

**Supporting Information**  
**for**  
**VISIBLE-LIGHT-PROMOTED *Se*-ARYLATION OF DIARYL DISELENIDES**  
**WITH 2-PHENYLIMIDAZOPYRIDINES IN THE PRESENCE OF**  
**AMMONIUM IODIDE:**  
**SYNTHESIS OF 2-PHENYL-3-(ARYLSELANYL)IMIDAZO[1,2-*a*]PYRIDINES**

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Characterization data of 3-selanylimidazo[1,2-*a*]pyridines (**3-9**, **11**, **13**)

**2-Phenyl-3-(phenylselanyl)imidazo[1,2-*a*]pyridine (3)**<sup>1</sup>: Yield: 161 mg (92%). Colorless powder (CH<sub>2</sub>Cl<sub>2</sub>-Hexane); Mp 98-99 °C; *R<sub>f</sub>* = 0.6 (hexane-EtOAc, 3:2). <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>): δ = 6.75 (t, *J* = 6.8 Hz, 1H, Ar-H), 7.06-7.12 (m, 5H, Ar-H), 7.23 (t, *J* = 6.8 Hz, 1H, Ar-H), 7.34 (t, *J* = 7.3 Hz, 1H, Ar-H), 7.42 (t, *J* = 7.3 Hz, 2H, Ar-H), 7.68 (d, *J* = 8.8 Hz, 1H, Ar-H), 8.17 (d, *J* = 7.3 Hz, 2H, Ar-H), 8.28 (d, *J* = 6.8 Hz, 1H, Ar-H). <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>): δ = 102.7 (s), 112.9 (d), 117.4 (d), 125.5 (d), 126.3 (d), 126.6 (d), 128.1 (d), 128.2 (d), 128.4 (d), 128.7 (d), 129.6 (d), 130.8 (s), 133.8 (s), 147.6 (s), 151.7 (s). MS (EI, 70 eV): *m/z* (%) = 78 (70), 270 (100), 350 (35) [M]<sup>+</sup>. HRMS: *m/z* [M]<sup>+</sup> calcd for C<sub>19</sub>H<sub>14</sub>N<sub>2</sub>Se: 350.0322; Found: 350.0330.

**3-[(4-Methoxyphenyl)selanyl]-2-phenylimidazo[1,2-*a*]pyridine (4)**<sup>2</sup>: Yield: 147 mg (78%). Colorless prisms (CH<sub>2</sub>Cl<sub>2</sub>-Hexane); Mp 107-109 °C; *R<sub>f</sub>* = 0.6 (Hexane-EtOAc, 3:2). <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>): δ = 3.71 (s, 3H, Me), 6.72 (dt, *J* = 8.8, 3.4 Hz, 2H, Ar-H), 6.86 (td, *J* = 6.8, 1.0 Hz, 1H, Ar-H), 7.10 (dt, *J* = 8.8, 2.9 Hz, 2H, Ar-H), 7.29 (td, *J* = 6.8, 1.0 Hz, 1H, Ar-H), 7.38 (tt, *J* = 7.3, 1.5 Hz, 1H, Ar-H), 7.46 (td, *J* = 6.8, 1.5 Hz, 2H, Ar-H), 7.71 (dd, *J* = 8.8, 1.0 Hz, 1H, Ar-H), 8.19 (dd, *J* = 7.3, 1.5 Hz, 2H, Ar-H), 8.39 (dt, *J* = 6.8, 1.5 Hz, 1H, Ar-H). <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>): δ = 55.2 (q), 104.1 (s), 113.0 (d), 115.4 (d), 117.4 (d), 120.4 (s), 125.6 (d), 126.4 (d), 128.3 (d), 128.4 (d), 128.8 (d), 130.7 (d), 133.7 (s), 147.3 (s), 150.9 (s), 159.1 (s). MS (EI, 70 eV): *m/z* (%) = 61 (50), 152 (50), 194 (100), 300 (70), 380 (30) [M]<sup>+</sup>. HRMS: *m/z* [M]<sup>+</sup> calcd for C<sub>20</sub>H<sub>16</sub>N<sub>2</sub>OSe: 380.0428; Found: 380.0422.

**3-[(4-Methylphenyl)selanyl]-2-phenylimidazo[1,2-*a*]pyridine (5)<sup>3</sup>:** Yield: 158 mg (87%). Colorless plates (CH<sub>2</sub>Cl<sub>2</sub>-Hexane); Mp 134-135 °C; *R<sub>f</sub>* = 0.6 (Hexane-EtOAc, 3:2). <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>): δ = 2.24 (s, 3H, Me), 6.84 (dt, *J* = 6.8, 1.0 Hz, 1H, Ar-H), 6.97-7.03 (m, 4H, Ar-H), 7.29 (dt, *J* = 7.8, 1.5 Hz, 1H, Ar-H), 7.37 (tt, *J* = 7.3, 1.5 Hz, 1H, Ar-H), 7.44 (t, *J* = 6.7 Hz, 2H, Ar-H), 7.70 (d, *J* = 8.8 Hz, 1H, Ar-H), 8.16 (d, *J* = 6.7 Hz, 2H, Ar-H), 8.35 (d, *J* = 6.8 Hz, 1H, Ar-H). <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>): δ = 20.9 (q), 103.2 (s), 112.9 (d), 117.4 (d), 125.6 (d), 126.3 (d), 126.9 (s), 128.3 (d), 128.4 (d), 128.5 (d), 128.7 (d), 130.4 (d), 133.8 (s), 136.7 (s), 147.6 (s), 151.5 (s). MS (EI, 70 eV): *m/z* (%) = 284 (100), 320 (20), 364 (50) [M]<sup>+</sup>. HRMS: *m/z* [M]<sup>+</sup> calcd for C<sub>20</sub>H<sub>16</sub>N<sub>2</sub>Se: 364.0479; Found: 364.0482.

**3-[(4-Chlorophenyl)selanyl]-2-phenylimidazo[1,2-*a*]pyridine (6)<sup>2</sup>:** Yield: 163 mg (85%). Colorless plates (CH<sub>2</sub>Cl<sub>2</sub>-Hexane); Mp 162-163 °C; *R<sub>f</sub>* = 0.6 (Hexane-EtOAc, 3:2). <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>): δ = 6.88 (td, *J* = 6.0, 0.8 Hz, 1H, Ar-H), 7.02 (dt, *J* = 8.4, 2.4 Hz, 2H, Ar-H), 7.14 (dt, *J* = 8.4, 2.4 Hz, 2H, Ar-H), 7.31-7.40 (m, 2H, Ar-H), 7.45 (t, *J* = 7.2 Hz, 2H, Ar-H), 7.73 (d, *J* = 8.8 Hz, 1H, Ar-H), 8.13 (dd, *J* = 6.8, 2.0 Hz, 2H, Ar-H), 8.32 (d, *J* = 6.8 Hz, 1H, Ar-H). <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>): δ = 102.4 (s), 113.2 (d), 117.6 (d), 125.4 (d), 126.7 (d), 128.3 (d), 128.6 (d), 128.7 (d), 129.0 (s), 129.5 (d), 129.8 (d), 132.9 (s), 133.5 (s), 147.7 (s), 151.9 (s). MS (EI, 70 eV): *m/z* (%) = 61 (55), 78 (30), 194 (100), 304 (70), 384 (40) [M]<sup>+</sup>. HRMS: *m/z* [M]<sup>+</sup> calcd for C<sub>19</sub>H<sub>13</sub>ClN<sub>2</sub>Se: 383.9932; Found: 383.9933.

**2-Phenyl-3-[(4-trifluoromethylphenyl)selanyl]imidazo[1,2-*a*]pyridine (7)<sup>3</sup>:** Yield: 194 mg (93%). Colorless needles (CH<sub>2</sub>Cl<sub>2</sub>-Hexane); Mp 174-176 °C; *R<sub>f</sub>* = 0.6

(Hexane-EtOAc, 3:2).  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ ):  $\delta$  = 6.90 (t,  $J$  = 6.8 Hz, 1H, Ar-H), 7.17 (d,  $J$  = 8.8 Hz, 2H, Ar-H), 7.34-7.46 (m, 6H, Ar-H), 7.77 (d,  $J$  = 8.8 Hz, 1H, Ar-H), 8.11 (d,  $J$  = 6.8 Hz, 2H, Ar-H), 8.30 (dd,  $J$  = 6.8, 1.0 Hz, 1H, Ar-H).  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ ):  $\delta$  = 101.5 (s), 113.4 (d), 117.7 (d), 123.9 (q,  $^1J_{\text{C-F}}$  = 271 Hz), 125.4 (d), 126.4 (q,  $^3J_{\text{C-F}}$  = 4.1 Hz), 126.9 (d), 127.9 (d), 128.4 (d), 128.68 (d), 128.74 (d), 129.0 (q,  $^2J_{\text{C-F}}$  = 33 Hz), 133.3 (s), 136.3 (s), 147.9 (s), 152.3 (s). MS (EI, 70 eV):  $m/z$  (%) = 61 (50), 78 (50), 194 (100), 338 (80), 418 (50)  $[\text{M}]^+$ . HRMS:  $m/z$   $[\text{M}]^+$  calcd for  $\text{C}_{20}\text{H}_{13}\text{F}_3\text{N}_2\text{Se}$ : 418.0196; Found: 418.0191.

**3-[(2-Methylphenyl)selanyl]-2-phenylimidazo[1,2-*a*]pyridine (8)<sup>2</sup>**: Yield: 158 mg (87%), Colorless plates ( $\text{Et}_2\text{O}$ ); Mp 124-126 °C;  $R_f$  = 0.6 (Hexane-EtOAc, 3:2).  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ ):  $\delta$  = 2.47 (s, 3H, Me), 6.54 (d,  $J$  = 7.8 Hz, 1H, Ar-H), 6.84 (d,  $J$  = 7.8 Hz, 1H, Ar-H), 6.87 (d,  $J$  = 8.3 Hz, 1H, Ar-H), 7.07 (t,  $J$  = 7.8 Hz, 1H, Ar-H), 7.18 (d,  $J$  = 7.3 Hz, 1H, Ar-H), 7.30-7.45 (m, 4H, Ar-H), 7.74 (d,  $J$  = 8.7 Hz, 1H, Ar-H), 8.11 (dt,  $J$  = 7.3, 1.5 Hz, 2H, Ar-H), 8.27 (d,  $J$  = 6.8 Hz, 1H, Ar-H).  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ ):  $\delta$  = 21.1 (q), 101.8 (s), 113.0 (d), 117.5 (d), 125.7 (d), 126.4 (d), 126.5 (d), 126.8 (d), 127.1 (d), 128.3 (d), 128.4 (d), 128.7 (d), 130.6 (d), 131.3 (s), 133.7 (s), 136.5 (s), 147.9 (s), 152.2 (s). MS (EI, 70 eV):  $m/z$  (%) = 194 (100), 364 (20)  $[\text{M}]^+$ . HRMS:  $m/z$   $[\text{M}]^+$  calcd for  $\text{C}_{20}\text{H}_{16}\text{N}_2\text{Se}$ : 364.0479; Found: 364.0477.

**3-Mesitylselanyl-2-phenylimidazo[1,2-*a*]pyridine (9)<sup>3</sup>**: Yield: 136 mg (70%). Colorless plates ( $\text{CH}_2\text{Cl}_2$ -Hexane); Mp 158-160 °C;  $R_f$  = 0.7 (Hexane-EtOAc, 3:2).  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ ):  $\delta$  = 2.18 (s, 3H, Me), 2.22 (s, 6H, Me), 6.76 (t,  $J$  = 7.2 Hz, 1H, Ar-H), 6.79 (s, 2H, Ar-H), 7.19 (td,  $J$  = 6.0, 1.5 Hz, 1H, Ar-H), 7.38 (tt,  $J$  = 6.8, 1.5

Hz, 1H, Ar-H), 7.45 (t,  $J = 6.8$  Hz, 2H, Ar-H), 7.63 (d,  $J = 9.3$  Hz, 1H, Ar-H), 8.03-8.06 (m, 3H, Ar-H).  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ ):  $\delta = 20.7$  (q), 23.6 (q), 104.6 (s), 112.5 (d), 117.4 (d), 125.3 (d), 125.4 (d), 126.3 (s), 128.07 (d), 128.08 (d), 129.0 (d), 129.4 (d), 134.2 (s), 138.0 (s), 141.3 (s), 146.8 (s), 150.1 (s). MS (EI, 70 eV):  $m/z$  (%) = 61 (20), 78 (20), 194 (100), 392 (40)  $[\text{M}]^+$ . HRMS:  $m/z$   $[\text{M}]^+$  calcd for  $\text{C}_{22}\text{H}_{20}\text{N}_2\text{Se}$ : 392.0792; Found: 392.0799.

**3-(2-Thienylselanyl)-2-phenylimidazo[1,2-*a*]pyridine (11)<sup>3</sup>**: Yield: 159 mg (91%). Colorless powder ( $\text{Et}_2\text{O}$ ). Mp 78-79 °C;  $R_f = 0.7$  (Hexane-EtOAc, 3:2).  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ ):  $\delta = 6.88$ -6.95 (m, 2H, Ar-H), 7.13 (d,  $J = 3.6$  Hz, 1H, Ar-H), 7.25 (d,  $J = 3.6$  Hz, 1H, Ar-H), 7.31 (td,  $J = 6.8, 0.8$  Hz, 1H, Ar-H), 7.42 (td,  $J = 6.8, 1.6$  Hz, 1H, Ar-H), 7.50 (t,  $J = 7.6$  Hz, 2H, Ar-H), 7.70 (d,  $J = 9.2$  Hz, 1H, Ar-H), 8.20 (d,  $J = 6.8$  Hz, 2H, Ar-H), 8.57 (dd,  $J = 7.2, 1.2$  Hz, 1H, Ar-H).  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ ):  $\delta = 105.1$  (s), 113.1 (d), 117.4 (d), 124.1 (s), 125.5 (d), 126.6 (d), 127.9 (d), 128.3 (d), 128.5 (d), 129.0 (d), 129.8 (d), 132.9 (d), 133.5 (s), 147.0 (s), 150.4 (s). MS (EI, 70 eV):  $m/z$  (%) = 57 (60), 69 (30), 149 (100), 167 (25), 279 (20), 356 (5)  $[\text{M}]^+$ . HRMS:  $m/z$   $[\text{M}]^+$  calcd for  $\text{C}_{17}\text{H}_{12}\text{N}_2\text{SSe}$ : 355.9886; Found: 355.9894.

**3-Phenylselanyl-imidazo[1,2-*a*]pyridine (13)<sup>4</sup>**: Yield: 121 mg (89%). Yellow oil;  $R_f = 0.4$  (Hexane-EtOAc, 1:4).  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ ):  $\delta = 6.85$  (t,  $J = 7.0$  Hz, 1H, Ar-H), 7.13-7.18 (m, 5H, Ar-H), 7.27 (t,  $J = 8.2$  Hz, 1H, Ar-H), 7.69 (d,  $J = 9.6$  Hz, 1H, Ar-H), 7.98 (s, 1H, Ar-H), 8.26 (d,  $J = 6.8$  Hz, 1H, Ar-H).  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ ):  $\delta = 106.4$  (s), 113.0 (d), 117.9 (d), 125.2 (d), 125.7 (d), 126.8 (d), 128.9 (d), 129.5 (d), 130.5 (s), 143.0 (d), 148.2 (s). MS (EI, 70 eV):  $m/z$  (%) = 51 (26), 78 (94),

105 (26), 194 (100), 274 (11)  $[M]^+$ . HRMS:  $m/z$   $[M]^+$  calcd for  $C_{13}H_{10}N_2Se$ : 274.0009;

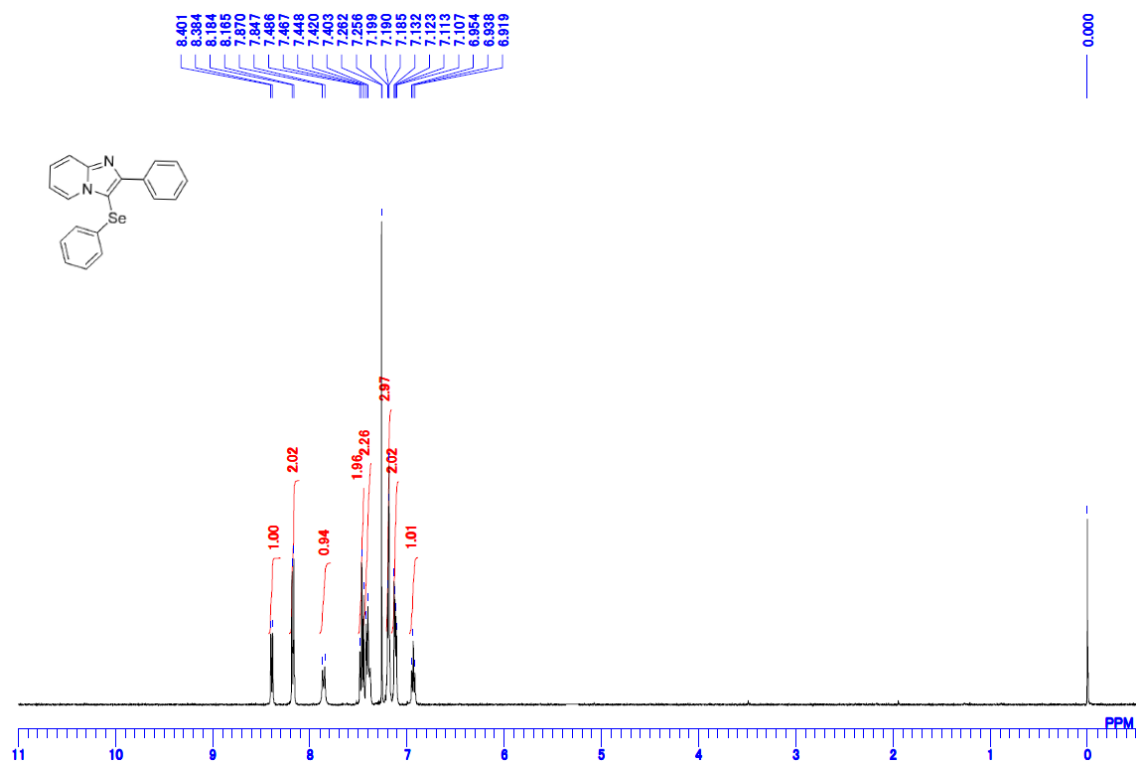
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## References

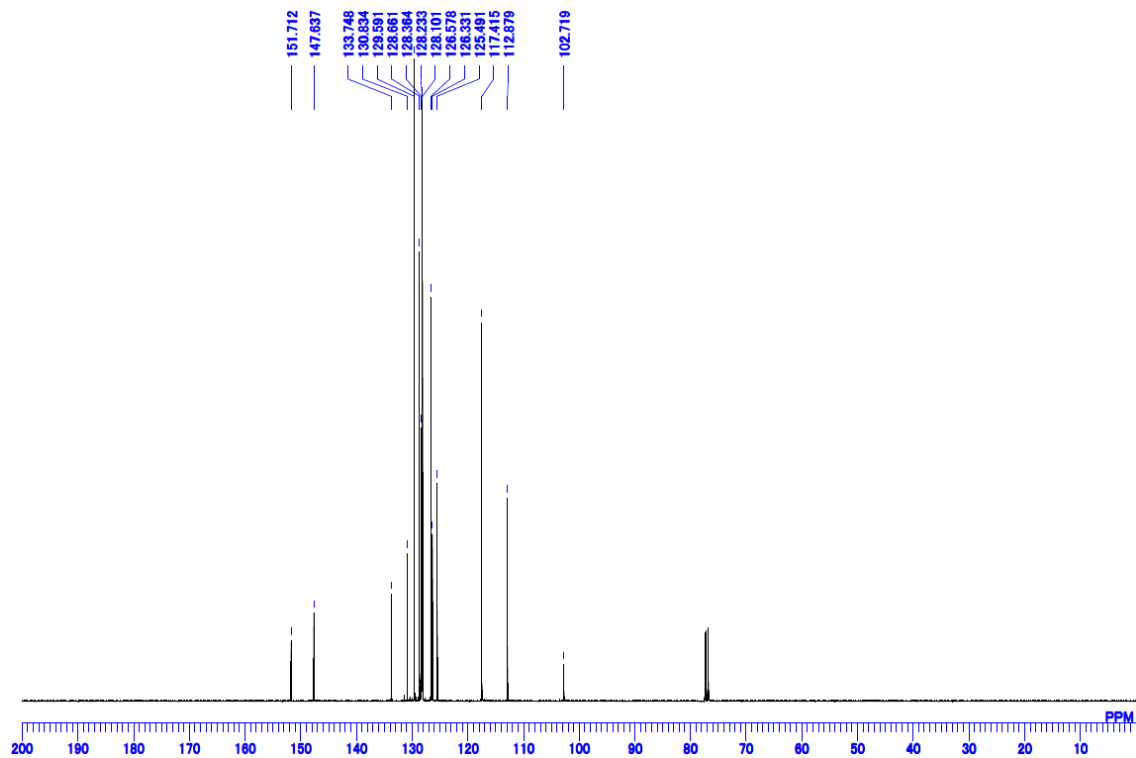
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# Copies of $^1\text{H}$ and $^{13}\text{C}$ -NMR spectra

## $^1\text{H}$ -NMR of 3

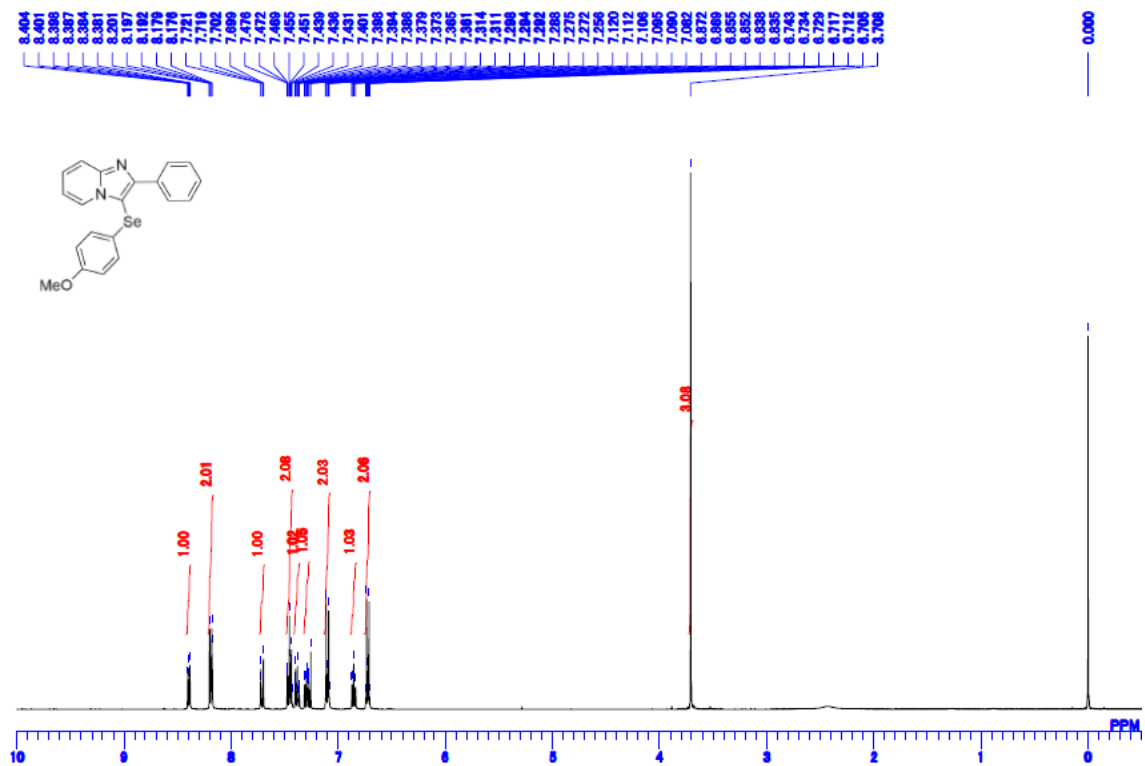


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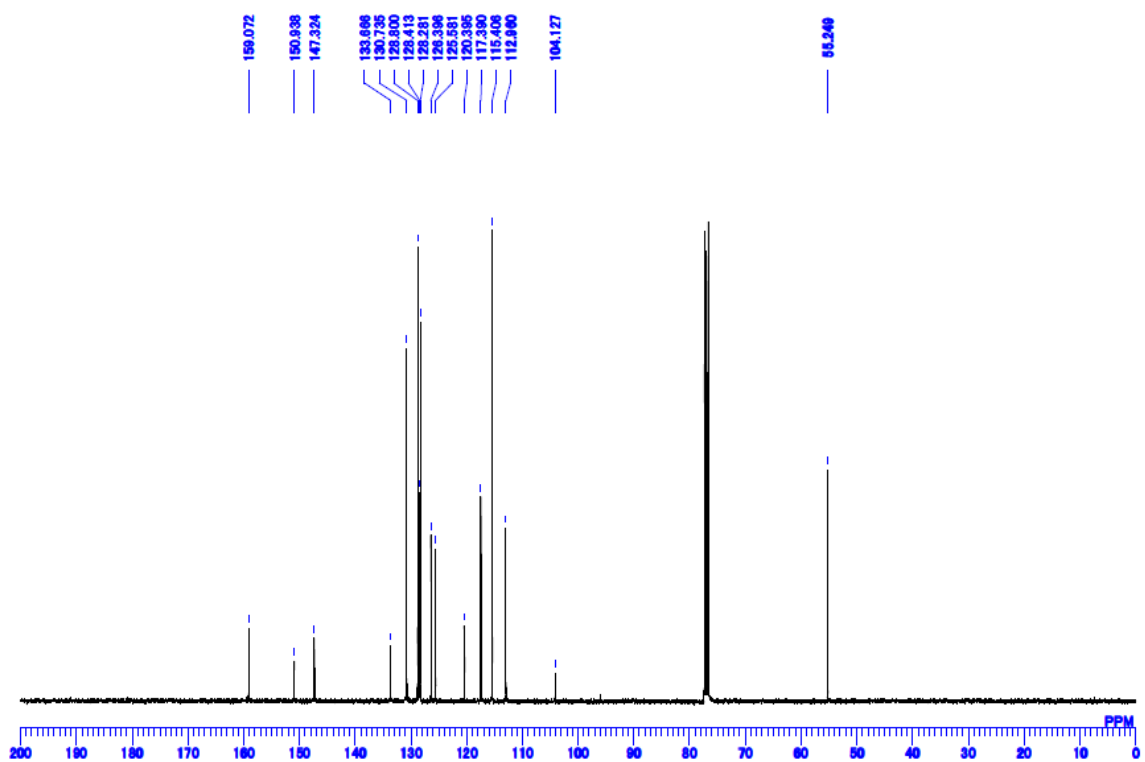




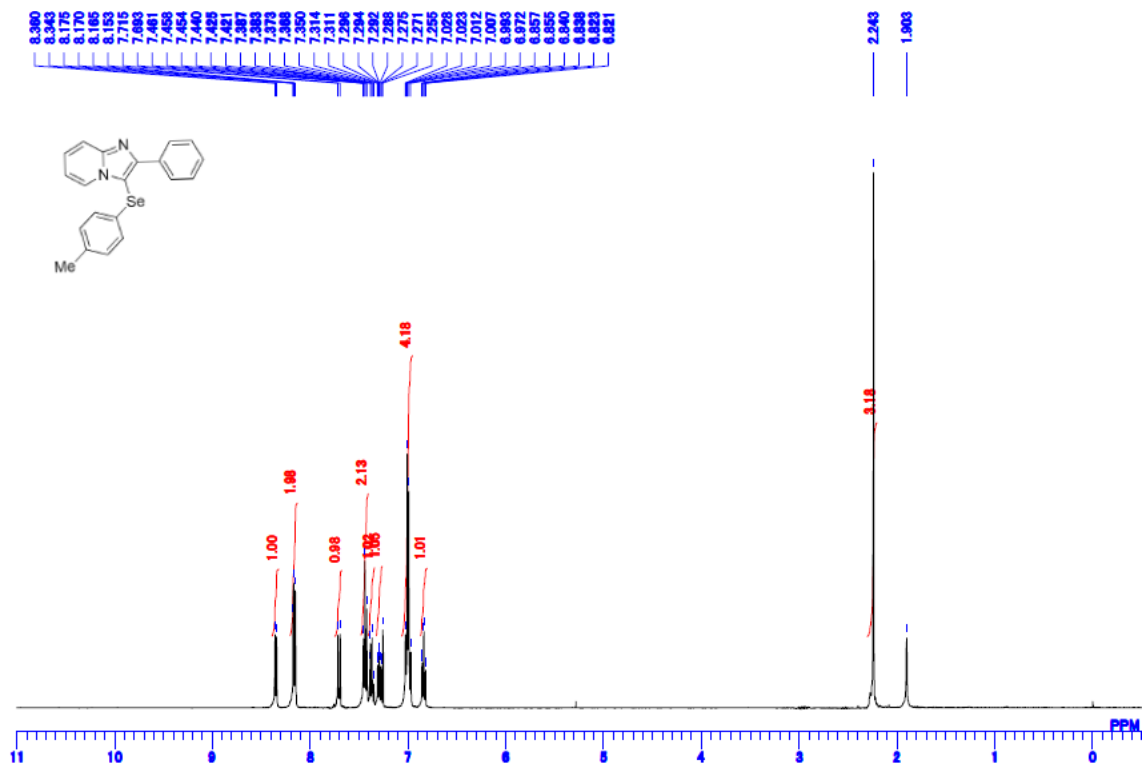
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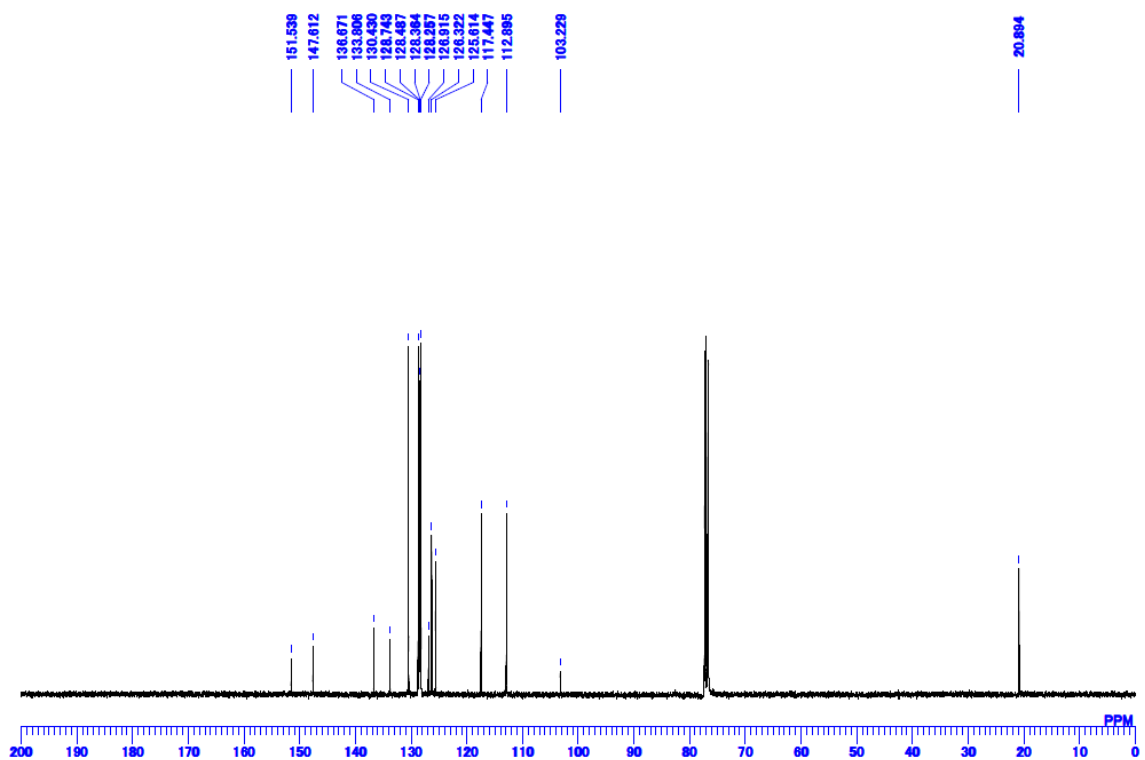
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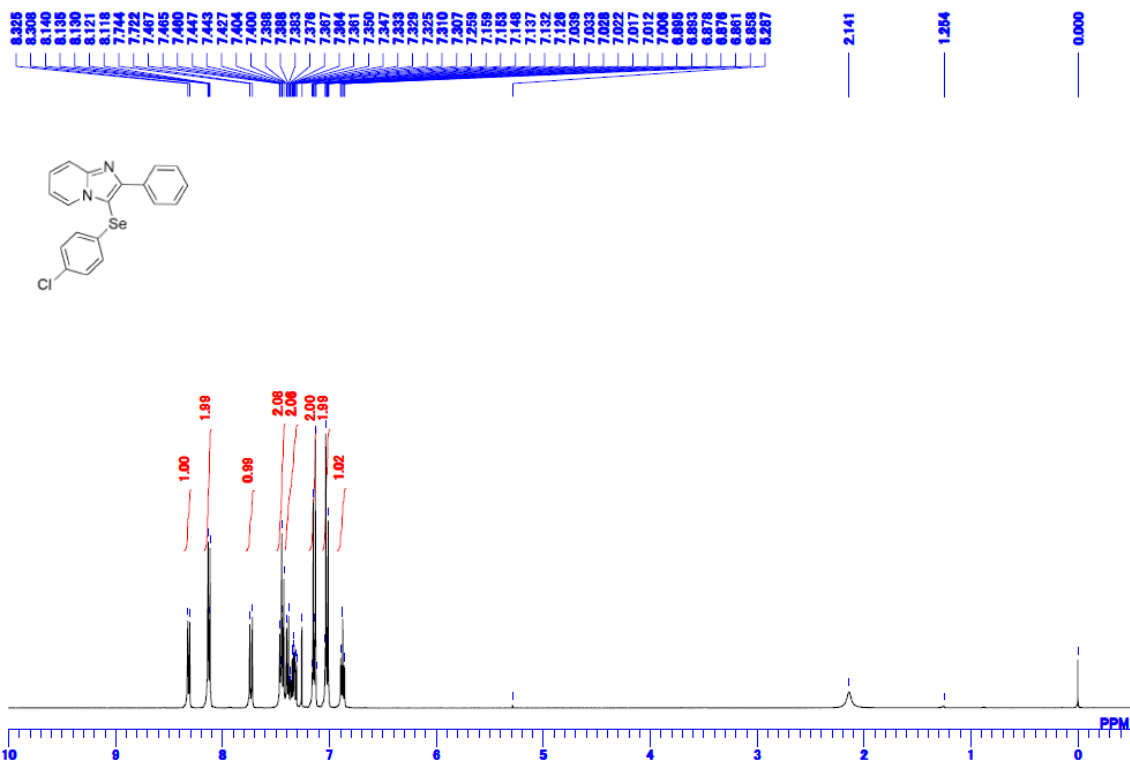
### <sup>1</sup>H-NMR of 5



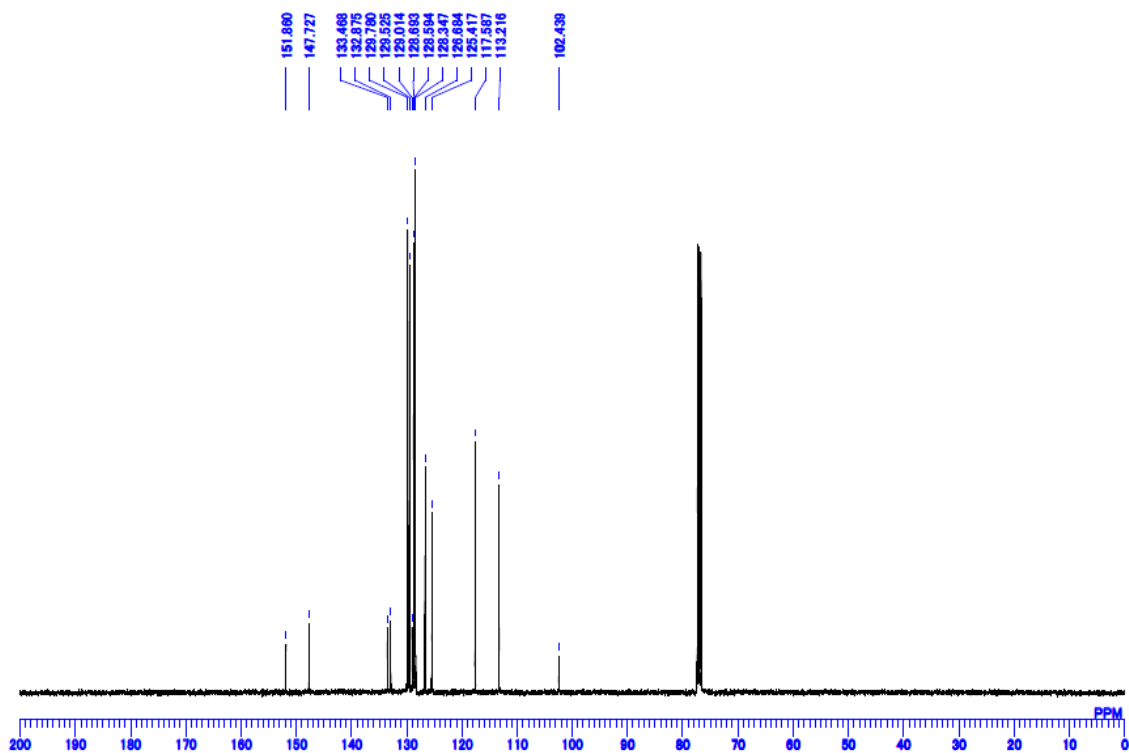
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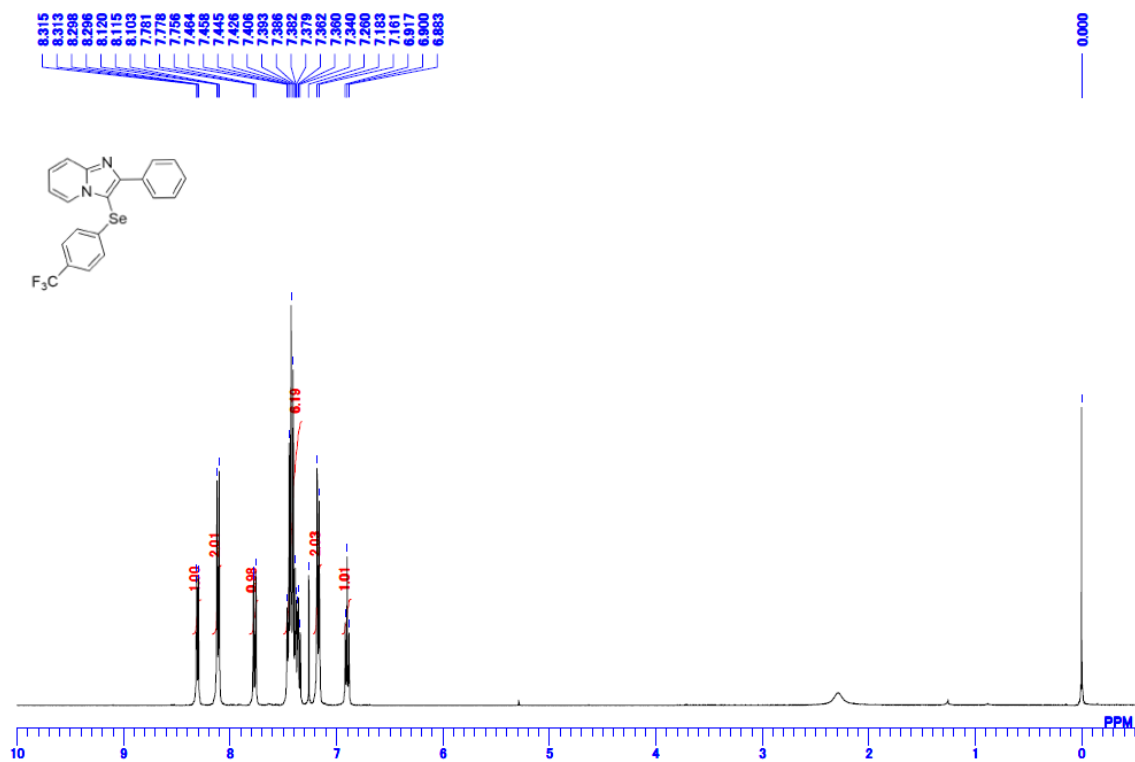
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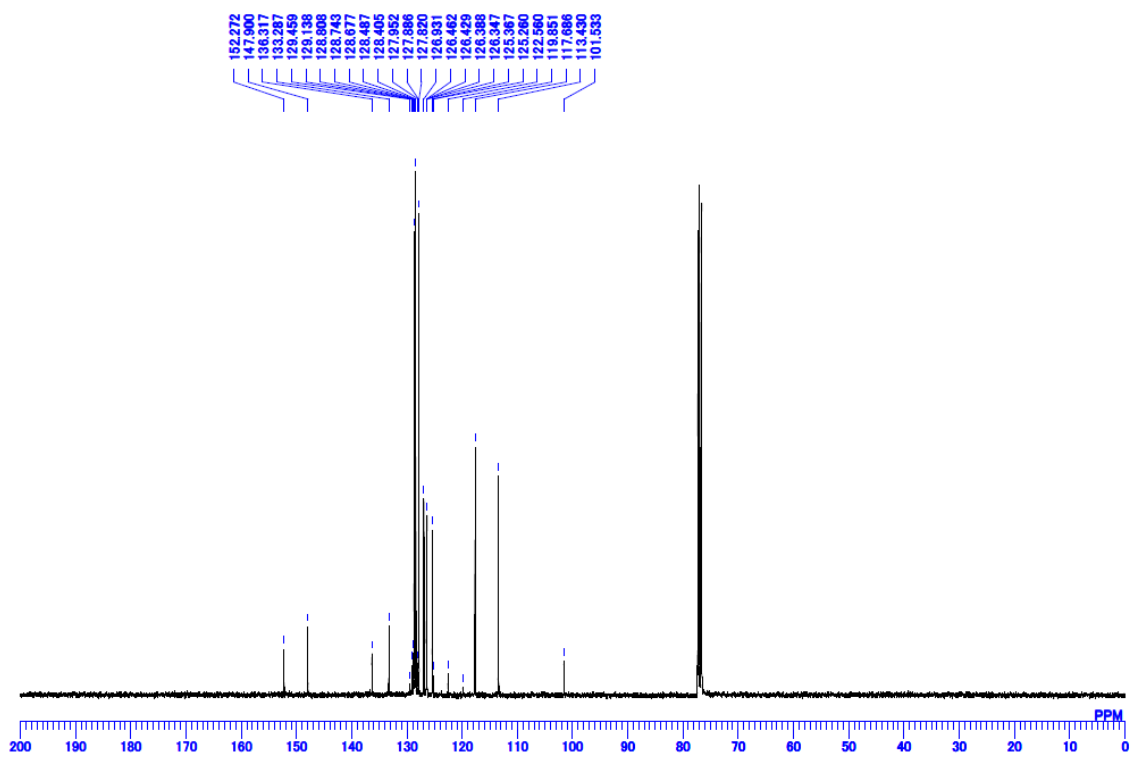
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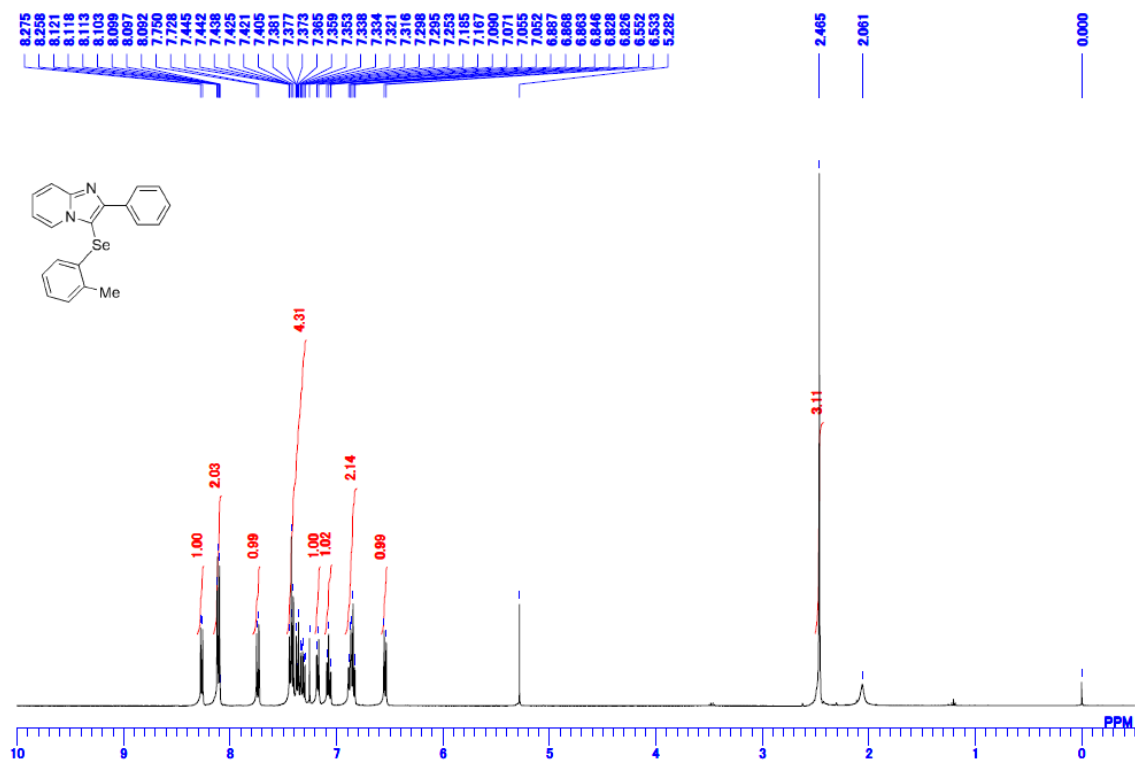
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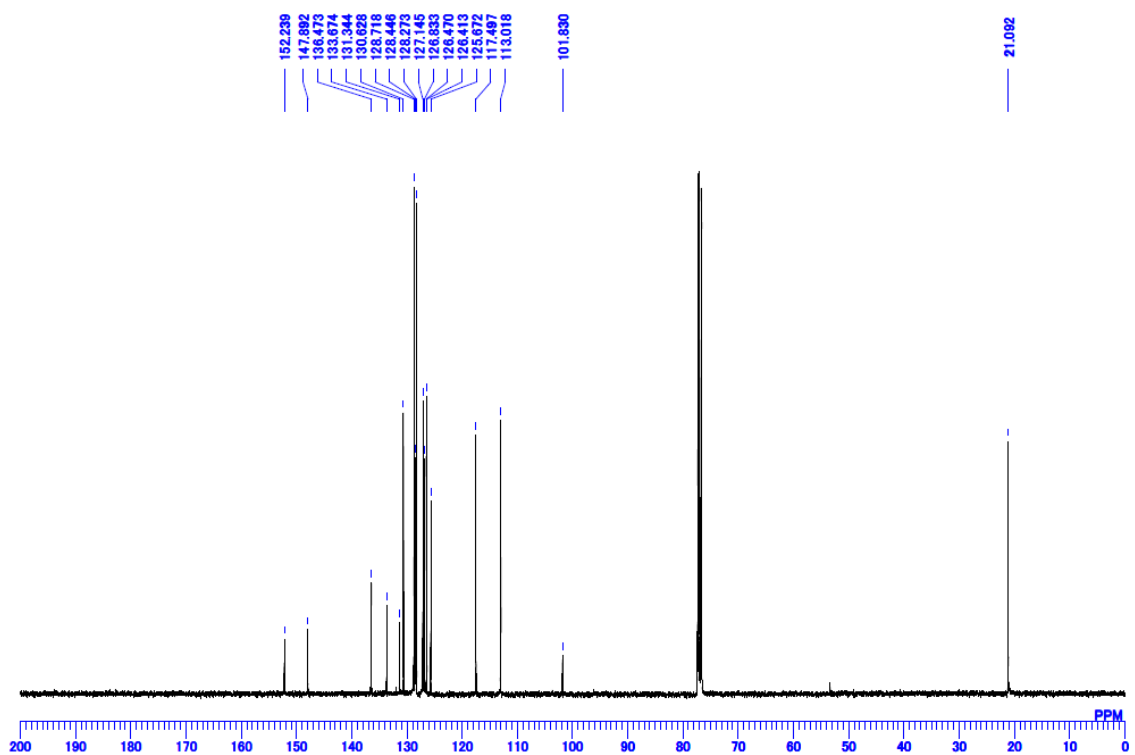
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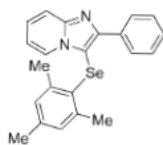
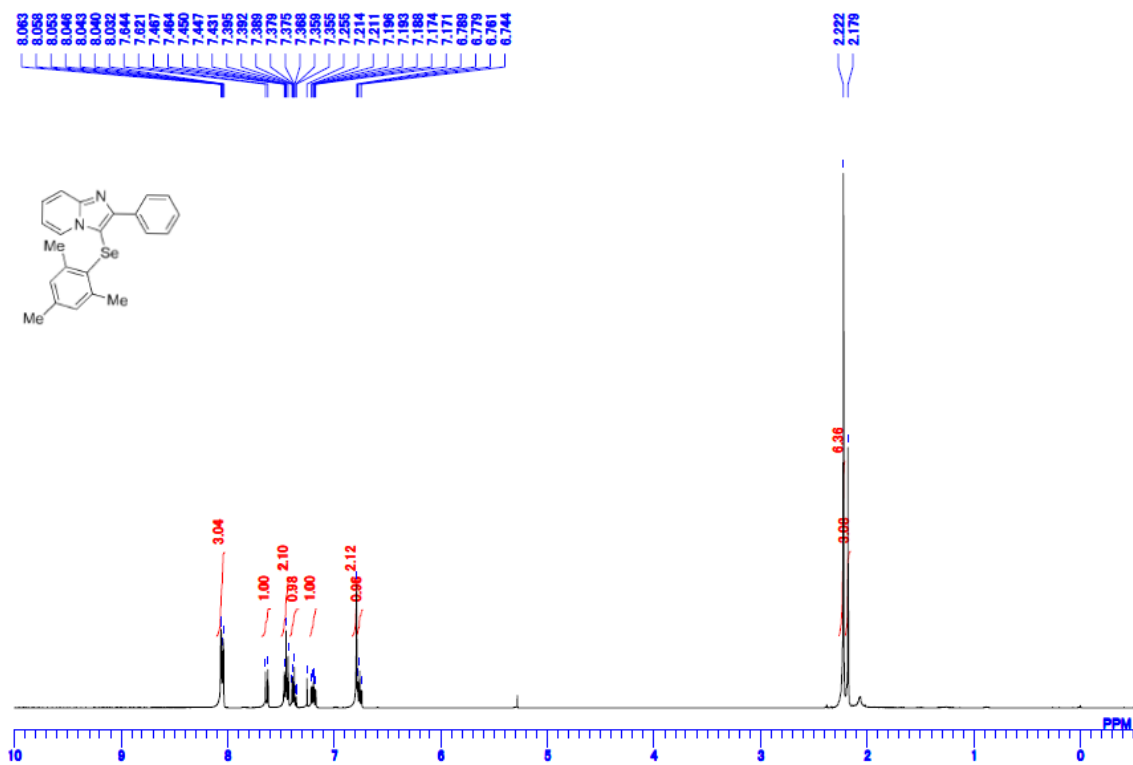
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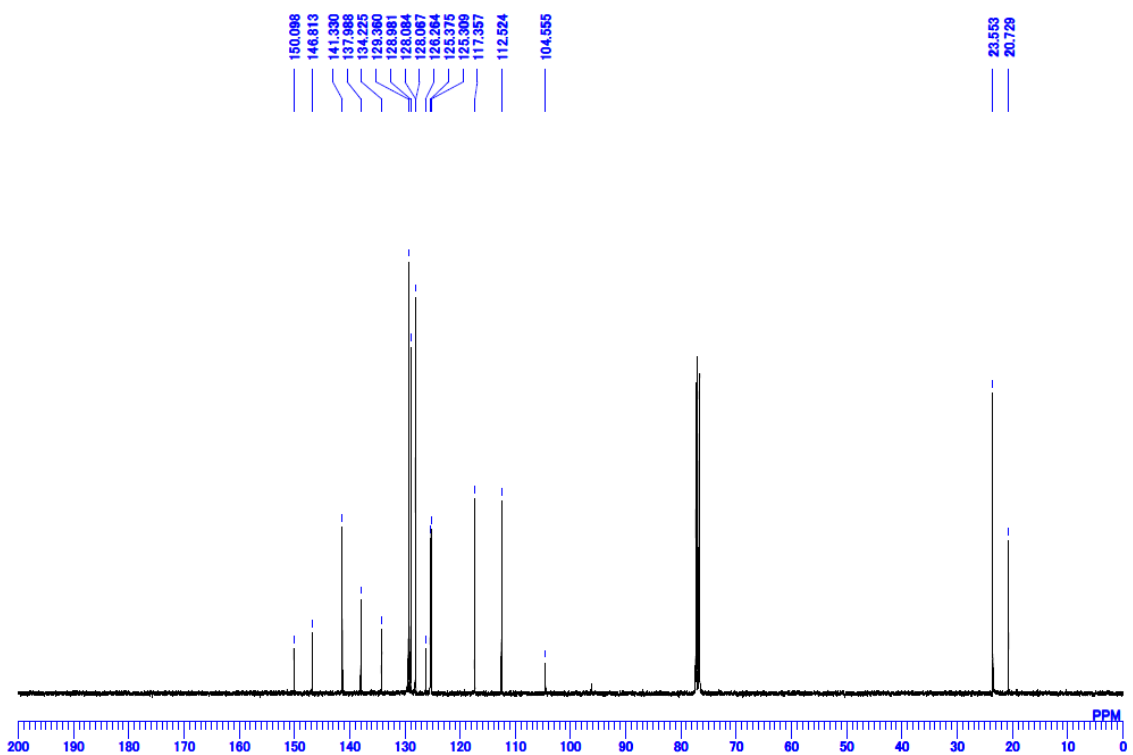
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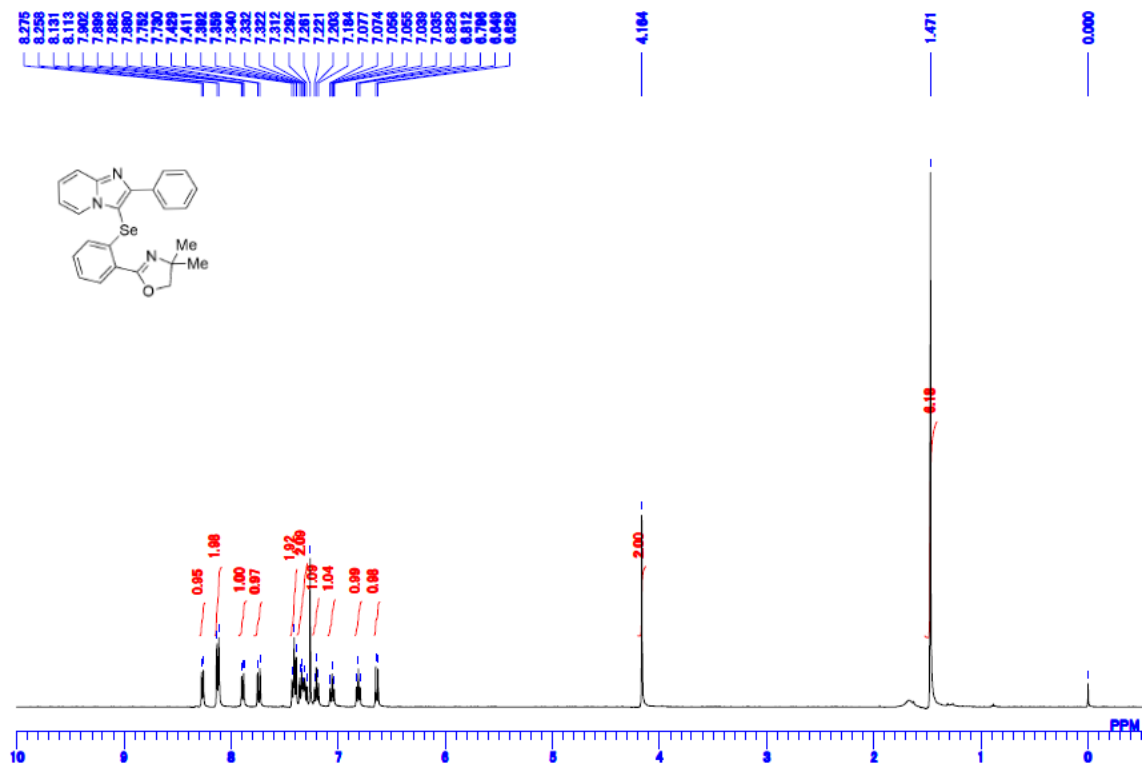
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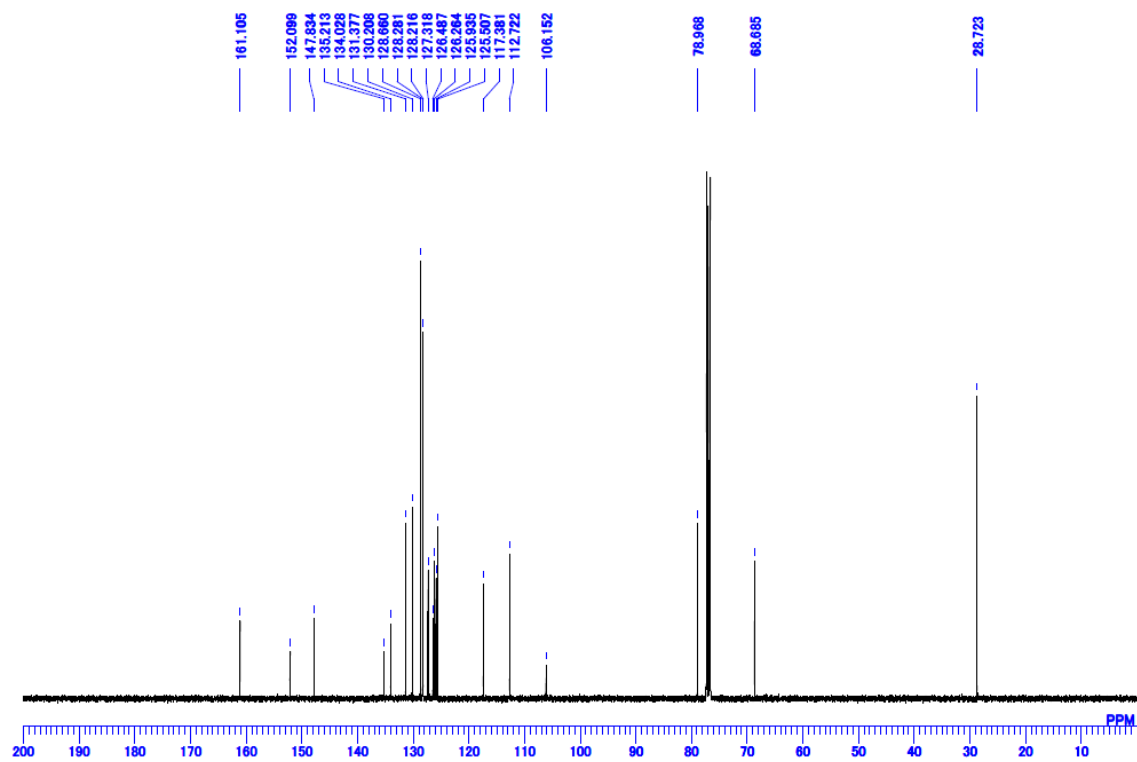
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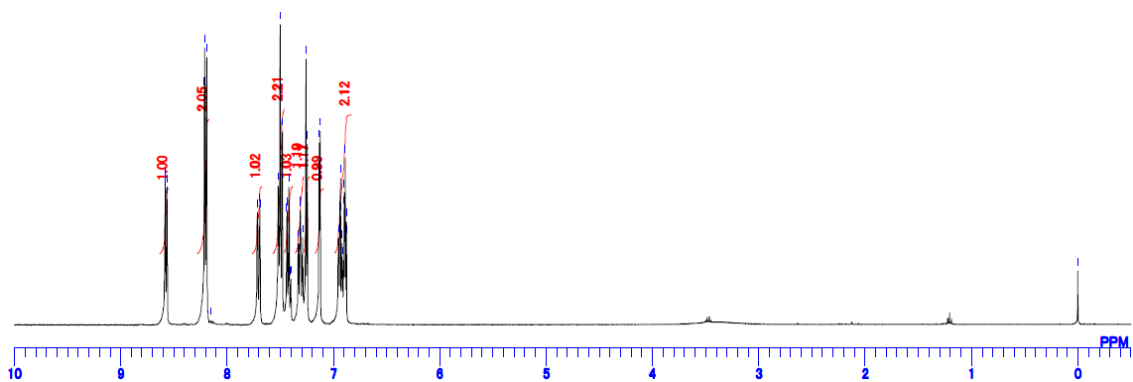
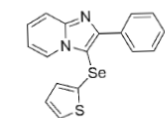
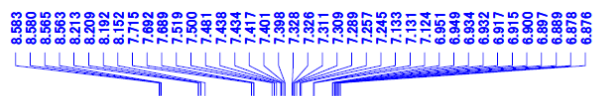
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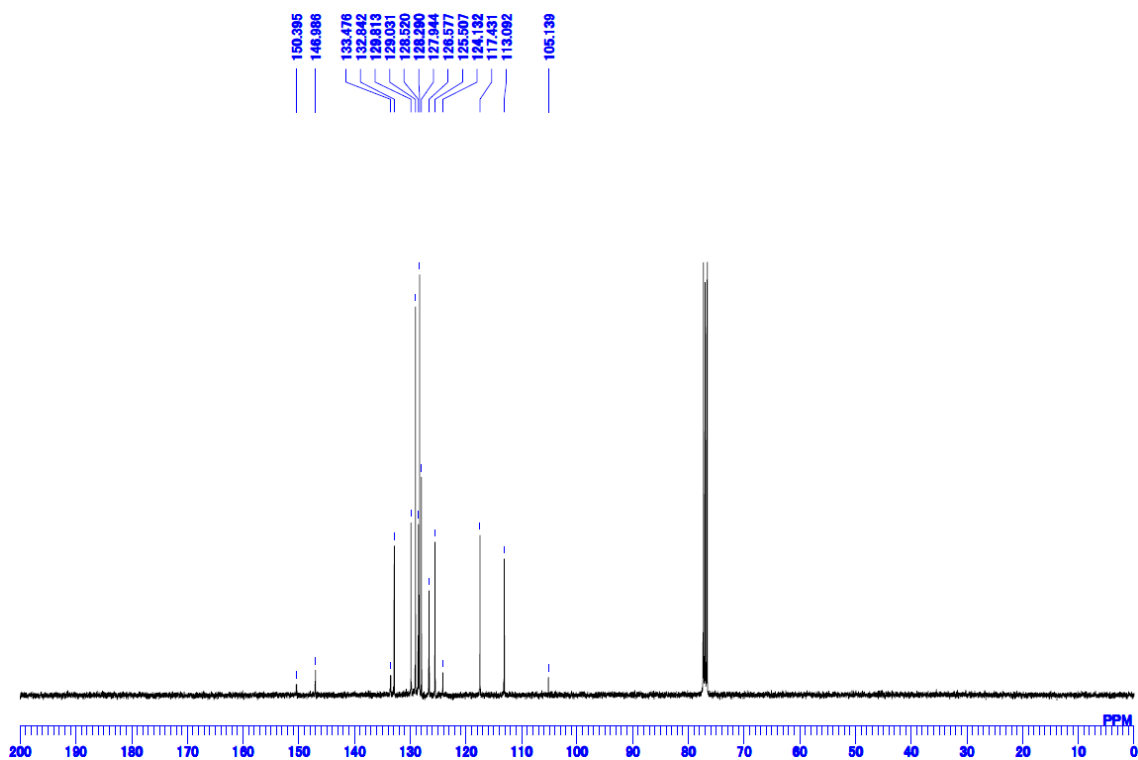
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# <sup>1</sup>H-NMR of 11

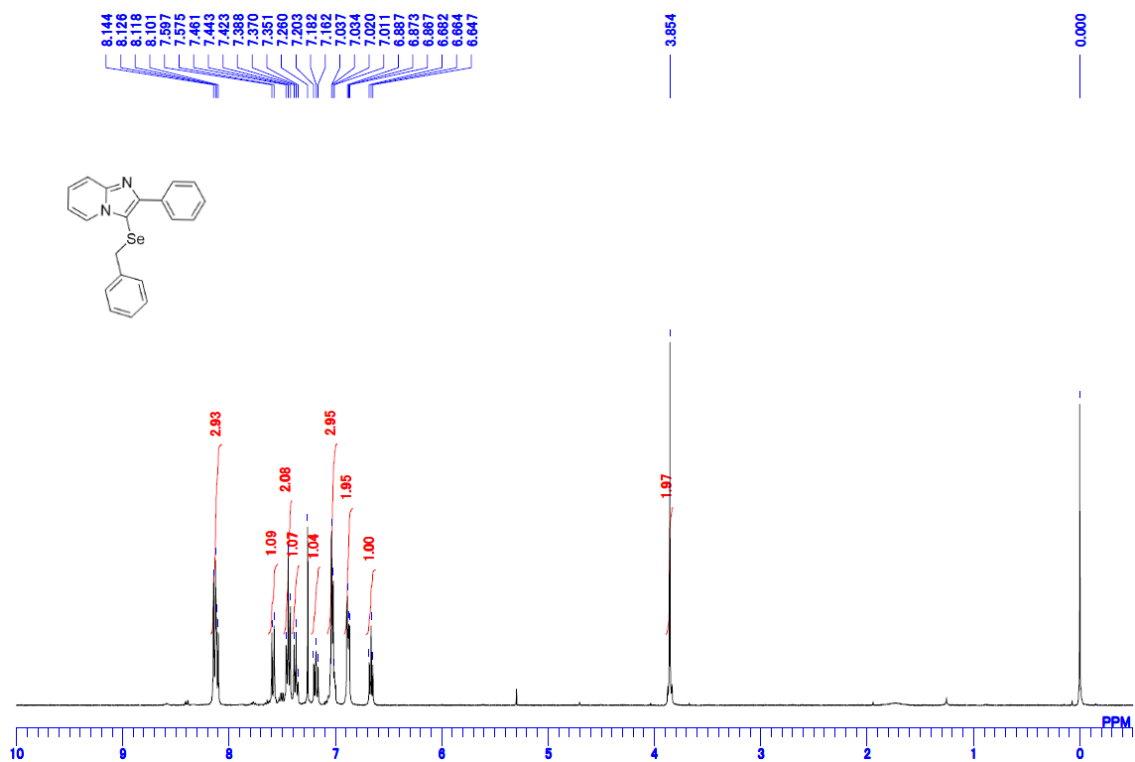


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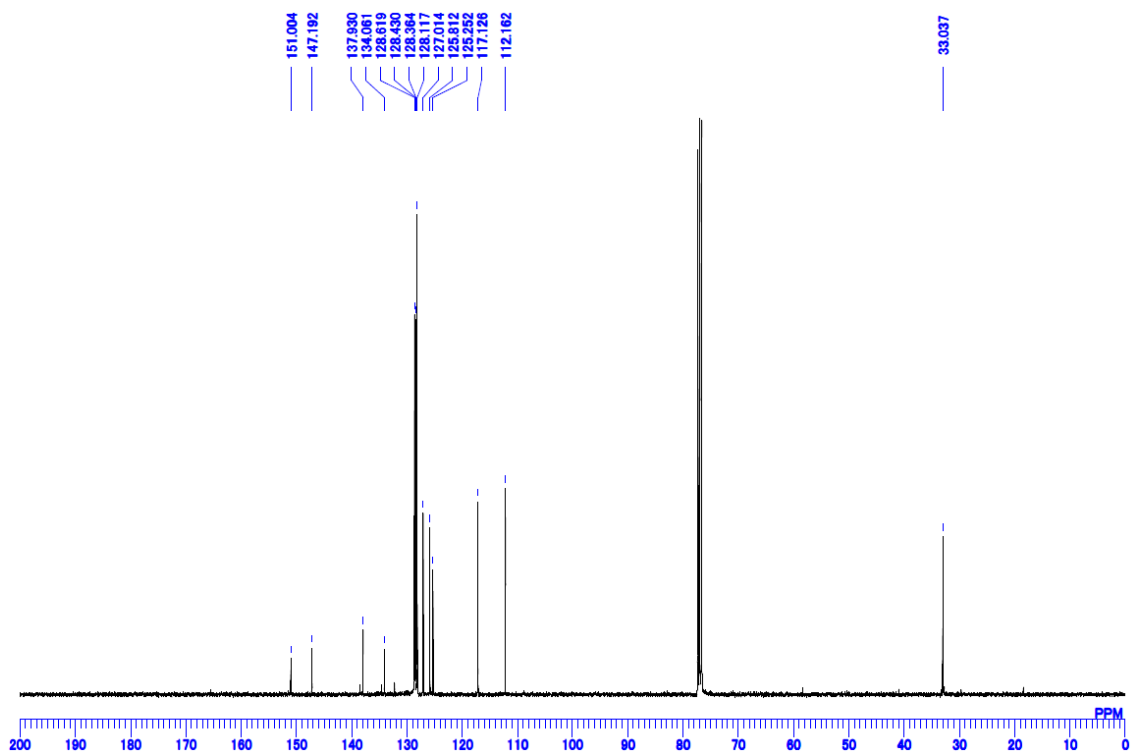




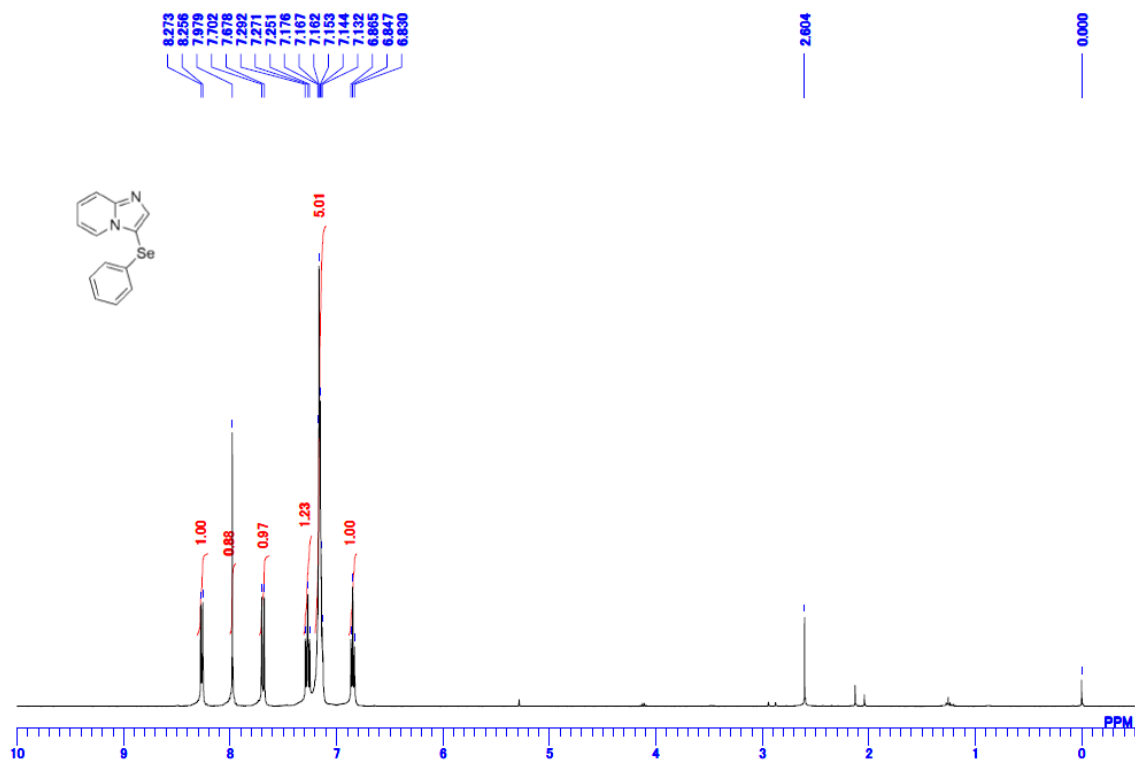
# <sup>1</sup>H-NMR of 12



# <sup>13</sup>C-NMR of 12



<sup>1</sup>H-NMR of **13**



<sup>13</sup>C-NMR of **13**

