

# Three-Component Aminoseleation of Arynes

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## 1. General Information

Unless otherwise specified, all reactions were carried out under an atmosphere of argon in flame-dried reaction vessels with Teflon screw caps. 25 °C corresponds to the room temperature (rt) of the lab when the experiments were carried out. Dry CH<sub>3</sub>CN was purchased from commercial sources and was stored under argon over 4 Å molecular sieves. CsF was dried by heating at 110 °C for 12 h and left to cool under argon. The 2-(trimethylsilyl)phenyl trifluoromethanesulfonate **2a** and the other symmetric and unsymmetrical aryne precursors were synthesized following literature procedure.<sup>1</sup>

Analytical thin layer chromatography was performed on TLC Silica gel 60 F<sub>254</sub>. Visualization was accomplished with short wave UV light or KMnO<sub>4</sub> staining solutions followed by heating. Flash chromatography was performed on silica gel (230-400 mesh) by standard techniques eluting with Pet. Ether-CH<sub>2</sub>Cl<sub>2</sub> solvent system.

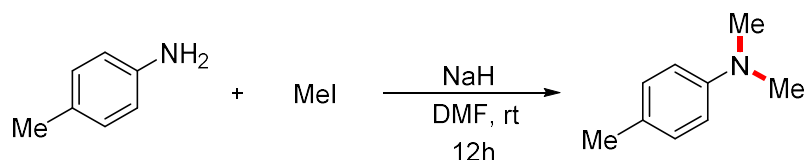
All compounds were fully characterized. <sup>1</sup>H and <sup>13</sup>C NMR spectra were recorded on Bruker Ultrashield spectrometer or Jeol ECZ spectrometer in CDCl<sub>3</sub> as solvent. Chemical shifts (δ) are given in ppm. The residual solvent signals were used as references and the chemical shifts converted to the TMS scale (CDCl<sub>3</sub>: δ<sub>H</sub> = 7.26 ppm, δ<sub>C</sub> = 77.16 ppm). Infrared (FT-IR) spectra were recorded on a Perkin Elmer Spectrum BX spectrophotometer, ν-max in cm<sup>-1</sup>. HRMS (ESI) data were recorded on a Waters Xevo G2-XS Q-TOF instrument.

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<sup>1</sup> (a) Sato, Y.; Tamura, T.; Kinbara, A.; Morib, M *Adv. Synth. Catal.* **2007**, *349*, 647. (b) Peña, D.; Cobas, A.; Pérez, D.; Guitián, E. *Synthesis*, **2002**, 1454.

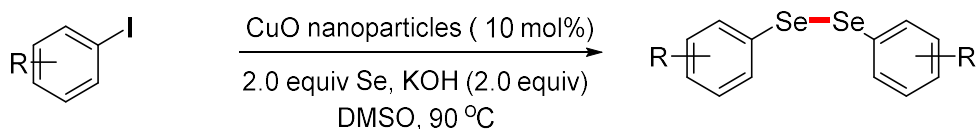
## 2. General Procedure for the Synthesis of Aniline Derivatives<sup>2</sup>

The tertiary amines derivatives **2a**, **2f**, **2p** and **7a** were purchased from commercial sources and used as received without further purification. Substrates **2b-e**, **2g-o** and **7c** were prepared using modified procedure (**2c** as an example below).<sup>2</sup>



To a suspension of NaH (1.1 g, 60% dispersion in mineral oil, 28 mmol) in DMF (15 mL) at 0 °C was added an *p*-toluidine (1.0 g, 9.0 mmol) followed by the subsequent addition of methyl iodide (28.0 mmol) under argon, and the reaction mixture was stirred for 12 h at 25 °C. The reaction was quenched with water, and organic materials were extracted with EtOAc three times. The combined extracts were washed with brine and dried over Na<sub>2</sub>SO<sub>4</sub>. After removal of the solvent under reduced pressure, the residue was purified by column chromatography (eluent: EtOAc: petroleum ether = 5:95) to afford the tertiary amine derivative **2c** (0.830 g, 66%).

## 3. General Procedure for the Synthesis of Diselenides<sup>3</sup>



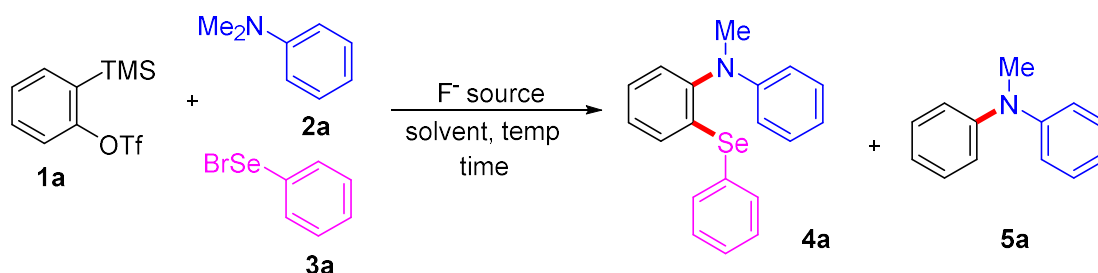
To a stirred solution of Se metal (2.0 mmol) and aryl iodide (1.0 mmol) in dry DMSO (2.0 mL) was added CuO nanoparticles (10.0 mol %) followed by KOH (2.0 equiv) under argon atmosphere at 90 °C. The progress of the reaction was monitored by TLC. After the reaction was complete, the reaction mixture was allowed to cool to room temperature and it was then quenched with water and extracted with EtOAc. The combined organic layers were dried over anhydrous Na<sub>2</sub>SO<sub>4</sub>. The solvent was removed under reduced pressure, and the residue was

<sup>2</sup> Lv, Y.; Zheng, Y.; Li, Y.; Xiong, T.; Zhang, J.; Liu, Q.; Zhang, Q. *Chem. Commun.* **2013**, 49, 8866.

<sup>3</sup> Singh, D.; Deobald, A. M.; Camargo, L. R. S.; Tabarelli, G.; Rodrigues, O. E. D.; Braga, A. L. *Org. Lett.* **2010**, 12, 3288.

purified by flash chromatography on a silica gel column chromatography (Pet Ether) to give the pure diselenides.

#### 4. General Procedure for the Optimization of Reaction Conditions



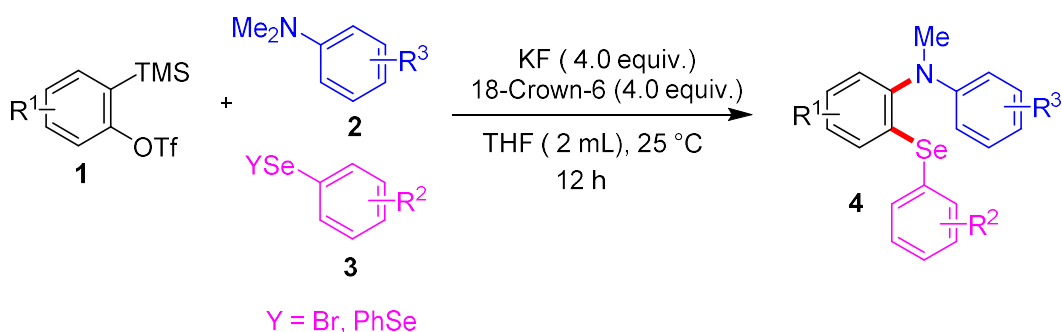
To a flame-dried screw-capped test tube equipped with a magnetic stir bar was added the fluoride source (0.60 mmol) inside the glove-box. Phenylselenenyl bromide **3a** (0.25 mmol) was added and the mixture was dissolved in 1.0 mL of THF outside the glove-box under argon and to this stirring solution was added *N,N*-dimethylaniline **2a** (0.030 g, 32  $\mu$ L, 0.25 mmol) and 2-(trimethylsilyl)phenyl trifluoromethanesulfonate **1a** (0.090 g, 73  $\mu$ L, 0.30 mmol) at 25  $^{\circ}$ C. Then the reaction mixture was allowed to react at indicated temperature and time. After indicated time over, the reaction was stopped, the solvent was evaporated and the crude residue pre-adsorbed on silica gel and purified by flash column chromatography on silica gel to afford the corresponding 2-selanyl aniline derivatives **4**.

**Table S1: Optimization of the Reaction Conditions<sup>a</sup>**

entry	F source	solvent	Temp ( $^{\circ}$ C)	Time (h)	Yield of <b>4a</b> (%) <sup>b</sup>	Yield of <b>5</b> (%) <sup>b</sup>
1	KF/ 18-crown-6	THF	25	12	55	18
2 <sup>c</sup>	KF/ 18-crown-6	THF	25	12	36	20
3 <sup>d</sup>	KF/ 18-crown-6	THF	25	12	50	24
4	KF/ 18-crown-6	DME	25	12	48	16
5	CsF	CH <sub>3</sub> CN	25	12	<5	<5
6	TBAF	THF	25	12	<5	<5
7	TBAT	toluene	25	12	<5	<5
8	KF/ 18-crown-6	THF	-10 – 25	12	27	29
9	KF/ 18-crown-6	THF	60	12	16	38
10 <sup>c</sup>	KF/ 18-crown-6	THF	25	12	51	<5
11 <sup>f</sup>	KF/ 18-crown-6	THF	25	12	72	<5
13 <sup>g</sup>	KF/ 18-crown-6	THF	25	24	72	<5

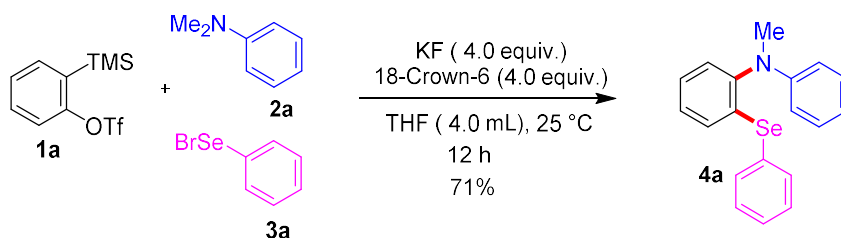
<sup>a</sup> Standard conditions: **1a** (0.30 mmol), **2a** (0.25 mmol), **3a** (0.25 mmol), fluoride source (2.4 equiv), solvent (1.0 mL), 25 °C and 12 h. <sup>b</sup> Yield of isolated product(s) is given. <sup>c</sup> PhSeCl (0.25 mmol) was used instead of PhSeBr. <sup>d</sup> PhSeSPh (0.375 mmol) was used instead of PhSeBr and 0.5 mmol of **1a**, fluoride source (4.0 equiv) was used, <sup>e</sup> 1.5 equiv. of **2a** was used. <sup>f</sup> 2.0 equiv of **1a**, 1.5 equiv of **2a**, fluoride source (4.0 equiv) was used. <sup>g</sup> Reaction was stirred for 24 h

## 5. General Procedure for the Aminoselenation of Arynes



To a flame-dried screw-capped test tube equipped with a magnetic stir bar was added the 18-crown-6 (0.528 g, 2.0 mmol), KF (0.116 g, 2.0 mmol) inside the glove-box. Electrophilic selenium source **3** (0.75 mmol) was added and the mixture was dissolved in 2.0 mL of THF outside the glove box under argon and kept stirring for five minutes. To this stirring mixture was added 0.5 mmol of the *N,N*-dimethyl aniline derivatives **2** and aryne precursor **1** (1.0 mmol). Then the reaction mixture was allowed to react at 25 °C for 12 h. After 12 h, the reaction was stopped, the solvent was evaporated and the crude residue pre-adsorbed on silica gel and purified by flash column chromatography on silica gel to afford the corresponding 2-selanyl aniline derivatives **4** in moderate to good yield.

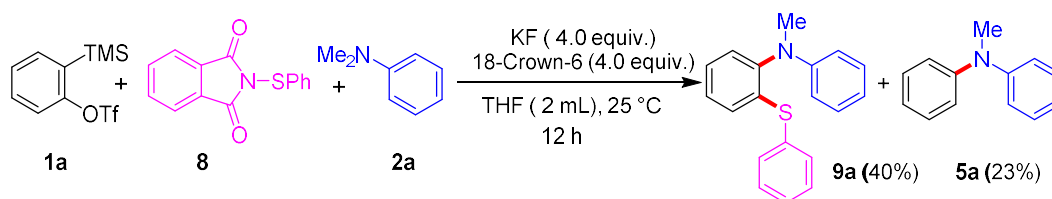
### Procedure for the 1.0 mmol scale



To a flame-dried screw-capped test tube equipped with a magnetic stir bar was added the 18-crown-6 (1.056 g, 4.0 mmol), KF (0.232 g, 4.0 mmol) inside the glove-box. Phenylselenenyl

bromide **3a** (0.354 g, 1.5 mmol) was added and the mixture was dissolved in 4.0 mL of THF outside the glove-box under argon and kept stirring for five minutes. To this stirring mixture was added *N,N*-dimethyl aniline **2a** (0.121 g, 127  $\mu$ L, 1.0 mmol) and 2-(trimethylsilyl)phenyltrifluoromethanesulfonate **1a** (0.597 g, 486  $\mu$ L, 2.0 mmol). Then the reaction mixture was allowed to react at 25 °C for 12 h. After 12 h, the reaction was stopped, the solvent was evaporated and the crude residue pre-adsorbed on silica gel and purified by flash column chromatography (Pet.ether/DCM = 95/05) on silica gel to afford *N*-methyl-*N*-phenyl-2-(phenylselanyl)aniline **4a** as a white solid (0.240 g, 71% yield).

## 6. Procedure for the Preparation of *N*-methyl-*N*-phenyl-2-(phenylthio)aniline<sup>4</sup>

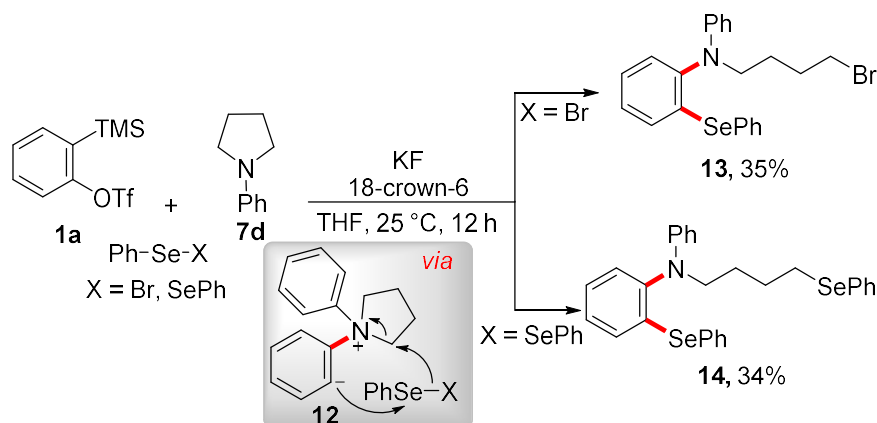


To a flame-dried screw-capped test tube equipped with a magnetic stir bar was added the 18-crown-6 (0.264 g, 1.0 mmol), KF (0.058 g, 1.0 mmol) inside the glove-box. 2-(phenylthio)isoindoline-1,3-dione **8** (0.096 g, 0.375 mmol) was added and the mixture was dissolved in 1.0 mL of THF outside the glove-box under argon and kept stirring for five minutes. To this stirring mixture was added *N,N*-dimethylaniline **2a** (0.030 g, 32  $\mu$ L, 0.25 mmol) and 2-(trimethylsilyl)phenyltrifluoromethanesulfonate **1a** (0.149 g, 121  $\mu$ L, 0.5 mmol). Then the reaction mixture was allowed to react at 25 °C for 12 h. After 12 h, the reaction was stopped, the solvent was evaporated and the crude residue pre-adsorbed on silica gel and purified by flash column chromatography on silica gel to afford the *N*-methyl-*N*-phenyl-2-(phenylthio)aniline **9a** in 40% yield along with *N*-arylated product **5a** in 23% yield.

<sup>4</sup> Gaykar, R. N.; Bhattacharjee, S.; Biju, A. T. *Org. Lett.* **2019**, *21*, 737.

## 7. Mechanistic Experiments

### *Experiments to show the role of nucleophile in the dealkylation step*



To a flame-dried screw-capped test tube equipped with a magnetic stir bar was added the 18-crown-6 (0.528 g, 2.0 mmol), KF (0.116 g, 2.0 mmol) inside the glove-box. Electrophilic selenium source **3a** or **6a** (0.75 mmol) was added and the mixture was dissolved in 2.0 mL of THF outside the glove-box under argon and kept stirring for five minutes. To this stirring mixture was added 1-phenylpyrrolidine **7d**<sup>5</sup> (0.074g, 0.5 mmol) and aryne precursor **1a** (0.298 g, 243  $\mu$ L, 1.0 mmol). Then the reaction mixture was allowed to react at 25 °C for 12 h. After 12 h, the reaction was stopped, the solvent was evaporated and the crude residue pre-adsorbed on silica gel and purified by flash column chromatography on silica gel to afforded the corresponding 2-selanyl aniline derivatives **13** and **14** in 35% and 34% yield respectively.

*This experiment indicates the role of nucleophile (X = Br or SePh) in the dealkylation step in the three-component reaction.*

## 8. X-ray Data of **4f** and **13**

Single crystal of **4f** (recrystallized from Pet. ether at 25 °C) was mounted and the diffraction data was collected at 296 K on a Bruker SMART APEX CCD diffractometer using SMART/SAINT software. Intensity data were collected using graphite-monochromatized Mo-K $\alpha$

<sup>5</sup> Cano, R.; Ramón, D. J.; Yus, M. *J. Org. Chem.* **2011**, *76*, 654.

radiation (71.073 pm). The structure was solved by direct methods using the ShelXS<sup>6</sup> and refined with ShelXS<sup>6</sup>. Empirical absorption corrections were applied with SADABS.<sup>7</sup> All Non-hydrogen atoms were refined anisotropically and hydrogen atoms were included in geometric positions. Structure was drawn using Olex-2 and ORTEP-3. The crystallographic refinement parameters are given below:

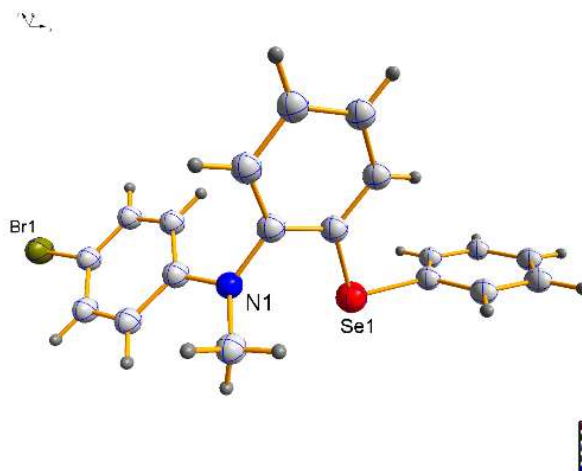
**Table S2 Crystal data and structure refinement for 4f**

Identification code	<b>4f</b>
CCDC Number	1953258
Empirical formula	C <sub>19</sub> H <sub>16</sub> BrNSe
Formula weight	417.20
Temperature/K	296.15
Crystal system	monoclinic
Space group	P21/n
a/Å	14.2571(4)
b/Å	6.2778(2)
c/Å	19.5208(5)
α/°	90.00
β/°	98.404(2)
γ/°	90.00
Volume/Å <sup>3</sup>	1728.41(9)
Z	4
ρ <sub>calc</sub> /mm <sup>3</sup>	1.603
μ/mm <sup>-1</sup>	4.480
F(000)	824.0
Radiation	MoKα(λ = 0.71073)
Crystal size/mm <sup>3</sup>	0.273 × 0.251 × 0.238
2θ range for data collection	3.32 to 55.2°
Index ranges	-18 ≤ h ≤ 18, -8 ≤ k ≤ 8, -25 ≤ l ≤ 25
Reflections collected	28032
Independent reflections	3991 [R(int) = 0.0613]
Data/restraints/parameters	3991/0/200
Goodness-of-fit on F <sup>2</sup>	1.012
Final R indexes	[I ≥ 2σ(I)] R <sub>1</sub> = 0.0398, wR <sub>2</sub> = 0.0752
Final R indexes [all data]	R <sub>1</sub> = 0.0847, wR <sub>2</sub> = 0.0868
Largest diff. peak/hole / e Å <sup>-3</sup>	0.59/-0.78

<sup>6</sup> SHELXS, G.M. Sheldrick, *Acta Cryst.* **2008**, *A64*, 112.

<sup>7</sup> Sheldrick, G. M. SADABS, University of Göttingen, Göttingen, Germany, **1999**.





**Figure S1.** Crystal Structure of **4f** (Thermal ellipsoids are shown with 50% probability)

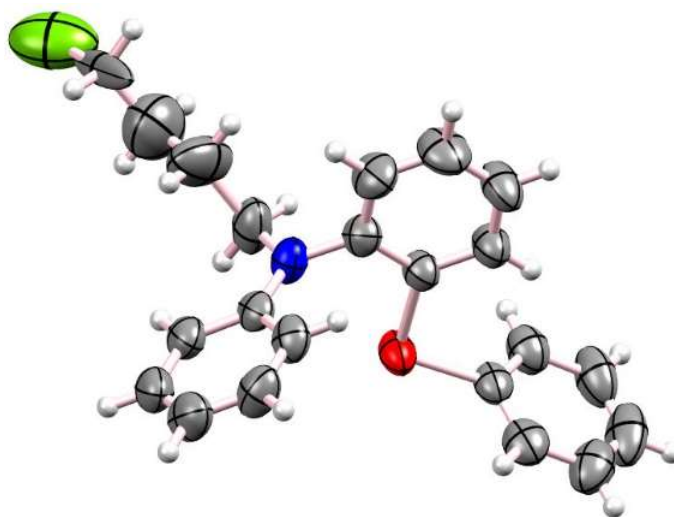
### *X-ray data of 13*

Single crystal of **13** (recrystallized from DCM/Pet Ether at 25 °C) was mounted and the diffraction data was collected at 298 K on a Bruker SMART APEX CCD diffractometer using SMART/SAINT software. Intensity data were collected using graphite-monochromatized Mo-K $\alpha$  radiation (71.073 pm). The structure was solved by direct methods using the ShelXS<sup>6</sup> and refined with ShelXS. Empirical absorption corrections were applied with SADABS.<sup>7</sup> All Non-hydrogen atoms were refined anisotropically and hydrogen atoms were included in geometric positions. Structure was drawn using Olex-2 and ORTEP-3. The crystallographic refinement parameters are given below:

**Table S3 Crystal data and structure refinement for**

Identification code	<b>13</b>
CCDC no	1961216
Empirical formula	C <sub>22</sub> H <sub>22</sub> BrNSe
Formula weight	459.289
Temperature/K	298
Crystal system	triclinic
Space group	P-1
a/Å	8.6022(8)
b/Å	10.7583(10)
c/Å	11.7185(11)
$\alpha$ /°	73.280(4)
$\beta$ /°	74.058(4)
$\gamma$ /°	82.430(4)
Volume/Å <sup>3</sup>	997.06(16)
Z	2

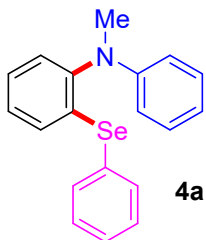
$\rho_{\text{calc}}/\text{mg}/\text{mm}^3$	1.530
$\mu/\text{mm}^{-1}$	3.891
F(000)	460.0
Crystal size/ $\text{mm}^3$	$0.6 \times 0.5 \times 0.4$
$2\theta$ range for data collection	3.748 to 49.998
Index ranges	$-10 \leq h \leq 10, -12 \leq k \leq 12, -13 \leq l \leq 13$
Reflections collected	24565
Independent reflections	3510 [Rint = 0.0383, Rsigma = 0.0236]
Data/restraints/parameters	3510/1/226
Goodness-of-fit on	1.033
Final R indexes	R1 = 0.0898, wR2 = 0.2104
Final R indexes [all data]	R1 = 0.1097, wR2 = 0.2210
Largest diff. peak/hole / $e \text{ \AA}^{-3}$	1.88/-2.14



**Figure S2.** Crystal Structure of **13**

## 9. Synthesis and Characterization of 2-Selanyl Aniline Derivatives

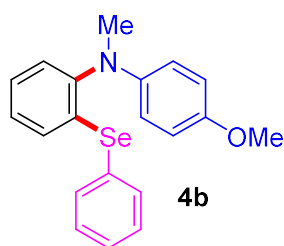
### *N*-Methyl-*N*-phenyl-2-(phenylselanyl)aniline (**4a**)



Following the general procedure, treatment of 2-(trimethylsilyl)phenyl trifluoromethanesulfonate **1a** (0.298 g, 243  $\mu$ L, 1.0 mmol) and *N,N*-dimethylaniline **2a** (0.061 g, 63  $\mu$ L, 0.5 mmol) with Phenylselenenyl bromide **3a** (0.177 g, 0.75 mmol) in the presence of KF (0.116 g, 2.0 mmol) and 18-crown-6 (0.528 g, 2.0 mmol) in THF (2.0 mL) at 25  $^{\circ}$ C for 12 h followed by flash column chromatography (Pet.ether/DCM = 95/05) of the crude reaction mixture using silica gel afforded *N*-methyl-*N*-phenyl-2-(phenylselanyl)aniline **4a** as a white solid (0.121 g, 72% yield).

*R<sub>f</sub>* (Pet. ether /DCM = 95/05): 0.44;  $^1\text{H NMR}$  (400 MHz,  $\text{CDCl}_3$ )  $\delta$  7.67-7.65 (m, 2H), 7.42-7.35 (m, 3H), 7.26-7.21 (m, 3H), 7.16 (dd,  $J_1 = 7.8$  Hz,  $J_2 = 1.4$  Hz, 1H), 7.11-7.07 (m, 1H), 7.04 (dd,  $J_1 = 7.9$  Hz,  $J_2 = 1.4$  Hz, 1H), 6.81 (t,  $J = 7.3$  Hz, 1H), 6.68 (d,  $J = 8.0$  Hz, 2H), 3.27 (s, 3H).  $^{13}\text{C NMR}$  (100 MHz,  $\text{CDCl}_3$ )  $\delta$  149.2, 146.9, 136.6, 136.3, 130.3, 129.7, 129.1, 128.6, 128.5, 128.4, 127.7, 127.6, 118.1, 114.0, 39.2. **HRMS (ESI)** calculated  $[\text{M}+\text{H}]^+$  for  $\text{C}_{19}\text{H}_{18}\text{NSe}$ : 340.0599, found: 340.0606. **FTIR** ( $\text{cm}^{-1}$ ) 3057, 2922, 1601, 1497, 1336, 1022.

### *N*-(4-Methoxyphenyl)-*N*-methyl-2-(phenylselanyl)aniline (**4b**)

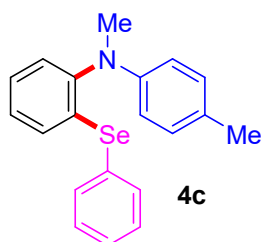


Following the general procedure, treatment of 2-(trimethylsilyl)phenyl trifluoromethanesulfonate **1a** (0.298 g, 243  $\mu$ L, 1.0 mmol) and 4-methoxy-*N,N*-dimethylaniline **2b** (0.076 g, 0.5 mmol) with Phenylselenenyl bromide **3a** (0.177 g, 0.75 mmol) in the presence of KF (0.116 g, 2.0 mmol) and 18-crown-6 (0.528 g, 2.0 mmol) in THF (2.0 mL) at 25  $^{\circ}$ C for 12 h followed by flash column chromatography (Pet.ether/DCM = 85/15) of the crude reaction mixture using silica gel afforded *N*-(4-methoxyphenyl)-*N*-methyl-2-(phenylselanyl)aniline **4b** as a white solid (0.135 g, 73% yield).

*R<sub>f</sub>* (Pet. ether /DCM = 90/10): 0.24;  $^1\text{H NMR}$  (400 MHz,  $\text{CDCl}_3$ )  $\delta$  7.67-7.64 (m, 2H), 7.42-7.34 (m, 3H), 7.21-7.17 (m, 1H), 7.11 (dd,  $J_1 = 7.8$  Hz,  $J_2 = 1.4$  Hz, 1H), 7.06-7.02 (m, 1H), 6.98 (dd,  $J_1 = 7.9$  Hz,  $J_2 = 1.5$  Hz, 1H), 6.84-6.80 (m, 2H), 6.69-6.65 (m, 2H), 3.78 (s, 3H), 3.21 (s, 3H).  $^{13}\text{C NMR}$  (100 MHz,  $\text{CDCl}_3$ )  $\delta$  152.8, 147.8, 143.8, 136.7, 135.9, 130.0, 129.6, 128.6, 128.5, 127.6, 127.5, 127.0, 116.2, 114.6, 55.8, 40.0. **HRMS (ESI)** calculated  $[\text{M}+\text{H}]^+$  for

C<sub>20</sub>H<sub>20</sub>N<sub>2</sub>Se: 370.0705, found: 370.0690. **FTIR (cm<sup>-1</sup>)** 3053, 2950, 1576, 1508, 1469, 1241, 1037.

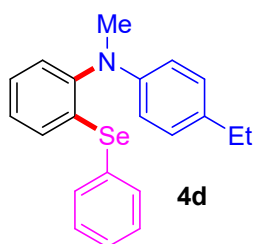
#### ***N*-Methyl-2-(phenylselenanyl)-*N*-(*p*-tolyl)aniline (4c)**



Following the general procedure, treatment of 2-(trimethylsilyl)phenyl trifluoromethanesulfonate **1a** (0.149 g, 121  $\mu$ L, 0.5 mmol) and *N,N*,4-trimethylaniline **2c** (0.034 g, 0.25 mmol) with Phenylselenenyl bromide **3a** (0.088 g, 0.375 mmol) in the presence of KF (0.058 g, 1.0 mmol) and 18-crown-6 (0.264 g, 1.0 mmol) in THF (1.0 mL) at 25 °C for 12 h followed by flash column chromatography (Pet.ether/DCM = 95/05) of the crude reaction mixture using silica gel afforded *N*-methyl-2-(phenylselenanyl)-*N*-(*p*-tolyl)aniline **4c** as a pale yellow oil (0.060 g, 68% yield).

**R<sub>f</sub>** (Pet. ether /DCM = 95/05): 0.49; **<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>)**  $\delta$  7.68-7.65 (m, 2H), 7.43-7.35 (m, 3H), 7.23-7.19 (m, 1H), 7.14 (dd,  $J_1 = 7.9$  Hz,  $J_2 = 1.3$  Hz, 1H), 7.09-7.04 (m, 3H), 7.01 (dd,  $J_1 = 7.9$  Hz,  $J_2 = 1.3$  Hz, 1H), 6.61 (d,  $J = 8.5$  Hz, 2H), 3.25 (s, 3H), 2.30 (s, 3H). **<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>)**  $\delta$  147.3, 147.1, 136.6, 136.3, 130.1, 129.64, 129.62, 128.6, 128.5, 128.2, 127.6, 127.4, 127.3, 114.4, 39.5, 20.5. **HRMS (ESI)** calculated  $[M+H]^+$  for C<sub>20</sub>H<sub>20</sub>N<sub>2</sub>Se: 354.0755, found: 354.0765. **FTIR (cm<sup>-1</sup>)** 3449, 3058, 1614, 1574, 1512, 1470, 1021.

#### ***N*-(4-Ethylphenyl)-*N*-methyl-2-(phenylselenanyl)aniline (4d)**

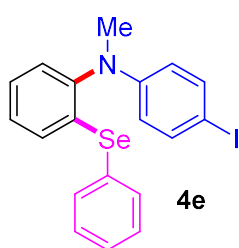


Following the general procedure, treatment of 2 (trimethylsilyl)phenyl trifluoromethanesulfonate **1a** (0.298 g, 243  $\mu$ L, 1.0 mmol) and 4-ethyl-*N,N*-dimethylaniline **2d** (0.075 g, 0.5 mmol) with Phenylselenenyl bromide **3a** (0.177 g, 0.75 mmol) in the presence of KF (0.116 g, 2.0 mmol) and 18-crown-6 (0.528 g, 2.0 mmol) in THF (2.0 mL) at 25 °C for 12 h followed by flash column chromatography (Pet.ether/DCM = 95/05) of the crude reaction mixture using silica gel afforded *N*-(4-ethylphenyl)-*N*-methyl-2-(phenylselenanyl)aniline **4d** as a pale yellow oil (0.135 g, 74% yield).

**R<sub>f</sub>** (Pet. ether /DCM = 95/05): 0.50; **<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>)**  $\delta$  7.72-7.69 (m, 2H), 7.45-7.38(m, 3H), 7.26-7.22 (m, 1H), 7.18(dd,  $J_1 = 7.8$  Hz,  $J_2 = 1.6$  Hz, 1H), 7.13-7.08(m, 3H), 7.04 (dd,  $J_1 = 7.9$  Hz,  $J_2 = 1.4$  Hz, 1H), 6.69-6.66 (m, 2H), 3.28 (s, 3H), 2.64 (q,  $J = 7.7$  Hz, 2H), 1.27

(t,  $J = 7.7$  Hz, 3H).  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  147.3, 136.6, 136.3, 133.9, 130.1, 129.6, 129.1, 128.8, 128.6, 128.4, 128.3, 127.5, 127.3, 114.3, 39.4, 28.0, 15.9. HRMS (ESI) calculated  $[\text{M}+\text{H}]^+$  for  $\text{C}_{21}\text{H}_{22}\text{NSe}$ : 368.0912, found: 368.0915. FTIR ( $\text{cm}^{-1}$ ) 3450, 2961, 2866, 1613, 1512, 1333.

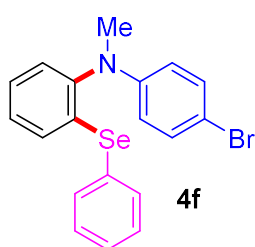
#### *N*-(4-Iodophenyl)-*N*-methyl-2-(phenylselanyl)aniline (4e)



Following the general procedure, treatment of 2-(trimethylsilyl)phenyl trifluoromethanesulfonate **1a** (0.298 g, 243  $\mu\text{L}$ , 1.0 mmol) and 4-iodo-*N,N*-dimethylaniline **2e** (0.124 g, 0.5 mmol) with Phenylselanyl bromide **3a** (0.177 g, 0.75 mmol) in the presence of KF (0.116g, 2.0 mmol) and 18-crown-6 (0.528 g, 2.0 mmol) in THF (2.0 mL) at 25  $^\circ\text{C}$  for 12 h followed by flash column chromatography (Pet.ether/DCM = 97/03) of the crude reaction mixture using silica gel afforded *N*-(4-iodophenyl)-*N*-methyl-2-(phenylselanyl)aniline **4e** as a pale yellow oil (0.147 g, 63% yield).

$R_f$  (Pet. ether /DCM = 95/05): 0.60;  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  7.65-7.62 (m, 2H), 7.47 (d,  $J = 8.8$  Hz, 2H), 7.41-7.36 (m, 3H), 7.25-7.21 (m, 1H), 7.14-7.09 (m, 2H), 7.04 (dd,  $J_1 = 7.8$  Hz,  $J_2 = 1.2$  Hz, 1H), 6.42 (d,  $J = 8.8$  Hz, 2H), 3.23 (s, 3H).  $^{13}\text{C}$  NMR (125 MHz,  $\text{CDCl}_3$ )  $\delta$  148.6, 146.0, 137.6, 136.4, 136.1, 130.6, 129.7, 128.7, 128.5, 128.1, 127.9, 127.8, 116.0, 79.4, 39.1. HRMS (ESI) calculated  $[\text{M}+\text{H}]^+$  for  $\text{C}_{19}\text{H}_{17}\text{INSe}$ : 465.9565, found: 465.9568. FTIR ( $\text{cm}^{-1}$ ) 3057, 2871, 1576, 1489, 1340, 1115.

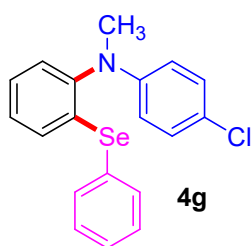
#### *N*-(4-Bromophenyl)-*N*-methyl-2-(phenylselanyl)aniline (4f)



Following the general procedure, treatment of 2-(trimethylsilyl)phenyl trifluoromethanesulfonate **1a** (0.149 g, 121  $\mu\text{L}$ , 0.5 mmol) and 4-bromo-*N,N*-dimethylaniline **2f** (0.050 g, 0.25 mmol) with Phenylselanyl bromide **3a** (0.088 g, 0.375 mmol) in the presence of KF (0.058 g, 1.0 mmol) and 18-crown-6 (0.264 g, 1.0 mmol) in THF (1.0 mL) at 25  $^\circ\text{C}$  for 12 h followed by flash column chromatography (Pet.ether/DCM = 97/03) of the crude reaction mixture using silica gel afforded *N*-(4-bromophenyl)-*N*-methyl-2-(phenylselanyl)aniline **4f** as a white solid (0.064 g, 62% yield).

**R<sub>f</sub>** (Pet. ether /DCM = 95/05): 0.60; **<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>)** δ 7.67-7.65 (m, 2H), 7.43-7.37(m, 3H), 7.34-7.23 (m, 3H), 7.16-7.11(m, 2H), 7.07-7.04 (m, 1H), 6.56-6.52 (m, 2H), 3.25 (s, 3H). **<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>)** δ 148.1, 146.1, 136.5, 136.2, 131.7, 130.4, 129.7, 128.8, 128.5, 128.0, 127.9, 127.8, 115.4, 110.1, 39.2. **HRMS (ESI)** calculated [M+H]<sup>+</sup> for C<sub>19</sub>H<sub>17</sub>BrNSe: 417.9704, found:417.9704. **FTIR (cm<sup>-1</sup>)** 3415, 2922, 1573, 1489, 1337, 1115.

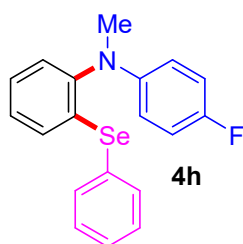
#### ***N*-(4-Chlorophenyl)-*N*-methyl-2-(phenylselanyl)aniline (4g)**



Following the general procedure, treatment of 2-(trimethylsilyl)phenyl trifluoromethanesulfonate **1a** (0.298 g, 243 μL, 1.0 mmol) and 4-chloro-*N,N*-dimethylaniline **2g** (0.078 g, 0.5 mmol) with Phenylselenyl bromide **3a** (0.177 g, 0.75 mmol) in the presence of KF (0.116 g, 2.0 mmol) and 18-crown-6 (0.528 g, 2.0 mmol) in THF (2.0 mL) at 25 °C for 12 h followed by flash column chromatography (Pet.ether/DCM = 95/05) of the crude reaction mixture using silica gel afforded *N*-(4-chlorophenyl)-*N*-methyl-2-(phenylselanyl)aniline **4g** as a white solid (0.119 g, 64% yield).

**R<sub>f</sub>** (Pet. ether /DCM = 95/05): 0.60; **<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>)** δ 7.68-7.65 (m, 2H), 7.46-7.36 (m, 3H), 7.28-7.24 (m, 1H), 7.21-7.10 (m, 4H), 7.06 (dd, *J*<sub>1</sub> = 7.9 Hz, *J*<sub>2</sub> = 1.5 Hz, 1H), 6.61-6.58 (m, 2H), 3.26 (s, 3H). **<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>)** δ 147.7, 146.2, 136.5, 136.2, 130.4, 129.7, 128.9, 128.7, 128.5, 128.0, 127.9, 127.8, 122.9, 115.0, 39.3. **HRMS (ESI)** calculated [M+H]<sup>+</sup> for C<sub>19</sub>H<sub>17</sub>ClNSe: 374.0209, found: 374.0211. **FTIR (cm<sup>-1</sup>)** 3056, 2873, 1597, 1492, 1338, 1111.

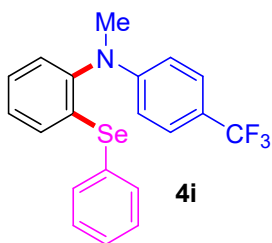
#### ***N*-(4-Fluorophenyl)-*N*-methyl-2-(phenylselanyl)aniline (4h)**



Following the general procedure, treatment of 2-(trimethylsilyl)phenyl trifluoromethanesulfonate **1a** (0.298 g, 243 μL, 1.0 mmol) and 4-fluoro-*N,N*-dimethylaniline **2h** (0.070 g, 0.5 mmol) with Phenylselenyl bromide **3a** (0.177 g, 0.75 mmol) in the presence of KF (0.116 g, 2.0 mmol) and 18-crown-6 (0.528 g, 2.0 mmol) in THF (2.0 mL) at 25 °C for 12 h followed by flash column chromatography (Pet.ether/DCM = 95/05) of the crude reaction mixture using silica gel afforded *N*-(4-fluorophenyl)-*N*-methyl-2-(phenylselanyl)aniline **4h** as a light yellow solid (0.126 g, 70% yield).

**R<sub>f</sub>** (Pet. ether /DCM = 95/05): 0.60; **<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>)** δ 7.66-7.63 (m, 2H), 7.42-7.34 (m, 3H), 7.23-7.19 (m, 1H), 7.13-7.05 (m, 2H), 7.01 (dd, *J*<sub>1</sub> = 7.9 Hz, *J*<sub>2</sub> = 1.5 Hz, 1H), 6.95-6.89 (m, 2H), 6.63-6.57 (m, 2H), 3.23 (s, 3H). **<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>)** δ 156.9 (d, *J* = 236.4 Hz), 147.2, 145.8 (d, *J* = 1.4 Hz), 136.6, 136.1, 130.4, 129.7, 128.7, 128.3, 128.2, 127.6 (d, *J* = 20.5 Hz), 116.0, 115.3 (d, *J* = 3.5 Hz), 115.3, 39.8. **HRMS (ESI)** calculated [M+H]<sup>+</sup> for C<sub>19</sub>H<sub>17</sub>FNSe: 358.0505, found: 358.0515. **FTIR (cm<sup>-1</sup>)** 3054, 2870, 1507, 1470, 1335, 1225, 1023.

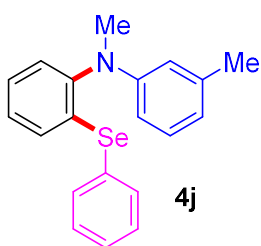
#### ***N*-Methyl-2-(phenylselenanyl)-*N*-(4-(trifluoromethyl)phenyl)aniline (4i)**



Following the general procedure, treatment of 2-(trimethylsilyl)phenyl trifluoromethanesulfonate **1a** (0.149 g, 121 μL, 0.5 mmol) and *N,N*-dimethyl-4-(trifluoromethyl)aniline **2i** (0.047 g, 0.25 mmol) with Phenylselenyl bromide **3a** (0.088 g, 0.375 mmol) in the presence of KF (0.058 g, 1.0 mmol) and 18-crown-6 (0.264 g, 1.0 mmol) in THF (1.0 mL) at 65 °C for 12 h followed by flash column chromatography (Pet.ether/DCM = 95/05) of the crude reaction mixture using silica gel afforded *N*-methyl-2-(phenylselenanyl)-*N*-(4-(trifluoromethyl)phenyl)aniline **4i** as a pale yellow oil (0.028 g, 28% yield).

**R<sub>f</sub>** (Pet. ether /DCM = 95/05): 0.53; **<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>)** δ 7.60-7.58 (m, 2H), 7.42 (d, *J* = 8.7 Hz, 2H), 7.39-7.32 (m, 3H), 7.25-7.23 (m, 1H), 7.15-7.11 (m, 2H), 7.08-7.06 (m, 1H), 6.60 (d, *J* = 8.6 Hz, 2H), 3.27 (s, 3H). **<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>)** δ 151.2, 145.5, 136.4, 136.1, 131.0, 129.8, 128.9, 128.8, 128.3, 128.1, 127.9, 136.4 (q, *J* = 3.5 Hz), 125.2 (q, *J* = 270.0 Hz), 119.3 (q, *J* = 33.0 Hz), 112.7, 39.0. **HRMS (ESI)** calculated [M+H]<sup>+</sup> for C<sub>20</sub>H<sub>17</sub>F<sub>3</sub>NSe: 408.0473. found: 408.0479. **FTIR (cm<sup>-1</sup>)** 3058, 2924, 2363, 1616, 1472, 1326, 1111.

#### ***N*-Methyl-2-(phenylselenanyl)-*N*-(*m*-tolyl)aniline (4j)**

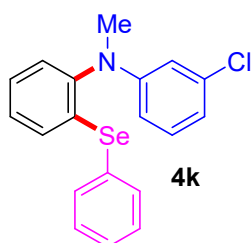


Following the general procedure, treatment of 2-(trimethylsilyl)phenyl trifluoromethanesulfonate **1a** (0.298 g, 243 μL, 1.0 mmol) and *N,N*,3-trimethylaniline **2j** (0.068 g, 0.5 mmol) with Phenylselenyl bromide **3a** (0.177 g, 0.75 mmol) in the presence of KF (0.116 g, 2.0 mmol) and 18-crown-6 (0.528 g, 2.0 mmol) in THF (2.0 mL) at 25 °C for 12 h followed by flash column chromatography (Pet.ether/DCM = 95/05) of the crude reaction mixture using

silica gel afforded *N*-methyl-2-(phenylselanyl)-*N*-(*m*-tolyl)aniline **4j** as a white solid (0.101 g, 57% yield).

*R<sub>f</sub>*(Pet. ether /DCM = 95/05): 0.50; <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ 7.72-7.70 (m, 2H), 7.47-7.39 (m, 3H), 7.28-7.24 (m, 1H), 7.21-7.11 (m, 3H), 7.07 (dd, *J*<sub>1</sub> = 7.9 Hz, *J*<sub>2</sub> = 1.3 Hz, 1H), 6.69 (d, *J* = 7.9 Hz, 1H), 6.56 (s, 1H), 6.54-6.52 (m, 1H), 3.30 (s, 3H), 2.36 (s, 3H). <sup>13</sup>C NMR (125 MHz, CDCl<sub>3</sub>) δ 149.2, 147.0, 138.7, 136.5, 136.3, 130.3, 129.6, 128.9, 128.6, 128.5, 128.4, 127.6, 127.5, 119.1, 114.7, 111.4, 39.3, 22.0. HRMS (ESI) calculated [M+H]<sup>+</sup> for C<sub>20</sub>H<sub>20</sub>NSe: 354.0755, found: 354.0760. FTIR (cm<sup>-1</sup>) 3052, 2917, 1604, 1573, 1463, 1339, 1027.

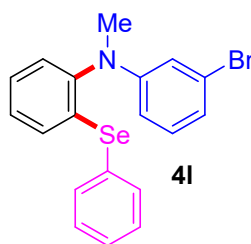
#### *N*-(3-Chlorophenyl)-*N*-methyl-2-(phenylselanyl)aniline (**4k**)



Following the general procedure, treatment of 2-(trimethylsilyl)phenyl trifluoromethanesulfonate **1a** (0.298 g, 243 μL, 1.0 mmol) and 3-chloro-*N,N*-dimethylaniline **2k** (0.078 g, 0.5 mmol) with Phenylselenenyl bromide **3a** (0.177 g, 0.75 mmol) in the presence of KF (0.116 g, 2.0 mmol) and 18-crown-6 (0.528 g, 2.0 mmol) in THF (2.0 mL) at 25 °C for 12 h followed by flash column chromatography (Pet.ether/DCM = 95/05) of the crude reaction mixture using silica gel afforded *N*-(3-chlorophenyl)-*N*-methyl-2-(phenylselanyl)aniline **4k** as a light yellow oil (0.092 g, 49% yield).

*R<sub>f</sub>*(Pet. ether /DCM = 95/05): 0.50; <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ 7.63-7.61 (m, 2H), 7.39-7.32 (m, 3H), 7.25-7.21 (m, 1H), 7.13-7.08 (m, 3H), 7.04-7.02 (m, 1H), 6.65-6.73 (m, 1H), 6.61 (t, *J* = 2.1 Hz, 1H), 6.47 (dd, *J*<sub>1</sub> = 8.4 Hz, *J*<sub>2</sub> = 2.3 Hz, 1H), 3.23 (s, 3H). <sup>13</sup>C NMR (125 MHz, CDCl<sub>3</sub>) δ 150.2, 146.0, 136.4, 136.1, 135.0, 134.1, 133.1, 130.8, 130.0, 129.7, 128.7, 128.0, 127.9, 117.8, 113.5, 112.0, 39.2. HRMS (ESI) calculated [M+H]<sup>+</sup> for C<sub>19</sub>H<sub>17</sub>ClNSe: 374.0209, found: 374.0209. FTIR (cm<sup>-1</sup>) 3057, 2922, 2363, 1596, 1481, 1341.

#### *N*-(3-Bromophenyl)-*N*-methyl-2-(phenylselanyl)aniline (**4l**)



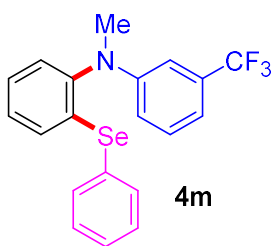
Following the general procedure, treatment of 2-(trimethylsilyl)phenyl trifluoromethanesulfonate **1a** (0.298 g, 243 μL, 1.0 mmol) and 3-bromo-*N,N*-dimethylaniline **2l** (0.100 g, 0.5 mmol) with Phenylselenenyl bromide **3a** (0.177 g, 0.75 mmol) in the presence of KF (0.116 g, 2.0 mmol) and 18-crown-6 (0.528 g, 2.0 mmol) in THF (2.0 mL) at 25 °C for 12 h



followed by flash column chromatography (Pet.ether/DCM = 95/05) of the crude reaction mixture using silica gel afforded *N*-(3-bromophenyl)-*N*-methyl-2-(phenylselenanyl)aniline **4l** as a sticky liquid (0.104 g, 50% yield).

**R<sub>f</sub>** (Pet. ether /DCM = 95/05): 0.53; **<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>)** δ 7.64-7.62 (m, 2H), 7.40-7.33 (m, 3H), 7.25-7.21 (m, 1H), 7.13-7.09 (m, 2H), 7.06-7.02 (m, 2H), 6.90-6.88 (m, 1H), 6.78 (t, *J* = 2.0 Hz, 1H), 6.51 (dd, *J*<sub>1</sub> = 8.3 Hz, *J*<sub>2</sub> = 2.3 Hz, 1H), 3.23 (s, 3H). **<sup>13</sup>C NMR (125 MHz, CDCl<sub>3</sub>)** δ 150.3, 145.9, 136.4, 136.1, 130.8, 130.3, 129.7, 128.73, 128.70, 128.1, 128.04, 127.96, 123.3, 120.7, 116.3, 112.5, 39.2. **HRMS (ESI)** calculated [M+H]<sup>+</sup> for C<sub>19</sub>H<sub>17</sub>BrNSe: 417.9704, found: 417.9704. **FTIR (cm<sup>-1</sup>)** 3057, 2922, 2363, 1593, 1479, 1340, 1075.

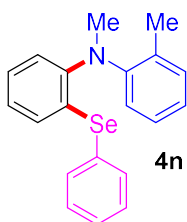
#### *N*-Methyl-2-(phenylselenanyl)-*N*-(3-(trifluoromethyl)phenyl)aniline (**4m**)



Following the general procedure, treatment of 2-(trimethylsilyl)phenyl trifluoromethanesulfonate **1a** (0.298 g, 243 μL, 1.0 mmol) and *N,N*-dimethyl-3-(trifluoromethyl)aniline **2m** (0.095 g, 0.5 mmol) with Phenylselenyl bromide **3a** (0.177 g, 0.75 mmol) in the presence of KF (0.116 g, 2.0 mmol) and 18-crown-6 (0.528 g, 2.0 mmol) in THF (2.0 mL) at 25 °C for 12 h followed by flash column chromatography (Pet.ether/DCM = 95/05) of the crude reaction mixture using silica gel afforded *N*-Methyl-2-(phenylselenanyl)-*N*-(3-(trifluoromethyl)phenyl)aniline **4m** as a pale yellow oil (0.106 g, 52% yield).

**R<sub>f</sub>** (Pet. ether /DCM = 95/05): 0.56; **<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>)** δ 7.65 (d, *J* = 7.1 Hz, 2H), 7.43-7.36 (m, 3H), 7.31-7.26 (m, 2H), 7.18-7.11 (m, 3H), 7.05 (d, *J* = 7.6 Hz, 1H), 6.90 (s, 1H), 6.75 (d, *J* = 8.3 Hz, 1H), 3.31 (s, 3H). **<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>)** δ 149.2, 145.9, 136.4, 136.0, 131.4 (q, *J* = 31.7 Hz), 131.0, 129.7, 129.4, 128.7, 128.6, 128.2, 128.1, 124.6 (q, *J* = 273.6 Hz), 116.9, 114.3 (q, *J* = 3.8 Hz), 109.6 (q, *J* = 3.8 Hz), 39.2. **HRMS (ESI)** calculated [M+H]<sup>+</sup> for C<sub>20</sub>H<sub>17</sub>F<sub>3</sub>NSe: 408.0473, found: 408.0479. **FTIR (cm<sup>-1</sup>)** 3060, 2922, 1612, 1480, 1354, 1166, 1122, 1073.

#### *N,N*-2-Dimethyl-*N*-(2-(phenylselenanyl)phenyl)aniline (**4n**)

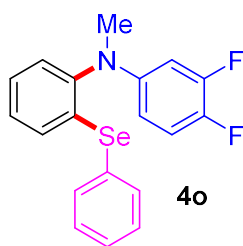


Following the general procedure, treatment of 2-(trimethylsilyl)phenyl trifluoromethanesulfonate **1a** (0.298 g, 243 μL, 1.0 mmol) and *N,N*,2-trimethylaniline **2n** (0.068 g, 0.5 mmol) with Phenylselenyl bromide **3a** (0.177

g, 0.75 mmol) in the presence of KF (0.116 g, 2.0 mmol) and 18-crown-6 (0.528 g, 2.0 mmol) in THF (2.0 mL) at 25 °C for 12 h followed by flash column chromatography (Pet.ether/DCM = 95/05) of the crude reaction mixture using silica gel afforded *N*,2-dimethyl-*N*-(2-(phenylselanyl)phenyl)aniline **4n** as a light yellow oil (0.054 g, 31% yield).

**R<sub>f</sub>** (Pet. ether /DCM = 95/05): 0.47; **<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>)** δ 7.63-7.61 (m, 2H), 7.40-7.32 (m, 3H), 7.2-7.14 (m, 2H), 7.10-7.05 (m, 2H), 7.02-6.99 (m, 1H), 6.94-6.92 (m, 1H), 6.89-6.84 (m, 2H), 3.22 (s, 3H), 2.10 (s, 3H). **<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>)** δ 149.4, 136.3, 132.7, 131.8, 131.6, 130.6, 129.5, 129.2, 128.3, 126.8, 126.5, 124.5, 123.5, 123.0, 120.7, 41.6, 19.1. **HRMS (ESI)** calculated [M+H]<sup>+</sup> for C<sub>20</sub>H<sub>20</sub>NSe: 354.0755, found: 354.0760. **FTIR (cm<sup>-1</sup>)** 2363, 1636, 1572, 1467, 1278, 1023.

### 3,4-Difluoro-*N*-methyl-*N*-(2-(phenylselanyl)phenyl)aniline (**4o**)

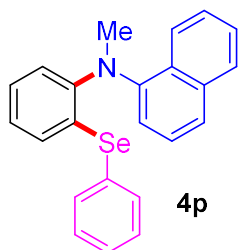


Following the general procedure, treatment of 2-(trimethylsilyl)phenyl trifluoromethanesulfonate **1a** (0.298 g, 243 μL, 1.0 mmol) and 3,4-difluoro-*N,N*-dimethylaniline **2o** (0.079 g, 0.5 mmol) with Phenylselanyl bromide **3a** (0.177 g, 0.75 mmol) in the presence of KF (0.116 g, 2.0 mmol) and 18-crown-6 (0.528 g, 2.0 mmol) in THF (2.0 mL) at 25 °C for

12 h followed by flash column chromatography (Pet.ether/DCM = 95/05) of the crude reaction mixture using silica gel afforded 3,4-difluoro-*N*-methyl-*N*-(2-(phenylselanyl)phenyl)aniline **4o** as a pale yellow oil (0.109 g, 58% yield).

**R<sub>f</sub>** (Pet. ether /DCM = 95/05): 0.55; **<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>)** δ 7.68 (d, *J* = 7.6 Hz, 2H), 7.46-7.39 (m, 3H), 7.30-7.26 (m, 1H), 7.18-7.09 (m, 3H), 7.03 (q, *J* = 9.4 Hz, 1H), 6.49-6.44 (m, 1H), 7.35-7.32 (m, 1H), 3.26 (s, 3H). **<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>)** δ 150.7 (dd, *J*<sub>1</sub> = 244.4 Hz, *J*<sub>2</sub> = 13.4 Hz), 146.3, 146.1, 143.5 (dd, *J*<sub>1</sub> = 237.6 Hz, *J*<sub>2</sub> = 13.0 Hz), 136.4, 136.0, 130.7, 129.7, 128.8, 128.5, 128.0, 127.9, 117.2 (d, *J*<sub>1</sub> = 17.7 Hz), 108.9 (dd, *J*<sub>1</sub> = 5.1 Hz, *J*<sub>2</sub> = 2.9 Hz), 102.8 (d, *J*<sub>1</sub> = 21.4 Hz), 39.5. **HRMS (ESI)** calculated [M+H]<sup>+</sup> for C<sub>19</sub>H<sub>16</sub>F<sub>2</sub>NSe: 376.0411, found: 376.0419. **FTIR (cm<sup>-1</sup>)** 3057, 2921, 1600, 1515, 1474, 1269.

### *N*-Methyl-*N*-(2-(phenylselanyl)phenyl)naphthalen-1-amine (**4p**)

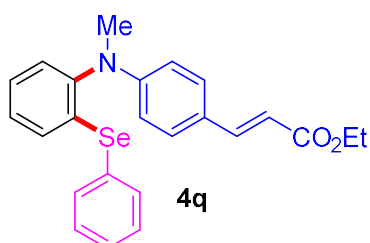


Following the general procedure, treatment of 2-(trimethylsilyl)phenyl trifluoromethanesulfonate **1a** (0.298 g, 243  $\mu$ L, 1.0 mmol) and *N,N*-dimethylnaphthalen-1-amine **2p** (0.086 g, 82  $\mu$ L, 0.5 mmol) with Phenylselenyl bromide **3a** (0.177 g, 0.75 mmol) in the presence of KF (0.116 g, 2.0 mmol) and 18-crown-6 (0.528 g, 2.0 mmol) in THF (2.0 mL) at 25  $^{\circ}$ C for 12 h followed by flash column chromatography

(Pet. ether/DCM = 95/05) of the crude reaction mixture using silica gel afforded *N*-methyl-*N*-(2-(phenylselanyl)phenyl)naphthalen-1-amine **4p** as a sticky liquid (0.126 g, 65% yield).

$R_f$  (Pet. ether /DCM = 95/05): 0.44;  $^1\text{H NMR}$  (400 MHz,  $\text{CDCl}_3$ )  $\delta$  8.19 (d,  $J = 7.4$  Hz, 1H), 7.86 (d,  $J = 8.5$  Hz, 1H), 7.88-7.63 (m, 3H), 7.49-7.36 (m, 6H), 7.17 (d,  $J = 7.4$  Hz, 1H), 7.12-7.04 (m, 2H), 7.00 (d,  $J = 7.8$  Hz, 1H), 6.93 (t,  $J = 7.4$  Hz, 1H), 3.42 (s, 3H).  $^{13}\text{C NMR}$  (100 MHz,  $\text{CDCl}_3$ )  $\delta$  150.4, 147.6, 136.2, 135.2, 131.5, 131.0, 129.6, 129.3, 129.2, 128.4, 128.3, 127.1, 125.9, 125.7, 125.6, 125.0, 124.9, 124.1, 123.4, 117.8, 42.8. **HRMS (ESI)** calculated  $[\text{M}+\text{H}]^+$  for  $\text{C}_{23}\text{H}_{19}\text{NSe}$ : 390.0755, found: 390.0760. **FTIR** ( $\text{cm}^{-1}$ ) 3052, 2854, 1572, 1466, 1394, 1294, 1022.

#### Ethyl (*E*)-3-(4-(methyl(2-(phenylselanyl)phenyl)amino)phenyl)acrylate (**4q**)



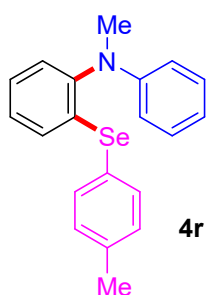
Following the general procedure, treatment of 2-(trimethylsilyl)phenyltrifluoromethanesulfonate **1a** (0.149 g, 121  $\mu$ L, 0.5 mmol) and ethyl (*E*)-3-(4-(dimethylamino)phenyl)acrylate **2q** (0.055 g, 0.25 mmol) with Phenylselenyl bromide **3a** (0.088 g, 0.375 mmol) in the presence of KF (0.058 g, 1.0 mmol) and 18-crown-6 (0.264 g, 1.0 mmol) in THF (1.0 mL) at 65  $^{\circ}$ C for 12 h followed by flash column chromatography (Pet. ether/DCM = 80/20) of the crude reaction mixture using silica gel

afforded ethyl (*E*)-3-(4-(methyl(2-(phenylselanyl)phenyl)amino)phenyl)acrylate **4q** as a pale yellow oil (0.055 g, 50% yield).

$R_f$  (Pet. ether /DCM = 80/20): 0.30;  $^1\text{H NMR}$  (400 MHz,  $\text{CDCl}_3$ )  $\delta$  7.65-7.59 (m, 3H), 7.39-7.32 (m, 5H), 7.26-7.22 (m, 1H), 7.15-7.10 (m, 2H), 7.07-7.05 (m, 1H), 6.57 (d,  $J = 8.7$  Hz, 2H), 6.23 (d,  $J = 15.9$  Hz, 1H), 4.24 (q,  $J = 7.1$  Hz, 2H), 3.28 (s, 3H), 1.33 (t,  $J = 7.1$  Hz, 3H).  $^{13}\text{C NMR}$  (100 MHz,  $\text{CDCl}_3$ )  $\delta$  167.9, 150.6, 145.6, 145.1, 136.4, 136.0, 130.9, 129.7, 129.6, 128.83, 128.76, 128.2, 128.02, 128.00, 124.0, 113.5, 113.4, 60.3, 39.1, 14.5. **HRMS (ESI)** calculated

$[M+H]^+$  for  $C_{24}H_{24}NO_2Se$ : 438.0967, found: 438.0970. **FTIR** ( $cm^{-1}$ ) 3060, 2922, 2329, 1702, 1624, 1171, 1038.

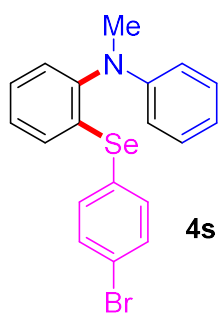
#### ***N*-Methyl-*N*-phenyl-2-(*p*-tolylselanyl)aniline (**4r**)**



Following the general procedure, treatment of 2-(trimethylsilyl)phenyl trifluoromethanesulfonate **1a** (0.149 g, 121  $\mu$ L, 0.5 mmol) and *N,N*-dimethylaniline **2a** (0.030 g, 32  $\mu$ L, 0.25 mmol) with 1,2-di-*p*-tolyldiselane **6b** (0.128 g, 0.375 mmol) in the presence of KF (0.058 g, 1.0 mmol) and 18-crown-6 (0.264 g, 1.0 mmol) in THF (1.0 mL) at 25  $^{\circ}$ C for 12 h followed by flash column chromatography (Pet.ether/DCM = 95/05) of the crude reaction mixture using silica gel afforded *N*-methyl-*N*-phenyl-2-(*p*-tolylselanyl)aniline **4r** as a pale yellow solid (0.049 g, 56% yield).

**R<sub>f</sub>** (Pet. ether /DCM = 95/05): 0.45;  **$^1H$  NMR** (400 MHz,  $CDCl_3$ )  $\delta$  7.53 (d,  $J$  = 8.0 Hz, 2H), 7.24-7.17 (m, 5H), 7.13-7.11 (m, 1H), 7.08-7.04 (m, 1H), 6.98-6.93 (m, 1H), 6.79 (t,  $J$  = 7.3 Hz, 1H), 6.66 (d,  $J$  = 8.3 Hz, 2H), 3.25 (s, 3H), 2.39 (s, 3H).  **$^{13}C$  NMR** (100 MHz,  $CDCl_3$ )  $\delta$  149.2, 146.6, 138.9, 136.93, 136.88, 130.6, 129.8, 129.1, 128.5, 127.5, 127.4, 124.3, 118.0, 114.0, 39.2, 21.4. **HRMS** (ESI) calculated  $[M+H]^+$  for  $C_{20}H_{20}NSe$ : 354.0755, found: 354.0760. **FTIR** ( $cm^{-1}$ ) 3058, 2920, 1642, 1601, 1497, 1337.

#### **2-((4-Bromophenyl)selanyl)-*N*-methyl-*N*-phenylaniline (**4s**)**

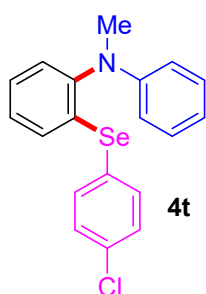


Following the general procedure, treatment of 2-(trimethylsilyl)phenyl trifluoromethanesulfonate **1a** (0.149 g, 121  $\mu$ L, 0.5 mmol) and *N,N*-dimethylaniline **2a** (0.030 g, 32  $\mu$ L, 0.25 mmol) with 1,2-bis(4-bromophenyl)diselane **6c** (0.176 g, 0.375 mmol) in the presence of KF (0.058 g, 1.0 mmol) and 18-crown-6 (0.264 g, 1.0 mmol) in THF (1.0 mL) at 25  $^{\circ}$ C for 12 h followed by flash column chromatography (Pet.ether/DCM = 95/05) of the crude reaction mixture using silica gel afforded 2-((4-bromophenyl)selanyl)-*N*-methyl-*N*-phenylaniline **4s** as a light yellow solid (0.058g, 56% yield).

**R<sub>f</sub>** (Pet. ether /DCM = 95/05): 0.50;  **$^1H$  NMR** (400 MHz,  $CDCl_3$ )  $\delta$  7.50-7.45 (m, 4H), 7.26-7.20 (m, 3H), 7.17-7.15 (m, 1H), 7.12-7.08 (m, 1H), 7.03-7.01 (m, 1H), 6.80 (t,  $J$  = 7.3 Hz, 1H), 6.64 (d,  $J$  = 7.9 Hz, 2H), 3.24 (s, 3H).  **$^{13}C$  NMR** (100 MHz,  $CDCl_3$ )  $\delta$  149.1, 147.0, 138.0, 135.7,

132.8, 130.4, 129.1, 128.7, 128.0, 127.7, 127.4, 123.2, 118.2, 114.1, 39.3. **HRMS (ESI)** calculated  $[M+H]^+$  for  $C_{19}H_{17}BrNSe$ : 417.9704, found: 417.9713. **FTIR (cm<sup>-1</sup>)** 3056, 2921, 1600, 1497, 1465, 1006.

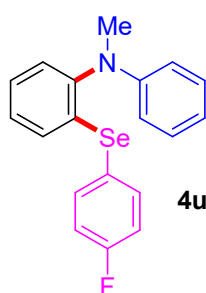
#### 2-((4-Chlorophenyl)selanyl)-*N*-methyl-*N*-phenylaniline (**4t**)



Following the general procedure, treatment of 2-(trimethylsilyl)phenyl trifluoromethanesulfonate **1a** (0.149 g, 121  $\mu$ L, 0.5 mmol) and *N,N*-dimethylaniline **2a** (0.030 g, 32  $\mu$ L, 0.25 mmol) with 1,2-bis(4-chlorophenyl)diselane **6d** (0.143 g, 0.375 mmol) in the presence of KF (0.058 g, 1.0 mmol) and 18-crown-6 (0.264 g, 1.0 mmol) in THF (1.0 mL) at 25 °C for 12 h followed by flash column chromatography (Pet.ether/DCM = 95/05) of the crude reaction mixture using silica gel afforded 2-((4-chlorophenyl)selanyl)-*N*-methyl-*N*-phenylaniline **4t** as a light yellow solid (0.059 g, 63% yield).

*R<sub>f</sub>*(Pet. ether /DCM = 95/05): 0.53; **<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>)**  $\delta$  7.57-7.54 (m, 2H), 7.34-7.31 (m, 2H), 7.26-7.20 (m, 3H), 7.17-7.15 (m, 1H), 7.12-7.08 (m, 1H), 7.01 (dd,  $J_1 = 7.9$  Hz,  $J_2 = 1.5$  Hz, 1H), 6.83-6.79 (m, 1H), 6.66-6.64 (m, 2H), 3.25 (s, 3H). **<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>)**  $\delta$  149.1, 147.0, 137.8, 135.8, 135.1, 130.3, 129.9, 129.1, 128.7, 128.0, 127.7, 126.7, 118.2, 114.1, 39.3. **HRMS (ESI)** calculated  $[M+H]^+$  for  $C_{19}H_{17}ClNSe$ : 374.0209, found: 374.0211. **FTIR (cm<sup>-1</sup>)** 3057, 2363, 1600, 1498, 1338, 1087.

#### 2-((4-Fluorophenyl)selanyl)-*N*-methyl-*N*-phenylaniline (**4u**)

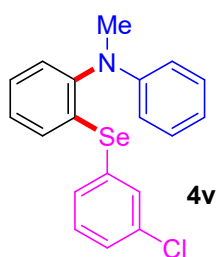


Following the general procedure, treatment of 2-(trimethylsilyl)phenyl trifluoromethanesulfonate **1a** (0.149 g, 121  $\mu$ L, 0.5 mmol) and *N,N*-dimethylaniline **2a** (0.030 g, 32  $\mu$ L, 0.25 mmol) with 1,2-bis(4-fluorophenyl)diselane **6e** (0.131 g, 0.375 mmol) in the presence of KF (0.058 g, 1.0 mmol) and 18-crown-6 (0.264 g, 1.0 mmol) in THF (1.0 mL) at 25 °C for 12 h followed by flash column chromatography (Pet.ether/DCM = 95/05) of the crude reaction mixture using silica gel afforded 2-((4-fluorophenyl)selanyl)-*N*-methyl-*N*-phenylaniline **4u** as a yellow solid (0.063 g, 71% yield).

*R<sub>f</sub>*(Pet. ether /DCM = 95/05): 0.50; **<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>)**  $\delta$  7.68-7.63 (m, 2H), 7.29-7.23 (m, 3H), 7.18 (dd,  $J_1 = 7.8$  Hz,  $J_2 = 1.5$  Hz, 1H), 7.14-7.08 (m, 3H), 6.98 (d,  $J = 7.8$  Hz,  $J_2 = 1.5$

Hz, 1H), 6.84 (t,  $J = 7.3$  Hz, 1H), 6.71-6.68 (m, 2H), 3.29 (s, 3H).  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  163.4 (d,  $J = 248.6$  Hz), 149.1, 146.7, 138.9 (d,  $J = 8.0$  Hz), 137.4 (d,  $J = 8.1$  Hz), 136.4, 129.8, 129.1, 128.6, 127.7 (d,  $J = 9.4$  Hz), 122.8 (d,  $J = 3.4$  Hz), 118.2, 116.9 (d,  $J = 21.4$  Hz), 114.1, 39.2. HRMS (ESI) calculated  $[\text{M}+\text{H}]^+$  for  $\text{C}_{19}\text{H}_{17}\text{FNSe}$ : 358.0505, found: 358.0512. FTIR ( $\text{cm}^{-1}$ ) 3060, 2363, 1641, 1582, 1489, 1226.

### 2-((3-Chlorophenyl)selanyl)-*N*-methyl-*N*-phenylaniline (4v)

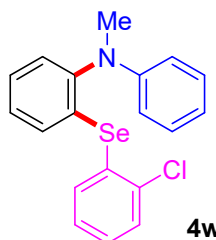


Following the general procedure, treatment of 2-(trimethylsilyl)phenyl trifluoromethanesulfonate **1a** (0.149 g, 121  $\mu\text{L}$ , 0.5 mmol) and *N,N*-dimethylaniline **2a** (0.030 g, 32  $\mu\text{L}$ , 0.25 mmol) with 1,2-bis(3-chlorophenyl)diselane **6f** (0.143 g, 0.375 mmol) in the presence of KF (0.058 g, 1.0 mmol) and 18-crown-6 (0.264 g, 1.0 mmol) in THF (1.0 mL) at 25  $^\circ\text{C}$  for 12 h followed by flash column chromatography (Pet.ether/DCM = 95/05)

of the crude reaction mixture using silica gel afforded 2-((3-chlorophenyl)selanyl)-*N*-methyl-*N*-phenylaniline **4v** as a white solid (0.035 g, 38% yield).

R<sub>f</sub> (Pet. ether /DCM = 95/05): 0.53;  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  7.61-7.57 (m, 1H), 7.49-7.47 (m, 1H), 7.35-7.32 (m, 1H), 7.28-7.09 (m, 6H), 7.06-7.04 (m, 1H), 6.79 (t,  $J = 7.3$  Hz, 1H), 6.62 (d,  $J = 7.9$  Hz, 2H), 3.23 (s, 3H).  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  149.0, 147.1, 135.7, 135.3, 135.0, 134.1, 130.8, 130.6, 130.2, 129.0, 128.68, 128.67, 128.2, 127.7, 118.2, 114.0, 39.3. HRMS (ESI) calculated  $[\text{M}+\text{H}]^+$  for  $\text{C}_{19}\text{H}_{17}\text{ClNSe}$ : 374.0209, found: 374.0214. FTIR ( $\text{cm}^{-1}$ ) 3057, 2921, 1600, 1567, 1497, 1461, 1027.

### 2-((2-Chlorophenyl)selanyl)-*N*-methyl-*N*-phenylaniline (4w)

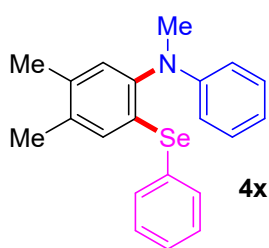


Following the general procedure, treatment of 2-(trimethylsilyl)phenyl trifluoromethanesulfonate **1a** (0.149 g, 121  $\mu\text{L}$ , 0.5 mmol) and *N,N*-dimethylaniline **2a** (0.030 g, 32  $\mu\text{L}$ , 0.25 mmol) with 1,2-bis(2-chlorophenyl)diselane **6g** (0.143 g, 0.375 mmol) in the presence of KF (0.058g, 1.0 mmol) and 18-crown-6 (0.264 g, 1.0 mmol) in THF (1.0 mL) at

25  $^\circ\text{C}$  for 12 h followed by flash column chromatography (Pet.ether/DCM = 95/05) of the crude reaction mixture using silica gel afforded 2-((2-chlorophenyl)selanyl)-*N*-methyl-*N*-phenylaniline **4w** as a pale yellow oil (0.046 g, 49% yield).

**R<sub>f</sub>** (Pet. ether /DCM = 95/05): 0.51; **<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>)** δ 7.55 (dd, *J*<sub>1</sub> = 7.7 Hz, *J*<sub>2</sub> = 1.3 Hz, 1H), 7.47 (dd, *J*<sub>1</sub> = 8.0 Hz, *J*<sub>2</sub> = 1.1 Hz, 1H), 7.30-7.25 (m, 2H), 7.24-7.17 (m, 4H), 7.16-7.09 (m, 2H), 6.79 (t, *J* = 7.3 Hz, 1H), 6.67-6.65 (m, 2H), 3.25 (s, 3H). **<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>)** δ 149.2, 148.1, 138.5, 136.9, 133.9, 132.1, 130.1, 129.7, 129.1, 128.9, 128.7, 127.7, 127.5, 118.2, 114.1, 39.4. **HRMS (ESI)** calculated [M+H]<sup>+</sup> for C<sub>19</sub>H<sub>17</sub>ClNSe: 374.0209, found: 374.0210. **FTIR (cm<sup>-1</sup>)** 3057, 2922, 1598, 1496, 1445, 1022.

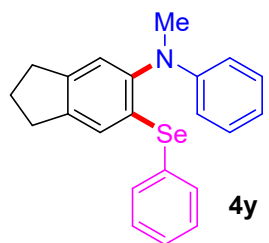
#### ***N*,4,5-Trimethyl-*N*-phenyl-2-(phenylselanyl)aniline (4x)**



Following the general procedure, treatment of 4,5-dimethyl-2-(trimethylsilyl)phenyl trifluoromethanesulfonate **1b** (0.326 g, 1.0 mmol) and *N,N*-dimethylaniline **2a** (0.061 g, 63 μL, 0.5 mmol) with Phenylselanyl bromide **3a** (0.177 g, 0.75 mmol) in the presence of KF (0.116 g, 2.0 mmol) and 18-crown-6 (0.528 g, 2.0 mmol) in THF (2.0 mL) at 25 °C for 12 h followed by flash column chromatography (Pet.ether/DCM = 95/05) of the crude reaction mixture using silica gel afforded *N*,4,5-trimethyl-*N*-phenyl-2-(phenylselanyl)aniline **4x** as a white solid (0.124 g, 68% yield).

**R<sub>f</sub>** (Pet. ether /DCM = 95/05): 0.45; **<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>)** δ 7.61-7.59(m, 2H), 7.36-7.31(m, 3H), 7.24-7.20 (m, 2H), 6.97 (s, 1H), 6.91 (s, 1H), 6.78 (t, *J* = 7.3 Hz, 1H), 6.64 (d, *J* = 7.9 Hz, 2H), 3.22 (s, 3H), 2.20 (s, 3H), 2.16 (s, 3H). **<sup>13</sup>C NMR (125 MHz, CDCl<sub>3</sub>)** δ 149.4, 145.1, 136.9, 136.3, 135.6, 132.4, 131.6, 129.7, 129.4, 129.0, 128.1, 117.6, 113.7, 39.3, 19.5, 19.4. **HRMS (ESI)** calculated [M+H]<sup>+</sup> for C<sub>21</sub>H<sub>22</sub>NSe: 368.0912, found: 368.0919. **FTIR (cm<sup>-1</sup>)** 3059, 2919, 2363, 1597, 1495, 1380, 1328, 1025.

#### ***N*-Methyl-*N*-phenyl-6-(phenylselanyl)-2,3-dihydro-1*H*-inden-5-amine (4y)**

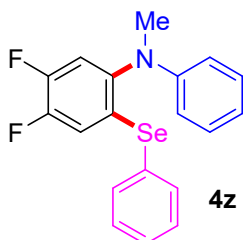


Following the general procedure, treatment of 6-(trimethylsilyl)-2,3-dihydro-1*H*-inden-5-yl trifluoromethanesulfonate **1c** (0.338 g, 1.0 mmol) and *N,N*-dimethylaniline **2a** (0.061 g, 63 μL, 0.5 mmol) with Phenylselanyl bromide **3a** (0.177 g, 0.75 mmol) in the presence of KF (0.116 g, 2.0 mmol) and 18-crown-6 (0.528 g, 2.0 mmol) in THF (2.0 mL) at 25 °C for 12 h followed by flash column chromatography (Pet.ether/DCM = 95/05) of the crude reaction mixture using silica gel afforded *N*-methyl-*N*-

phenyl-6-(phenylselanyl)-2,3-dihydro-1*H*-inden-5-amine **4y** as a white solid (0.150 g, 79% yield).

**R<sub>f</sub>** (Pet. ether /DCM = 95/05): 0.40; **<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>)** δ 7.68-7.65 (m, 2H), 7.42-7.35 (m, 3H), 7.28-7.23 (m, 2H), 7.06 (s, 1H), 6.97 (s, 1H), 6.81 (tt, *J*<sub>1</sub> = 7.4 Hz, *J*<sub>2</sub> = 1.0 Hz, 1H), 6.71-6.68 (m, 2H), 3.26 (s, 3H), 2.88-2.80 (m, 4H), 2.09 (p, *J* = 7.4 Hz, 2H). **<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>)** δ 149.5, 145.3, 144.7, 144.1, 136.0, 132.9, 129.5, 129.2, 129.0, 128.2, 126.5, 124.4, 117.6, 113.8, 39.3, 32.7, 32.6, 25.8. **HRMS (ESI)** calculated [M+H]<sup>+</sup> for C<sub>22</sub>H<sub>22</sub>NSe: 380.0912, found: 380.0915. **FTIR (cm<sup>-1</sup>)** 3588, 3062, 3951, 2843, 1598, 1499.

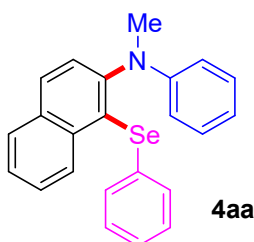
#### 4,5-Difluoro-*N*-methyl-*N*-phenyl-2-(phenylselanyl)aniline (**4z**)



Following the general procedure, treatment of 4,5-difluoro-2-(trimethylsilyl)phenyl trifluoromethanesulfonate **1d** (0.334 g, 1.0 mmol) and *N,N*-dimethylaniline **2a** (0.061 g, 63 μL, 0.5 mmol) with Phenylselanyl bromide **3a** (0.177 g, 0.75 mmol) in the presence of KF (0.116 g, 2.0 mmol) and 18-crown-6 (0.528 g, 2.0 mmol) in THF (2.0 mL) at 25 °C for 12 h followed by flash column chromatography (Pet. ether/DCM = 95/05) of the crude reaction mixture using silica gel afforded 4,5-difluoro-*N*-methyl-*N*-phenyl-2-(phenylselanyl)aniline **4z** as a pale yellow oil (0.102 g, 55% yield).

**R<sub>f</sub>** (Pet. ether /DCM = 95/05): 0.55; **<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>)** δ 7.65-7.63 (m, 2H), 7.46-7.38 (m, 3H), 7.28-7.24 (m, 2H), 6.99 (dd, *J*<sub>1</sub> = 10.7 Hz, *J*<sub>2</sub> = 7.4 Hz, 1H), 6.86 (t, *J* = 7.3 Hz, 1H), 6.76 (dd, *J*<sub>1</sub> = 10.5 Hz, *J*<sub>2</sub> = 8.6 Hz, 1H), 6.70-6.67 (m, 2H), 3.23 (s, 3H). **<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>)** δ 149.7 (dd, *J*<sub>1</sub> = 254.1 Hz, *J*<sub>2</sub> = 16.6 Hz), 149.4 (dd, *J*<sub>1</sub> = 242.9 Hz, *J*<sub>2</sub> = 7.0 Hz), 148.7, 142.6 (dd, *J*<sub>1</sub> = 6.1 Hz, *J*<sub>2</sub> = 3.7 Hz), 136.7, 132.3 (dd, *J*<sub>1</sub> = 4.5 Hz, *J*<sub>2</sub> = 3.5 Hz), 130.0, 129.3, 129.2, 127.5, 118.9, 118.0 (d, *J* = 19.7 Hz), 117.1 (dd, *J*<sub>1</sub> = 16.3 Hz, *J*<sub>2</sub> = 1.2 Hz), 114.4, 39.3. **HRMS (ESI)** calculated [M+H]<sup>+</sup> for C<sub>19</sub>H<sub>16</sub>F<sub>2</sub>NSe: 376.0411, found: 376.0417. **FTIR (cm<sup>-1</sup>)** 3061, 2877, 1597, 1488, 1392, 1286, 1170.

#### *N*-Methyl-*N*-phenyl-1-(phenylselanyl)naphthalen-2-amine (**4aa**)



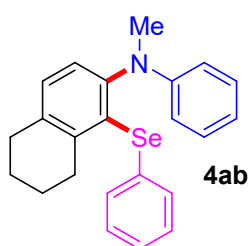
Following the general procedure, treatment of 3-(trimethylsilyl)naphthalen-2-yl trifluoromethanesulfonate **1e** (0.174 g, 0.5 mmol) and *N,N*-dimethylaniline **2a** (0.030 g, 32 μL, 0.25 mmol) with Phenylselanyl



bromide **3a** (0.088 g, 0.375 mmol) in the presence of KF (0.058 g, 1.0 mmol) and 18-crown-6 (0.264 g, 1.0 mmol) in THF (1.0 mL) at 25 °C for 12 h followed by flash column chromatography (Pet.ether/DCM = 95/05) of the crude reaction mixture using silica gel afforded *N*-methyl-*N*-phenyl-1-(phenylselanyl)naphthalen-2-amine **4aa** as a yellow oil (0.047 g, 48% yield).

**R<sub>f</sub>** (Pet. ether /DCM = 95/05): 0.3; **<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>)** δ 8.47-8.45(m, 1H), 7.96 (d, *J* = 8.6 Hz, 1H), 7.88-7.86 (m, 1H), 7.52-7.46 (m, 2H), 7.42 (d, *J* = 8.6 Hz, 1H), 7.17-7.06 (m, 7H), 7.73 (t, *J* = 7.3 Hz, 1H), 6.55 (d, *J* = 7.9 Hz, 2H), 3.24 (s, 3H). **<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>)** δ 150.2, 149.2, 136.4, 133.4, 132.9, 132.0, 130.1, 129.4, 129.1, 129.0, 128.5, 127.5, 127.4, 126.2, 126.0, 117.5, 113.6, 39.9. **HRMS (ESI)** calculated [M+H]<sup>+</sup> for C<sub>23</sub>H<sub>20</sub>NSe: 390.0755, found: 390.0764. **FTIR (cm<sup>-1</sup>)** 3056, 2923, 2364, 1589, 1497, 1362, 1131, 1023.

#### ***N*-Methyl-*N*-phenyl-1-(phenylselanyl)-5,6,7,8-tetrahydronaphthalen-2-amine (4ab)**

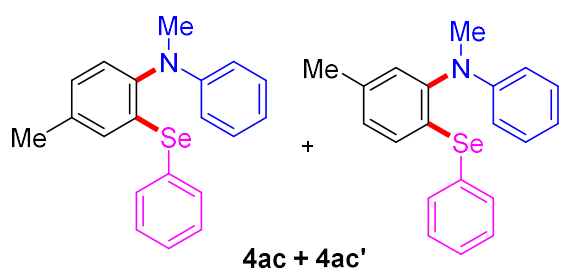


Following the general procedure, treatment of 1-(trimethylsilyl)-5,6,7,8-tetrahydronaphthalen-2-yl trifluoromethanesulfonate **1f** (0.352 g, 1.0 mmol) and *N,N*-dimethylaniline **2a** (0.061 g, 63 μL, 0.5 mmol) with Phenylselanyl bromide **3a** (0.177 g, 0.75 mmol) in the presence of KF (0.116g, 2.0 mmol) and 18-crown-6 (0.528 g, 2.0 mmol) in THF (2.0 mL)

at 25 °C for 12 h followed by flash column chromatography (Pet.ether/DCM = 95/05) of the crude reaction mixture using silica gel afforded *N*-methyl-*N*-phenyl-1-(phenylselanyl)-5,6,7,8-tetrahydronaphthalen-2-amine **4ab** as a pale yellow oil (0.134 g, 68% yield).

**R<sub>f</sub>** (Pet. ether /DCM = 95/05): 0.4; **<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>)** δ 7.22 (d, *J* = 8.1 Hz, 1H), 7.18-7.10(m, 8H), 6.70 (t, *J* = 7.2 Hz, 1H), 6.50(d, *J* = 8.1 Hz, 2H), 3.13 (s, 3H), 2.84 (d, *J* = 6.7 Hz, 4H), 1.76 (t, *J* = 2.8 Hz, 4H). **<sup>13</sup>C NMR (125 MHz, CDCl<sub>3</sub>)** δ 149.7, 149.3, 143.5, 137.2, 133.4, 132.5, 132.0, 129.8, 129.1, 128.9, 126.7, 125.8, 116.7, 112.9, 39.7, 31.1, 30.2, 23.6, 22.8. **HRMS (ESI)** calculated [M+H]<sup>+</sup> for C<sub>23</sub>H<sub>24</sub>NSe: 394.1068, found: 394.1075. **FTIR (cm<sup>-1</sup>)** 3059, 2934, 2861, 1602, 1501, 1347.

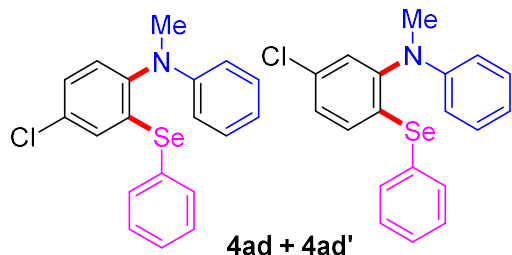
#### ***N*,4-dimethyl-*N*-phenyl-2-(phenylselanyl)aniline (4ac) and *N*,5-dimethyl-*N*-phenyl-2-(phenylselanyl)aniline (4ac')**



Following the general procedure, treatment of 4-methyl-2-(trimethylsilyl)phenyl trifluoromethanesulfonate **1g** (0.156 g, 0.5 mmol) and *N,N*-dimethylaniline **2a** (0.030 g, 0.032 mL, 0.25 mmol) with Phenylselanyl bromide **3a** (0.088 g, 0.375 mmol) in the presence of KF (0.058 g, 1.0 mmol) and 18-crown-6 (0.264 g, 1.0 mmol) in THF (1.0 mL) at 25 °C for 12 h followed by flash column chromatography (Pet.ether/DCM = 95/05) of the crude reaction mixture using silica gel afforded *N*,4-dimethyl-*N*-phenyl-2-(phenylselanyl)aniline (**4ac**) and *N*,5-dimethyl-*N*-phenyl-2-(phenylselanyl)aniline (**4ac'**) as a mixture of regioisomers in 1.4:1 ratio as a pale yellow oil (0.065 g, 74% yield).

**R<sub>f</sub>** (Pet. ether /DCM = 95/05): 0.49; **<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) of Major isomer;** δ 7.69-7.64 (m, 2H), 7.45-7.35 (m, 3H), 7.28-7.24 (m, 2H), 7.09-7.00 (m, 2H), 6.96-6.94 (m, 1H), 6.85-6.80 (m, 1H), 6.71-6.68 (m, 2H), 3.27 (s, 3H), 2.32 (s, 3H). **<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) of Minor isomer;** δ 7.69-7.64 (m, 2H), 7.45-7.35 (m, 3H), 7.28-7.24 (m, 2H), 7.09-7.00 (m, 2H), 6.89 (s, 1H), 6.85-6.80 (m, 1H), 6.71-6.68 (m, 2H), 3.27 (s, 3H), 2.26 (s, 3H). **<sup>13</sup>C NMR (125 MHz, CDCl<sub>3</sub>) of Major isomer** δ 149.2, 147.1, 138.1, 135.9, 131.9, 131.0, 129.5, 129.2, 129.1, 129.0, 128.5, 128.3, 117.9, 113.9, 39.3, 20.9. **<sup>13</sup>C NMR (125 MHz, CDCl<sub>3</sub>) of Minor isomer** δ 149.1, 144.5, 137.5, 136.3, 135.7, 130.9, 129.6, 129.0, 128.7, 128.4, 128.5, 128.3, 117.8, 113.8, 39.2, 21.2. **HRMS (ESI) calculated [M+H]<sup>+</sup> for C<sub>20</sub>H<sub>20</sub>NSe:** 354.0755, found: 354.0757. **FTIR (cm<sup>-1</sup>)** 3058, 2919, 1599, 1495, 1335, 1032.

#### 4-Chloro-*N*-methyl-*N*-phenyl-2-(phenylselanyl)aniline (**4ad**) and 5-Chloro-*N*-methyl-*N*-phenyl-2-(phenylselanyl)aniline (**4ad'**)

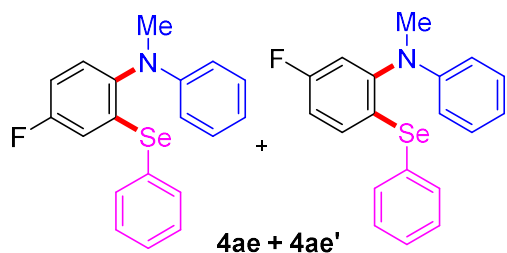


Following the general procedure, treatment of 4-chloro-2-(trimethylsilyl)phenyl trifluoromethanesulfonate **1h** (0.333 g, 1.0 mmol) *N,N*-dimethylaniline **2a** (0.061 g, 63 μL, 0.5 mmol) and with Phenylselanyl bromide **3a** (0.177 g, 0.75 mmol) in the presence of KF (0.116 g, 2.0 mmol) and 18-crown-6 (0.528 g, 2.0 mmol) in THF (2.0 mL) at 25 °C for 12 h followed by flash column chromatography (Pet.ether/DCM = 95/05) of the crude reaction mixture using silica gel afforded 4-chloro-*N*-methyl-*N*-phenyl-2-(phenylselanyl)aniline (**4ad**) and 5-chloro-*N*-methyl-*N*-phenyl-2-(phenylselanyl)aniline (**4ad'**) as a mixture of regioisomers in 1.4:1 ratio as a pale yellow oil (0.065 g, 74% yield).

(phenylselanyl)aniline (**4ad**) and 5-chloro-*N*-methyl-*N*-phenyl-2-(phenylselanyl)aniline (**4ad'**) as a mixture of regioisomers in 1.7:1 ratio (0.118 g, 68% yield, pale yellow oil, regioisomer ratio determined by <sup>1</sup>H-NMR analysis of crude reaction mixture).

*R<sub>f</sub>* (Pet. ether /DCM = 95/05): 0.53; <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ 7.71-7.66(m, 3H), 7.50-7.38(m, 4H), 7.31-7.27 (m, 3H), 6.75-6.72(m, 3H), 3.27 (s, 3H). **Representative peaks of other isomer** <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ 3.28 (s). <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ 148.8, 145.2, 138.6, 136.8, 133.1, 131.4, 129.9, 129.4, 129.14, 129.10, 128.8, 127.6, 118.5, 114.2, 39.2. **Representative peaks of other isomer** <sup>13</sup>C NMR (125 MHz, CDCl<sub>3</sub>) δ 148.6, 147.9, 136.4, 132.8, 132.7, 129.8, 129.3, 129.2, 128.5, 128.0, 127.5, 127.3, 118.8, 114.6, 39.2. **HRMS (ESI)** calculated [M+H]<sup>+</sup> for C<sub>19</sub>H<sub>17</sub>ClNSe: 374.0209, found: 374.0210. **FTIR (cm<sup>-1</sup>)** 3061, 2950, 2871, 1601, 1499, 1332.

**4-Fluoro-*N*-methyl-*N*-phenyl-2-(phenylselanyl)aniline(4ae) and 5-fluoro-*N*-methyl-*N*-phenyl-2-(phenylselanyl)aniline (4ae')**



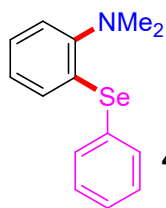
Following the general procedure, treatment of 5-fluoro-2-(trimethylsilyl)phenyl trifluoromethanesulfonate **1i** (0.316 g, 1.0 mmol) and *N,N*-dimethylaniline **2a** (0.061 g, 63 μL, 0.5 mmol) with Phenylselenenyl bromide **3a** (0.177 g, 0.75 mmol) in the presence of KF (0.116 g, 2.0 mmol) and 18-crown-6

(0.528 g, 2.0 mmol) in THF (2.0 mL) at 25 °C for 12 h followed by flash column chromatography (Pet.ether/DCM = 95/05) of the crude reaction mixture using silica gel afforded 4-fluoro-*N*-methyl-*N*-phenyl-2-(phenylselanyl)aniline (**4ae**) and 5-fluoro-*N*-methyl-*N*-phenyl-2-(phenylselanyl)aniline (**4ae'**) as a mixture of regioisomers in 2.3:1 ratio as a sticky liquid (0.100 g, 56% yield).

*R<sub>f</sub>*(Pet. ether /DCM = 95/05): 0.50; <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ 7.70-7.68 (m, 2H), 7.49-7.40 (m, 3H), 7.28-7.24 (m, 2H), 7.11-7.07 (m, 1H), 6.87-6.82 (m, 2H), 6.72-6.68 (m, 2H), 6.64 (dd, *J*<sub>1</sub> = 9.0 Hz, *J*<sub>2</sub> = 2.9 Hz, 1H), 3.25 (s, 3H). **Representative peaks of other isomer** <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ 3.26 (s). <sup>13</sup>C NMR (125 MHz, CDCl<sub>3</sub>) δ 161.7 (d, *J* = 248.1 Hz), 149.1, 142.4 (d, *J* = 2.9 Hz), 139.3 (d, *J* = 7.6 Hz), 137.0, 132.3 (d, *J* = 8.9 Hz), 129.9, 129.2, 129.1, 127.3, 118.3, 116.1 (d, *J* = 24.9 Hz), 114.7 (d, *J* = 21.4 Hz), 113.9, 39.2. **Representative peaks of other isomer** <sup>13</sup>C NMR (125 MHz, CDCl<sub>3</sub>) δ 162.7 (d, *J* = 247.7 Hz), 148.8, 148.6 (d, *J* = 8.4

Hz), 135.9, 129.7, 129.6, 129.1, 128.9, 128.5, 118.8, 115.4 (d,  $J = 21.0$  Hz), 114.2 (d,  $J = 23.0$  Hz), 114.6, 39.4. **HRMS (ESI)** calculated  $[M+H]^+$  for  $C_{19}H_{17}FNSe$ : 358.0505, found: 358.0508. **FTIR (cm<sup>-1</sup>)** 3061, 2871, 1596, 1477, 1252, 1194.

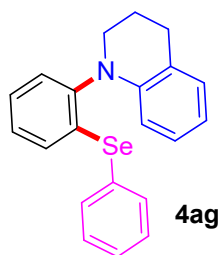
#### ***N,N*-Dimethyl-2-(phenylselanyl)aniline (4af)**



Following the general procedure, treatment of 2-(trimethylsilyl)phenyltrifluoromethanesulfonate **1a** (0.298 g, 243  $\mu$ L, 1.0 mmol) and *N,N*-dimethyl-1-phenylmethanamine **7a** (0.068 g, 75  $\mu$ L, 0.5 mmol) with Phenylselanyl bromide **3a** (0.177 g, 0.75 mmol) in the presence of KF (0.116 g, 2.0 mmol) and 18-crown-6 (0.528 g, 2.0 mmol) in THF (2.0 mL) at 25 °C for 12 h followed by flash column chromatography (Pet.ether/DCM = 95/05) of the crude reaction mixture using silica gel afforded *N,N*-dimethyl-2-(phenylselanyl)aniline **4af** as a white solid (0.064 g, 46% yield).

**R<sub>f</sub>** (Pet. ether /DCM = 95/05): 0.31; **<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>)**  $\delta$  7.69-7.67 (m, 2H), 7.43-7.36 (m, 3H), 7.18-7.14 (m, 2H), 6.91-6.84 (m, 2H), 2.80 (s, 6H). **<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>)**  $\delta$  151.9, 136.7, 132.3, 129.6, 129.3, 128.8, 128.5, 126.6, 125.0, 120.2, 45.1. **HRMS (ESI)** calculated  $[M+H]^+$  for  $C_{14}H_{16}NSe$ : 278.0442, found: 278.0446. **FTIR (cm<sup>-1</sup>)** 3049, 2828, 2784, 2363, 1573, 1470, 1438, 941.

#### **1-(2-(Phenylselanyl)phenyl)-1,2,3,4-tetrahydroquinoline (4ag)**



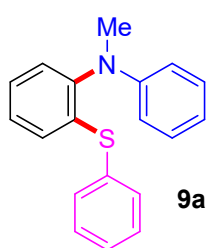
Following the general procedure, treatment of 2-(trimethylsilyl)phenyltrifluoromethanesulfonate **1a** (0.298 g, 243 $\mu$ L, 1.0 mmol) and 1-methyl-1,2,3,4-tetrahydroquinoline **7c** (0.074 g, 0.5 mmol) with Phenylselanyl bromide **3a** (0.177 g, 0.75 mmol) in the presence of KF (0.116 g, 2.0 mmol) and 18-crown-6 (0.528 g, 2.0 mmol) in THF (2.0 mL) at 25 °C for 12 h followed by flash column chromatography (Pet.ether/DCM = 95/05)

of the crude reaction mixture using silica gel afforded 1-(2-(phenylselanyl)phenyl)-1,2,3,4-tetrahydroquinoline **4ag** as a colorless oil (0.081 g, 44% yield).

**R<sub>f</sub>** (Pet. ether /DCM = 95/05): 0.40; **<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>)**  $\delta$  7.66-7.63(m, 2H), 7.39-7.36(m, 3H), 7.23-7.21 (m, 2H), 7.09-7.03(m, 2H), 6.99 (d,  $J = 7.7$  Hz, 1H), 6.91 (t,  $J = 7.3$  Hz, 1H), 6.66 (t,  $J = 7.4$  Hz, 1H), 6.20 (d,  $J = 8.1$  Hz, 1H), 3.61-3.50 (m, 2H), 2.91 (s, 2H), 2.18-2.13

(m, 2H).  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  145.8, 145.1, 136.8, 136.7, 120.0, 129.7, 129.5, 128.9, 128.7, 128.3, 127.7, 127.6, 126.8, 122.7, 117.7, 114.2, 50.8, 28.0, 22.7. HRMS (ESI) calculated  $[\text{M}+\text{H}]^+$  for  $\text{C}_{21}\text{H}_{20}\text{NSe}$ : 366.0755, found: 366.0760. FTIR ( $\text{cm}^{-1}$ ) 3450, 3060, 2924, 1573, 1495, 1304.

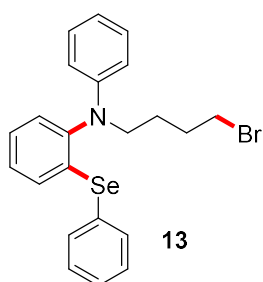
#### *N*-Methyl-*N*-phenyl-2-(phenylthio)aniline (**9a**)



Following the general procedure, treatment of 2-(trimethylsilyl)phenyl trifluoromethanesulfonate **1a** (0.149 g, 121  $\mu\text{L}$ , 0.5 mmol) and *N,N*-dimethylaniline **2a** (0.030 g, 32  $\mu\text{L}$ , 0.25 mmol) with 2-(phenylthio)isoindoline-1,3-dione **8** (0.096 g, 0.375 mmol) in the presence of KF (0.058 g, 1.0 mmol) and 18-crown-6 (0.264 g, 1.0 mmol) in THF (1.0 mL) at 25  $^\circ\text{C}$  for 12 h followed by flash column chromatography (Pet.ether/DCM = 95/05) of the crude reaction mixture using silica gel afforded *N*-methyl-*N*-phenyl-2-(phenylthio)aniline **9a** as a white solid (0.029 g, 40% yield).

$R_f$  (Pet. ether / $\text{CH}_2\text{Cl}_2$  = 95/05): 0.46;  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  7.48-7.44 (m, 2H), 7.39-7.31 (m, 3H), 7.24-7.19 (m, 4H), 7.14-7.11 (m, 1H), 7.03-7.01 (m, 1H), 6.78 (t,  $J$  = 7.3 Hz, 1H), 6.65-6.63 (m, 2H), 3.25 (s, 3H).  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  149.0, 146.0, 138.8, 134.1, 133.4, 129.5, 129.9, 128.9, 128.2, 127.3, 127.2, 117.7, 113.6, 39.1. HRMS (ESI) calculated  $[\text{M}+\text{H}]^+$  for  $\text{C}_{19}\text{H}_{18}\text{NS}$ : 292.1154, found: 292.1160. FTIR ( $\text{cm}^{-1}$ ) 3058, 2924, 2874, 2808, 2333, 1919, 1729, 1600, 1577, 1496, 1442, 1340, 1131, 1027, 867.

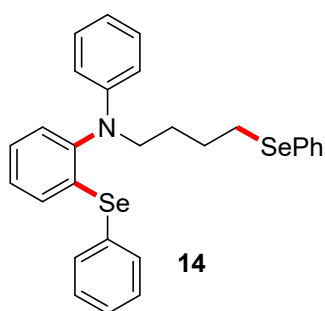
#### *N*-(4-Bromobutyl)-*N*-phenyl-2-(phenylselenanyl)aniline (**13**)



Following the general procedure, treatment of 2-(trimethylsilyl)phenyltrifluoromethanesulfonate **1a** (0.298 g, 243  $\mu\text{L}$ , 1.0 mmol) and 1-phenylpyrrolidine **7d** (0.074 g, 0.5 mmol) with Phenylselenyl bromide **3a** (0.177 g, 0.75 mmol) in the presence of KF (0.116 g, 2.0 mmol) and 18-crown-6 (0.528 g, 2.0 mmol) in THF (2.0 mL) at 25  $^\circ\text{C}$  for 12 h followed by flash column chromatography (Pet.ether/DCM = 95/05) of the crude reaction mixture using silica gel afforded *N*-(4-bromobutyl)-*N*-phenyl-2-(phenylselenanyl)aniline **13** as a white solid (0.080 g, 35% yield).

*R<sub>f</sub>*(Pet. ether /DCM = 95/05): 0.48; <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ 7.69-7.64 (m, 2H), 7.45-7.38 (m, 3H), 7.30-7.21 (m, 4H), 7.16-7.12 (m, 1H), 7.07 (dd, *J*<sub>1</sub> = 7.9 Hz, *J*<sub>2</sub> = 1.2 Hz, 1H), 6.83 (t, *J* = 7.3 Hz, 1H), 6.68-6.66 (m, 2H), 3.75-3.71 (m, 2H), 3.49 (t, *J* = 6.5 Hz, 2H), 2.09-1.92 (m, 4H). <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ 148.1, 144.7, 136.9, 136.5, 130.6, 129.9, 129.7, 129.2, 128.7, 128.3, 127.6, 127.5, 118.0, 114.0, 50.8, 33.5, 30.6, 26.4. HRMS (ESI) calculated [M+H]<sup>+</sup> for C<sub>22</sub>H<sub>23</sub>BrNSe: 460.0174, found: 460.0178. FTIR (cm<sup>-1</sup>) 3057, 2922, 1599, 1497, 1465, 1027.

#### *N*-Phenyl-2-(phenylselanyl)-*N*-(4-(phenylselanyl)butyl)aniline (14)



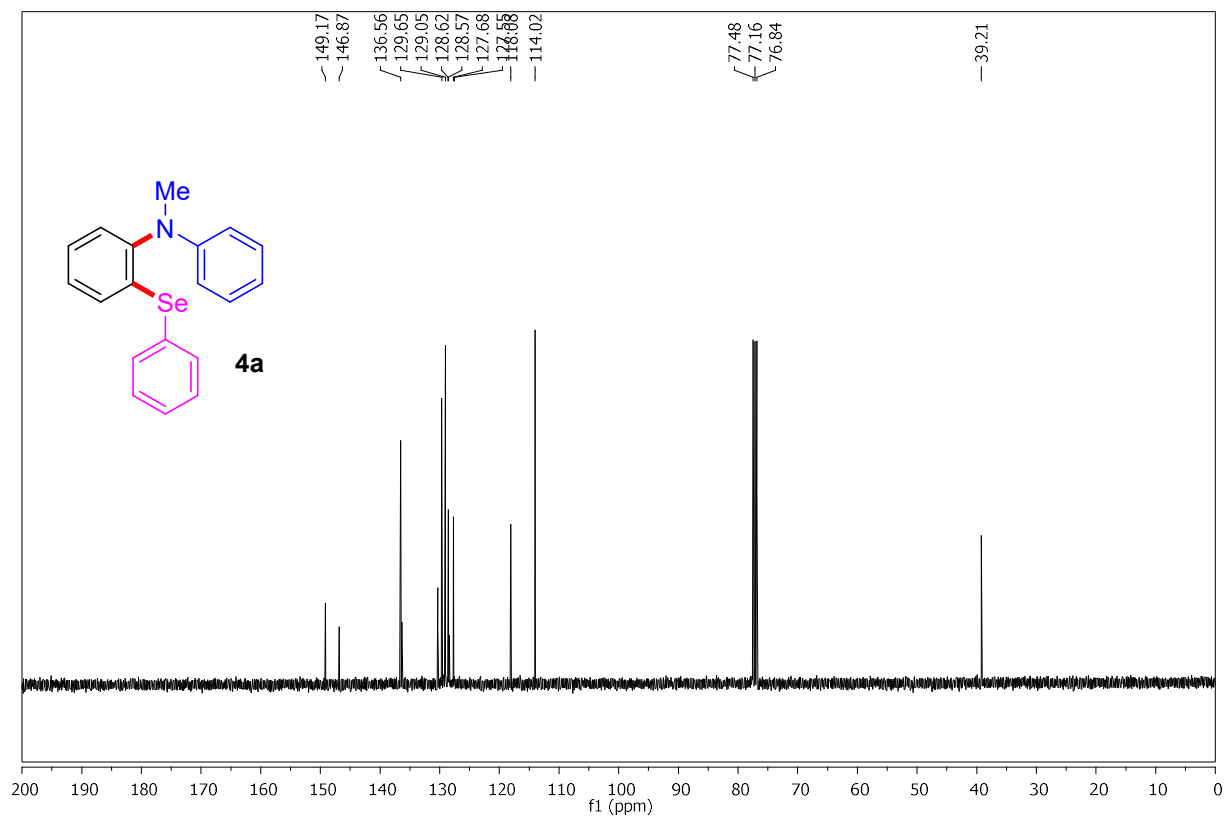
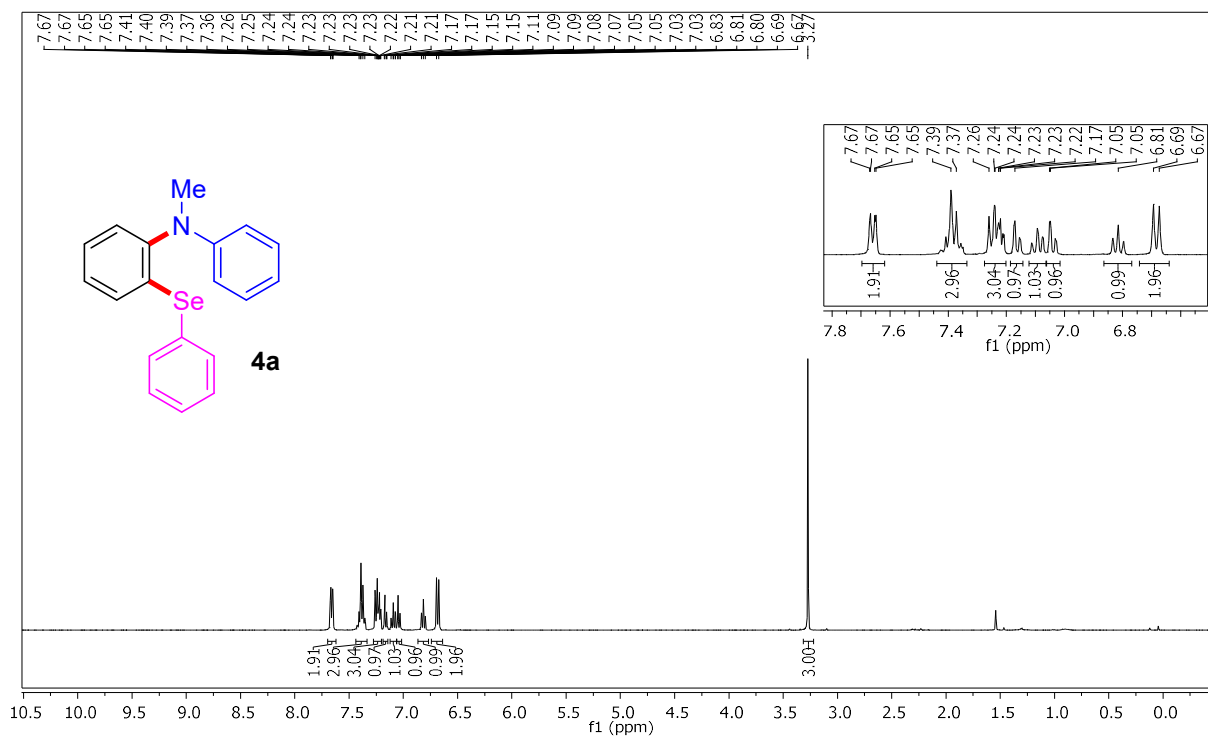
Following the general procedure, treatment of 2-(trimethylsilyl)phenyl trifluoromethanesulfonate **1a** (0.298 g, 243 μL, 1.0 mmol) and 1-phenylpyrrolidine **7d** (0.074 g, 0.5 mmol) with 1,2-diphenyldiselenane **6** (0.234 g, 0.75 mmol) in the presence of KF (0.116 g, 2.0 mmol) and 18-crown-6 (0.528 g, 2.0 mmol) in THF (2.0 mL) at 25 °C for 12 h followed by flash column chromatography (Pet.ether/DCM = 95/05) of the crude reaction

mixture using silica gel afforded *N*-phenyl-2-(phenylselanyl)-*N*-(4-(phenylselanyl)butyl)aniline **14** as a pale yellow oil (0.093 g, 34% yield).

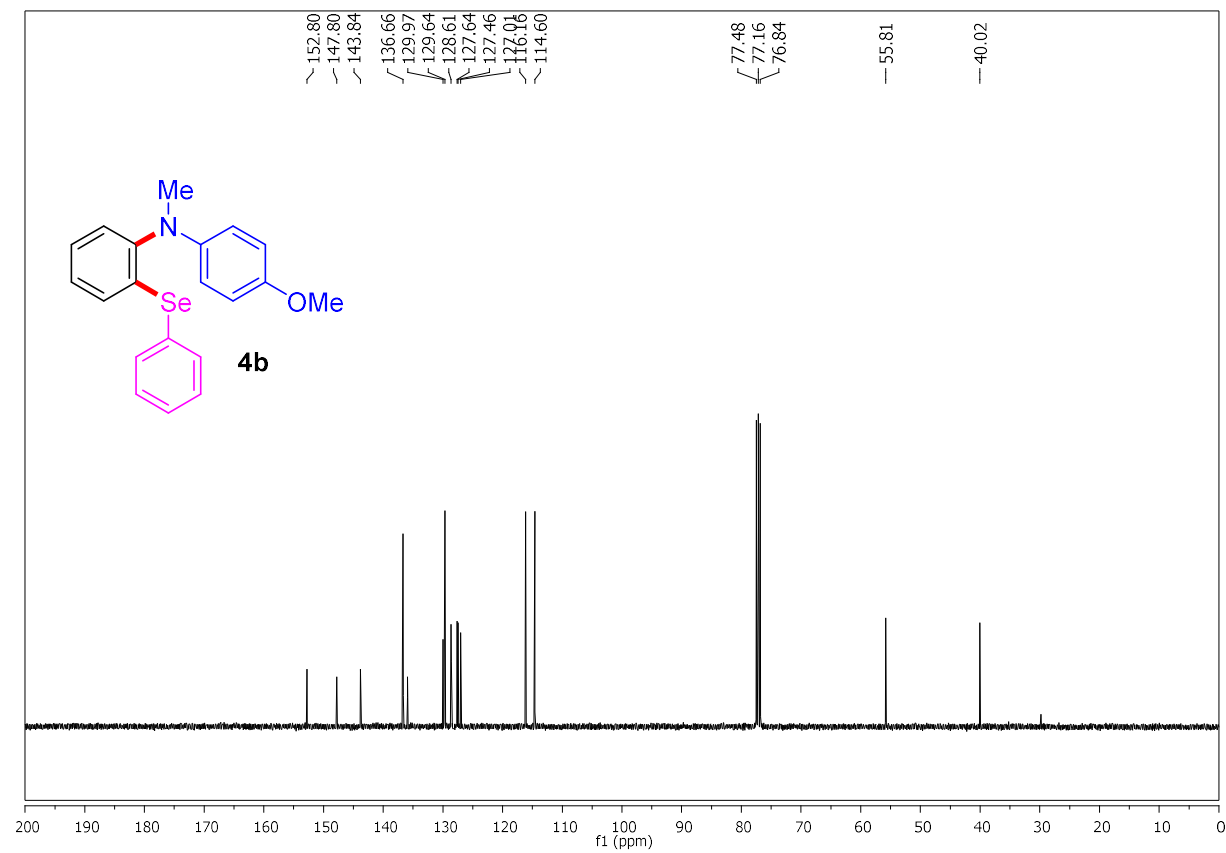
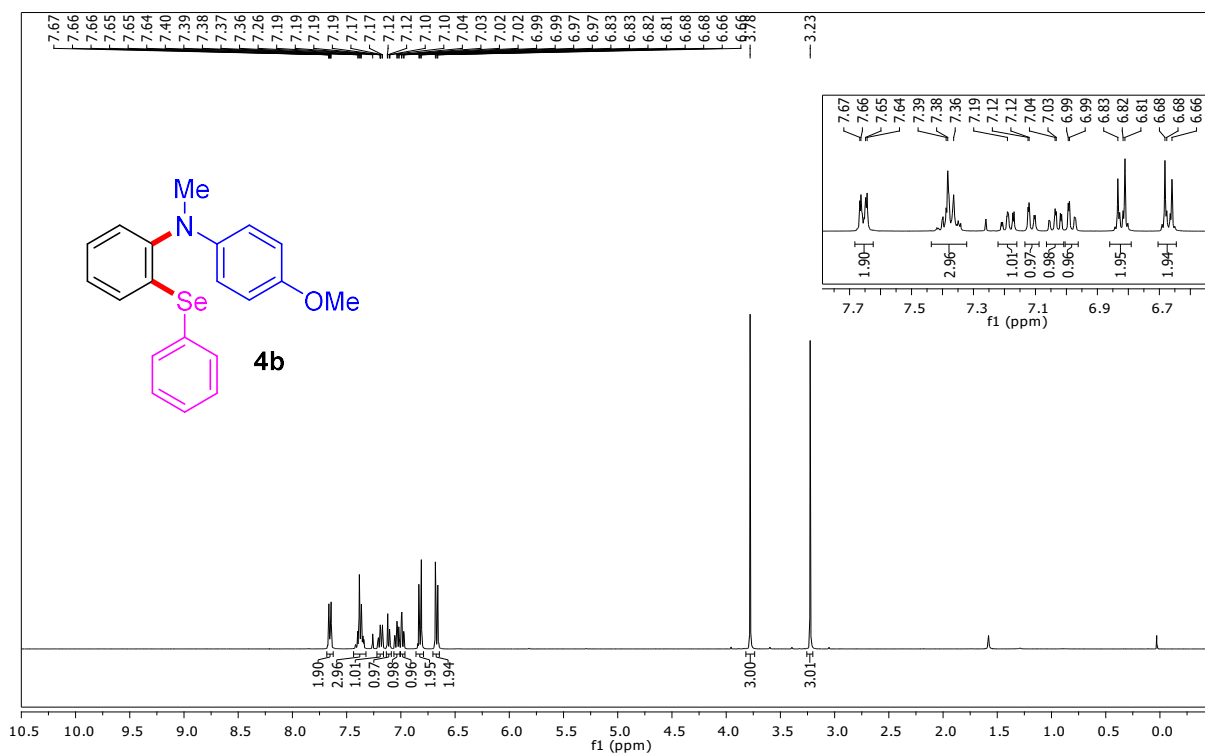
*R<sub>f</sub>*(Pet. ether /DCM = 95/05): 0.33; <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ 7.62-7.60 (m, 2H), 7.51-7.49 (m, 2H), 7.39-7.33 (m, 3H), 7.29-7.18 (m, 6H), 7.14-7.12 (m, 1H), 7.10-7.06 (m, 1H), 7.02-7.00 (m, 1H), 6.77 (t, *J* = 7.3 Hz, 1H), 6.60 (d, *J* = 7.9 Hz, 2H), 3.65-3.61 (m, 2H), 2.98-2.92 (m, 2H), 1.93-1.85 (m, 2H), 1.83-1.76 (m, 2H). <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ 148.1, 144.8, 137.0, 136.6, 132.9, 130.5, 130.4, 130.0, 129.7, 129.2, 128.7, 128.4, 127.6, 127.4, 126.9, 117.8, 114.0, 51.0, 28.0, 27.8. HRMS (ESI) calculated [M+H]<sup>+</sup> for C<sub>28</sub>H<sub>28</sub>NSe<sub>2</sub>: 538.0547, found: 538.0555. FTIR (cm<sup>-1</sup>) 3056, 2922, 1599, 1572, 1496, 1022.

## 10. Synthesis and Characterization of 2-Selanyl aniline Derivatives

### *N*-Methyl-*N*-phenyl-2-(phenylselanyl)aniline (4a)

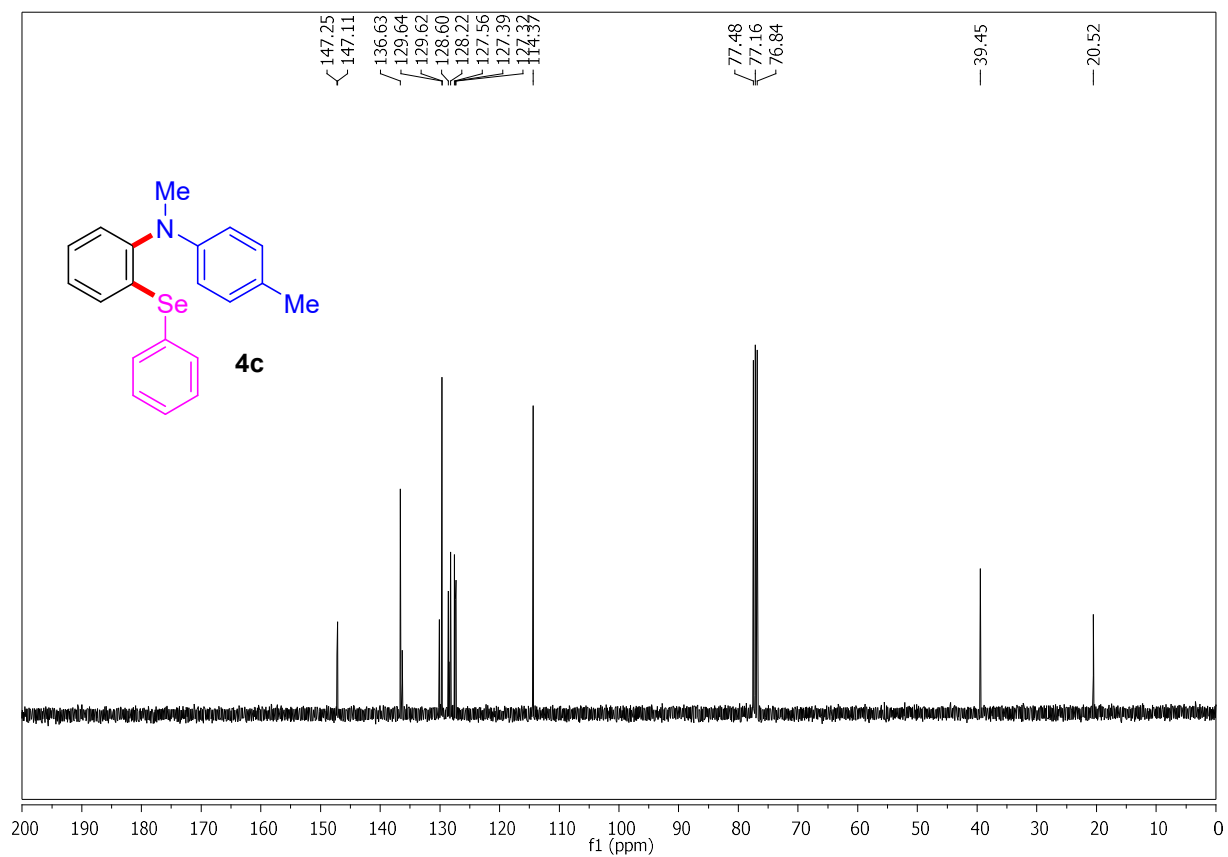
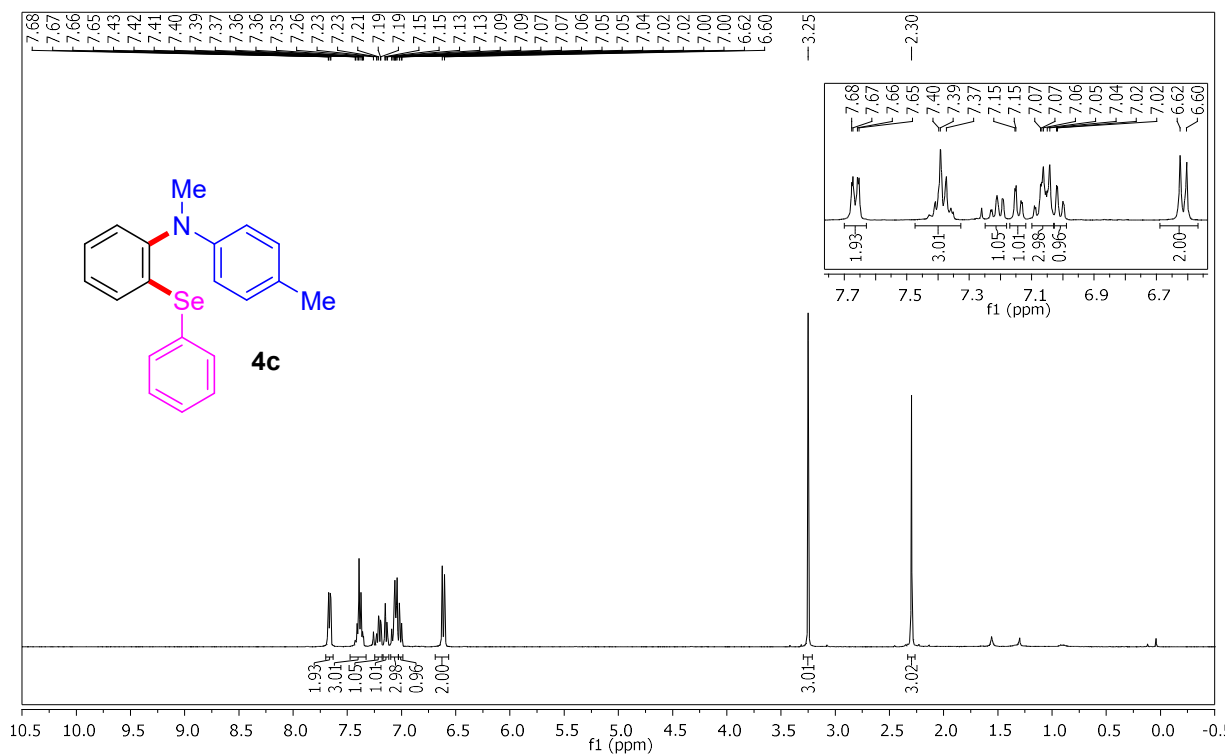


***N*-(4-Methoxyphenyl)-*N*-methyl-2-(phenylselenanyl)aniline (4b)**

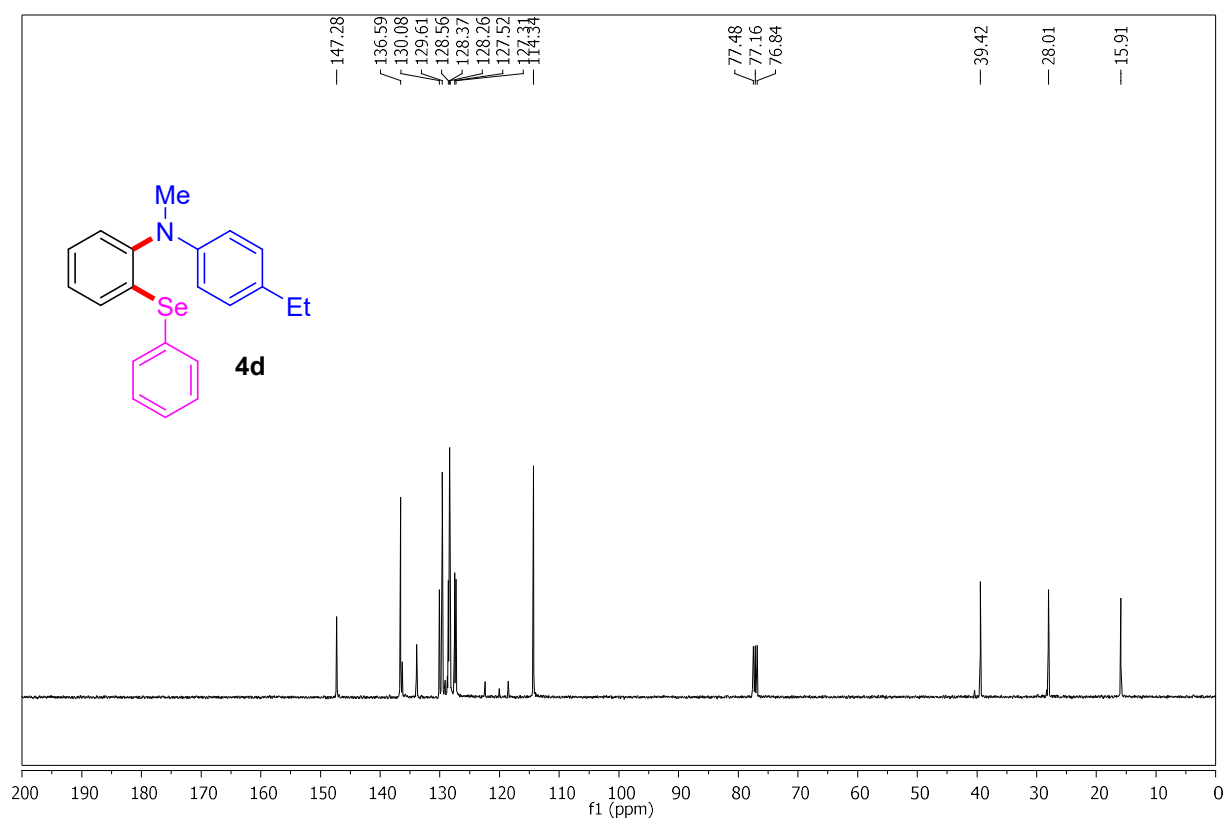
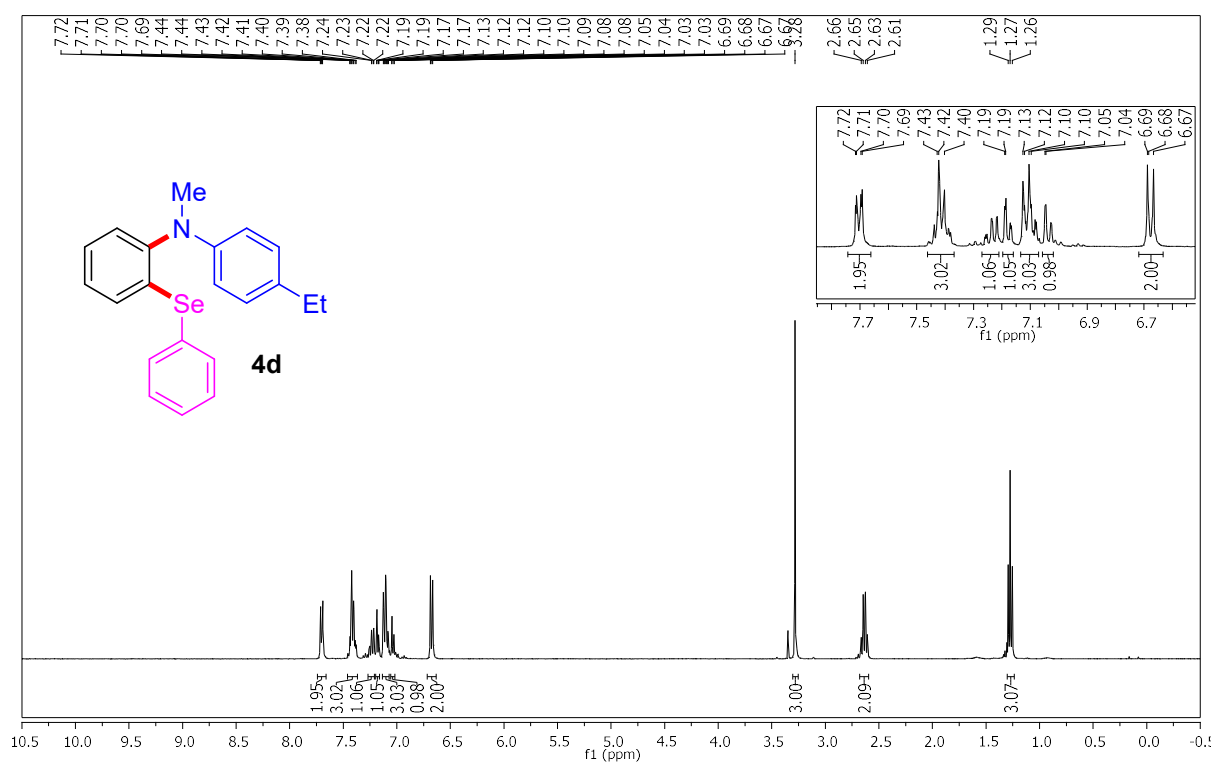


***N*-Methyl-2-(phenylselanyl)-*N*-(*p*-tolyl)aniline (4c)**

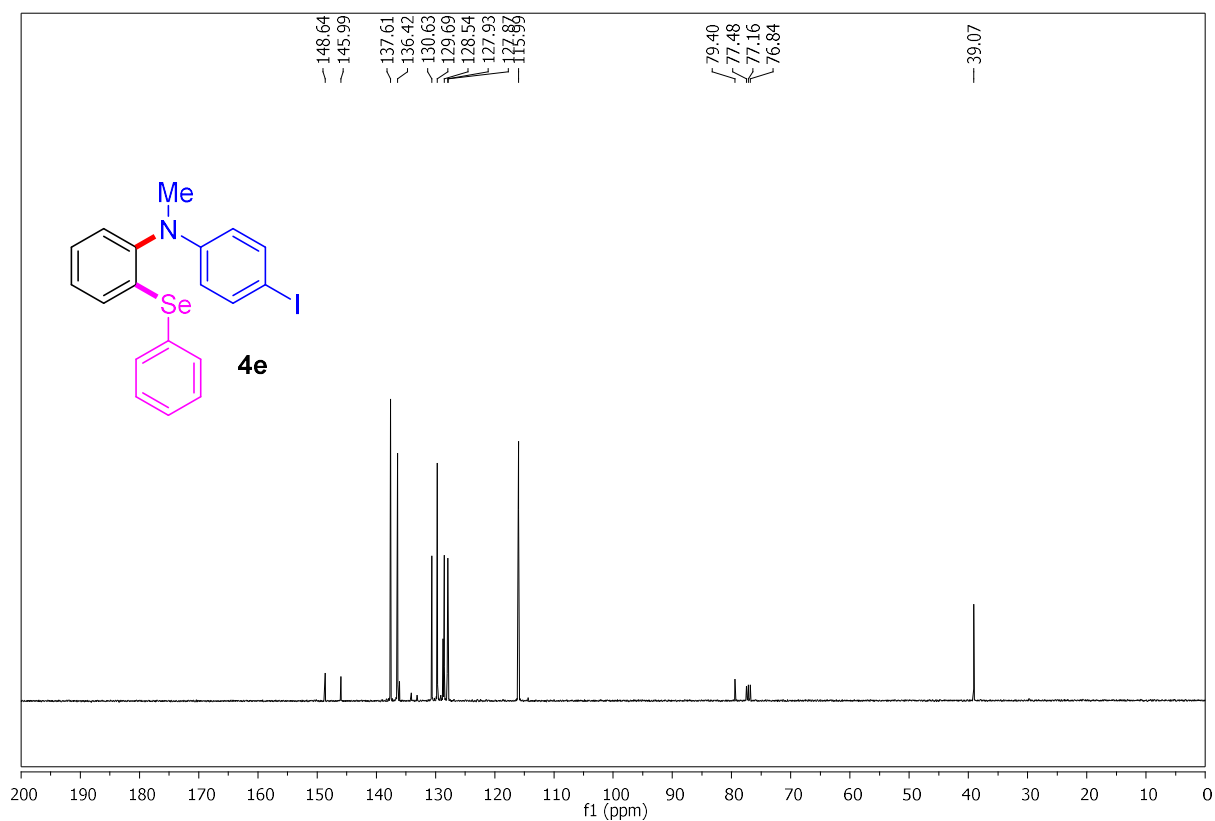
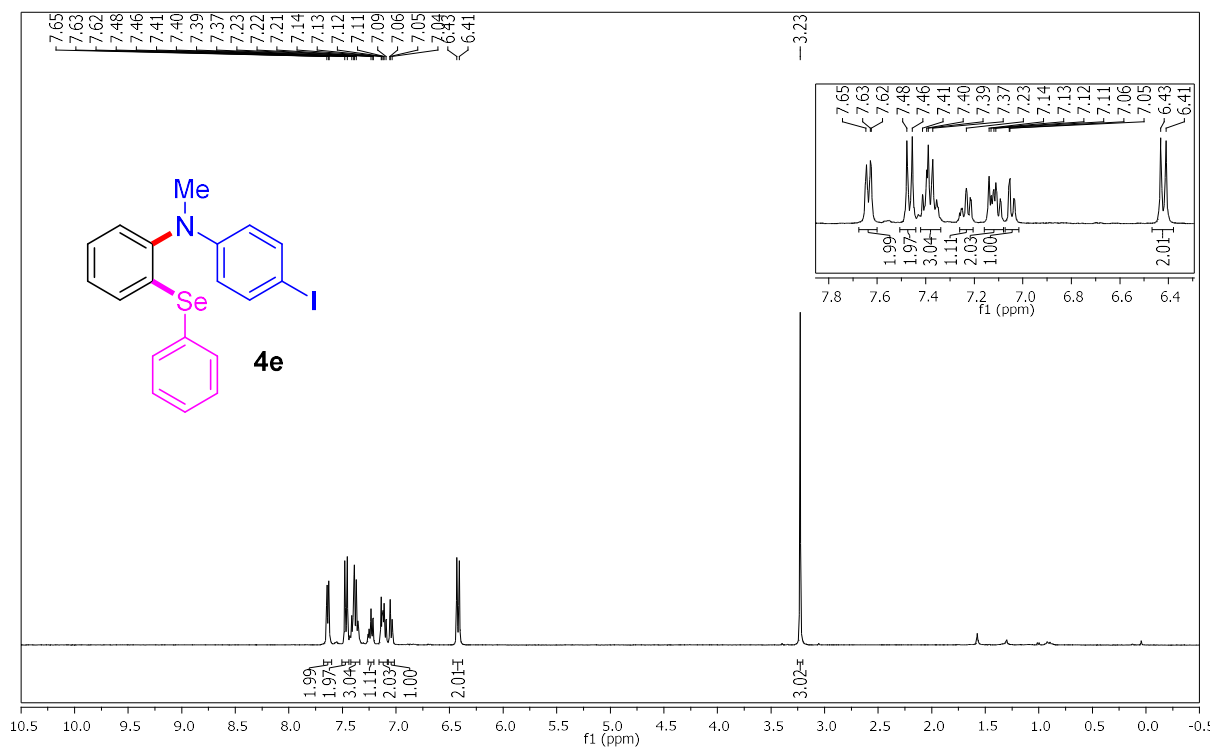




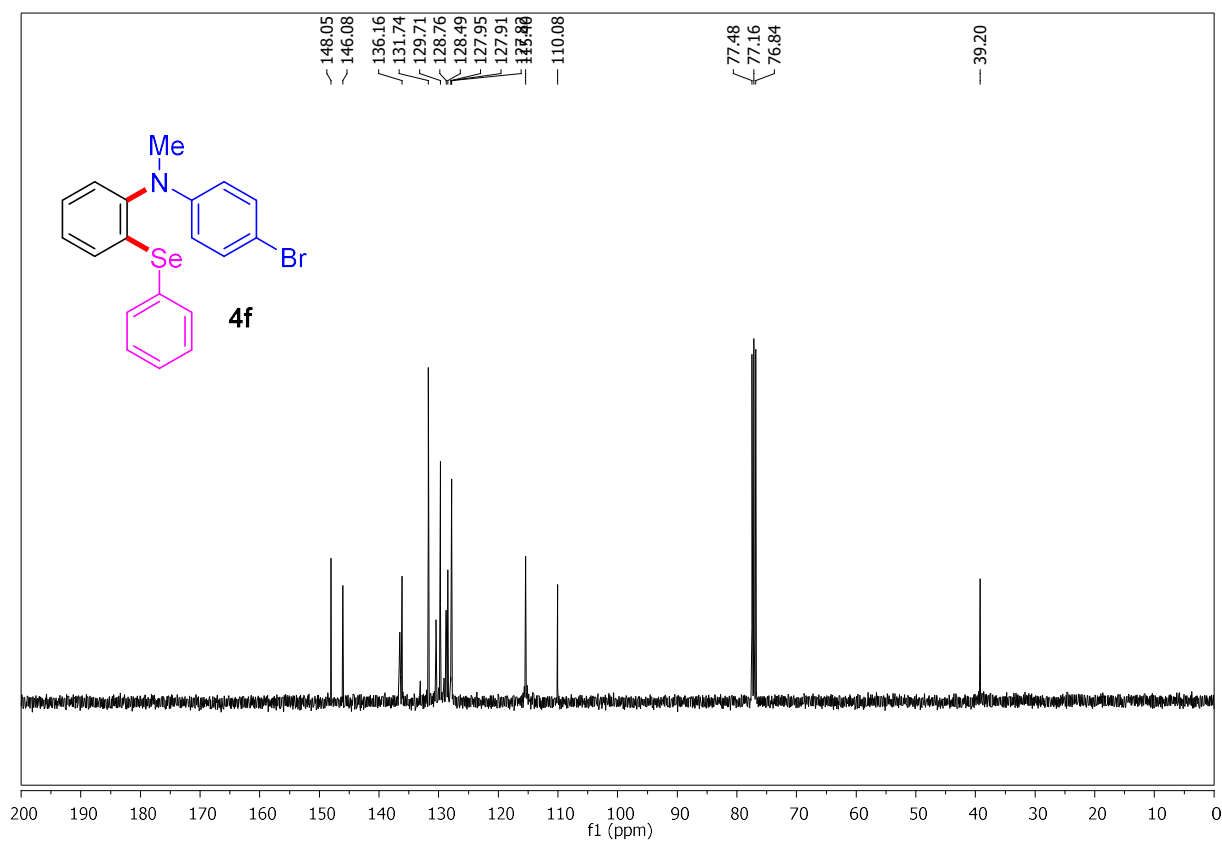
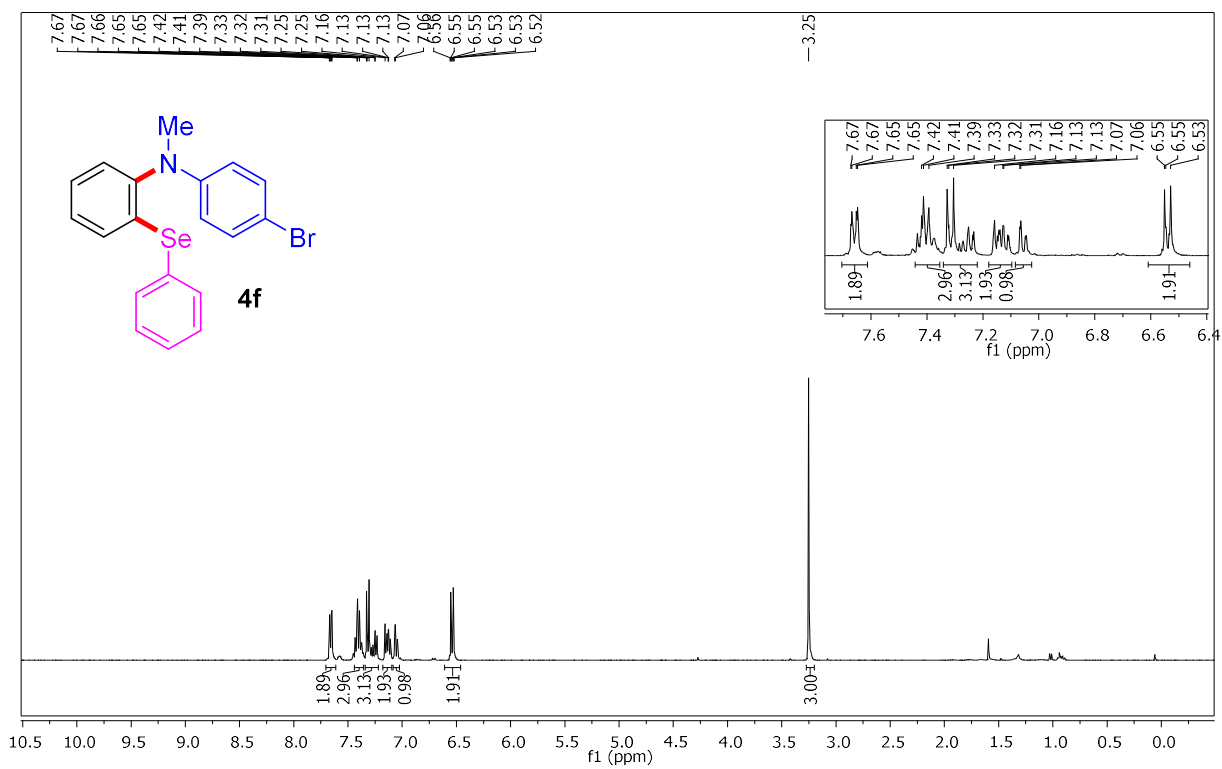
***N*-(4-Ethylphenyl)-*N*-methyl-2-(phenylselanyl)aniline (4d)**



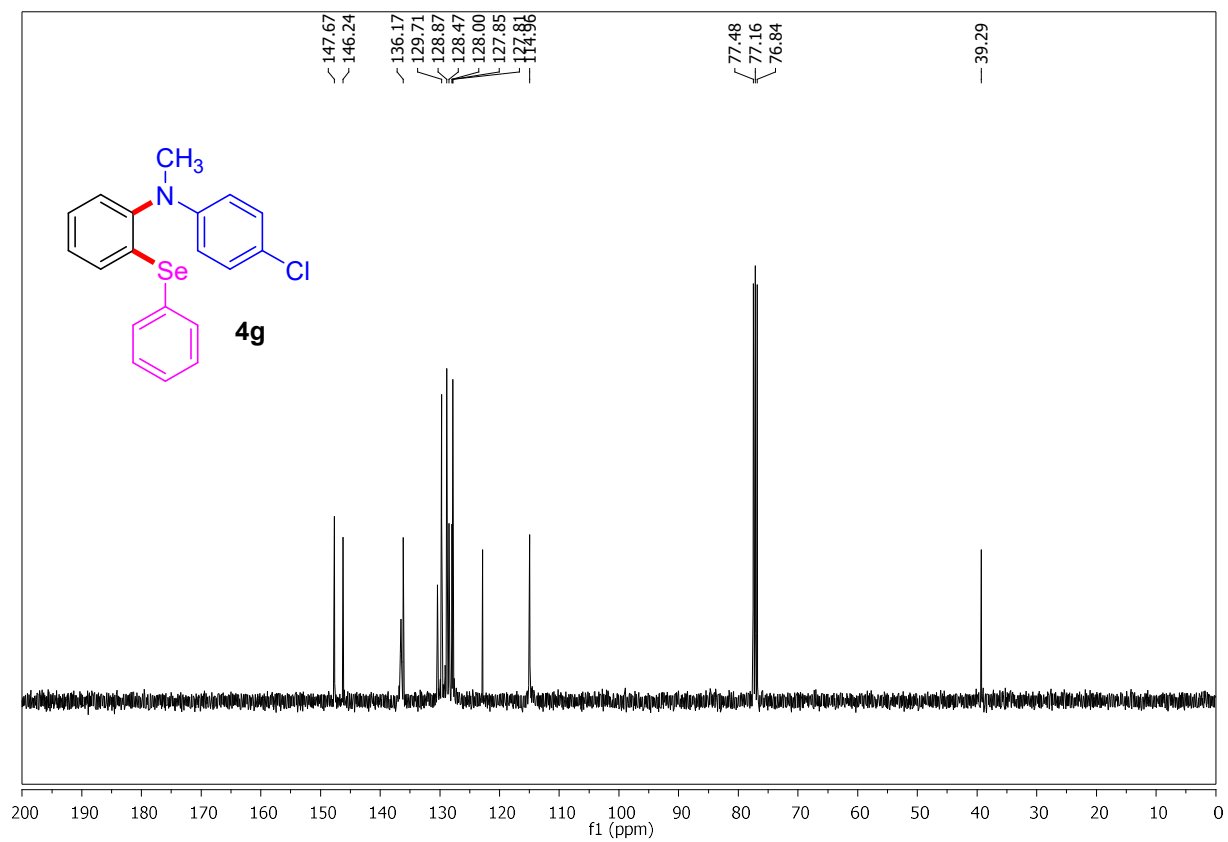
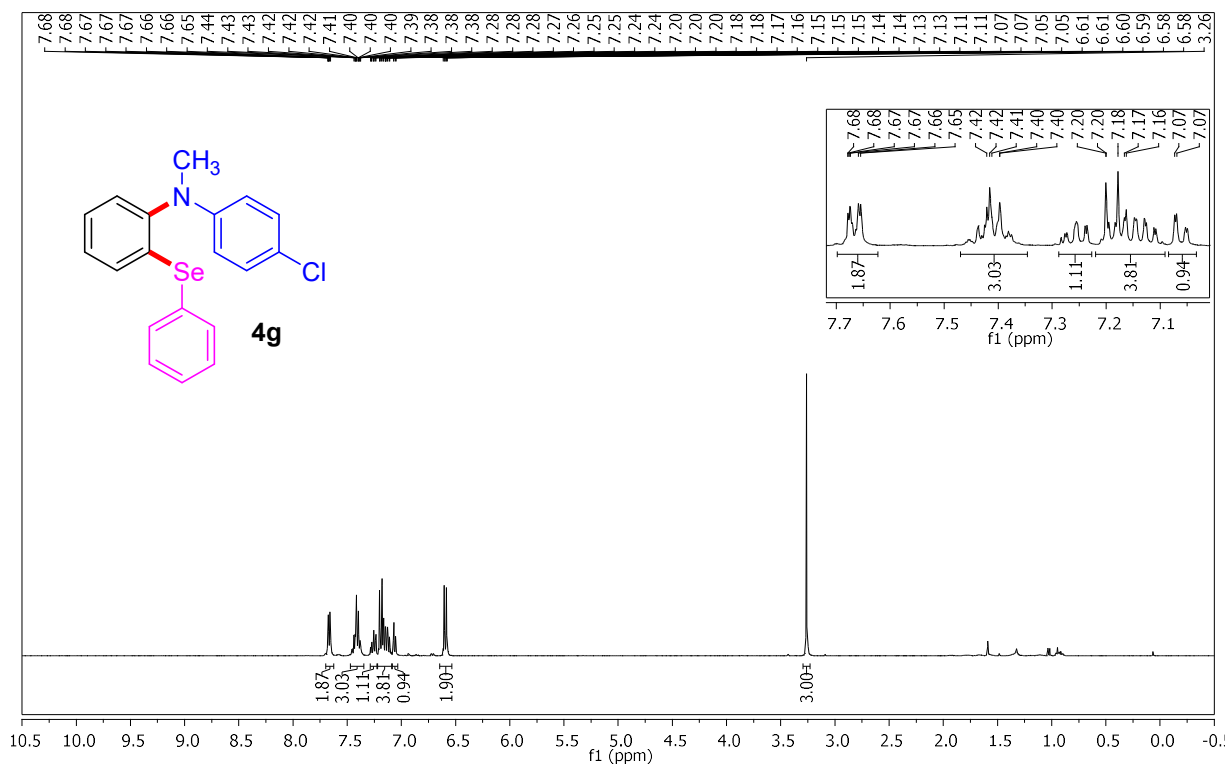
***N*-(4-Iodophenyl)-*N*-methyl-2-(phenylselanyl)aniline (4e)**



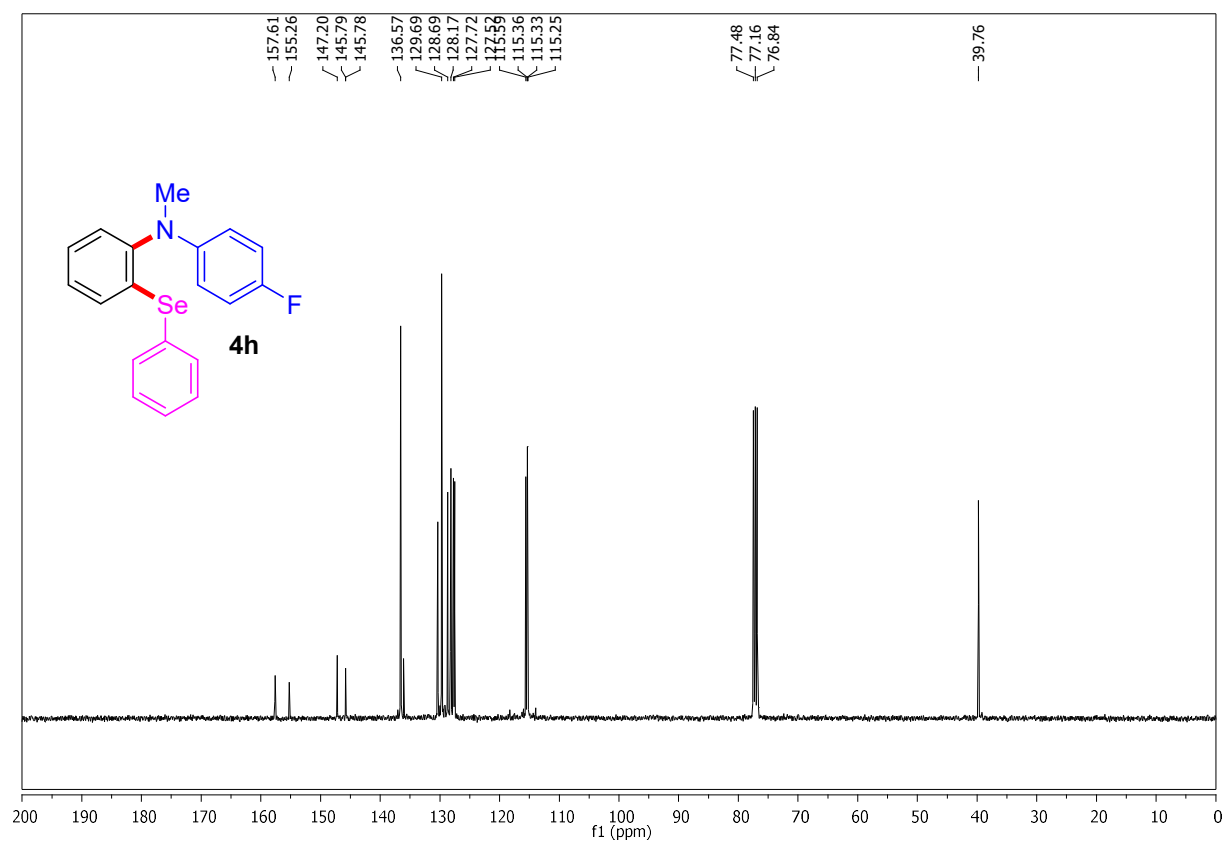
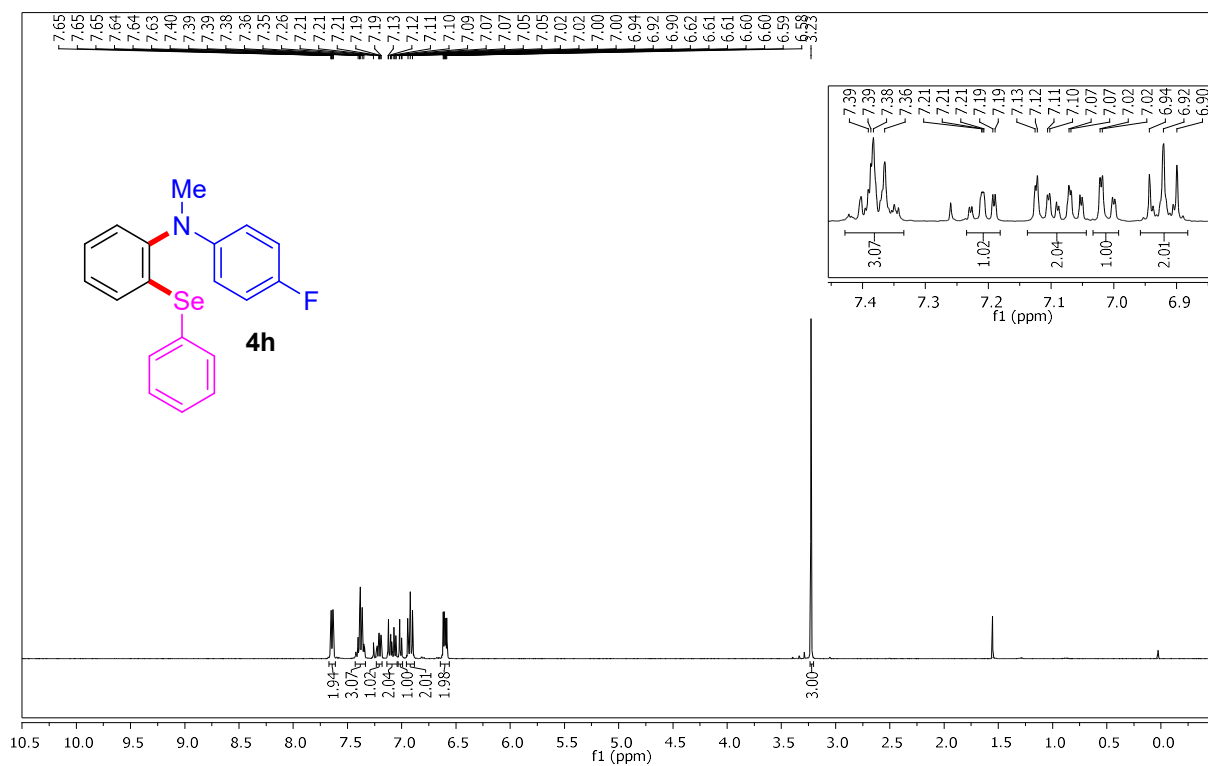
***N*-(4-Bromophenyl)-*N*-methyl-2-(phenylselanyl)aniline (4f)**



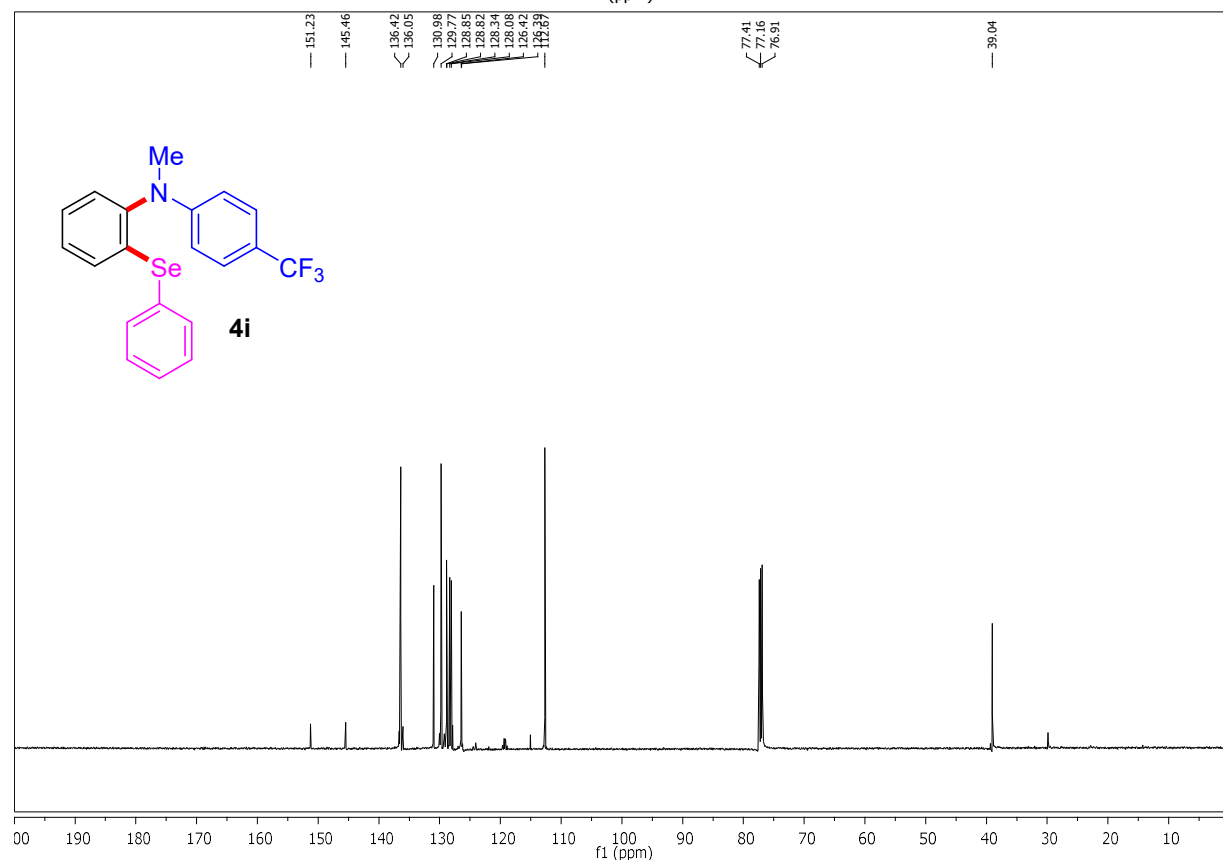
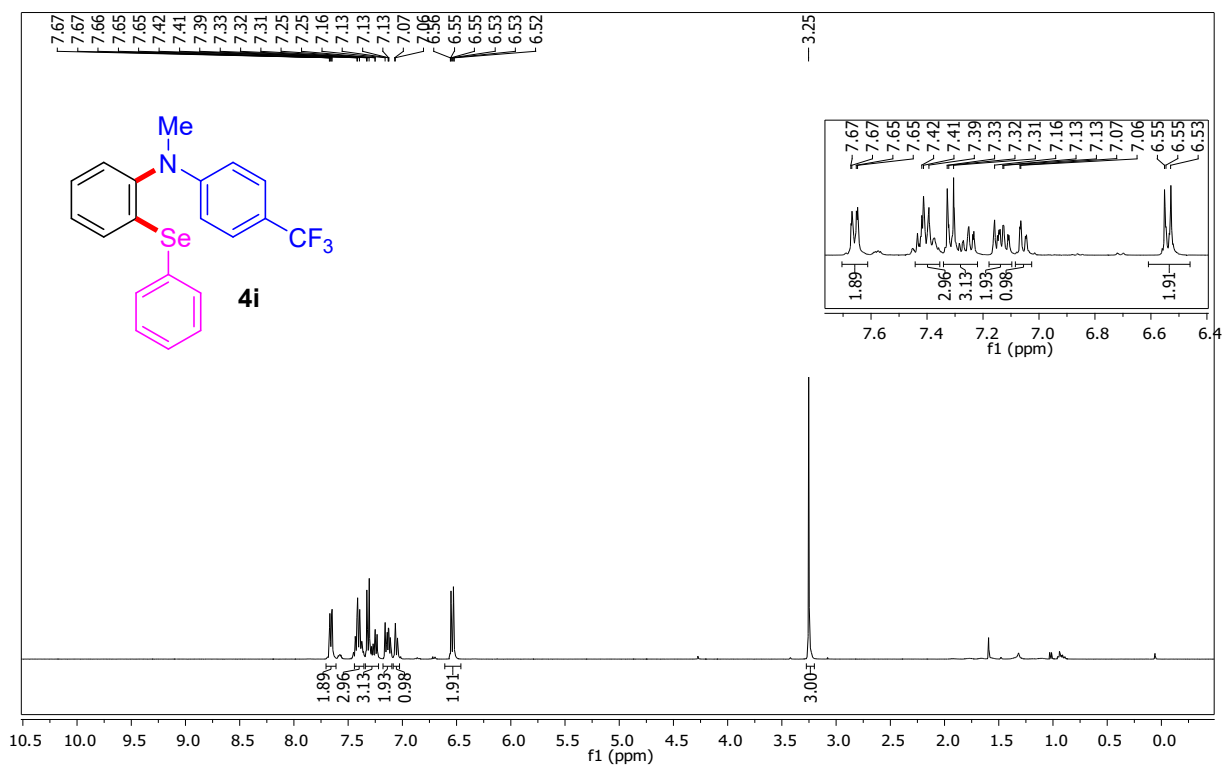
***N*-(4-Chlorophenyl)-*N*-methyl-2-(phenylselanyl)aniline (4g)**



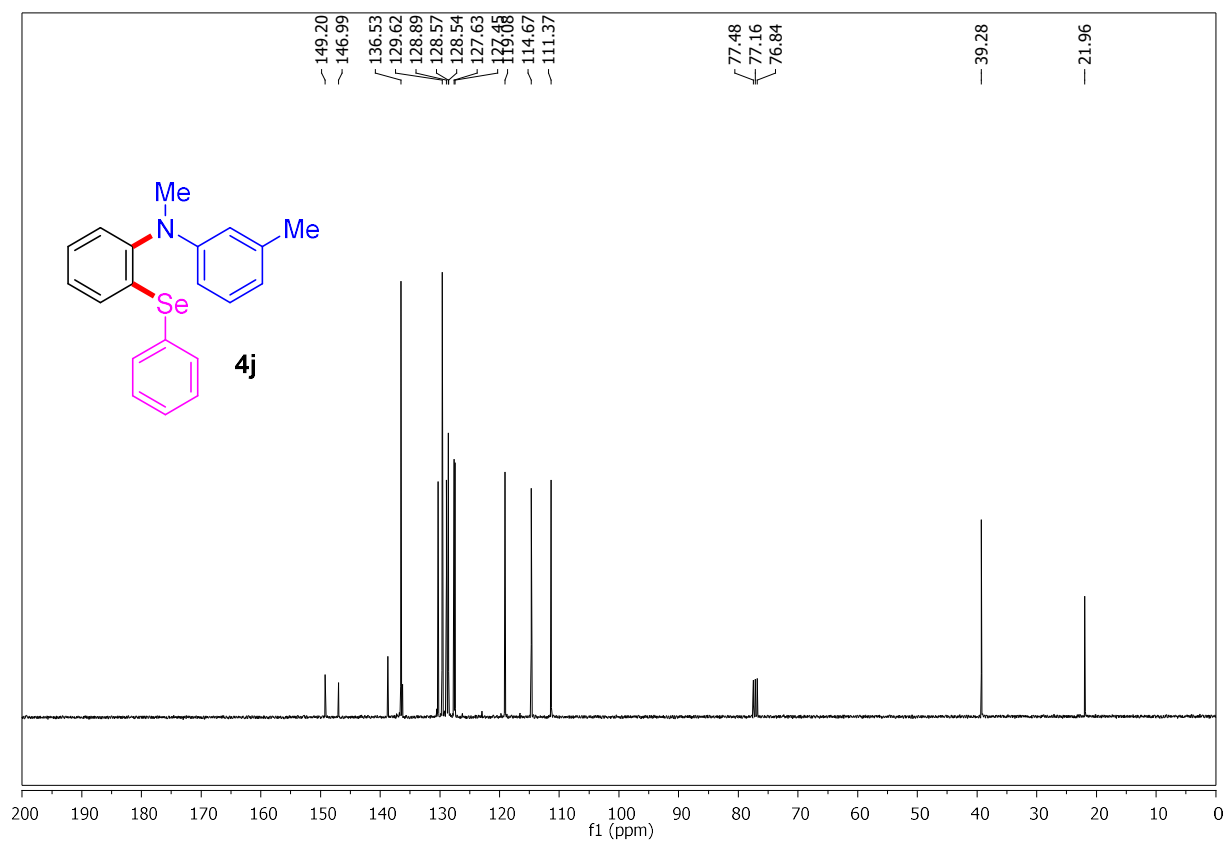
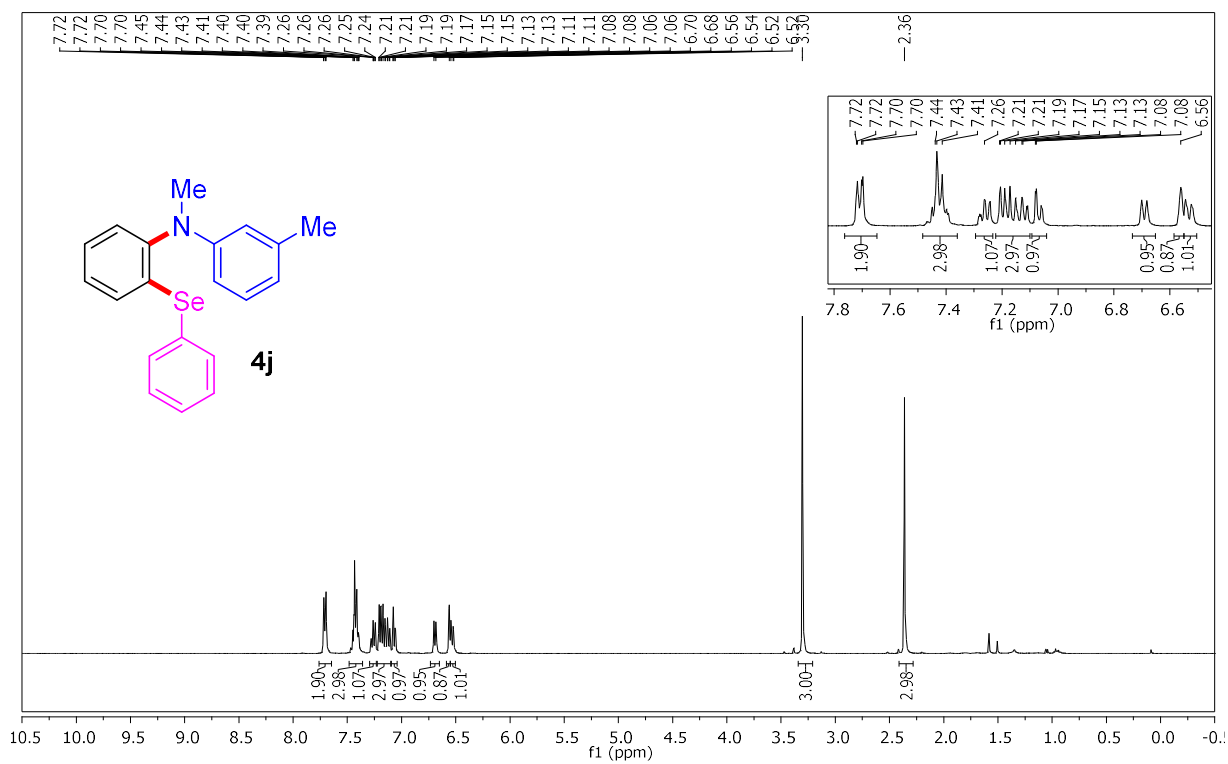
***N*-(4-Fluorophenyl)-*N*-methyl-2-(phenylselanyl)aniline (4h)**



***N*-Methyl-2-(phenylselanyl)-*N*-(4-(trifluoromethyl)phenyl)aniline (4i)**

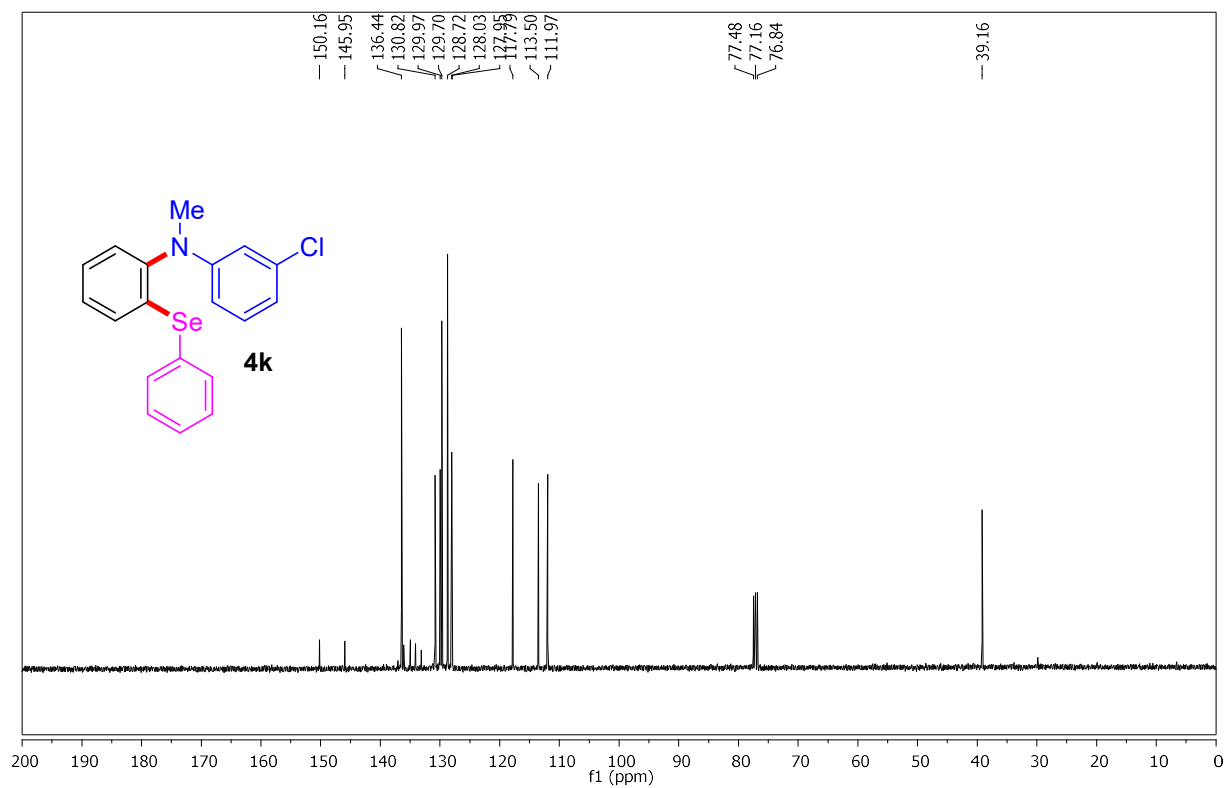
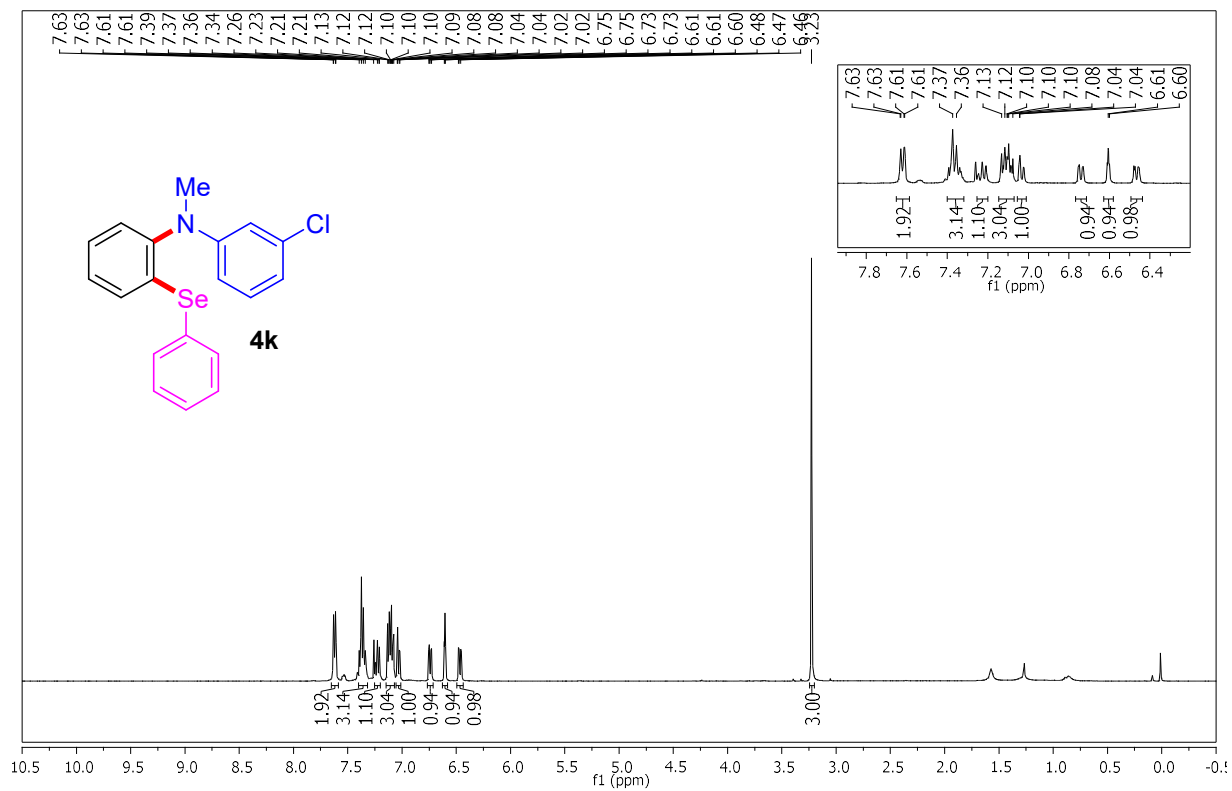


***N*-Methyl-2-(phenylselanyl)-*N*-(*m*-tolyl)aniline (4j)**

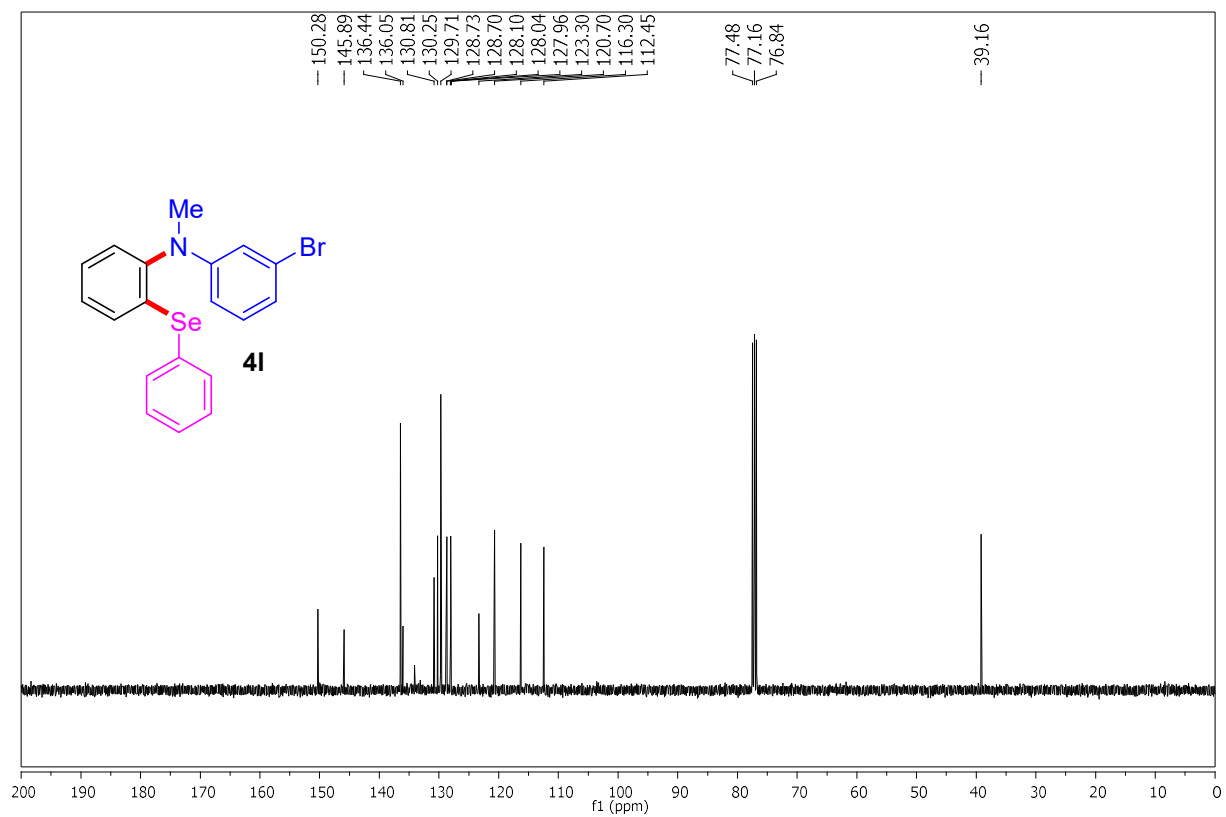
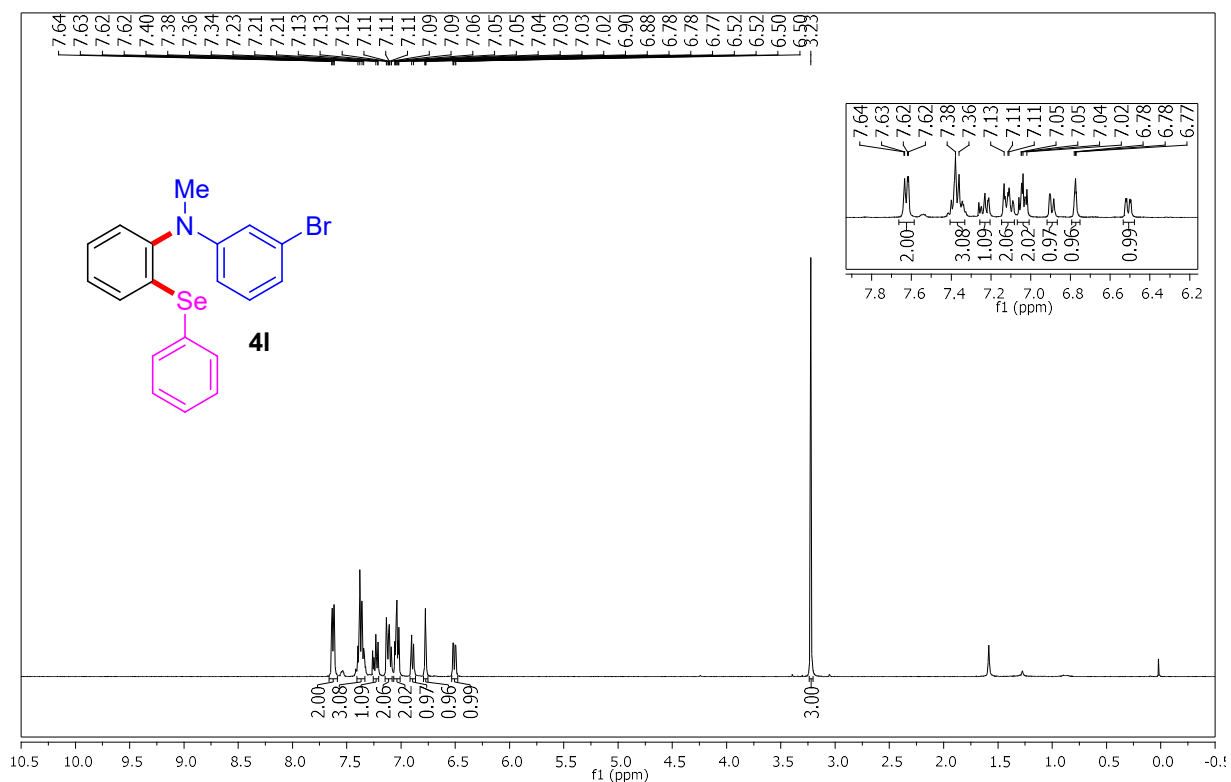




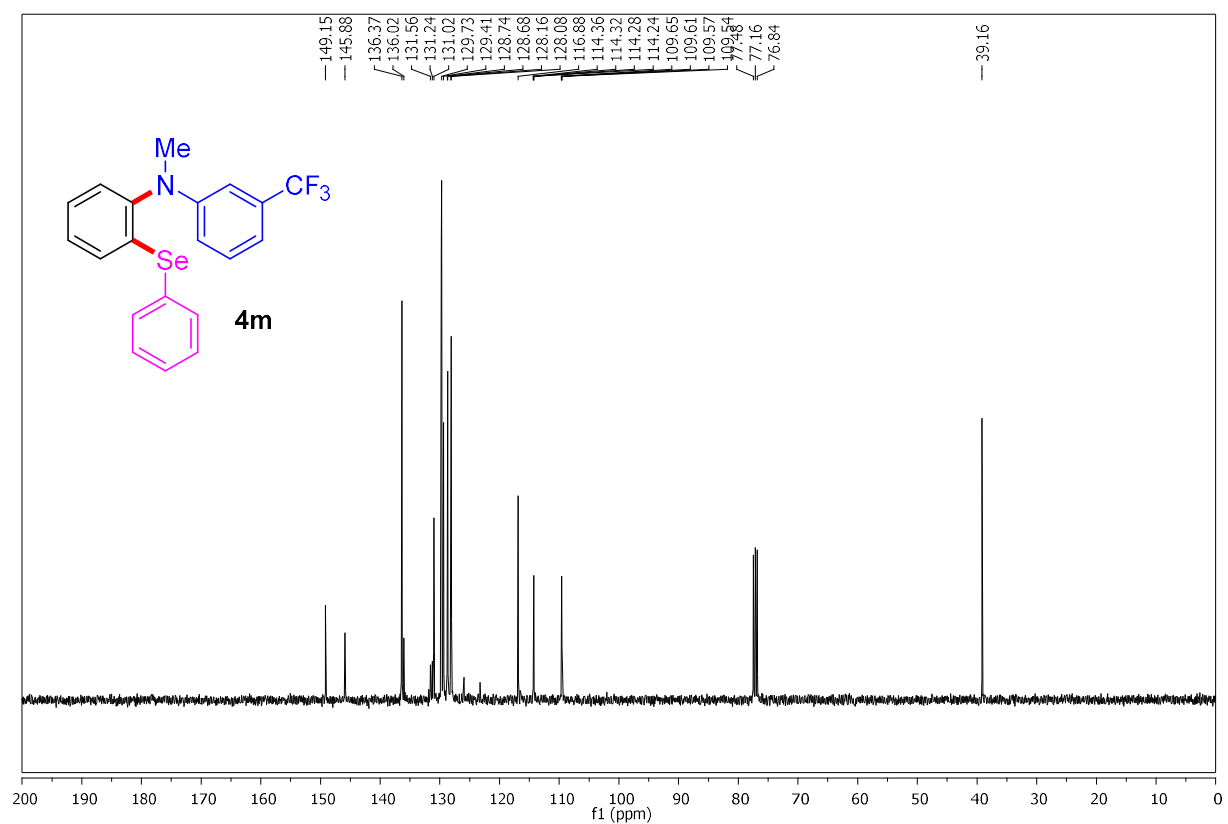
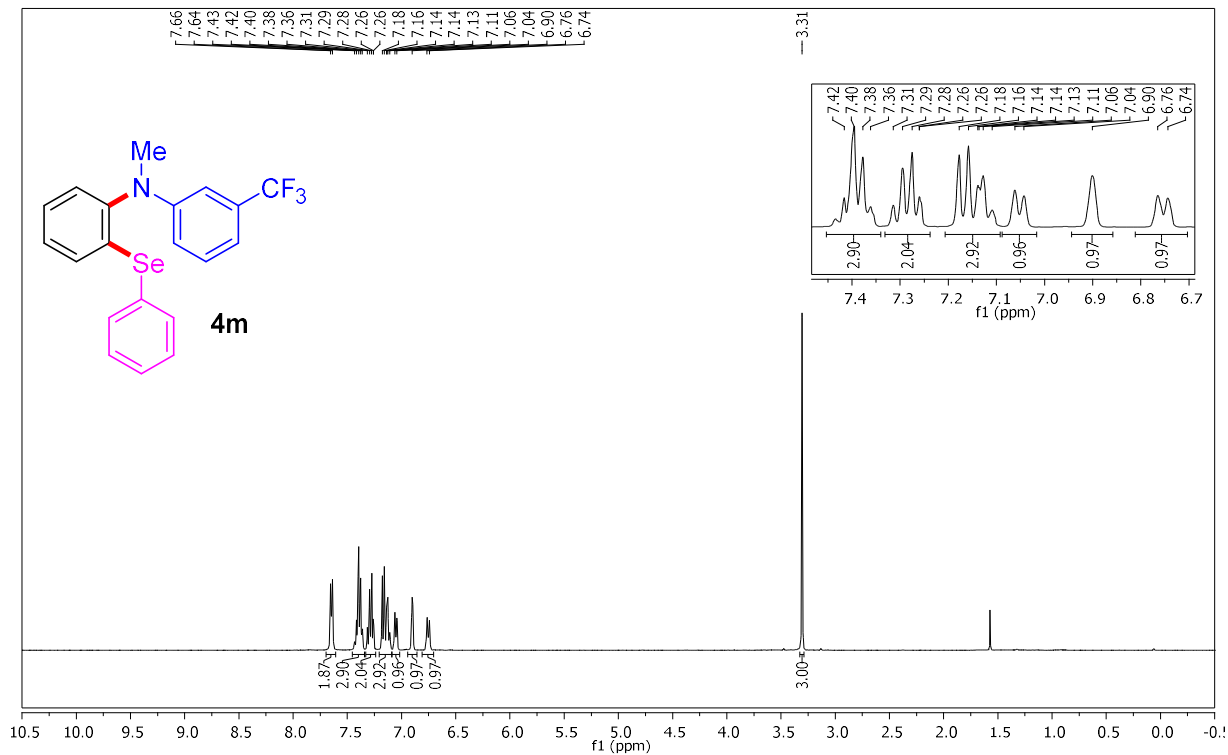
***N*-(3-Chlorophenyl)-*N*-methyl-2-(phenylselanyl)aniline (4k)**



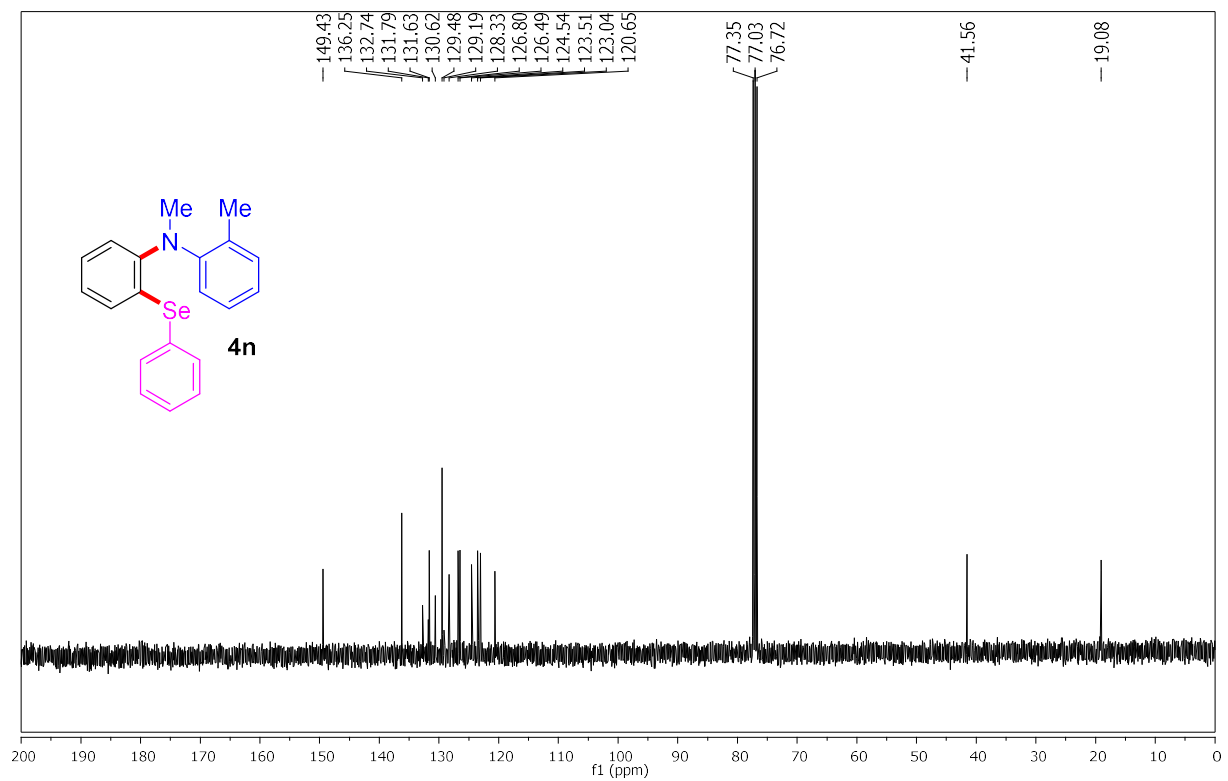
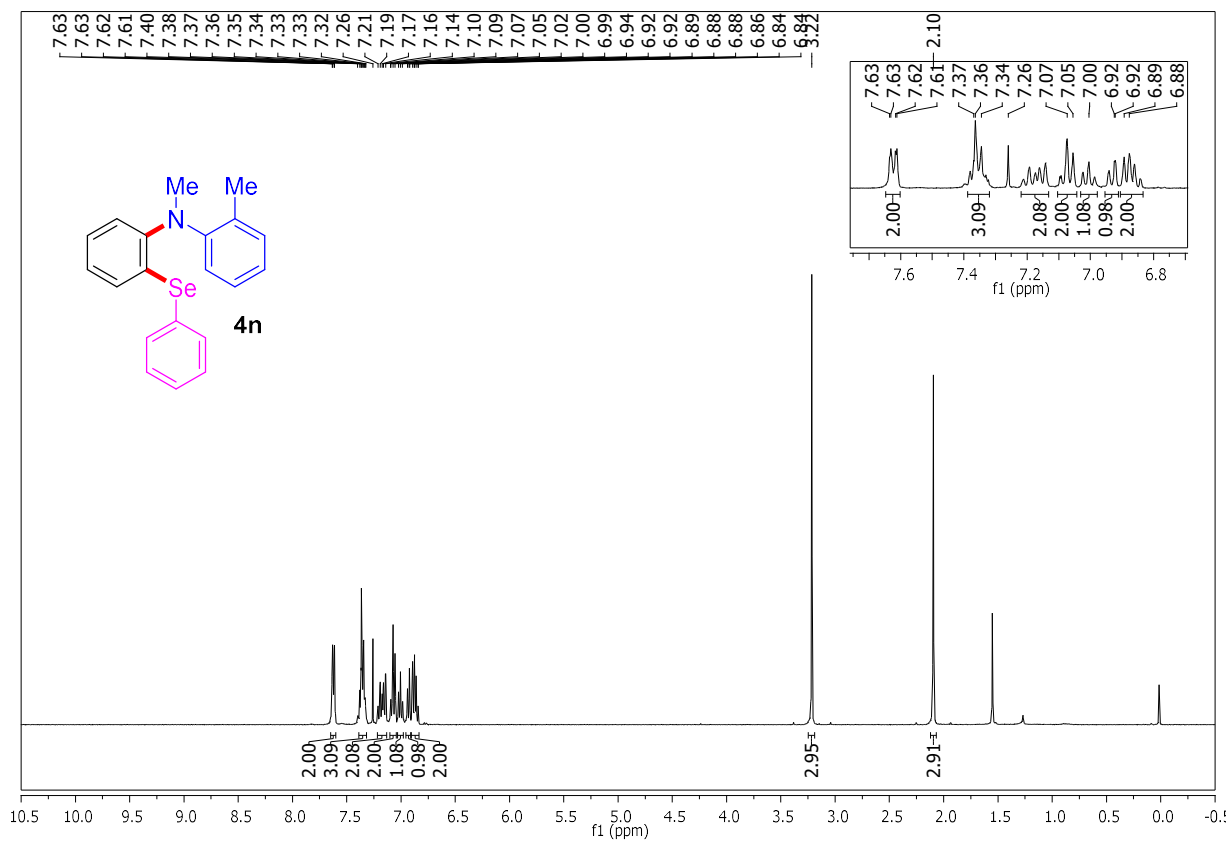
***N*-(3-Bromophenyl)-*N*-methyl-2-(phenylselanyl)aniline (4l)**



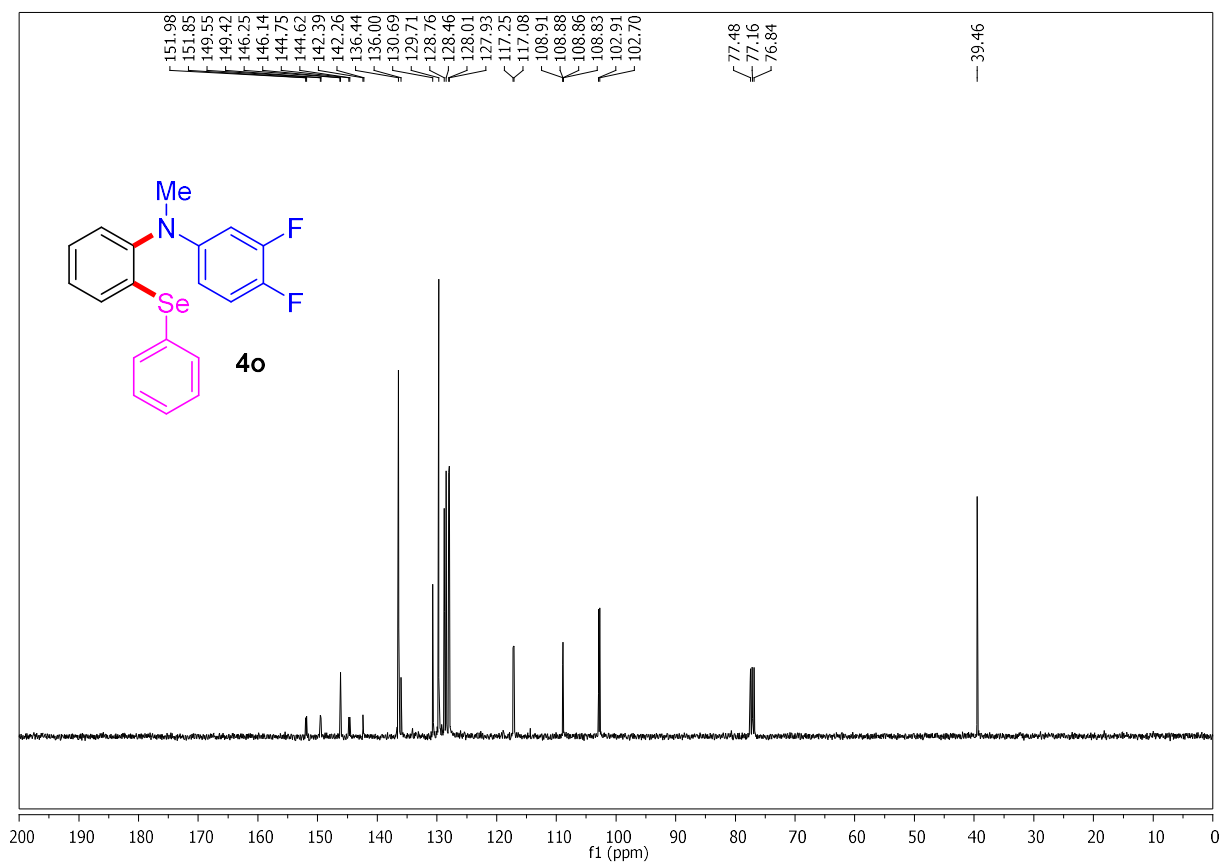
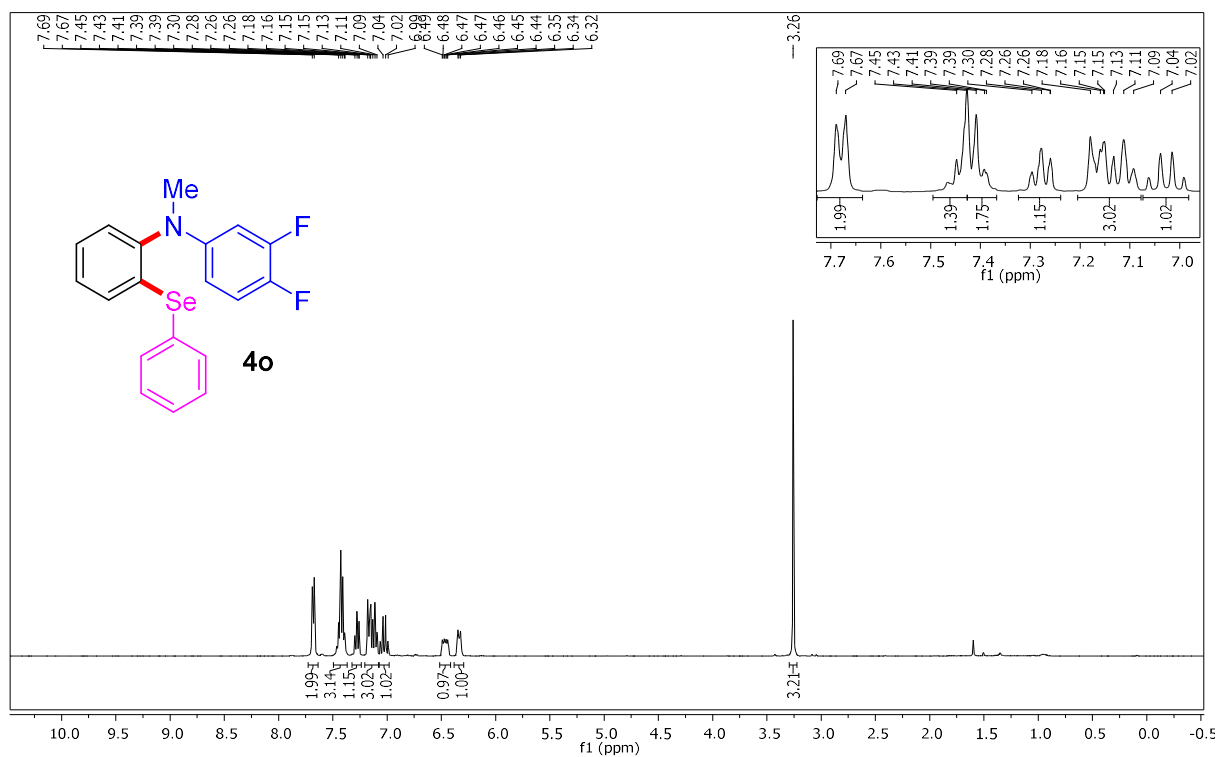
***N*-Methyl-2-(phenylselanyl)-*N*-(3-(trifluoromethyl)phenyl)aniline (4m)**



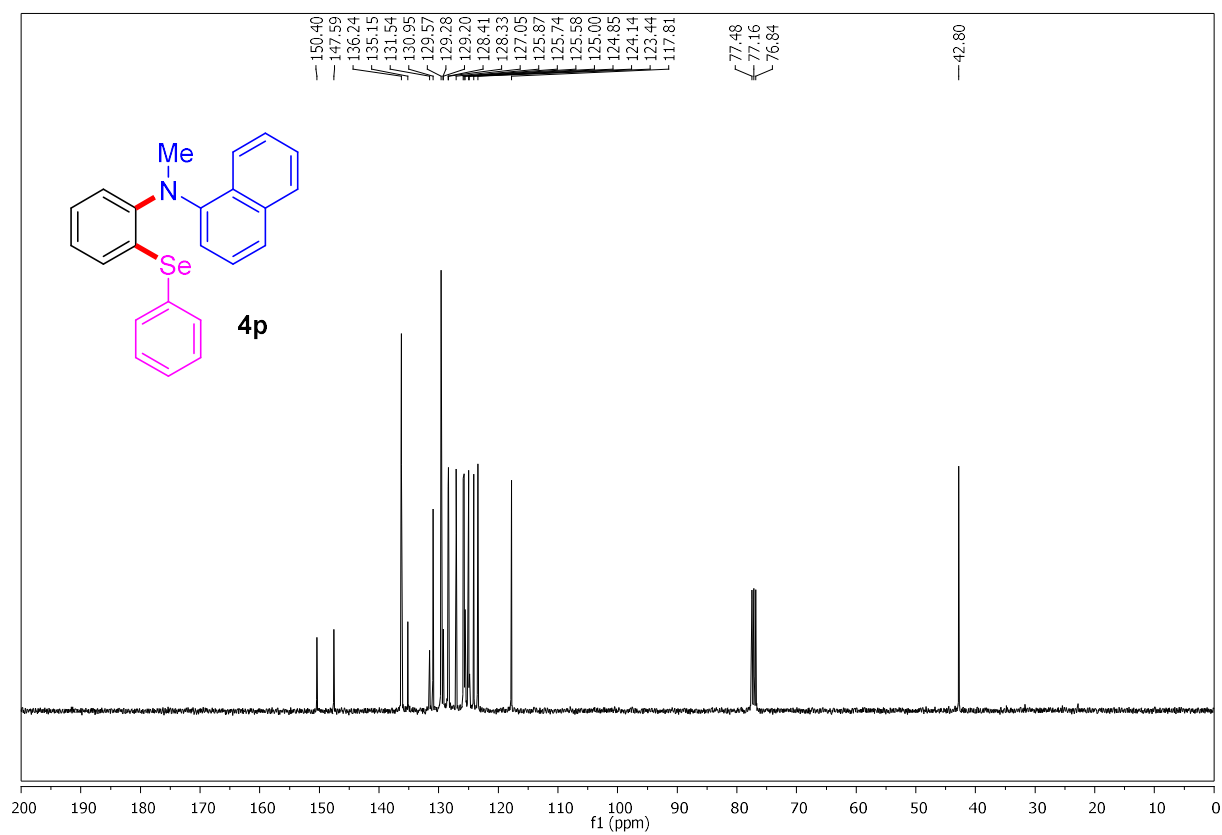
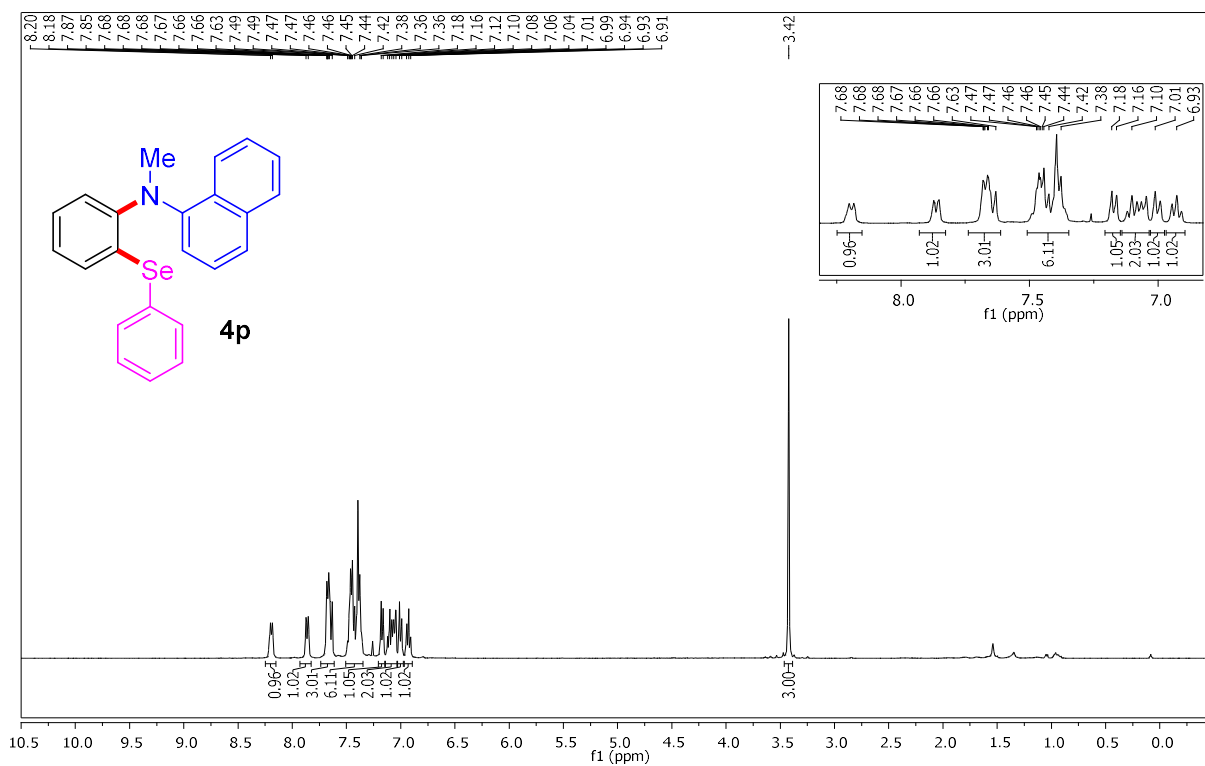
***N*,2-Dimethyl-*N*-(2-(phenylselanyl)phenyl)aniline(4n)**



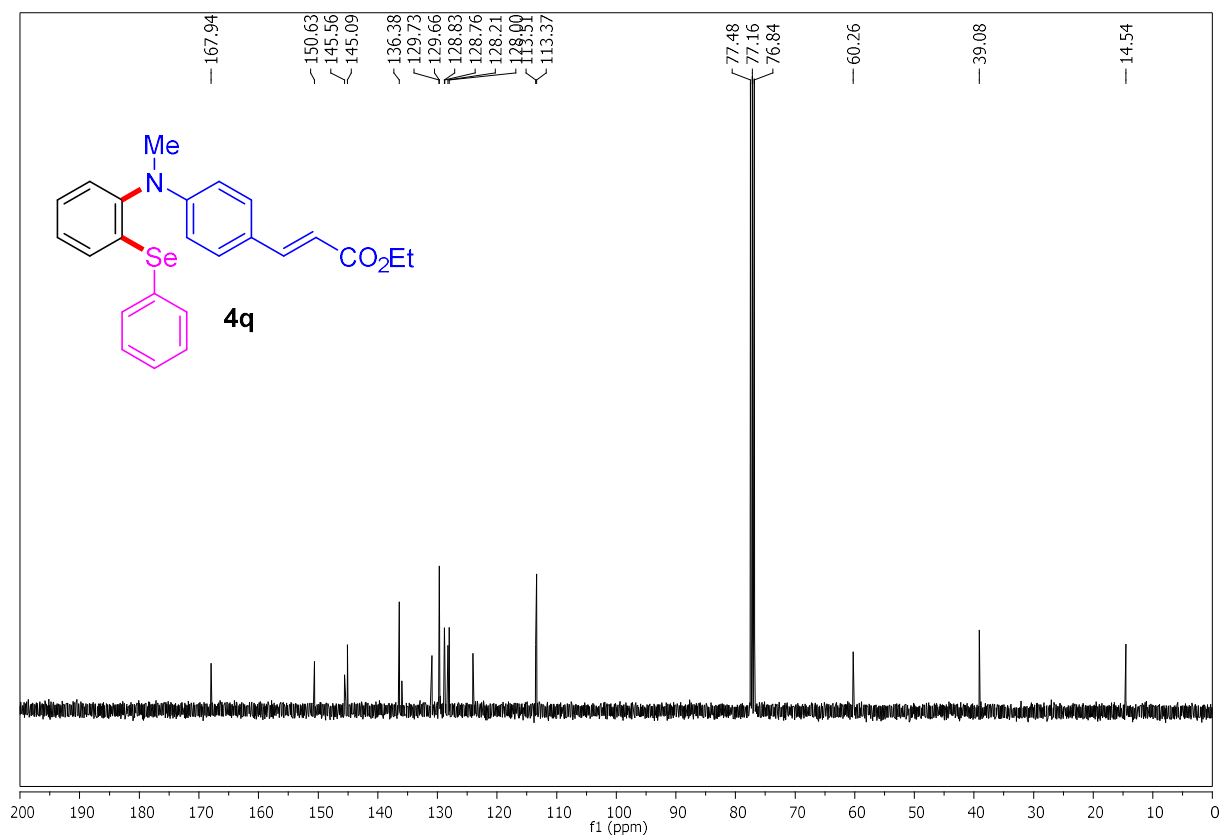
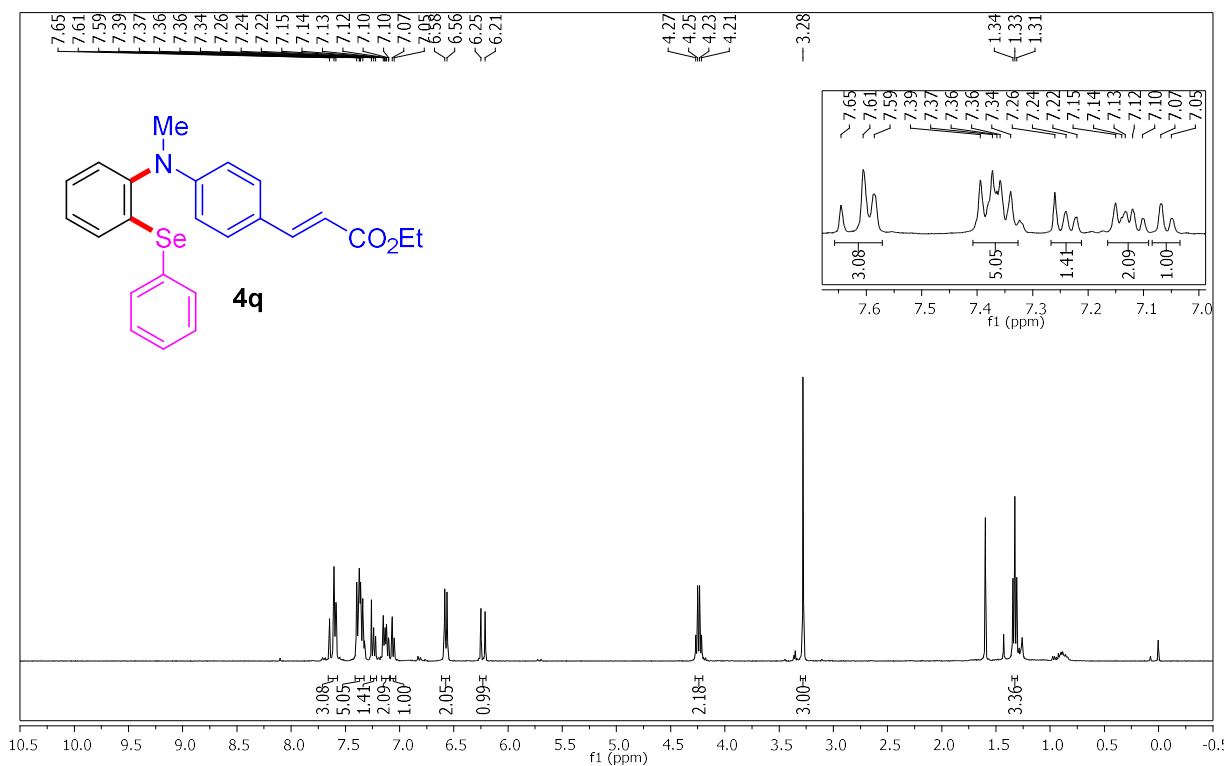
**3,4-Difluoro-N-methyl-N-(2-(phenylselanyl)phenyl)aniline (4o)**



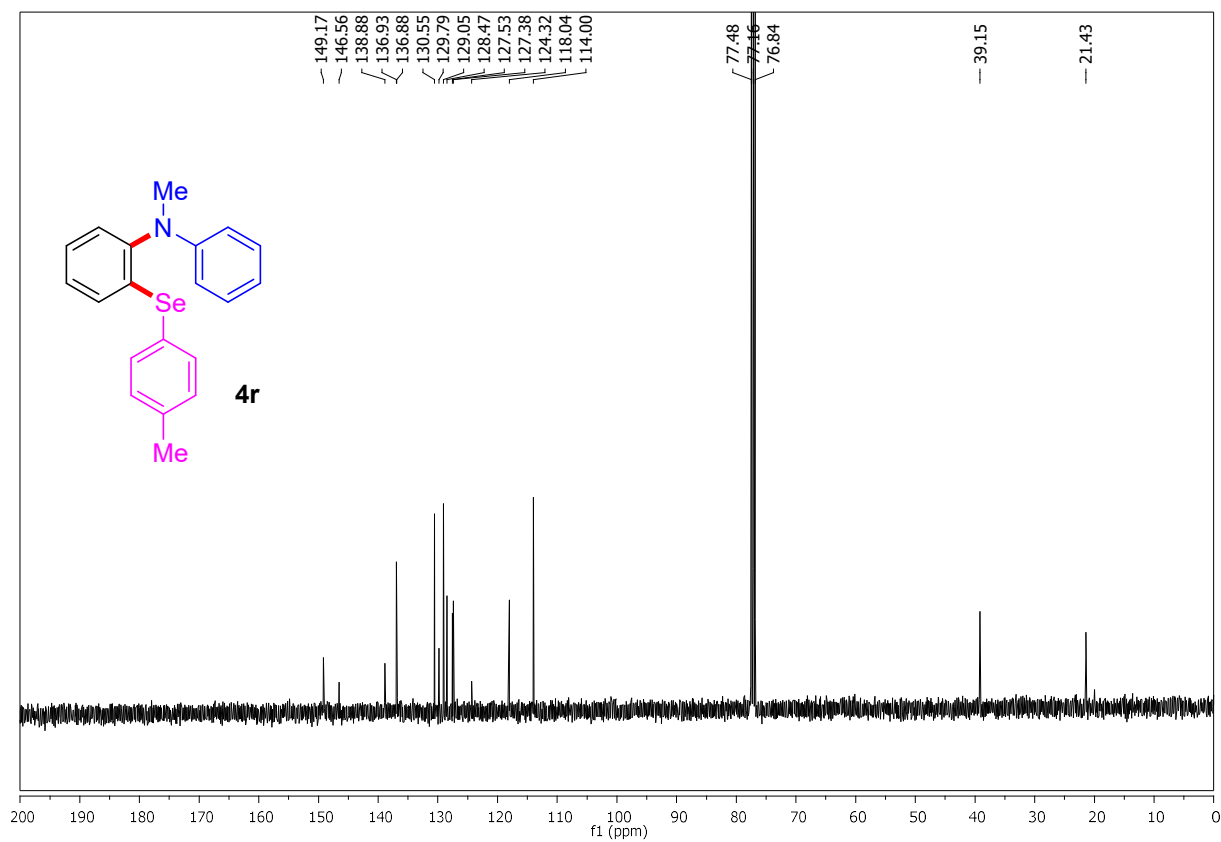
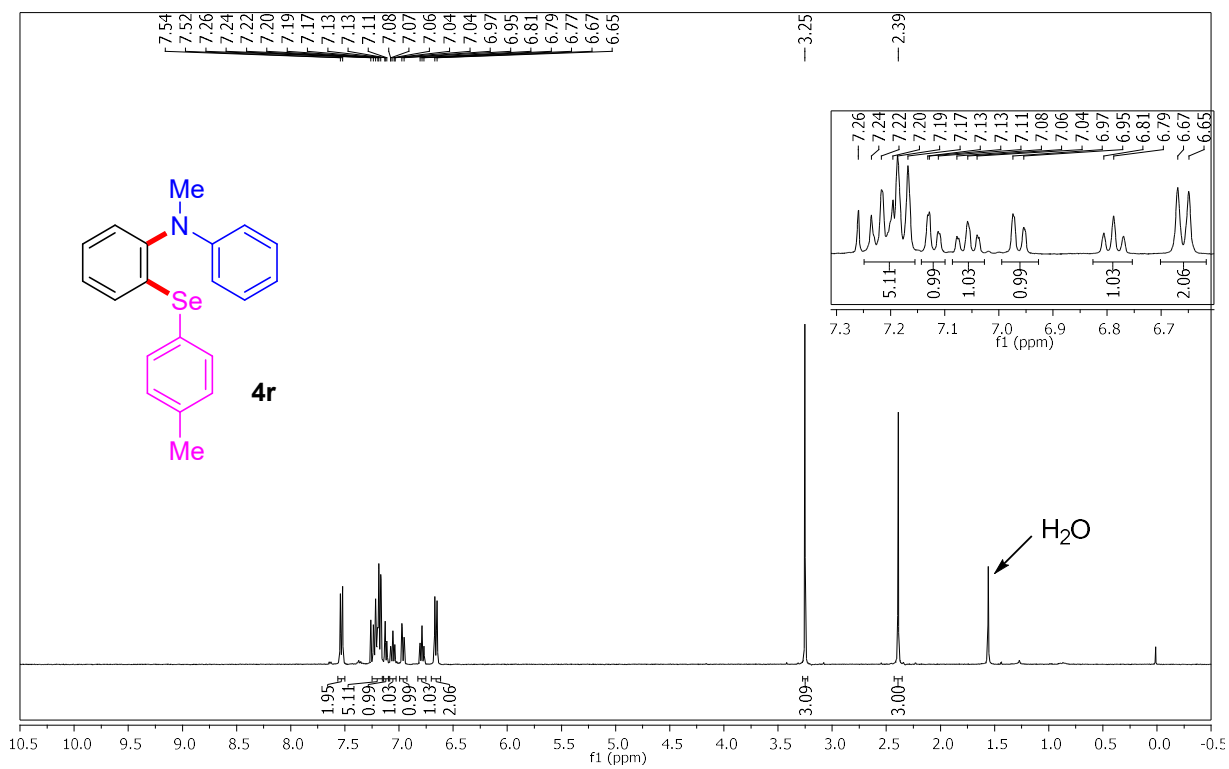
***N*-Methyl-*N*-(2-(phenylselanyl)phenyl)naphthalen-1-amine (4p)**



**Ethyl (E)-3-(4-(methyl(2-(phenylselanyl)phenyl)amino)phenyl)acrylate (4q)**

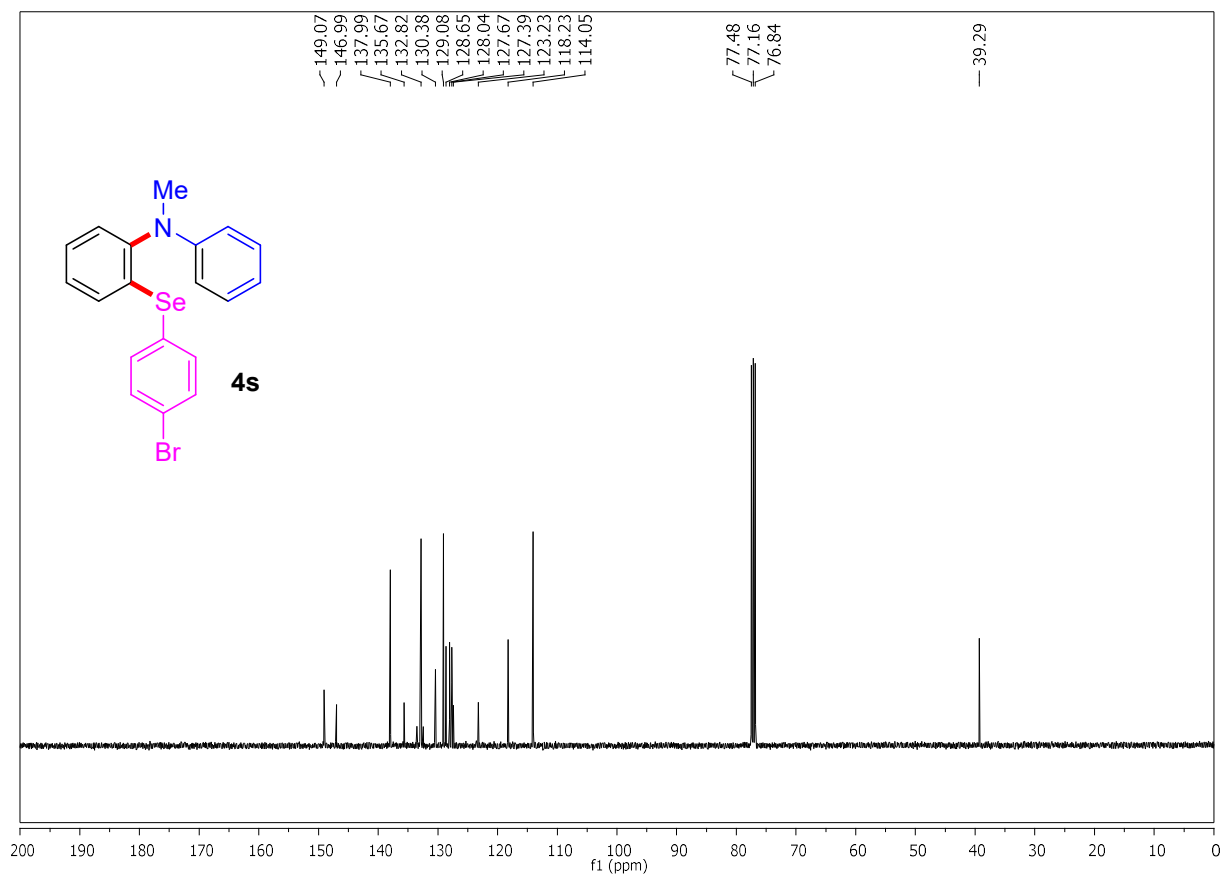
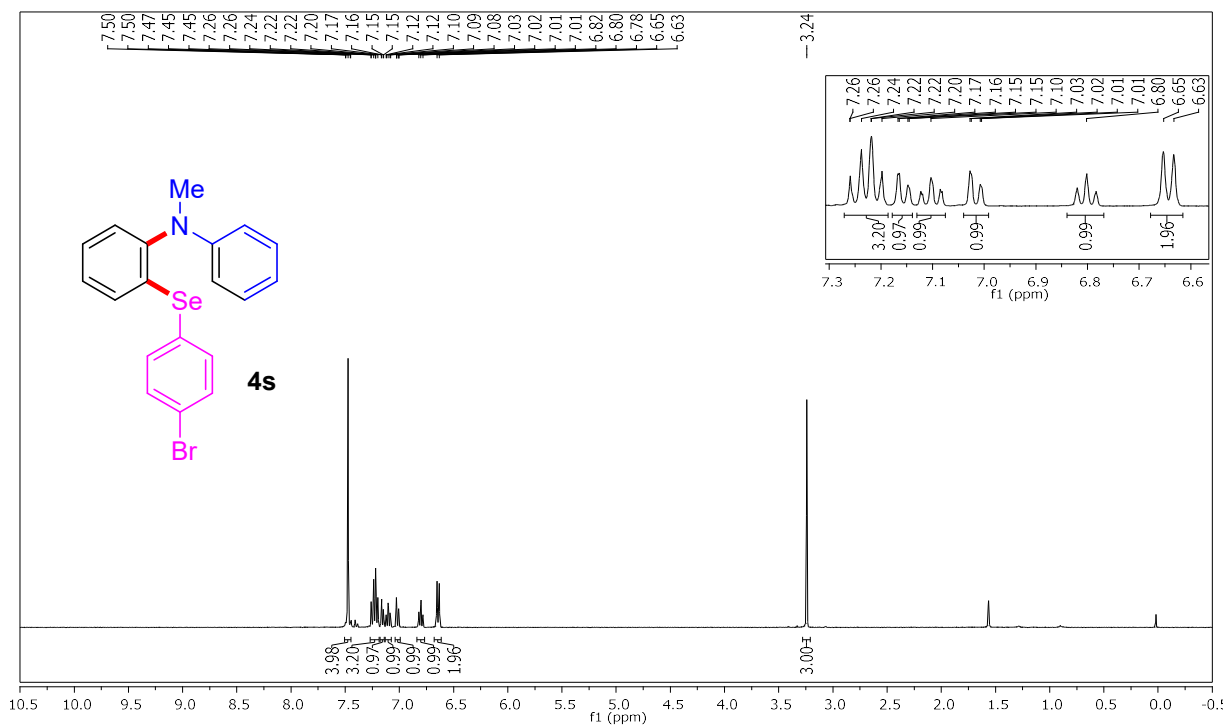


***N*-Methyl-*N*-phenyl-2-(*p*-tolylselanyl)aniline (4r)**

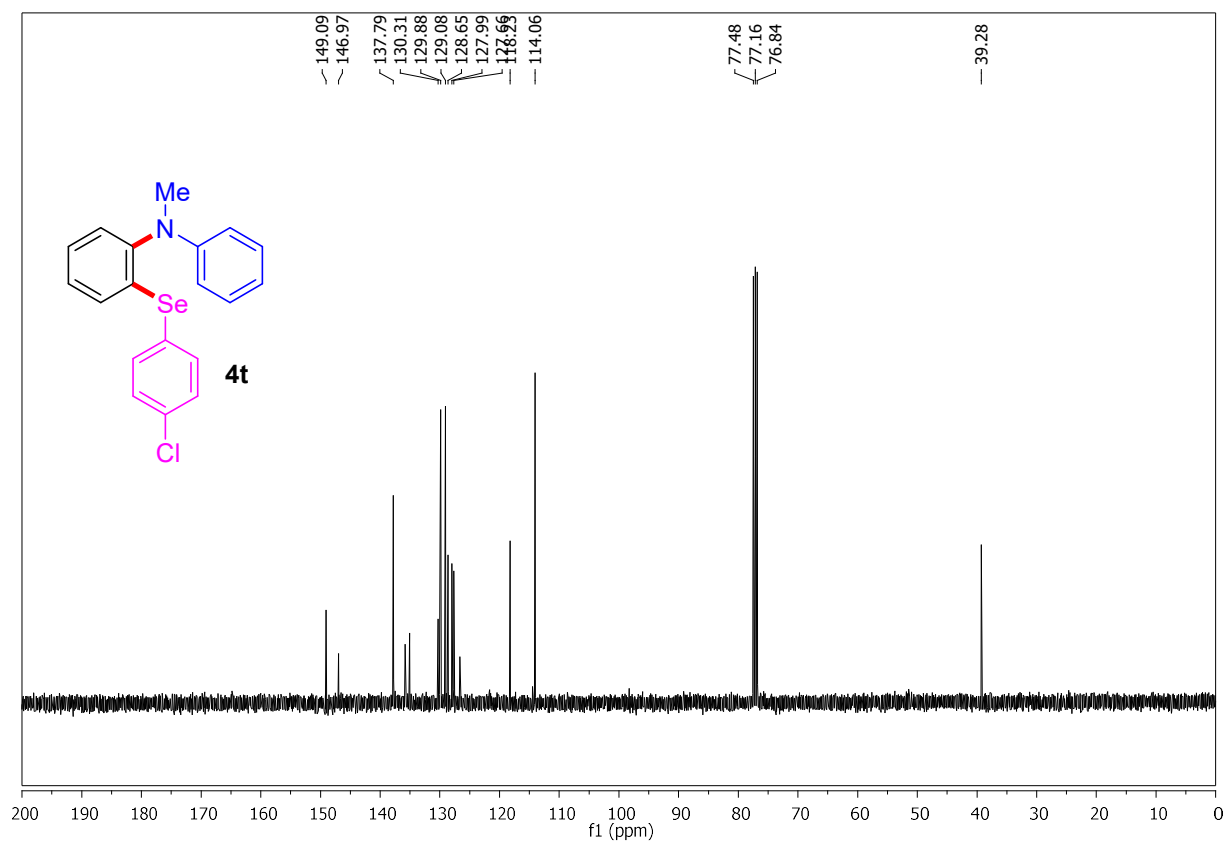
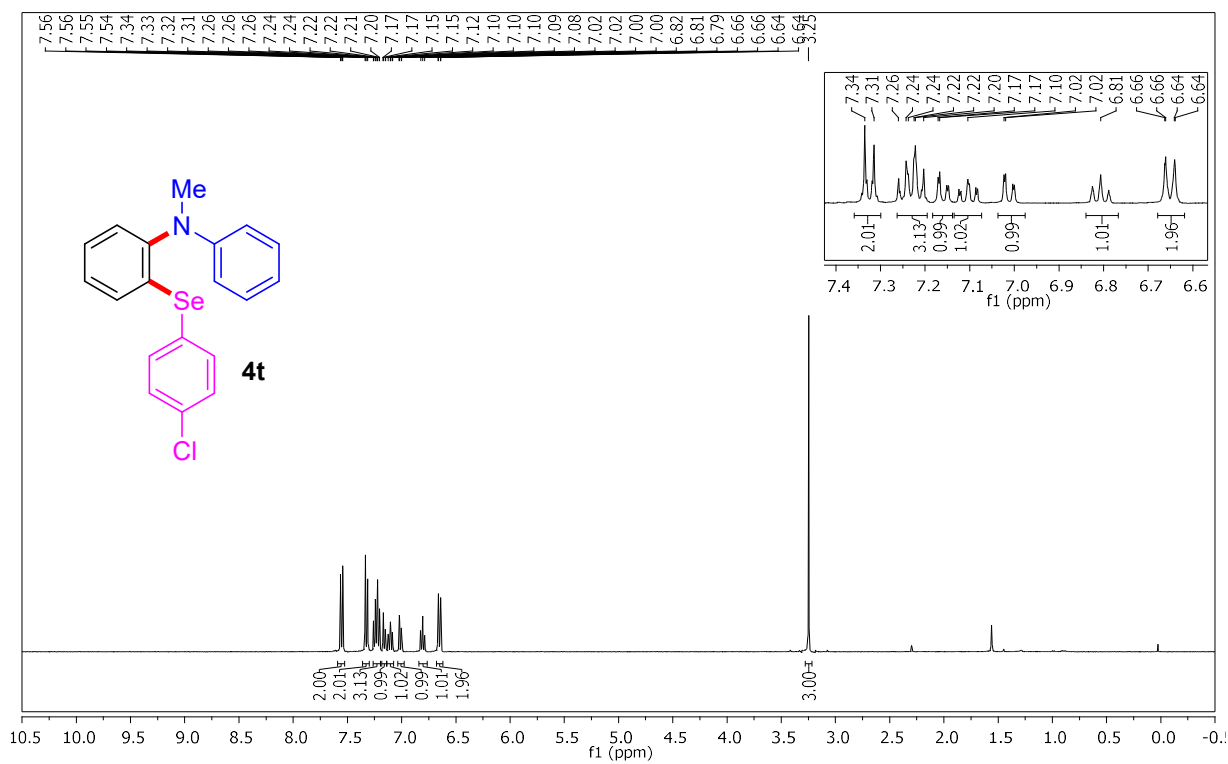


**2-((4-Bromophenyl)selanyl)-*N*-methyl-*N*-phenylaniline (4s)**

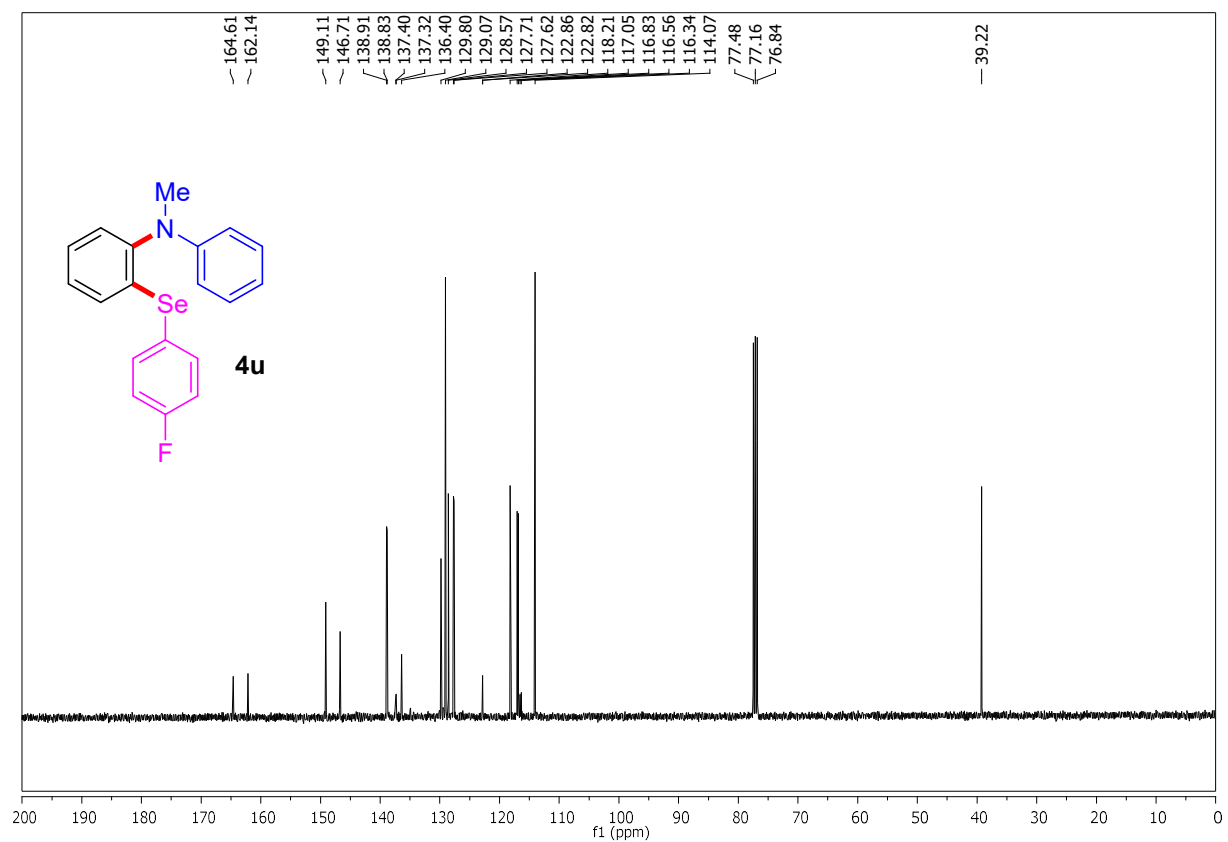
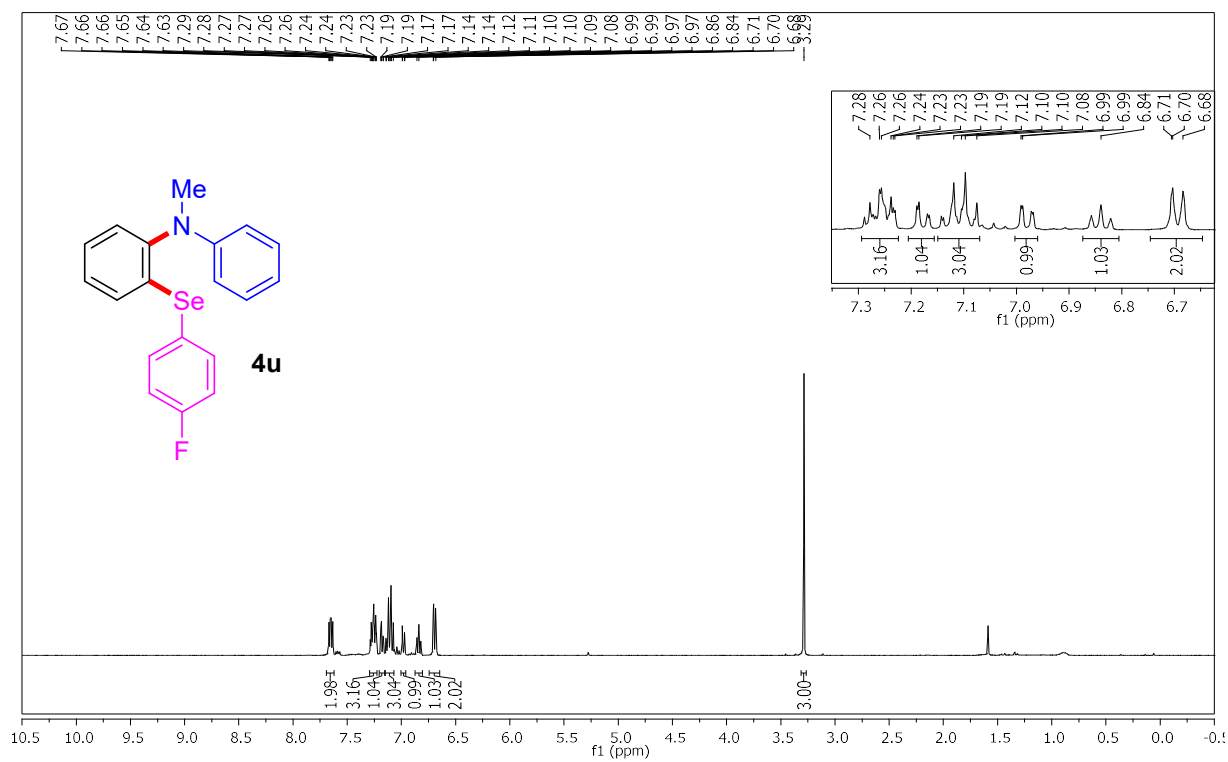




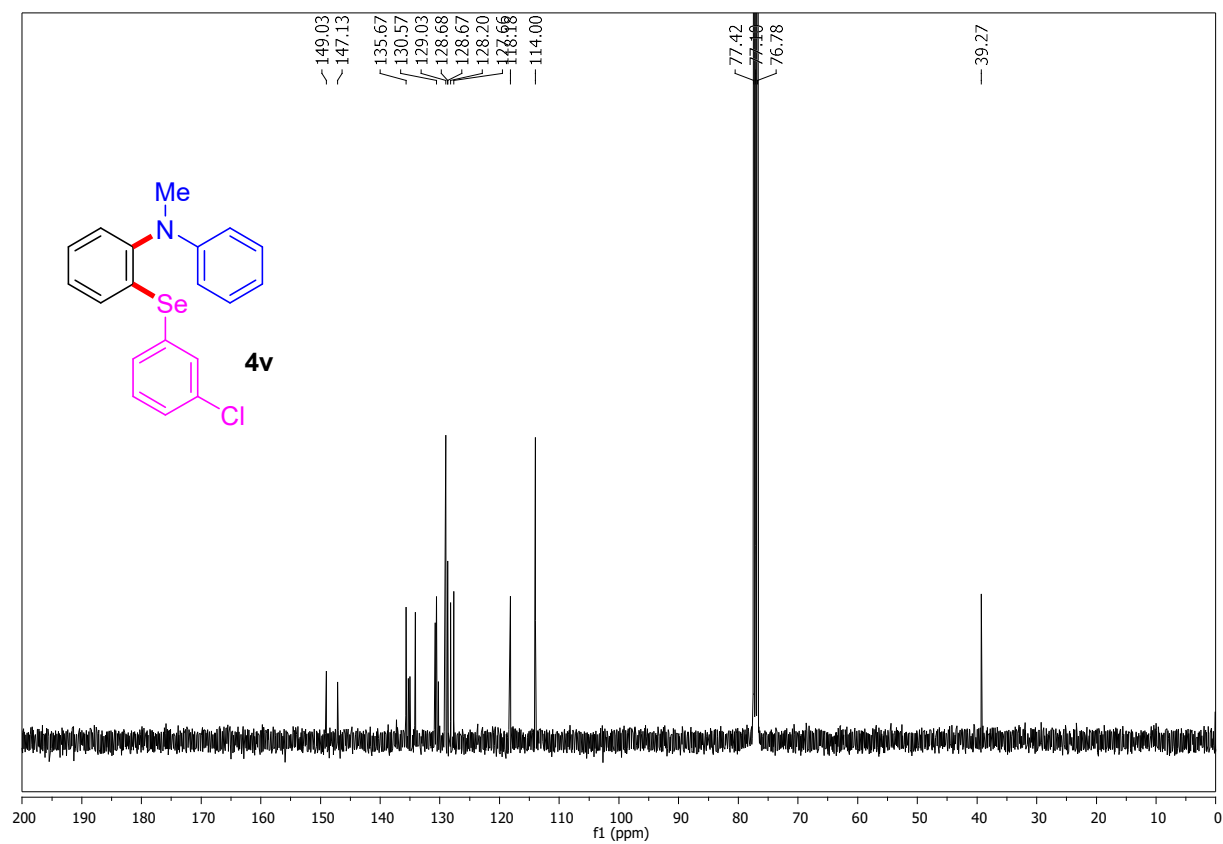
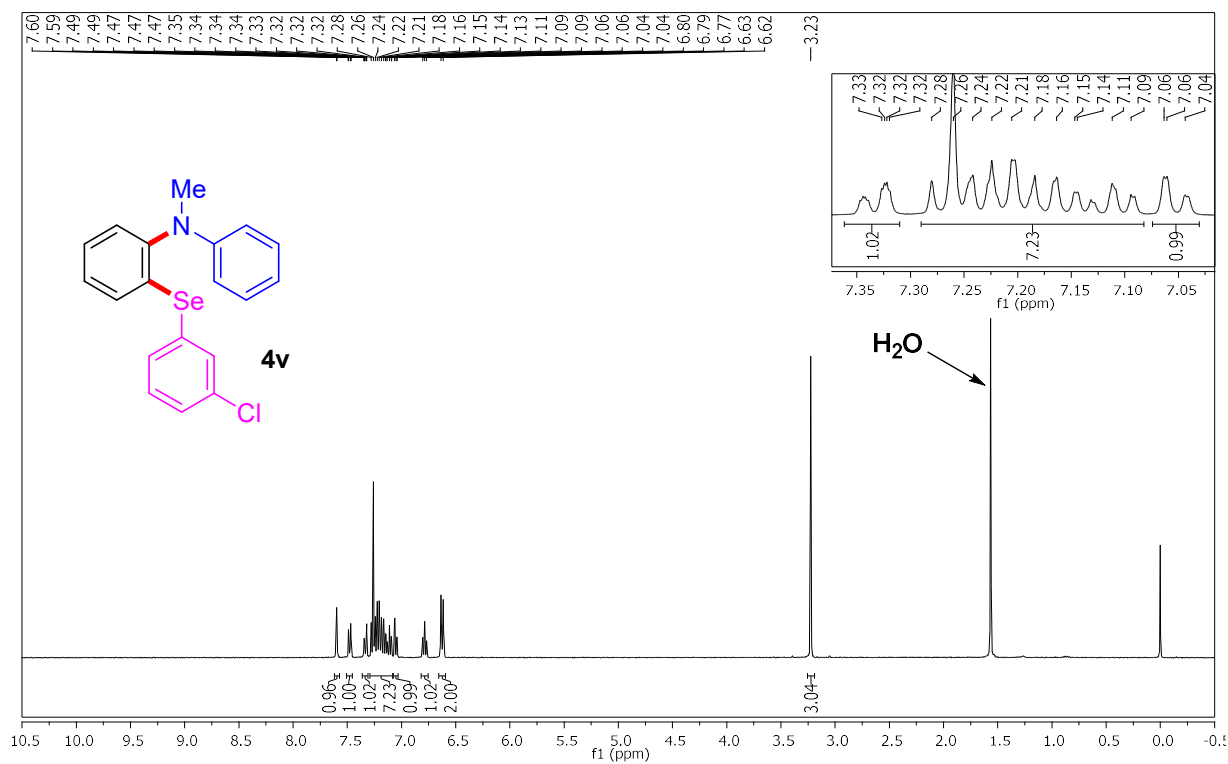
**2-((4-Chlorophenyl)selenyl)-N-methyl-N-phenylaniline (4t)**



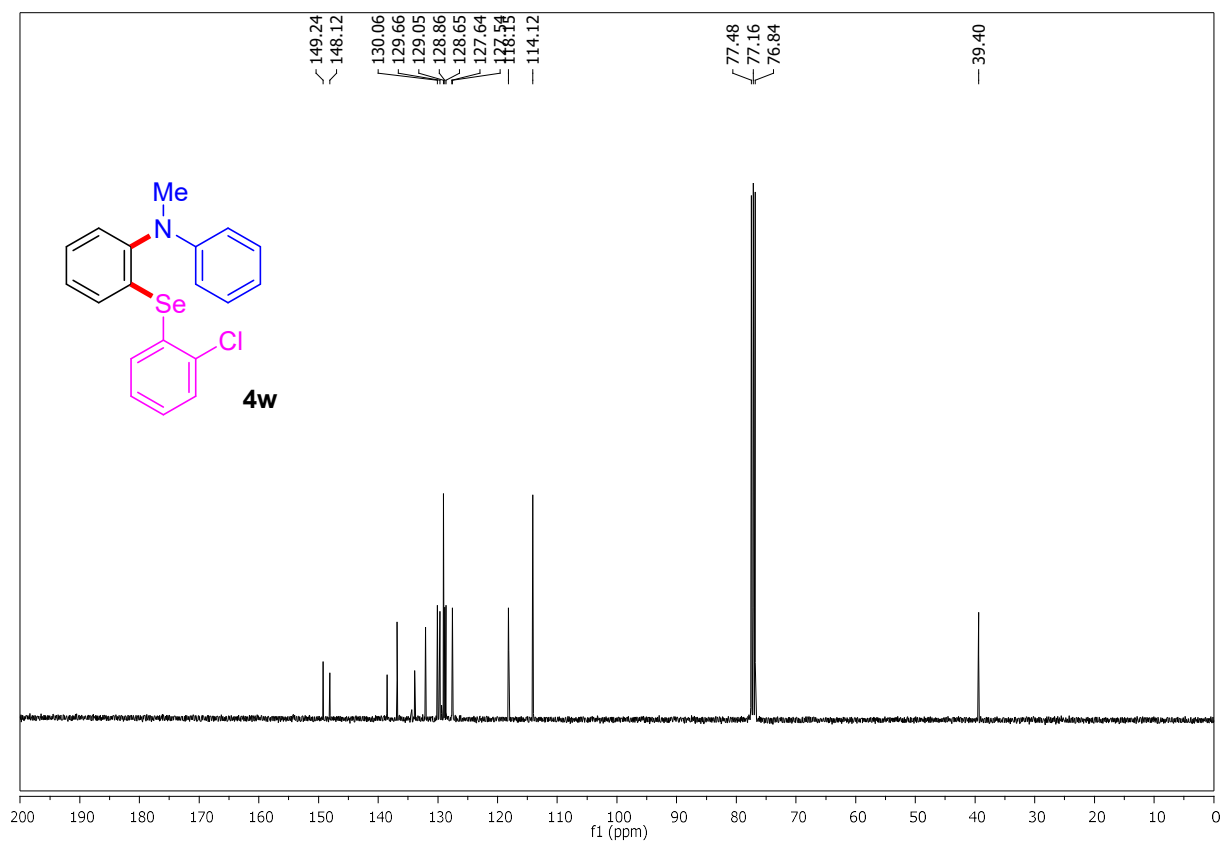
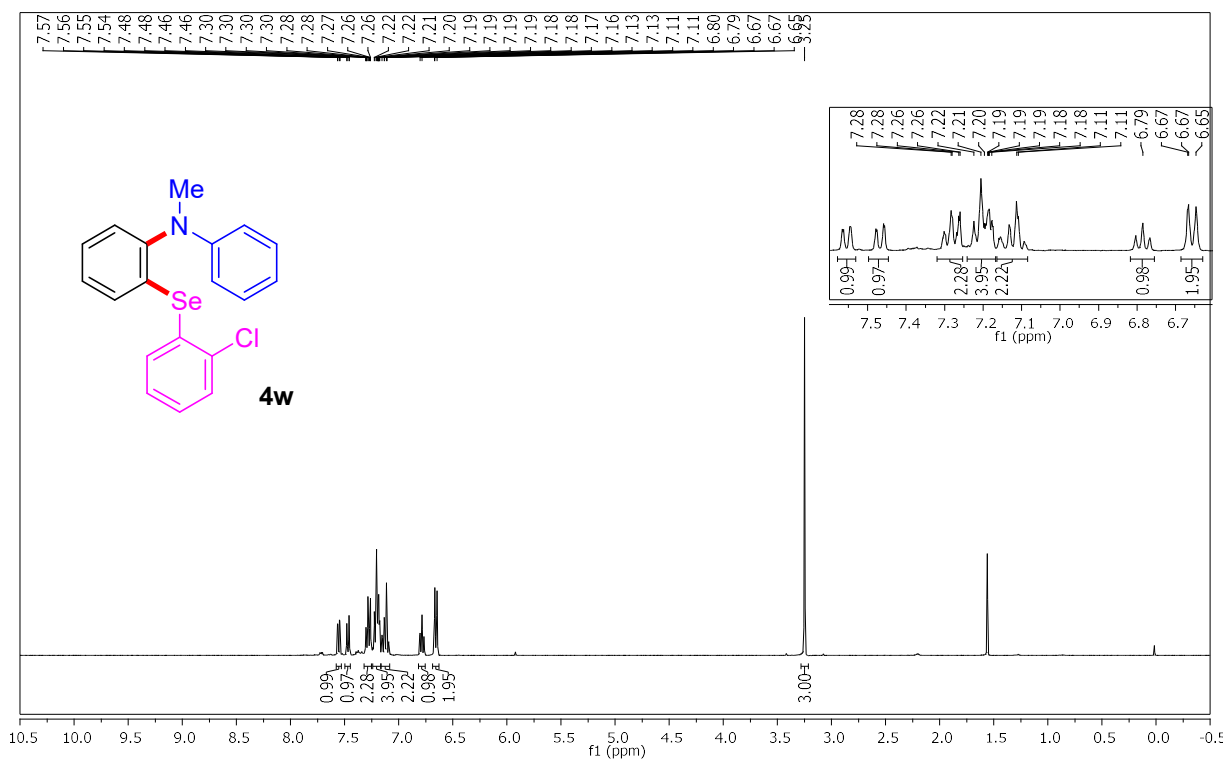
**2-((4-Fluorophenyl)selenanyl)-N-methyl-N-phenylaniline (4u)**



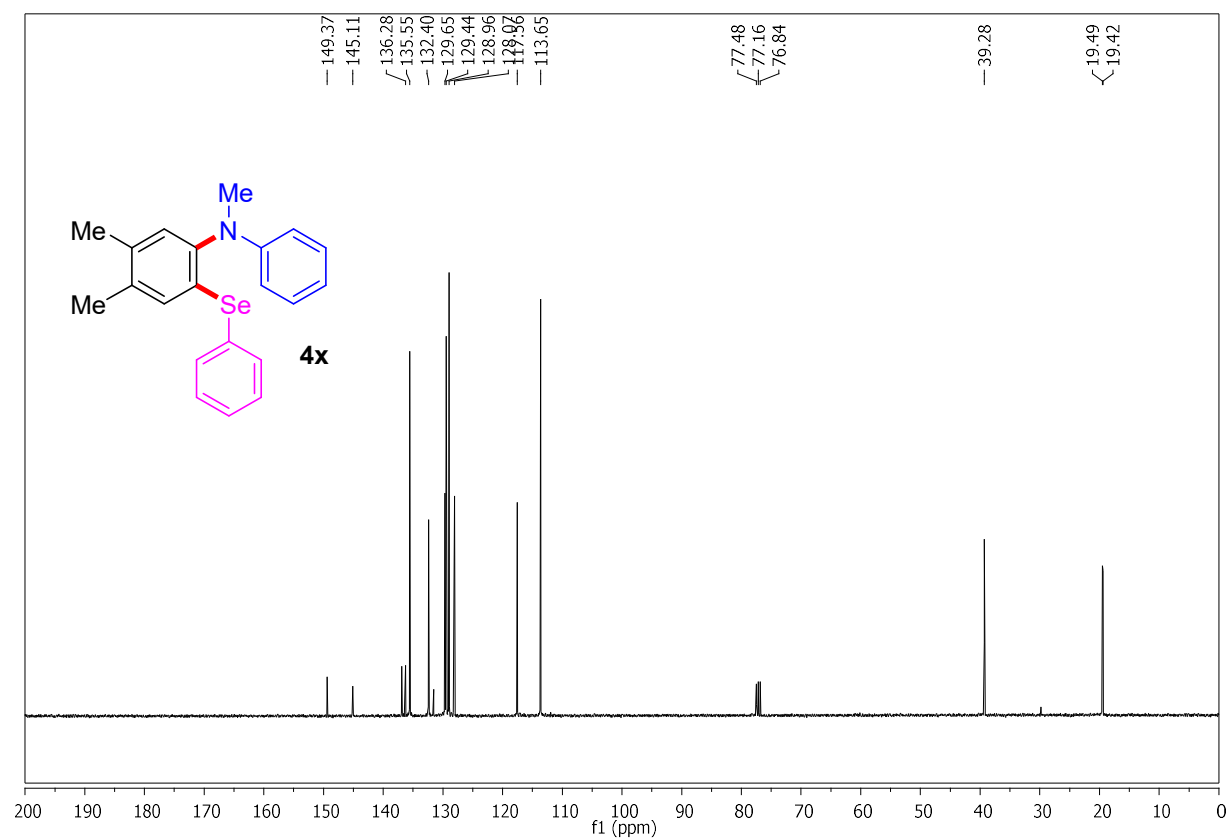
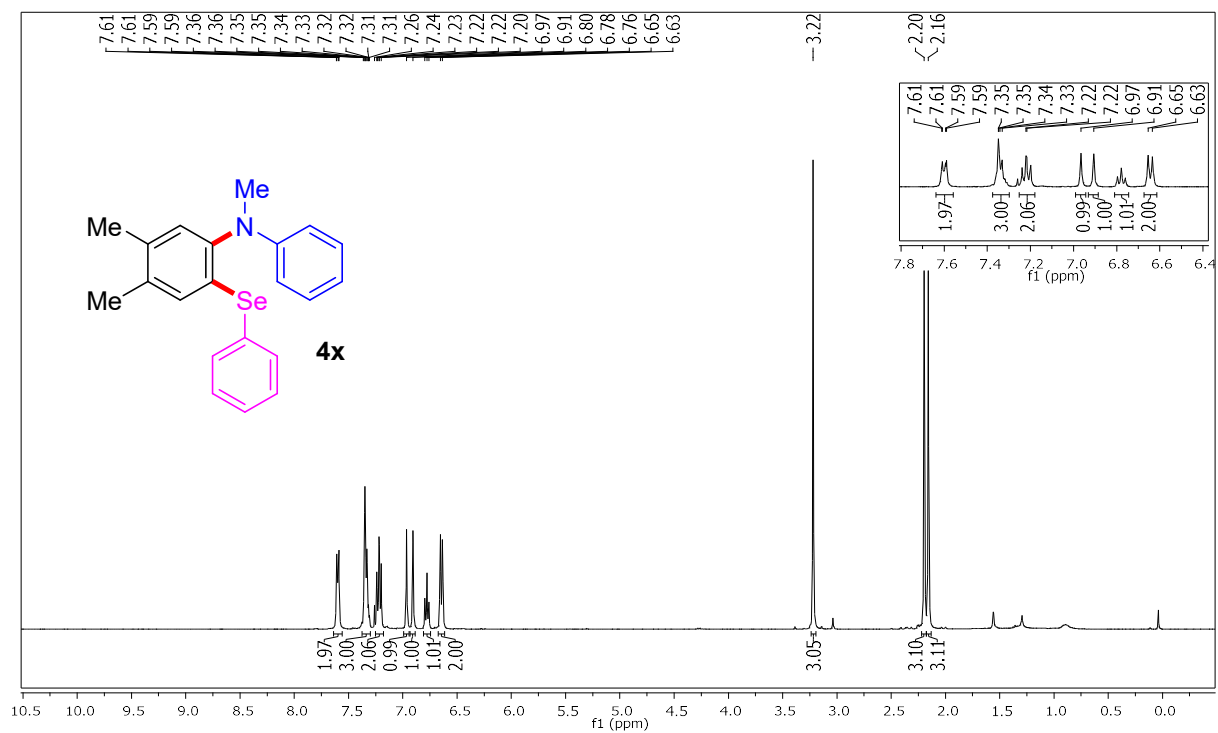
**2-((3-Chlorophenyl)selenyl)-N-methyl-N-phenylaniline (4v)**



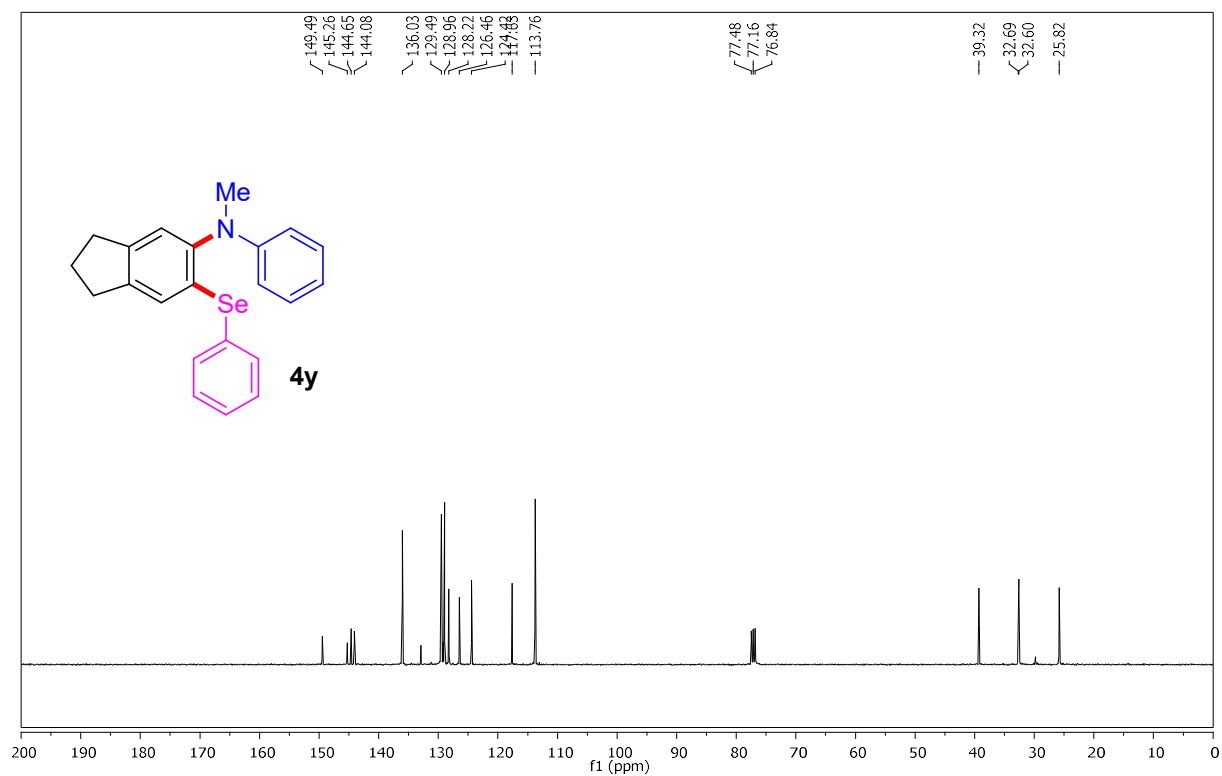
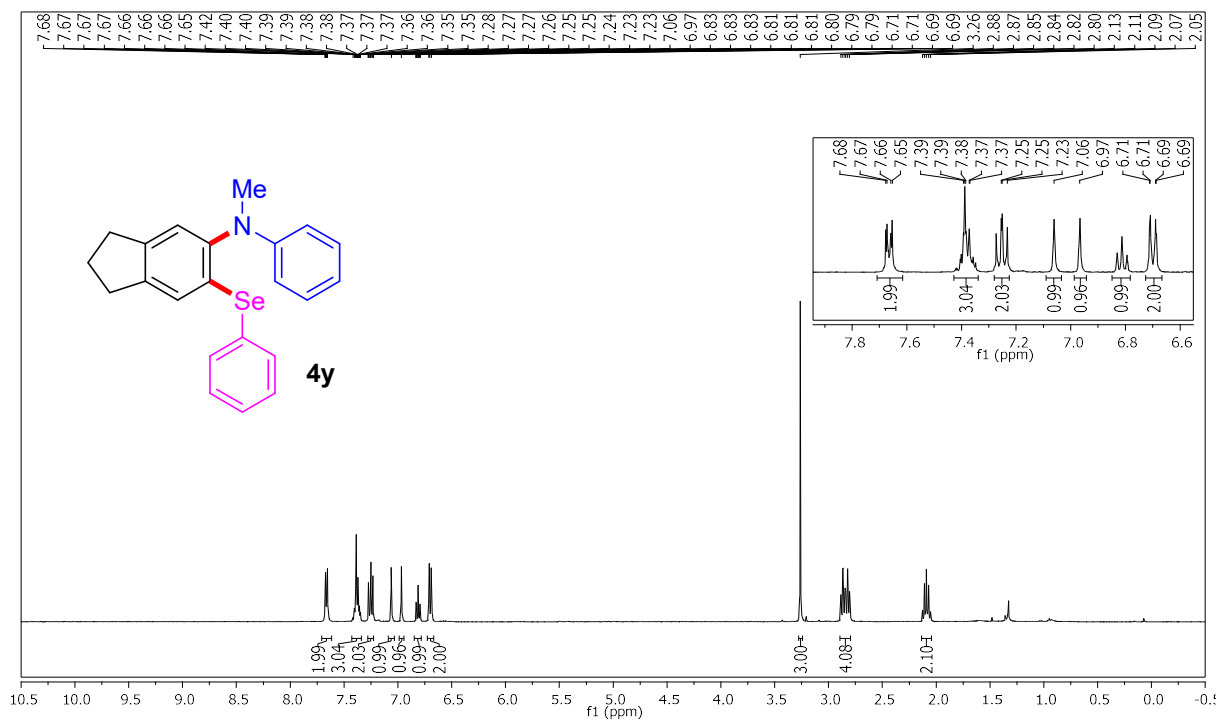
**2-((2-Chlorophenyl)selanyl)-N-methyl-N-phenylaniline (4v)**



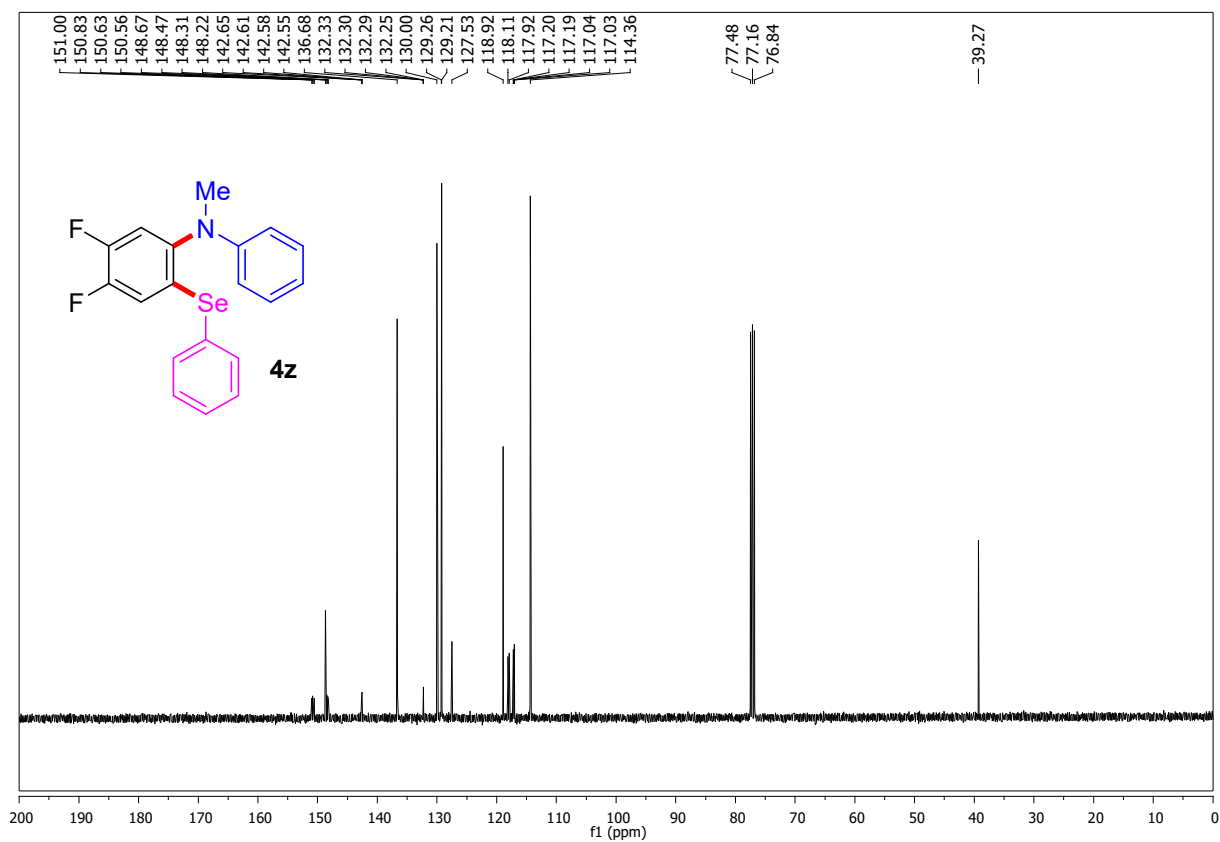
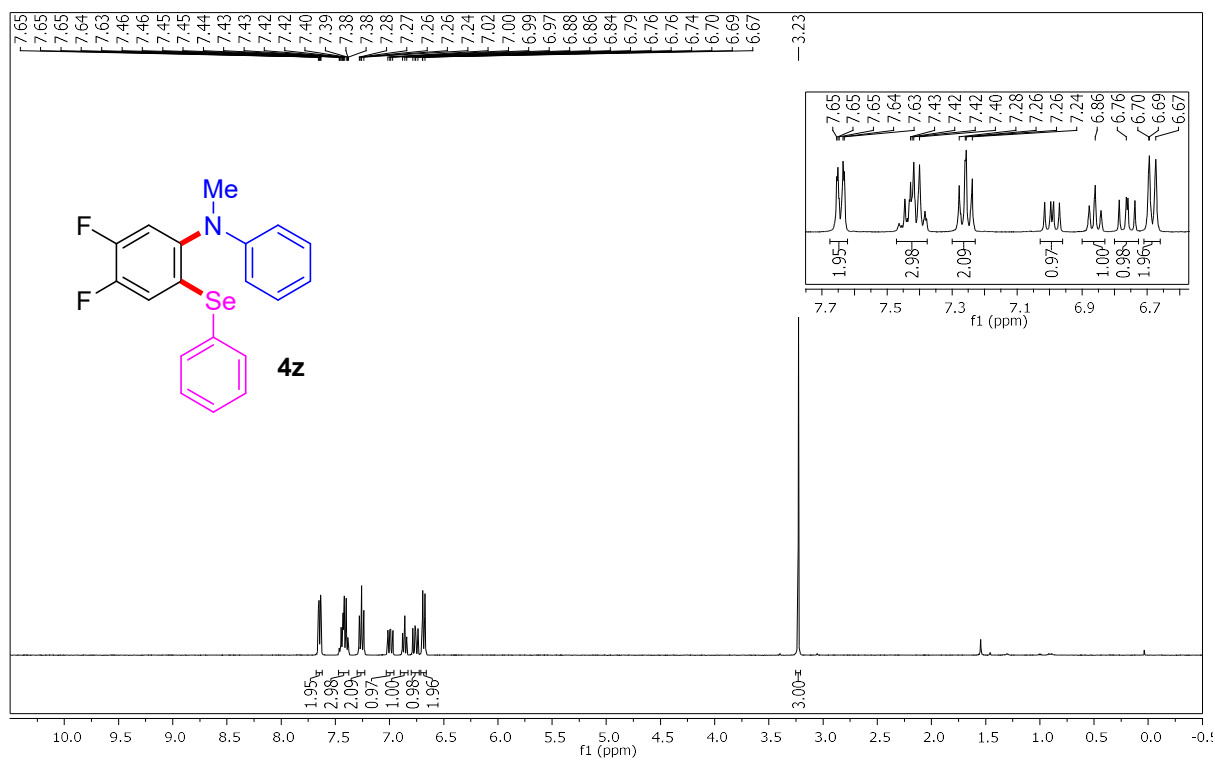
***N*,4,5-Trimethyl-*N*-phenyl-2-(phenylselanyl)aniline (4x)**



***N*-Methyl-*N*-phenyl-6-(phenylselanyl)-2,3-dihydro-1*H*-inden-5-amine (4y)**

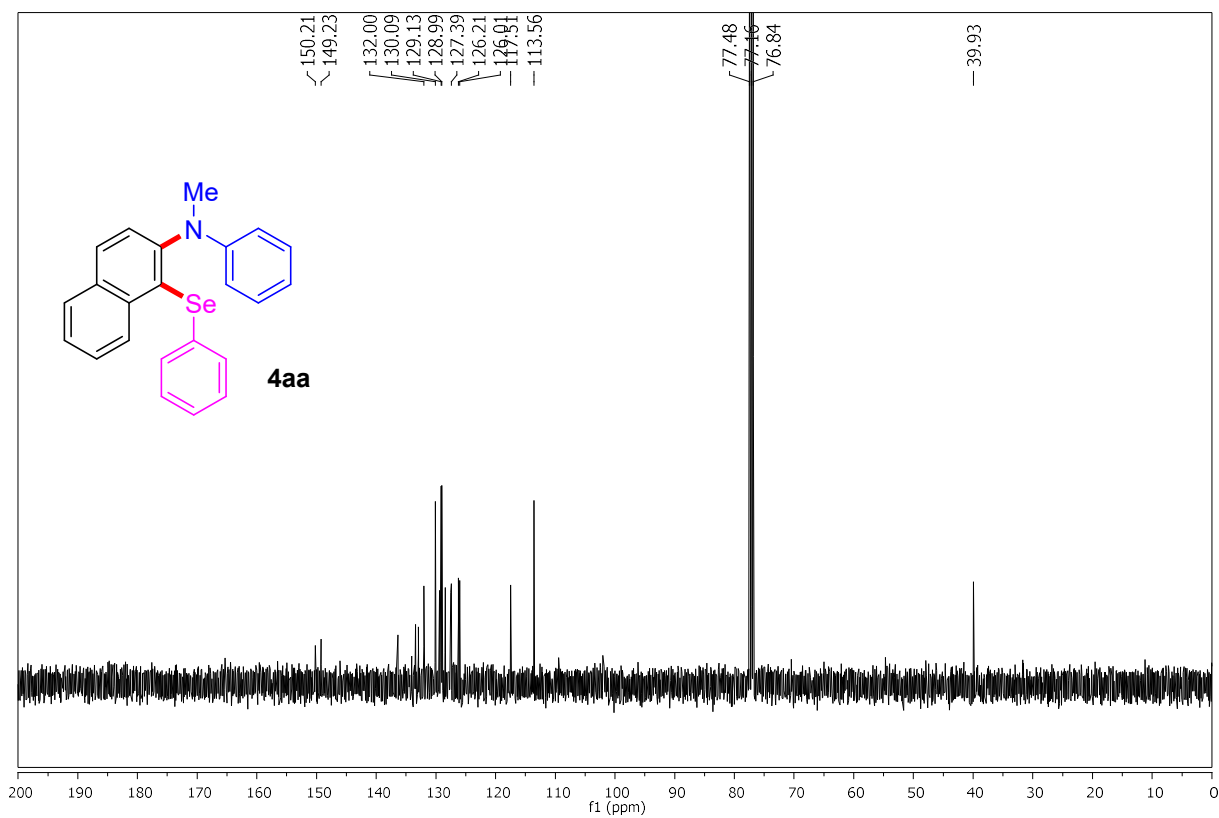
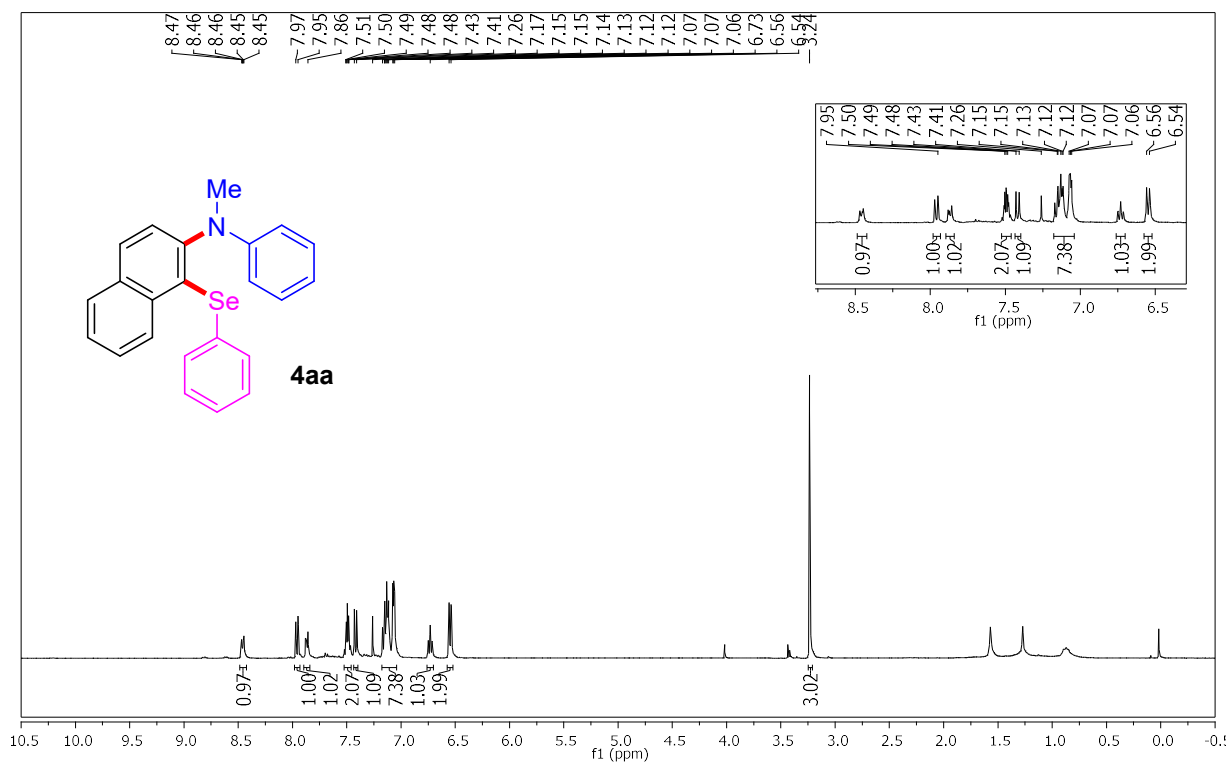


**4,5-Difluoro-N-methyl-N-phenyl-2-(phenylselanyl)aniline (4z)**

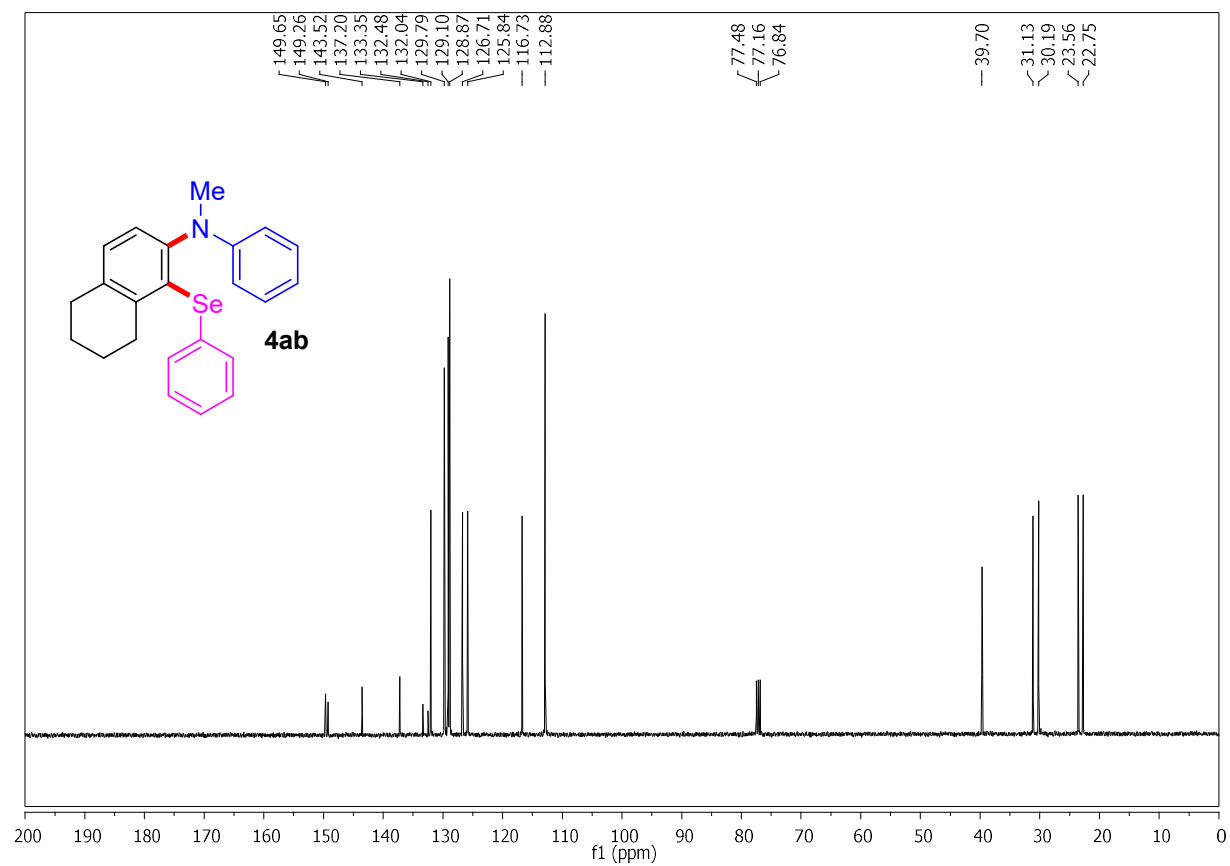
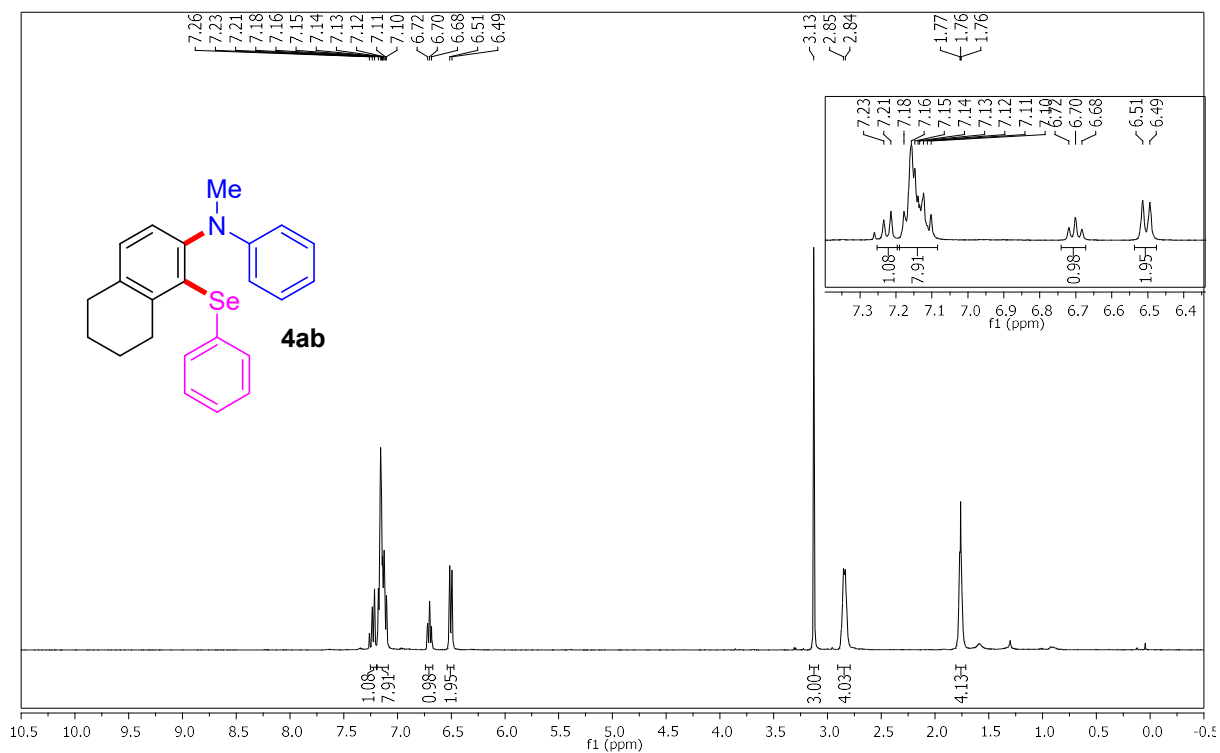


**N-Methyl-N-phenyl-1-(phenylselanyl)naphthalen-2-amine (4aa)**



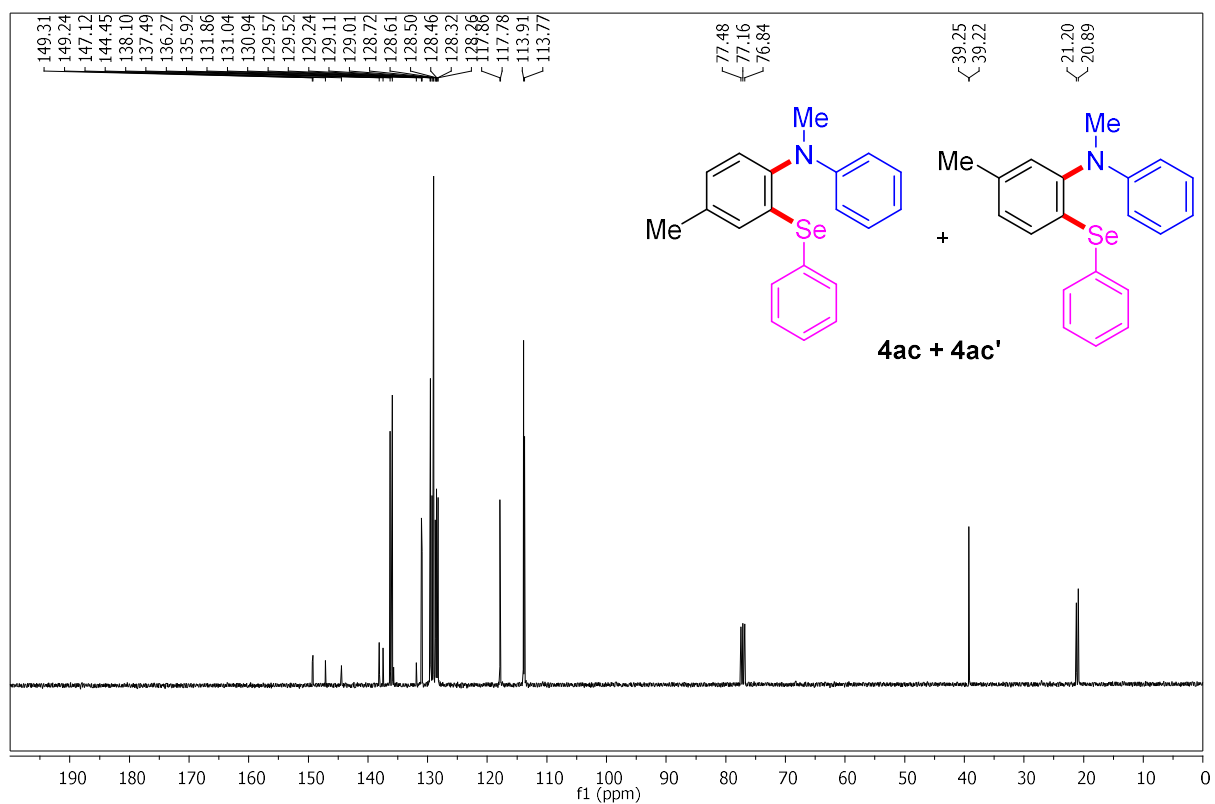
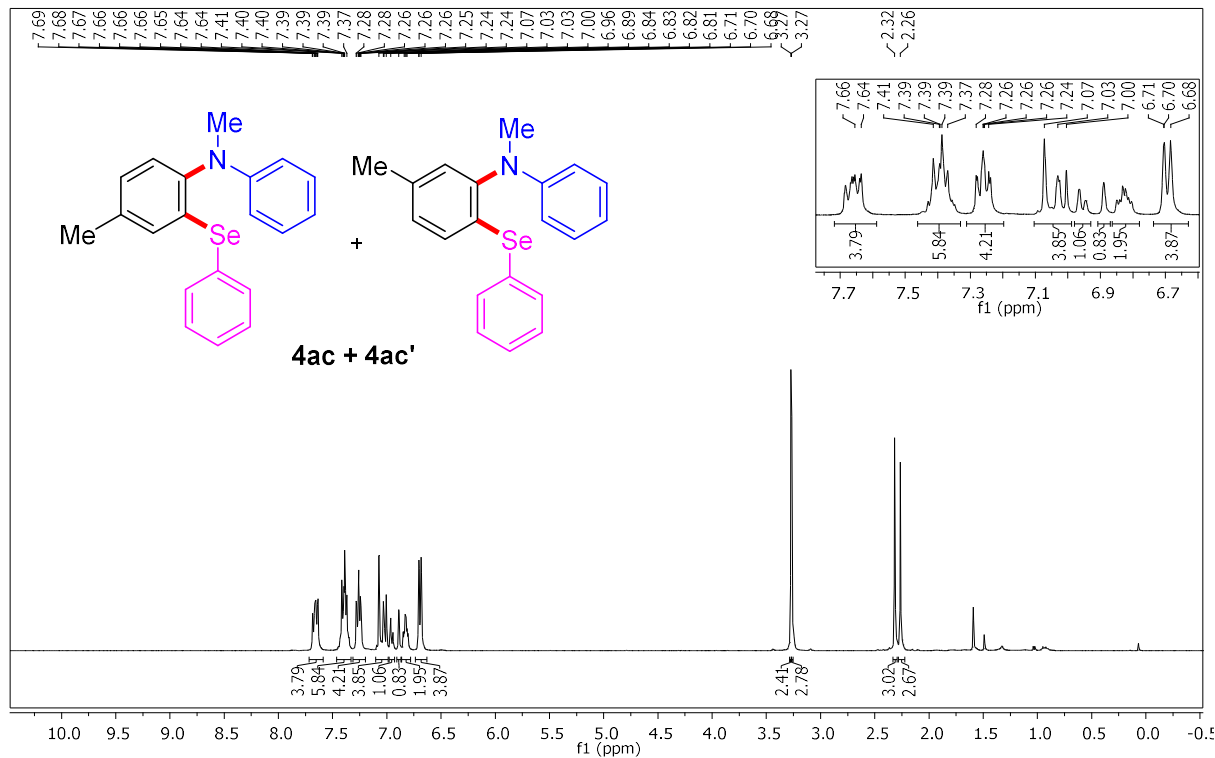


***N*-Methyl-*N*-phenyl-1-(phenylselanyl)-5,6,7,8-tetrahydronaphthalen-2-amine (4ab)**



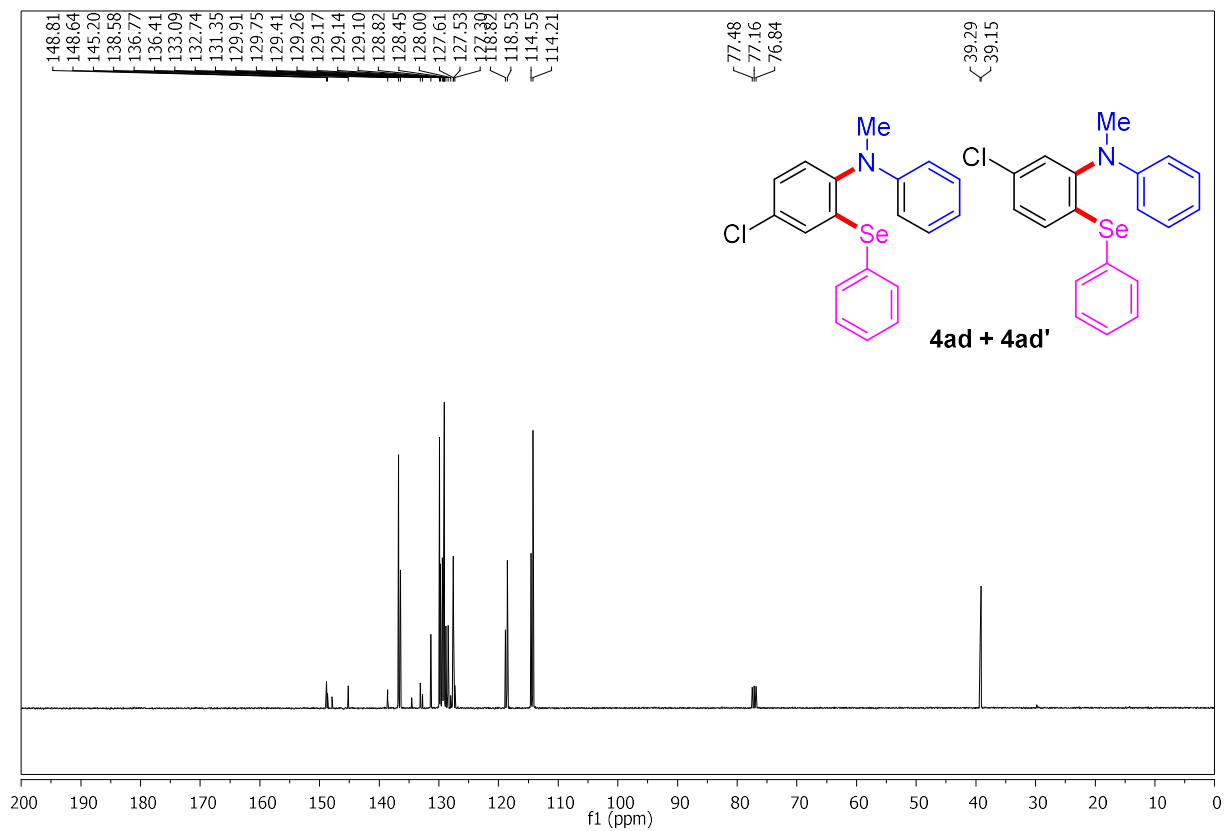
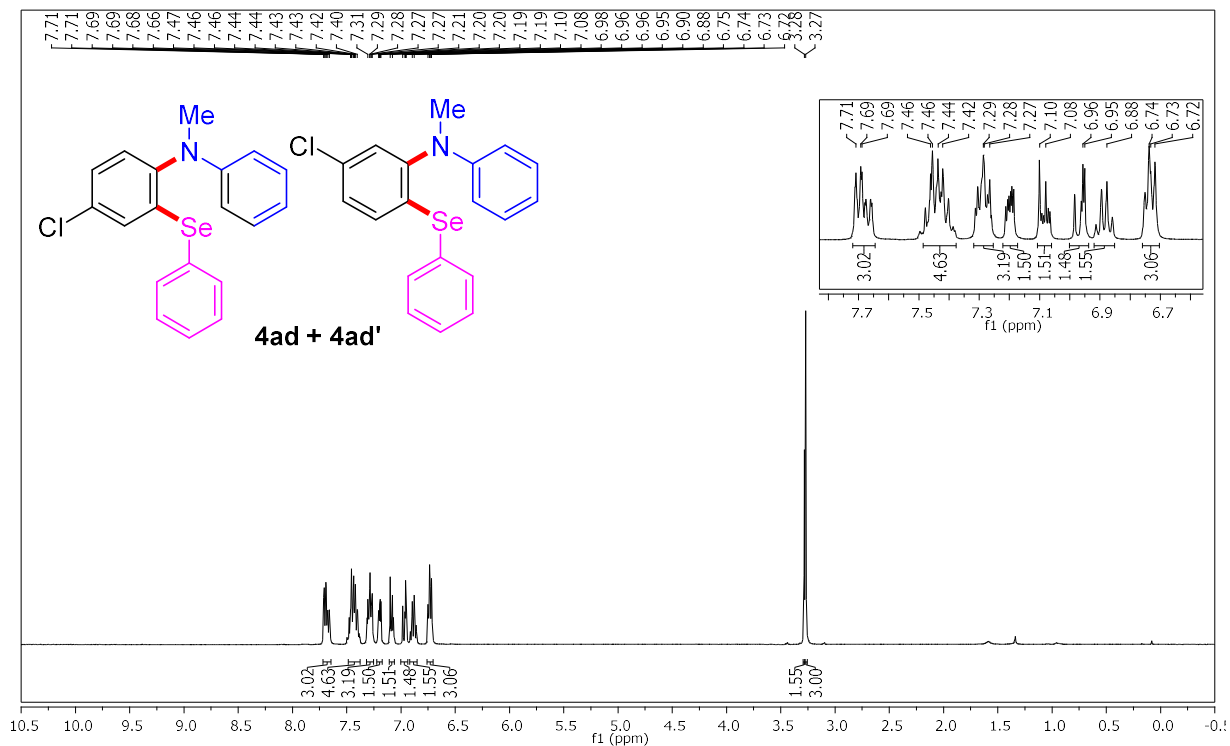
***N*,4-dimethyl-*N*-phenyl-2-(phenylselanyl)aniline (4ac) and**

***N*,5-dimethyl-*N*-phenyl-2-(phenylselanyl)aniline (4ac')**



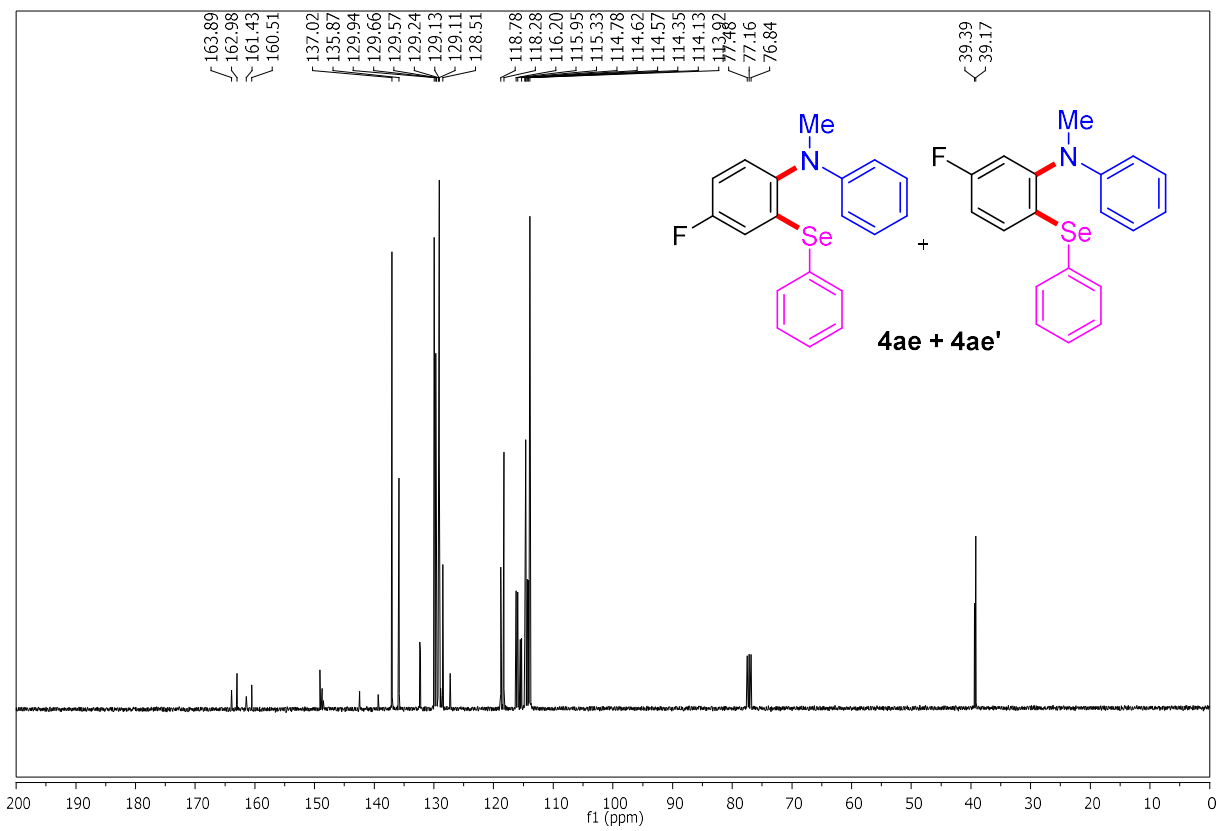
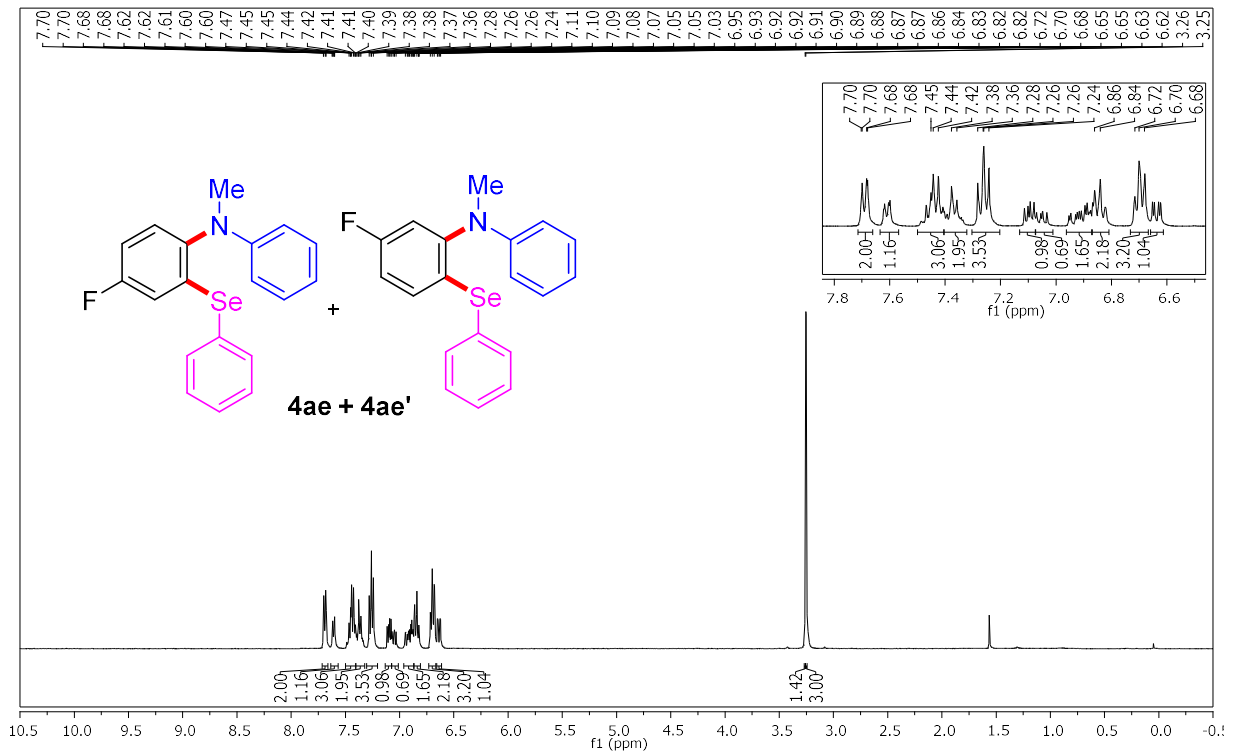
**4-Chloro-*N*-methyl-*N*-phenyl-2-(phenylselanyl)aniline (4ad) and**

**5-Chloro-N-methyl-N-phenyl-2-(phenylselanyl)aniline (4ad')**

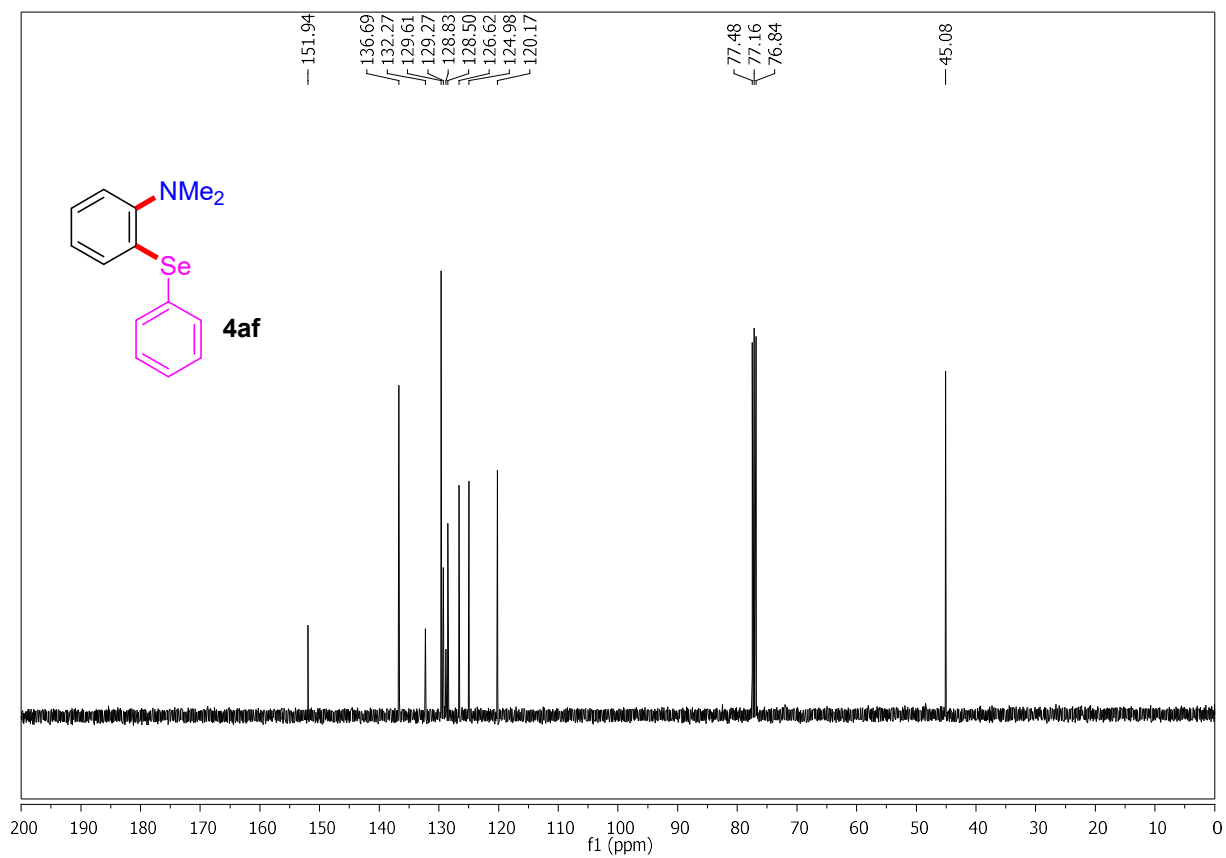
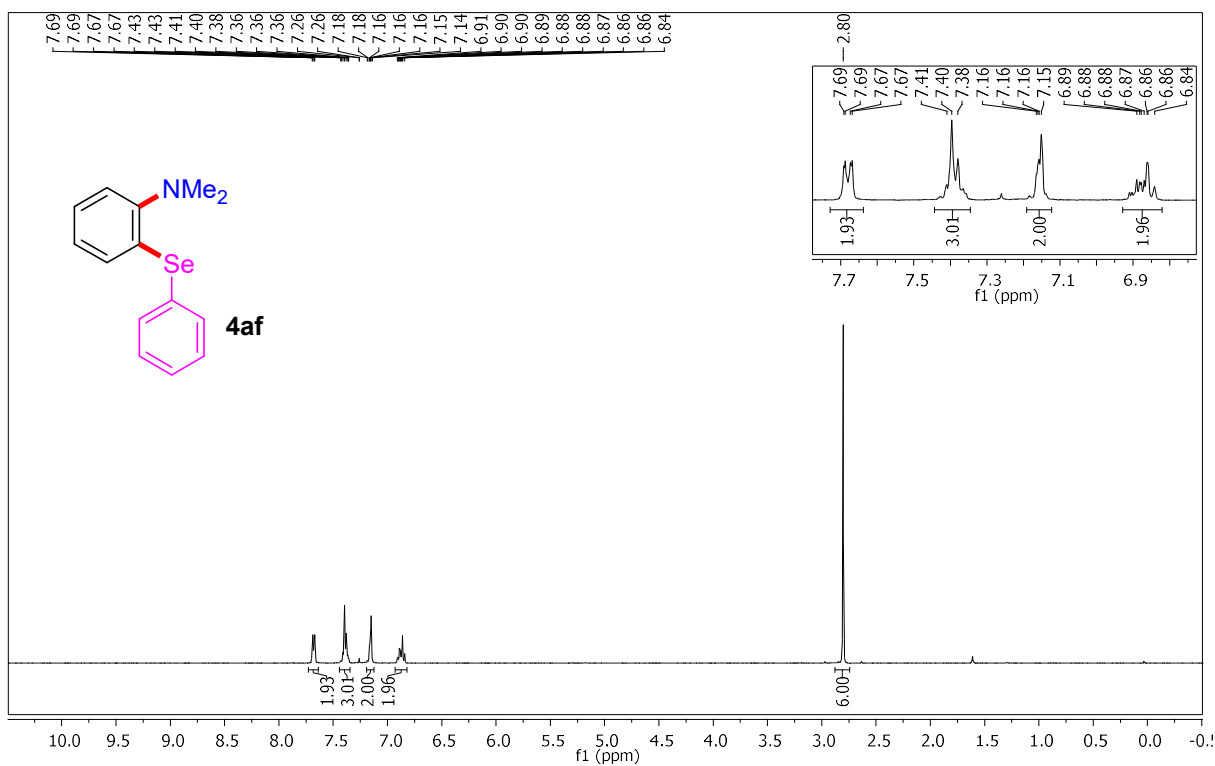


**4-Fluoro-N-methyl-N-phenyl-2-(phenylselanyl)aniline (4ae) and**

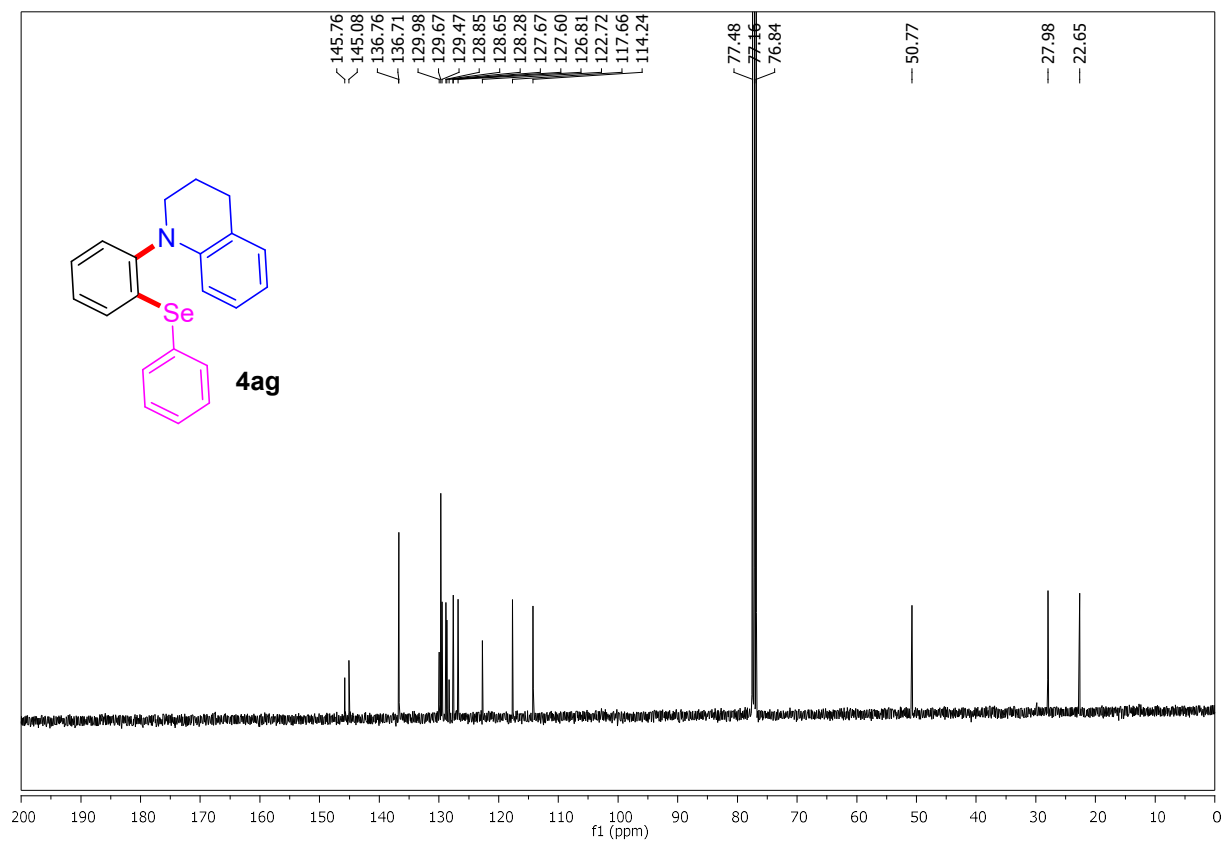
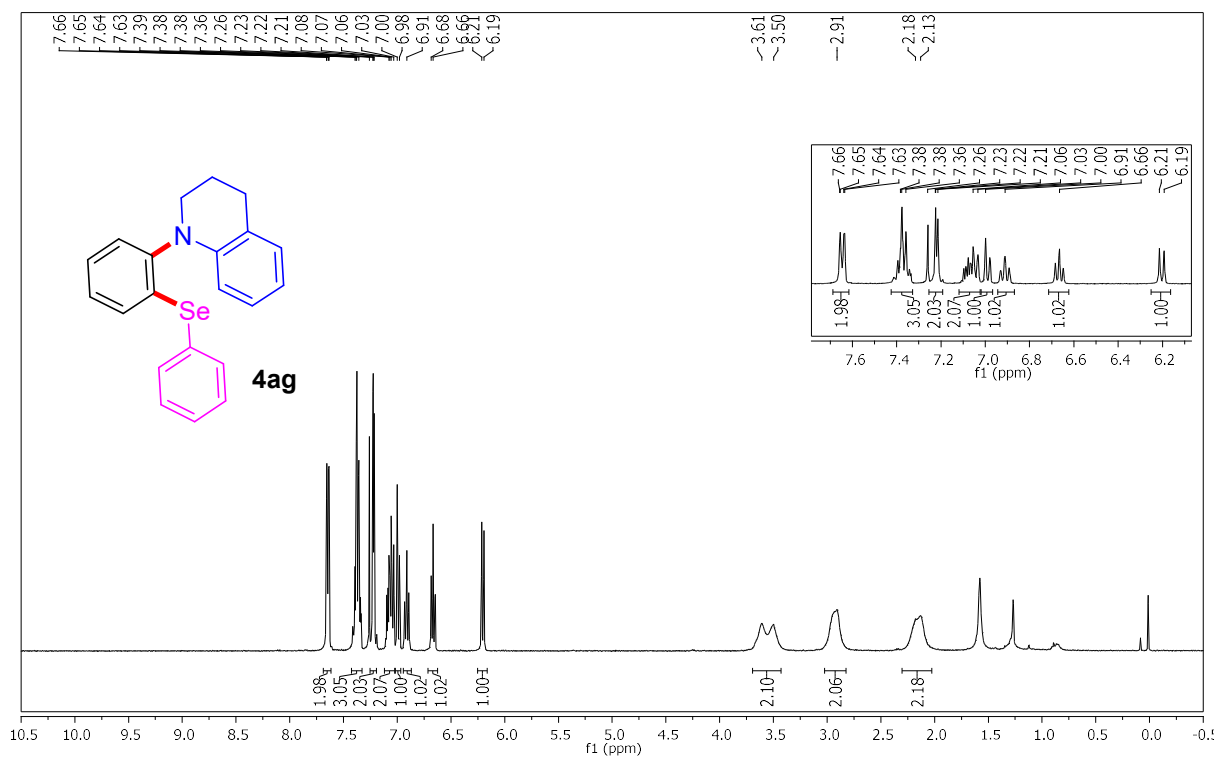
**5-fluoro-*N*-methyl-*N*-phenyl-2-(phenylselanyl)aniline (4ae')**



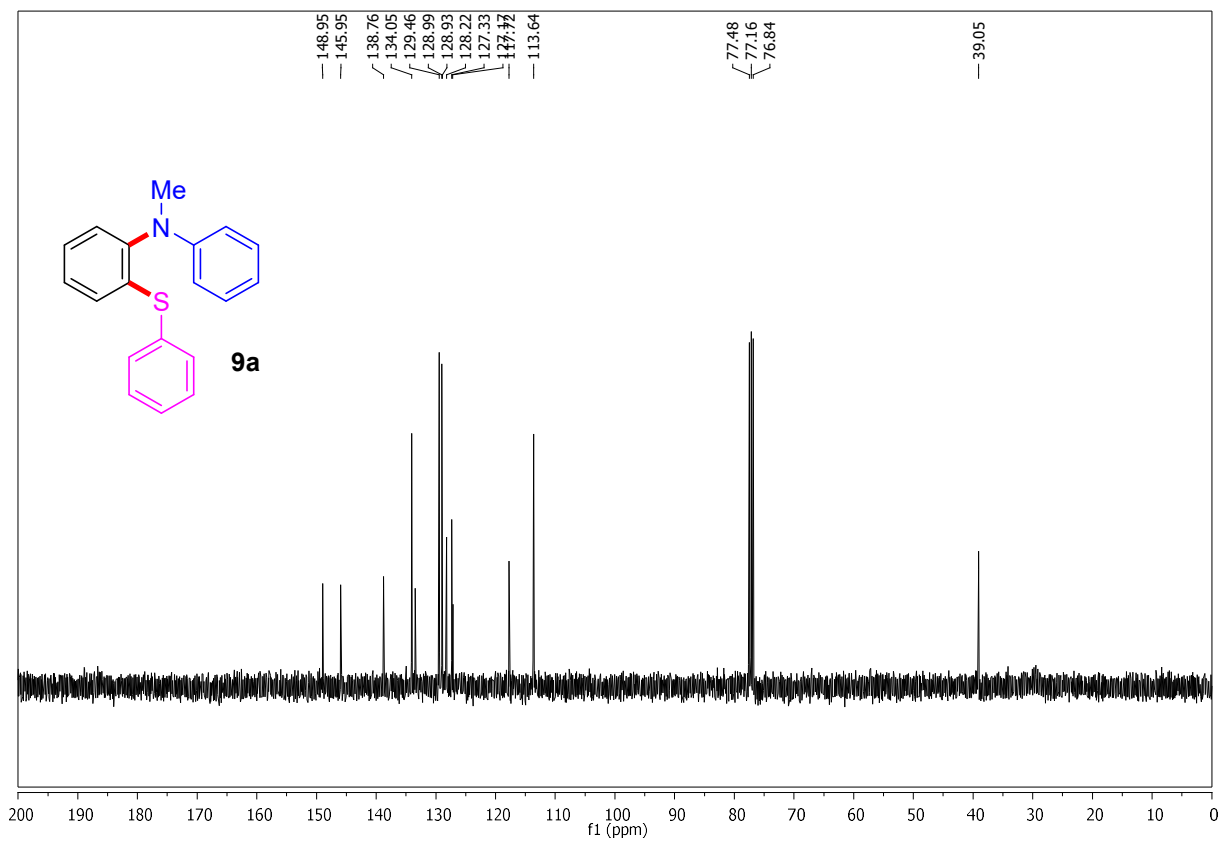
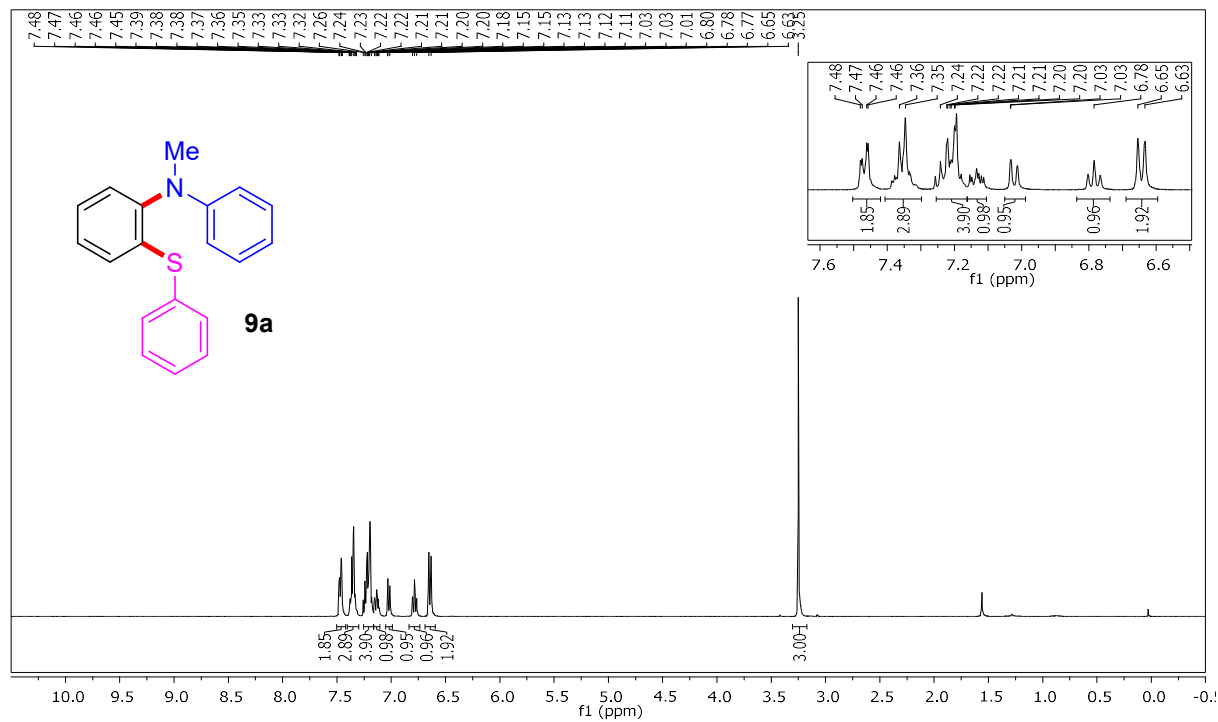
***N,N*-Dimethyl-2-(phenylselanyl)aniline (4af)**



**1-(2-(Phenylselanyl)phenyl)-1,2,3,4-tetrahydroquinoline (4ag)**

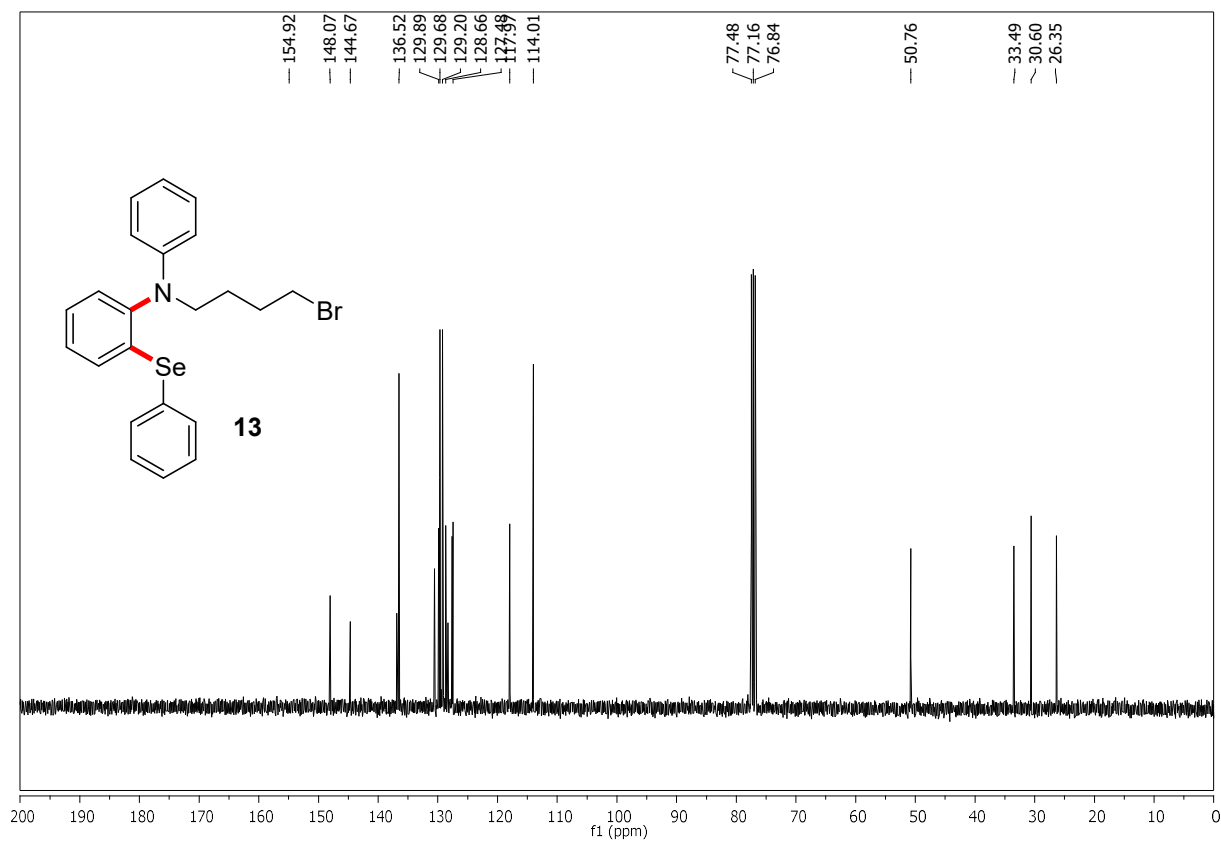
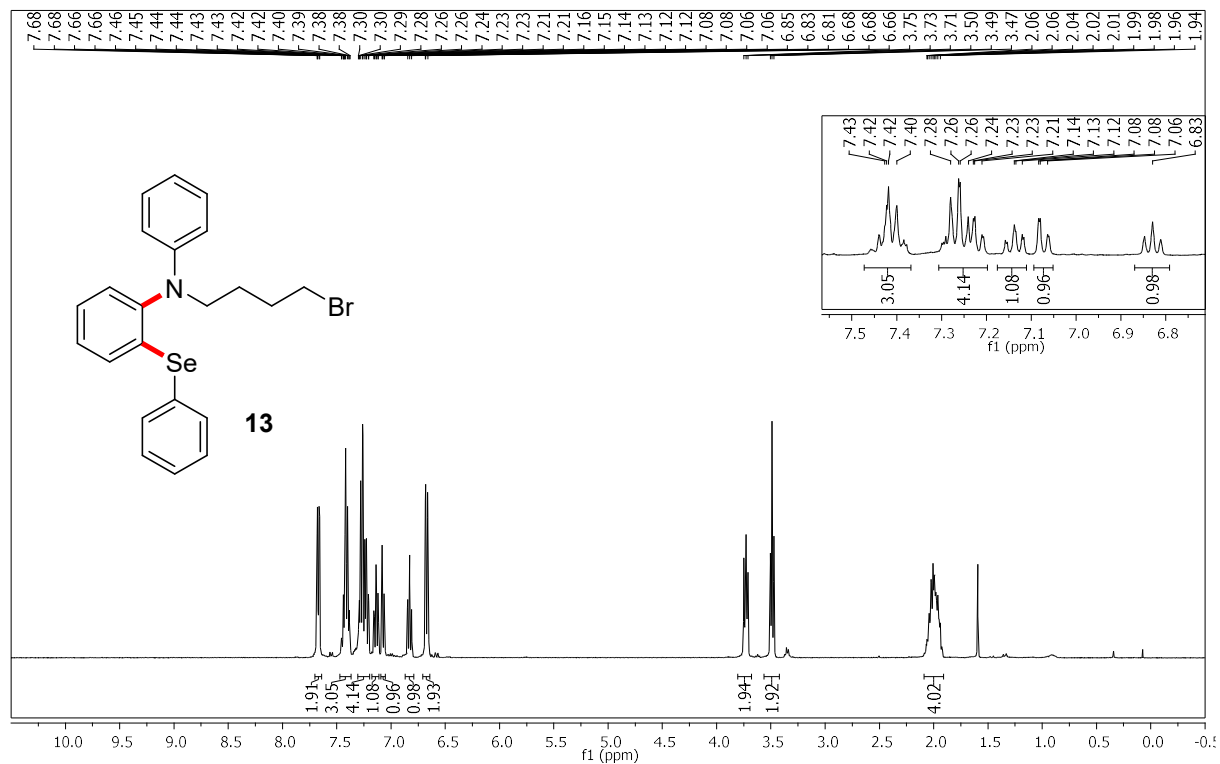


### ***N*-Methyl-*N*-phenyl-2-(phenylthio)aniline (**9a**)**





***N*-(4-Bromobutyl)-*N*-phenyl-2-(phenylselanyl)aniline (13)**



***N*-Phenyl-2-(phenylselanyl)-*N*-(4-(phenylselanyl)butyl)aniline (14)**

