

## Supporting Information

### Selective Hydrosilylation of *N*-Allylimines using a (3-Iminophosphine)Palladium Precatalyst

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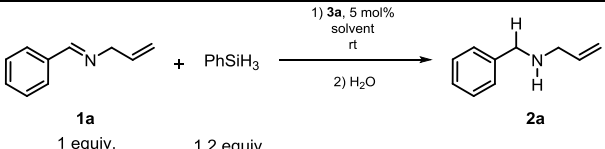
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**General methods and instrumentation:** All NMR-scale reactions were set up in a nitrogen-filled glovebox.  $\text{CDCl}_3$  was purchased from Cambridge Isotope Laboratories, dried over calcium hydride, freeze-pump-thawed three times, vacuum transferred, and stored over molecular sieves in the glovebox.  $[(3\text{IP})\text{Pd}(\text{allyl})\text{OTf}]$  (**3a** and **3b**) precatalysts were synthesized via the reported procedures.<sup>1,2</sup>  $\text{PhSiH}_3$  was purchased from Acros. All aldehydes and allylamine required to synthesize **1a-1x** were supplied by Alfa Aesar, AK Scientific, Sigma-Aldrich or Acros.  $^1\text{H}$  and  $^{13}\text{C}$  NMR data were obtained on either a 400 MHz Varian VXR NMR spectrometer at 399.95 MHz for  $^1\text{H}$  NMR and 100.56 MHz for  $^{13}\text{C}$  NMR or on a 600 MHz Bruker Avance III at 599.9 MHz for  $^1\text{H}$  NMR and 150.8 MHz for  $^{13}\text{C}$  NMR.  $^{19}\text{F}$  NMR was obtained on the 400 MHz Varian NMR at 376.29 MHz. High resolution mass spectrometry data were determined by either the University of Illinois Mass Spectrometry Laboratory, Urbana, IL, USA or the University of Toledo Mass Spectrometry Laboratory, Toledo, OH, USA.

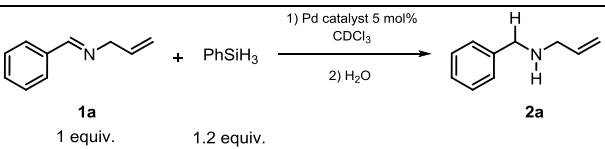
**Synthesis of allylimines:** Aldehydes (1 equiv.) and allylamine (1.2 equiv.) were dissolved in either diethylether or dichloromethane and stirred over molecular sieves overnight. After reaction completion, the mixture was filtered, dried over  $\text{MgSO}_4$  in a Schlenk flask, cannula filtered, and the volatiles were removed under vacuum (in an ice bath for compound **1w** and **1x**, due to their low boiling points). The resulting allylimine was further degassed under vacuum, transferred to the glovebox and kept over molecular sieves in the freezer. All known allylimines were confirmed by  $^1\text{H}$  and  $^{13}\text{C}$  NMR spectroscopy with the *E* isomer as the major product. Reactions to form **1w** and **1x** were performed in dichloromethane over magnesium sulfate instead of molecular sieves.

**Catalytic reactions and isolation of allylamines:** All catalytic reactions were set up inside a nitrogen-filled glovebox in an NMR tube. Allylimine (0.5 mmol) was added to a mixture of  $\text{PhSiH}_3$  (0.6 mmol) and palladium precatalyst (5 mol%, **3a** or **3b**) dissolved in  $\text{CDCl}_3$ . Temperature was controlled with an oil bath on a hot plate connected to a thermoprobe.  $^1\text{H}$  NMR was collected frequently to check the reaction completion detected by disappearance of the iminic proton or corresponding starting material. Then, the mixture was hydrolyzed in  $\text{H}_2\text{O}$  and extracted with diethylether (3x2 ml) and dried over either  $\text{MgSO}_4$  or  $\text{Na}_2\text{SO}_4$ . The dried solution was filtered with a small plug of celite and after removal of volatiles (in an ice bath for compound **2w** and **2x**, due to their low boiling points), was purified via silica column chromatography (hexanes : ethylacetate, 90 : 10). It was also noted that the hydrosilylated product can be hydrolyzed to the corresponding allylamine product over silica gel directly.

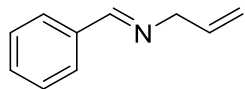
**Table S1.** Solvent Optimization.

				
<b>Solvent</b>	CDCl <sub>3</sub>	C <sub>6</sub> D <sub>6</sub>	CD <sub>3</sub> CN	Pyridine-d <sub>5</sub>
<b>Conversion (20 h)</b>	79%	43%	51%	34%

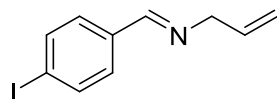
**Table S2.** Catalytic hydrosilylation of allylimine using other Pd-systems.<sup>a</sup>

	
<b>Catalyst (5 mol% palladium)</b>	<b>Conversion in 48h, 40 °C</b>
Pd <sub>2</sub> dba <sub>3</sub> +PPh <sub>3</sub> (1:2)	No product formation
PdCl <sub>2</sub> +PPh <sub>3</sub> (1:2)	Reaction reached completion in 24 h
Pd(OAc) <sub>2</sub> + PPh <sub>3</sub> (1:2)	25% (longer time resulted in a complex mixture of compounds)
Pd(PPh <sub>3</sub> ) <sub>4</sub>	18%
(AllylPdCl) <sub>2</sub> + PPh <sub>3</sub> (1:2)	28% (longer time resulted in a complex mixture of compounds)
<b>3a</b>	Reaction was complete in 8 h

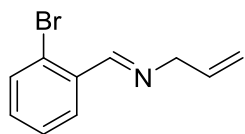
<sup>a</sup> <sup>1</sup>H NMR spectra was observed frequently to monitor reaction completion.



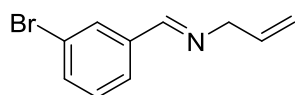
N-allyl-1-phenylmethanimine (**1a**):<sup>3</sup> Colorless liquid, 92% isolated yield, <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz): 8.29 (s, 1H), 7.79-7.74 (m, 2H), 7.44-7.40 (m, 3H), 6.09 (ddt, <sup>3</sup>J=17.2 Hz, <sup>3</sup>J=10.4 Hz, <sup>3</sup>J=5.6 Hz, 1H), 5.25 (dq, <sup>3</sup>J=17.2 Hz, <sup>4</sup>J= <sup>2</sup>J=1.6 Hz, 1H), 5.17 (dq, <sup>3</sup>J=10.4 Hz, <sup>4</sup>J= <sup>2</sup>J=1.6 Hz, 1H), 4.27 (dt, <sup>3</sup>J=5.6 Hz, <sup>4</sup>J=1.6 Hz, 2H); <sup>13</sup>C{<sup>1</sup>H} NMR (CDCl<sub>3</sub>, 400 MHz): 162.0, 136.2, 135.9, 130.7, 128.6, 128.2, 116.1, 63.6.



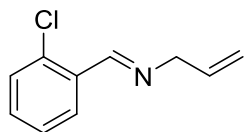
N-allyl-1-(4-iodophenyl)methanimine (**1b**): Colorless liquid, 77% isolated yield, <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz): 8.21 (s, 1H), 7.75 (d, <sup>3</sup>J=8.4 Hz, 2H), 7.47 (d, <sup>3</sup>J=8.4 Hz, 2H), 6.05 (ddt, <sup>3</sup>J=17.2 Hz, <sup>3</sup>J=10.4 Hz, <sup>3</sup>J=5.6 Hz, 1H), 5.22 (dq, <sup>3</sup>J=17.2 Hz, <sup>4</sup>J= <sup>2</sup>J=1.6 Hz, 1H), 5.16 (dq, <sup>3</sup>J=10.4 Hz, <sup>4</sup>J= <sup>2</sup>J=1.6 Hz, 1H), 4.24 (dm, <sup>3</sup>J=5.6 Hz, 2H); <sup>13</sup>C{<sup>1</sup>H} NMR (CDCl<sub>3</sub>, 400 MHz): 161.0, 137.9, 135.7, 129.7, 116.4, 97.4, 63.6.



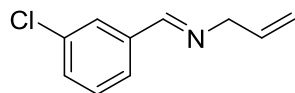
N-allyl-1-(2-bromophenyl)methanimine (**1c**):<sup>4</sup> Pale yellow oily liquid, 90% isolated yield, <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz): 8.67 (s, 1H), 8.05 (d, <sup>3</sup>J=8.0 Hz, 1H), 7.55 (d, <sup>3</sup>J=8.0 Hz, 1H), 7.32 (t, <sup>3</sup>J=8.0 Hz, 1H), 7.24 (t, <sup>3</sup>J=8.0 Hz, 1H), 6.08 (m, 1H), 5.25 (dm, <sup>3</sup>J=17.2 Hz, 1H), 5.18 (dm, <sup>3</sup>J=10.4 Hz, 1H), 4.30 (dm, <sup>3</sup>J=6.0 Hz, 2H); <sup>13</sup>C{<sup>1</sup>H} NMR (CDCl<sub>3</sub>, 400 MHz) 161.0, 135.6, 134.5, 133.0, 131.9, 128.8, 127.6, 125.1, 116.4, 63.6.



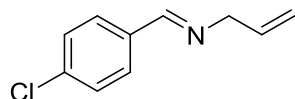
N-allyl-1-(3-bromophenyl)methanimine (**1d**):<sup>5</sup> Pale yellow oily liquid, 86% isolated yield, <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz): 8.18 (s, 1H), 7.92 (s, 1H), 7.60 (d, <sup>3</sup>J=7.6 Hz, 1H), 7.51 (d, <sup>3</sup>J=7.6 Hz, 1H), 7.24 (t, <sup>3</sup>J=7.6 Hz, 1H), 6.04 (ddt, <sup>3</sup>J=17.2 Hz, <sup>3</sup>J=10.4 Hz, <sup>3</sup>J=5.6 Hz, 1H), 5.22 (dq, <sup>3</sup>J=17.2 Hz, <sup>4</sup>J= <sup>2</sup>J=1.6 Hz, 1H), 5.16 (dq, <sup>3</sup>J=10.4 Hz, <sup>4</sup>J= <sup>2</sup>J=1.6 Hz, 1H), 4.24 (dm, <sup>3</sup>J=5.6 Hz, 2H); <sup>13</sup>C{<sup>1</sup>H} NMR (CDCl<sub>3</sub>, 400 MHz): 160.2, 138.1, 135.5, 133.5, 130.6, 130.1, 126.9, 122.9, 116.3, 63.4.



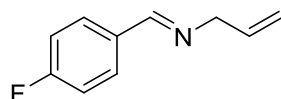
N-allyl-1-(2-chlorophenyl)methanimine (**1e**):<sup>4</sup> Colorless oily liquid, 86% isolated yield, <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz): 8.72 (s, 1H), 8.07 (dd, <sup>3</sup>J=7.6 Hz, <sup>4</sup>J=2.0 Hz, 1H), 7.35-7.25 (m, 3H), 6.12-6.02 (m, 1H), 5.24 (dd, <sup>3</sup>J=17.2 Hz, <sup>2</sup>J=1.6 Hz, 1H), 5.17 (dd, <sup>3</sup>J=10.0 Hz, <sup>2</sup>J=1.6 Hz, 1H), 4.29 (dm, <sup>3</sup>J=5.6 Hz, 2H); <sup>13</sup>C{<sup>1</sup>H} NMR (CDCl<sub>3</sub>, 400 MHz): 158.6, 135.7, 135.1, 133.1, 131.5, 129.7, 128.3, 127.0, 116.3, 63.7.



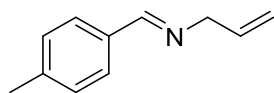
N-allyl-1-(3-chlorophenyl)methanimine (**1f**):<sup>6</sup> Colorless oily liquid, 84% isolated yield, <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz): 8.20 (s, 1H), 7.76 (d, <sup>4</sup>J=1.6 Hz, 1H), 7.55 (dt, <sup>3</sup>J=7.6 Hz, <sup>4</sup>J=1.6 Hz, 1H), 7.36-7.27 (m, 2H), 6.09-5.99 (m, 1H), 5.22 (dm, <sup>3</sup>J=17.2 Hz, 1H), 5.15 (dm, <sup>3</sup>J=10.4 Hz, 1H), 4.23 (dm, <sup>3</sup>J=6.0 Hz, 2H); <sup>13</sup>C{<sup>1</sup>H} NMR (CDCl<sub>3</sub>, 400 MHz): 160.3, 137.9, 135.5, 134.7, 130.6, 129.8, 127.7, 126.5, 116.3, 63.4.



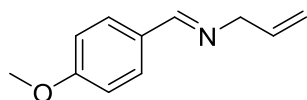
N-allyl-1-(4-chlorophenyl)methanimine (**1g**):<sup>7</sup> Pale yellow oily liquid, 80% isolated yield, <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz): 8.23 (s, 1H), 7.67 (d, <sup>3</sup>J=8.4 Hz, 2H), 7.37 (d, <sup>3</sup>J=8.4 Hz, 2H), 6.05 (ddt, <sup>3</sup>J=17.2 Hz, <sup>3</sup>J=10.0 Hz, <sup>3</sup>J=5.6 Hz, 1H), 5.22 (dq, <sup>3</sup>J=17.2 Hz, <sup>4</sup>J= <sup>2</sup>J=1.6 Hz, 1H), 5.16 (dq, <sup>3</sup>J=10.0 Hz, <sup>4</sup>J= <sup>2</sup>J=1.6 Hz, 1H), 4.24 (dm, <sup>3</sup>J=5.6 Hz, 2H); <sup>13</sup>C{<sup>1</sup>H} NMR (CDCl<sub>3</sub>, 400 MHz): 160.6, 136.7, 135.7, 134.7, 129.4, 128.9, 116.3, 63.6.



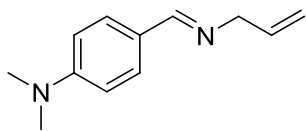
N-allyl-1-(4-fluorophenyl)methanimine (**1h**):<sup>8</sup> Pale yellow oily liquid, 83% isolated yield, <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz): 8.25 (s, 1H), 7.76-7.71 (m, 2H), 7.12-7.06 (m, 2H), 6.06 (ddt, <sup>3</sup>J=17.2 Hz, <sup>3</sup>J=10.4 Hz, <sup>3</sup>J=6.0 Hz, 1H), 5.23 (dq, <sup>3</sup>J=17.2 Hz, <sup>4</sup>J= <sup>2</sup>J=1.6 Hz, 1H), 5.15 (dq, <sup>3</sup>J=10.4 Hz, <sup>4</sup>J= <sup>2</sup>J=1.6 Hz, 1H), 4.24 (dm, <sup>3</sup>J=6.0 Hz, 2H); <sup>13</sup>C{<sup>1</sup>H} NMR (CDCl<sub>3</sub>, 400 MHz): 164.3 (d, <sup>1</sup>J<sub>CF</sub>=250.6 Hz), 160.6, 135.9, 132.6 (d, <sup>4</sup>J<sub>CF</sub>=2.9 Hz), 130.1 (d, <sup>3</sup>J<sub>CF</sub>=8.7 Hz), 116.2, 115.8 (d, <sup>2</sup>J<sub>CF</sub>=21.9 Hz), 63.5; <sup>19</sup>F{<sup>1</sup>H} NMR (CDCl<sub>3</sub>, 400 MHz): 109.9.



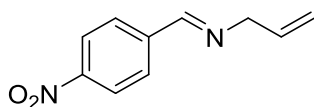
N-allyl-1-(p-tolyl)methanimine (**1i**):<sup>8</sup> Colorless oily liquid, 92% isolated yield, <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz): 8.25 (s, 1H), 7.66 (d, <sup>3</sup>J=8.0 Hz, 2H), 7.22 (d, <sup>3</sup>J=8.0 Hz, 2H), 6.08 (ddt, <sup>3</sup>J=17.2 Hz, <sup>3</sup>J=10.4 Hz, <sup>3</sup>J=5.6 Hz, 1H), 5.27 (dq, <sup>3</sup>J=17.2 Hz, <sup>2</sup>J= <sup>4</sup>J=1.6 Hz, 1H), 5.16 (dq, <sup>3</sup>J=10.4 Hz, <sup>2</sup>J= <sup>4</sup>J=1.6 Hz, 1H), 4.25 (dm, <sup>3</sup>J=5.6 Hz, 2H), 2.38 (s, 3H); <sup>13</sup>C{<sup>1</sup>H} NMR (CDCl<sub>3</sub>, 400 MHz): 161.8, 140.9, 136.0, 133.6, 129.3, 128.1, 115.9, 63.5, 21.5.



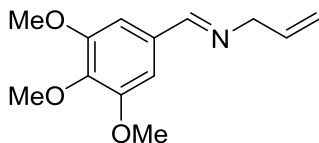
N-allyl-1-(4-methoxyphenyl)methanimine (**1j**):<sup>7</sup> Colorless oily liquid, 94% isolated yield, <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz): 8.19 (s, 1H), 7.68 (d, <sup>3</sup>J=8.8 Hz, 2H), 6.90 (d, <sup>3</sup>J=8.8 Hz, 2H), 6.05 (ddt, <sup>3</sup>J=17.2 Hz, <sup>3</sup>J=10.4 Hz, <sup>3</sup>J=5.6 Hz, 1H), 5.22 (dq, <sup>3</sup>J=17.2 Hz, <sup>2</sup>J= <sup>4</sup>J=1.6 Hz, 1H), 5.13 (dq, <sup>3</sup>J=10.4 Hz, <sup>2</sup>J= <sup>4</sup>J=1.6 Hz, 1H), 4.20 (dm, <sup>3</sup>J=5.6 Hz, 2H), 3.80 (s, 3H); <sup>13</sup>C{<sup>1</sup>H} NMR (CDCl<sub>3</sub>, 400 MHz): 161.6, 161.3, 136.2, 129.7, 129.1, 115.9, 114.0, 63.5, 55.3.



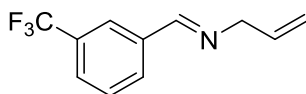
N-allyl-1-(4-N,N-dimethylaminophenyl)methanimine (**1k**):<sup>6</sup> Colorless oily liquid, 81% isolated yield, <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz): 8.14 (s, 1H), 7.63 (d, <sup>3</sup>J=8.8 Hz, 2H), 6.68 (d, <sup>3</sup>J=8.8 Hz, 2H), 6.07 (ddt, <sup>3</sup>J=17.2 Hz, <sup>3</sup>J=10.2 Hz, <sup>3</sup>J=5.8 Hz, 1H), 5.23 (dq, <sup>3</sup>J=17.2 Hz, <sup>4</sup>J= <sup>2</sup>J=1.8 Hz, 1H), 5.14 (dq, <sup>3</sup>J=10.2 Hz, <sup>4</sup>J= <sup>2</sup>J=1.8 Hz, 1H), 4.20 (dm, <sup>3</sup>J=5.8 Hz, 2H), 2.98 (s, 6H); <sup>13</sup>C{<sup>1</sup>H} NMR (CDCl<sub>3</sub>, 400 MHz): 161.9, 152.0, 136.6, 129.5, 124.3, 115.5, 111.5, 63.5, 40.1.



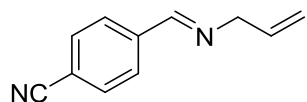
N-allyl-1-(4-nitrophenyl)methanimine (**1l**):<sup>9</sup> Pale yellow solid, 86% isolated yield, <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz): 8.38 (s, 1H), 8.26 (d, <sup>3</sup>J=8.8 Hz, 2H), 7.91 (d, <sup>3</sup>J=8.8 Hz, 2H), 6.07 (ddt, <sup>3</sup>J=17.2 Hz, <sup>3</sup>J=10.4 Hz, <sup>3</sup>J=6.0 Hz, 1H), 5.24 (dq, <sup>3</sup>J=17.2 Hz, <sup>4</sup>J= <sup>2</sup>J=1.6 Hz, 1H), 5.19 (dq, <sup>3</sup>J=10.4 Hz, <sup>4</sup>J= <sup>2</sup>J=1.6 Hz, 1H), 4.32 (dm, <sup>3</sup>J=6.0 Hz, 2H); <sup>13</sup>C{<sup>1</sup>H} NMR (CDCl<sub>3</sub>, 400 MHz): 159.7, 149.1, 141.7, 135.2, 128.9, 124.0, 116.8, 63.8.



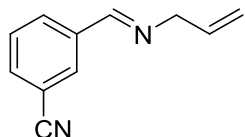
N-allyl-1-(3,4,5-trimethoxyphenyl)methanimine (**1m**):<sup>10</sup> Colorless oily liquid, 86% isolated yield, <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz): 8.15 (s, 1H), 6.96 (s, 2H), 6.05-5.97 (m, 1H), 5.19 (dm, <sup>3</sup>J=17.2 Hz, 1H), 5.12 (dm, <sup>3</sup>J=10.4 Hz, 1H), 4.21 (dm, <sup>3</sup>J=5.6 Hz, 2H), 3.86 (s, 6H), 3.84 (s, 3H); <sup>13</sup>C{<sup>1</sup>H} NMR (CDCl<sub>3</sub>, 400 MHz): 161.6, 153.4, 140.2, 135.8, 131.7, 116.2, 105.0, 63.4, 60.9, 56.2.



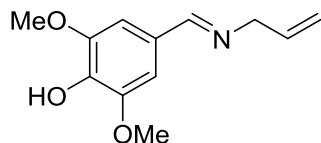
N-allyl-1-(3-(trifluoromethyl)phenyl)methanimine (**1n**):<sup>11</sup> Colorless oily liquid, 81% isolated yield, <sup>1</sup>H NMR (CDCl<sub>3</sub>, 600 MHz): 8.33 (s, 1H), 8.04 (s, 1H), 7.92 (d, <sup>3</sup>J=7.6 Hz, 1H), 7.67 (d, <sup>3</sup>J=7.6 Hz, 1H), 7.53 (t, <sup>3</sup>J=7.6 Hz, 1H), 6.06 (ddt, <sup>3</sup>J=17.2 Hz, <sup>3</sup>J=10.0 Hz, <sup>3</sup>J=5.6 Hz, 1H), 5.25 (dq, <sup>3</sup>J=17.2 Hz, <sup>4</sup>J= <sup>2</sup>J=1.6 Hz, 1H), 5.18 (dq, <sup>3</sup>J=10.0 Hz, <sup>4</sup>J= <sup>2</sup>J=1.6 Hz, 1H), 4.29 (dm, <sup>3</sup>J=5.6 Hz, 2H); <sup>13</sup>C{<sup>1</sup>H} NMR (CDCl<sub>3</sub>, 600 MHz): 160.4, 137.0, 135.5, 131.4, 131.2 (q, <sup>2</sup>J<sub>C-F</sub>=32.7 Hz), 129.2, 127.2 (q, <sup>3</sup>J<sub>C-F</sub>=3.5 Hz), 124.9 (q, <sup>3</sup>J<sub>C-F</sub>=3.0 Hz), 124.0 (q, <sup>1</sup>J<sub>C-F</sub>=272.2 Hz), 116.5, 63.6; <sup>19</sup>F{<sup>1</sup>H} NMR (CDCl<sub>3</sub>, 400 MHz): -63.16.



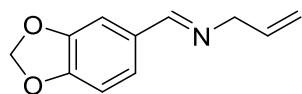
N-allyl-1-(4-cyanophenyl)methanimine (**1o**):<sup>12</sup> Colorless liquid, 86% isolated yield, <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz): 8.31 (s, 1H), 7.84 (d, <sup>3</sup>J=7.6 Hz, 2H), 7.68 (d, <sup>3</sup>J=7.6 Hz, 2H), 6.04 (ddt, <sup>3</sup>J=17.2 Hz, <sup>3</sup>J=10.4 Hz, <sup>3</sup>J=5.6 Hz, 1H), 5.22 (dq, <sup>3</sup>J=17.2 Hz, <sup>2</sup>J= <sup>4</sup>J=1.6 Hz, 1H), 5.17 (dq, <sup>3</sup>J=10.4 Hz, <sup>2</sup>J= <sup>4</sup>J=1.6 Hz, 1H), 4.28 (dm, <sup>3</sup>J=5.6 Hz, 2H); <sup>13</sup>C{<sup>1</sup>H} NMR (CDCl<sub>3</sub>, 400 MHz): 160.0, 140.0, 135.2, 132.5, 128.6, 118.6, 116.7, 114.0, 63.6.



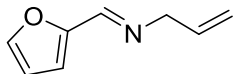
N-allyl-1-(3-cyanophenyl)methanimine (**1p**): Colorless liquid, 81% isolated yield, <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz): 8.27 (s, 1H), 8.03 (s, 1H), 7.94 (d, <sup>3</sup>J=7.6 Hz, 1H), 7.66 (d, <sup>3</sup>J=7.6 Hz, 1H), 7.50 (t, <sup>3</sup>J=7.6 Hz, 1H), 6.03 (ddt, <sup>3</sup>J=17.2 Hz, <sup>3</sup>J=10.4 Hz, <sup>3</sup>J=6.0 Hz, 1H), 5.21 (dq, <sup>3</sup>J=17.2 Hz, <sup>4</sup>J= <sup>2</sup>J=1.6 Hz, 1H), 5.15 (dq, <sup>3</sup>J=10.4 Hz, <sup>4</sup>J= <sup>2</sup>J=1.6 Hz, 1H), 4.26 (dm, <sup>3</sup>J=6.0 Hz, 2H); <sup>13</sup>C{<sup>1</sup>H} NMR (CDCl<sub>3</sub>, 400 MHz): 159.4, 137.2, 135.2, 133.7, 132.2, 131.5, 129.5, 118.3, 116.6, 112.9, 63.4.



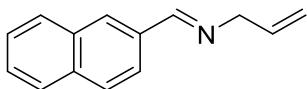
4-((allylimino)methyl)-2,6-dimethoxyphenol (**1q**): Pale orange solid, 91% isolated yield, <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz): 8.15 (s, 1H), 7.00 (s, 2H), 6.09-6.00 (m, 1H), 5.22 (dm, <sup>3</sup>J=17.2 Hz, 1H), 5.14 (dm, <sup>3</sup>J=10.2 Hz, 1H), 4.22 (dm, <sup>3</sup>J=5.2 Hz, 2H), 3.88 (s, 6H); <sup>13</sup>C{<sup>1</sup>H} NMR (CDCl<sub>3</sub>, 400 MHz): 161.9, 147.4, 137.7, 136.1, 127.6, 116.2, 105.1, 63.4, 56.4.



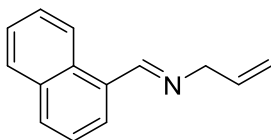
N-allyl-1-(benzo[1,3]dioxol-5-yl)methanimine (**1r**):<sup>13</sup> Colorless liquid, 85% isolated yield, <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz): 8.15 (s, 1H), 7.37 (d, <sup>4</sup>J=1.6 Hz, 1H), 7.10 (dd, <sup>3</sup>J=7.8 Hz, <sup>4</sup>J=1.6 Hz, 1H), 6.81 (d, <sup>3</sup>J=7.8 Hz, 1H), 6.04 (ddt, <sup>3</sup>J=17.2 Hz, <sup>3</sup>J=10.6 Hz, <sup>3</sup>J=5.8 Hz, 1H), 5.98 (s, 2H), 5.21 (dq, <sup>3</sup>J=17.2 Hz, <sup>4</sup>J= <sup>2</sup>J=1.8 Hz, 1H), 5.14 (dq, <sup>3</sup>J=10.6 Hz, <sup>4</sup>J= <sup>2</sup>J=1.8 Hz, 1H), 5.20 (dm, <sup>3</sup>J=5.8 Hz, 2H); <sup>13</sup>C{<sup>1</sup>H} NMR (CDCl<sub>3</sub>, 400 MHz): 161.2, 149.9, 148.3, 136.1, 131.1, 124.5, 116.0, 108.1, 106.6, 101.5, 63.3.



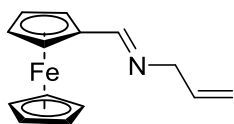
N-allyl-1-(furan-2-yl)methanimine (**1s**):<sup>14</sup> Dark red liquid, 81% isolated yield, <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz): 8.07 (s, 1H), 7.49 (d, <sup>3</sup>J=1.6 Hz, 1H), 6.74 (d, <sup>3</sup>J=3.6 Hz, 1H), 6.45 (dd, <sup>3</sup>J=3.6 Hz, <sup>3</sup>J=1.6 Hz, 1H), 6.08-5.98 (m, 1H), 5.19 (dd, <sup>3</sup>J=17.2 Hz, <sup>2</sup>J=1.6 Hz, 1H), 5.13 (dd, <sup>3</sup>J=10.0 Hz, <sup>2</sup>J=1.6 Hz, 1H), 4.20 (dd, <sup>3</sup>J=5.6 Hz, <sup>4</sup>J=1.2 Hz, 2H); <sup>13</sup>C{<sup>1</sup>H} NMR (CDCl<sub>3</sub>, 400 MHz): 151.6, 150.4, 144.8, 135.6, 116.5, 114.1, 111.7, 63.7.



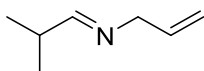
N-allyl-1-(naphthalen-2-yl)methanimine (**1t**):<sup>15</sup> Colorless liquid, 91% isolated yield, <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz): 8.39 (s, 1H), 8.08 (dd, <sup>3</sup>J=8.8 Hz, <sup>4</sup>J=1.1 Hz, 1H), 8.02 (s, 1H), 7.89-7.84 (m, 3H), 7.54-7.50 (m, 2H), 6.20-6.13 (m, 1H), 5.34 (dm, <sup>3</sup>J=17.2 Hz, 1H), 5.25 (dm, <sup>3</sup>J=10.3 Hz, 1H), 4.34 (dm, <sup>3</sup>J=5.5 Hz, 2H); <sup>13</sup>C{<sup>1</sup>H} NMR (CDCl<sub>3</sub>, 400 MHz): 162.0, 135.9, 134.7, 133.8, 133.0, 130.0, 128.6, 128.4, 127.8, 127.1, 126.4, 123.8, 116.1, 63.6.



N-allyl-1-(naphthalen-1-yl)methanimine (**1u**):<sup>15</sup> Colorless liquid, 90% isolated yield, <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz): 9.00 (d, <sup>3</sup>J=5.6 Hz, 1H), 8.96 (s, 1H), 7.95-7.90 (m, 3H), 7.63-7.52 (m, 3H), 6.25-6.15 (m, 1H), 5.34 (dm, <sup>3</sup>J=17.2 Hz, 1H), 5.23 (dm, <sup>3</sup>J=10.0 Hz, 1H), 4.41 (dm, <sup>3</sup>J=4.4 Hz, 2H); <sup>13</sup>C{<sup>1</sup>H} NMR (CDCl<sub>3</sub>, 400 MHz): 161.7, 136.2, 133.9, 131.7, 131.4, 131.1, 128.8, 128.7, 127.2, 126.1, 125.3, 124.3, 116.1, 64.6.



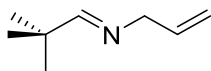
N-allyl-1-(ferrocenyl)methanimine (**1v**):<sup>16</sup> Dark red oily liquid, 80% isolated yield, <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz): 8.13 (s, 1H), 6.03 (ddt, <sup>3</sup>J=17.2 Hz, <sup>3</sup>J=10.4 Hz, <sup>3</sup>J=5.6 Hz, 1H), 5.21 (dm, <sup>3</sup>J=17.2 Hz, 1H), 5.14 (dm, <sup>3</sup>J=10.4 Hz, 1H), 4.66 (t, J=2.0 Hz, 2H), 4.37 (t, J=2.0 Hz, 2H), 4.18 (s, 5H), 4.09 (dm, <sup>3</sup>J=5.6 Hz, 2H); <sup>13</sup>C{<sup>1</sup>H} NMR (CDCl<sub>3</sub>, 400 MHz): 162.3, 136.5, 115.8, 80.5, 70.6, 69.2, 68.6, 63.8.



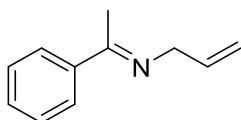
N-allyl-2-methylpropan-1-imine (**1w**):<sup>17</sup> Colorless liquid, 87% isolated yield, <sup>1</sup>H NMR (CDCl<sub>3</sub>, 600 MHz): 7.54 (dm, <sup>3</sup>J=4.8 Hz, 1H), 5.96 (m, 1H), 5.13 (dm, <sup>3</sup>J=15.6 Hz, 1H), 5.08 (dm, <sup>3</sup>J=10.2 Hz, 1H), 3.98 (d, <sup>3</sup>J=5.4 Hz, 2H),



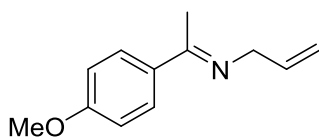
2.44 (sept,  $^3J=7.2$  Hz, 1H), 1.08 (d,  $^3J=7.2$  Hz, 6H);  $^{13}\text{C}\{^1\text{H}\}$  NMR ( $\text{CDCl}_3$ , 600 MHz): 171.1, 136.3, 115.7, 63.4, 34.3, 19.4.



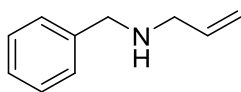
N-allyl-2,2-dimethylpropan-1-imine (**1x**):<sup>18</sup> Colorless liquid, 90% isolated yield,  $^1\text{H}$  NMR ( $\text{CDCl}_3$ , 600 MHz): 7.52 (s, 1H), 5.96 (m, 1H), 5.13 (dm,  $^3J=17.4$  Hz, 1H), 5.07 (dm,  $^3J=10.2$  Hz, 1H), 3.99 (dm,  $^3J=6.0$  Hz, 2H), 1.08 (s, 9H);  $^{13}\text{C}\{^1\text{H}\}$  NMR ( $\text{CDCl}_3$ , 600 MHz): 173.5, 136.4, 115.5, 63.2, 36.3, 27.0.



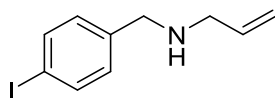
N-allyl-1-phenylethan-1-imine (**1y**):<sup>19</sup> (E:Z 91:9 by  $^1\text{H}$  NMR) Colorless oily liquid, 90% isolated yield,  $^1\text{H}$  NMR ( $\text{CDCl}_3$ , 400 MHz): 7.81-7.80 (m, 2H), 7.40-7.37 (m, 3H), 6.12 (ddt,  $^3J=17.4$  Hz,  $^3J=10.2$  Hz,  $^3J=5.4$  Hz, 1H), 5.26 (dq,  $^3J=17.4$  Hz,  $^4J=^2J=1.8$  Hz, 1H), 5.15 (dq,  $^3J=10.2$  Hz,  $^4J=^2J=1.8$  Hz, 1H), 4.19 (d,  $^3J=5.4$  Hz, 2H), 2.25 (s, 3H);  $^{13}\text{C}\{^1\text{H}\}$  NMR ( $\text{CDCl}_3$ , 600 MHz): 166.4, 141.3, 136.2, 129.7, 128.4, 126.8, 115.3, 54.7, 15.8.



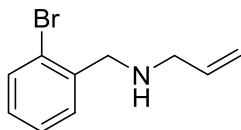
N-allyl-1-(4-methoxyphenyl)ethan-1-imine (**1z**):<sup>20</sup> (E:Z 96:4 by  $^1\text{H}$  NMR) Colorless oily liquid, 86% isolated yield,  $^1\text{H}$  NMR ( $\text{CDCl}_3$ , 600 MHz): 7.78 (dm,  $^3J=8.9$  Hz, 2H), 6.89 (dm,  $^3J=8.9$  Hz, 2H), 6.11 (ddt,  $^3J=17.2$  Hz,  $^3J=10.4$  Hz,  $^3J=5.4$  Hz, 1H), 5.24 (dq,  $^3J=17.2$  Hz,  $^4J=^2J=1.8$  Hz, 1H), 5.14 (dq,  $^3J=10.4$  Hz,  $^4J=^2J=1.8$  Hz, 1H), 4.16 (dm,  $^3J=5.4$  Hz, 2H), 3.84 (s, 3H), 2.22 (s, 3H);  $^{13}\text{C}\{^1\text{H}\}$  NMR ( $\text{CDCl}_3$ , 600 MHz): 165.6, 160.9, 136.4, 133.9, 128.3, 115.1, 113.6, 55.5, 54.6, 15.4.



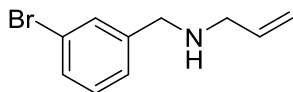
N-benzylprop-2-en-1-amine (**2a**):<sup>21</sup> Colorless liquid (60 mg, 81% isolated yield),  $^1\text{H}$  NMR ( $\text{CDCl}_3$ , 600 MHz): 7.34-7.31 (m, 4H), 7.28-7.24 (m, 1H), 5.94 (ddt,  $^3J=16.3$  Hz,  $^3J=10.3$  Hz,  $^3J=6.0$  Hz, 1H), 5.20 (dq,  $^3J=16.3$  Hz,  $^4J=^2J=1.7$  Hz, 1H), 5.13 (dq,  $^3J=10.3$  Hz,  $^4J=^2J=1.7$  Hz, 1H), 3.80 (s, 2H), 3.29 (dt,  $^3J=6.0$  Hz,  $^4J=1.7$  Hz, 2H), 1.60 (s, broad, 1H);  $^{13}\text{C}\{^1\text{H}\}$  NMR ( $\text{CDCl}_3$ , 600 MHz): 140.3, 136.8, 128.5, 128.3, 127.1, 116.2, 53.4, 51.9; HRMS (ESI) (m/z):  $[\text{M}+\text{H}]^+$  calc for  $\text{C}_{10}\text{H}_{14}\text{N}$ , 148.1126; found, 148.1120.



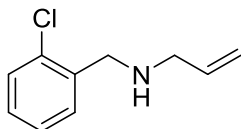
N-(4-iodobenzyl)prop-2-en-1-amine (**2b**): Colorless oily liquid (121 mg, 89% isolated yield),  $^1\text{H}$  NMR ( $\text{CDCl}_3$ , 400 MHz): 7.64 (d,  $^3\text{J}=8.0$  Hz, 2H), 7.08 (d,  $^3\text{J}=8.0$  Hz, 2H), 5.91 (ddt,  $^3\text{J}=17.2$  Hz,  $^3\text{J}=10.4$  Hz,  $^3\text{J}=6.0$  Hz, 1H), 5.18 (dq,  $^3\text{J}=17.2$  Hz,  $^4\text{J}=^2\text{J}=1.6$  Hz, 1H), 5.11 (dq,  $^3\text{J}=10.4$  Hz,  $^4\text{J}=^2\text{J}=1.6$  Hz, 1H), 3.73 (s, 2H), 3.25 (dt,  $^3\text{J}=6.0$  Hz,  $^4\text{J}=1.6$  Hz, 2H), 1.43 (broad s, 1H);  $^{13}\text{C}\{^1\text{H}\}$  NMR ( $\text{CDCl}_3$ , 400 MHz): 140.0, 137.5, 136.7, 130.3, 116.3, 92.3, 52.7, 51.8; HRMS (ESI) (m/z):  $[\text{M}+\text{H}]^+$  calc for  $\text{C}_{10}\text{H}_{13}\text{IN}$ , 274.0093; found, 274.0103.



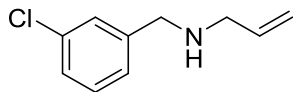
N-(2-bromobenzyl)prop-2-en-1-amine (**2c**):<sup>22</sup> Colorless oily liquid (89 mg, 79% isolated yield),  $^1\text{H}$  NMR ( $\text{CDCl}_3$ , 600 MHz): 7.54 (d,  $^3\text{J}=7.8$  Hz, 1H), 7.39 (dd,  $^3\text{J}=7.2$  Hz,  $^4\text{J}=1.2$  Hz, 1H), 7.28 (t,  $^3\text{J}=7.8$  Hz, 1H), 7.13 (td,  $^3\text{J}=7.2$  Hz,  $^4\text{J}=1.2$  Hz, 1H), 5.98-5.91 (m, 1H), 5.22 (dm,  $^3\text{J}=17.4$  Hz, 1H), 5.13 (dm,  $^3\text{J}=10.2$  Hz, 1H), 3.87 (s, 2H), 3.28 (dm,  $^3\text{J}=6.0$  Hz, 2H), 1.83 (broad s, 1H);  $^{13}\text{C}\{^1\text{H}\}$  NMR ( $\text{CDCl}_3$ , 600 MHz): 139.0, 136.5, 133.0, 130.6, 128.8, 127.6, 124.2, 116.6, 53.1, 51.6; HRMS (ESI) (m/z):  $[\text{M}+\text{H}]^+$  calc for  $\text{C}_{10}\text{H}_{13}\text{BrN}$ , 226.0231; found, 226.0230.



N-(3-bromobenzyl)prop-2-en-1-amine (**2d**):<sup>23</sup> Colorless oily liquid (101 mg, 76% isolated yield),  $^1\text{H}$  NMR ( $\text{CDCl}_3$ , 600 MHz): 7.50 (s, 1H), 7.38 (d,  $^3\text{J}=7.2$  Hz, 1H), 7.25 (d,  $^3\text{J}=7.2$  Hz, 1H), 7.19 (t,  $^3\text{J}=7.2$  Hz, 1H), 5.92 (ddt,  $^3\text{J}=17.2$  Hz,  $^3\text{J}=10.2$  Hz,  $^3\text{J}=5.8$  Hz, 1H), 5.20 (dq,  $^3\text{J}=17.2$  Hz,  $^4\text{J}=^2\text{J}=1.8$  Hz, 1H), 5.13 (dq,  $^3\text{J}=10.2$  Hz,  $^4\text{J}=^2\text{J}=1.8$  Hz, 1H), 3.76 (s, 2H), 3.26 (dt,  $^3\text{J}=5.8$  Hz,  $^4\text{J}=1.8$  Hz, 2H), 1.37 (broad s, 1H);  $^{13}\text{C}\{^1\text{H}\}$  NMR ( $\text{CDCl}_3$ , 600 MHz): 142.8, 136.7, 131.3, 130.2, 130.1, 126.9, 122.7, 116.4, 52.7, 51.8; HRMS (ESI) (m/z):  $[\text{M}+\text{H}]^+$  calc for  $\text{C}_{10}\text{H}_{13}\text{BrN}$ , 226.0231; found, 226.0227.

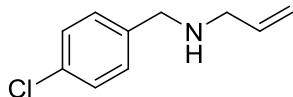


N-(2-chlorobenzyl)prop-2-en-1-amine (**2e**):<sup>24</sup> Colorless oily liquid (74 mg, 82% isolated yield),  $^1\text{H}$  NMR ( $\text{CDCl}_3$ , 600 MHz): 7.39-7.35 (m, 2H), 7.25-7.19 (m, 2H), 5.94 (ddt,  $^3\text{J}=17.2$  Hz,  $^3\text{J}=10.2$  Hz,  $^3\text{J}=5.8$  Hz, 1H), 5.21 (dq,  $^3\text{J}=17.2$  Hz,  $^4\text{J}=^2\text{J}=1.8$  Hz, 1H), 5.13 (dq,  $^3\text{J}=10.2$  Hz,  $^4\text{J}=^2\text{J}=1.8$  Hz, 1H), 3.89 (s, 2H), 3.28 (dt,  $^3\text{J}=5.8$  Hz,  $^4\text{J}=1.8$  Hz, 2H), 1.59 (broad s, 1H);  $^{13}\text{C}\{^1\text{H}\}$  NMR ( $\text{CDCl}_3$ , 600 MHz): 137.7, 136.8, 133.9, 130.4, 129.7, 128.5, 126.9, 116.3, 51.8, 50.8; HRMS (ESI) (m/z):  $[\text{M}+\text{H}]^+$  calc for  $\text{C}_{10}\text{H}_{13}\text{ClN}$ , 182.0737; found, 182.0736.

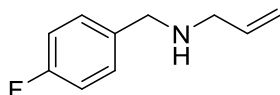


N-(3-chlorobenzyl)prop-2-en-1-amine (**2f**):<sup>23</sup> Colorless oily liquid (76 mg, 84% isolated yield),  $^1\text{H}$  NMR ( $\text{CDCl}_3$ , 400 MHz): 7.34 (s, 1H), 7.26-7.19 (m, 3H), 5.97-5.87 (m, 1H), 5.20 (dm,  $^3\text{J}=17.4$  Hz, 1H), 5.13 (dm,  $^3\text{J}=10.2$  Hz,

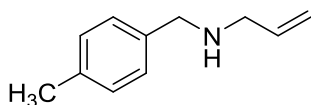
1H), 3.77 (s, 2H), 3.26 (dm,  $^3J=6.0$  Hz, 2H), 1.43 (broad s, 1H);  $^{13}\text{C}\{^1\text{H}\}$  NMR ( $\text{CDCl}_3$ , 600 MHz): 142.5, 136.7, 134.4, 129.7, 128.4, 127.2, 126.4, 116.3, 52.7, 51.8; HRMS (ESI) (m/z):  $[\text{M}+\text{H}]^+$  calc for  $\text{C}_{10}\text{H}_{13}\text{ClN}$ , 182.0737; found, 182.0731.



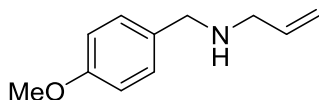
N-(4-chlorobenzyl)prop-2-en-1-amine (**2g**):<sup>7</sup> Colorless oily liquid (84 mg, 92% isolated yield),  $^1\text{H}$  NMR ( $\text{CDCl}_3$ , 400 MHz): 7.30-7.24 (m, 4H), 5.91 (ddt,  $^3J=17.2$  Hz,  $^3J=10.4$  Hz,  $^3J=6.0$  Hz, 1H), 5.19 (dm,  $^3J=17.2$  Hz, 1H), 5.12 (dm,  $^3J=10.4$  Hz, 1H), 3.76 (s, 2H), 3.25 (dm,  $^3J=6.0$  Hz, 2H), 1.40 (broad s, 1H);  $^{13}\text{C}\{^1\text{H}\}$  NMR ( $\text{CDCl}_3$ , 400 MHz): 138.9, 136.7, 132.7, 129.6, 128.6, 116.3, 52.6, 51.8; HRMS (ESI) (m/z):  $[\text{M}+\text{H}]^+$  calc for  $\text{C}_{10}\text{H}_{13}\text{ClN}$ , 182.0737; found, 182.0739.



N-(4-fluorobenzyl)prop-2-en-1-amine (**2h**):<sup>25</sup> Colorless oily liquid (74 mg, 90% isolated yield),  $^1\text{H}$  NMR ( $\text{CDCl}_3$ , 400 MHz): 7.30-7.26 (m, 2H), 7.03-6.97 (m, 2H), 5.92 (ddt,  $^3J=17.2$  Hz,  $^3J=10.0$  Hz,  $^3J=6.0$  Hz, 1H), 5.19 (dq,  $^3J=17.2$  Hz,  $^4J=^2J=1.6$  Hz, 1H), 5.11 (dq,  $^3J=10.0$  Hz,  $^4J=^2J=1.6$  Hz, 1H), 3.75 (s, 2H), 3.26 (dt,  $^3J=6.0$  Hz,  $^4J=1.6$  Hz, 2H), 1.39 (broad s, 1H);  $^{13}\text{C}\{^1\text{H}\}$  NMR ( $\text{CDCl}_3$ , 400 MHz): 162.0 (d,  $^1J_{\text{C-F}}=244.0$  Hz), 136.8, 136.1 (d,  $^4J_{\text{C-F}}=2.9$  Hz), 129.8 (d,  $^3J_{\text{C-F}}=7.8$  Hz), 116.2, 115.2 (d,  $^2J_{\text{C-F}}=21.5$  Hz), 52.6, 51.8;  $^{19}\text{F}\{^1\text{H}\}$  NMR ( $\text{CDCl}_3$ , 400 MHz): -116.49; HRMS (ESI) (m/z):  $[\text{M}+\text{H}]^+$  calc for  $\text{C}_{10}\text{H}_{13}\text{FN}$ , 166.1032; found, 166.1040.

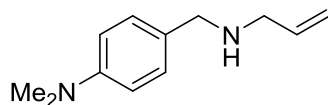


N-(4-methylbenzyl)prop-2-en-1-amine (**2i**): Colorless liquid (70 mg, 84% isolated yield),  $^1\text{H}$  NMR ( $\text{CDCl}_3$ , 600 MHz): 7.21 (d,  $^3J=7.9$  Hz, 2H), 7.14 (d,  $^3J=7.9$  Hz, 2H), 5.96-5.90 (m, 1H), 5.19 (dm,  $^3J=17.2$  Hz, 1H), 5.11 (dm,  $^3J=10.2$  Hz, 1H), 3.76 (s, 2H), 3.27 (dt,  $^3J=5.9$  Hz,  $^4J=1.4$  Hz, 2H), 2.33 (s, 3H), 1.52 (broad s, 1H);  $^{13}\text{C}\{^1\text{H}\}$  NMR ( $\text{CDCl}_3$ , 600 MHz): 137.3, 136.9, 136.6, 129.2, 128.3, 116.1, 53.1, 51.8, 21.2; HRMS (ESI) (m/z):  $[\text{M}+\text{H}]^+$  calc for  $\text{C}_{11}\text{H}_{16}\text{N}$ , 162.1283; found, 162.1288.

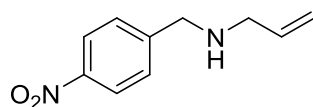


N-(4-methoxybenzyl)prop-2-en-1-amine (**2j**):<sup>26</sup> Colorless oily liquid (67 mg, 76% isolated yield),  $^1\text{H}$  NMR ( $\text{CDCl}_3$ , 400 MHz): 7.24 (d,  $^3J=8.8$  Hz, 2H), 6.91 (d,  $^3J=8.8$  Hz, 2H), 5.97 (ddt,  $^3J=17.2$  Hz,  $^3J=10.2$  Hz,  $^3J=5.8$  Hz, 1H), 5.23 (dq,  $^3J=17.2$  Hz,  $^4J=^2J=1.8$  Hz, 1H), 5.16 (dq,  $^3J=10.2$  Hz,  $^4J=^2J=1.8$  Hz, 1H), 3.85 (s, 3H), 3.77 (s, 2H), 3.31 (dt,

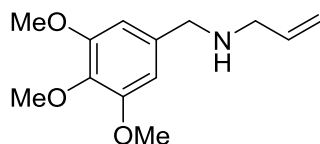
$^3J=5.8$  Hz,  $^4J=1.8$  Hz, 2H), 1.52 (broad s, 1H);  $^{13}\text{C}\{^1\text{H}\}$  NMR ( $\text{CDCl}_3$ , 600 MHz): 158.7, 137.0, 132.6, 129.5, 116.1, 113.9, 55.4, 52.8, 51.9; HRMS (ESI) ( $m/z$ ):  $[\text{M}+\text{H}]^+$  calc for  $\text{C}_{11}\text{H}_{16}\text{NO}$ , 178.1232; found, 178.1238.



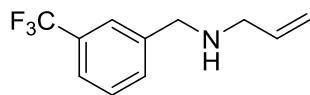
N-(4-N,N-dimethylaminobenzyl)prop-2-en-1-amine (**2k**): Colorless oily liquid (87 mg, 91% isolated yield),  $^1\text{H}$  NMR ( $\text{CDCl}_3$ , 400 MHz): 7.20 (dm,  $^3J=8.8$  Hz, 2H), 6.72 (dm,  $^3J=8.8$  Hz, 2H), 5.94 (ddt,  $^3J=16.8$  Hz,  $^3J=10.0$  Hz,  $^3J=6.0$  Hz, 1H), 5.19 (dq,  $^3J=16.8$  Hz,  $^4J=^2J=1.6$  Hz, 1H), 5.11 (dq,  $^3J=10.0$  Hz,  $^4J=^2J=1.6$  Hz, 1H), 3.70 (s, 2H), 3.27 (dt,  $^3J=6.0$  Hz,  $^4J=1.6$  Hz, 2H), 2.94 (s, 6H), 1.42 (broad s, 1H);  $^{13}\text{C}\{^1\text{H}\}$  NMR ( $\text{CDCl}_3$ , 400 MHz): 149.9, 137.1, 129.2, 128.4, 115.9, 112.8, 52.9, 51.8, 40.9; HRMS (ESI) ( $m/z$ ):  $[\text{M}+\text{H}]^+$  calc for  $\text{C}_{12}\text{H}_{19}\text{N}_2$ , 191.1548; found, 191.1557.



N-(4-nitrobenzyl)prop-2-en-1-amine (**2l**):<sup>24</sup> Pale yellow oily liquid (75 mg, 78% isolated yield),  $^1\text{H}$  NMR ( $\text{CDCl}_3$ , 400 MHz): 8.18 (d,  $^3J=8.4$  Hz, 2H), 7.51 (d,  $^3J=8.4$  Hz, 2H), 5.91 (ddt,  $^3J=17.6$  Hz,  $^3J=10.4$  Hz,  $^3J=6.0$  Hz, 1H), 5.20 (dq,  $^3J=17.6$  Hz,  $^4J=^2J=1.6$  Hz, 1H), 5.14 (dq,  $^3J=10.4$  Hz,  $^4J=^2J=1.6$  Hz, 1H), 3.90 (s, 2H), 3.28 (dt,  $^3J=6.0$  Hz,  $^4J=1.6$  Hz, 2H), 1.50 (broad s, 1H);  $^{13}\text{C}\{^1\text{H}\}$  NMR ( $\text{CDCl}_3$ , 400 MHz): 148.4, 136.5, 128.9, 123.9, 116.7, 52.6, 52.0; HRMS (ESI) ( $m/z$ ):  $[\text{M}+\text{H}]^+$  calc for  $\text{C}_{10}\text{H}_{13}\text{N}_2\text{O}_2$ , 193.0977; found, 193.0975.

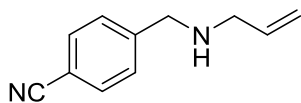


N-(3,4,5-trimethoxybenzyl)prop-2-en-1-amine (**2m**): Colorless oily liquid (106 mg, 89% isolated yield),  $^1\text{H}$  NMR ( $\text{CDCl}_3$ , 400 MHz): 6.56 (s, 2H), 5.94 (ddt,  $^3J=17.2$  Hz,  $^3J=10.4$  Hz,  $^3J=6.0$  Hz, 1H), 5.21 (dm,  $^3J=17.2$  Hz, 1H), 5.12 (dm,  $^3J=10.4$  Hz, 1H), 3.86 (s, 6H), 3.83 (s, 3H), 3.73 (s, 2H), 3.29 (dm,  $^3J=6.0$  Hz, 2H), 1.48 (broad s, 1H);  $^{13}\text{C}\{^1\text{H}\}$  NMR ( $\text{CDCl}_3$ , 400 MHz): 153.3, 136.8, 136.2, 116.3, 105.0, 61.0, 56.2, 53.7, 52.0; HRMS (ESI) ( $m/z$ ):  $[\text{M}+\text{H}]^+$  calc for  $\text{C}_{13}\text{H}_{20}\text{NO}_3$ , 238.1443; found, 238.1447.

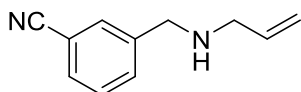


N-(3-(trifluoromethyl)benzyl)prop-2-en-1-amine (**2n**):<sup>27</sup> Colorless oily liquid (99 mg, 92% isolated yield),  $^1\text{H}$  NMR ( $\text{CDCl}_3$ , 600 MHz): 7.61 (s, 1H), 7.53-7.50 (m, 2H), 7.45-7.42 (m, 1H), 5.93 (ddt,  $^3J=16.4$  Hz,  $^3J=10.2$  Hz,  $^3J=6.0$

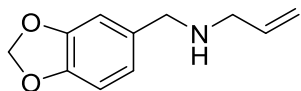
Hz, 1H), 5.21 (dq,  $^3J=16.4$  Hz,  $^4J=^2J=1.6$  Hz, 1H), 5.13 (dq,  $^3J=10.2$  Hz,  $^4J=^2J=1.6$  Hz, 1H), 3.85 (s, 2H), 3.28 (dt,  $^3J=6.0$  Hz,  $^4J=1.6$  Hz, 2H), 1.43 (broad s, 1H);  $^{13}\text{C}\{^1\text{H}\}$  NMR ( $\text{CDCl}_3$ , 400 MHz): 141.4, 136.6, 131.6, 130.8 (q,  $^2J_{\text{C-F}}=32.3$  Hz), 128.9, 125.0 (q,  $^3J_{\text{C-F}}=3.5$  Hz), 124.3 (q,  $^1J_{\text{C-F}}=271.8$  Hz), 123.9 (q,  $^3J_{\text{C-F}}=3.8$  Hz), 116.4, 52.8, 51.9;  $^{19}\text{F}\{^1\text{H}\}$  NMR ( $\text{CDCl}_3$ , 400 MHz): -62.96; HRMS (ESI) (m/z):  $[\text{M}+\text{H}]^+$  calc for  $\text{C}_{11}\text{H}_{13}\text{F}_3\text{N}$ , 216.1000; found, 216.0998.



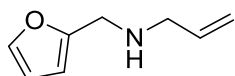
N-(4-cyanobenzyl)prop-2-en-1-amine (**2o**):<sup>24</sup> Colorless oily liquid (75 mg, 83% isolated yield),  $^1\text{H}$  NMR ( $\text{CDCl}_3$ , 400 MHz): 7.61 (d,  $^3J=8.4$  Hz, 2H), 7.45 (d,  $^3J=8.4$  Hz, 2H), 5.90 (ddt,  $^3J=17.2$  Hz,  $^3J=10.4$  Hz,  $^3J=6.0$  Hz, 1H), 5.19 (dq,  $^3J=17.2$  Hz,  $^4J=^2J=1.6$  Hz, 1H), 5.13 (dq,  $^3J=10.4$  Hz,  $^4J=^2J=1.6$  Hz, 1H), 3.85 (s, 2H), 3.26 (dt,  $^3J=6.0$  Hz,  $^4J=1.6$  Hz, 2H), 1.44 (broad s, 1H);  $^{13}\text{C}\{^1\text{H}\}$  NMR ( $\text{CDCl}_3$ , 400 MHz): 146.1, 136.4, 132.3, 128.8, 119.1, 116.5, 110.8, 52.7, 51.9; HRMS (ESI) (m/z):  $[\text{M}+\text{H}]^+$  calc for  $\text{C}_{11}\text{H}_{13}\text{N}_2$ , 173.1079; found, 173.1087.



N-(3-cyanobenzyl)prop-2-en-1-amine (**2p**):<sup>23</sup> Colorless oily liquid (76 mg, 88% isolated yield),  $^1\text{H}$  NMR ( $\text{CDCl}_3$ , 400 MHz): 7.66 (s, 1H), 7.59-7.53 (m, 2H), 7.42 (t,  $^3J=7.6$  Hz, 1H), 5.91 (ddt,  $^3J=17.2$  Hz,  $^3J=10.2$  Hz,  $^3J=5.8$  Hz, 1H), 5.20 (dq,  $^3J=17.2$  Hz,  $^4J=^2J=1.6$  Hz, 1H), 5.14 (dq,  $^3J=10.2$  Hz,  $^4J=^2J=1.6$  Hz, 1H), 3.83 (s, 2H), 3.27 (dt,  $^3J=5.8$  Hz,  $^4J=1.6$  Hz, 2H), 1.46 (broad s, 1H);  $^{13}\text{C}\{^1\text{H}\}$  NMR ( $\text{CDCl}_3$ , 400 MHz): 142.0, 136.5, 132.7, 131.8, 130.8, 129.3, 119.1, 116.6, 112.5, 52.4, 51.9; HRMS (ESI) (m/z):  $[\text{M}+\text{H}]^+$  calc for  $\text{C}_{11}\text{H}_{13}\text{N}_2$ , 173.1079; found, 173.1084.

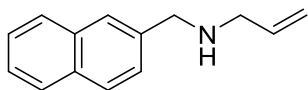


N-2-propen-1-yl-1,3-benzodioxole-5-methanamine (**2r**):<sup>28</sup> Colorless liquid (80 mg, 79% isolated yield),  $^1\text{H}$  NMR ( $\text{CDCl}_3$ , 600 MHz): 6.83 (s, 1H), 6.75 (s, 2H), 5.94-5.88 (m, 1H), 5.93 (s, 2H), 5.18 (dq,  $^3J=17.2$  Hz,  $^4J=^2J=1.7$  Hz, 1H), 5.10 (dq,  $^3J=10.3$  Hz,  $^4J=^2J=1.7$  Hz, 1H), 3.69 (s, 2H), 3.25 (dt,  $^3J=6.0$  Hz,  $^4J=1.7$  Hz, 2H), 1.43 (broad s, 1H);  $^{13}\text{C}\{^1\text{H}\}$  NMR ( $\text{CDCl}_3$ , 600 MHz): 147.8, 146.6, 136.9, 134.4, 121.4, 116.1, 108.9, 108.2, 101.0, 53.2, 51.7; HRMS (ESI) (m/z):  $[\text{M}+\text{H}]^+$  calc for  $\text{C}_{11}\text{H}_{14}\text{NO}_2$ , 192.1025; found, 192.1032.

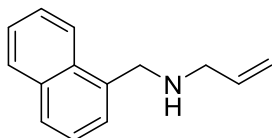


N-(furan-2-ylmethyl)prop-2-en-1-amine (**2s**):<sup>29</sup> Colorless liquid (55 mg, 81% isolated yield),  $^1\text{H}$  NMR ( $\text{CDCl}_3$ , 600 MHz): 7.36-7.35 (m, 1H), 6.31-6.30 (m, 1H), 6.17 (d,  $^3J=3.2$  Hz, 1H), 5.90 (ddt,  $^3J=16.8$  Hz,  $^3J=10.2$  Hz,  $^3J=6.6$  Hz, 1H), 5.19 (dm,  $^3J=16.8$  Hz, 1H), 5.11 (dm,  $^3J=10.2$  Hz, 1H), 3.78 (s, 2H), 3.25 (dm,  $^3J=6.6$  Hz, 2H), 1.57 (broad s,

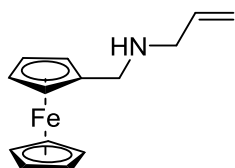
1H);  $^{13}\text{C}\{^1\text{H}\}$  NMR ( $\text{CDCl}_3$ , 600 MHz): 153.9, 141.9, 136.6, 116.4, 110.2, 107.1, 51.6, 45.5; HRMS (ESI) (m/z):  $[\text{M}+\text{H}]^+$  calc for  $\text{C}_8\text{H}_{12}\text{NO}$ , 138.0919; found, 138.0907.



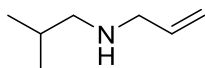
N-(naphthalen-2-ylmethyl)prop-2-en-1-amine (**2t**):<sup>30</sup> White solid (88 mg, 89% isolated yield),  $^1\text{H}$  NMR ( $\text{CDCl}_3$ , 400 MHz): 7.85-7.81 (m, 3H), 7.78 (s, 1H), 7.50- 7.45 (m, 3H), 5.97 (ddt,  $^3\text{J}=17.2$  Hz,  $^3\text{J}=10.4$  Hz,  $^3\text{J}=6.0$  Hz, 1H), 5.23 (dm,  $^3\text{J}=17.2$  Hz, 1H), 5.15 (dm,  $^3\text{J}=10.4$  Hz, 1H), 3.97 (s, 2H), 3.33 (dm,  $^3\text{J}=6.0$  Hz, 2H), 1.52 (broad s, 1H);  $^{13}\text{C}\{^1\text{H}\}$  NMR ( $\text{CDCl}_3$ , 400 MHz): 137.9, 136.9, 133.5, 132.7, 128.2, 127.81, 127.76, 126.7, 126.6, 126.1, 125.7, 116.2, 53.5, 51.9; HRMS (ESI) (m/z):  $[\text{M}+\text{H}]^+$  calc for  $\text{C}_{14}\text{H}_{16}\text{N}$ , 198.1283; found, 198.1285.



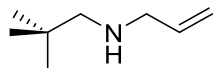
N-(naphthalen-1-ylmethyl)prop-2-en-1-amine (**2u**):<sup>31</sup> Colorless oily liquid (86 mg, 87% isolated yield),  $^1\text{H}$  NMR ( $\text{CDCl}_3$ , 400 MHz): 8.13 (d,  $^3\text{J}=8.0$  Hz, 1H), 7.87 (d,  $^3\text{J}=8.0$  Hz, 1H), 7.78 (d,  $^3\text{J}=8.0$  Hz, 1H), 7.56-7.41 (m, 4H), 6.00 (ddt,  $^3\text{J}=17.2$  Hz,  $^3\text{J}=10.2$  Hz,  $^3\text{J}=6.2$  Hz, 1H), 5.25 (dq,  $^3\text{J}=17.2$  Hz,  $^4\text{J}=^2\text{J}=1.8$  Hz, 1H), 5.16 (dq,  $^3\text{J}=10.2$  Hz,  $^4\text{J}=^2\text{J}=1.8$  Hz, 1H), 4.24 (s, 2H), 3.40 (dt,  $^3\text{J}=6.2$  Hz,  $^4\text{J}=1.8$  Hz, 2H), 1.50 (broad s, 1H);  $^{13}\text{C}\{^1\text{H}\}$  NMR ( $\text{CDCl}_3$ , 400 MHz): 137.0, 136.0, 134.0, 131.9, 128.8, 127.9, 126.24, 126.20, 125.7, 125.5, 123.8, 116.4, 52.5, 51.0; HRMS (ESI) (m/z):  $[\text{M}+\text{H}]^+$  calc for  $\text{C}_{14}\text{H}_{16}\text{N}$ , 198.1283; found, 198.1288.



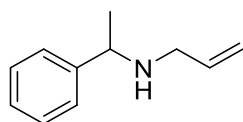
N-allyl-1-(ferrocenyl)methanamine (**2v**):<sup>32</sup> Red oily liquid (107 mg, 84% isolated yield),  $^1\text{H}$  NMR ( $\text{CDCl}_3$ , 400 MHz): 5.97-5.87 (m, 1H), 5.19 (dm,  $^3\text{J}=16.8$  Hz, 1H), 5.11 (dm,  $^3\text{J}=10.4$  Hz, 1H), 4.19 (t,  $\text{J}=2.0$  Hz, 2H), 4.12 (s, 5H), 4.11 (t,  $\text{J}=2.0$  Hz, 2H), 3.51 (s, 2H), 3.28 (dm,  $^3\text{J}=6.0$  Hz, 2H), 1.44 (broad s, 1H);  $^{13}\text{C}\{^1\text{H}\}$  NMR ( $\text{CDCl}_3$ , 400 MHz): 137.0, 116.1, 86.9, 68.54, 68.51, 67.9, 52.1, 48.4; HRMS (ESI) (m/z):  $[\text{M}+\text{H}]^+$  calc for  $\text{C}_{14}\text{H}_{18}\text{FeN}$ , 256.0789; found, 256.0793.



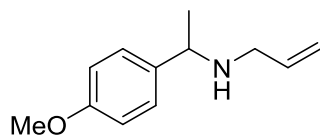
N-isobutylprop-2-en-1-amine (**2w**):<sup>33</sup> Colorless liquid (49 mg, 88% isolated yield),  $^1\text{H}$  NMR ( $\text{CDCl}_3$ , 400 MHz): 5.88 (ddt,  $^3\text{J}=17.2$  Hz,  $^3\text{J}=10.4$  Hz,  $^3\text{J}=6.0$  Hz, 1H), 5.14 (dm,  $^3\text{J}=17.2$  Hz, 1H), 5.05 (dm,  $^3\text{J}=10.4$  Hz, 1H), 3.21 (dm,  $^3\text{J}=6.0$  Hz, 2H), 2.39 (d,  $^3\text{J}=6.8$  Hz, 2H), 1.72 (m, 1H), 1.65 (broad s, 1H), 0.88 (d,  $^3\text{J}=6.8$  Hz, 6H);  $^{13}\text{C}\{^1\text{H}\}$  NMR ( $\text{CDCl}_3$ , 400 MHz): 137.1, 115.8, 57.5, 52.7, 28.4, 20.8; HRMS (ESI) (m/z):  $[\text{M}+\text{H}]^+$  calc for  $\text{C}_7\text{H}_{16}\text{N}$ , 114.1283; found, 114.1282.



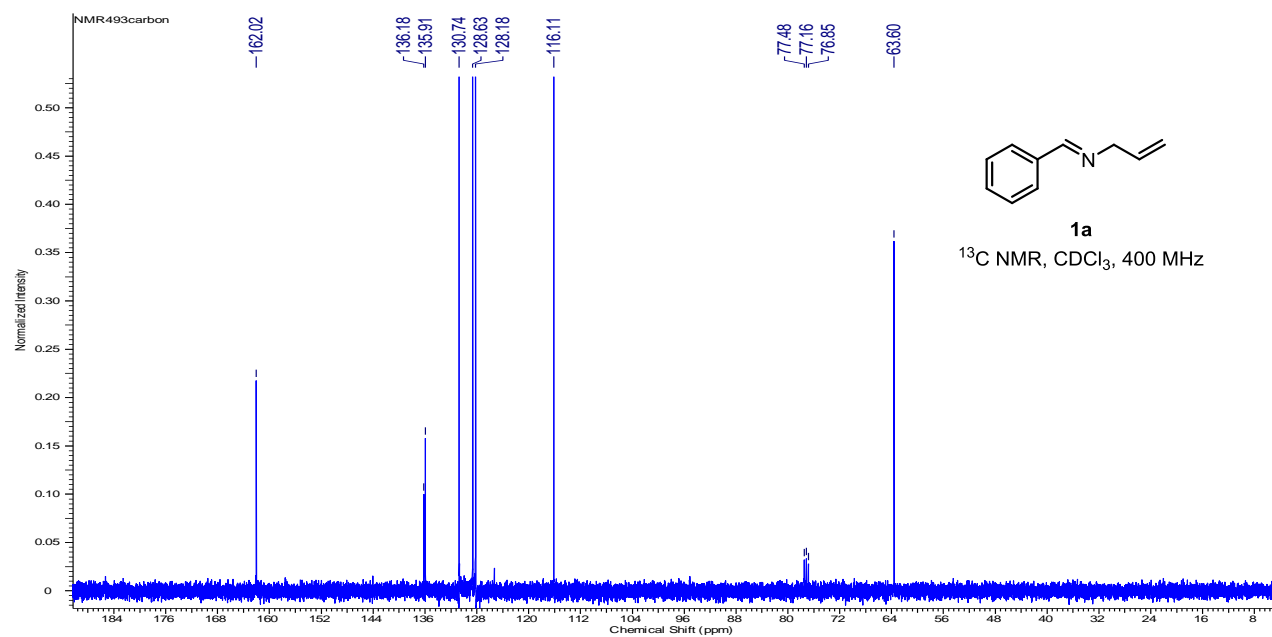
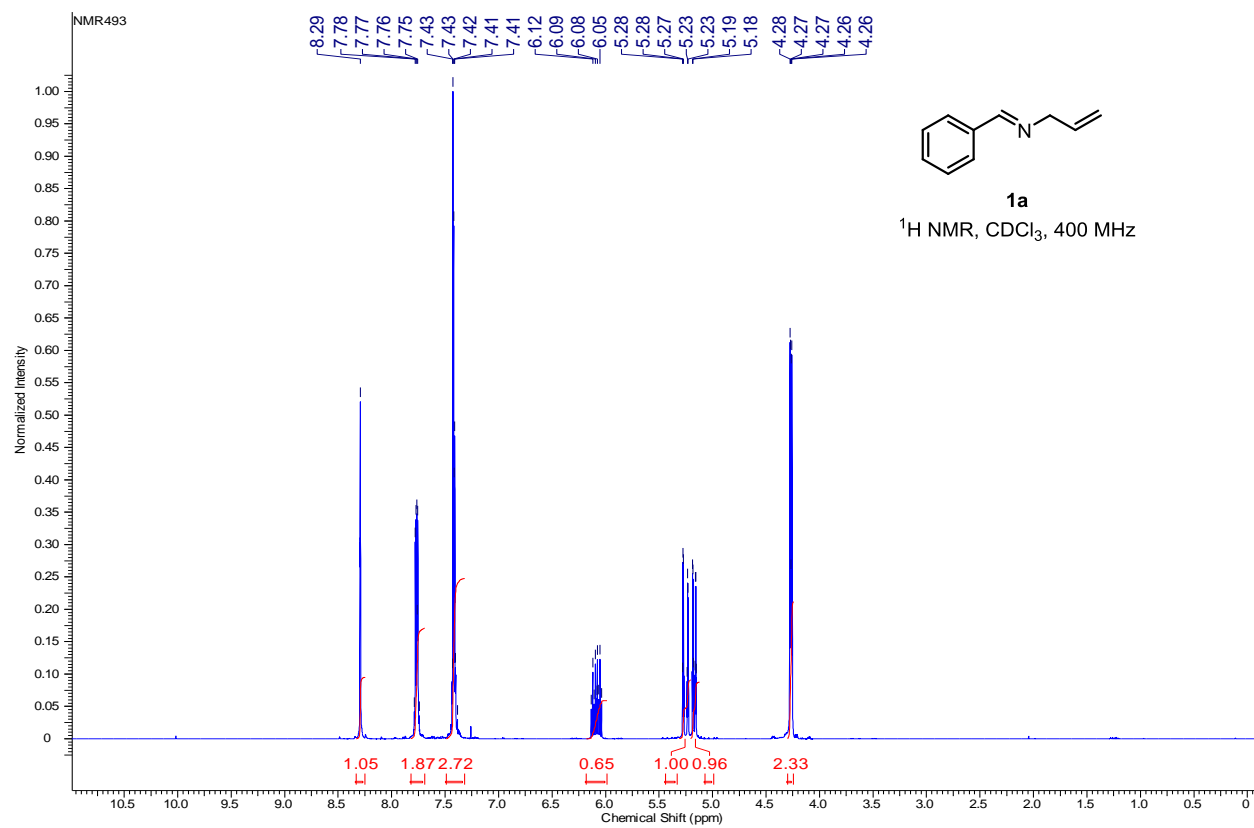
N-neopentylprop-2-en-1-amine (**2x**):<sup>34</sup> Colorless liquid (51 mg, 81% isolated yield), <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz): 5.89 (ddt, <sup>3</sup>J=17.2 Hz, <sup>3</sup>J=10.4 Hz, <sup>3</sup>J=6.0 Hz, 1H), 5.16 (dm, <sup>3</sup>J=17.2 Hz, 1H), 5.07 (dm, <sup>3</sup>J=10.4 Hz, 1H), 3.24 (dm, <sup>3</sup>J=6.0 Hz, 2H), 2.33 (s, 2H), 1.13 (broad s, 1H), 0.91 (s, 9H); <sup>13</sup>C{<sup>1</sup>H} NMR (CDCl<sub>3</sub>, 400 MHz): 137.5, 115.7, 62.0, 53.5, 31.5, 28.0; HRMS (ESI) (m/z): [M+H]<sup>+</sup> calc for C<sub>8</sub>H<sub>18</sub>N, 128.1439; found, 128.1432.



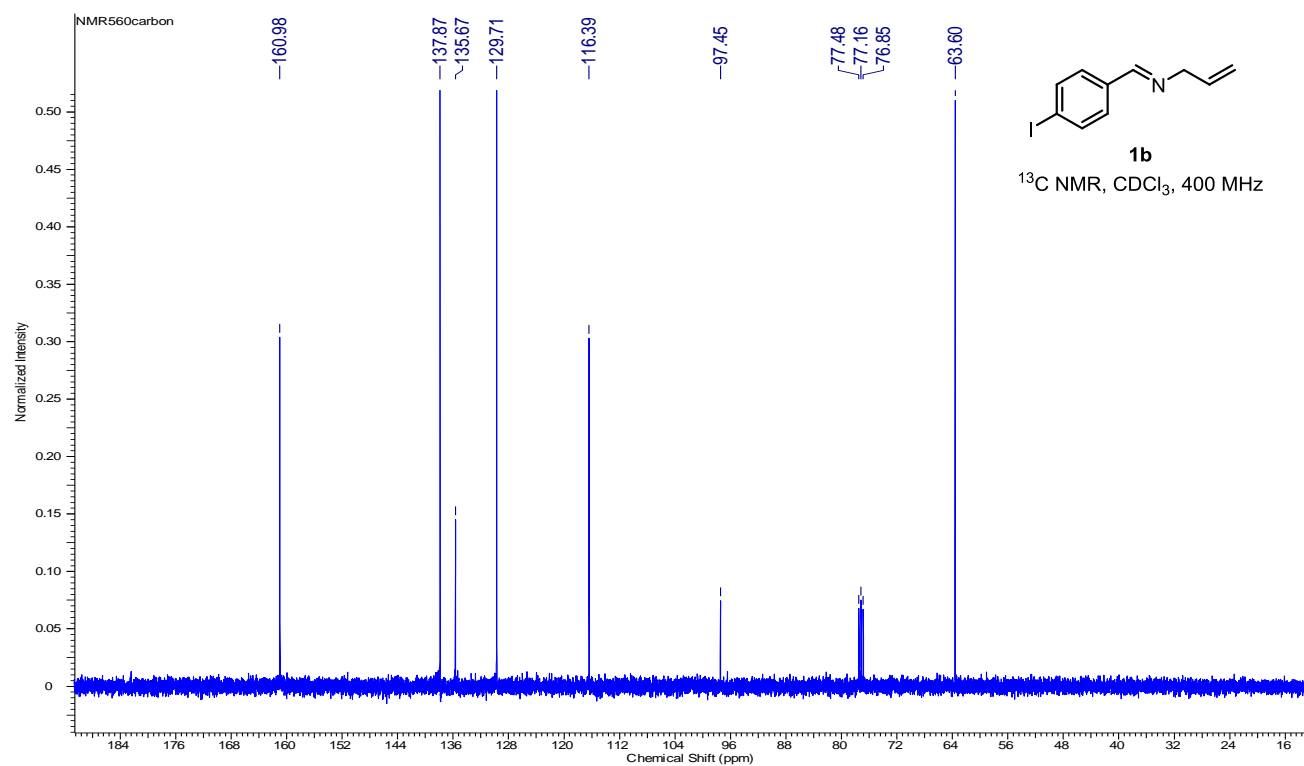
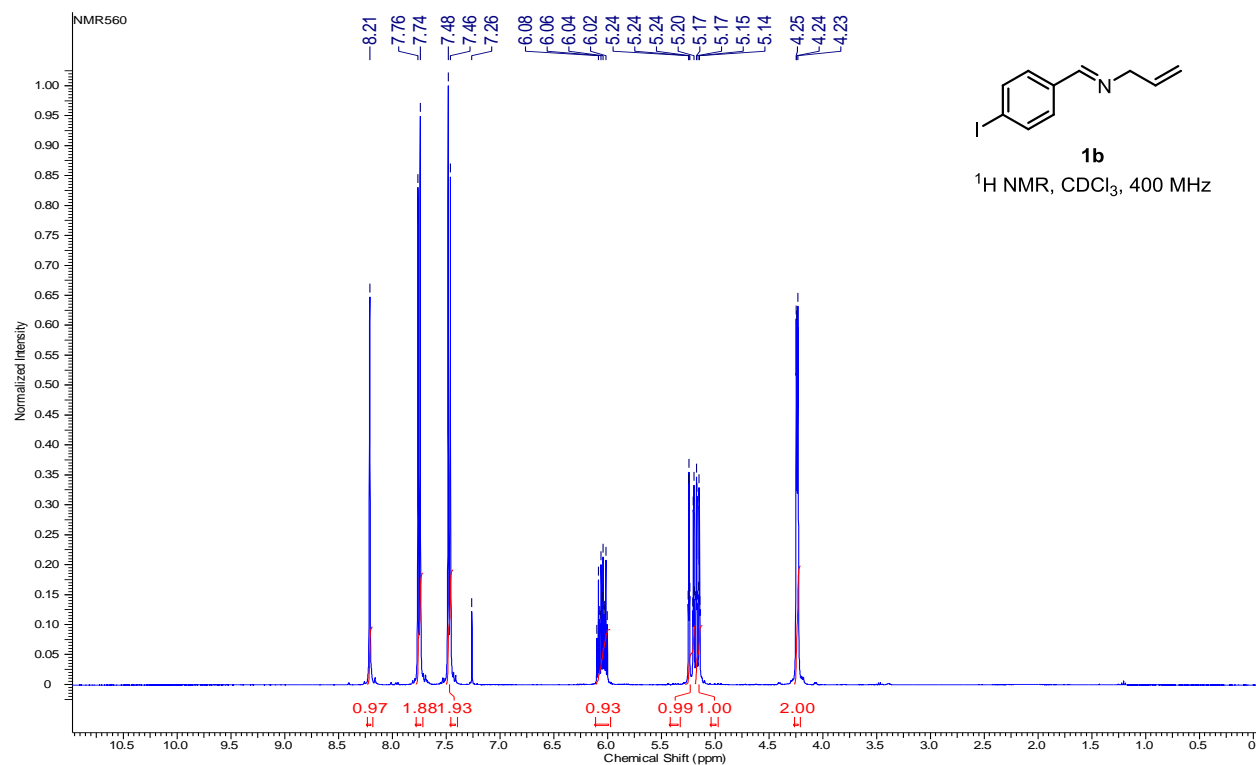
N-(1-phenylethyl)prop-2-en-1-amine (**2y**):<sup>35</sup> Pale yellow oily liquid (55 mg, 68% isolated yield), <sup>1</sup>H NMR (CDCl<sub>3</sub>, 600 MHz): 7.34-7.31 (m, 4H), 7.26-7.23 (m, 1H), 5.89 (ddt, <sup>3</sup>J=16.8 Hz, <sup>3</sup>J=10.2 Hz, <sup>3</sup>J=6.0 Hz, 1H), 5.13 (dq, <sup>3</sup>J=16.8 Hz, <sup>4</sup>J= <sup>2</sup>J=1.8 Hz, 1H), 5.07 (dq, <sup>3</sup>J=10.2 Hz, <sup>4</sup>J= <sup>2</sup>J=1.8 Hz, 1H), 3.80 (q, <sup>3</sup>J=6.6 Hz, 1H), 3.10 (dm, <sup>3</sup>J=6.0 Hz, 2H), 1.37 (d, <sup>3</sup>J=6.6 Hz, 3H), 1.35 (broad s, 1H); <sup>13</sup>C{<sup>1</sup>H} NMR (CDCl<sub>3</sub>, 600 MHz): 145.6, 137.1, 128.6, 127.0, 126.7, 115.8, 57.7, 50.4, 24.4; HRMS (ESI) (m/z): [M+H]<sup>+</sup> calc for C<sub>11</sub>H<sub>16</sub>N, 162.1283; found, 162.1284.

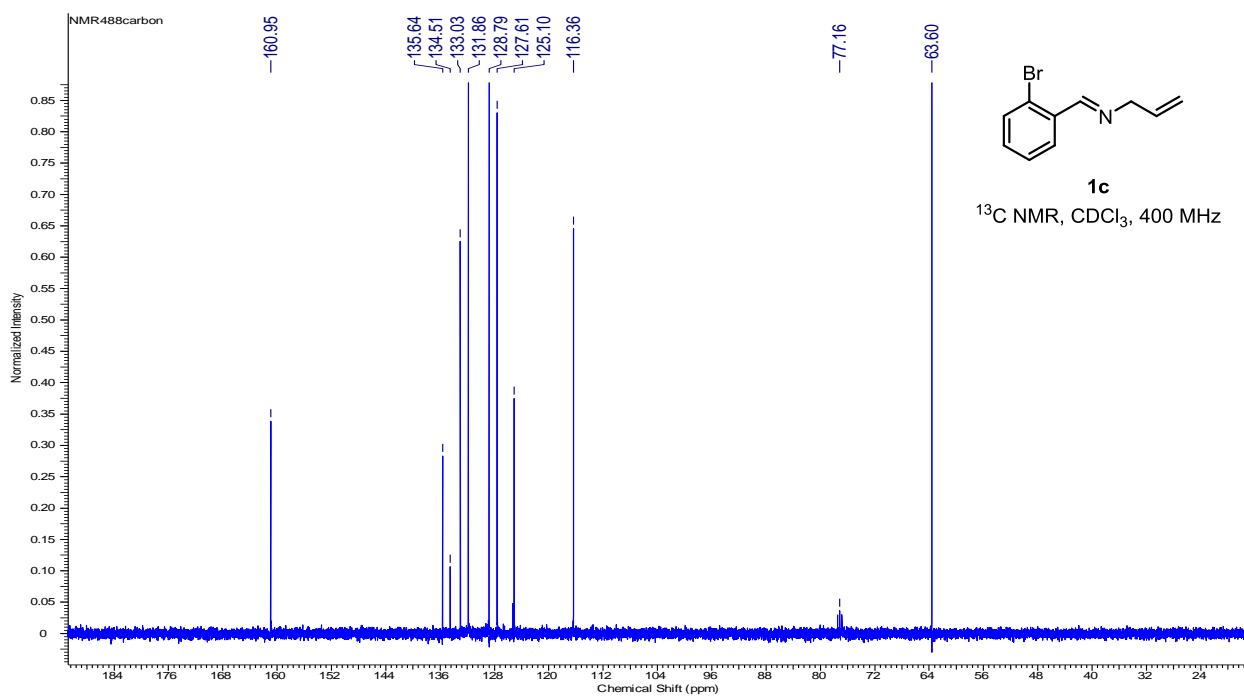
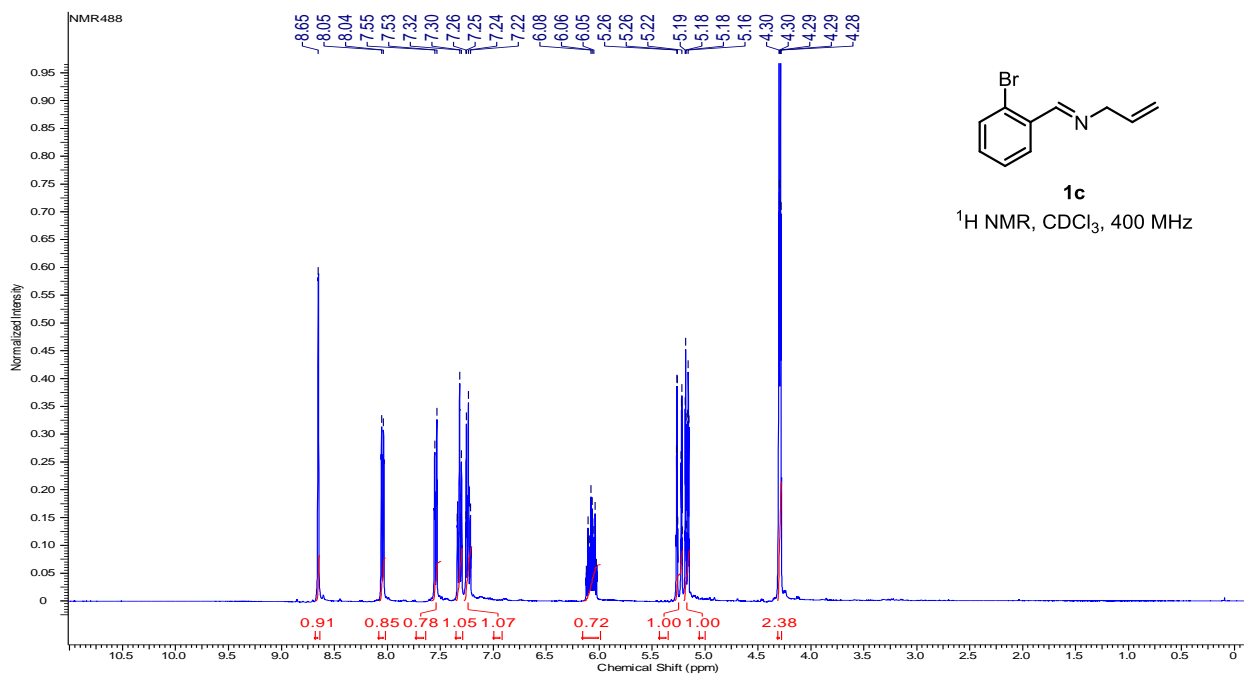


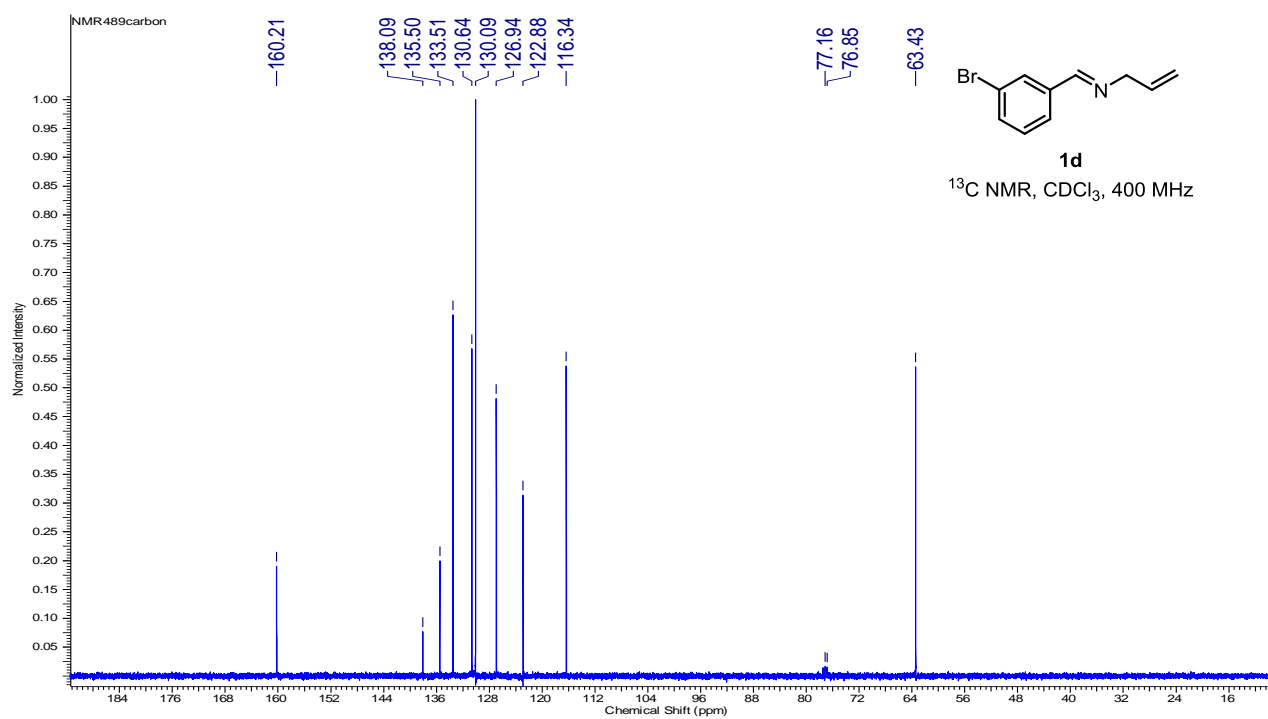
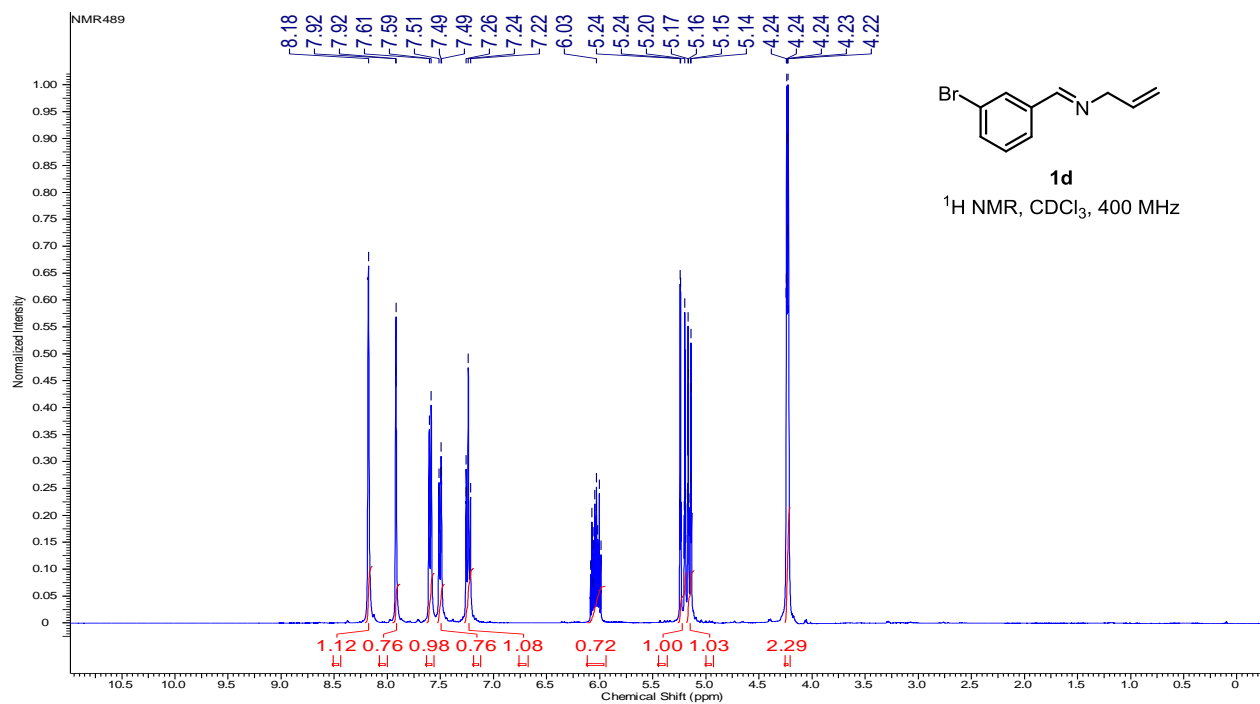
N-(1-(4-methoxyphenyl)ethyl)prop-2-en-1-amine (**2z**):<sup>35</sup> Colorless oily liquid (51 mg, 53% isolated yield), <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz): 7.23 (dm, <sup>3</sup>J=13.2 Hz, 2H), 6.87 (dm, <sup>3</sup>J=13.2 Hz, 2H), 5.88 (ddt, <sup>3</sup>J=17.2 Hz, <sup>3</sup>J=10.4 Hz, <sup>3</sup>J=6.0 Hz, 1H), 5.12 (dm, <sup>3</sup>J=17.2 Hz, 1H), 5.06 (dm, <sup>3</sup>J=10.4 Hz, 1H), 3.80 (s, 3H), 3.76 (q, <sup>3</sup>J=6.4 Hz, 1H), 3.09 (dm, <sup>3</sup>J=6.0 Hz, 2H), 1.36 (broad s, 1H), 1.34 (d, <sup>3</sup>J=6.4 Hz, 3H); <sup>13</sup>C{<sup>1</sup>H} NMR (CDCl<sub>3</sub>, 400 MHz): 158.6, 137.6, 137.1, 127.7, 115.8, 113.9, 57.0, 55.4, 50.3, 24.4; HRMS (ESI) (m/z): [M+H]<sup>+</sup> calc for C<sub>12</sub>H<sub>18</sub>NO, 192.1388; found, 192.1385.

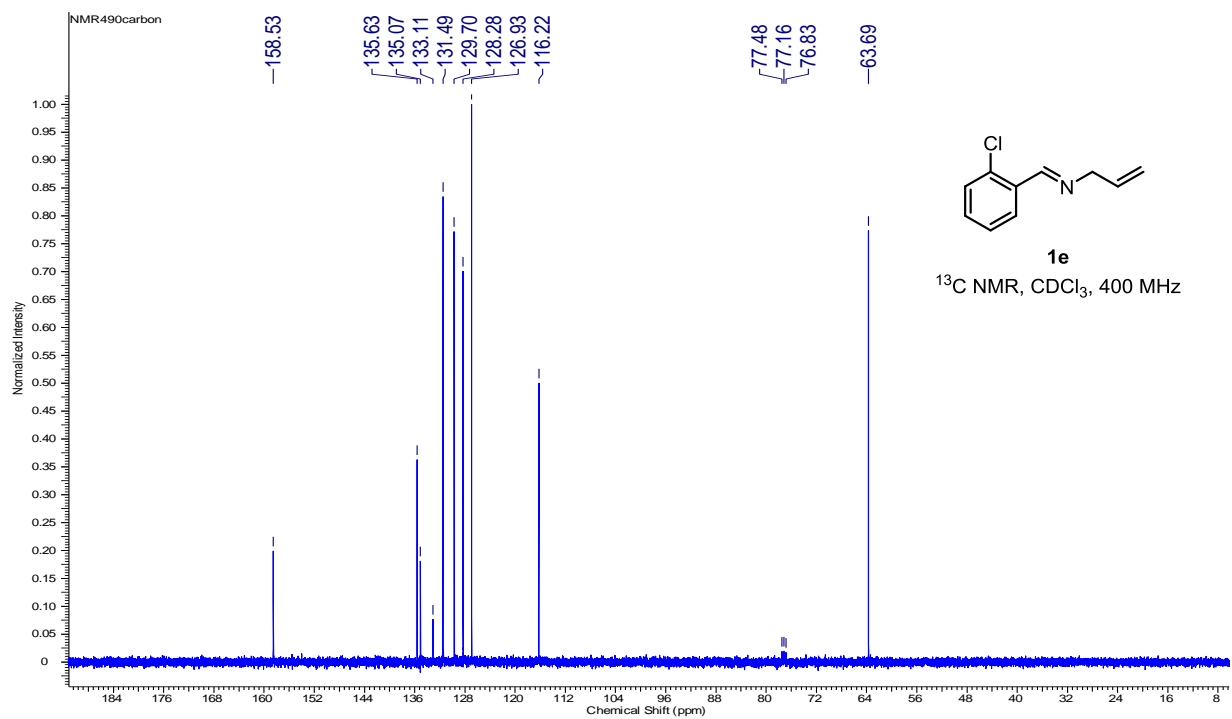
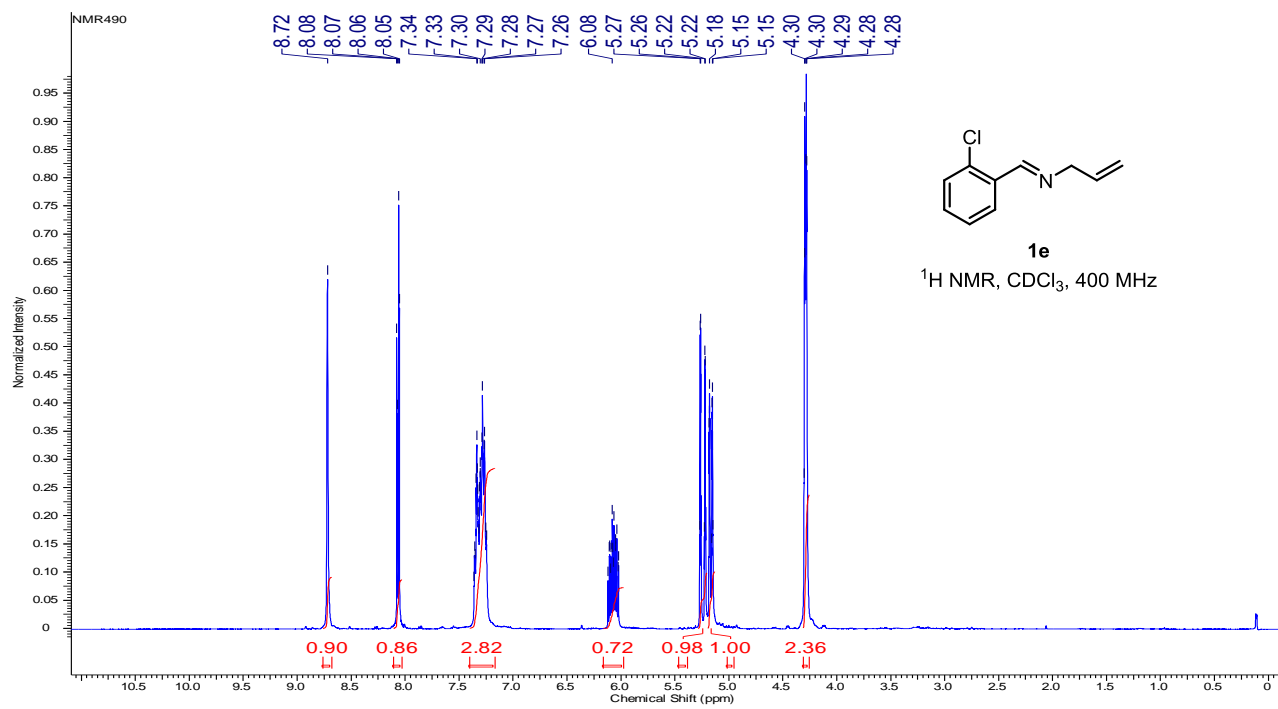


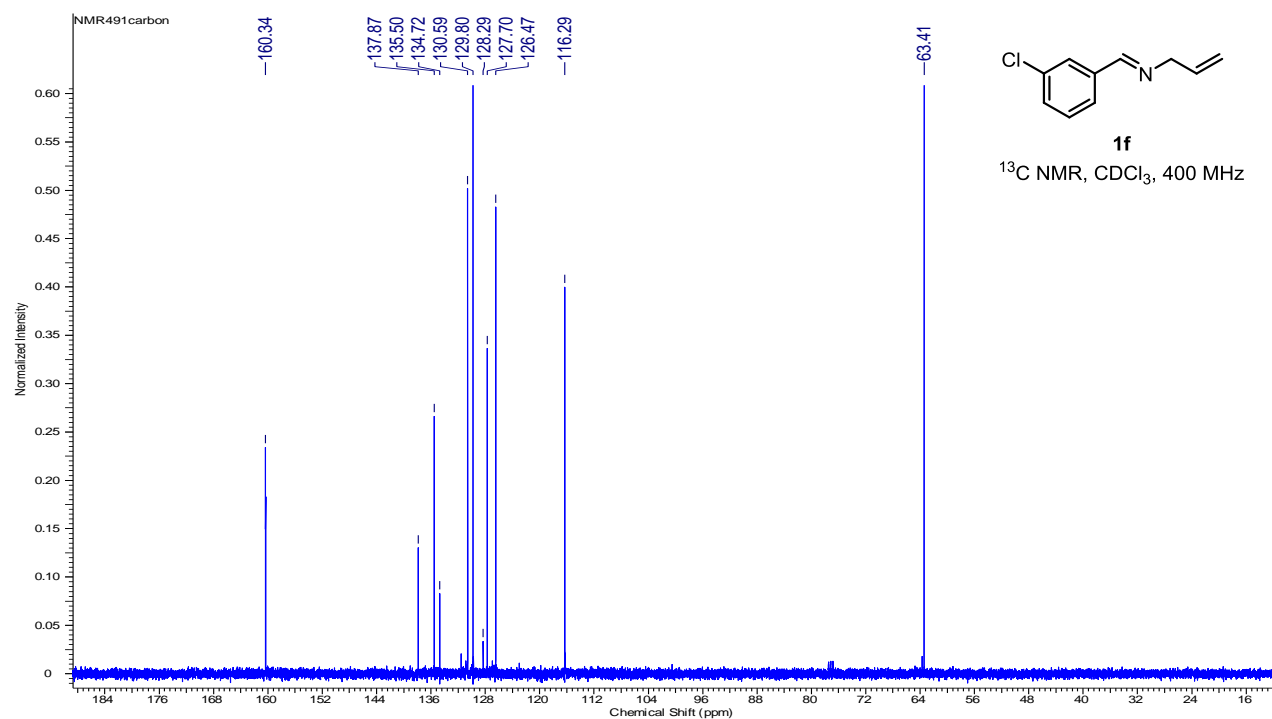
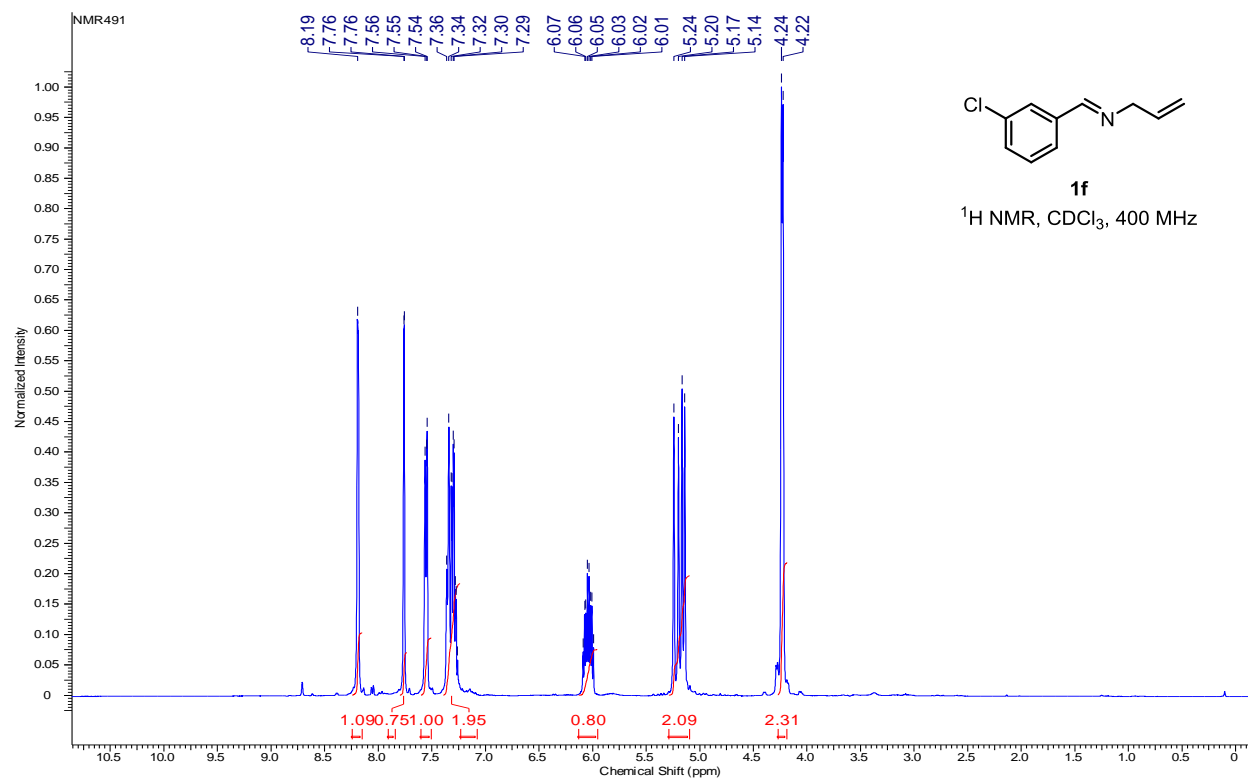


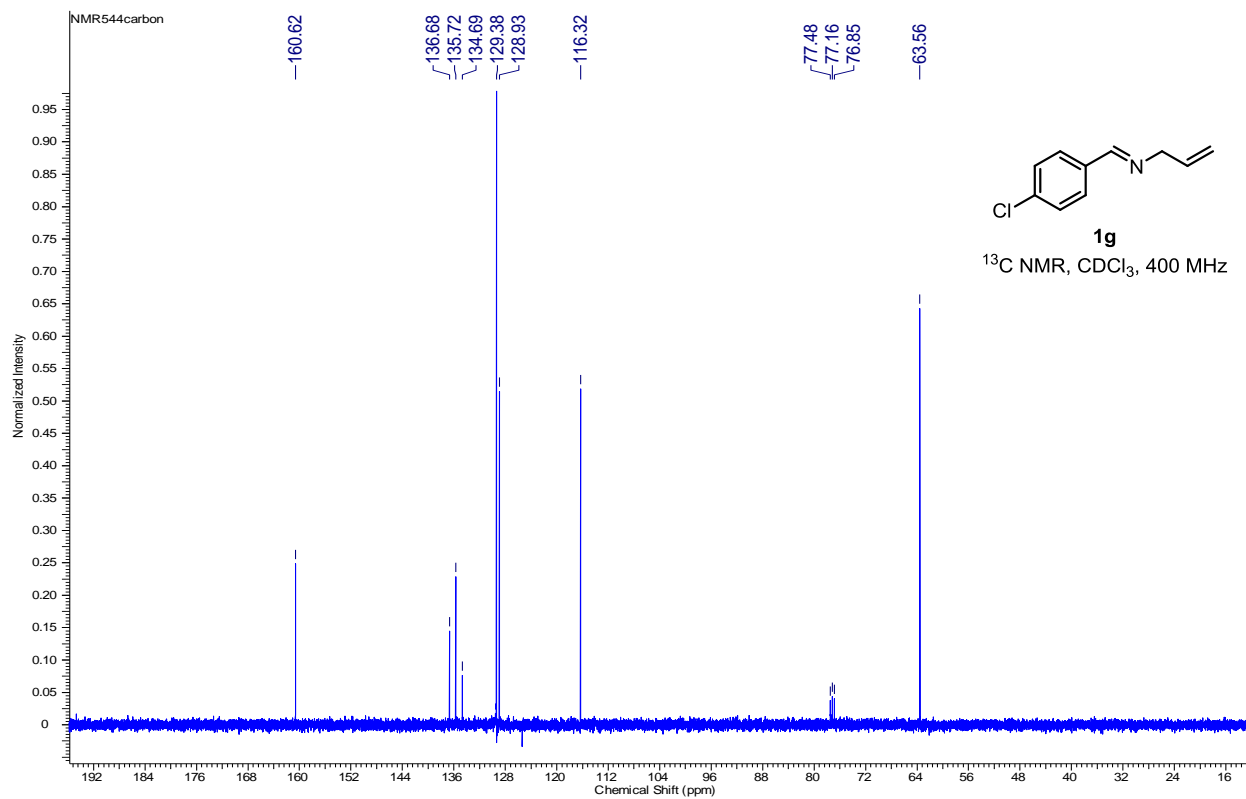
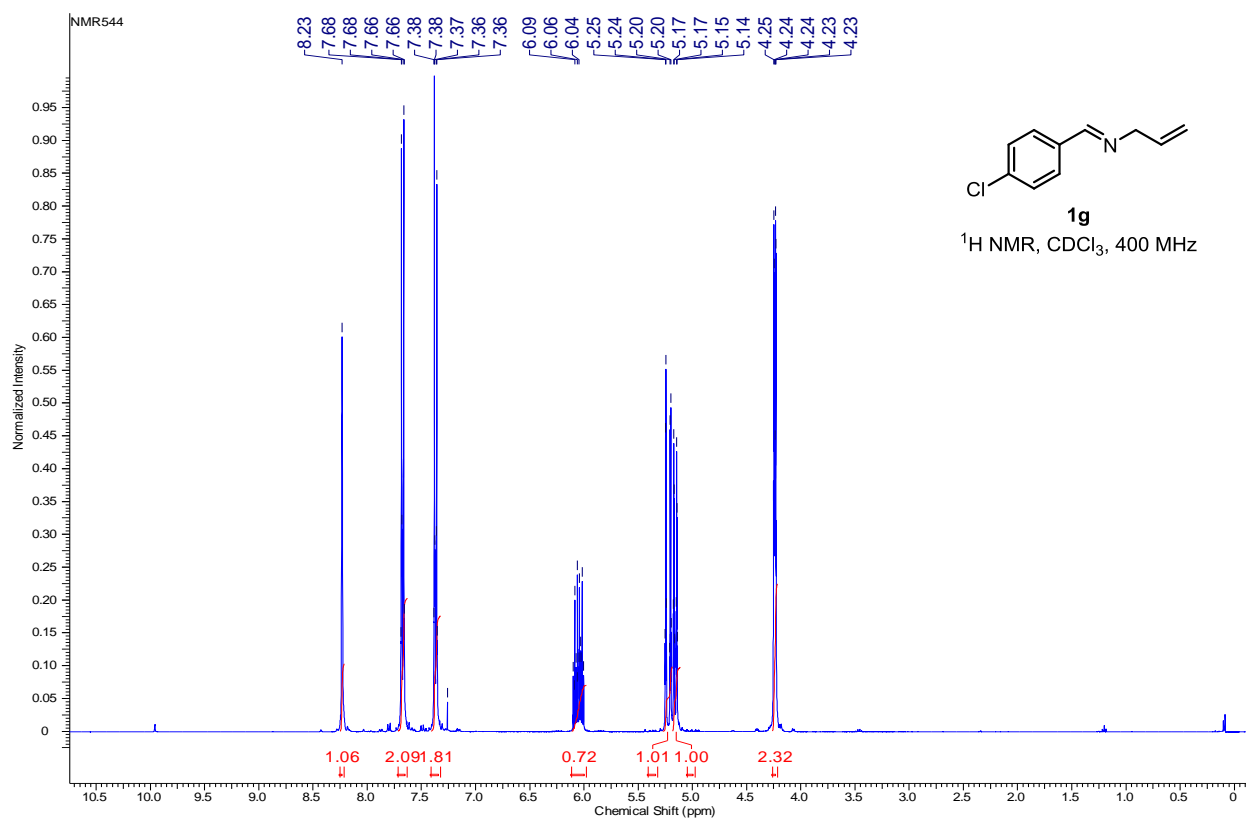


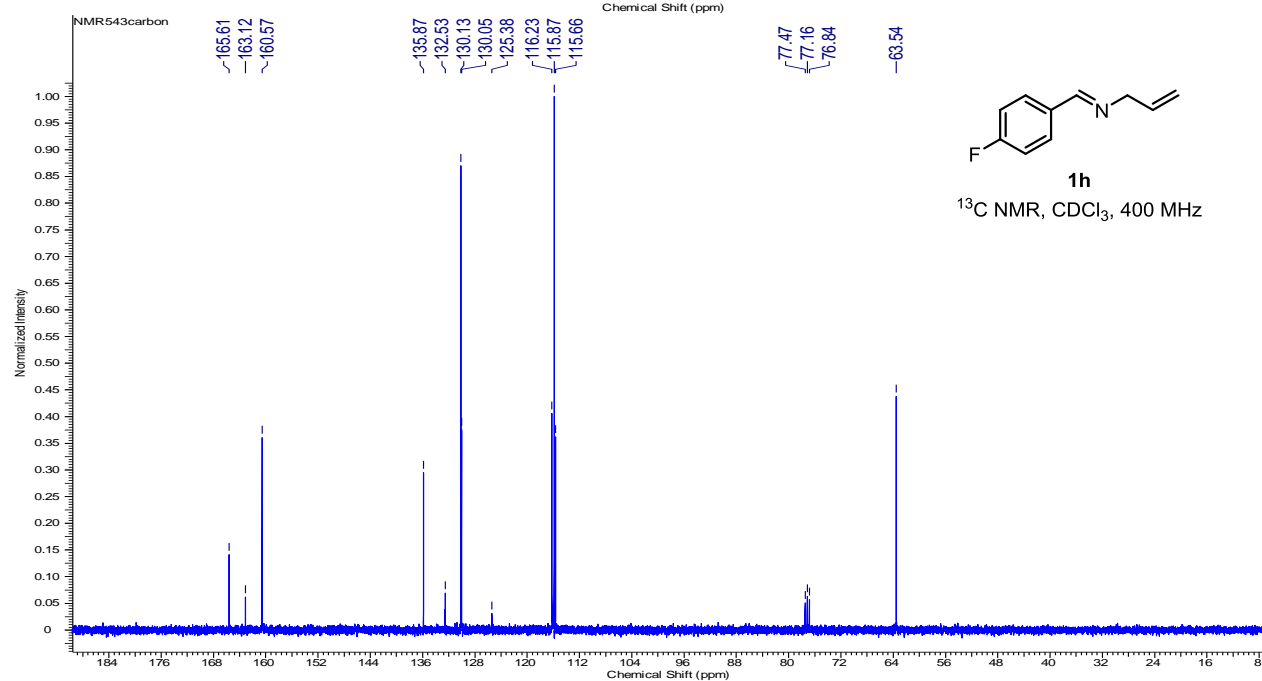
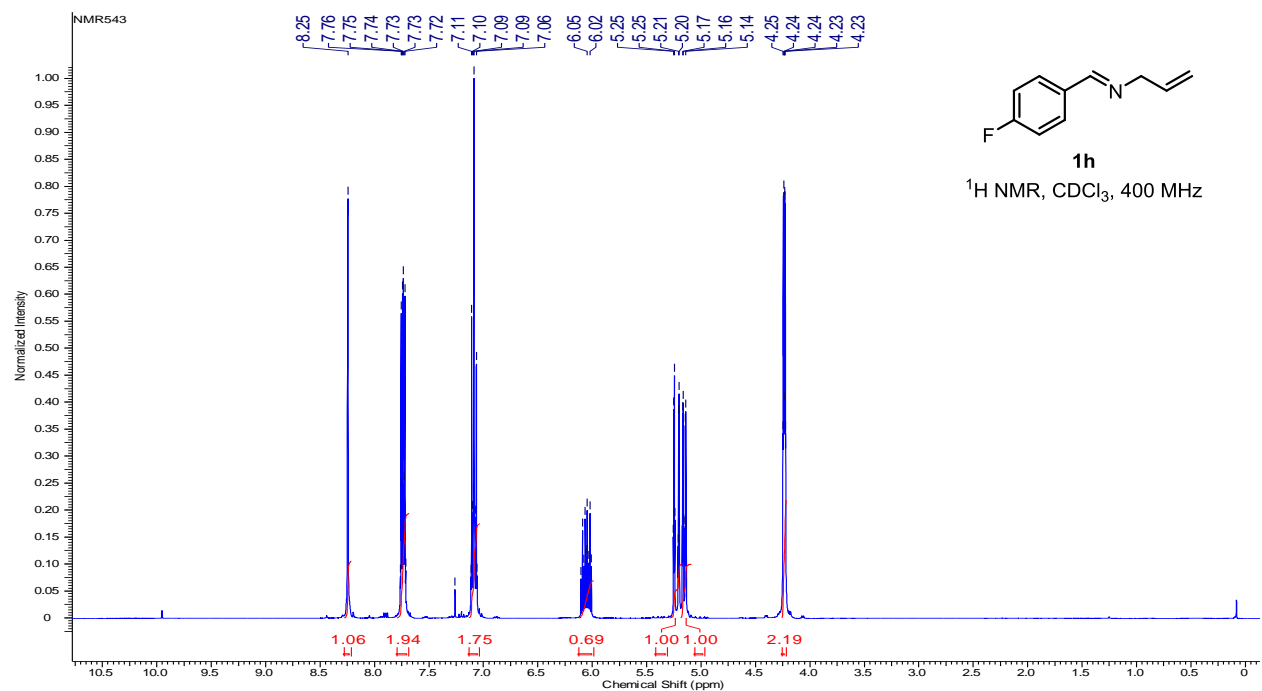


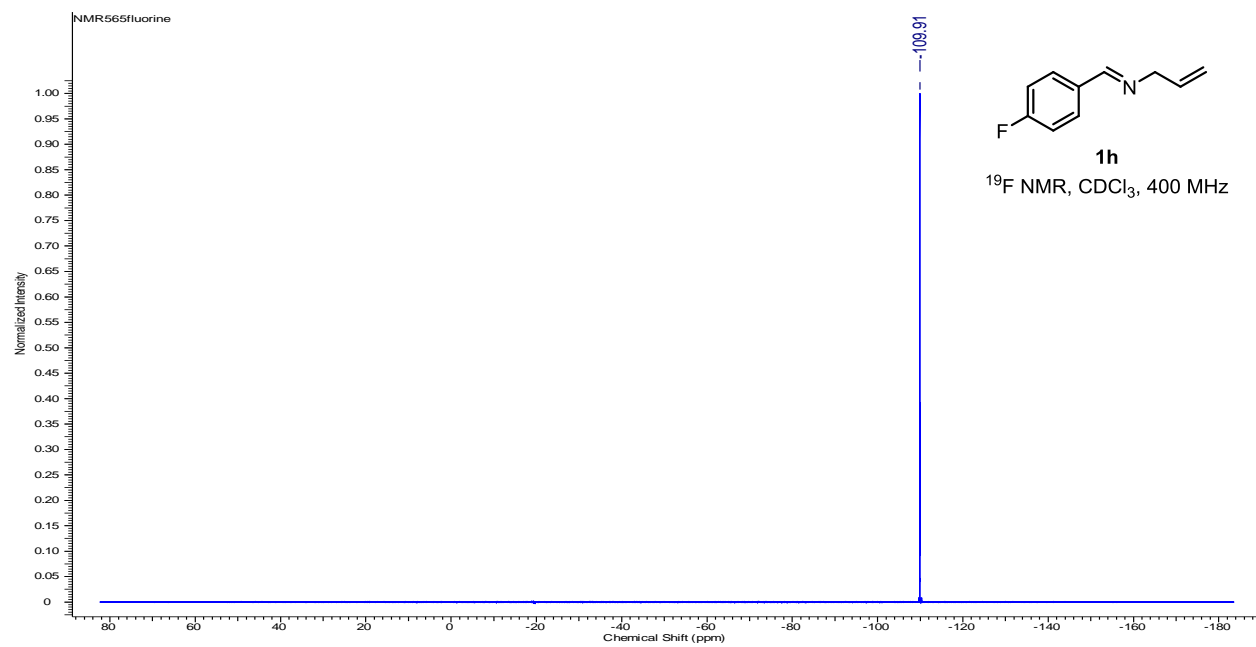




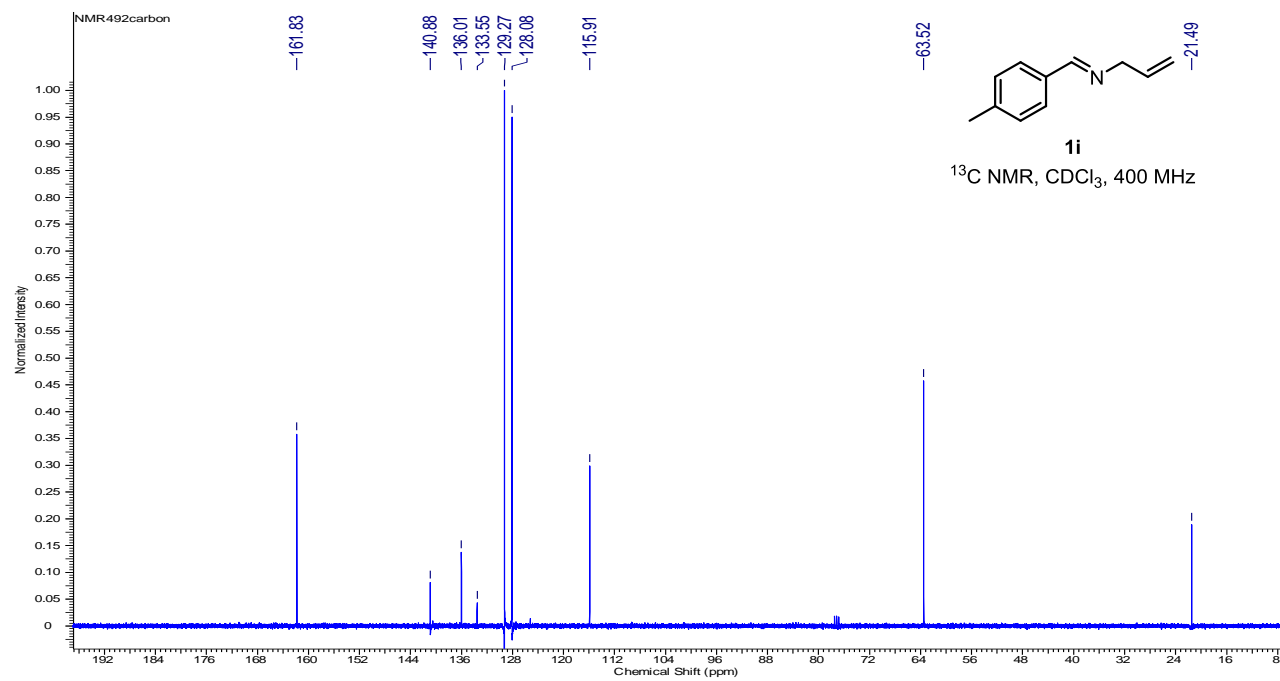
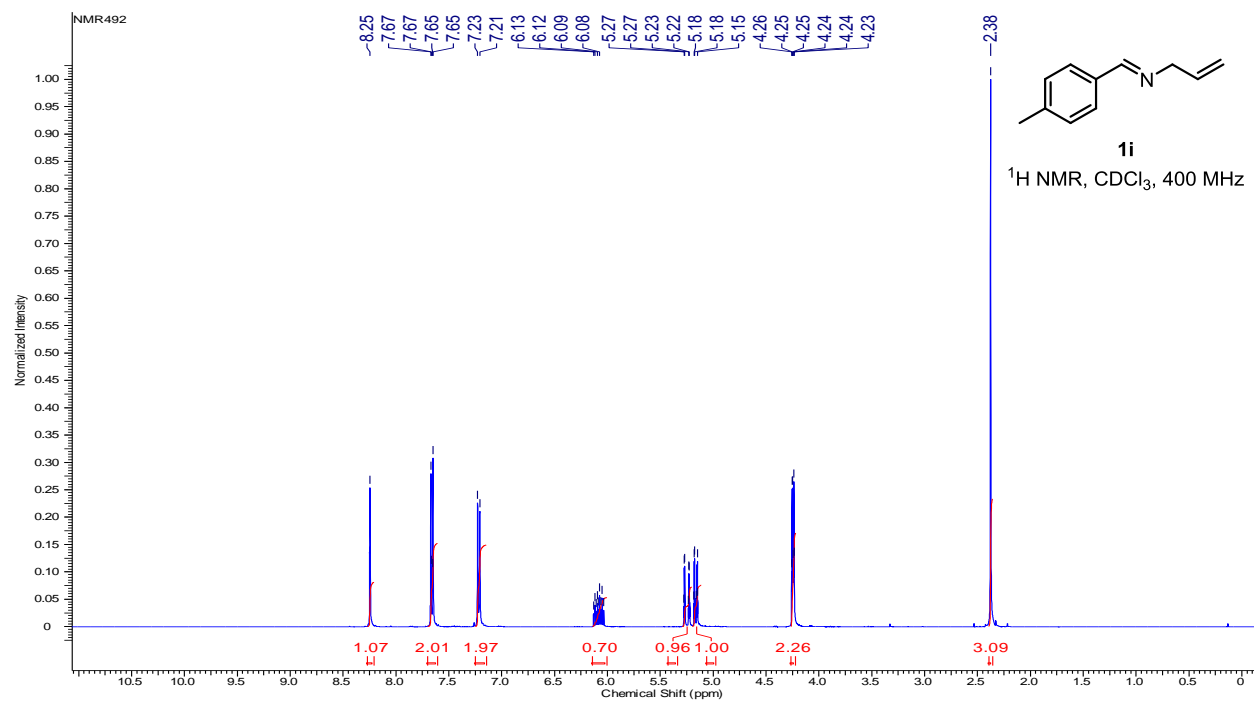


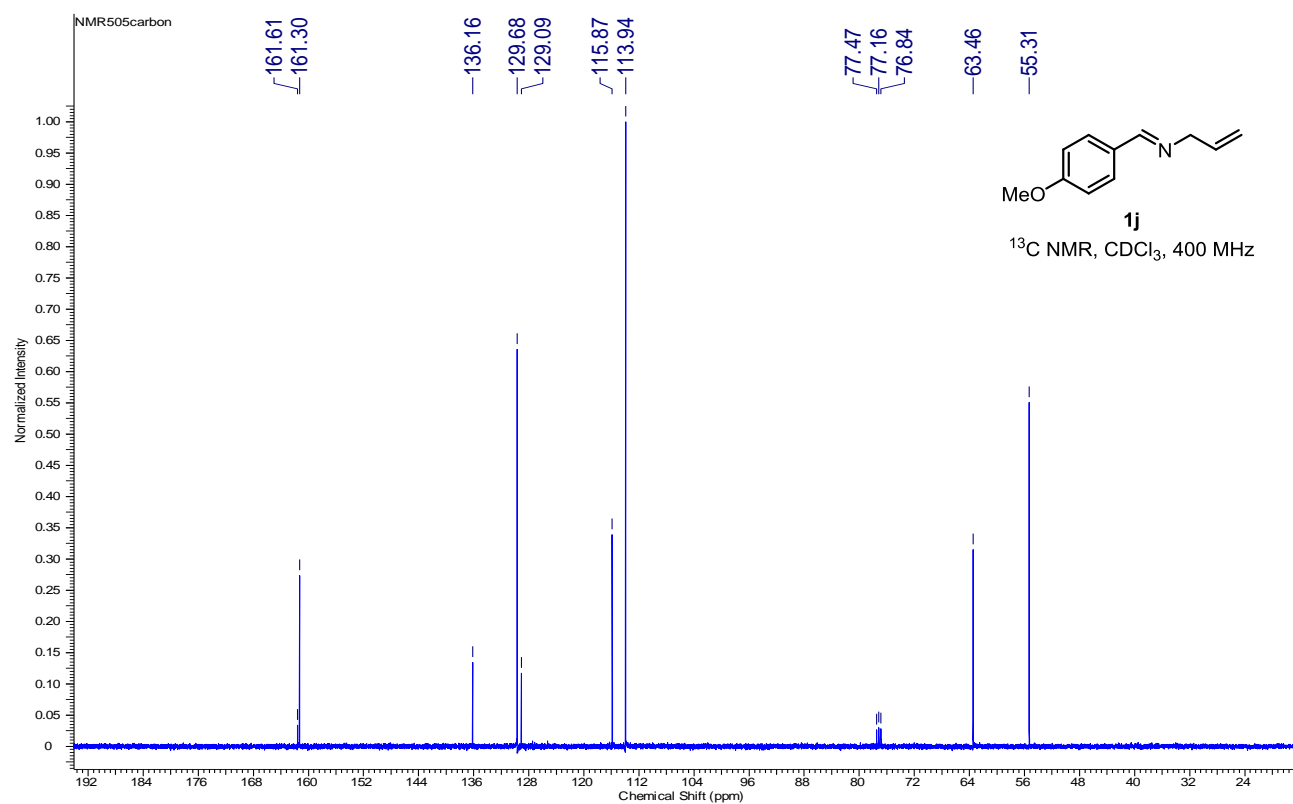
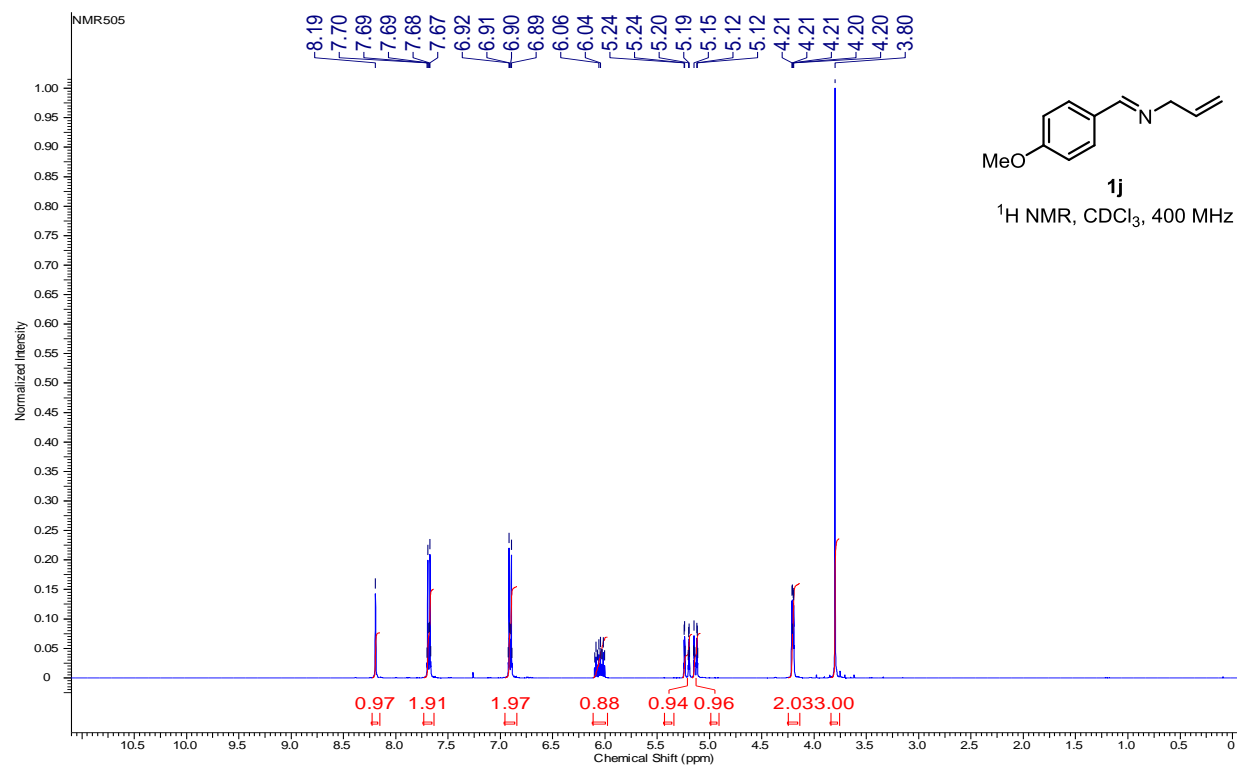


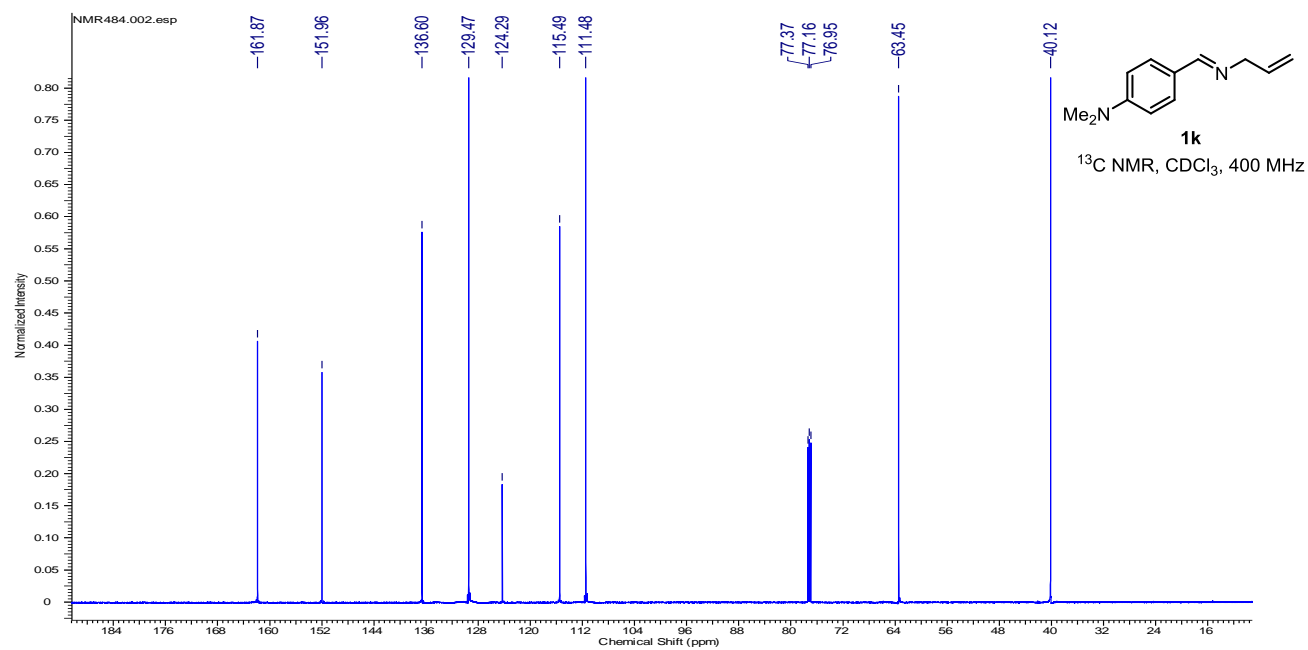
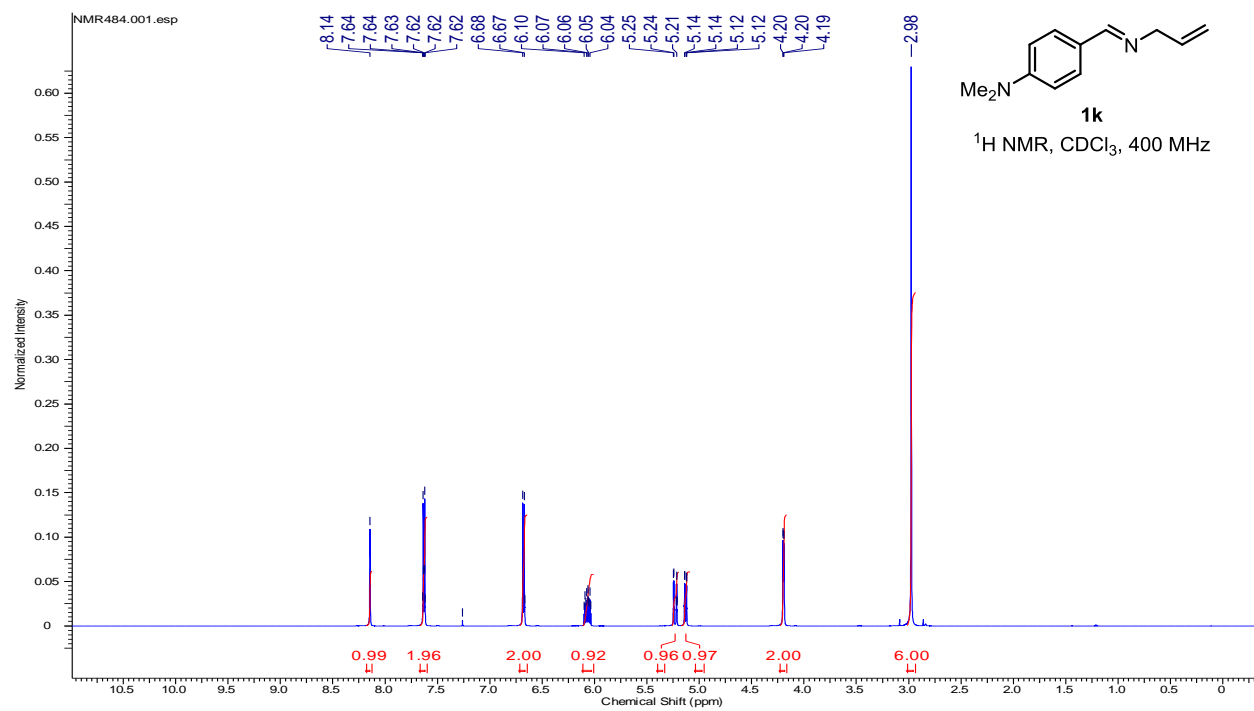


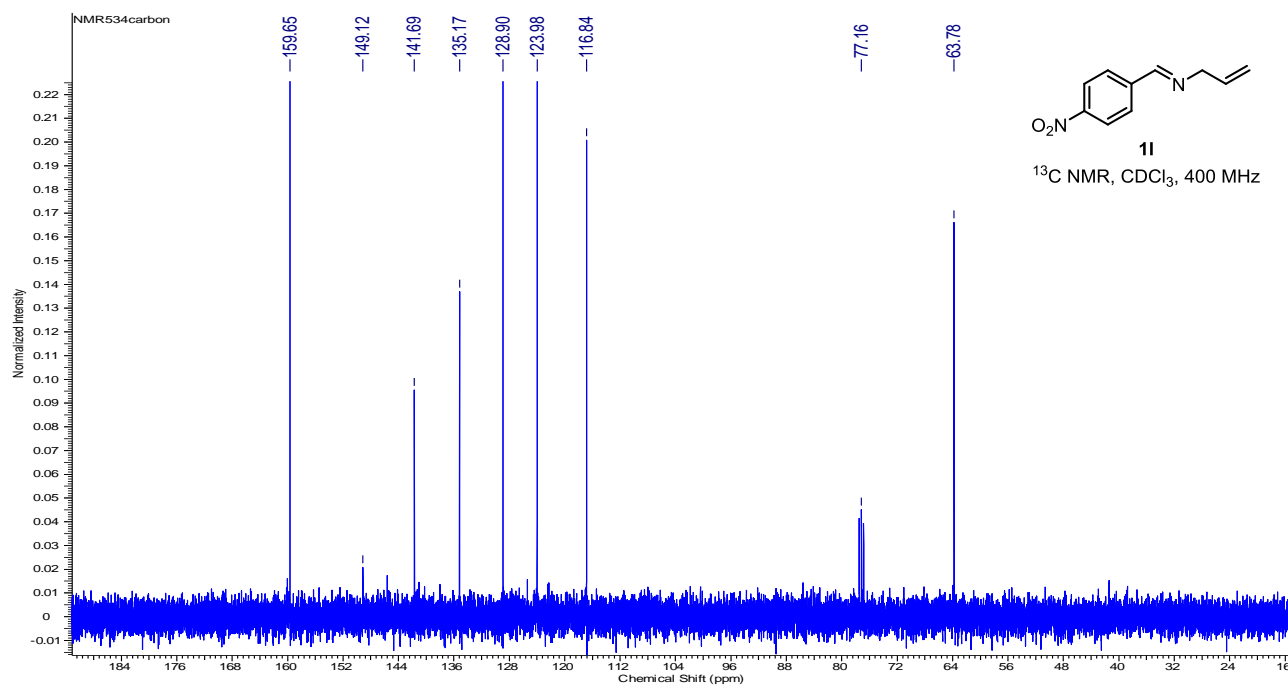
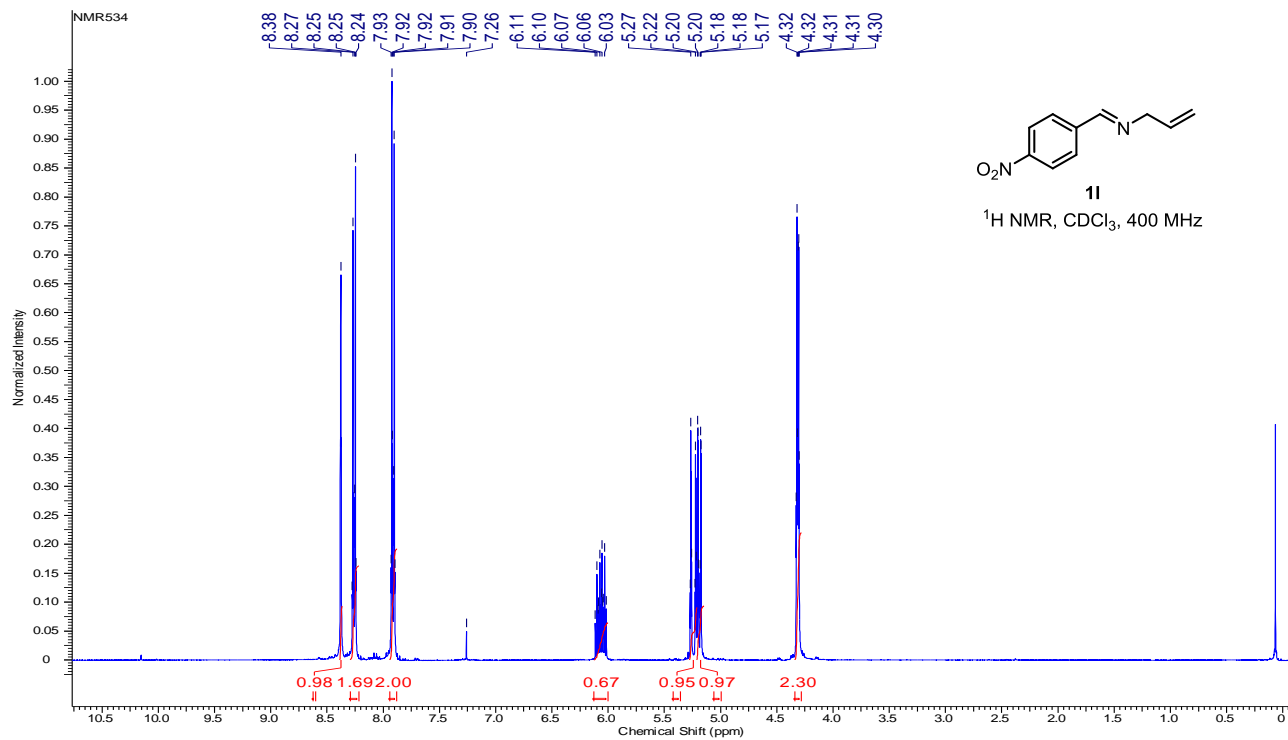


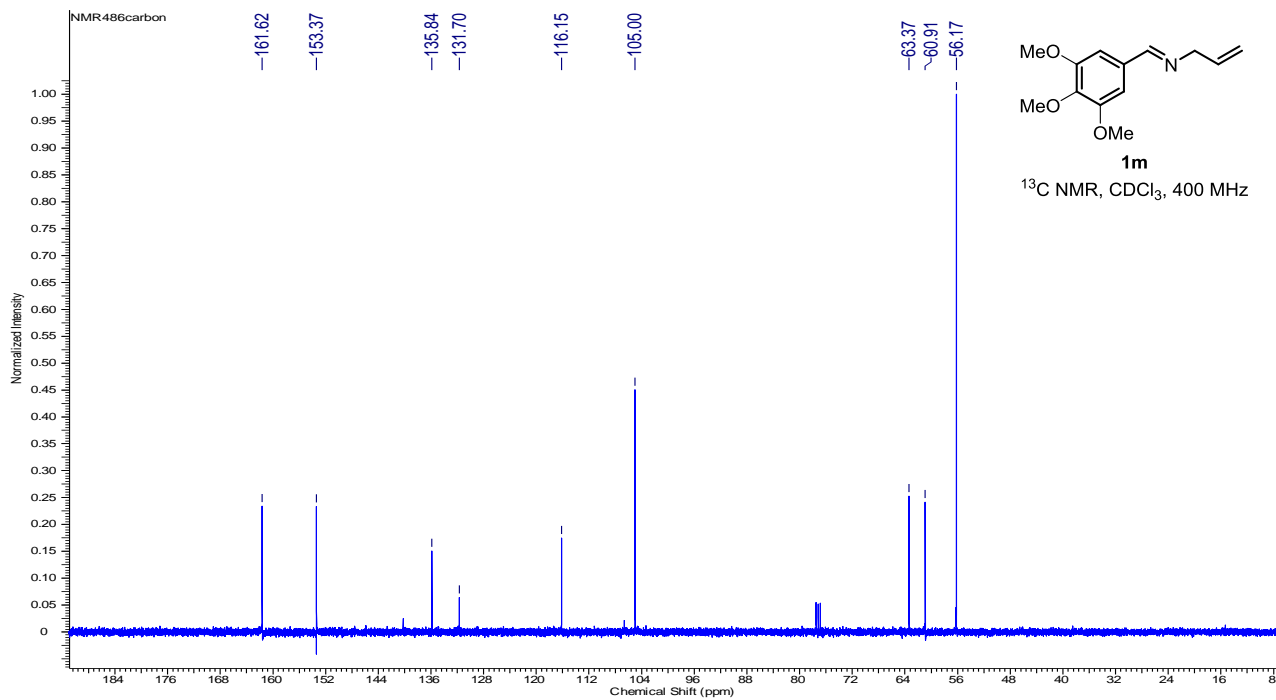
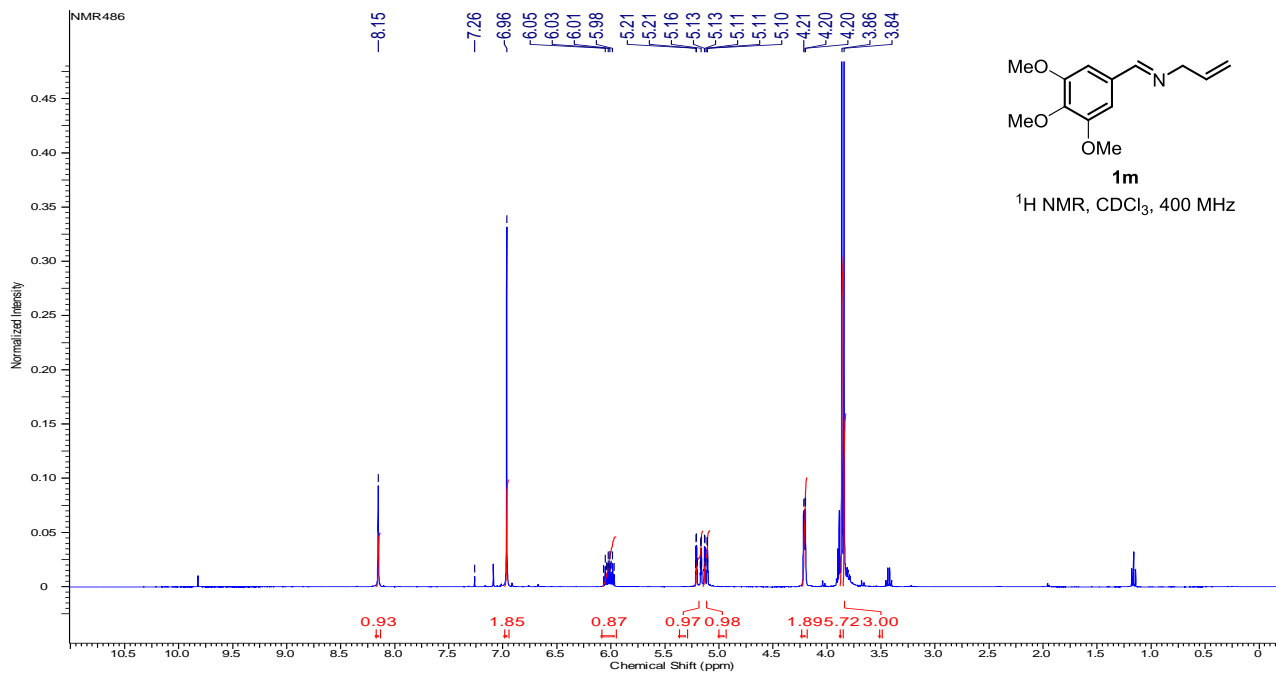


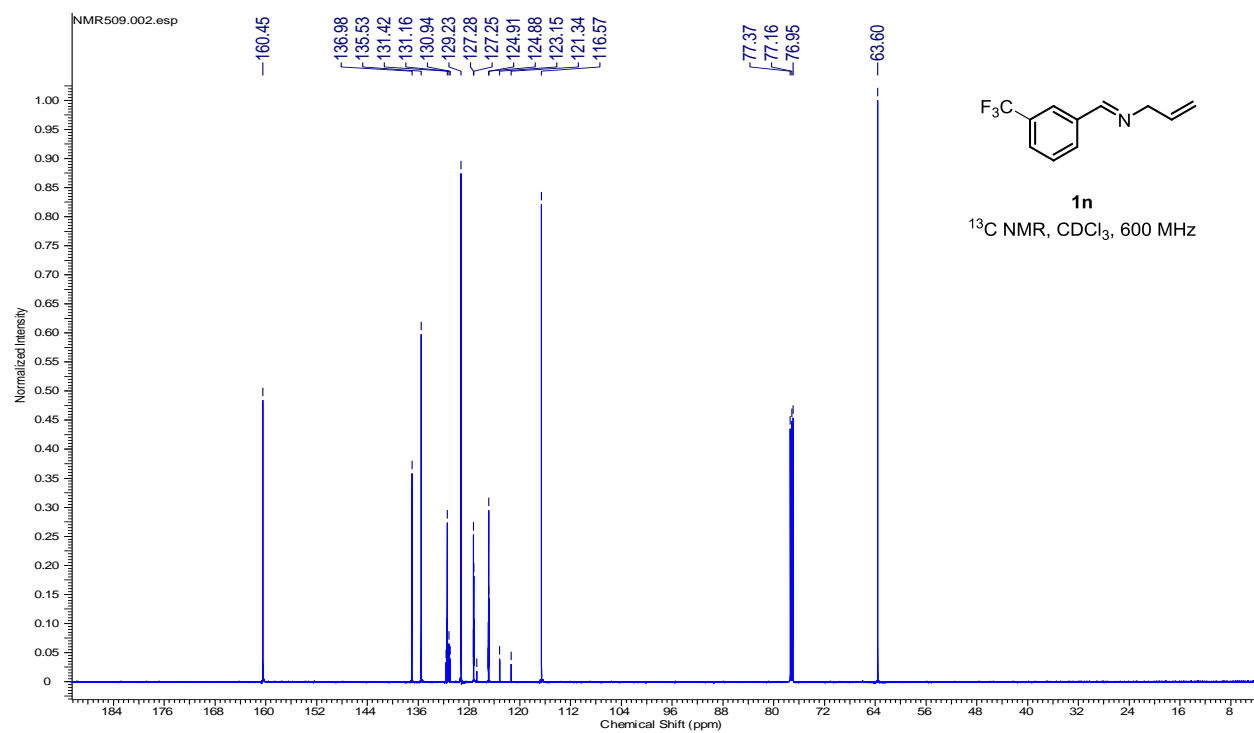
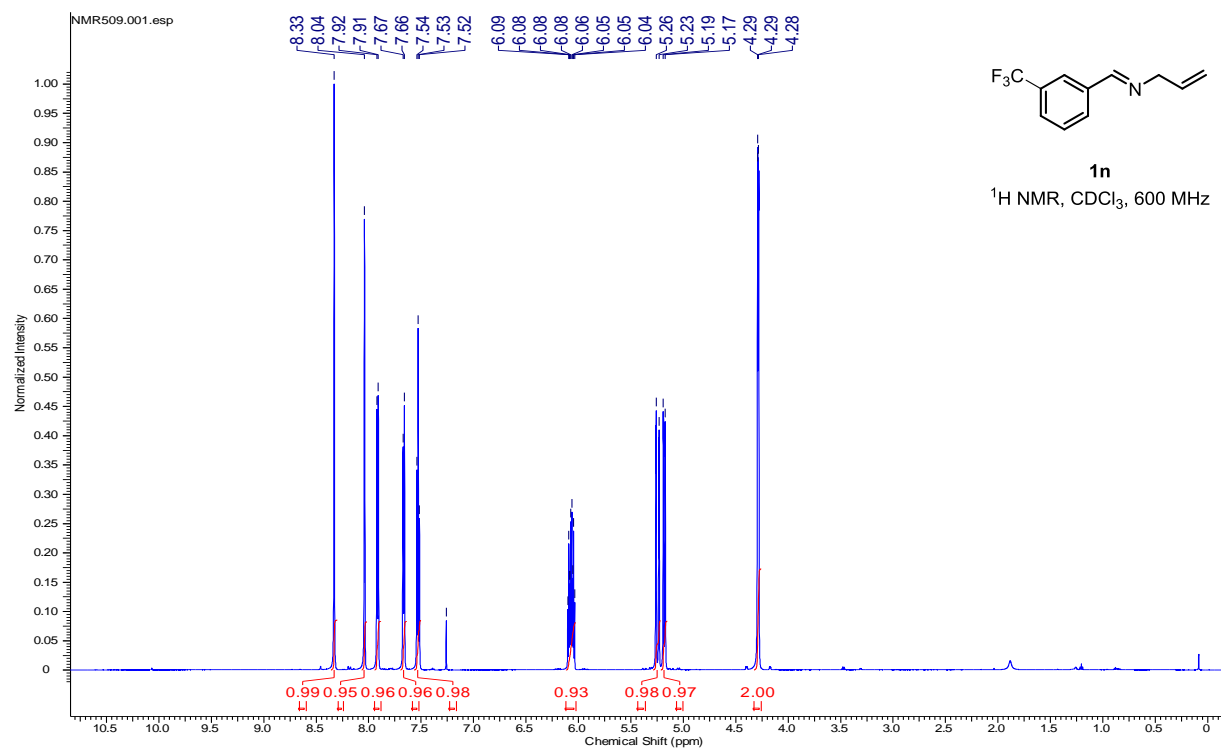


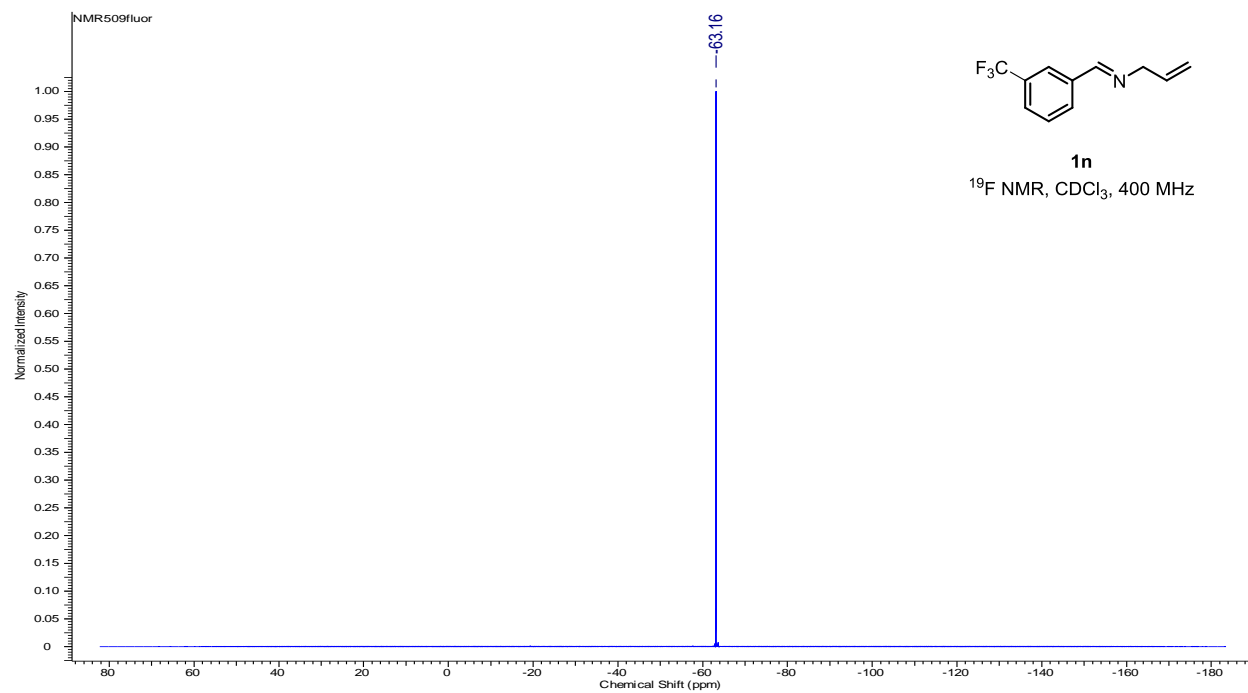


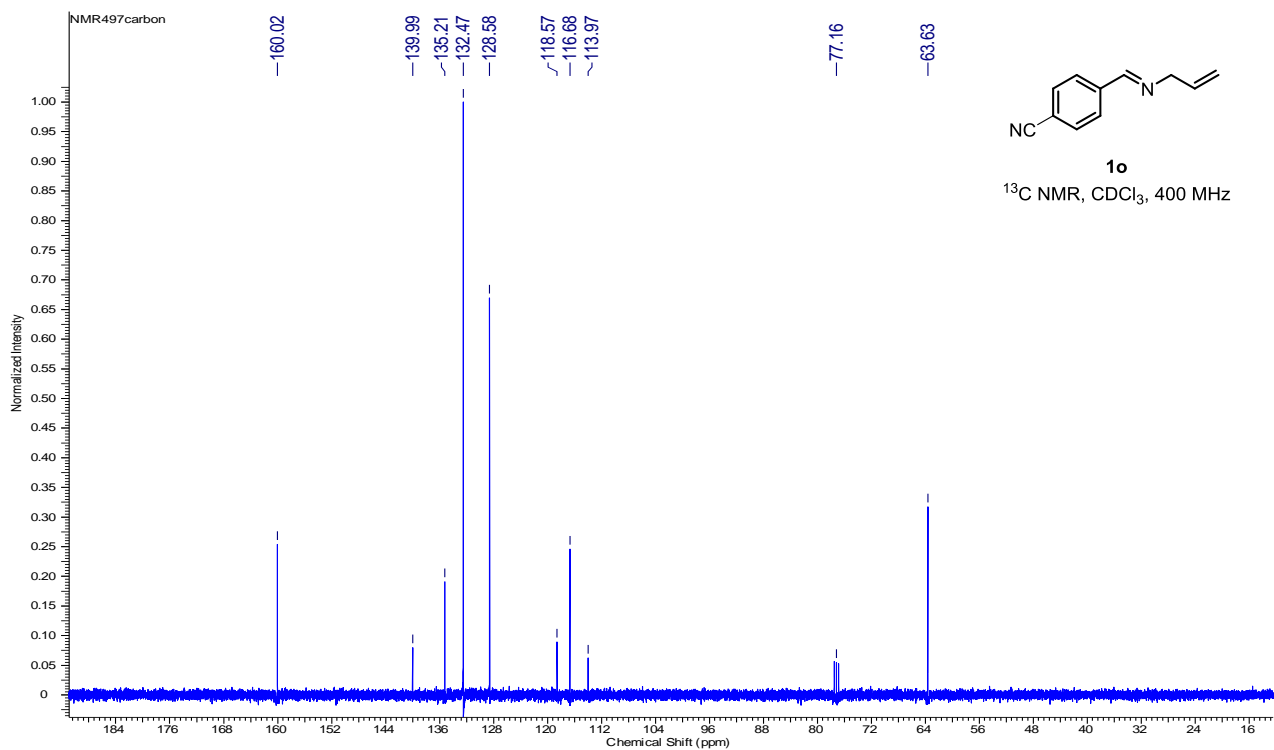
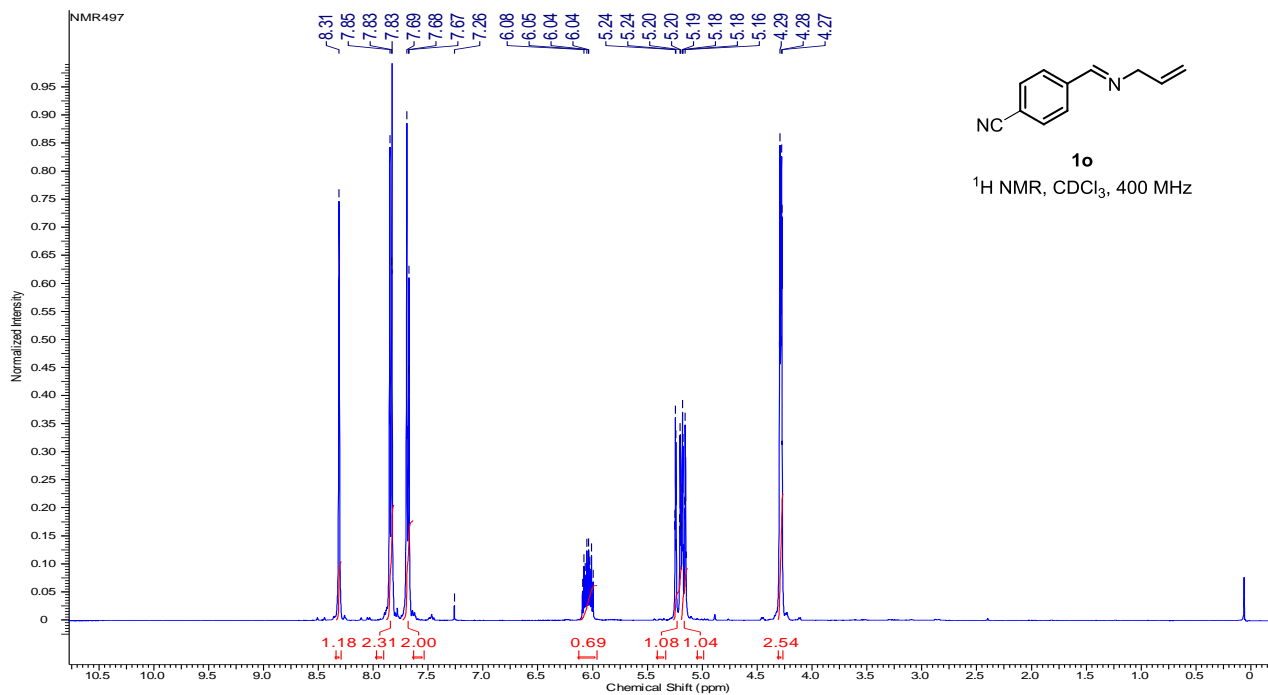




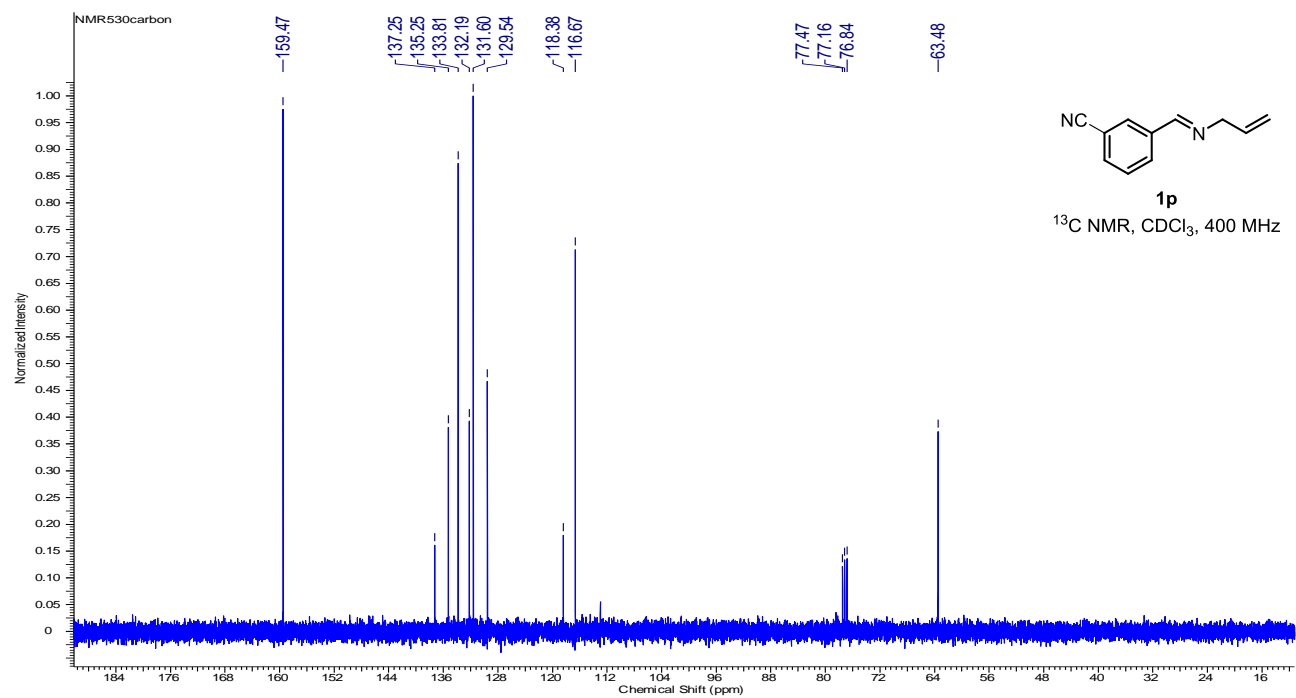
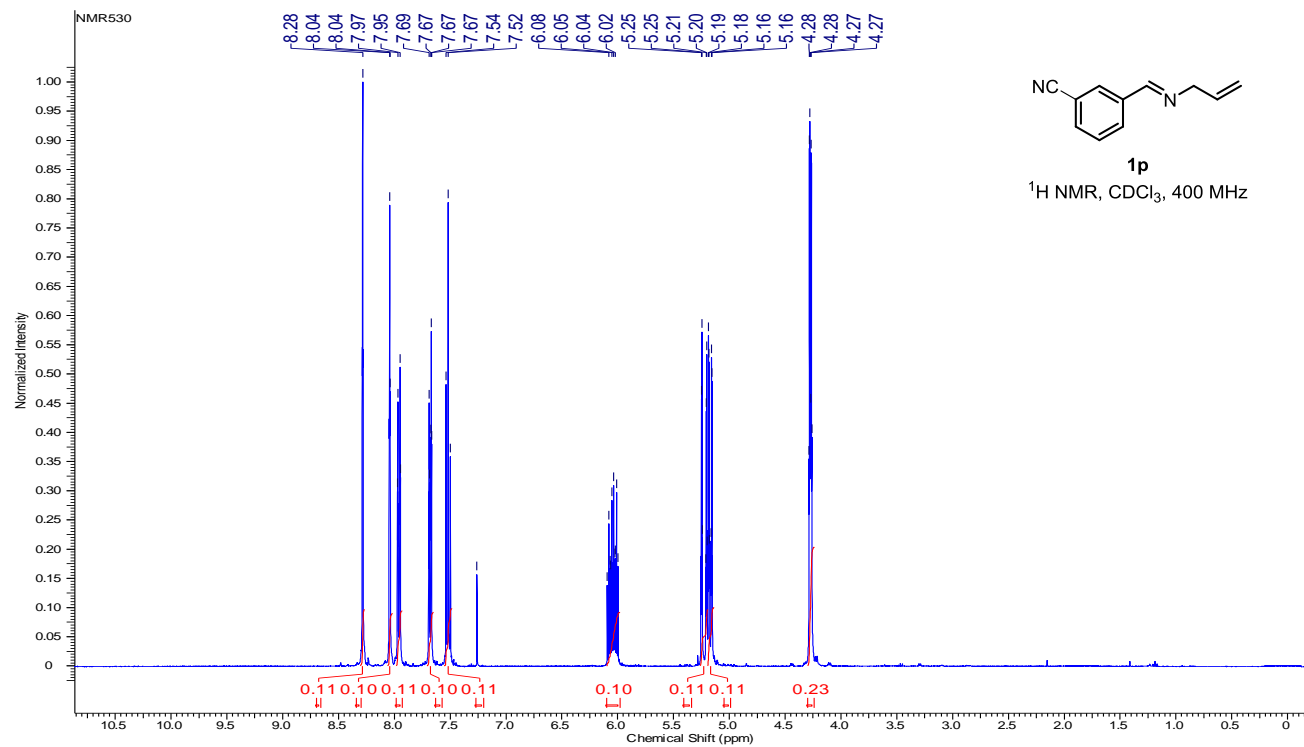


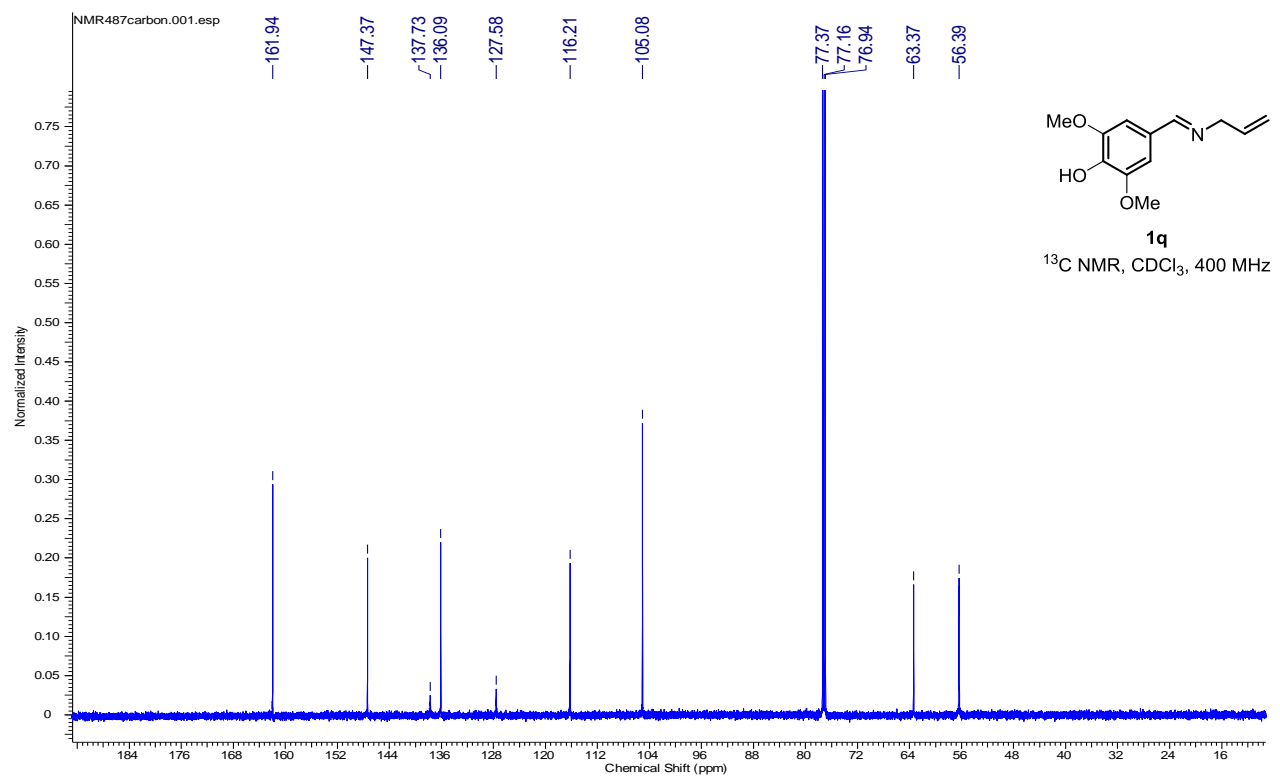
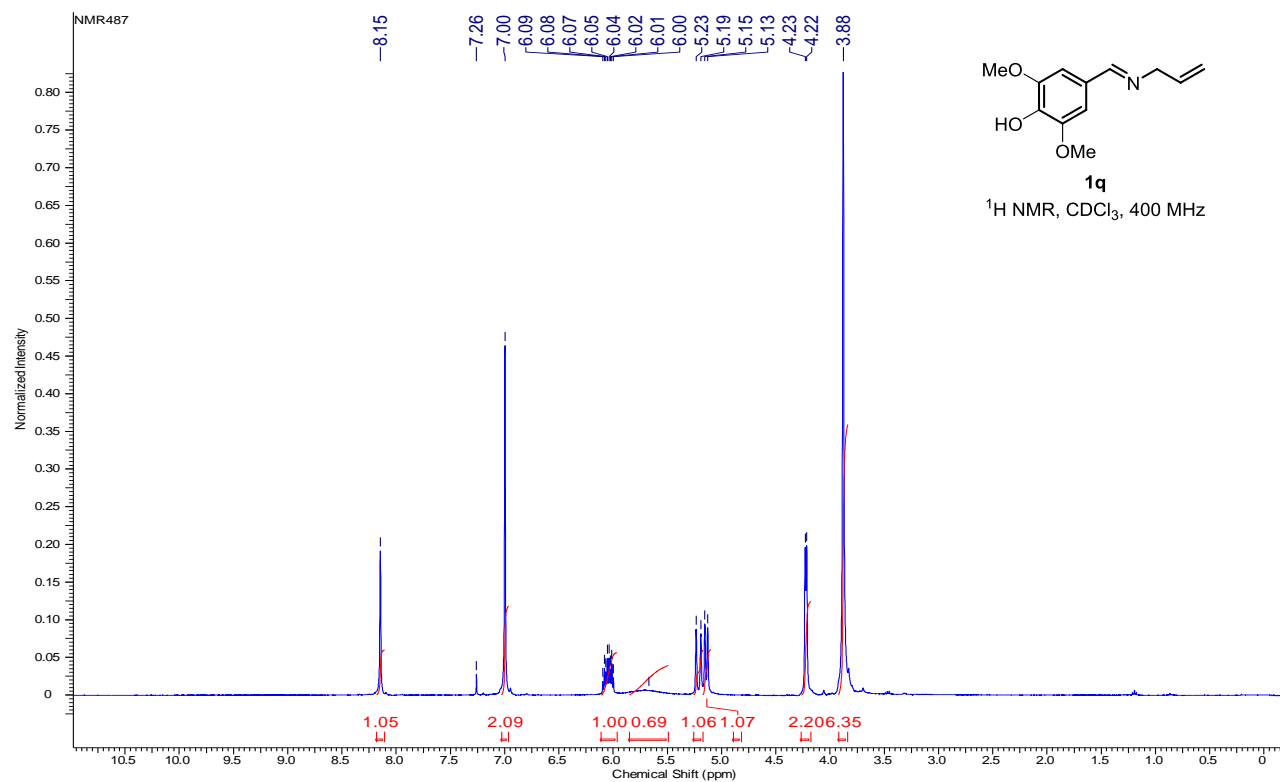


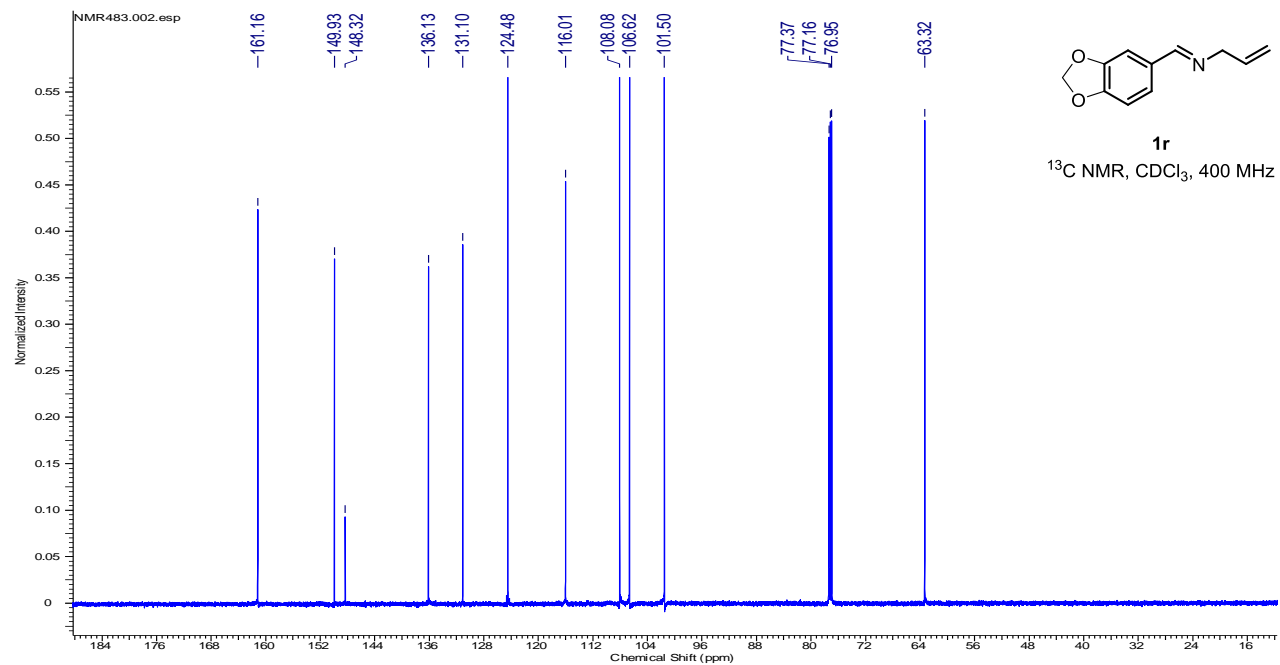
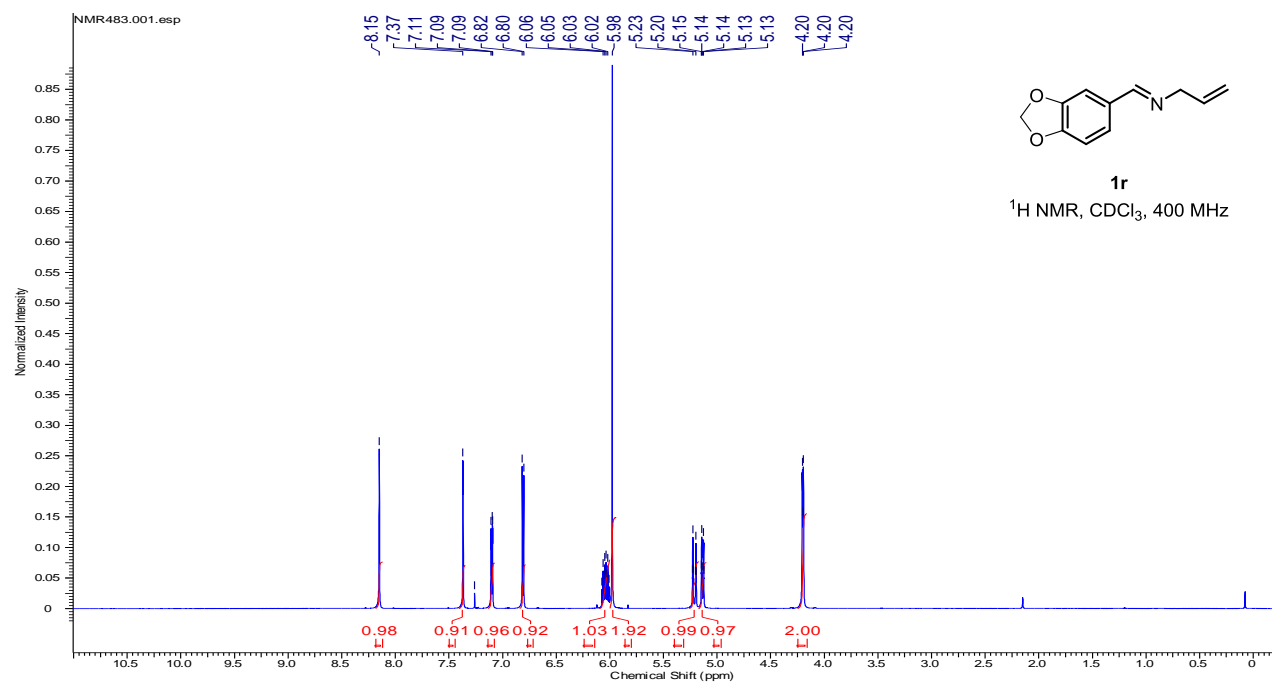


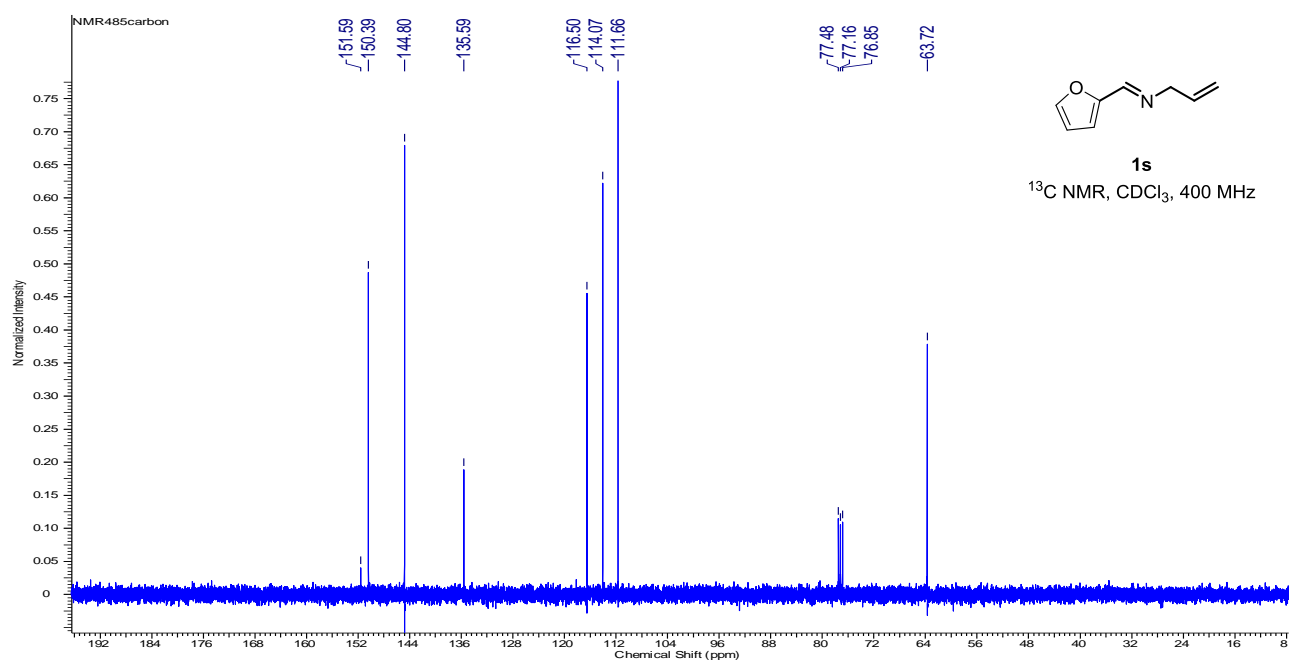
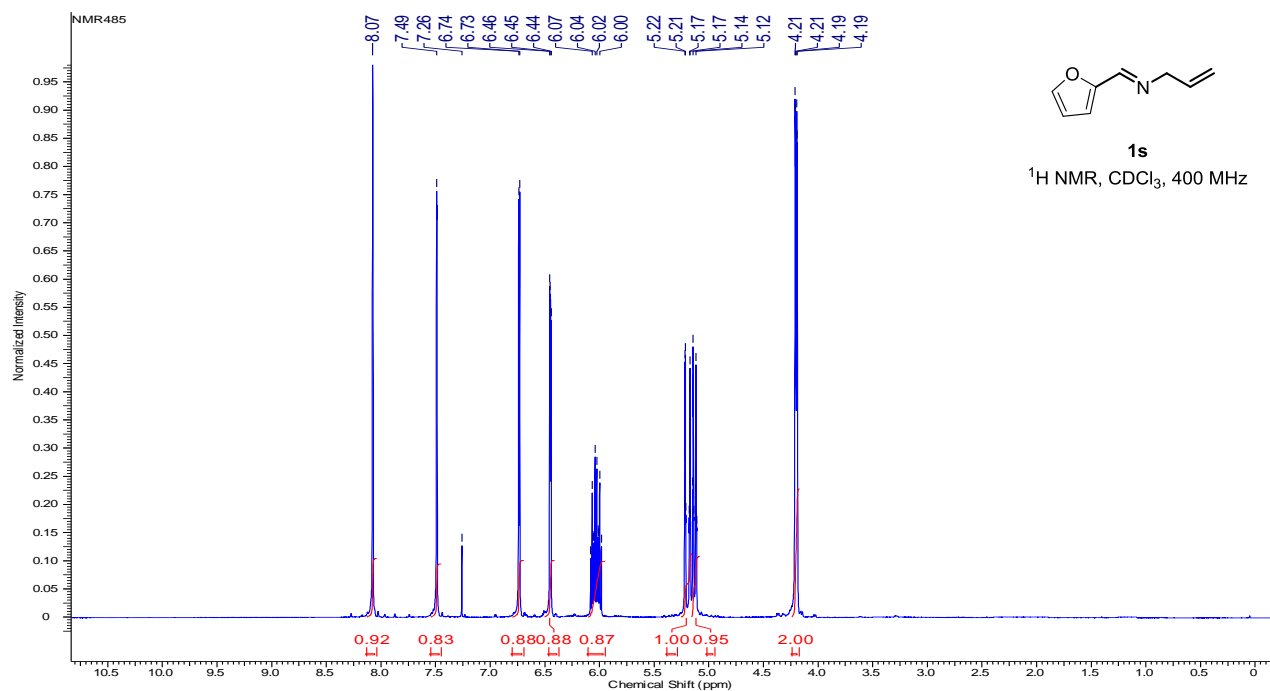


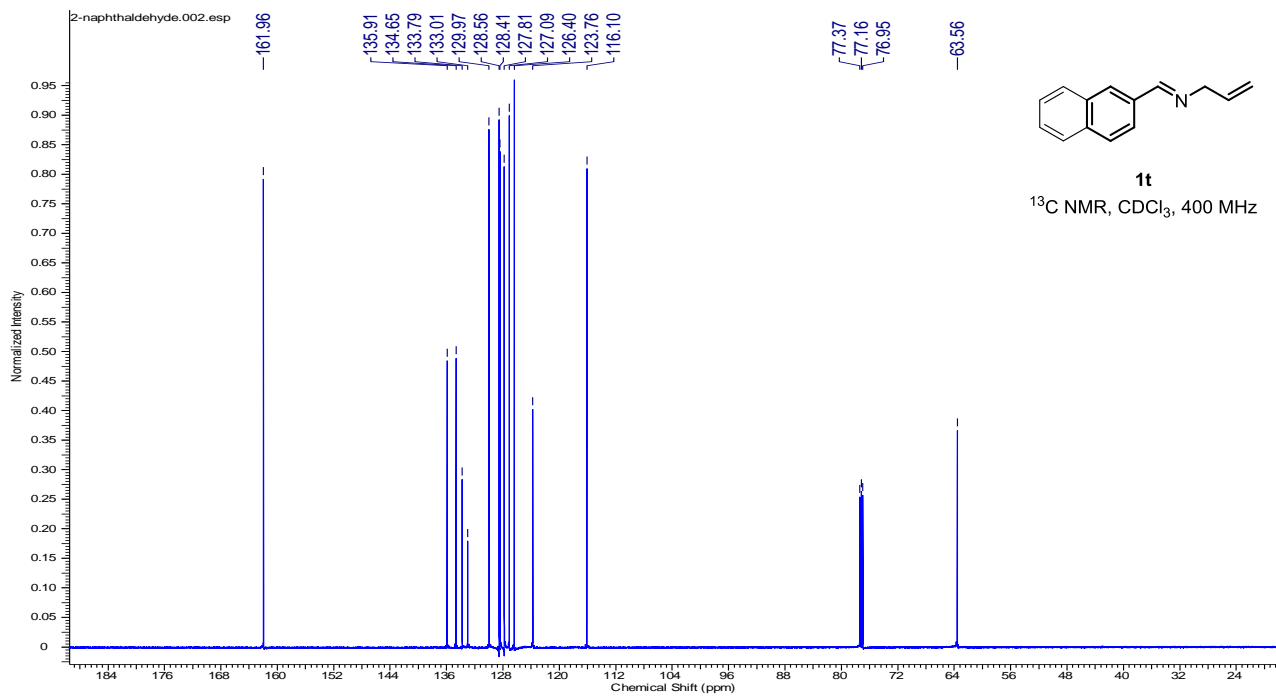
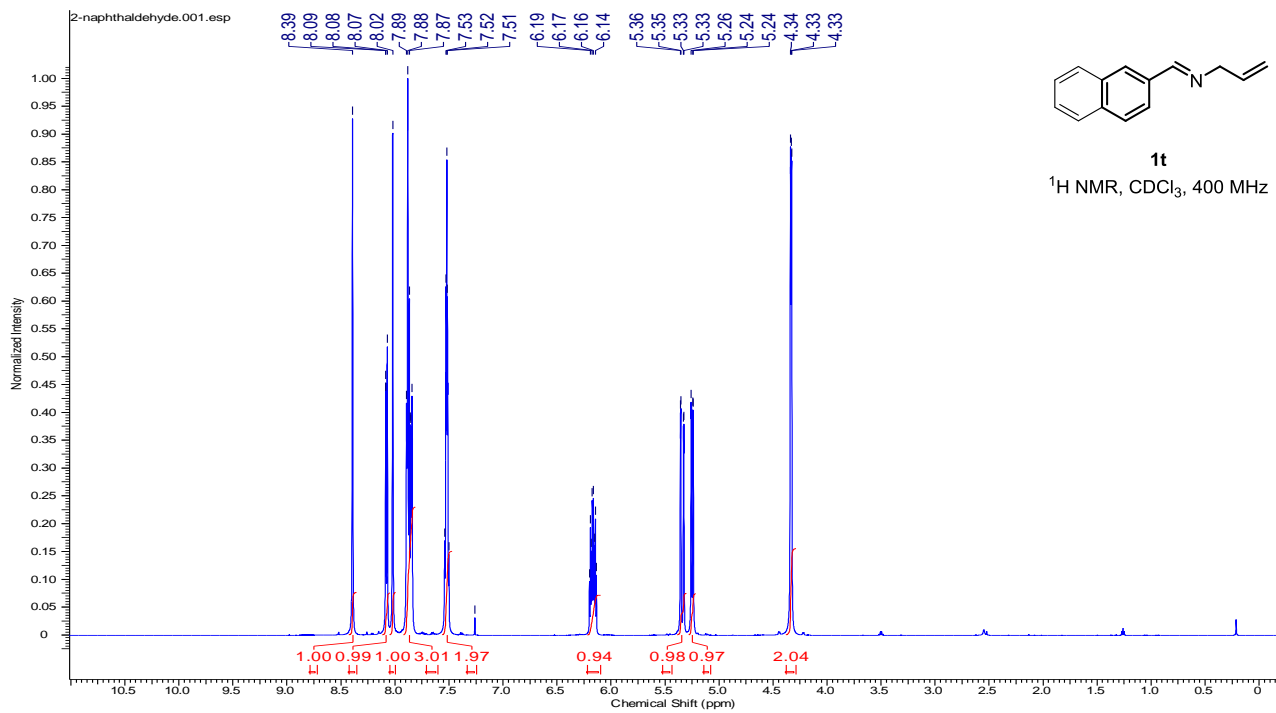


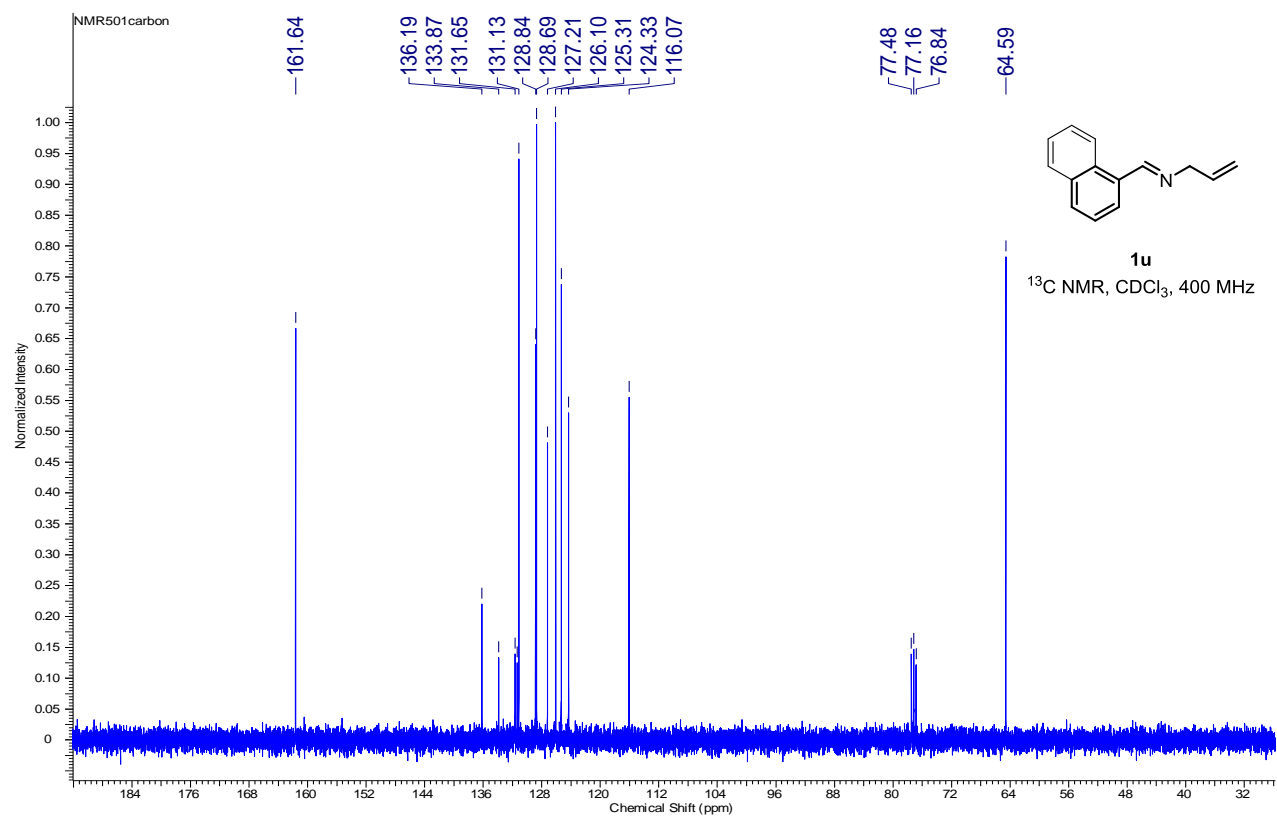
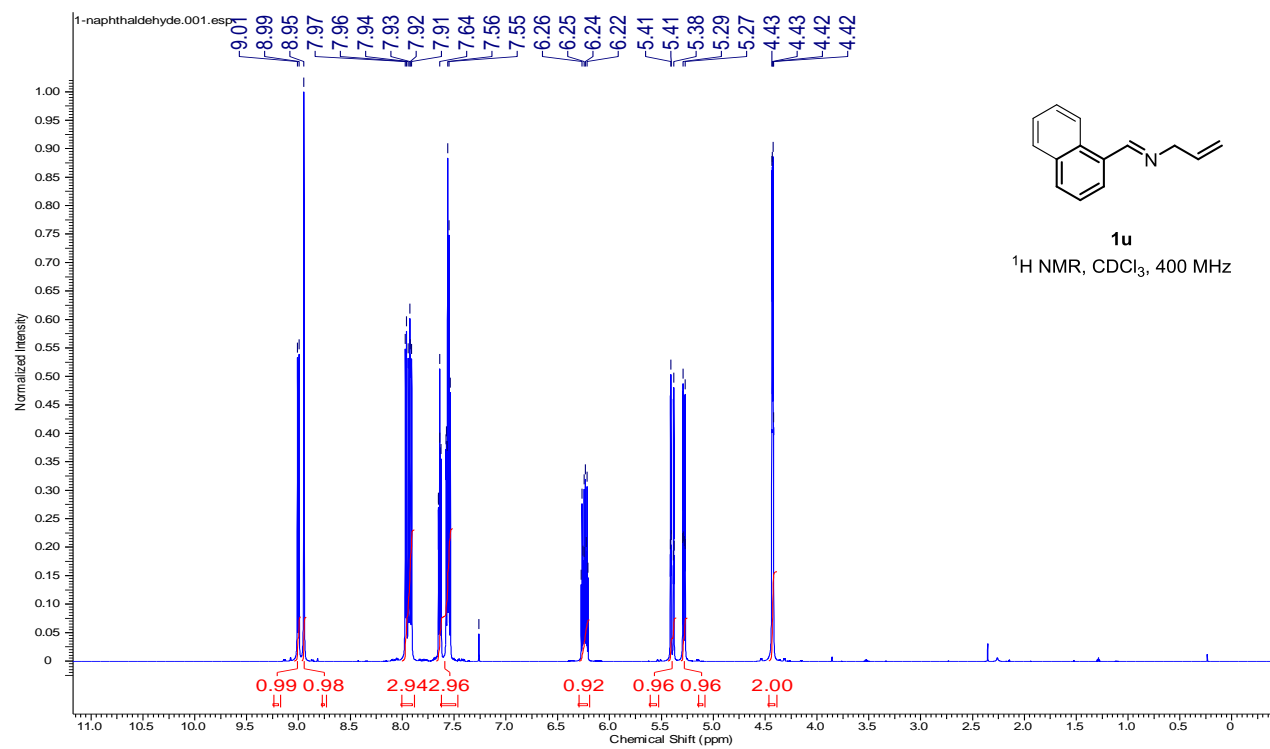


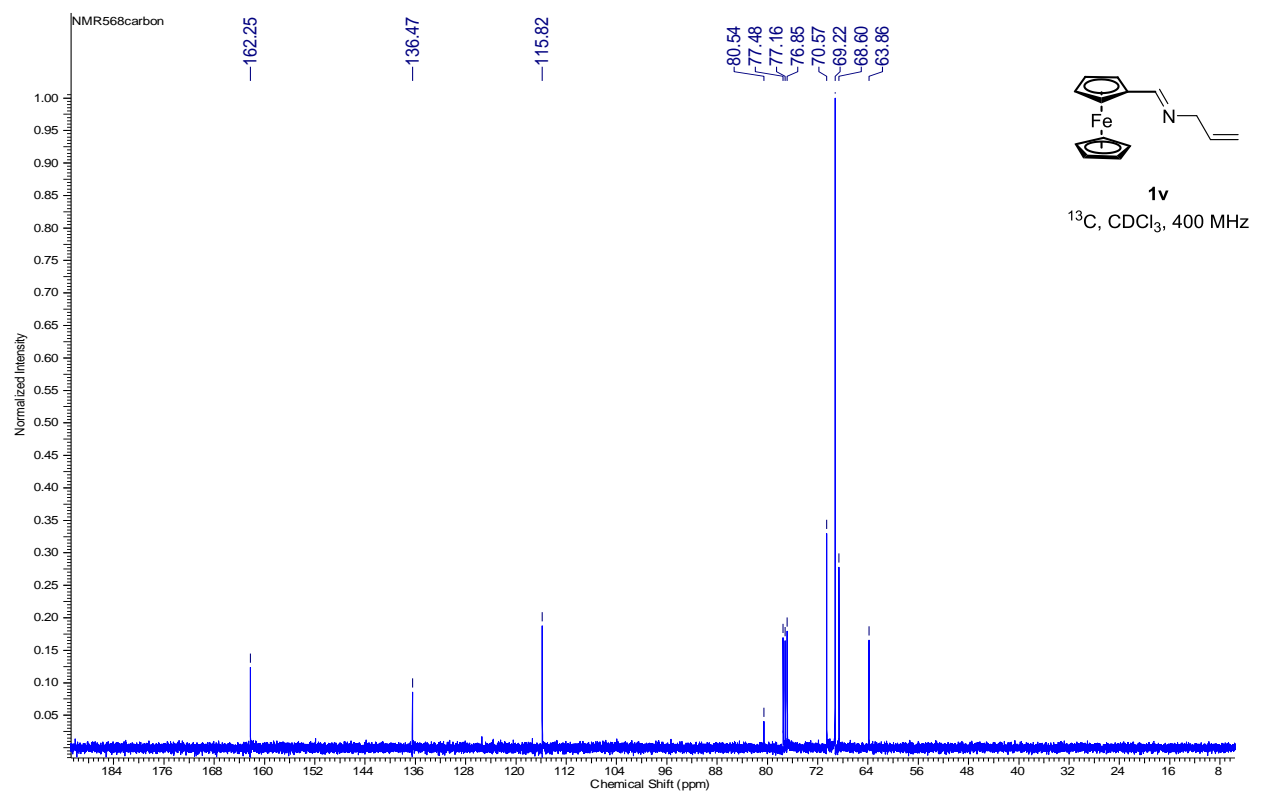
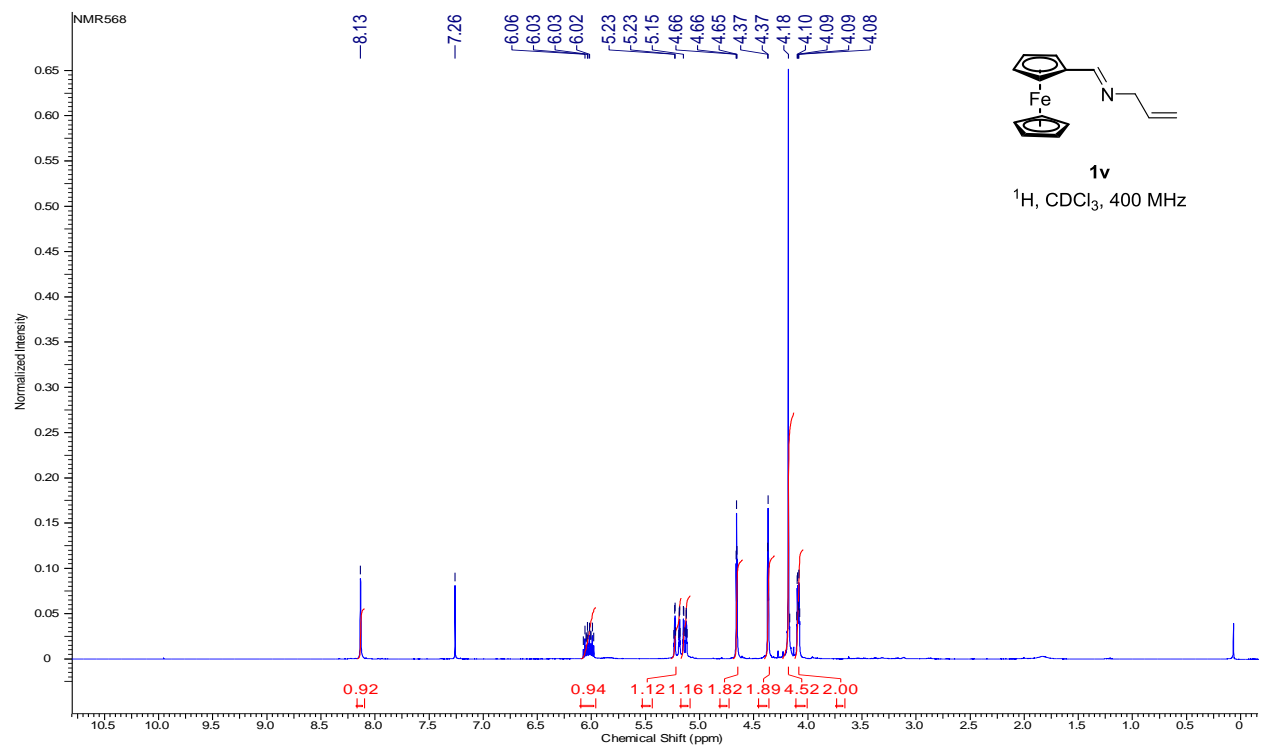


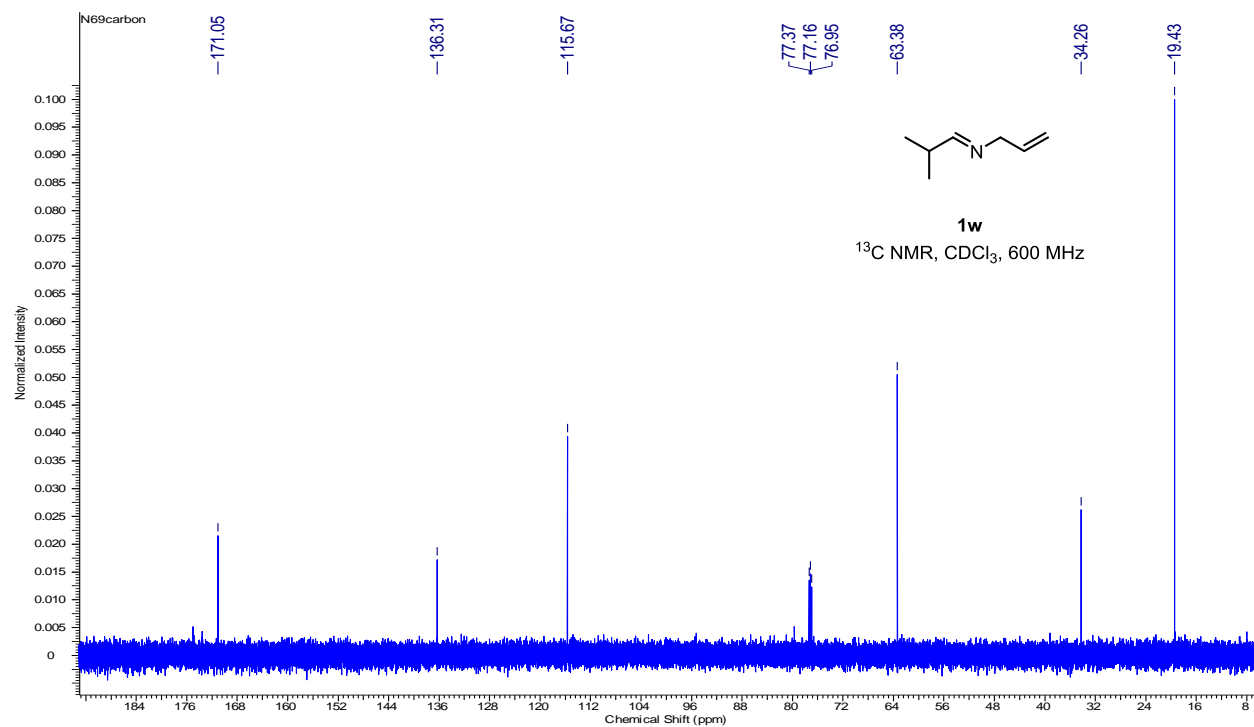
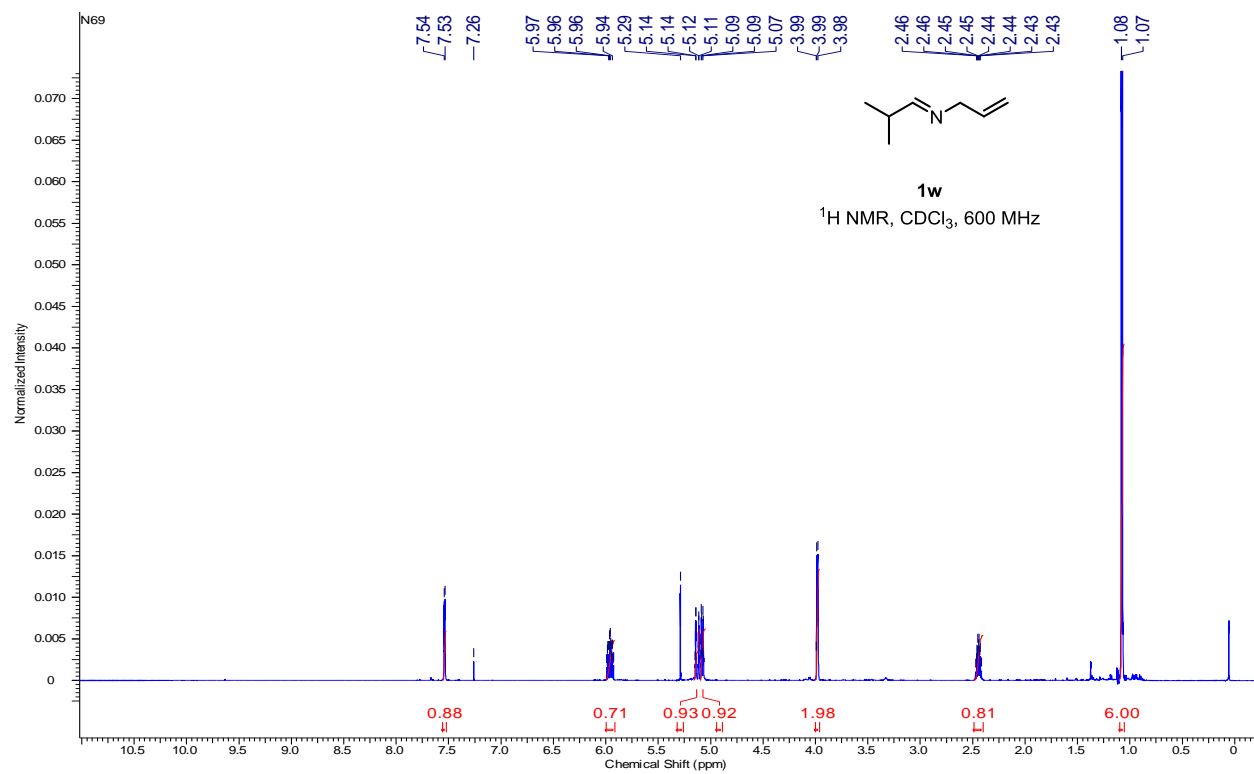




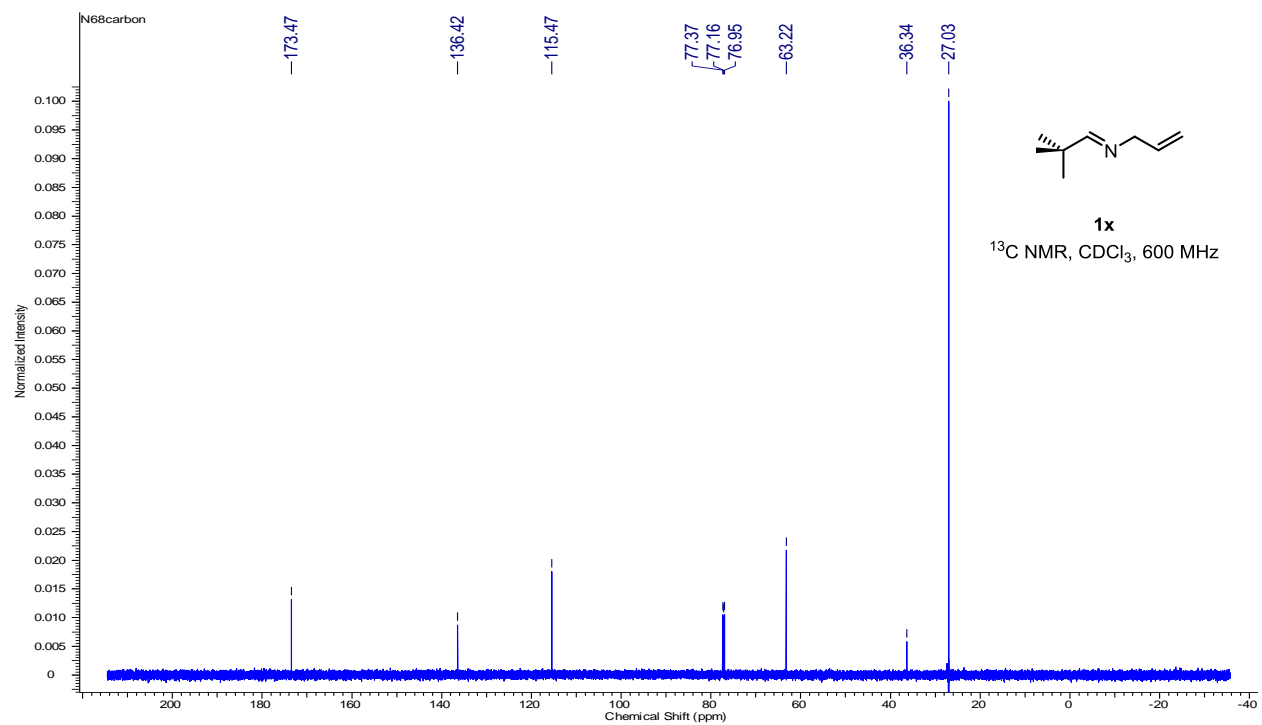
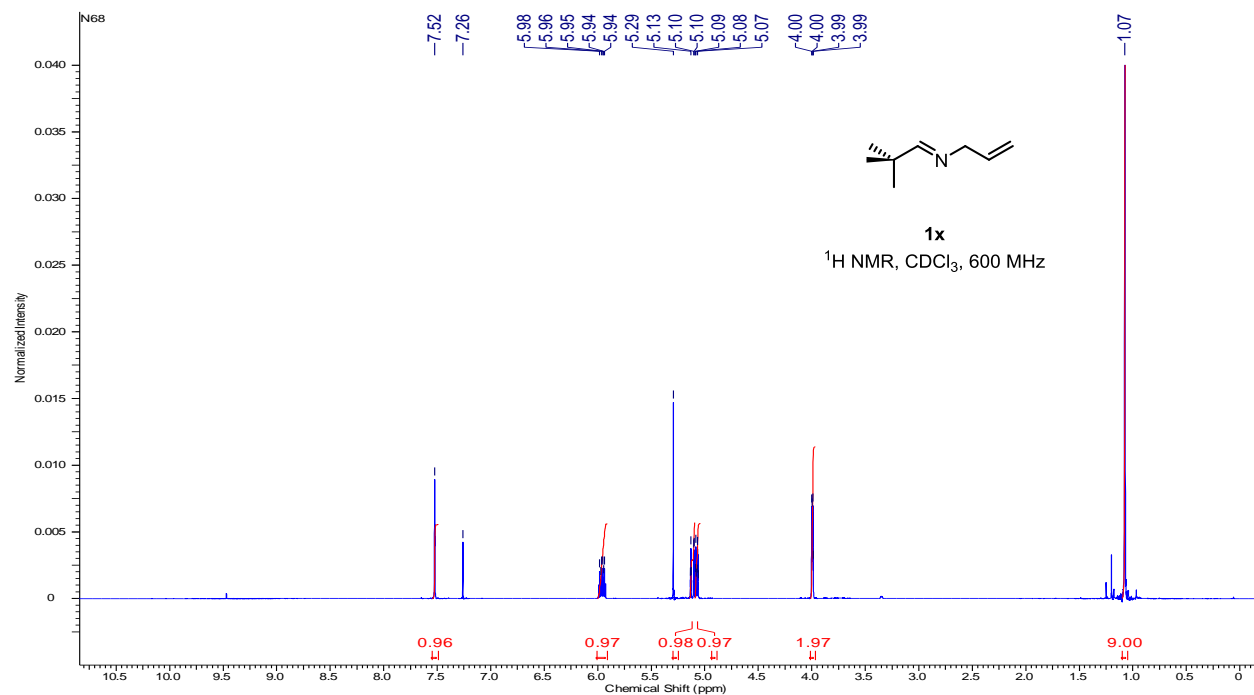


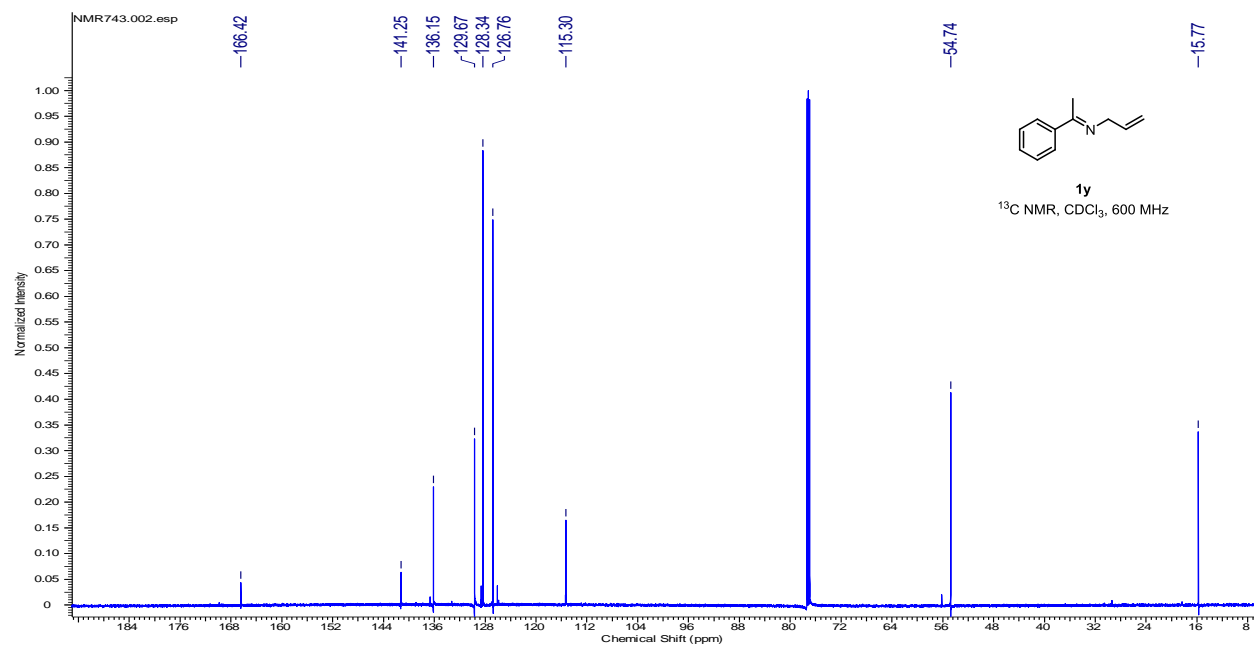
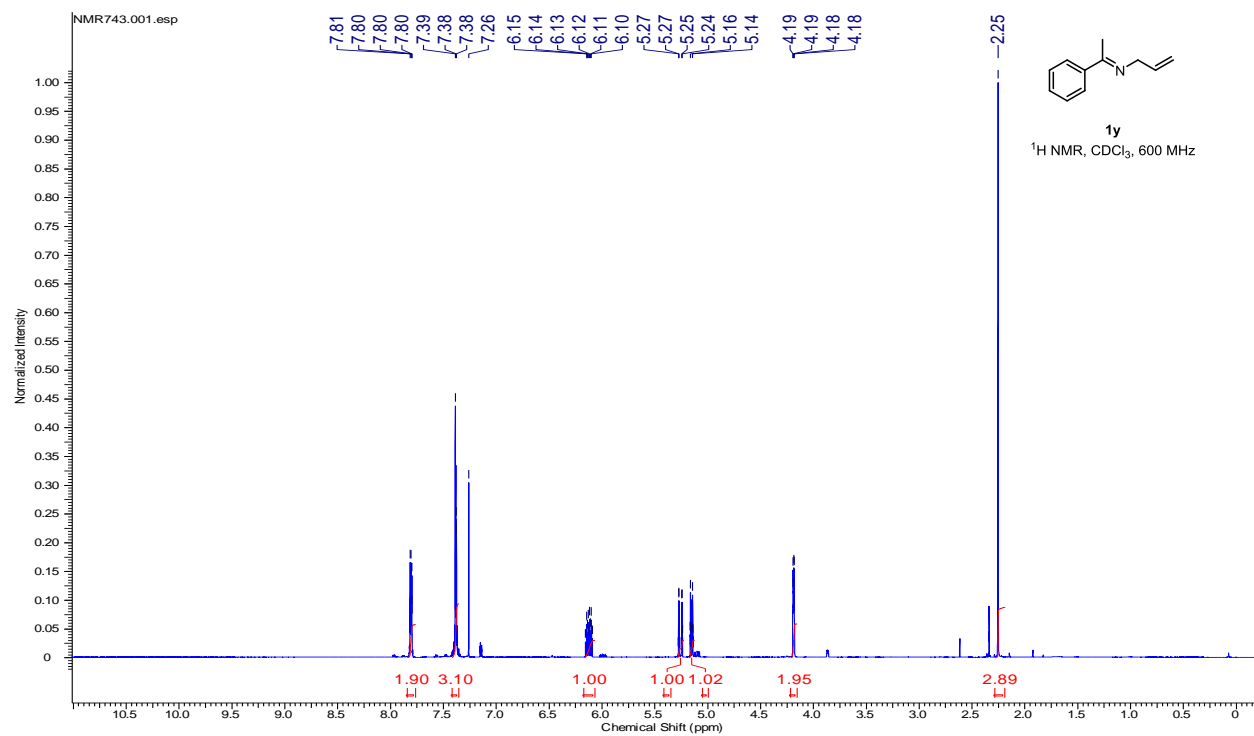


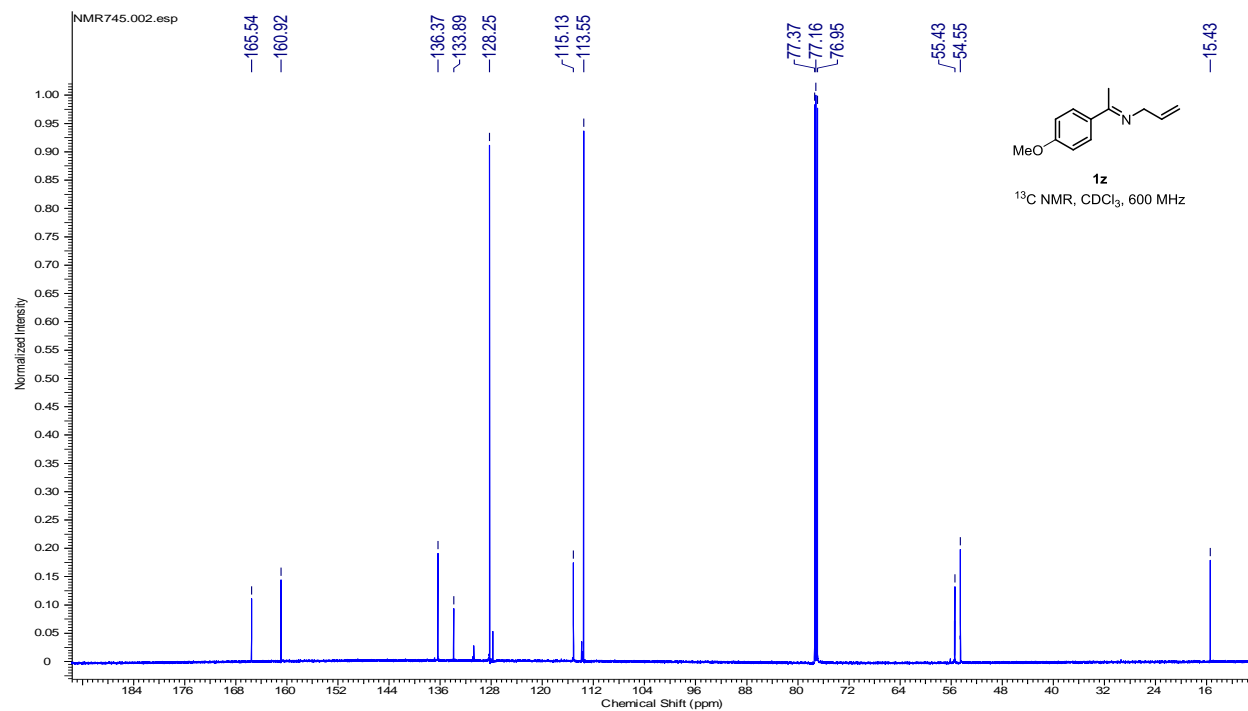
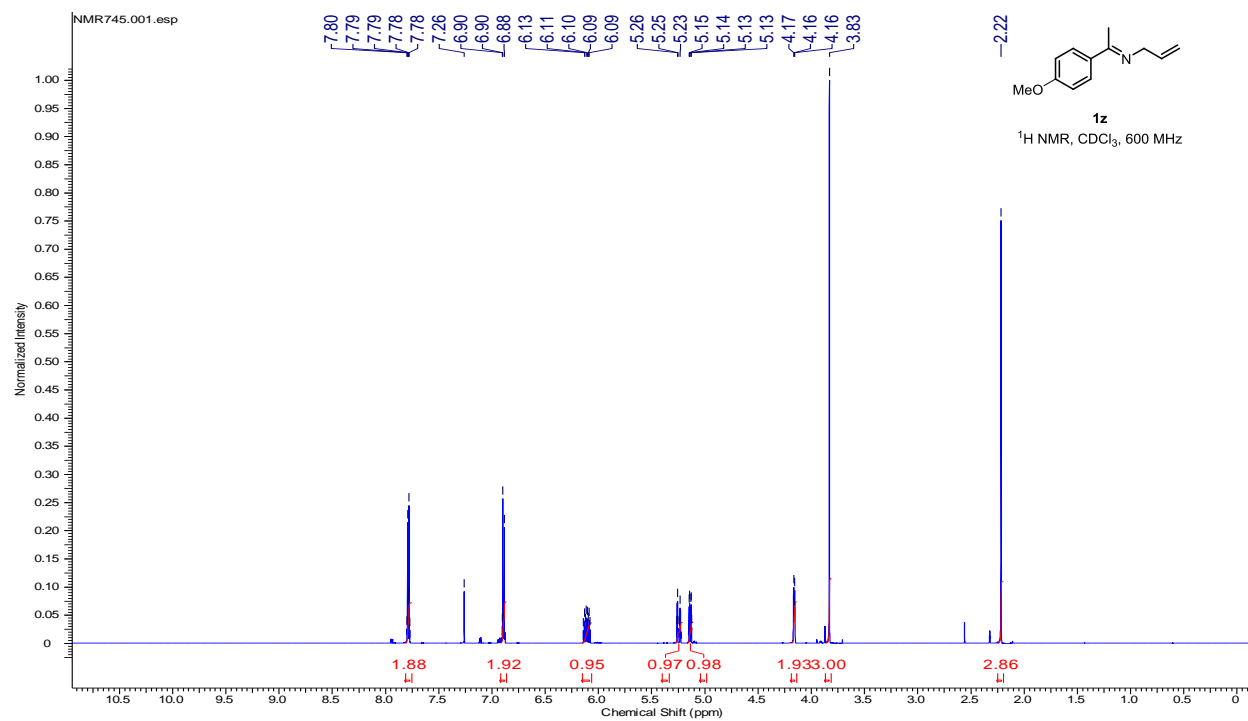


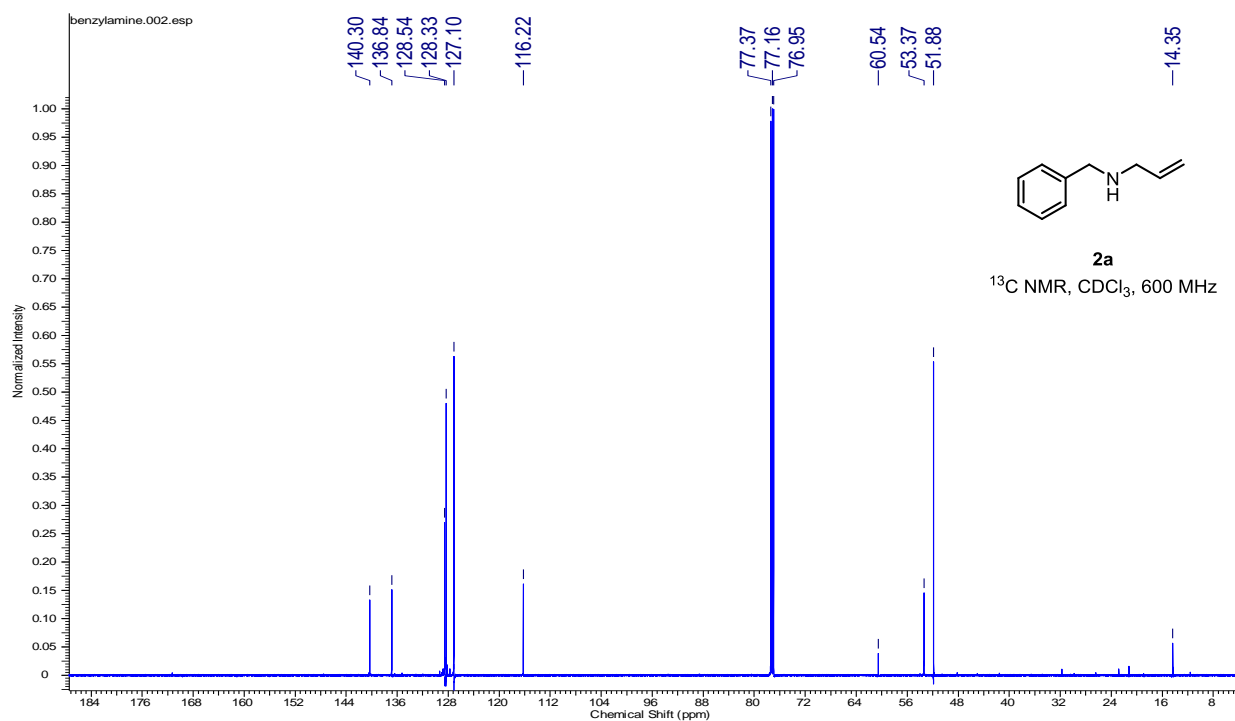
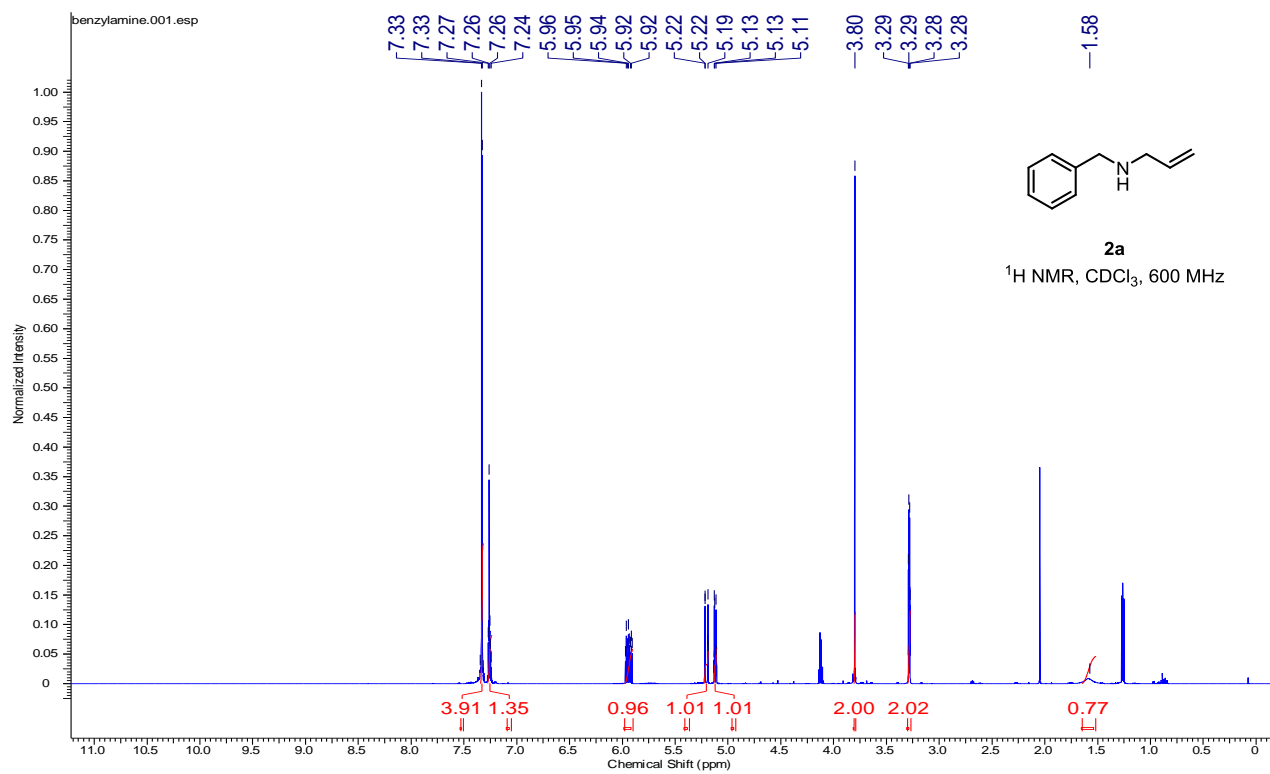


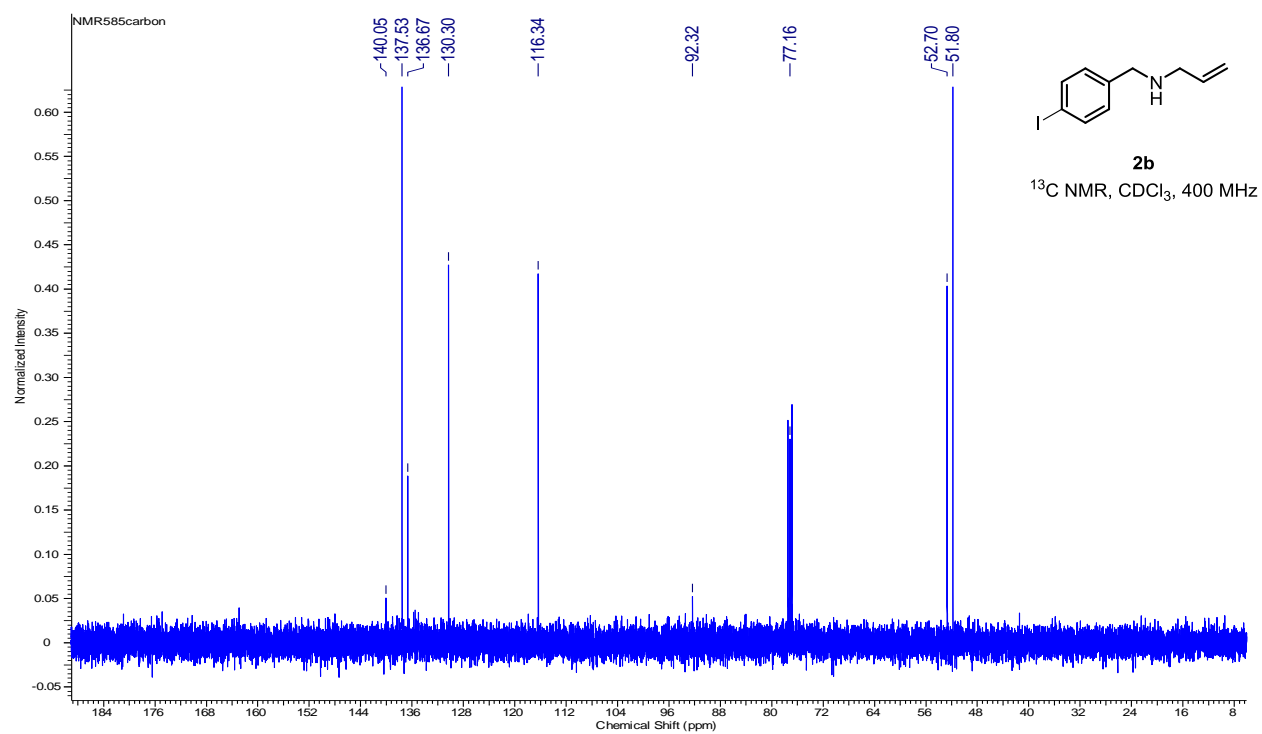
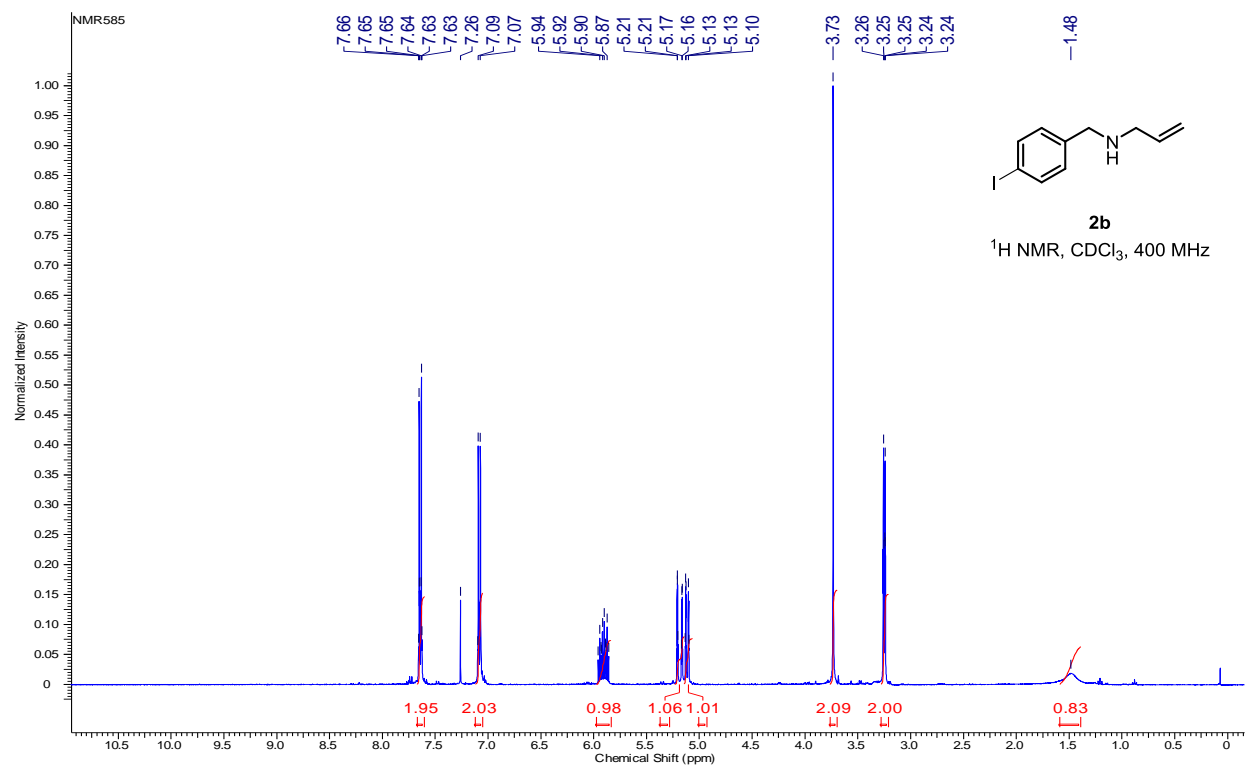


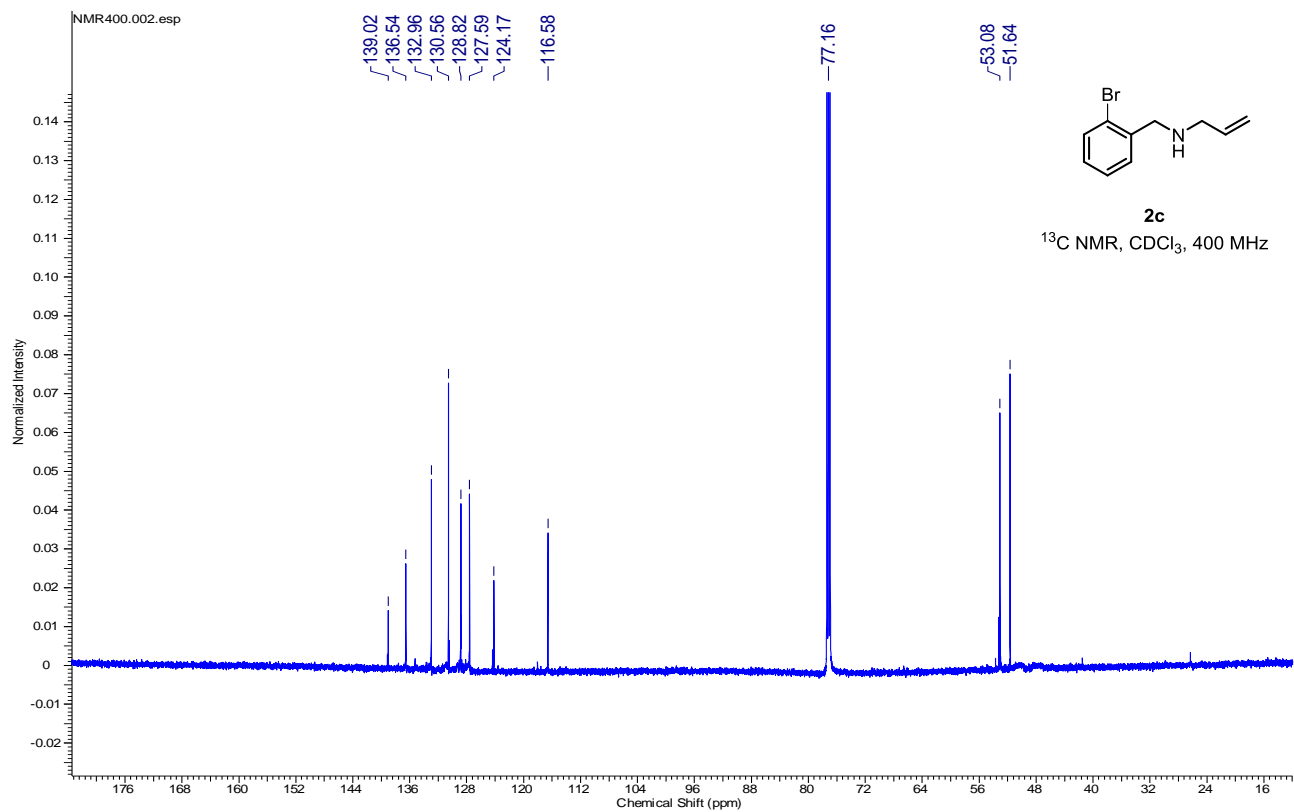
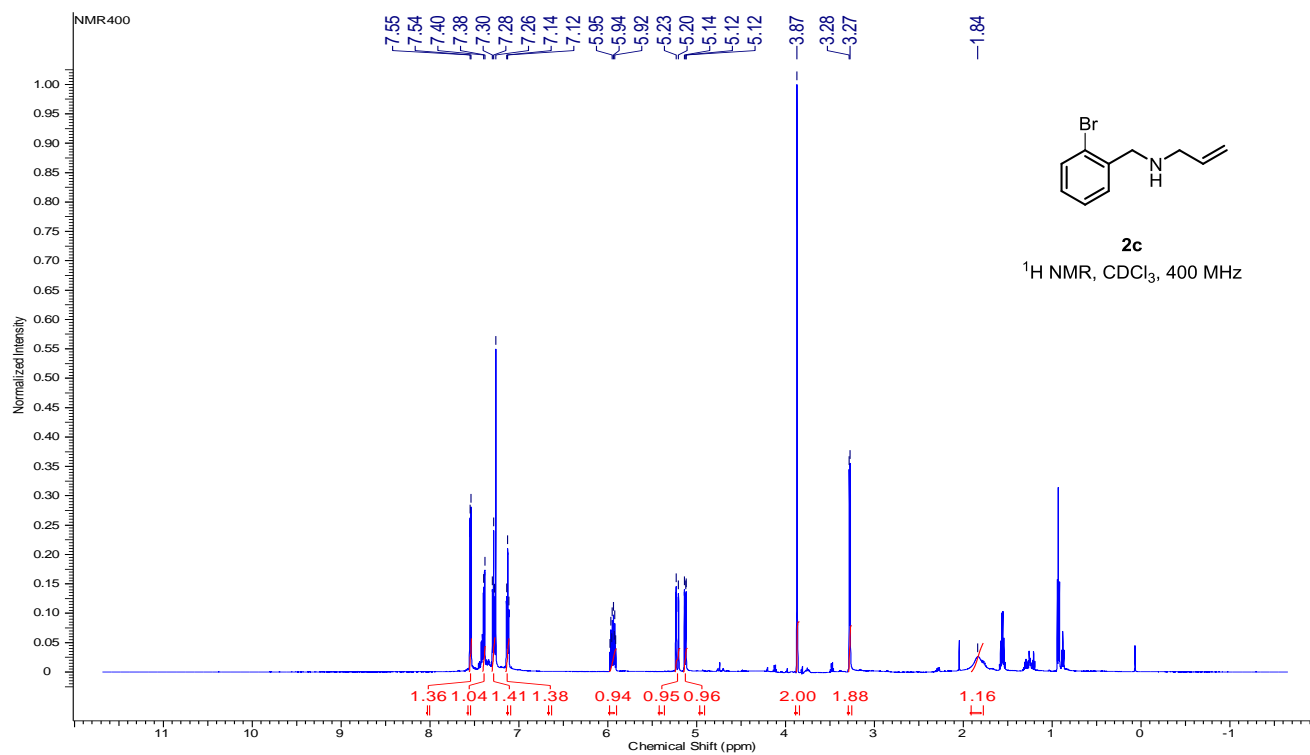


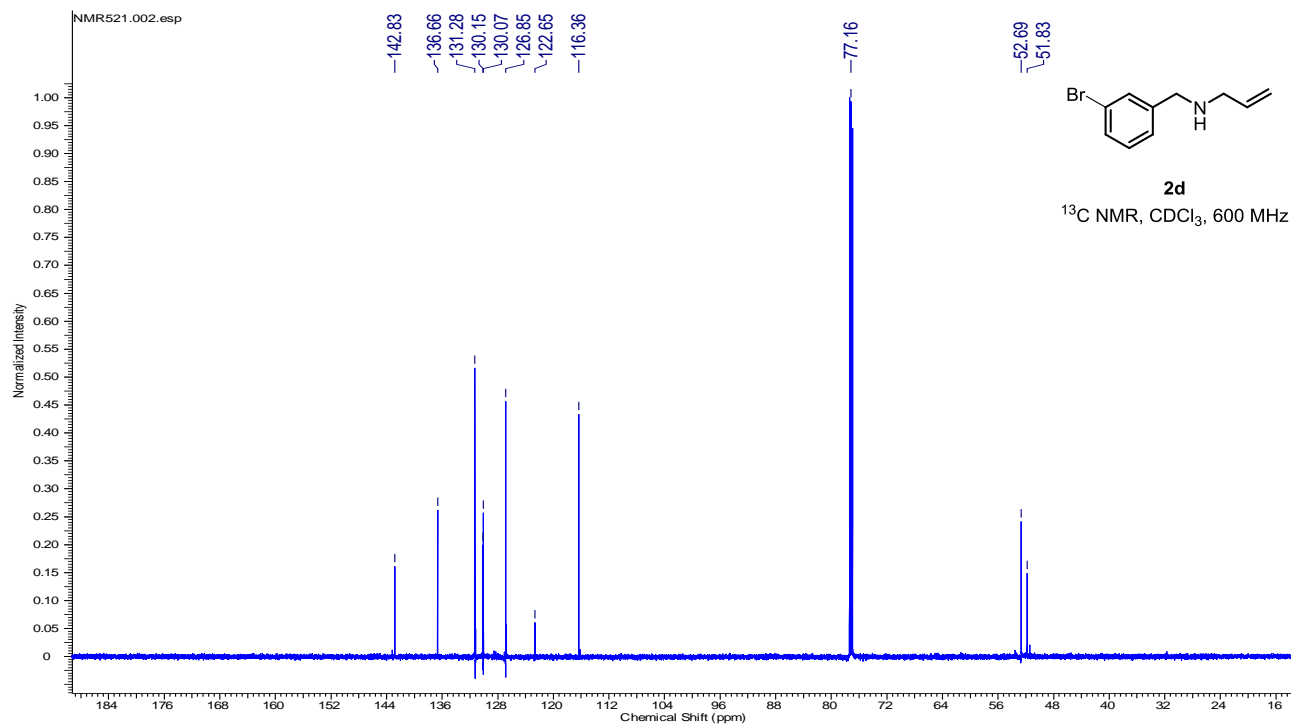
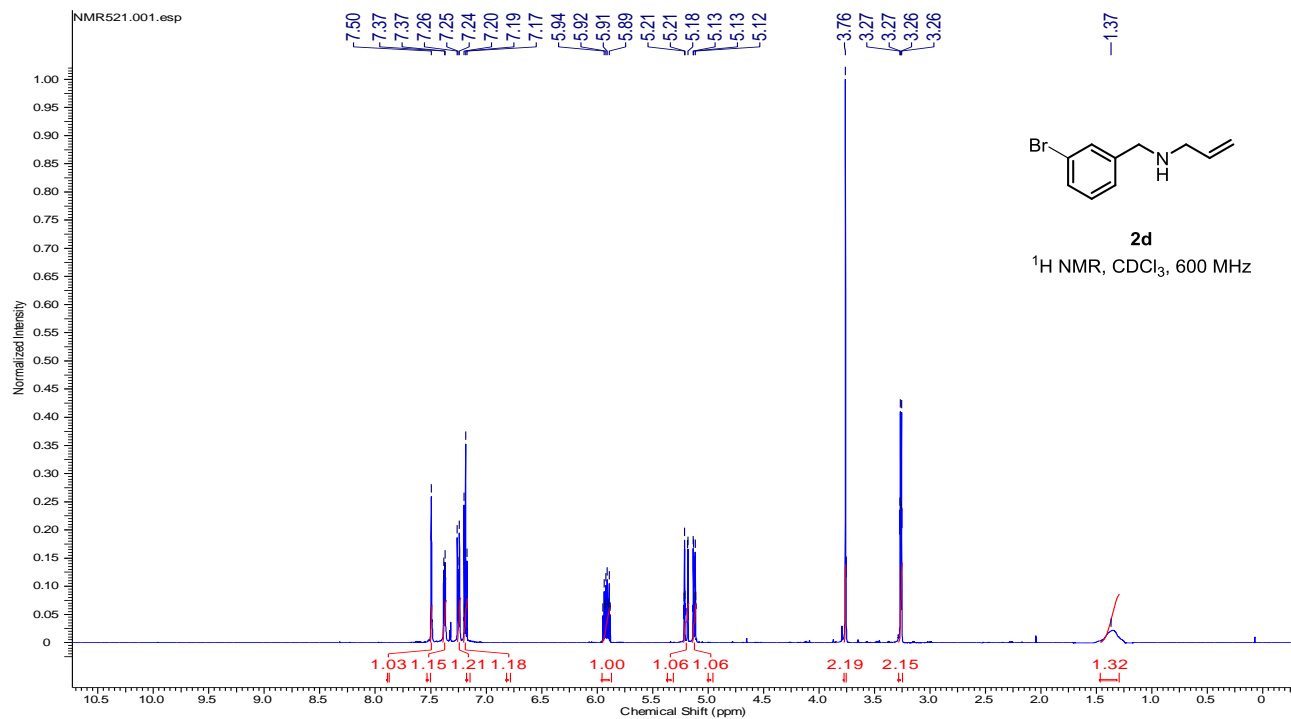


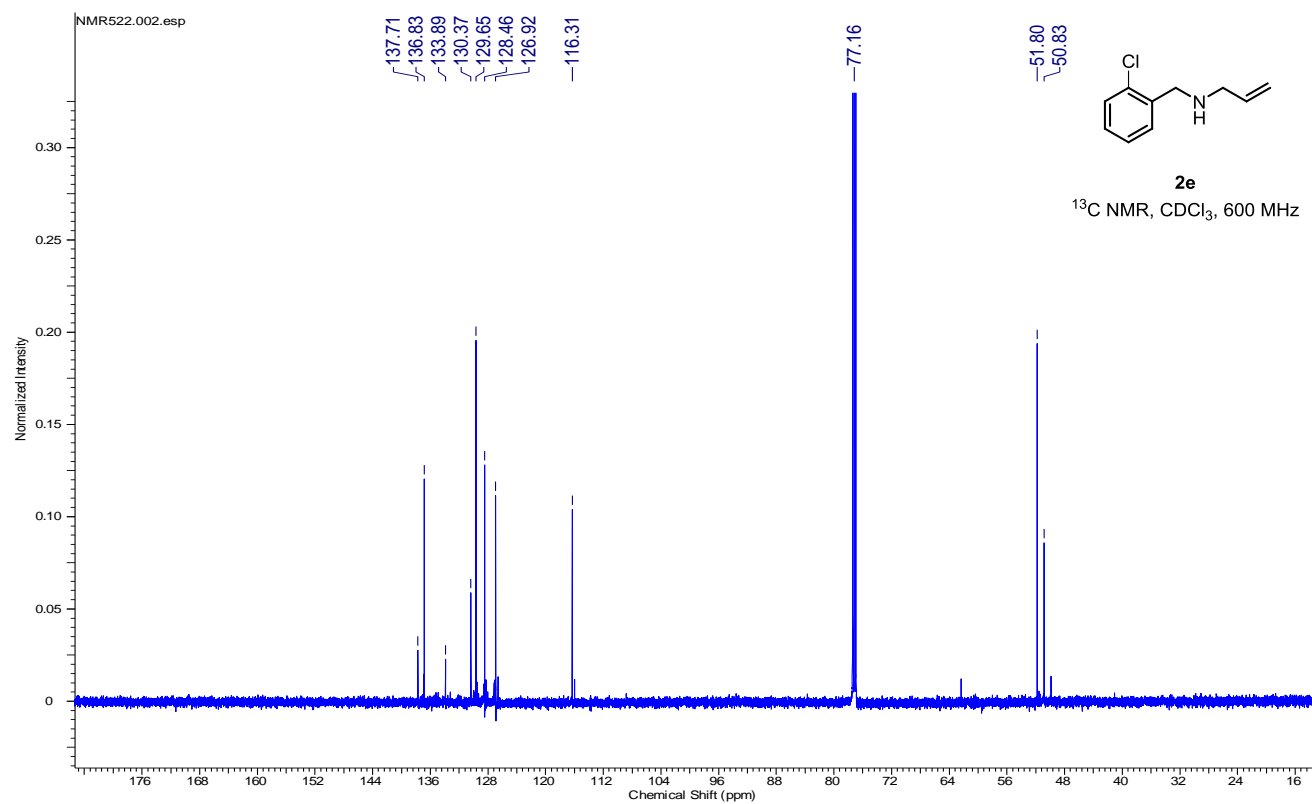
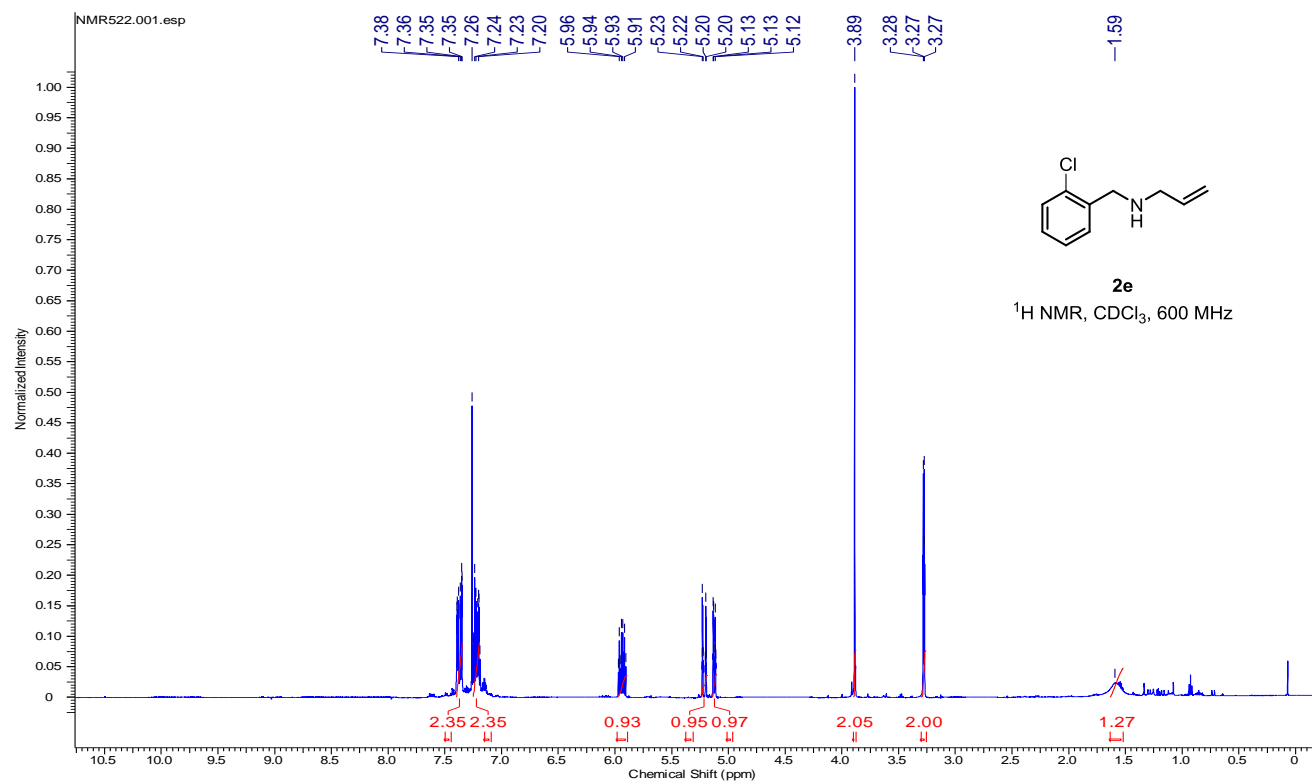




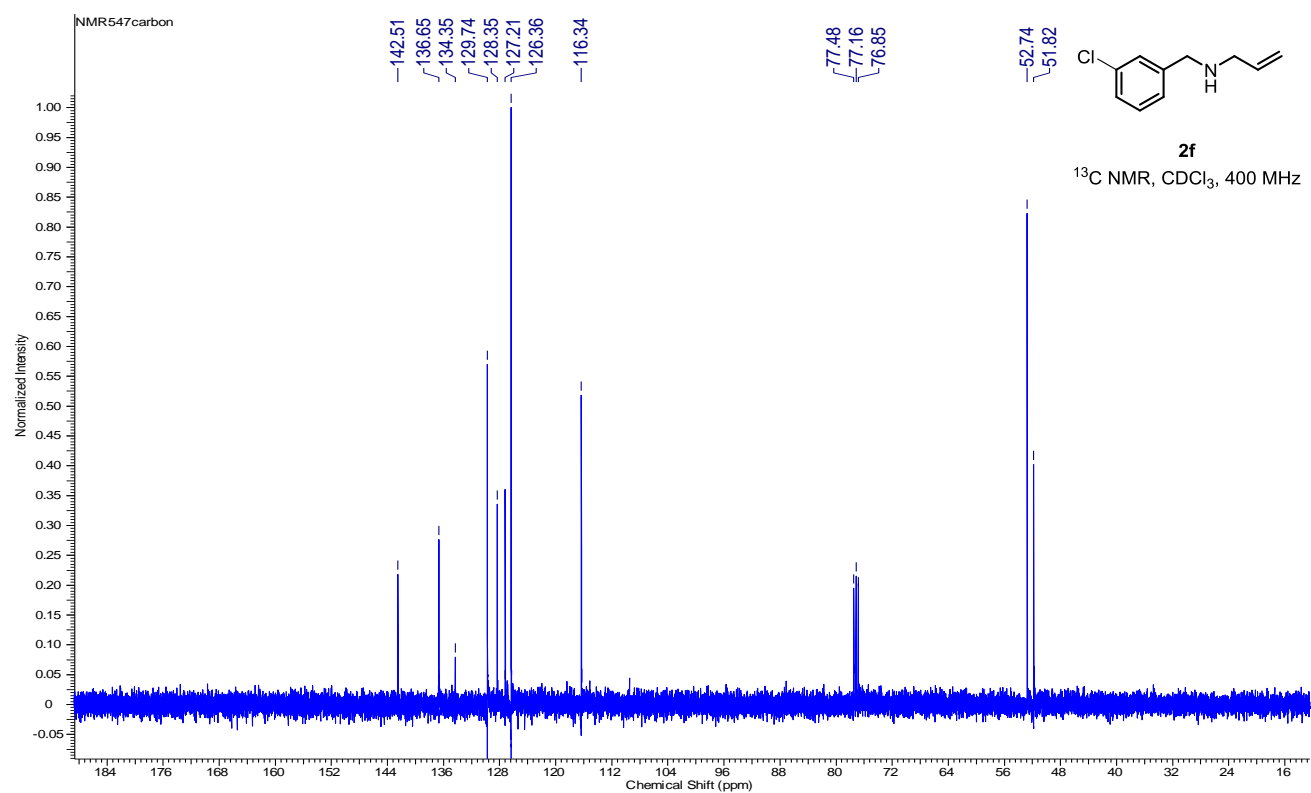
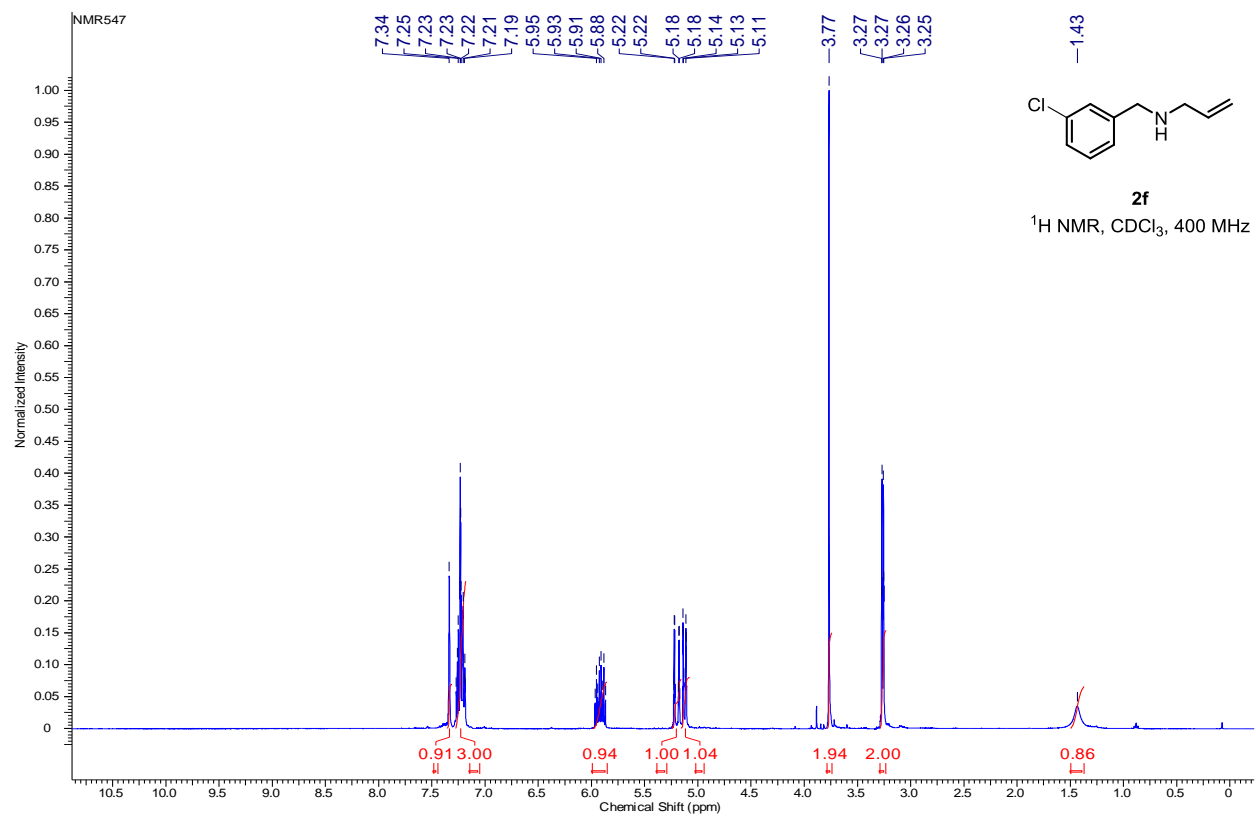


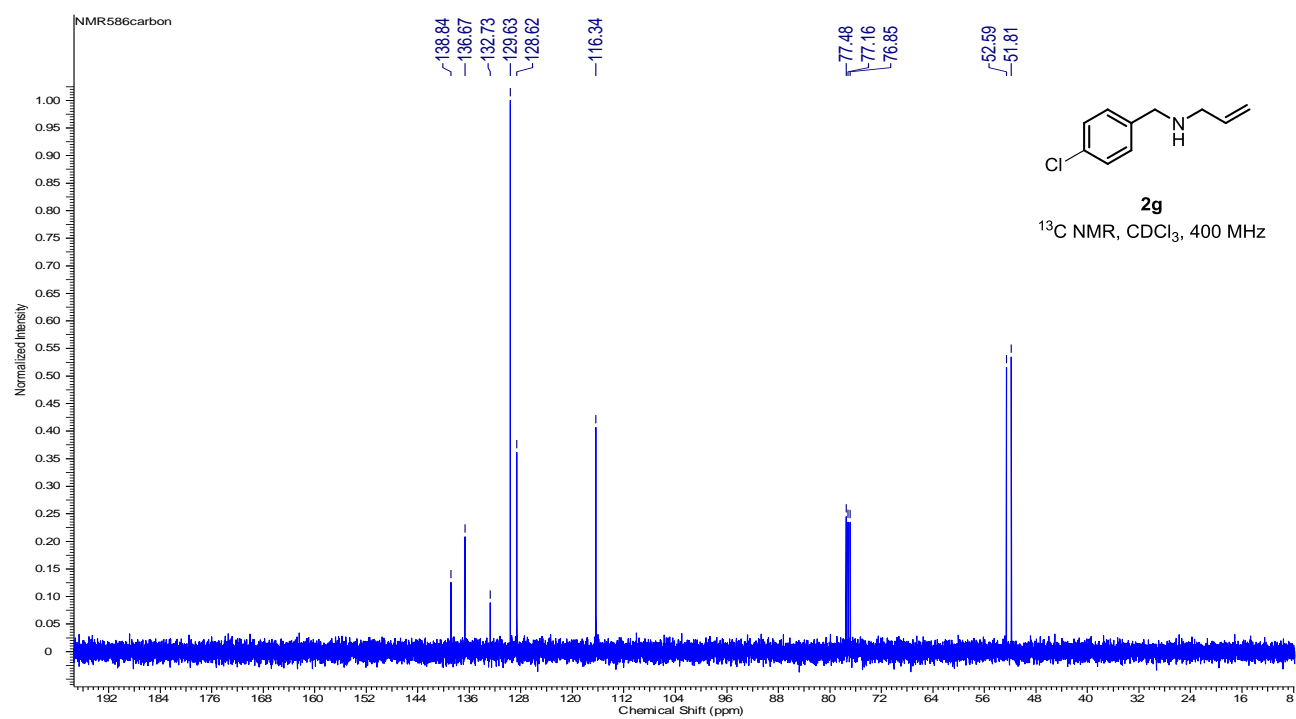
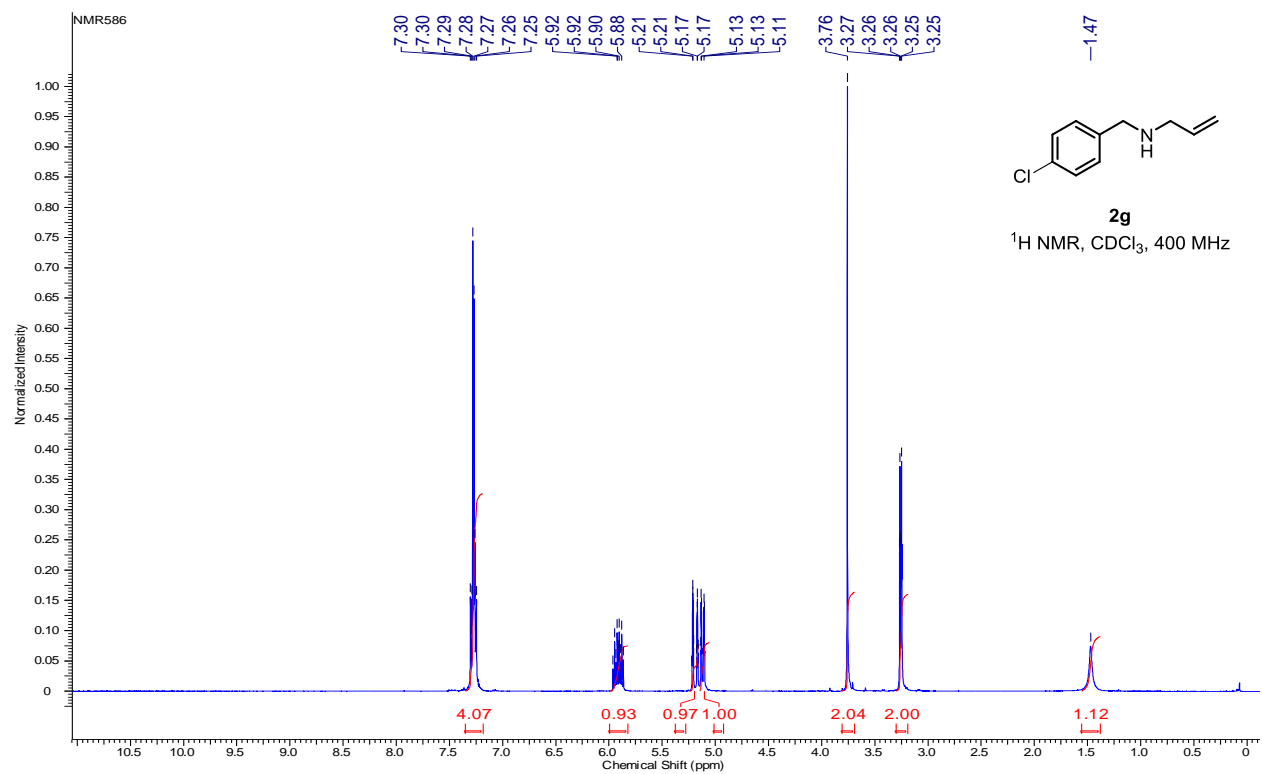


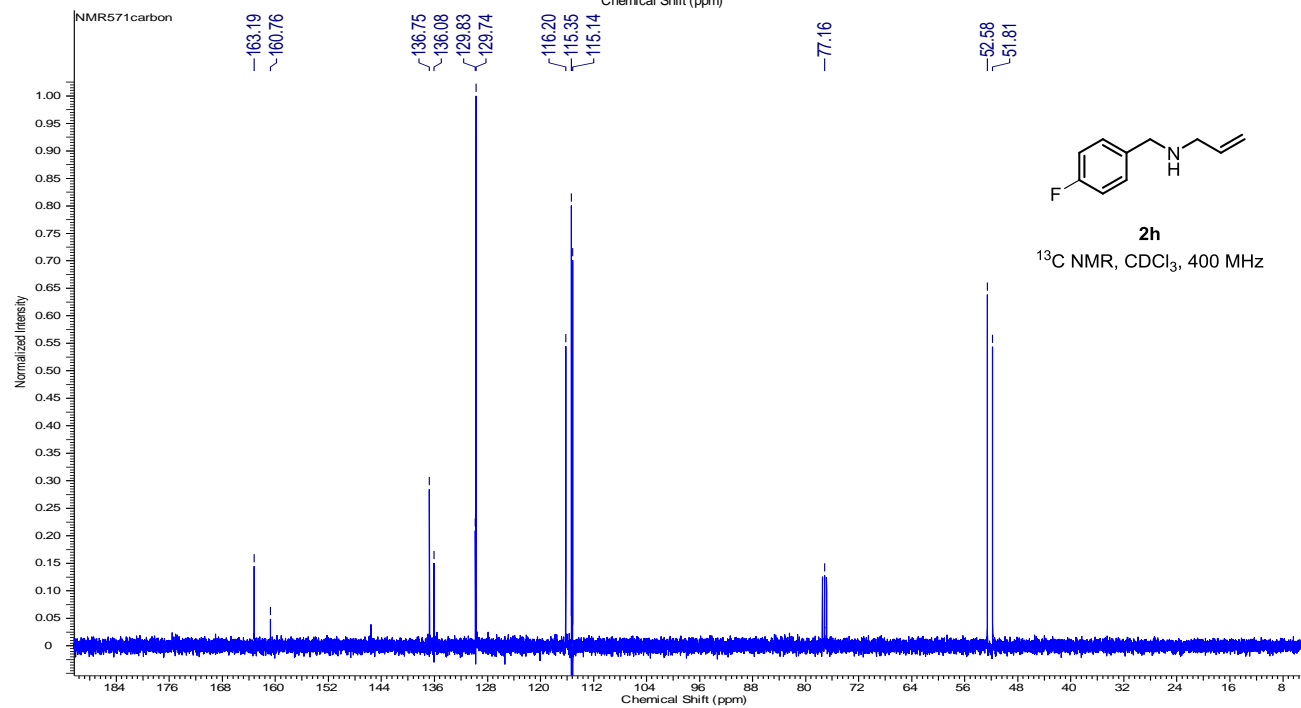
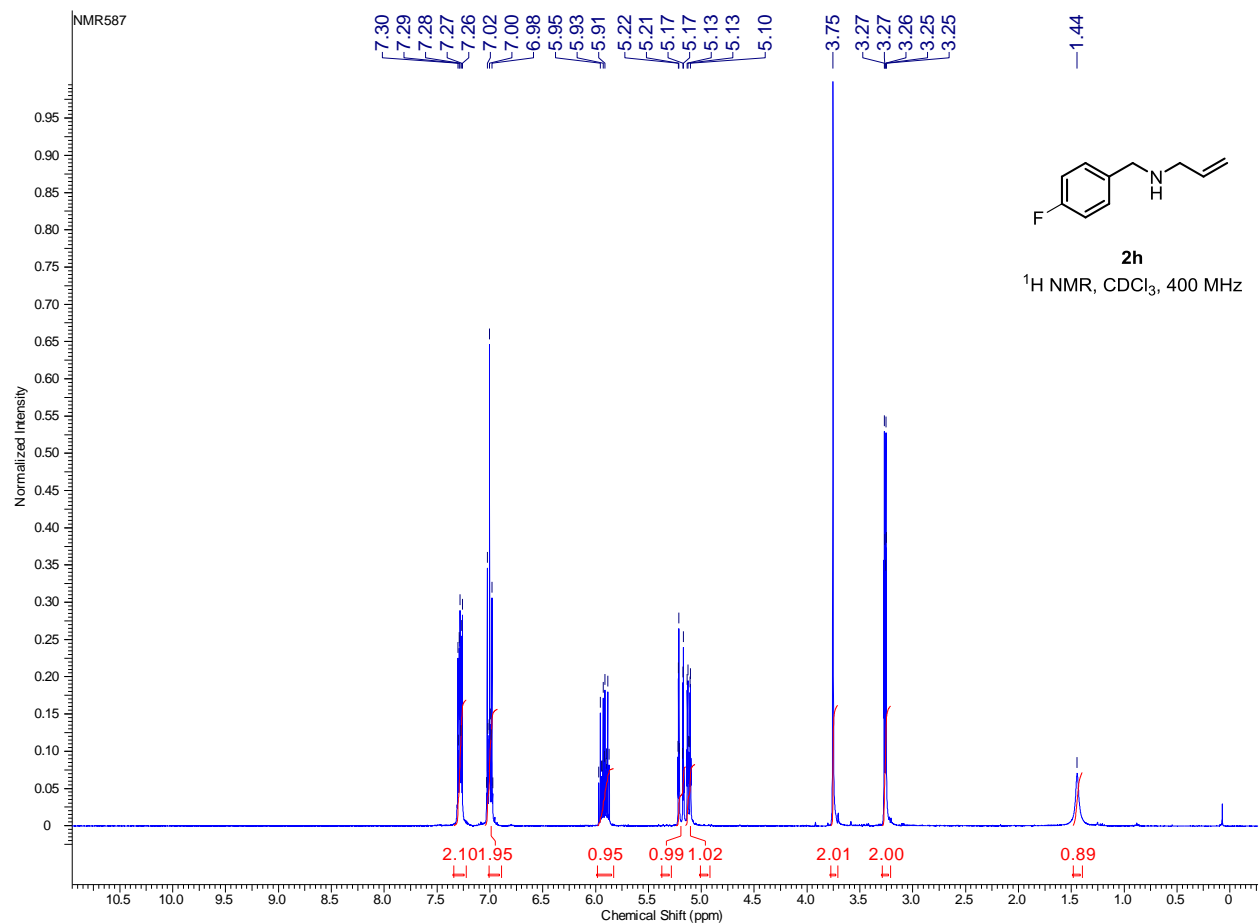


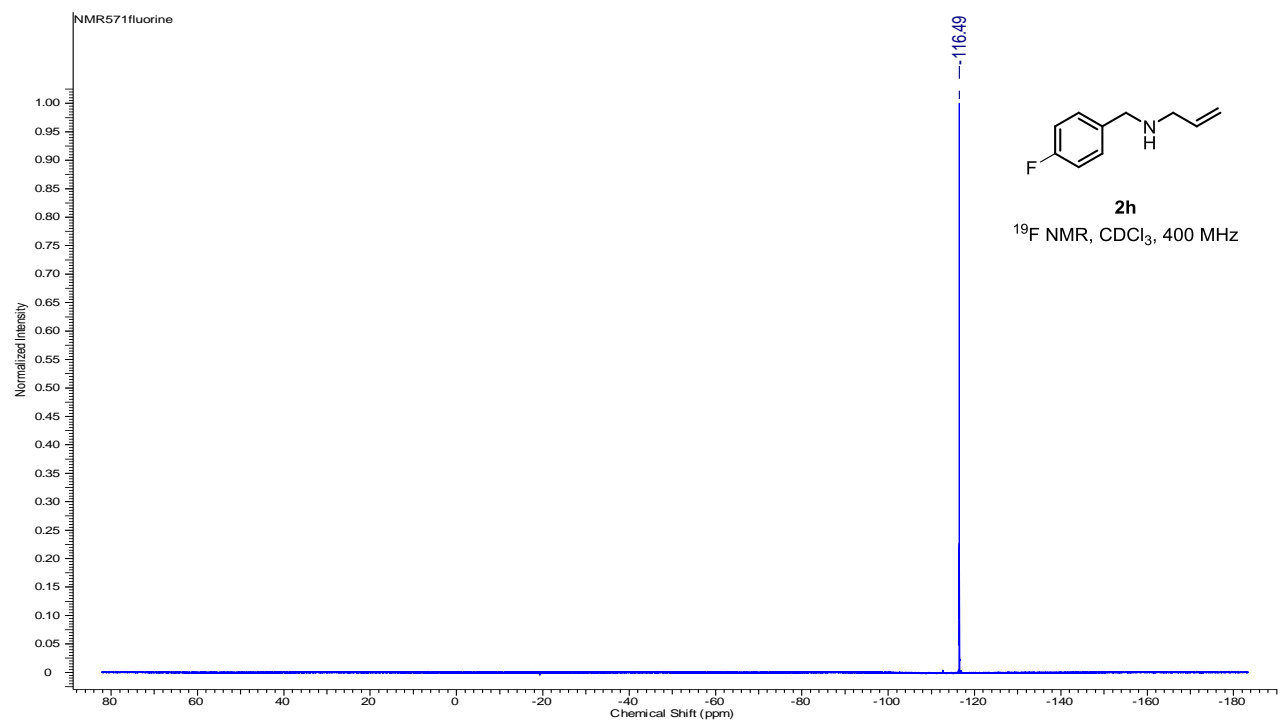


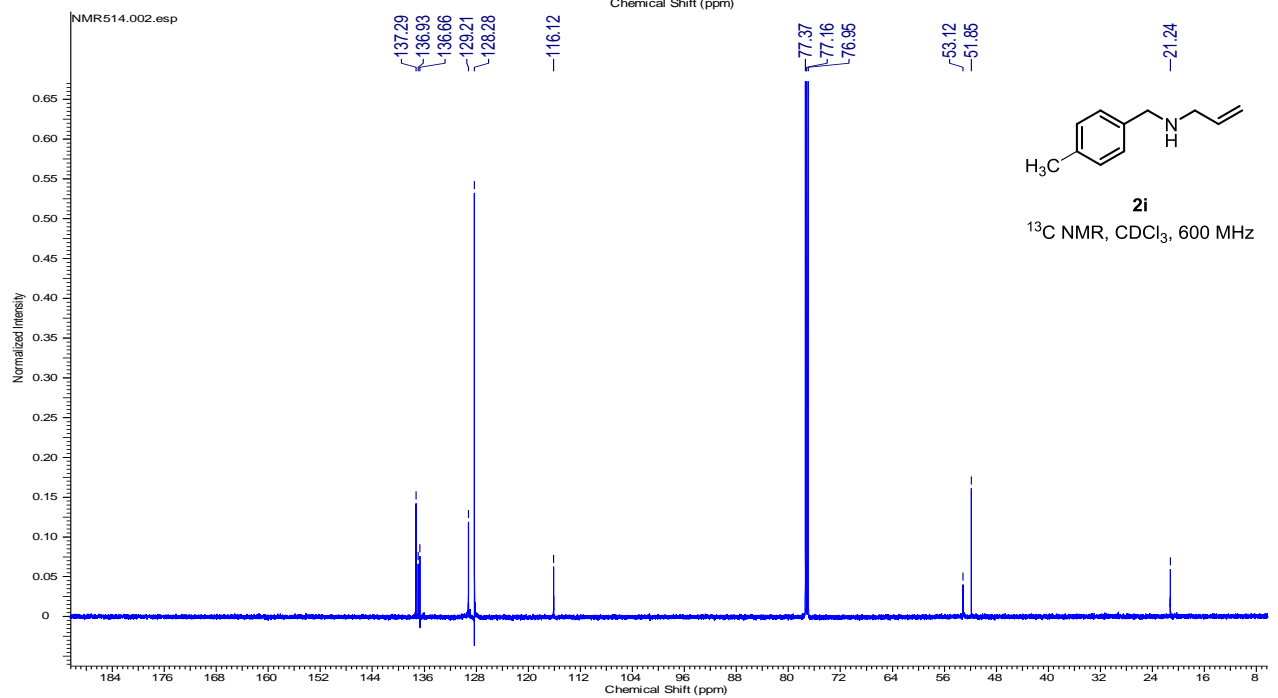
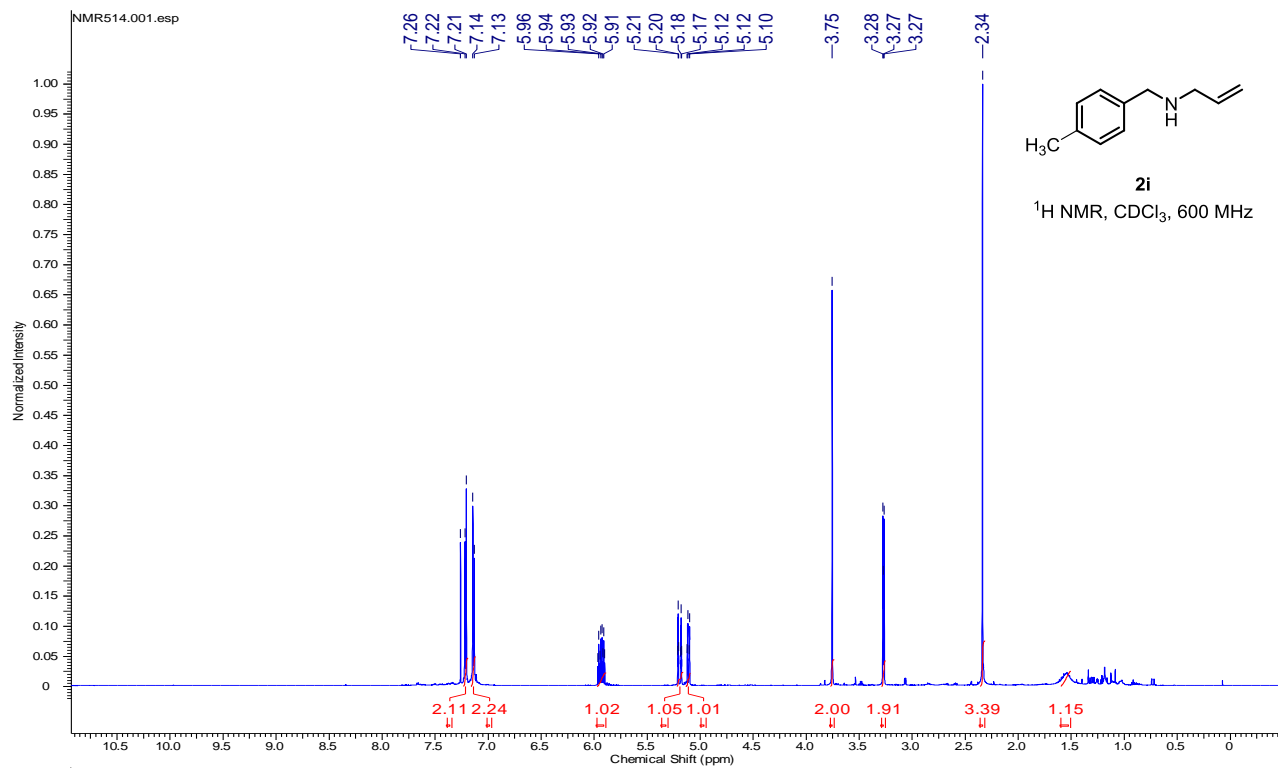


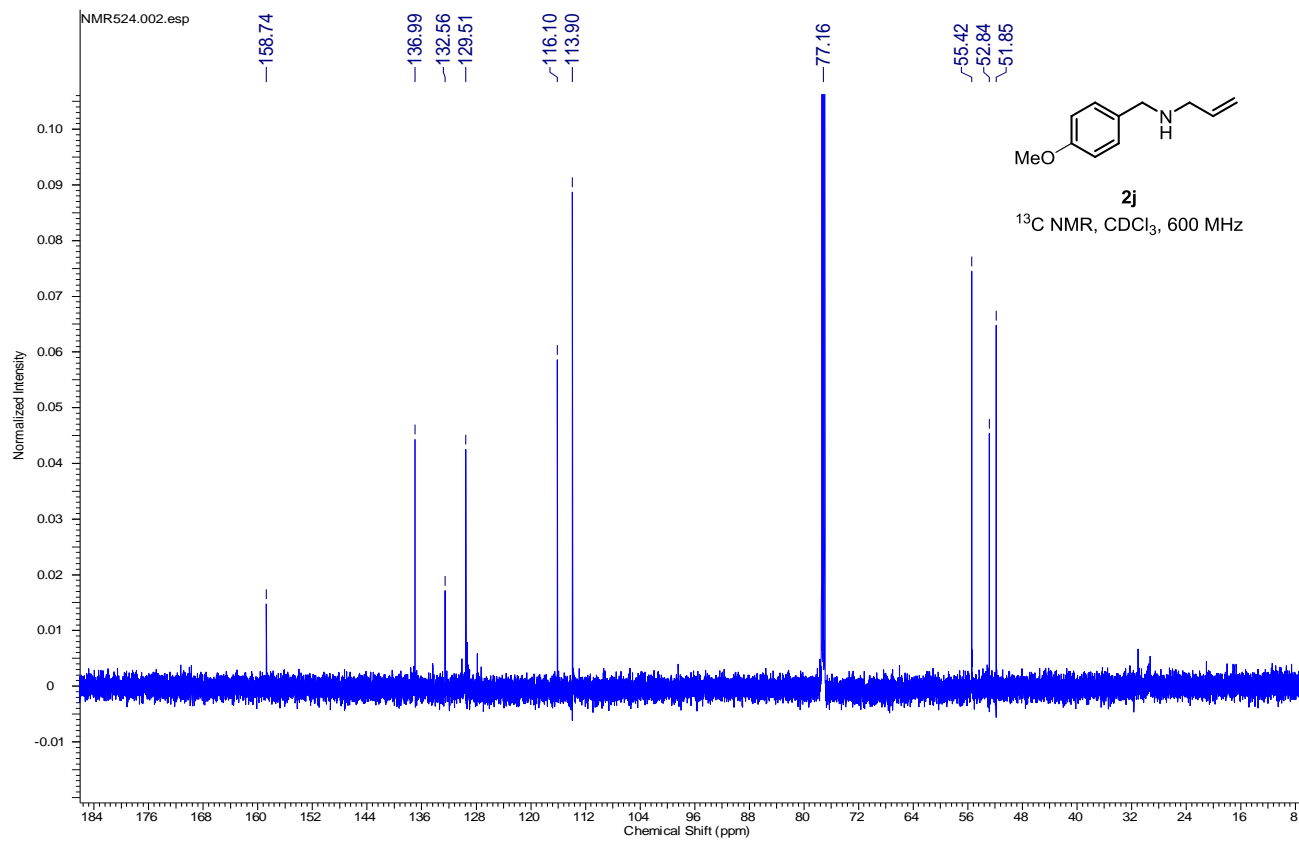
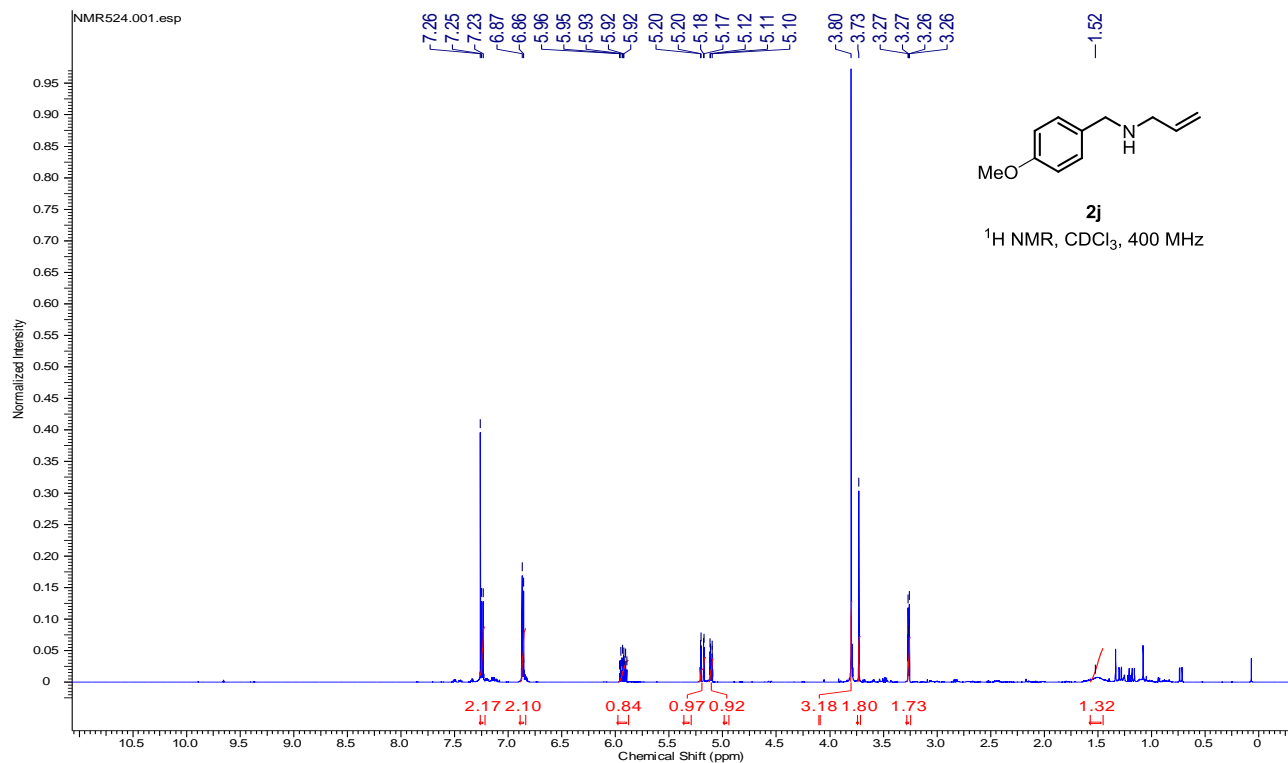


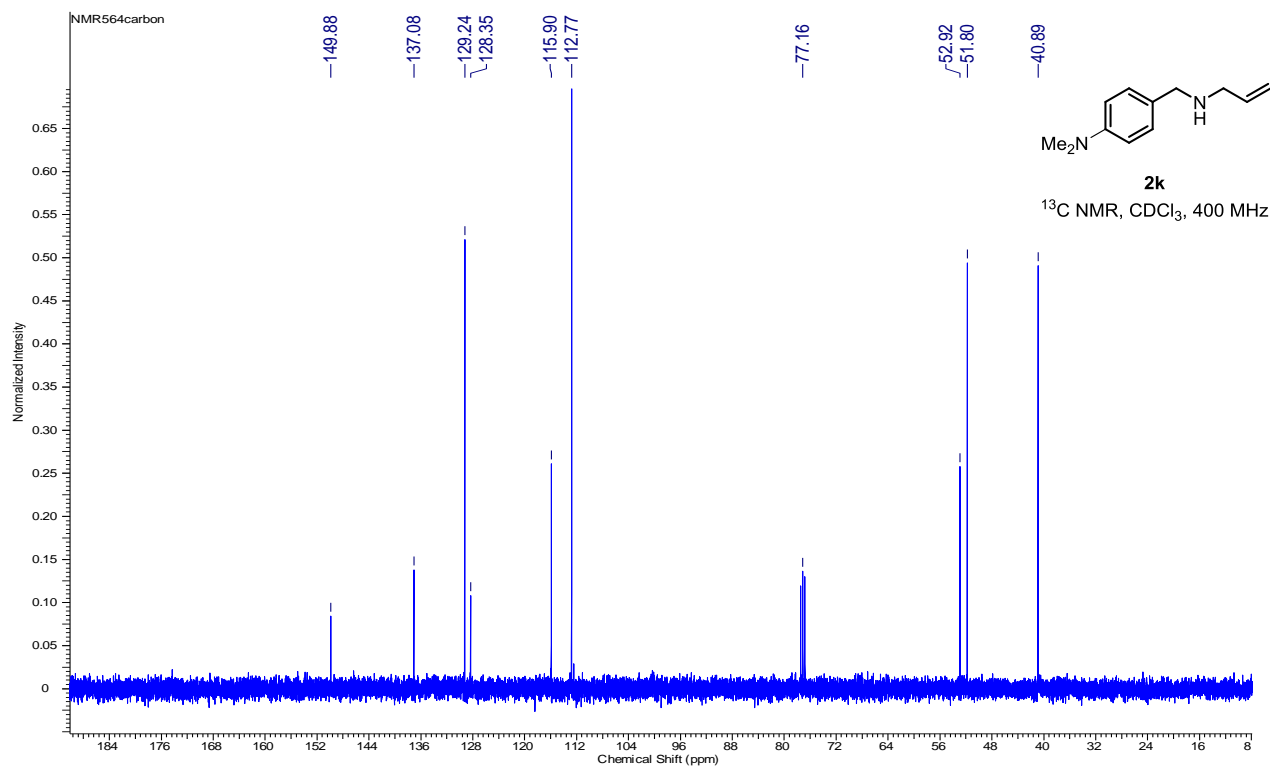
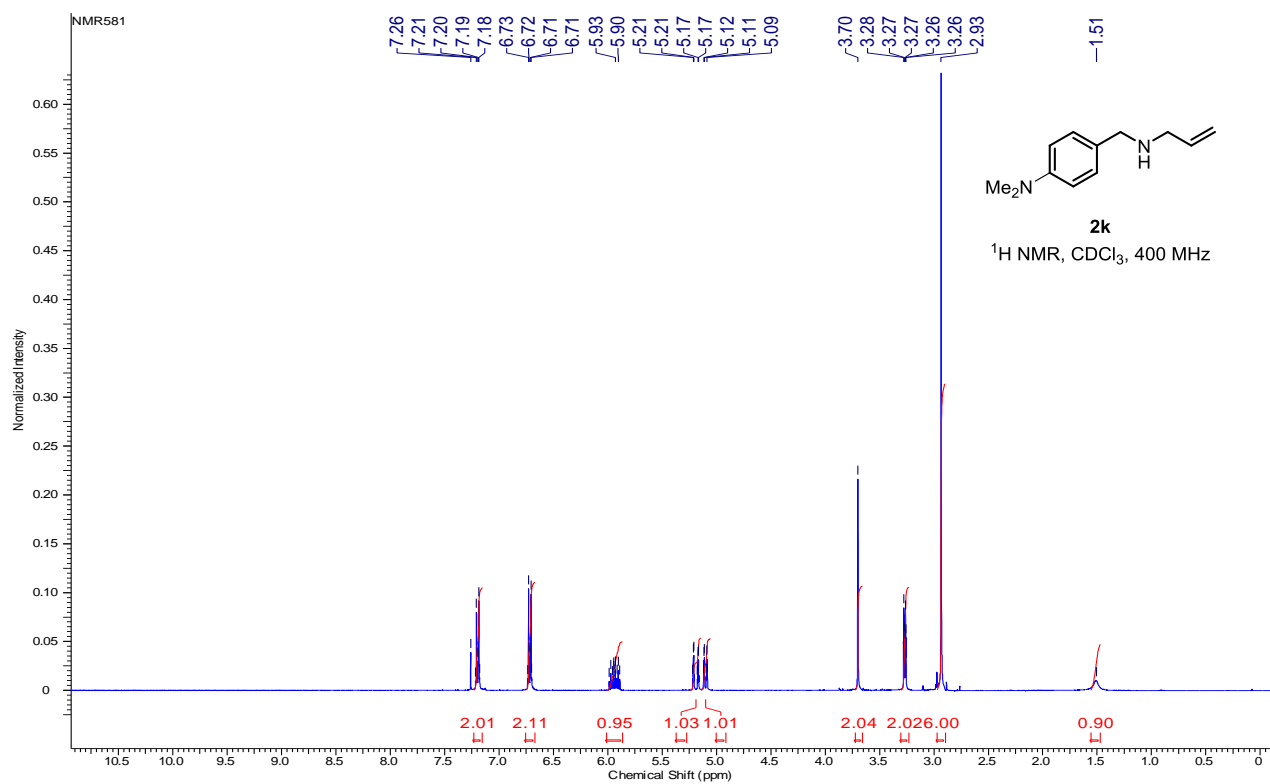


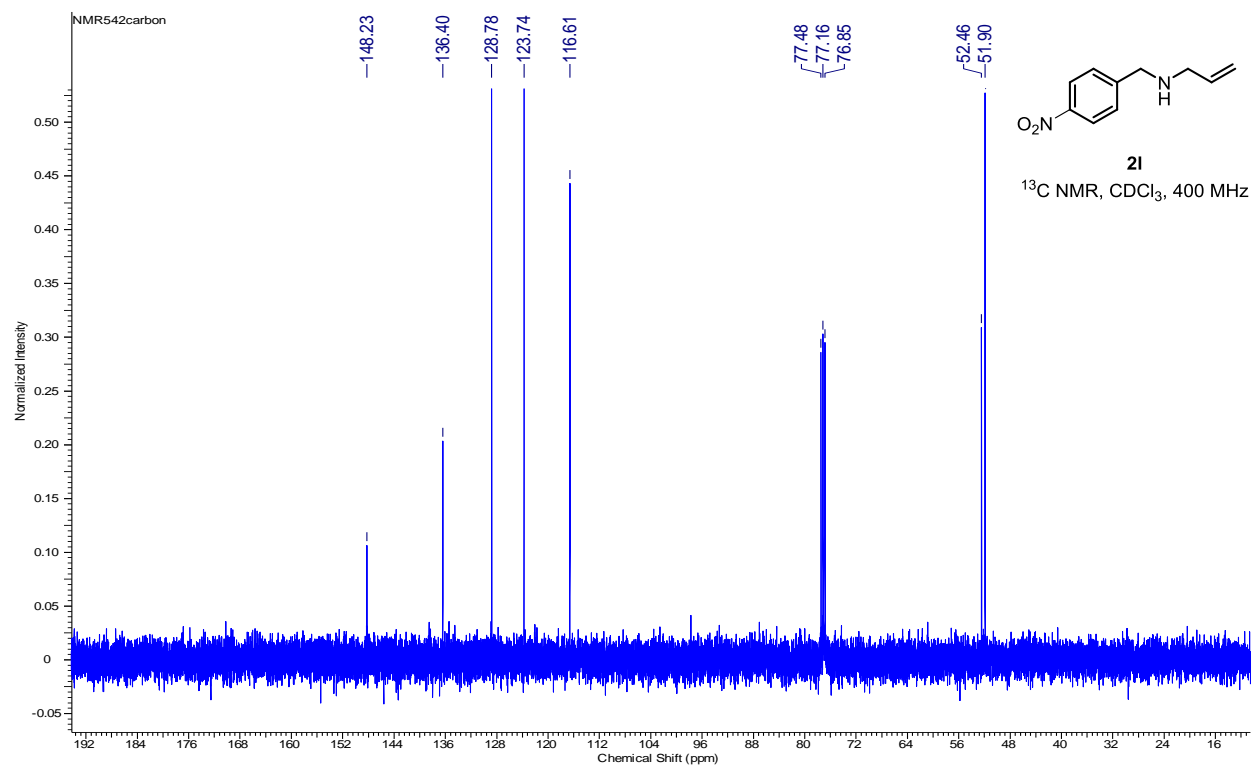
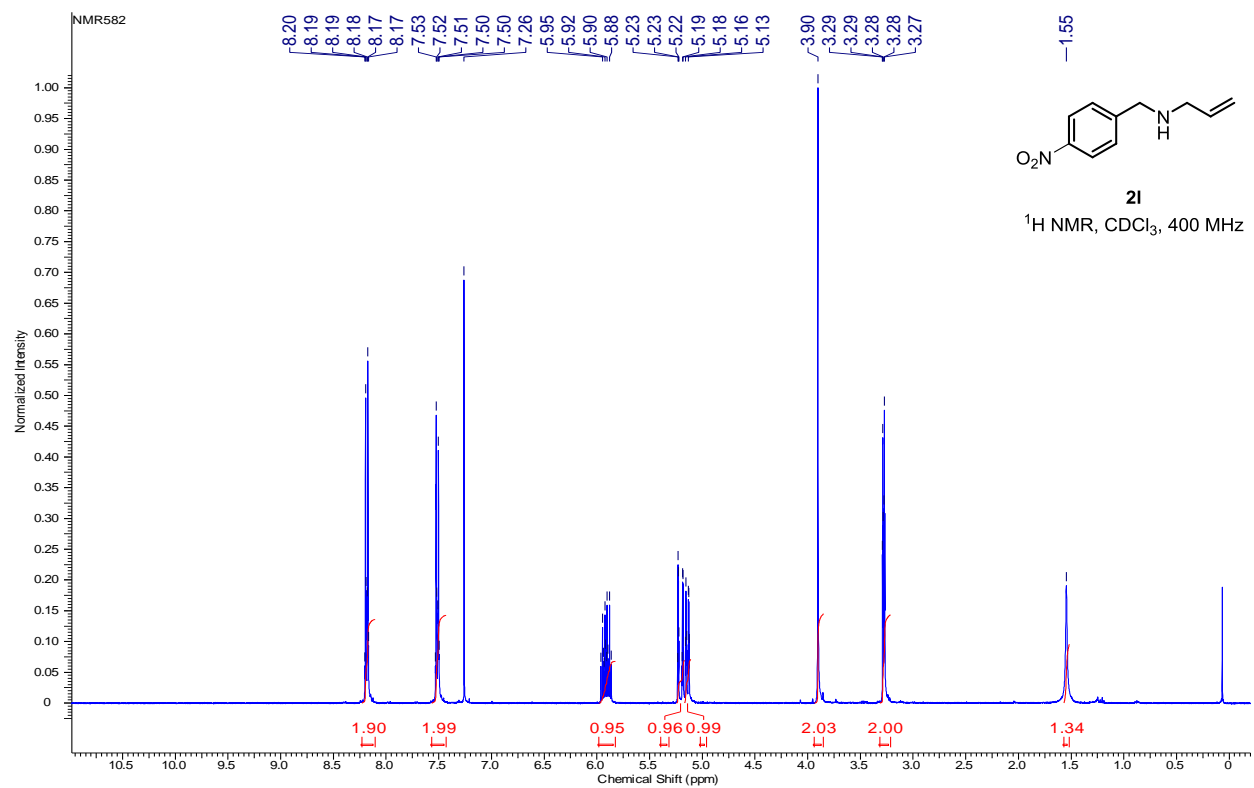




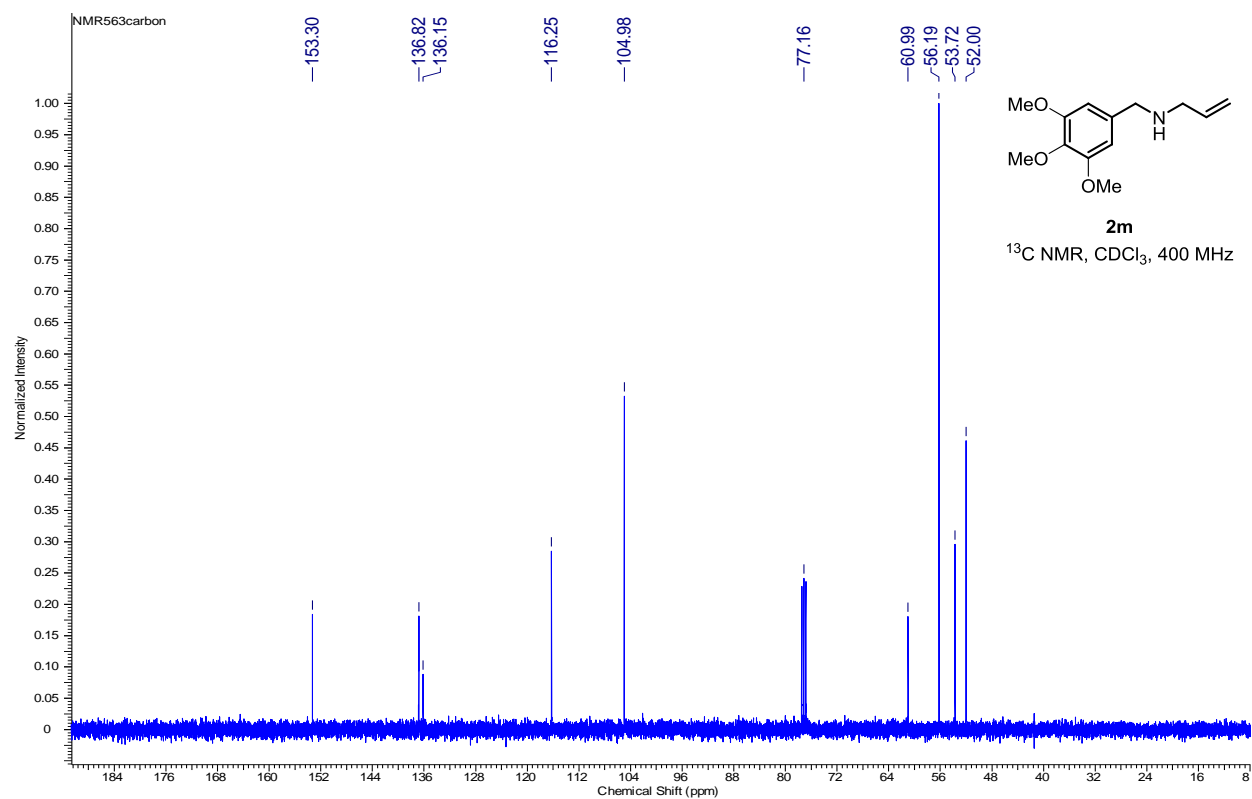
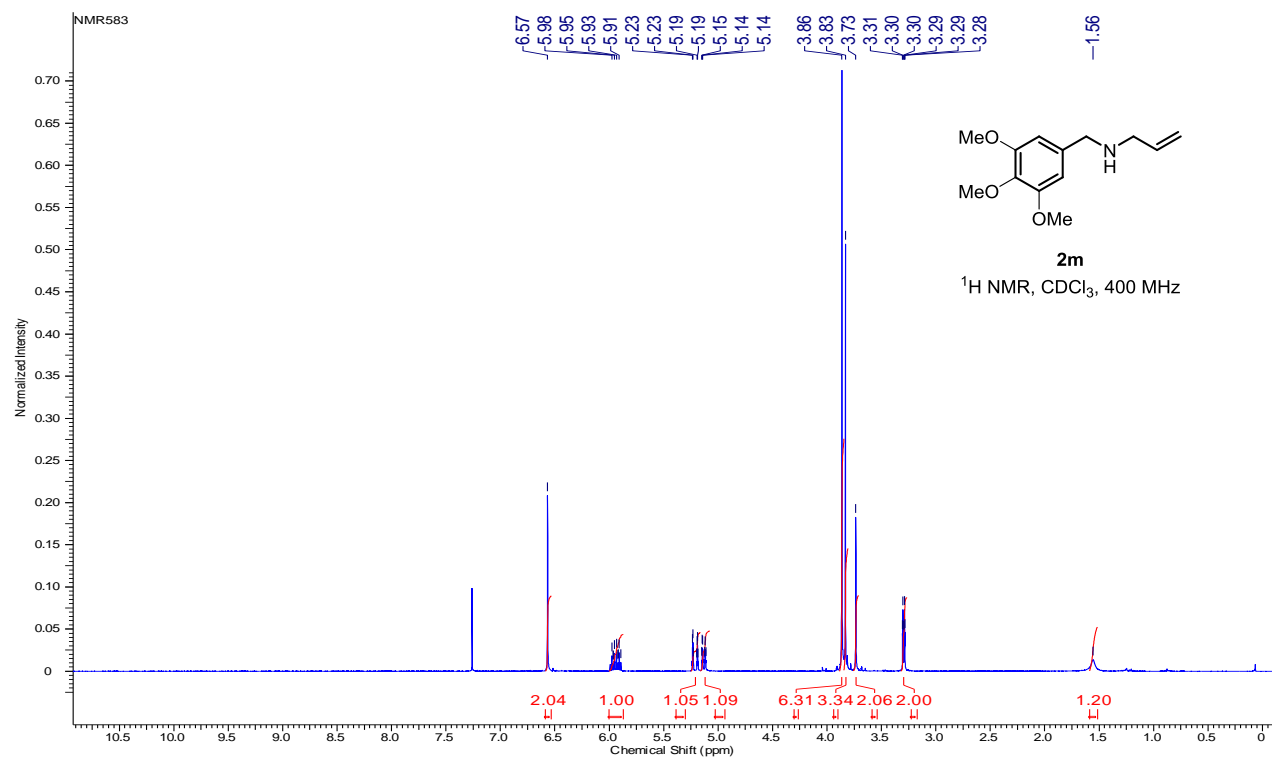


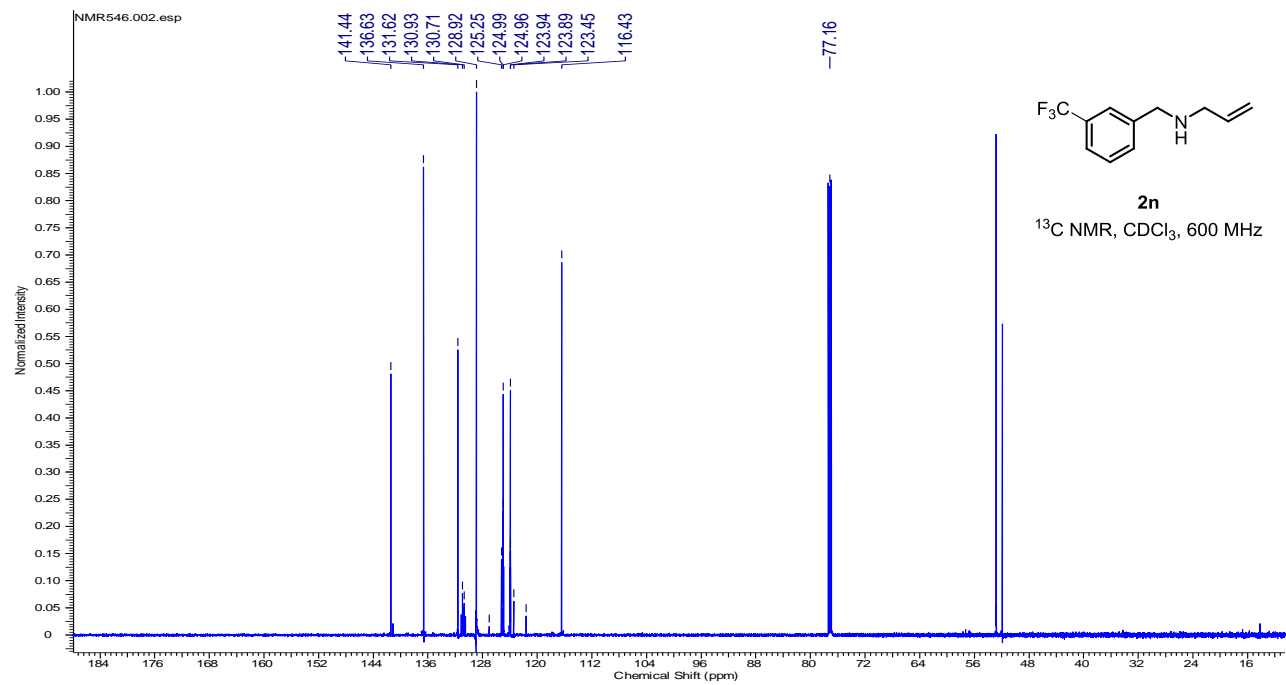
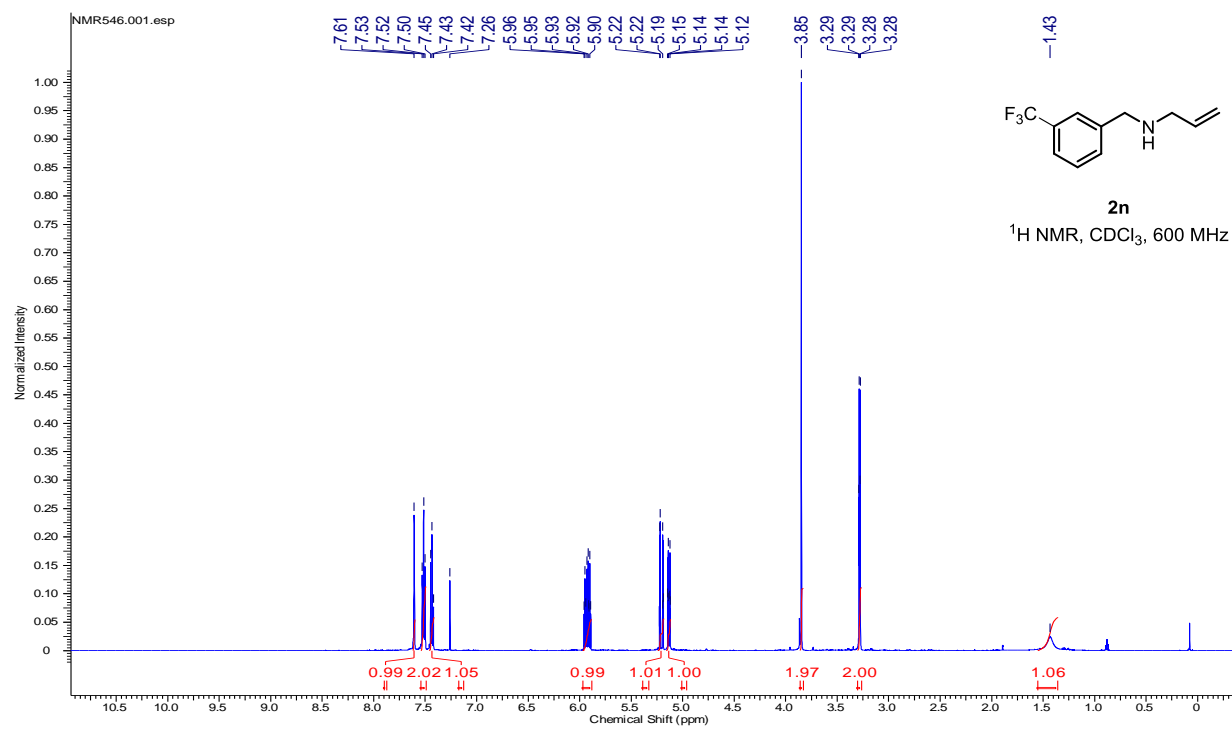


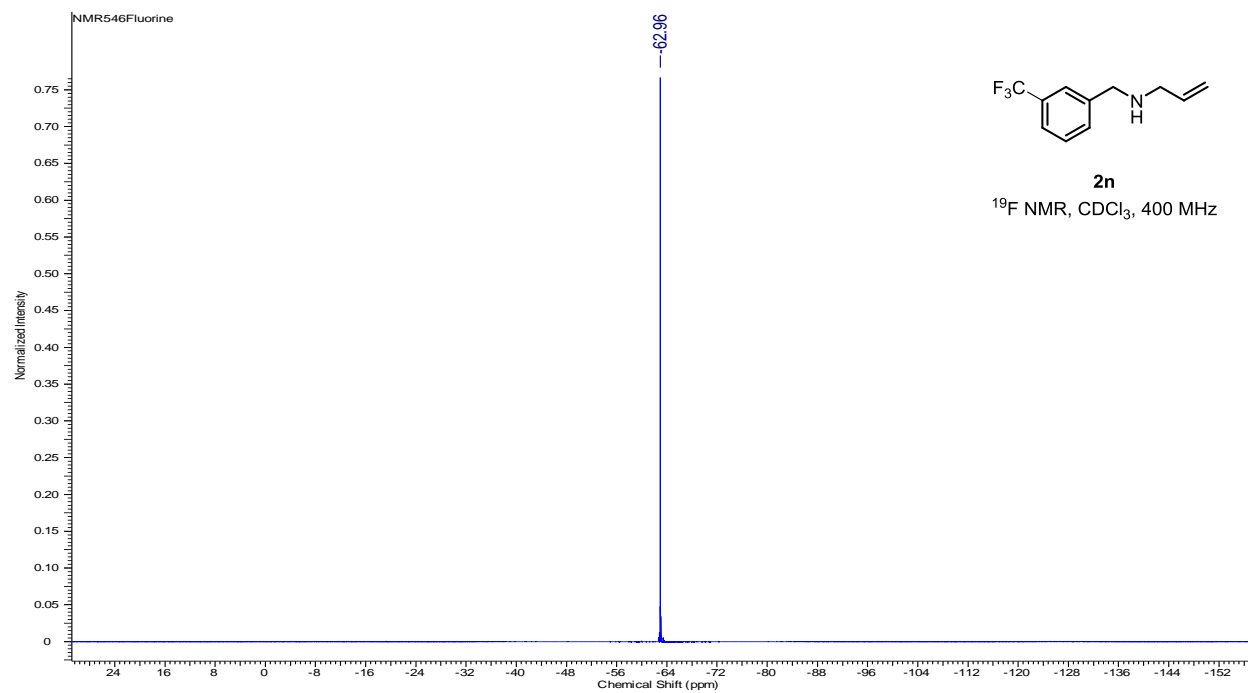


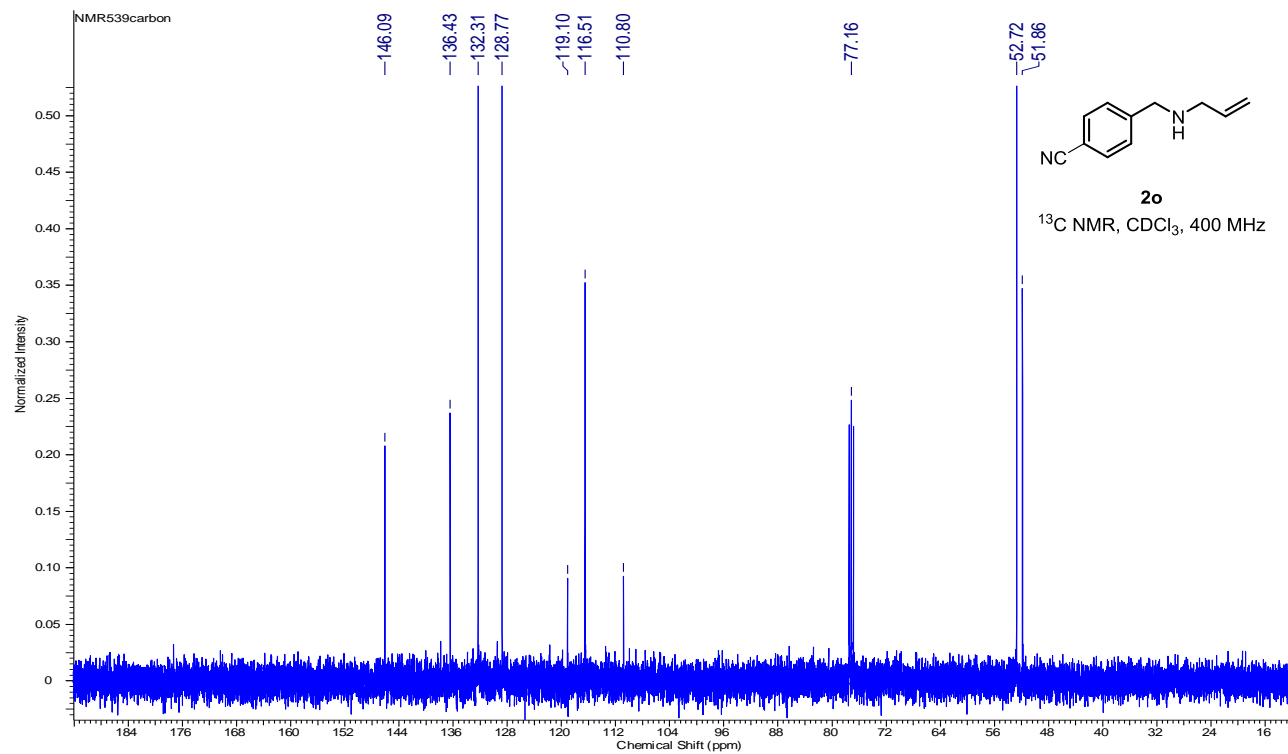
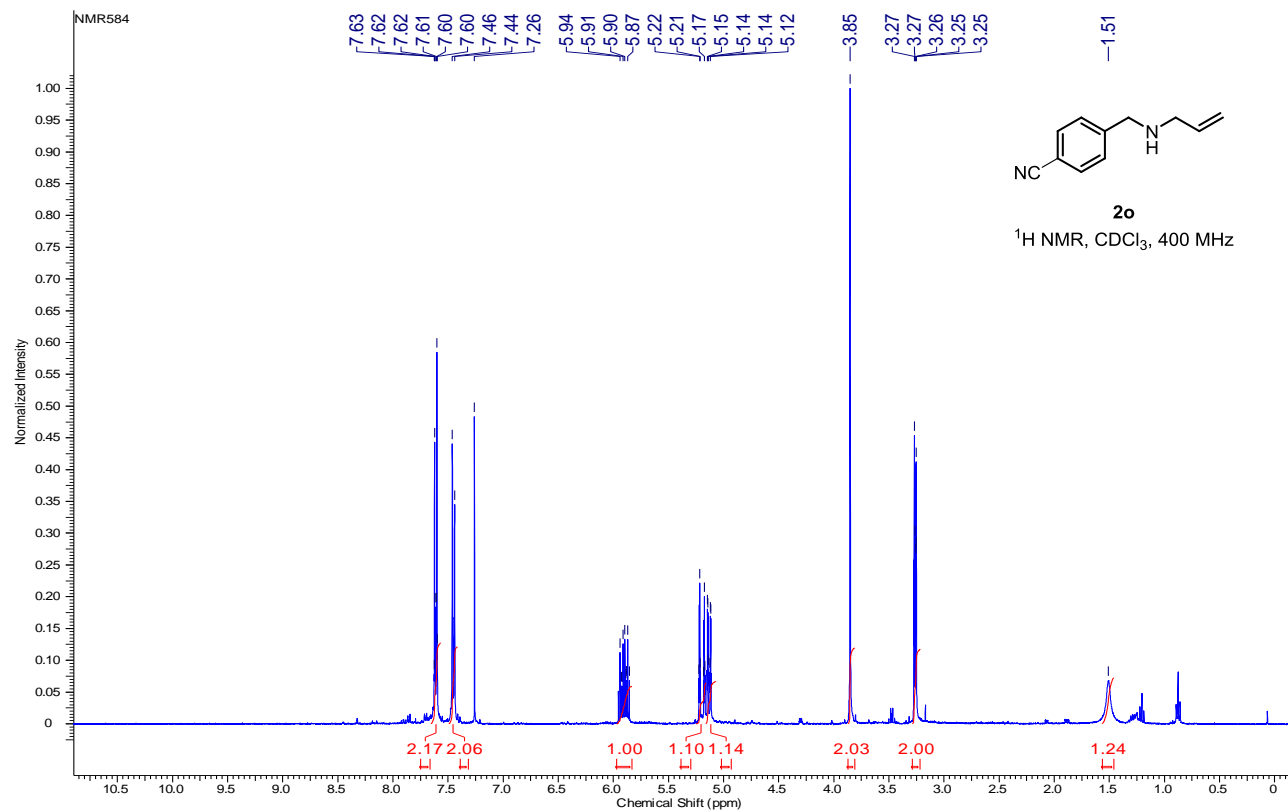


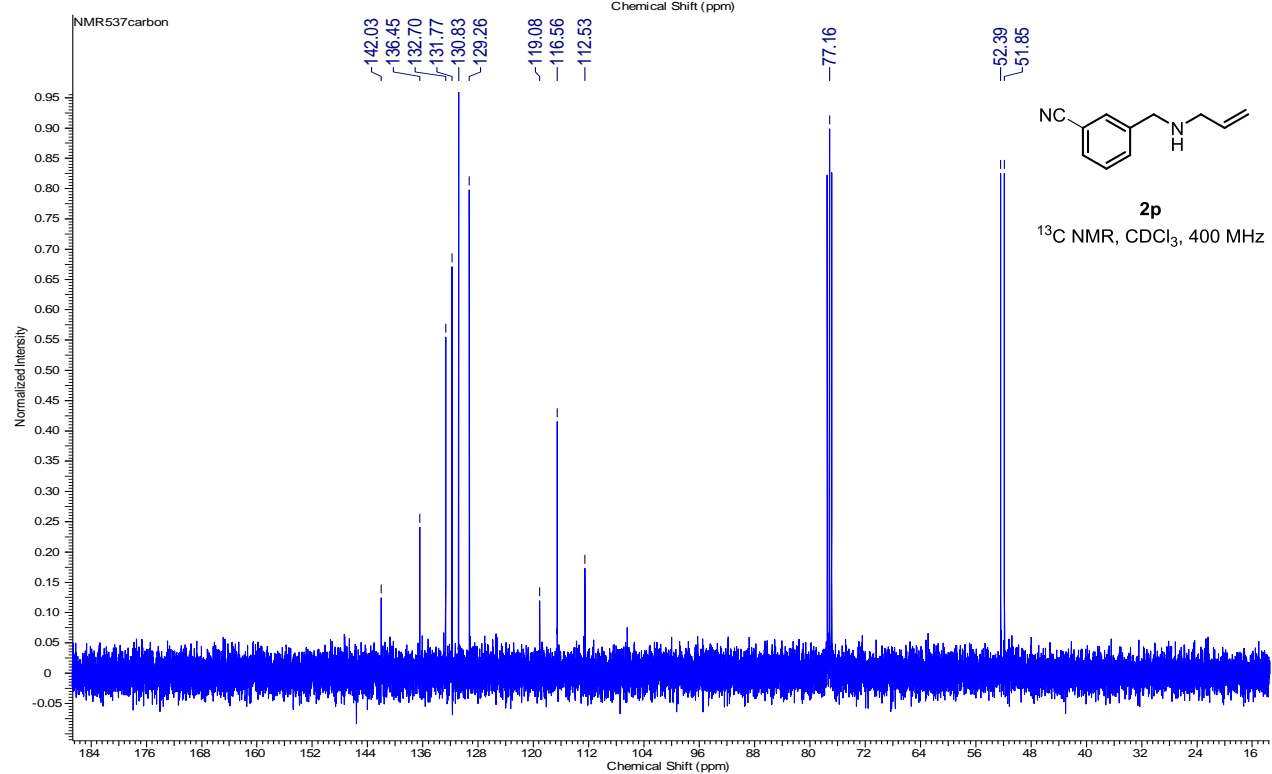
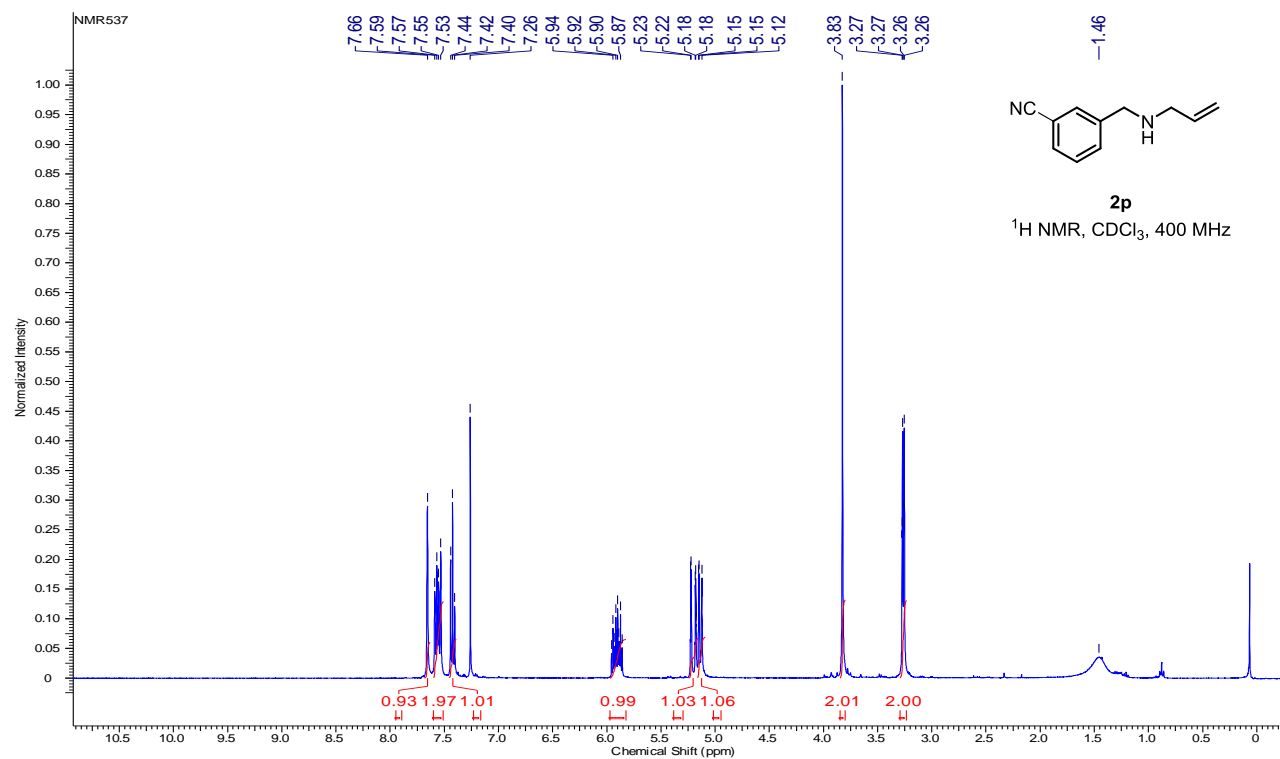


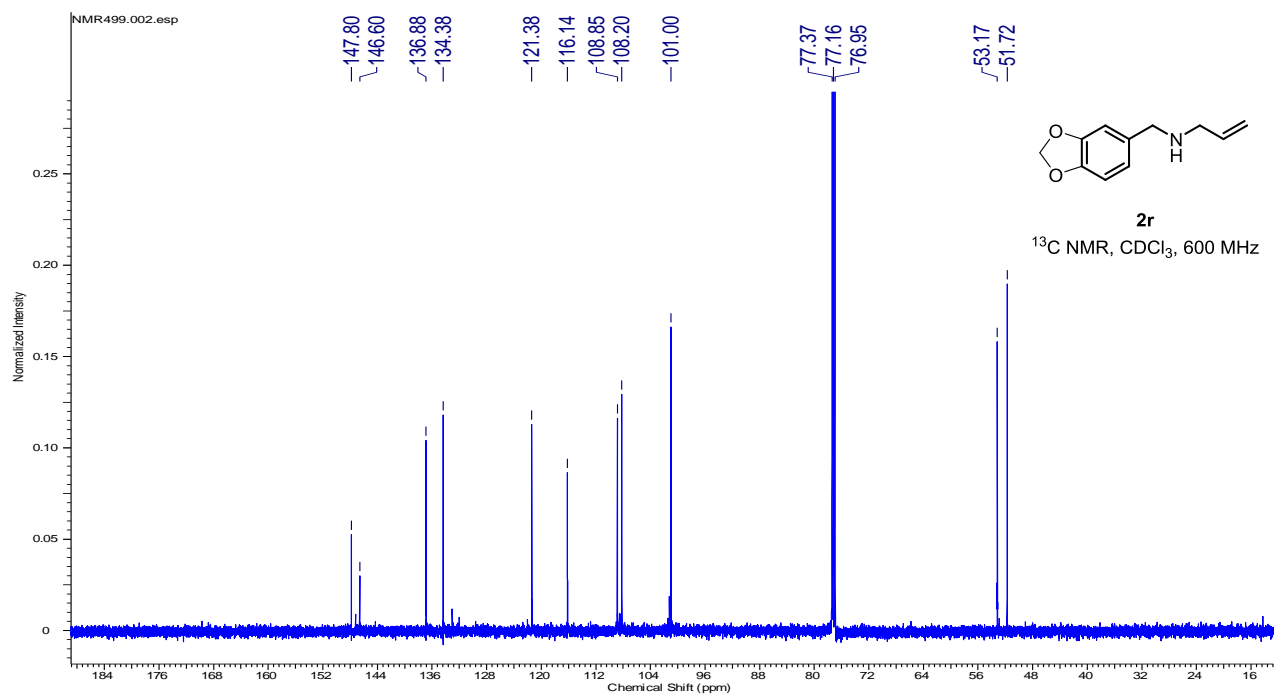
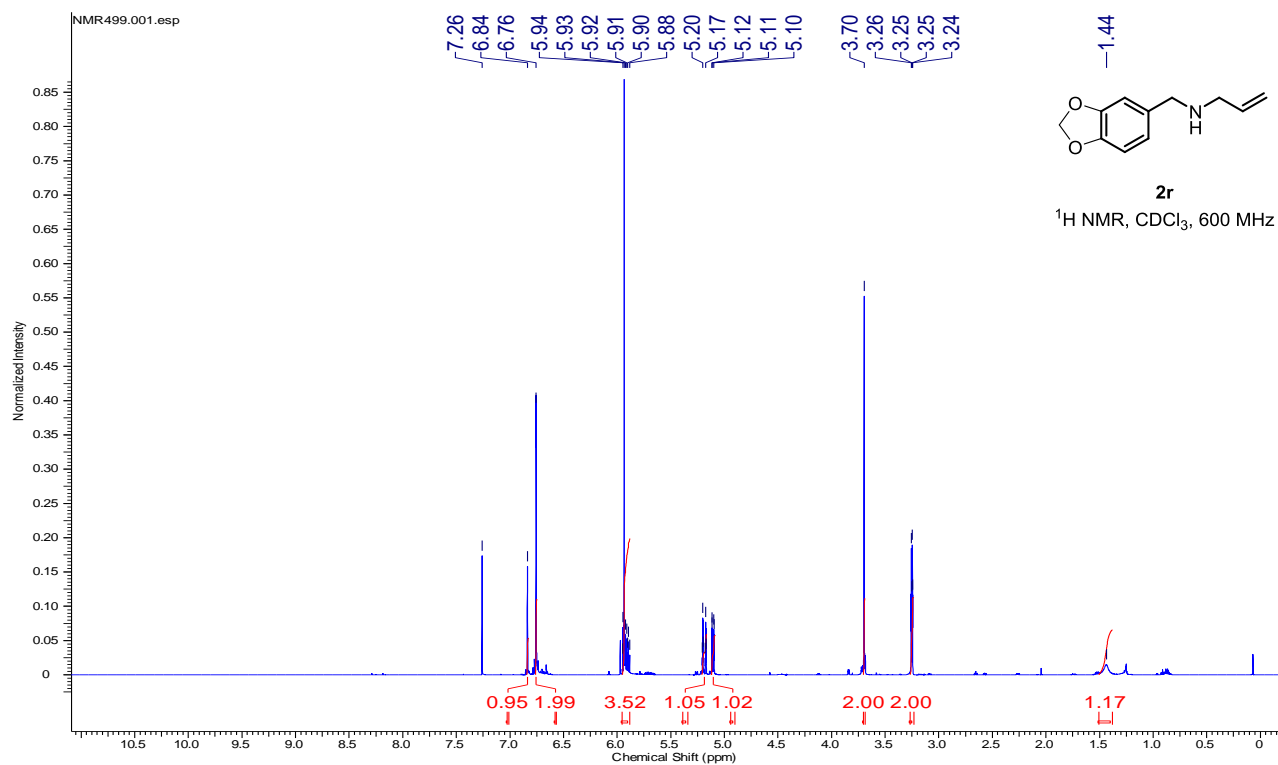


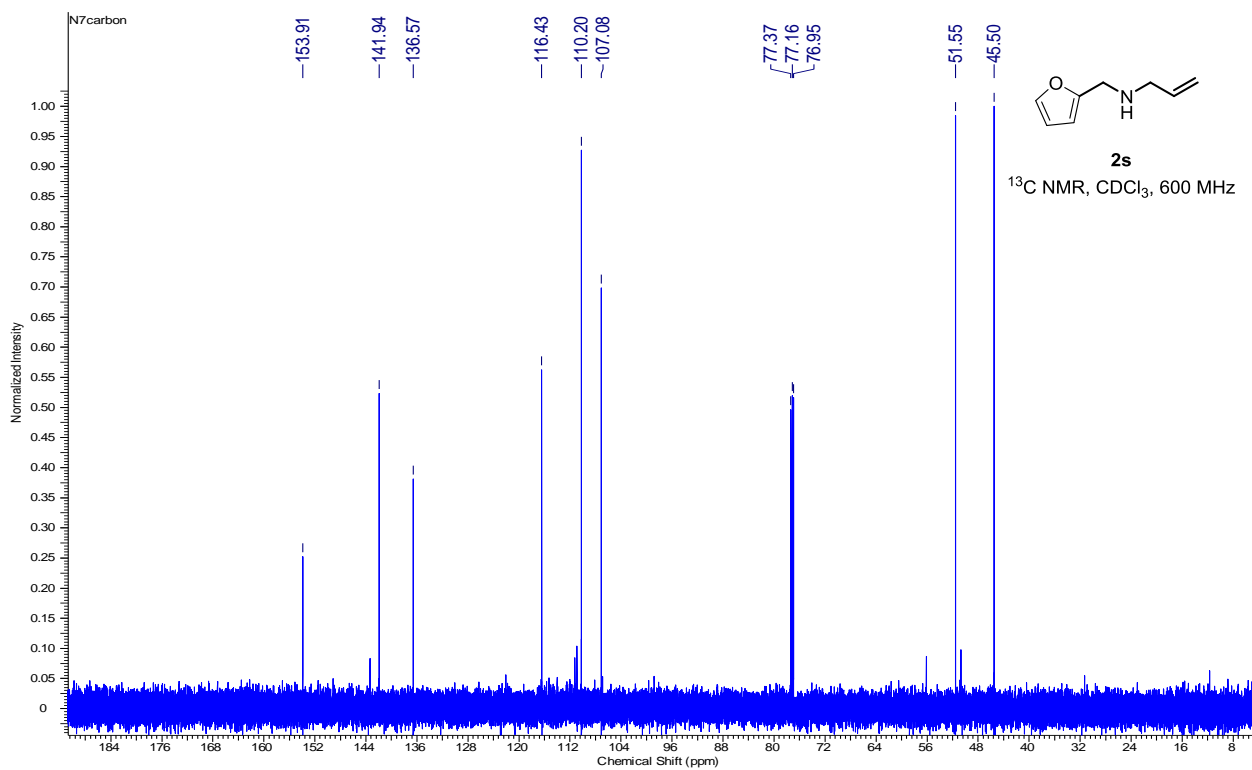
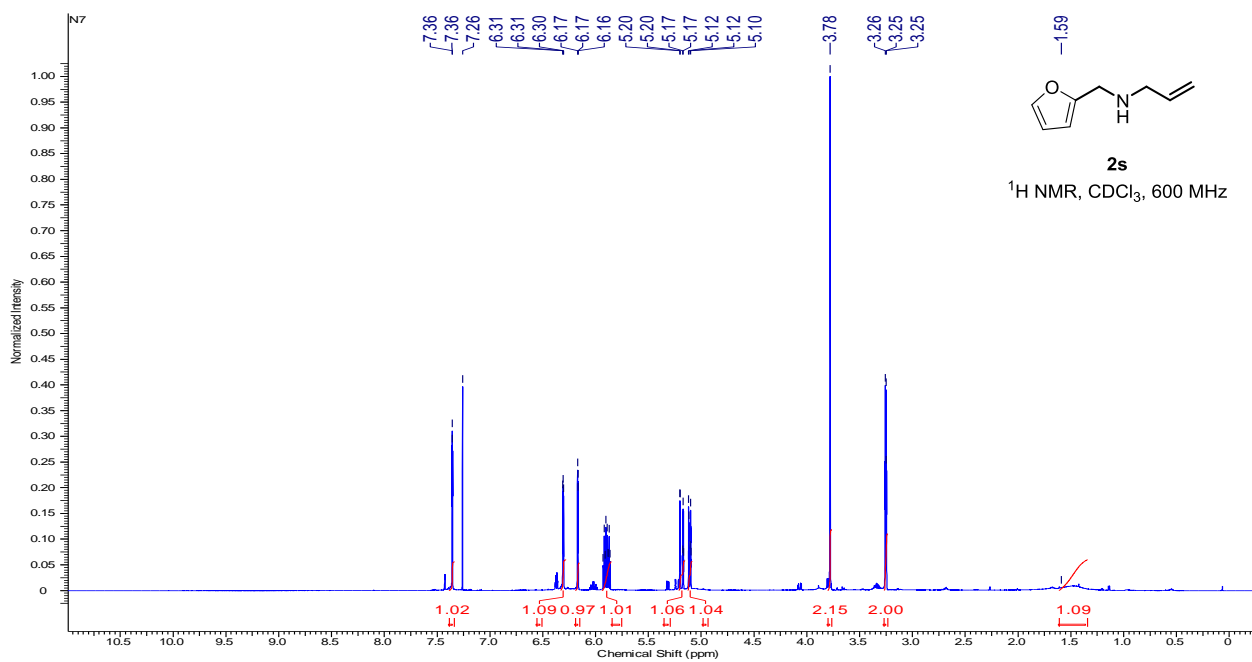


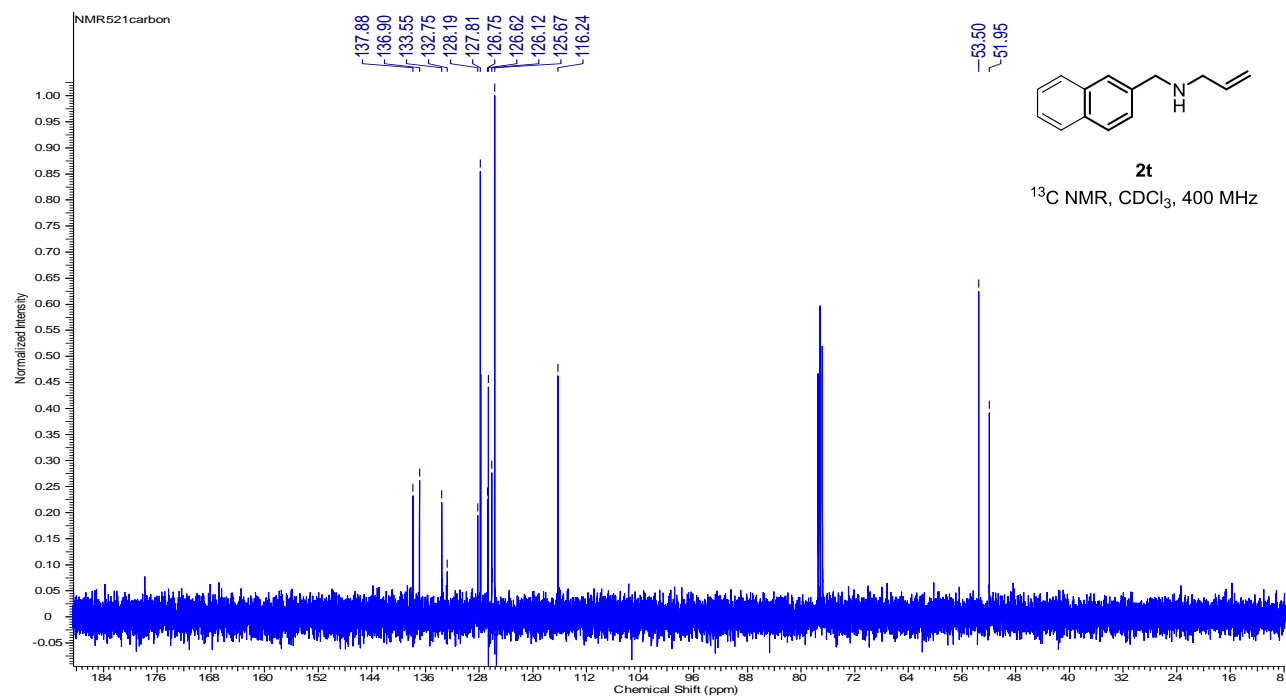
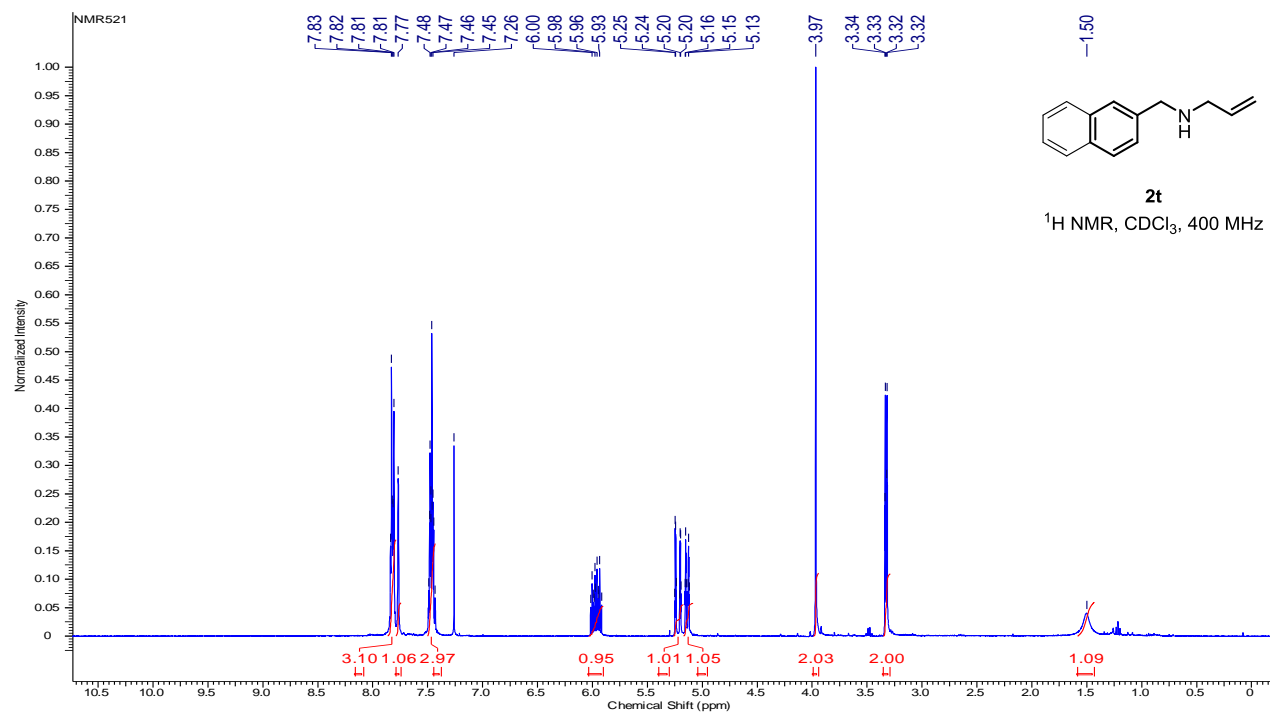




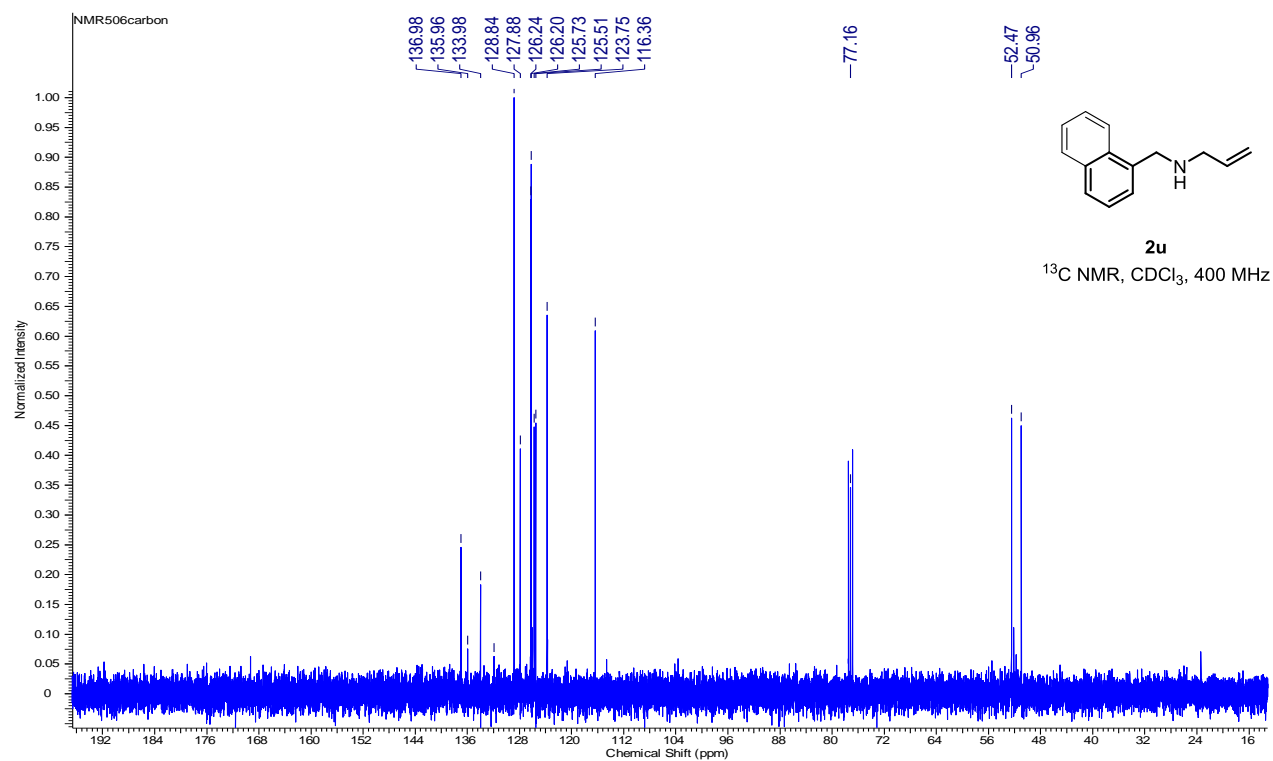
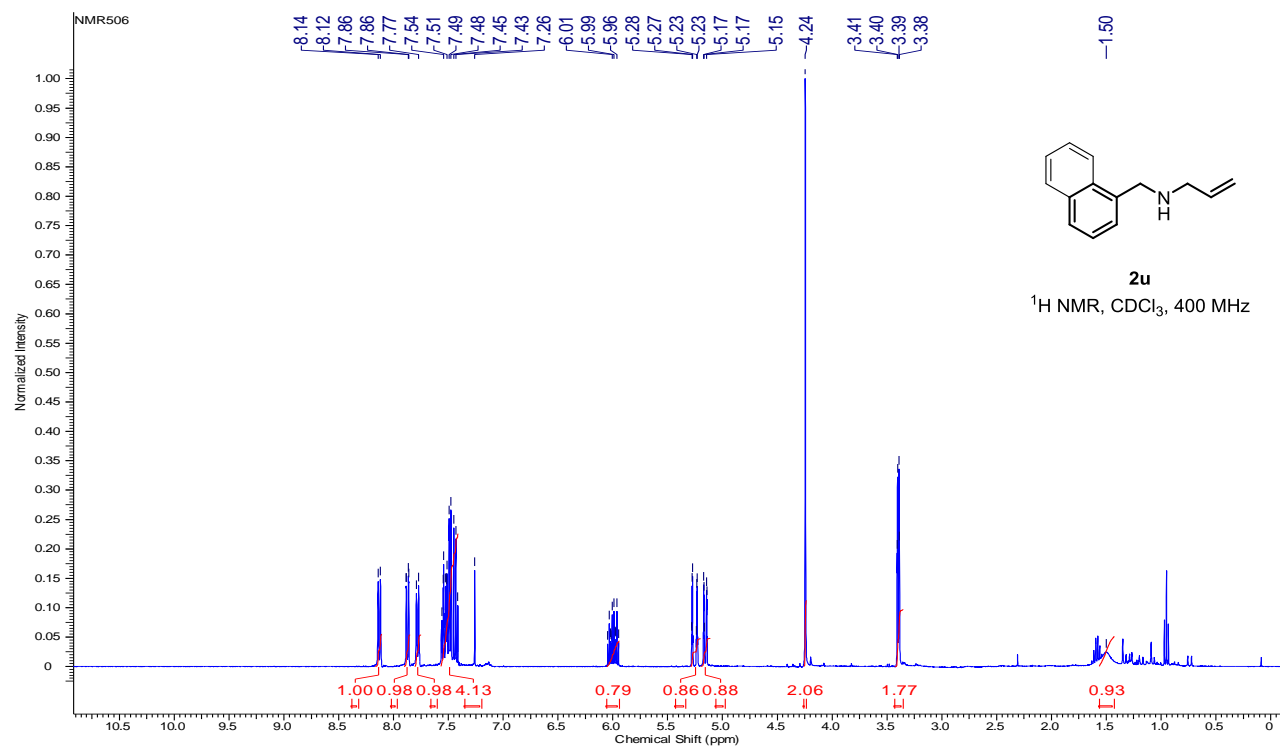


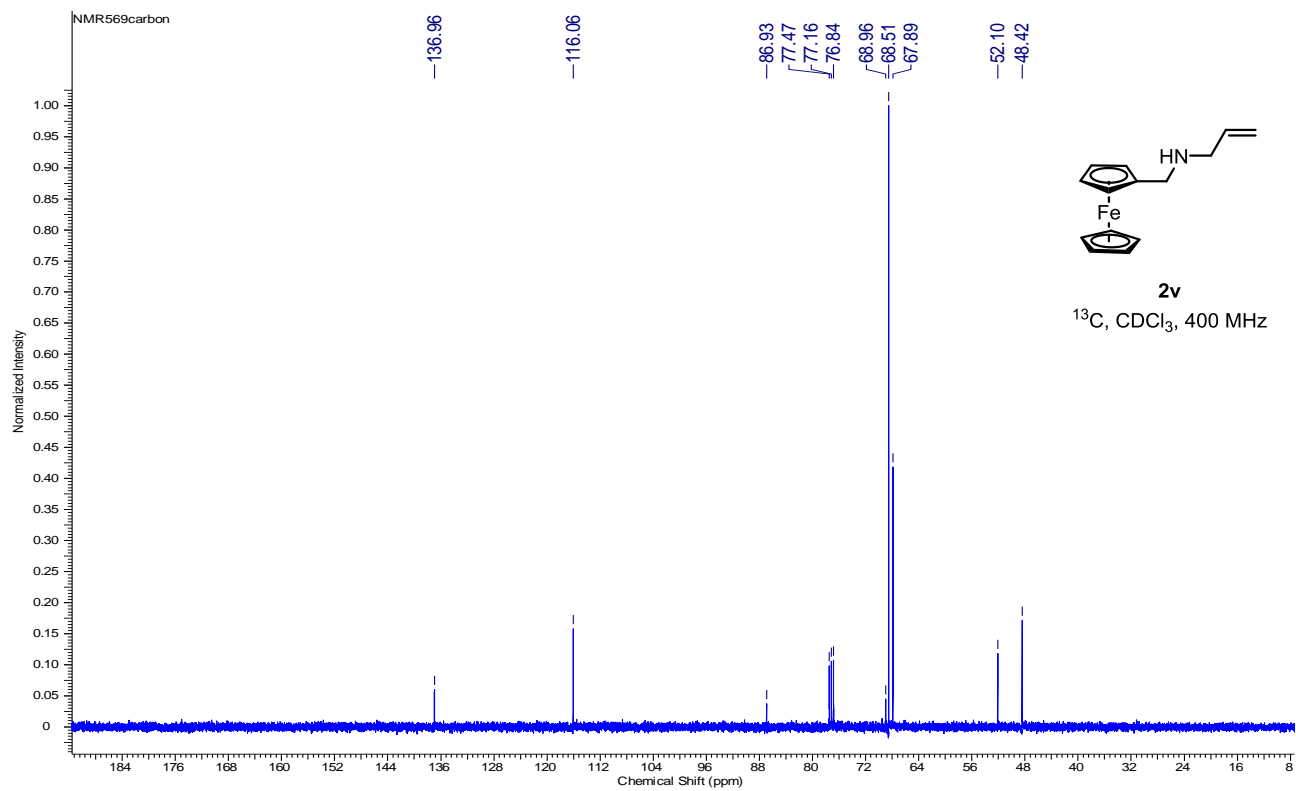
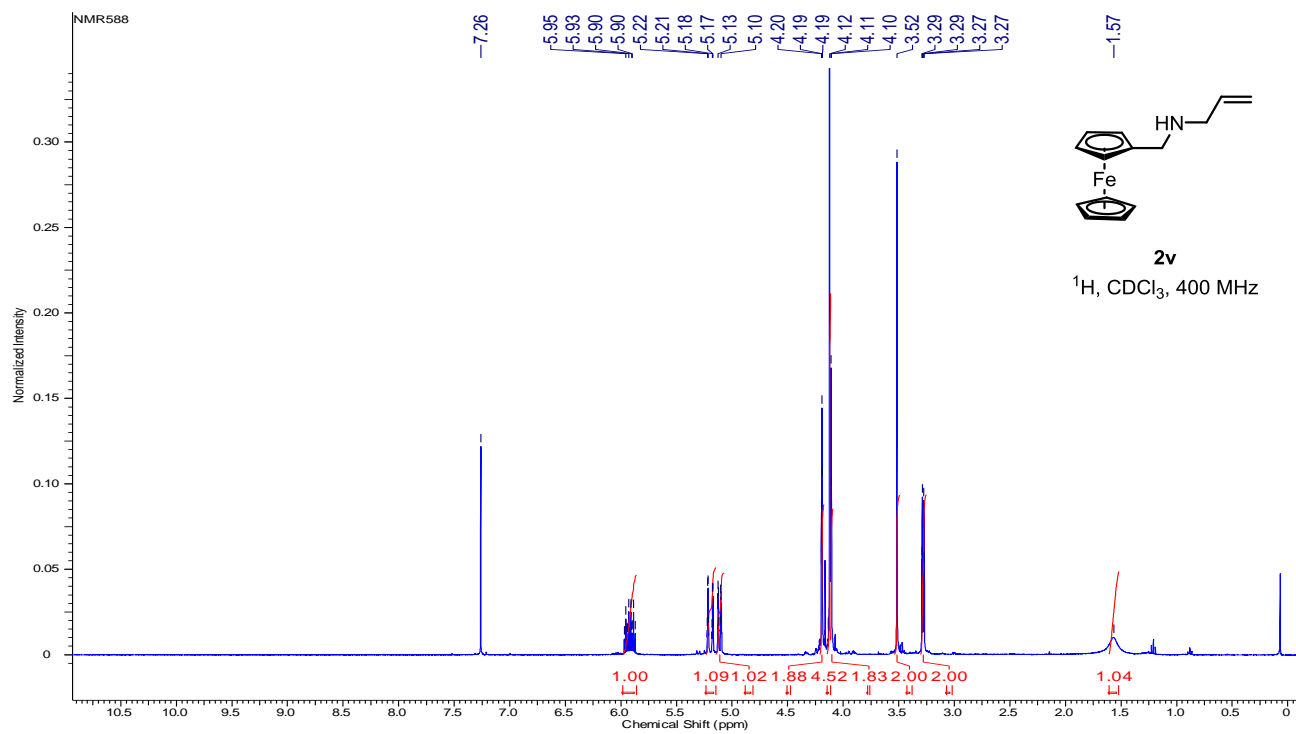


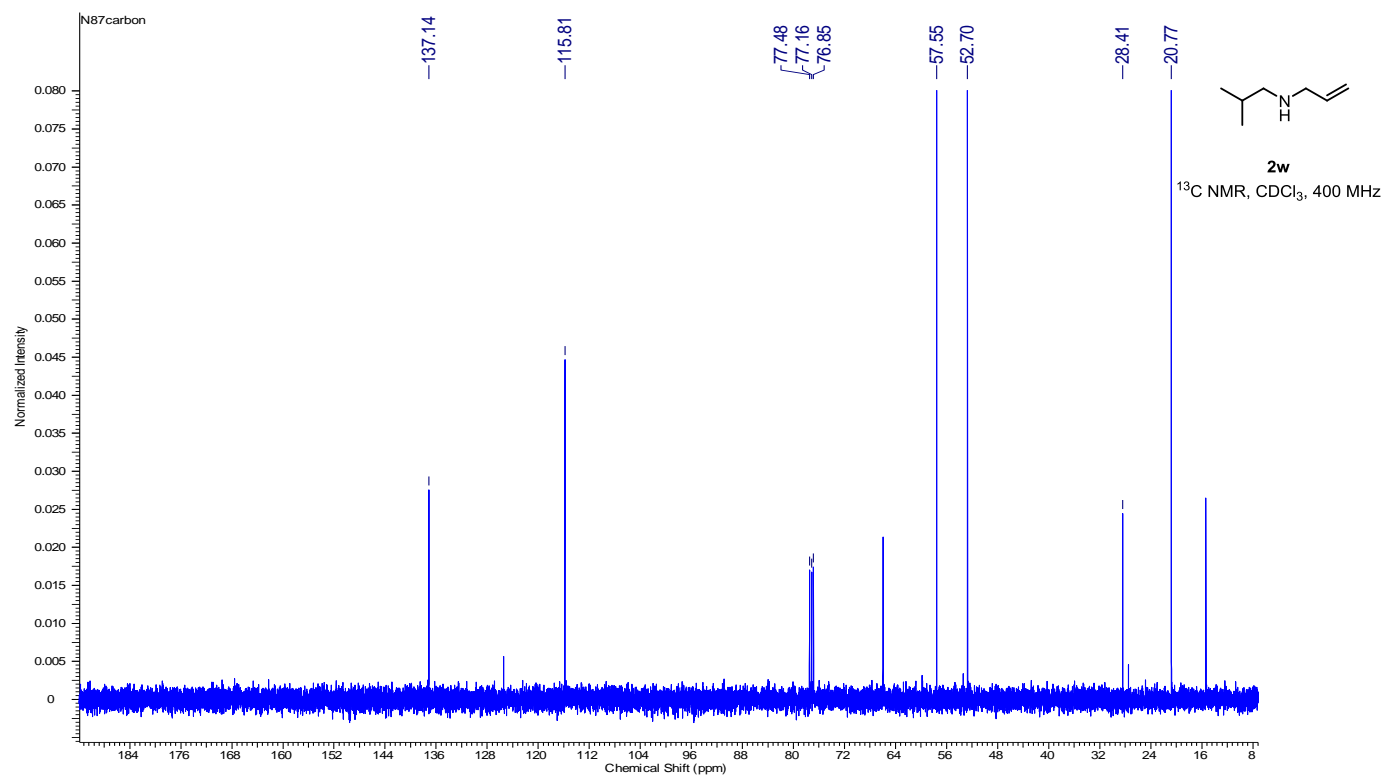
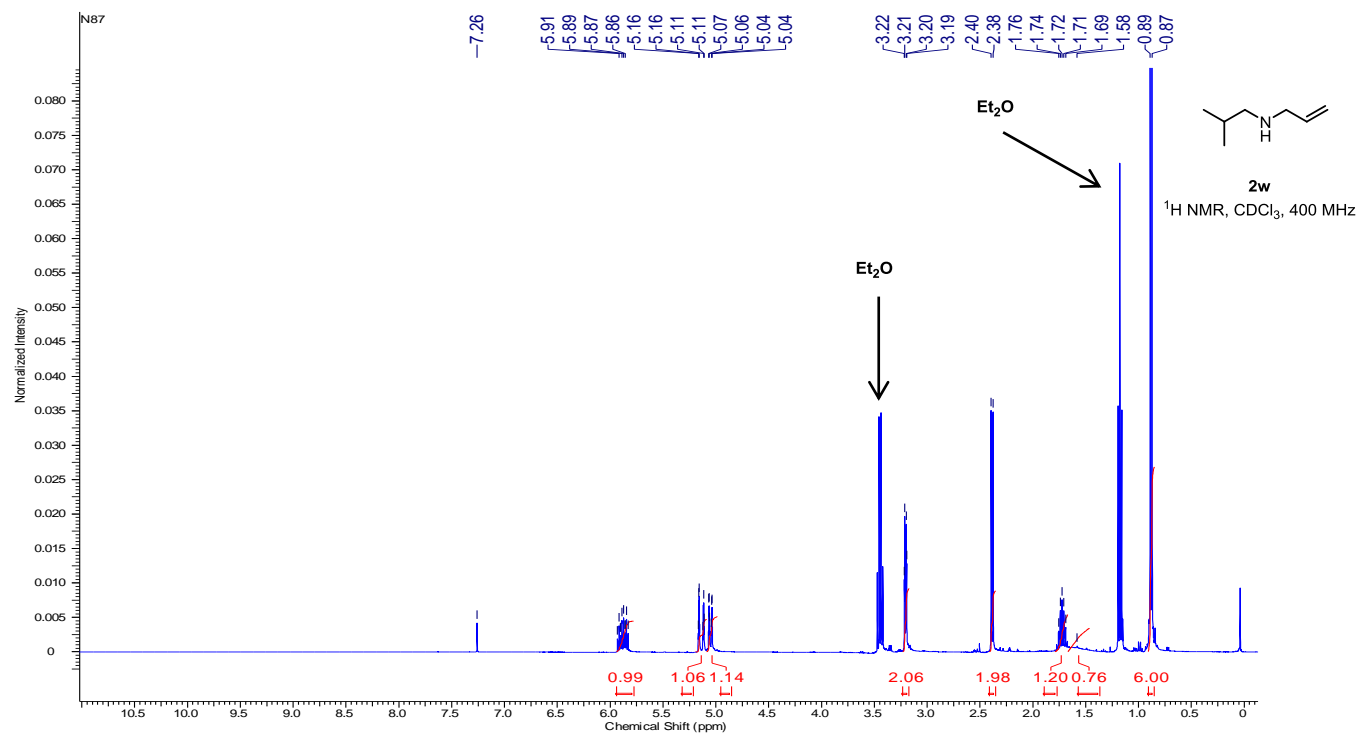


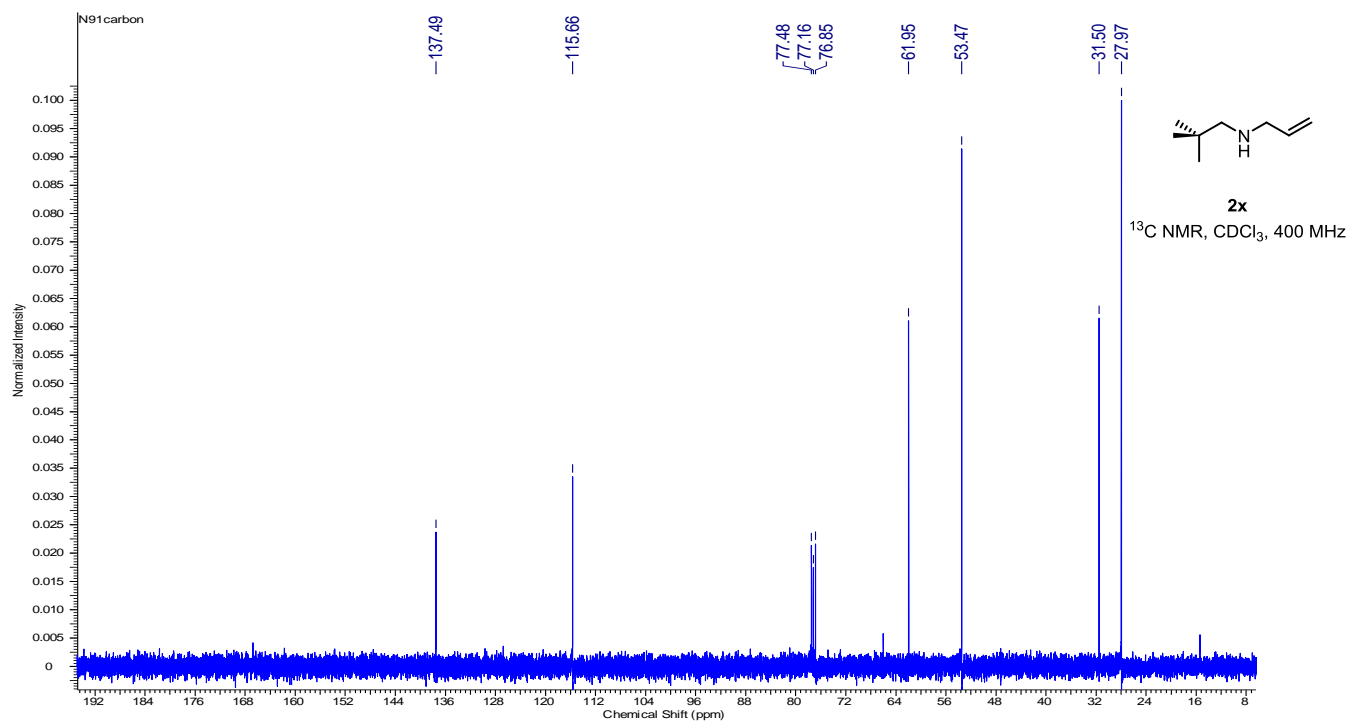
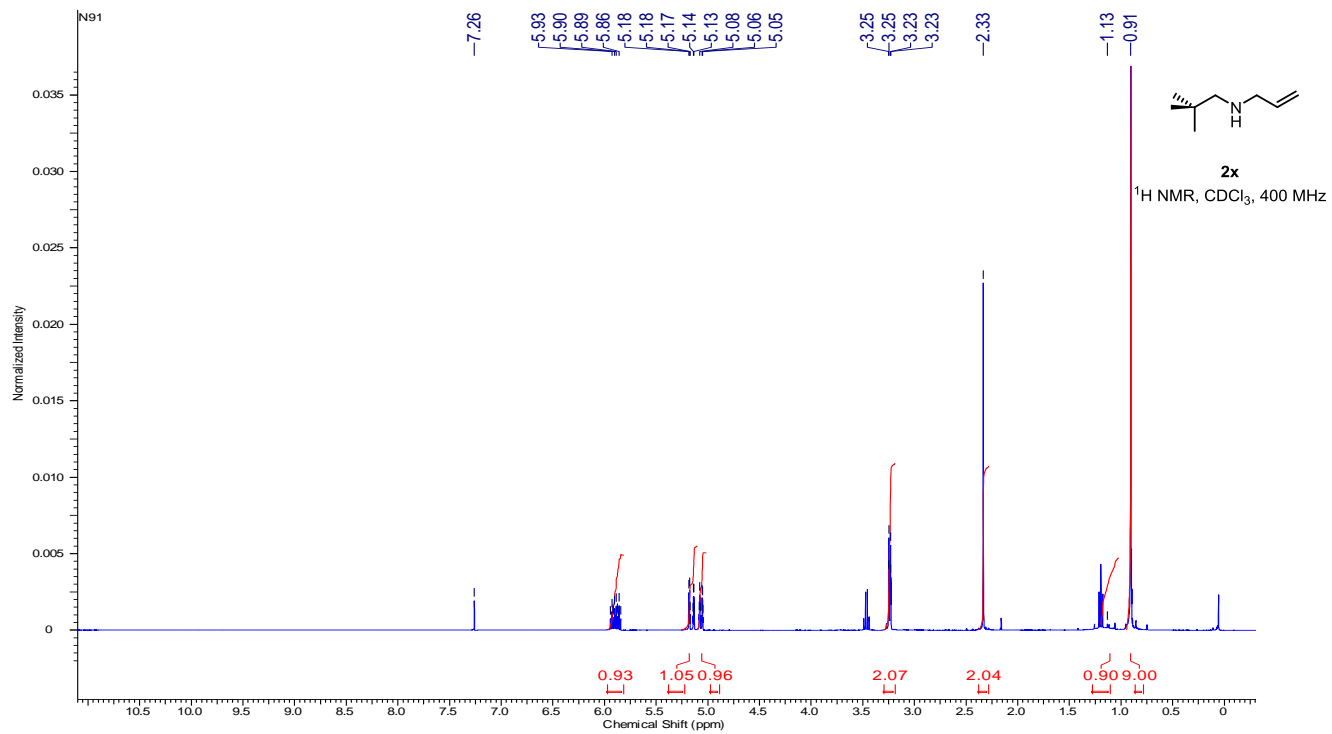


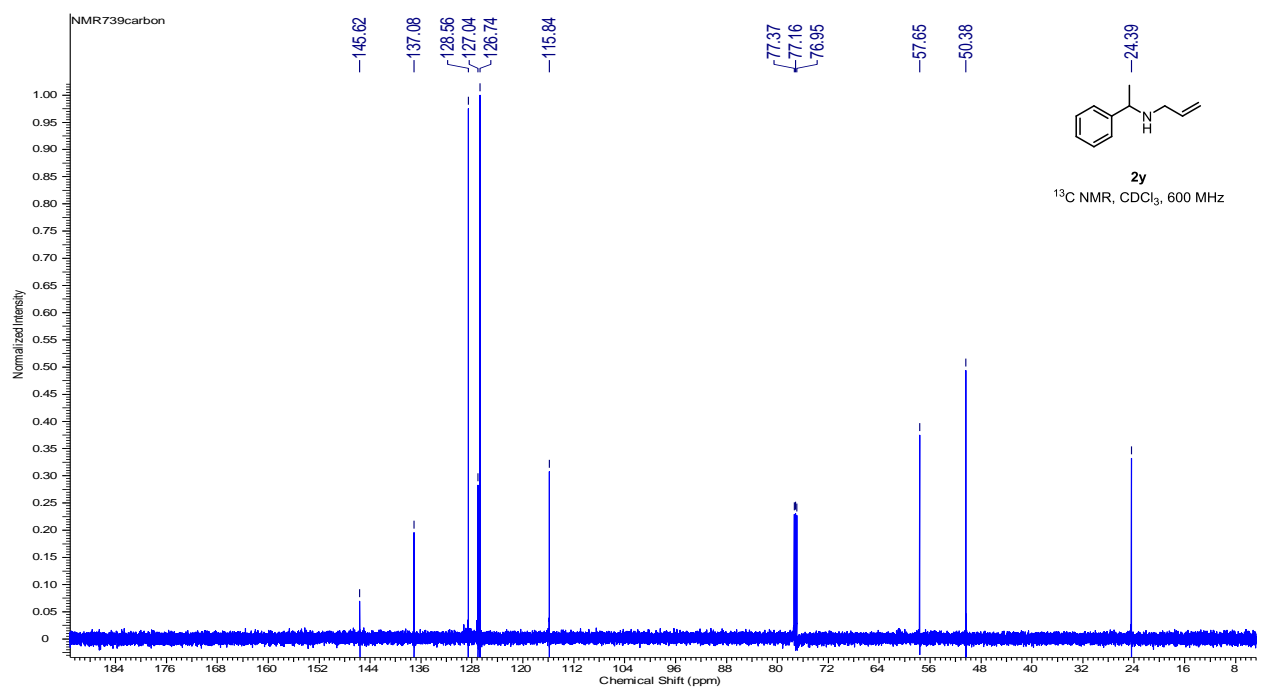
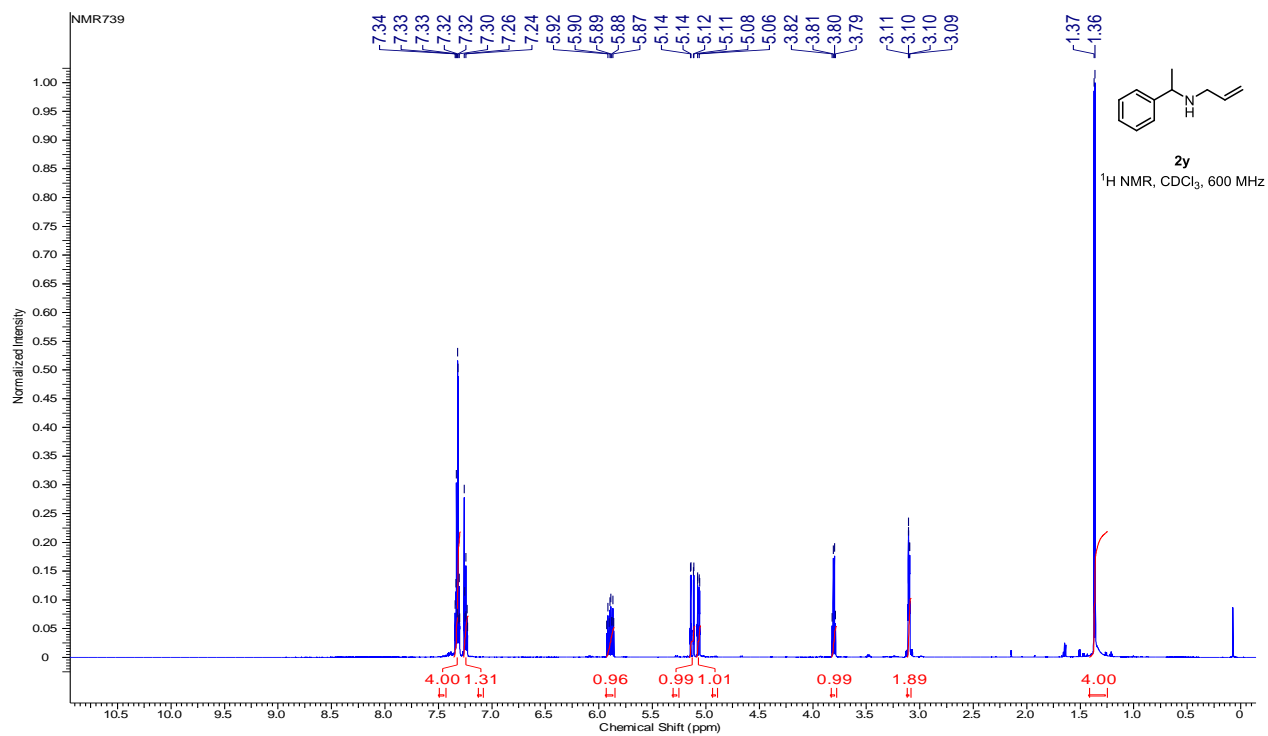


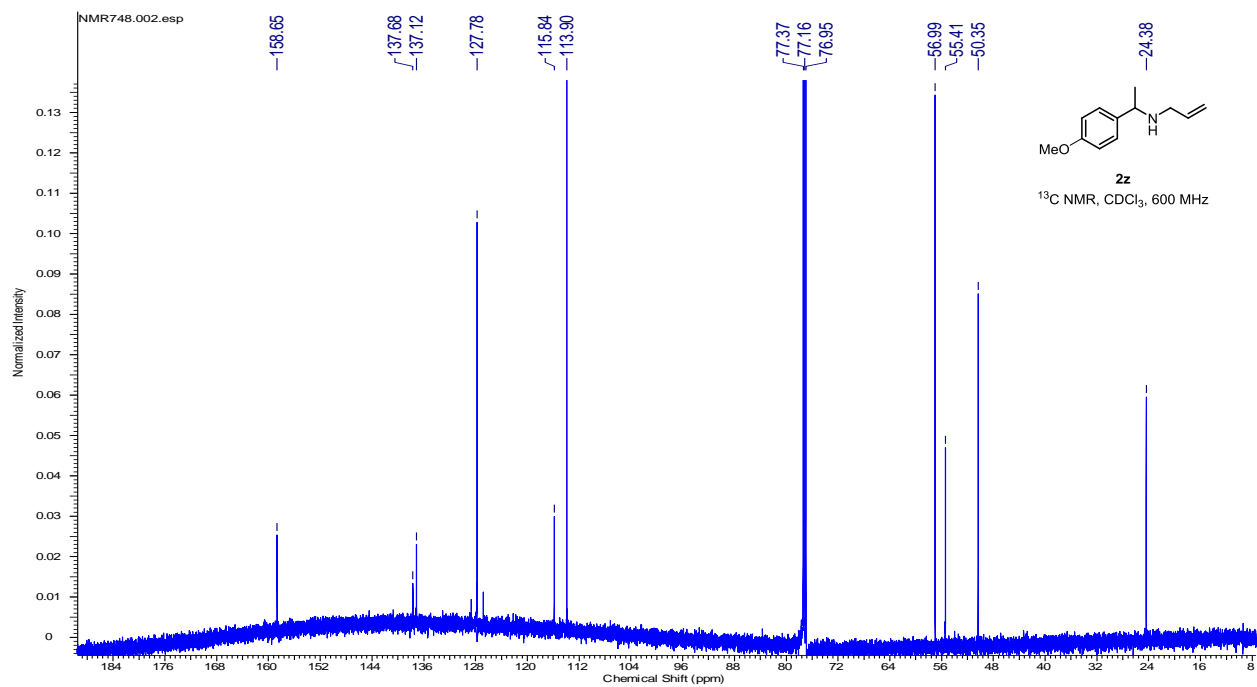
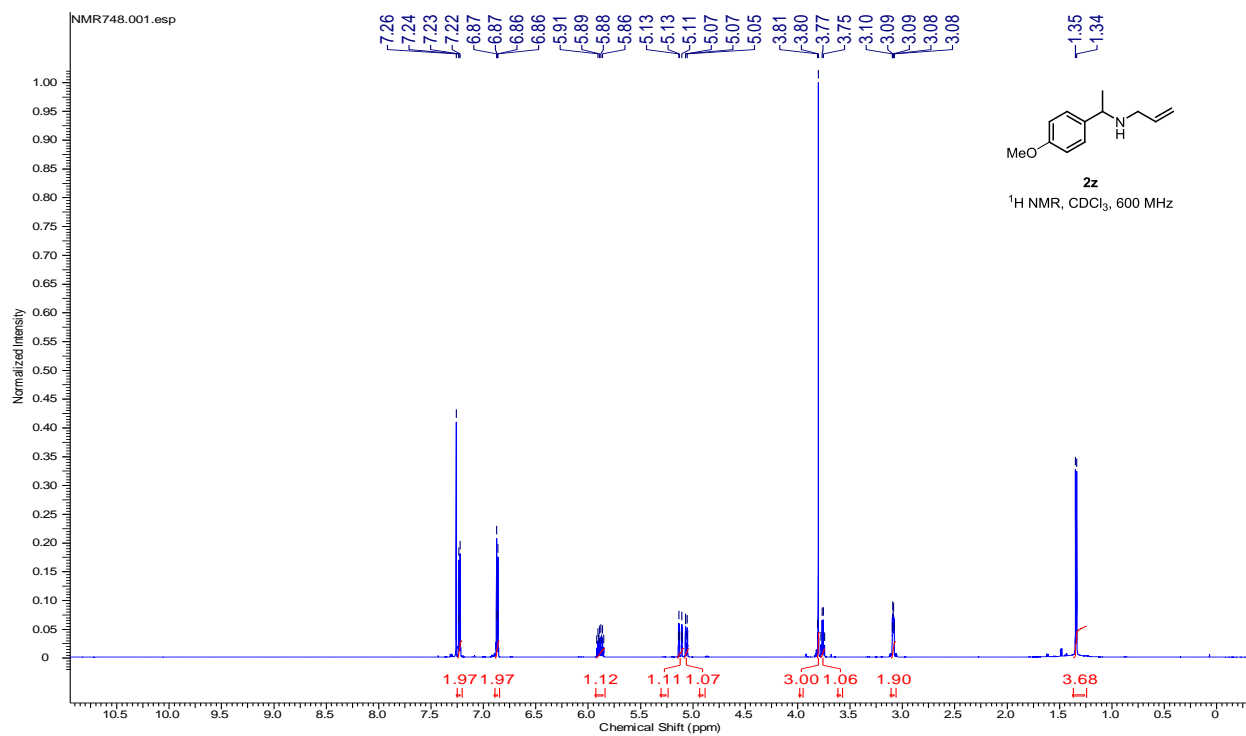


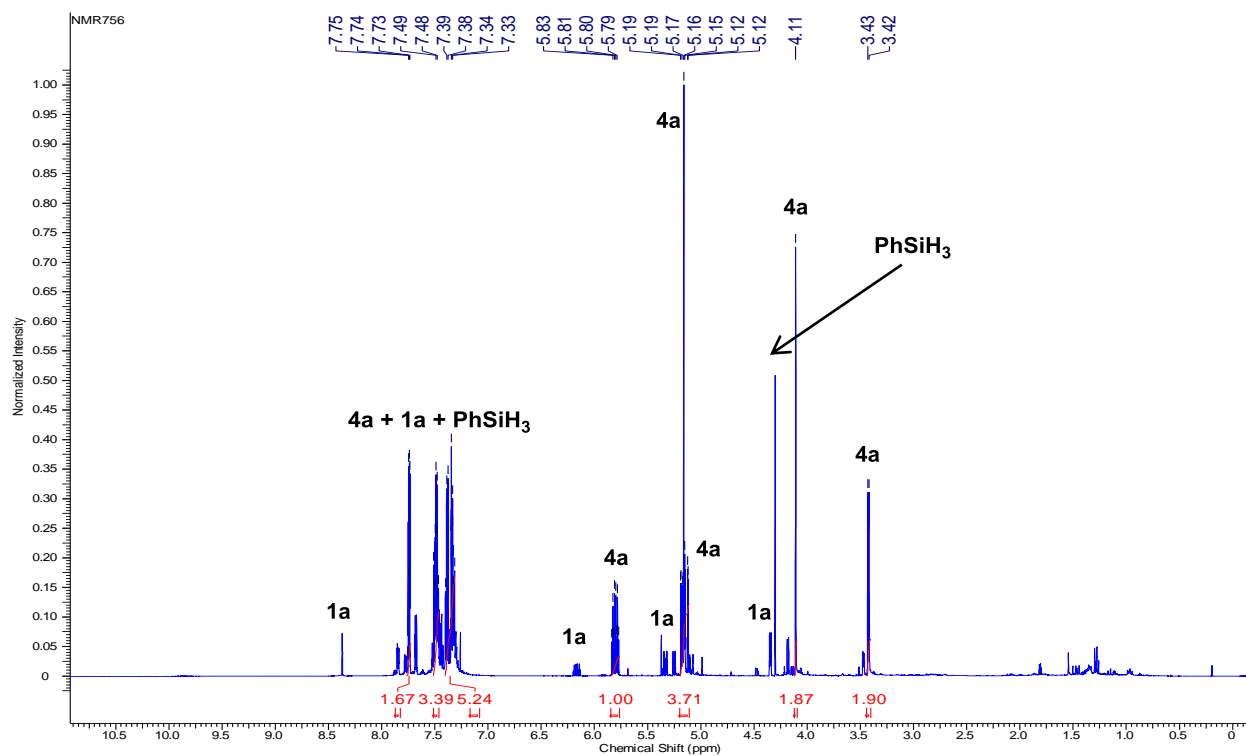
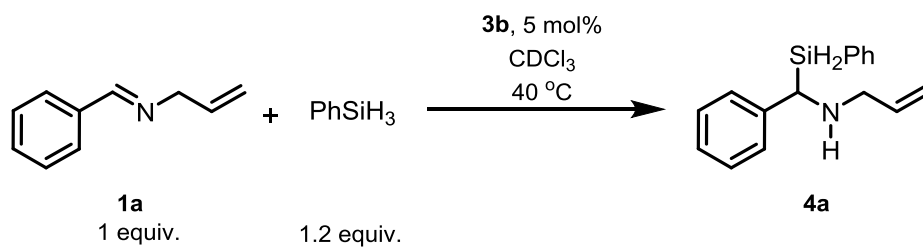












## References

1. J. F. Beck and J. A. R. Schmidt, *RSC Adv.*, 2012, **2**, 128-131.
2. A. R. Shaffer and J. A. R. Schmidt, *Organometallics*, 2008, **27**, 1259-1266.
3. H. Naeimi, F. Salimi and K. Rabiei, *J. Mol. Catal. A: Chem.*, 2006, **260**, 100-104.
4. M. D'Hooghe, A. Waterinckx and N. De Kimpe, *J. Org. Chem.*, 2005, **70**, 227-232.
5. M. S. Sigman, P. Vachal and E. N. Jacobsen, *Angew. Chem. Int. Ed.*, 2000, **39**, 1279-1281.
6. S. Krompiec, M. Mazik, W. Zielinski, P. Wagner and M. Smolik, *Pol. J. Chem.*, 1996, **70**, 1223-1227.
7. K. A. Tehrani, T. NguyenVan, M. Karikomi, M. Rottiers and N. De Kimpe, *Tetrahedron*, 2002, **58**, 7145-7152.
8. D. J. St. Cyr and B. A. Arndtsen, *J. Am. Chem. Soc.*, 2007, **129**, 12366-12367.
9. K. Afarinkia, C. W. Rees and J. I. G. Cadogan, *Tetrahedron*, 1990, **46**, 7175-7196.
10. V. V. Levin, A. D. Dilman, P. A. Belyakov, M. I. Struchkova and V. A. Tartakovsky, *Eur. J. Org. Chem.*, 2008, 5226-5230.
11. M. B. Tait, S. Butterworth and J. Clayden, *Org. Lett.*, 2015, **17**, 1236-1239.
12. G. Coulthard, W. P. Unsworth and R. J. K. Taylor, *Tetrahedron Lett.*, 2015, **56**, 3113-3116.
13. M. Jayaraman, P. E. Fanwick and M. Cushman, *J. Org. Chem.*, 1998, **63**, 5736-5737.
14. J.-M. Huang, J.-F. Zhang, Y. Dong and W. Gong, *J. Org. Chem.*, 2011, **76**, 3511-3514.
15. B. M. Trost, S. Mahapatra and M. Hansen, *Angew. Chem. Int. Ed.*, 2015, **54**, 6032-6036.
16. A. Ghatak, F. F. Becker and B. K. Banik, *Heterocycles*, 2000, **53**, 2769-2773.
17. G. R. Cook, N. S. Barta and J. R. Stille, *J. Org. Chem.*, 1992, **57**, 461-467.
18. S. D. Worley, K. G. Taylor, B. Venugopalan and M. S. Clark, *Tetrahedron*, 1978, **34**, 833-839.
19. V. N. Wakchaure, P. S. J. Kaib, M. Leutzsch and B. List, *Angew. Chem. Int. Ed.*, 2015, **54**, 11852-11856.
20. Z. Chen, B. Lu, Z. Ding, K. Gao and N. Yoshikai, *Org. Lett.*, 2013, **15**, 1966-1969.
21. Y. Misumi, H. Seino and Y. Mizobe, *J. Am. Chem. Soc.*, 2009, **131**, 14636-14637.
22. C. J. Smith, C. D. Smith, N. Nikbin, S. V. Ley and I. R. Baxendale, *Org. Biomol. Chem.*, 2011, **9**, 1927-1937.
23. E. Choi, C. Lee, M. Cho, J. J. Seo, J. S. Yang, S. J. Oh, K. Lee, S.-K. Park, H. M. Kim, H. J. Kwon and G. Han, *J. Med. Chem.*, 2012, **55**, 10766-10770.
24. U. Orcel and J. Waser, *Angew. Chem. Int. Ed.*, 2015, **54**, 5250-5254.
25. N. Dieltiens and C. V. Stevens, *Org. Lett.*, 2007, **9**, 465-468.
26. N. Dieltiens, C. V. Stevens, K. Masschelein, G. Hennebel and S. Van der Jeught, *Tetrahedron*, 2008, **64**, 4295-4303.
27. C. Lee, E. Choi, M. Cho, B. Lee, S. J. Oh, S. Park, K. Lee, H. M. Kim and G. Han, *Bioorg. Med. Chem. Lett.*, 2012, **22**, 4189-4192.
28. H. Glatz and W. Bannwarth, *Tetrahedron Lett.*, 2003, **44**, 149-152.
29. N. Choony, A. Dadabhoy and P. G. Sammes, *J. Chem. Soc., Perkin Trans. 1*, 1998, 2017-2021.
30. E. Choi, C. Lee, J. E. Park, J. J. Seo, M. Cho, J. S. Kang, H. M. Kim, S.-K. Park, K. Lee and G. Han, *Bioorg. Med. Chem. Lett.*, 2011, **21**, 1218-1221.
31. P. Prediger, L. F. Barbosa, Y. Genisson and C. R. Duarte Correia, *J. Org. Chem.*, 2011, **76**, 7737-7749.
32. V. Gobe, P. Retailleau and X. Guinchard, *Org. Lett.*, 2014, **16**, 5438-5441.
33. B. Thiedemann, C. M. L. Schmitz and A. Staubitz, *J. Org. Chem.*, 2014, **79**, 10284-10295.
34. M. D'Hooghe and N. De Kimpe, *Arkivoc*, 2007, 365-373.
35. C. Wang, X. Wu, L. Zhou and J. Sun, *Org. Biomol. Chem.*, 2015, **13**, 577-582.



