

## Supporting Information

### **Visible Light-Mediated Alkenylation, Allylation, and Cyanation of Potassium Alkyltrifluoroborates with Organic Photoredox Catalysts**

Drew R. Heitz, Komal Rizwan, and Gary A. Molander\*

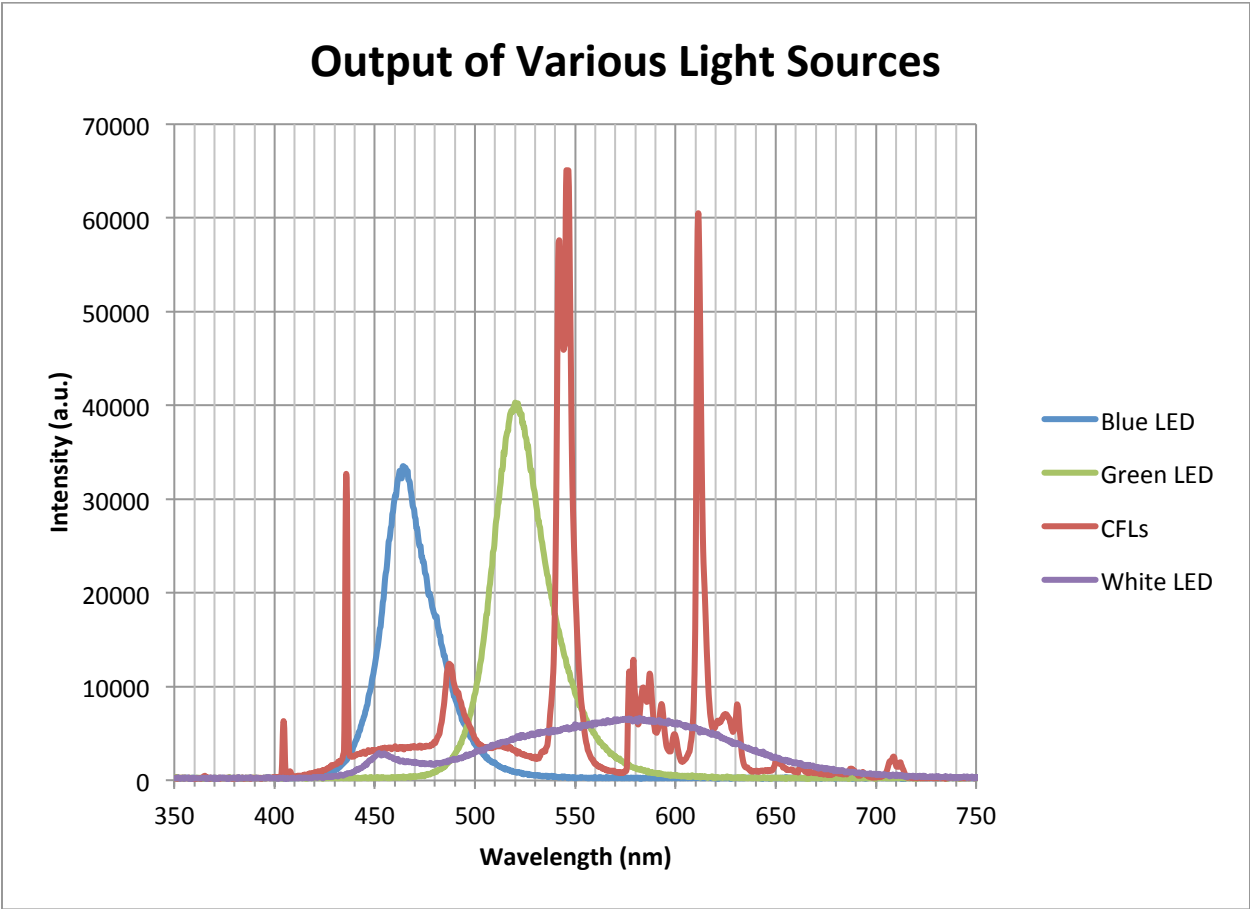
Roy and Diana Vagelos Laboratories, Department of Chemistry, University of Pennsylvania, 231 South 34th Street, Philadelphia, Pennsylvania 19104-6323, United States.

\* To whom correspondence should be addressed: [gmolandr@sas.upenn.edu](mailto:gmolandr@sas.upenn.edu)

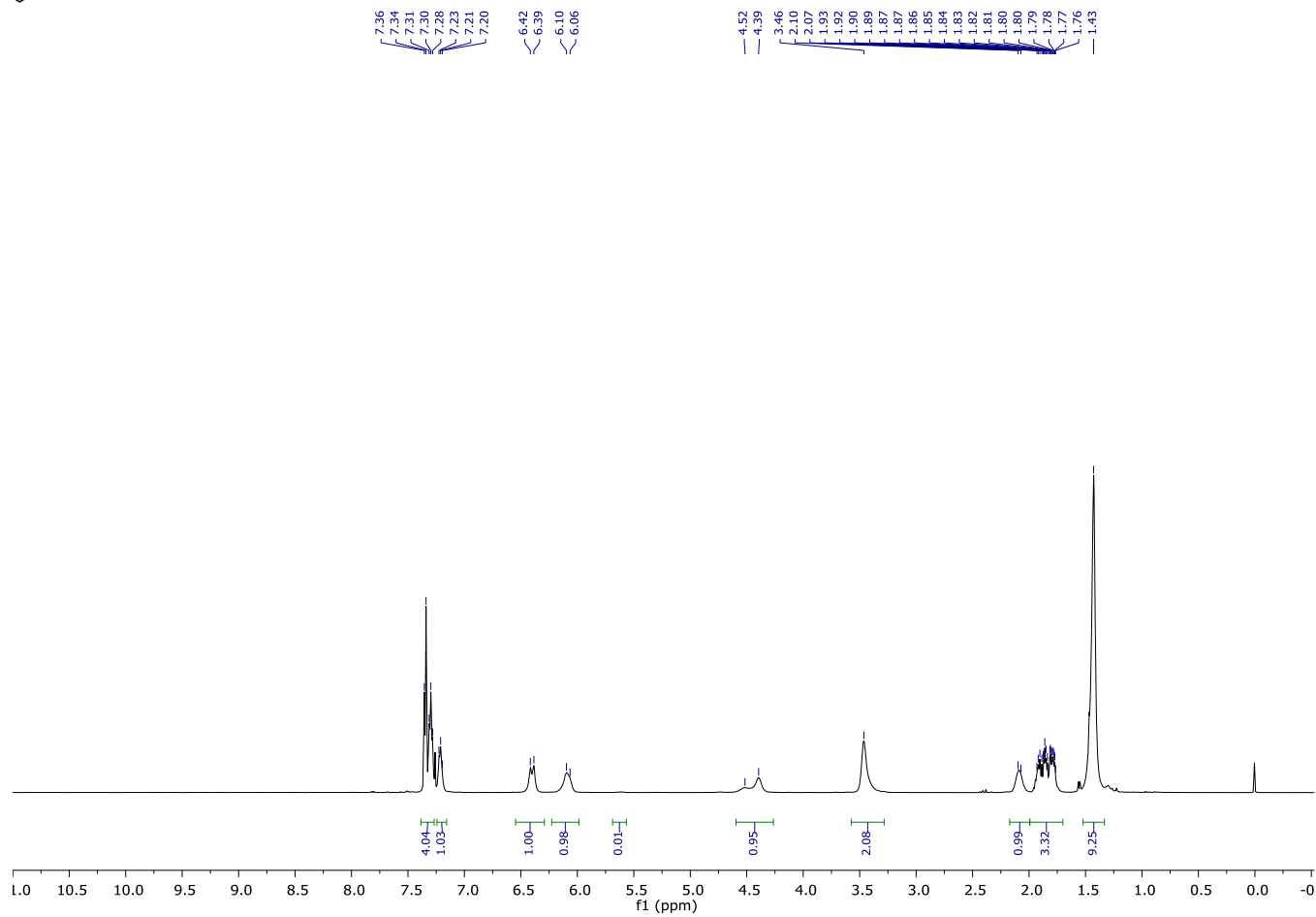
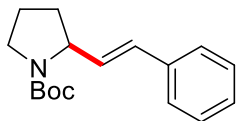
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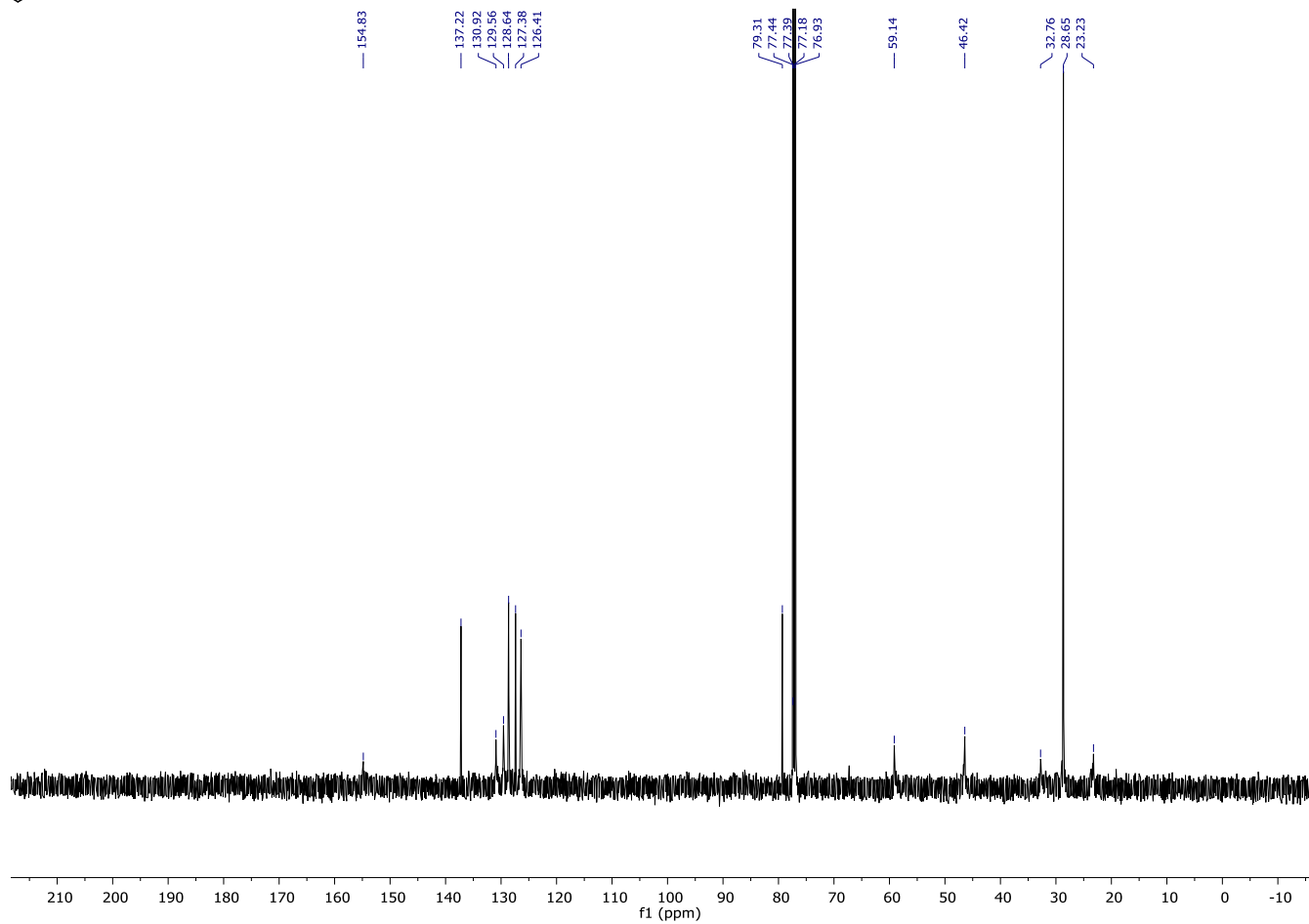
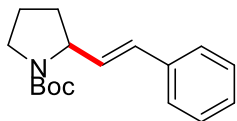
Output of Light Sources



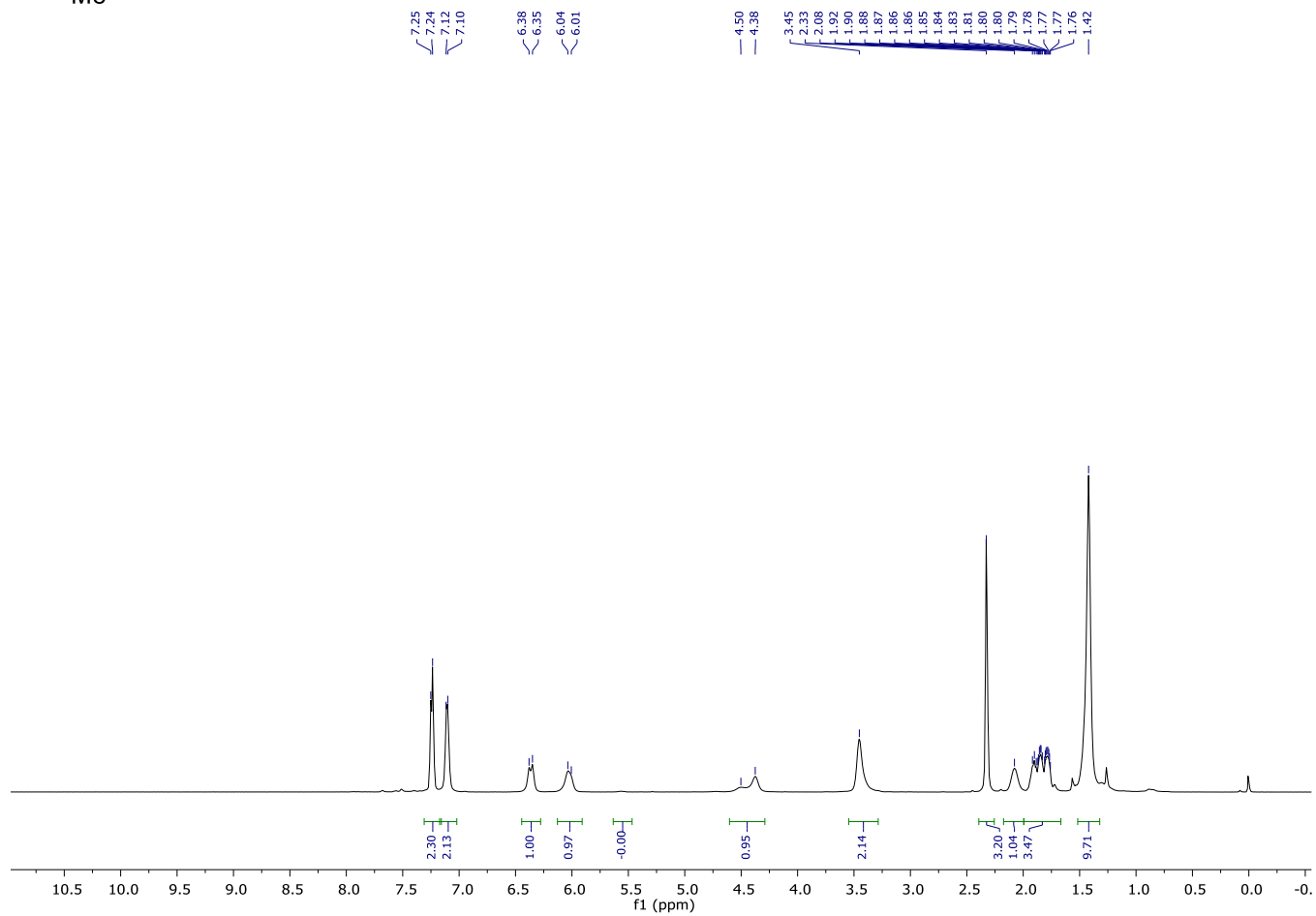
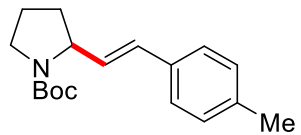
<sup>1</sup>H NMR (500 MHz, D-CHLOROFORM) Spectrum of *tert*-Butyl (E)-2-Styrylpyrrolidine-1-carboxylate (3a)



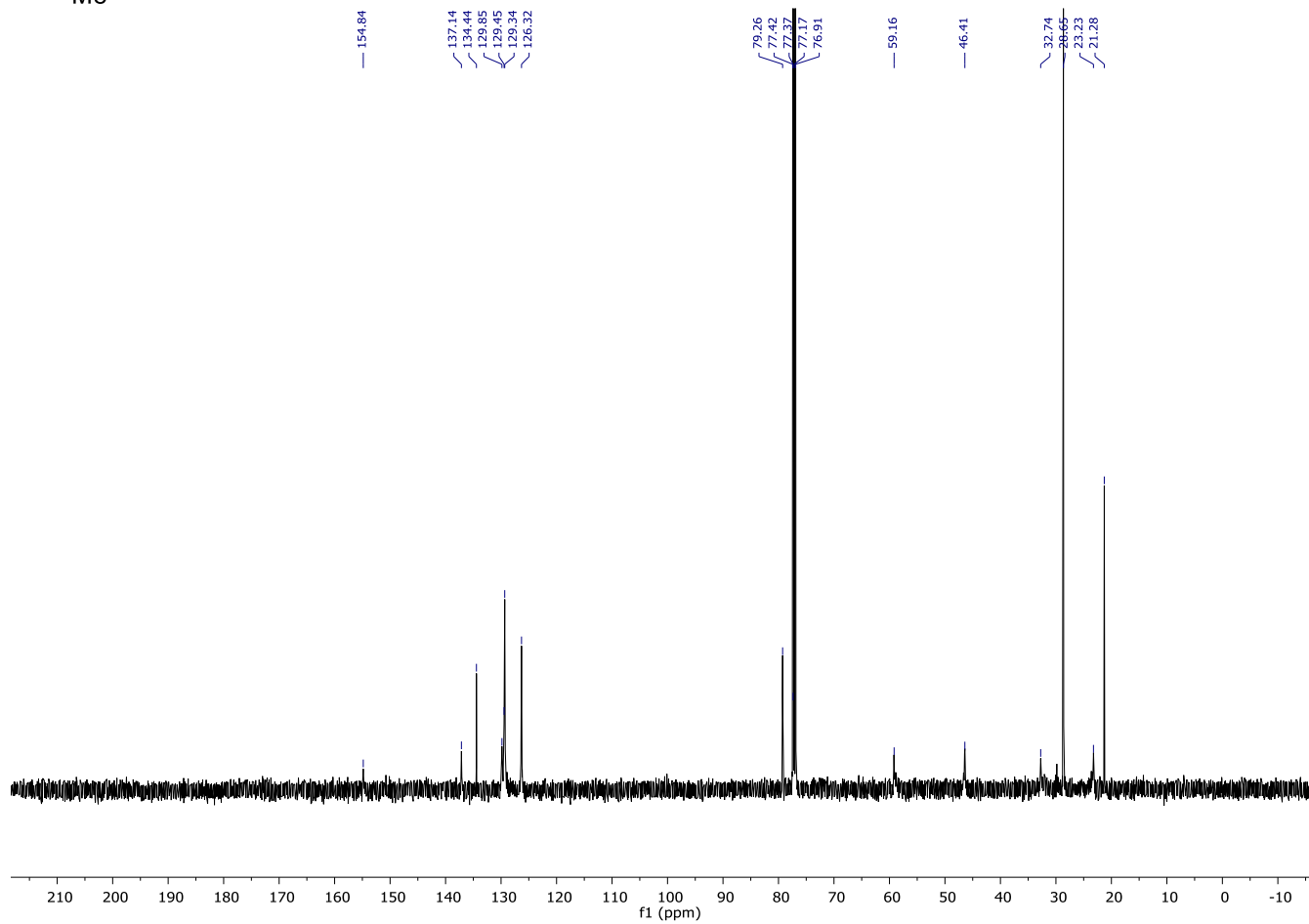
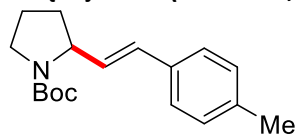
<sup>13</sup>C {<sup>1</sup>H} NMR (126 MHz, D-CHLOROFORM) Spectrum of *tert*-Butyl (E)-2-Styrylpyrrolidine-1-carboxylate (3a)



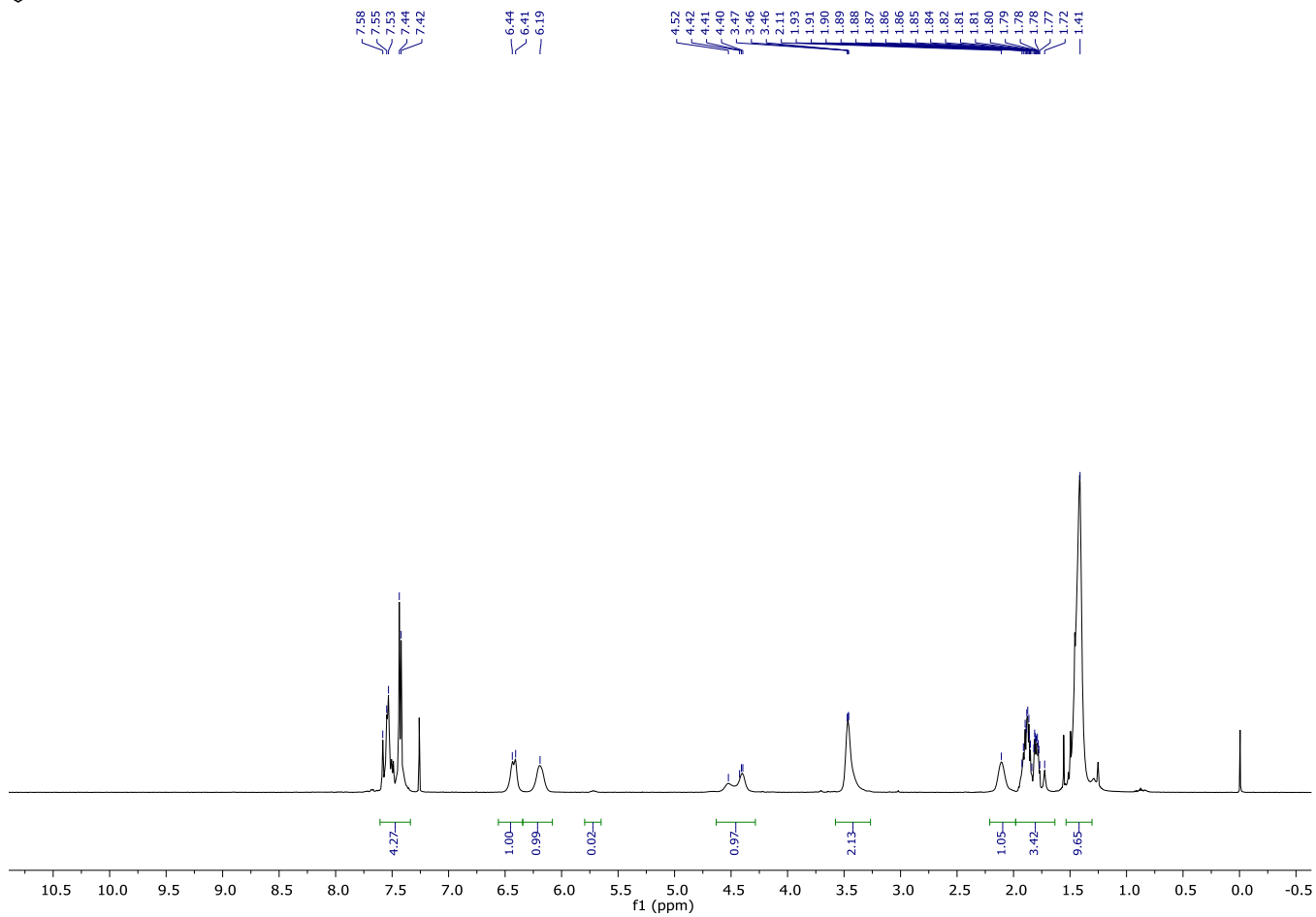
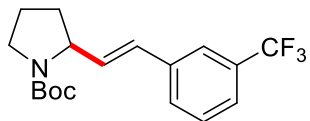
<sup>1</sup>H NMR (500 MHz, D-CHLOROFORM) Spectrum of *tert*-Butyl (E)-2-(4-Methylstyryl)pyrrolidine-1-carboxylate (3b)



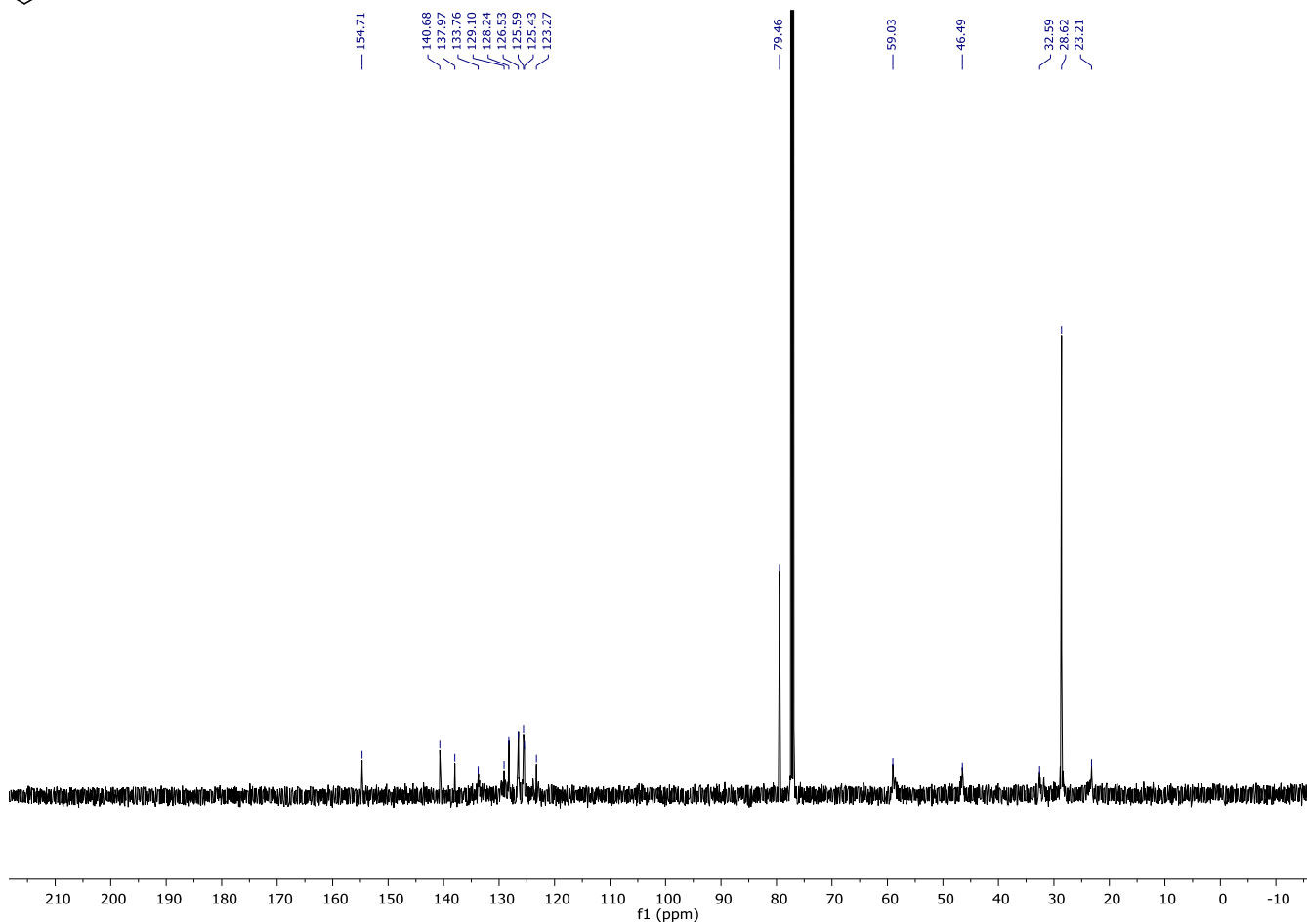
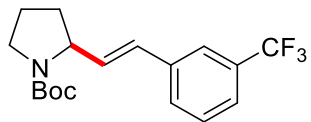
$^{13}\text{C}\{^1\text{H}\}$  NMR (126 MHz, D-CHLOROFORM) Spectrum of *tert*-Butyl (E)-2-(4-Methyl)styrylpyrrolidine-1-carboxylate (3b)



<sup>1</sup>H NMR (500 MHz, D-CHLOROFORM) Spectrum of *tert*-Butyl (E)-2-(3-Trifluoromethyl)styrylpyrrolidine-1-carboxylate (3c)

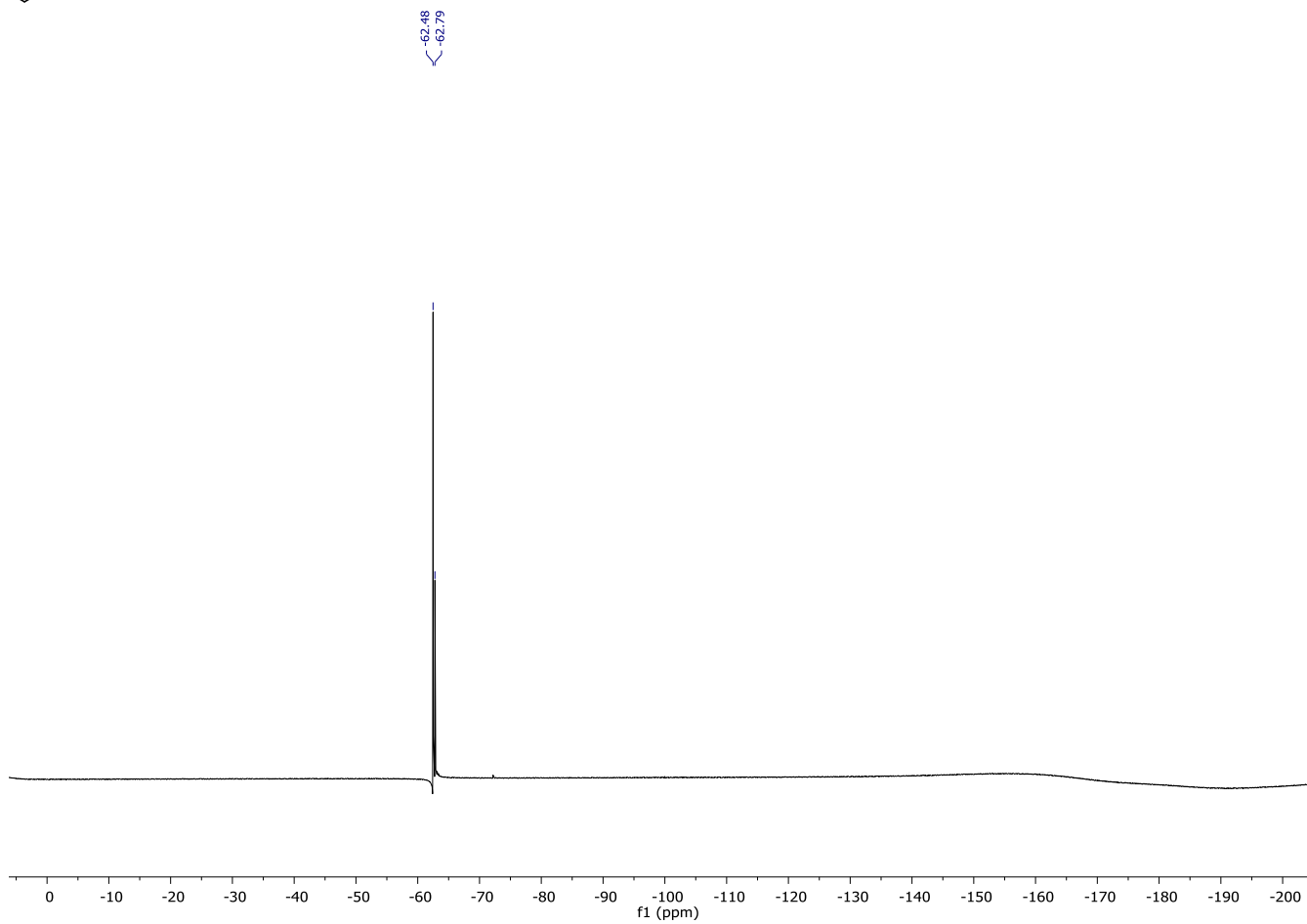
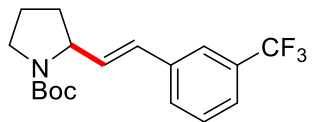


<sup>13</sup>C {<sup>1</sup>H} NMR (126 MHz, D-CHLOROFORM) Spectrum of *tert*-Butyl (E)-2-(3-Trifluoromethyl)styrylpyrrolidine-1-carboxylate (3c)

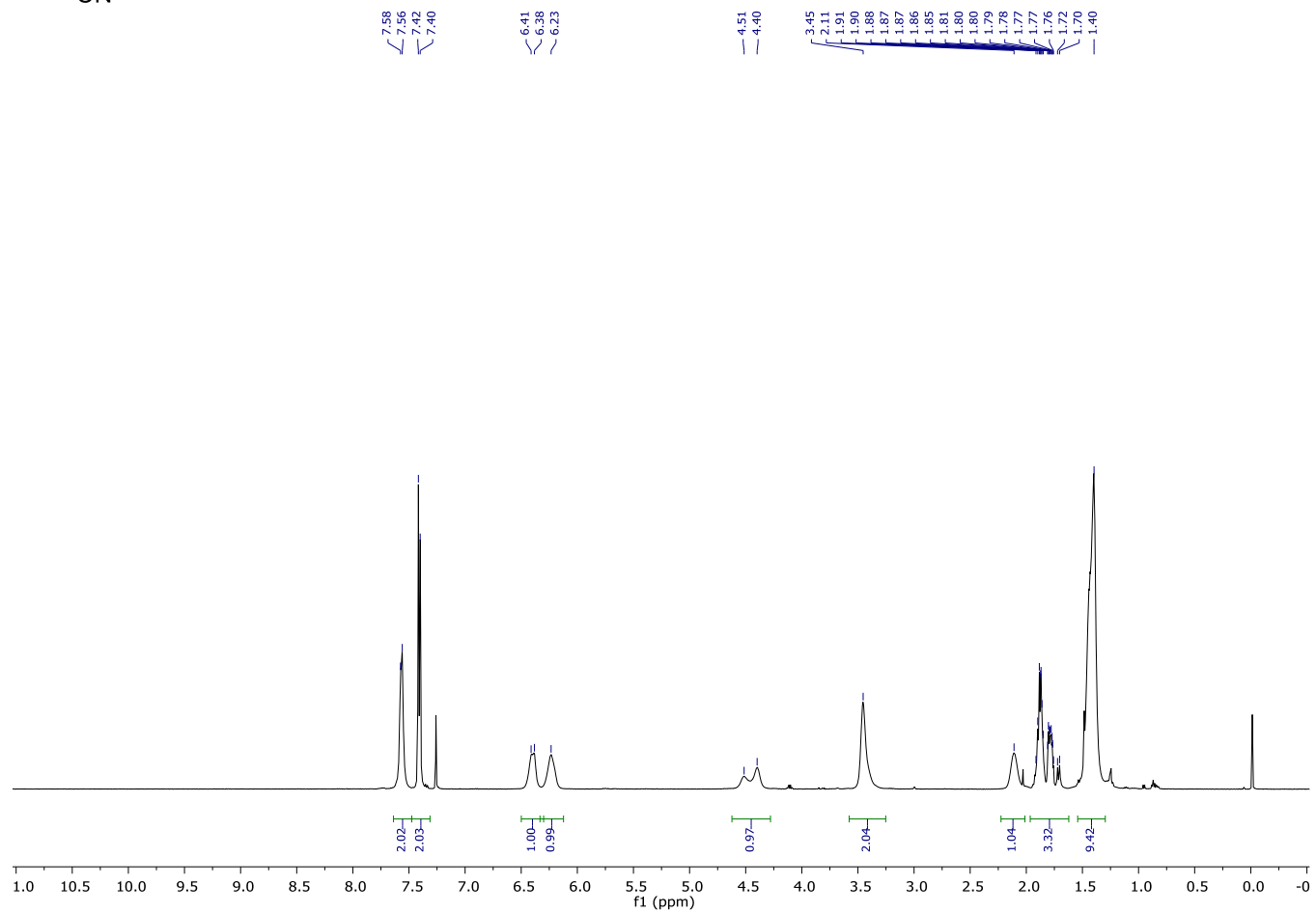
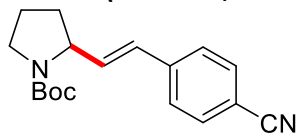




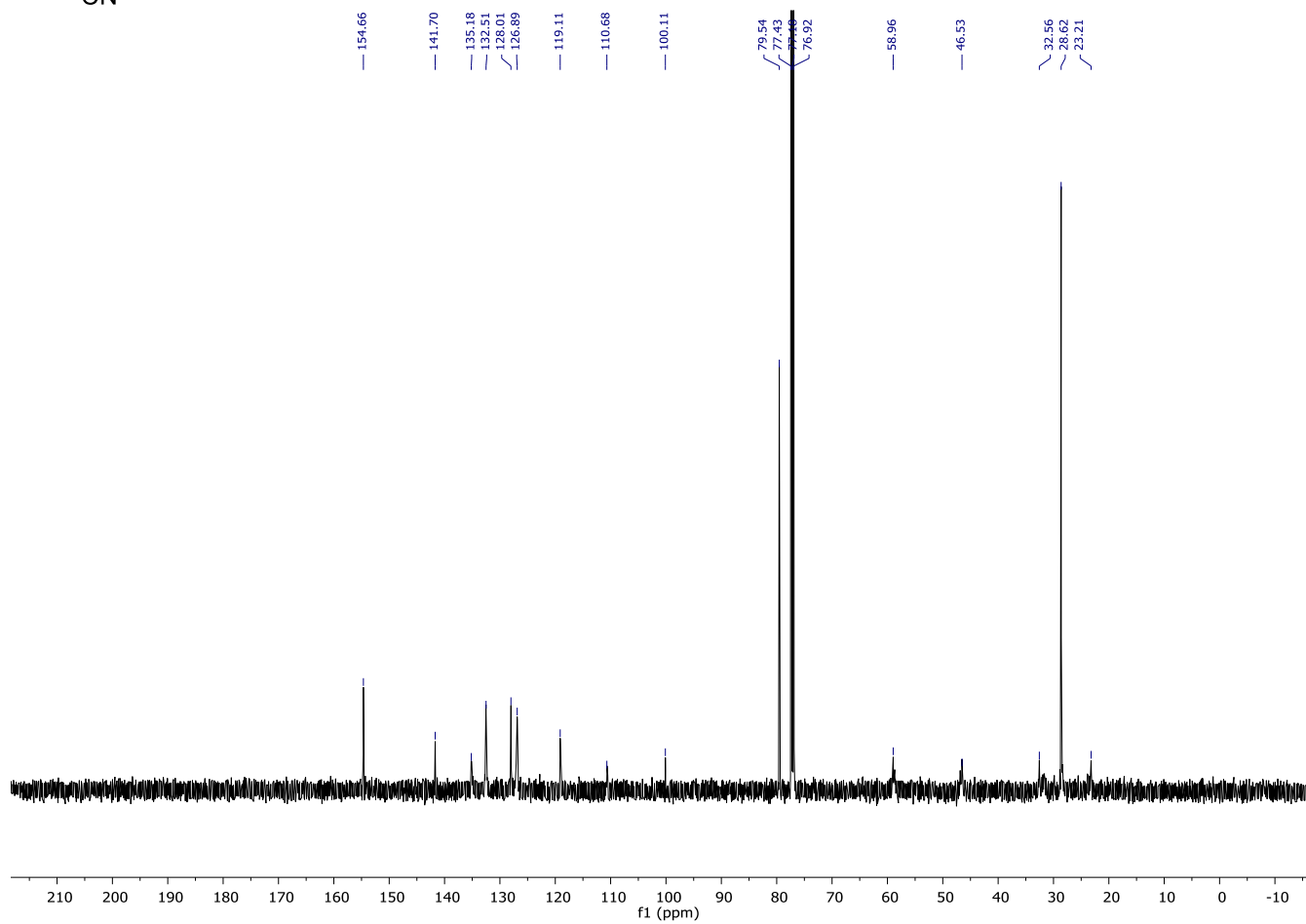
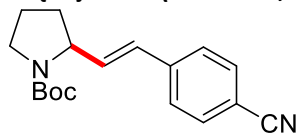
<sup>19</sup>F NMR (470.8 MHz, D-CHLOROFORM) Spectrum of *tert*-Butyl (E)-2-(3-Trifluoromethyl)styrylpyrrolidine-1-carboxylate (3c)



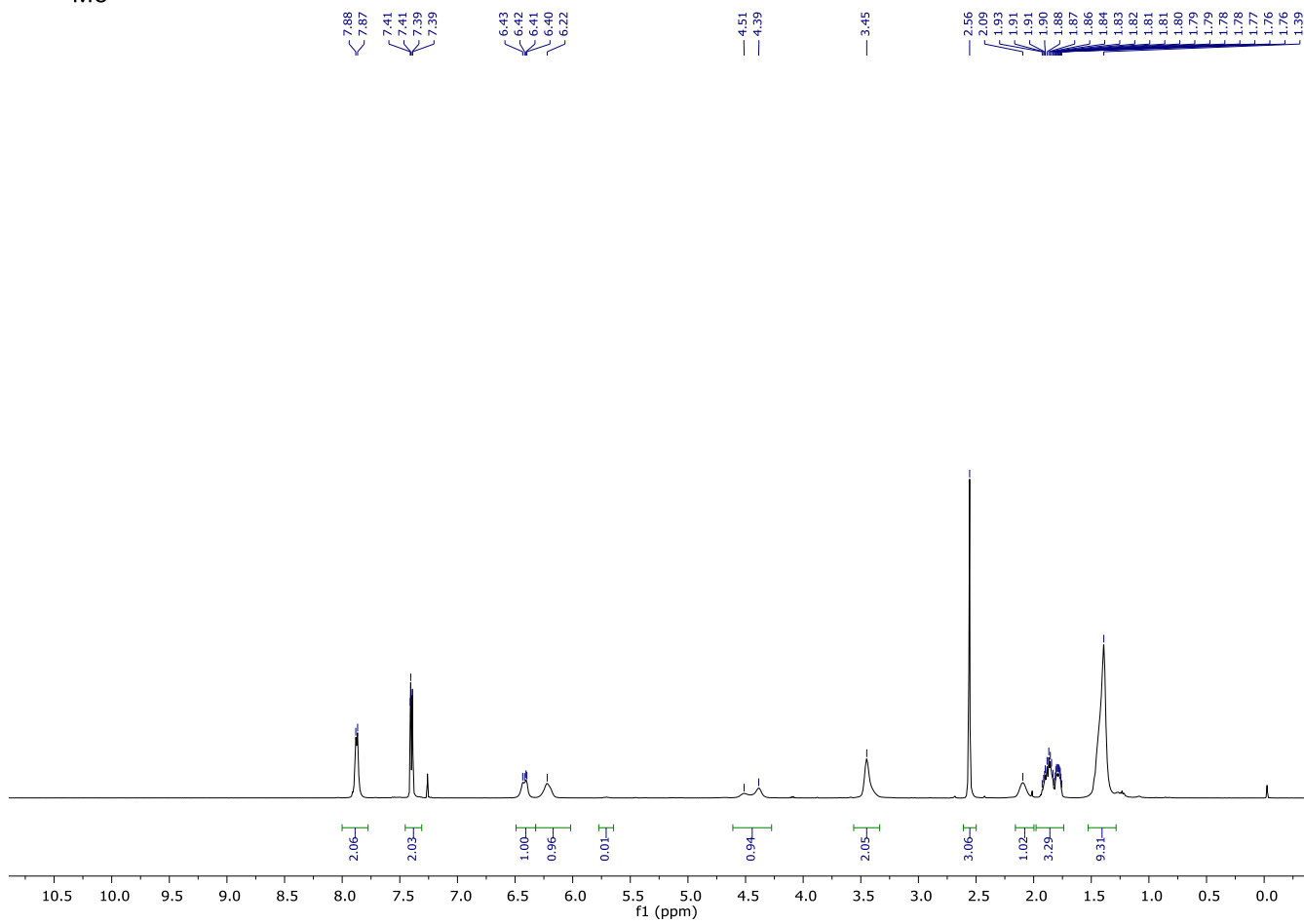
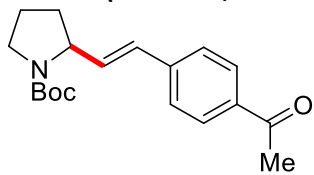
<sup>1</sup>H NMR (500 MHZ, D-CHLOROFORM) Spectrum of *tert*-Butyl (E)-2-(4-Cyano)styrylpyrrolidine-1-carboxylate (3d)



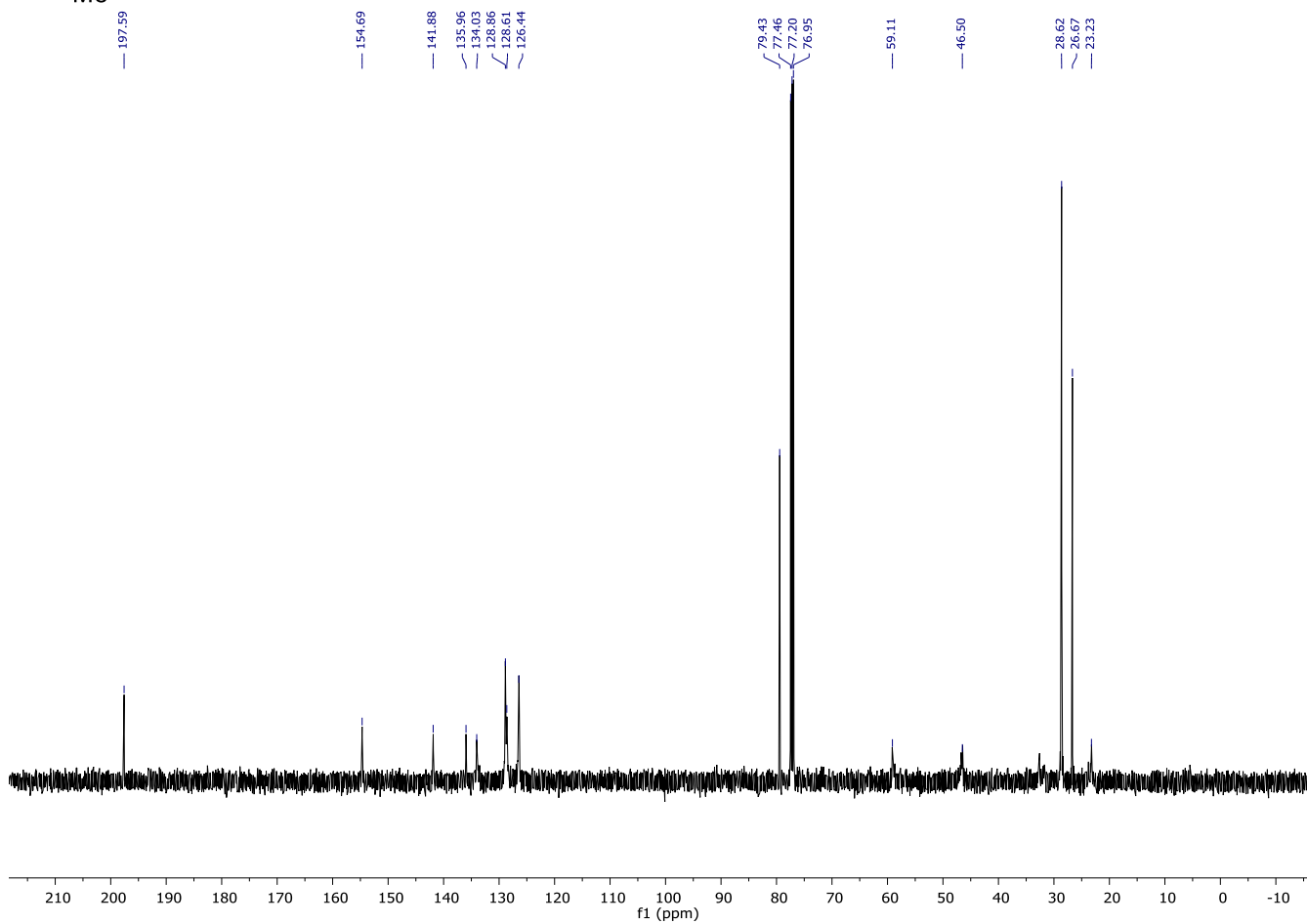
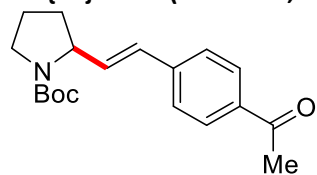
<sup>13</sup>C {<sup>1</sup>H} NMR (126 MHz, D-CHLOROFORM) Spectrum of *tert*-Butyl (E)-2-(4-Cyano)styrylpyrrolidine-1-carboxylate (3d)



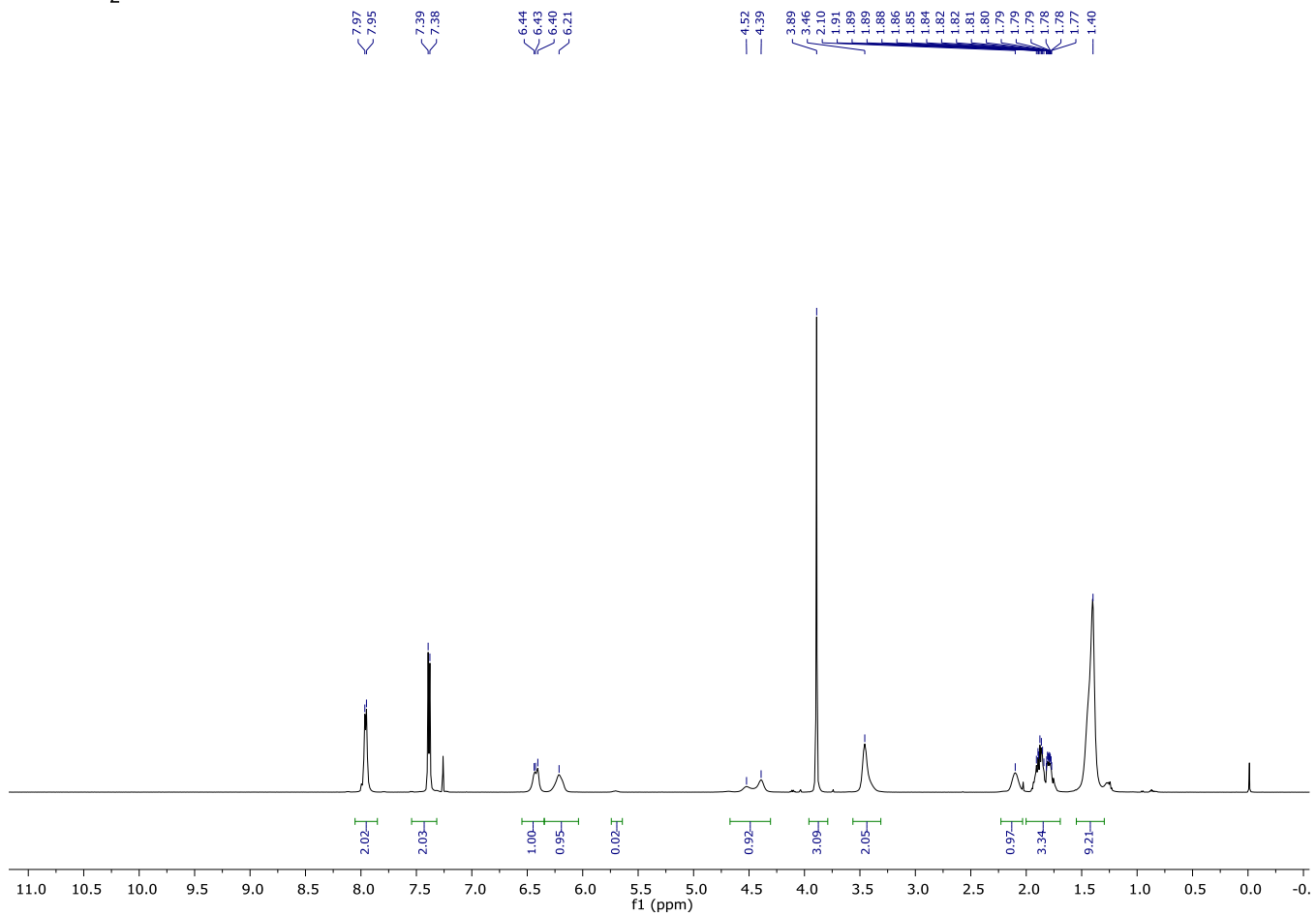
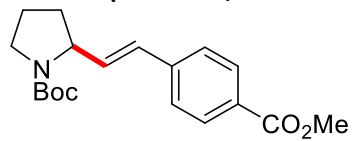
<sup>1</sup>H NMR (500 MHz, D-CHLOROFORM) Spectrum of *tert*-Butyl (E)-2-(4-Acetyl)styrylpyrrolidine-1-carboxylate (3e)



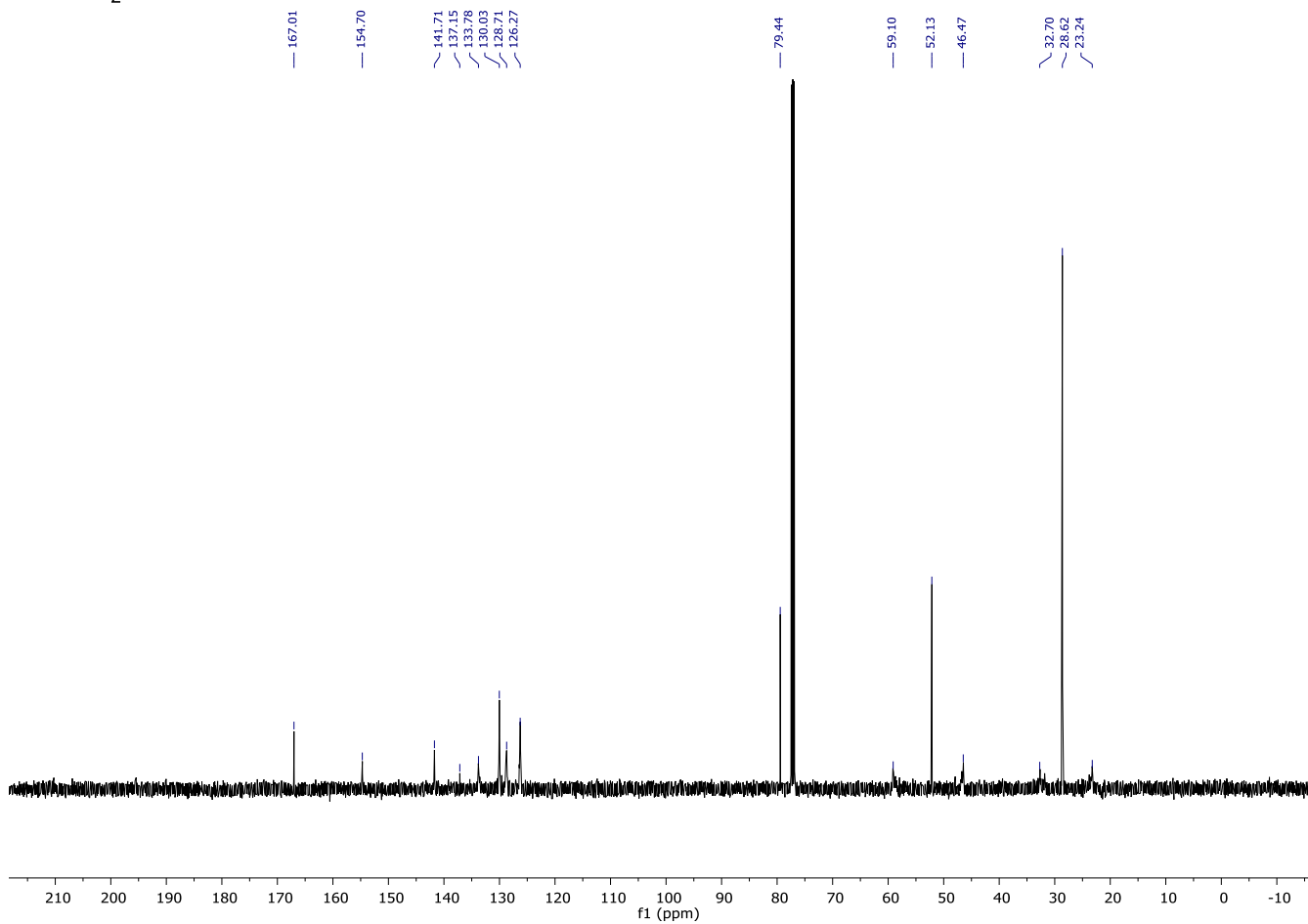
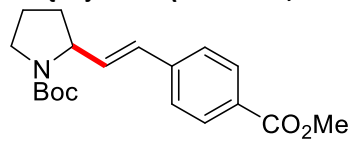
$^{13}\text{C}\{^1\text{H}\}$  NMR (126 MHz, D-CHLOROFORM) Spectrum of *tert*-Butyl (E)-2-(4-Acetyl)styrylpyrrolidine-1-carboxylate (3e)



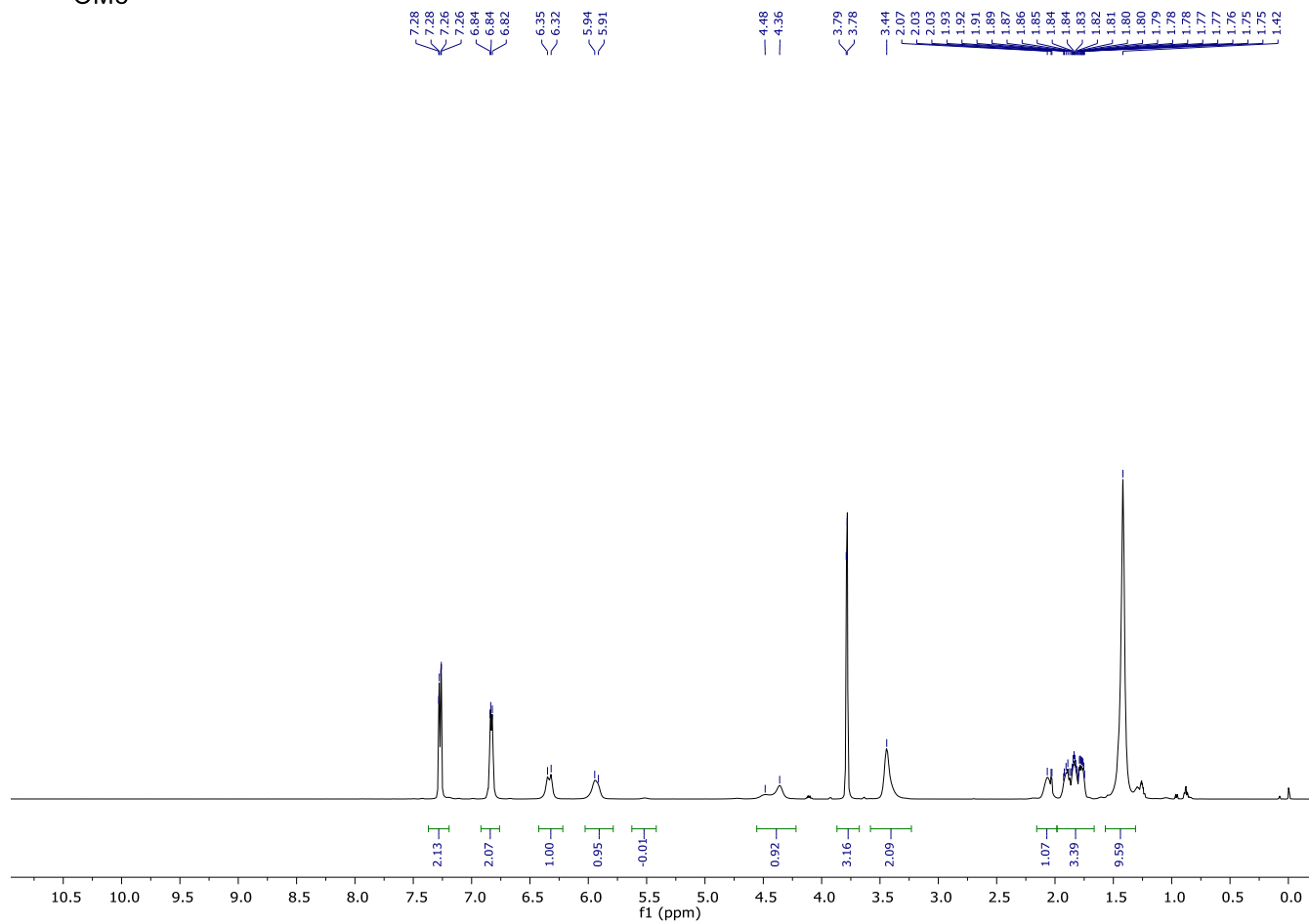
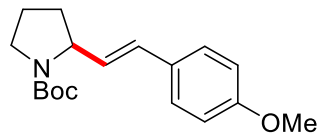
<sup>1</sup>H NMR (500 MHZ, D-CHLOROFORM) Spectrum of *tert*-Butyl (E)-2-(4-Methoxycarbonyl)styrylpyrrolidine-1-carboxylate (3f)



<sup>13</sup>C {<sup>1</sup>H} NMR (126 MHz, D-CHLOROFORM) Spectrum of *tert*-Butyl (E)-2-(4-Methoxycarbonyl)styrylpyrrolidine-1-carboxylate (3f)

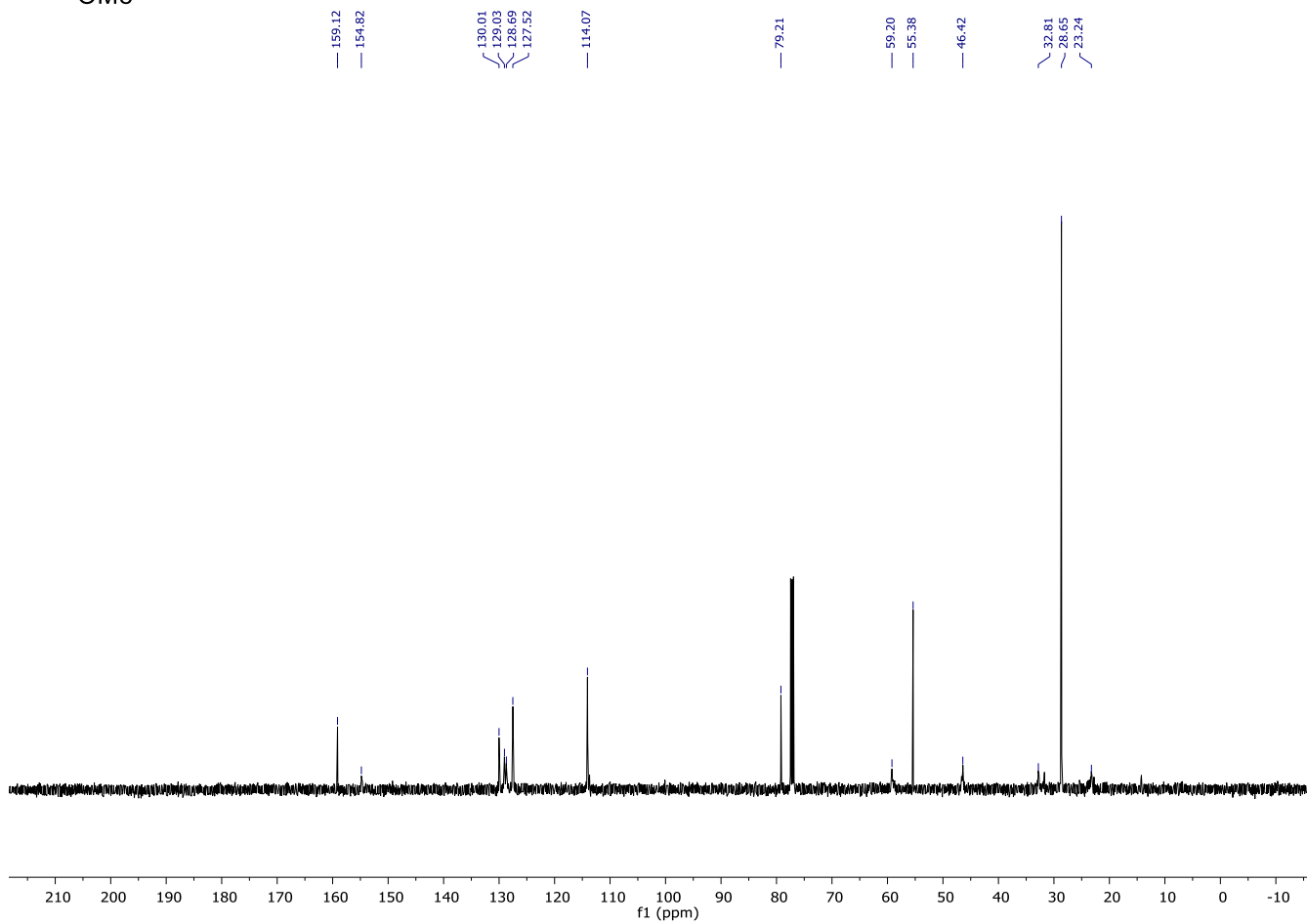
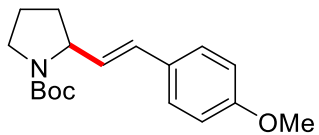


<sup>1</sup>H NMR (500 MHZ, D-CHLOROFORM) Spectrum of *tert*-Butyl (E)-2-(4-Methoxy)styrylpyrrolidine-1-carboxylate (3g)

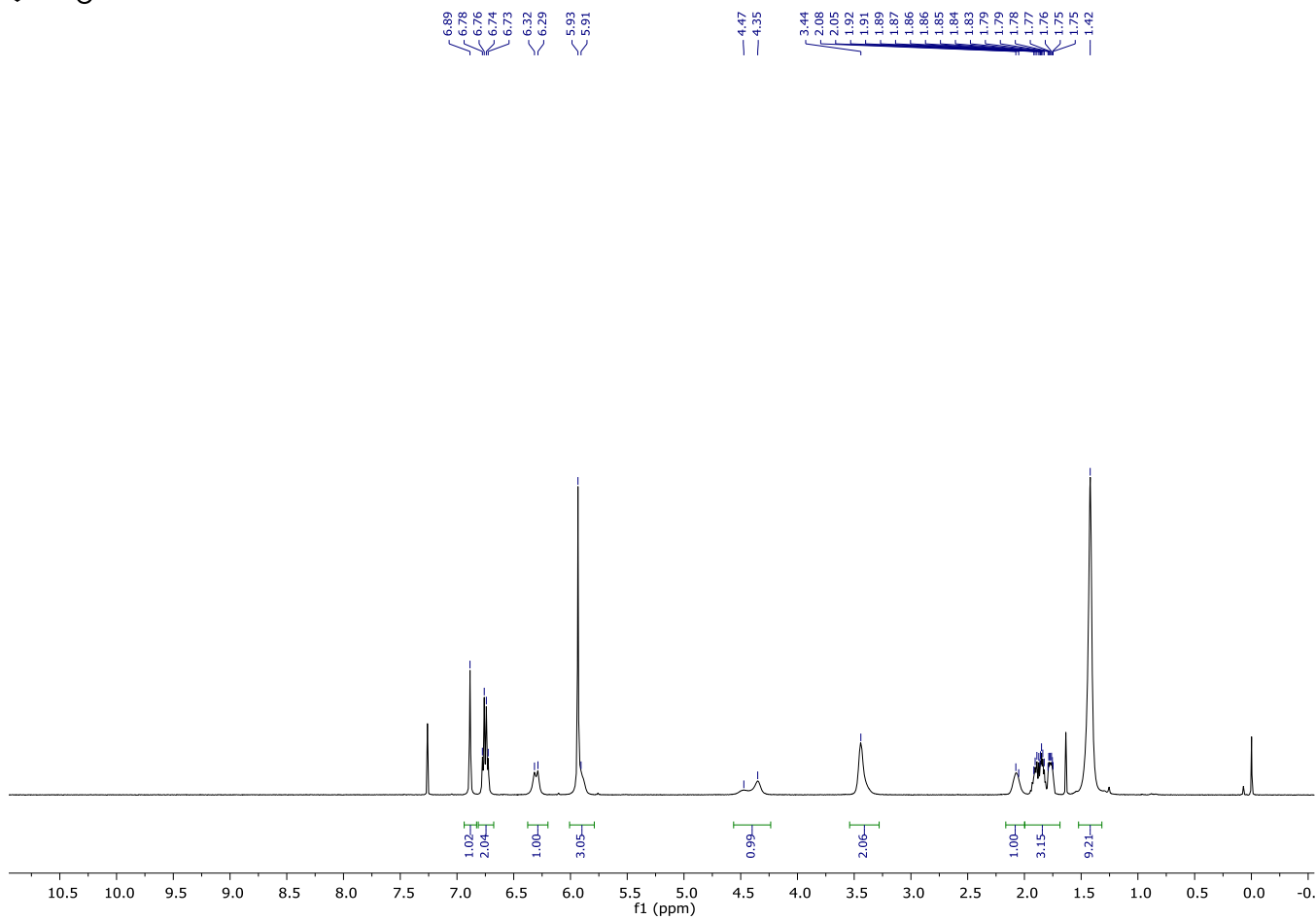
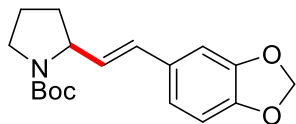




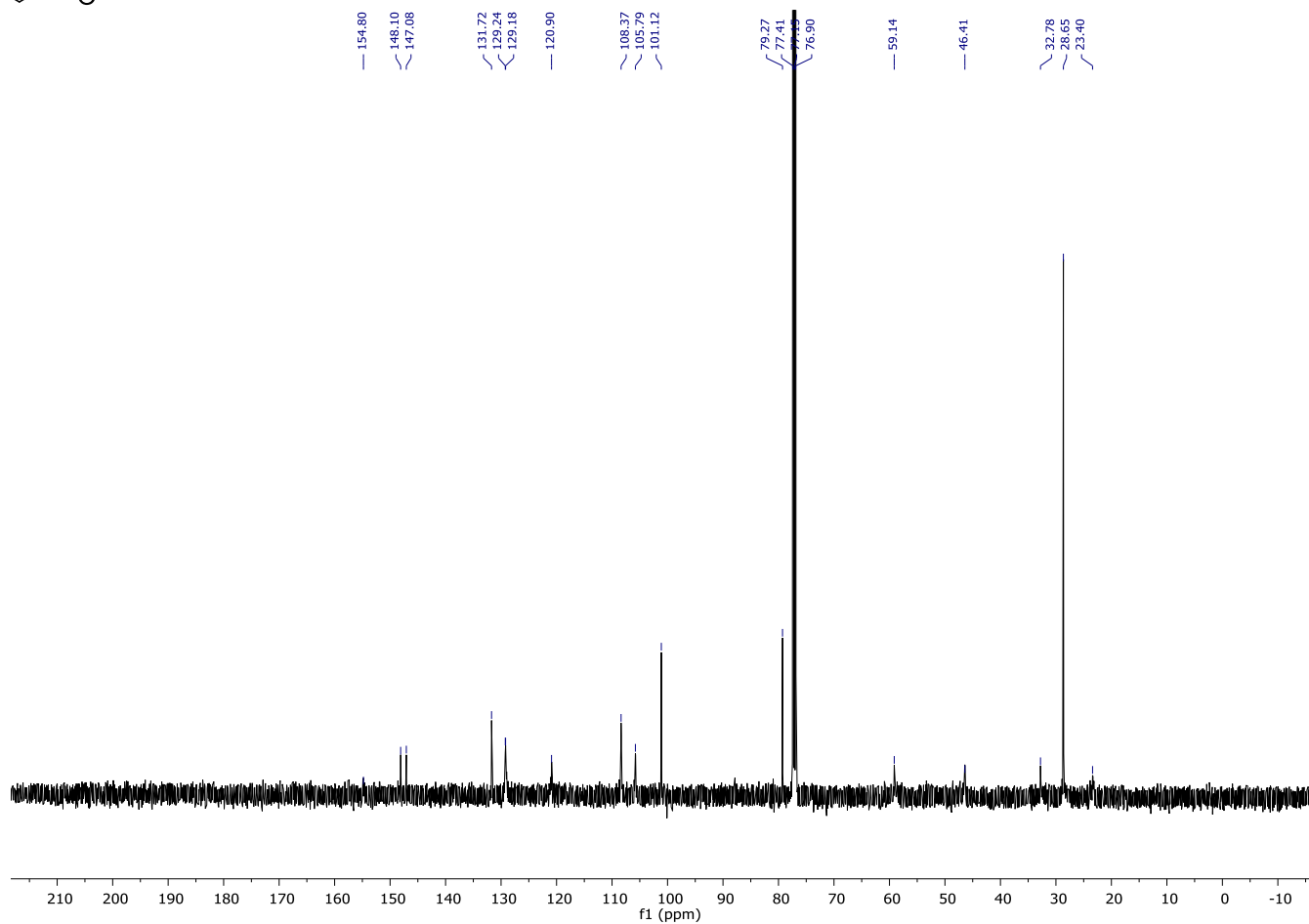
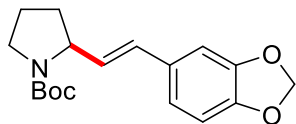
<sup>13</sup>C {<sup>1</sup>H} NMR (126 MHz, D-CHLOROFORM) Spectrum of *tert*-Butyl (E)-2-(4-Methoxy)styrylpyrrolidine-1-carboxylate (3g)



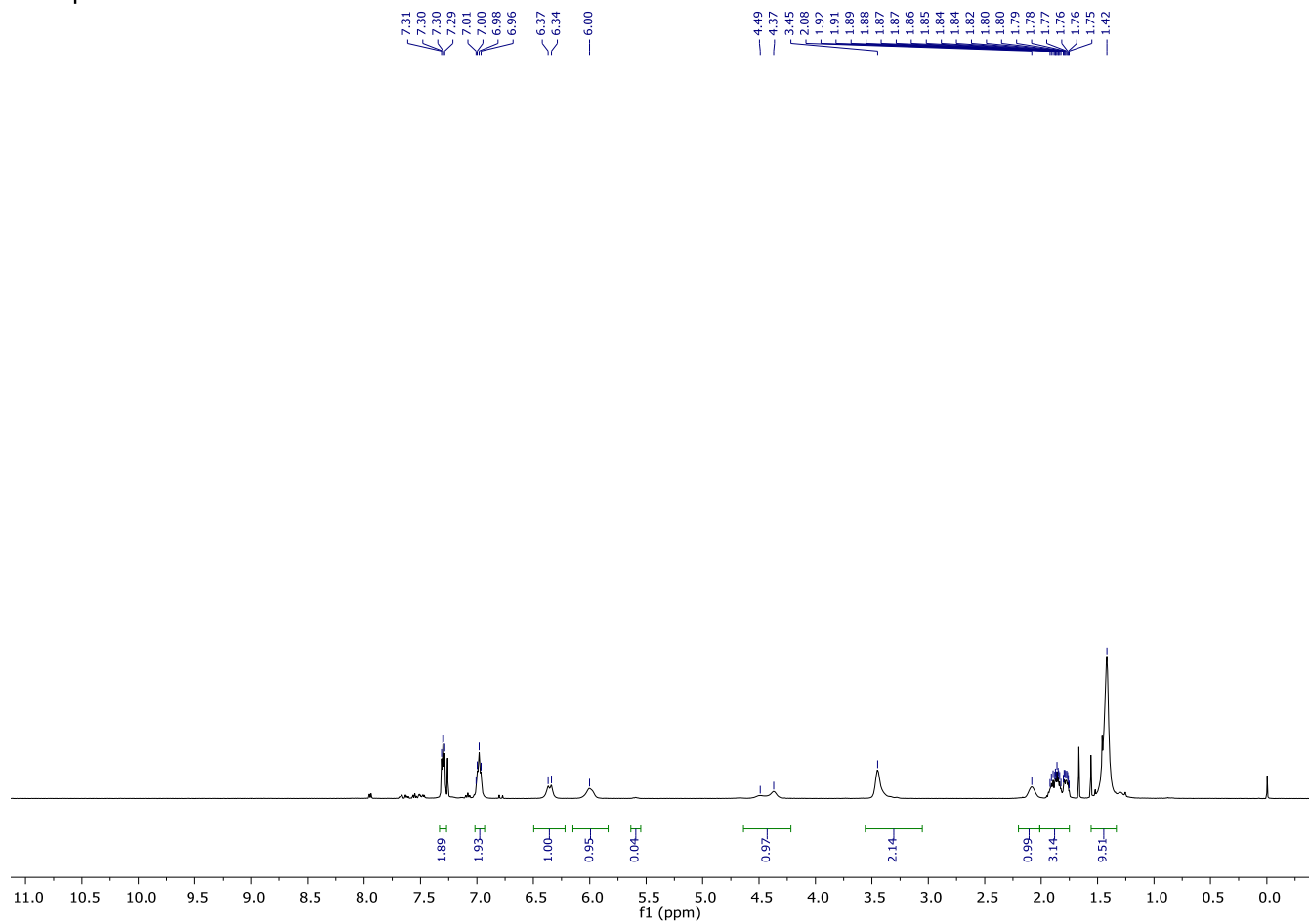
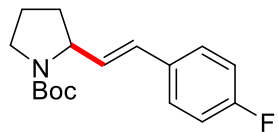
<sup>1</sup>H NMR (500 MHz, D-CHLOROFORM) Spectrum of *tert*-Butyl (E)-2-(2-(Benzo[d][1,3]dioxol-5-yl)vinyl)pyrrolidine-1-carboxylate (3h)



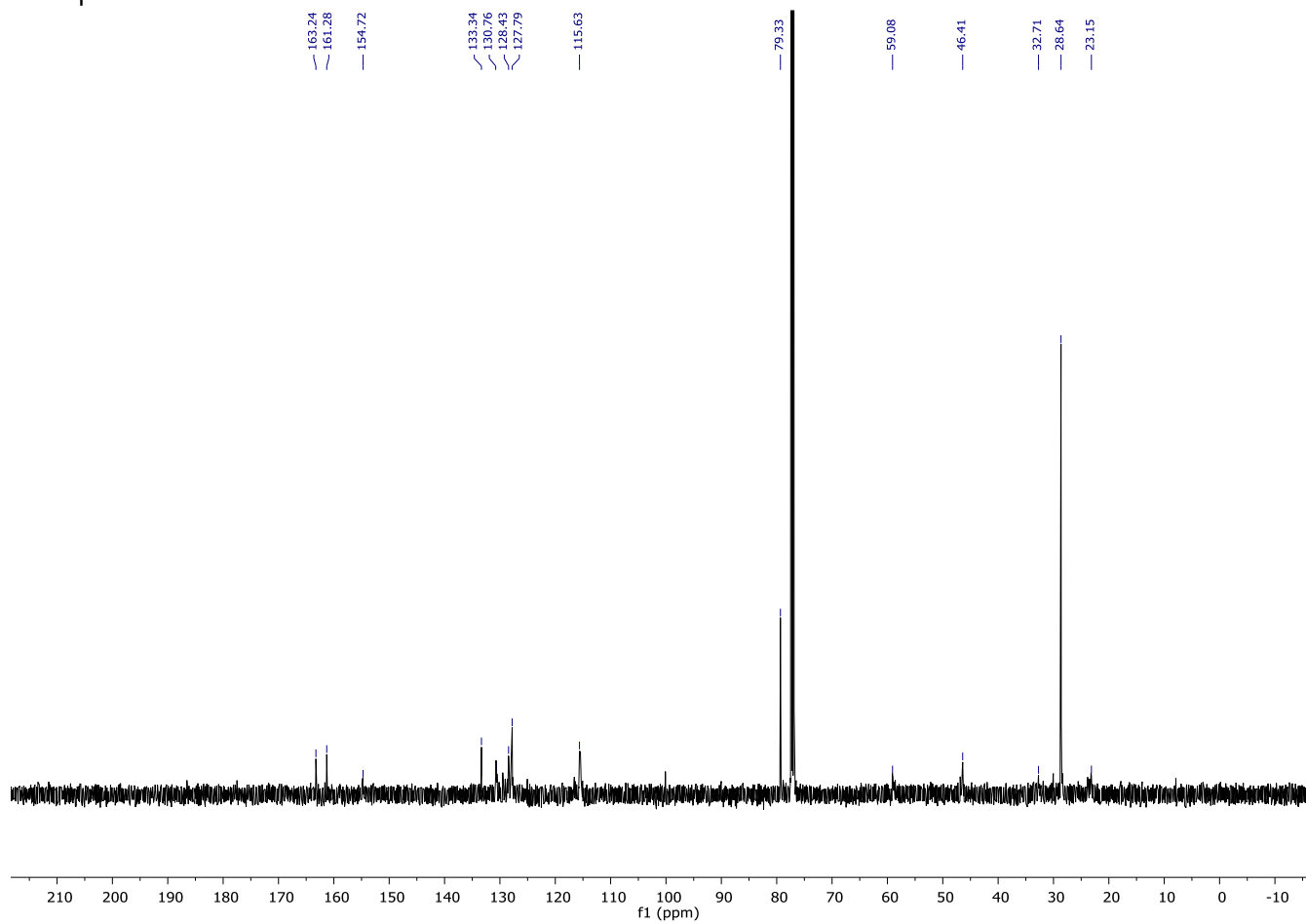
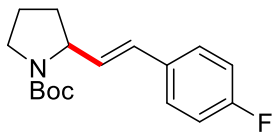
<sup>13</sup>C {<sup>1</sup>H} NMR (126 MHz, D-CHLOROFORM) Spectrum of *tert*-Butyl (E)-2-(2-(Benzo[d][1,3]dioxol-5-yl)vinyl)pyrrolidine-1-carboxylate (3h)



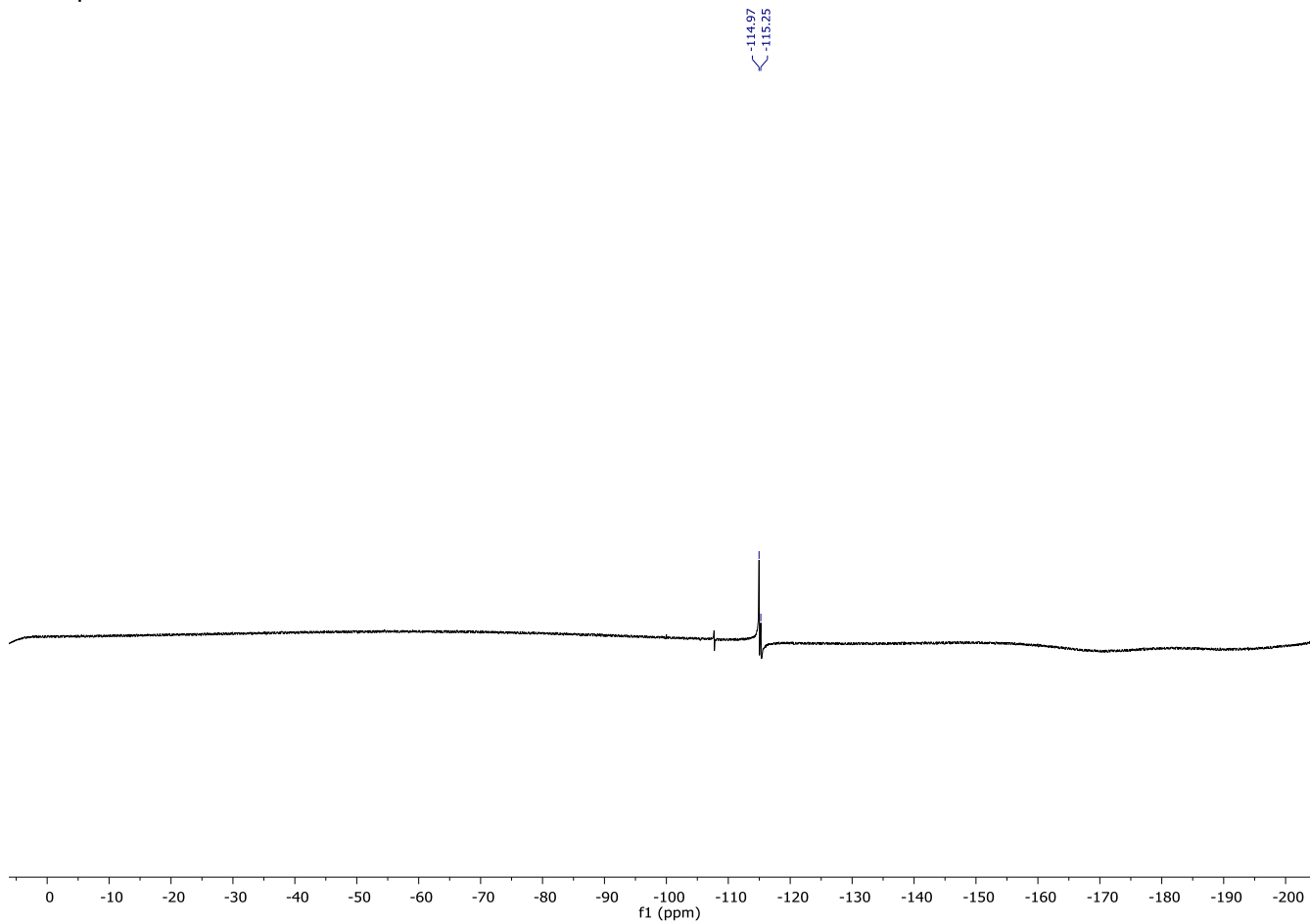
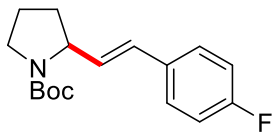
<sup>1</sup>H NMR (500 MHZ, D-CHLOROFORM) Spectrum of *tert*-Butyl (E)-2-(4-Fluoro)styrylpyrrolidine-1-carboxylate (3i)



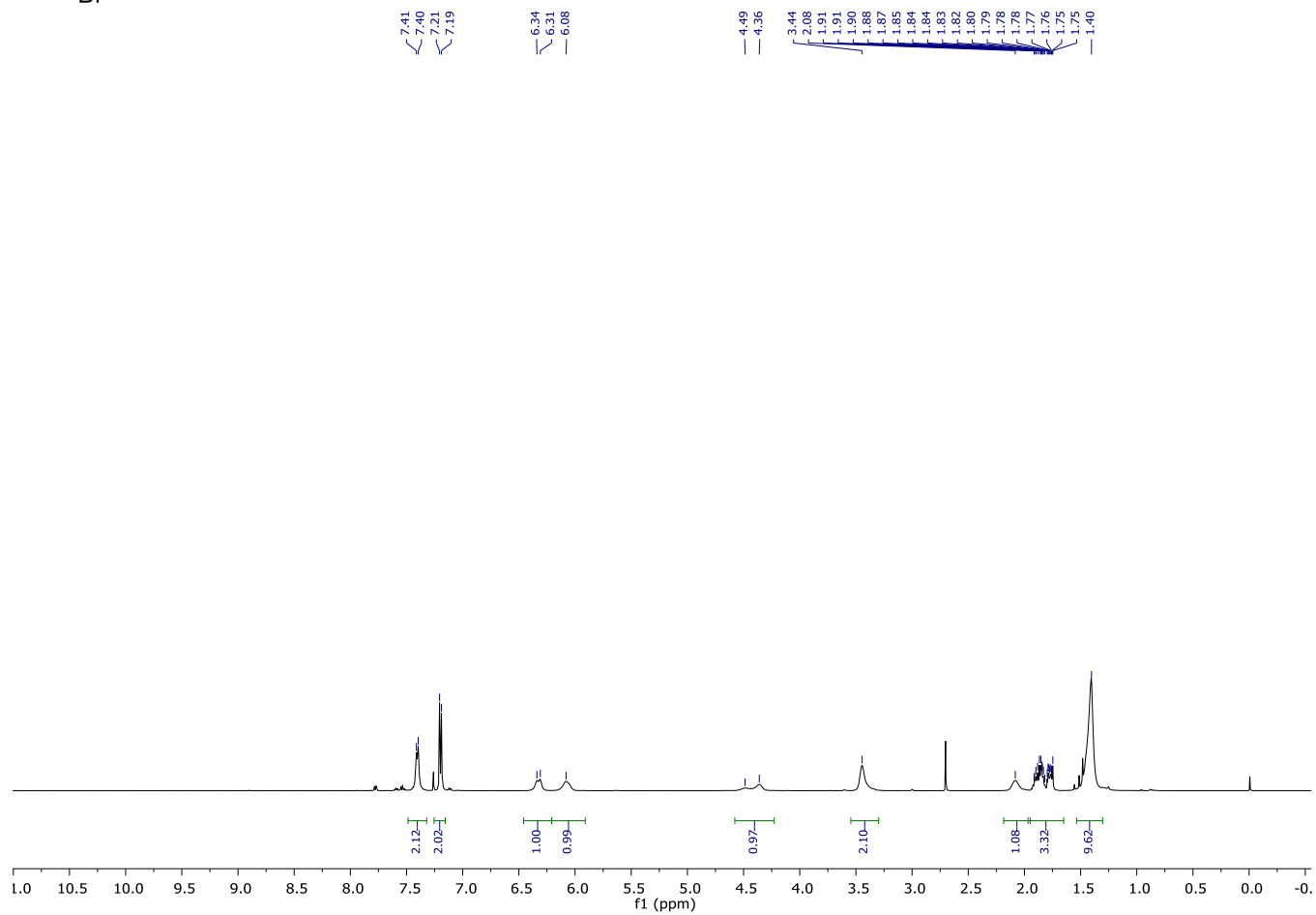
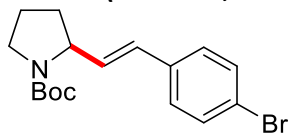
<sup>13</sup>C {<sup>1</sup>H} NMR (126 MHz, D-CHLOROFORM) Spectrum of *tert*-Butyl (E)-2-(4-Fluoro)styrylpyrrolidine-1-carboxylate (3i)



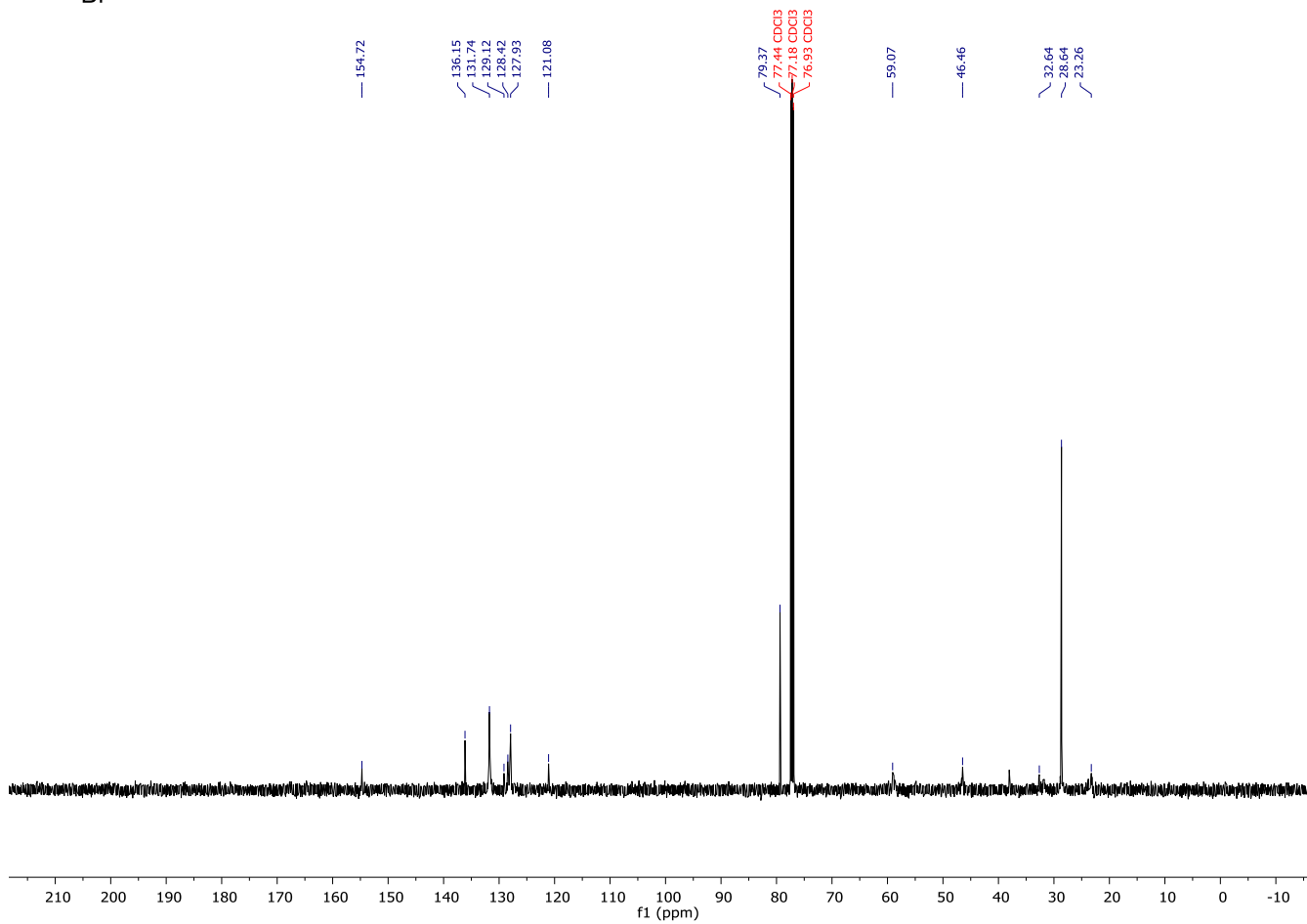
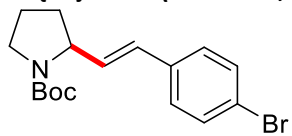
<sup>19</sup>F NMR (470.8 MHz, d-chloroform) Spectrum of *tert*-Butyl (E)-2-(4-Fluoro)styrylpyrrolidine-1-carboxylate (3i)



<sup>1</sup>H NMR (500 MHz, D-CHLOROFORM) Spectrum of *tert*-Butyl (E)-2-(4-Bromo)styrylpyrrolidine-1-carboxylate (3j)

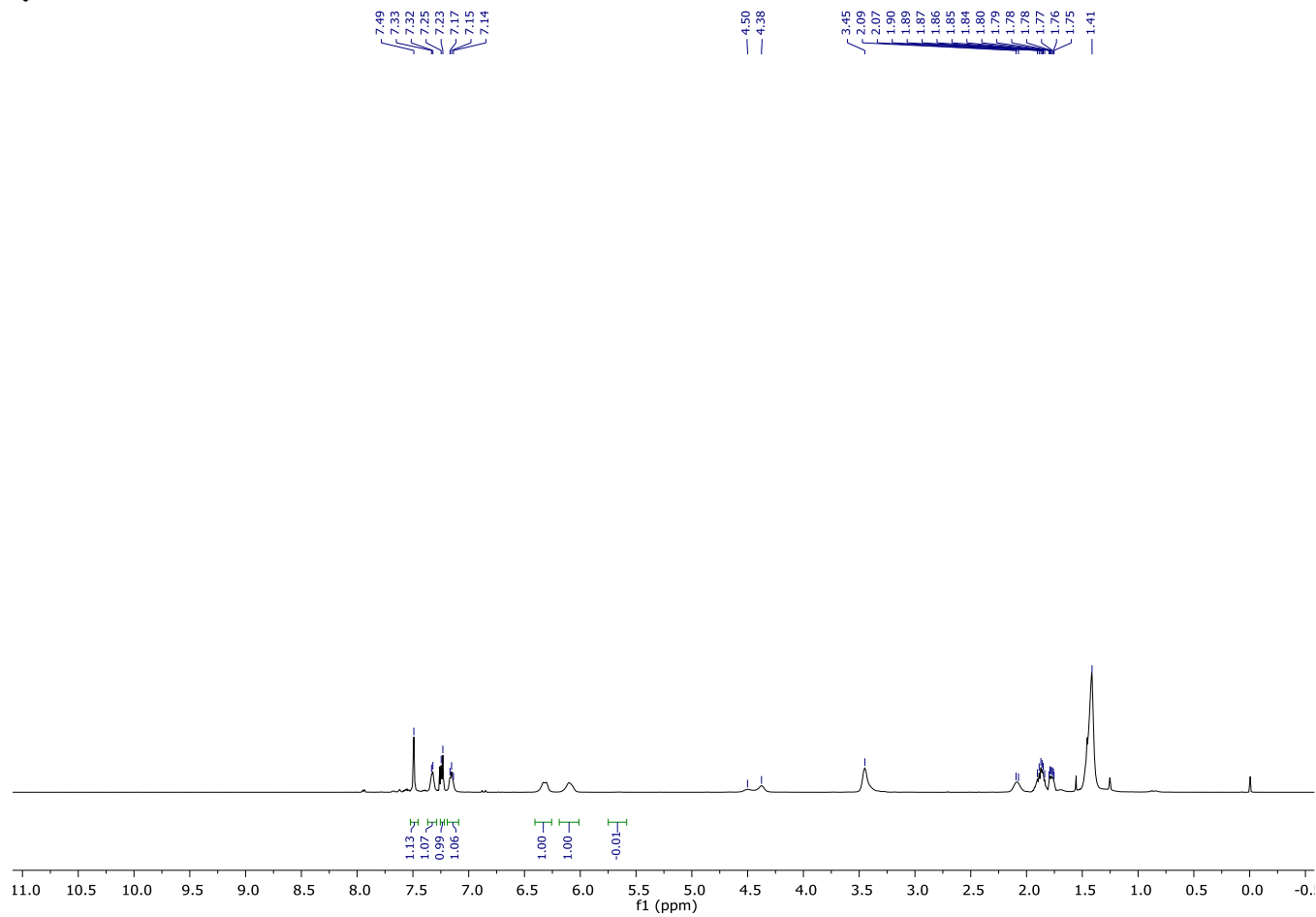
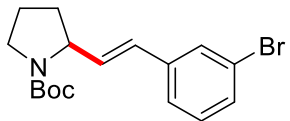


<sup>13</sup>C {<sup>1</sup>H} NMR (126 MHz, D-CHLOROFORM) Spectrum of *tert*-Butyl (E)-2-(4-Bromo)styrylpyrrolidine-1-carboxylate (3j)

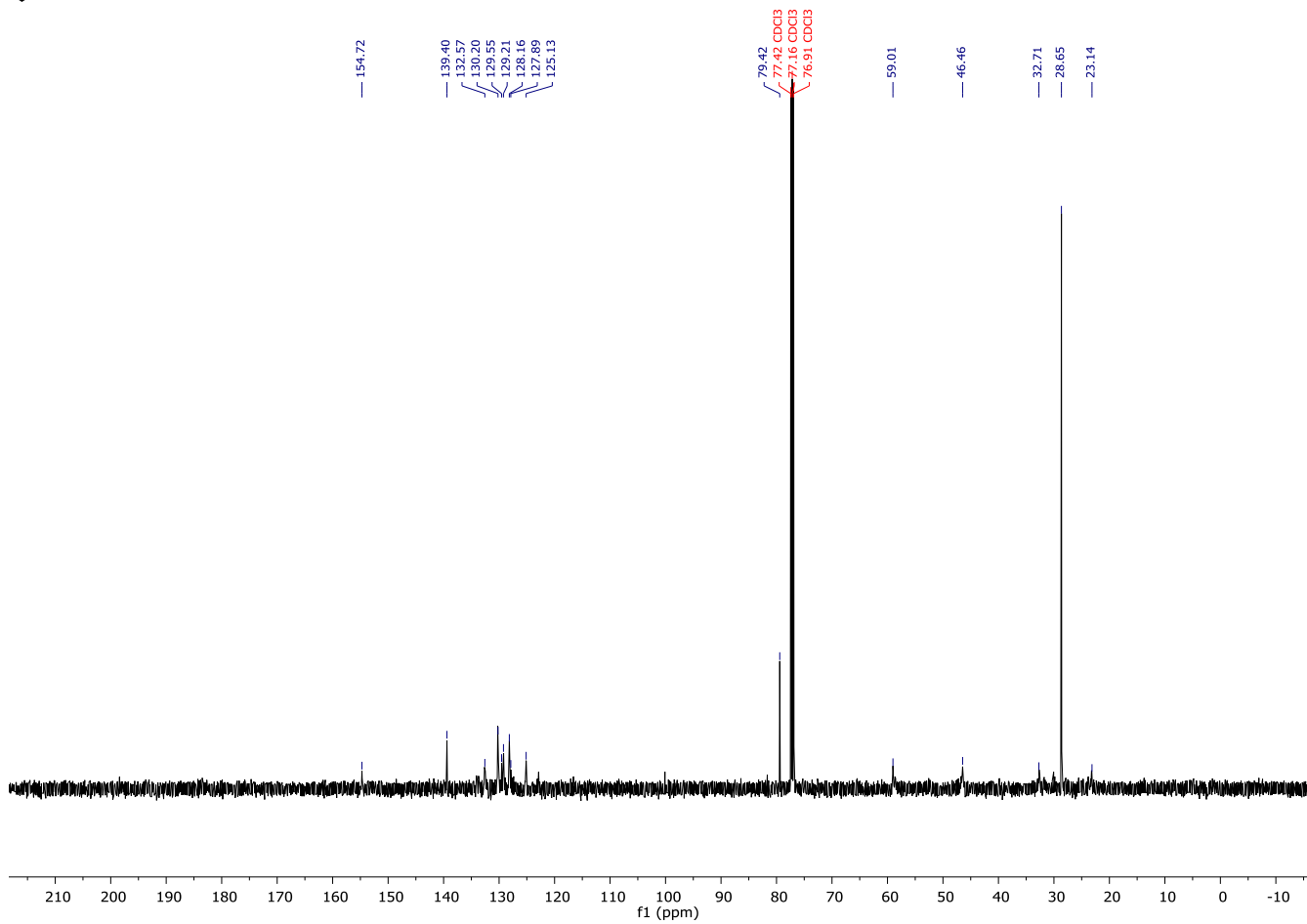
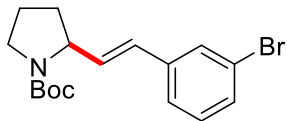




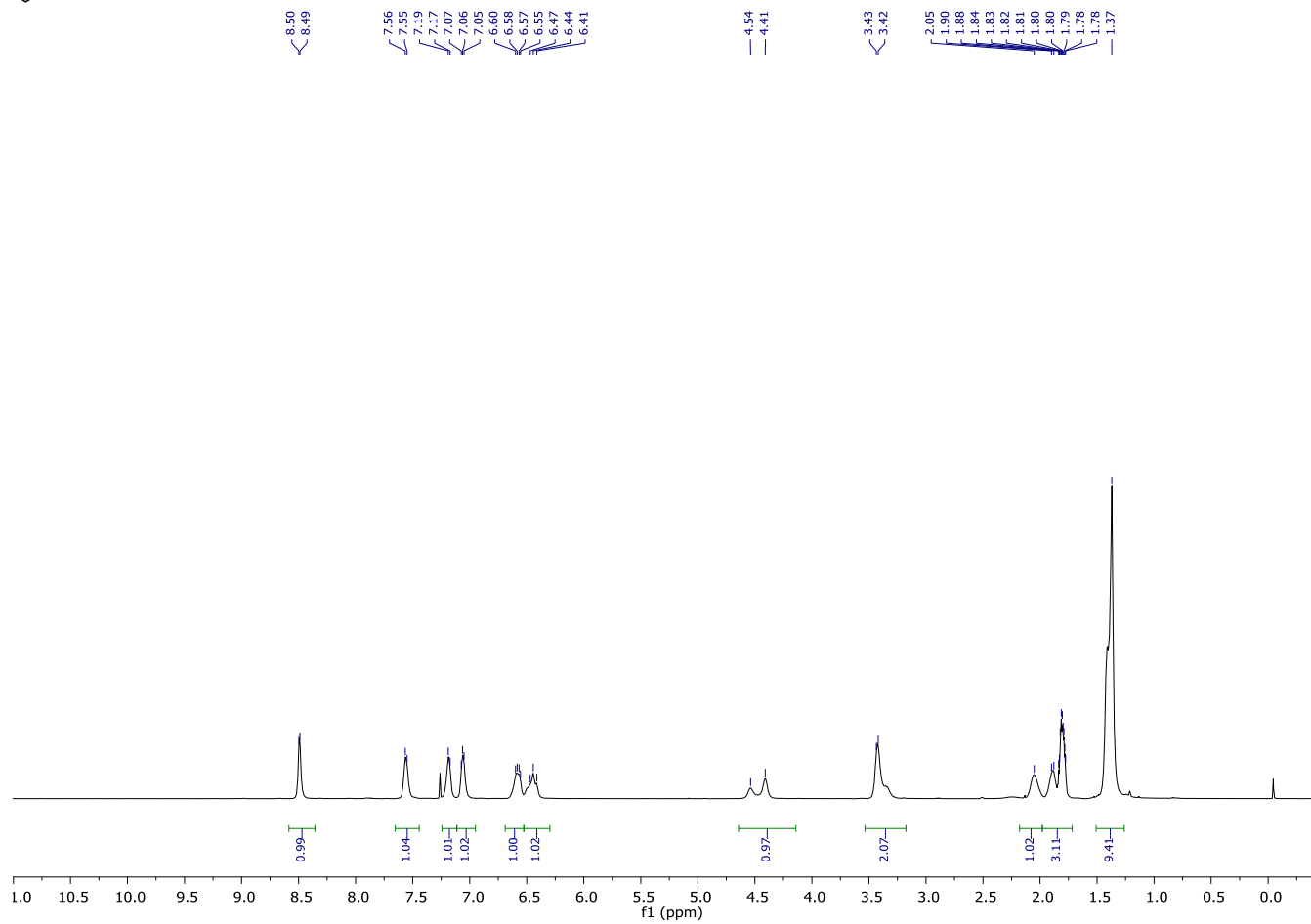
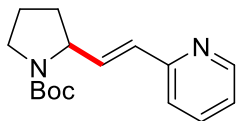
<sup>1</sup>H NMR (500 MHZ, D-CHLOROFORM) Spectrum of *tert*-Butyl (E)-2-(3-Bromo)styrylpyrrolidine-1-carboxylate (3k)



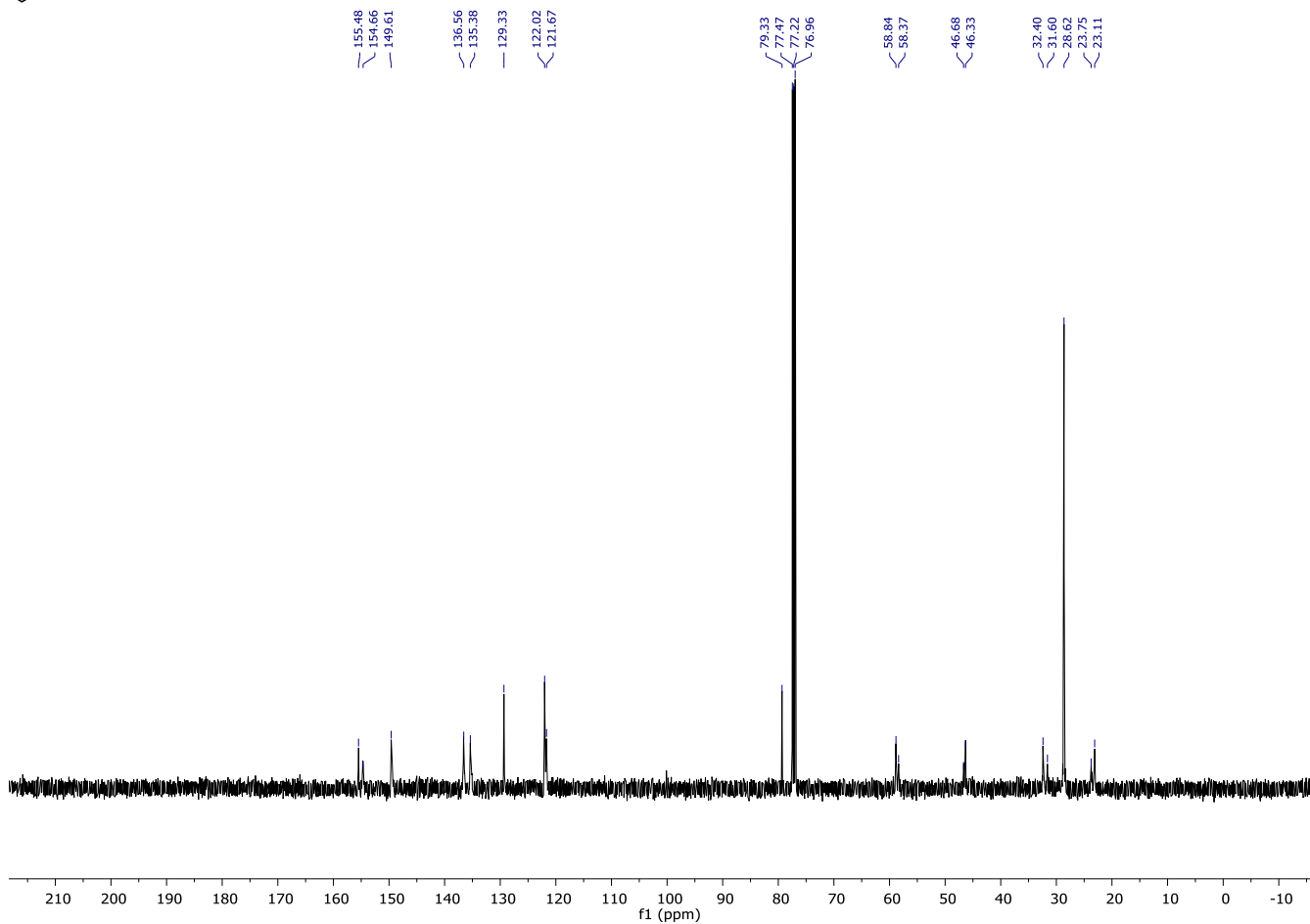
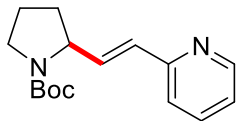
<sup>13</sup>C {<sup>1</sup>H} NMR (126 MHz, D-CHLOROFORM) Spectrum of *tert*-Butyl (E)-2-(3-Bromo)styrylpyrrolidine-1-carboxylate (3k)



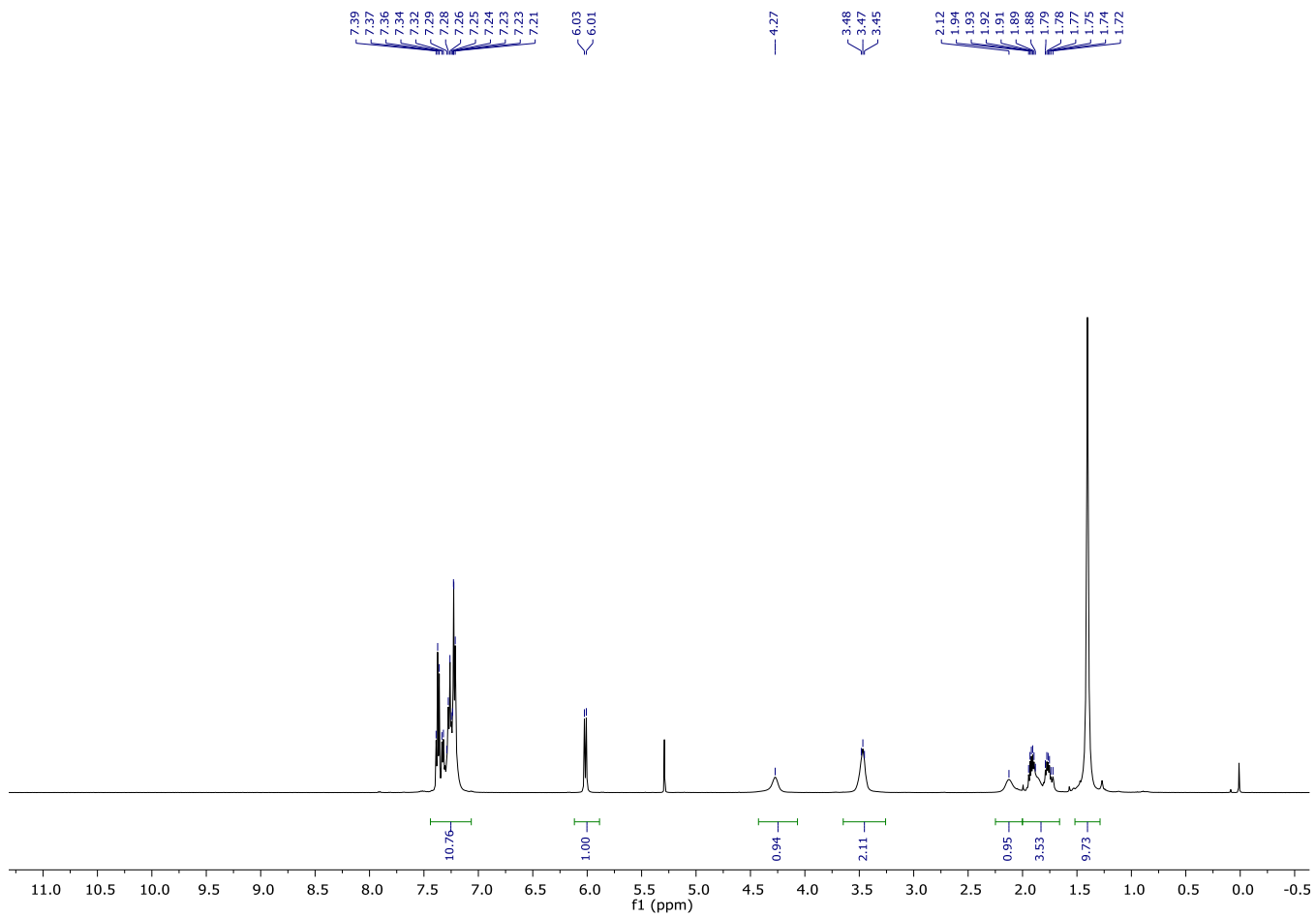
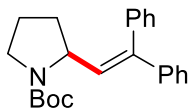
<sup>1</sup>H NMR (500 MHz, D-CHLOROFORM) Spectrum of *tert*-Butyl (E)-2-(2-(Pyridin-2-yl)vinyl)pyrrolidine-1-carboxylate (3I)



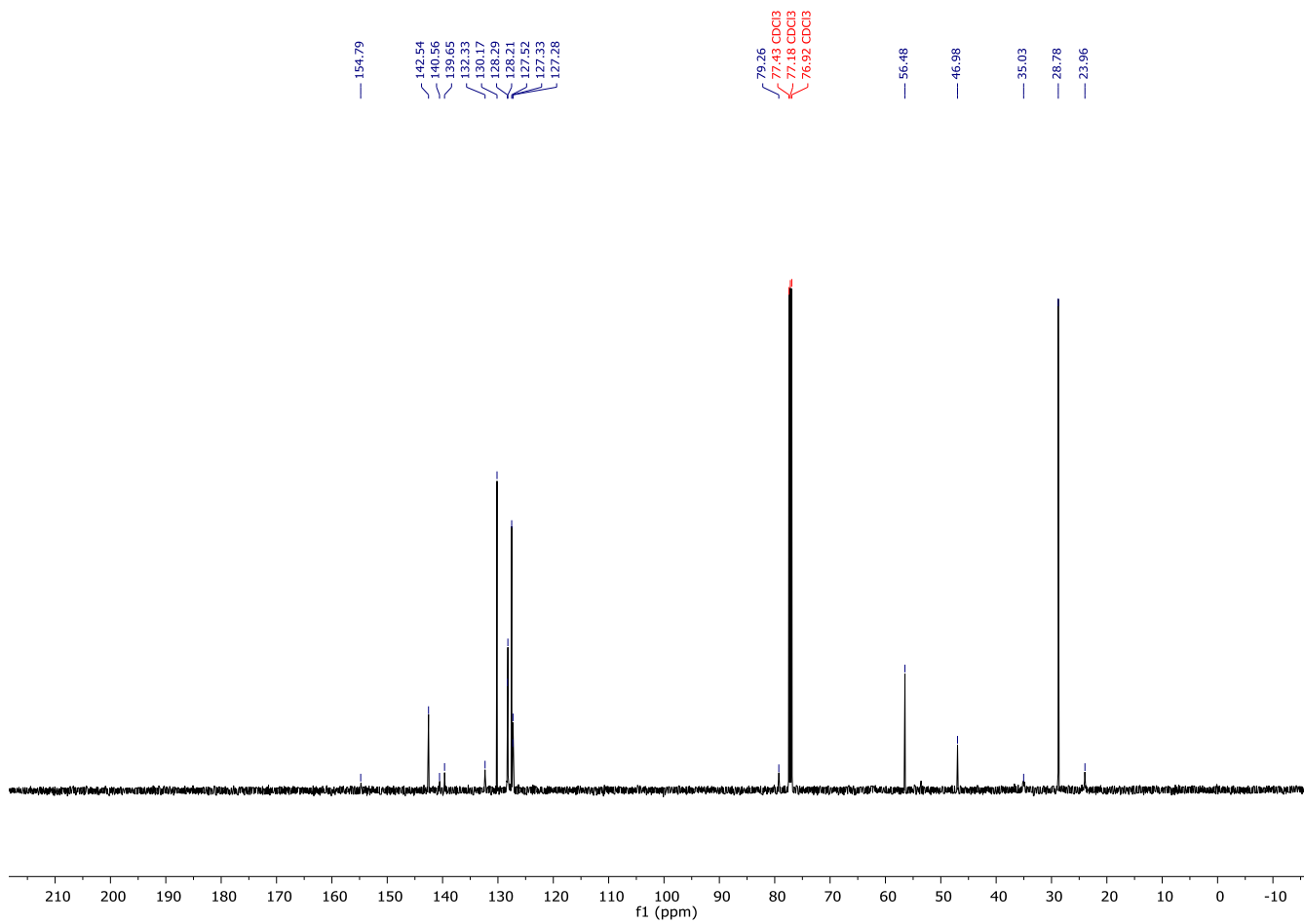
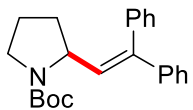
<sup>13</sup>C {<sup>1</sup>H} NMR (126 MHz, D-CHLOROFORM) Spectrum of *tert*-Butyl (E)-2-(2-(Pyridin-2-yl)vinyl)pyrrolidine-1-carboxylate (3l)



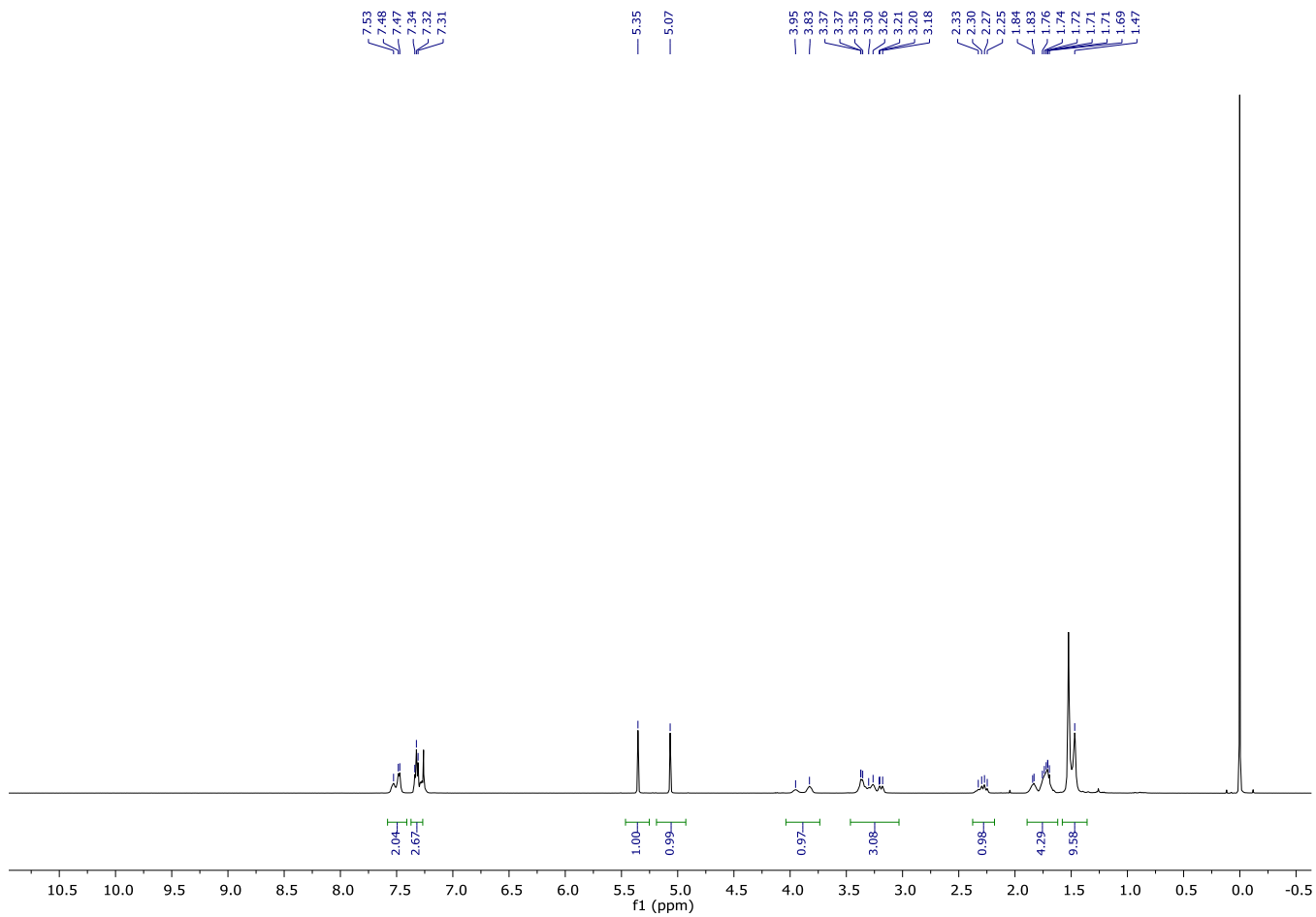
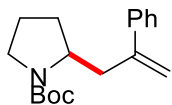
<sup>1</sup>H NMR (500 MHZ, D-CHLOROFORM) Spectrum of *tert*-Butyl 2-(2,2-Diphenylvinyl)pyrrolidine-1-carboxylate (3m)



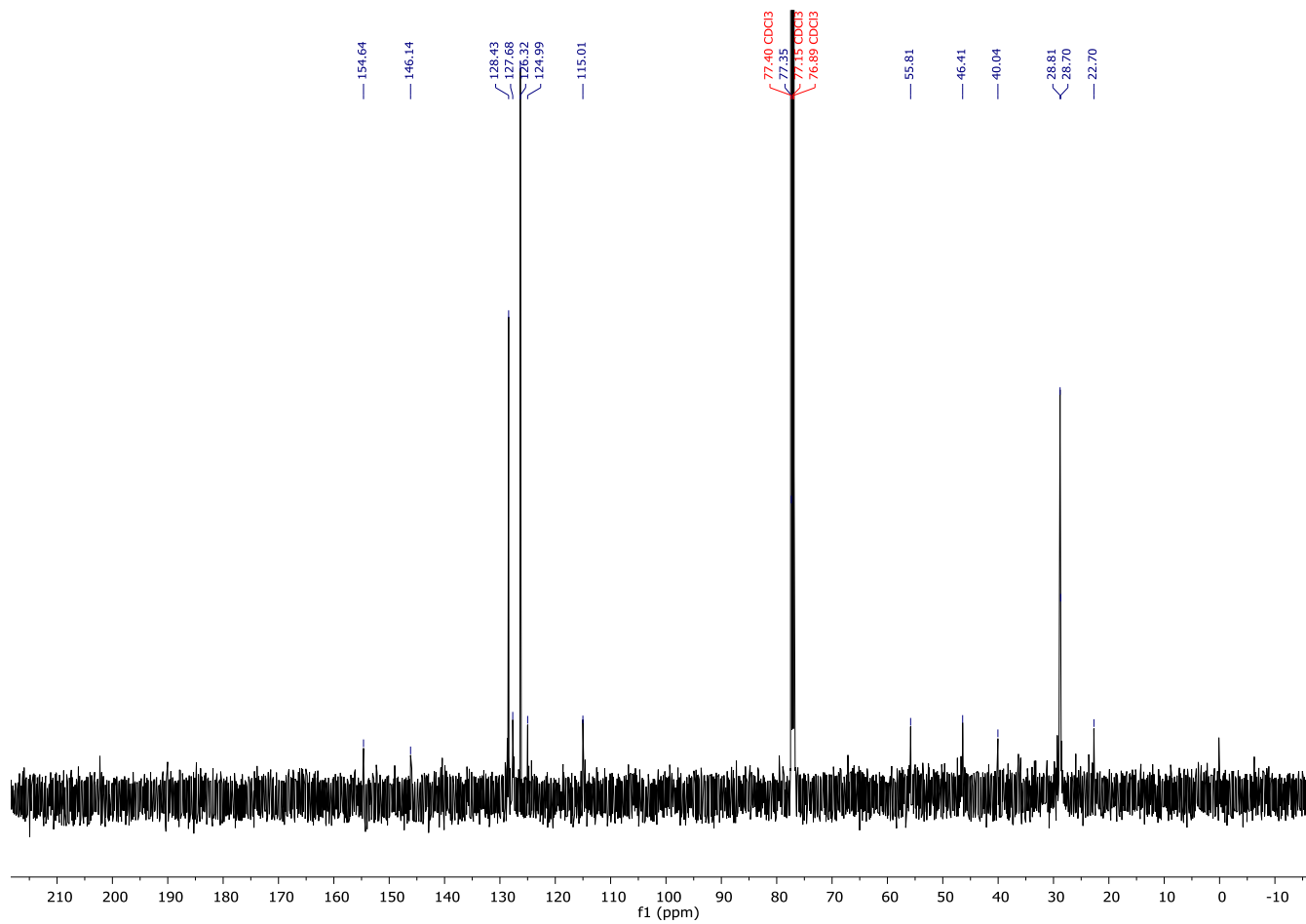
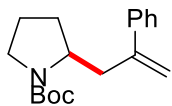
<sup>13</sup>C {<sup>1</sup>H} NMR (126 MHz, D-CHLOROFORM) Spectrum of *tert*-Butyl 2-(2,2-Diphenylvinyl)pyrrolidine-1-carboxylate (3m)



<sup>1</sup>H NMR (500 MHz, D-CHLOROFORM) Spectrum of *tert*-Butyl 2-(2-Phenylallyl)pyrrolidine-1-carboxylate (3q)

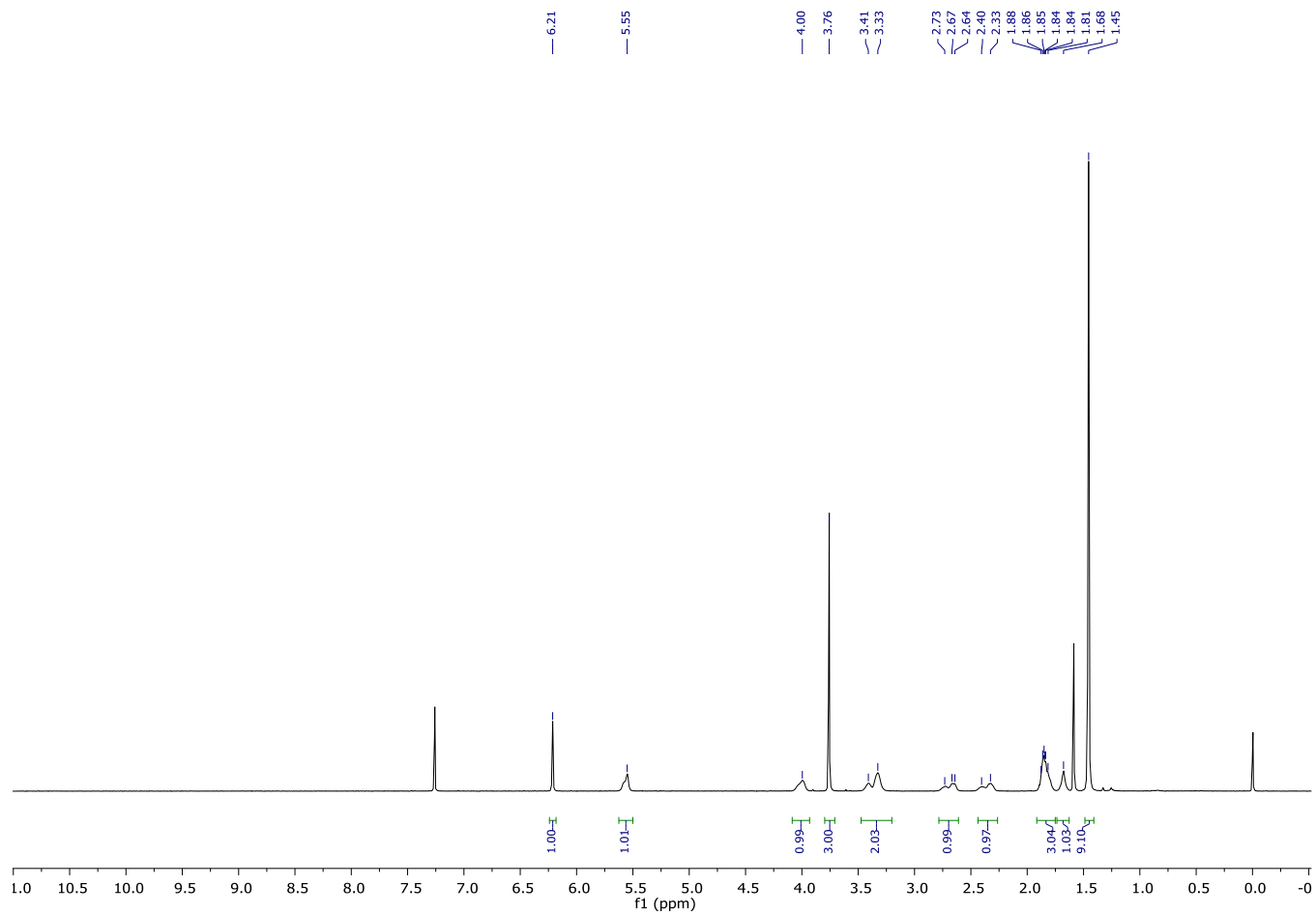
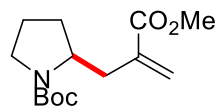


$^{13}\text{C}$  { $^1\text{H}$ } NMR (126 MHz, D-CHLOROFORM) Spectrum of *tert*-Butyl 2-(2-Phenylallyl)pyrrolidine-1-carboxylate (3q)

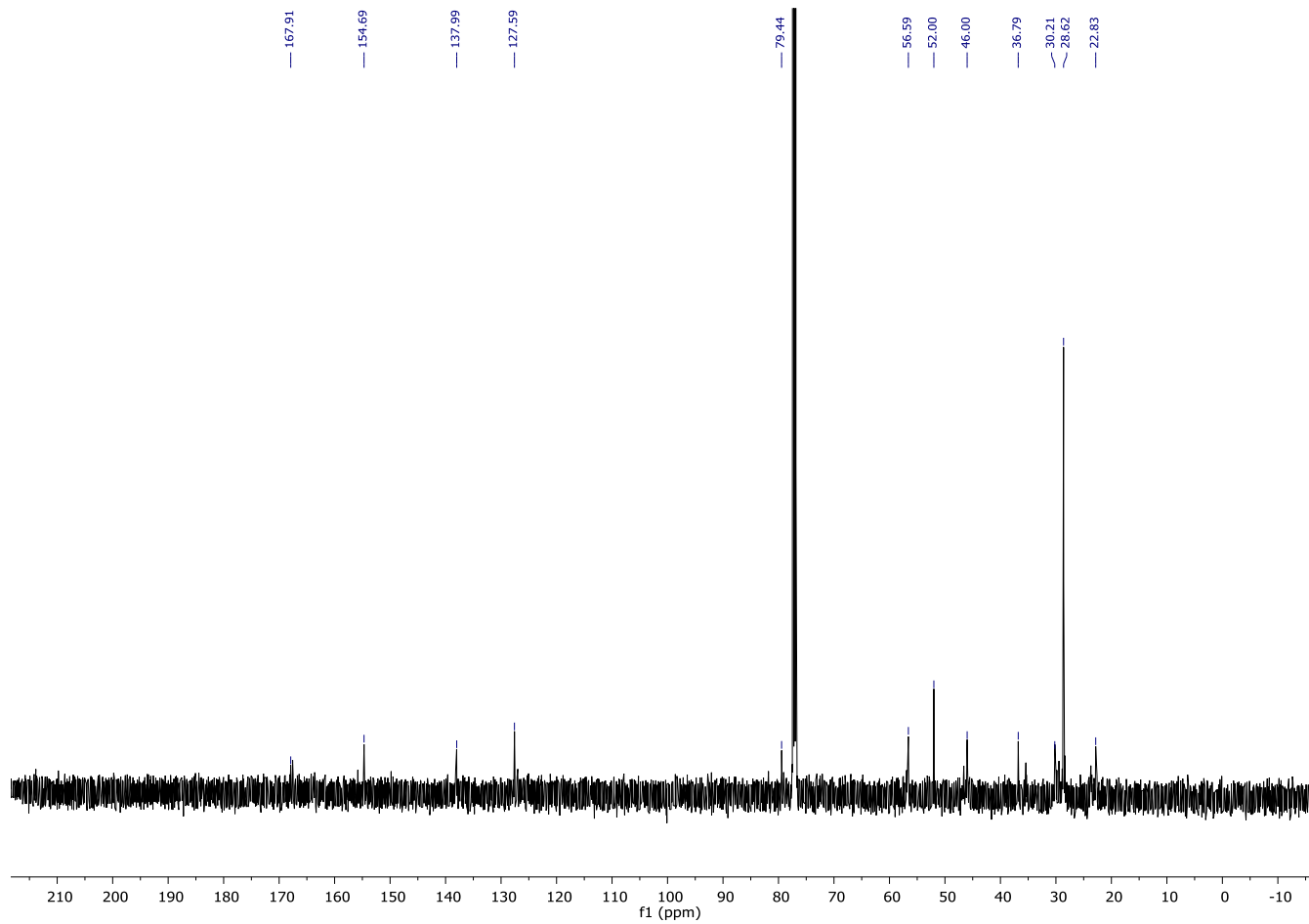
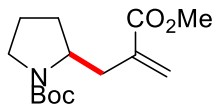




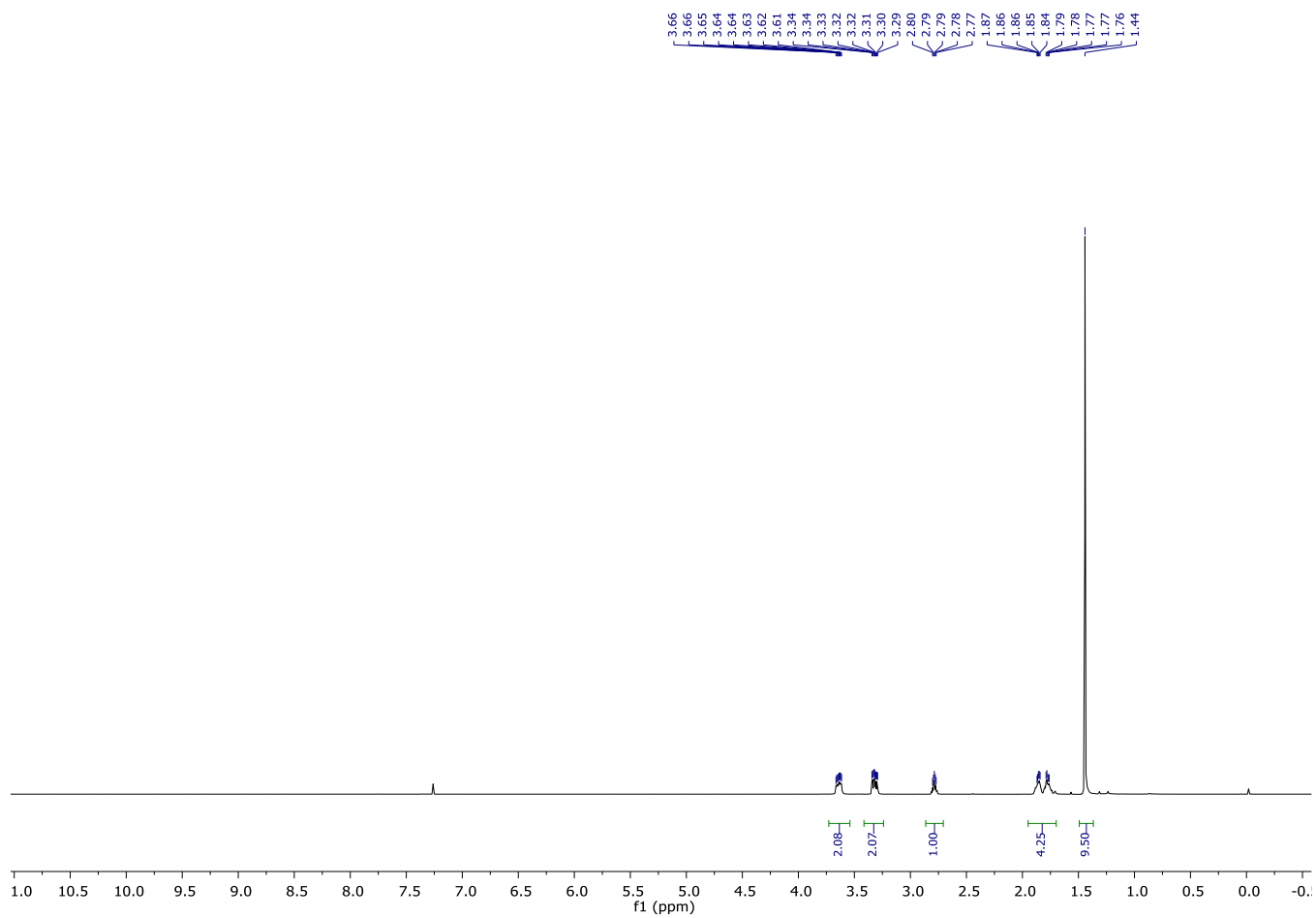
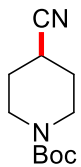
<sup>1</sup>H NMR (500 MHz, D-CHLOROFORM) Spectrum of *tert*-Butyl 2-(2-(Methoxycarbonyl)allyl)pyrrolidine-1-carboxylate (3r)



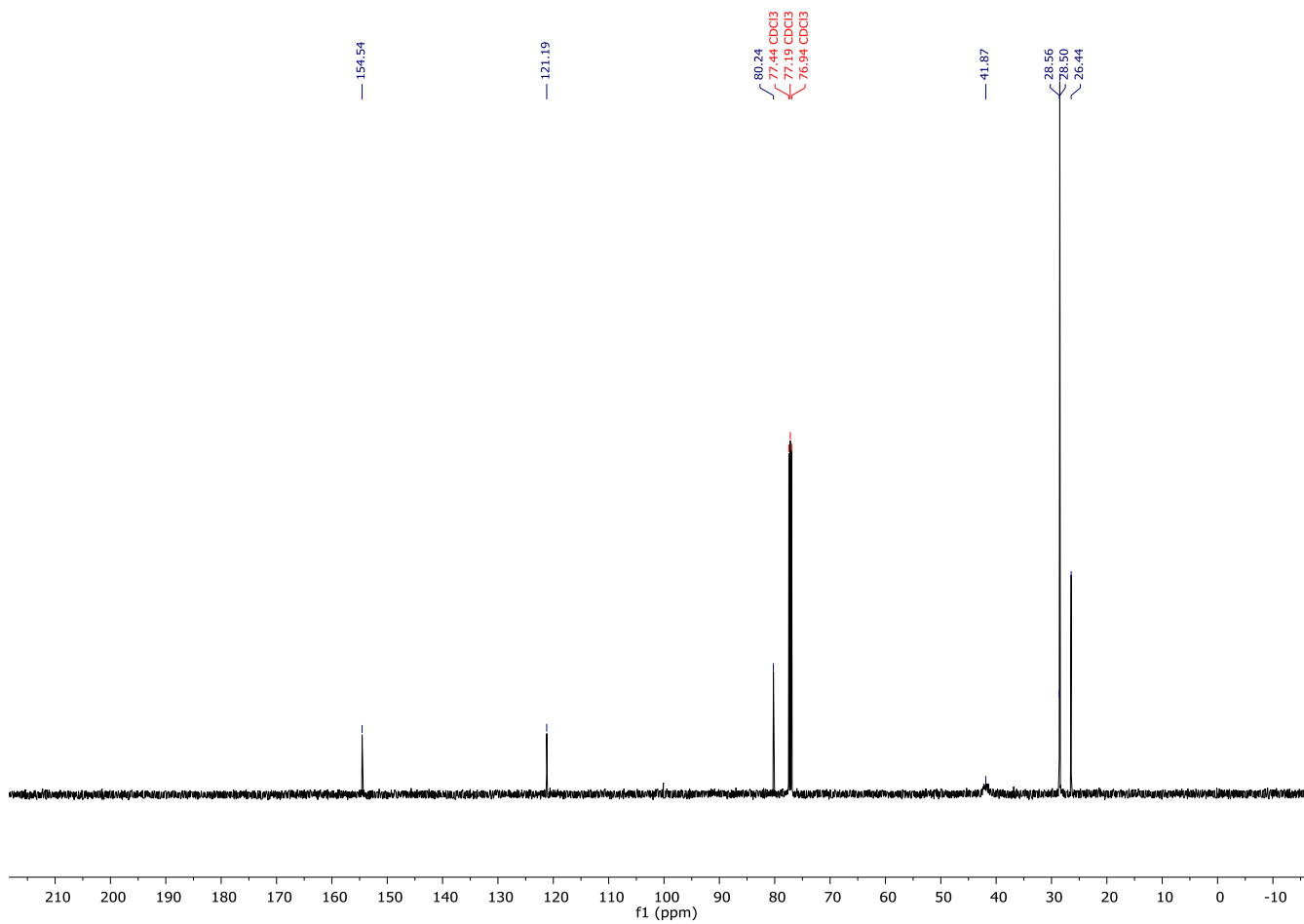
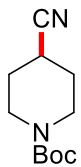
$^{13}\text{C}$  { $^1\text{H}$ } NMR (126 MHz, D-CHLOROFORM) Spectrum of *tert*-Butyl 2-(2-(Methoxycarbonyl)allyl)pyrrolidine-1-carboxylate (3r)



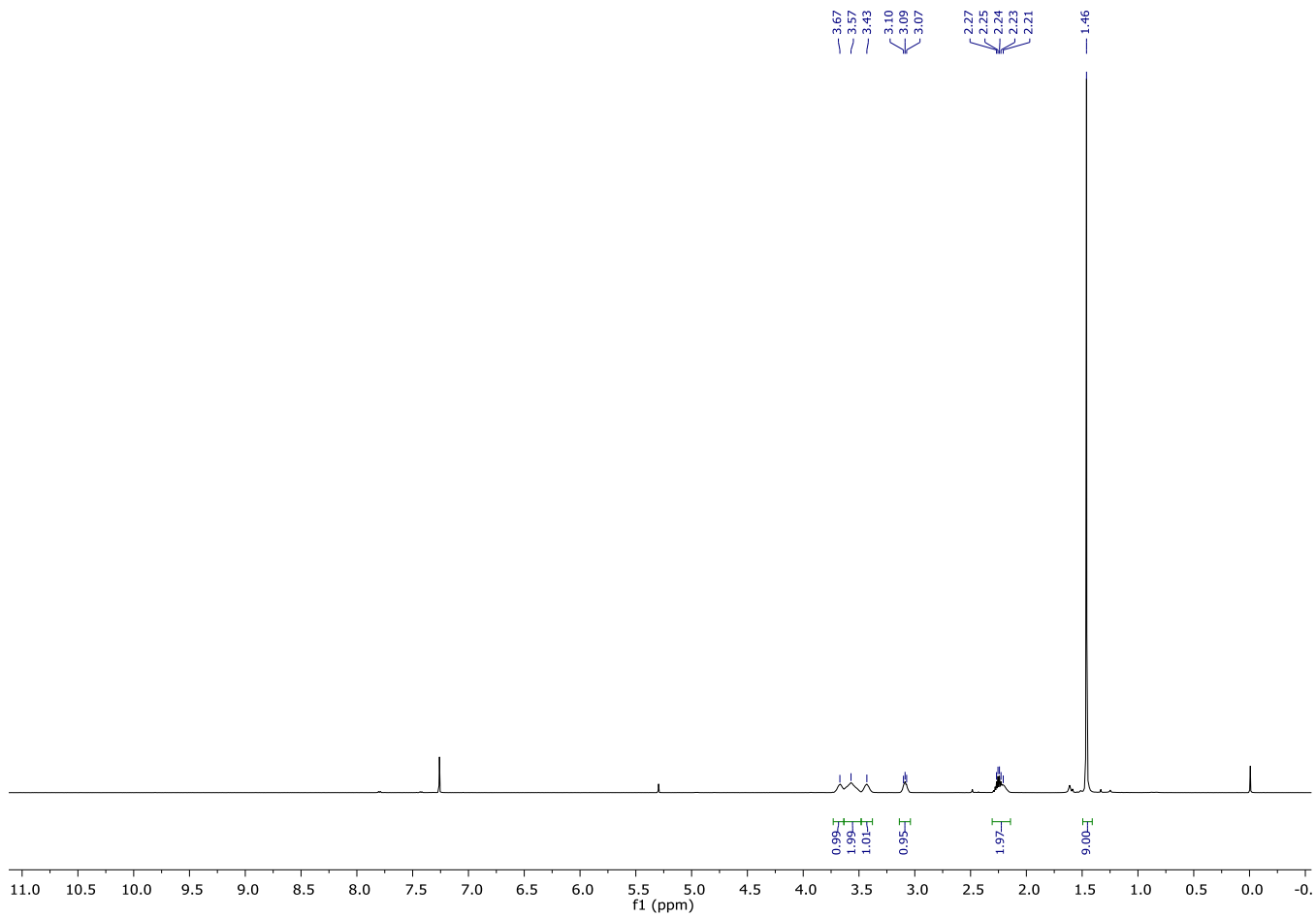
<sup>1</sup>H NMR (500 MHZ, D-CHLOROFORM) Spectrum of *tert*-Butyl 4-Cyanopiperidine-1-carboxylate (6a)



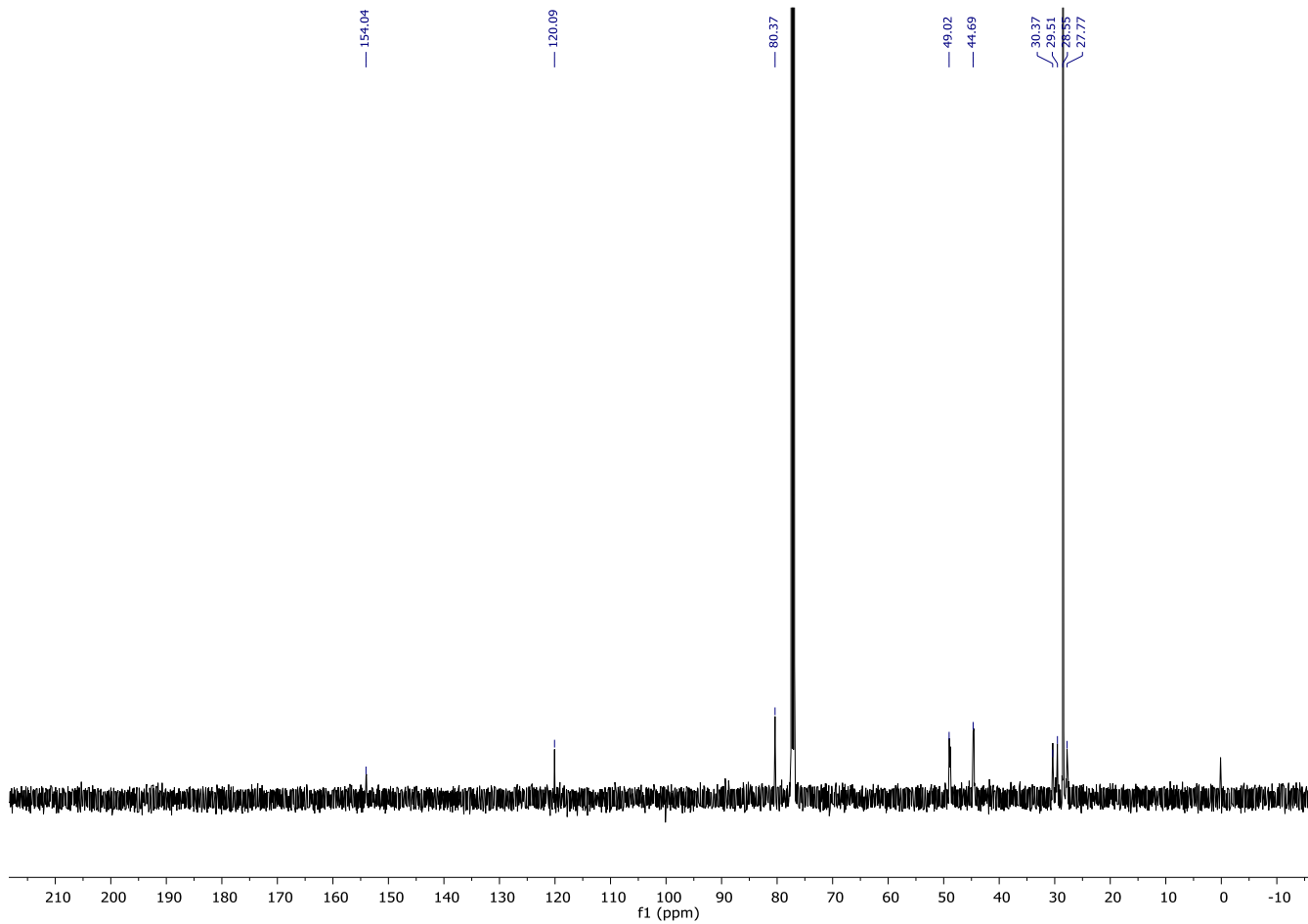
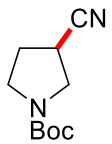
$^{13}\text{C}$  { $^1\text{H}$ } NMR (126 MHz, D-CHLOROFORM) Spectrum of *tert*-Butyl 4-Cyanopiperidine-1-carboxylate (6a)



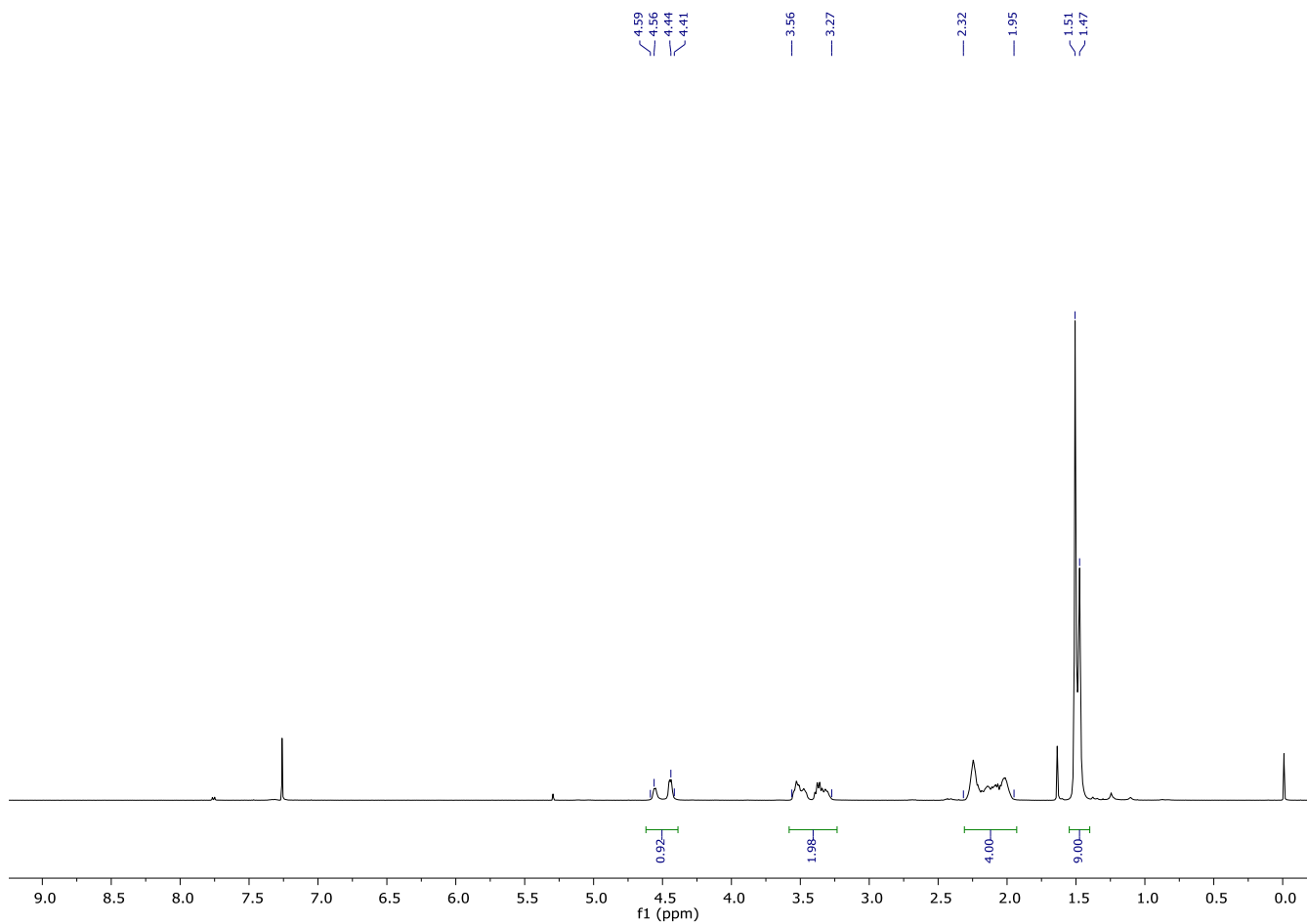
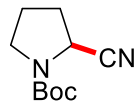
<sup>1</sup>H NMR (500 MHz, D-CHLOROFORM) Spectrum of *tert*-Butyl 3-Cyanopyrrolidine-1-carboxylate (6b)



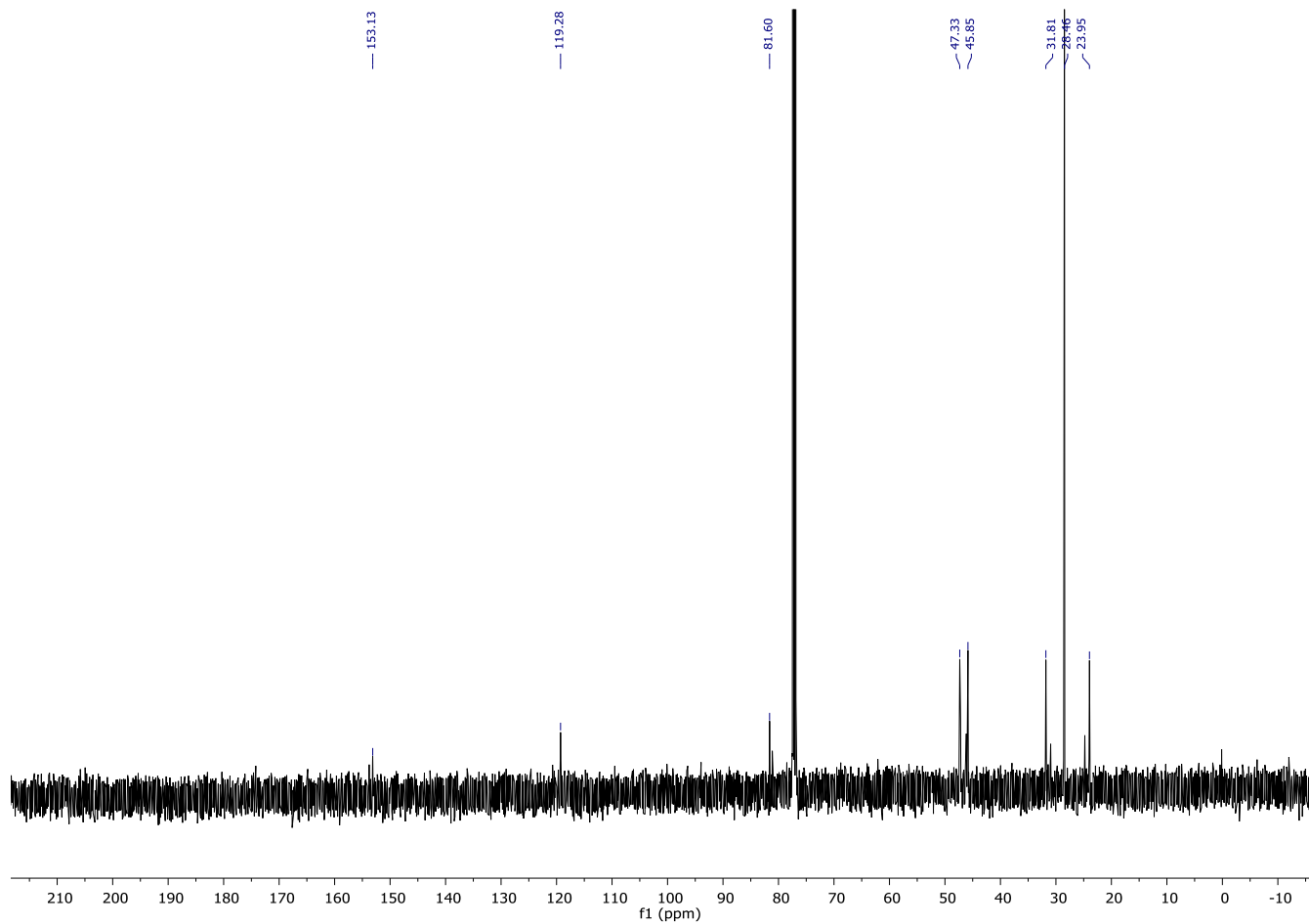
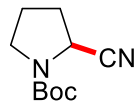
$^{13}\text{C}$  { $^1\text{H}$ } NMR (126 MHz, D-CHLOROFORM) Spectrum of *tert*-Butyl 3-Cyanopyrrolidine-1-carboxylate (6b)



<sup>1</sup>H NMR (500 MHz, D-CHLOROFORM) Spectrum of *tert*-Butyl 2-Cyanopyrrolidine-1-carboxylate (6c)

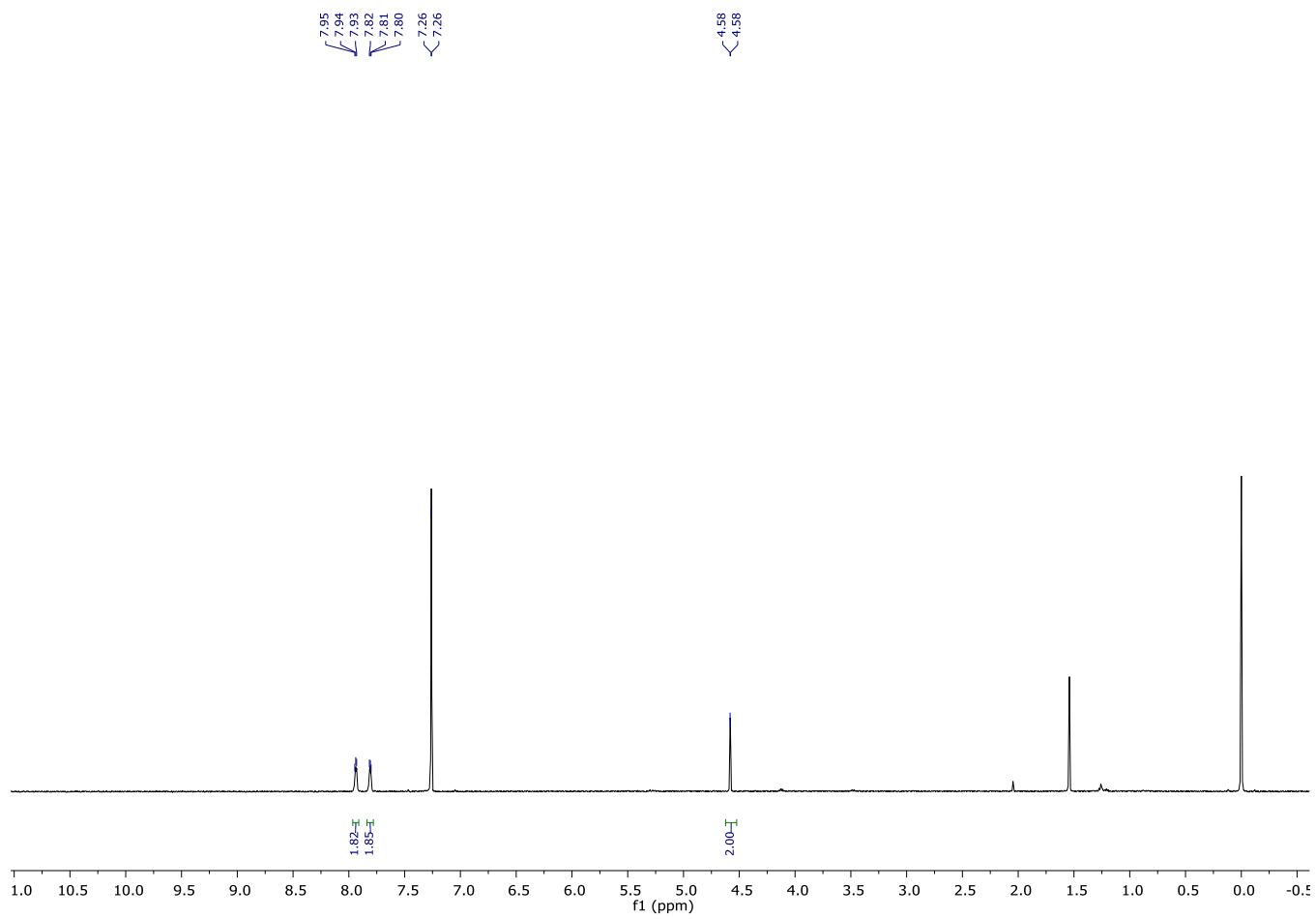
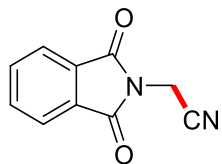


$^{13}\text{C}$  { $^1\text{H}$ } NMR (126 MHz, D-CHLOROFORM) Spectrum of *tert*-Butyl 2-Cyanopyrrolidine-1-carboxylate (6c)

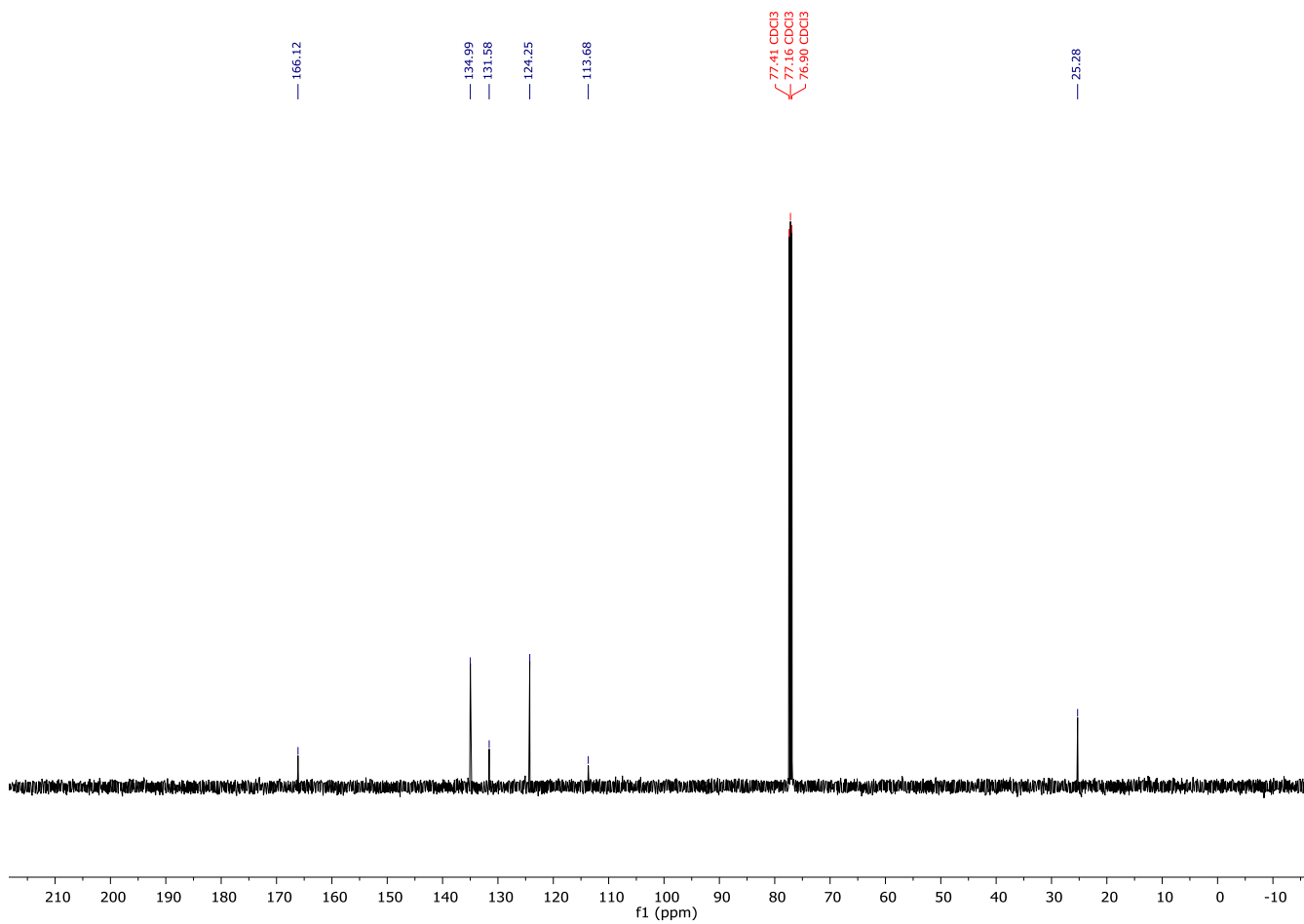
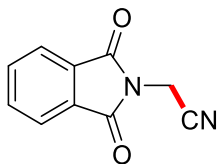




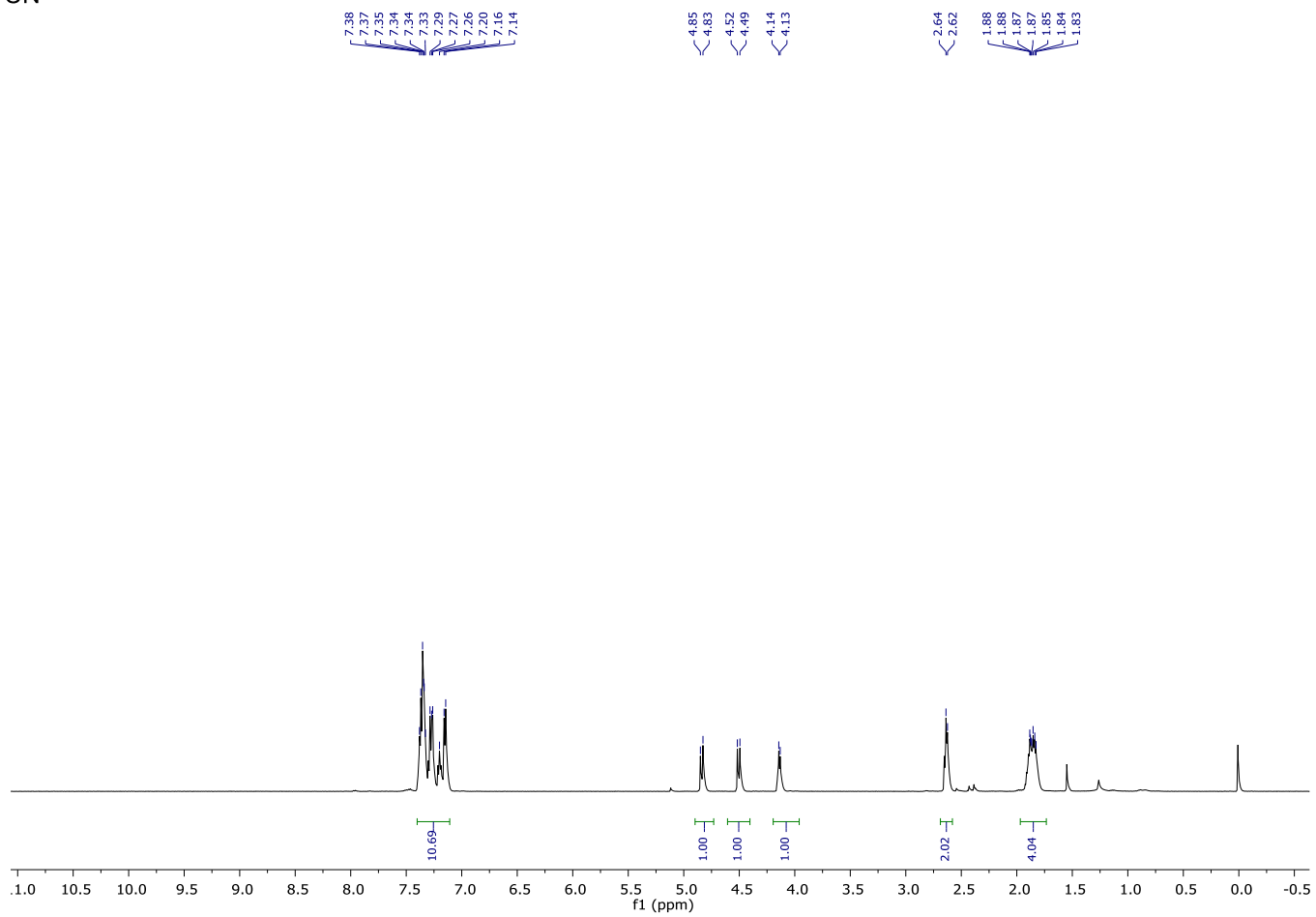
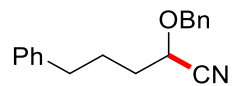
<sup>1</sup>H NMR (500 MHz, D-CHLOROFORM) Spectrum of 2-(1,3-Dioxoisindolin-2-yl)acetonitrile (6d)



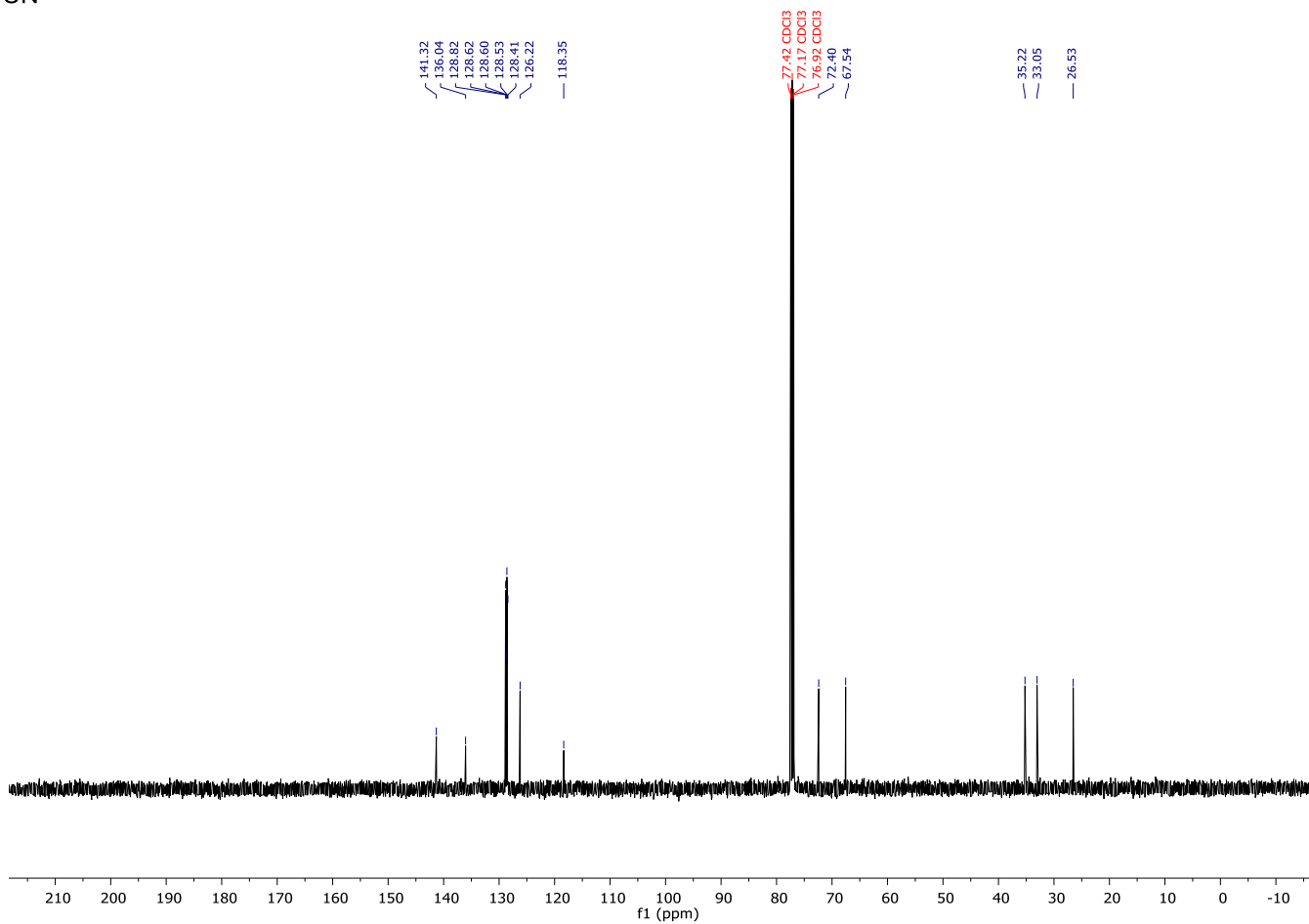
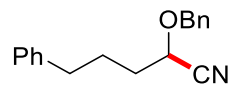
$^{13}\text{C}$  { $^1\text{H}$ } NMR (126 MHz, D-CHLOROFORM) Spectrum of 2-(1,3-Dioxoisindolin-2-yl)acetonitrile (6d)



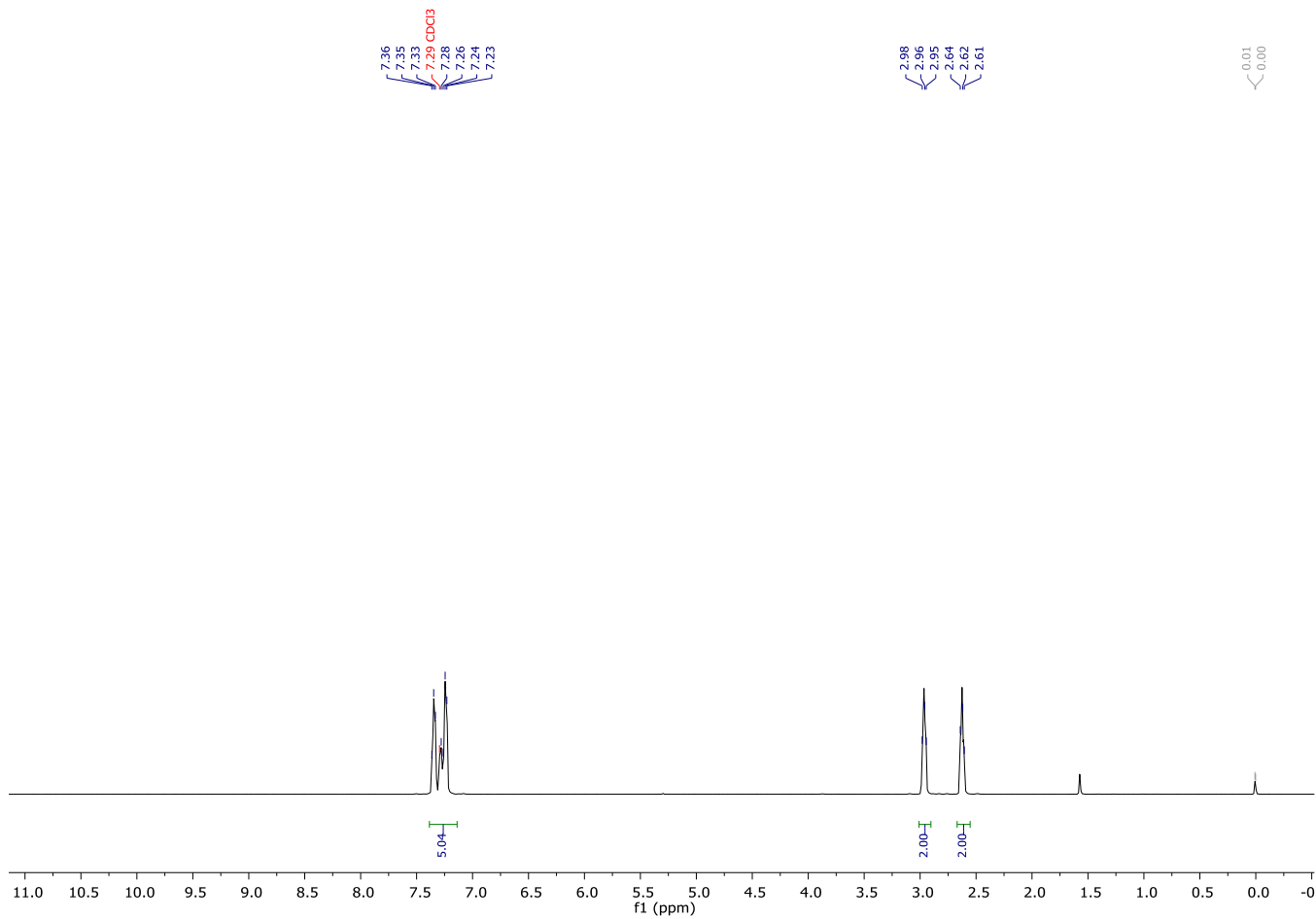
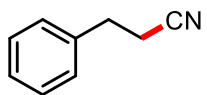
<sup>1</sup>H NMR (500 MHZ, D-CHLOROFORM) Spectrum of 2-(Benzyloxy)-5-phenylpentanenitrile (6e)



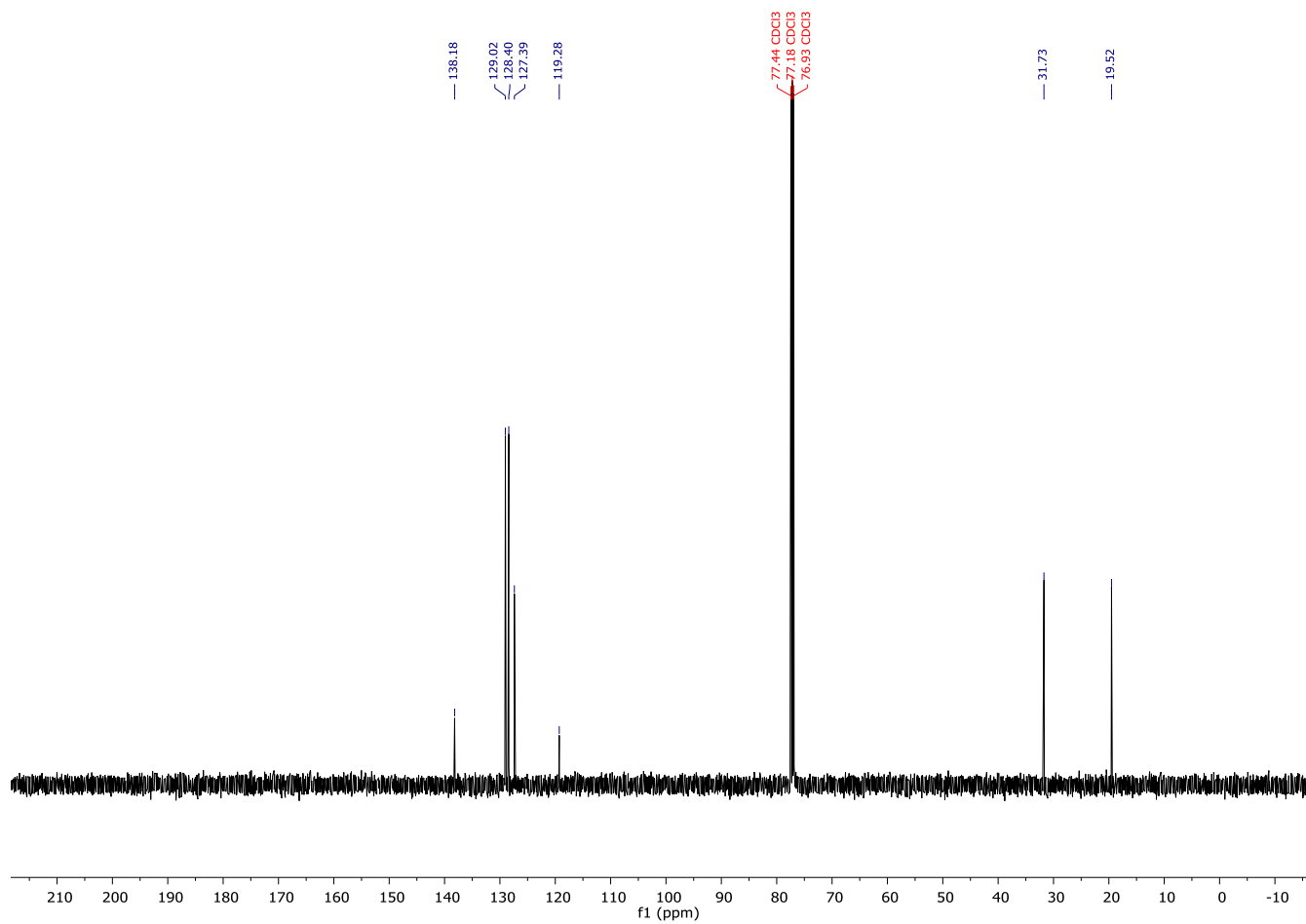
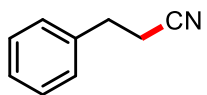
<sup>13</sup>C {<sup>1</sup>H} NMR (126 MHz, D-CHLOROFORM) Spectrum of 2-(Benzyloxy)-5-phenylpentanenitrile (6e)



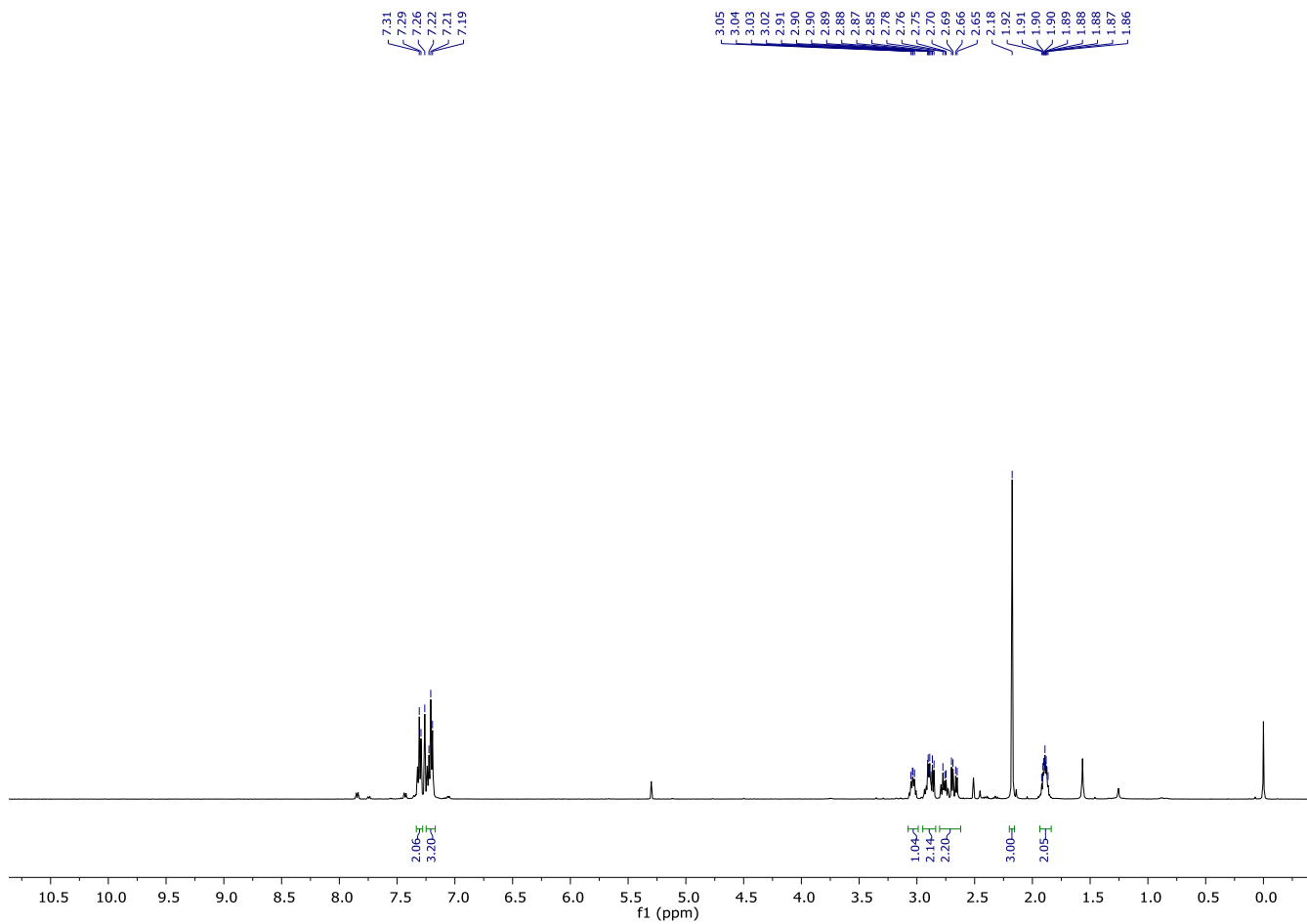
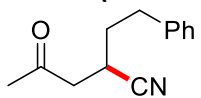
<sup>1</sup>H NMR (500 MHz, D-CHLOROFORM) Spectrum of 3-Phenylpropanenitrile (6f)



$^{13}\text{C}$  { $^1\text{H}$ } NMR (126 MHz, D-CHLOROFORM) Spectrum of 3-Phenylpropanenitrile (6f)



<sup>1</sup>H NMR (500 MHz, D-CHLOROFORM) Spectrum of 4-Oxo-2-phenethylpentanenitrile (6g)



$^{13}\text{C}$  { $^1\text{H}$ } NMR (126 MHz, D-CHLOROFORM) Spectrum of 4-Oxo-2-phenethylpentanenitrile (6g)

