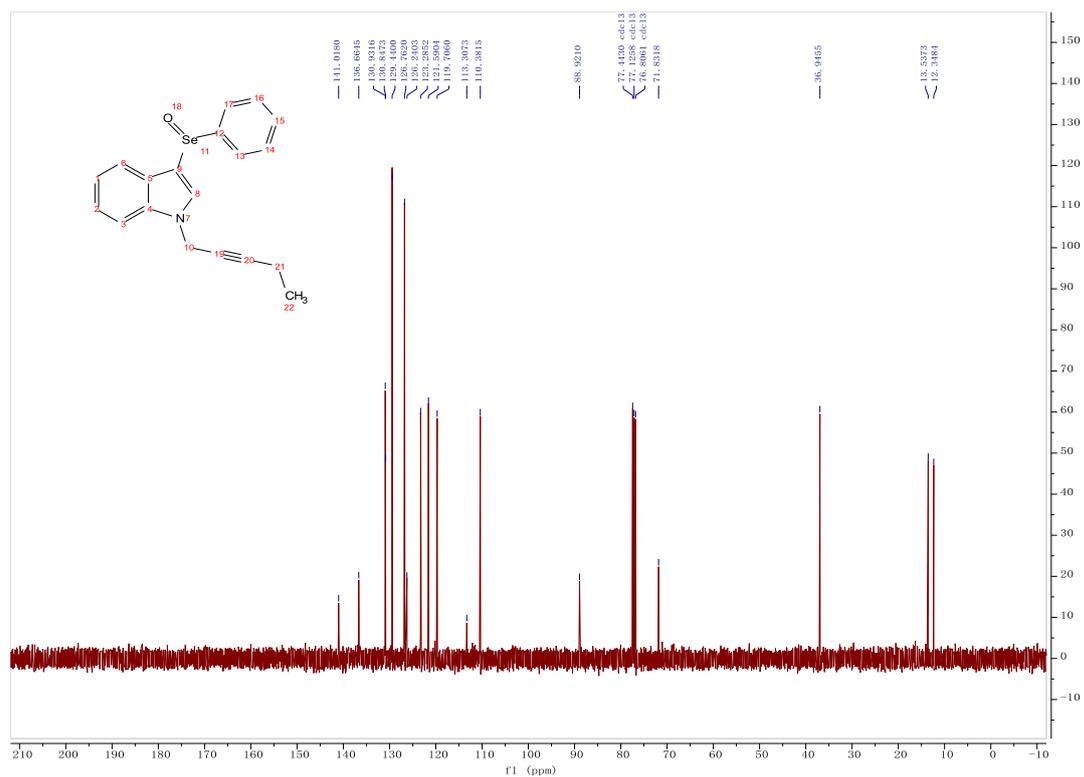


Figure S102. $^{13}\text{C}\{^1\text{H}\}$ NMR Spectra of **27** (100 MHz, CDCl_3)

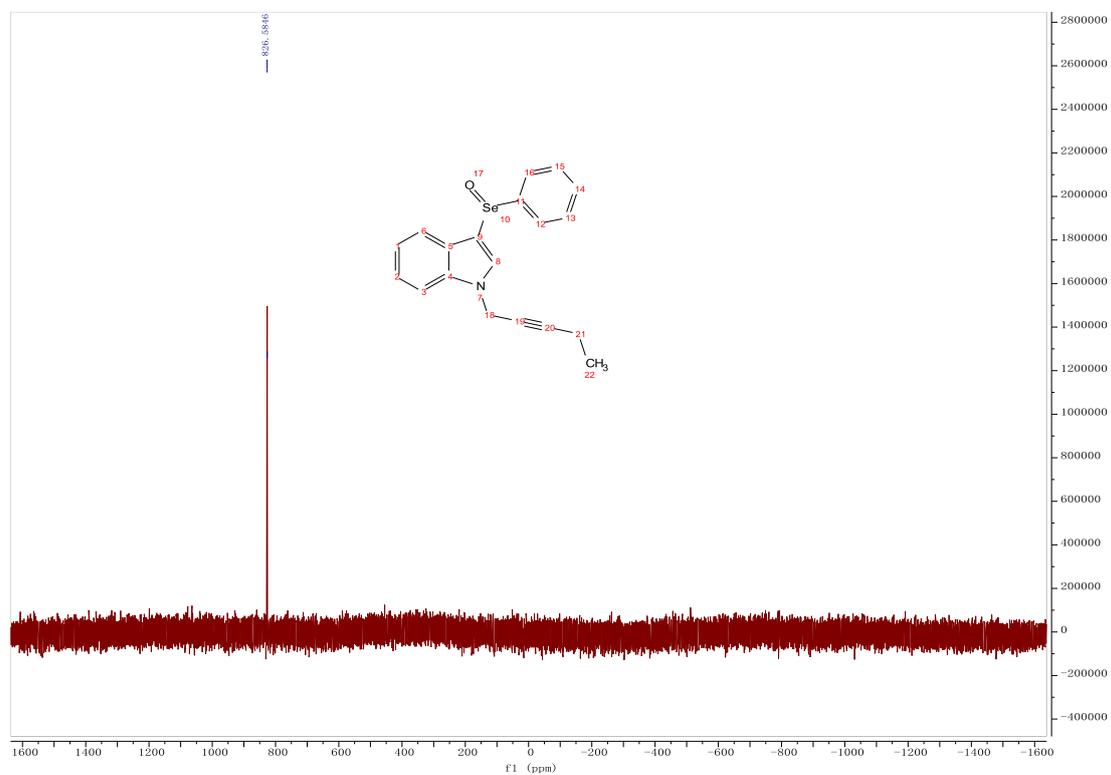


Figure S103. ^{77}Se NMR Spectra of **27** (114 MHz, CDCl_3)

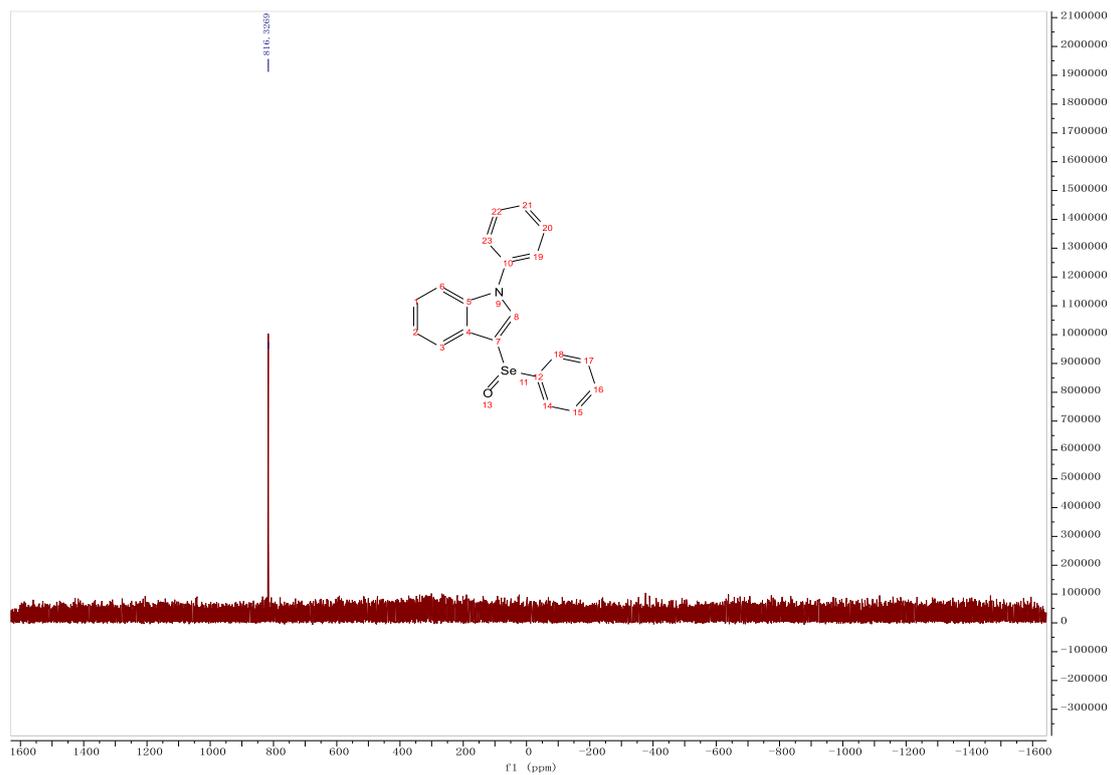


Figure S106. ^{77}Se NMR Spectra of **28** (114 MHz, CDCl_3)

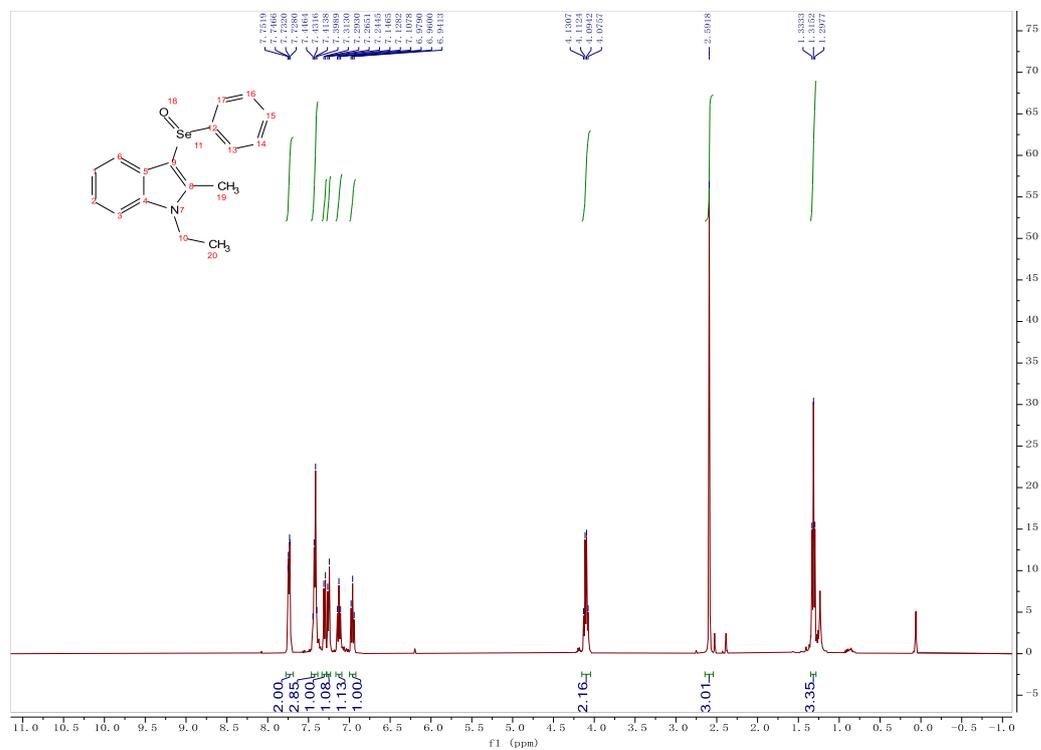


Figure S107. ^1H NMR Spectra of **29** (400 MHz, CDCl_3)

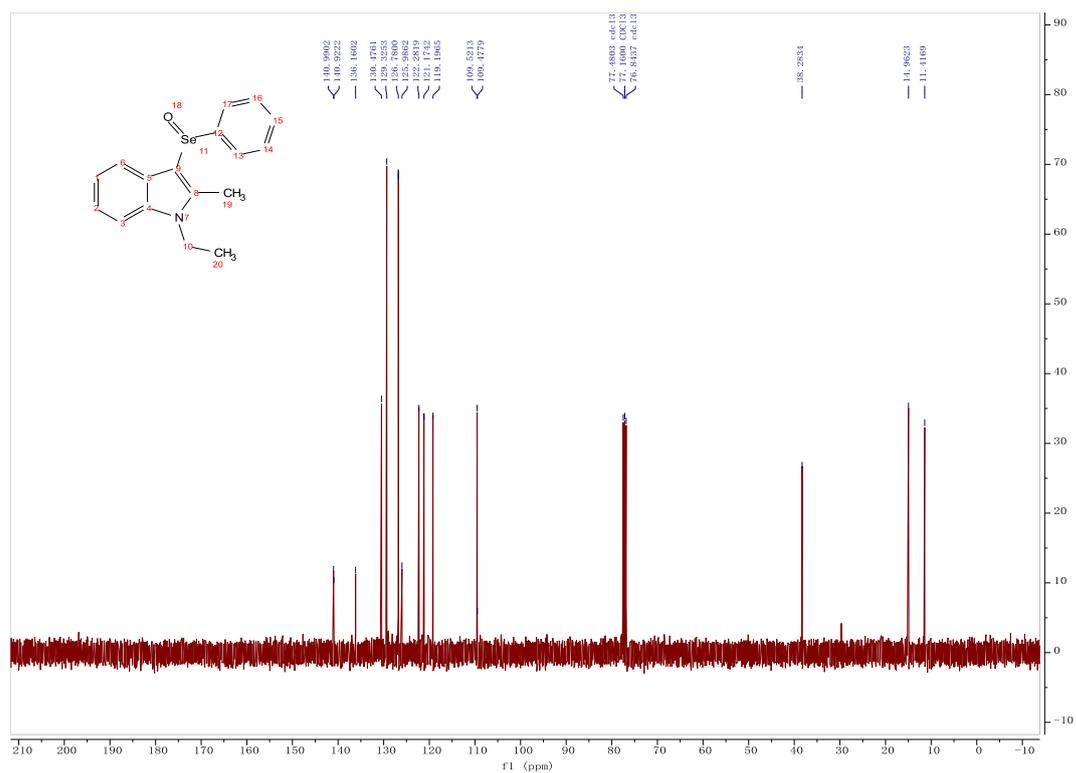


Figure S108. $^{13}\text{C}\{^1\text{H}\}$ NMR Spectra of **29** (100 MHz, CDCl_3)

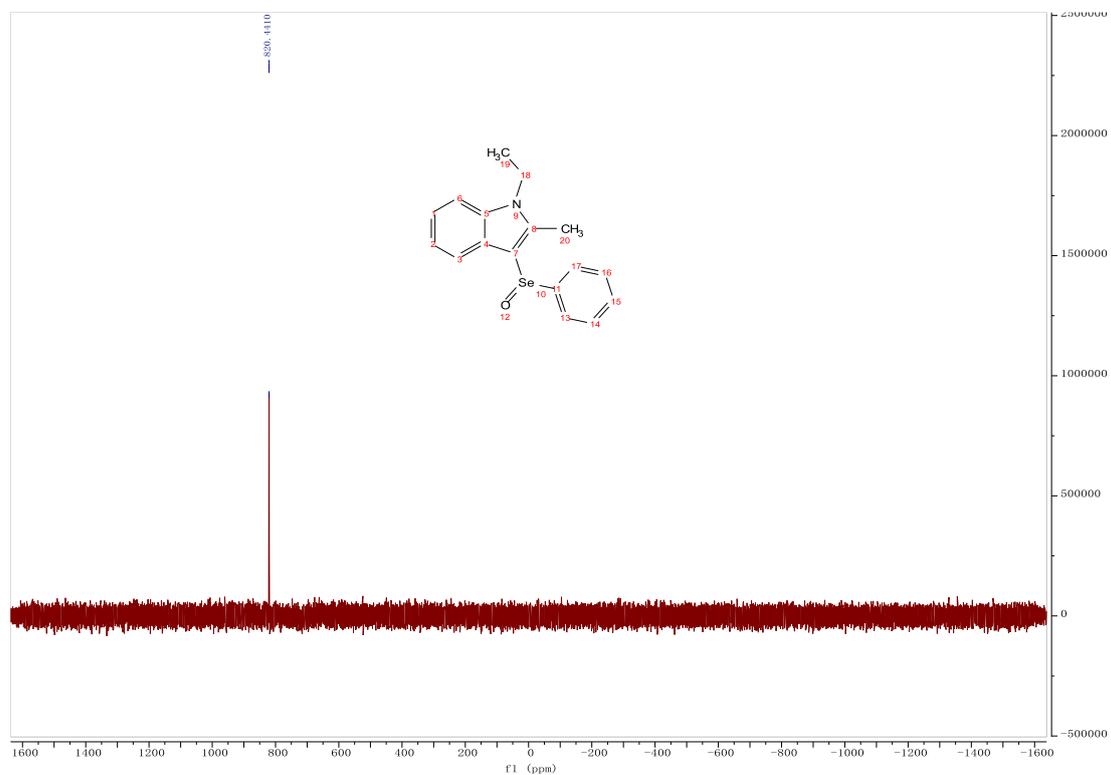


Figure S109. ^{77}Se NMR Spectra of **29** (114 MHz, CDCl_3)

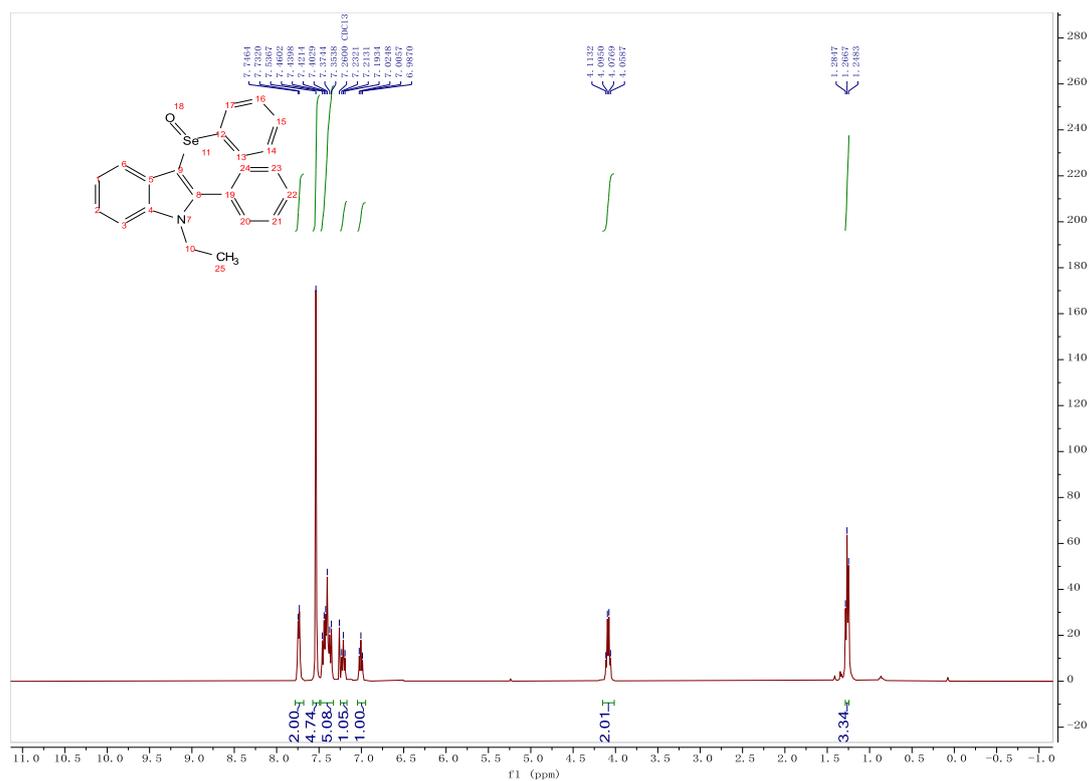


Figure S110. ^1H NMR Spectra of **30** (400 MHz, CDCl_3)

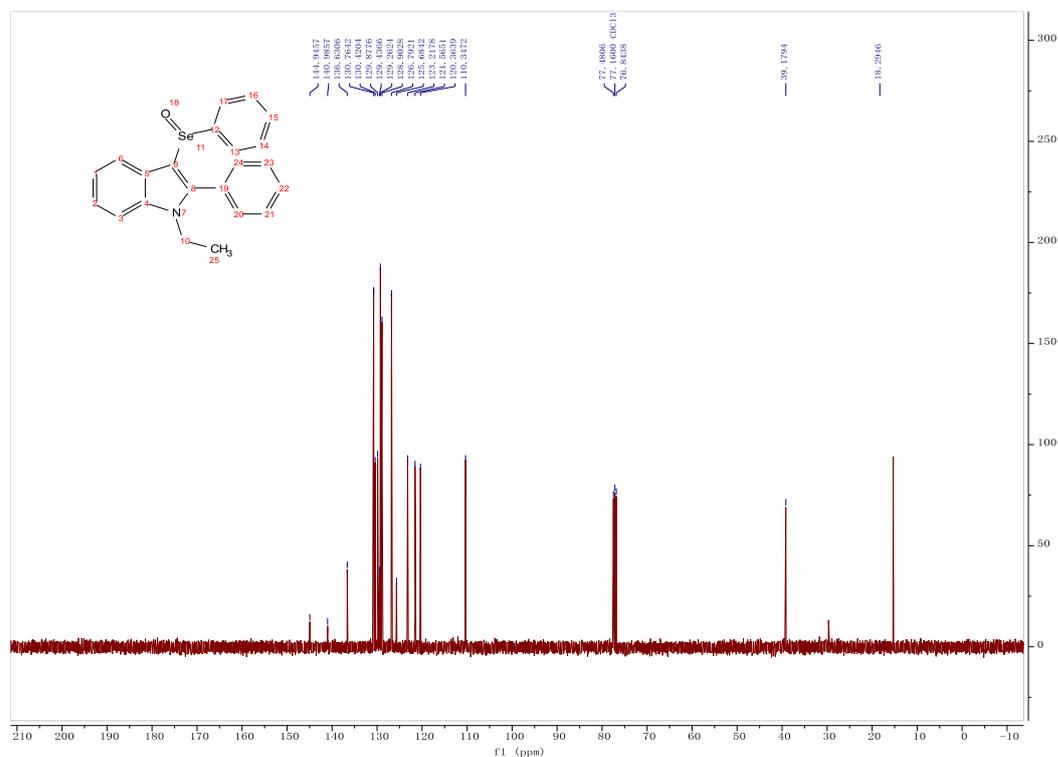


Figure S111. $^{13}\text{C}\{^1\text{H}\}$ NMR Spectra of **30** (100 MHz, CDCl_3)

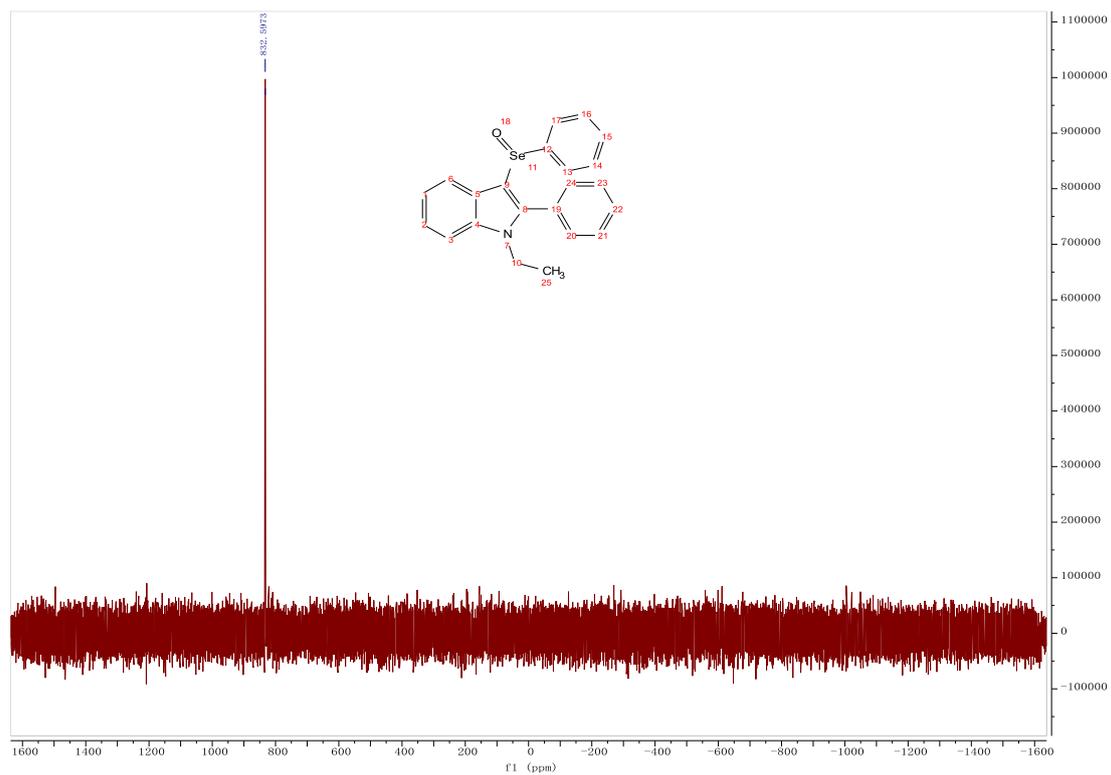


Figure S112. ^{77}Se NMR Spectra of **30** (114 MHz, CDCl_3)

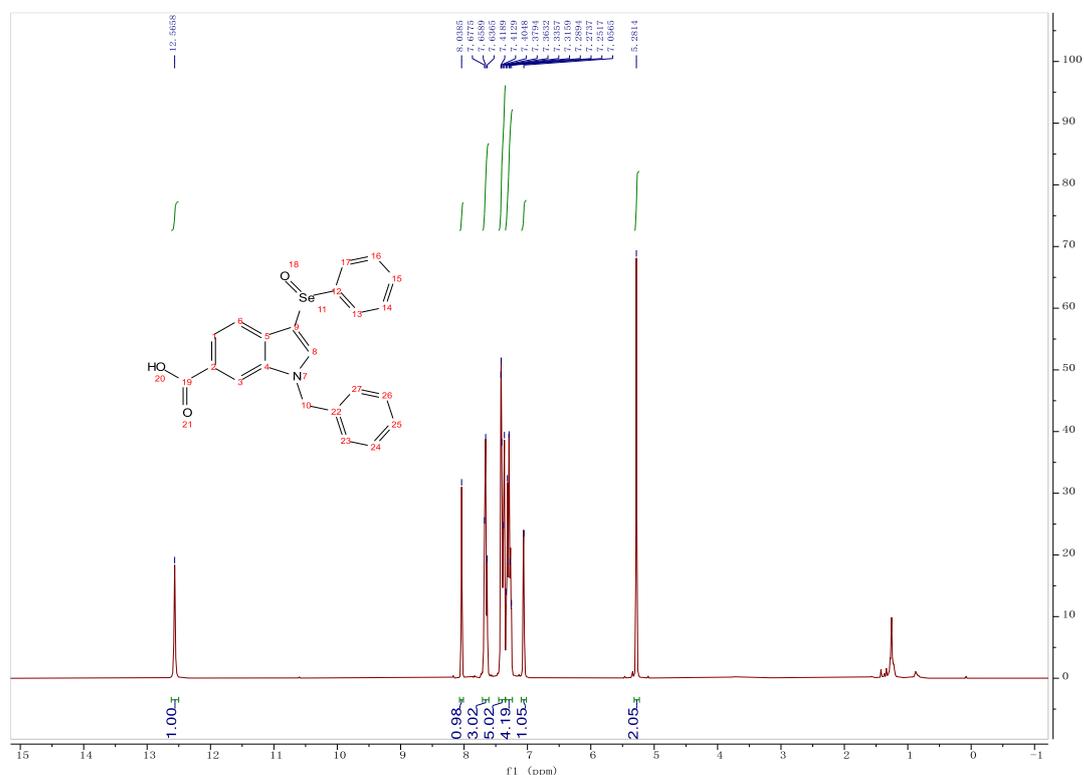


Figure S113. ^1H NMR Spectra of **31** (400 MHz, CDCl_3)

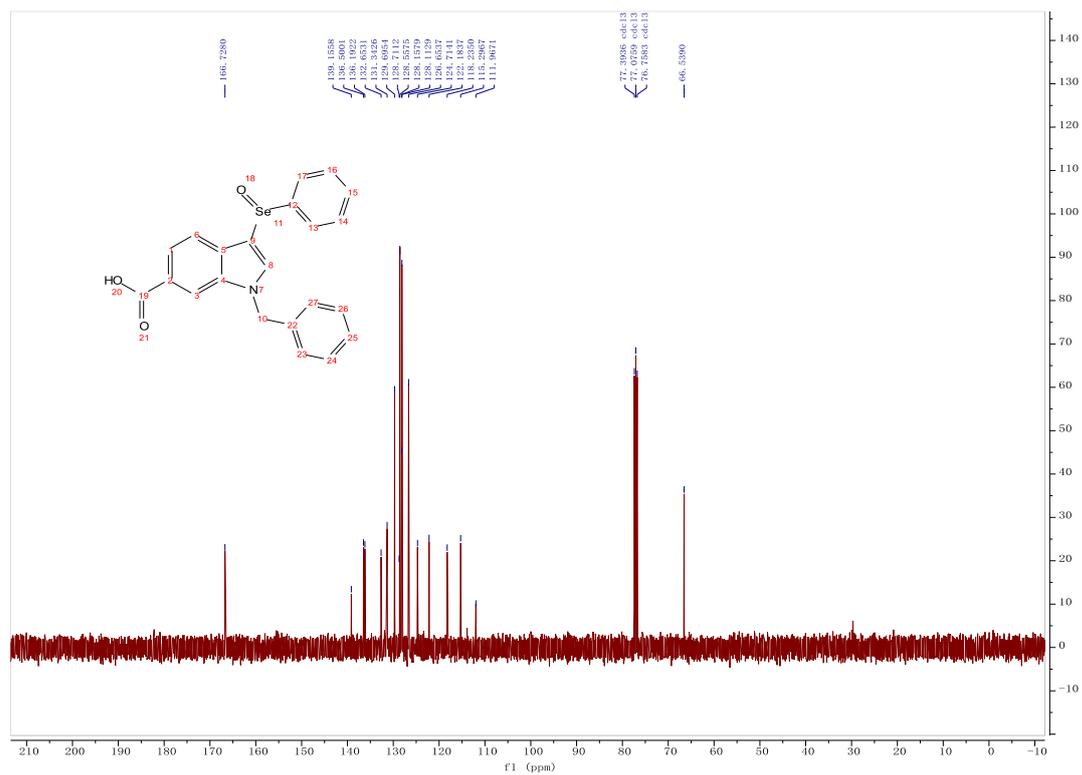


Figure S114. $^{13}\text{C}\{^1\text{H}\}$ NMR Spectra of **31** (100 MHz, CDCl_3)

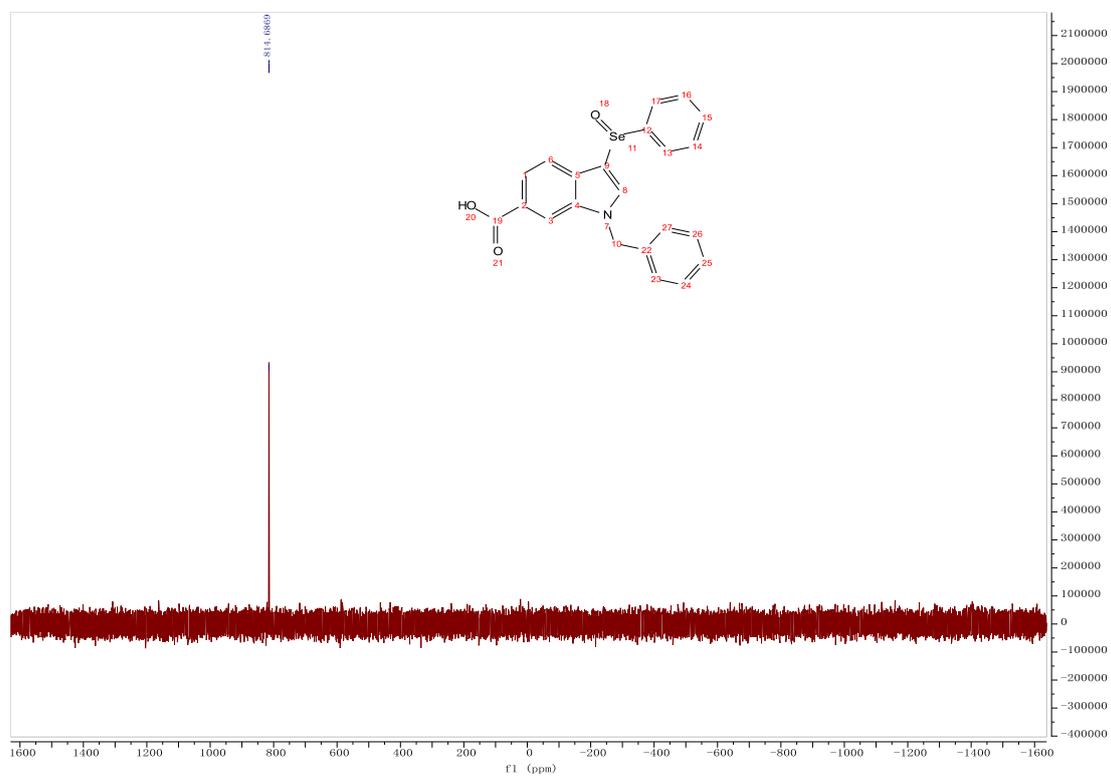
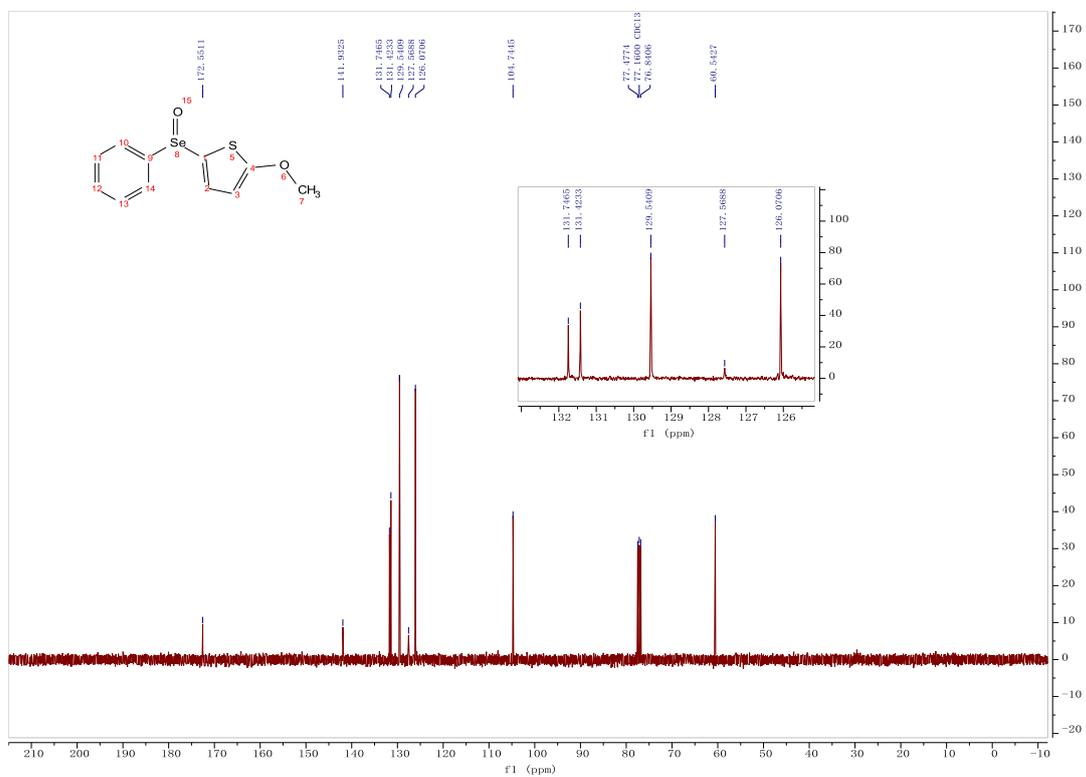
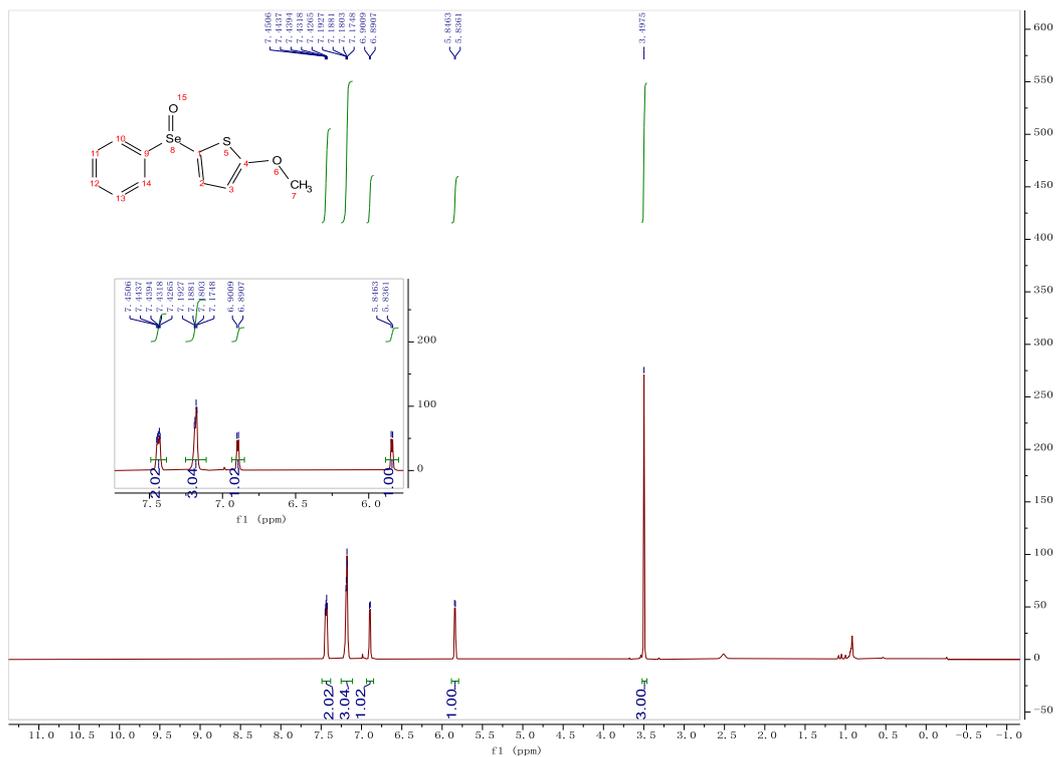


Figure S115. ^{77}Se NMR Spectra of **31** (114 MHz, CDCl_3)



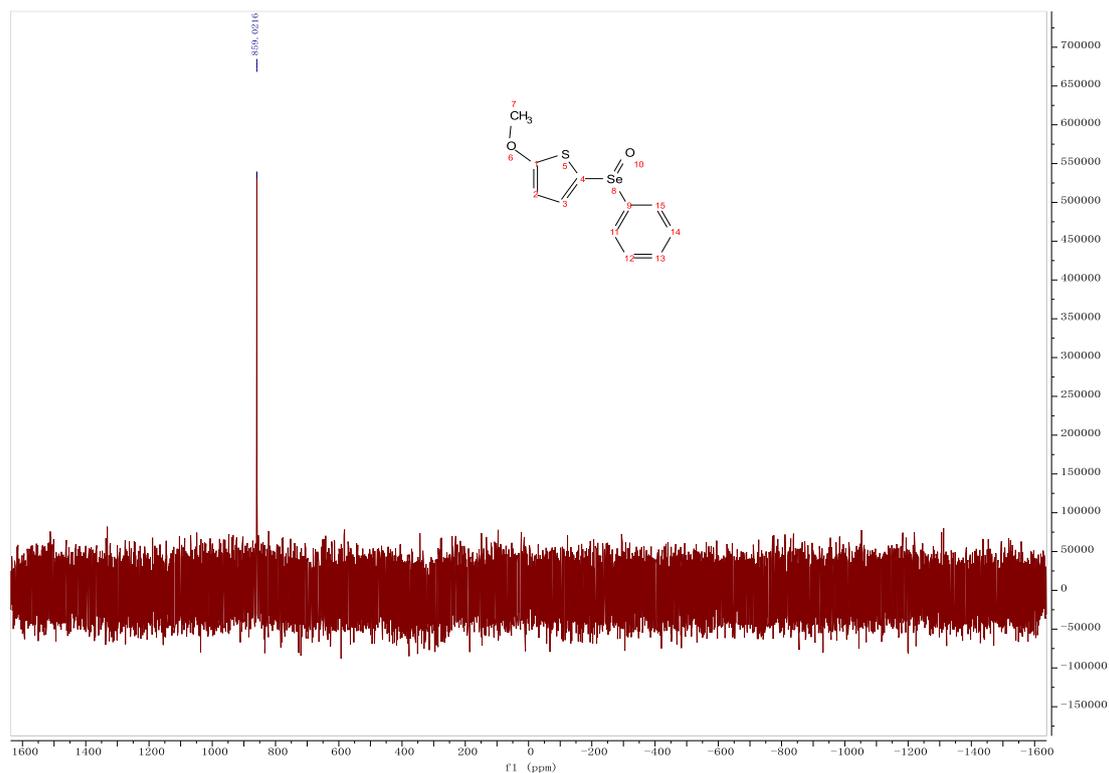
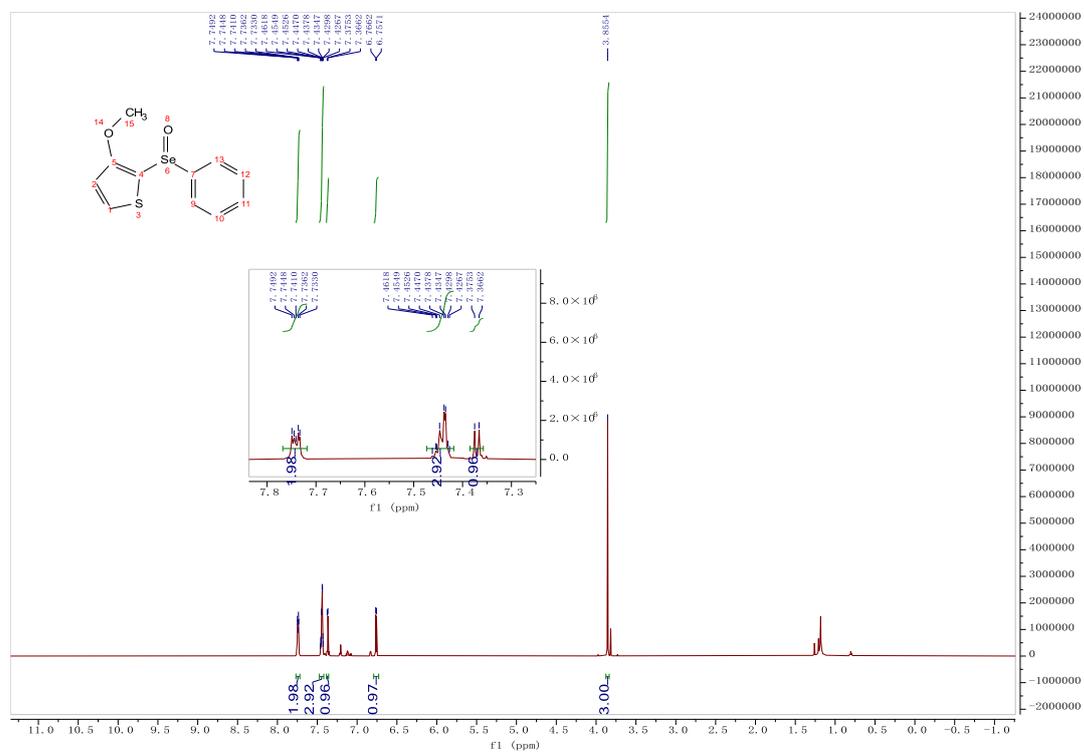


Figure S118. ^{77}Se NMR Spectra of **32** (114 MHz, CDCl_3)



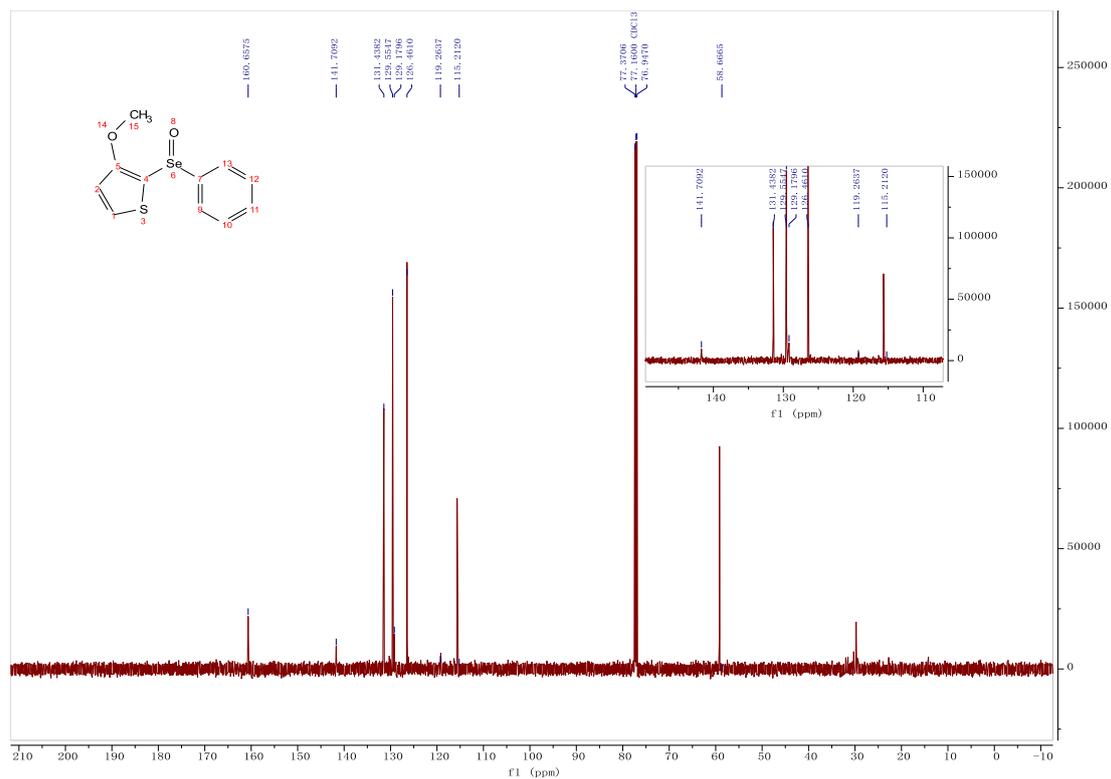


Figure S120. $^{13}\text{C}\{^1\text{H}\}$ NMR Spectra of **33** (150 MHz, CDCl_3)

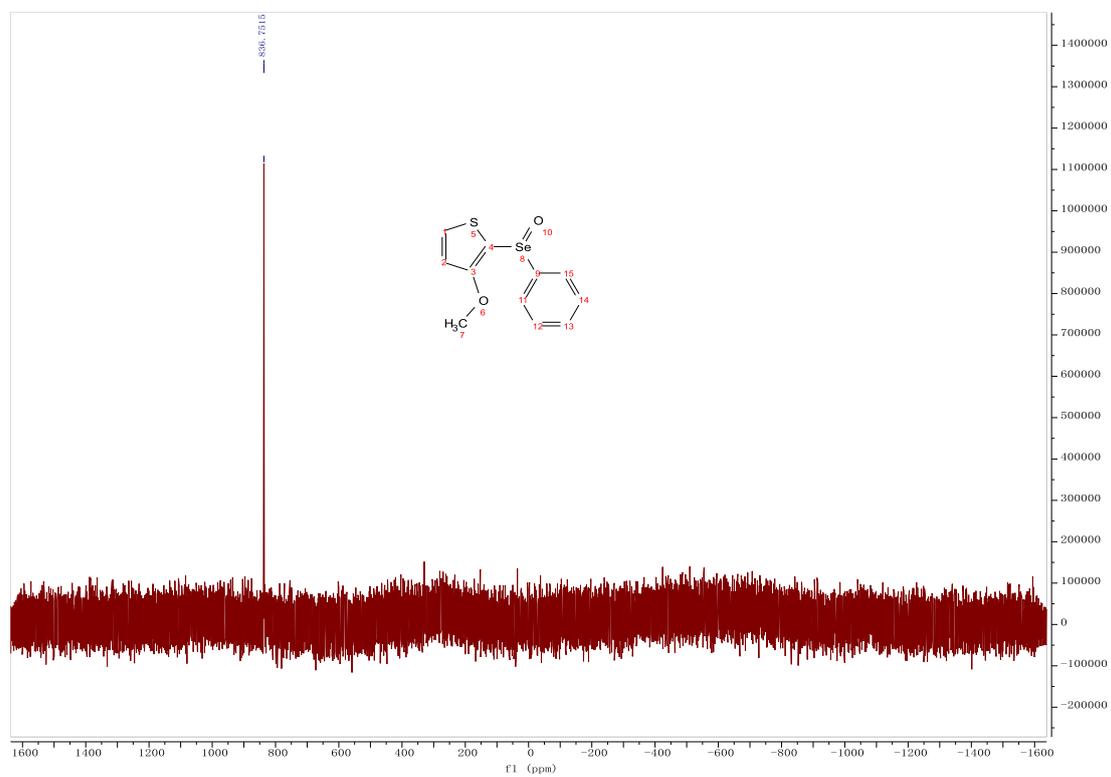


Figure S121. ^{77}Se NMR Spectra of **33** (114 MHz, CDCl_3)

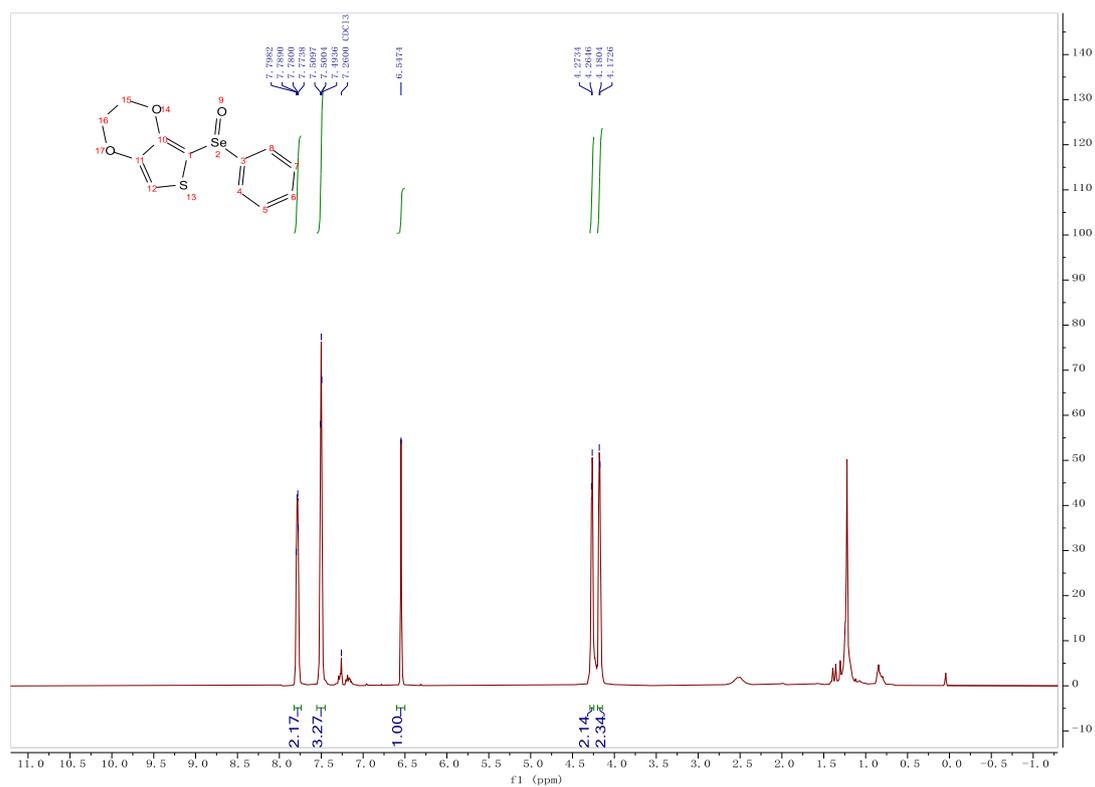


Figure S122. ^1H NMR Spectra of **34** (400 MHz, CDCl_3)

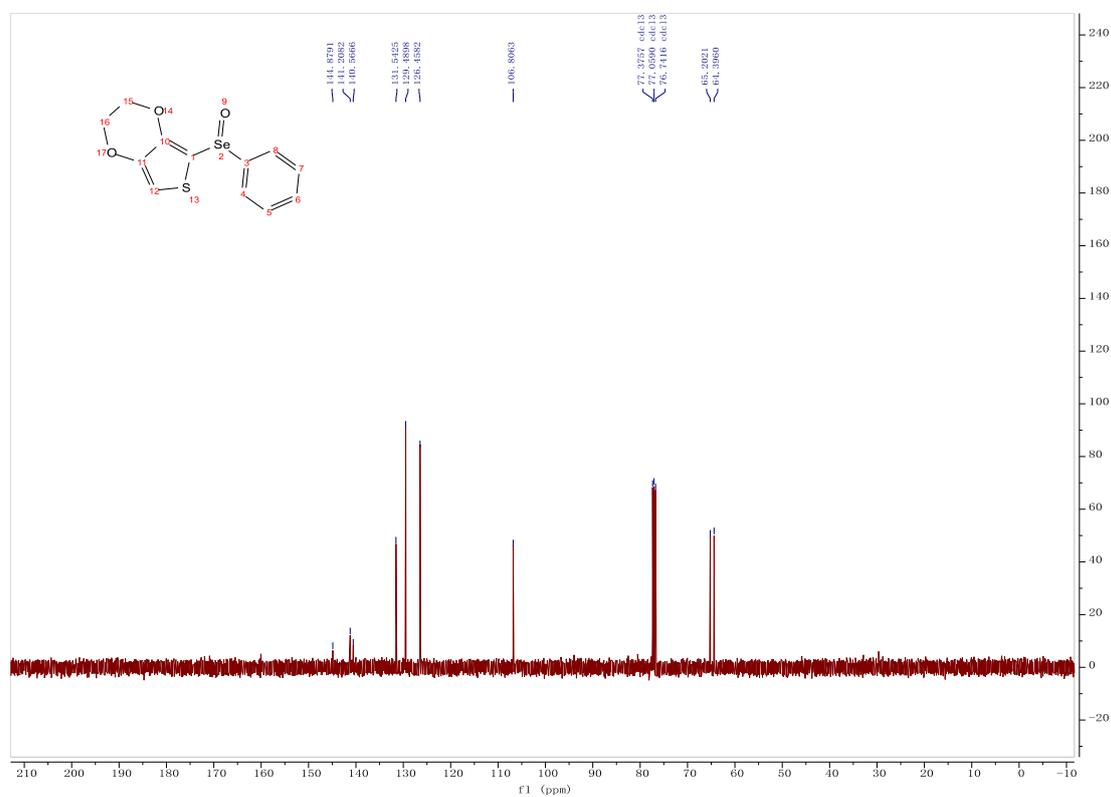


Figure S123. $^{13}\text{C}\{^1\text{H}\}$ NMR Spectra of **34** (100 MHz, CDCl_3)

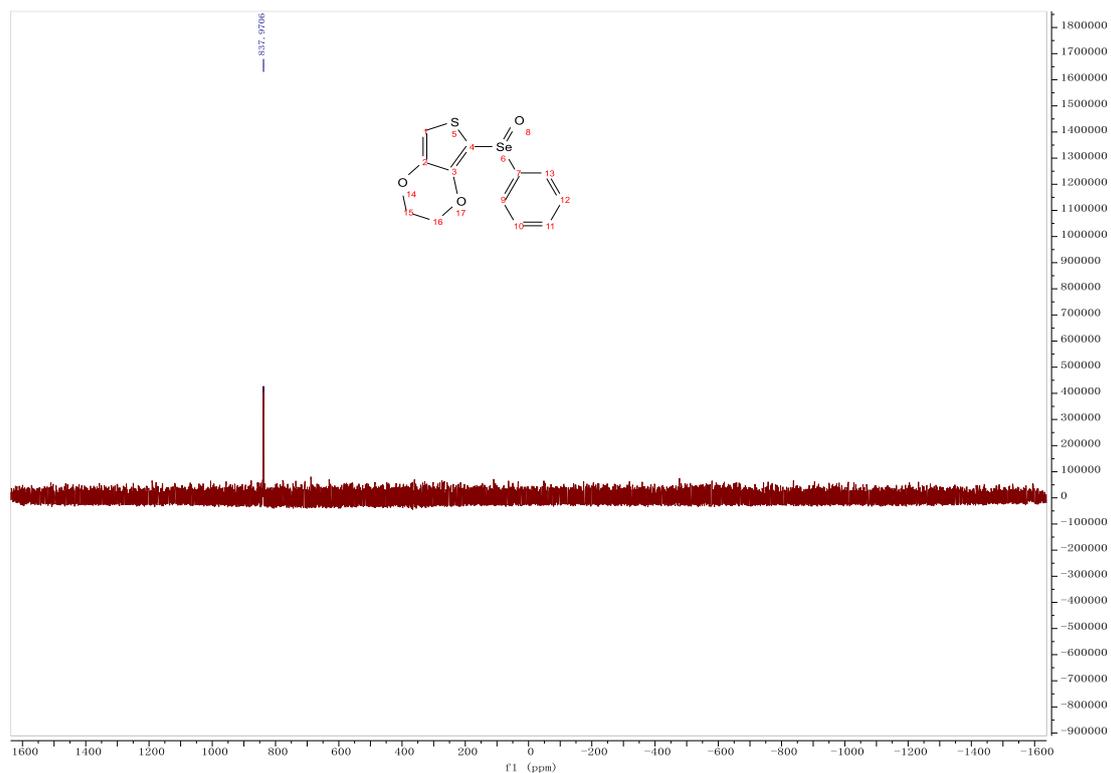


Figure S124. ^{77}Se NMR Spectra of **34** (114 MHz, CDCl_3)

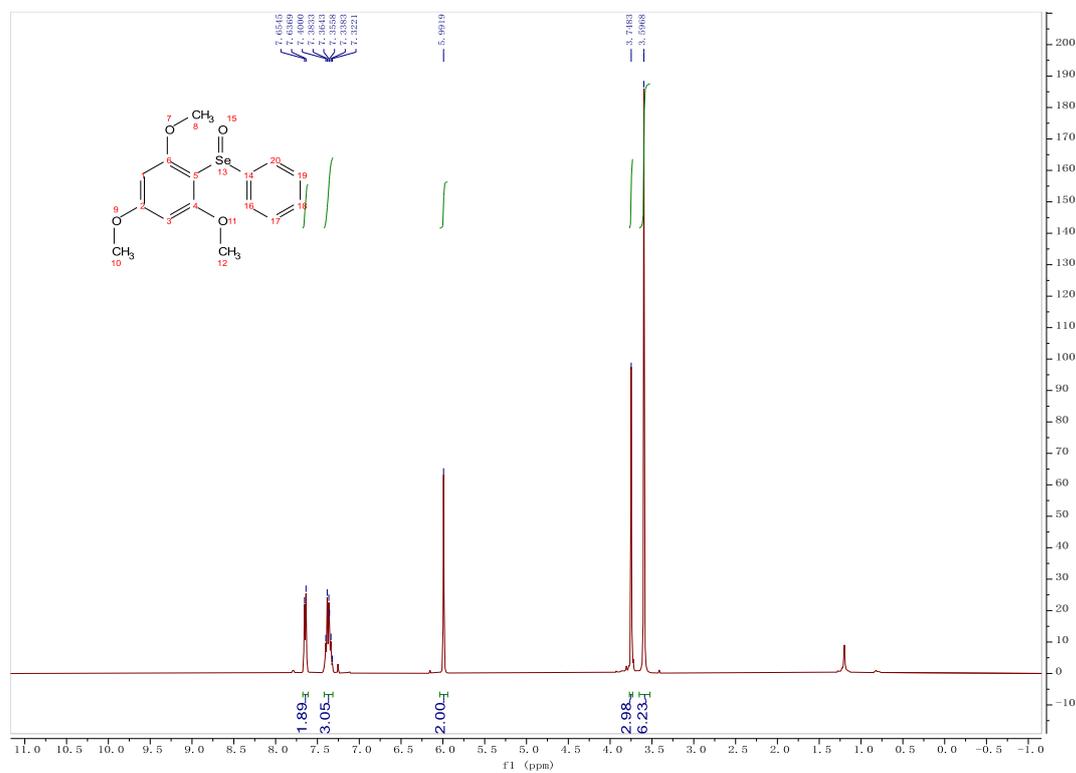


Figure S125. ^1H NMR Spectra of **35** (400 MHz, CDCl_3)

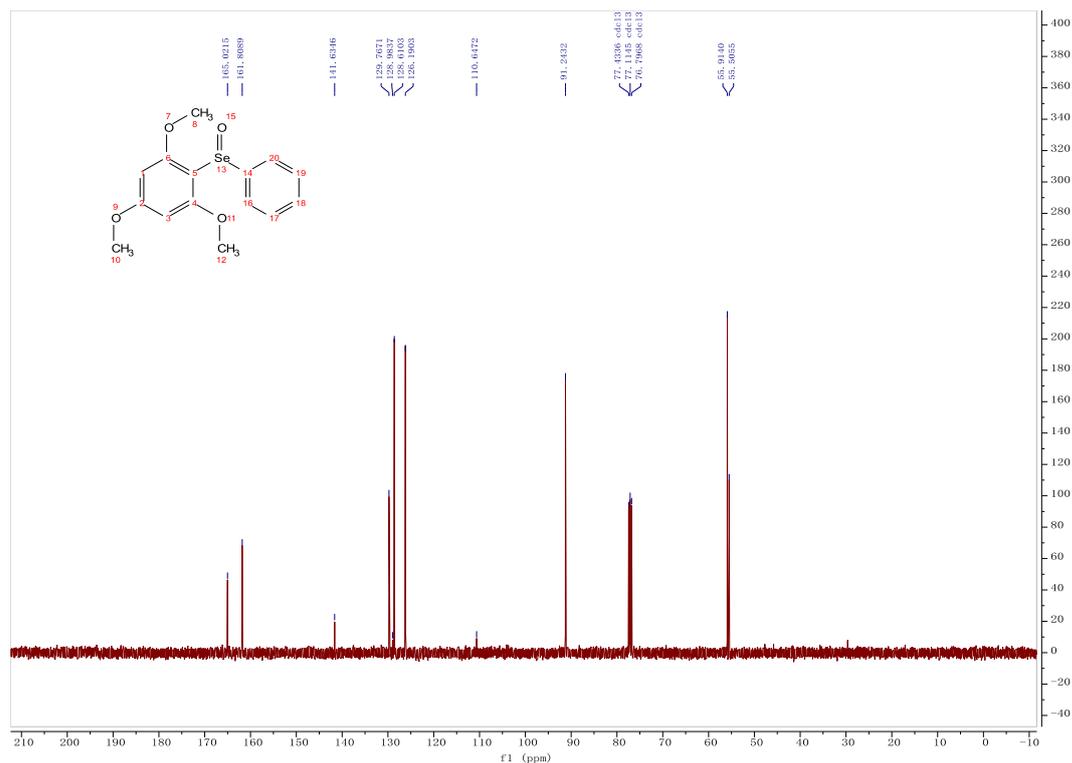


Figure S126. $^{13}\text{C}\{^1\text{H}\}$ NMR Spectra of **35** (100 MHz, CDCl_3)

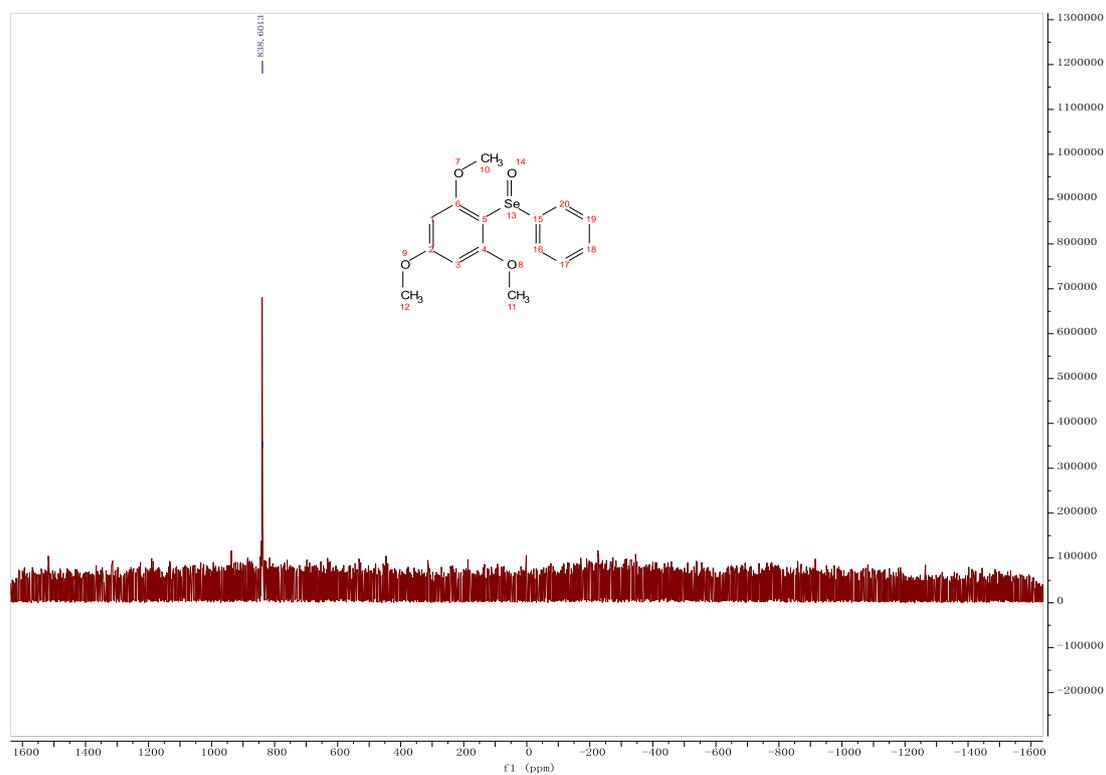


Figure S127. ^{77}Se NMR Spectra of **35** (114 MHz, CDCl_3)

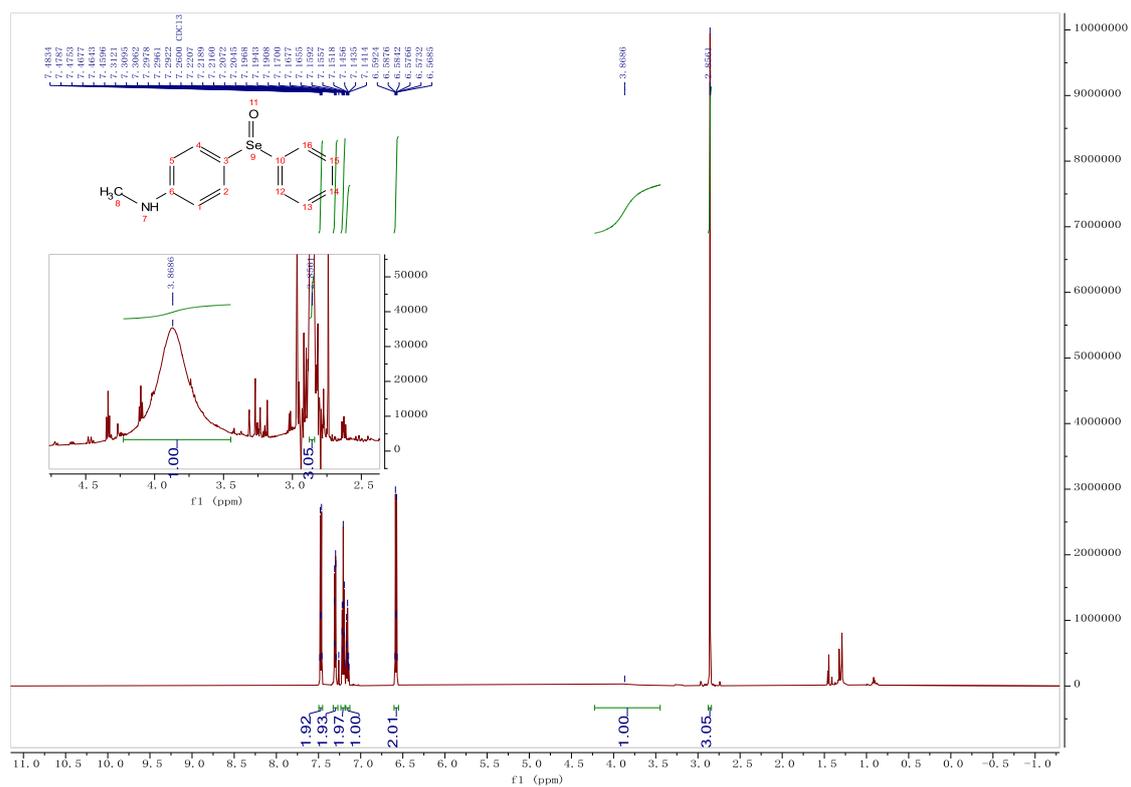


Figure S128. ^1H NMR Spectra of 36 (600 MHz, CDCl_3)

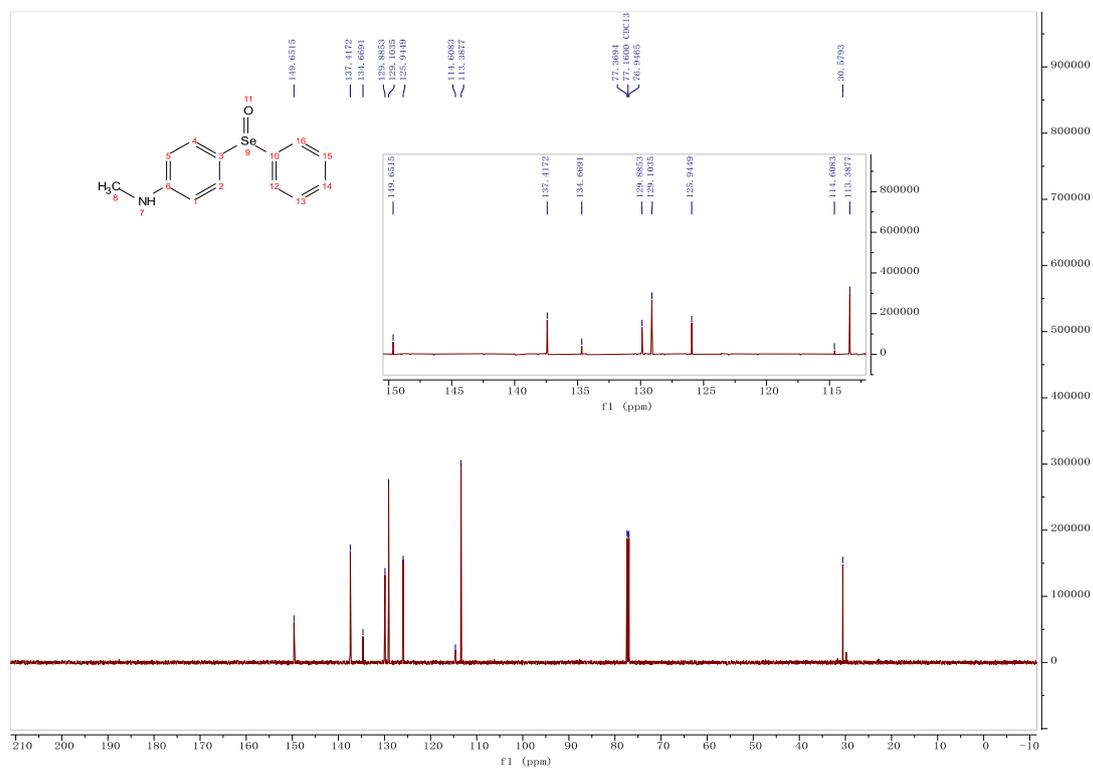


Figure S129. $^{13}\text{C}\{^1\text{H}\}$ NMR Spectra of 36 (150 MHz, CDCl_3)

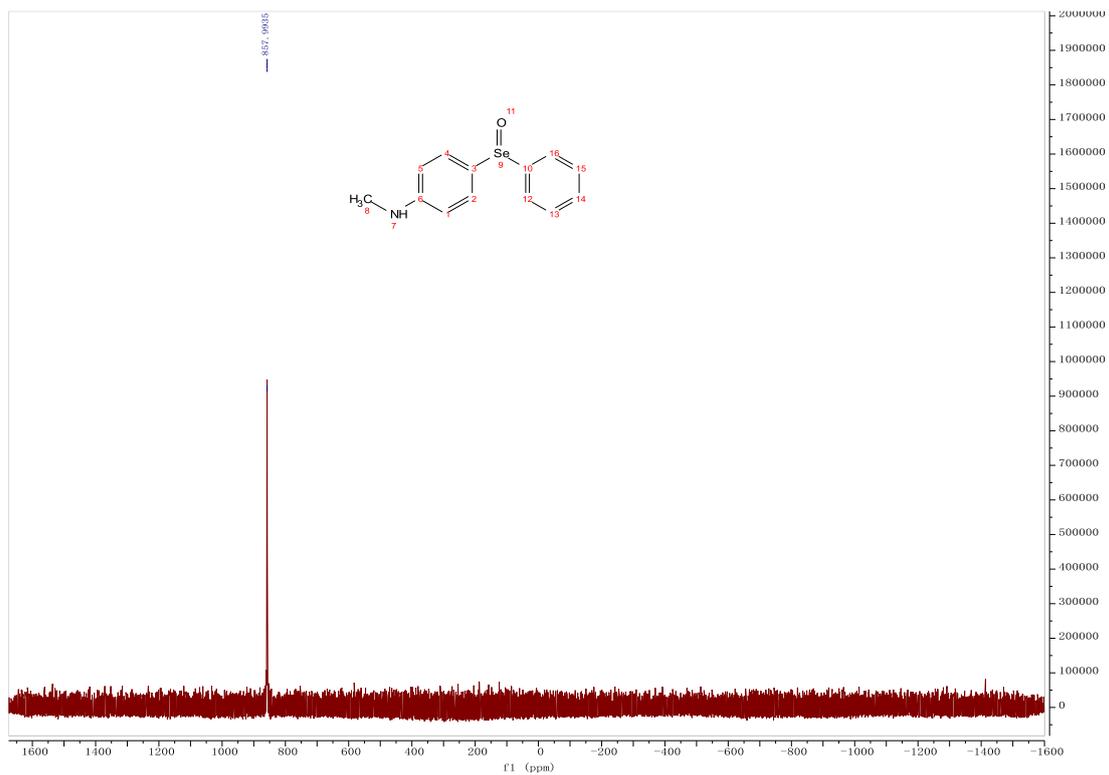


Figure S130. ⁷⁷Se NMR Spectra of 36 (114 MHz, CDCl₃)

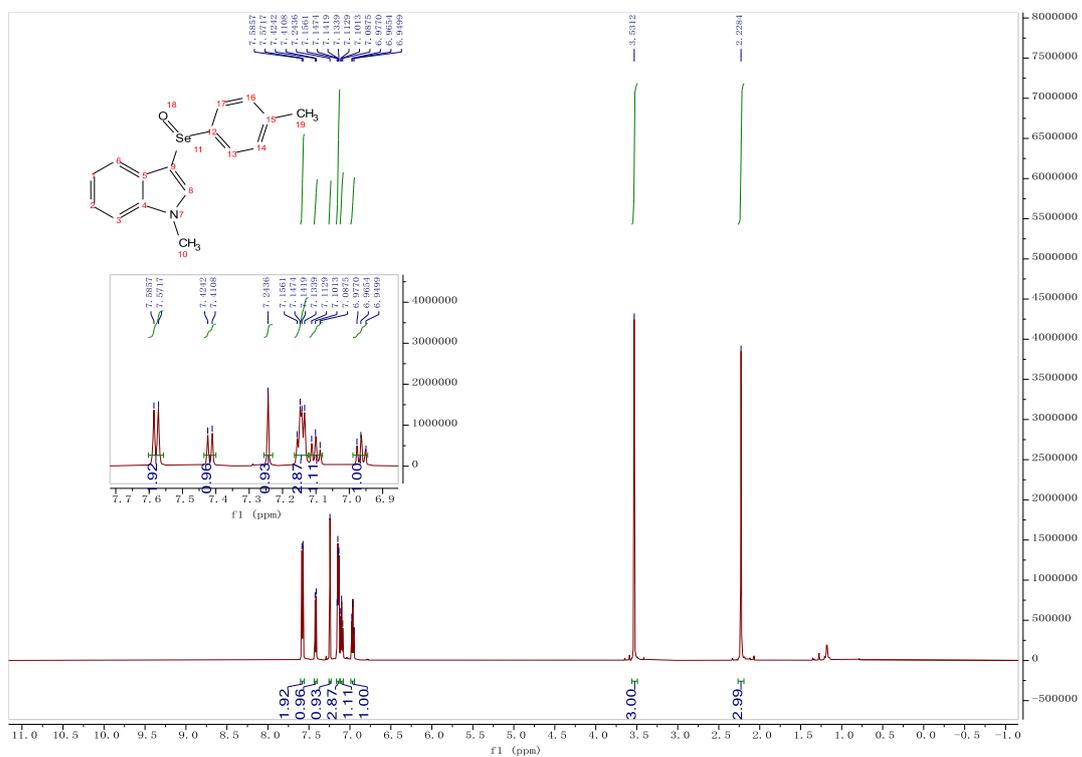


Figure S131. ¹H NMR Spectra of 37 (600 MHz, CDCl₃)

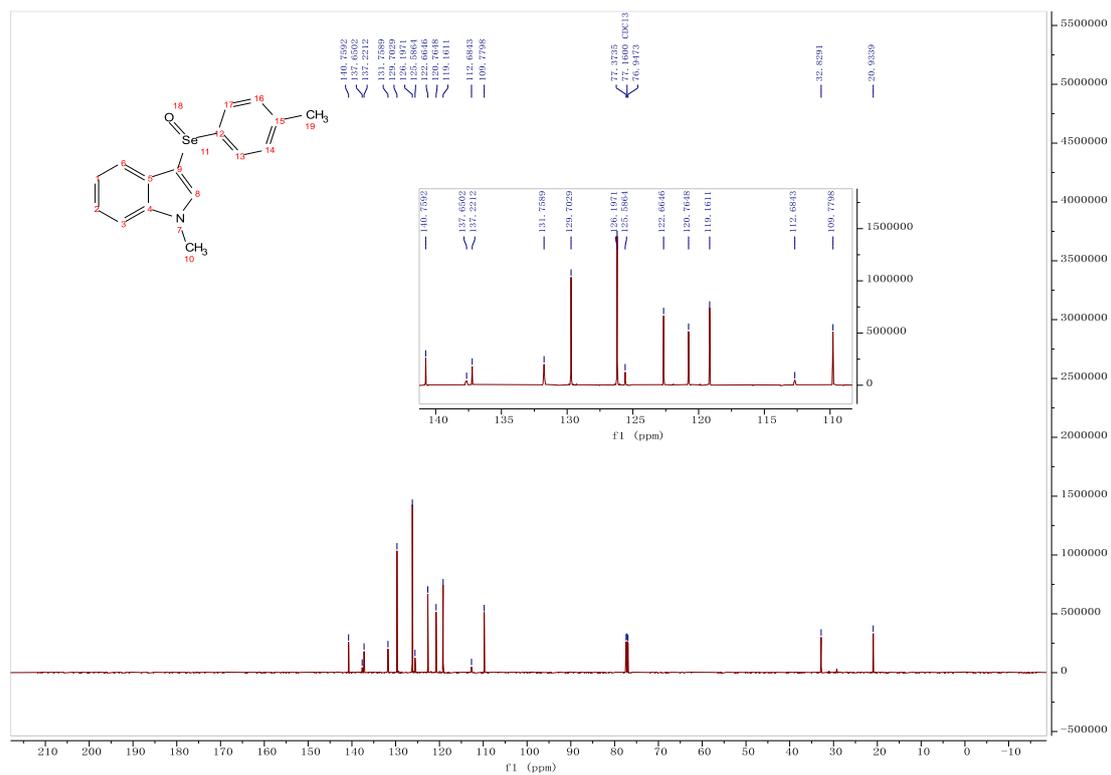


Figure S132. $^{13}\text{C}\{^1\text{H}\}$ NMR Spectra of **37** (150 MHz, CDCl_3)

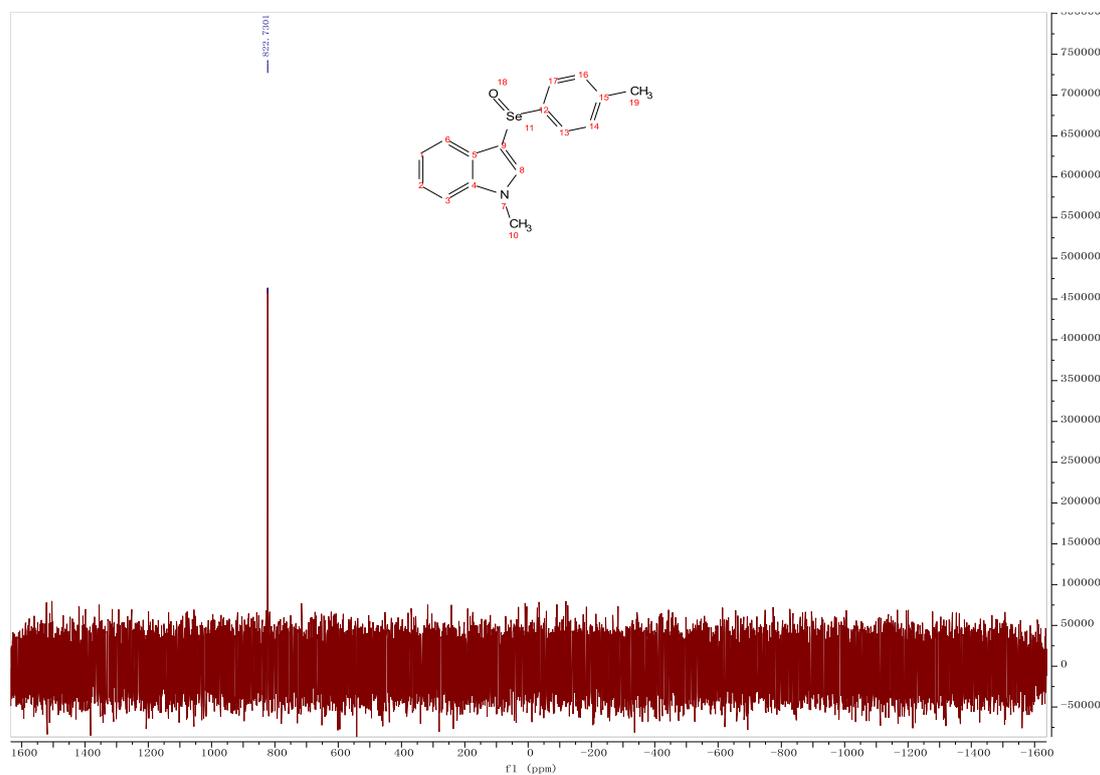


Figure S133. ^{77}Se NMR Spectra of **37** (114 MHz, CDCl_3)

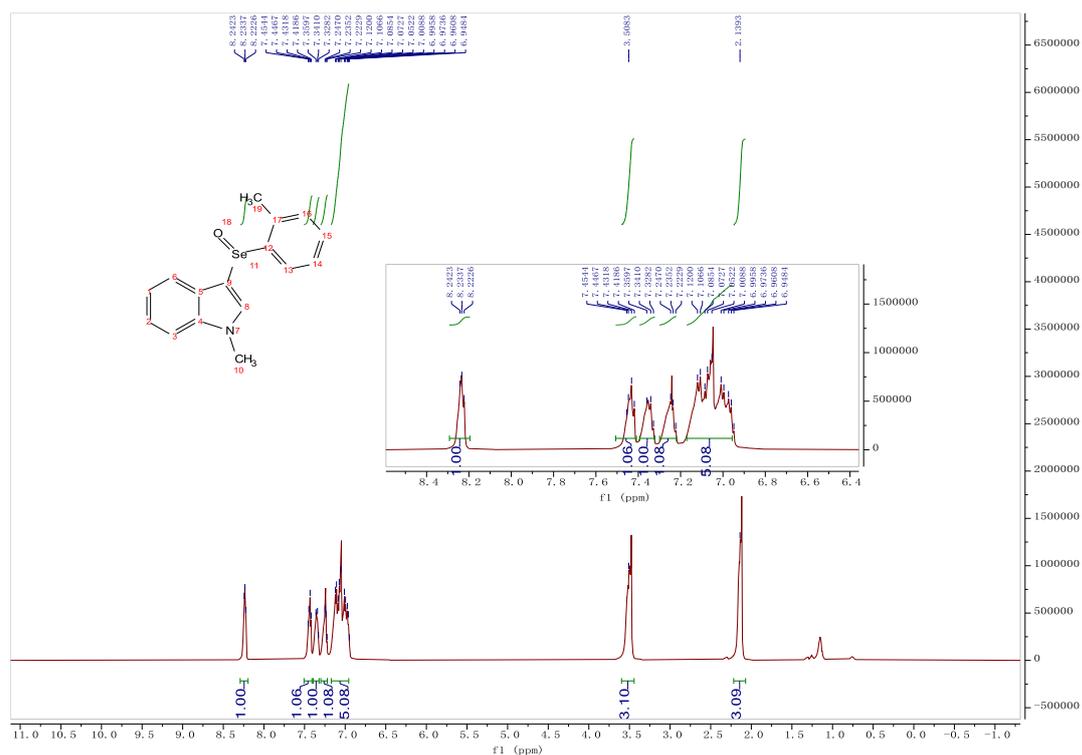


Figure S134. ¹H NMR Spectra of **38** (600 MHz, CDCl₃)

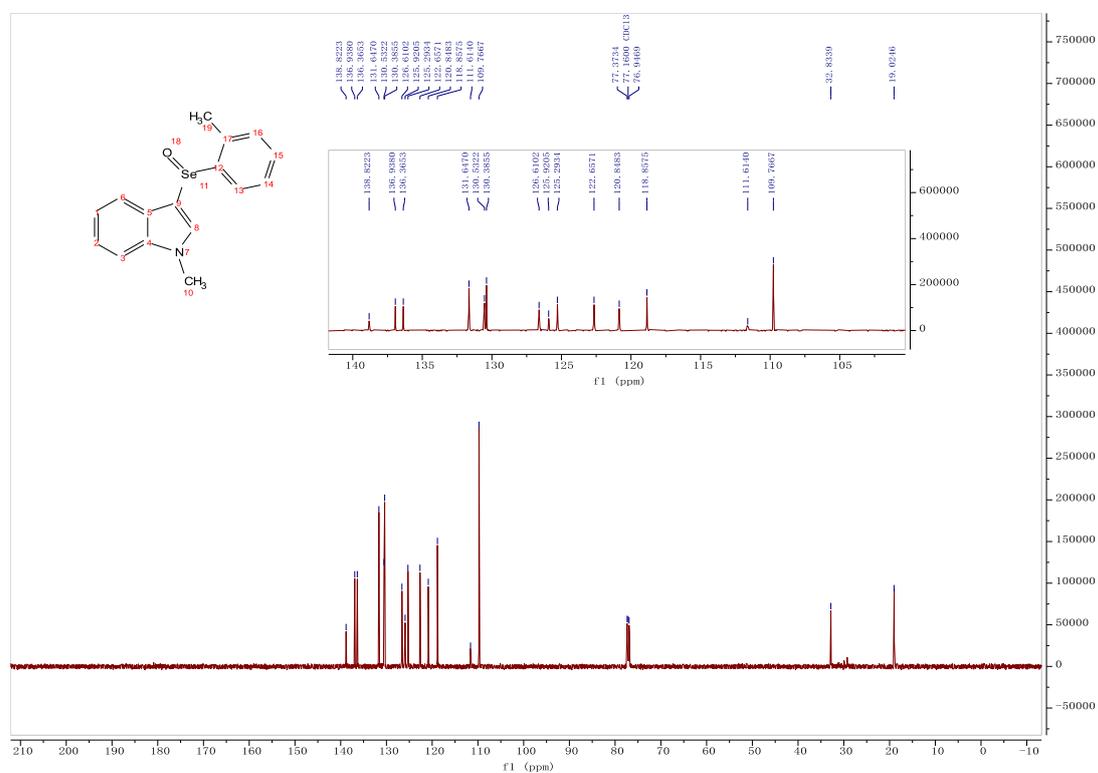


Figure S135. ¹³C{¹H} NMR Spectra of **38** (150 MHz, CDCl₃)

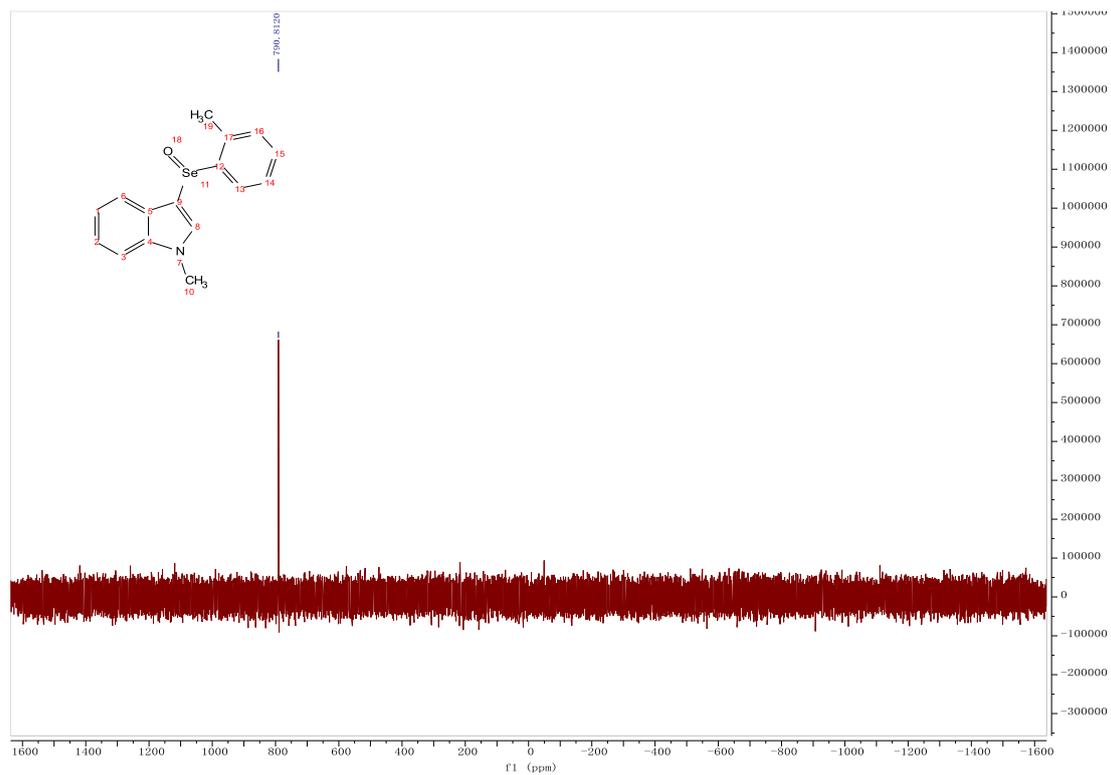


Figure S136. ^{77}Se NMR Spectra of **38** (114 MHz, CDCl_3)

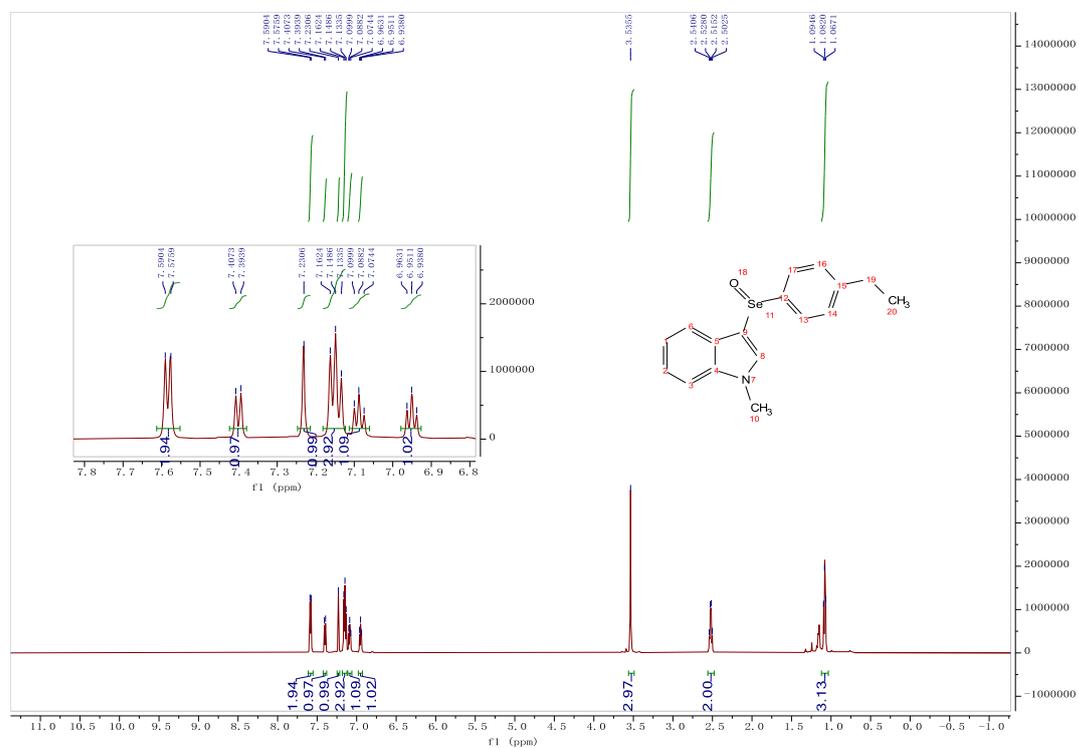


Figure S137. ^1H NMR Spectra of **39** (600 MHz, CDCl_3)

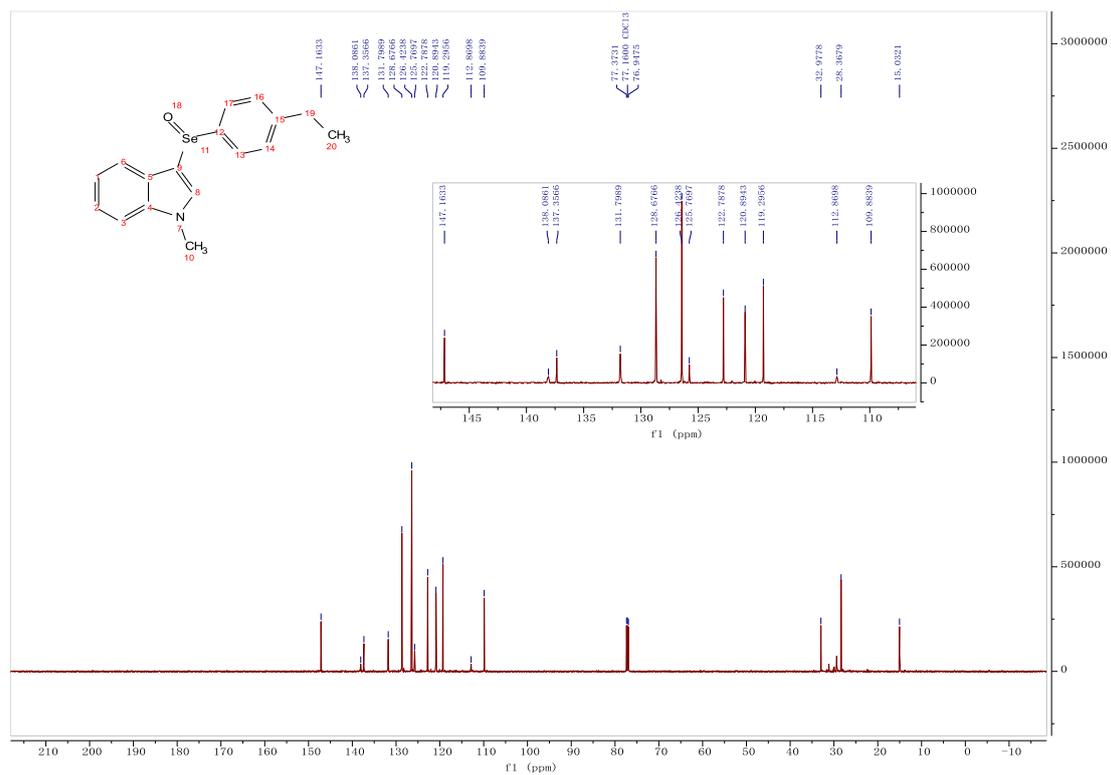


Figure S138. $^{13}\text{C}\{^1\text{H}\}$ NMR Spectra of **39** (150 MHz, CDCl_3)

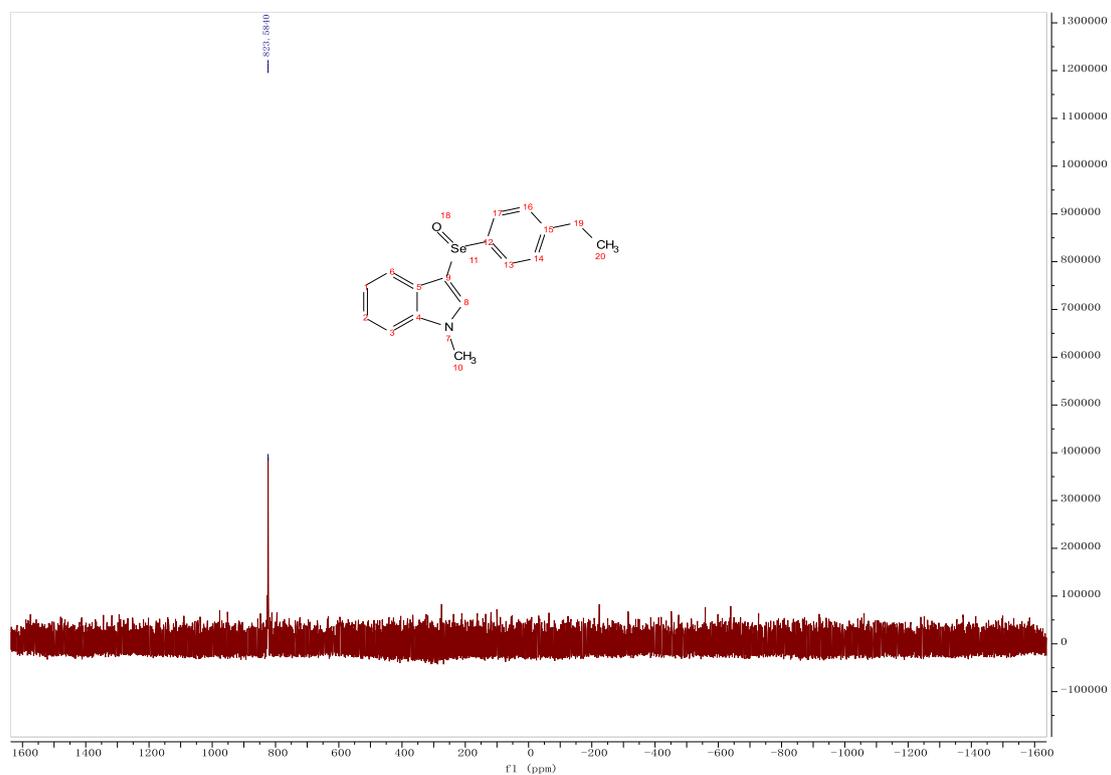


Figure S139. ^{77}Se NMR Spectra of **39** (114 MHz, CDCl_3)

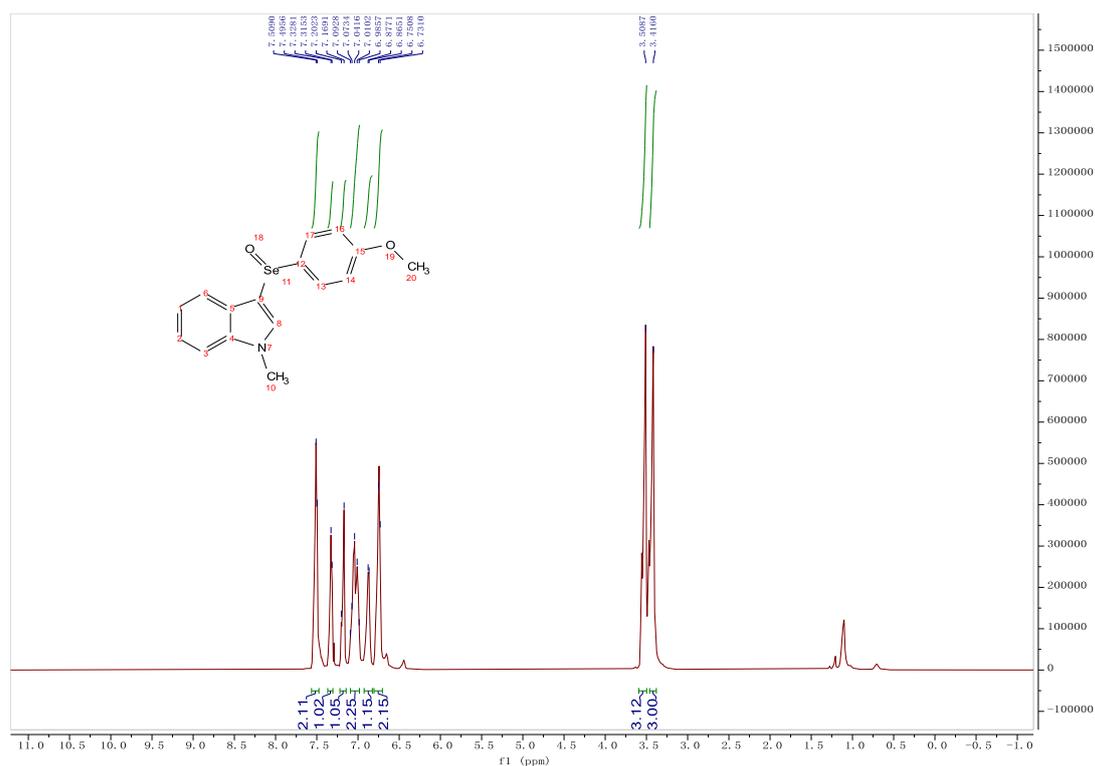


Figure S140. ^1H NMR Spectra of **40** (600 MHz, CDCl_3)

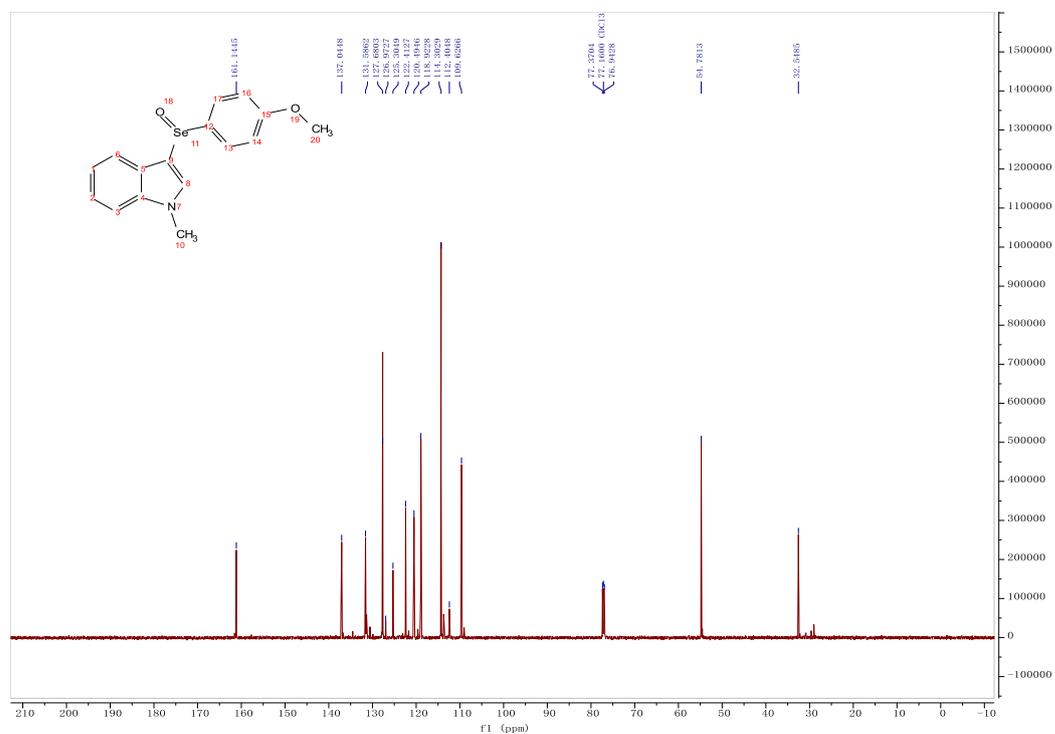


Figure S141. $^{13}\text{C}\{^1\text{H}\}$ NMR Spectra of **40** (150 MHz, CDCl_3)

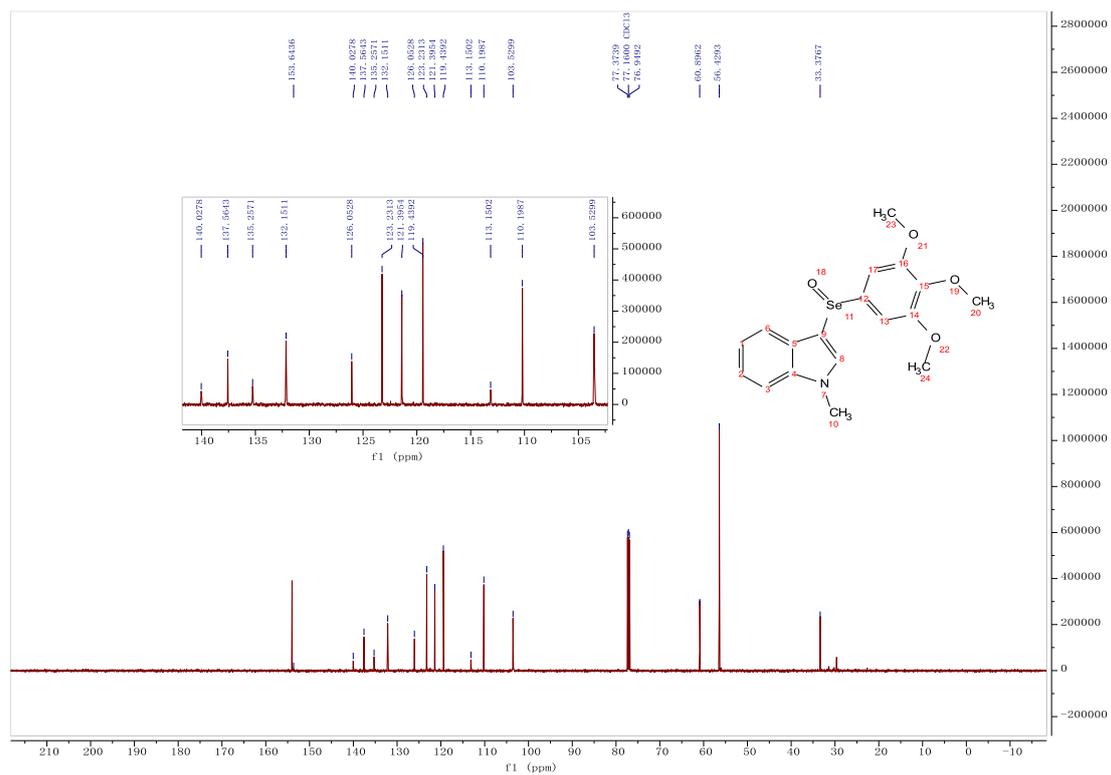


Figure S144. $^{13}\text{C}\{^1\text{H}\}$ NMR Spectra of **41** (150 MHz, CDCl_3)

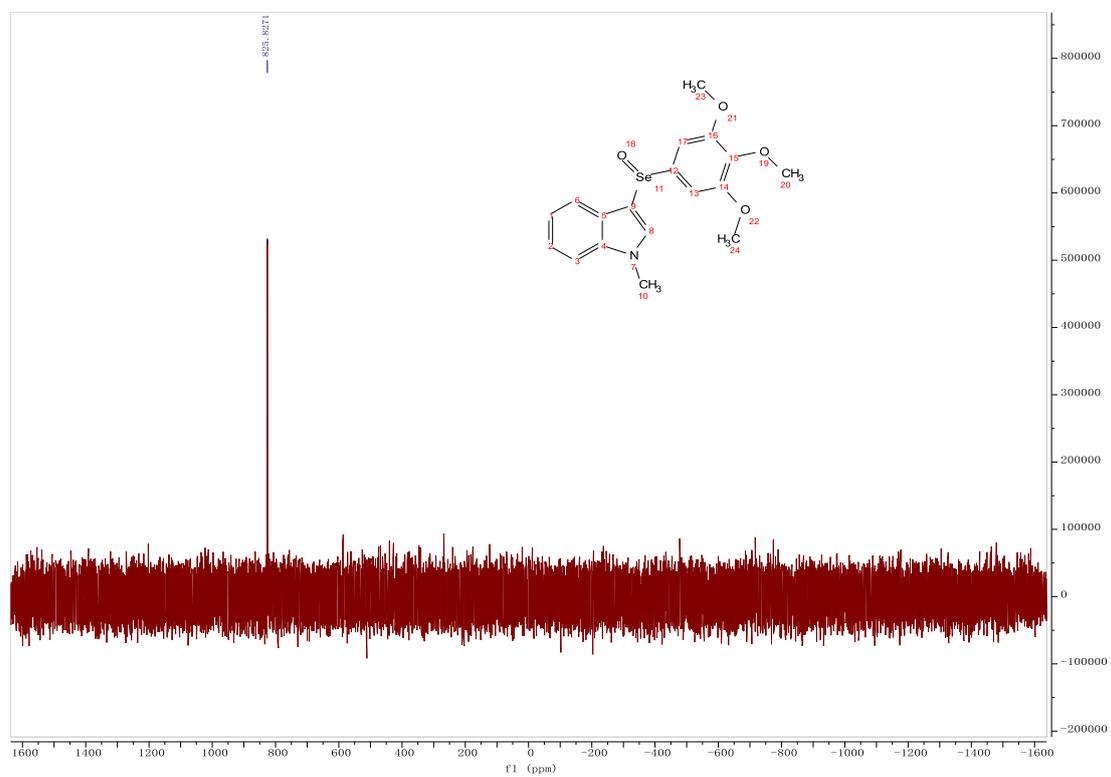


Figure S145. ^{77}Se NMR Spectra of **41** (114 MHz, CDCl_3)

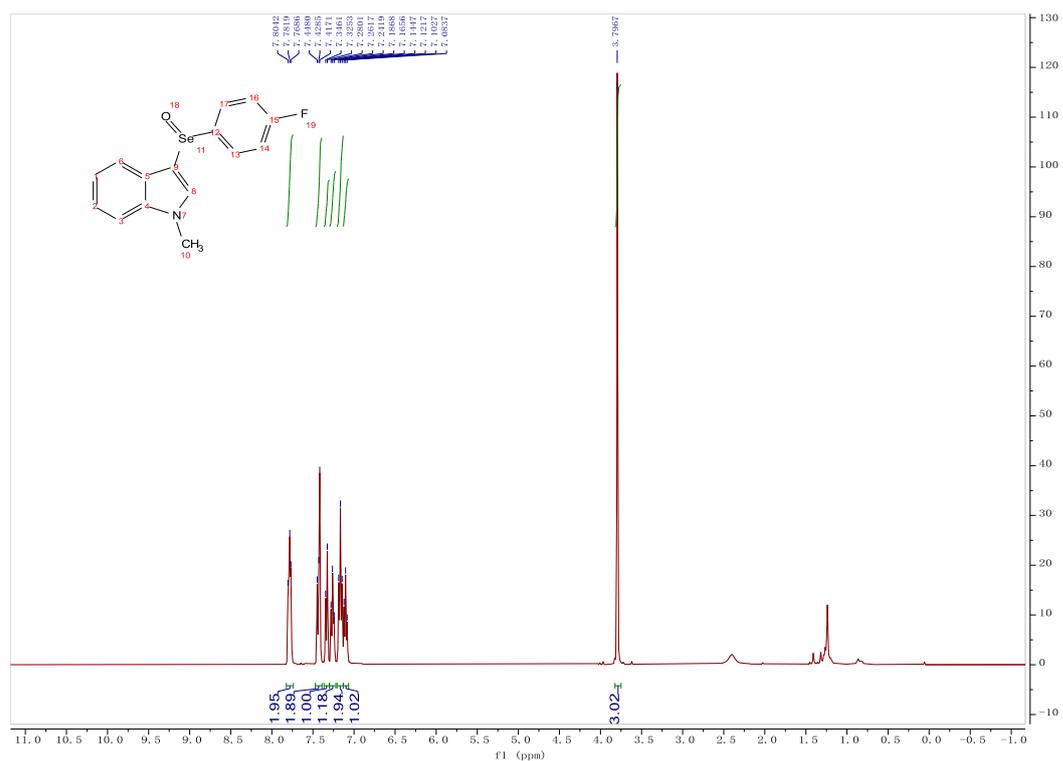


Figure S146. ¹H NMR Spectra of **42** (400 MHz, CDCl₃)

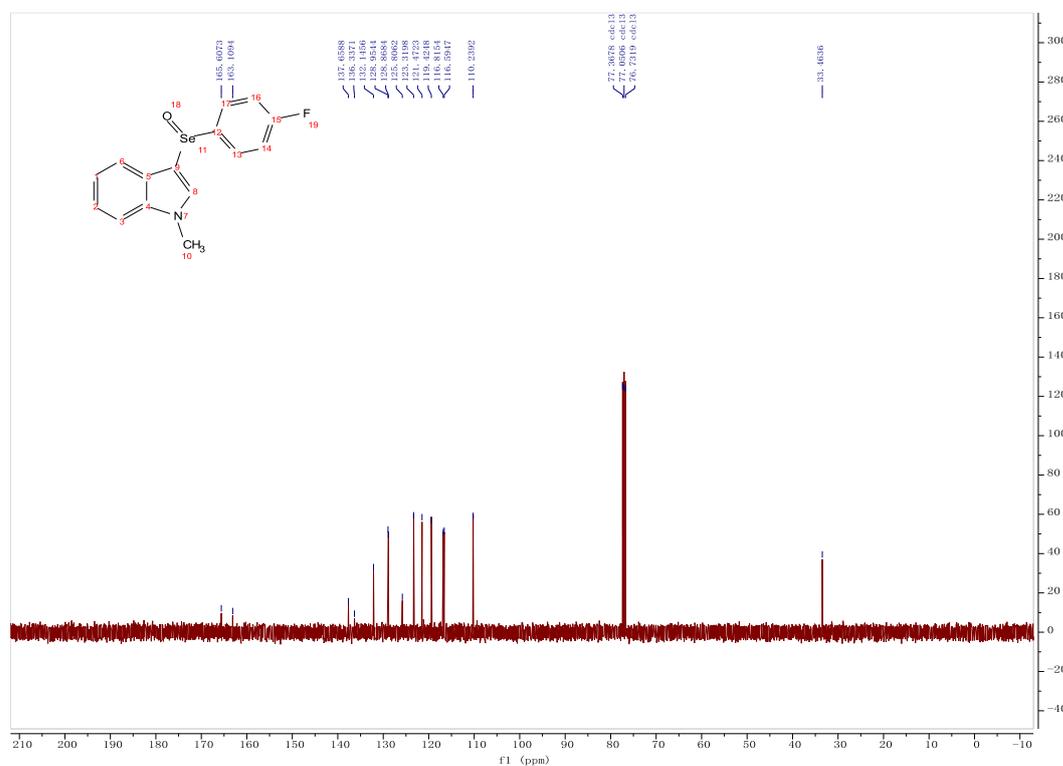
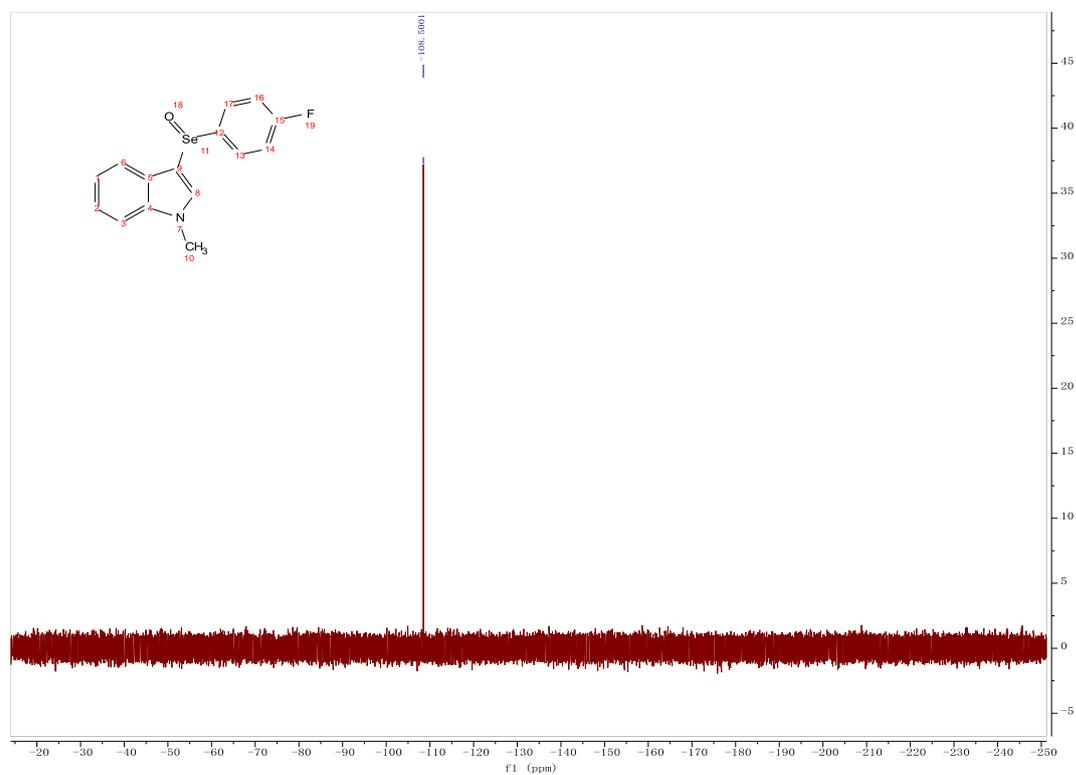
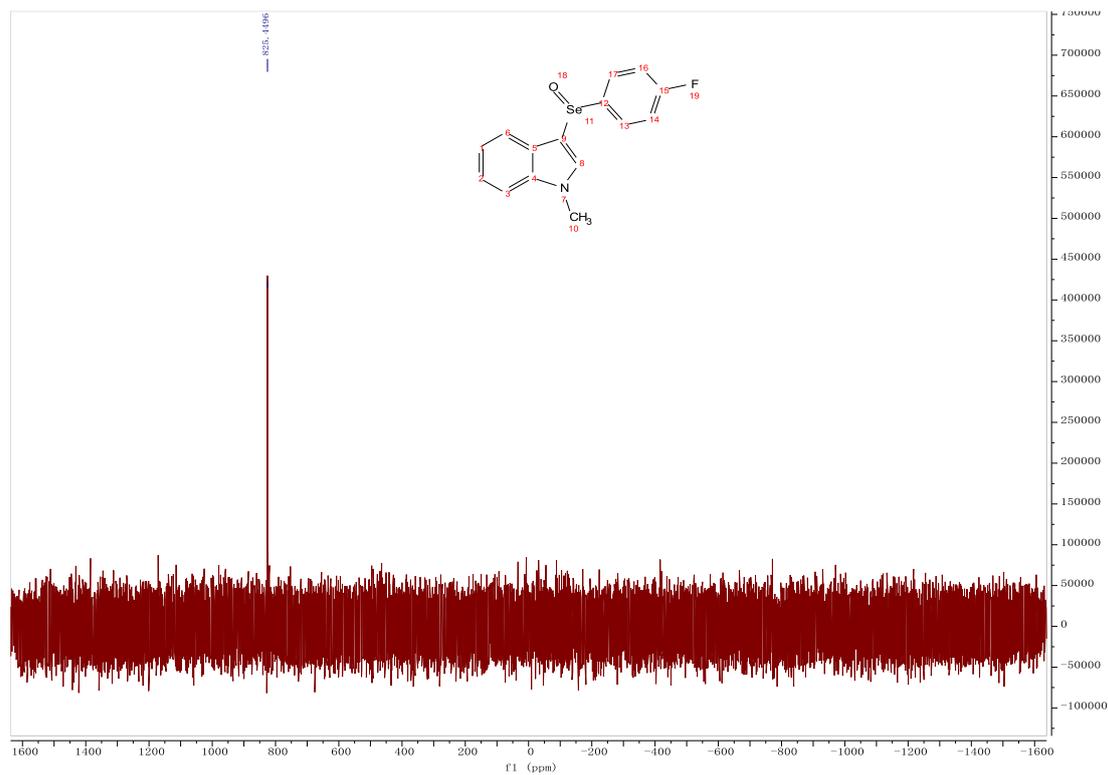


Figure S147. ¹³C{¹H} NMR Spectra of **42** (100 MHz, CDCl₃)



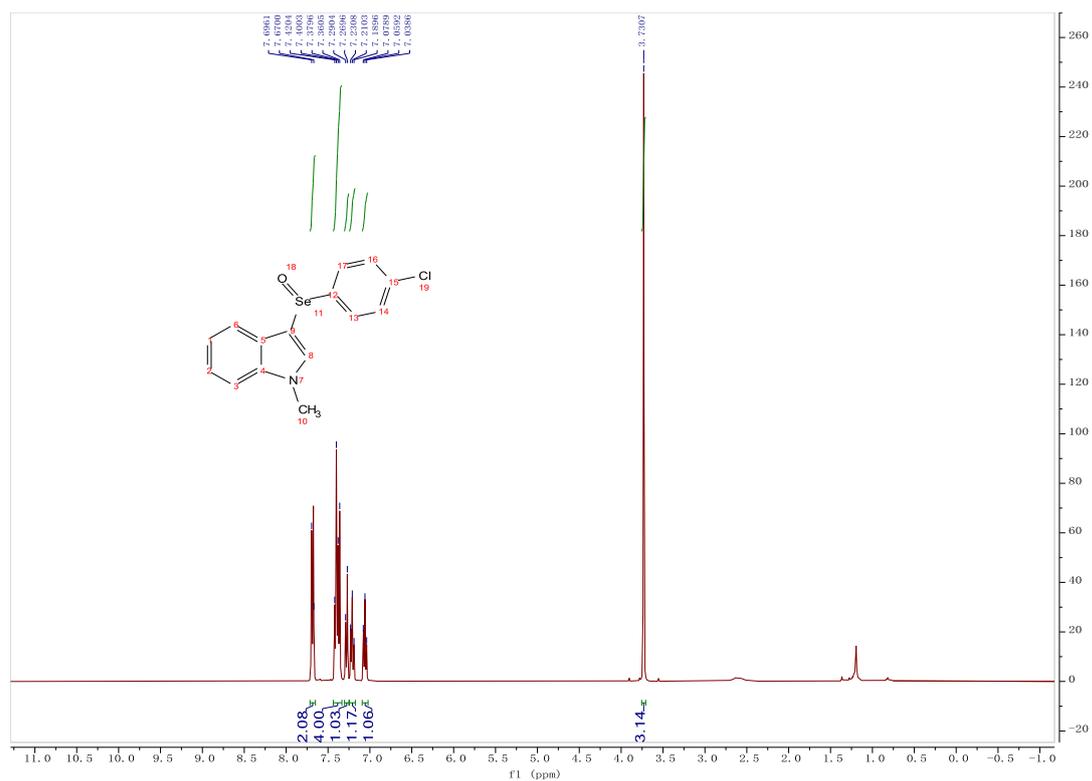


Figure S150. ¹H NMR Spectra of **43** (400 MHz, CDCl₃)

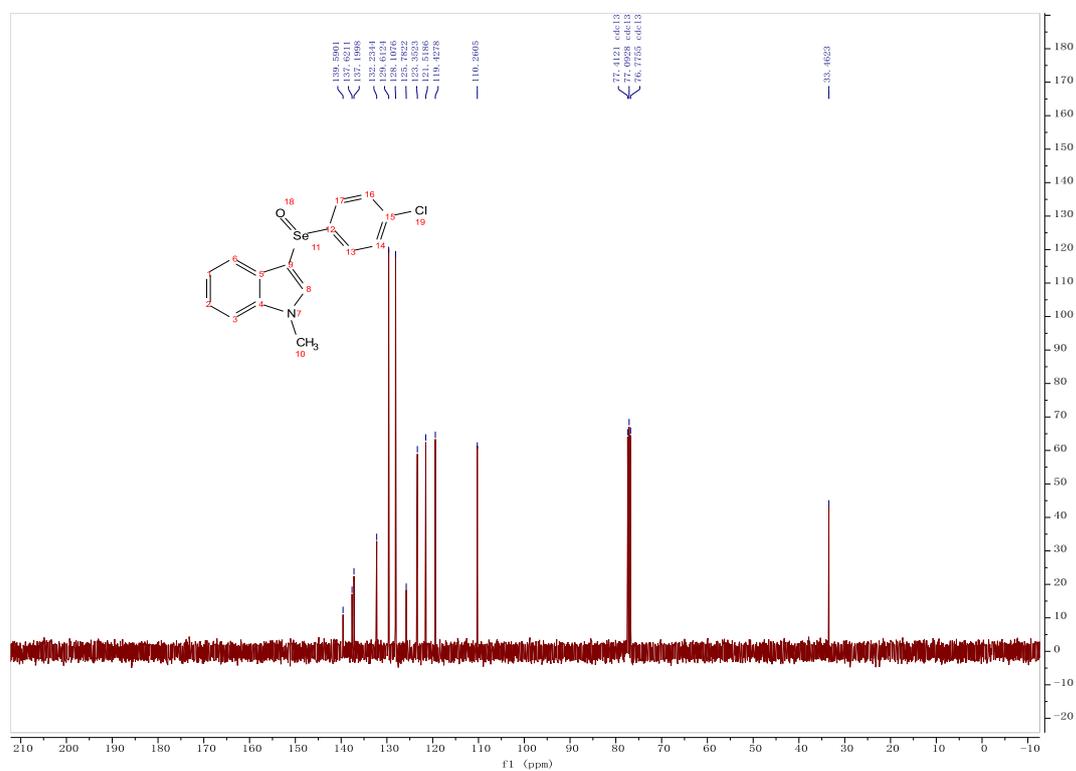


Figure S151. ¹³C{¹H} NMR Spectra of **43** (100 MHz, CDCl₃)

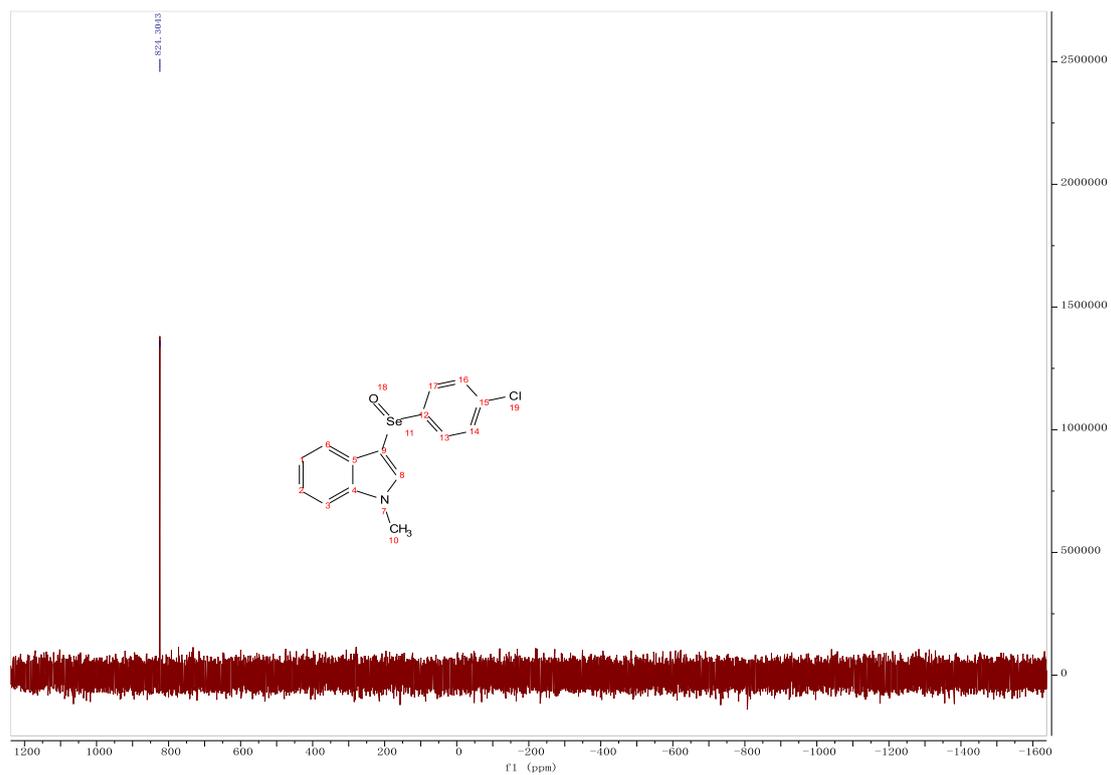


Figure S152. ^{77}Se NMR Spectra of 43 (114 MHz, CDCl_3)

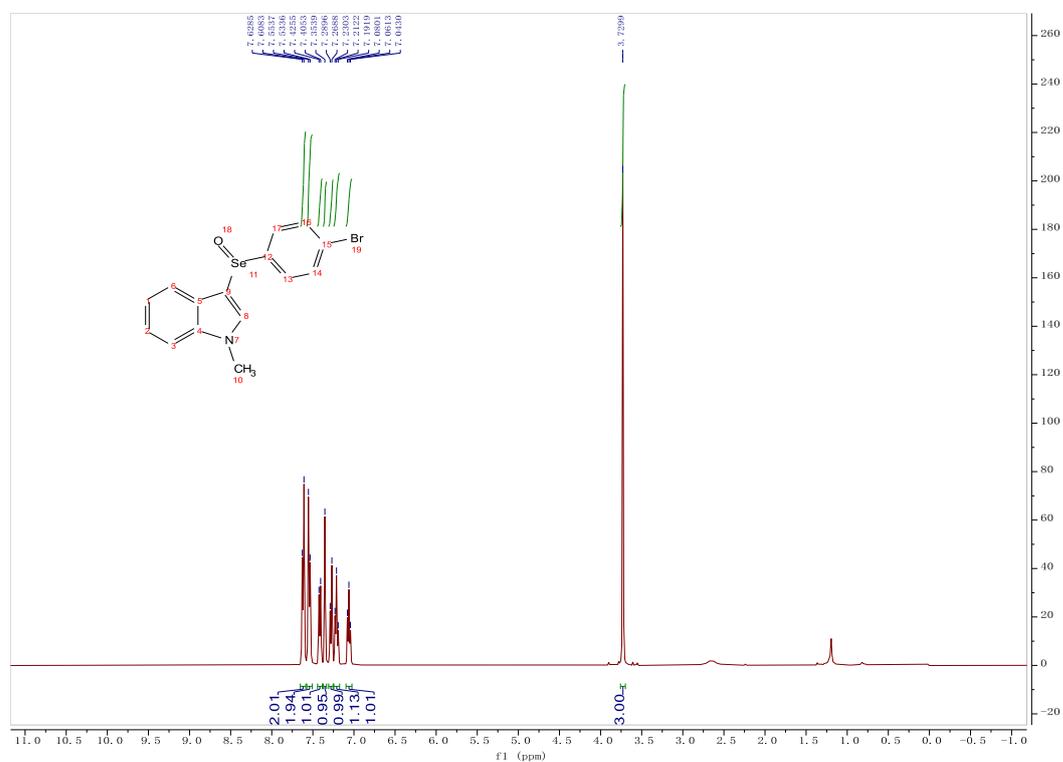


Figure S153. ^1H NMR Spectra of 44 (400 MHz, CDCl_3)

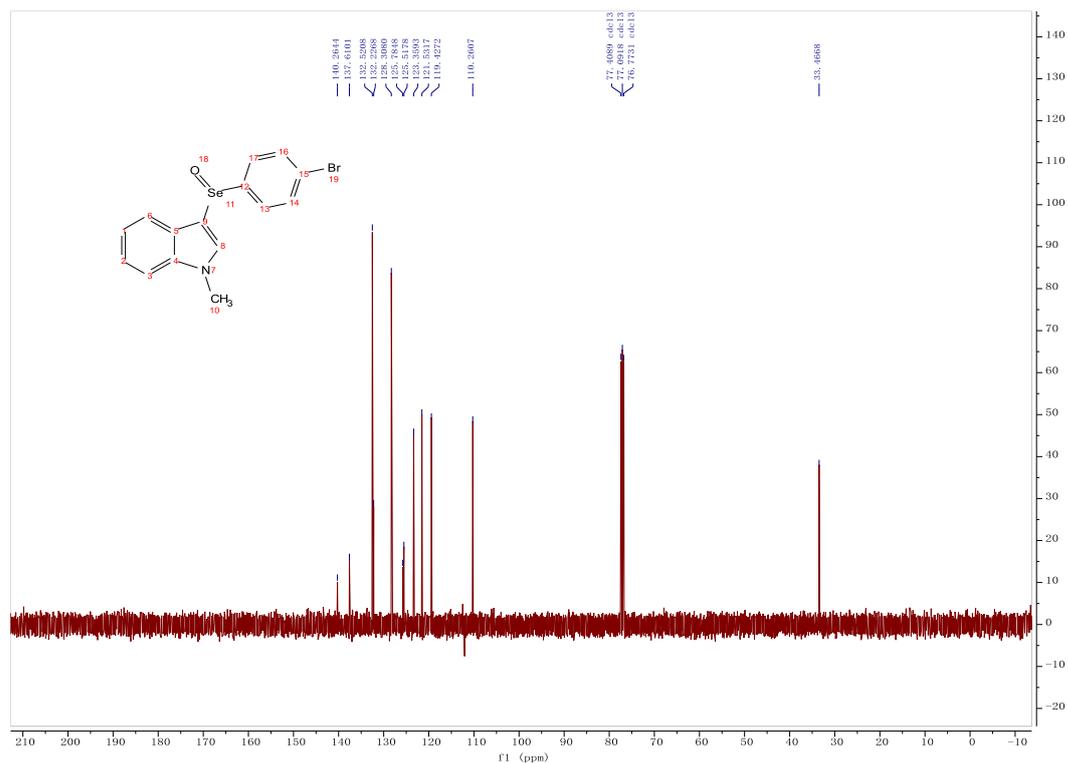


Figure S154. $^{13}\text{C}\{^1\text{H}\}$ NMR Spectra of 44 (100 MHz, CDCl_3)

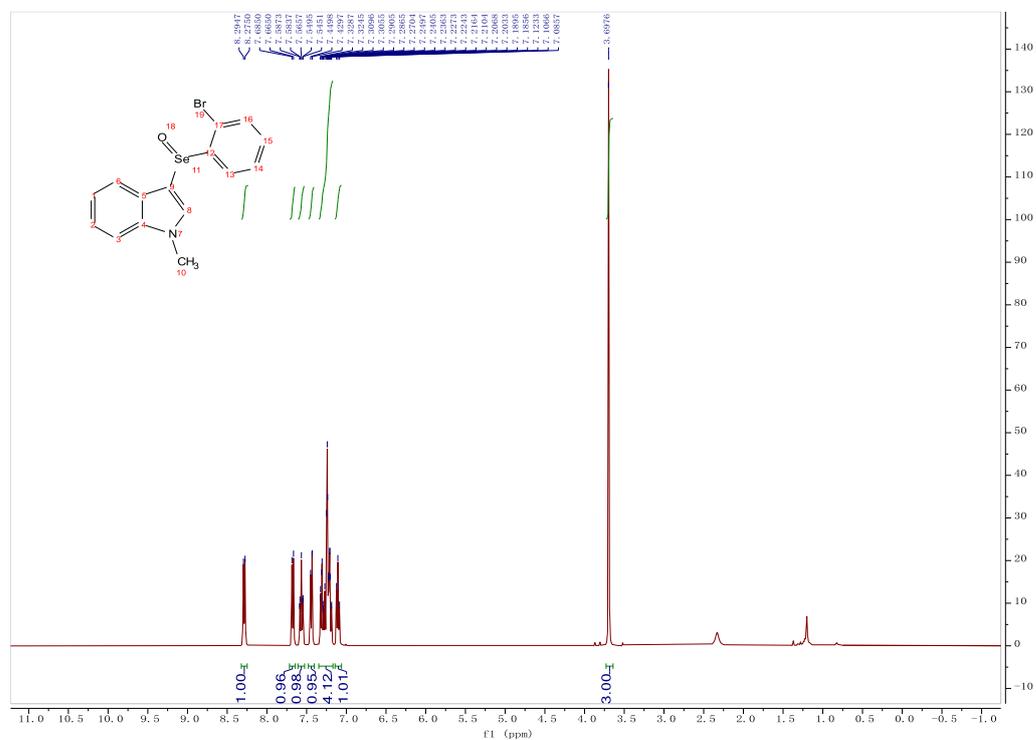


Figure S155. ^1H NMR Spectra of 45 (400 MHz, CDCl_3)

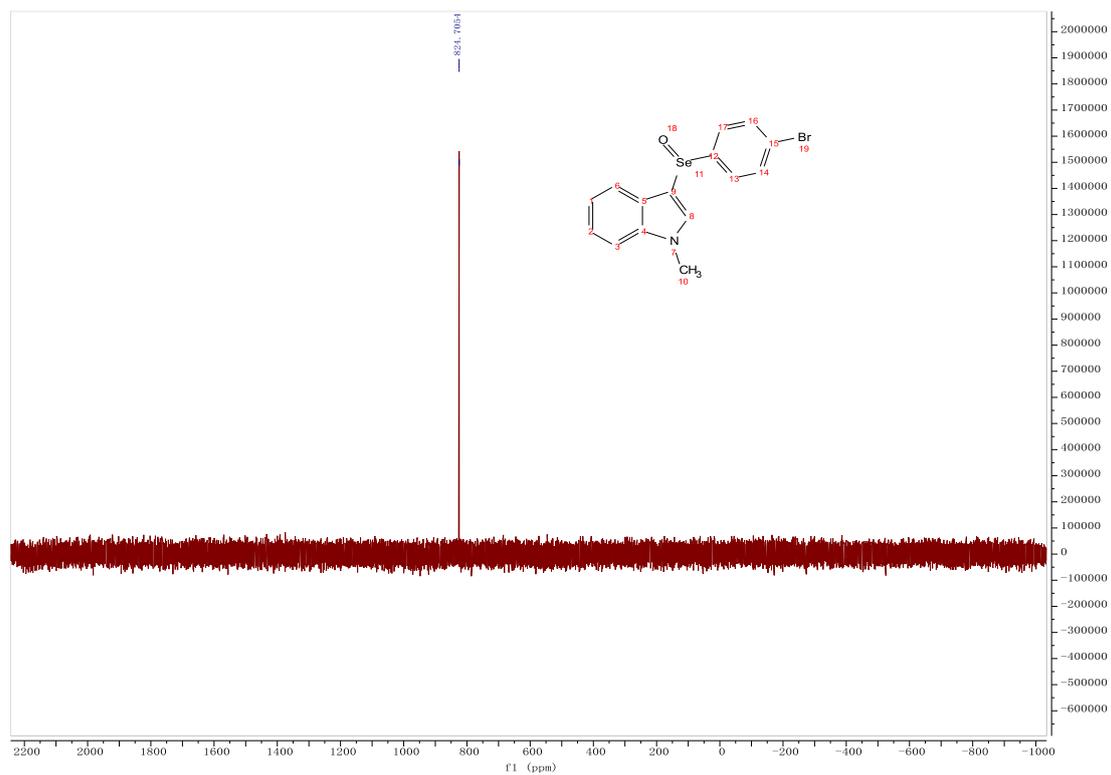


Figure S156. ^{77}Se NMR Spectra of **44** (114 MHz, CDCl_3)

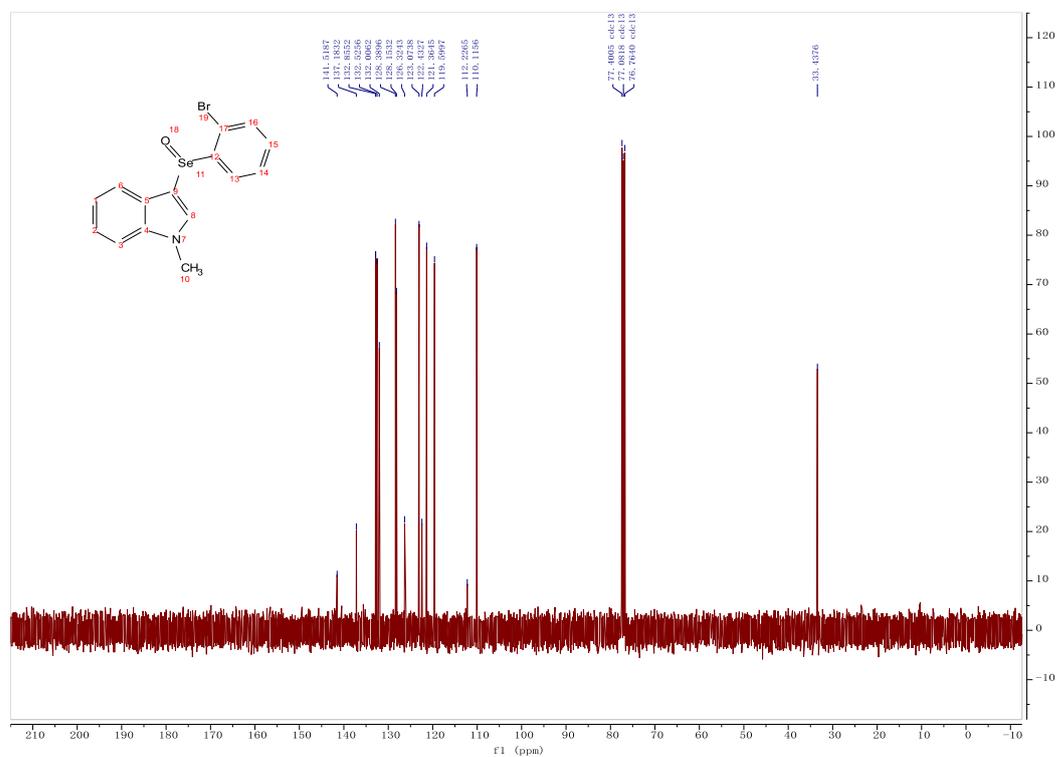


Figure S157. $^{13}\text{C}\{^1\text{H}\}$ NMR Spectra of **45** (100 MHz, CDCl_3)

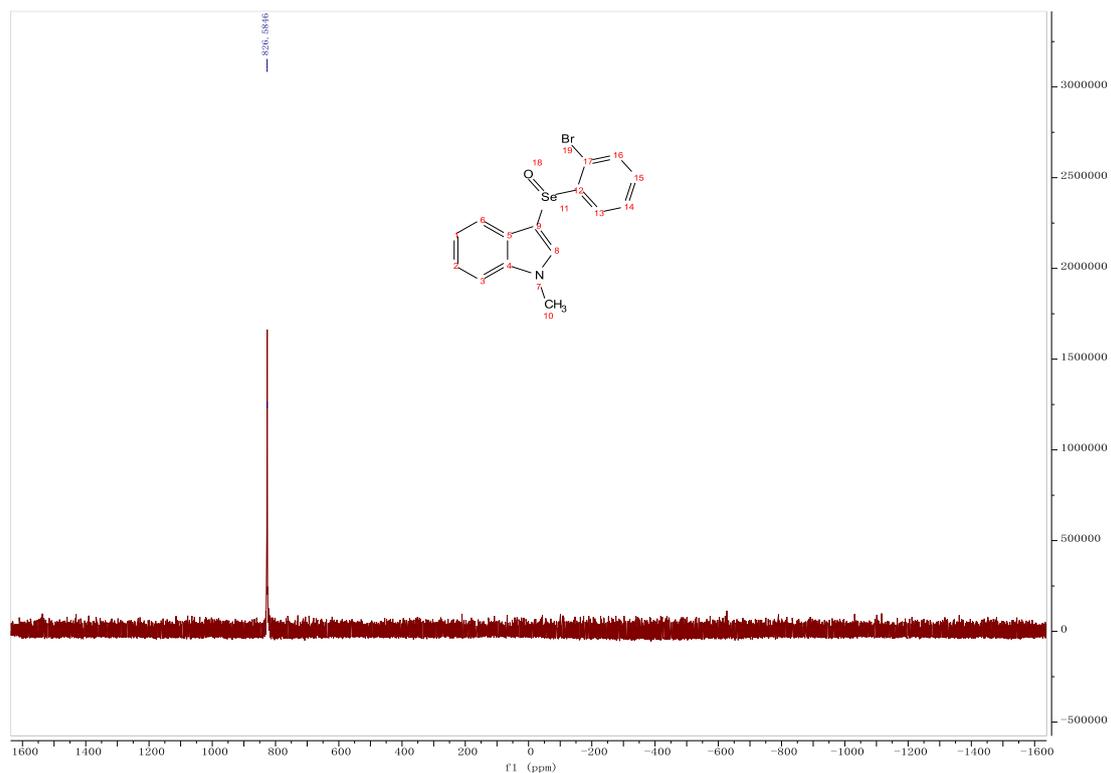


Figure S158. ^{77}Se NMR Spectra of **45** (114 MHz, CDCl_3)

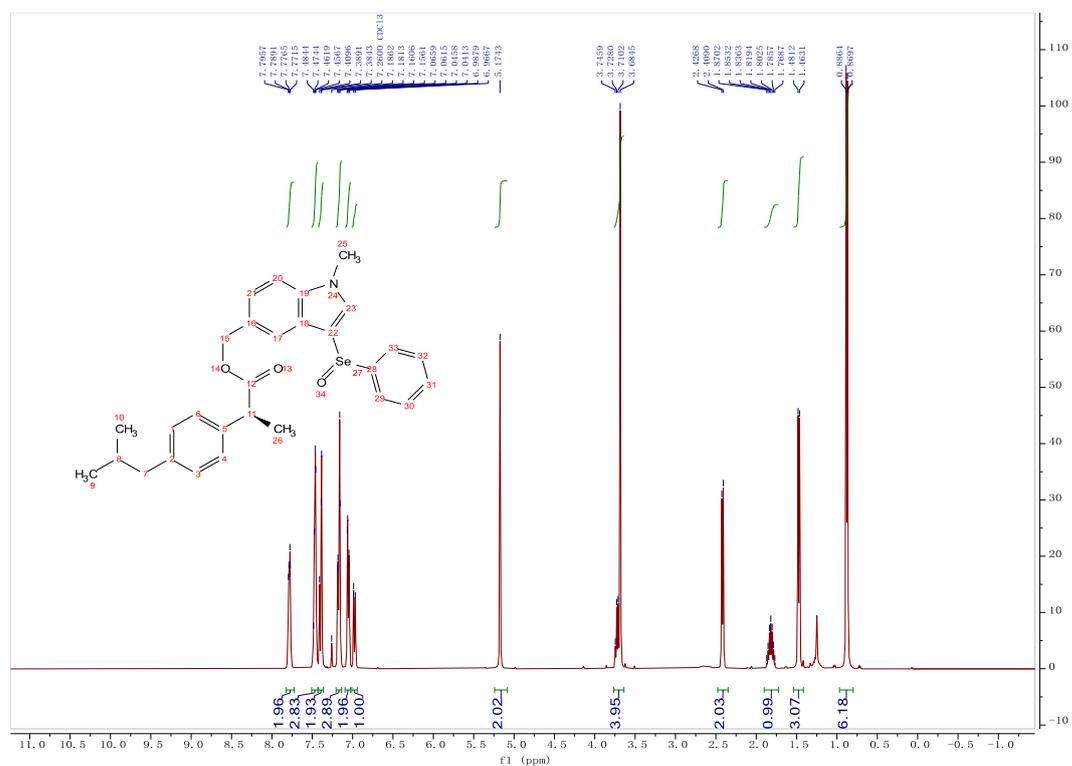


Figure S159. ^1H NMR Spectra of **46** (400 MHz, CDCl_3)

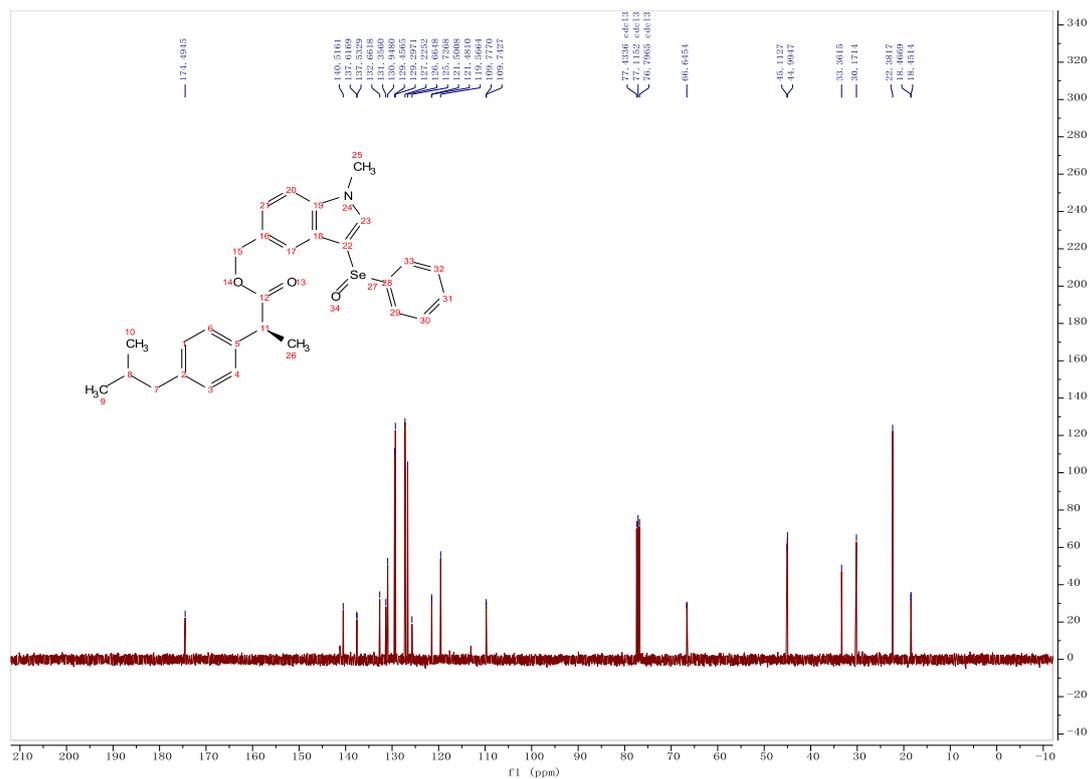


Figure S160. $^{13}\text{C}\{^1\text{H}\}$ NMR Spectra of 46 (100 MHz, CDCl_3)

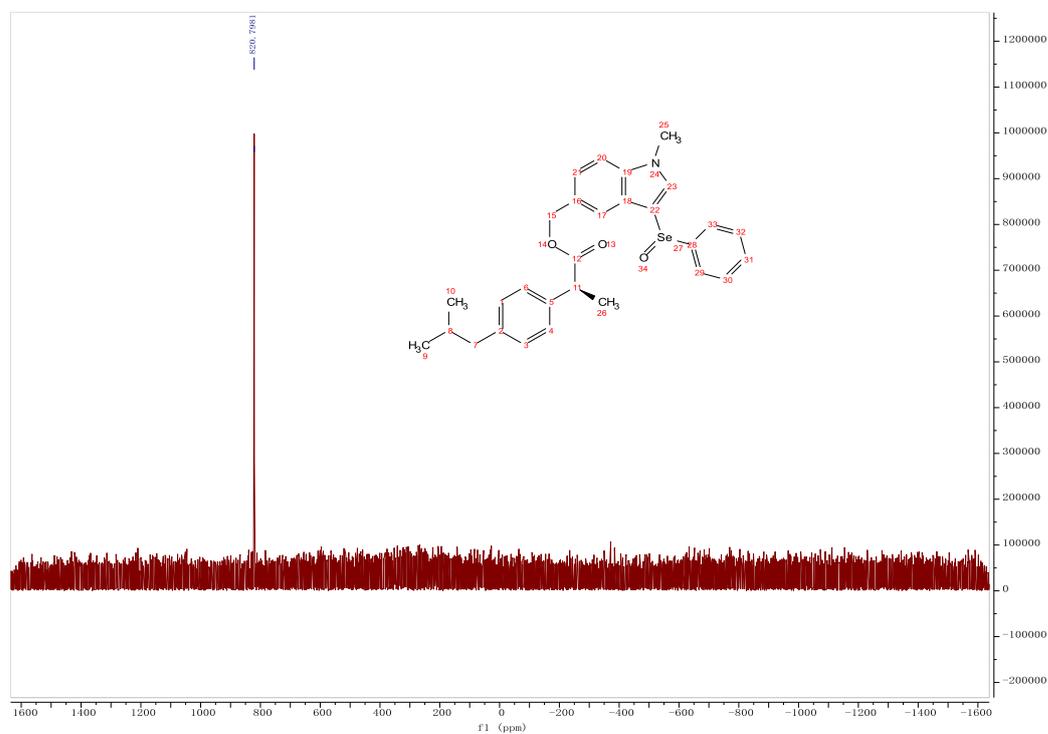


Figure S161. ^{77}Se NMR Spectra of 46 (114 MHz, CDCl_3)

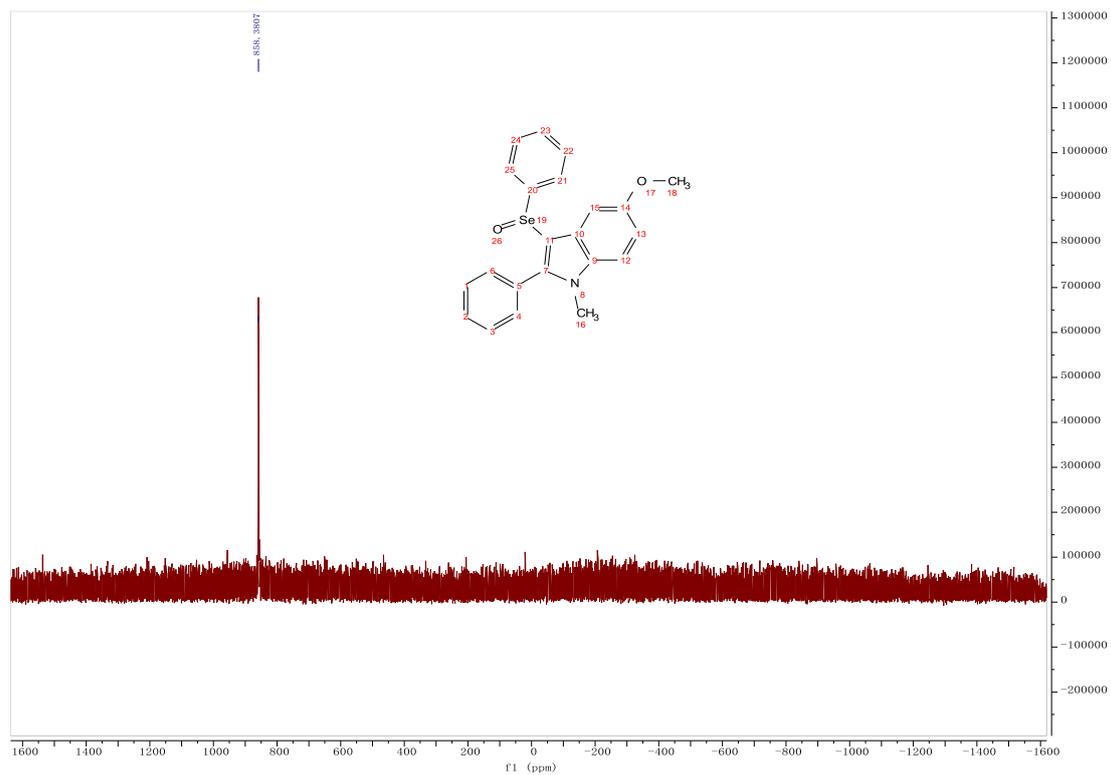


Figure S164. ^{77}Se NMR Spectra of **47** (114 MHz, CDCl_3)

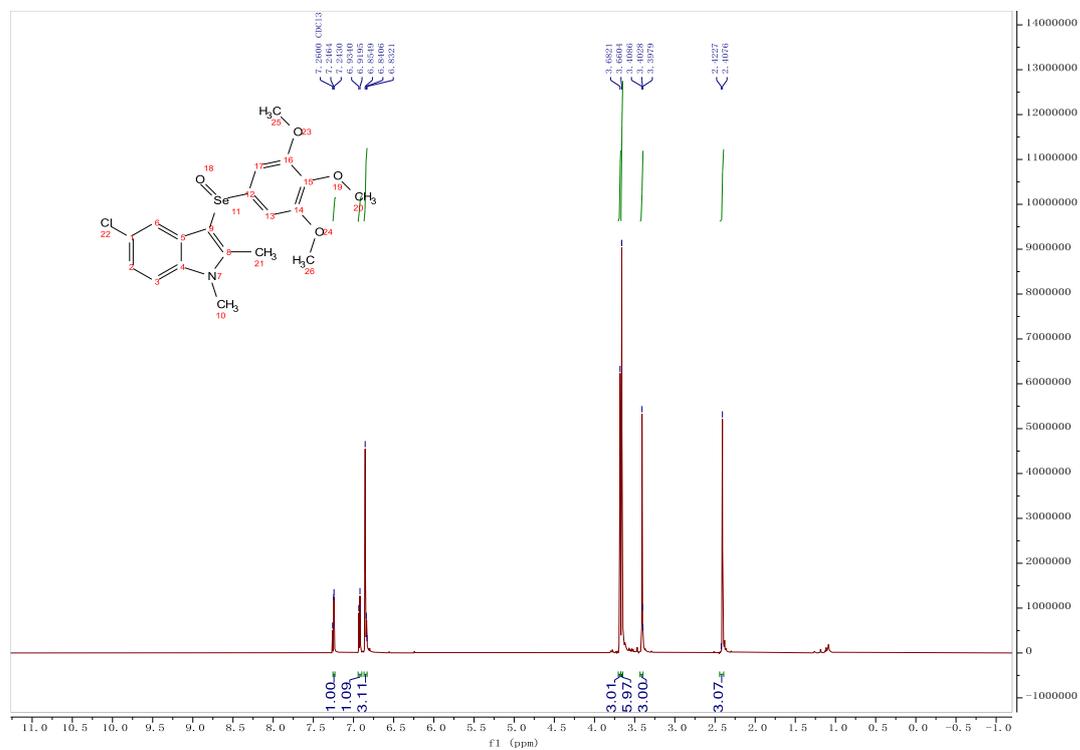


Figure S165. ^1H NMR Spectra of **48** (600 MHz, CDCl_3)

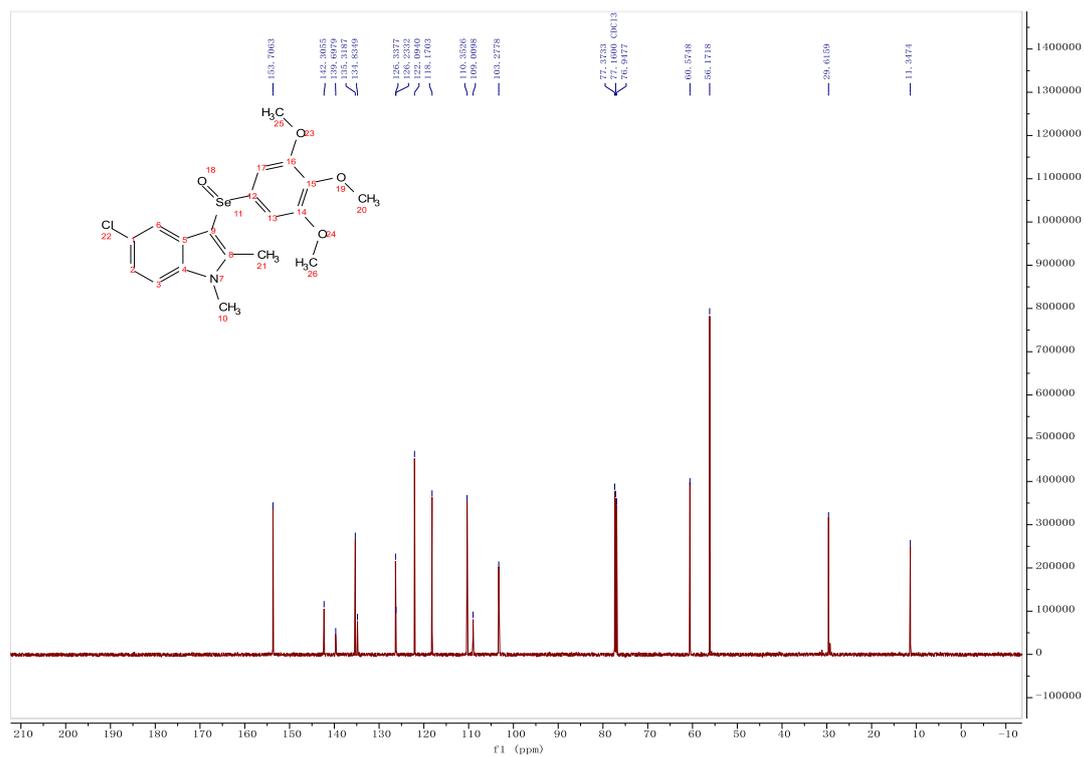


Figure S166. $^{13}\text{C}\{^1\text{H}\}$ NMR Spectra of **48** (150 MHz, CDCl_3)

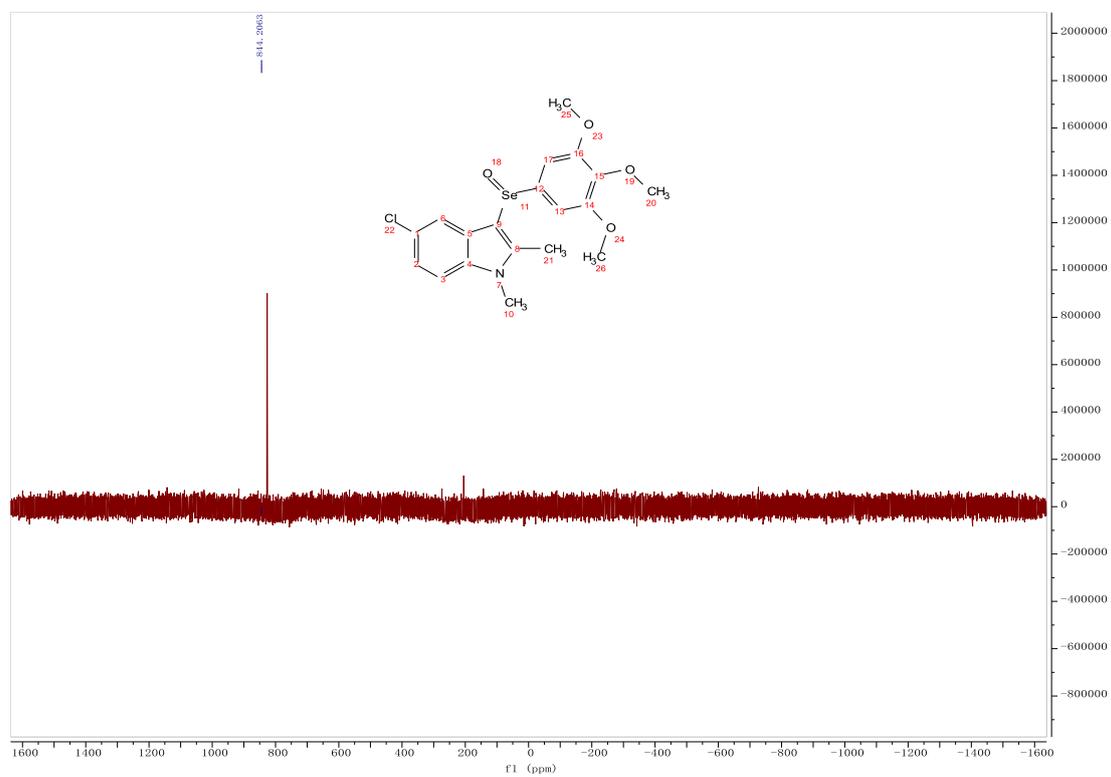


Figure S167. ^{77}Se NMR Spectra of **48** (114 MHz, CDCl_3)

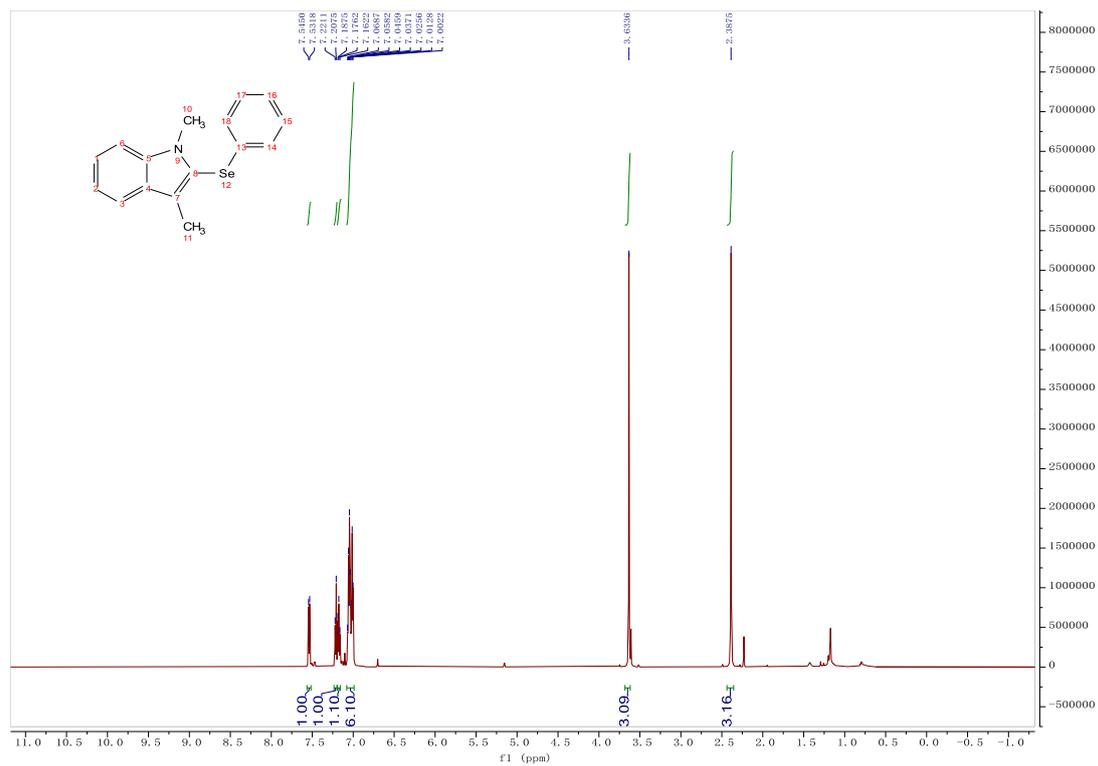


Figure S168. ¹H NMR Spectra of **49** (600 MHz, CDCl₃)

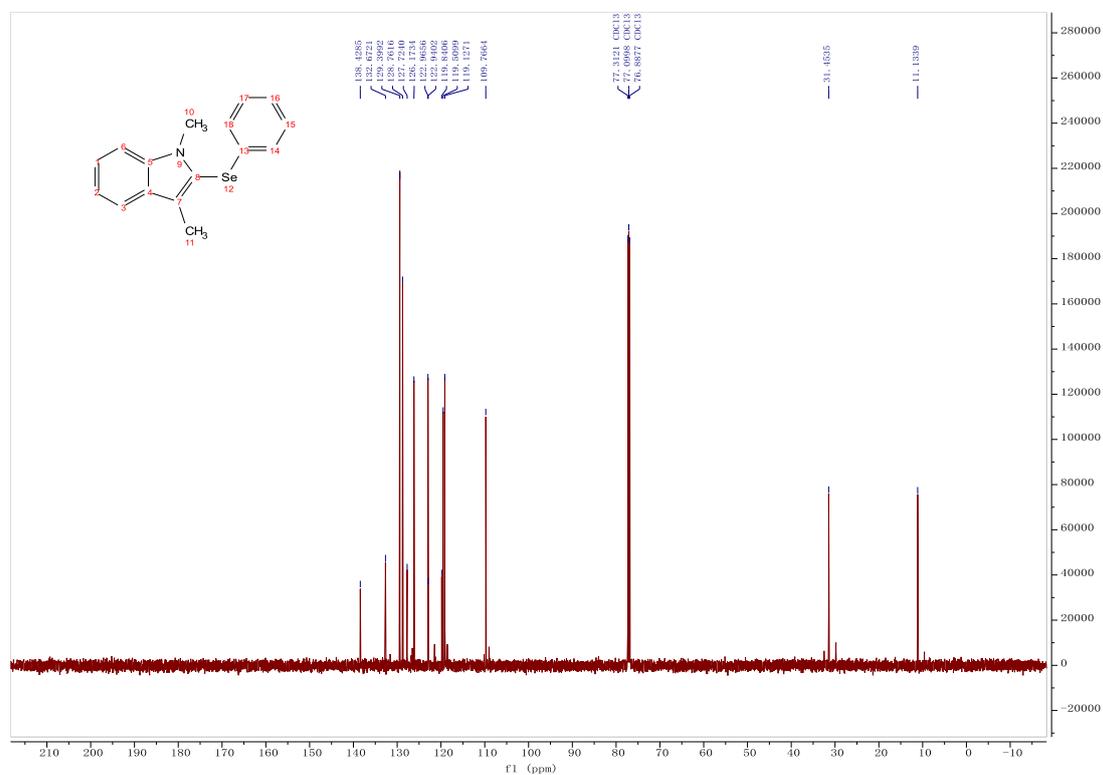


Figure S169. ¹³C{¹H} NMR Spectra of **49** (151 MHz, CDCl₃)

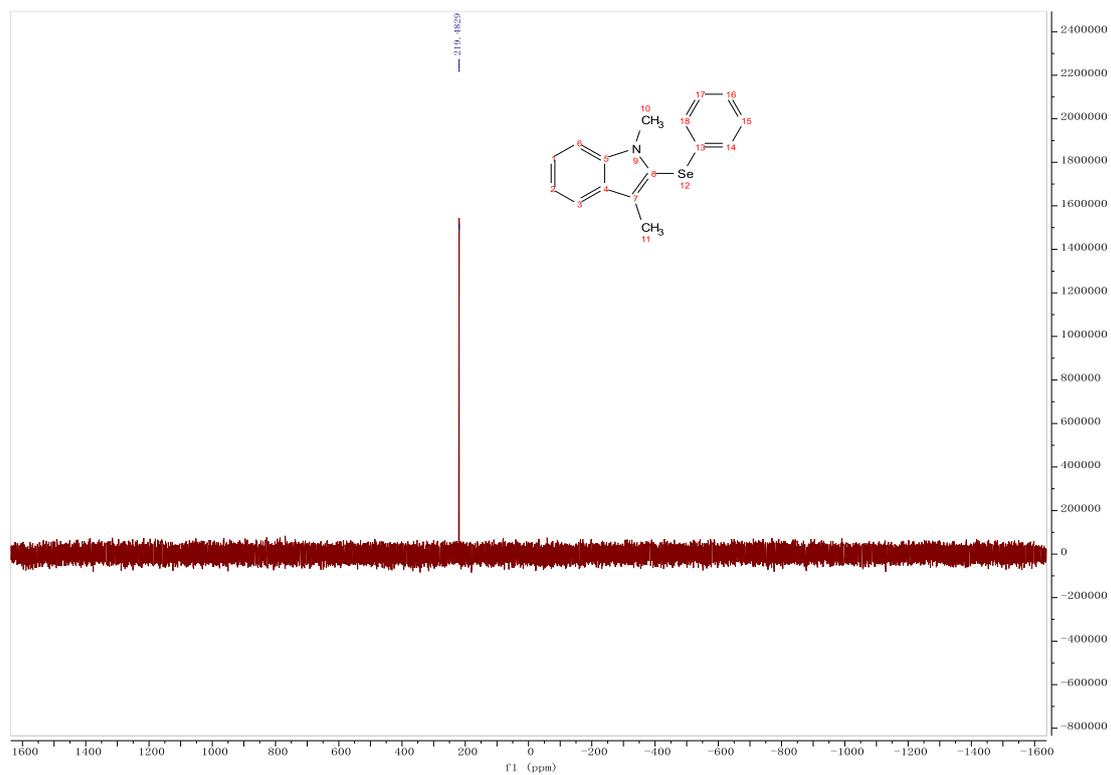


Figure S170. ^{77}Se NMR Spectra of **49** (114 MHz, CDCl_3)

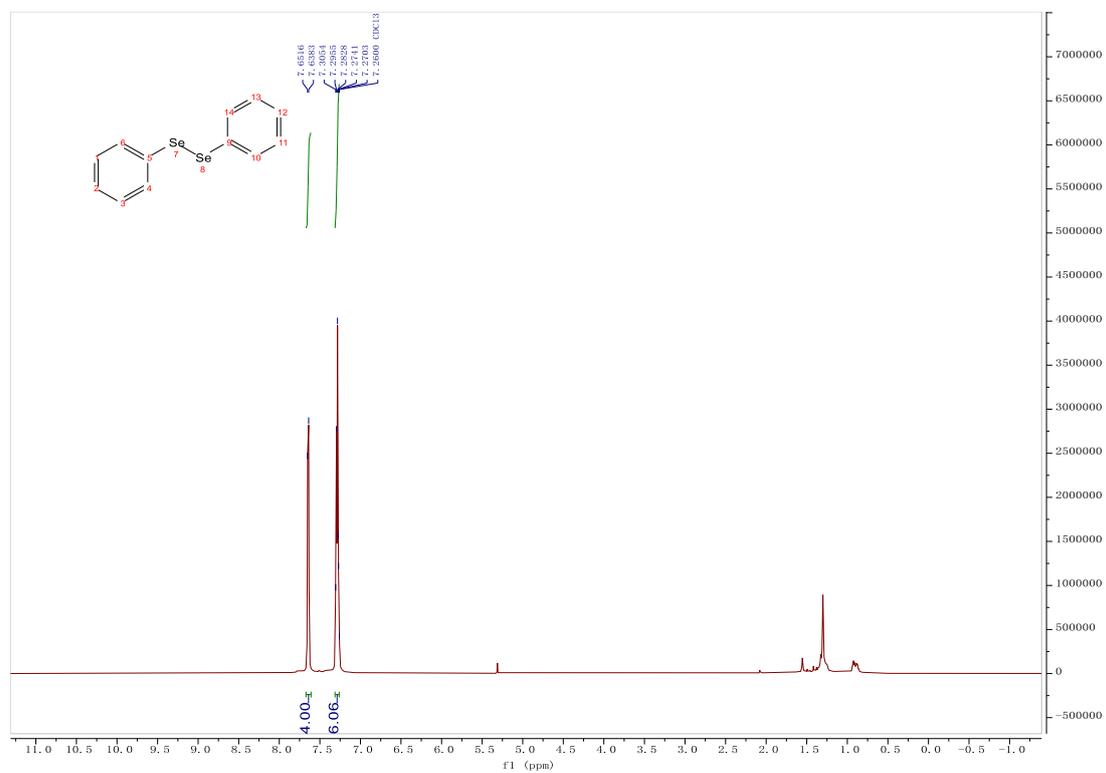


Figure S171. ^1H NMR Spectra of **50** (600 MHz, CDCl_3)

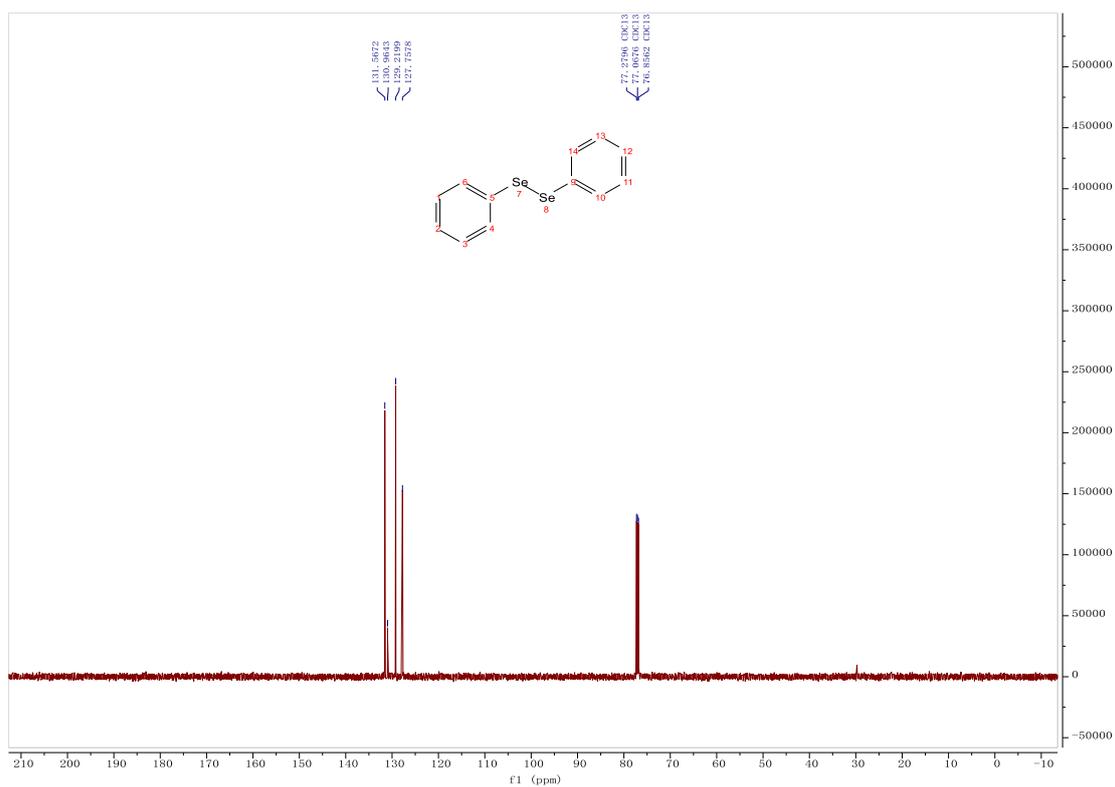


Figure S172. $^{13}\text{C}\{^1\text{H}\}$ NMR Spectra of **50** (151 MHz, CDCl_3)

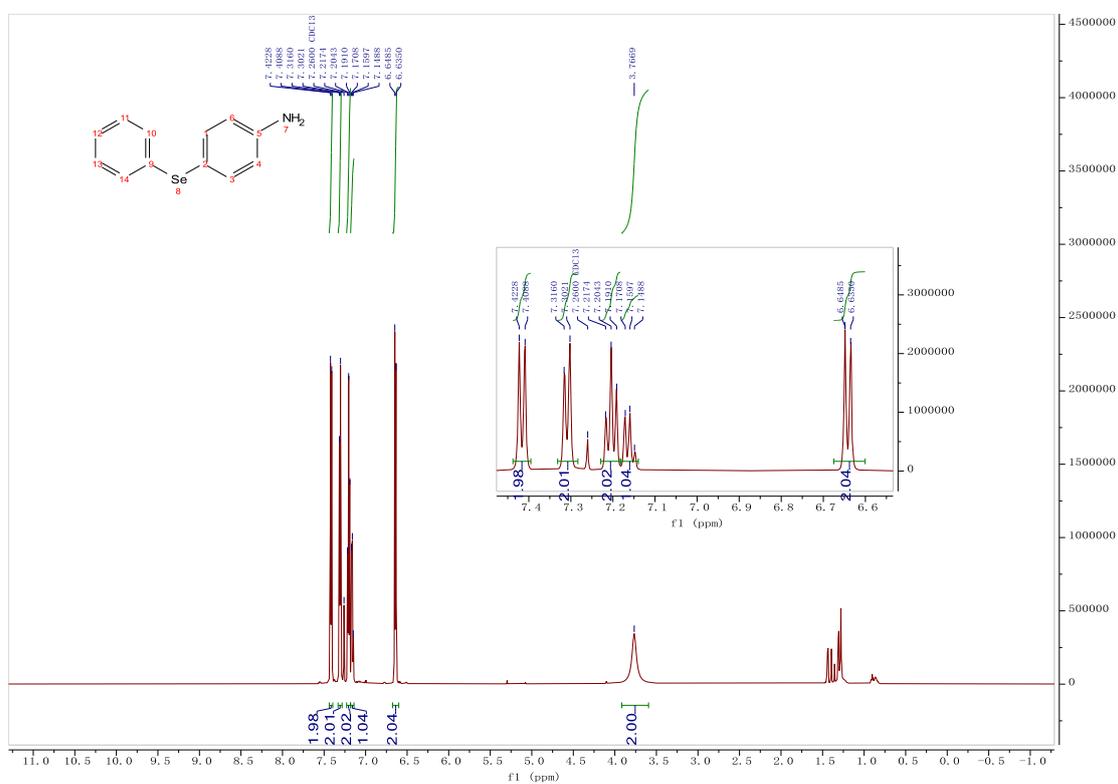


Figure S173. ^1H NMR Spectra of **51** (600 MHz, CDCl_3)

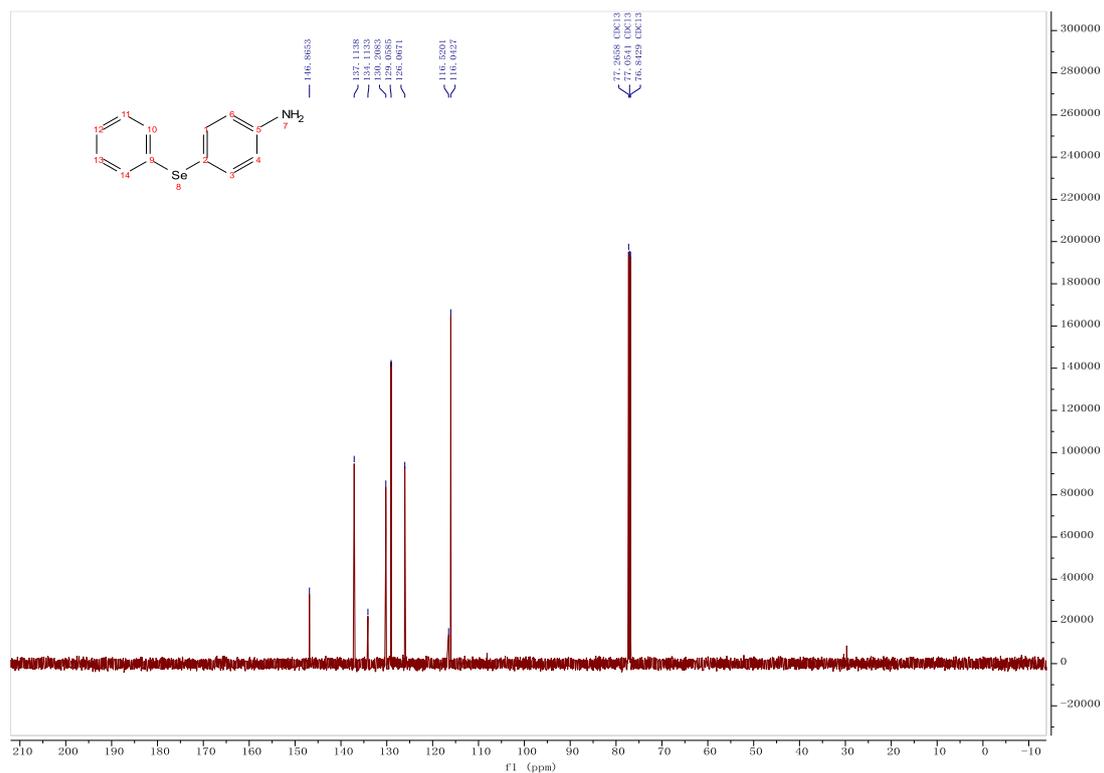


Figure S174. $^{13}\text{C}\{^1\text{H}\}$ NMR Spectra of **51** (151 MHz, CDCl_3)

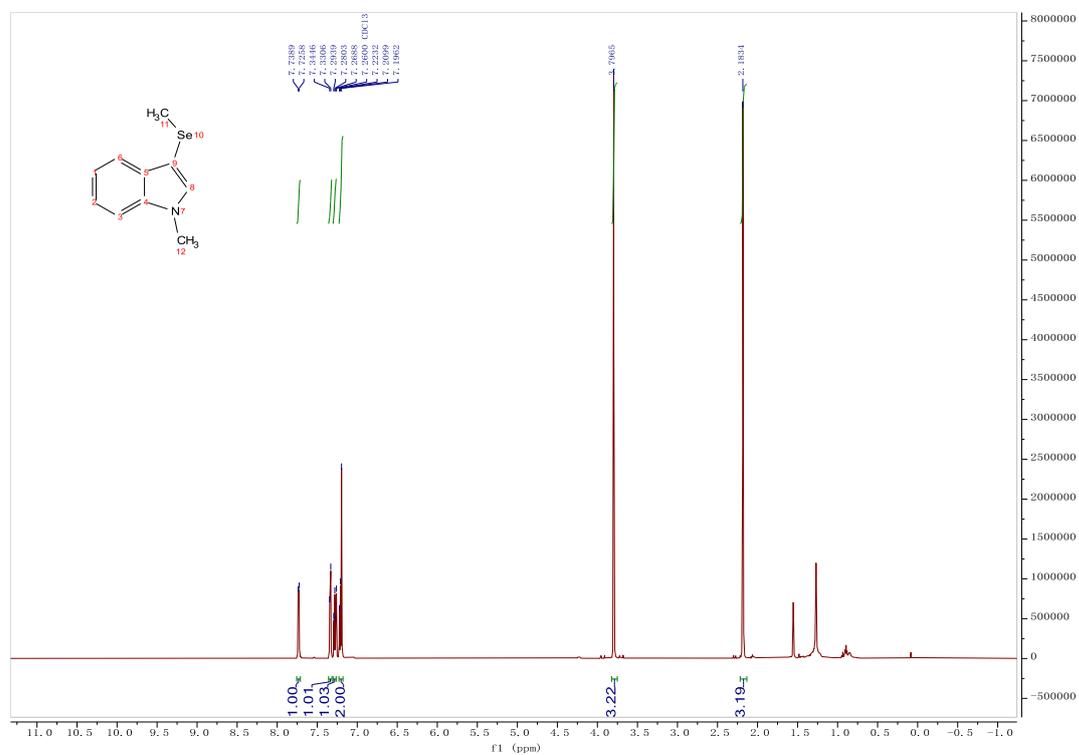


Figure S175. ^1H NMR Spectra of **52** (600 MHz, CDCl_3)

