

Supplementary Information

A new approach toward the synthesis of 2,4-bis(fluoroalkyl)-substituted quinoline derivatives using Fluoroalkyl Amino Reagent chemistry

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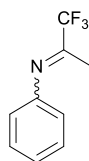
2,4-Bis(difluoromethyl)-7-(trifluoromethoxy)quinoline (3i) - ^1H NMR (400 MHz, CDCl_3)	166
2,4-Bis(difluoromethyl)-7-(trifluoromethoxy)quinoline (3i) - ^{19}F NMR (376 MHz, CDCl_3).....	167
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4-(Difluoromethyl)-7-fluoro-8-methyl-2-(trifluoromethyl)quinoline (2k) - ^{13}C NMR (101 MHz, CDCl_3)	186
2,4-Bis(difluoromethyl)-7-fluoro-8-methylquinoline (3m) - ^1H NMR (400 MHz, CDCl_3)	187
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7-Chloro-4-(difluoromethyl)-8-methyl-2-(trifluoromethyl)quinoline (2l) - ^{19}F NMR (376 MHz, CDCl_3)	191
7-Chloro-4-(difluoromethyl)-8-methyl-2-(trifluoromethyl)quinoline (2l) - ^{13}C NMR (101 MHz, CDCl_3)	192
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2,4-Bis(difluoromethyl)-6-(trifluoromethyl)quinoline (3p) - ^1H NMR (400 MHz, CDCl_3).....	199
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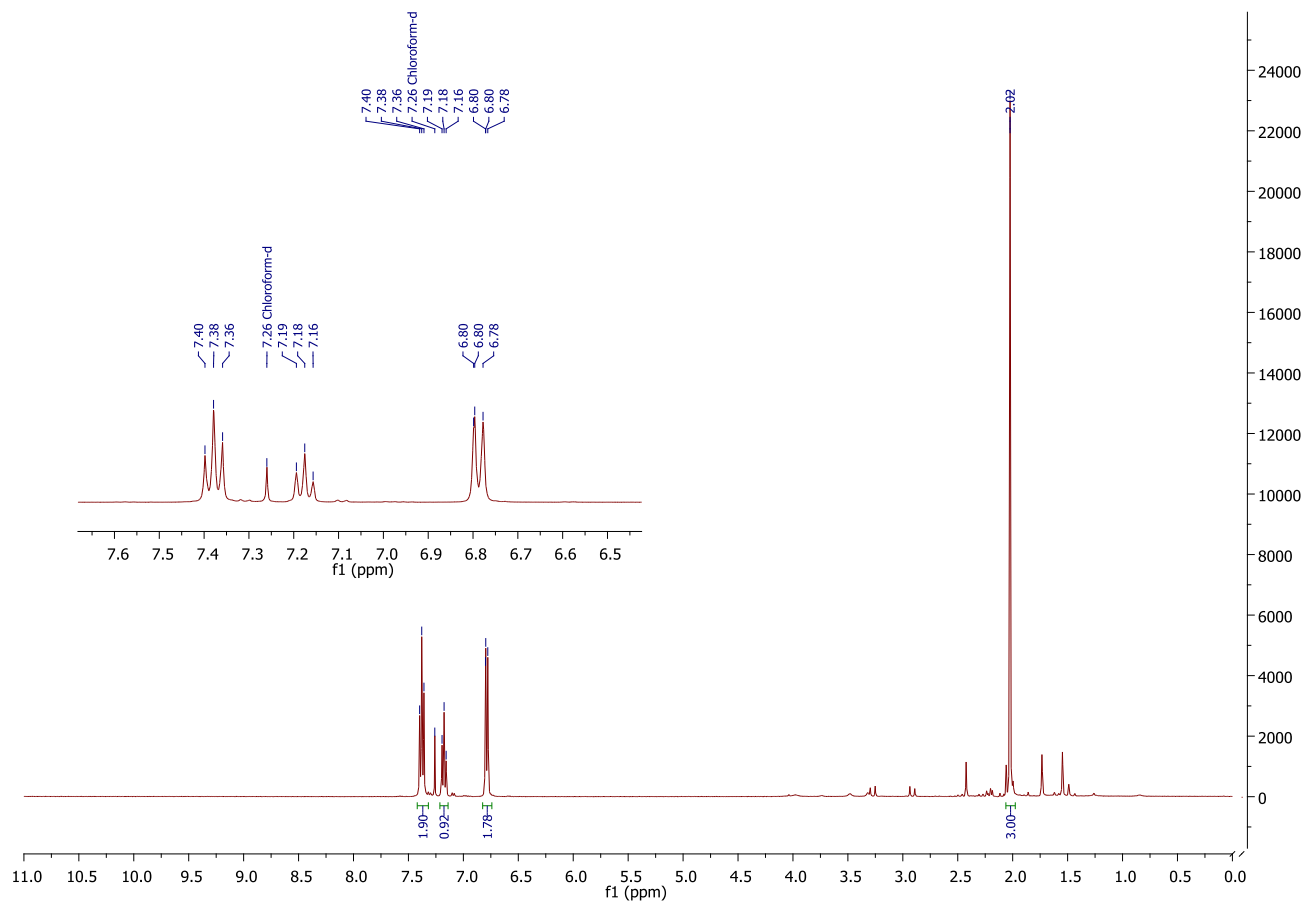
<i>Tris({[7-chloro-2,4-bis(difluoromethyl)quinolin-8-yl]methyl})amine (11) - ^{13}C NMR (101 MHz, CDCl_3)</i>	230
<i>8-(Benzenesulfinyl)-2,4-bis(difluoromethyl)quinoline (13) - ^1H NMR (400 MHz, CDCl_3)</i>	231
<i>8-(Benzenesulfinyl)-2,4-bis(difluoromethyl)quinoline (13) - ^{19}F NMR (376 MHz, CDCl_3)</i>	232
<i>8-(Benzenesulfinyl)-2,4-bis(difluoromethyl)quinoline amine (13) - ^{13}C NMR (101 MHz, CDCl_3)</i>	233

Ketimine derivatives 1

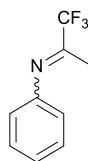
N-(1,1,1-Trifluoropropan-2-ylidene)aniline (**1a**) - ^1H NMR (400 MHz, CDCl_3)



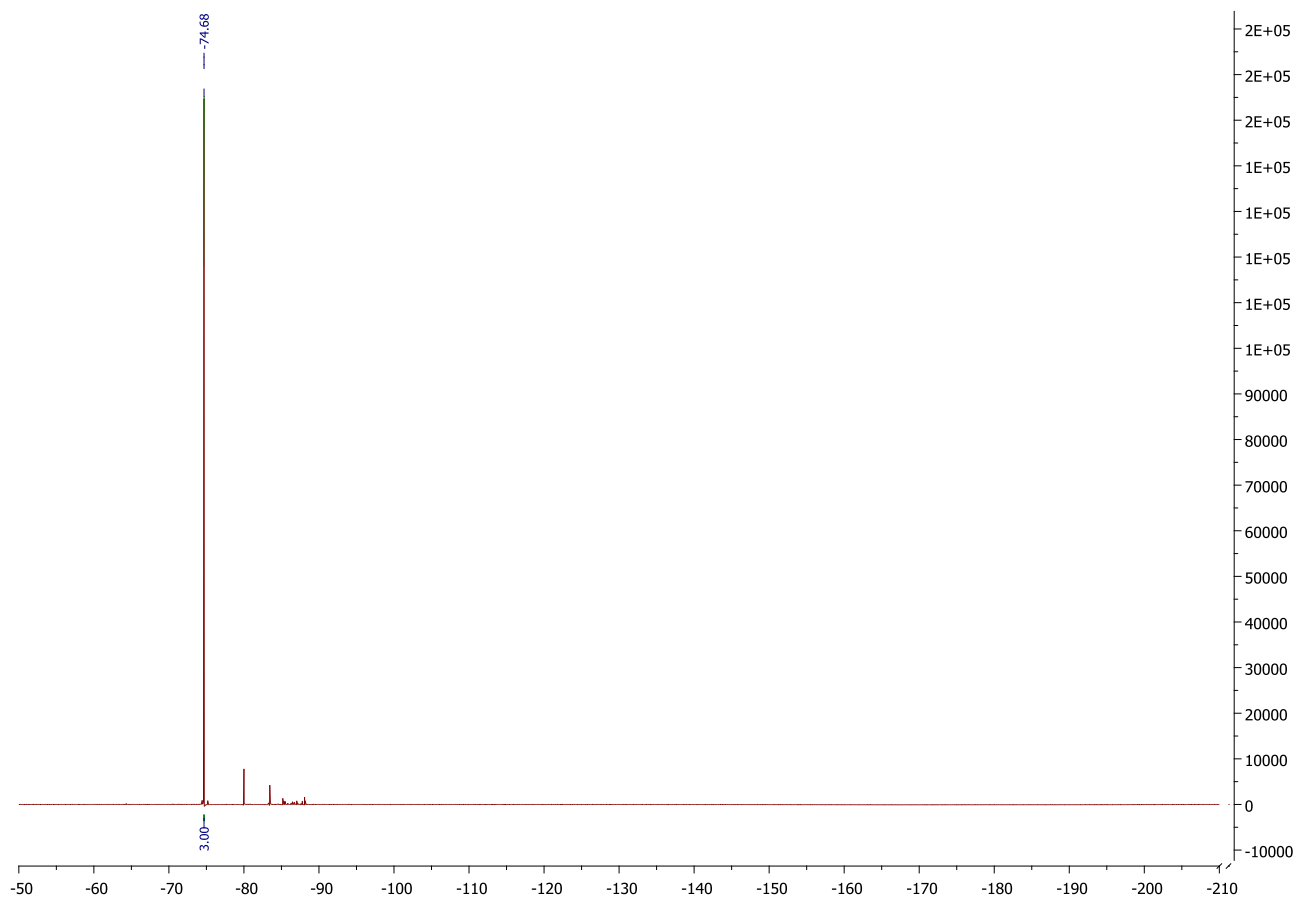
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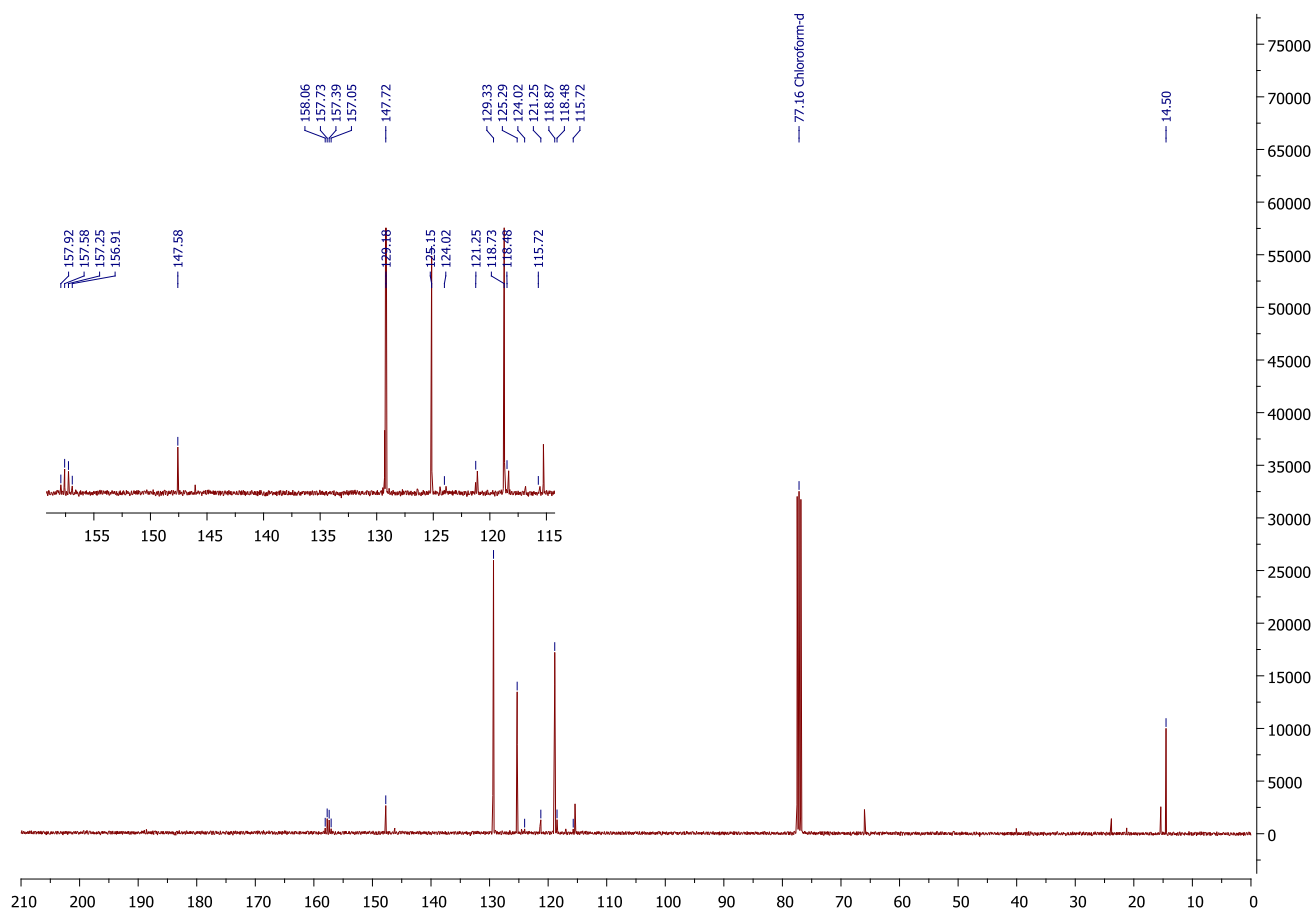
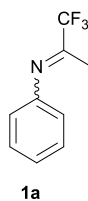
***N*-(1,1,1-Trifluoropropan-2-ylidene)aniline (1a) - ^{19}F NMR (376 MHz, CDCl_3)**



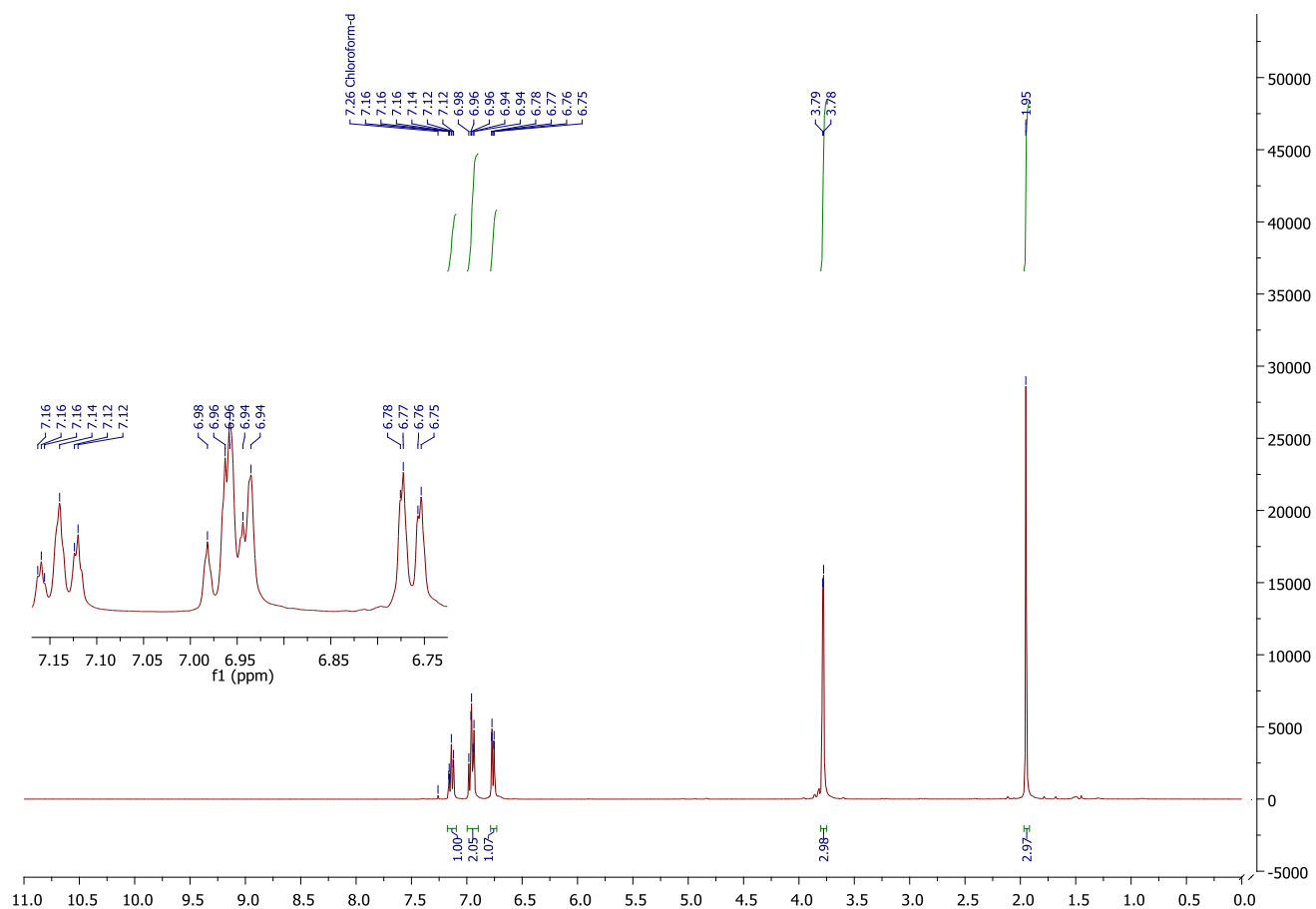
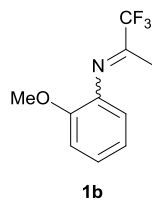
1a



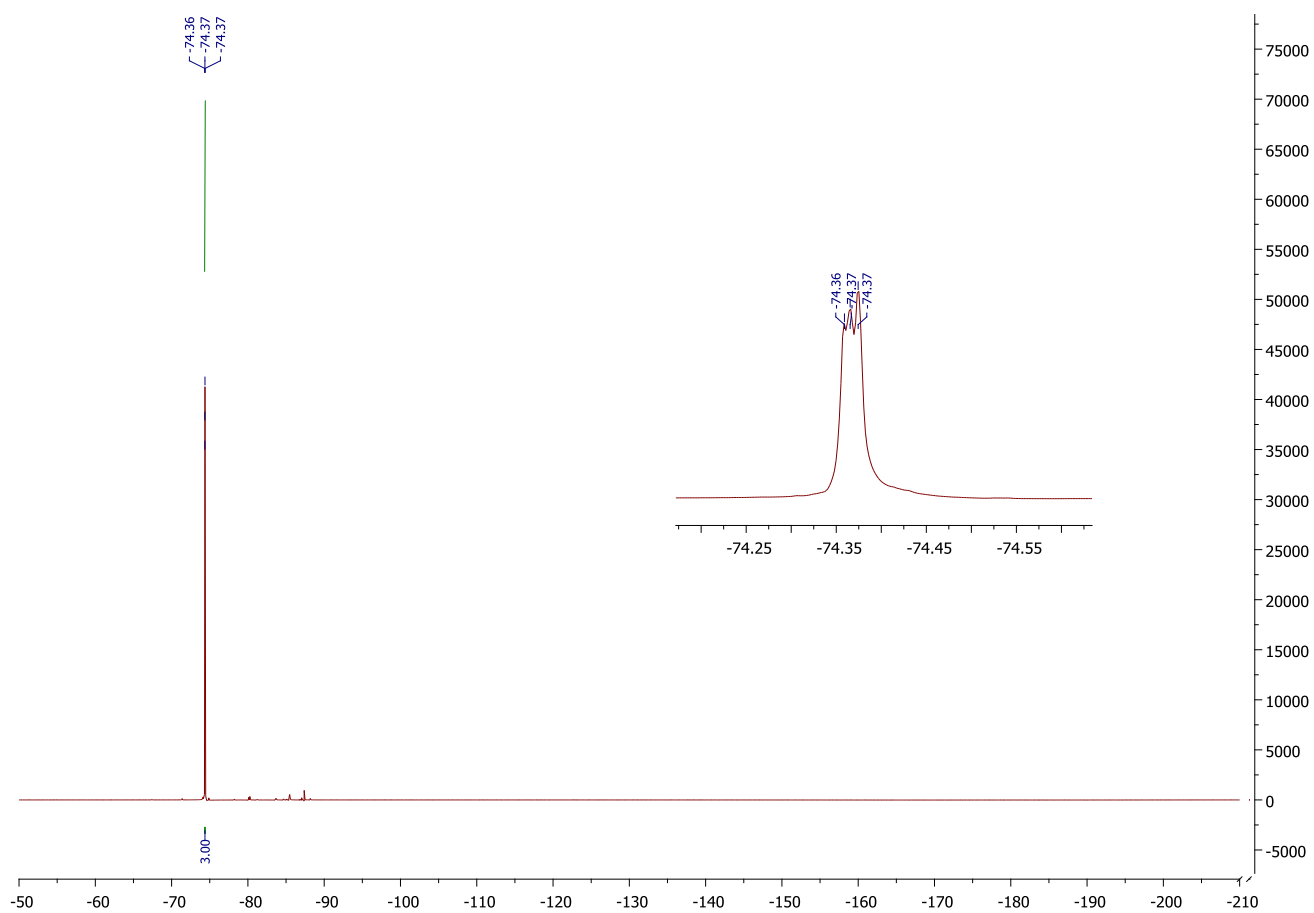
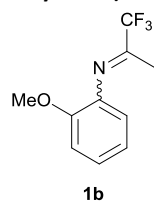
***N*-(1,1,1-Trifluoropropan-2-ylidene)aniline (1a) - ^{13}C NMR (101 MHz, CDCl_3)**



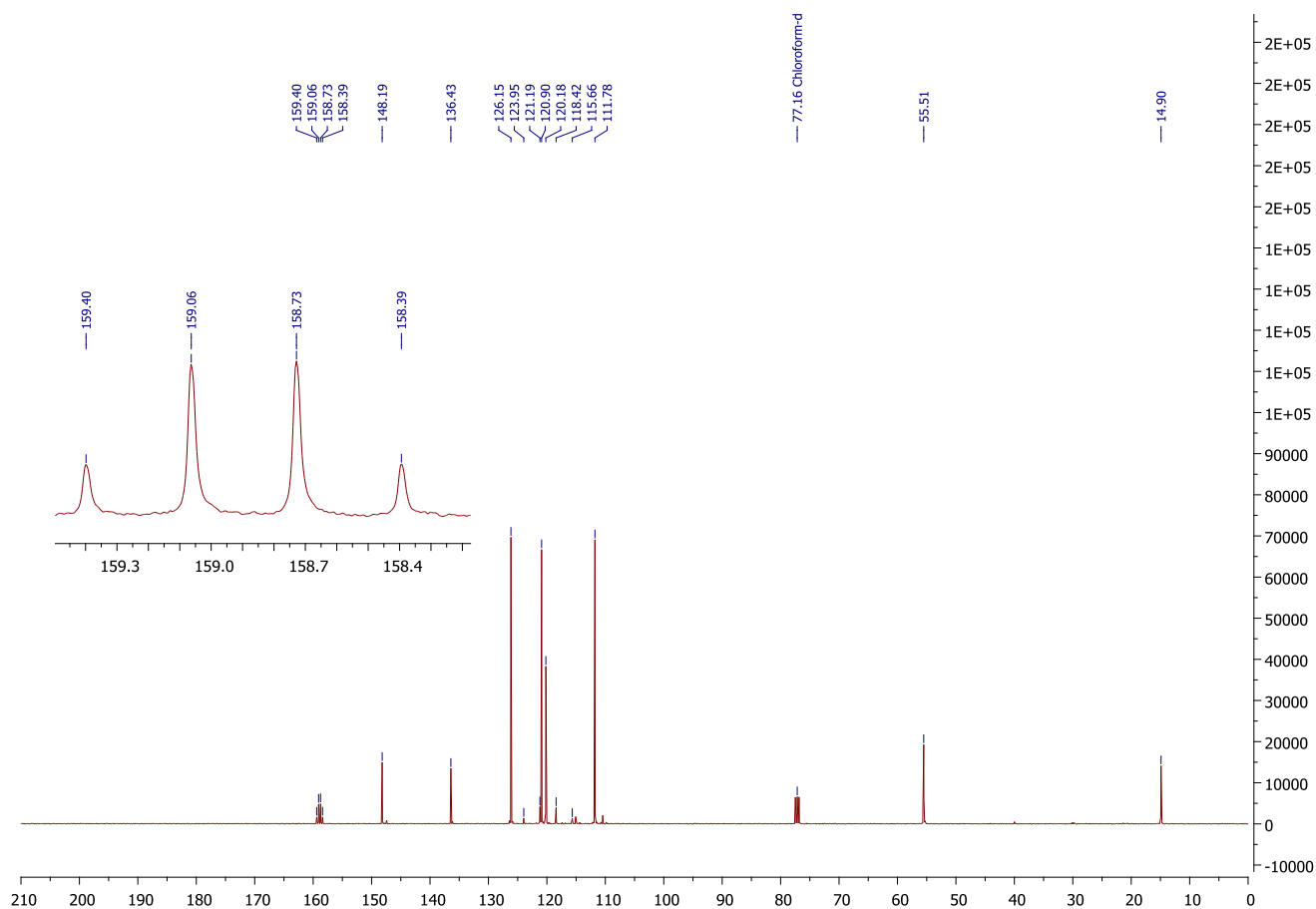
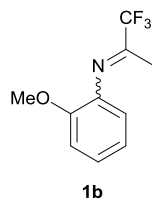
2-Methoxy-*N*-(1,1,1-trifluoropropan-2-ylidene)aniline (**1b**) - ¹H NMR (400 MHz, CDCl₃)



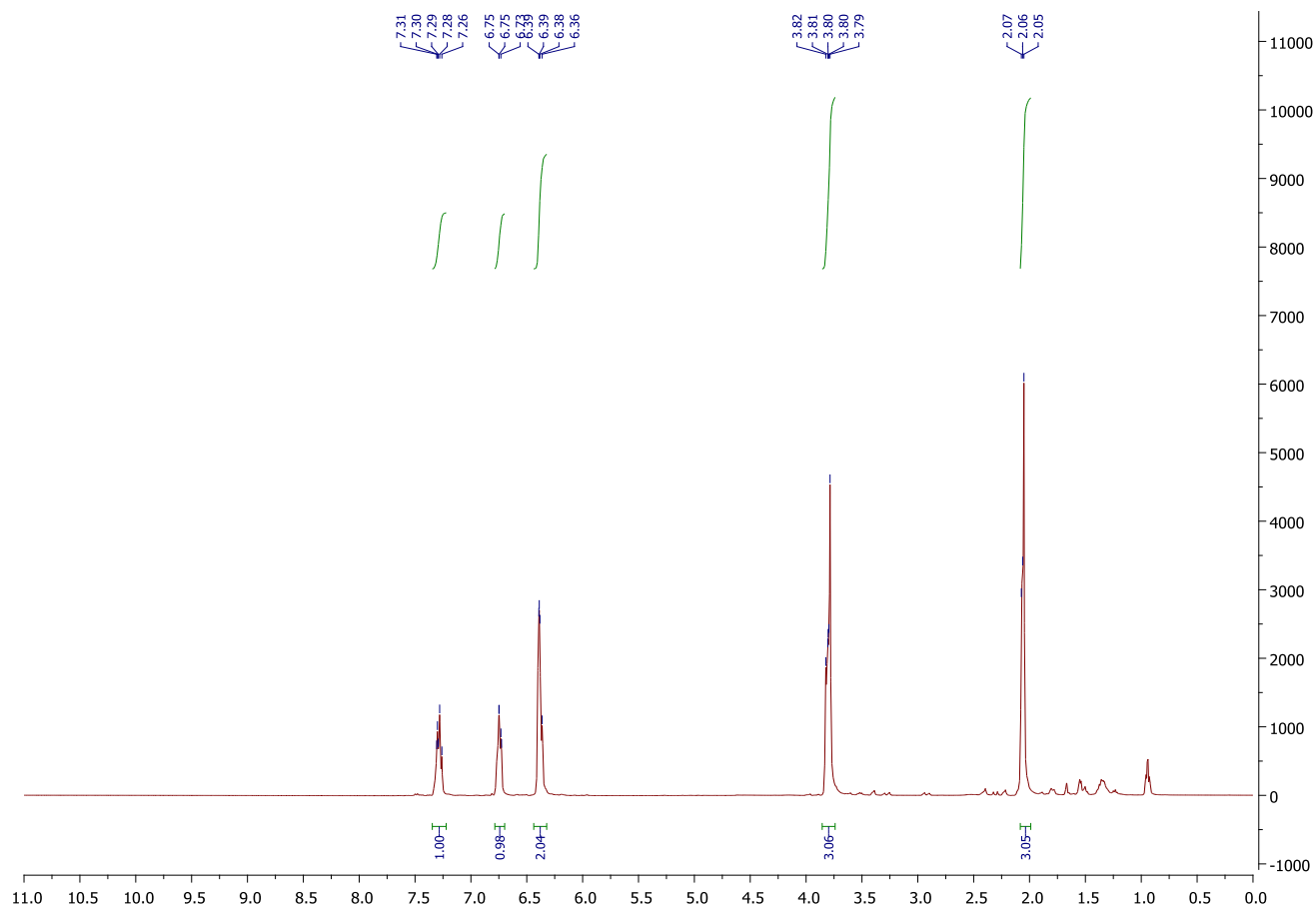
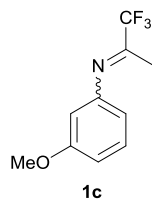
2-Methoxy-*N*-(1,1,1-trifluoropropan-2-ylidene)aniline (**1b**) - ^{19}F NMR (376 MHz, CDCl_3)



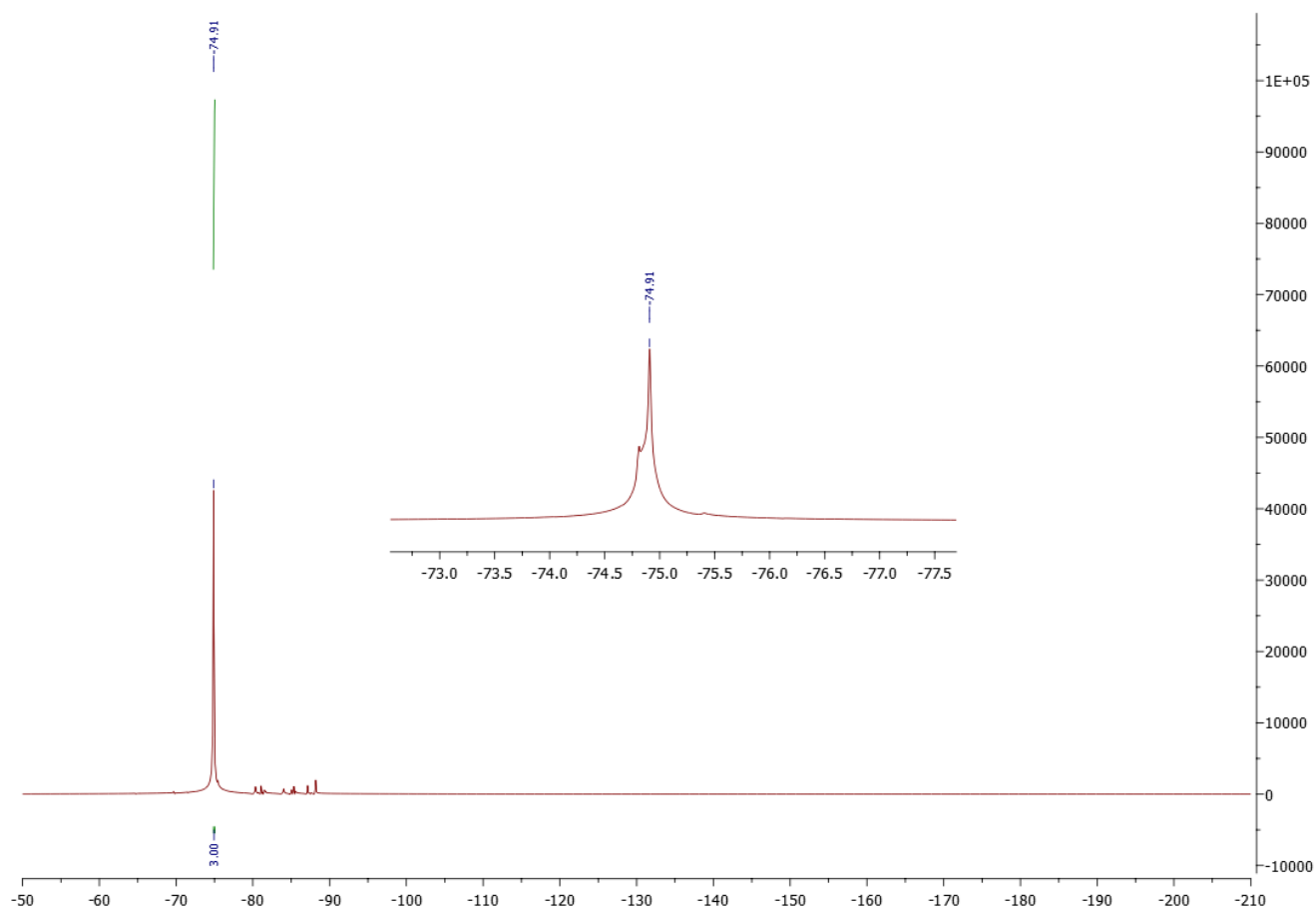
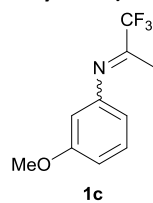
2-Methoxy-*N*-(1,1,1-trifluoropropan-2-ylidene)aniline (**1b**) - ^{13}C NMR (101 MHz, CDCl_3)



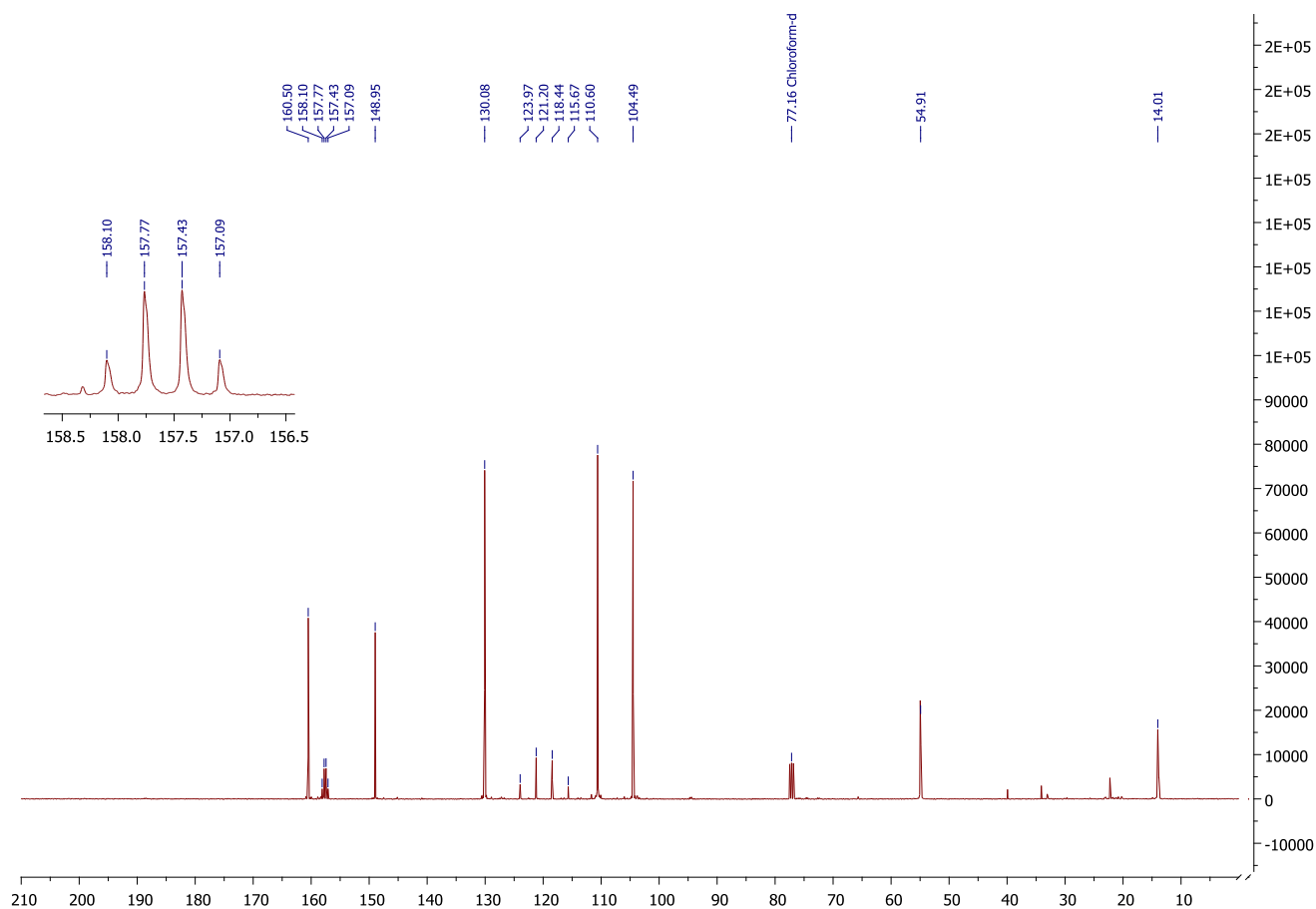
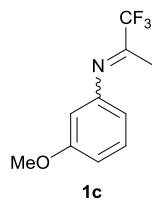
3-Methoxy-*N*-(1,1,1-trifluoropropan-2-ylidene)aniline (**1c**) - ^1H NMR (400 MHz, CDCl_3)



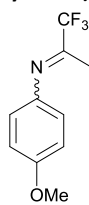
3-Methoxy-*N*-(1,1,1-trifluoropropan-2-ylidene)aniline (**1c**) - ^{19}F NMR (376 MHz, CDCl_3)



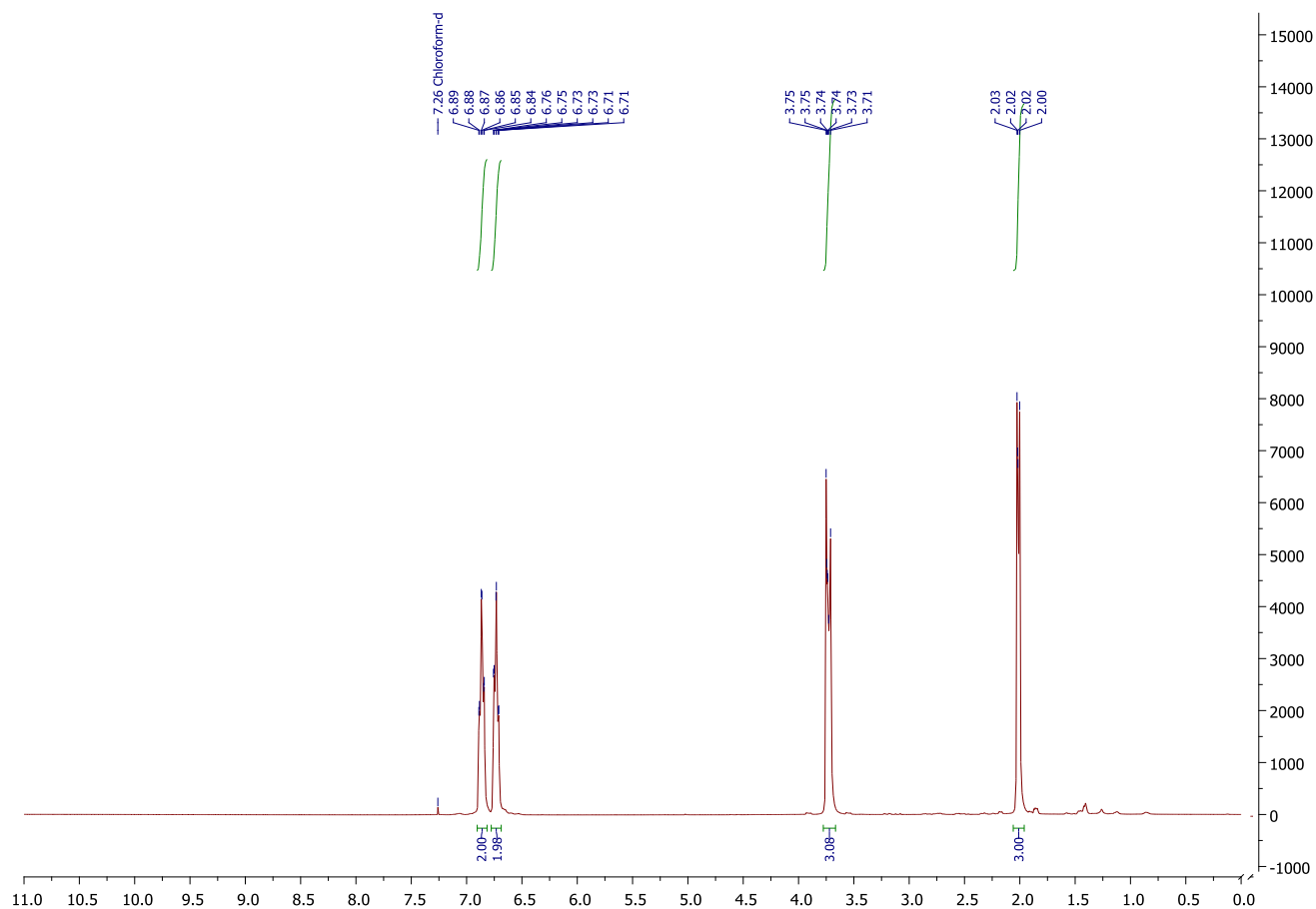
3-Methoxy-*N*-(1,1,1-trifluoropropan-2-ylidene)aniline (**1c**)- ^{13}C NMR (101 MHz, CDCl_3)



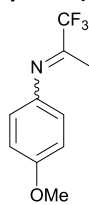
4-Methoxy-*N*-(1,1,1-trifluoropropan-2-ylidene)aniline (**1d**) - ^1H NMR (400 MHz, CDCl_3)



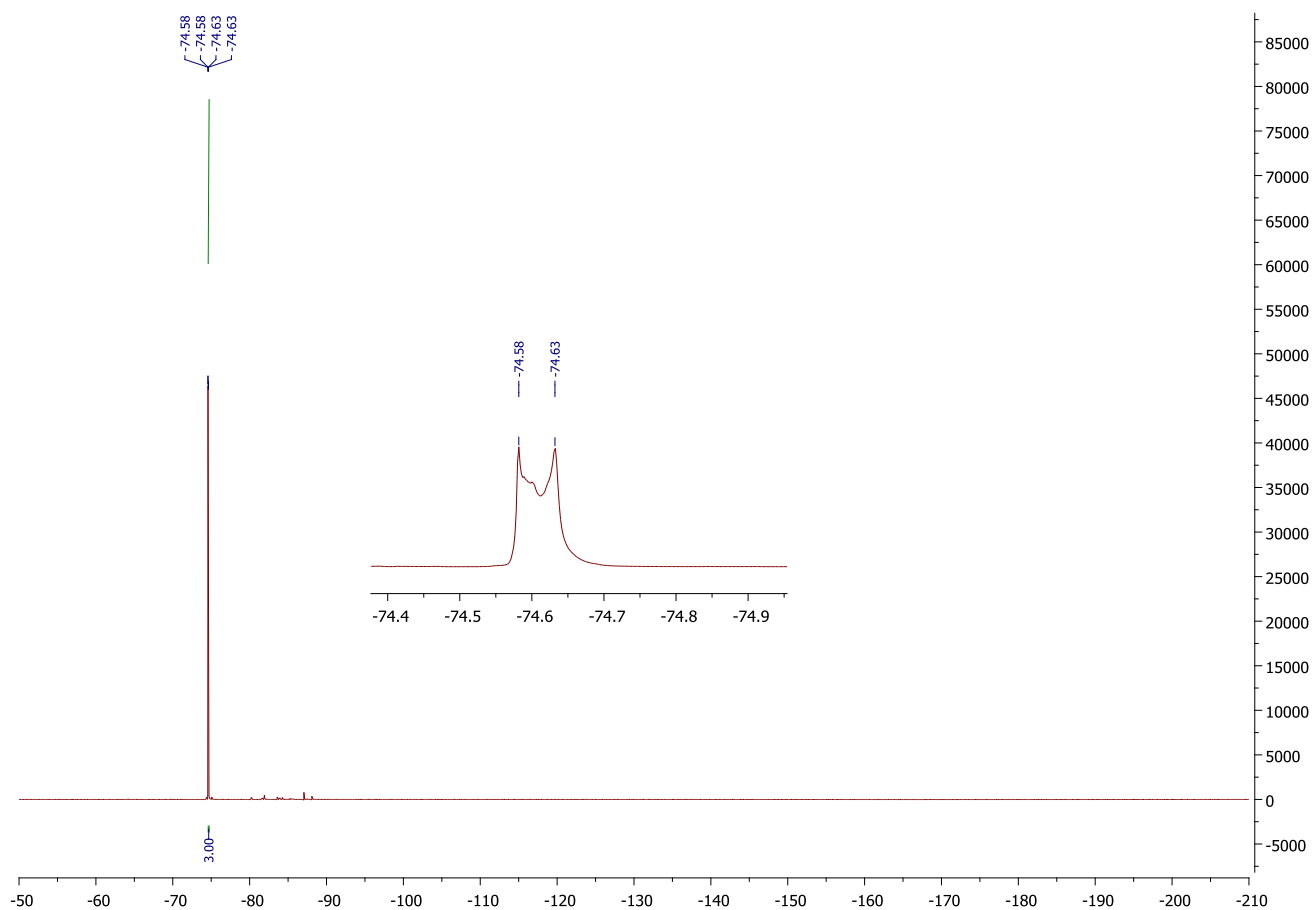
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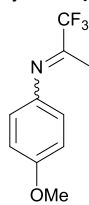
4-Methoxy-*N*-(1,1,1-trifluoropropan-2-ylidene)aniline (**1d**) - ^{19}F NMR (376 MHz, CDCl_3)



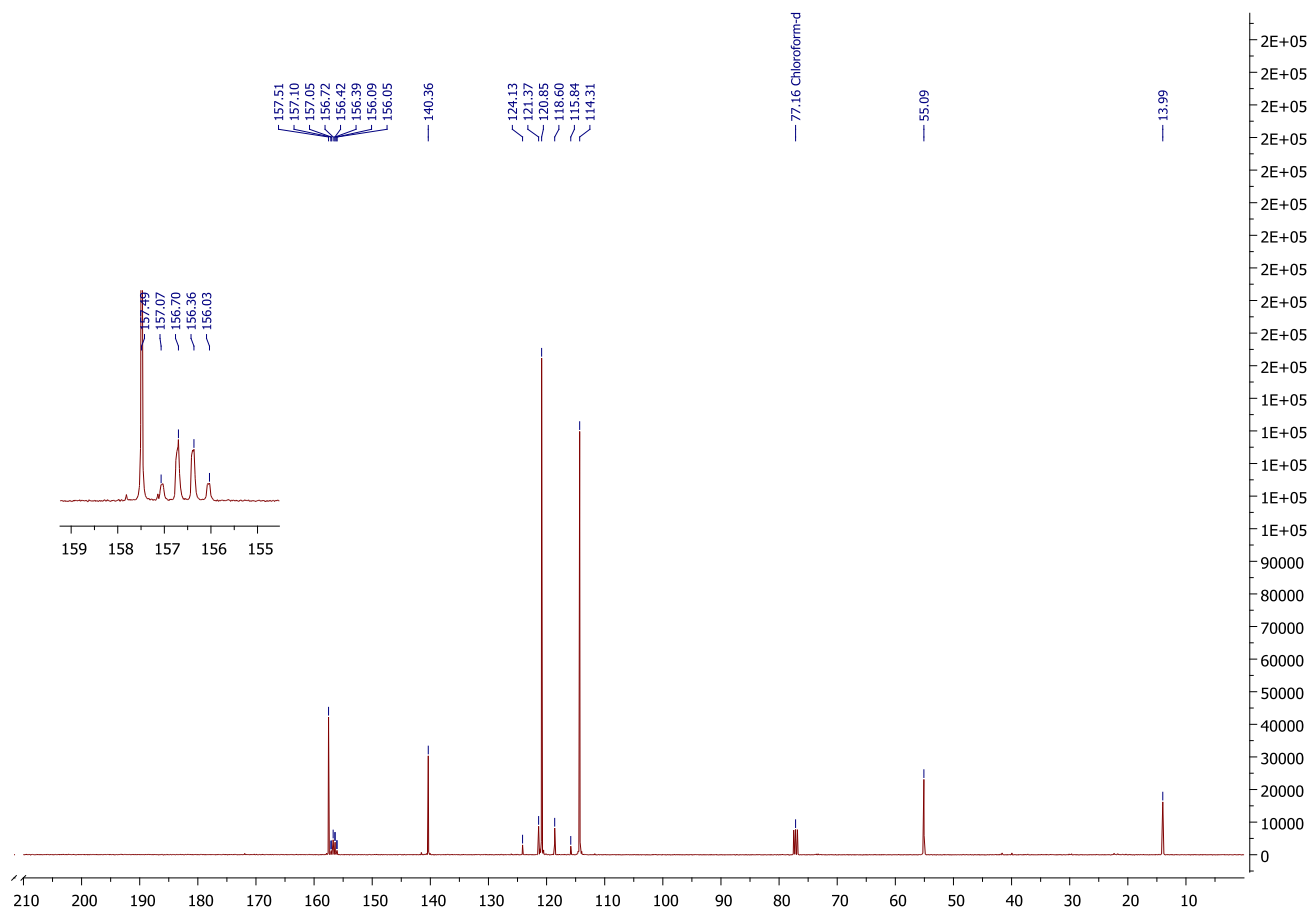
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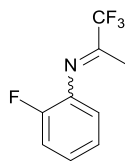
4-Methoxy-N-(1,1,1-trifluoropropan-2-ylidene)aniline (1d)- ^{13}C NMR (101 MHz, CDCl_3)



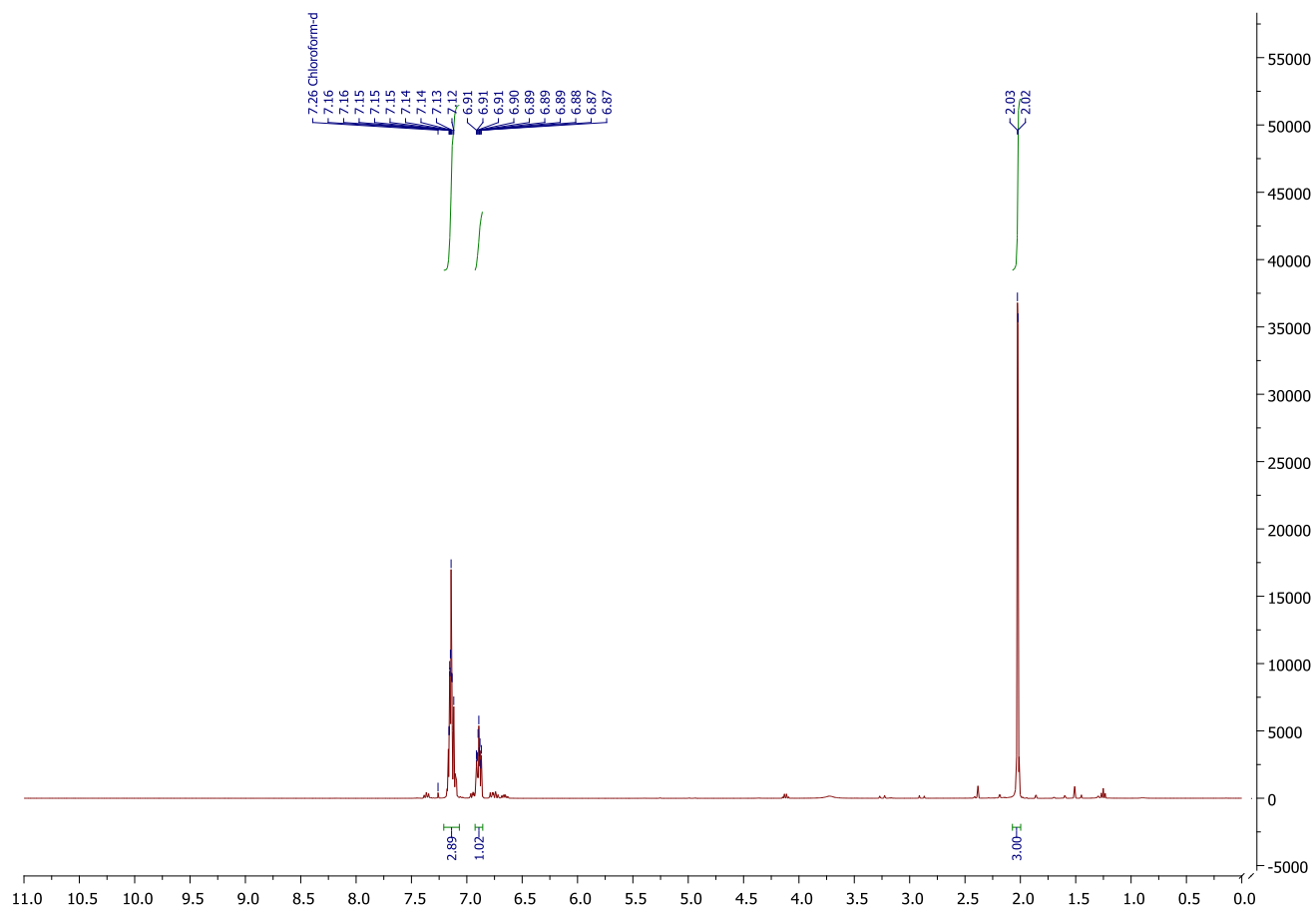
1d



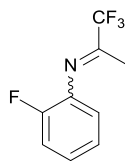
2-Fluoro-*N*-(1,1,1-trifluoropropan-2-ylidene)aniline (**1e**) - ^1H NMR (400 MHz, CDCl_3)



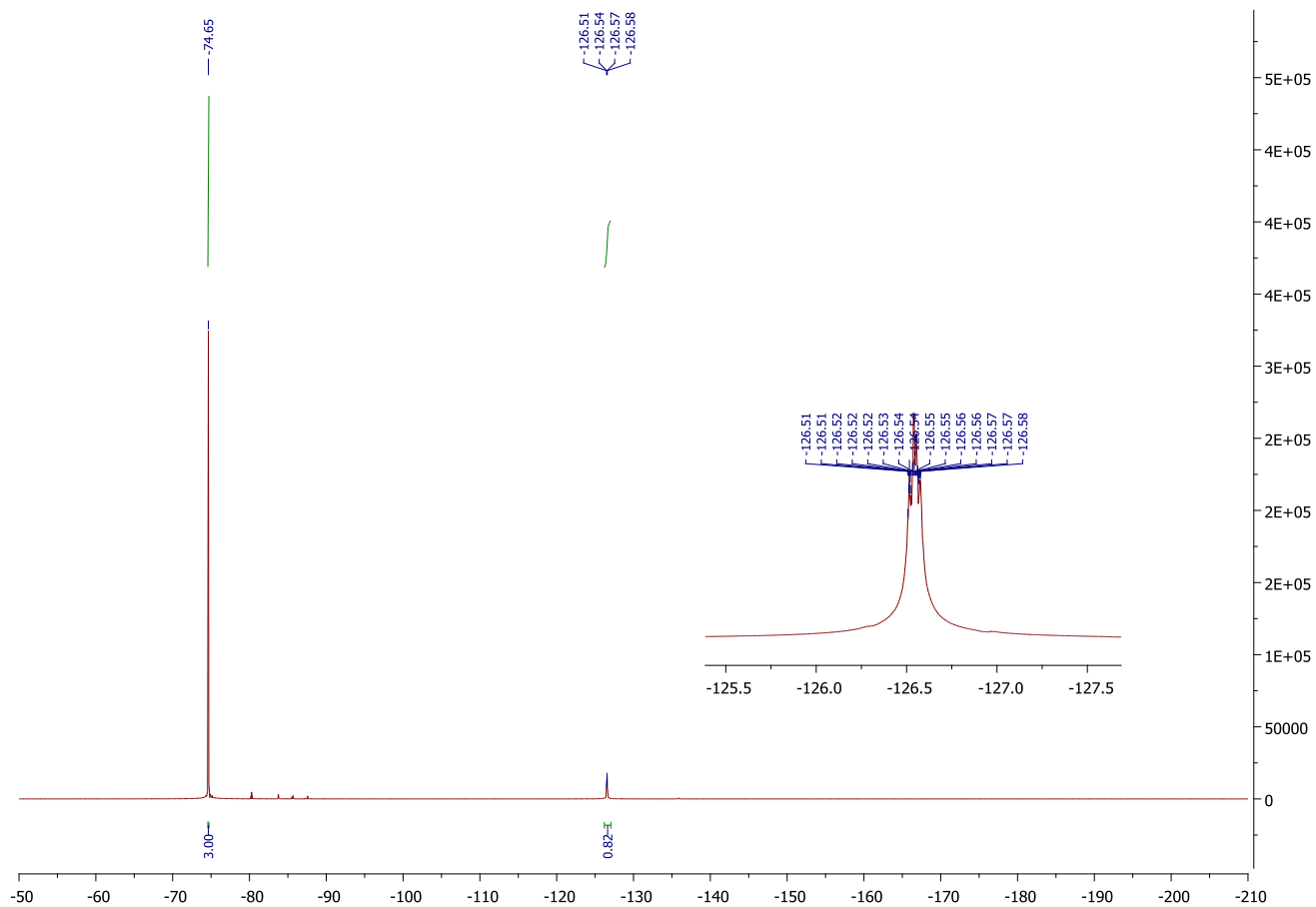
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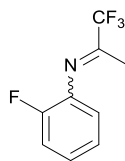
2-Fluoro-*N*-(1,1,1-trifluoropropan-2-ylidene)aniline (**1e**) - ^{19}F NMR (376 MHz, CDCl_3)



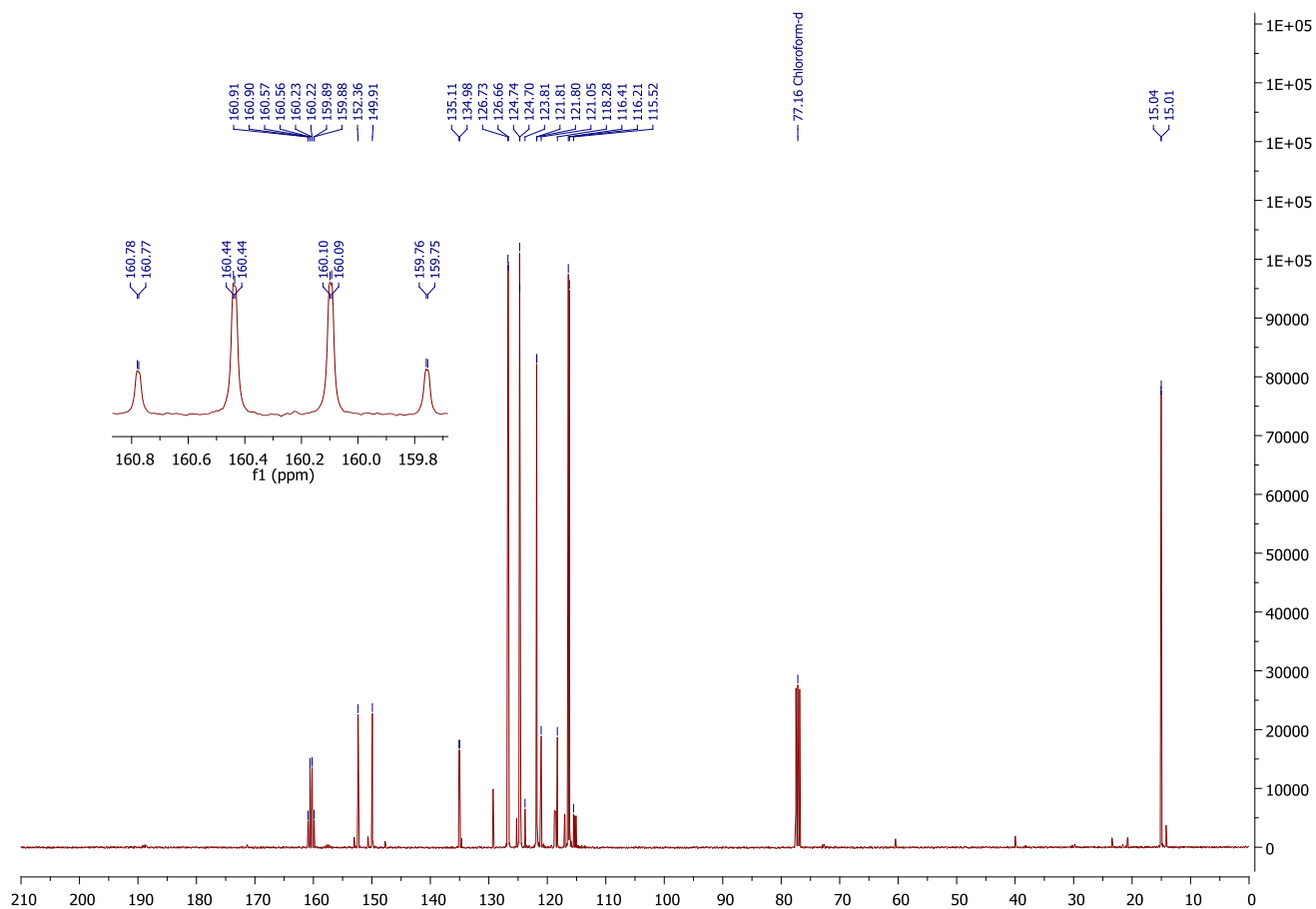
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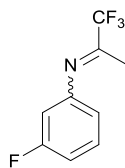
2-Fluoro-*N*-(1,1,1-trifluoropropan-2-ylidene)aniline (**1e**) - ^{13}C NMR (101 MHz, CDCl_3)



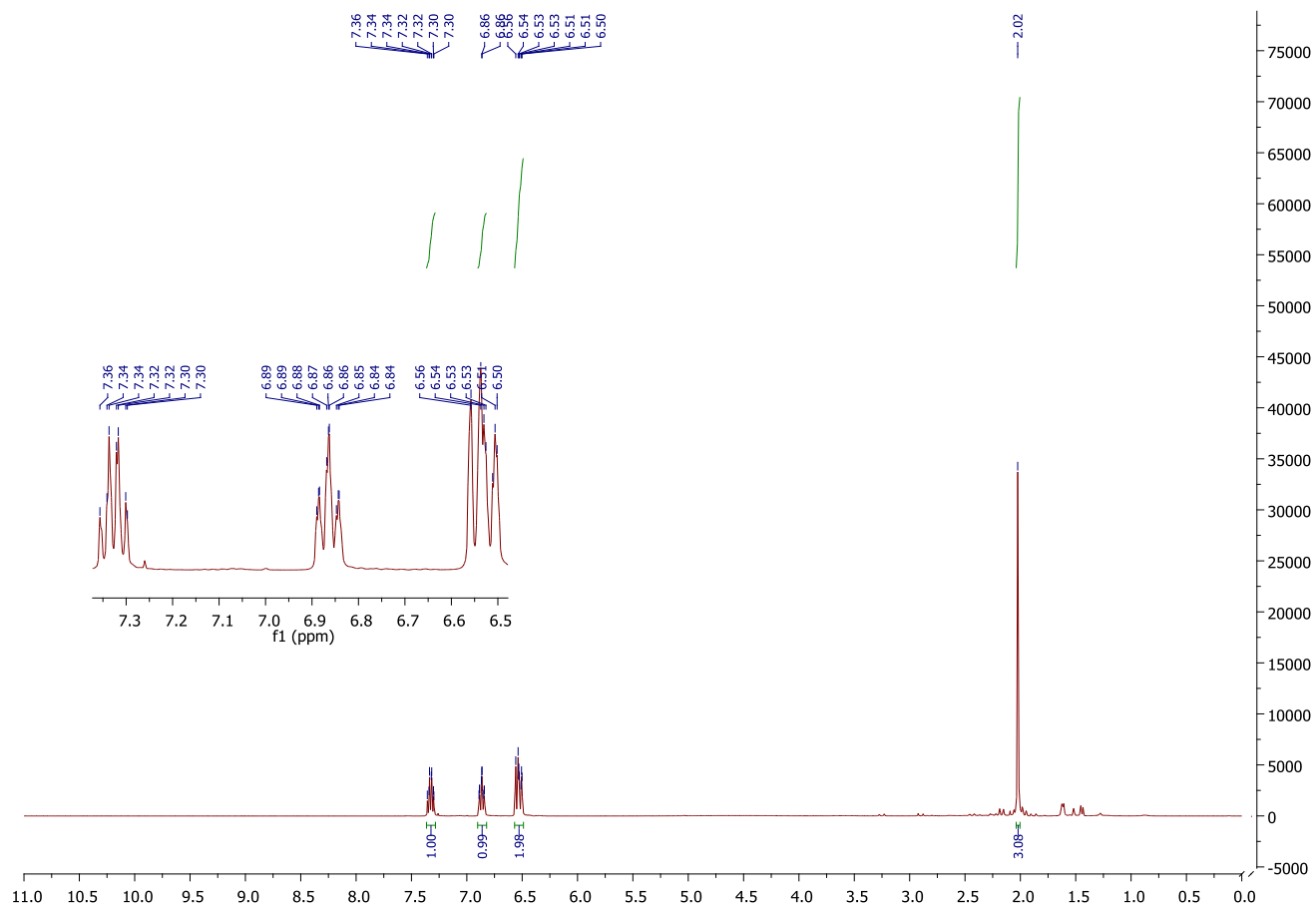
1e



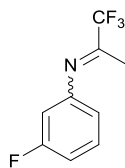
3-Fluoro-*N*-(1,1,1-trifluoropropan-2-ylidene)aniline (**1f**) - ^1H NMR (400 MHz, CDCl_3)



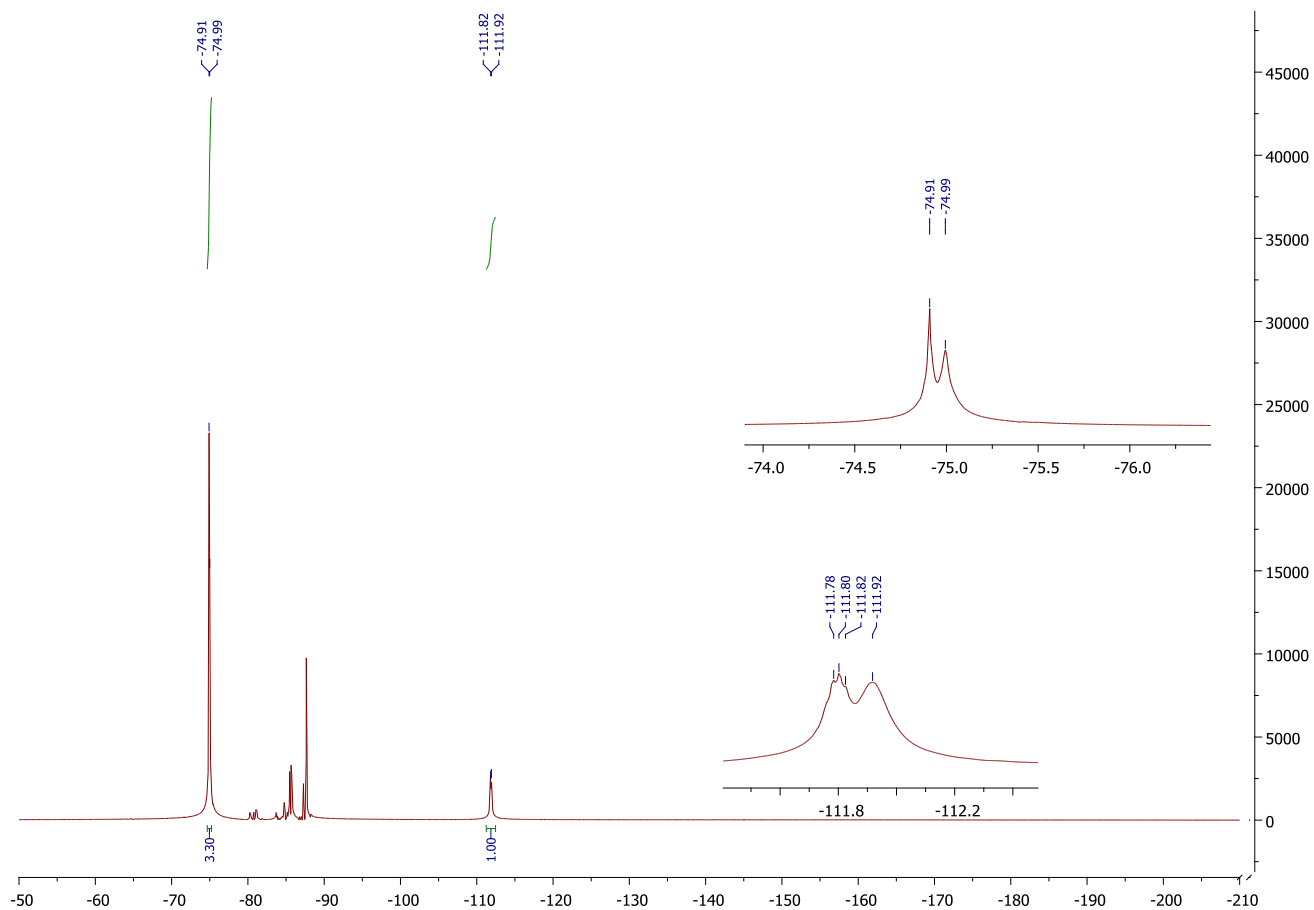
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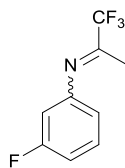
3-Fluoro-*N*-(1,1,1-trifluoropropan-2-ylidene)aniline (**1f**) - ^{19}F NMR (376 MHz, CDCl_3)



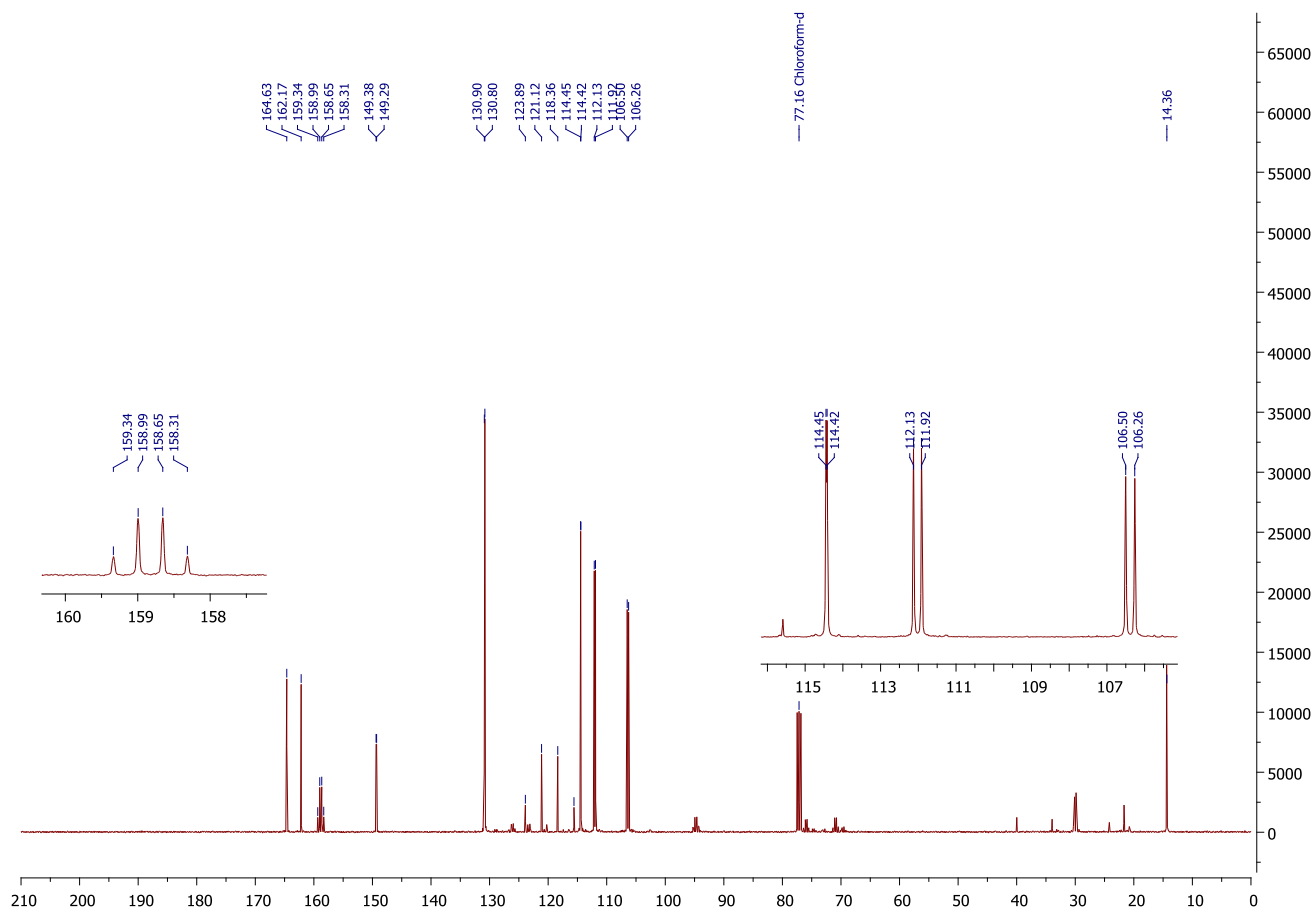
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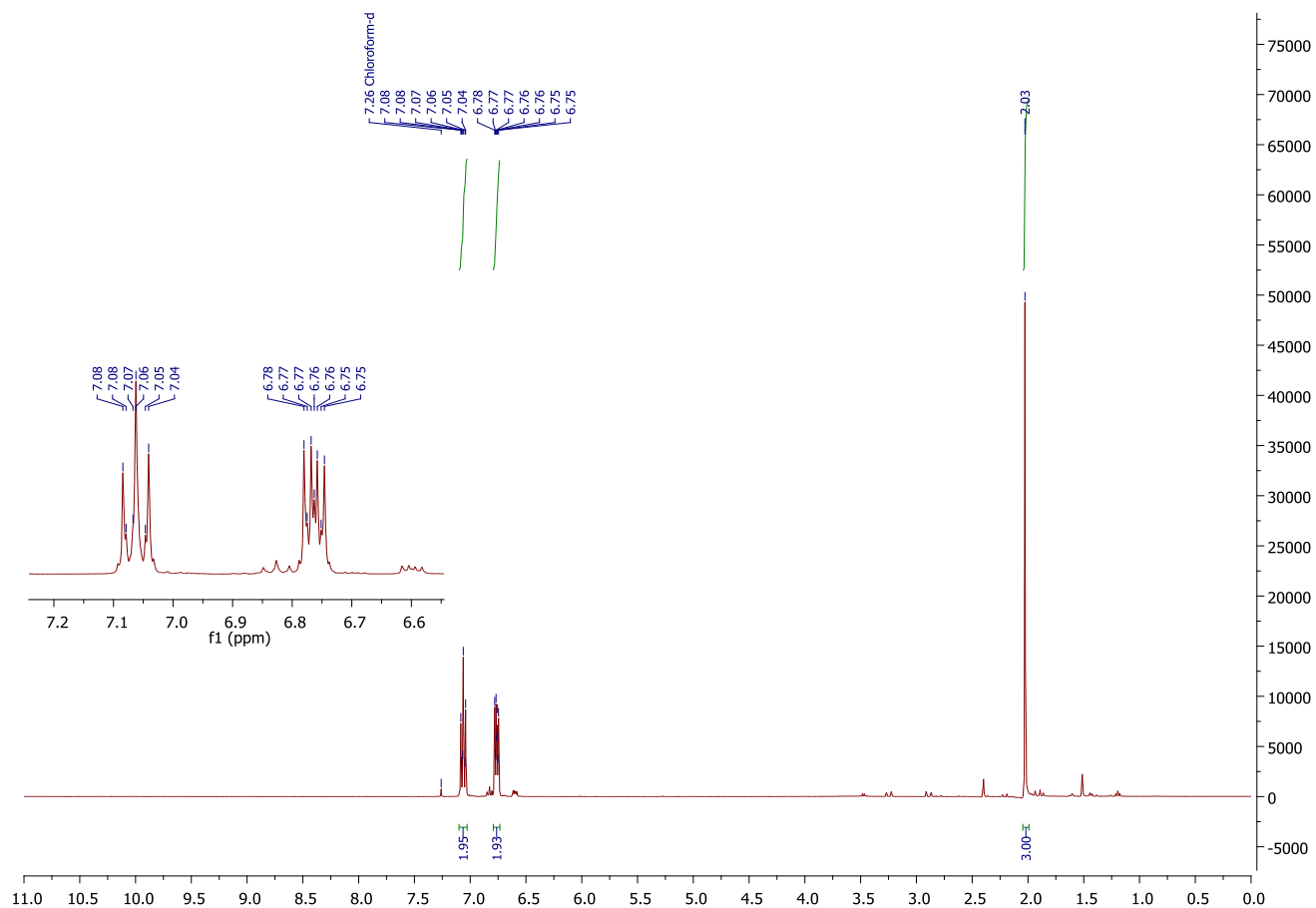
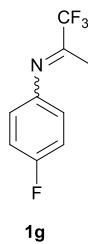
3-Fluoro-*N*-(1,1,1-trifluoropropan-2-ylidene)aniline (**1f**) - ^{13}C NMR (101 MHz, CDCl_3)



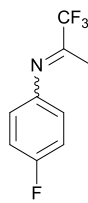
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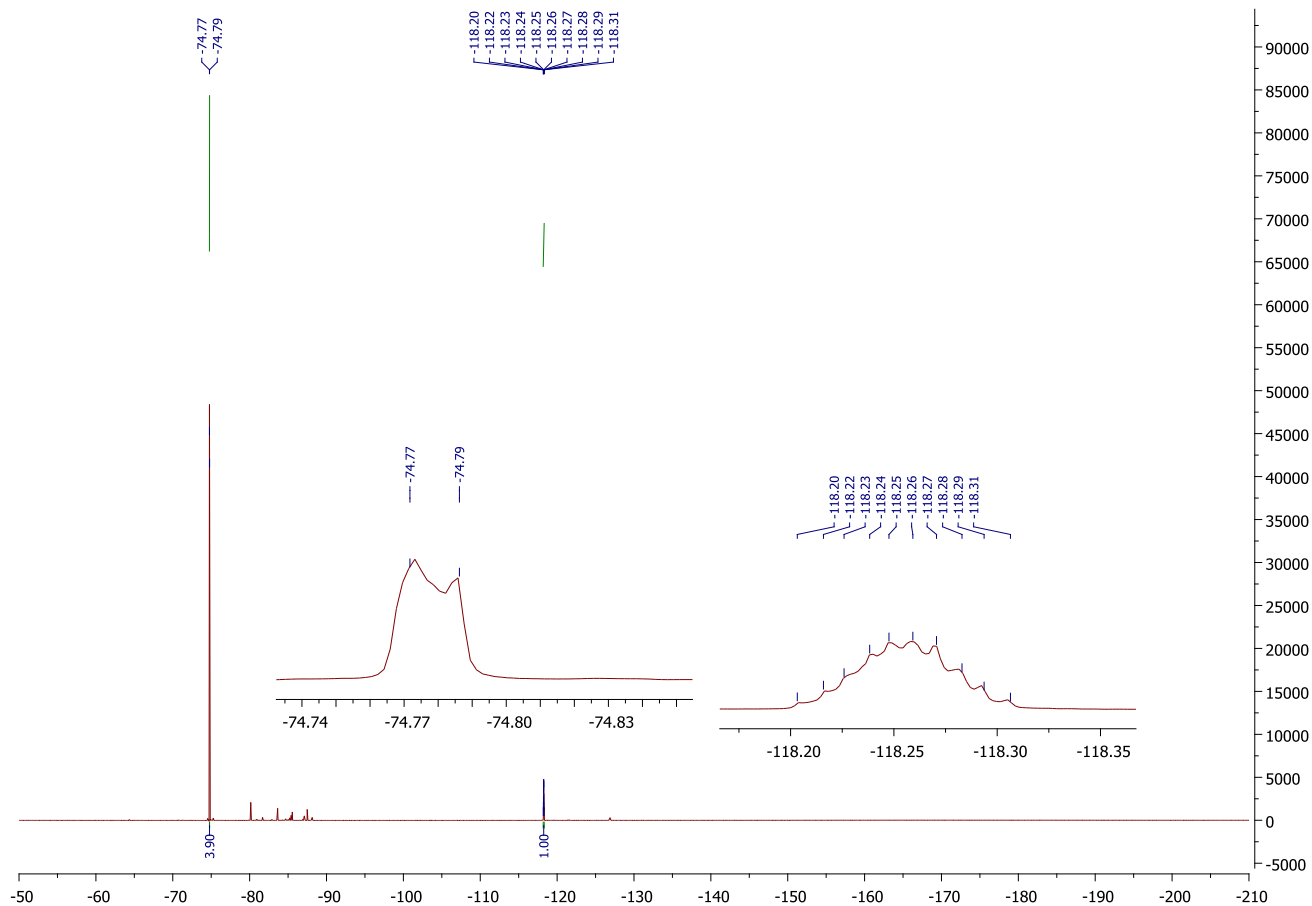
4-Fluoro-*N*-(1,1,1-trifluoropropan-2-ylidene)aniline (**1g**) - ^1H NMR (400 MHz, CDCl_3)



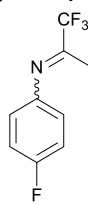
4-Fluoro-*N*-(1,1,1-trifluoropropan-2-ylidene)aniline (**1g**) - ^{19}F NMR (376 MHz, CDCl_3)



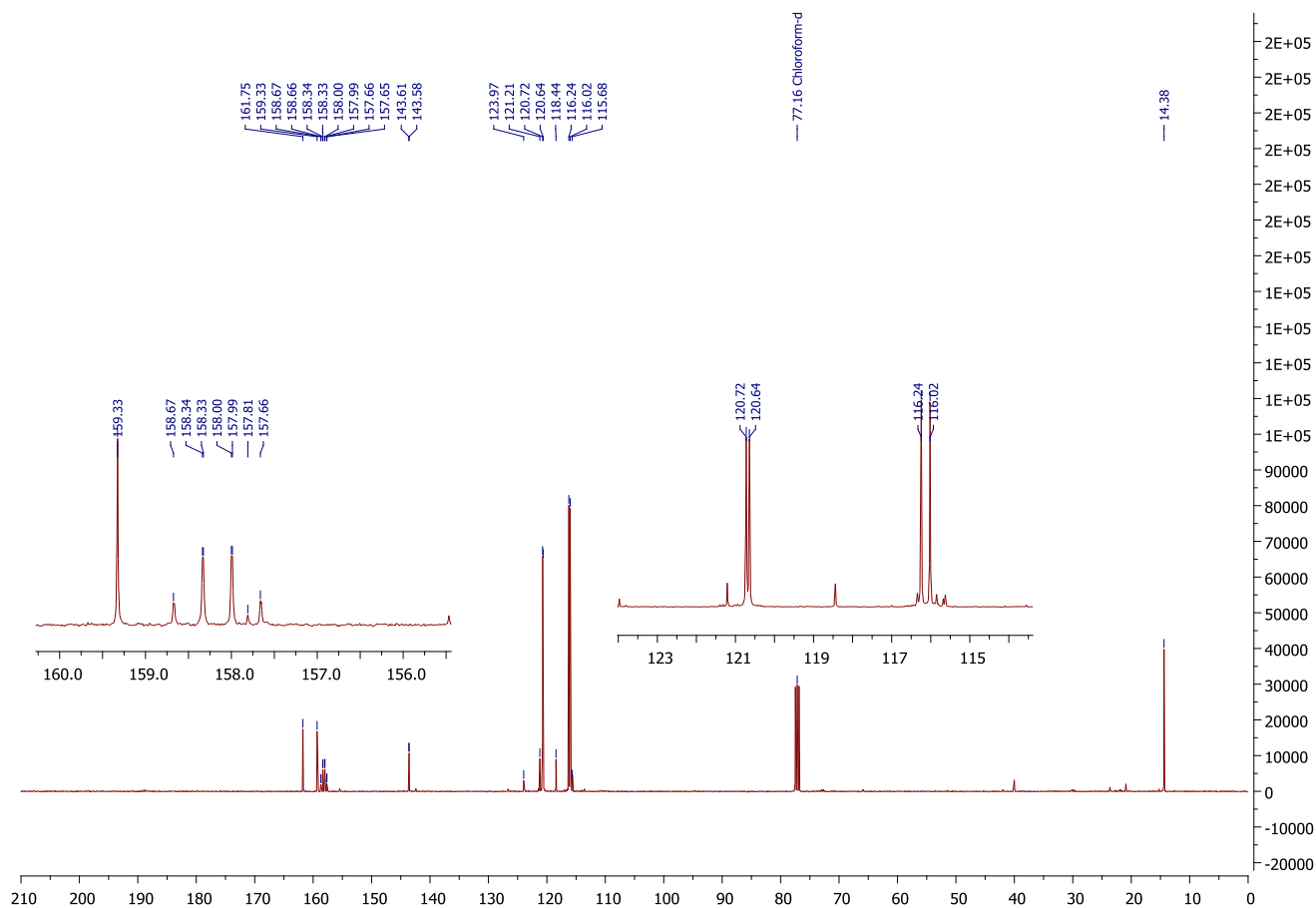
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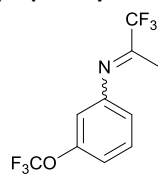
4-Fluoro-*N*-(1,1,1-trifluoropropan-2-ylidene)aniline (**1g**) - ^{13}C NMR (101 MHz, CDCl_3)



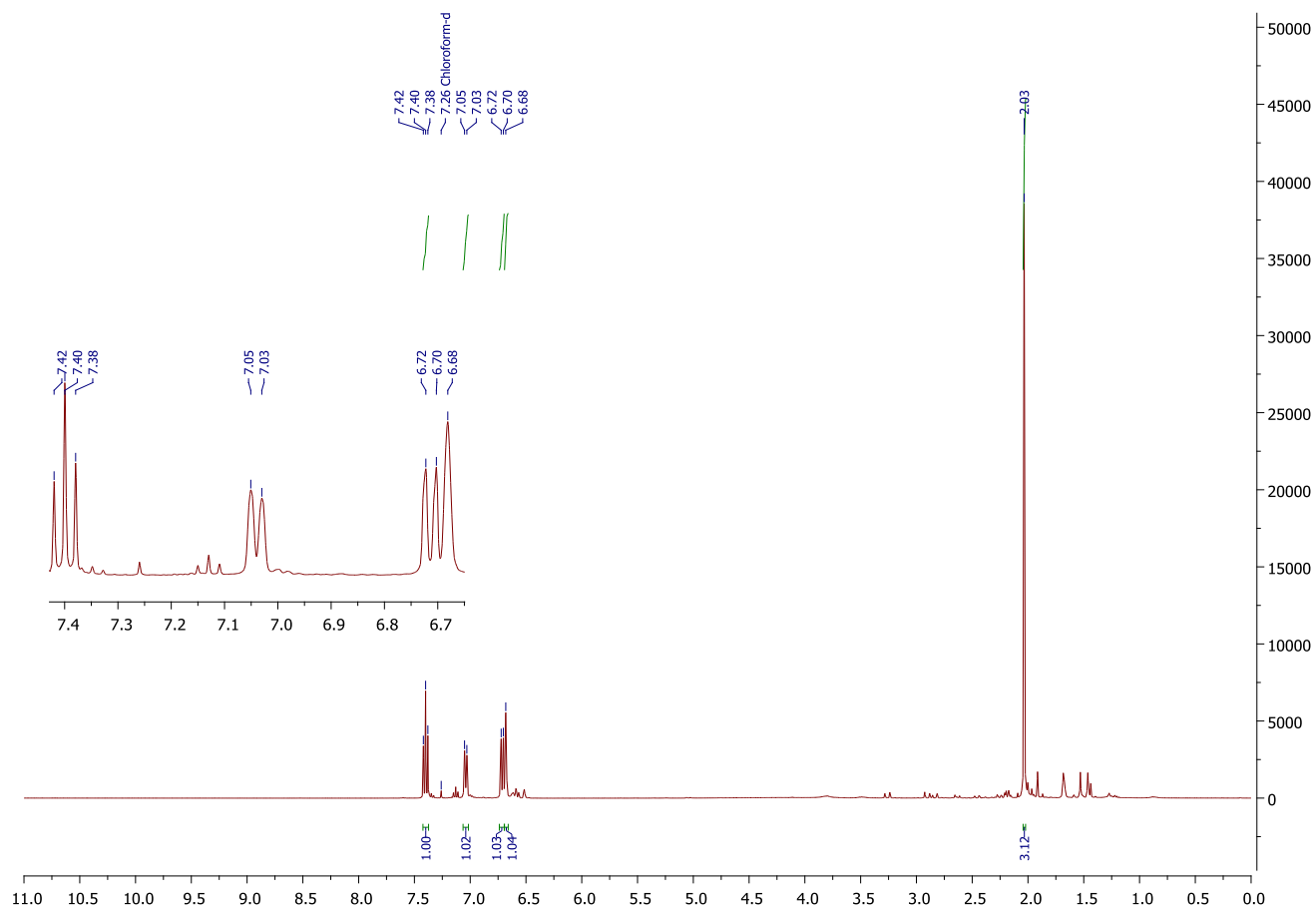
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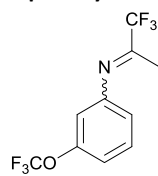
3-(Trifluoromethoxy)-*N*-(1,1,1-trifluoropropan-2-ylidene)aniline (1h) - ^1H NMR (400 MHz, CDCl_3)



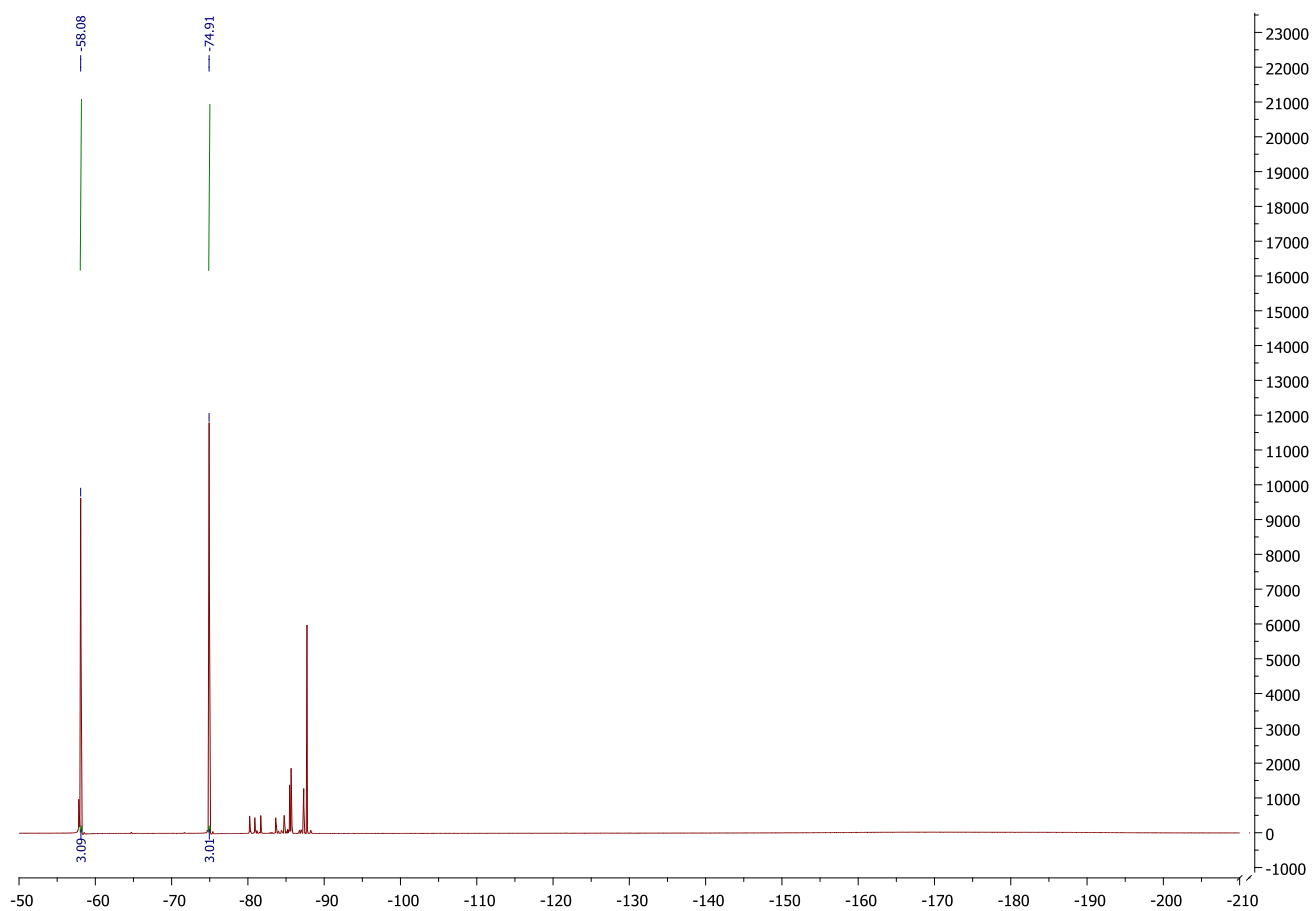
1h



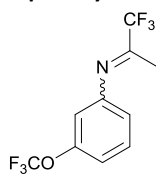
3-(Trifluoromethoxy)-*N*-(1,1,1-trifluoropropan-2-ylidene)aniline (**1h**) - ^{19}F NMR (376 MHz, CDCl_3)



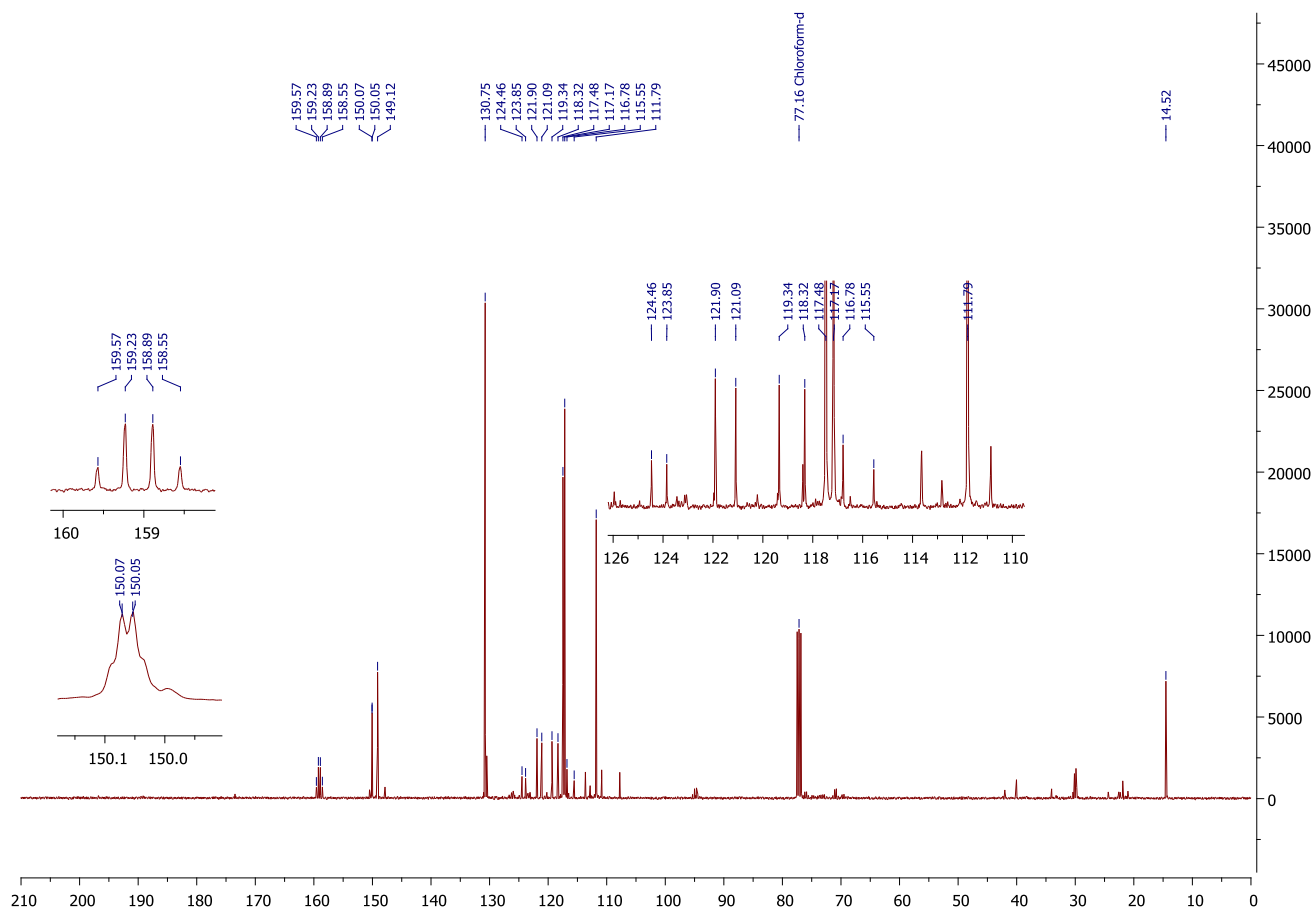
1h



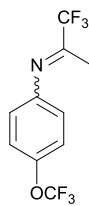
3-(Trifluoromethoxy)-*N*-(1,1,1-trifluoropropan-2-ylidene)aniline (1h)- ^{13}C NMR (101 MHz, CDCl_3)



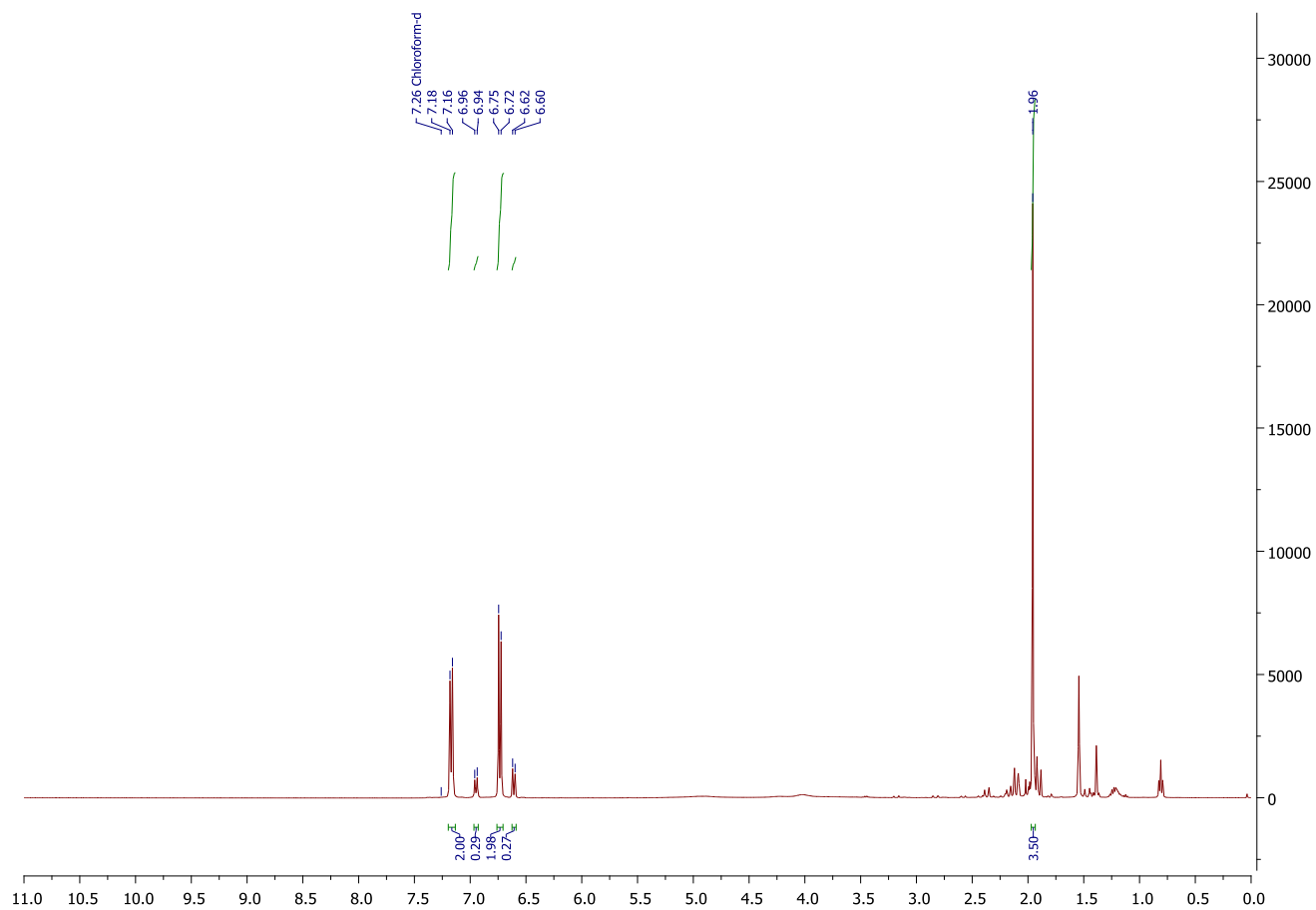
1h



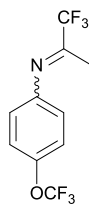
4-(Trifluoromethoxy)-*N*-(1,1,1-trifluoropropan-2-ylidene)aniline (**1i**) - ^1H NMR (400 MHz, CDCl_3)



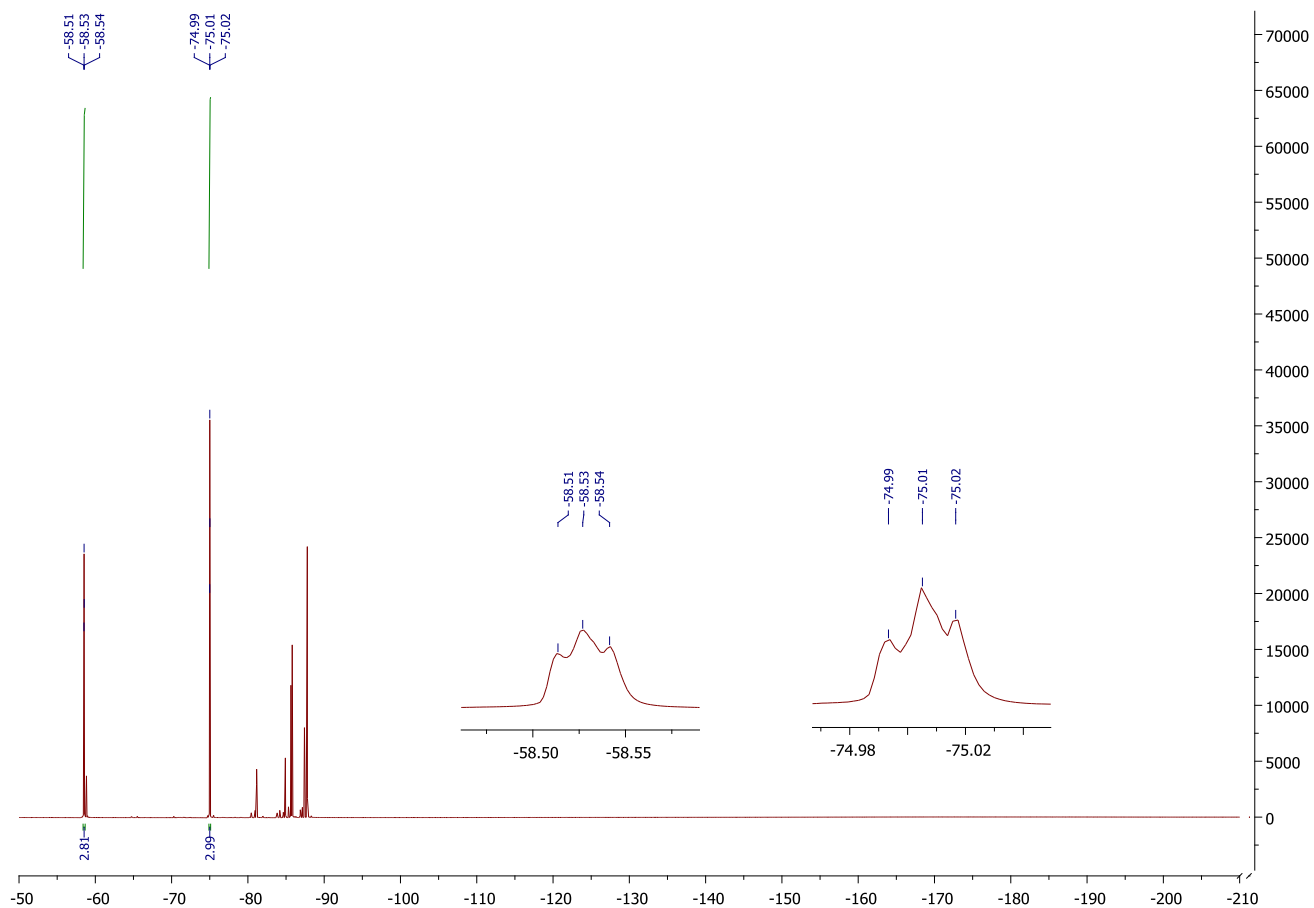
1i



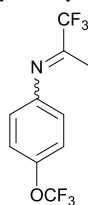
4-(Trifluoromethoxy)-*N*-(1,1,1-trifluoropropan-2-ylidene)aniline (**1i**) - ^{19}F NMR (376 MHz, CDCl_3)



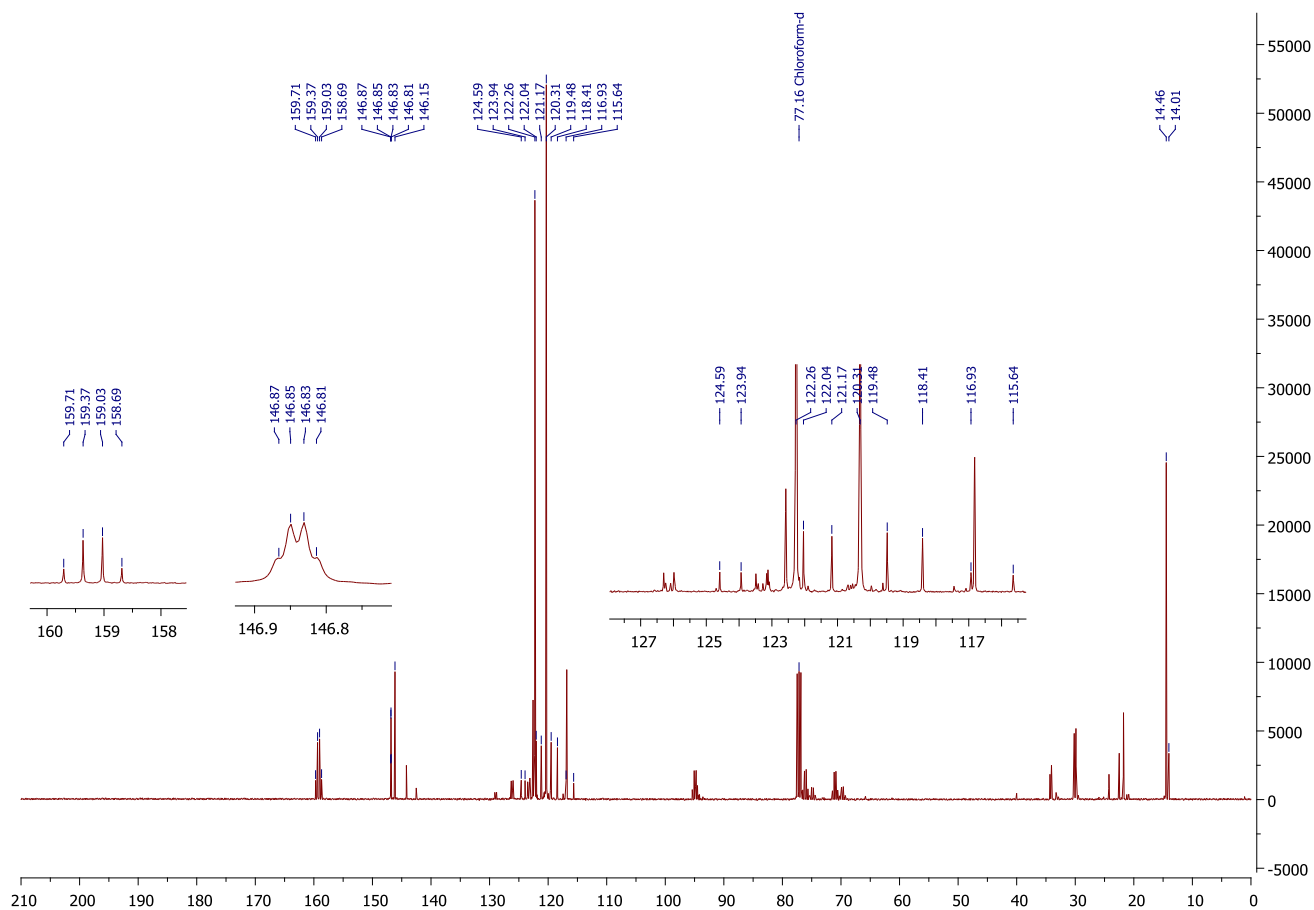
1i



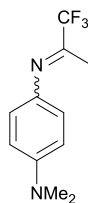
4-(Trifluoromethoxy)-*N*-(1,1,1-trifluoropropan-2-ylidene)aniline (**1i**)-¹³C NMR (101 MHz, CDCl₃)



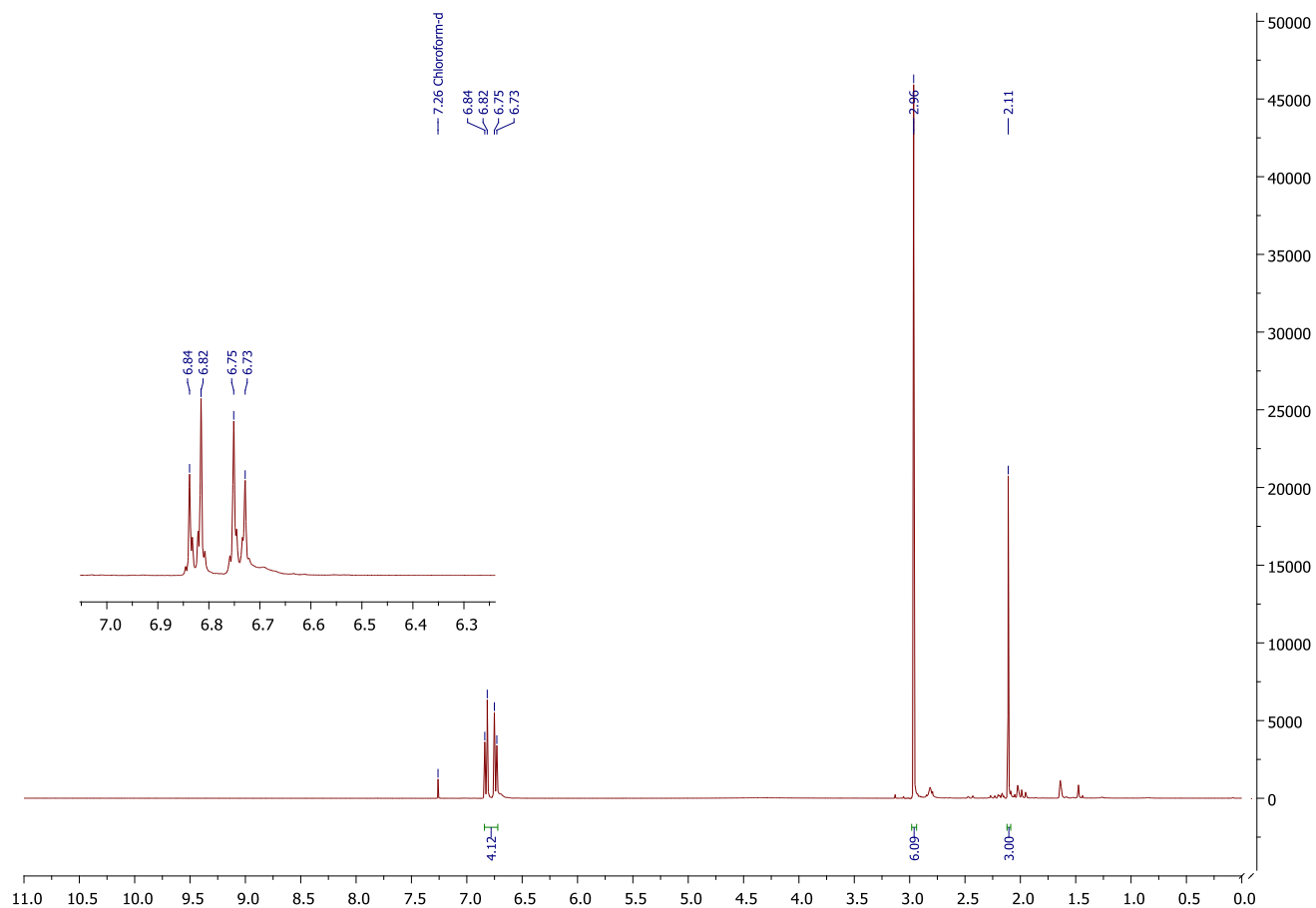
1i



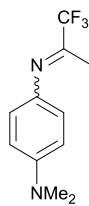
1-*N,N*-Dimethyl-4-*N*-(1,1,1-trifluoropropan-2-ylidene)benzene-1,4-diamine (1j) - ^1H NMR (400 MHz, CDCl_3)



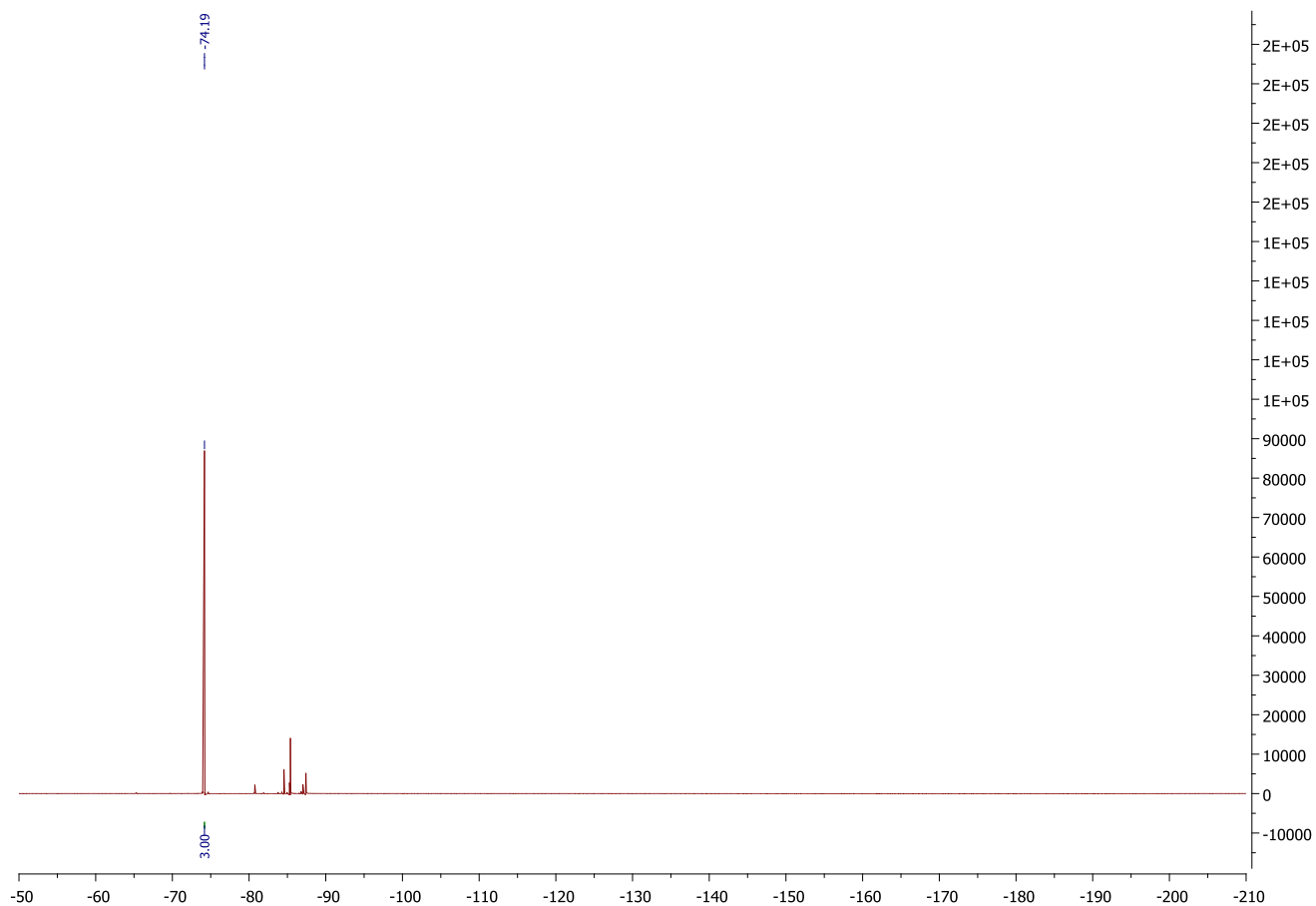
1j



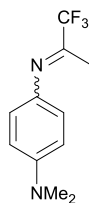
1-*N,N*-Dimethyl-4-*N*-(1,1,1-trifluoropropan-2-ylidene)benzene-1,4-diamine (1j) - ^{19}F NMR (376 MHz, CDCl_3)



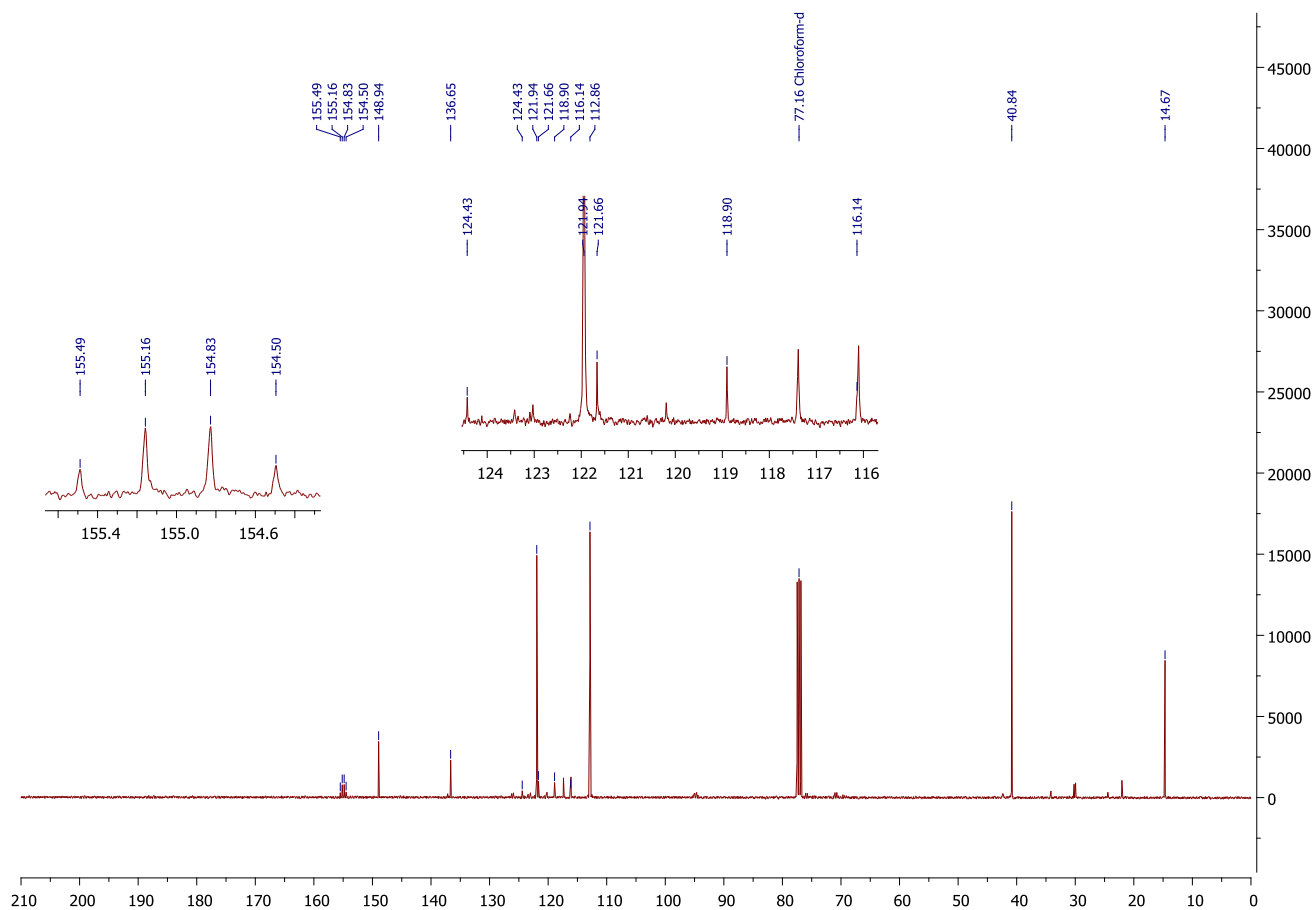
1j



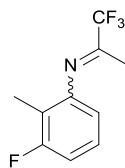
1-*N,N*-Dimethyl-4-*N*-(1,1,1-trifluoropropan-2-ylidene)benzene-1,4-diamine (1j) - ^{13}C NMR (101 MHz, CDCl_3)



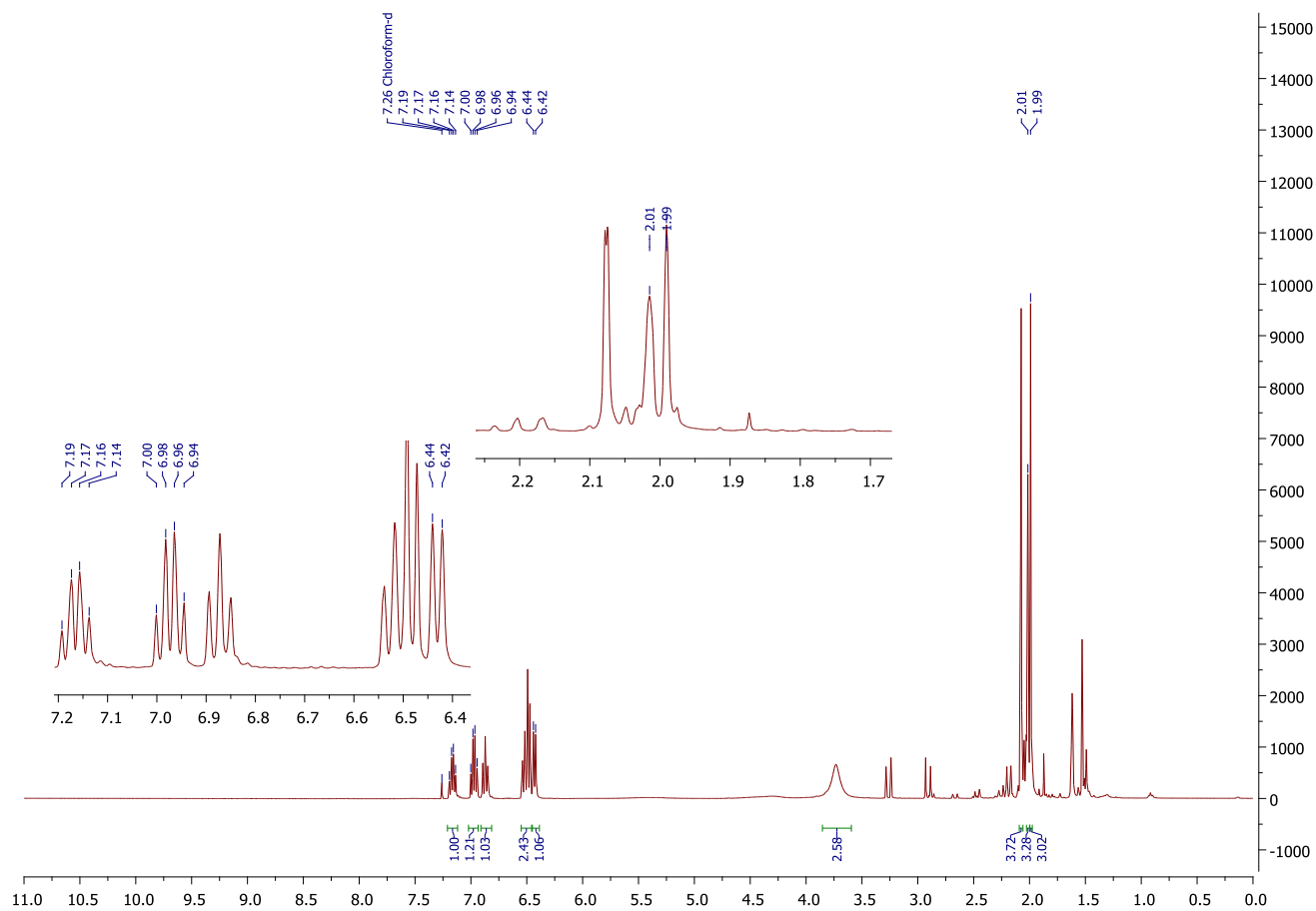
1j



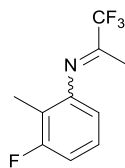
3-Fluoro-2-methyl-N-(1,1,1-trifluoropropan-2-ylidene)aniline (1k) - ^1H NMR (400 MHz, CDCl_3)



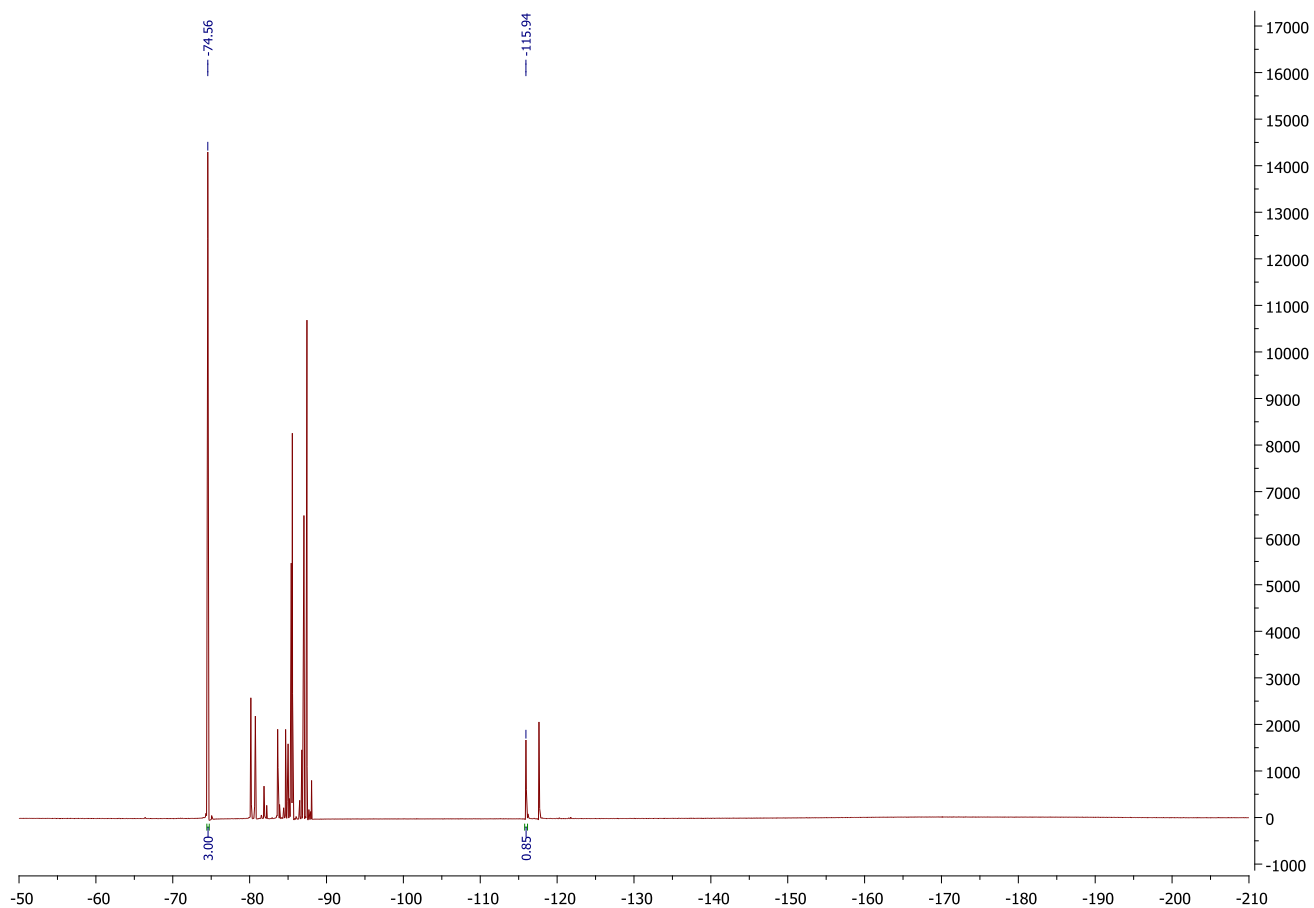
1k



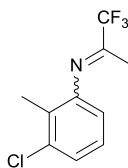
3-Fluoro-2-methyl-*N*-(1,1,1-trifluoropropan-2-ylidene)aniline (**1k**) - ^{19}F NMR (376 MHz, CDCl_3)



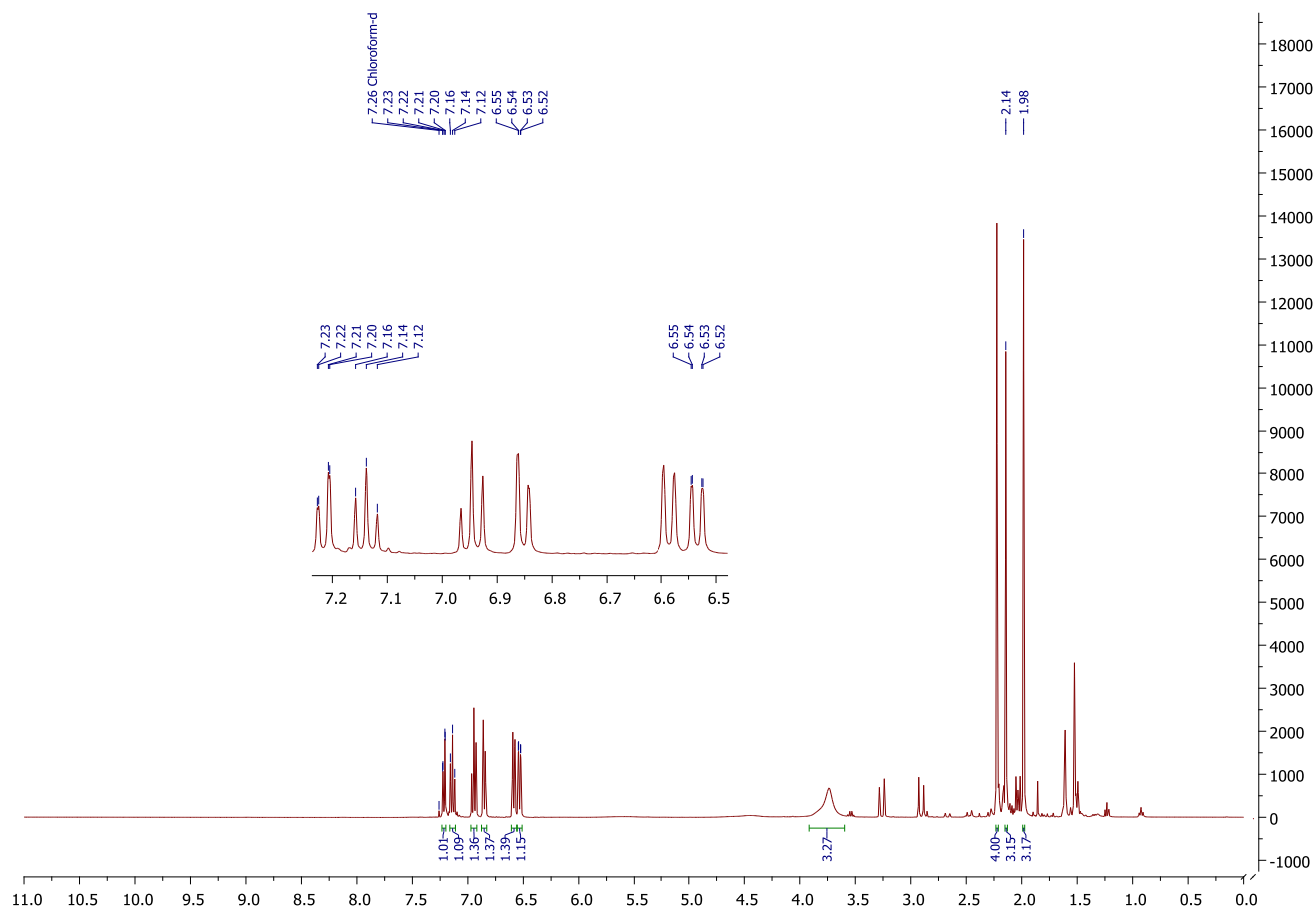
1k



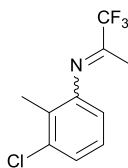
3-Chloro-2-methyl-*N*-(1,1,1-trifluoropropan-2-ylidene)aniline (1I) - ^1H NMR (400 MHz, CDCl_3)



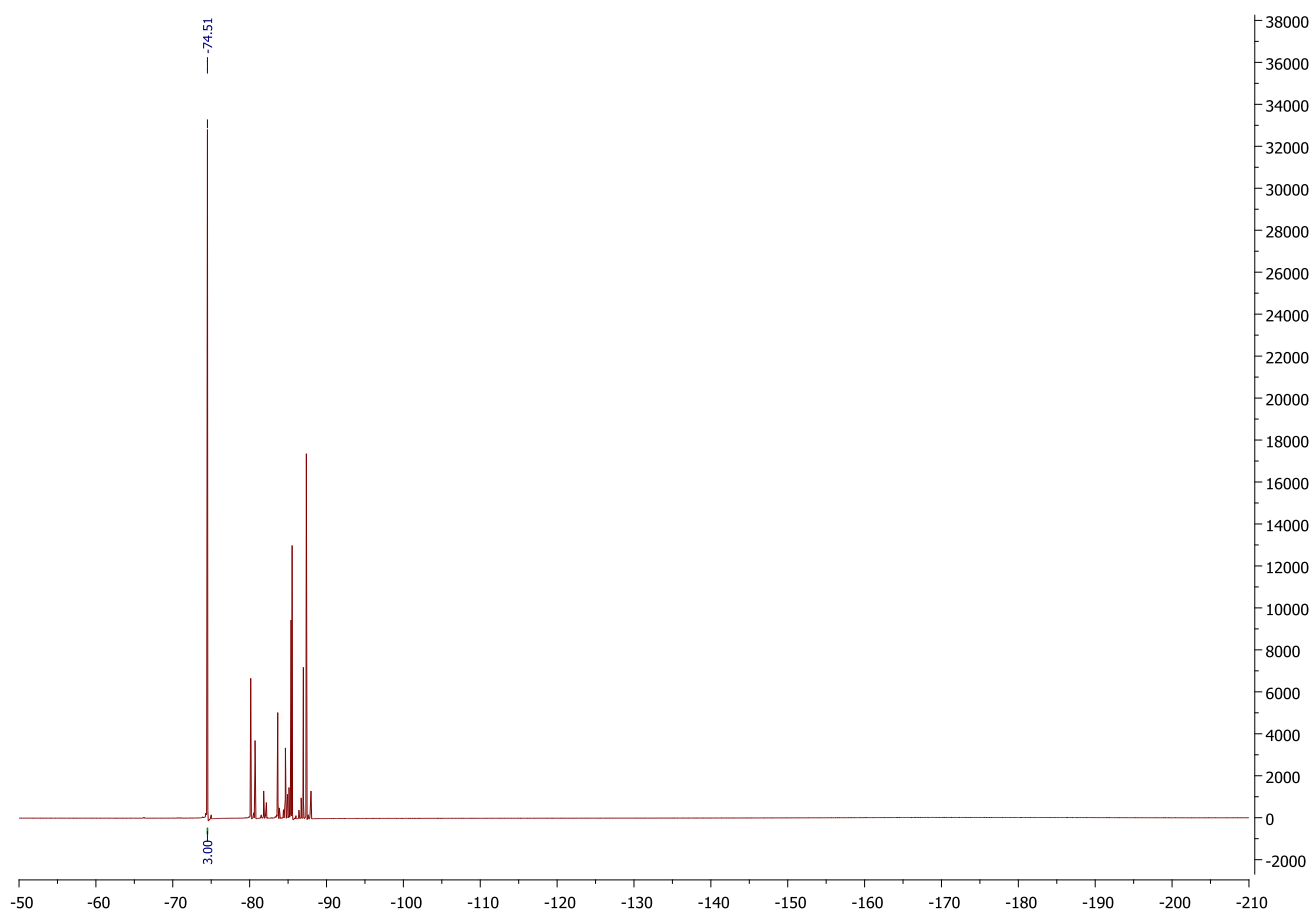
1I



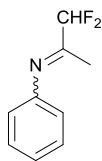
3-Chloro-2-methyl-*N*-(1,1,1-trifluoropropan-2-ylidene)aniline (**1l**) - ^{19}F NMR (376 MHz, CDCl_3)



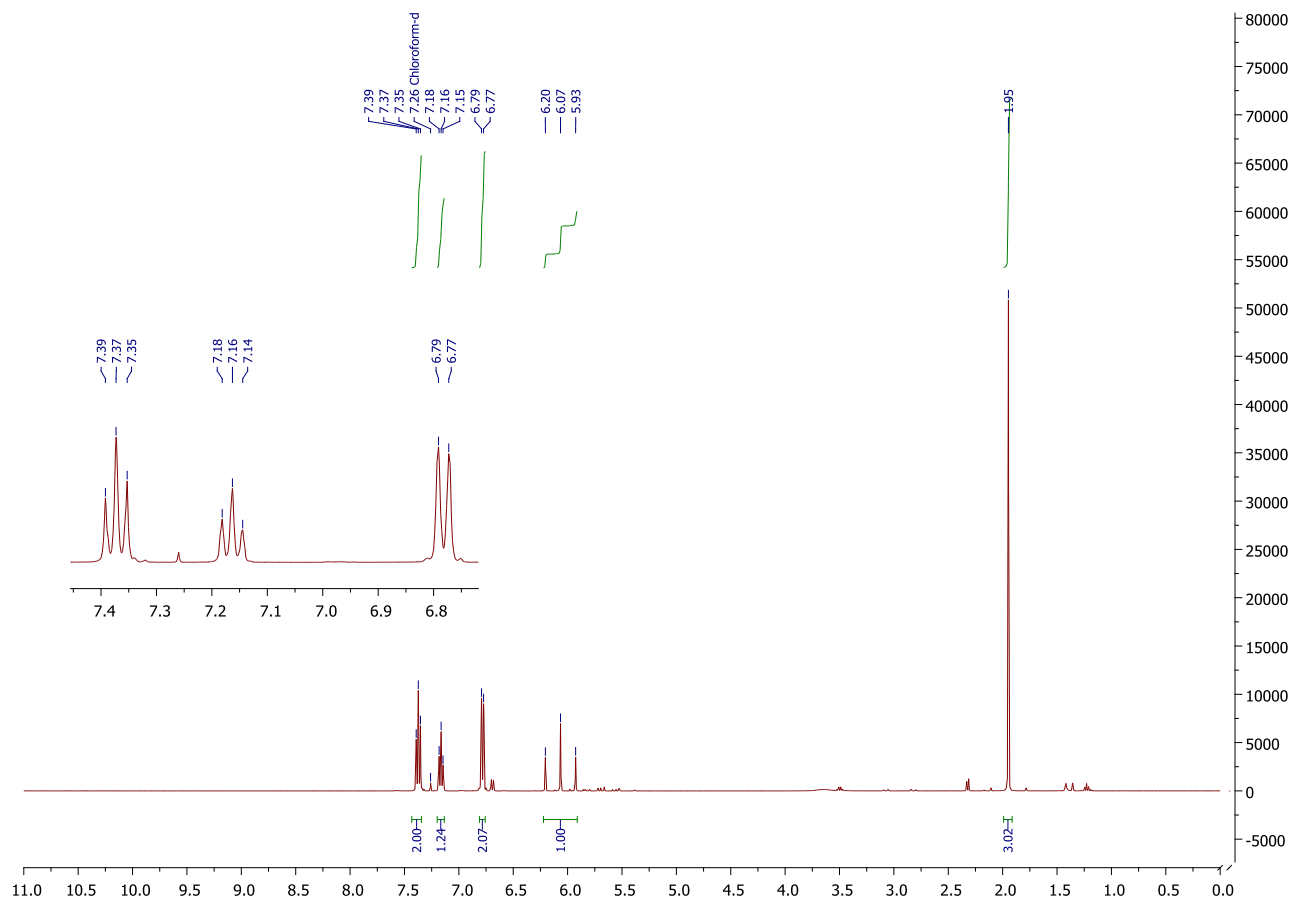
1l



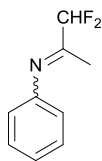
***N*-(1,1-Difluoropropan-2-ylidene)aniline (1aa) - ^1H NMR (400 MHz, CDCl_3)**



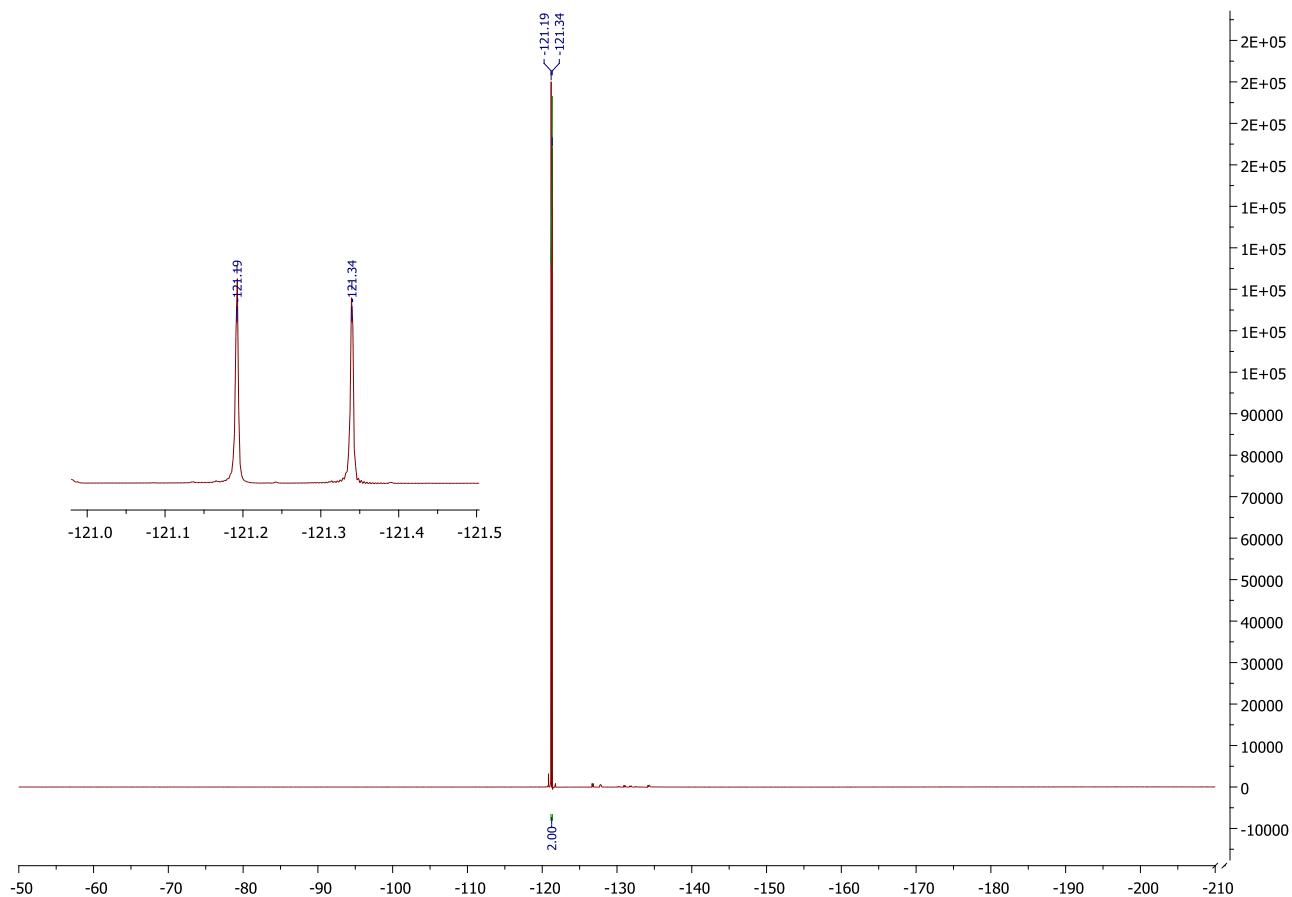
1aa



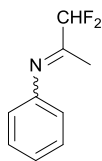
***N*-(1,1-Difluoropropan-2-ylidene)aniline (1aa) - ^{19}F NMR (376 MHz, CDCl_3)**



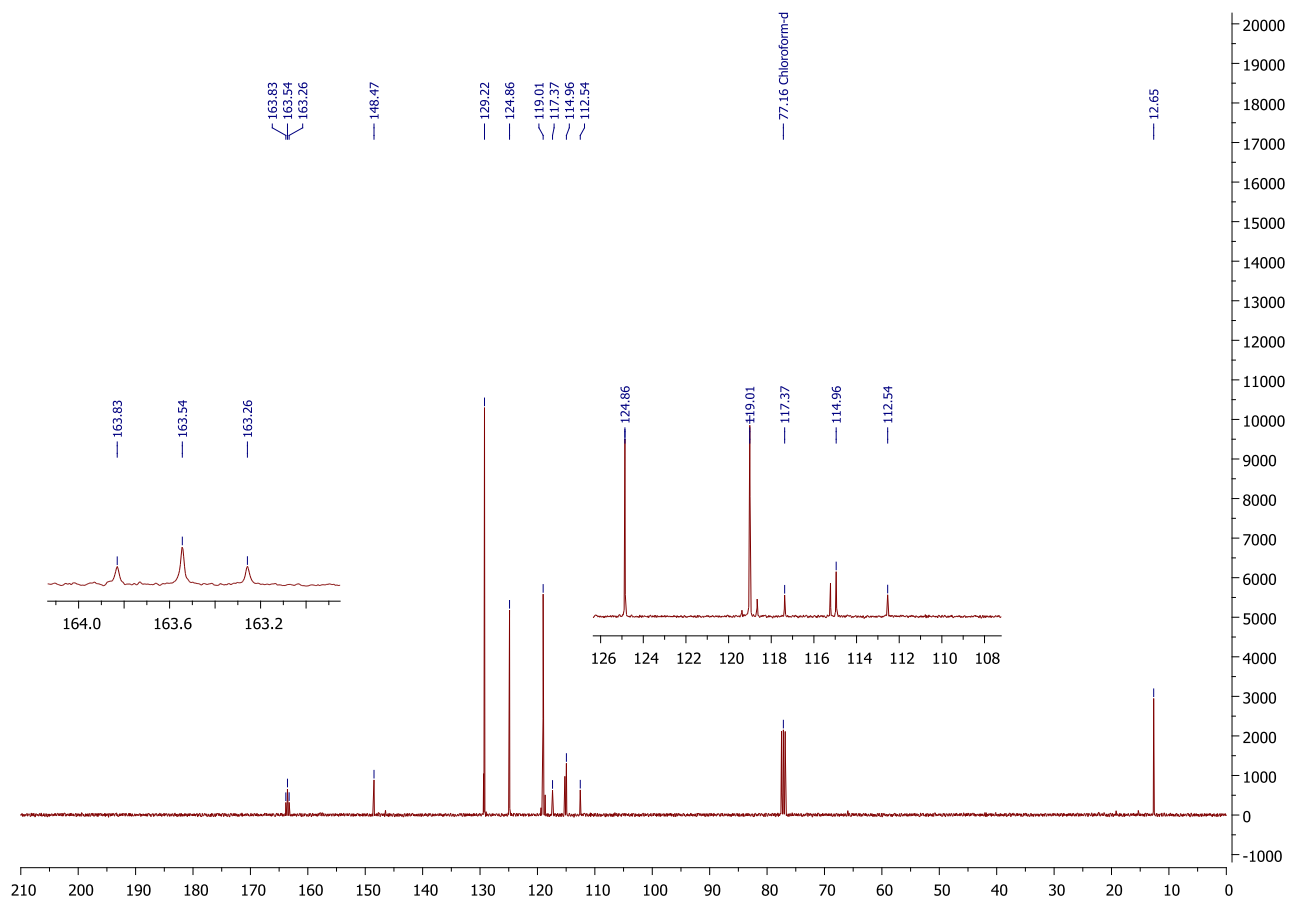
1aa



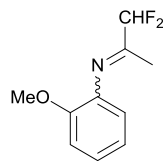
***N*-(1,1-Difluoropropan-2-ylidene)aniline (1aa) - ^{13}C NMR (101 MHz, CDCl_3)**



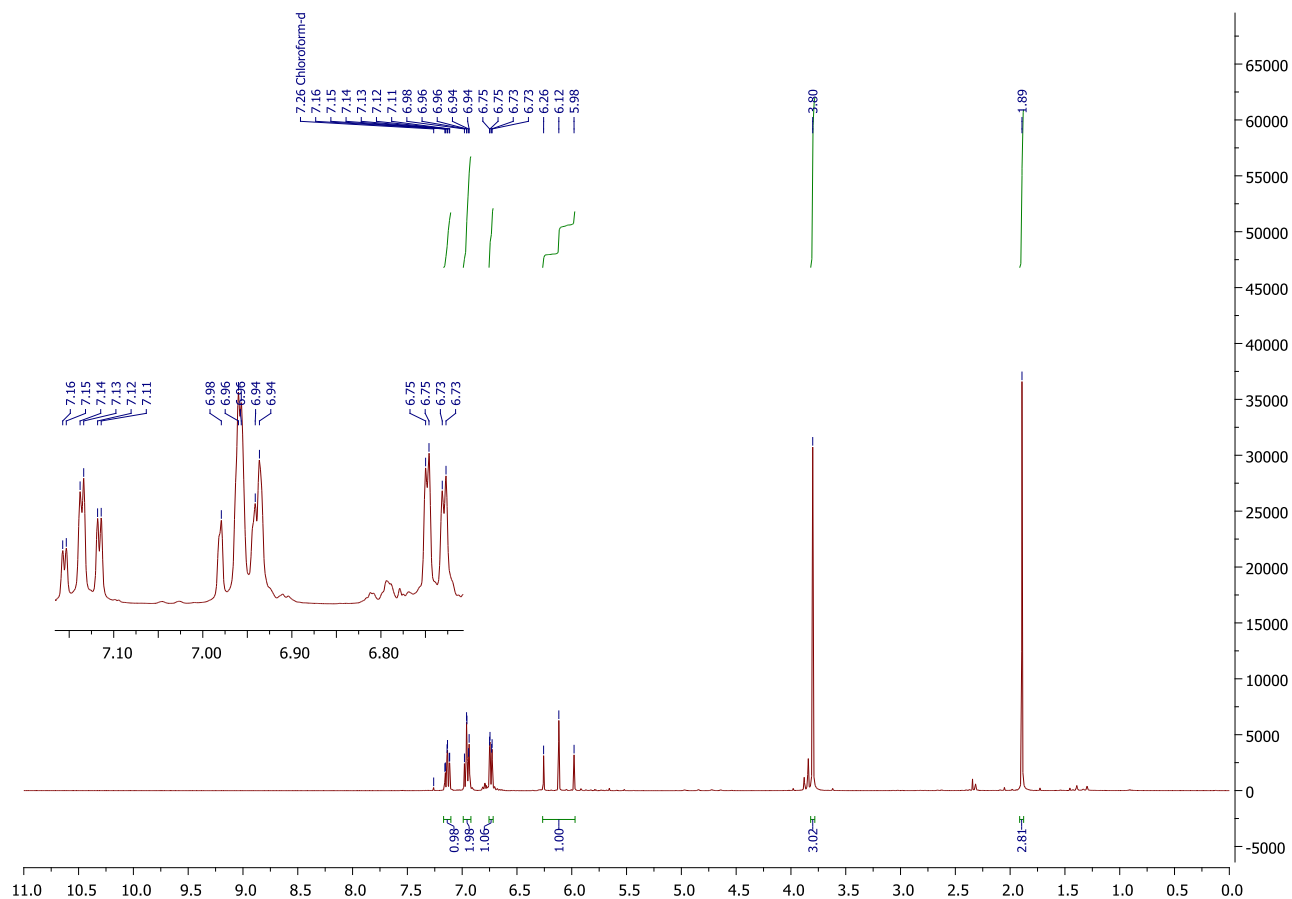
1aa



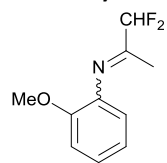
***N*-(1,1-Difluoropropan-2-ylidene)-2-methoxyaniline (1bb) - ^1H NMR (400 MHz, CDCl_3)**



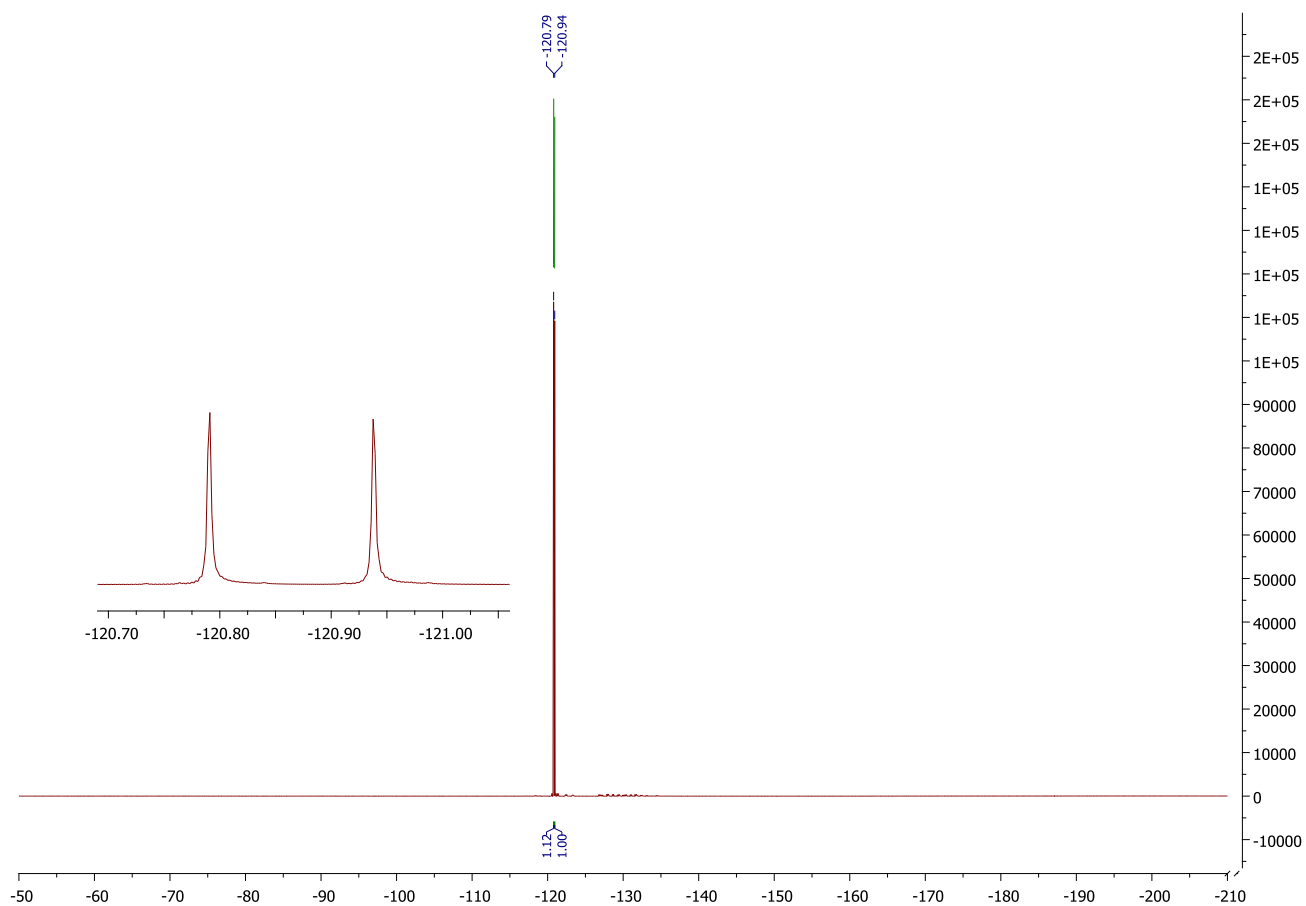
1bb



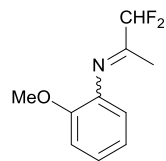
***N*-(1,1-Difluoropropan-2-ylidene)-2-methoxyaniline (1bb)- ^{19}F NMR (376 MHz, CDCl_3)**



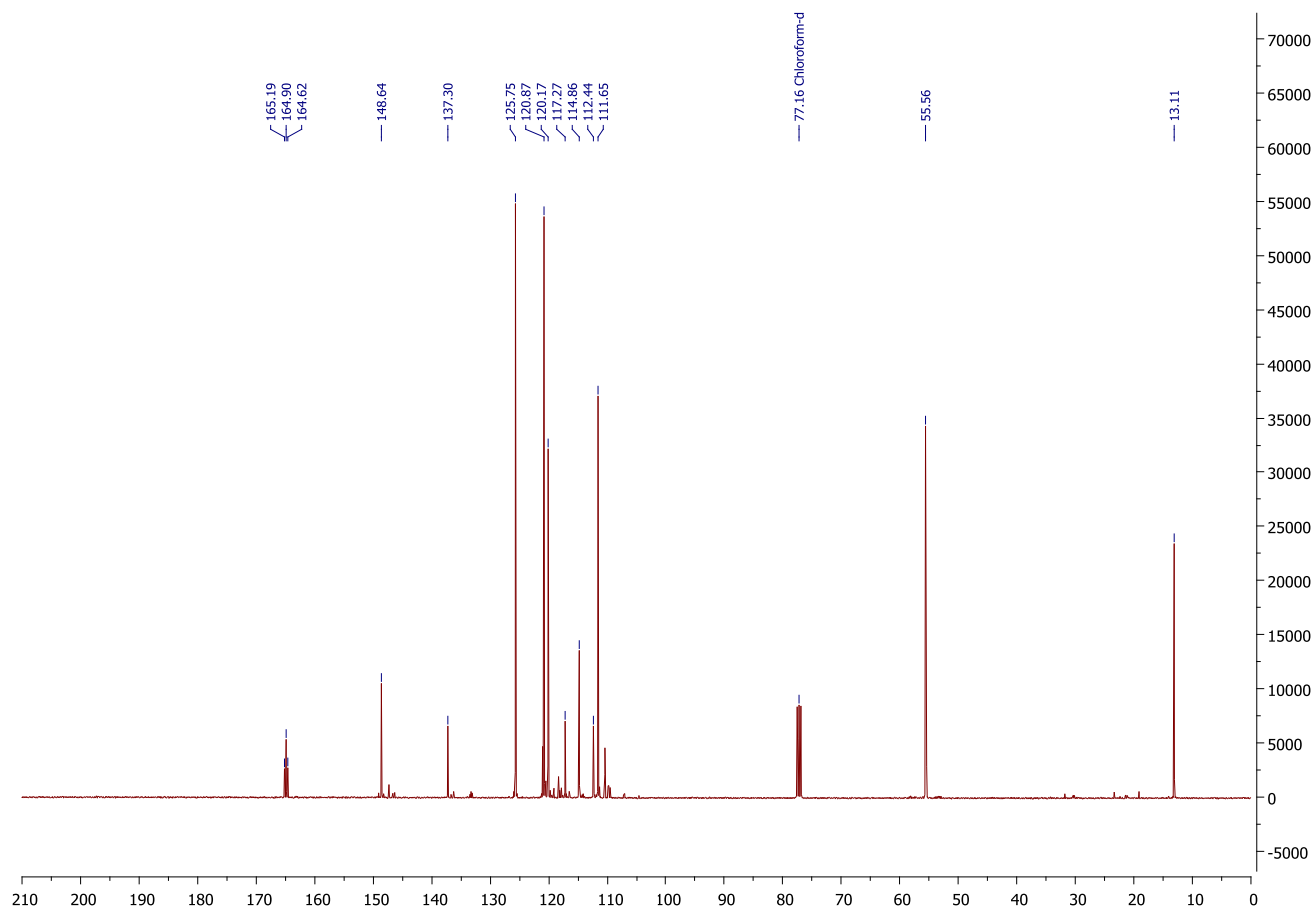
1bb



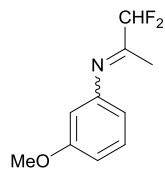
***N*-(1,1-Difluoropropan-2-ylidene)-2-methoxyaniline (1bb) - ^{13}C NMR (101 MHz, CDCl_3)**



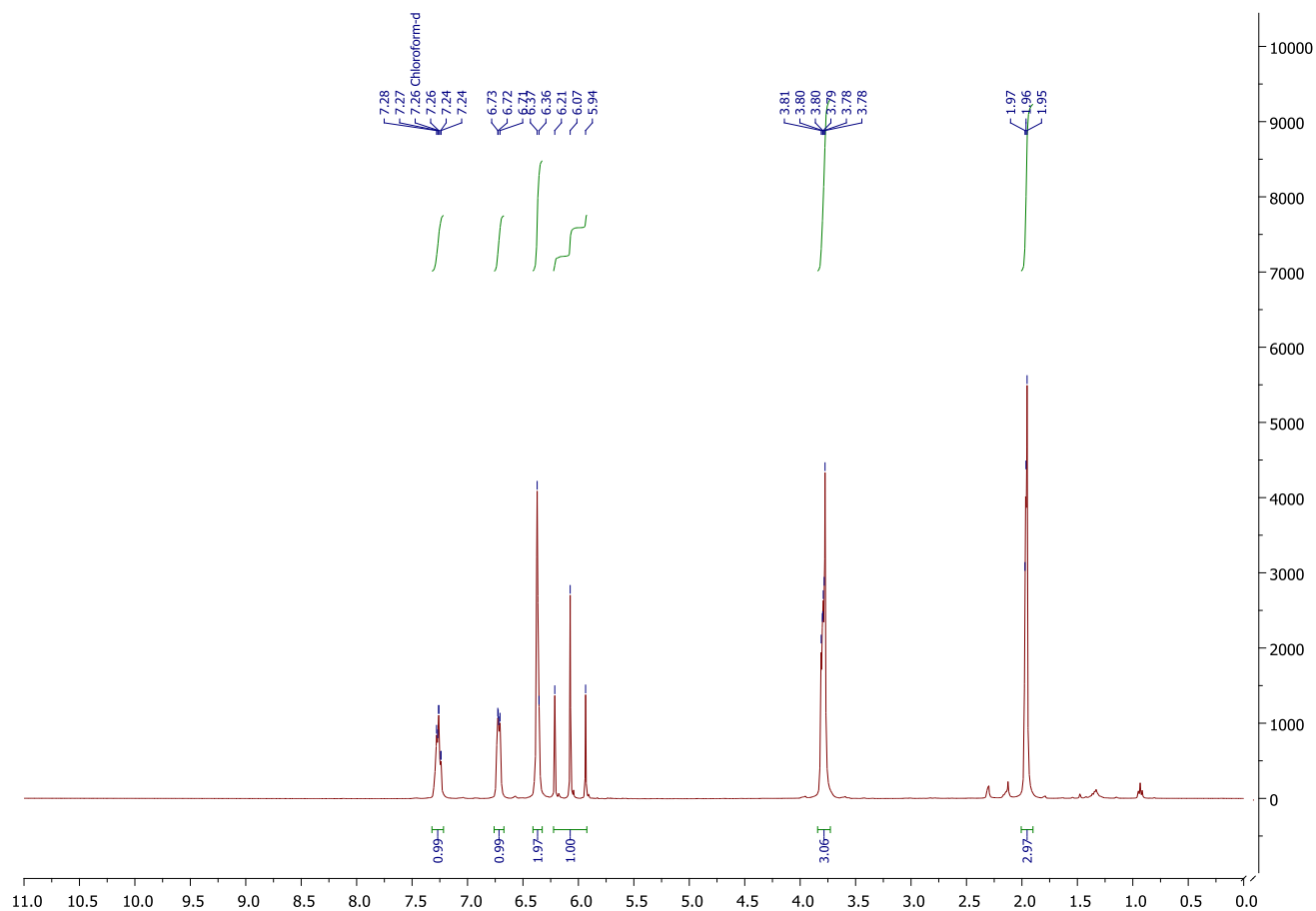
1bb



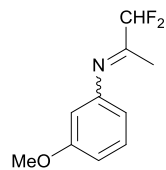
***N*-(1,1-Difluoropropan-2-ylidene)-3-methoxyaniline (1cc) - ^1H NMR (400 MHz, CDCl_3)**



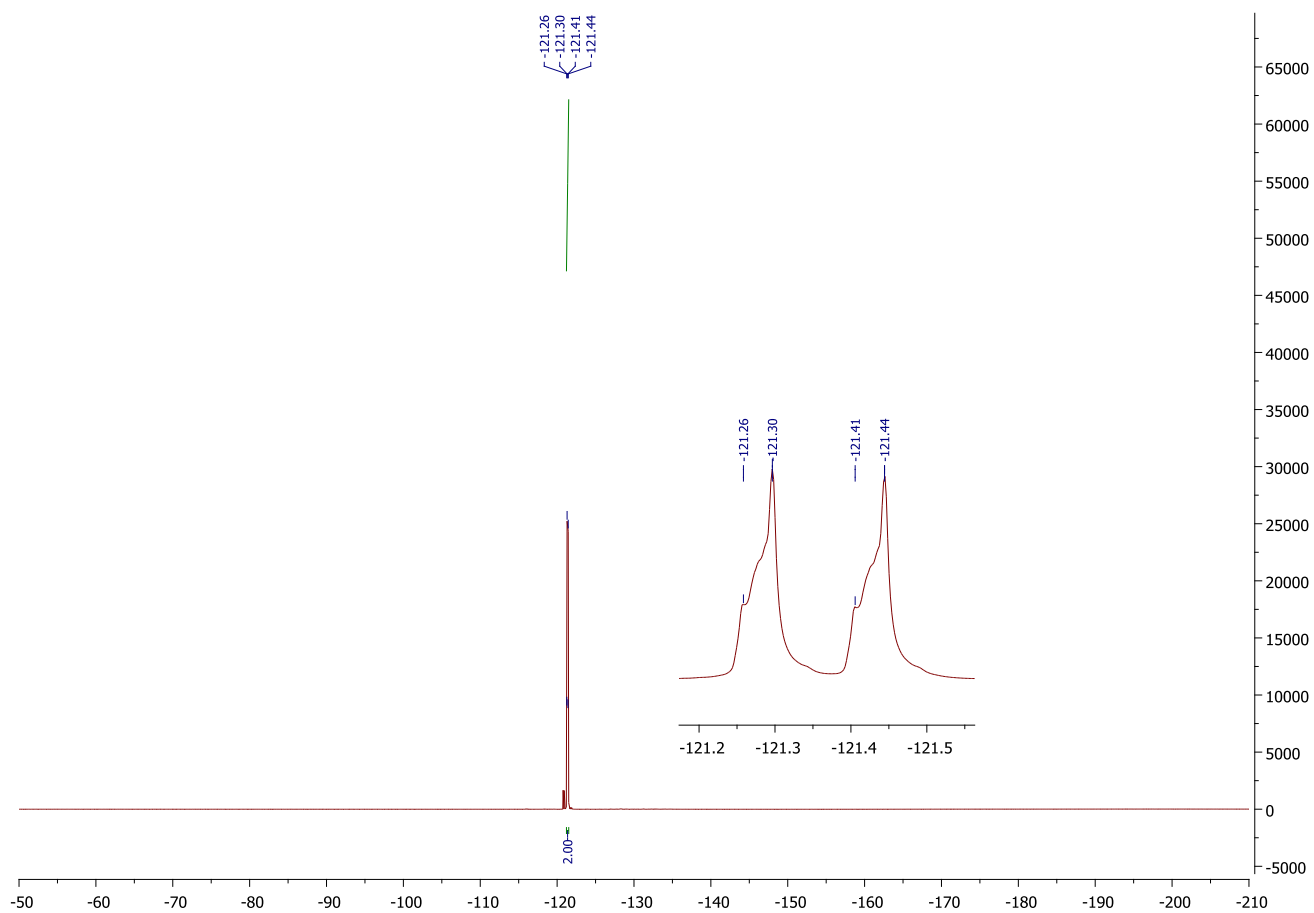
1cc



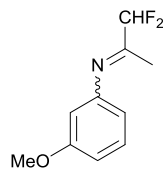
***N*-(1,1-Difluoropropan-2-ylidene)-3-methoxyaniline (1cc) - ^{19}F NMR (376 MHz, CDCl_3)**



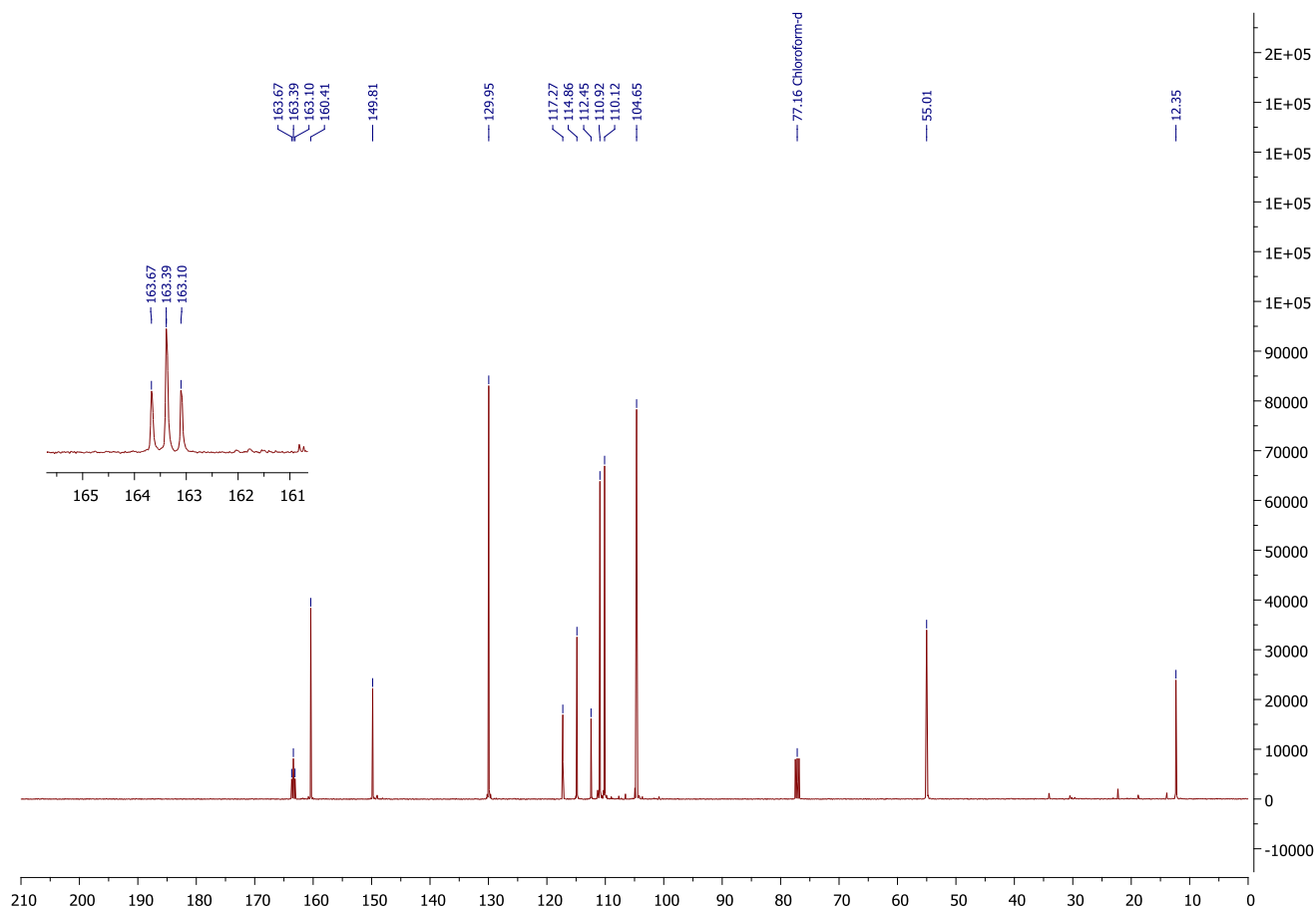
1cc



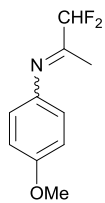
***N*-(1,1-Difluoropropan-2-ylidene)-3-methoxyaniline (1cc) - ^{13}C NMR (101 MHz, CDCl_3)**



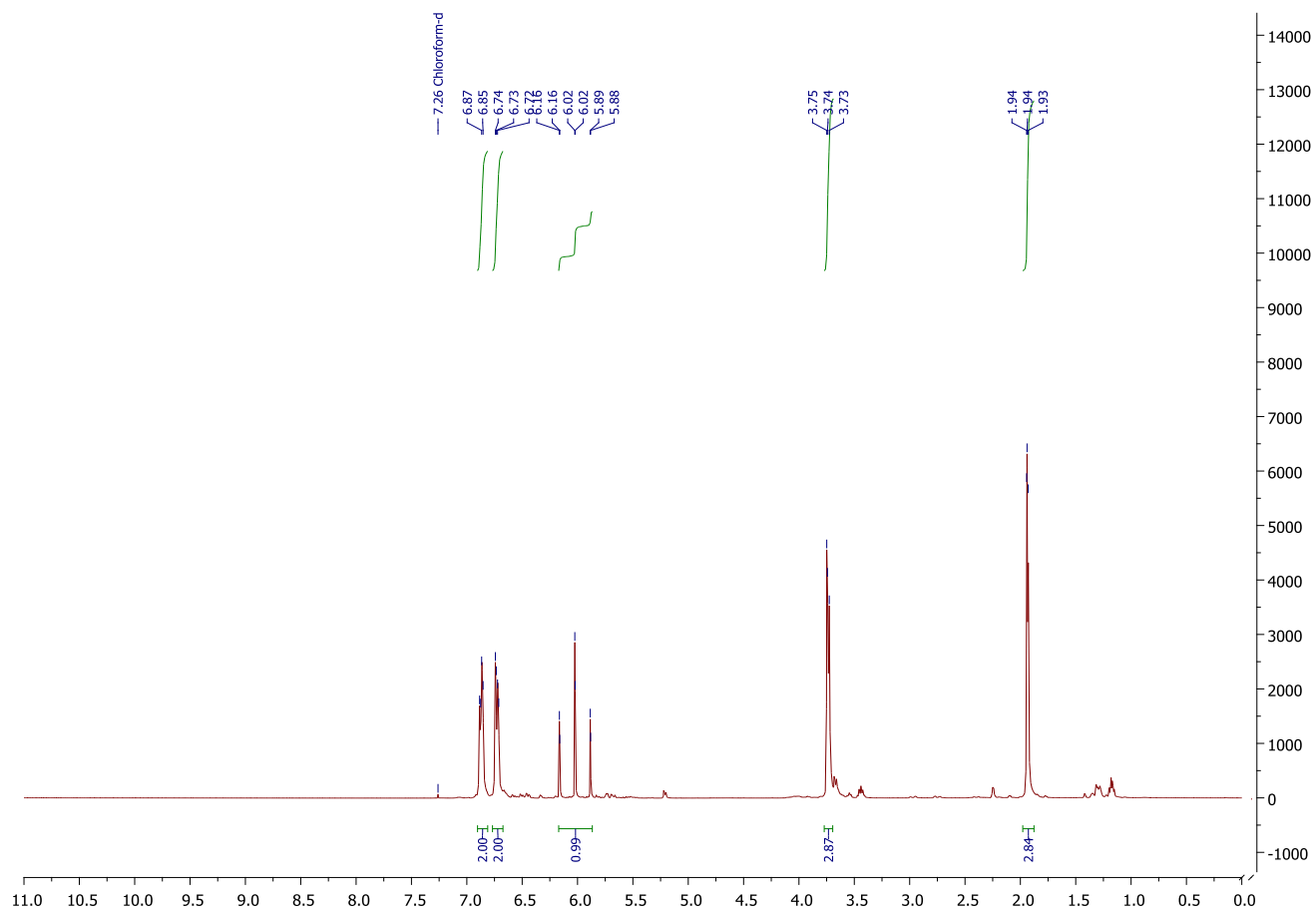
1cc



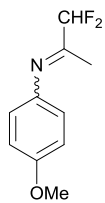
***N*-(1,1-Difluoropropan-2-ylidene)-4-methoxyaniline (1dd) - ^1H NMR (400 MHz, CDCl_3)**



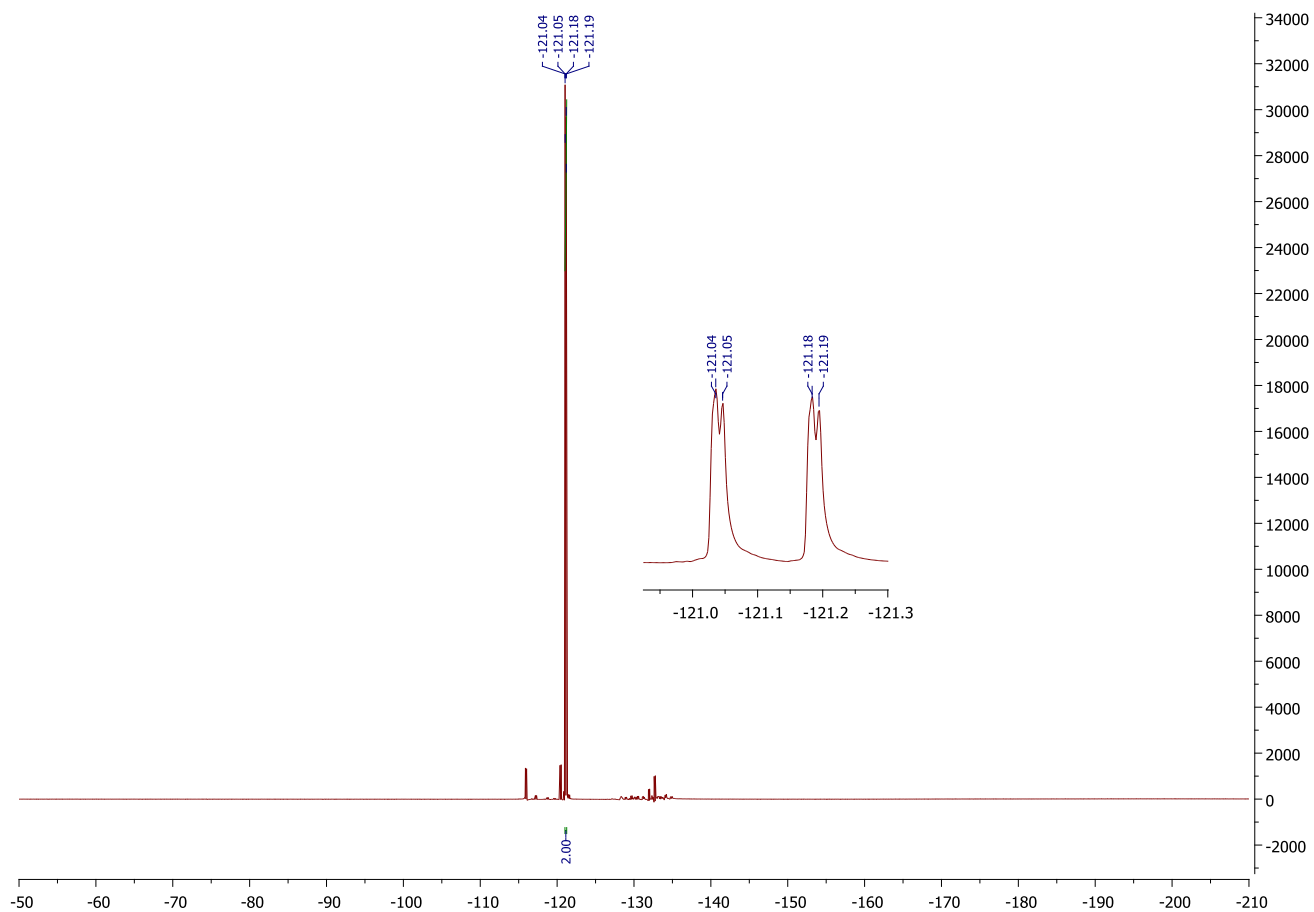
1dd



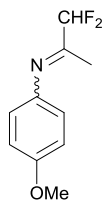
***N*-(1,1-Difluoropropan-2-ylidene)-4-methoxyaniline (1dd) - ^{19}F NMR (376 MHz, CDCl_3)**



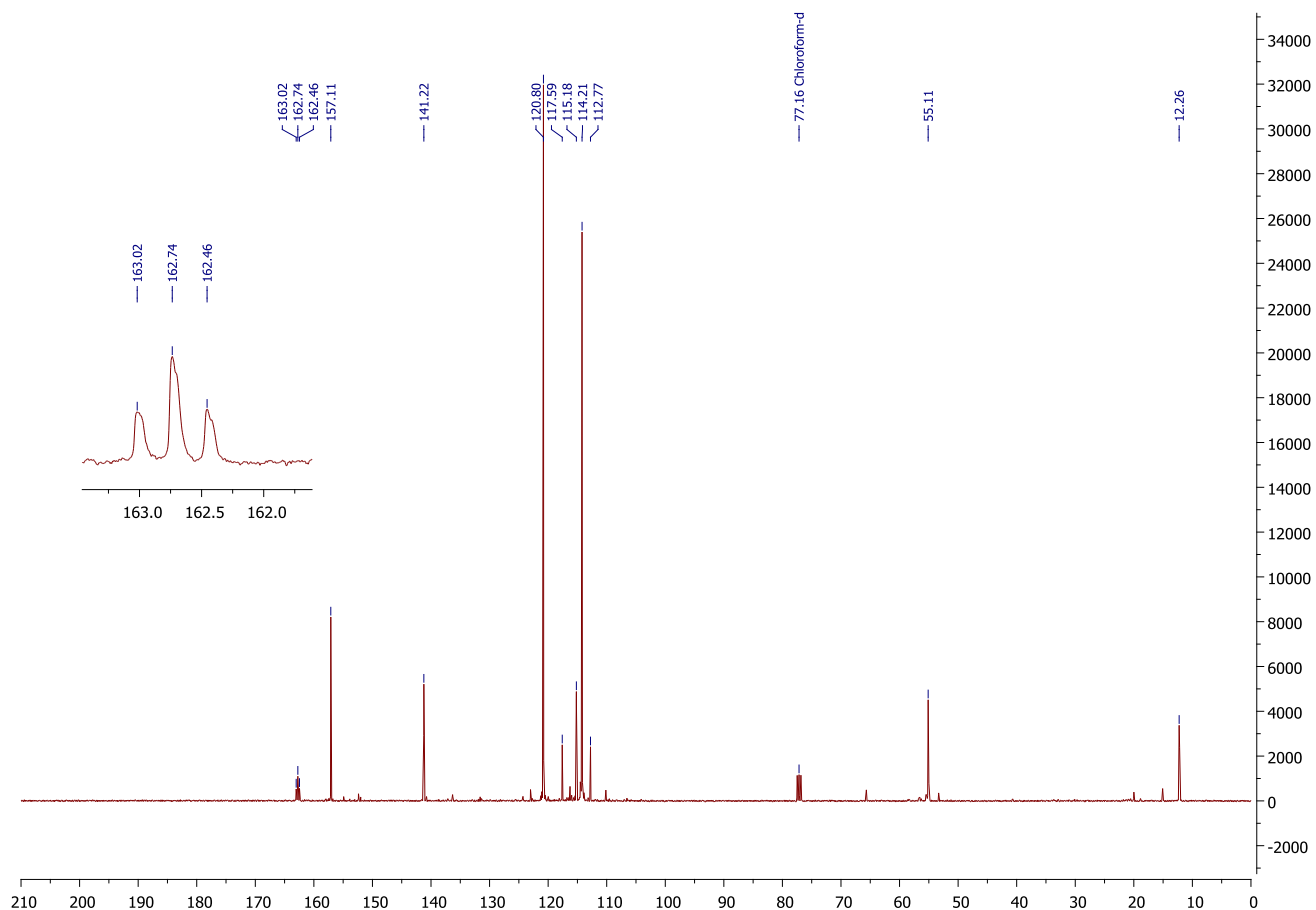
1dd



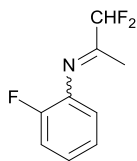
***N*-(1,1-Difluoropropan-2-ylidene)-4-methoxyaniline (1dd) - ^{13}C NMR (101 MHz, CDCl_3)**



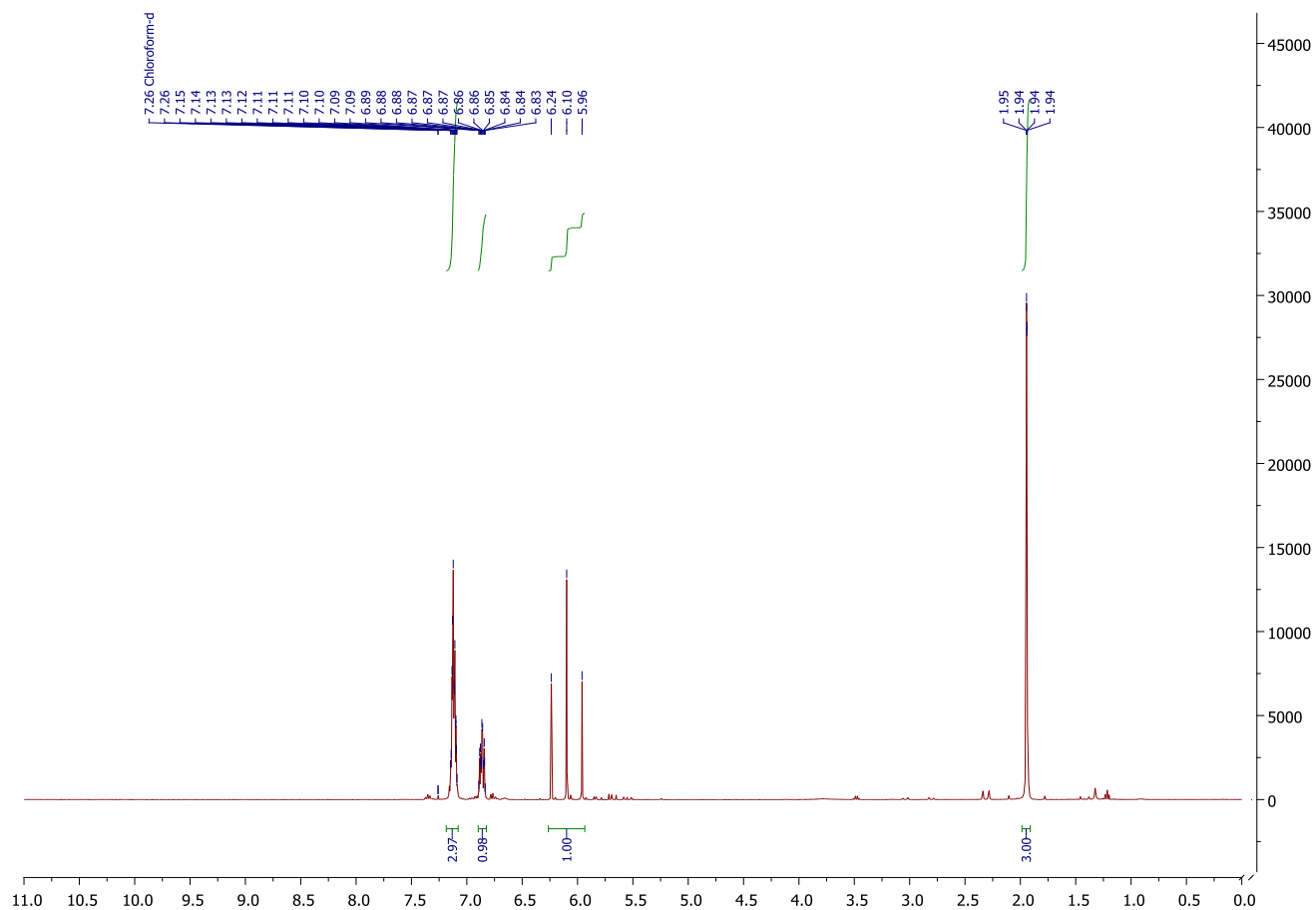
1dd



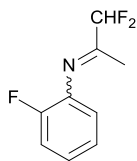
***N*-(1,1-difluoropropan-2-ylidene)-2-fluoroaniline (1ee) - ^1H NMR (400 MHz, CDCl_3)**



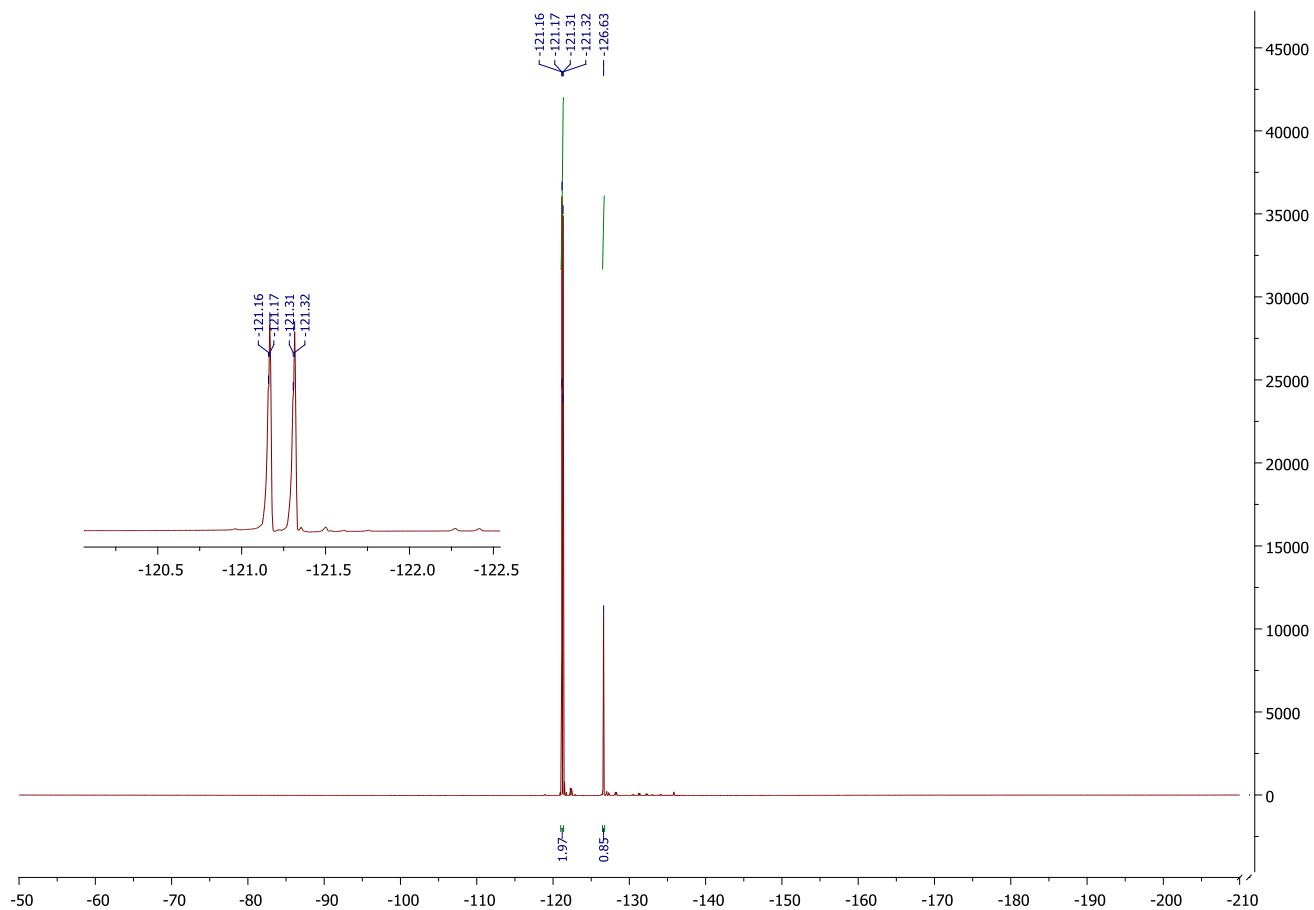
1ee



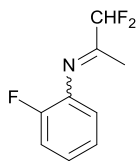
***N*-(1,1-difluoropropan-2-ylidene)-2-fluoroaniline (1ee) - ^{19}F NMR (376 MHz, CDCl_3)**



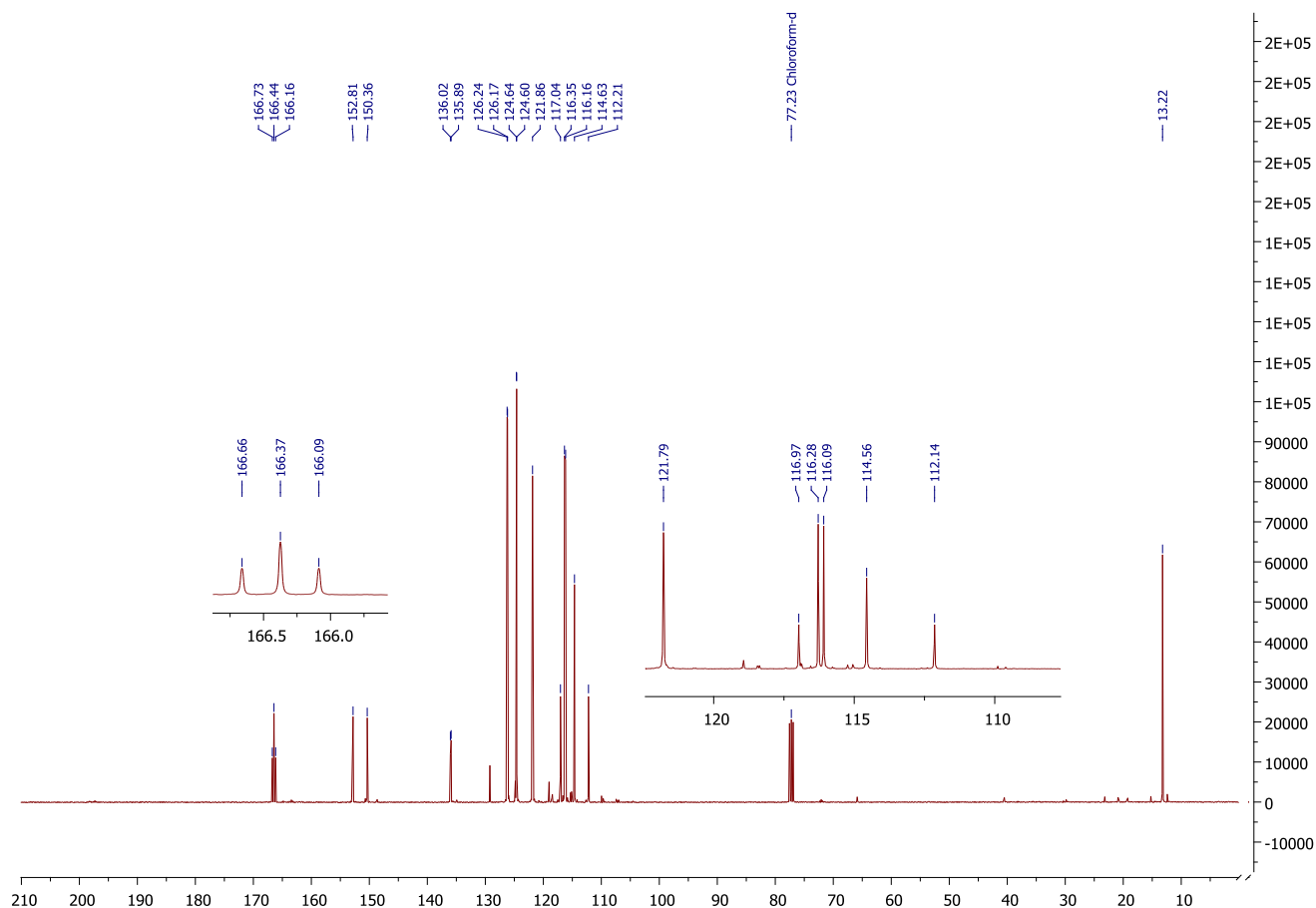
1ee



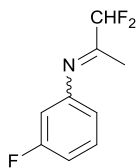
***N*-(1,1-difluoropropan-2-ylidene)-2-fluoroaniline (1ee) - ^{13}C NMR (101 MHz, CDCl_3)**



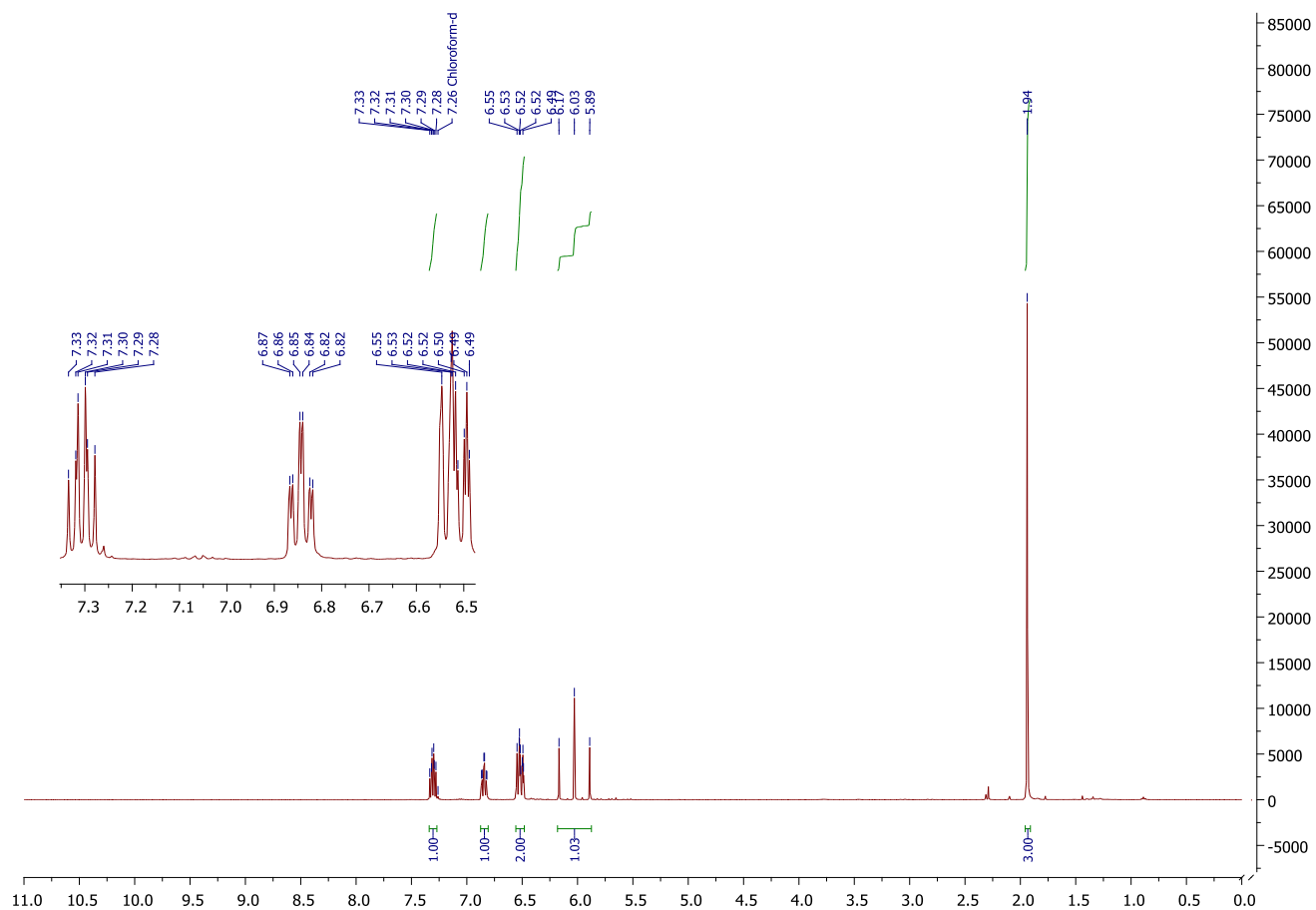
1ee



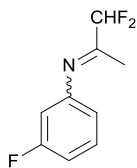
***N*-(1,1-difluoropropan-2-ylidene)-3-fluoroaniline (1ff) - ^1H NMR (400 MHz, CDCl_3)**



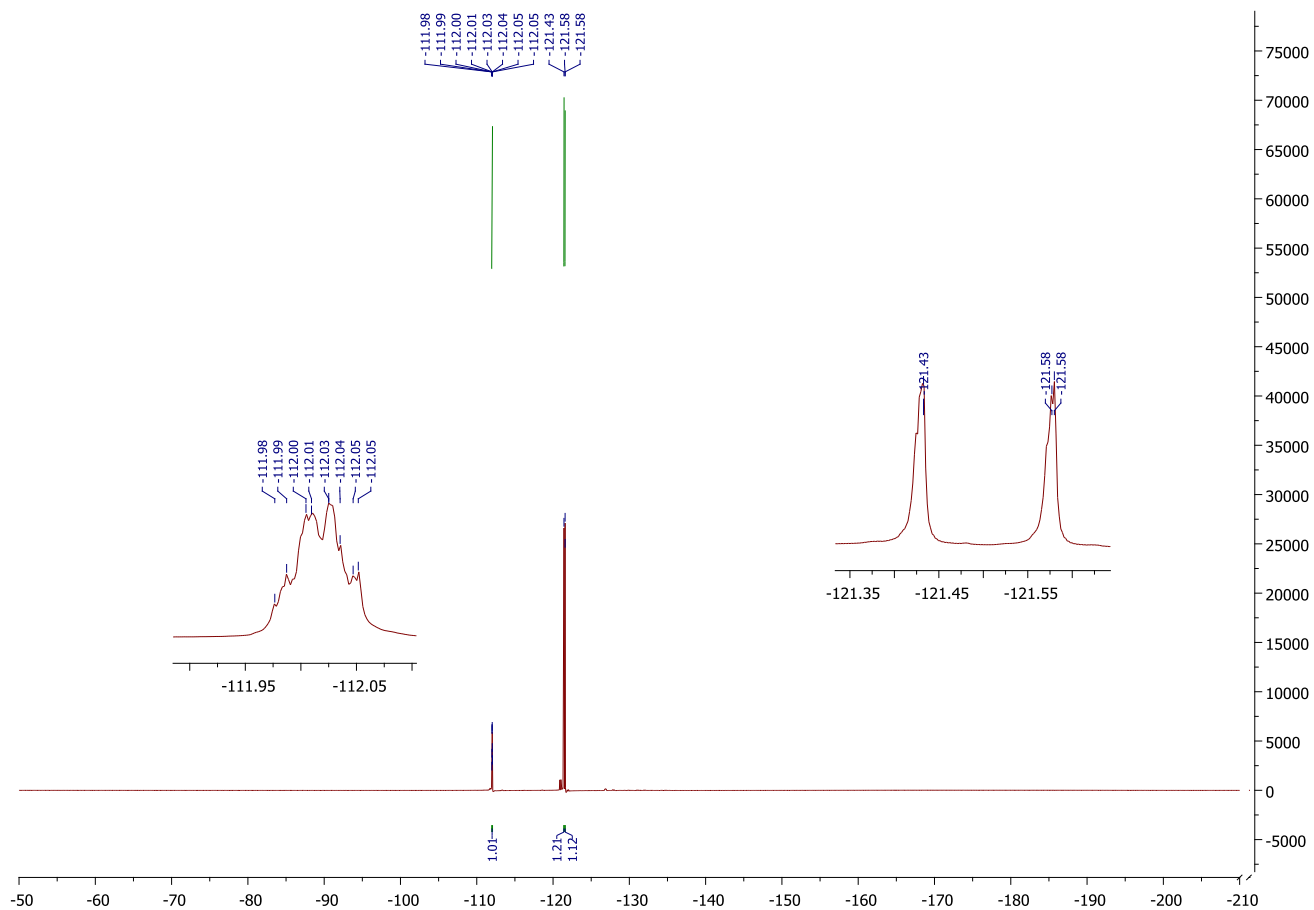
1ff



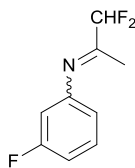
***N*-(1,1-difluoropropan-2-ylidene)-3-fluoroaniline (1ff) - ^{19}F NMR (376 MHz, CDCl_3)**



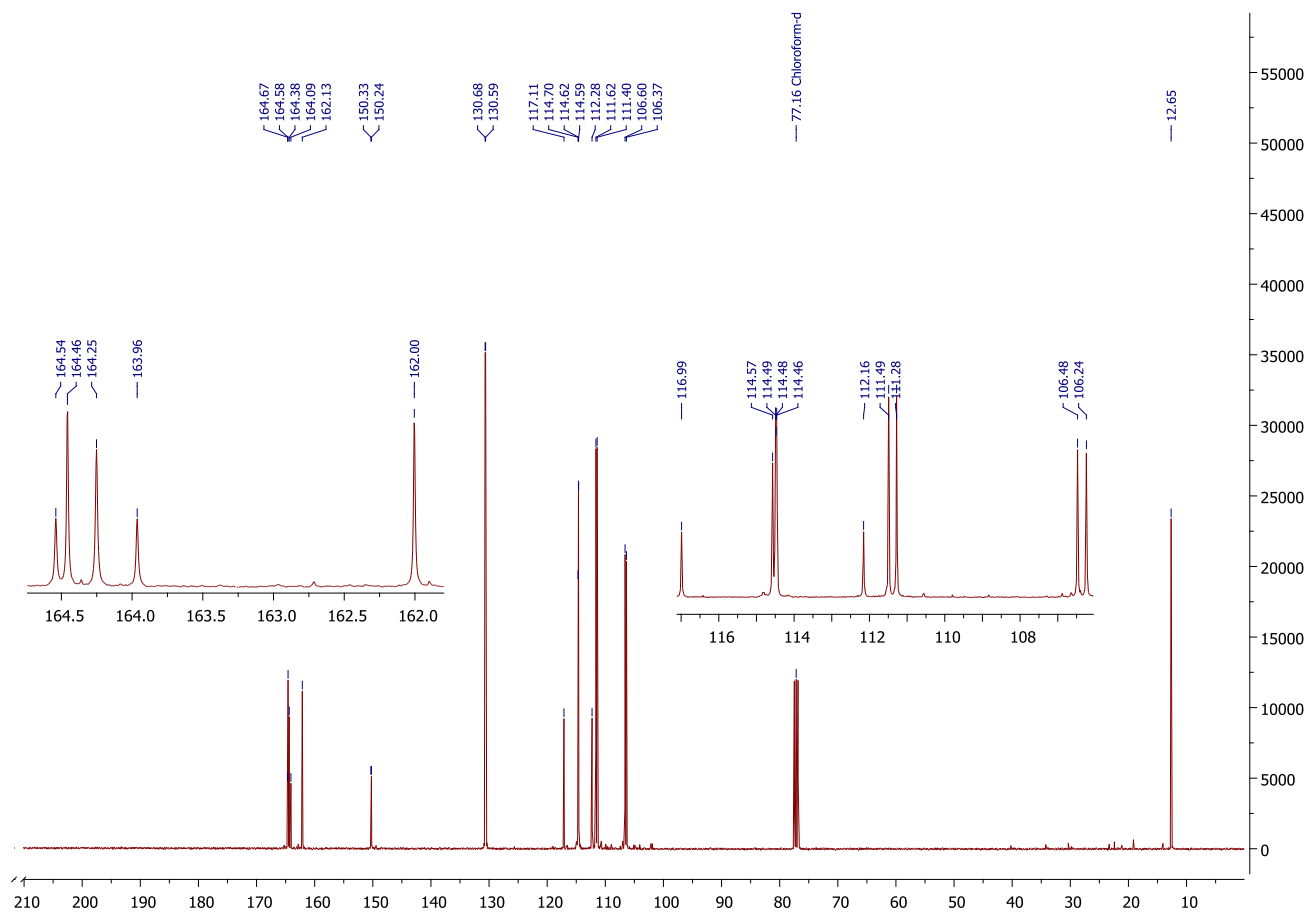
1ff



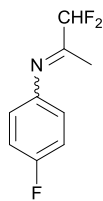
***N*-(1,1-difluoropropan-2-ylidene)-3-fluoroaniline (1ff) - ^{13}C NMR (101 MHz, CDCl_3)**



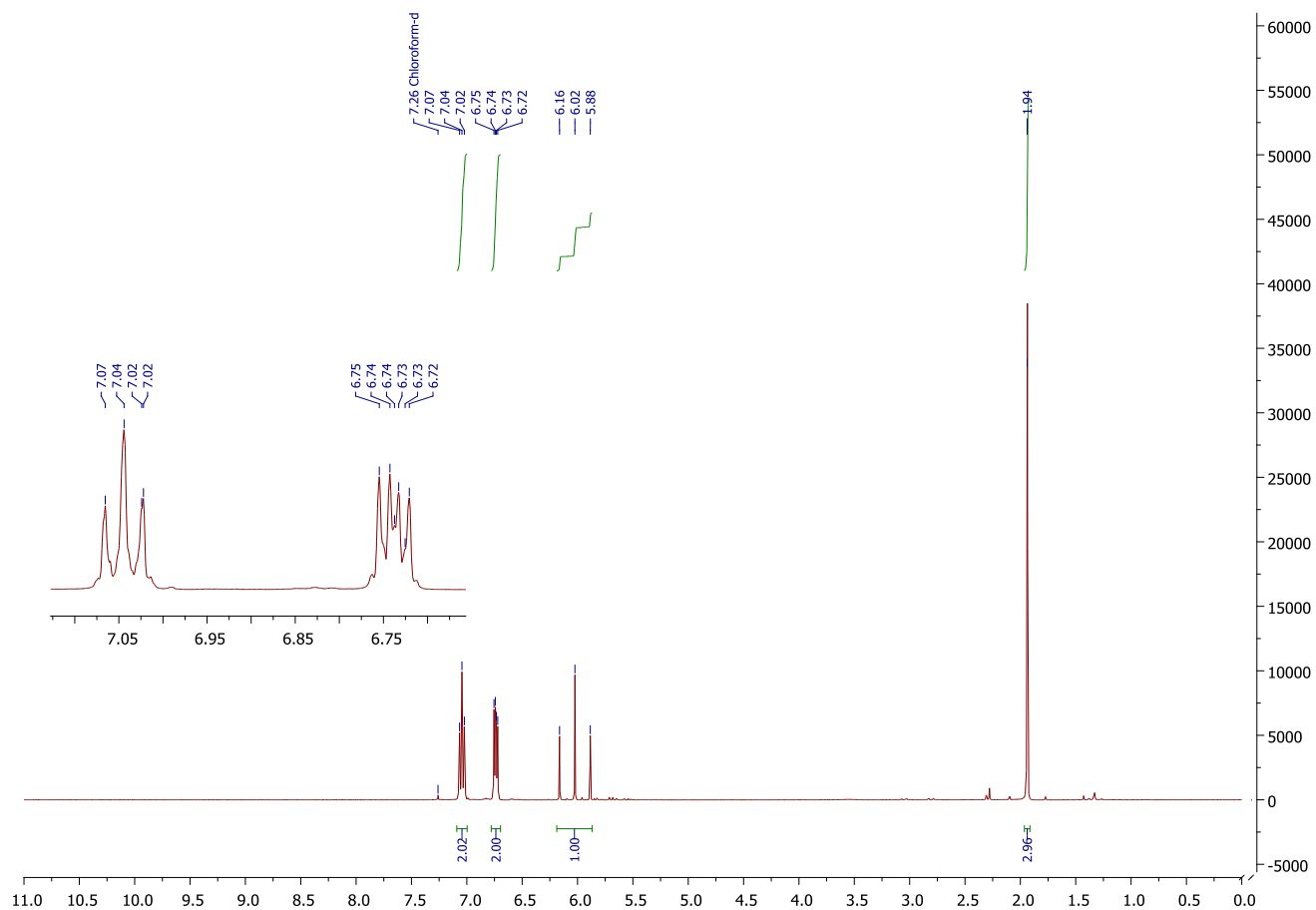
1ff



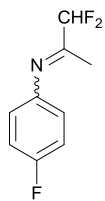
***N*-(1,1-difluoropropan-2-ylidene)-4-fluoroaniline (1gg) - ^1H NMR (400 MHz, CDCl_3)**



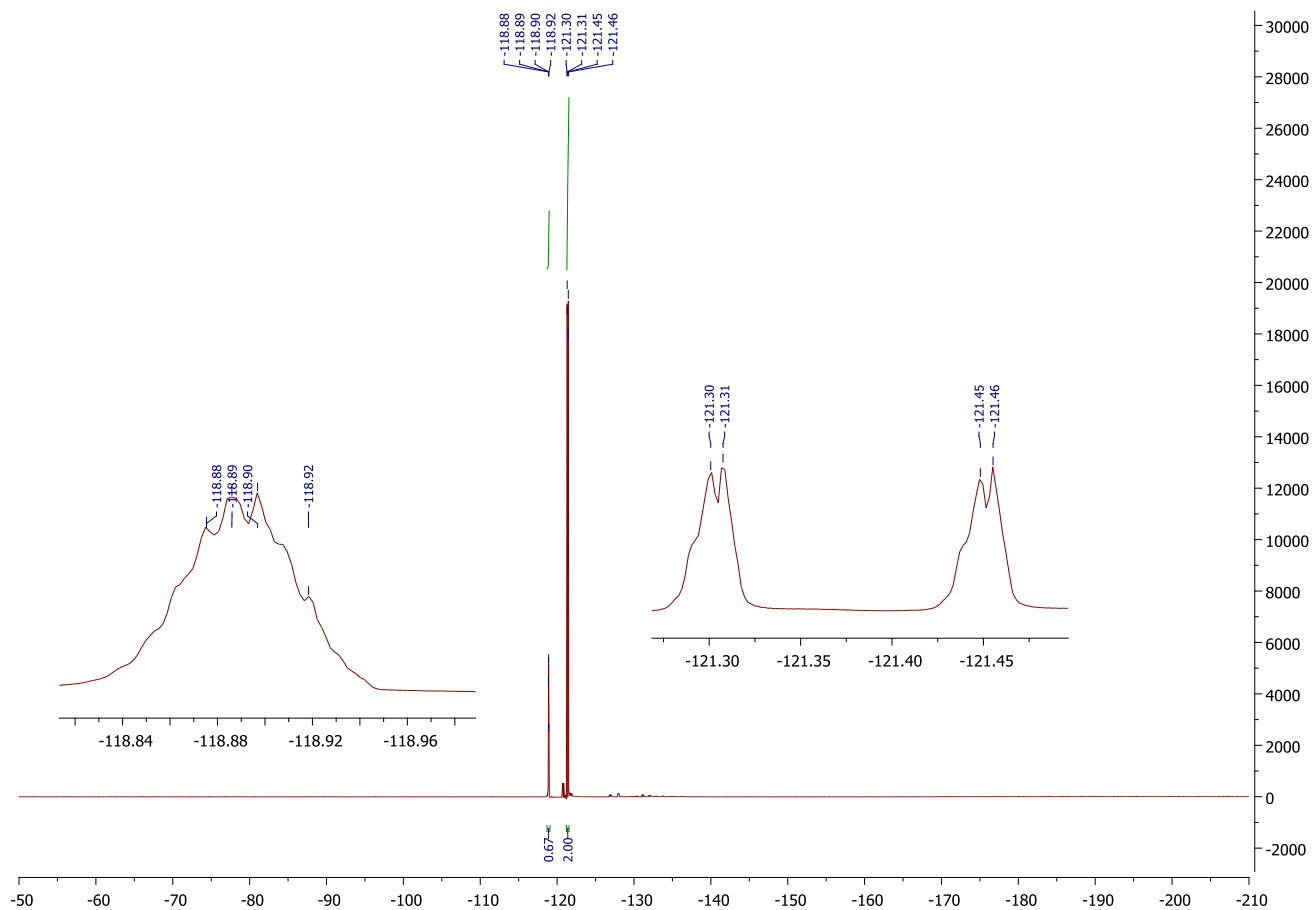
1gg



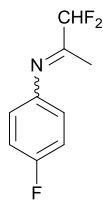
***N*-(1,1-difluoropropan-2-ylidene)-4-fluoroaniline (1gg) - ^{19}F NMR (376 MHz, CDCl_3)**



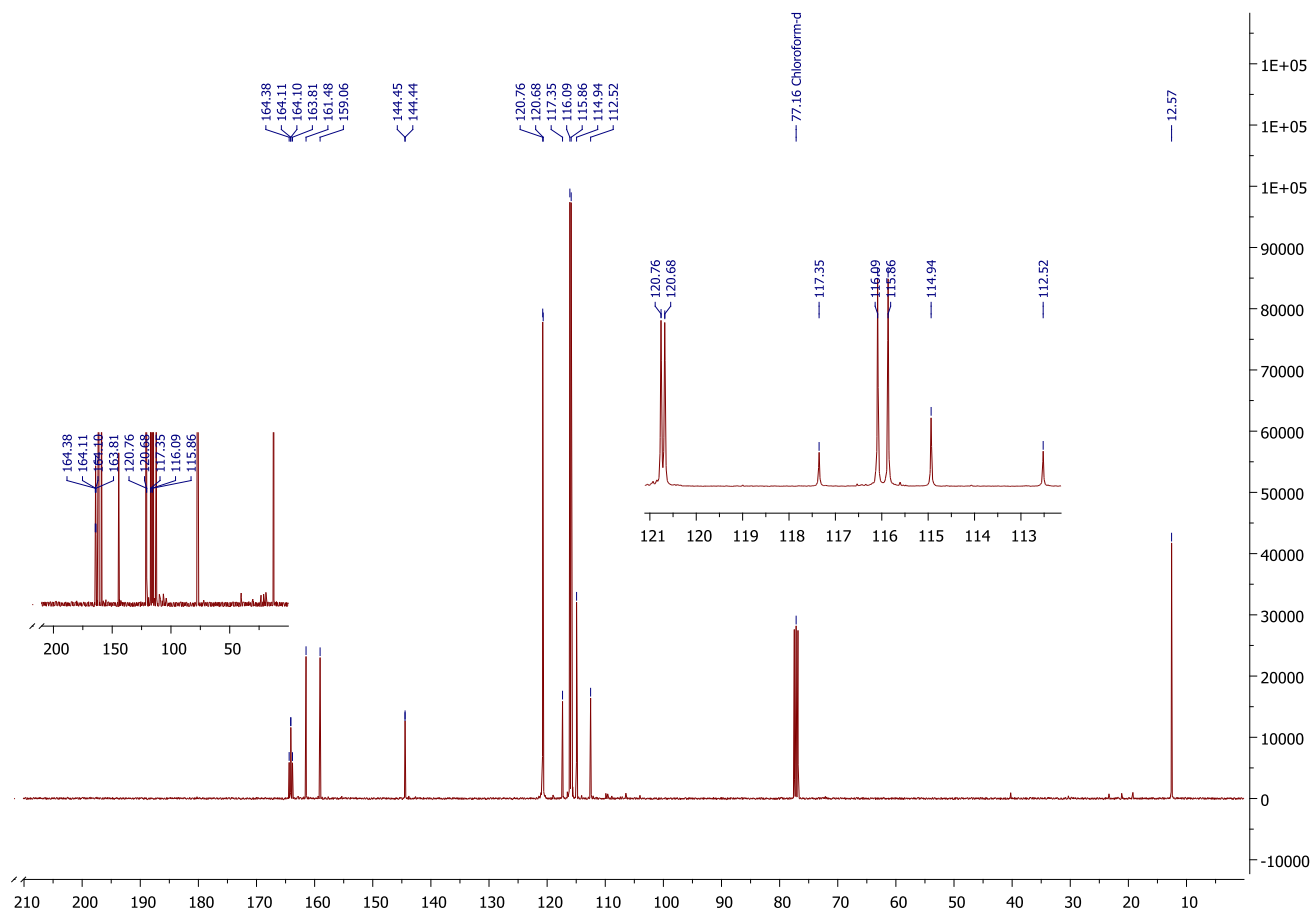
1gg



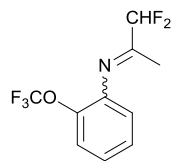
***N*-(1,1-difluoropropan-2-ylidene)-4-fluoroaniline (1gg) - ^{13}C NMR (101 MHz, CDCl_3)**



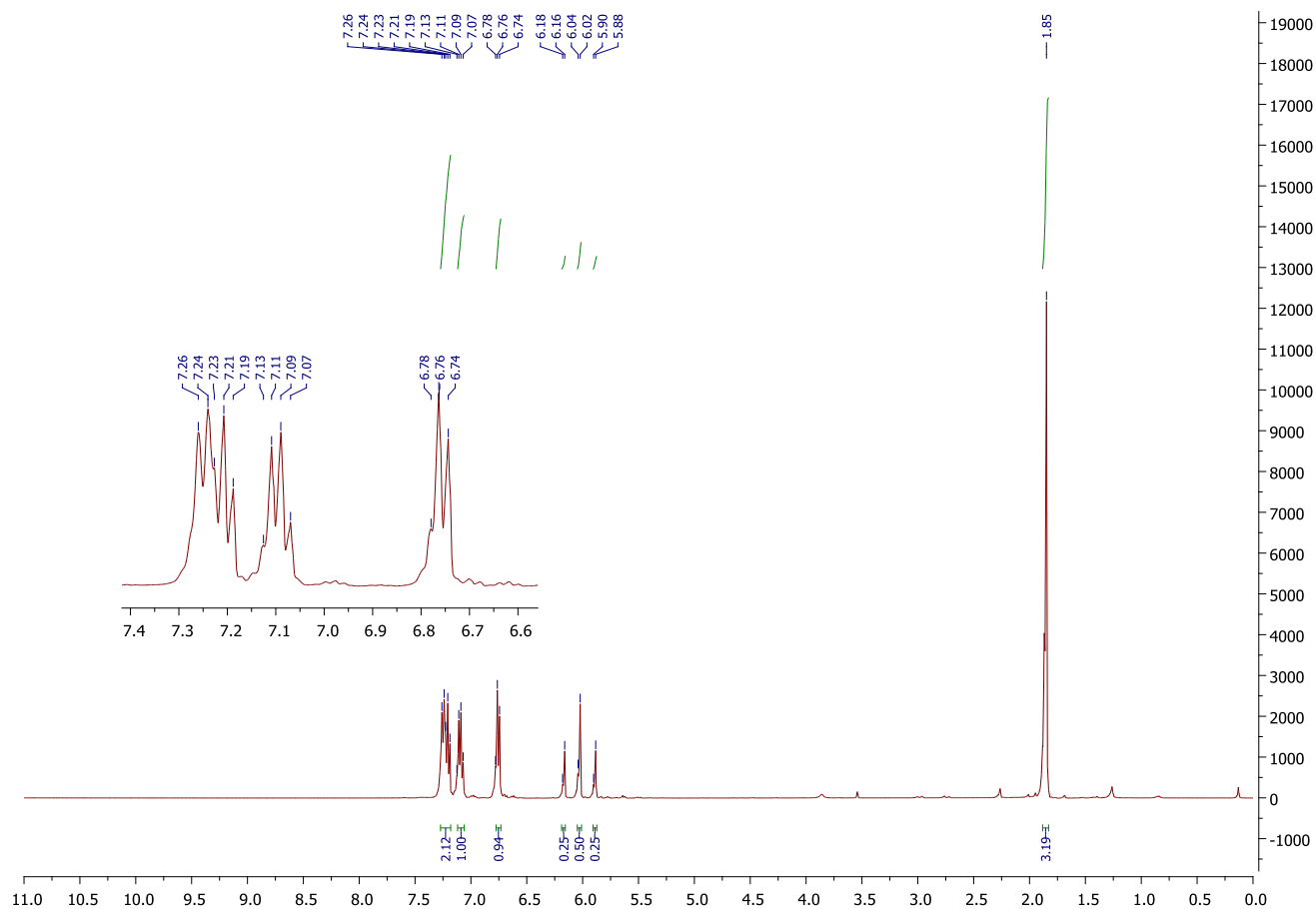
1gg



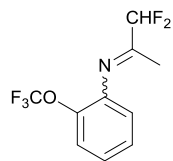
***N*-(1,1-difluoropropan-2-ylidene)-2-(trifluoromethoxy)aniline (1hh) - ^1H NMR (400 MHz, CDCl_3)**



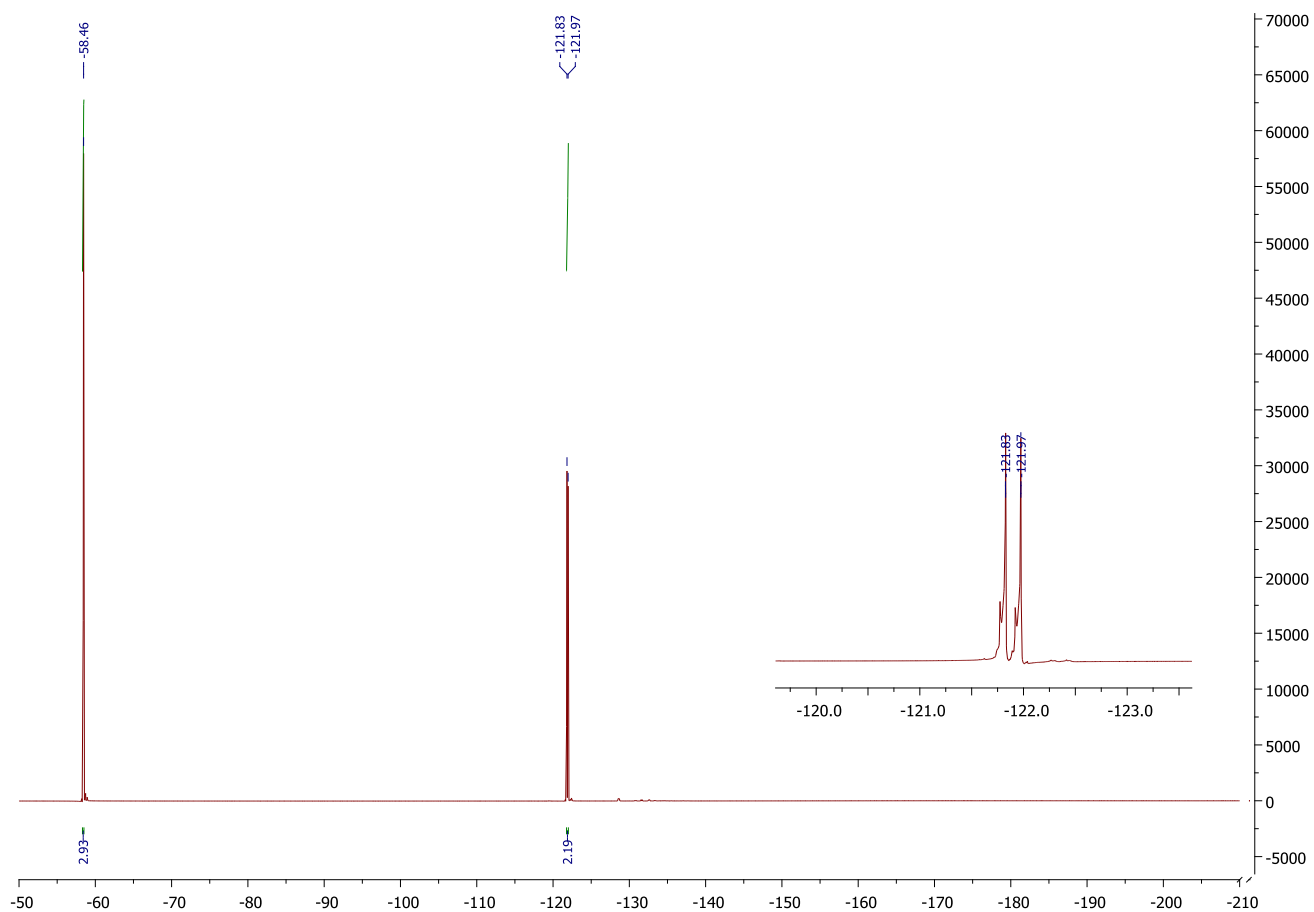
1hh



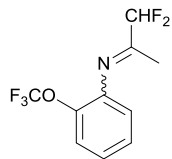
***N*-(1,1-difluoropropan-2-ylidene)-2-(trifluoromethoxy)aniline (1hh) - ^{19}F NMR (376 MHz, CDCl_3)**



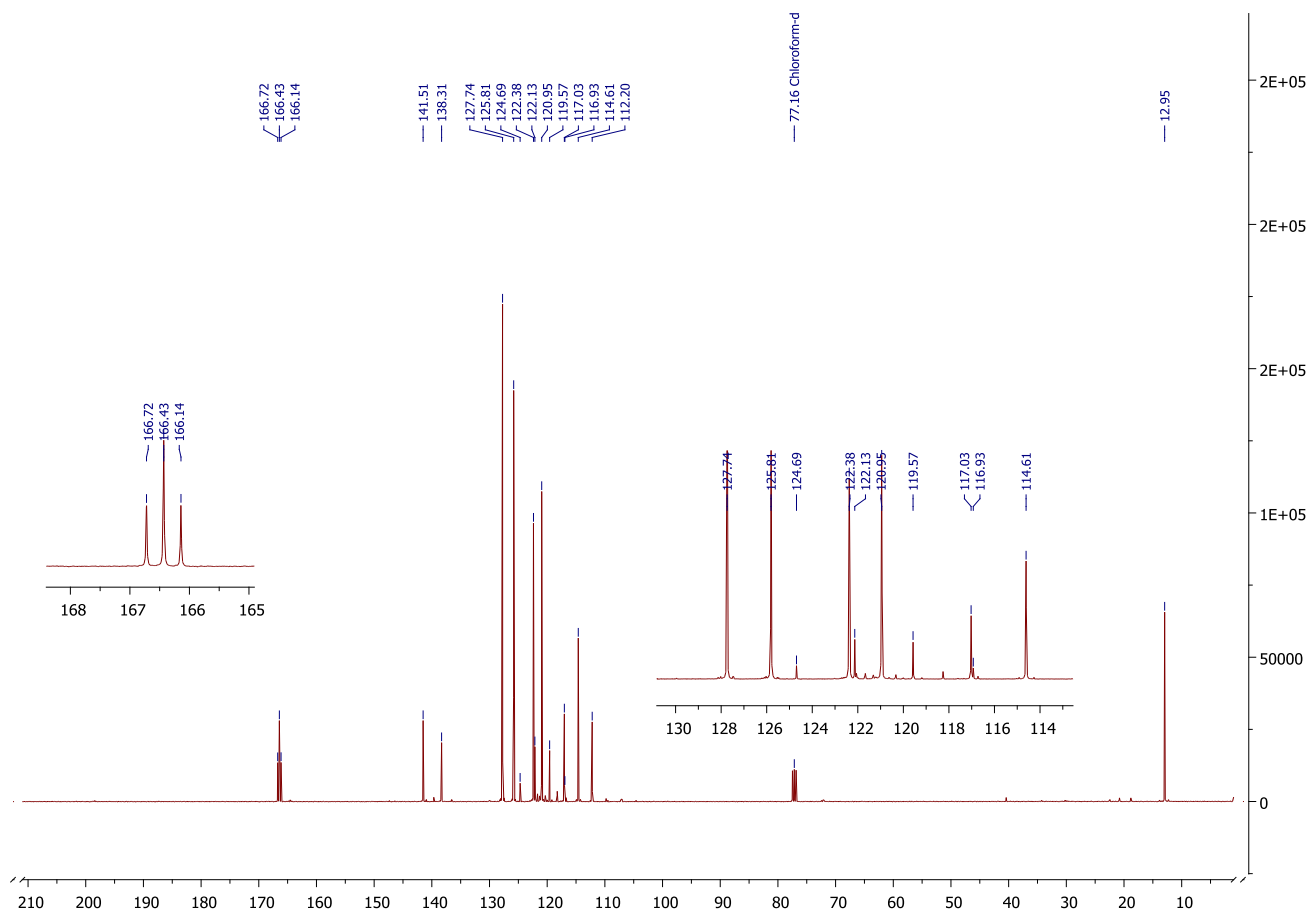
1hh



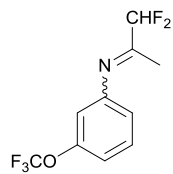
***N*-(1,1-difluoropropan-2-ylidene)-2-(trifluoromethoxy)aniline (1hh)-¹³C NMR (101 MHz, CDCl₃)**



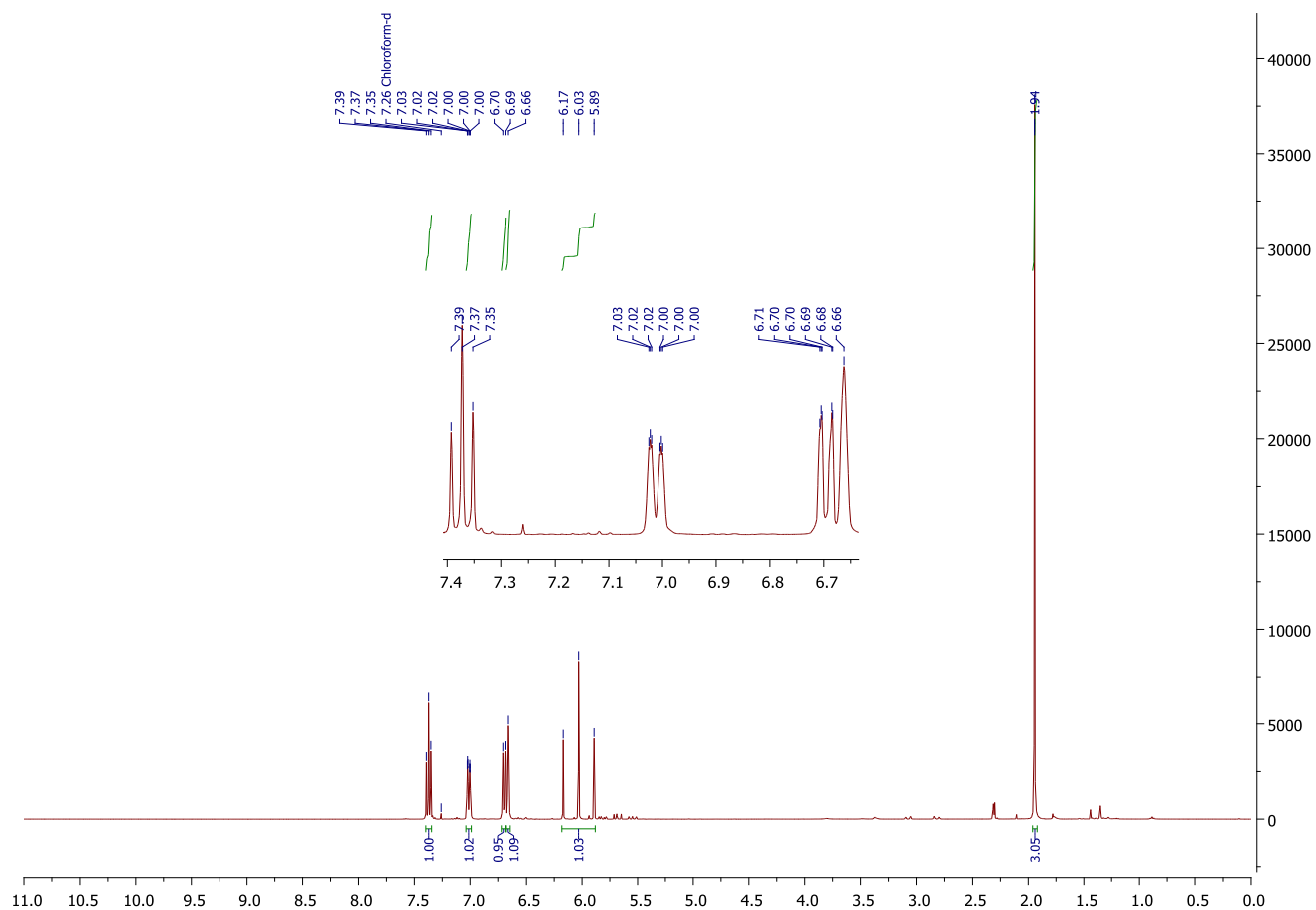
1hh



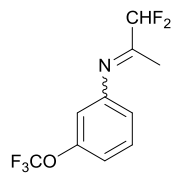
***N*-(1,1-difluoropropan-2-ylidene)-3-(trifluoromethoxy)aniline (1ii) - ^1H NMR (400 MHz, CDCl_3)**



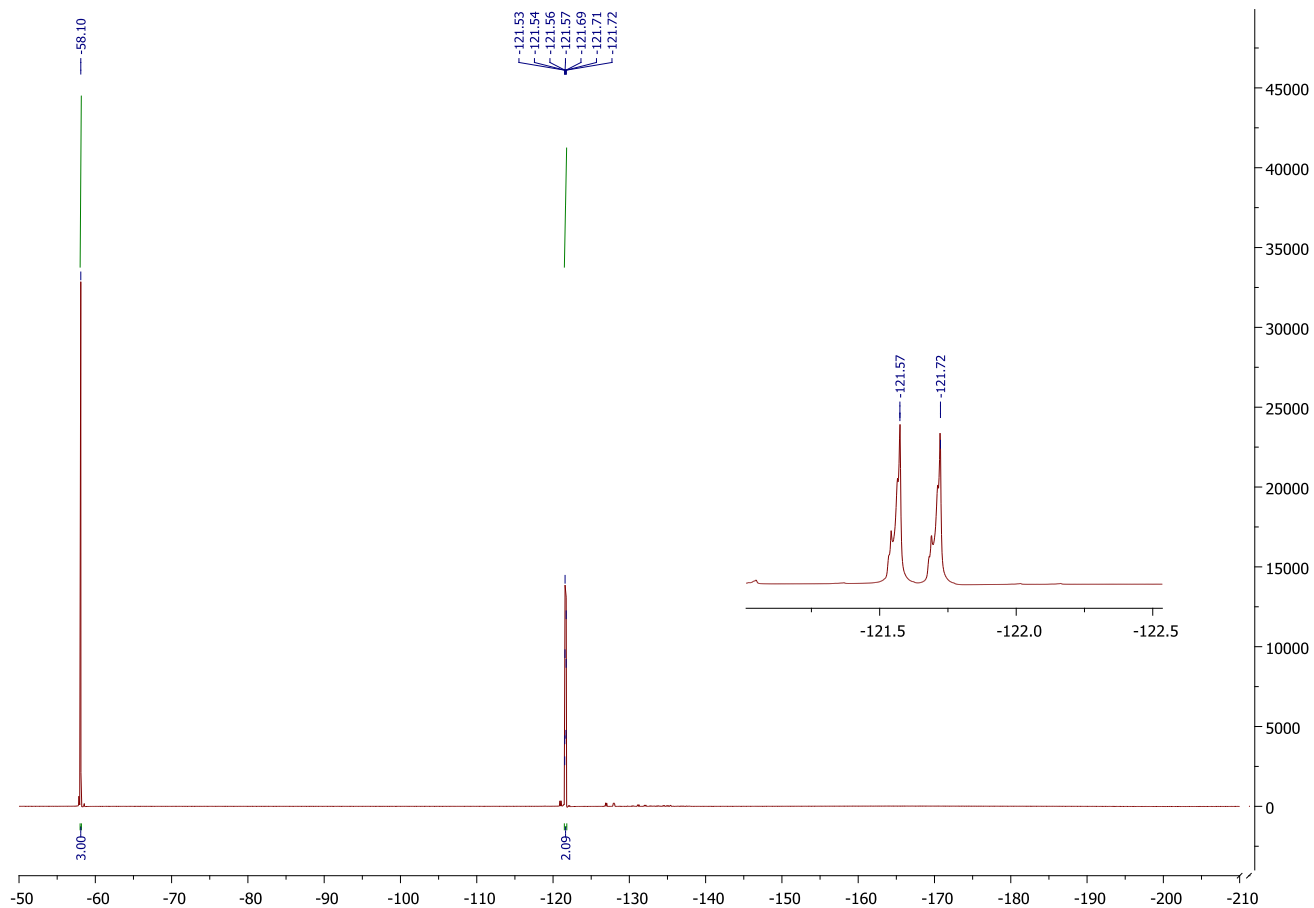
1ii



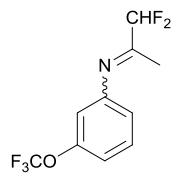
***N*-(1,1-difluoropropan-2-ylidene)-3-(trifluoromethoxy)aniline (1ii) - ^{19}F NMR (376 MHz, CDCl_3)**



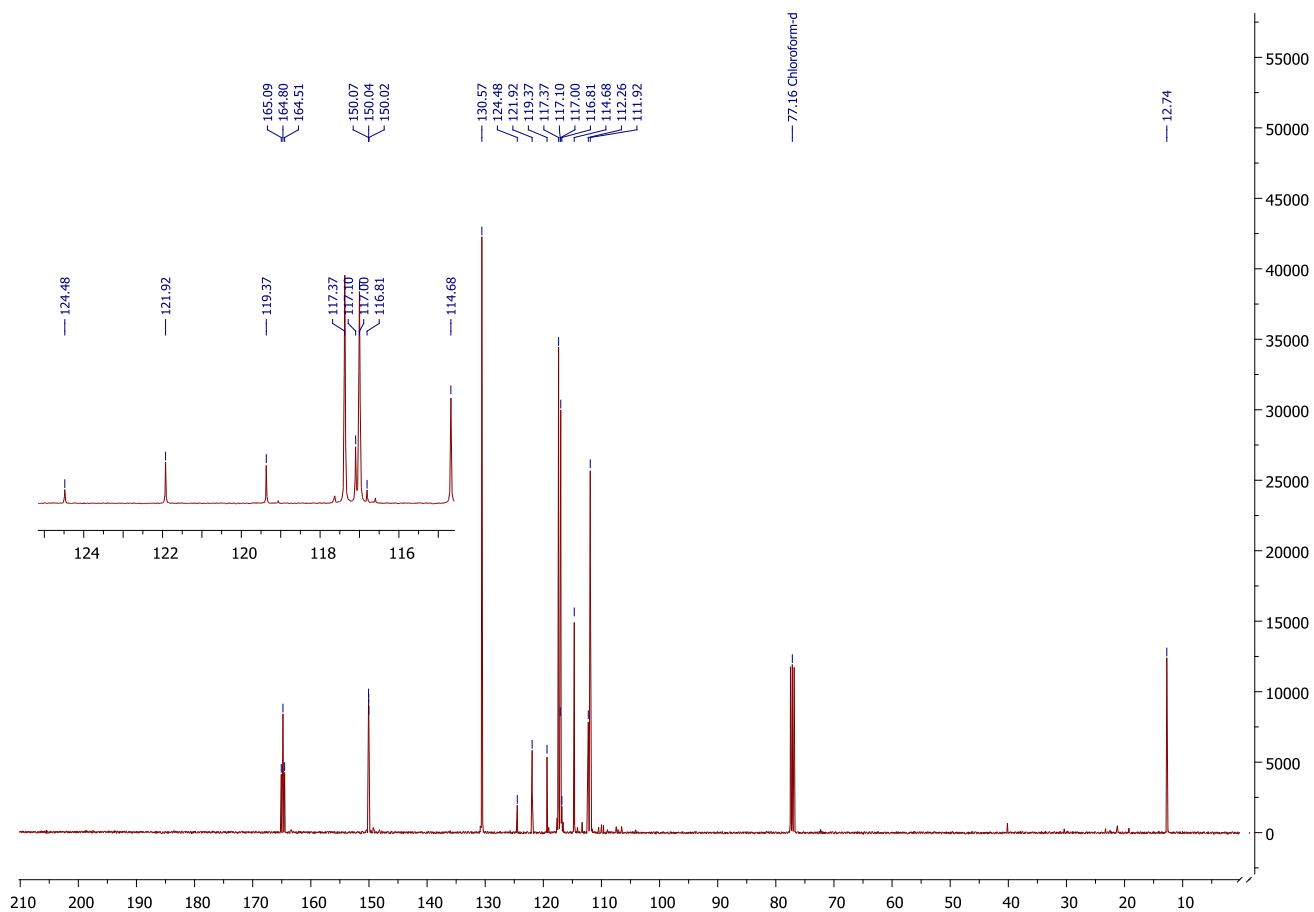
1ii



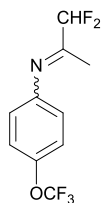
***N*-(1,1-difluoropropan-2-ylidene)-3-(trifluoromethoxy)aniline (1ii) - ^{13}C NMR (101 MHz, CDCl_3)**



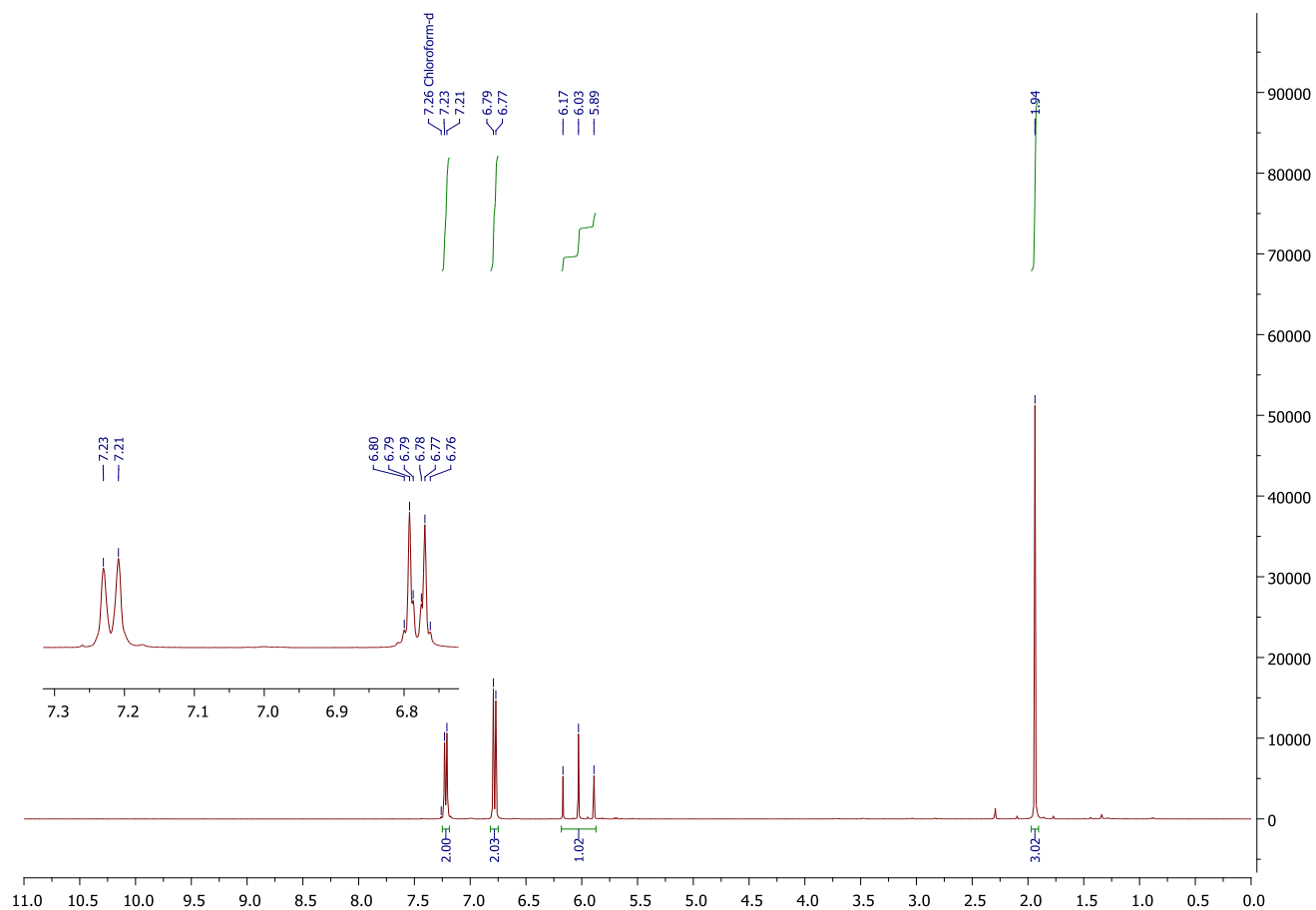
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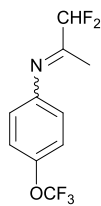
***N*-(1,1-difluoropropan-2-ylidene)-4-(trifluoromethoxy)aniline (1jj) - ^1H NMR (400 MHz, CDCl_3)**



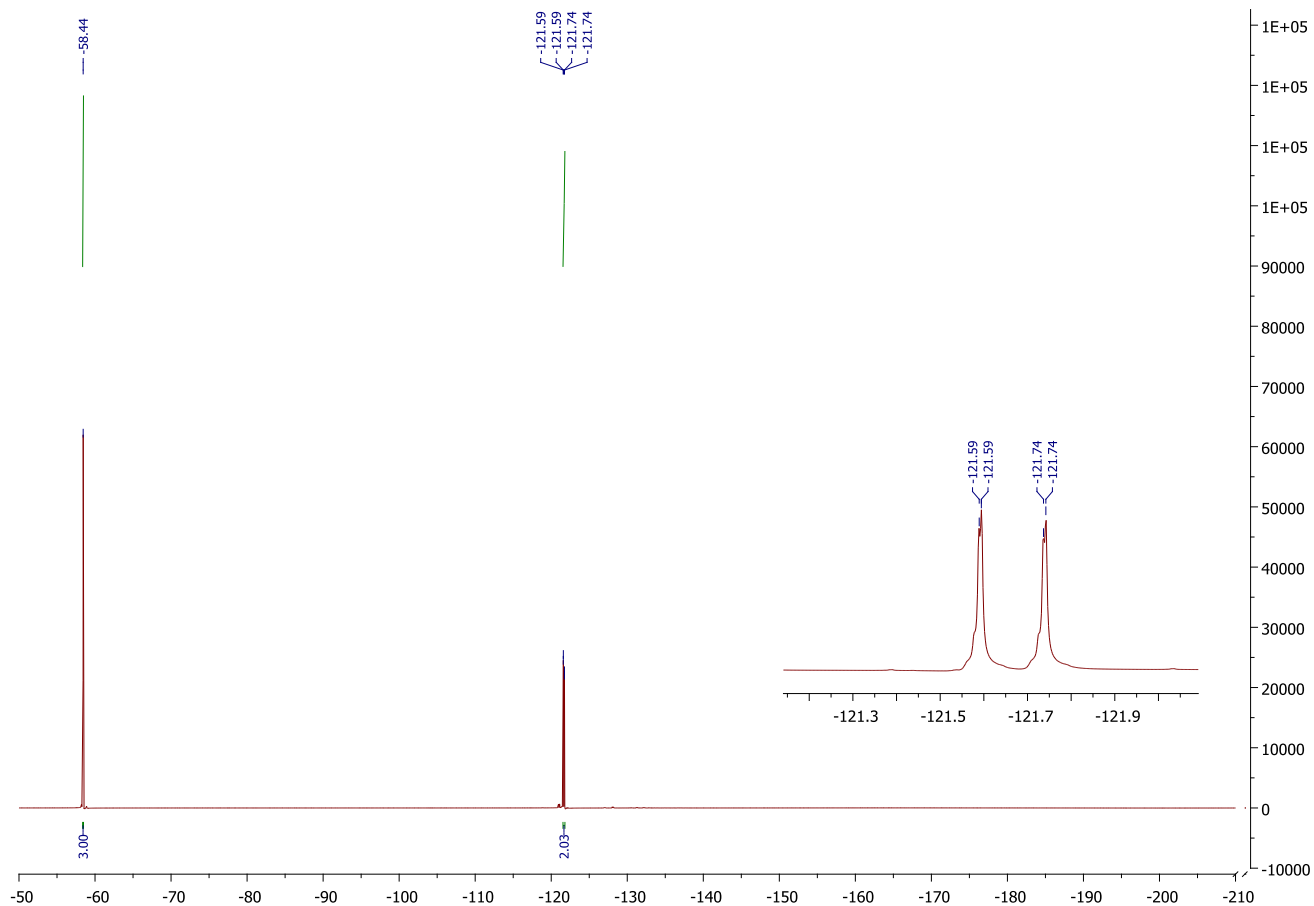
1jj



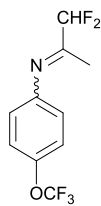
***N*-(1,1-difluoropropan-2-ylidene)-4-(trifluoromethoxy)aniline (1jj) - ^{19}F NMR (376 MHz, CDCl_3)**



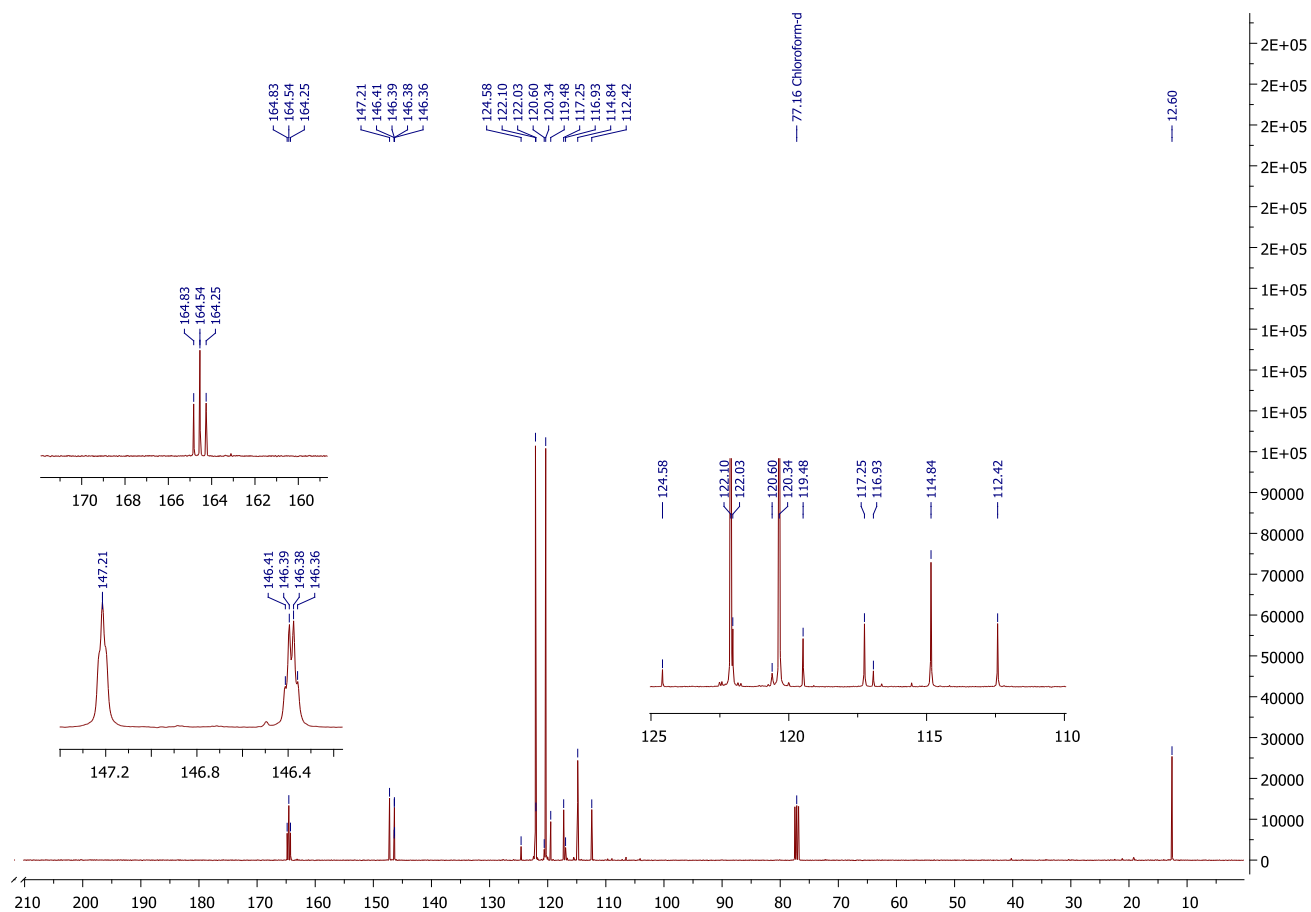
1jj



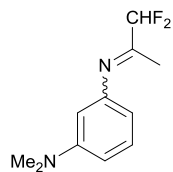
***N*-(1,1-difluoropropan-2-ylidene)-4-(trifluoromethoxy)aniline (1jj) - ^{13}C NMR (101 MHz, CDCl_3)**



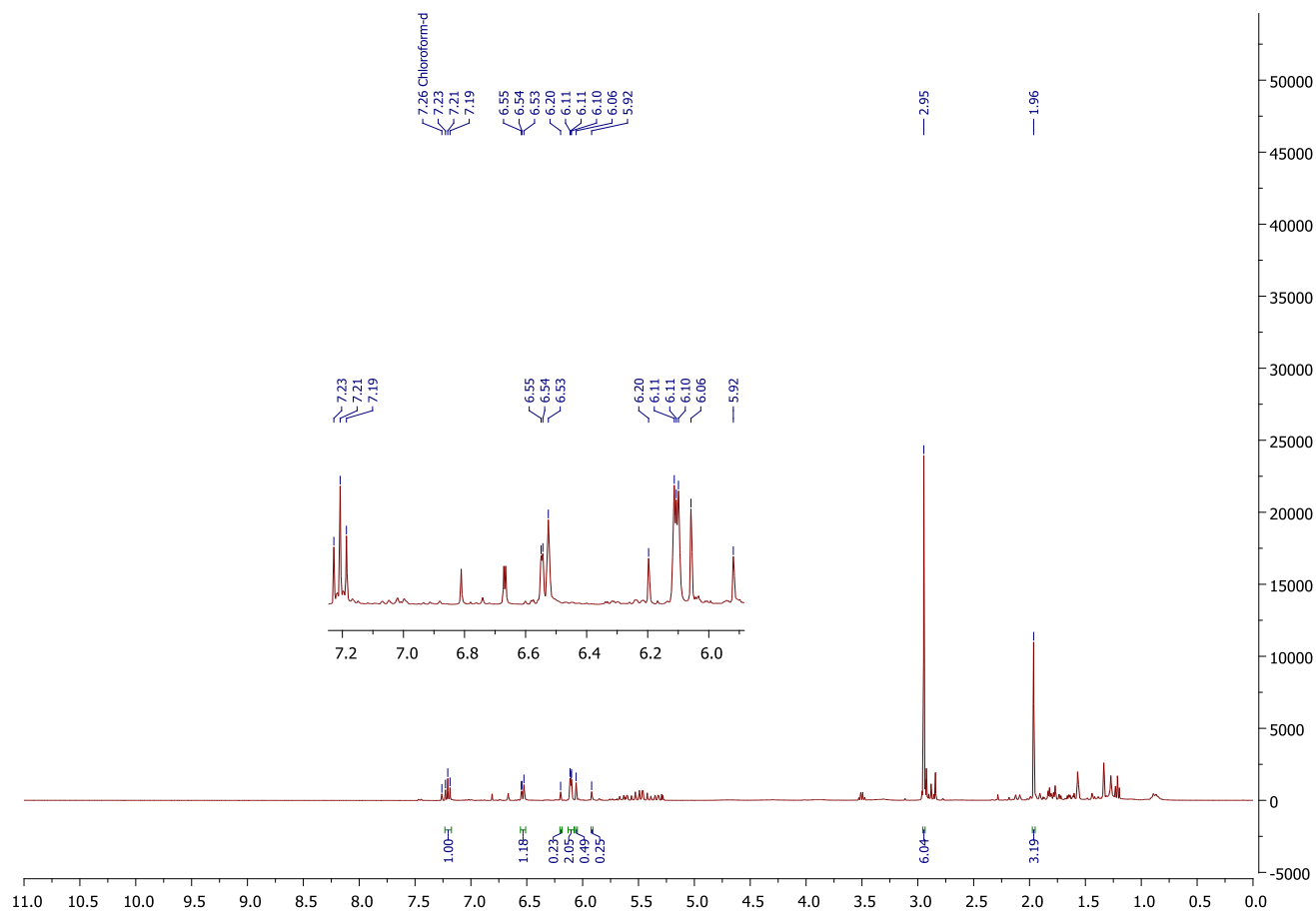
1jj



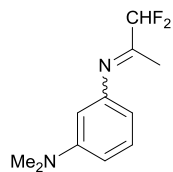
3-*N*-(1,1-difluoropropan-2-ylidene)-1-*N,N*-dimethylbenzene-1,3-diamine (1kk) - ^1H NMR (400 MHz, CDCl_3)



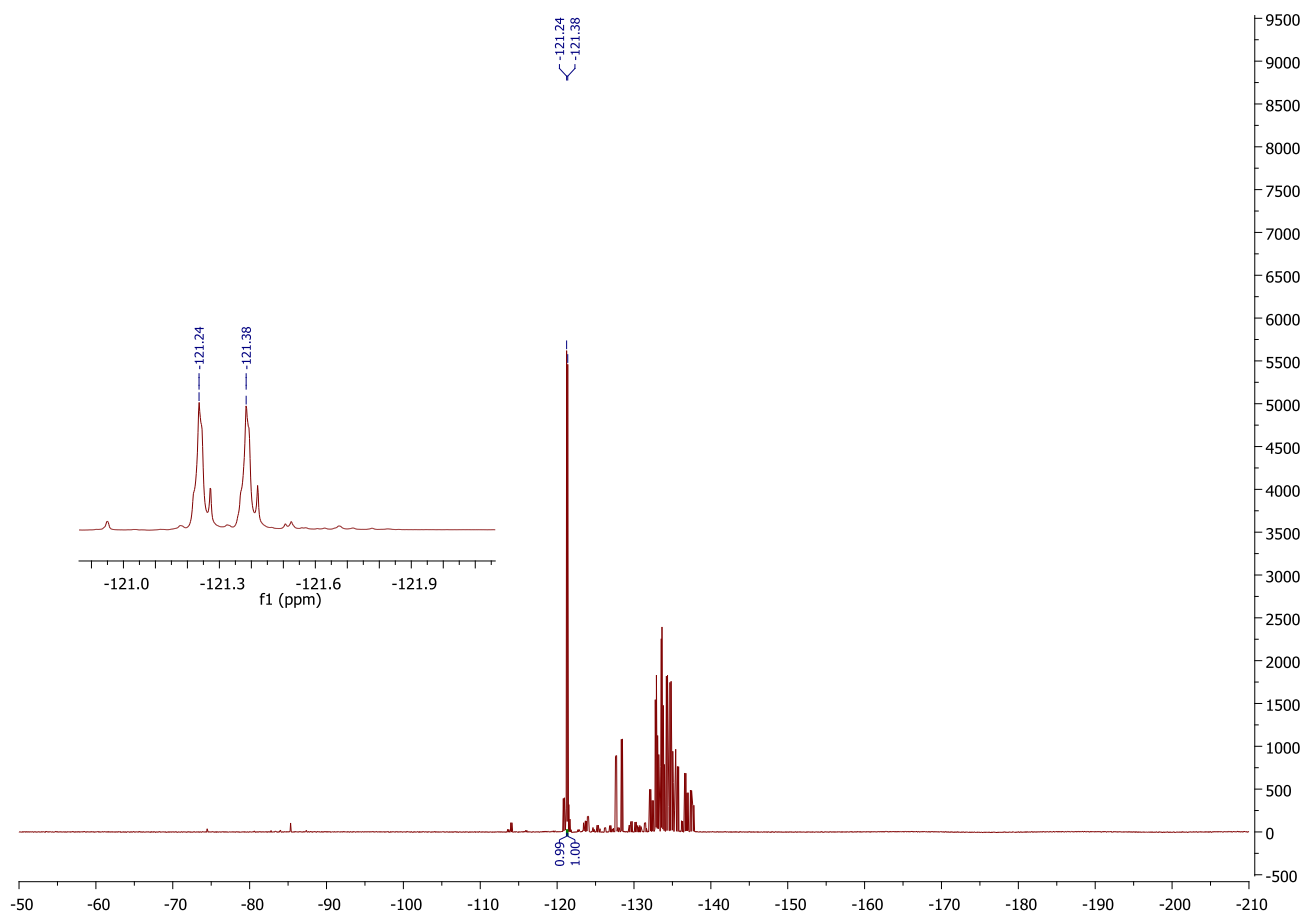
1kk



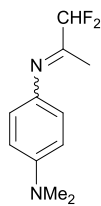
3-*N*-(1,1-difluoropropan-2-ylidene)-1-*N,N*-dimethylbenzene-1,3-diamine (1kk) - ^{19}F NMR (376 MHz, CDCl_3)



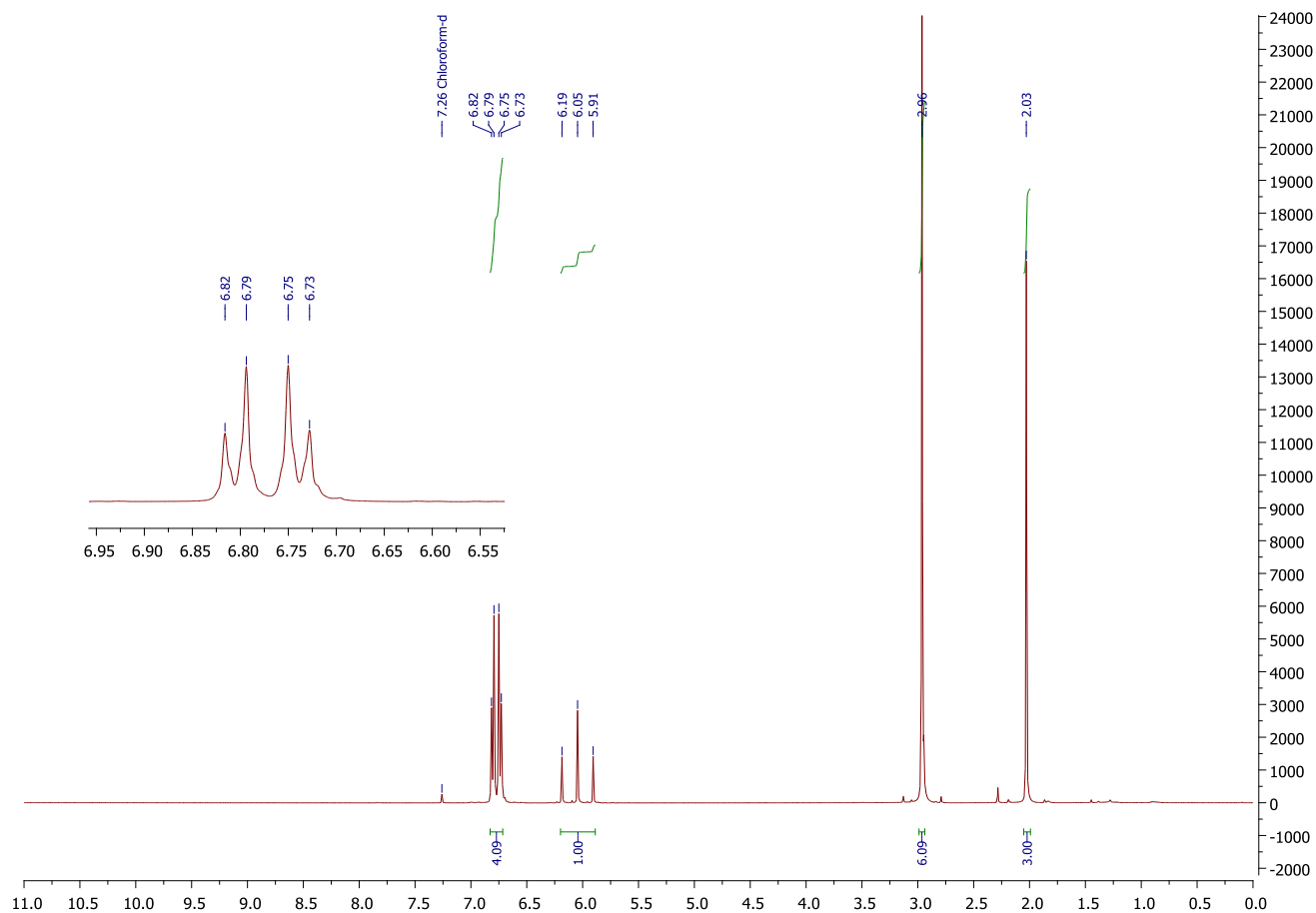
1kk



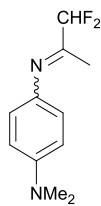
4-*N*-(1,1-difluoropropan-2-ylidene)-1-*N,N*-dimethylbenzene-1,4-diamine (1II) - ^1H NMR (400 MHz, CDCl_3)



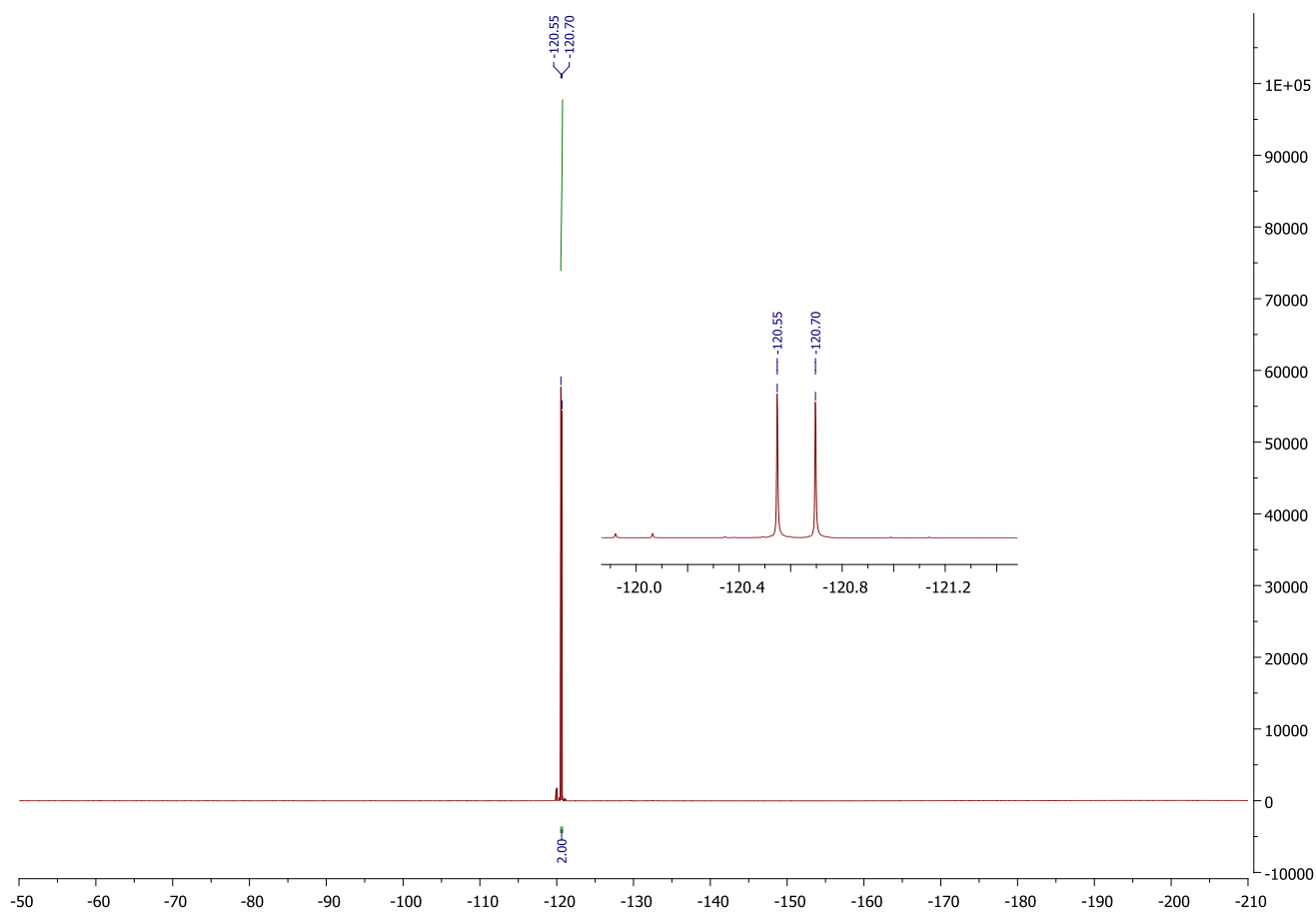
1II



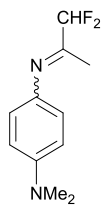
4-*N*-(1,1-difluoropropan-2-ylidene)-1-*N,N*-dimethylbenzene-1,4-diamine (1II) - ^{19}F NMR (376 MHz, CDCl_3)



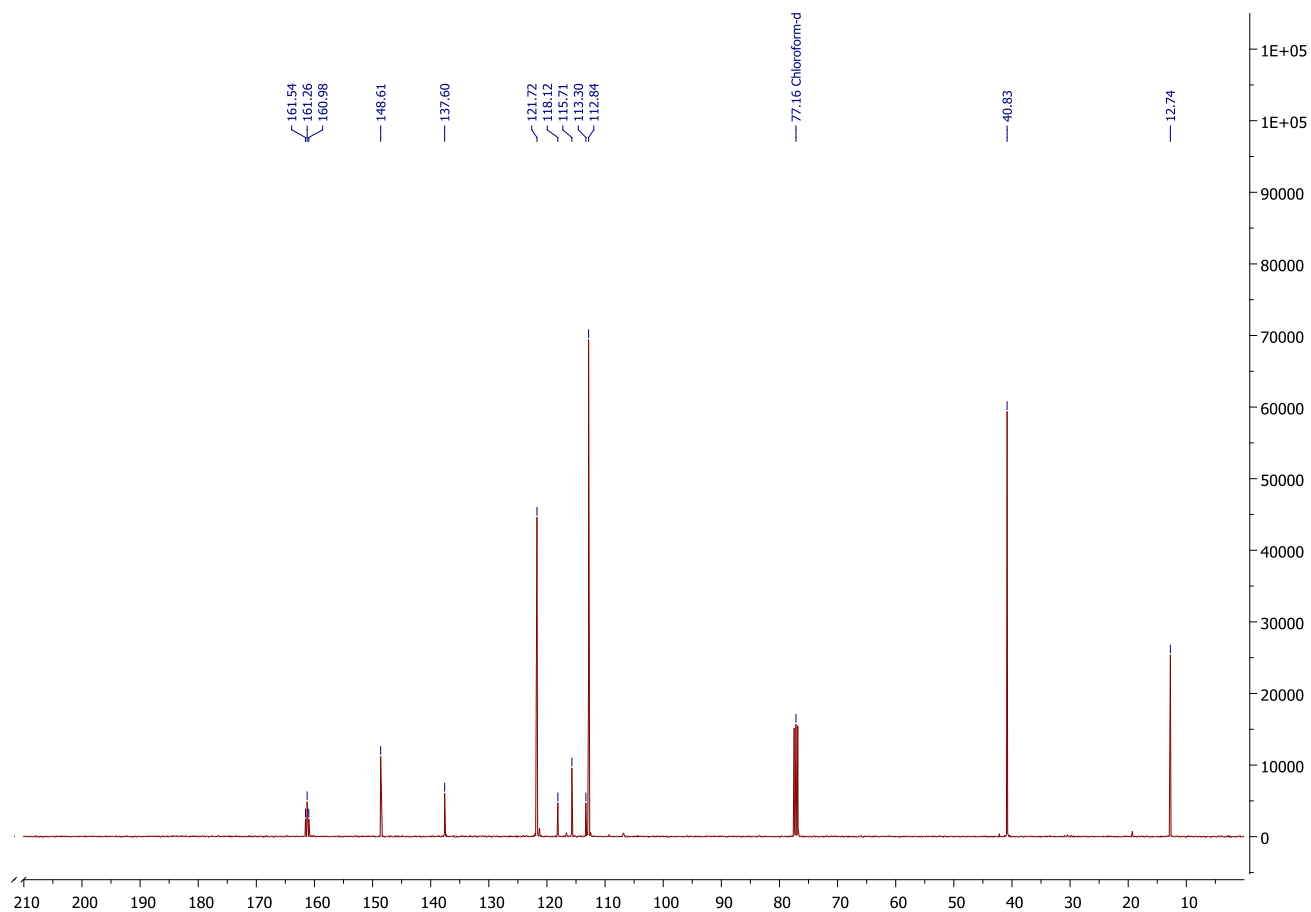
1II



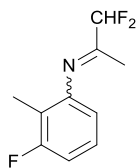
4-*N*-(1,1-difluoropropan-2-ylidene)-1-*N,N*-dimethylbenzene-1,4-diamine (1II) - ^{13}C NMR (101 MHz, CDCl_3)



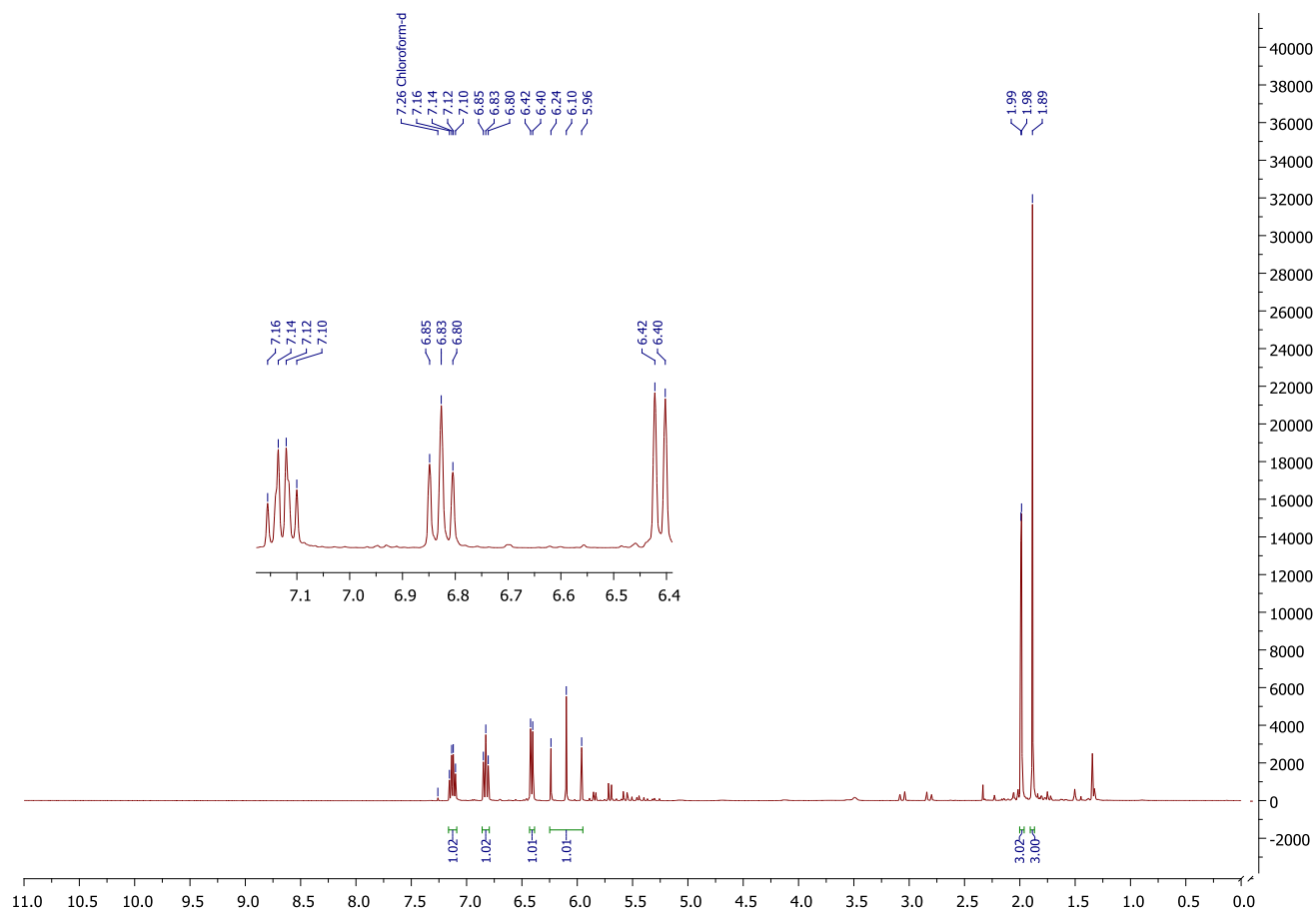
1II



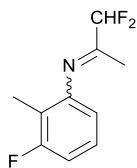
***N*-(1,1-difluoropropan-2-ylidene)-3-fluoro-2-methylaniline (1mm) - ^1H NMR (400 MHz, CDCl_3)**



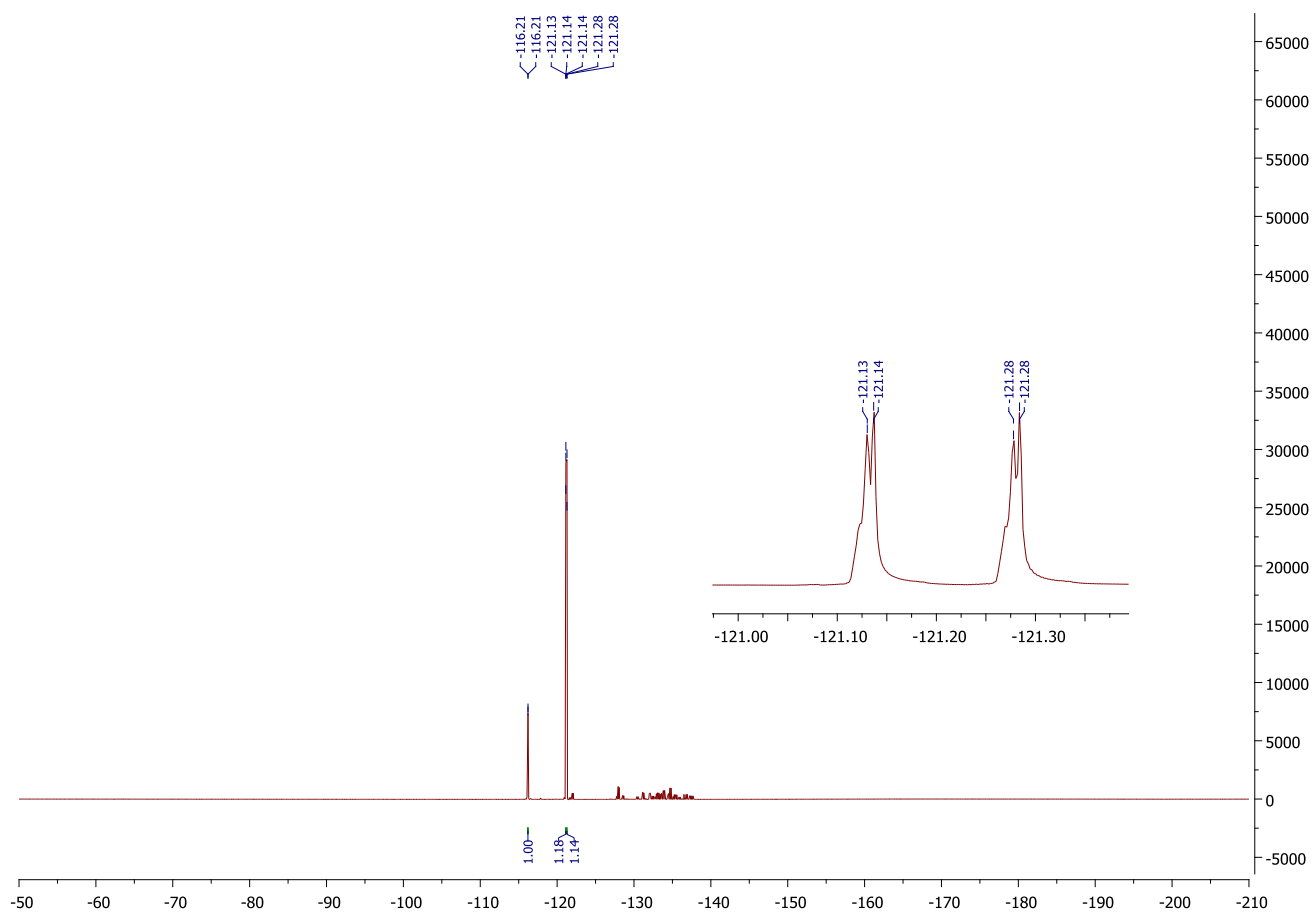
1mm



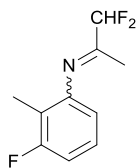
***N*-(1,1-difluoropropan-2-ylidene)-3-fluoro-2-methylaniline (1mm) - ^{19}F NMR (376 MHz, CDCl_3)**



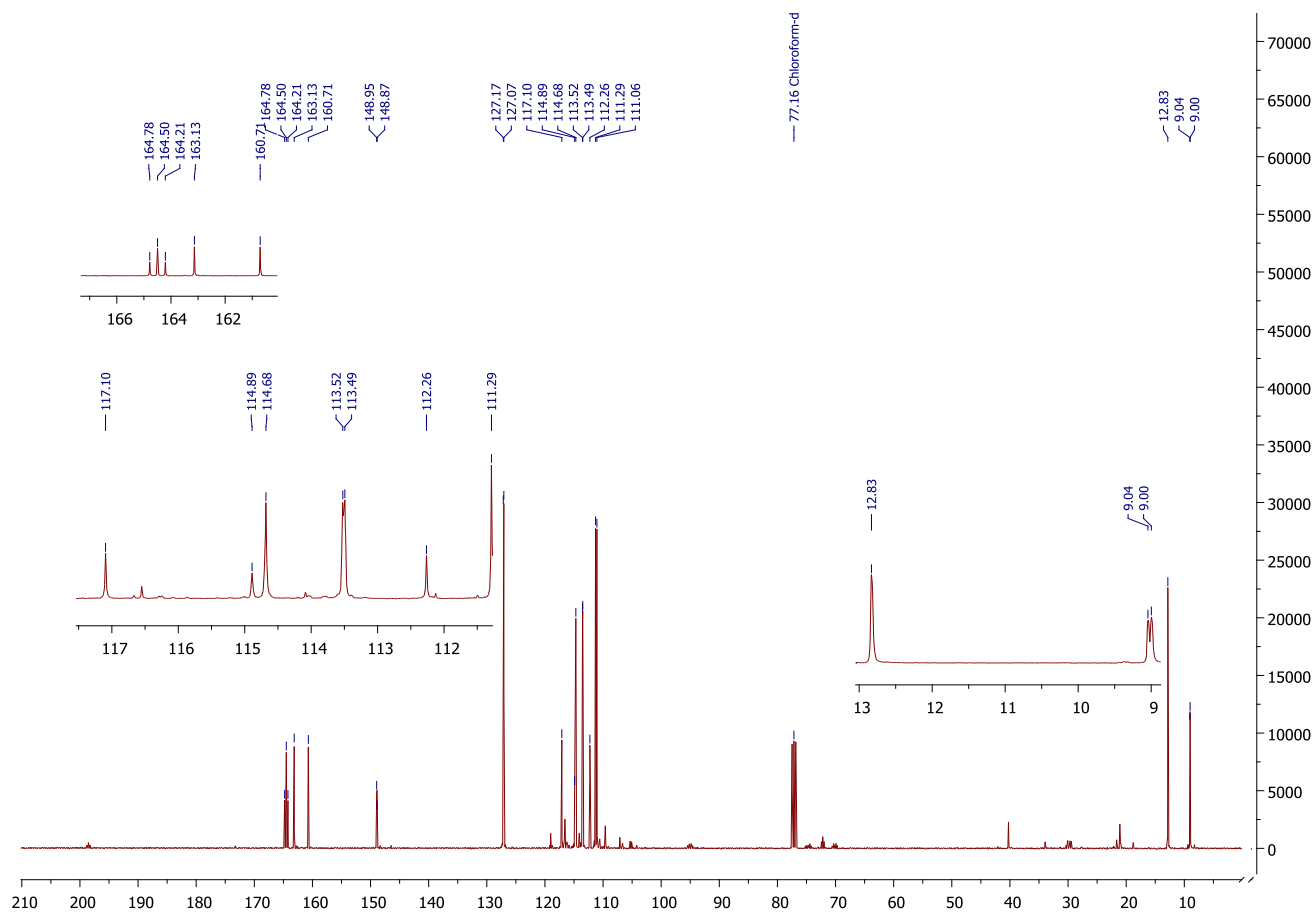
1mm



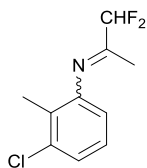
***N*-(1,1-difluoropropan-2-ylidene)-3-fluoro-2-methylaniline (1mm) - ^{13}C NMR (101 MHz, CDCl_3)**



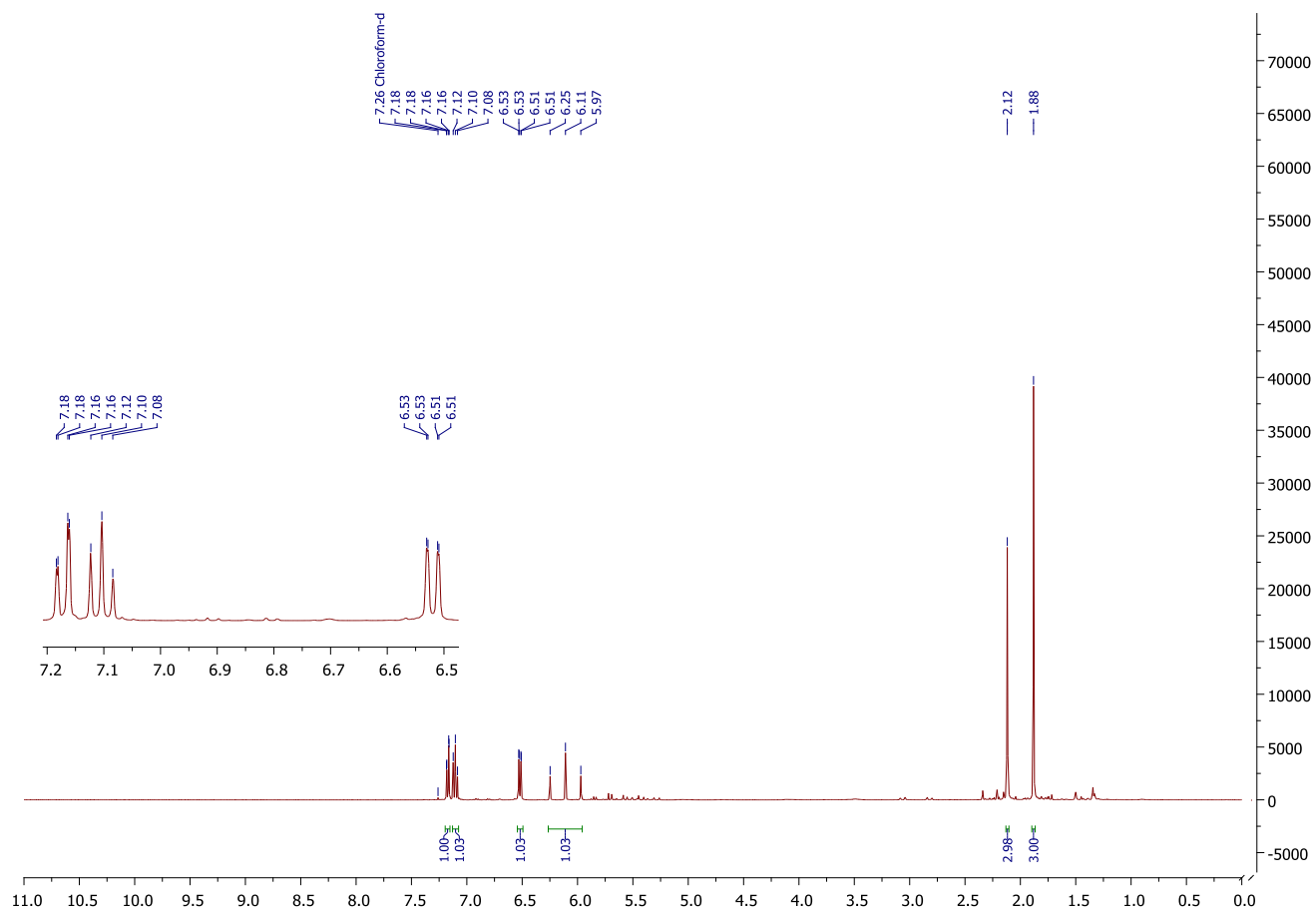
1mm



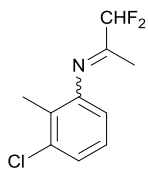
3-Chloro-*N*-(1,1-difluoropropan-2-ylidene)-2-methylaniline (1nn) - ^1H NMR (400 MHz, CDCl_3)



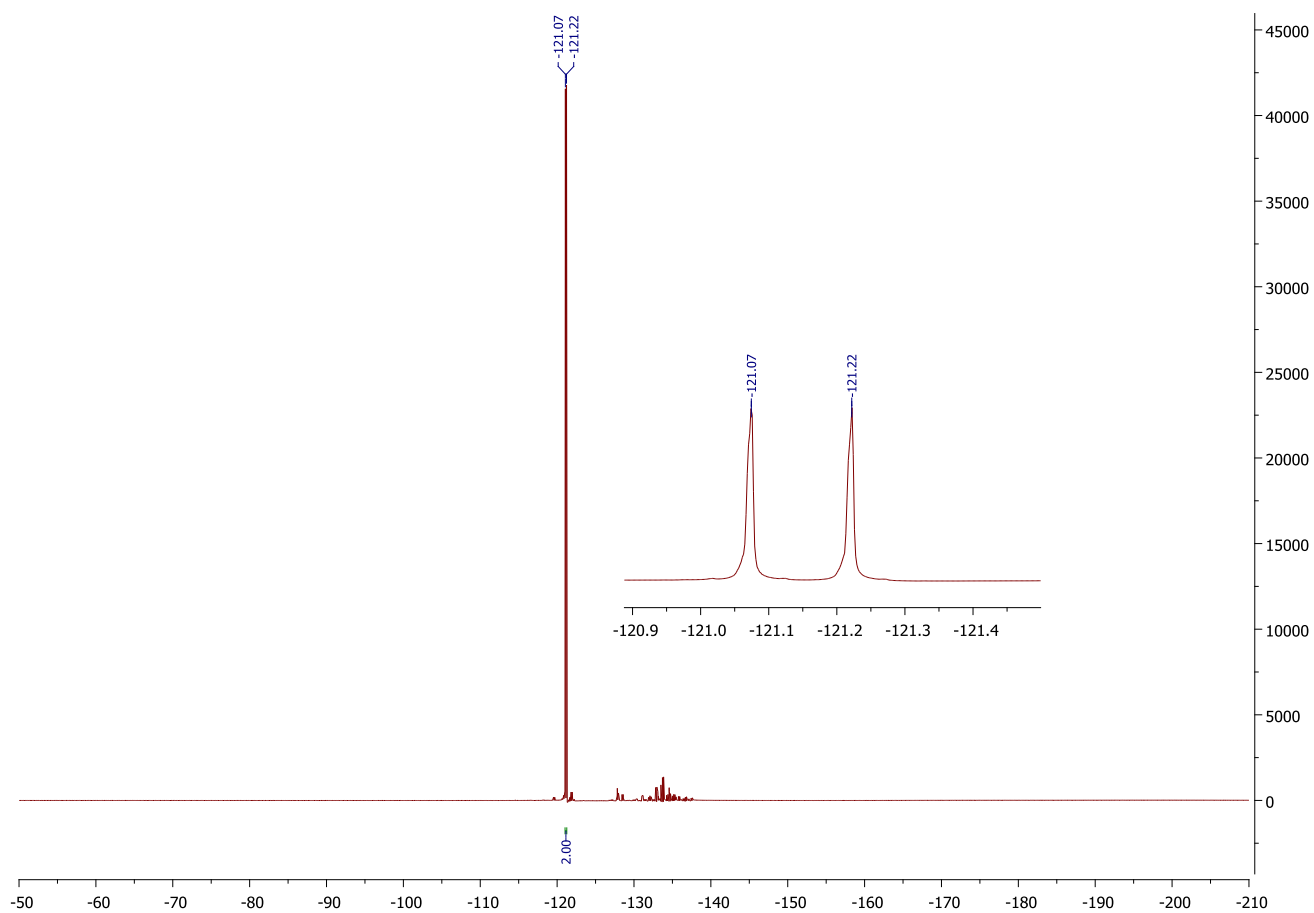
1nn



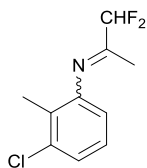
3-Chloro-*N*-(1,1-difluoropropan-2-ylidene)-2-methylaniline (1nn) - ^{19}F NMR (376 MHz, CDCl_3)



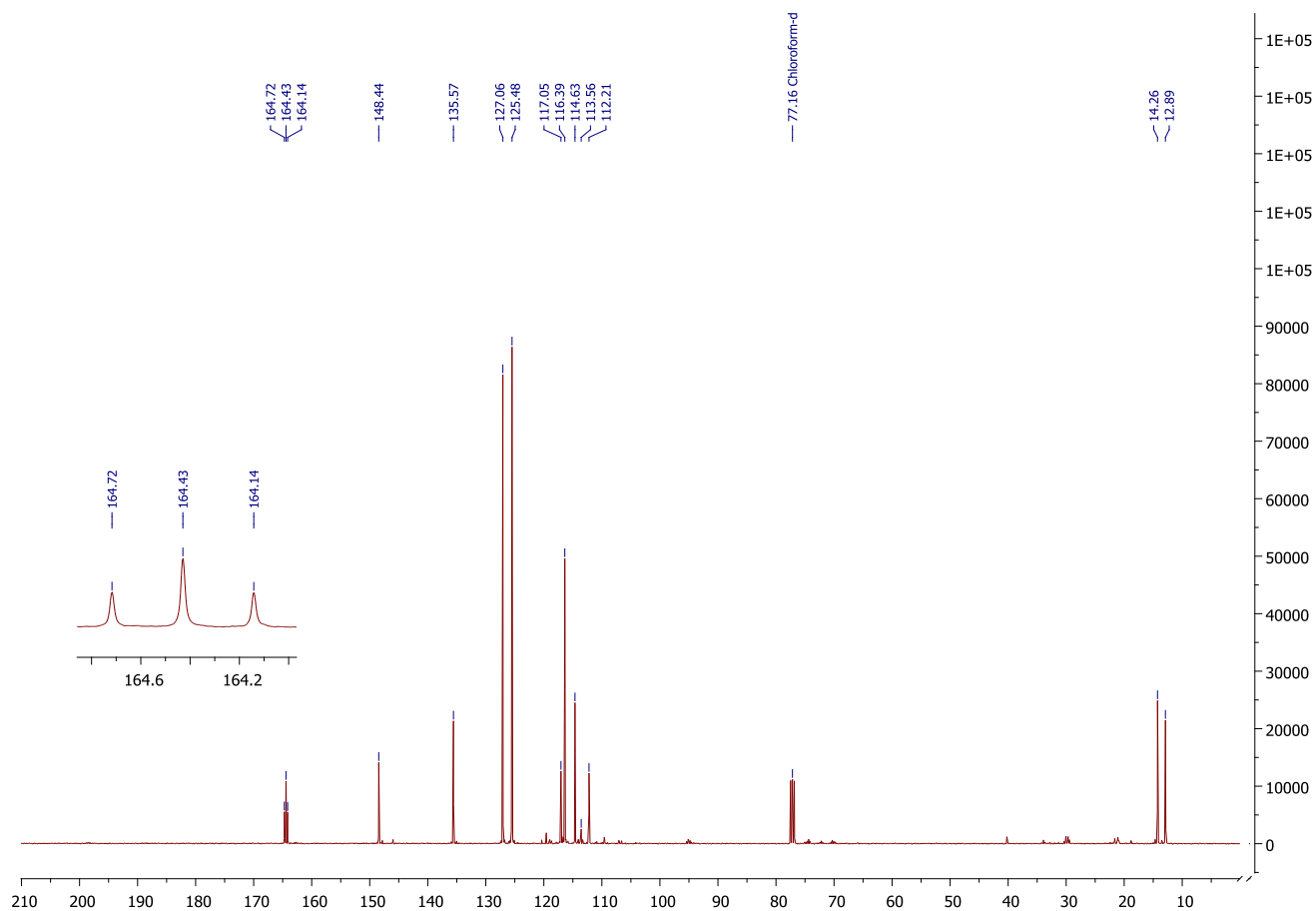
1nn



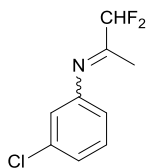
3-Chloro-*N*-(1,1-difluoropropan-2-ylidene)-2-methylaniline (1nn) - ^{13}C NMR (101 MHz, CDCl_3)



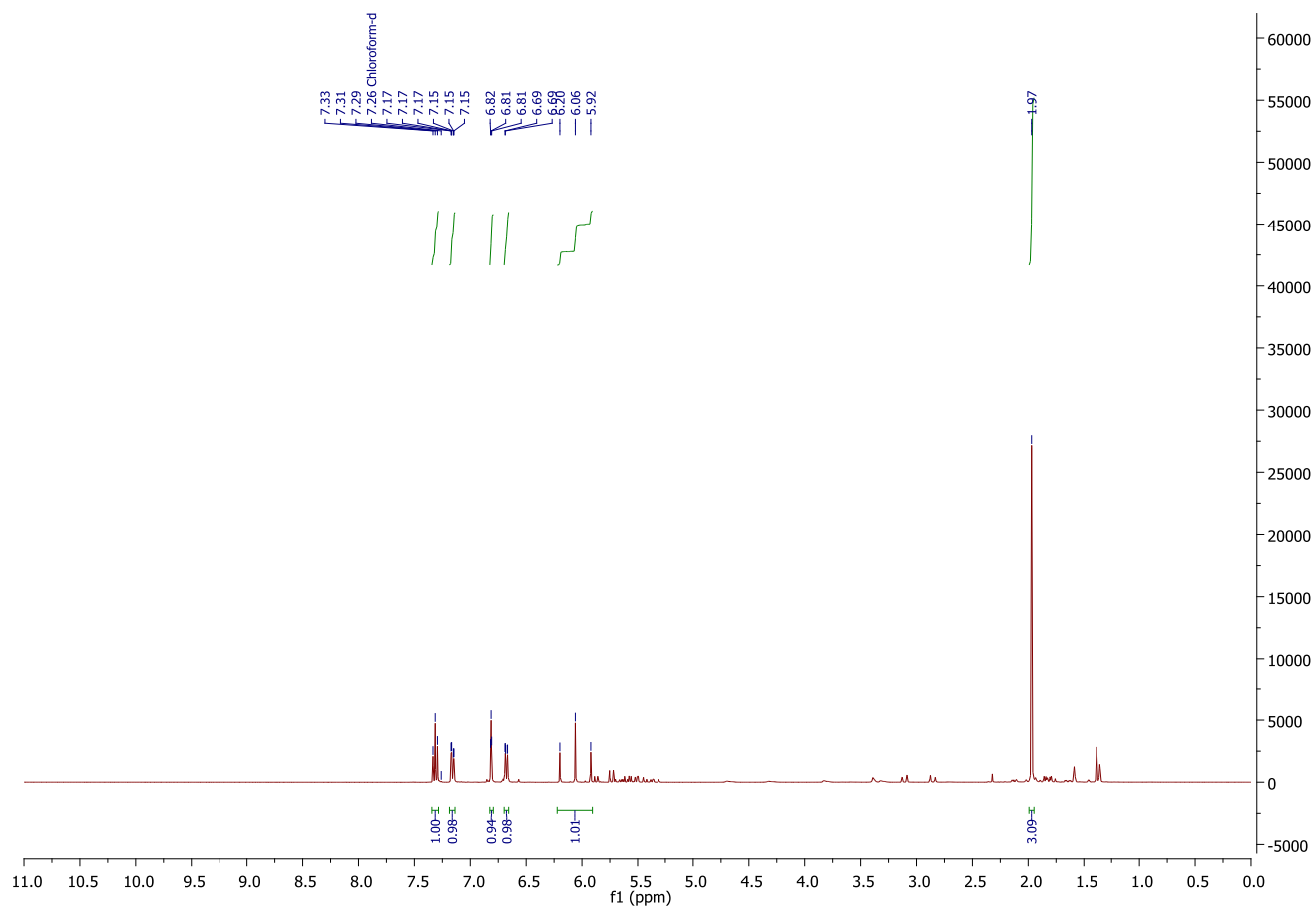
1nn



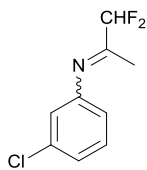
3-Chloro-N-(1,1-difluoropropan-2-ylidene)-aniline (100) - ^1H NMR (400 MHz, CDCl_3)



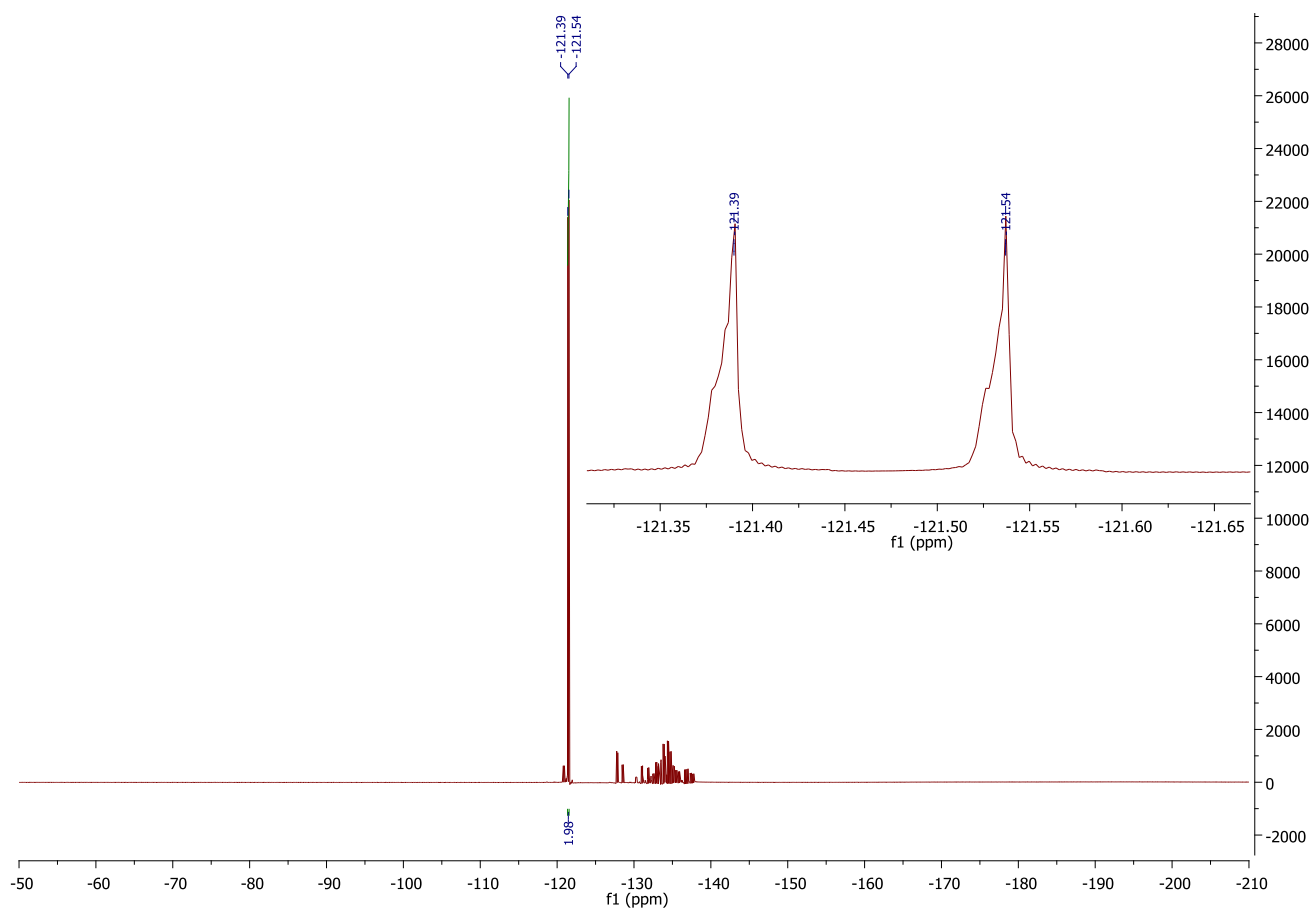
100



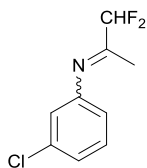
3-Chloro-*N*-(1,1-difluoropropan-2-ylidene)-aniline (**100**) - ^{19}F NMR (376 MHz, CDCl_3)



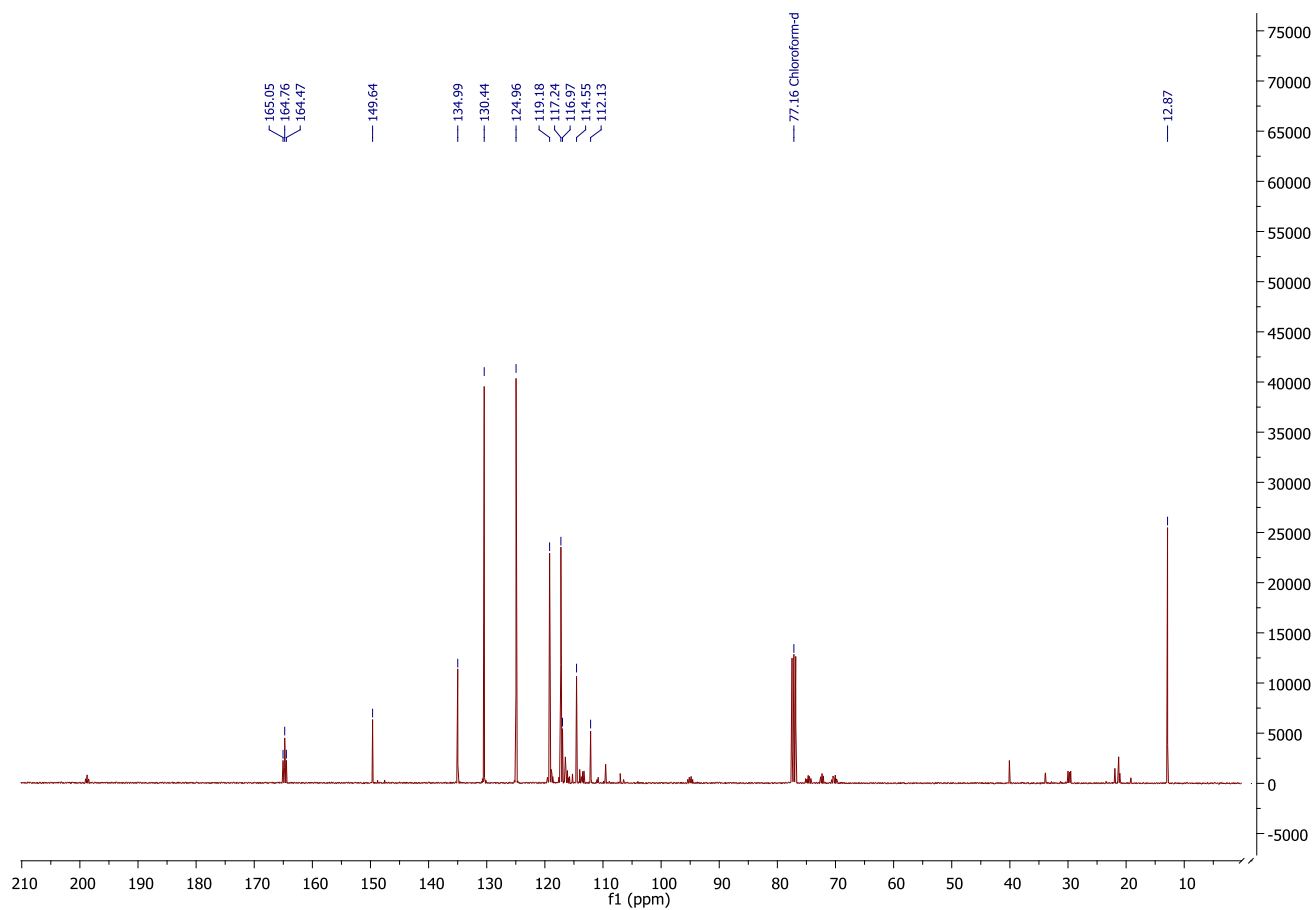
100



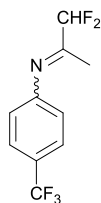
3-Chloro-*N*-(1,1-difluoropropan-2-ylidene)-aniline (**1oo**) - ^{13}C NMR (101 MHz, CDCl_3)



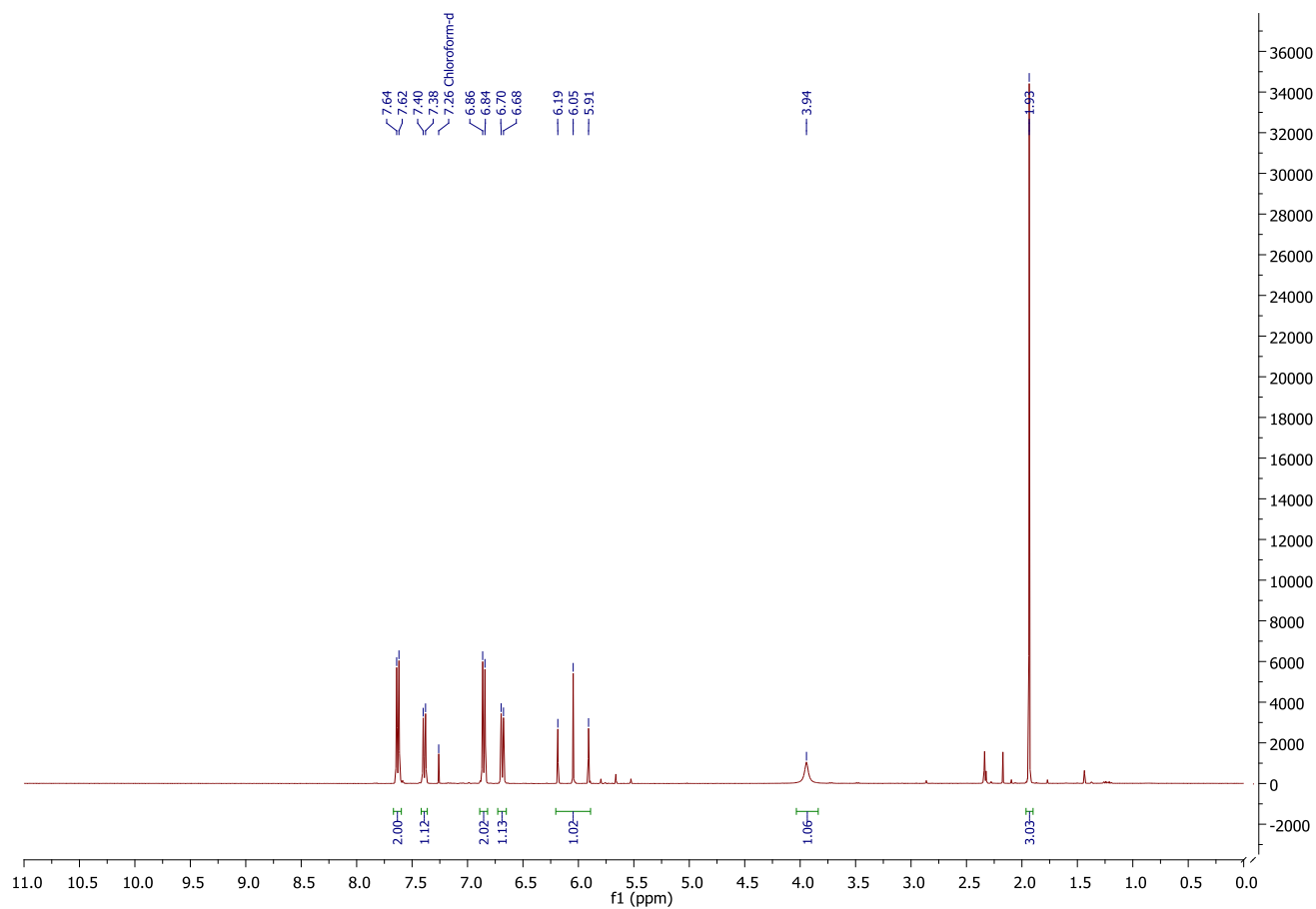
1oo



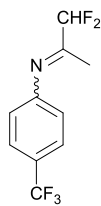
***N*-(1,1-difluoropropan-2-ylidene)-4-(trifluoromethyl)aniline (1pp) - ^1H NMR (400 MHz, CDCl_3)**



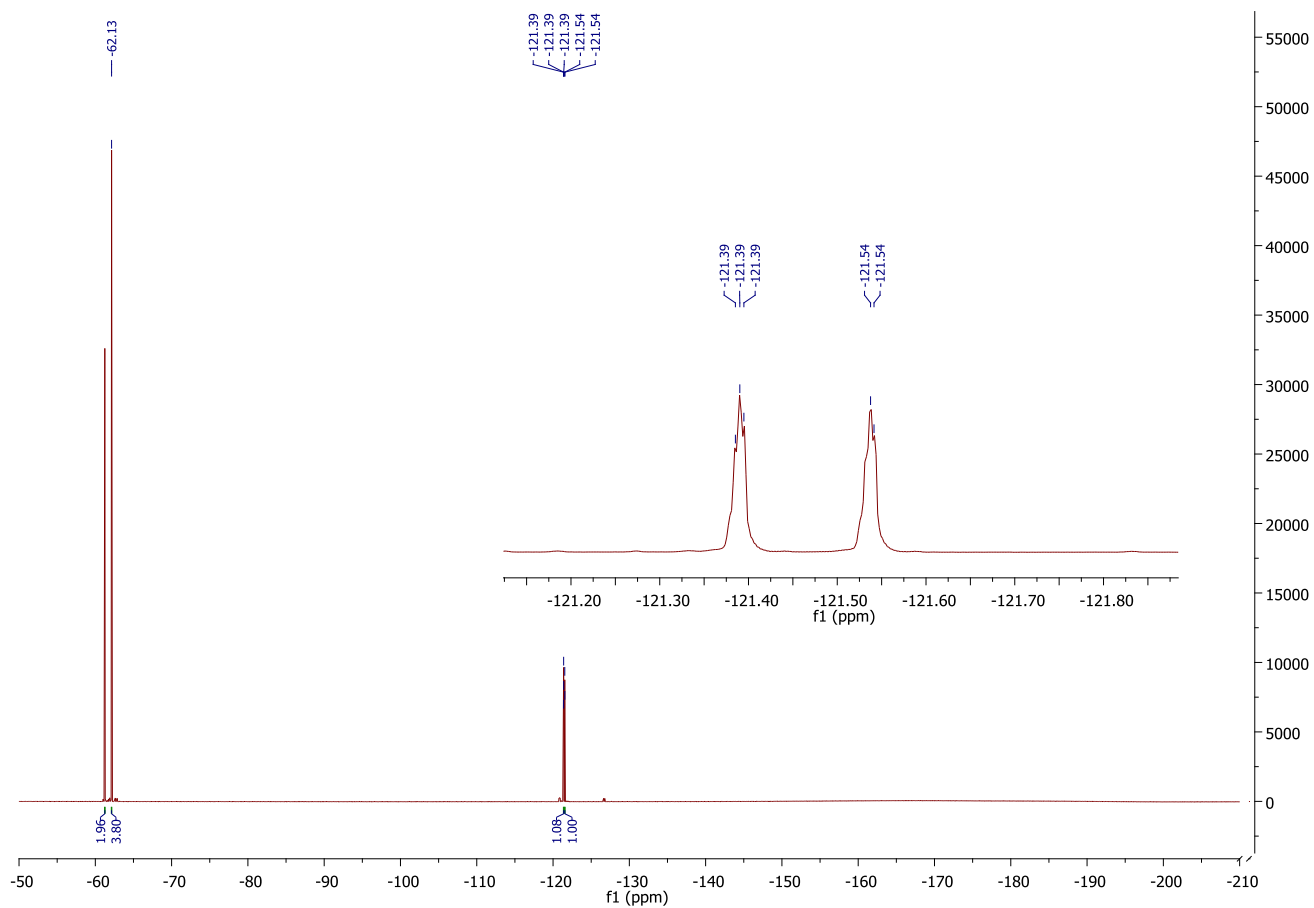
1pp



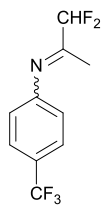
***N*-(1,1-difluoropropan-2-ylidene)-4-(trifluoromethyl)aniline (1pp) - ^{19}F NMR (376 MHz, CDCl_3)**



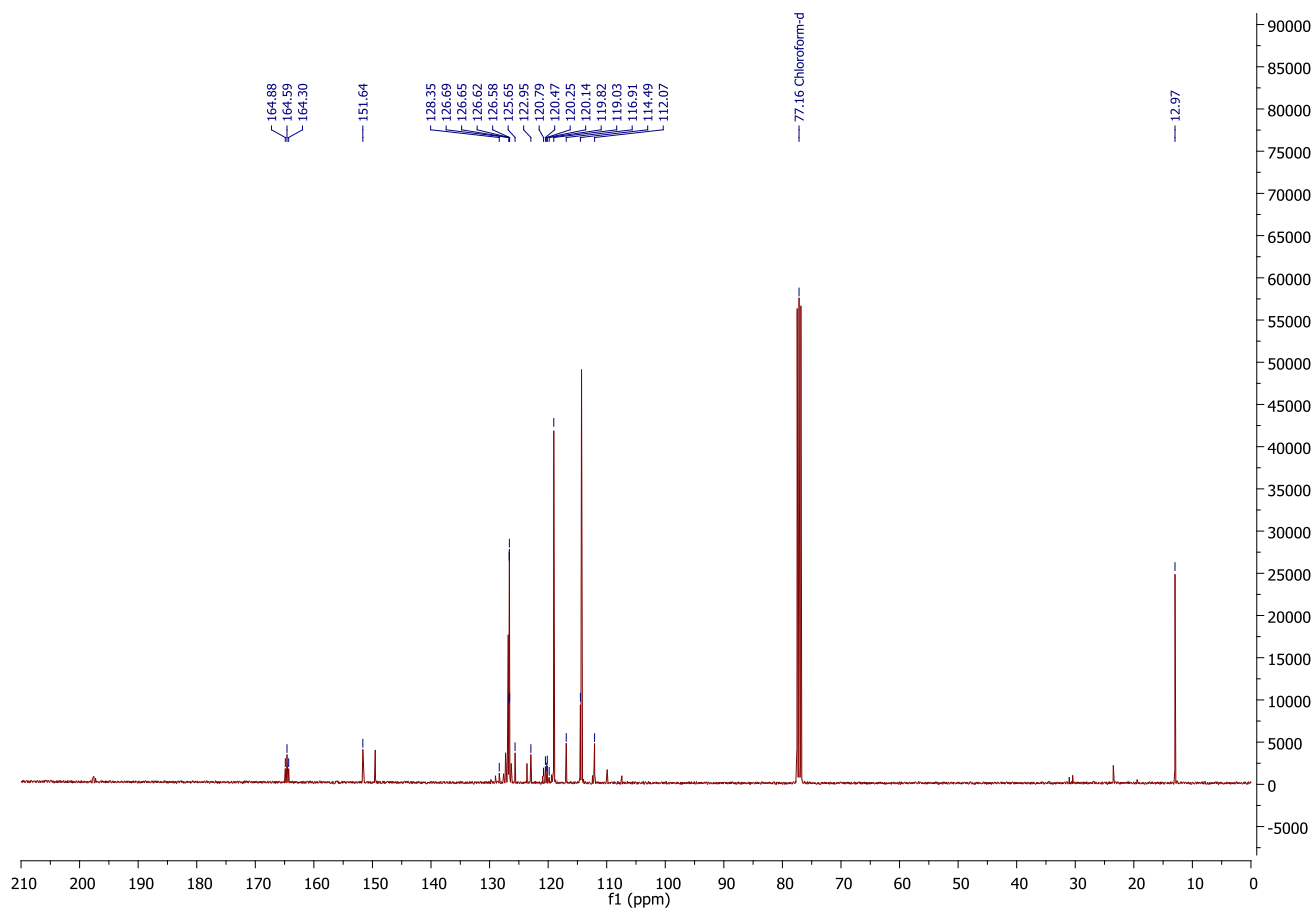
1pp



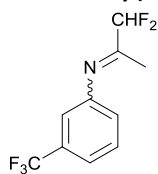
***N*-(1,1-difluoropropan-2-ylidene)-4-(trifluoromethyl)aniline (1pp)- ^{13}C NMR (101 MHz, CDCl_3)**



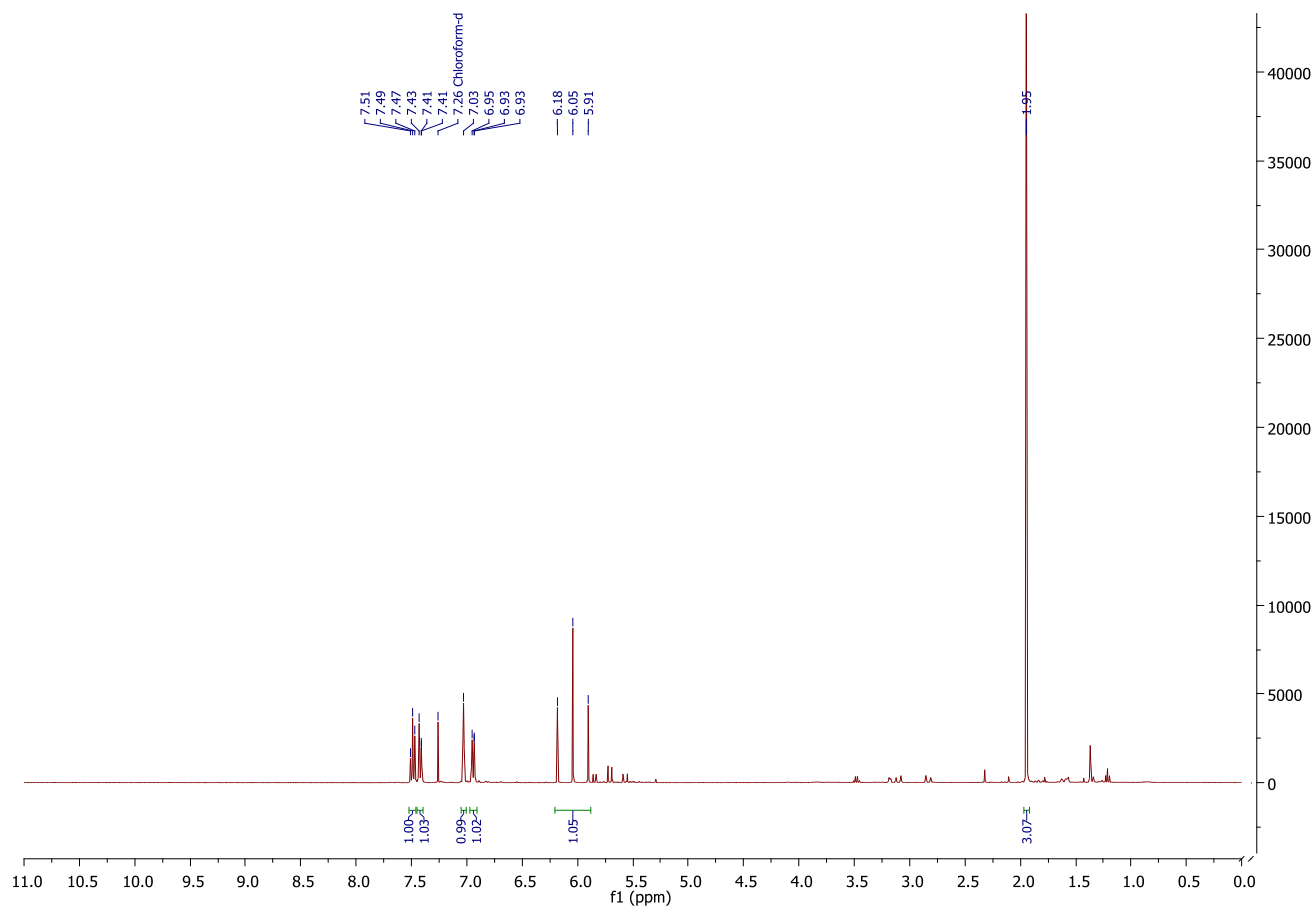
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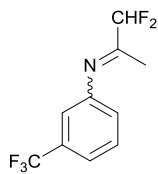
***N*-(1,1-difluoropropan-2-ylidene)-3-(trifluoromethyl)aniline (1qq) - ^1H NMR (400 MHz, CDCl_3)**



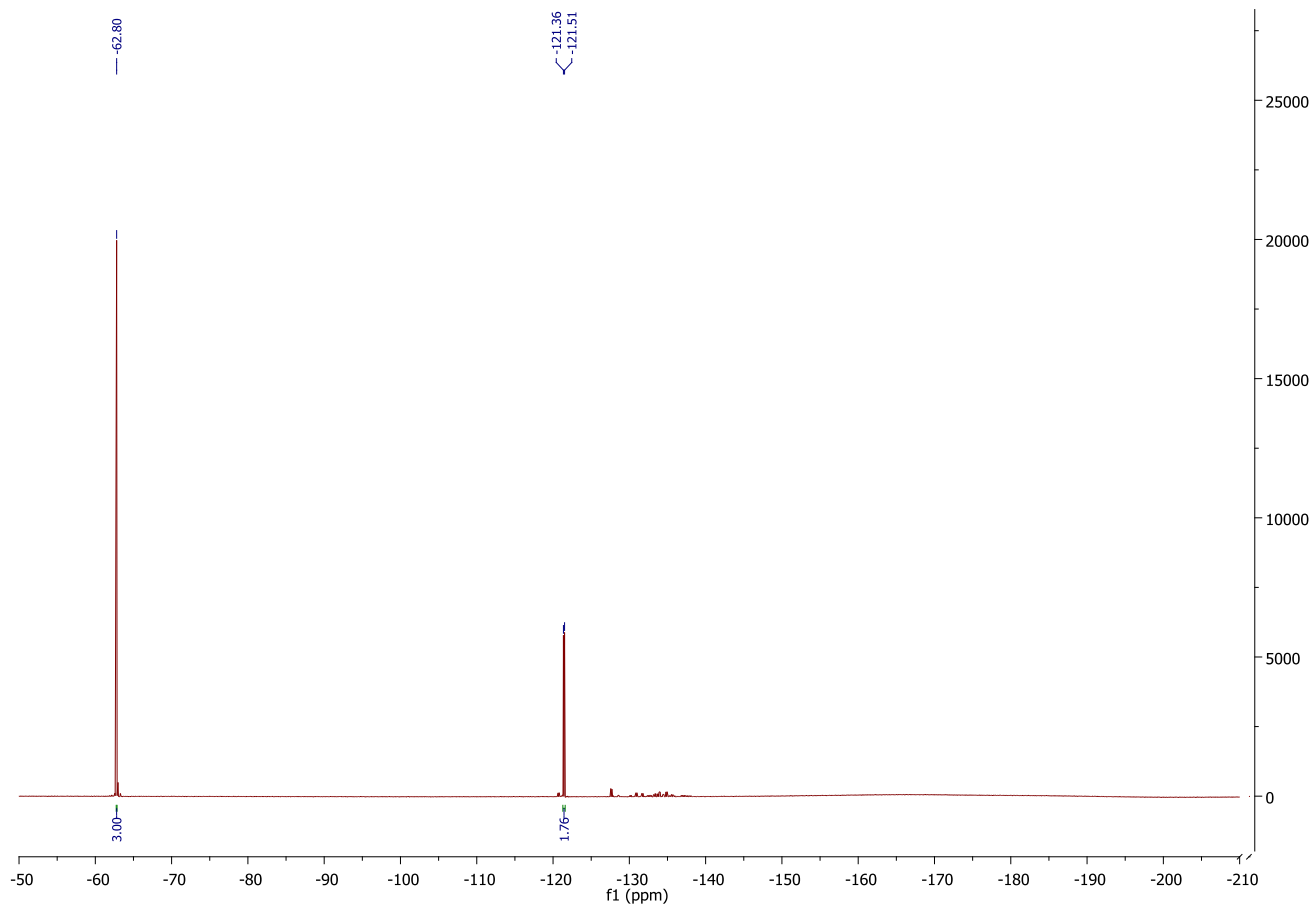
1qq



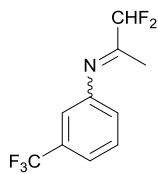
***N*-(1,1-difluoropropan-2-ylidene)-3-(trifluoromethyl)aniline (1qq) - ^{19}F NMR (376 MHz, CDCl_3)**



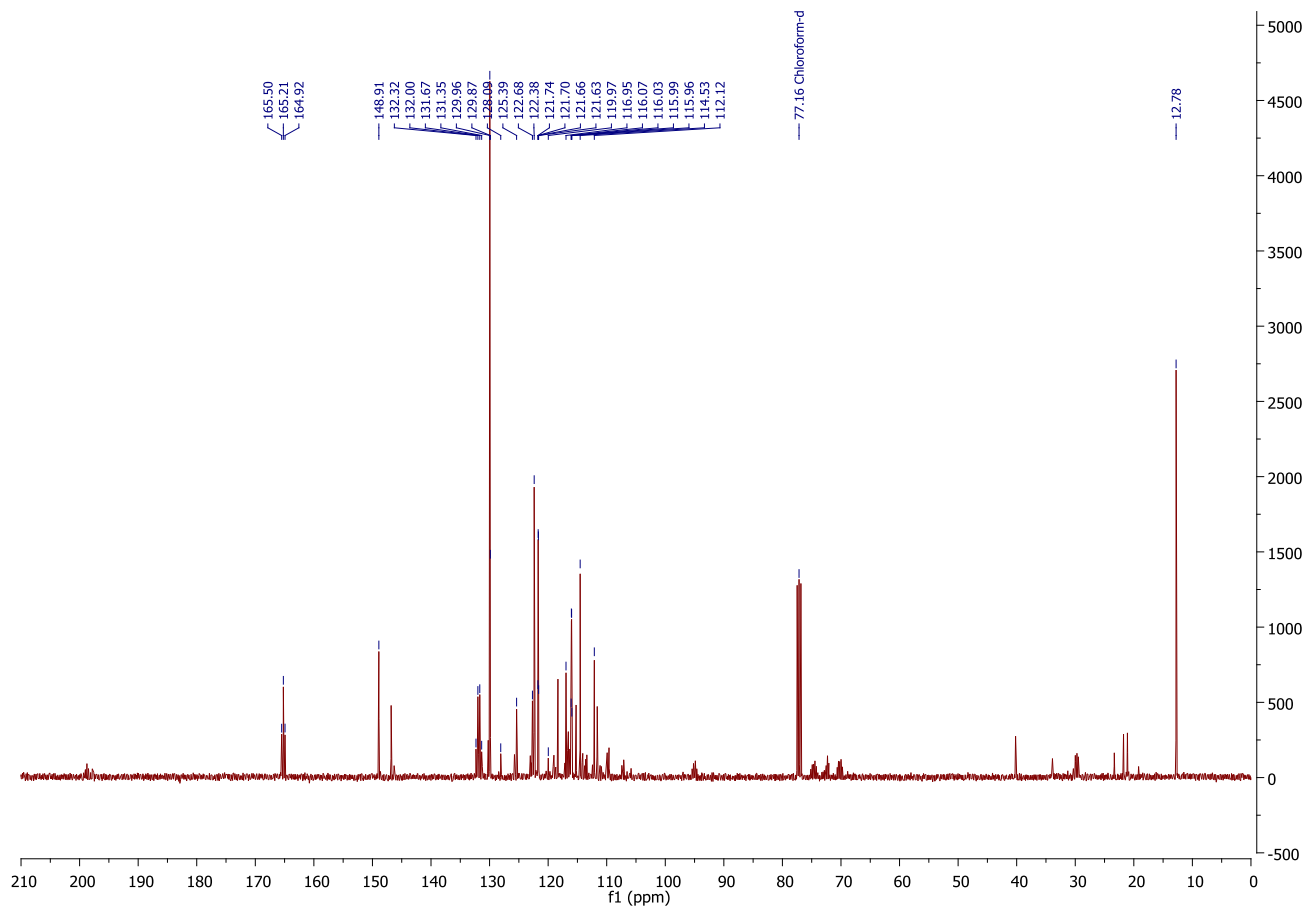
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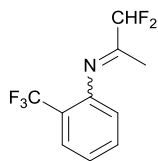
***N*-(1,1-difluoropropan-2-ylidene)-3-(trifluoromethyl)aniline (1qq) - ^{13}C NMR (101 MHz, CDCl_3)**



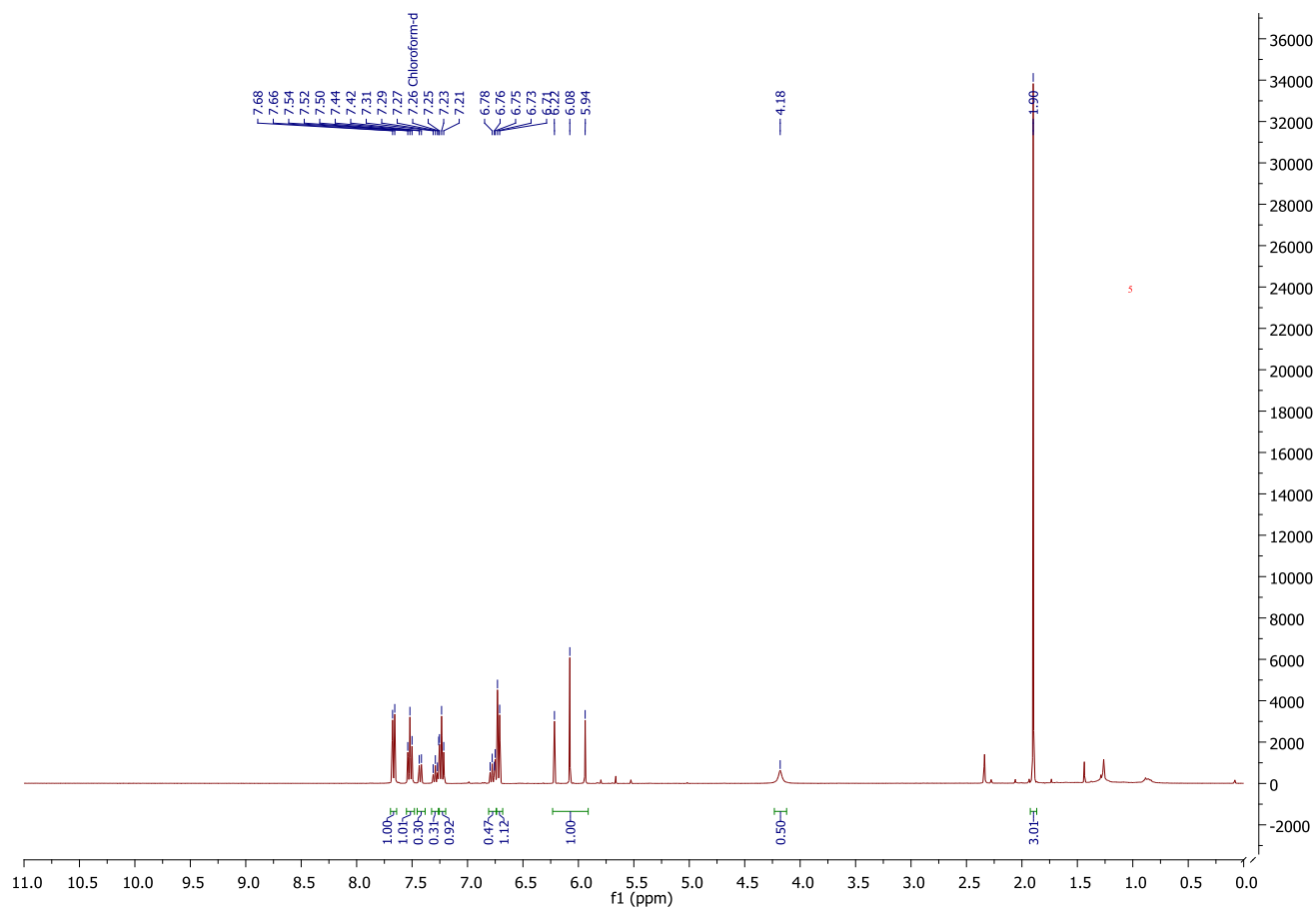
1qq



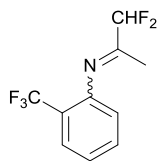
***N*-(1,1-difluoropropan-2-ylidene)-2-(trifluoromethyl)aniline (1rr) - ^1H NMR (400 MHz, CDCl_3)**



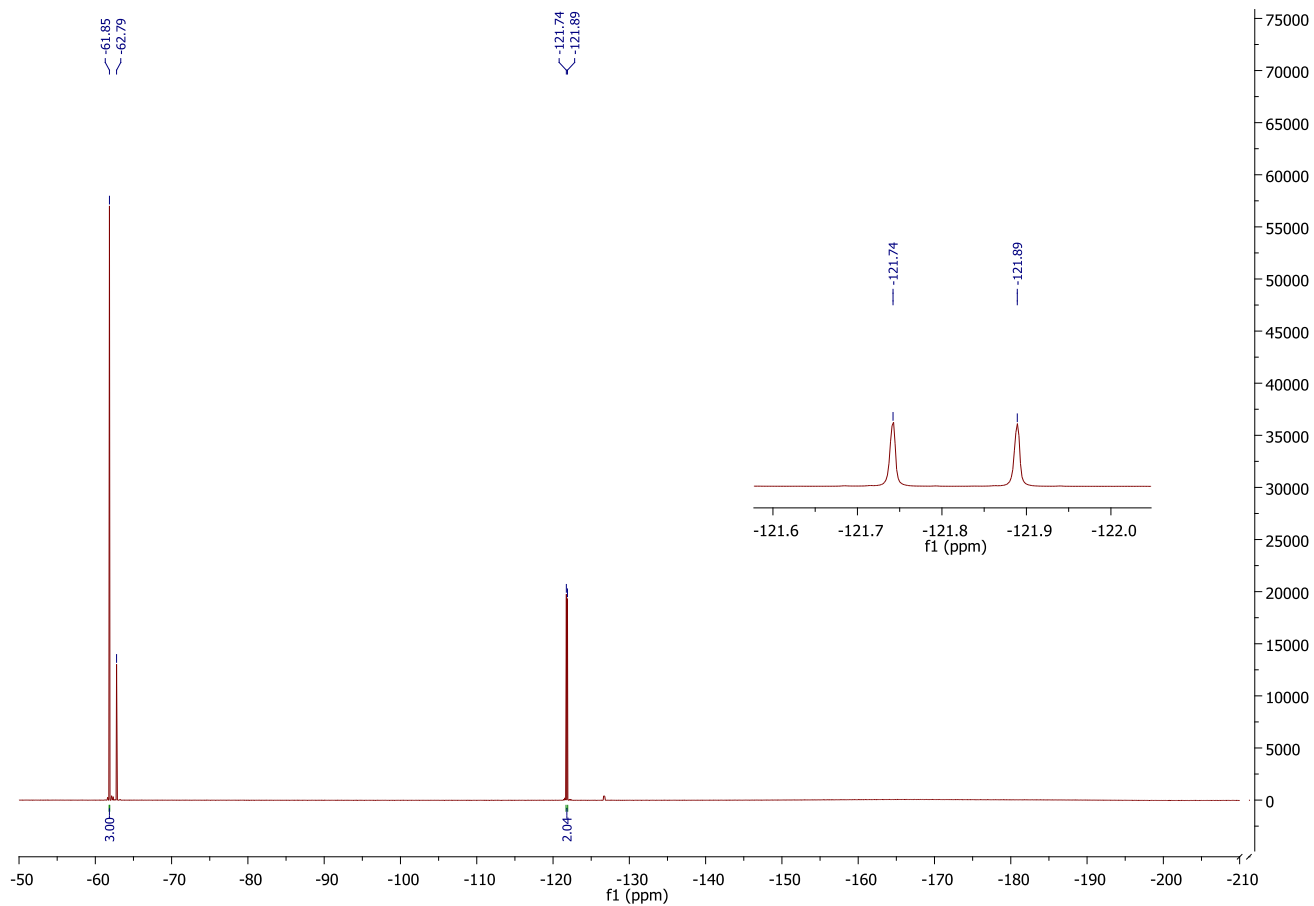
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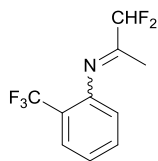
***N*-(1,1-difluoropropan-2-ylidene)-2-(trifluoromethyl)aniline (1rr) - ^{19}F NMR (376 MHz, CDCl_3)**



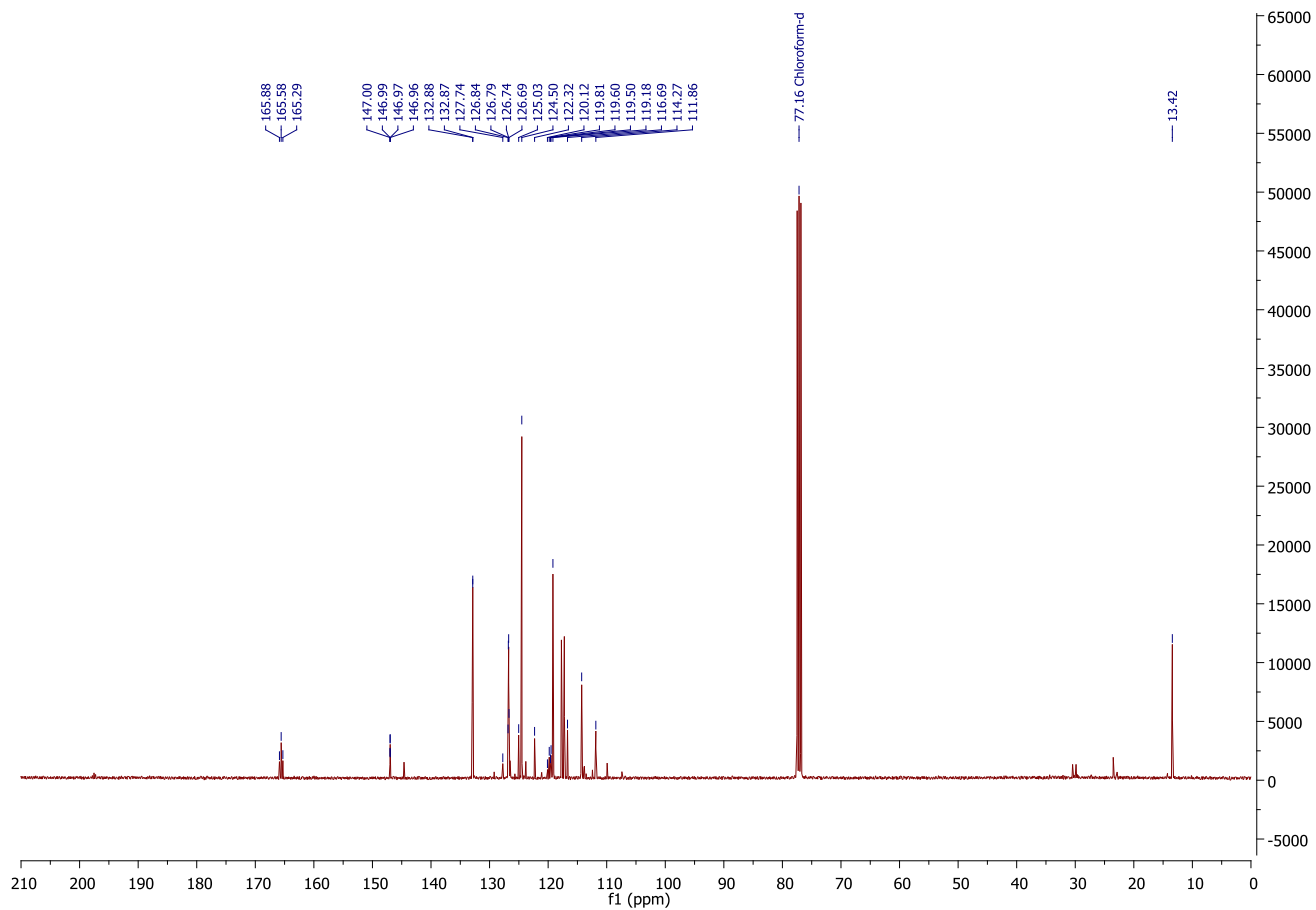
1rr



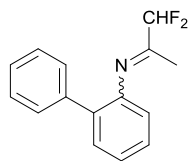
***N*-(1,1-difluoropropan-2-ylidene)-2-(trifluoromethyl)aniline (1rr) - ^{13}C NMR (101 MHz, CDCl_3)**



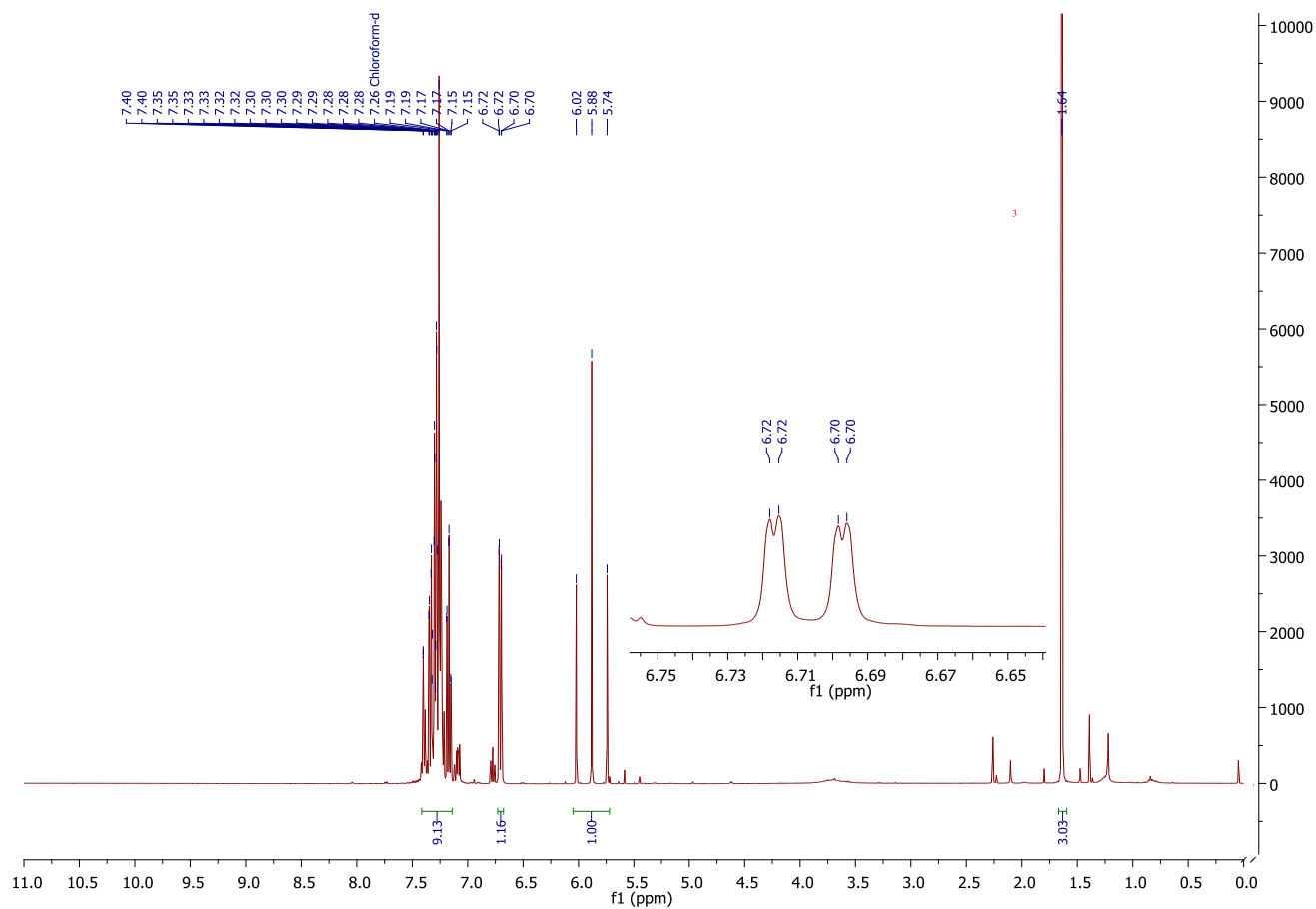
1rr



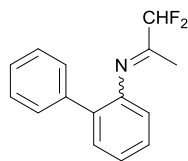
***N*-(1,1-difluoropropan-2-ylidene)-2-phenylaniline (1ss) - ^1H NMR (400 MHz, CDCl_3)**



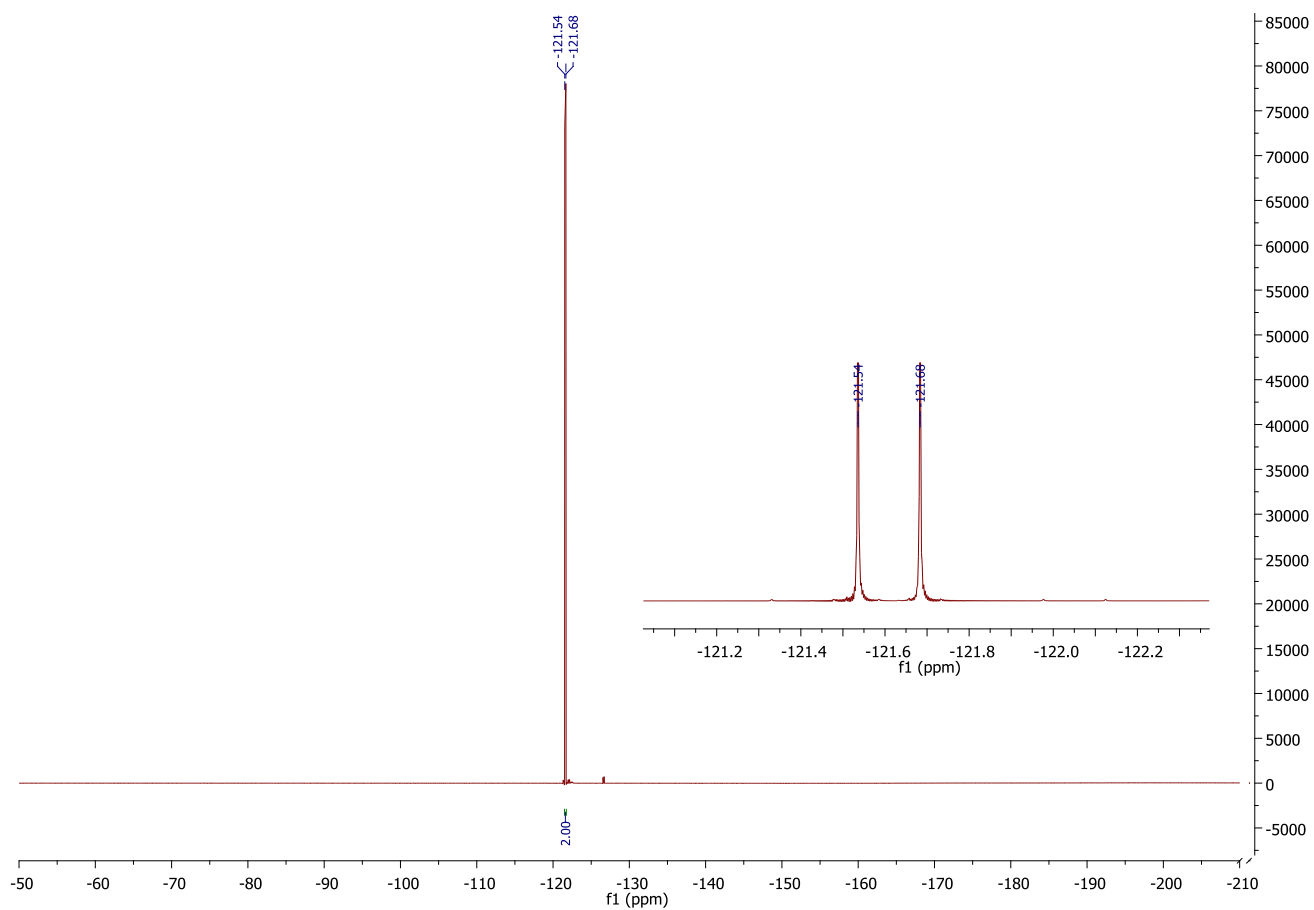
1ss



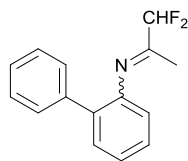
***N*-(1,1-difluoropropan-2-ylidene)-2-phenylaniline (1ss) - ^{19}F NMR (376 MHz, CDCl_3)**



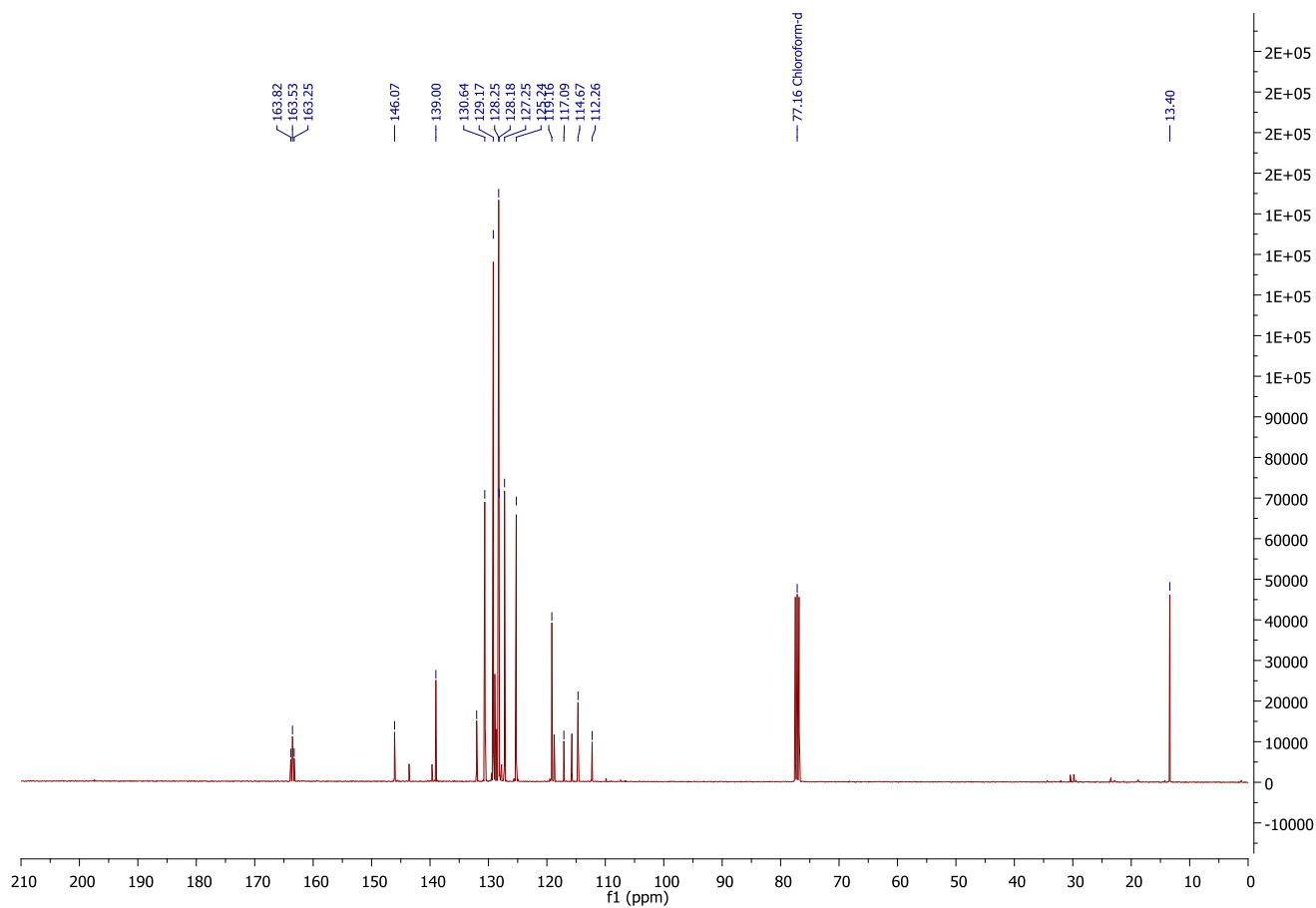
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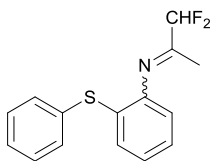
***N*-(1,1-difluoropropan-2-ylidene)-2-phenylaniline (1ss) - ^{13}C NMR (101 MHz, CDCl_3)**



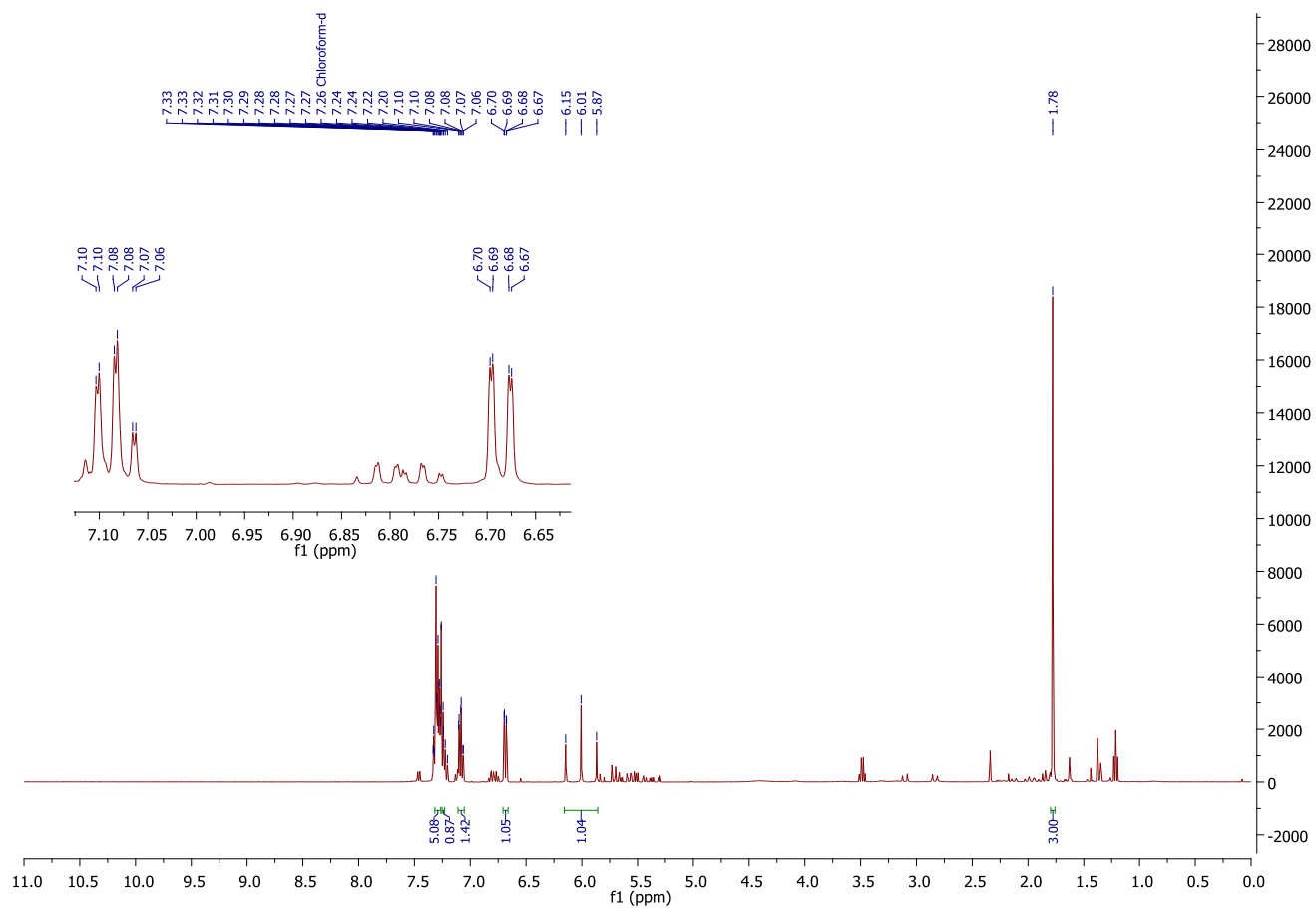
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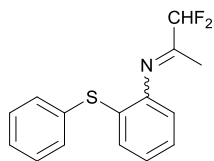
***N*-(1,1-difluoropropan-2-ylidene)-2-(phenylsulfanyl)aniline (1tt) - ^1H NMR (400 MHz, CDCl_3)**



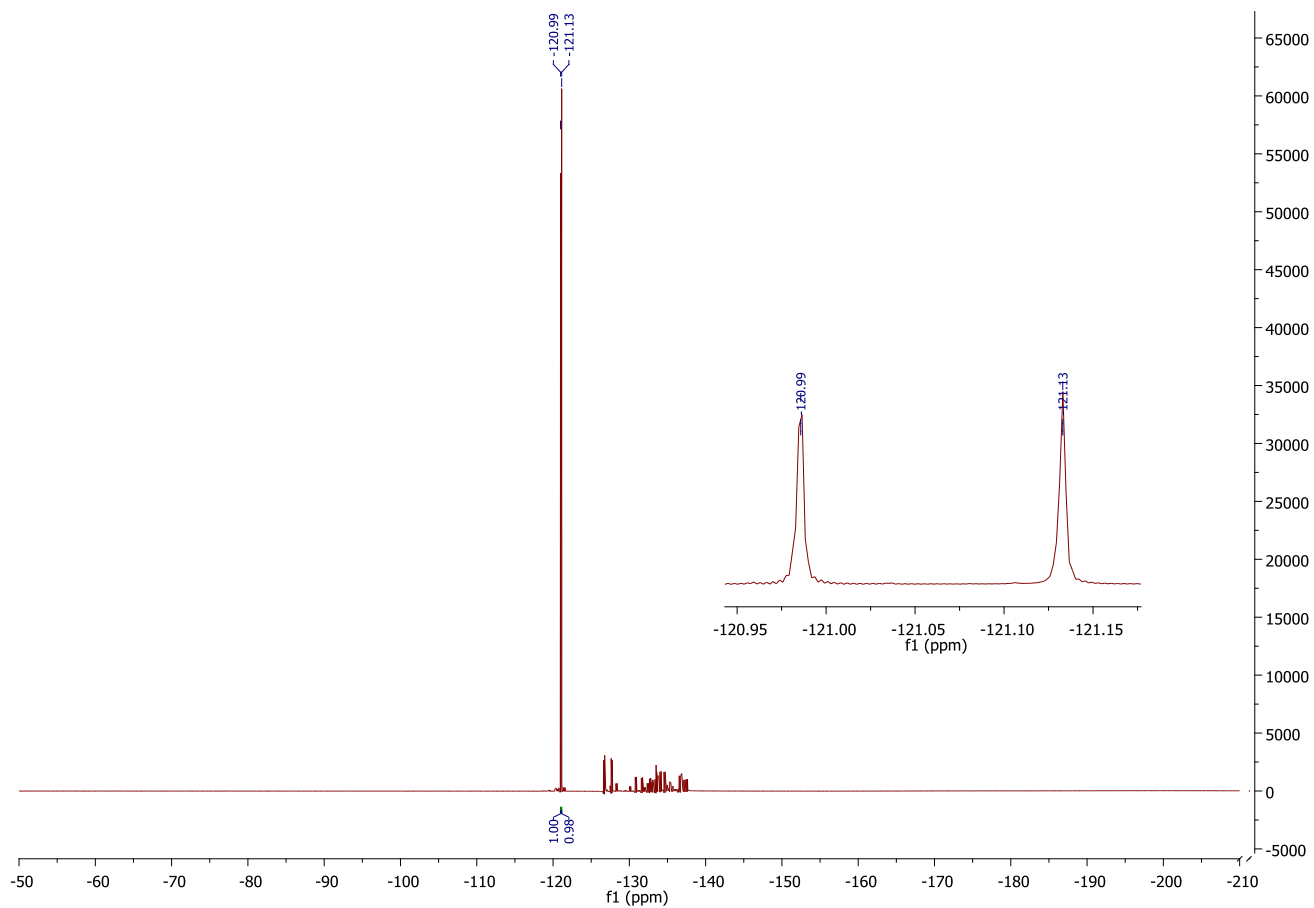
1tt



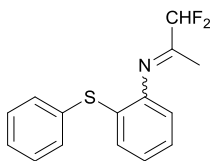
***N*-(1,1-difluoropropan-2-ylidene)-2-(phenylsulfanyl)aniline (1tt) - ^{19}F NMR (376 MHz, CDCl_3)**



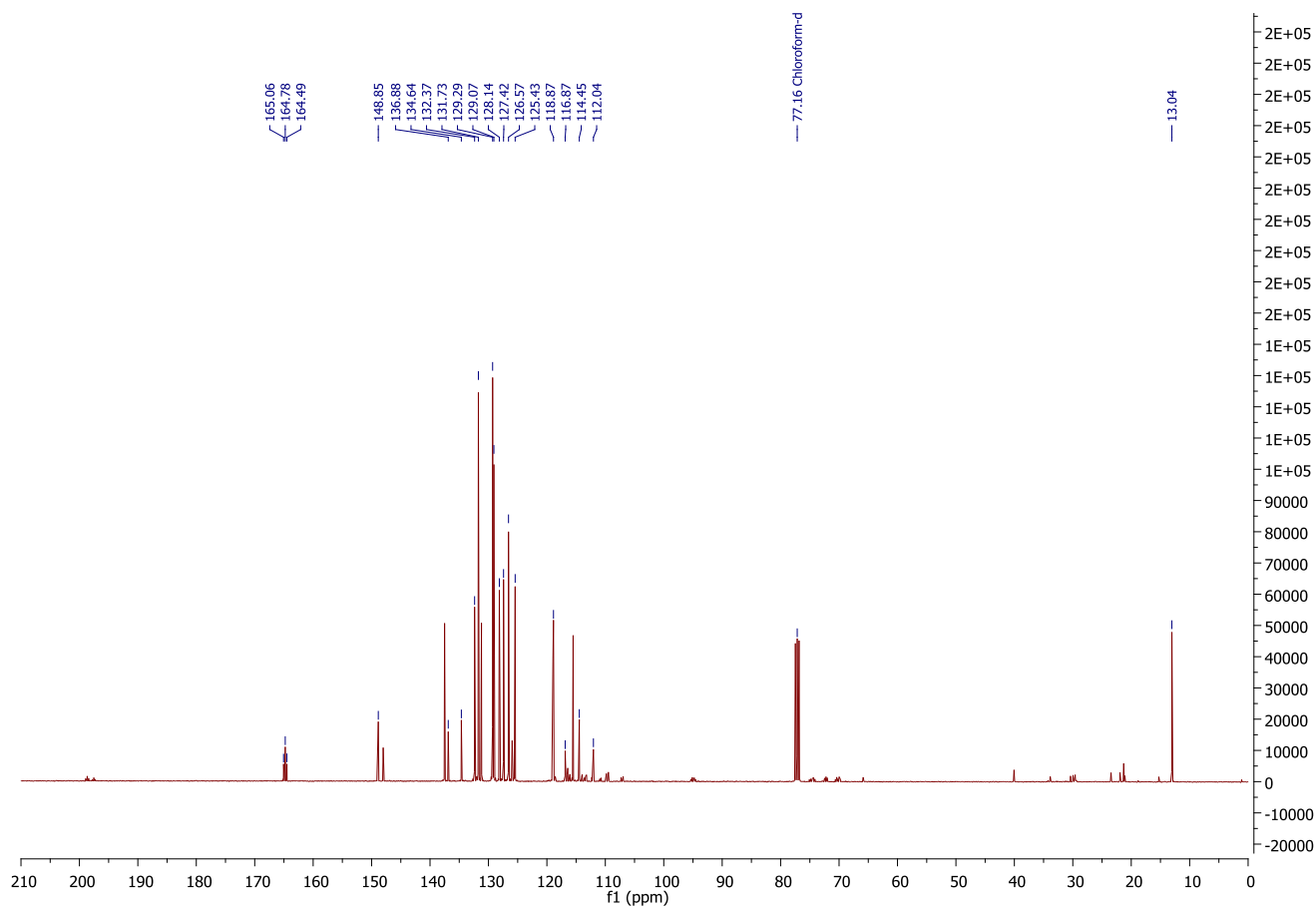
1tt



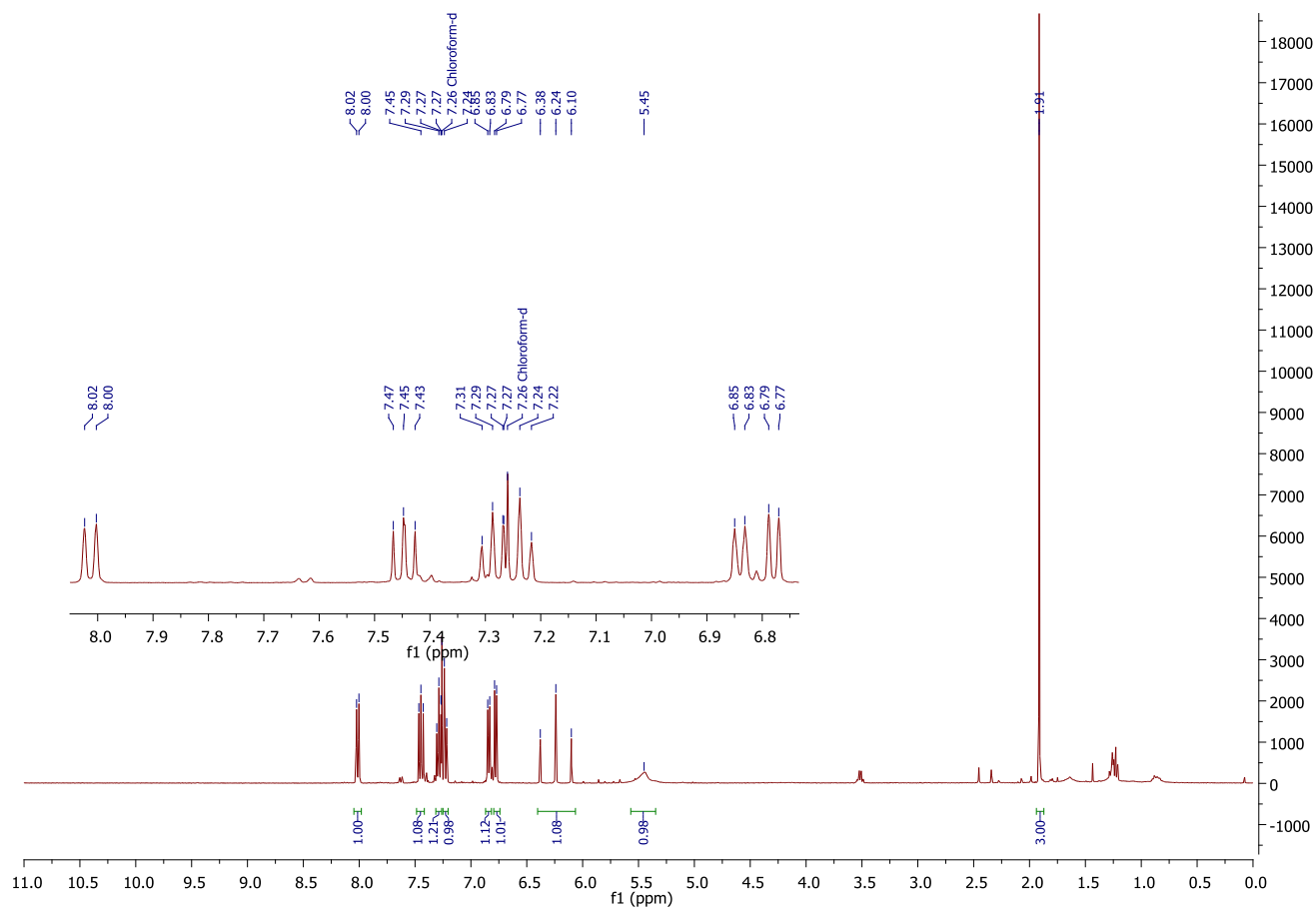
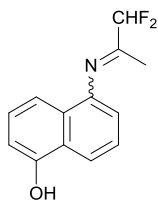
***N*-(1,1-difluoropropan-2-ylidene)-2-(phenylsulfanyl)aniline (1tt) - ^{13}C NMR (101 MHz, CDCl_3)**



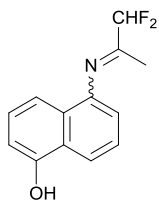
1tt



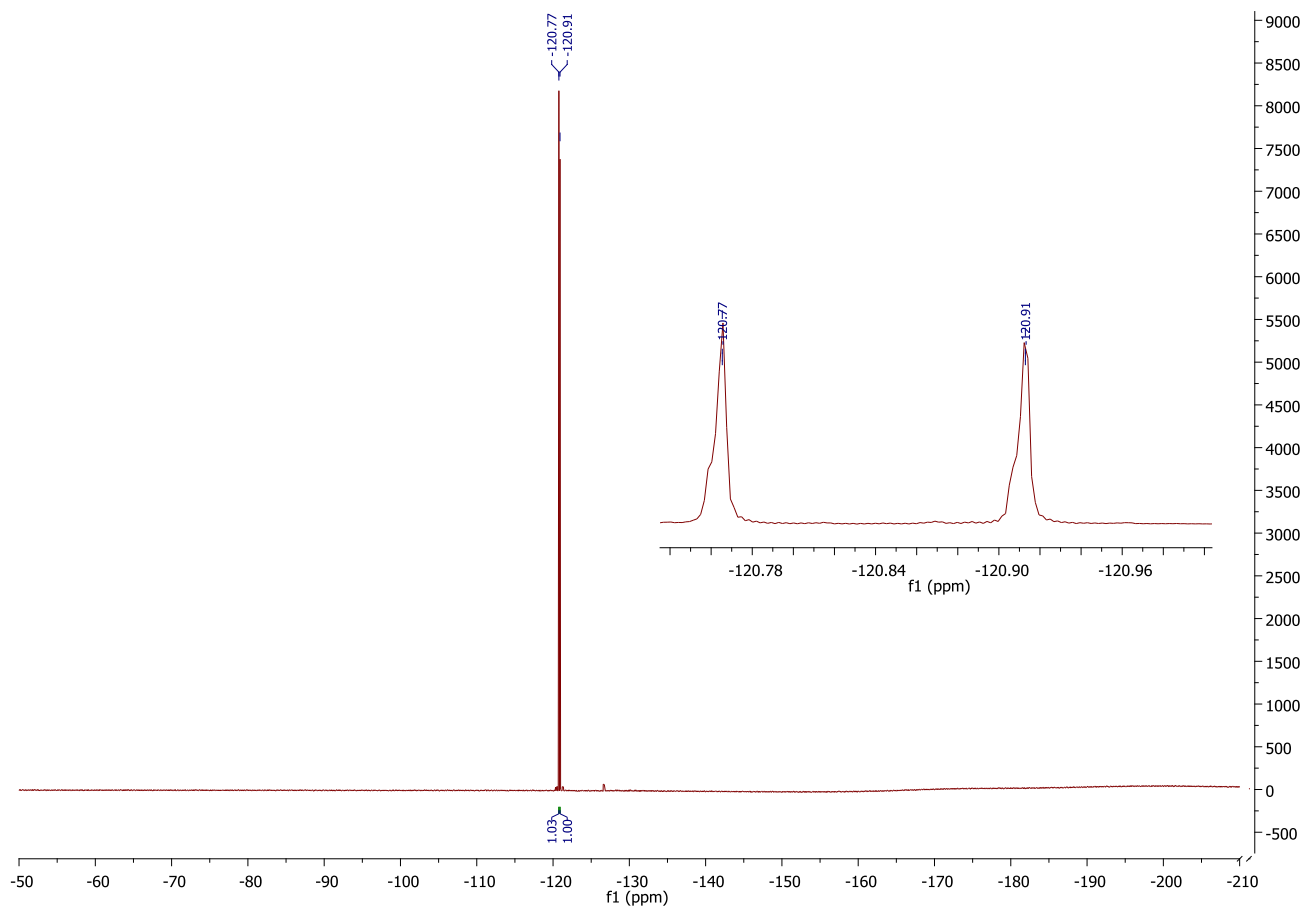
5-[(1,1-Difluoropropan-2-ylidene)amino]-1-naphthol (1uu) - ^1H NMR (400 MHz, CDCl_3)



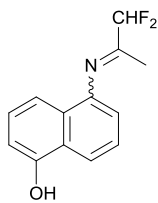
5-[(1,1-Difluoropropan-2-ylidene)amino]-1-naphthol (1uu) - ^{19}F NMR (376 MHz, CDCl_3)



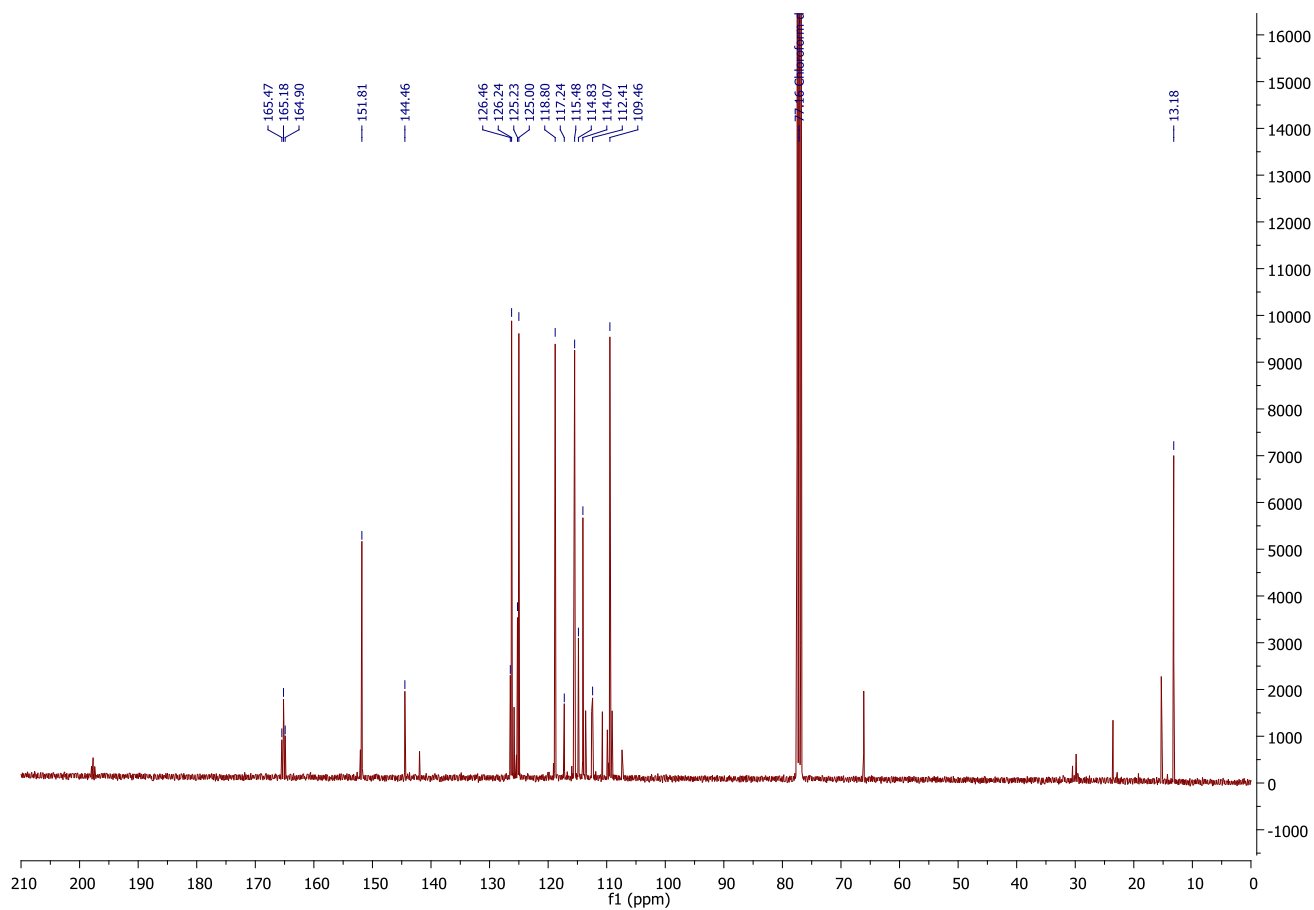
1uu



5-[(1,1-Difluoropropan-2-ylidene)amino]-1-naphthol (1uu) - ^{13}C NMR (101 MHz, CDCl_3)

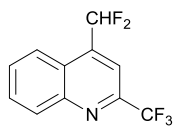


1uu

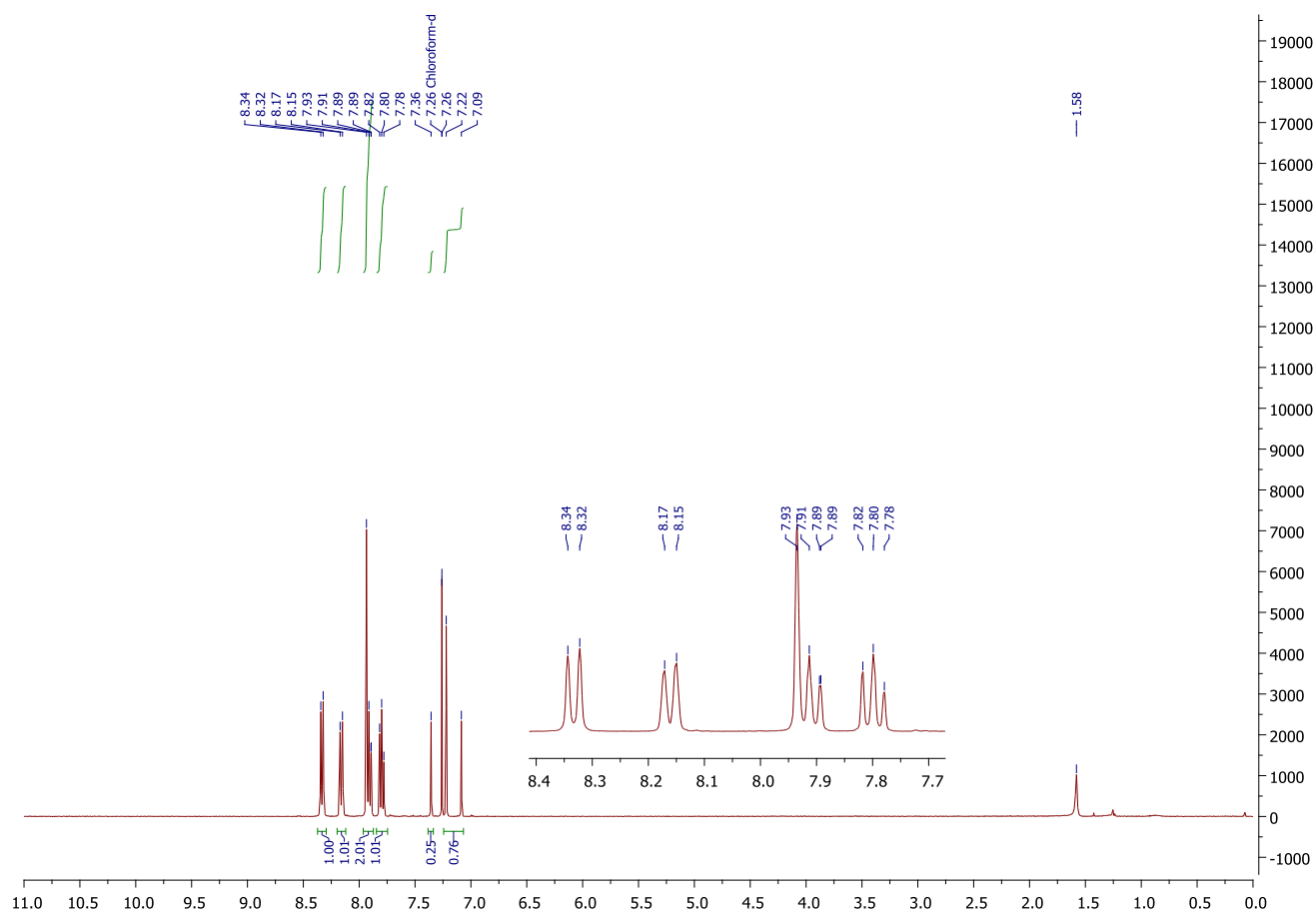


Quinoline derivatives 2 and 3

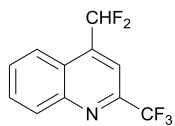
4-(Difluoromethyl)-2-(trifluoromethyl)quinoline (2ai) - ^1H NMR (400 MHz, CDCl_3)



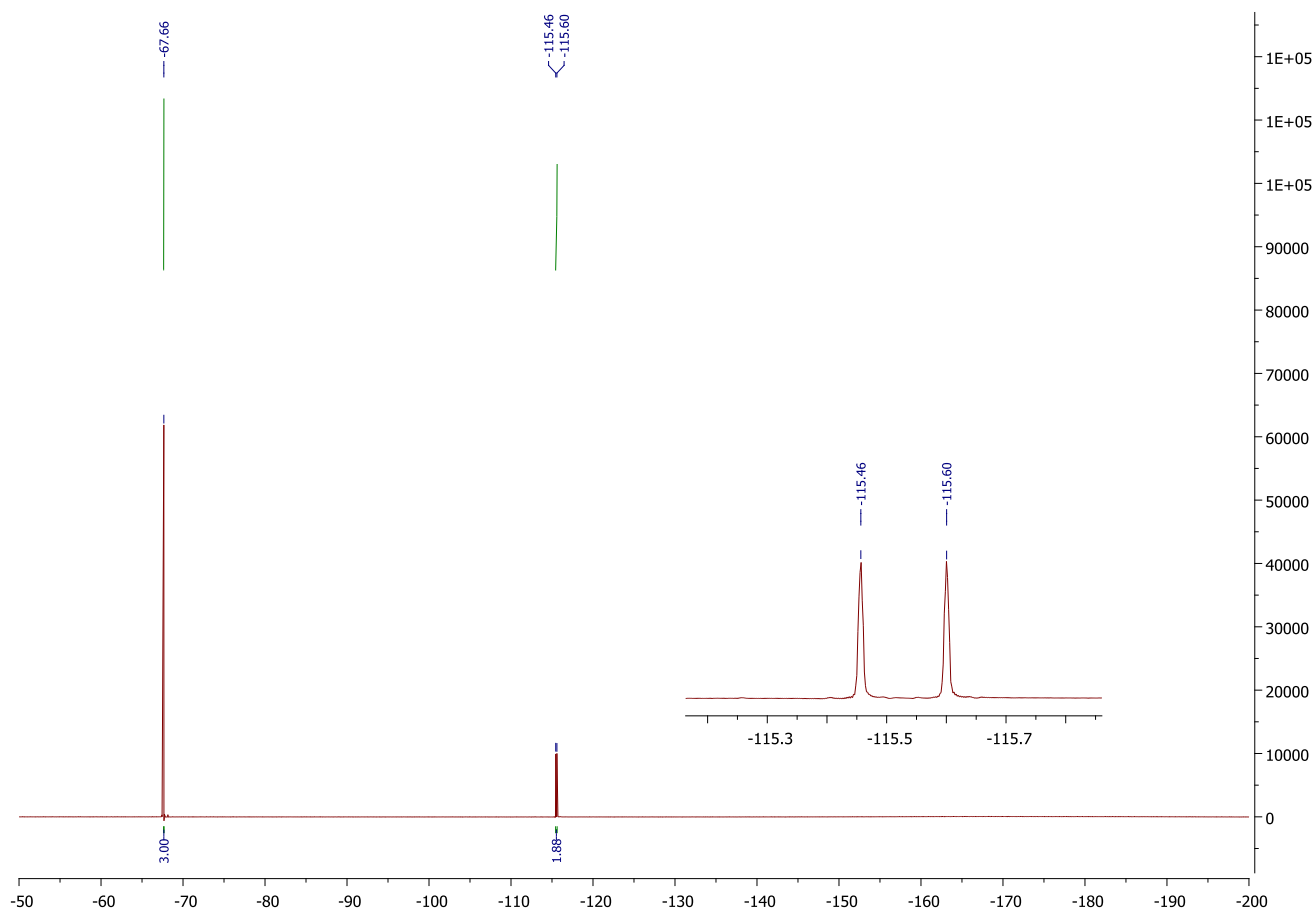
2ai



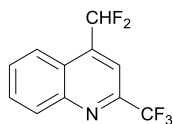
4-(Difluoromethyl)-2-(trifluoromethyl)quinoline (2ai) - ^{19}F NMR (376 MHz, CDCl_3)



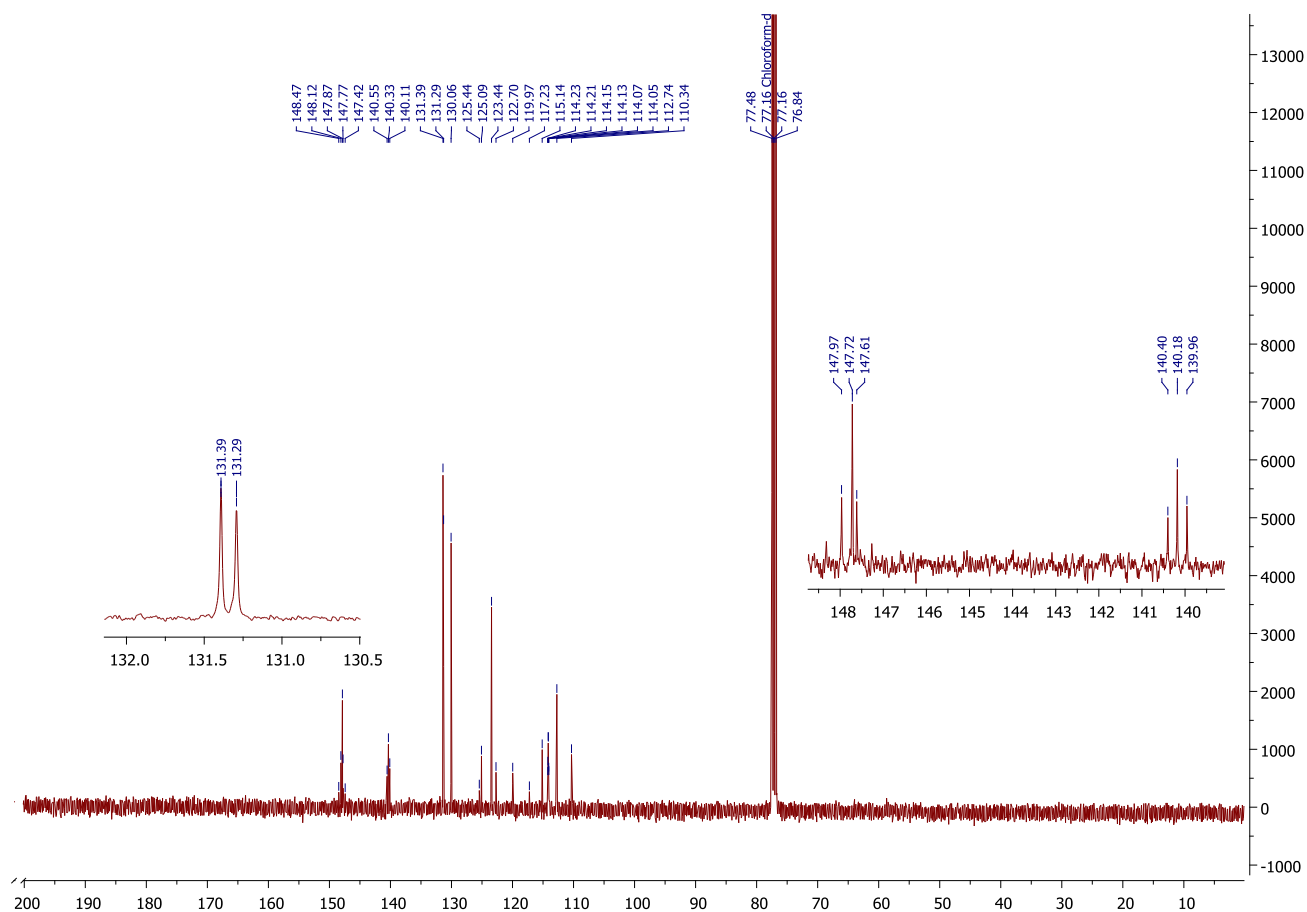
2ai



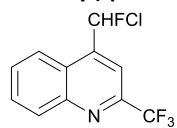
4-(Difluoromethyl)-2-(trifluoromethyl)quinoline (2ai) - ^{13}C NMR (101 MHz, CDCl_3)



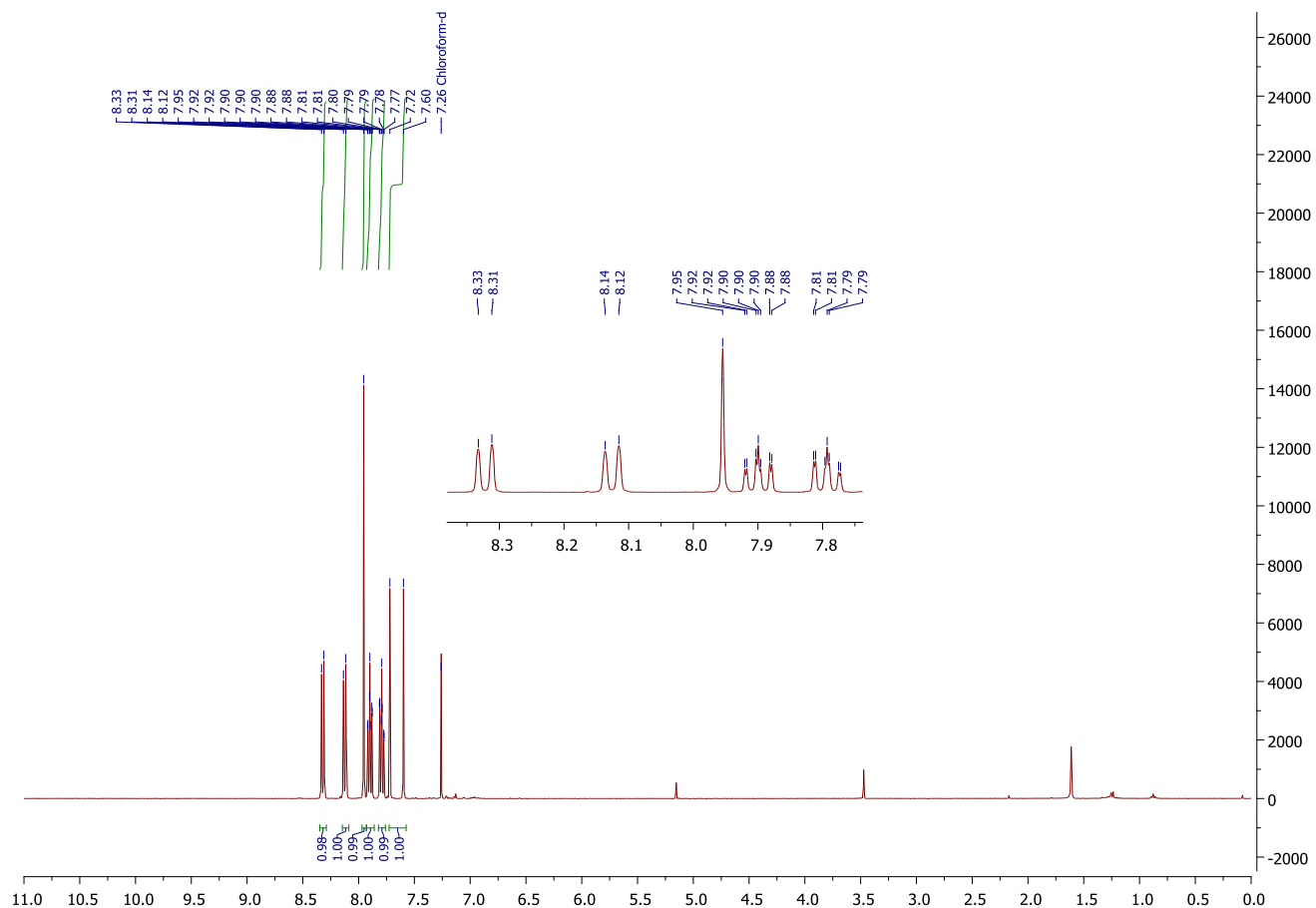
2ai



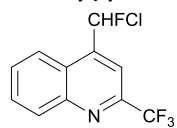
4-[Chloro(fluoro)methyl]-2-(trifluoromethyl)quinoline (2aii) - ^1H NMR (400 MHz, CDCl_3)



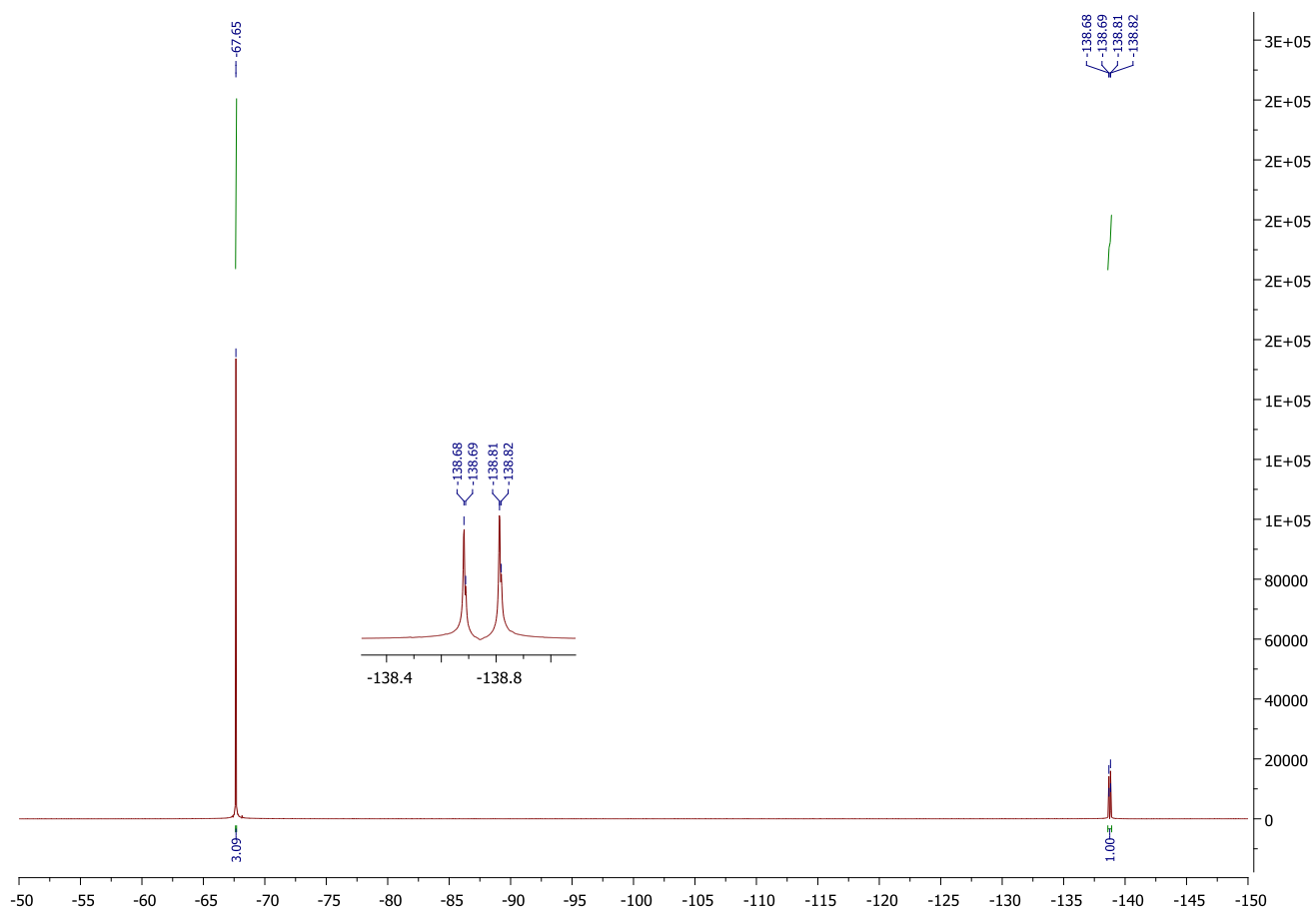
2aii



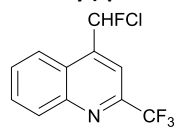
4-[Chloro(fluoro)methyl]-2-(trifluoromethyl)quinoline (2aii) - ^{19}F NMR (376 MHz, CDCl_3)



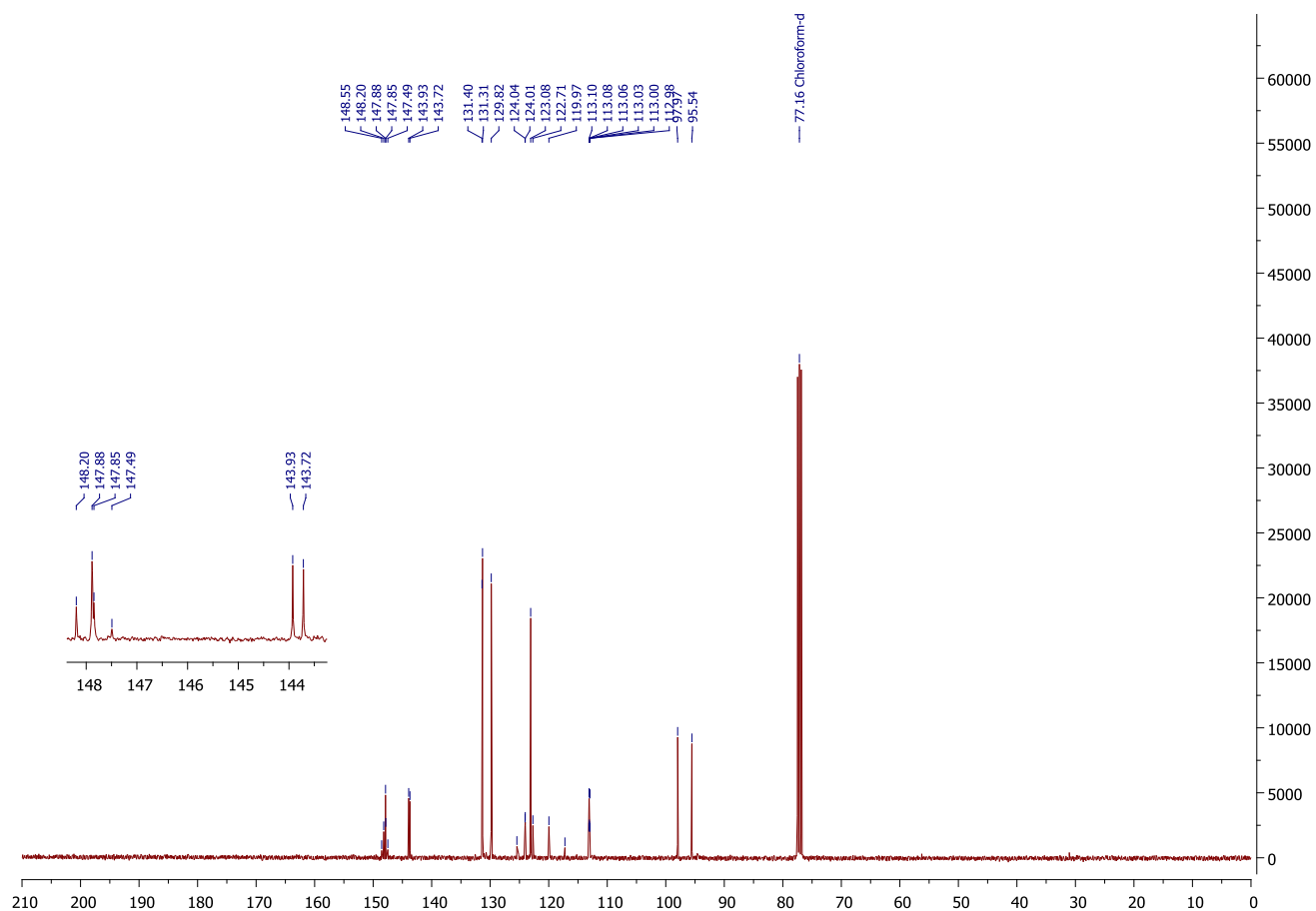
2aii



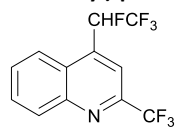
4-[Chloro(fluoro)methyl]-2-(trifluoromethyl)quinoline (2aii) - ^{13}C NMR (101 MHz, CDCl_3)



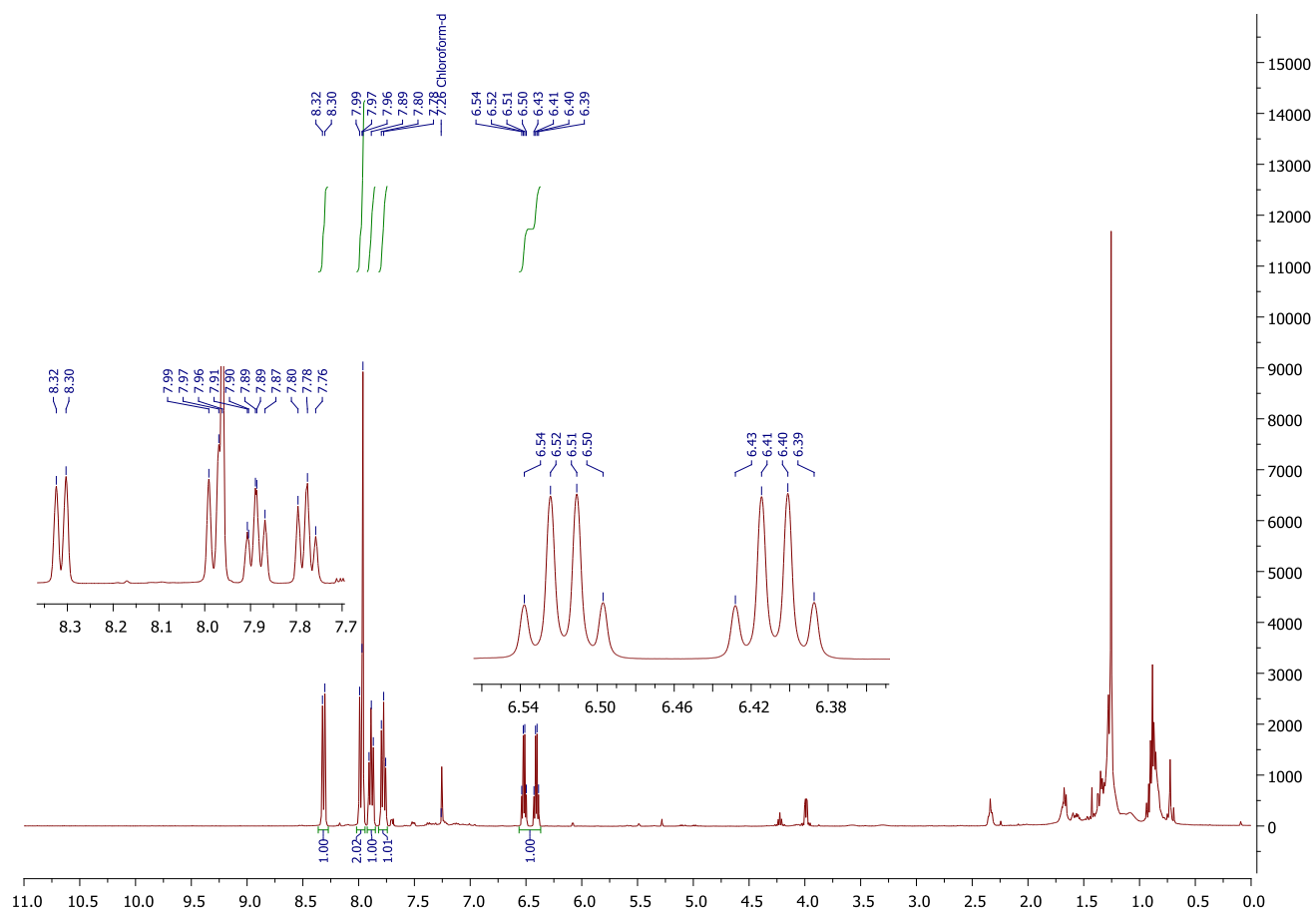
2aii



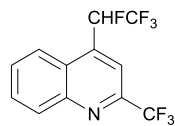
4-(1,2,2,2-Tetrafluoroethyl)-2-(trifluoromethyl)quinoline (2aiii) - ^1H NMR (400 MHz, CDCl_3)



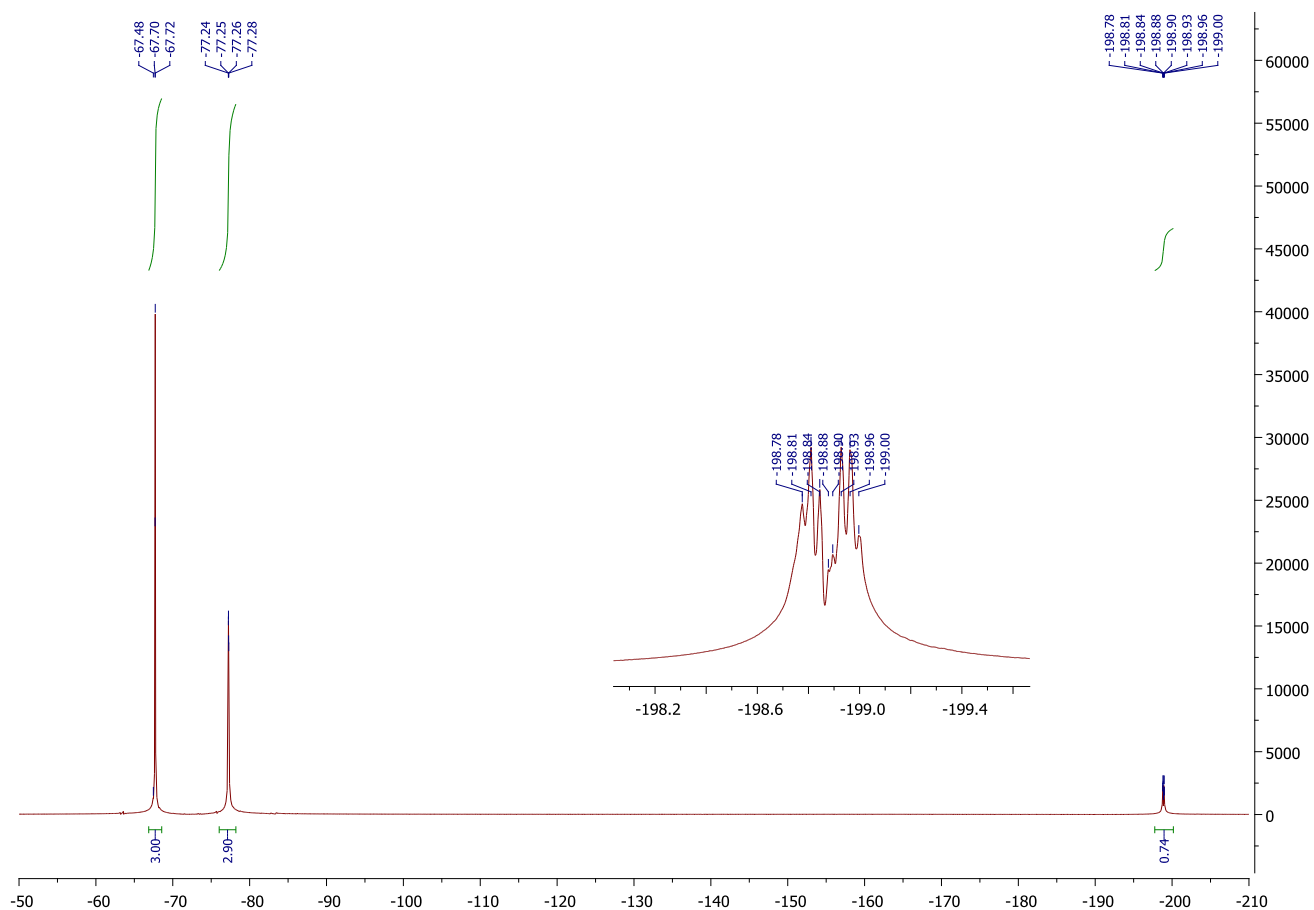
2aiii



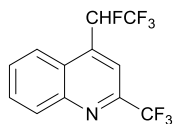
4-(1,2,2,2-Tetrafluoroethyl)-2-(trifluoromethyl)quinoline (2aiii) - ^{19}F NMR (376 MHz, CDCl_3)



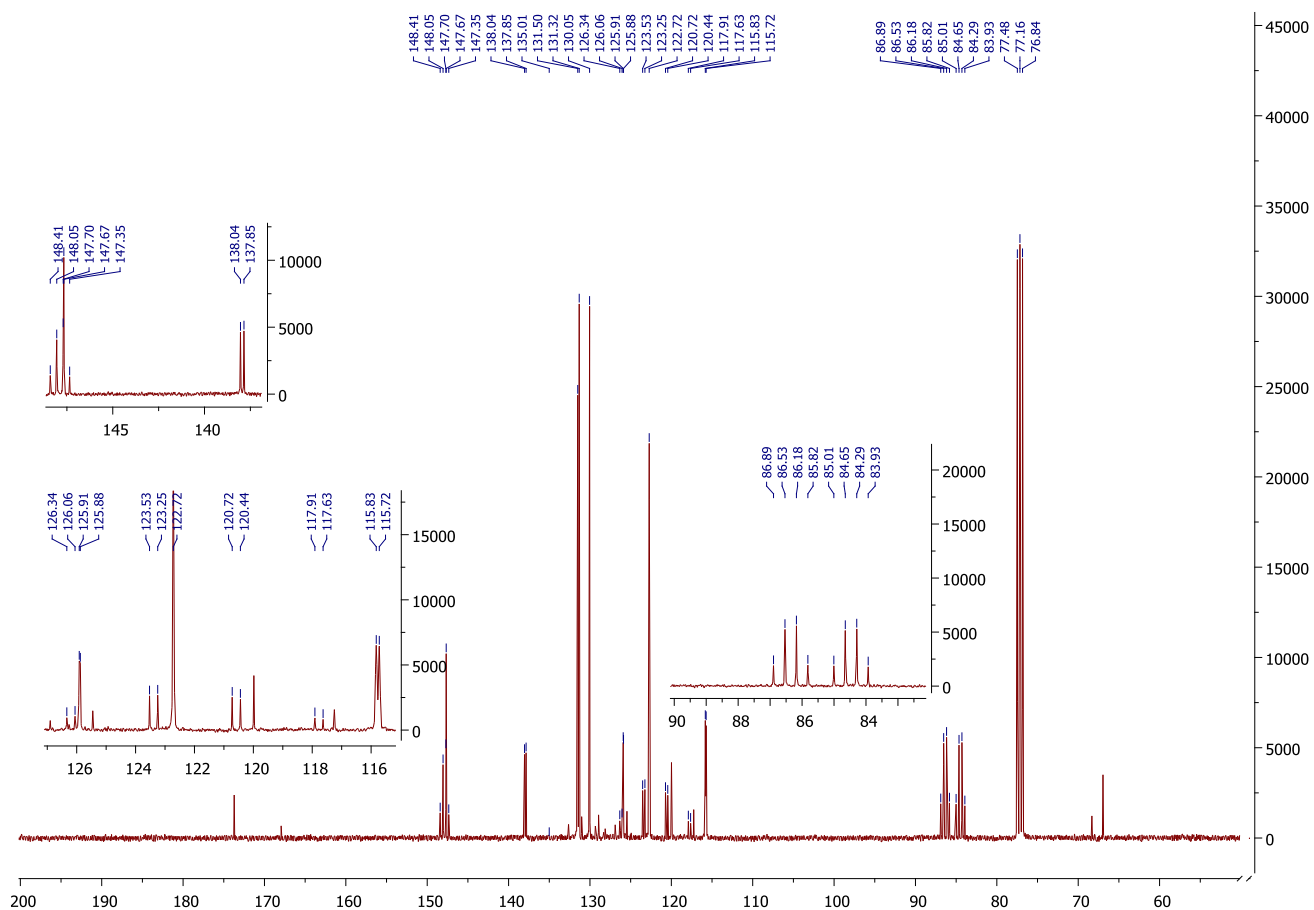
2aiii



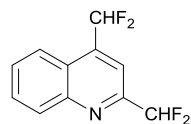
4-(1,2,2,2-Tetrafluoroethyl)-2-(trifluoromethyl)quinoline (2aiii) - ^{13}C NMR (101 MHz, CDCl_3)



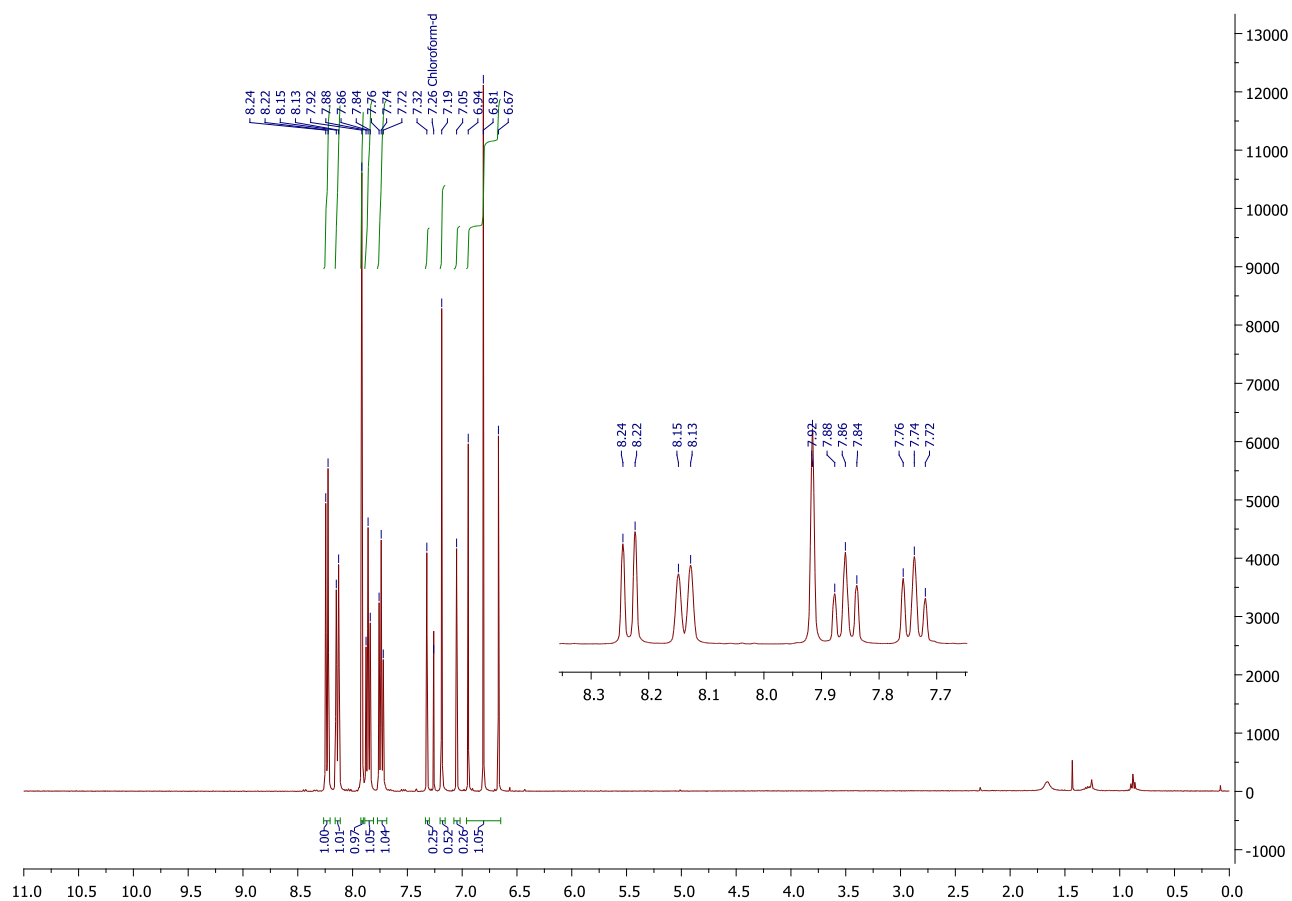
2aiii



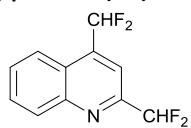
2,4-Bis(difluoromethyl)quinoline (3ai) - ^1H NMR (400 MHz, CDCl_3)



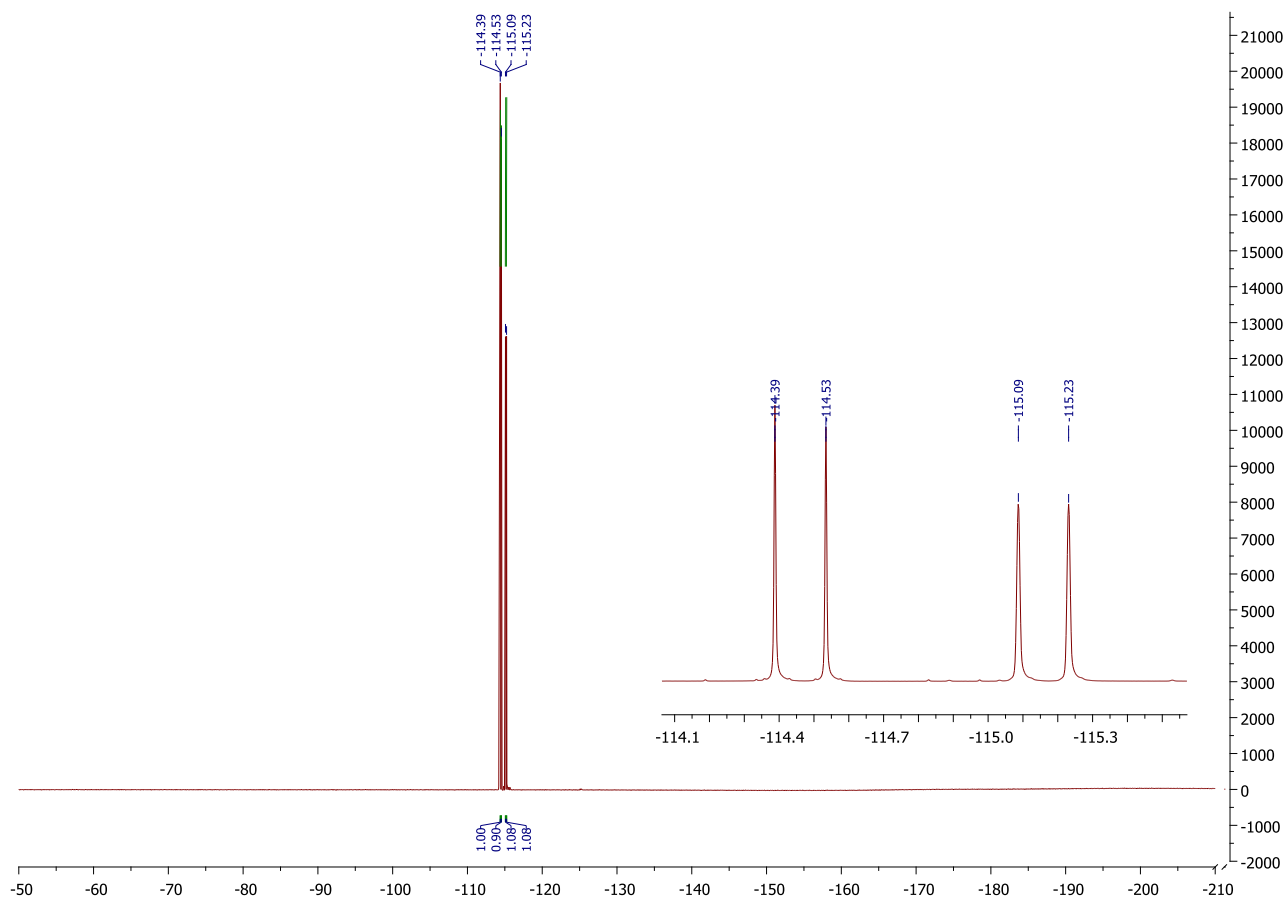
3ai



2,4-Bis(difluoromethyl)quinoline (3ai) - ^{19}F NMR (376 MHz, CDCl_3)

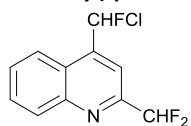


3ai

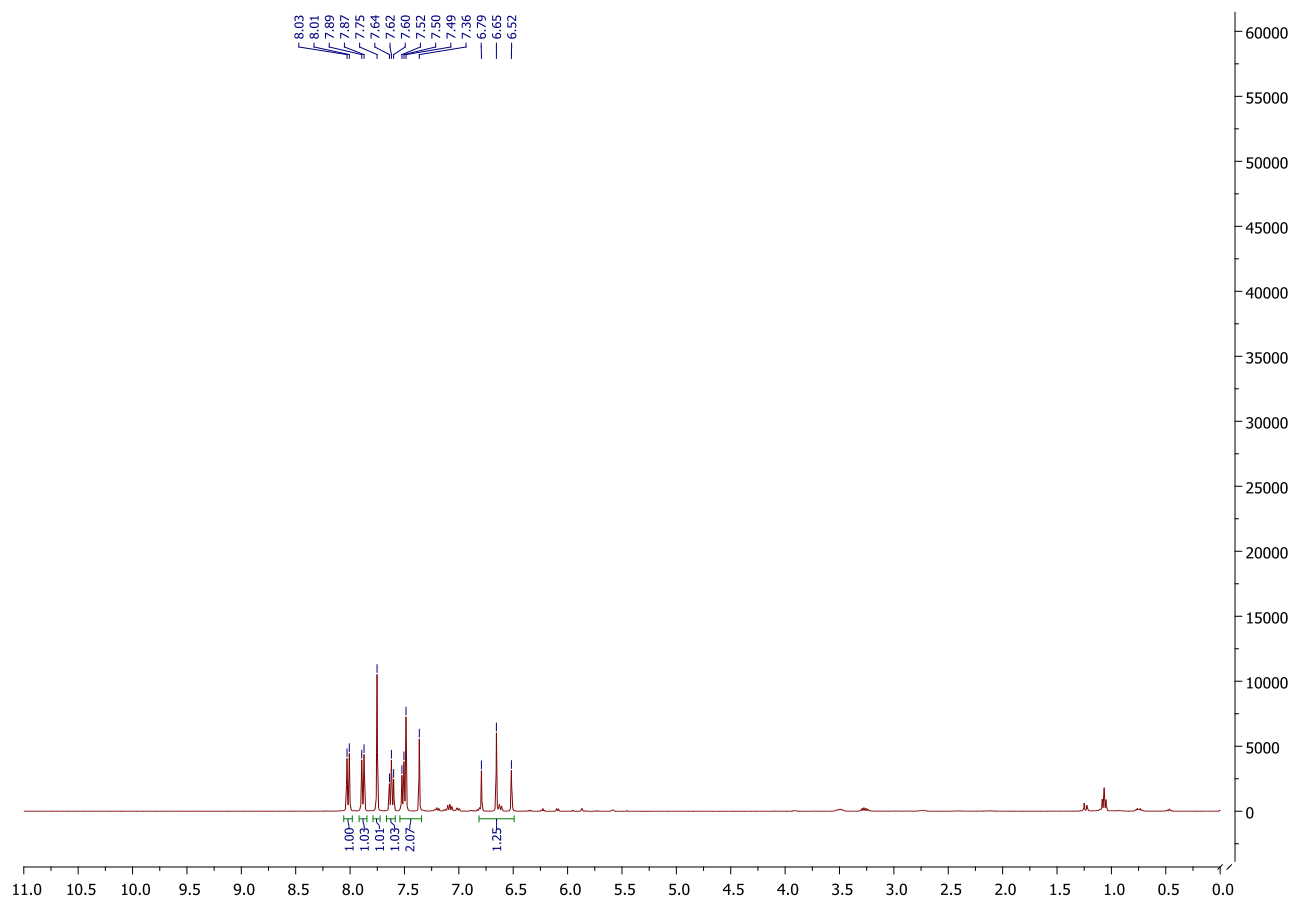


Fc1c(C(F)(F)F)c2ccccc2n1

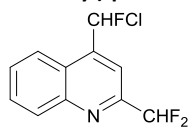
4-[Chloro(fluoro)methyl]-2-(difluoromethyl)quinoline (3aii) - ^1H NMR (400 MHz, CDCl_3)



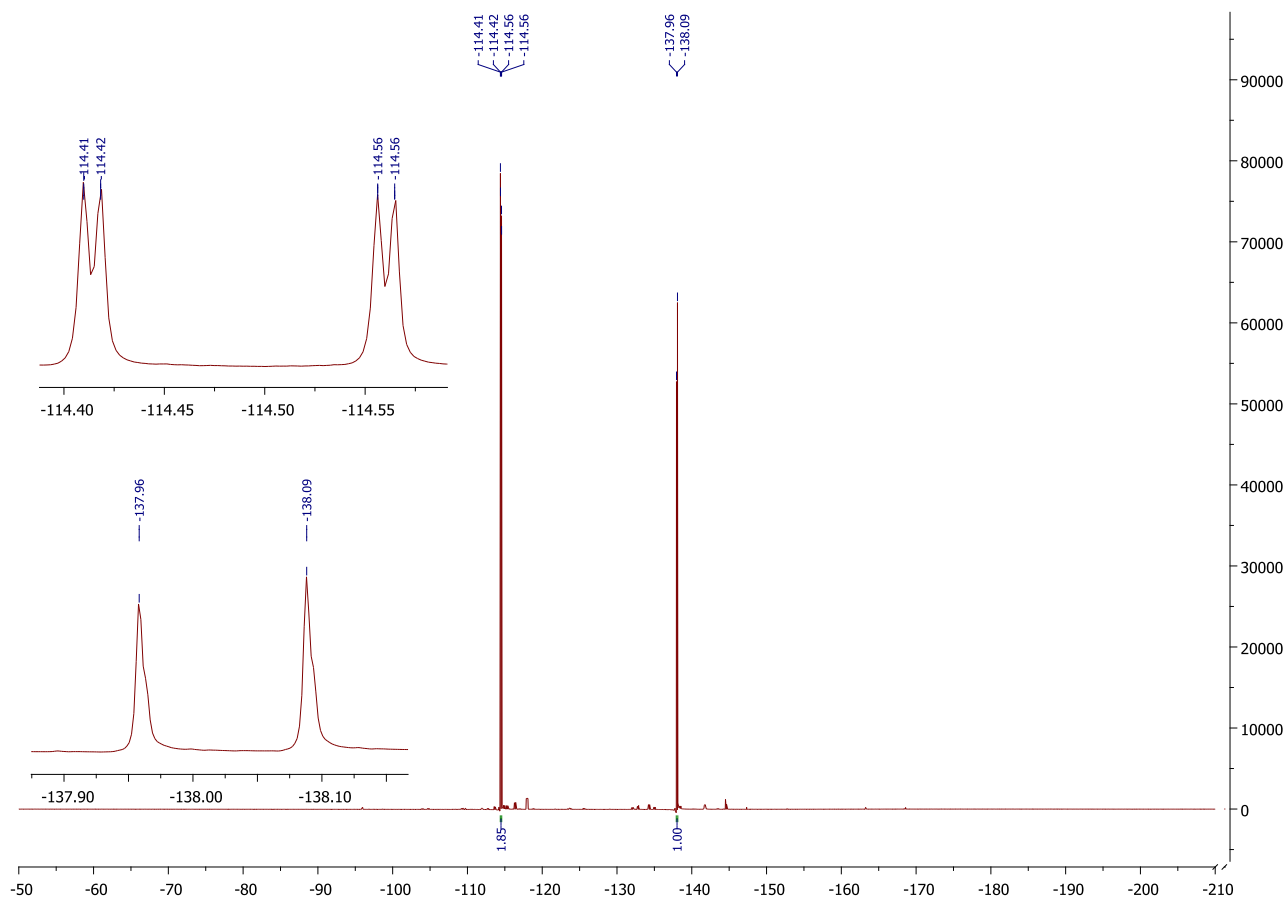
3aii



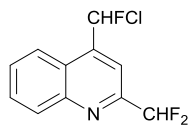
4-[Chloro(fluoro)methyl]-2-(difluoromethyl)quinoline (3aii) - ^{19}F NMR (376 MHz, CDCl_3)



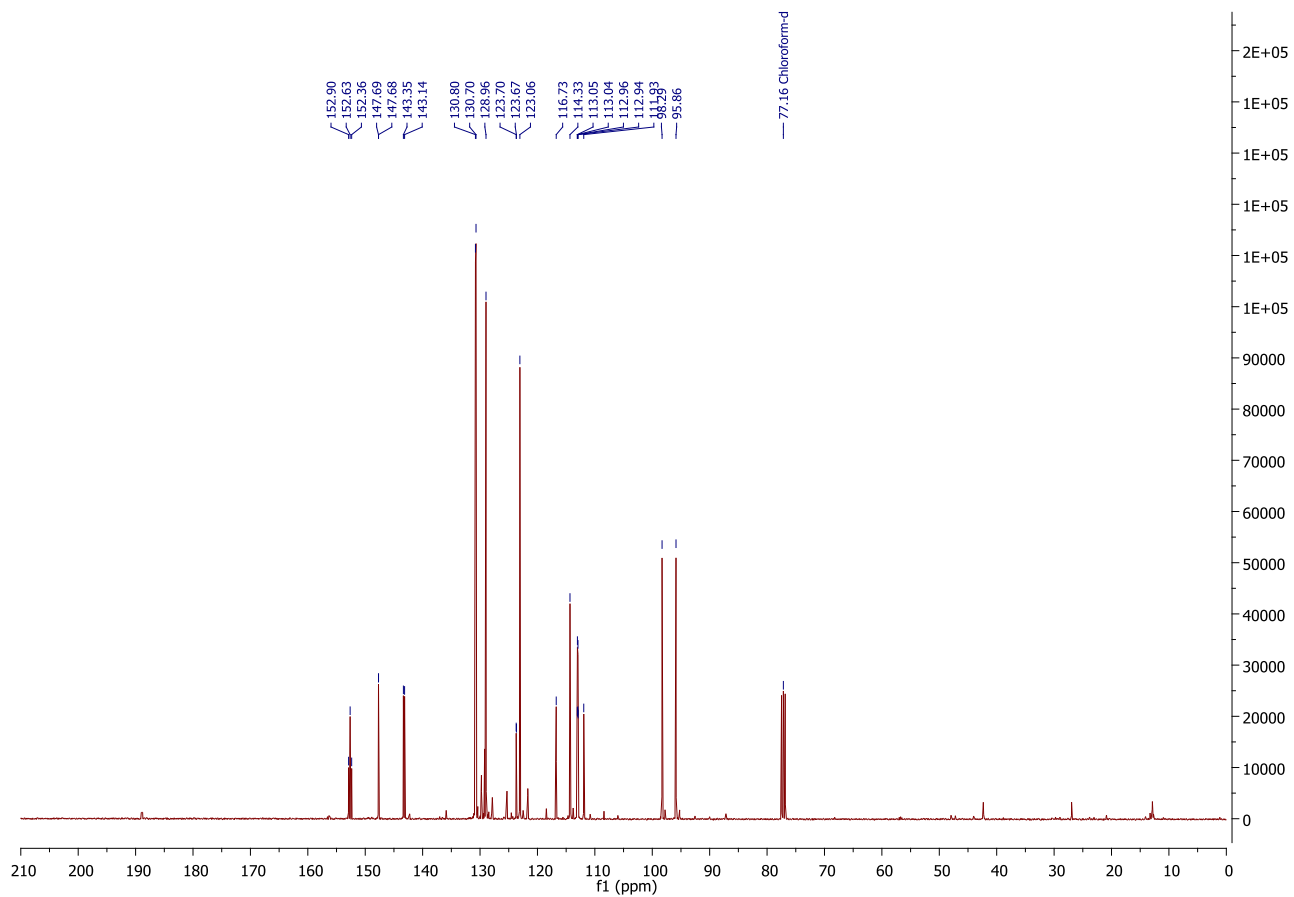
3aii



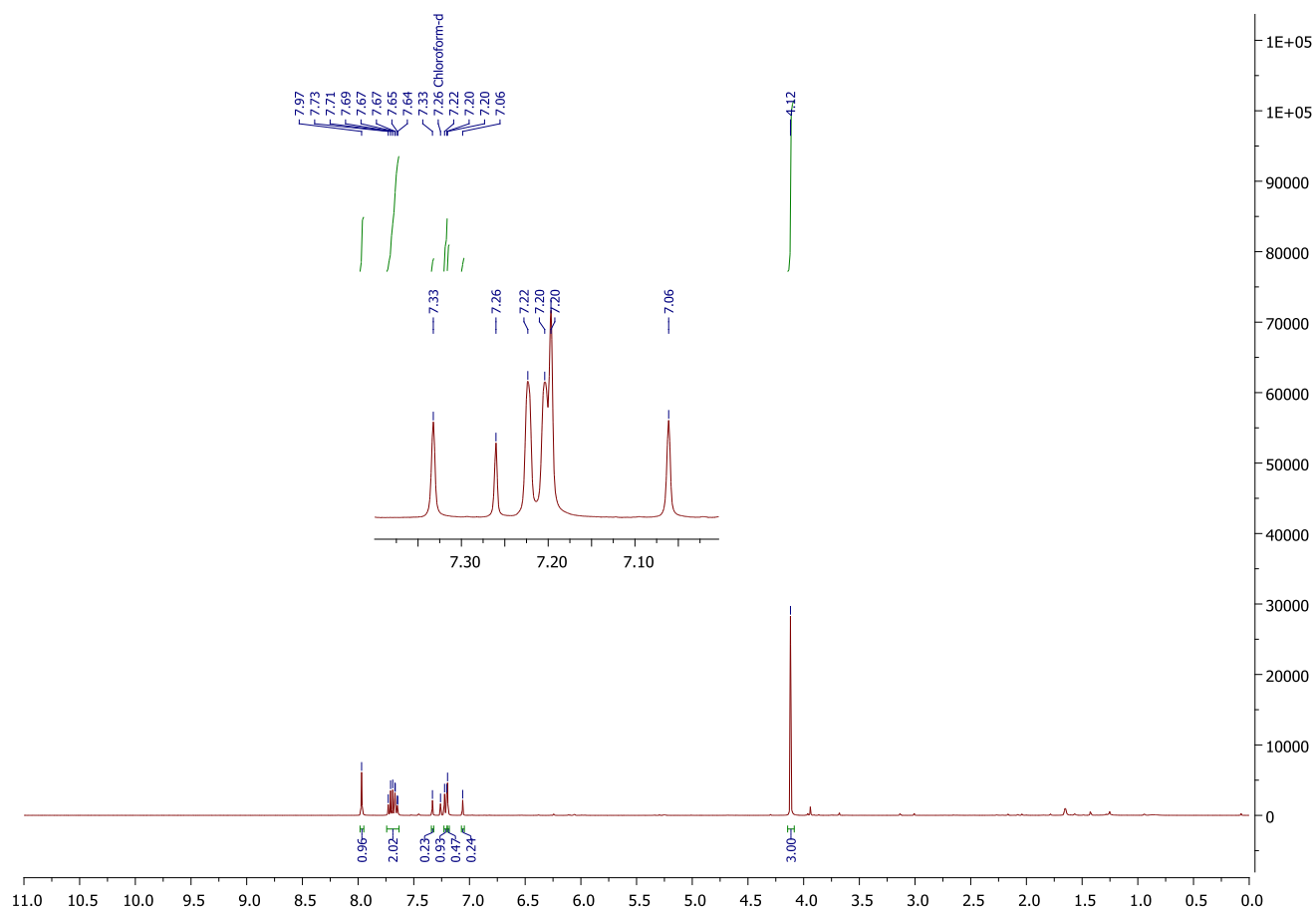
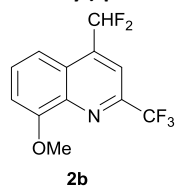
4-[Chloro(fluoro)methyl]-2-(difluoromethyl)quinoline (3aii) - ^{13}C NMR (101 MHz, CDCl_3)



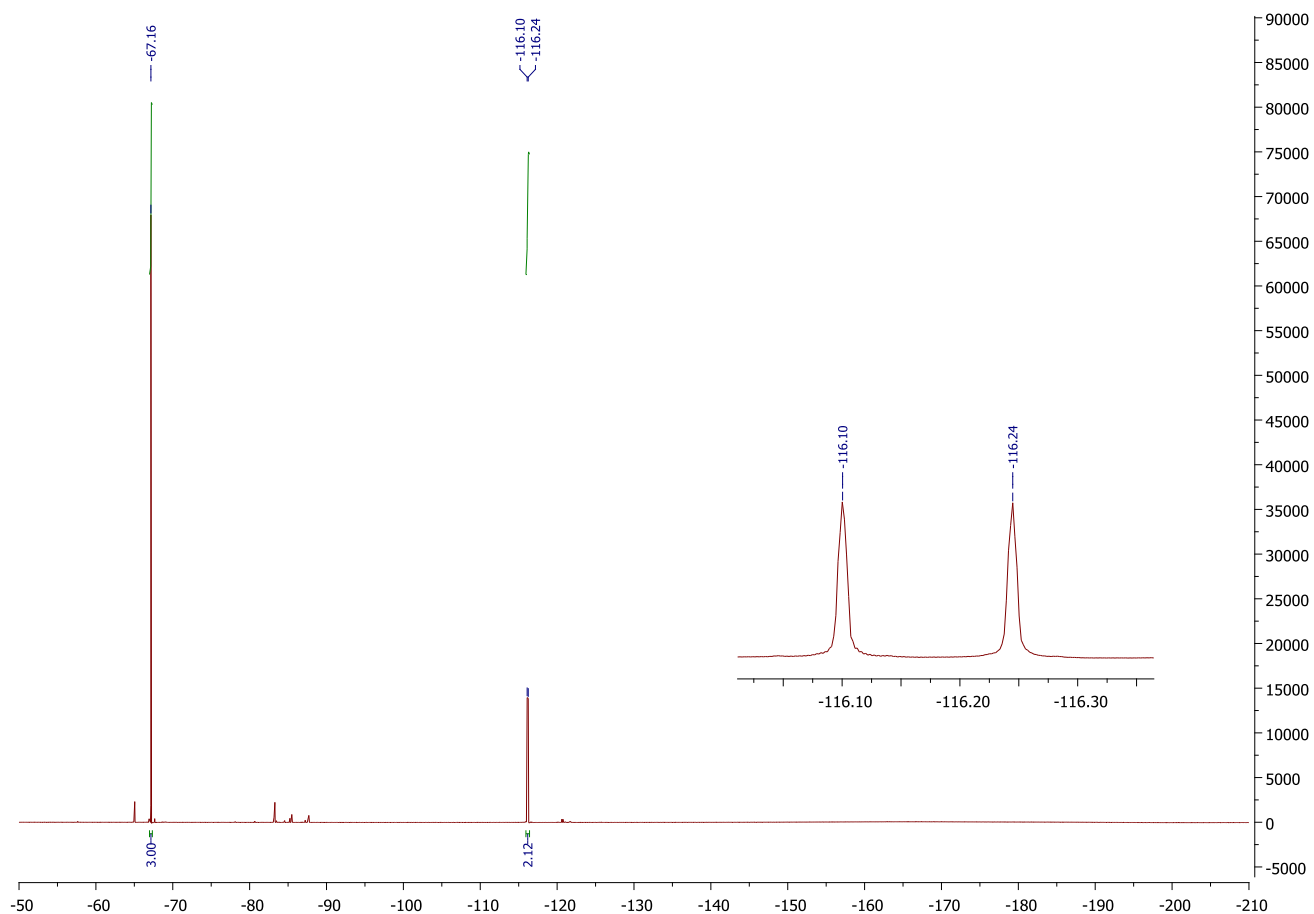
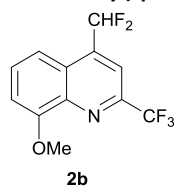
3aii



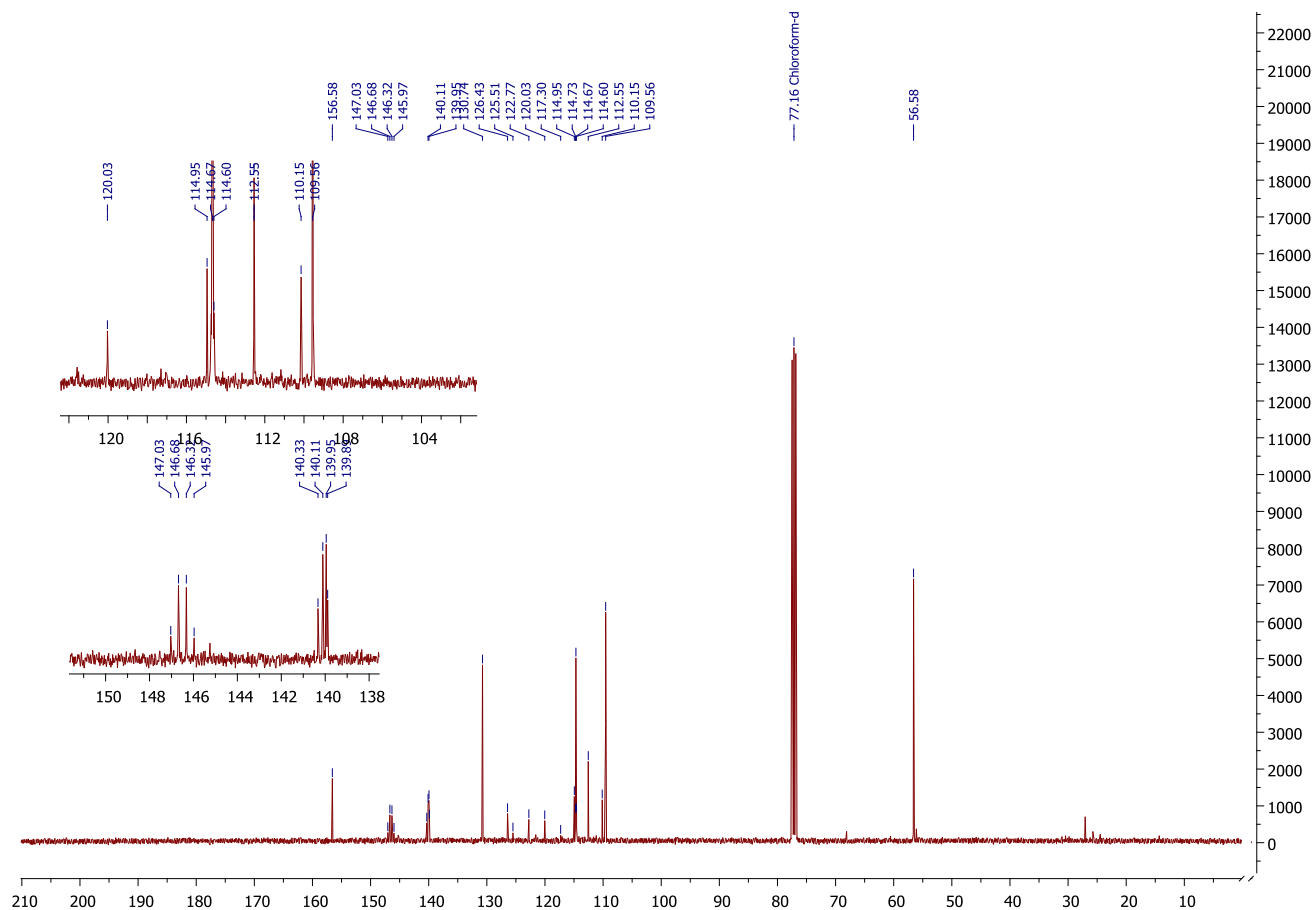
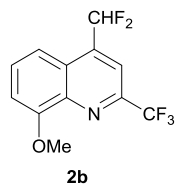
4-(Difluoromethyl)-8-methoxy-2-(trifluoromethyl)quinoline (2b) - ^{11}H NMR (400 MHz, CDCl_3 ; Me4Si)



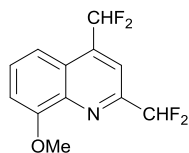
4-(Difluoromethyl)-8-methoxy-2-(trifluoromethyl)quinoline (2b) - ^{19}F NMR (376 MHz, CDCl_3)



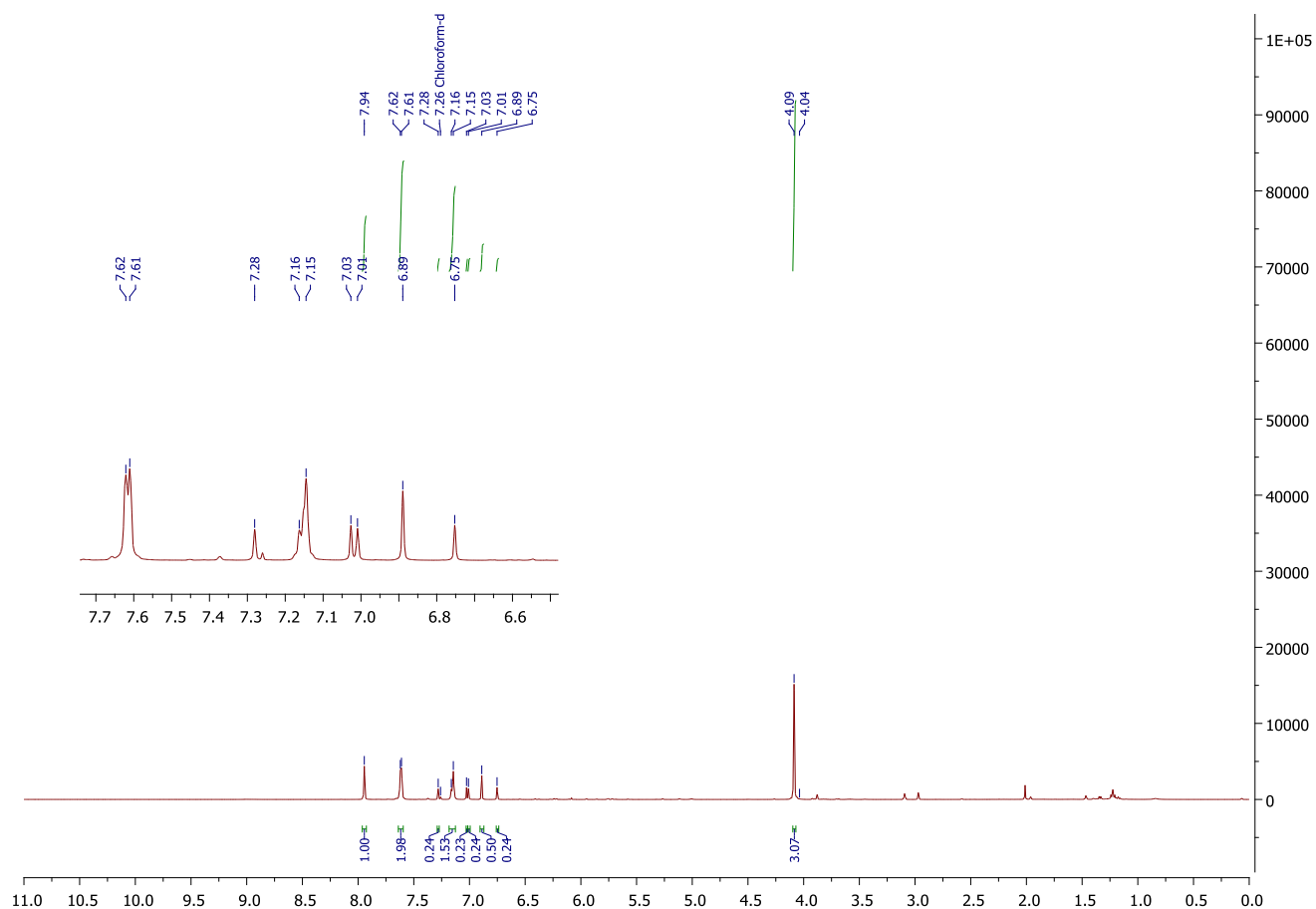
4-(Difluoromethyl)-8-methoxy-2-(trifluoromethyl)quinoline (2b) - ^{13}C NMR (101 MHz, CDCl_3)



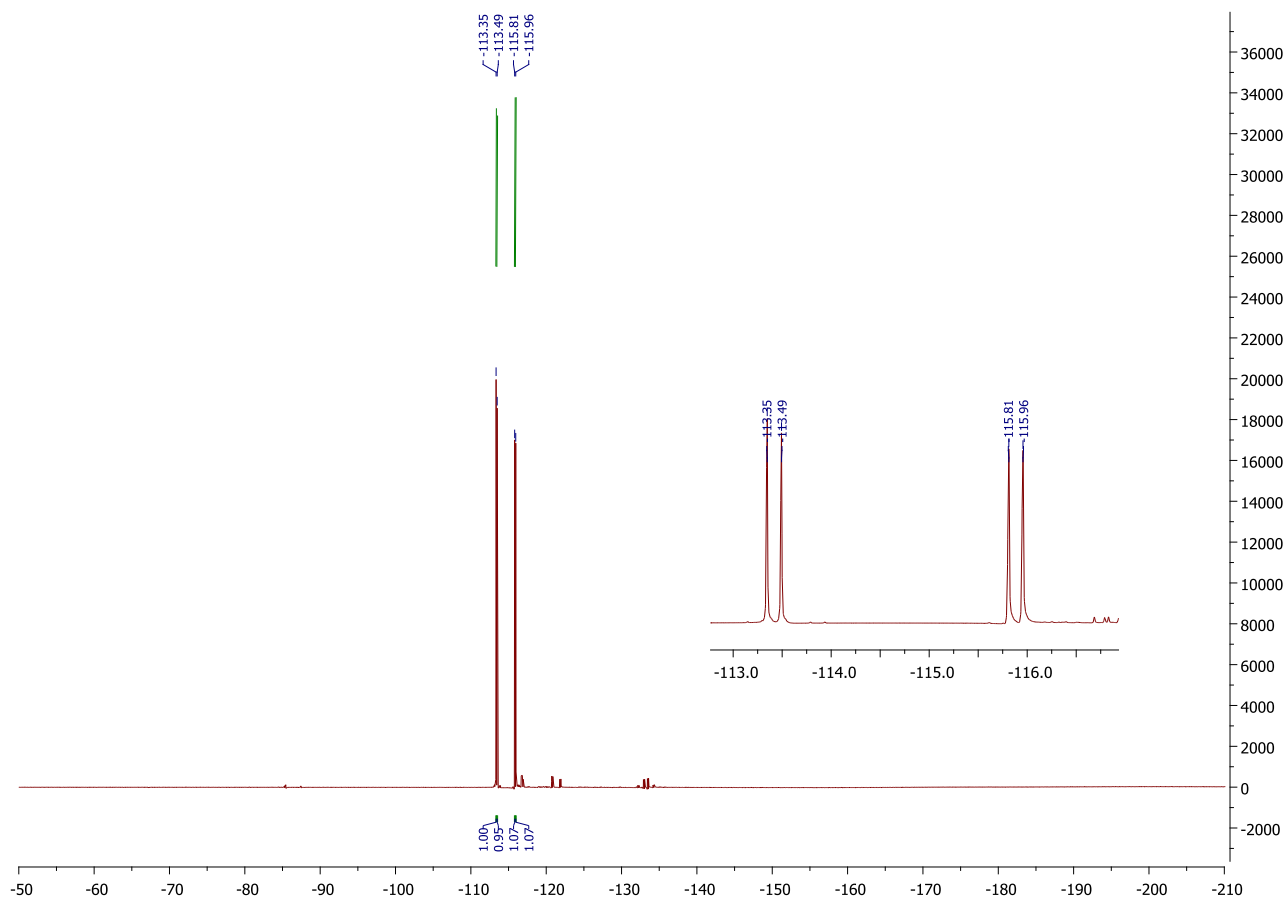
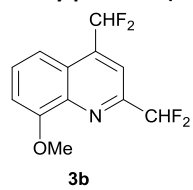
2,4-Bis(difluoromethyl)-8-methoxyquinoline (3b) - ^1H NMR (400 MHz, CDCl_3)



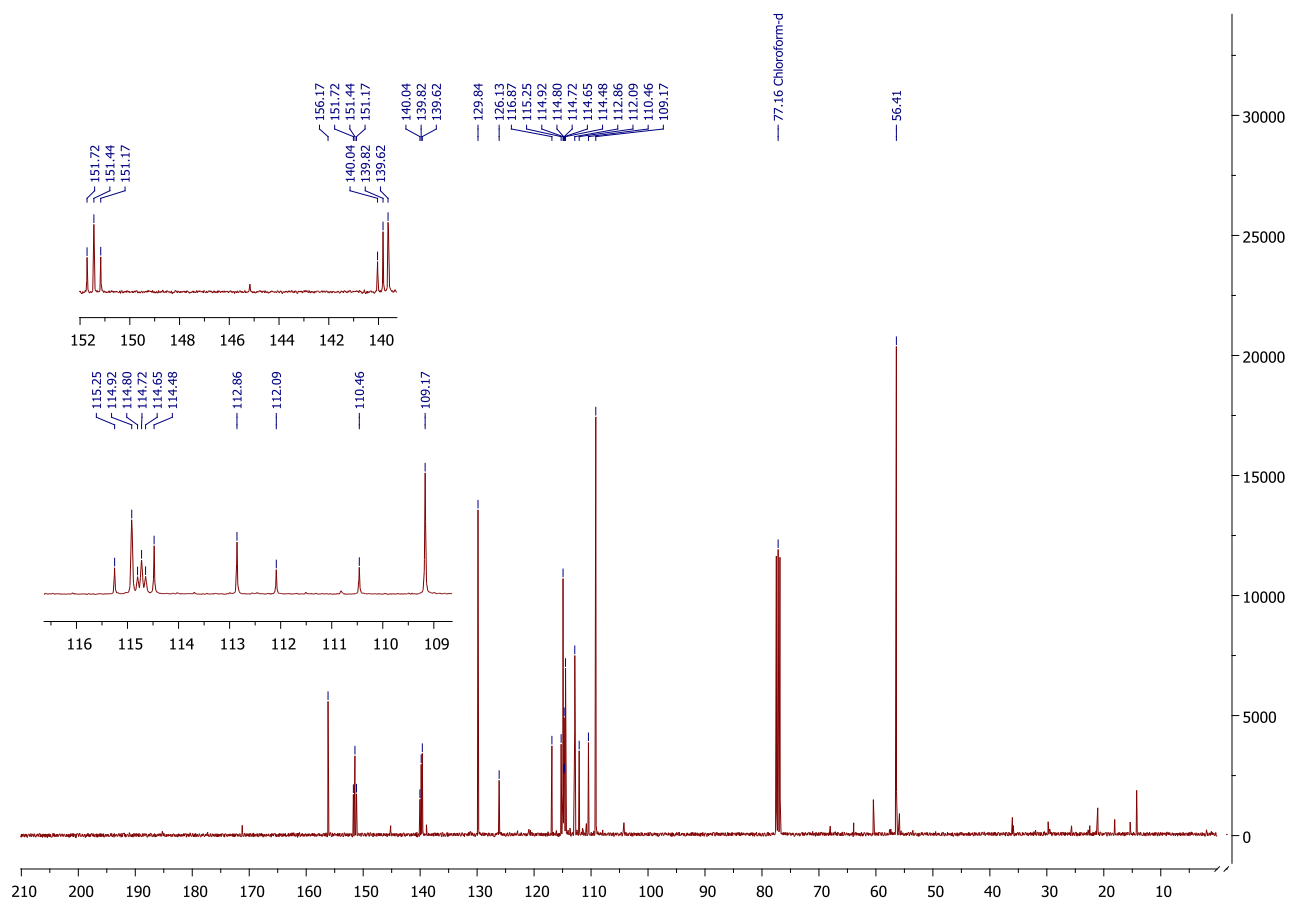
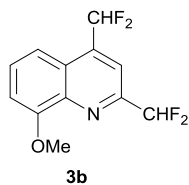
3b



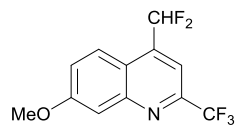
2,4-Bis(difluoromethyl)-8-methoxyquinoline (3b) - ^{19}F NMR (376 MHz, CDCl_3)



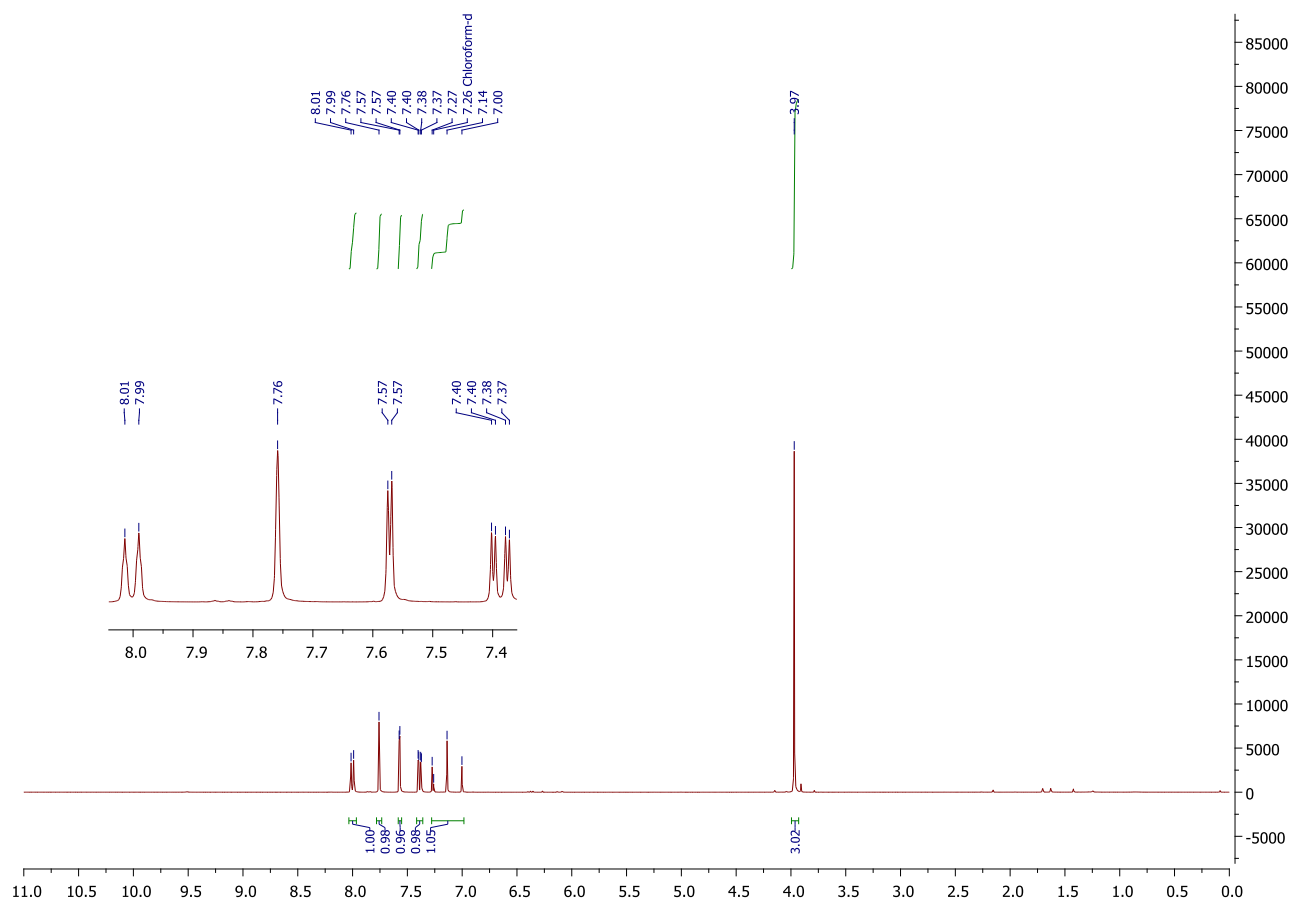
2,4-Bis(difluoromethyl)-8-methoxyquinoline (3b) - ^{13}C NMR (101 MHz, CDCl_3)



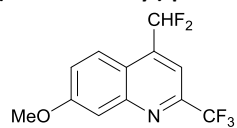
4-(Difluoromethyl)-7-methoxy-2-(trifluoromethyl)quinoline (2c) - ^1H NMR (400 MHz, CDCl_3)



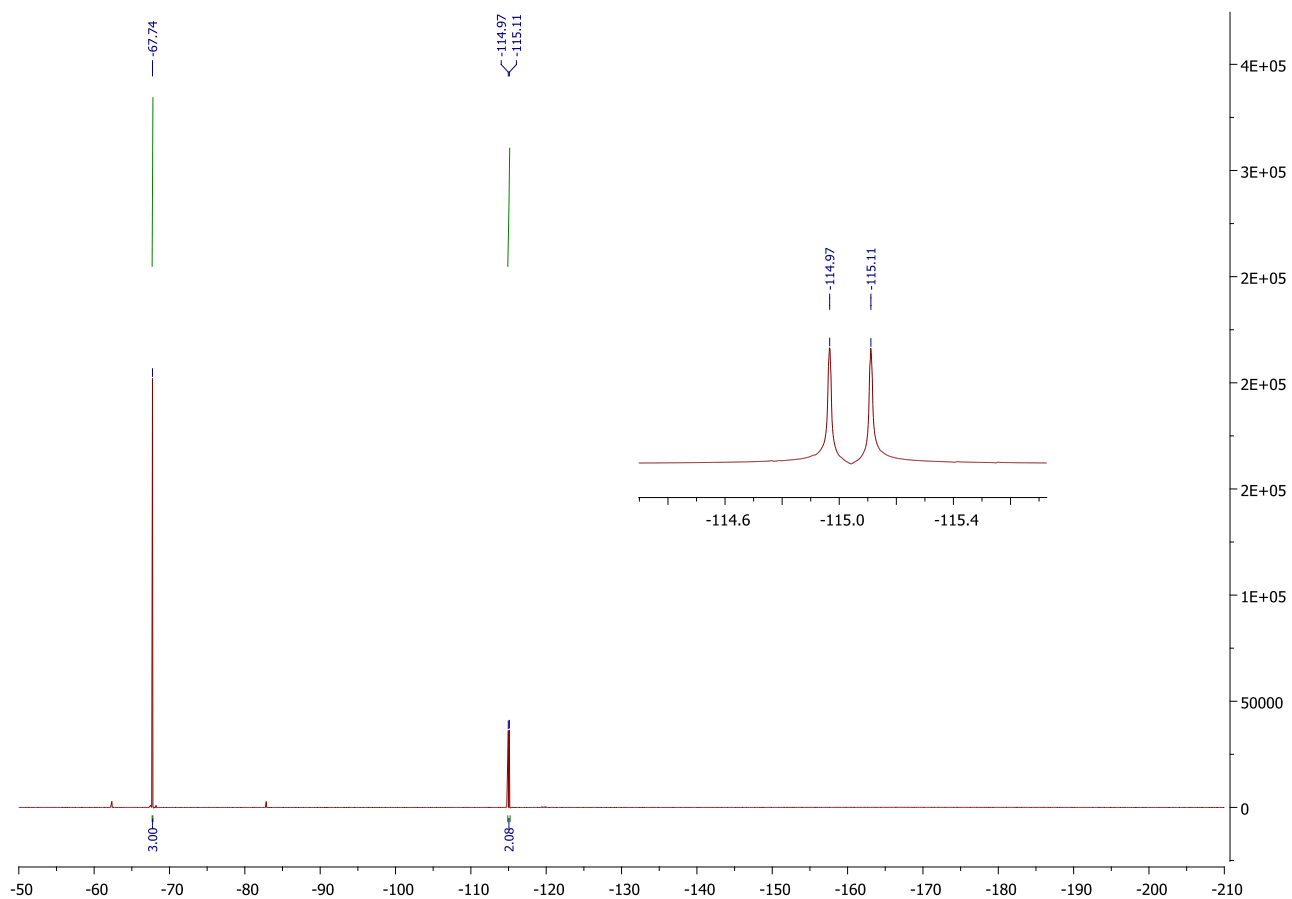
2c



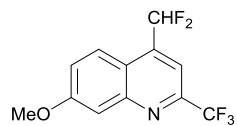
4-(Difluoromethyl)-7-methoxy-2-(trifluoromethyl)quinoline (2c) - ^{19}F NMR (376 MHz, CDCl_3)



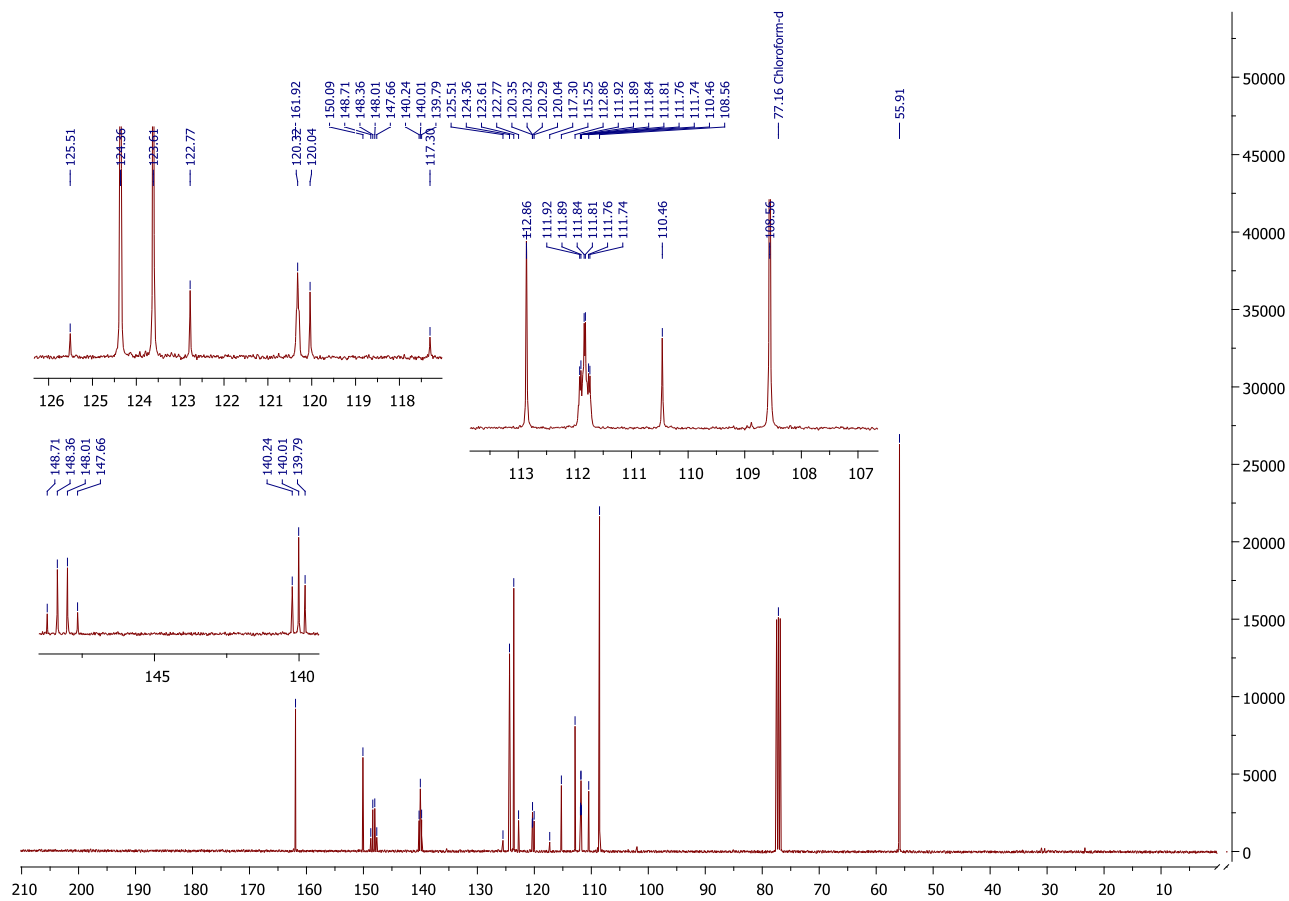
2c



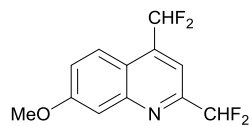
4-(Difluoromethyl)-7-methoxy-2-(trifluoromethyl)quinoline (2c) - ^{13}C NMR (101 MHz, CDCl_3)



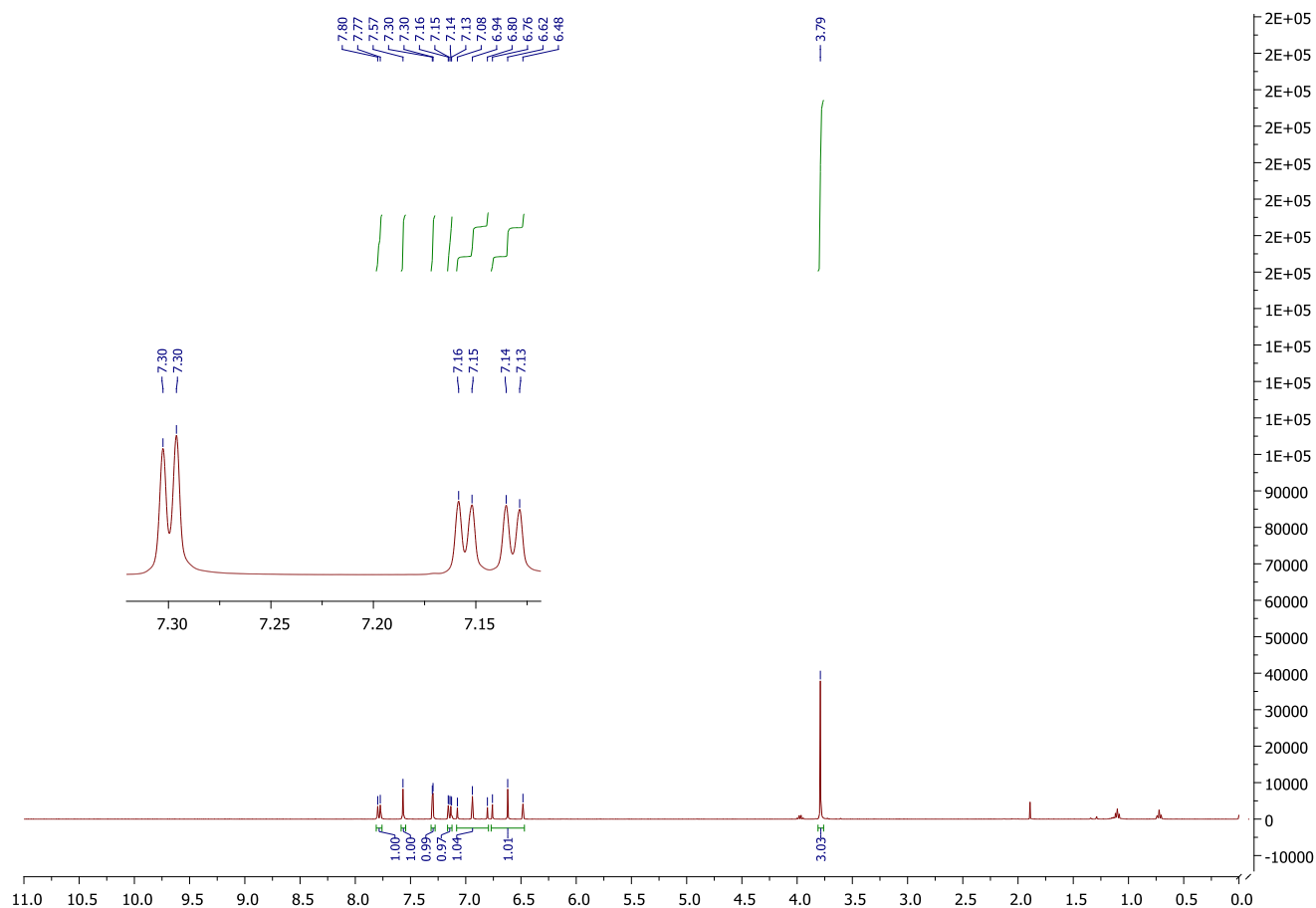
2c



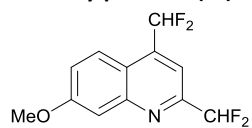
2,4-Bis(difluoromethyl)-7-methoxyquinoline (3c) - ^1H NMR (400 MHz, CDCl_3)



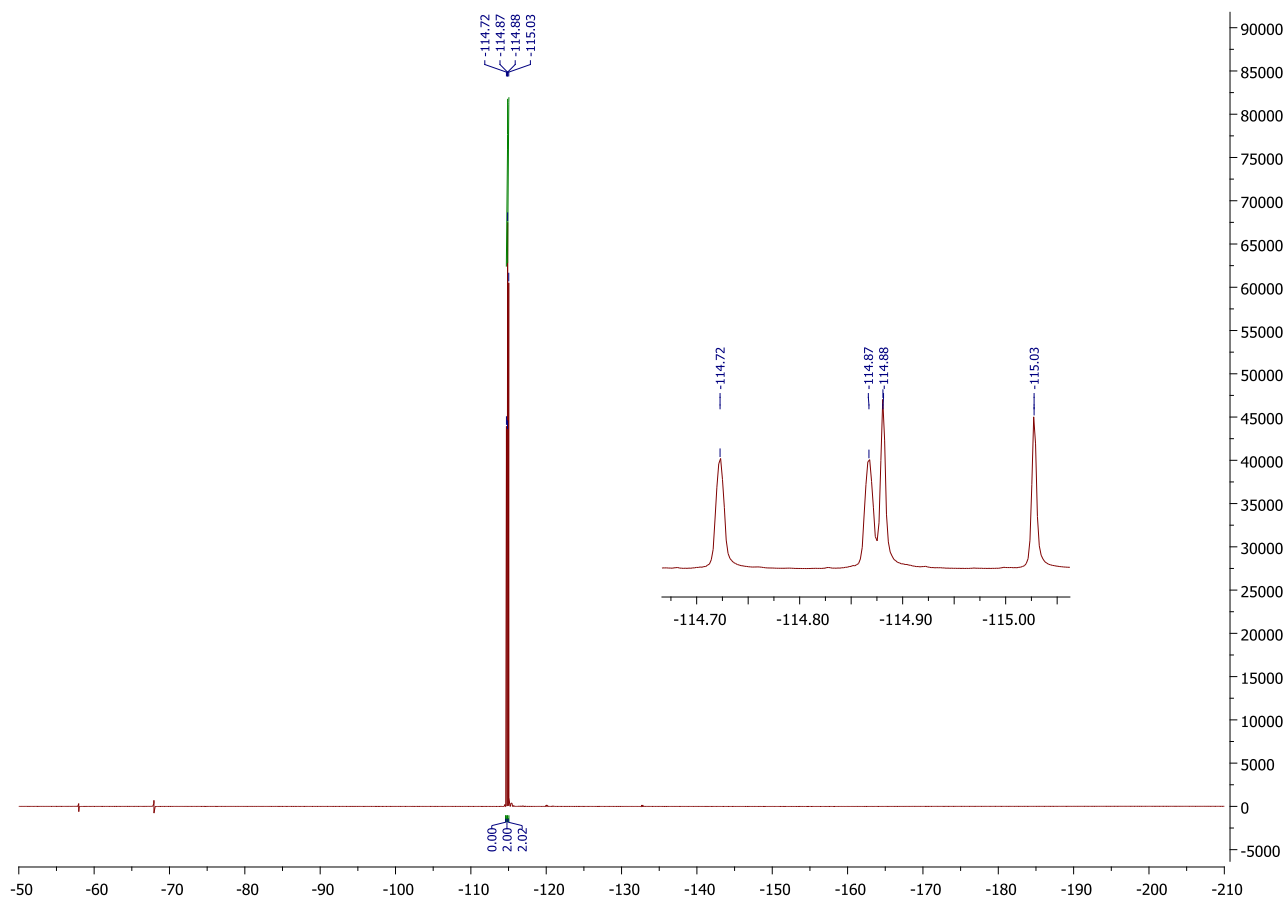
3c



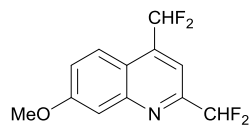
2,4-Bis(difluoromethyl)-7-methoxyquinoline (3c) - ^{19}F NMR (376 MHz, CDCl_3)



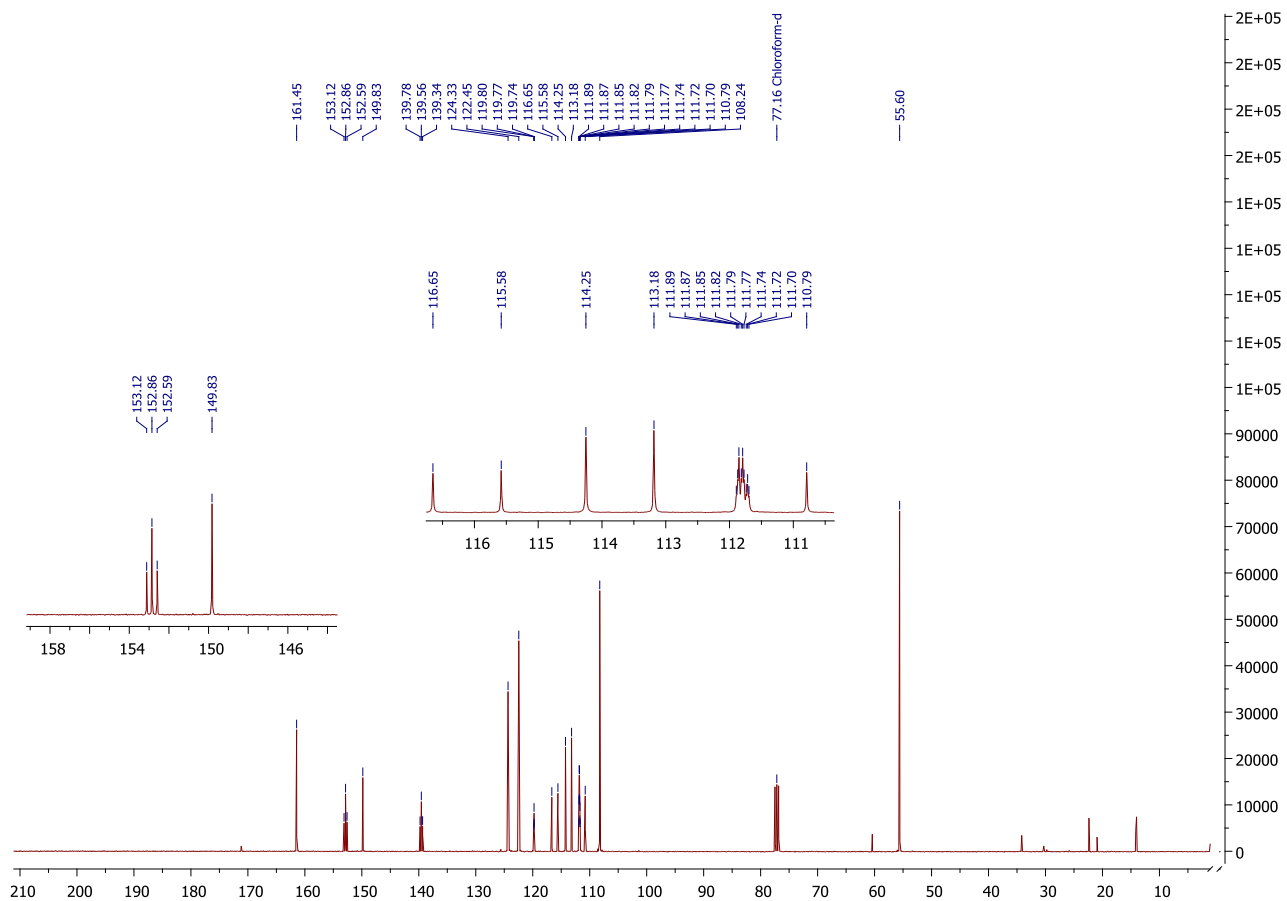
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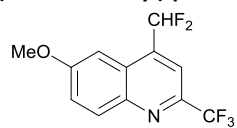
2,4-Bis(difluoromethyl)-7-methoxyquinoline (3c) - ^{13}C NMR (101 MHz, CDCl_3)



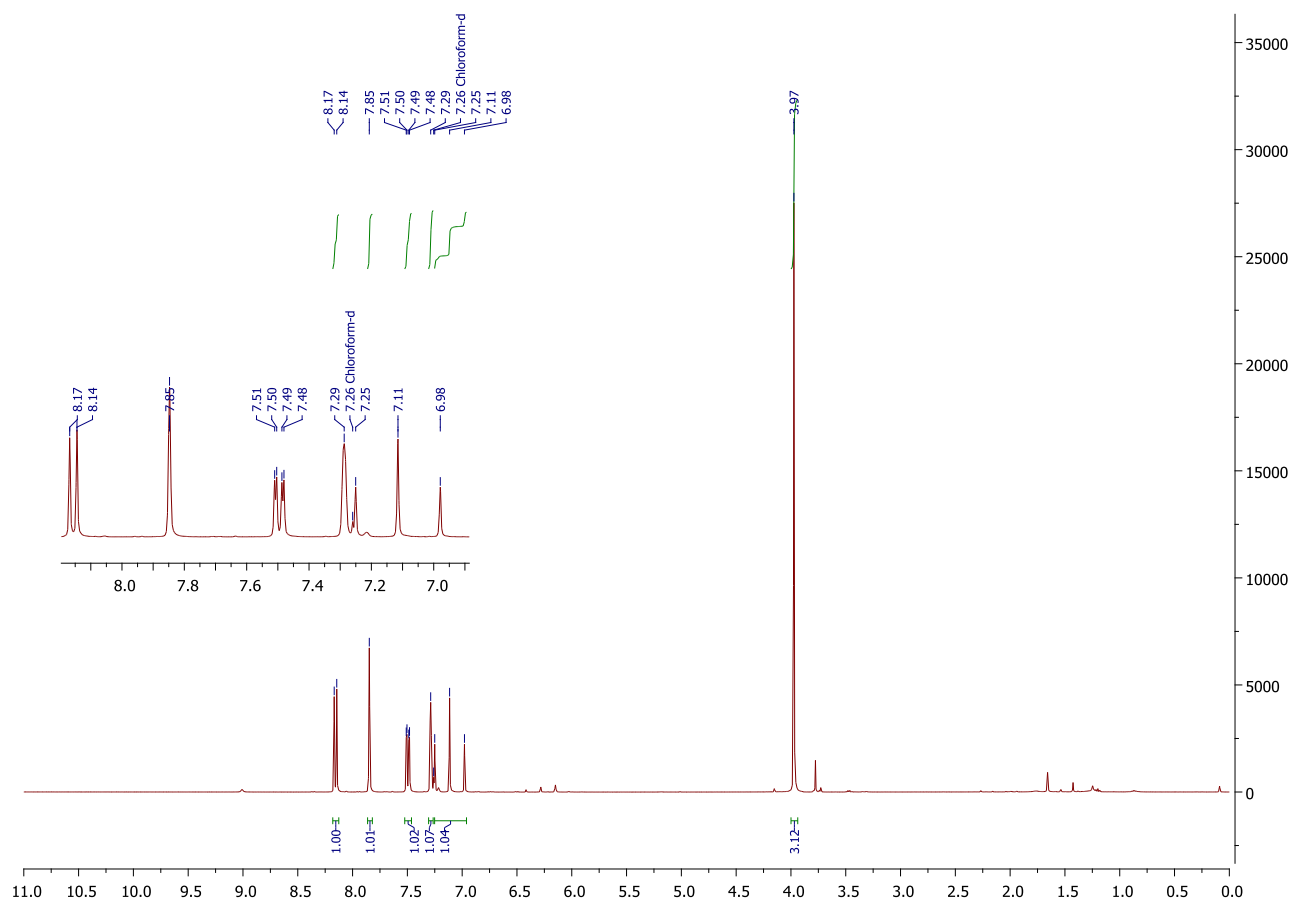
3c



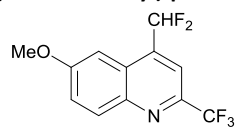
4-(Difluoromethyl)-6-methoxy-2-(trifluoromethyl)quinoline (2d) - ^1H NMR (400 MHz, CDCl_3)



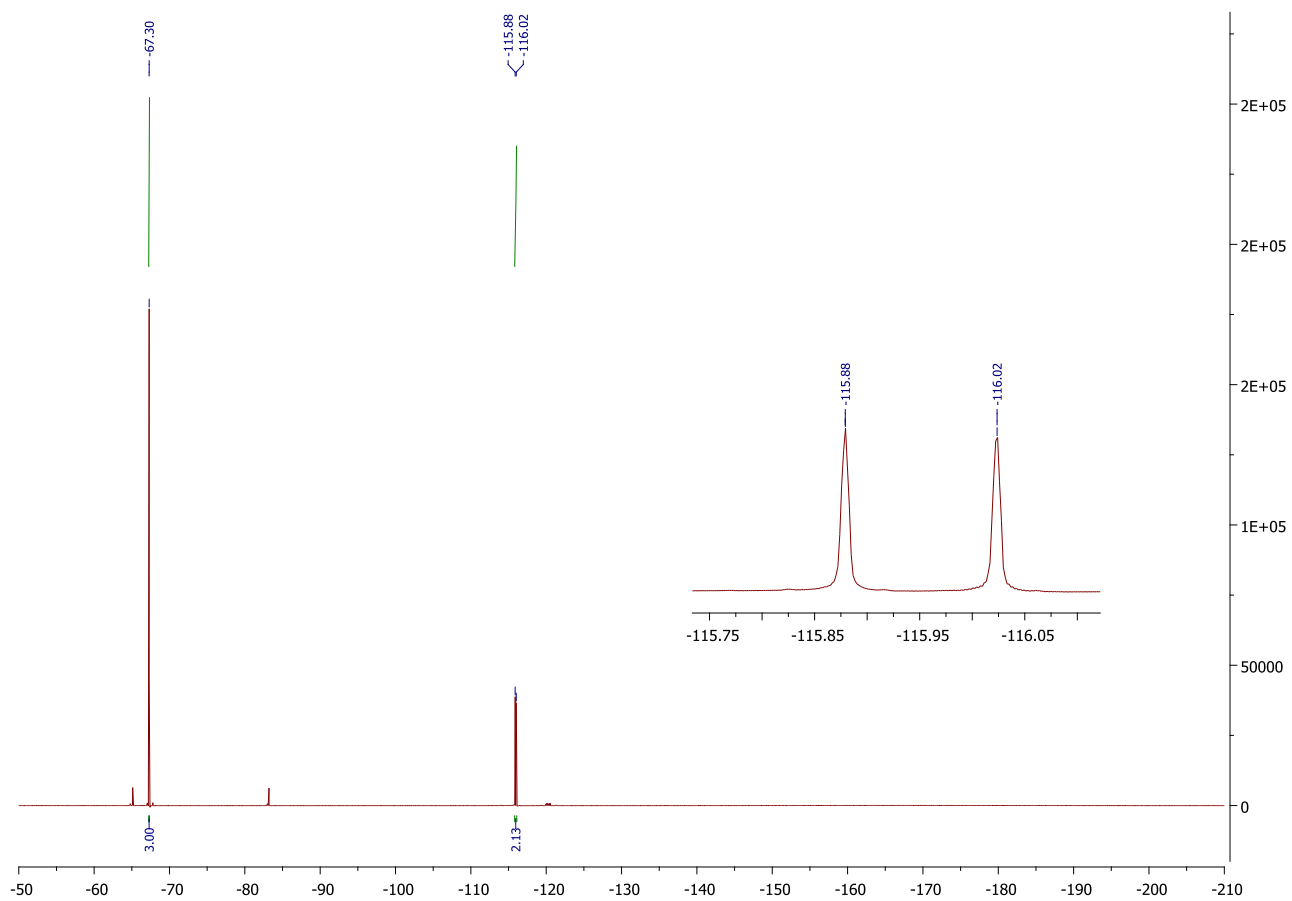
2d



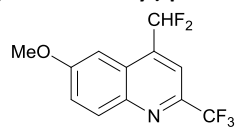
4-(Difluoromethyl)-6-methoxy-2-(trifluoromethyl)quinoline (2d) - ^{19}F NMR (376 MHz, CDCl_3)



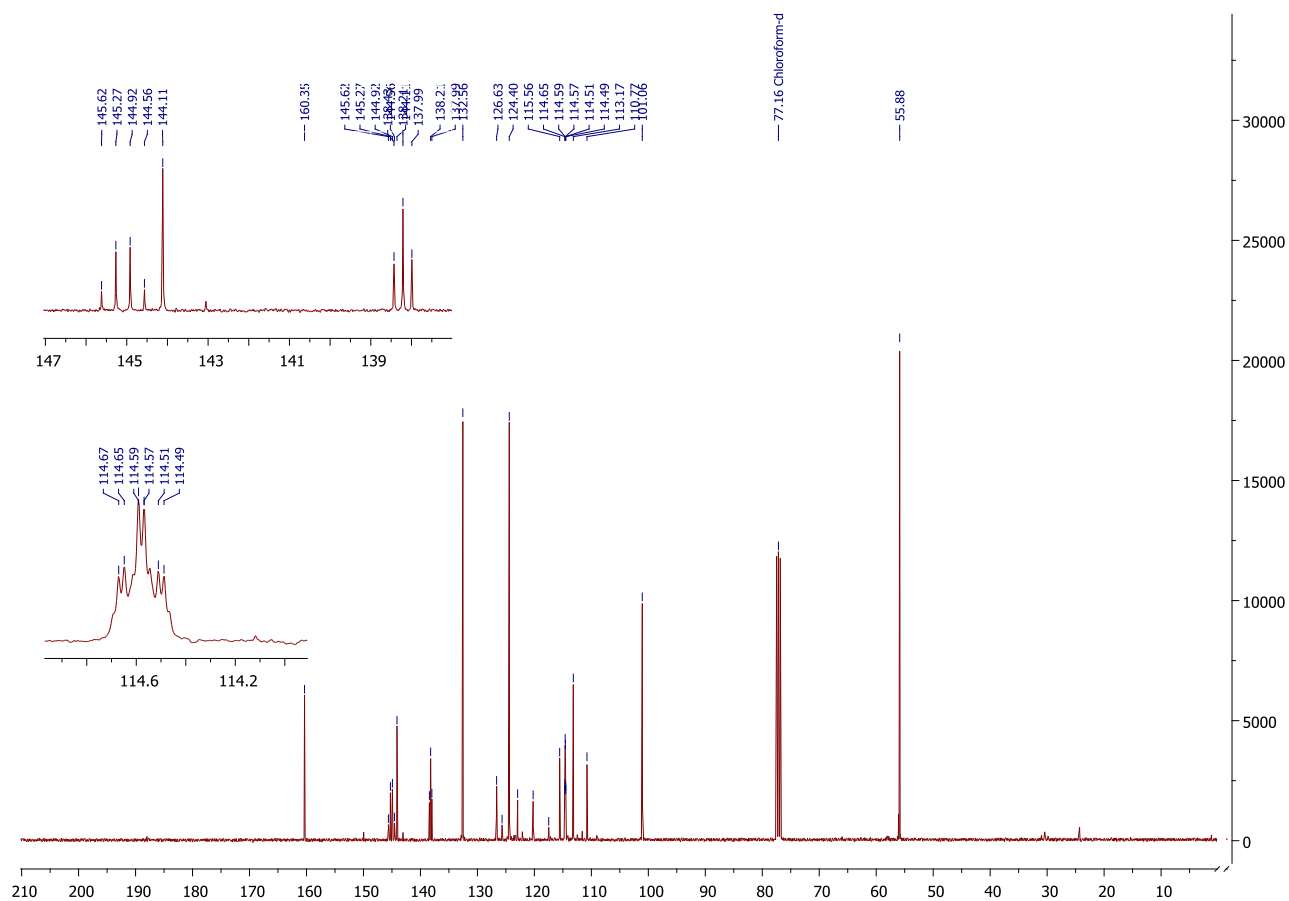
2d



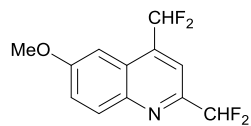
4-(Difluoromethyl)-6-methoxy-2-(trifluoromethyl)quinoline (2d) - ^{13}C NMR (101 MHz, CDCl_3)



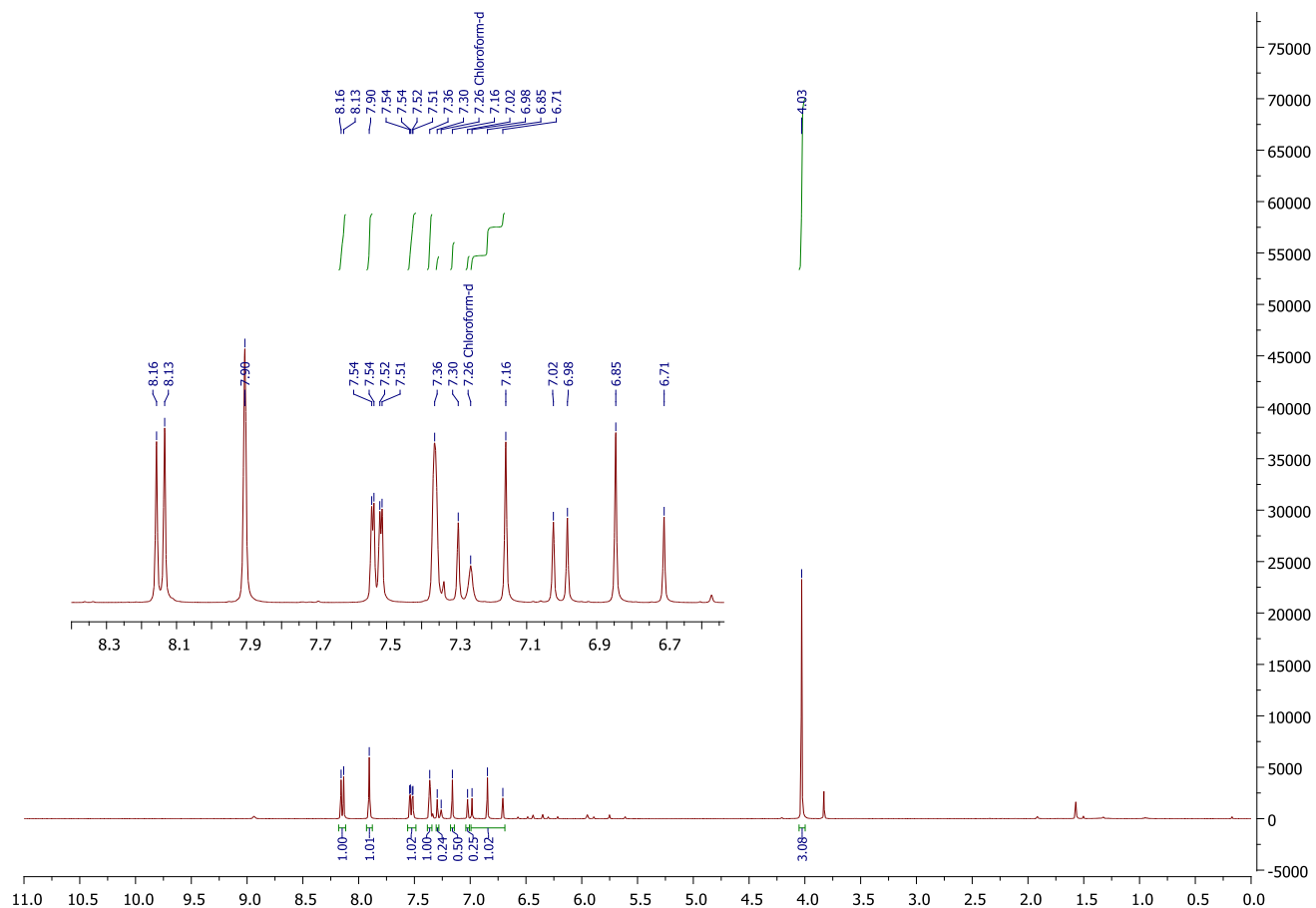
2d



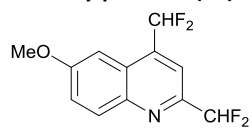
2,4-Bis(difluoromethyl)-6-methoxyquinoline (3d) - ^1H NMR (400 MHz, CDCl_3)



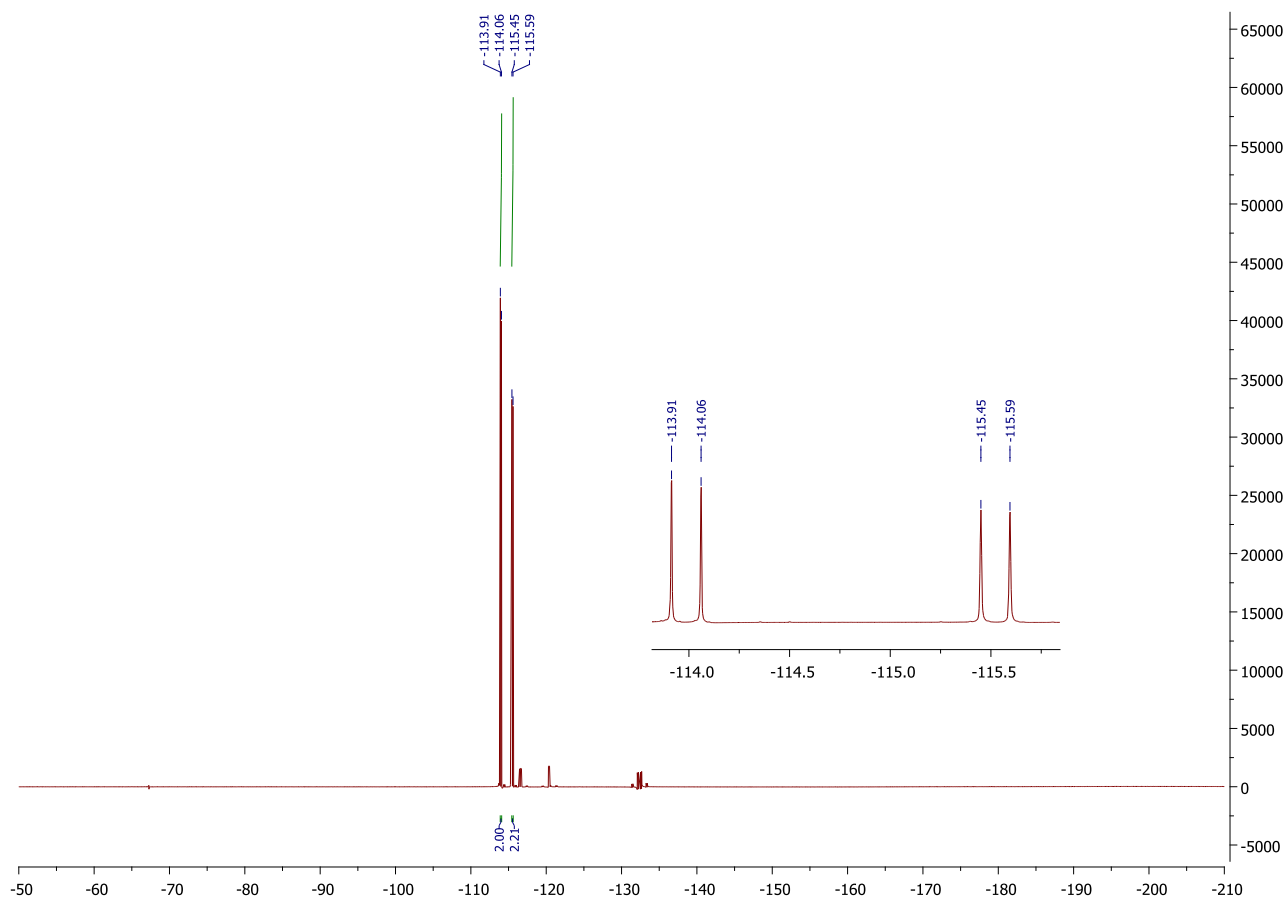
3d



2,4-Bis(difluoromethyl)-6-methoxyquinoline (3d) - ^{19}F NMR (376 MHz, CDCl_3)



3d

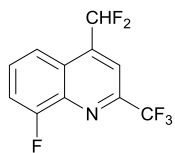


COc1ccc2c(c1)c(cnc2C(F)F)C(F)F

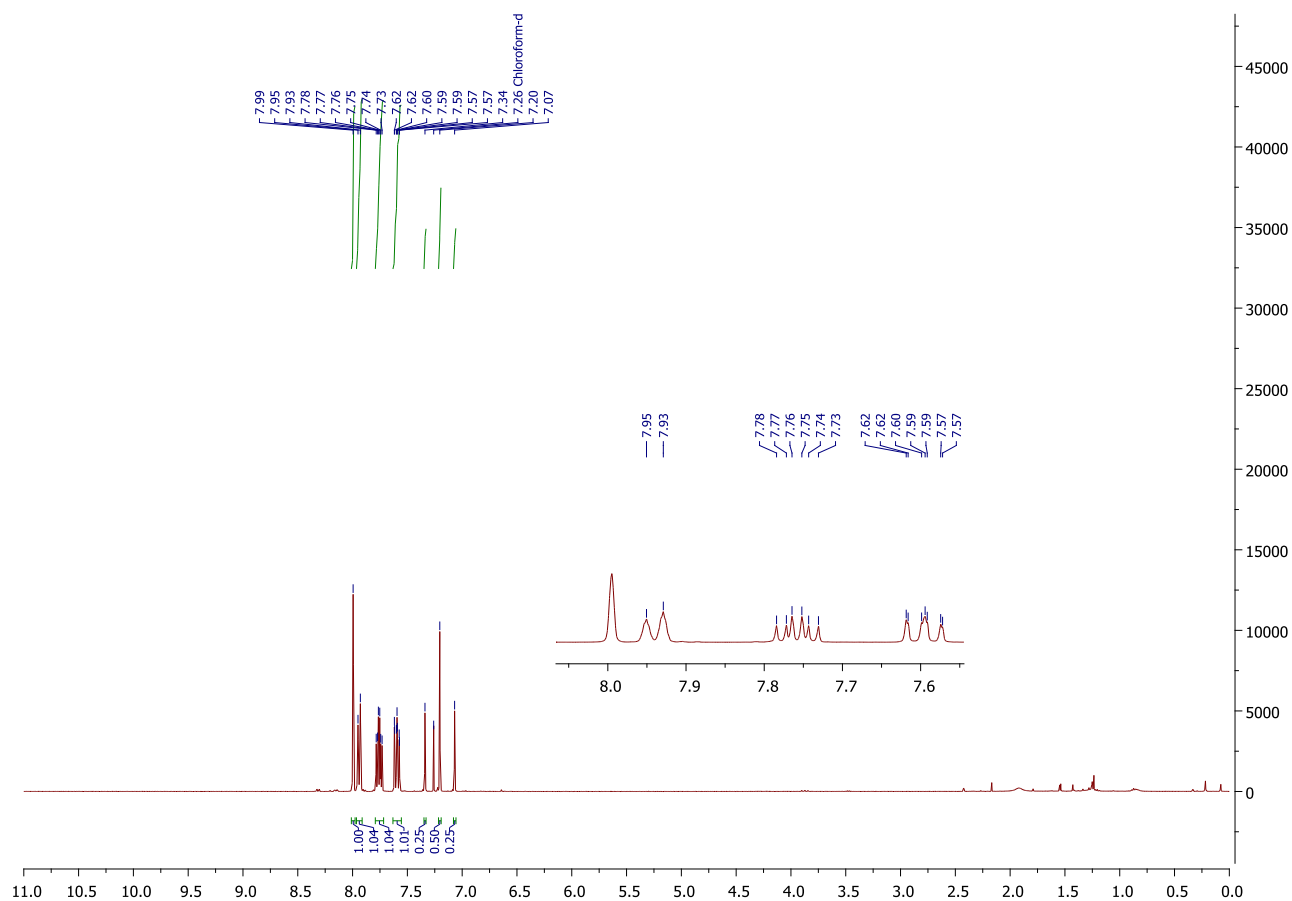
¹³C NMR spectrum of compound 10 in CDCl₃. The spectrum shows peaks from 111 to 159 ppm. An inset shows the region from 127 to 138 ppm. The solvent peak for CDCl₃ is at 77.16 ppm.

Chemical Shift (ppm)
159.77
150.20
149.93
149.66
143.96
138.24
137.81
132.11
126.21
123.71
116.90
115.96
114.78
114.70
114.62
114.51
113.57
111.18
111.35
112.12
111.48
111.51
114.51
114.70
115.96
116.90
77.16 (CDCl ₃)
55.79

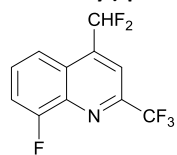
4-(Difluoromethyl)-8-fluoro-2-(trifluoromethyl)quinoline (2e) - ^1H NMR (400 MHz, CDCl_3)



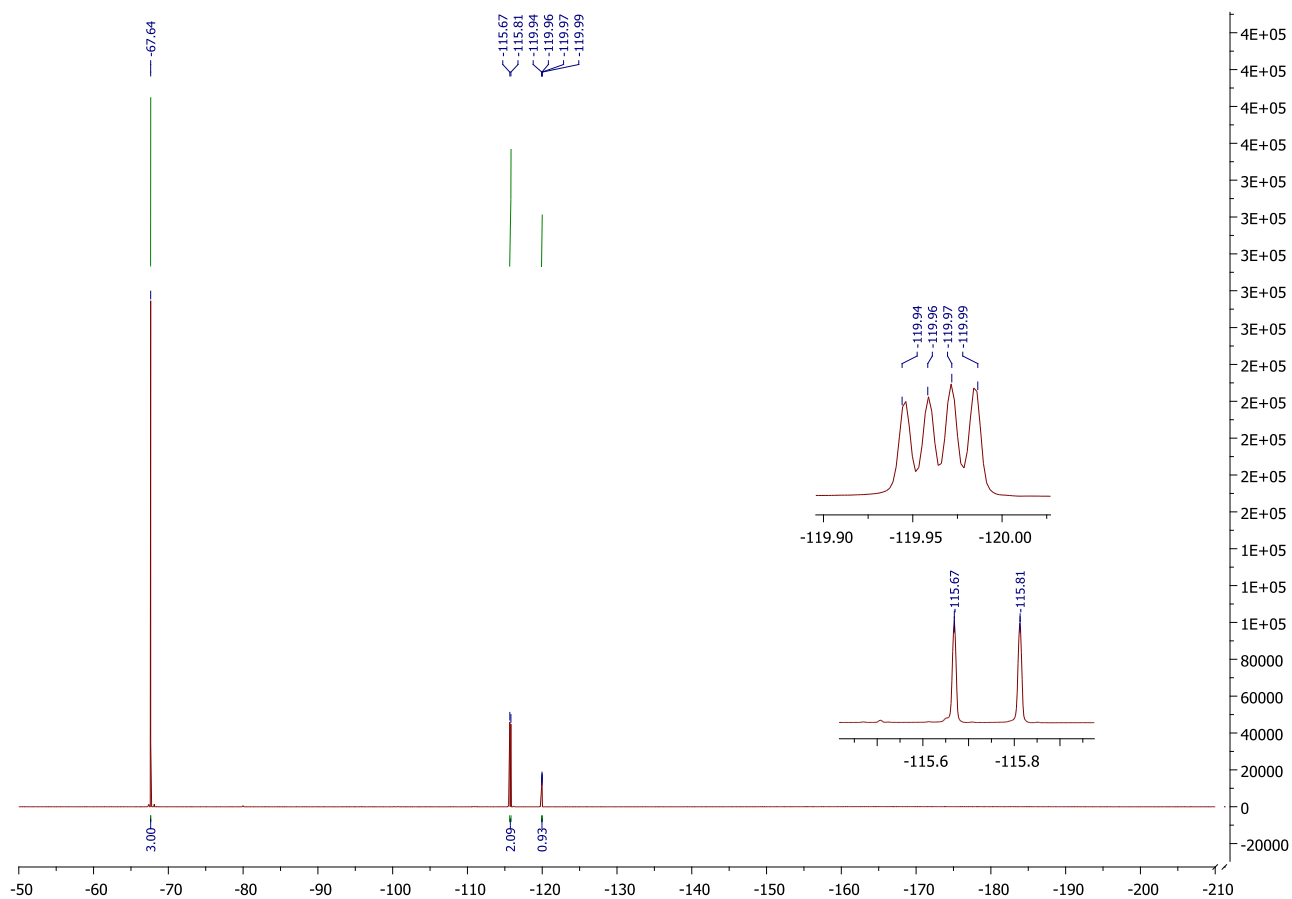
2e



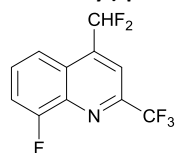
4-(Difluoromethyl)-8-fluoro-2-(trifluoromethyl)quinoline (2e) - ^{19}F NMR (376 MHz, CDCl_3)



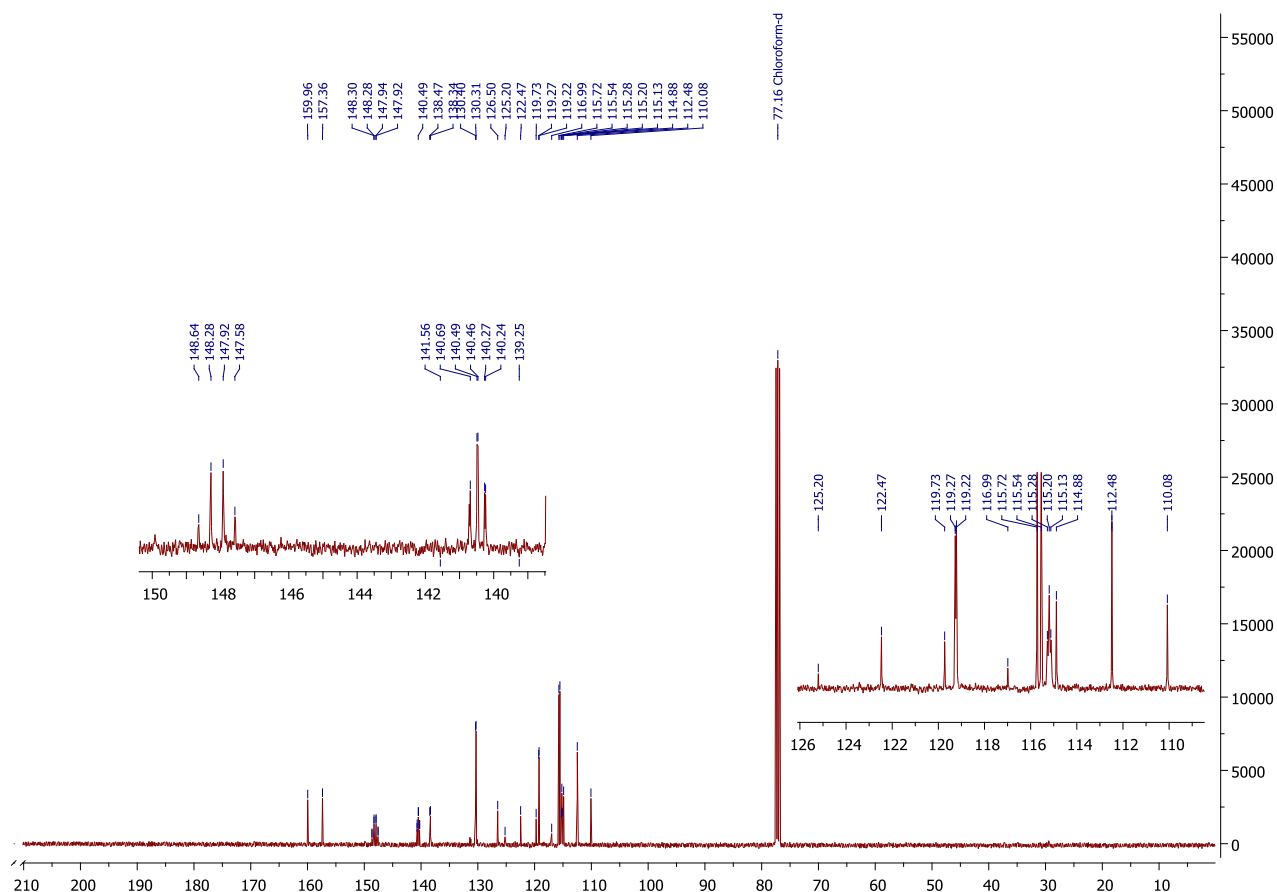
2e



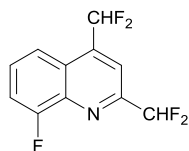
4-(Difluoromethyl)-8-fluoro-2-(trifluoromethyl)quinoline (2e) - ^{13}C NMR (101 MHz, CDCl_3)



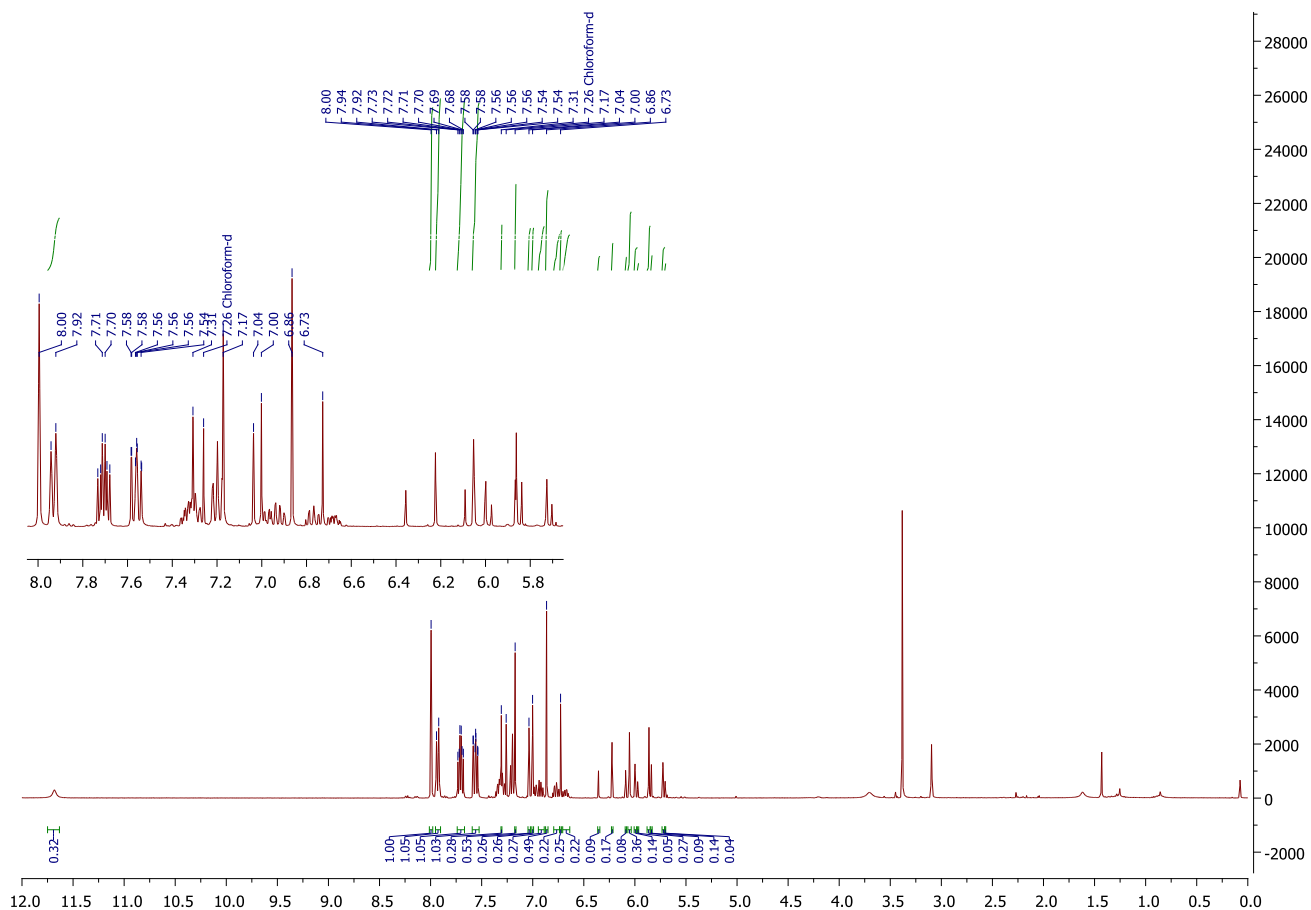
2e



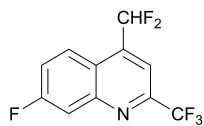
2,4-Bis(difluoromethyl)-8-fluoroquinoline (3e) - ^1H NMR (400 MHz, CDCl_3)



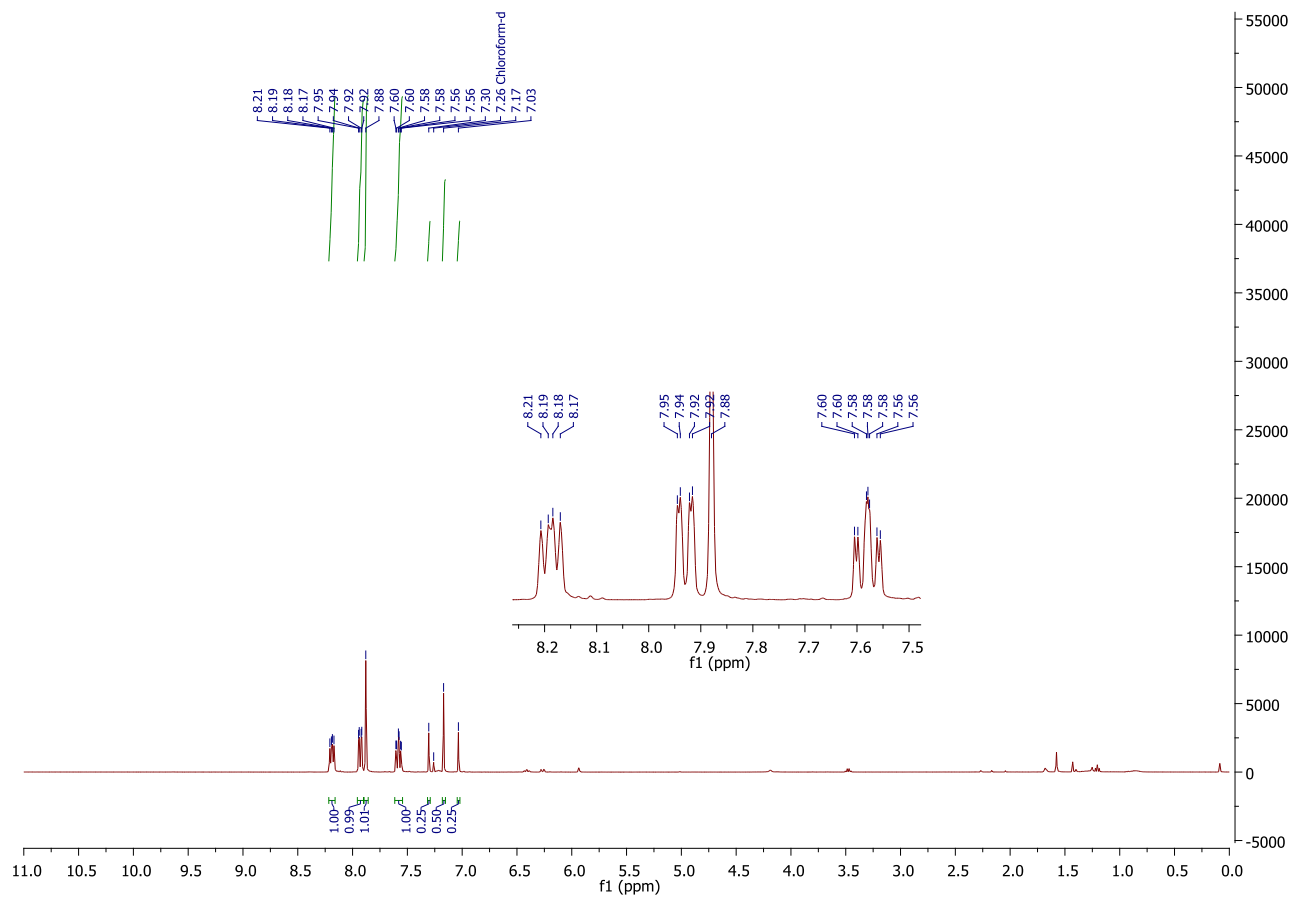
3e



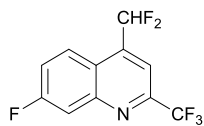
4-(Difluoromethyl)-7-fluoro-2-(trifluoromethyl)quinoline (2f) - ^1H NMR (400 MHz, CDCl_3)



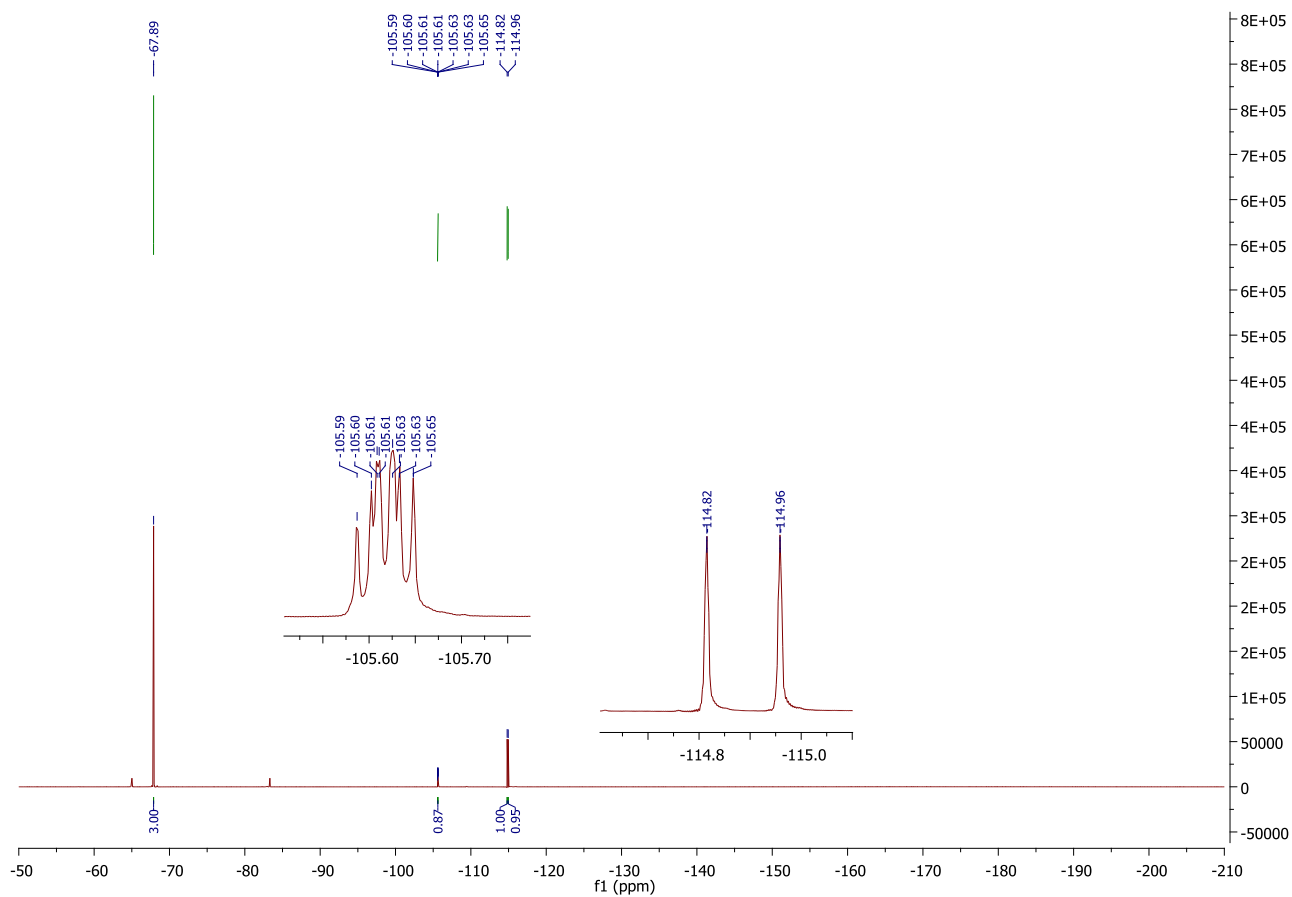
2f



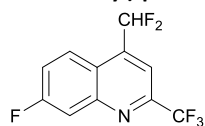
4-(Difluoromethyl)-7-fluoro-2-(trifluoromethyl)quinoline (2f) - ^{19}F NMR (376 MHz, CDCl_3)



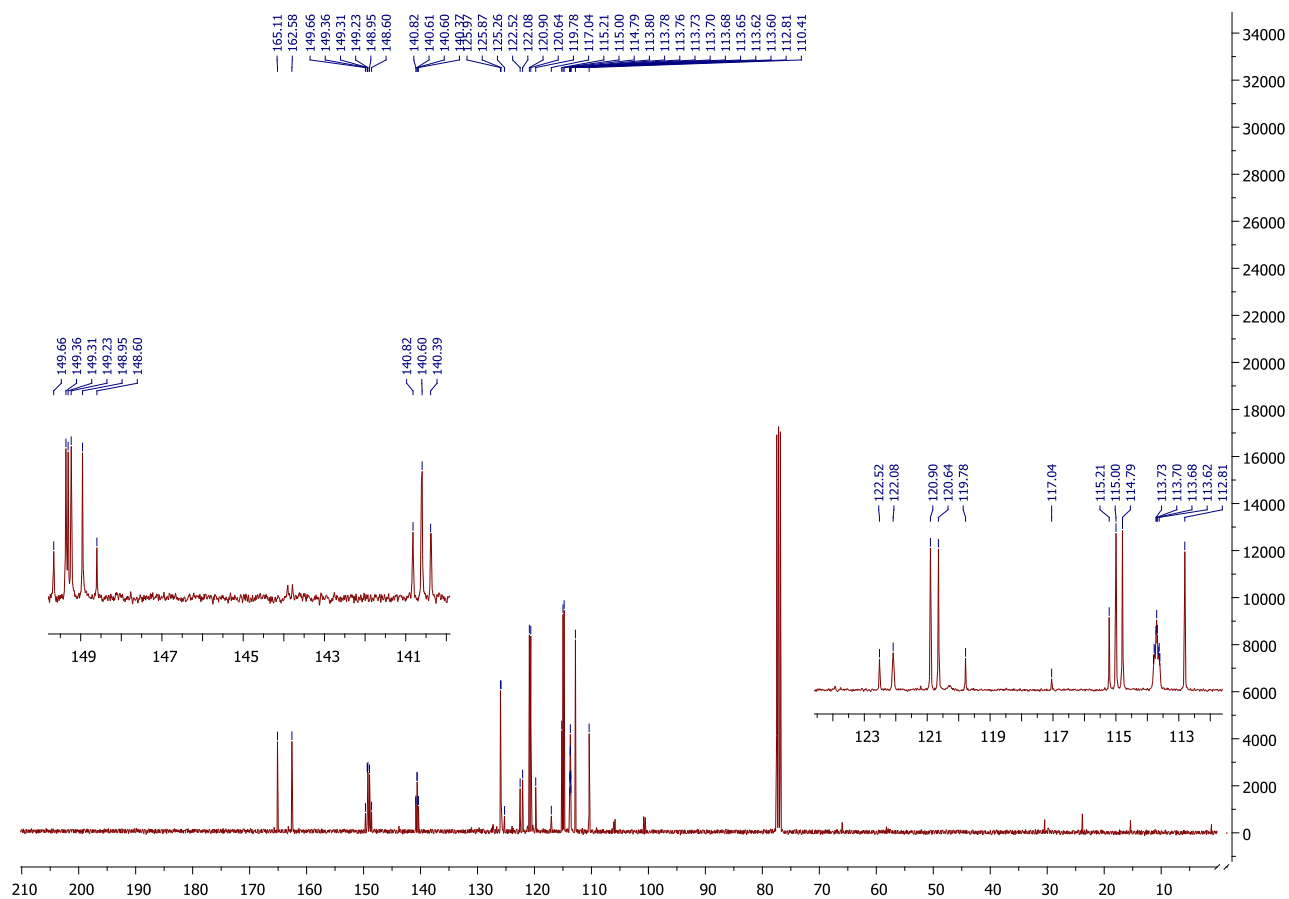
2f



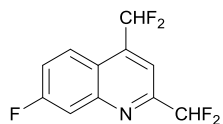
4-(Difluoromethyl)-7-fluoro-2-(trifluoromethyl)quinoline (2f) - ^{13}C NMR (101 MHz, CDCl_3)



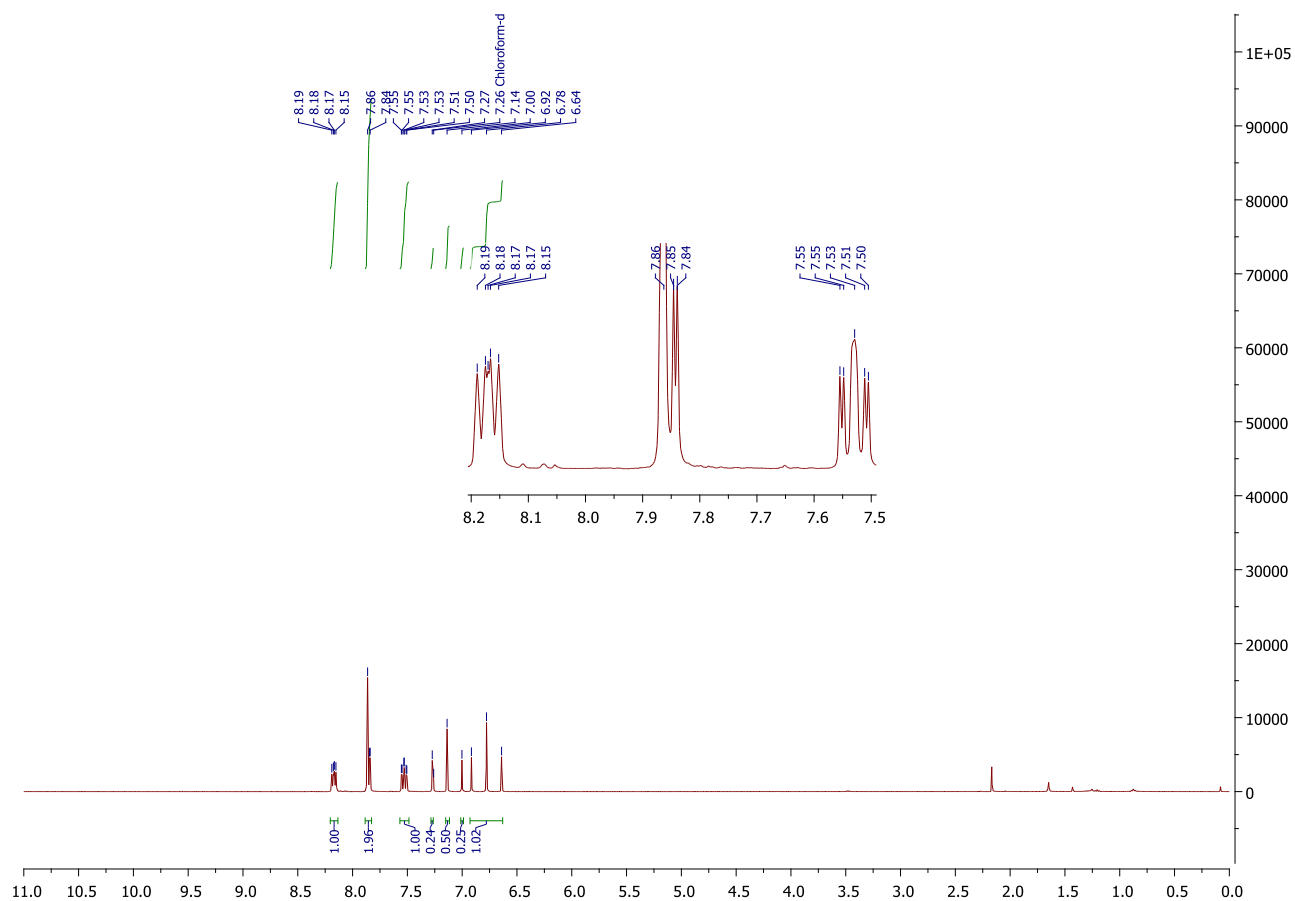
2f



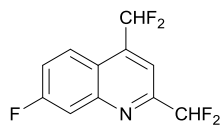
2,4-Bis(difluoromethyl)-7-fluoroquinoline (3f) - ^1H NMR (400 MHz, CDCl_3)



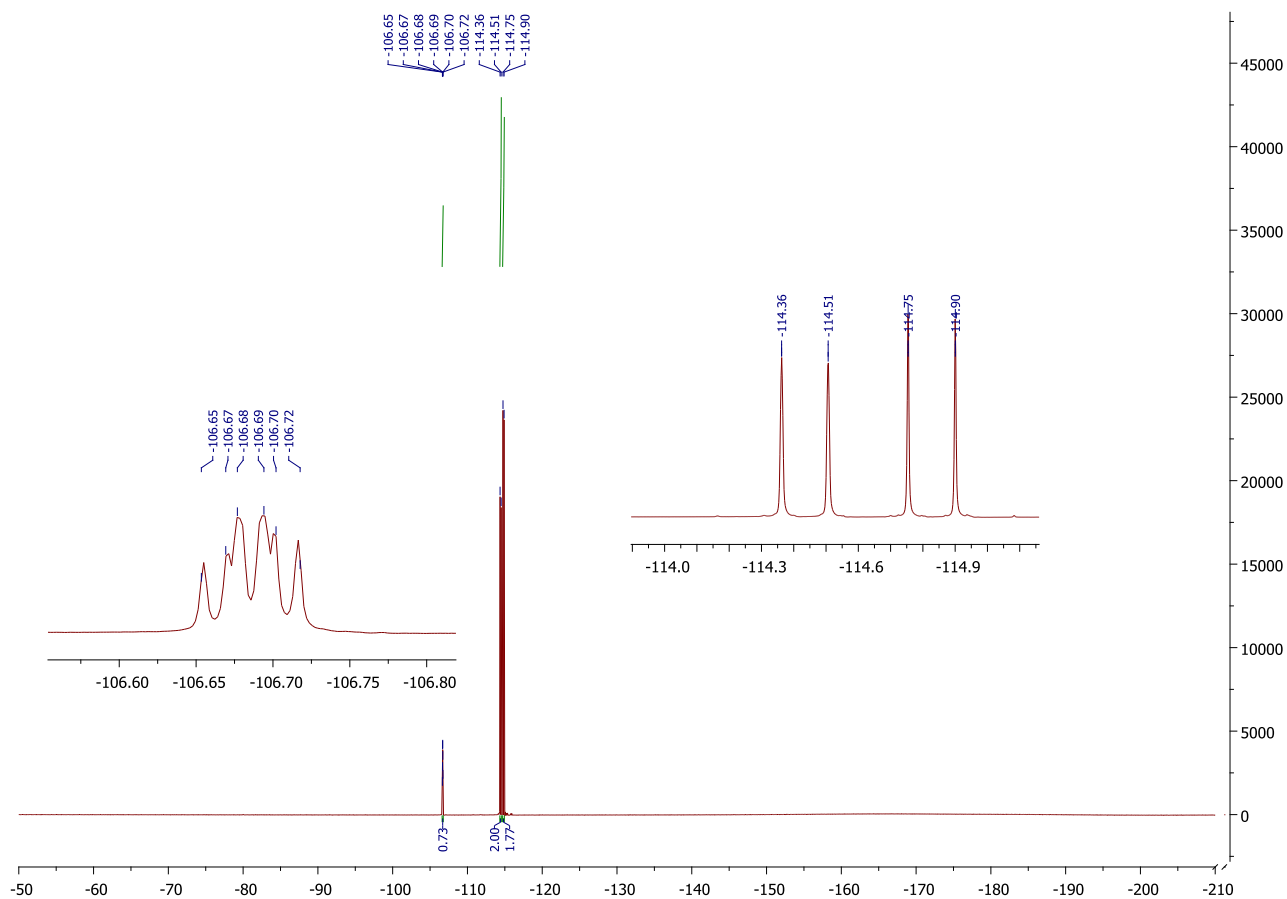
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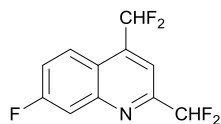
2,4-Bis(difluoromethyl)-7-fluoroquinoline (3f) - ^{19}F NMR (376 MHz, CDCl_3)



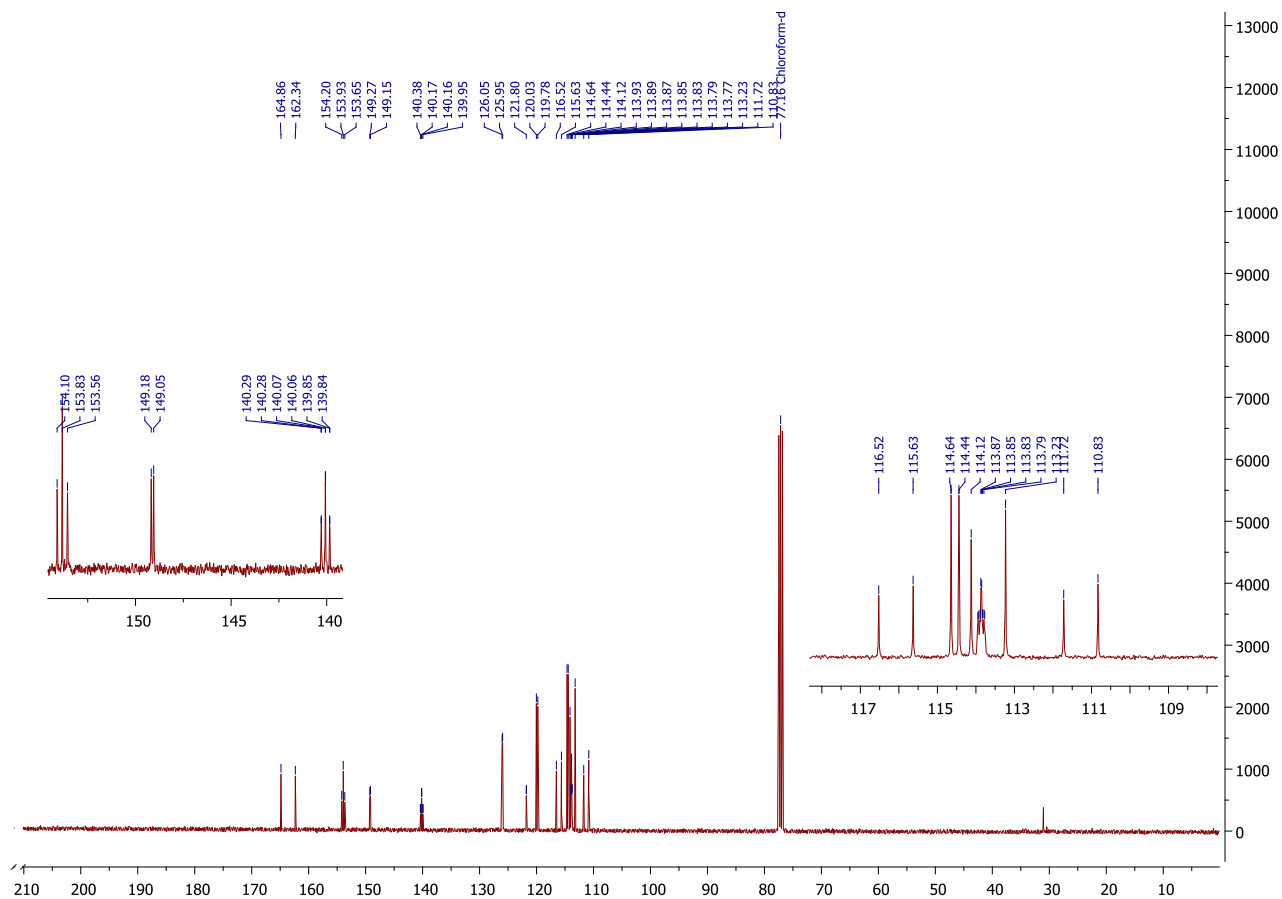
3f



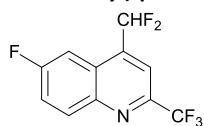
2,4-Bis(difluoromethyl)-7-fluoroquinoline (3f) - ^{13}C NMR (101 MHz, CDCl_3)



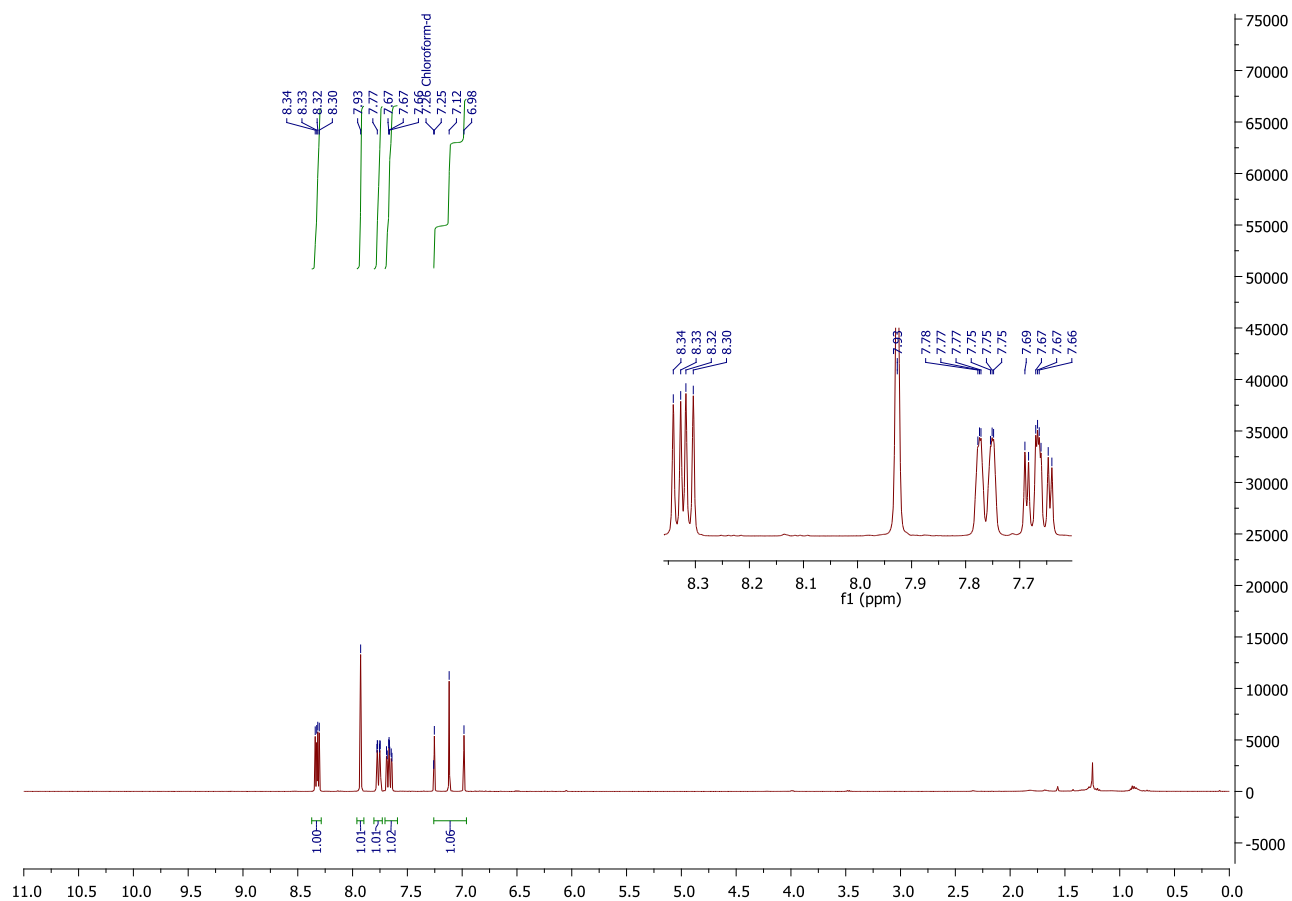
3f



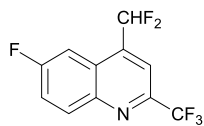
4-(Difluoromethyl)-6-fluoro-2-(trifluoromethyl)quinoline (2gi) - ^1H NMR (400 MHz, CDCl_3)



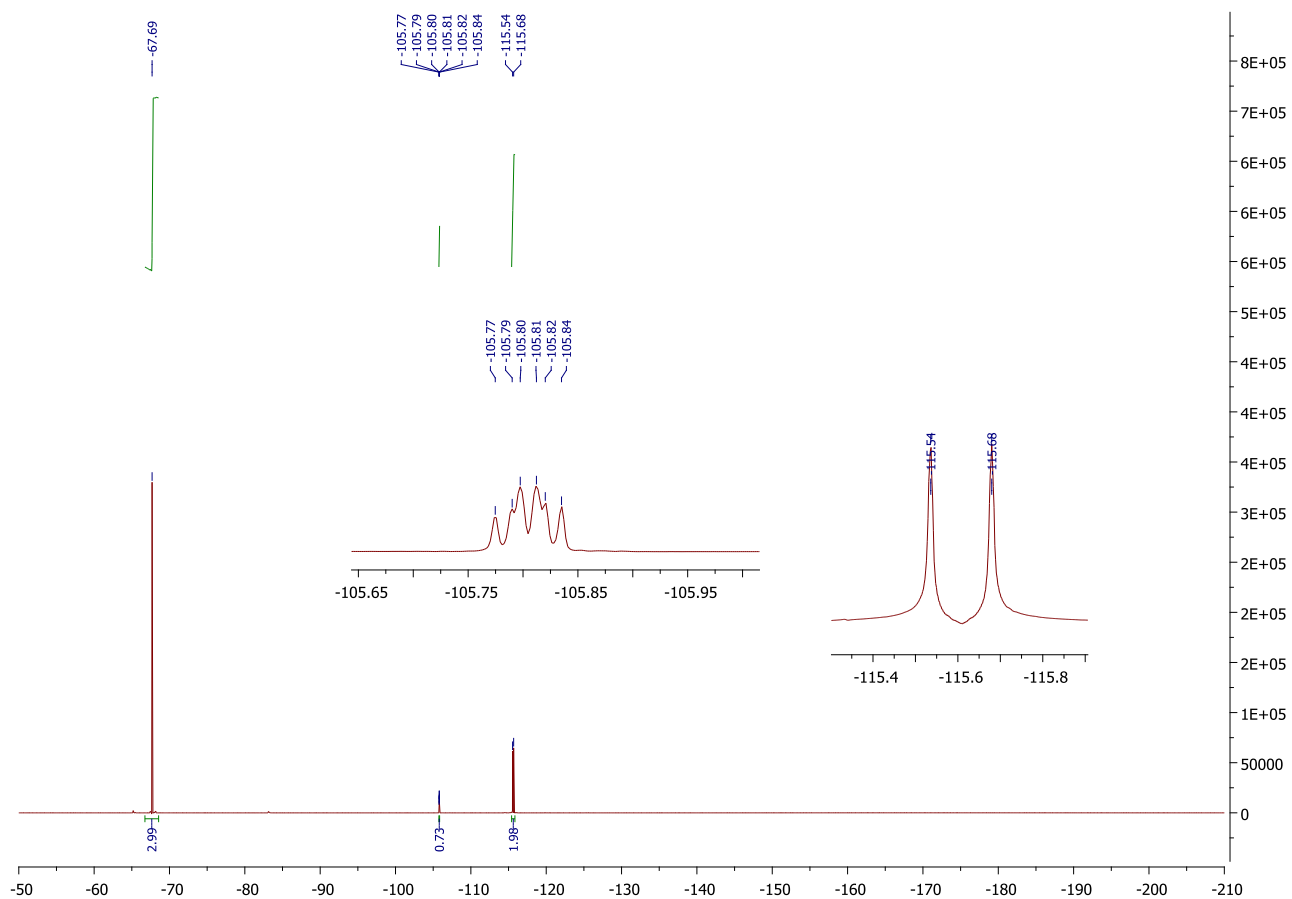
2gi



4-(Difluoromethyl)-6-fluoro-2-(trifluoromethyl)quinoline (2gi) - ^{19}F NMR (376 MHz, CDCl_3)



2gi

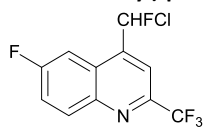


Fc1ccc2c(c1)c(cnc2)C(F)(F)F

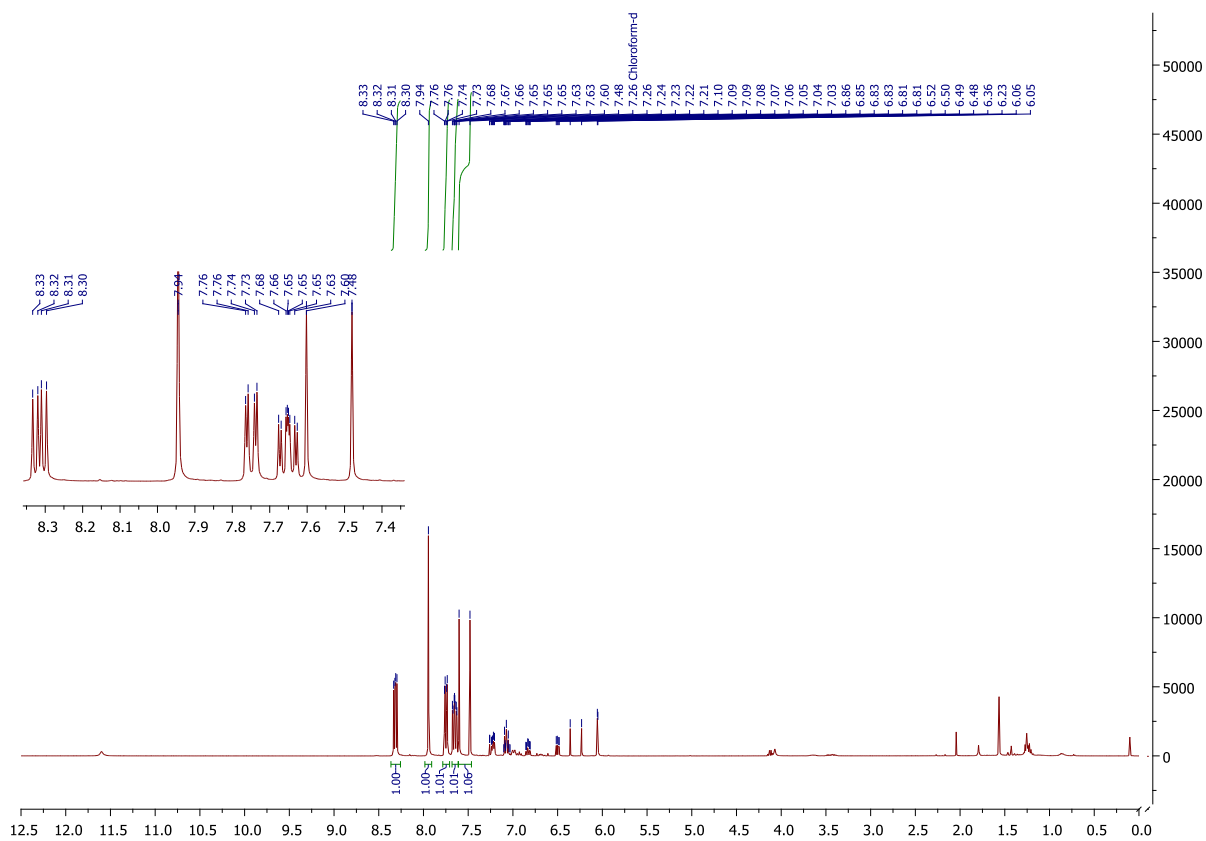
13C NMR spectrum of compound 10. The x-axis represents the chemical shift in ppm, ranging from 0 to 210. The y-axis represents the intensity, ranging from 0 to 45,000. The spectrum shows several sharp peaks, with the most intense peak at approximately 77.16 ppm, corresponding to the solvent Chloroform-d. Other significant peaks are observed in the aromatic region (110-140 ppm) and the carbonyl region (145-150 ppm). A list of peak chemical shifts is provided on the right side of the spectrum.

Chemical Shift (ppm)
163.68
161.15
147.51
147.48
147.15
147.12
145.06
139.95
139.89
139.73
139.62
136.12
126.01
125.35
122.62
122.15
121.89
119.88
117.15
115.18
115.09
115.02
112.78
110.38
107.81
107.57
77.16 Chloroform-d

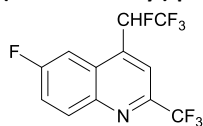
4-[Chloro(fluoro)methyl]-6-fluoro-2-(trifluoromethyl)quinoline (2gii) - ^1H NMR (400 MHz, CDCl_3)



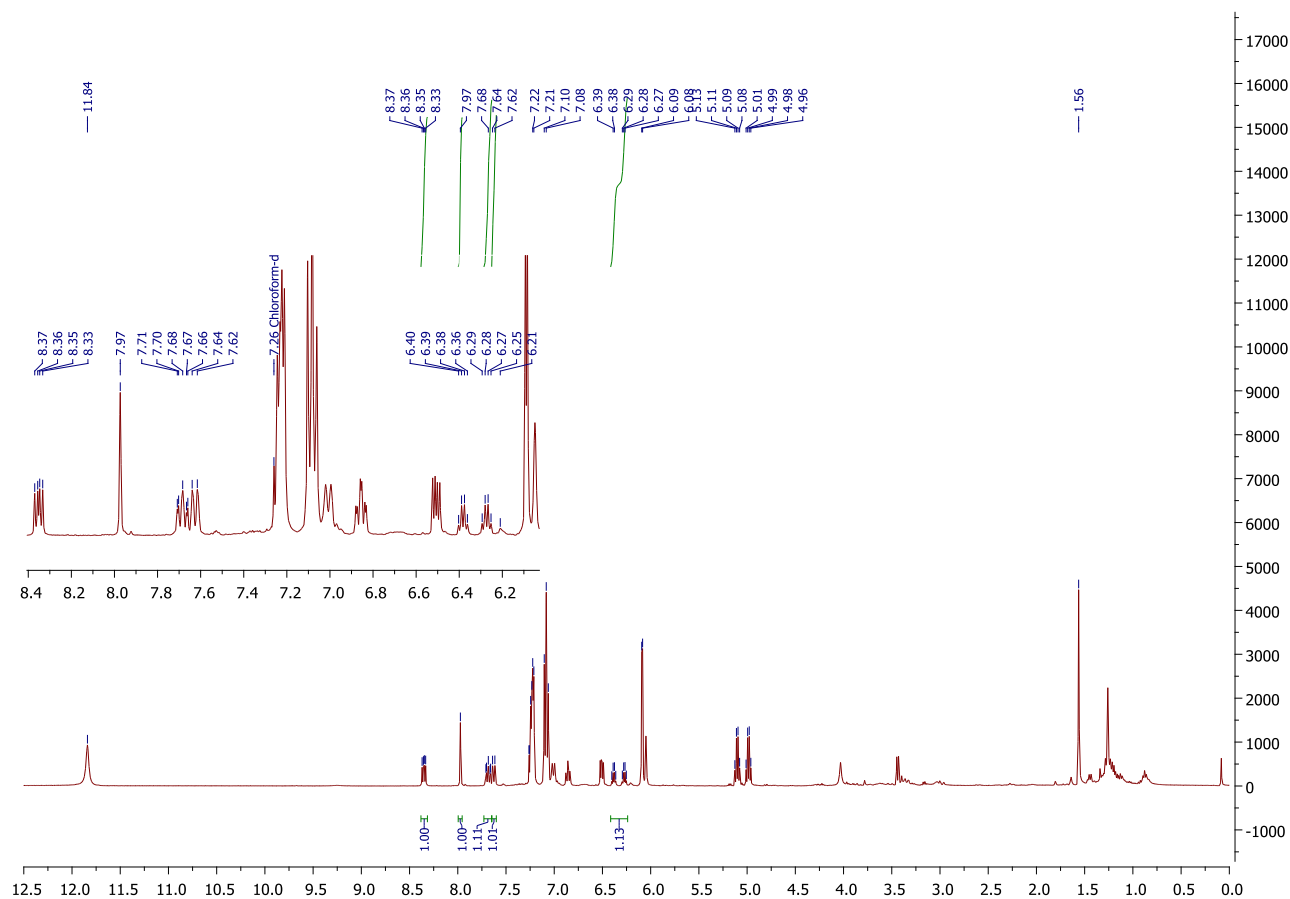
2gii



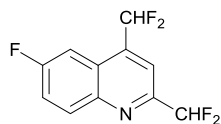
6-Fluoro-4-(1,2,2,2-tetrafluoroethyl)-2-(trifluoromethyl)quinoline (2giii) - ^1H NMR (400 MHz, CDCl_3)



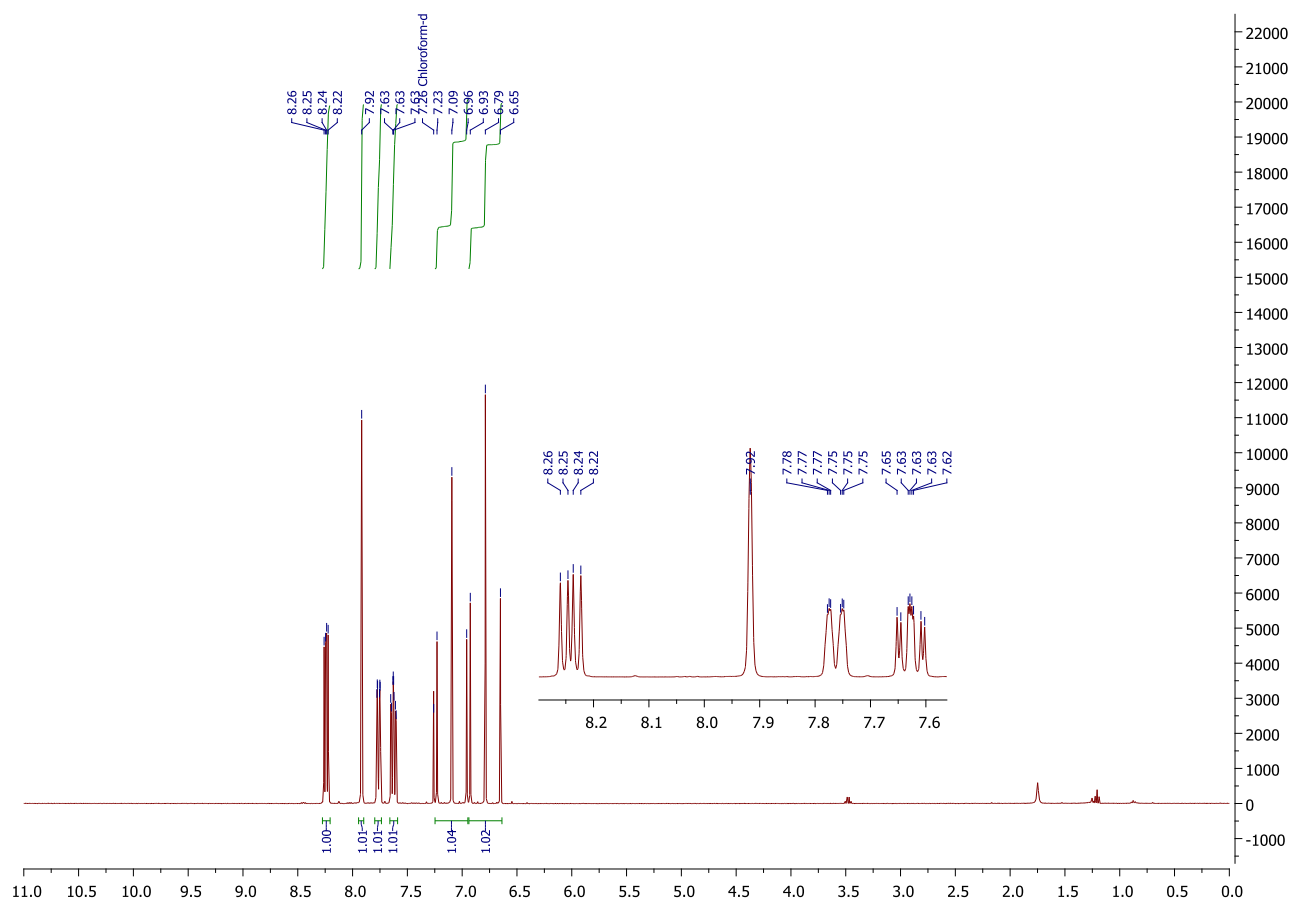
2giii



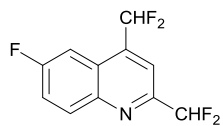
2,4-Bis(difluoromethyl)-6-fluoroquinoline (3gi) - ^1H NMR (400 MHz, CDCl_3)



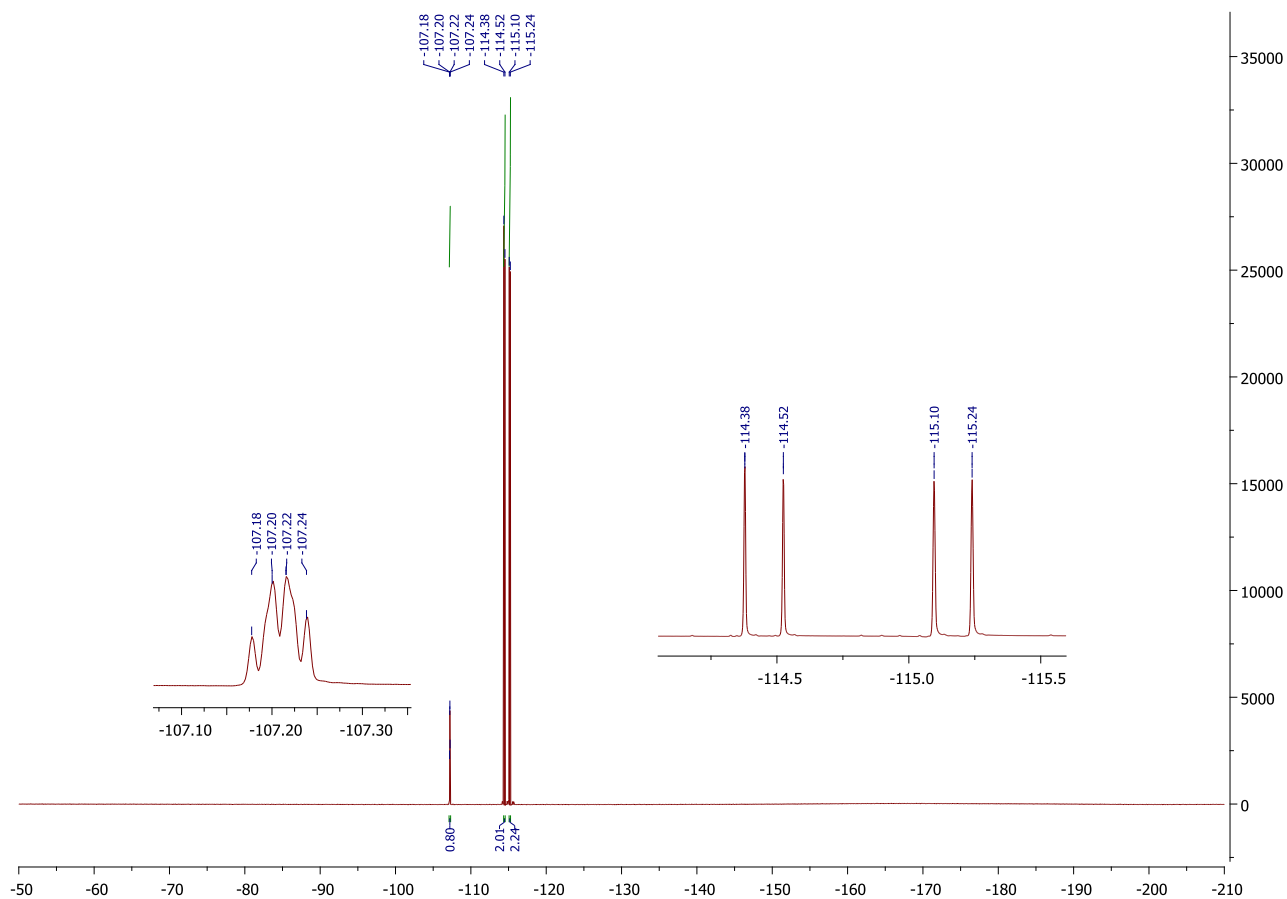
3gi



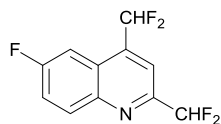
2,4-Bis(difluoromethyl)-6-fluoroquinoline (3gi) - ^{19}F NMR (376 MHz, CDCl_3)



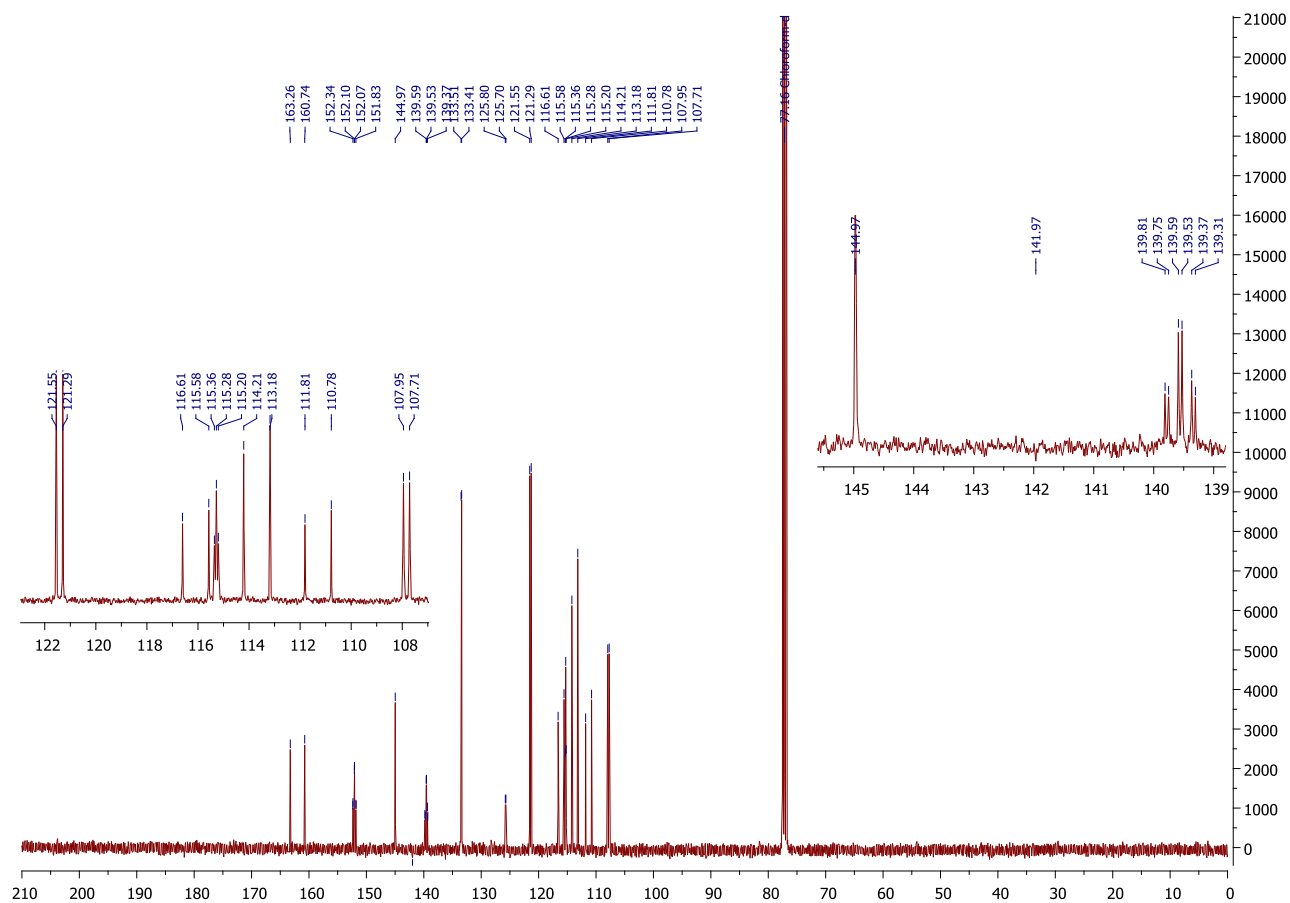
3gi



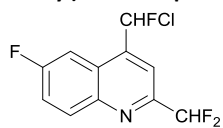
2,4-Bis(difluoromethyl)-6-fluoroquinoline (3gi) - ^{13}C NMR (101 MHz, CDCl_3)



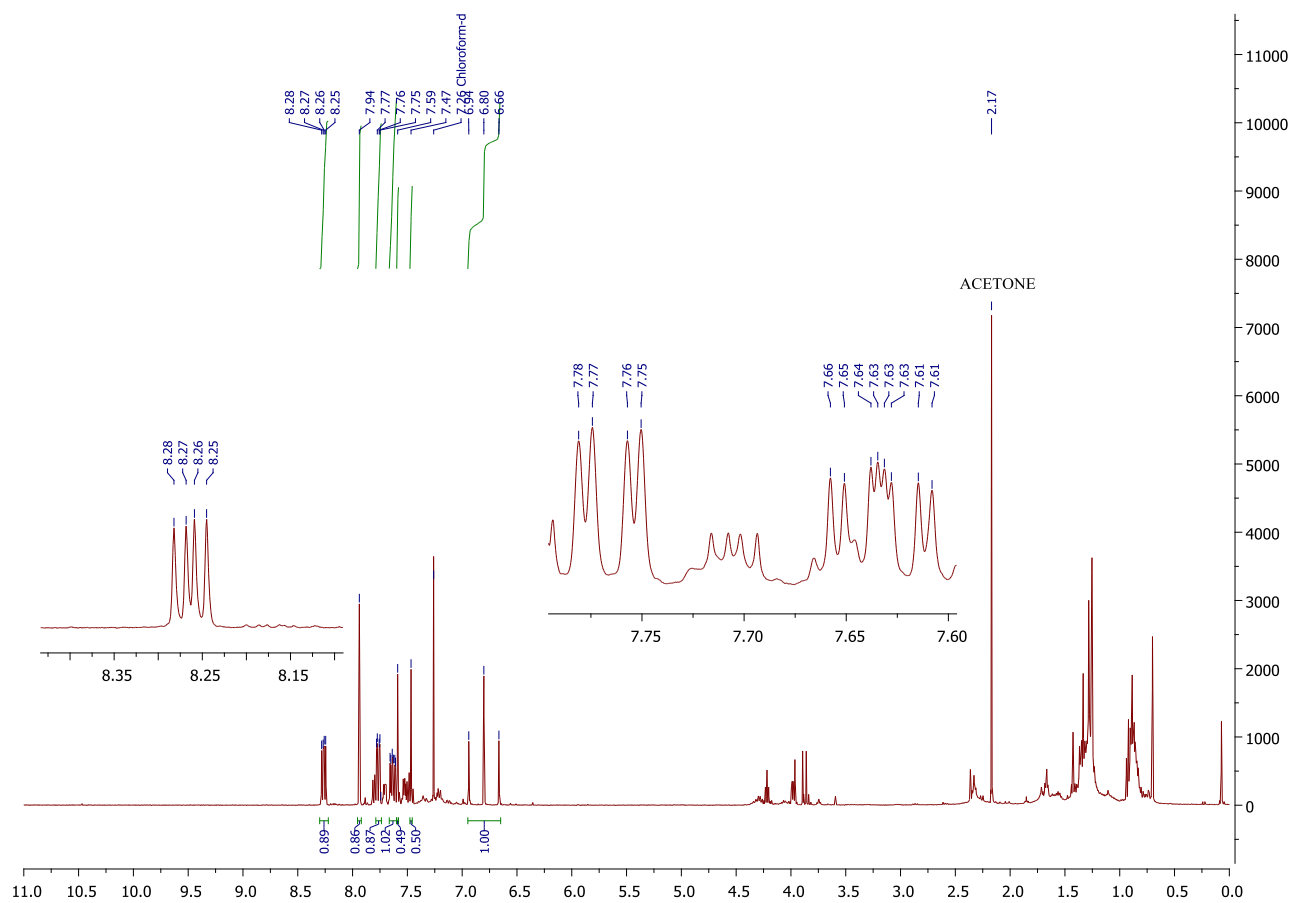
3gi



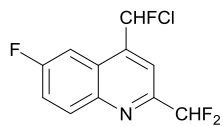
4-[Chloro(fluoro)methyl]-2-(difluoromethyl)-6-fluoroquinoline (3gii) - ^1H NMR (400 MHz, CDCl_3)



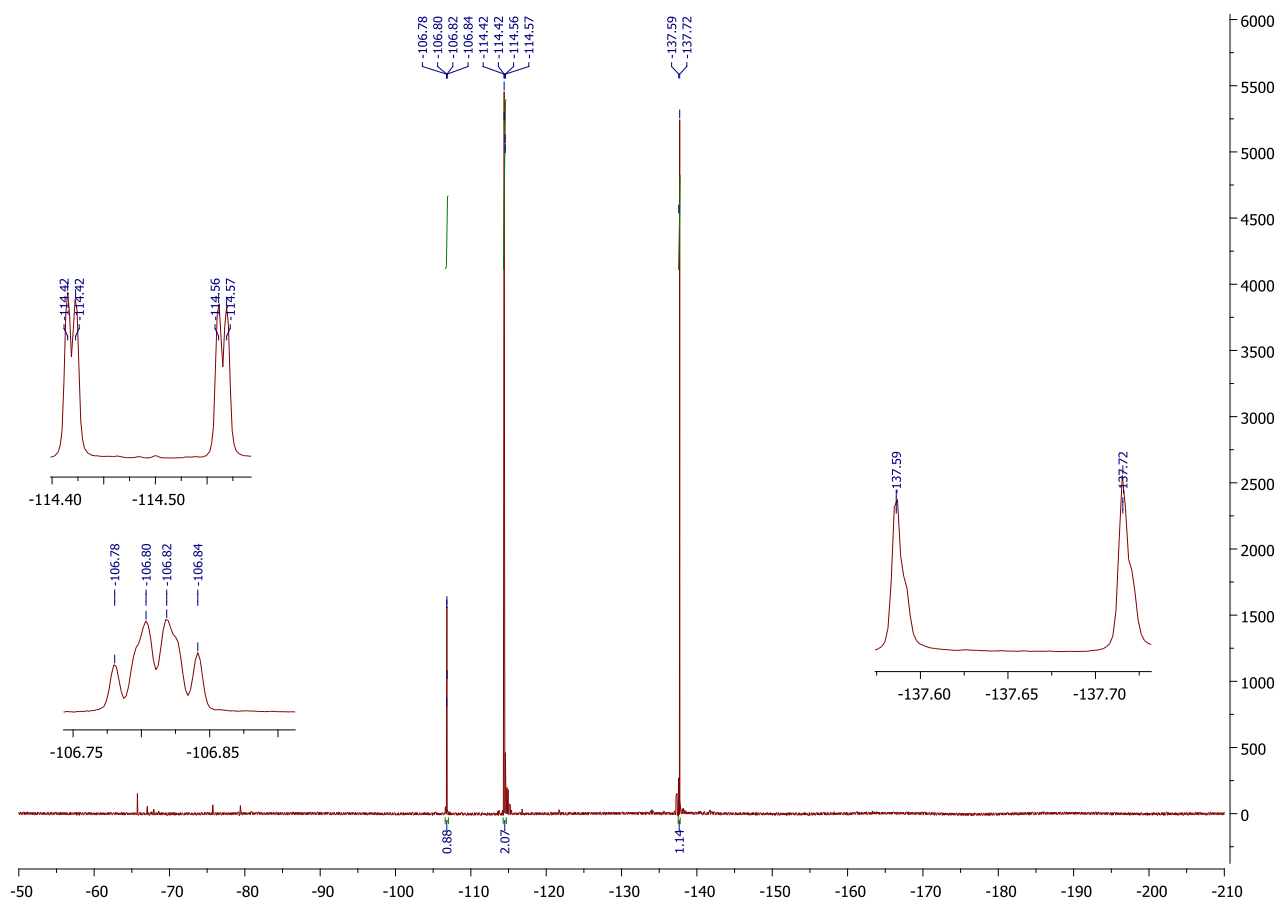
3gii



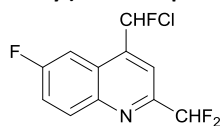
4-[Chloro(fluoro)methyl]-2-(difluoromethyl)-6-fluoroquinoline (3gii) - ^{19}F NMR (376 MHz, CDCl_3)



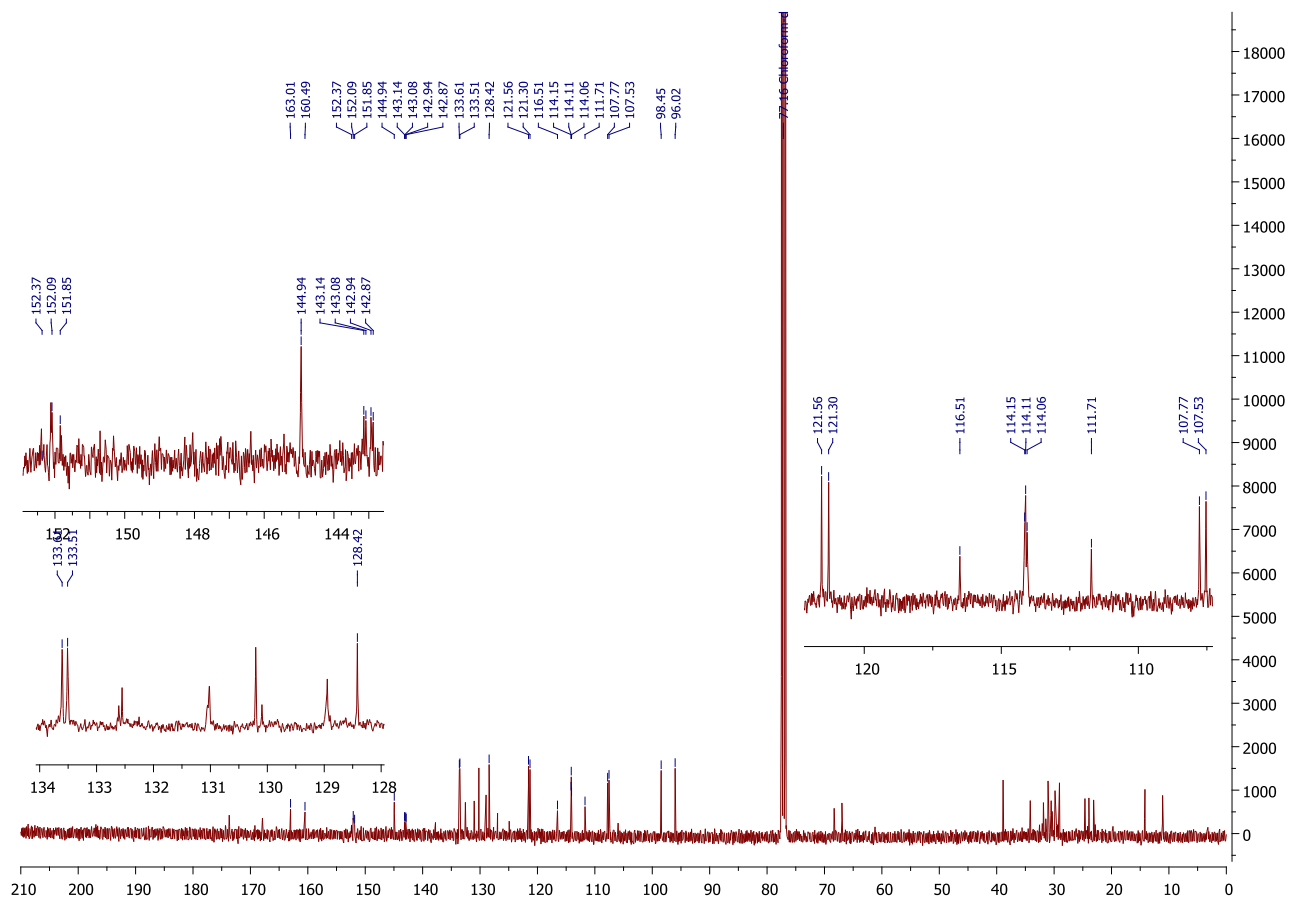
3gii



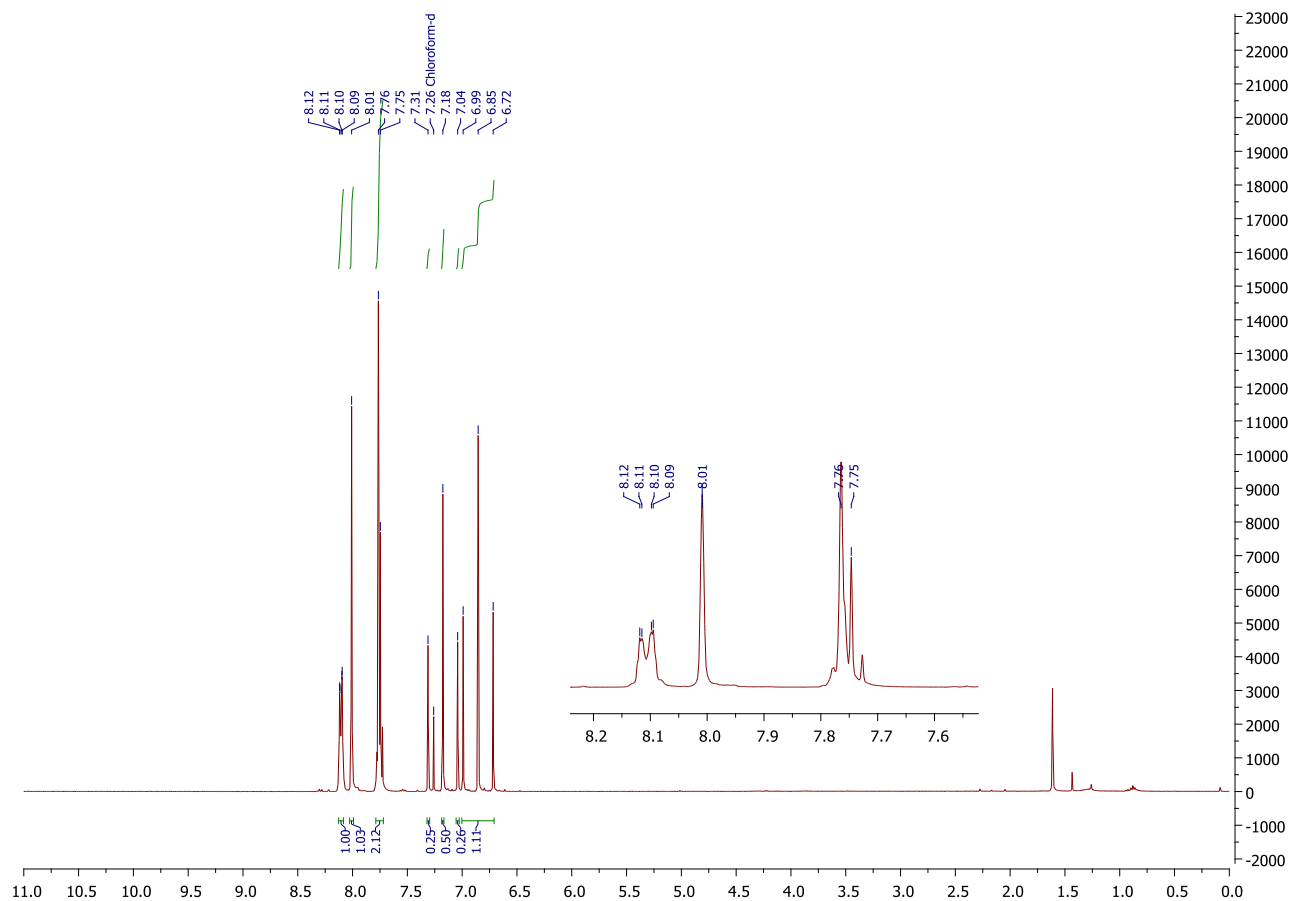
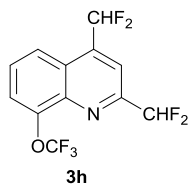
4-[Chloro(fluoro)methyl]-2-(difluoromethyl)-6-fluoroquinoline (3gii) - ^{13}C NMR (101 MHz, CDCl_3)



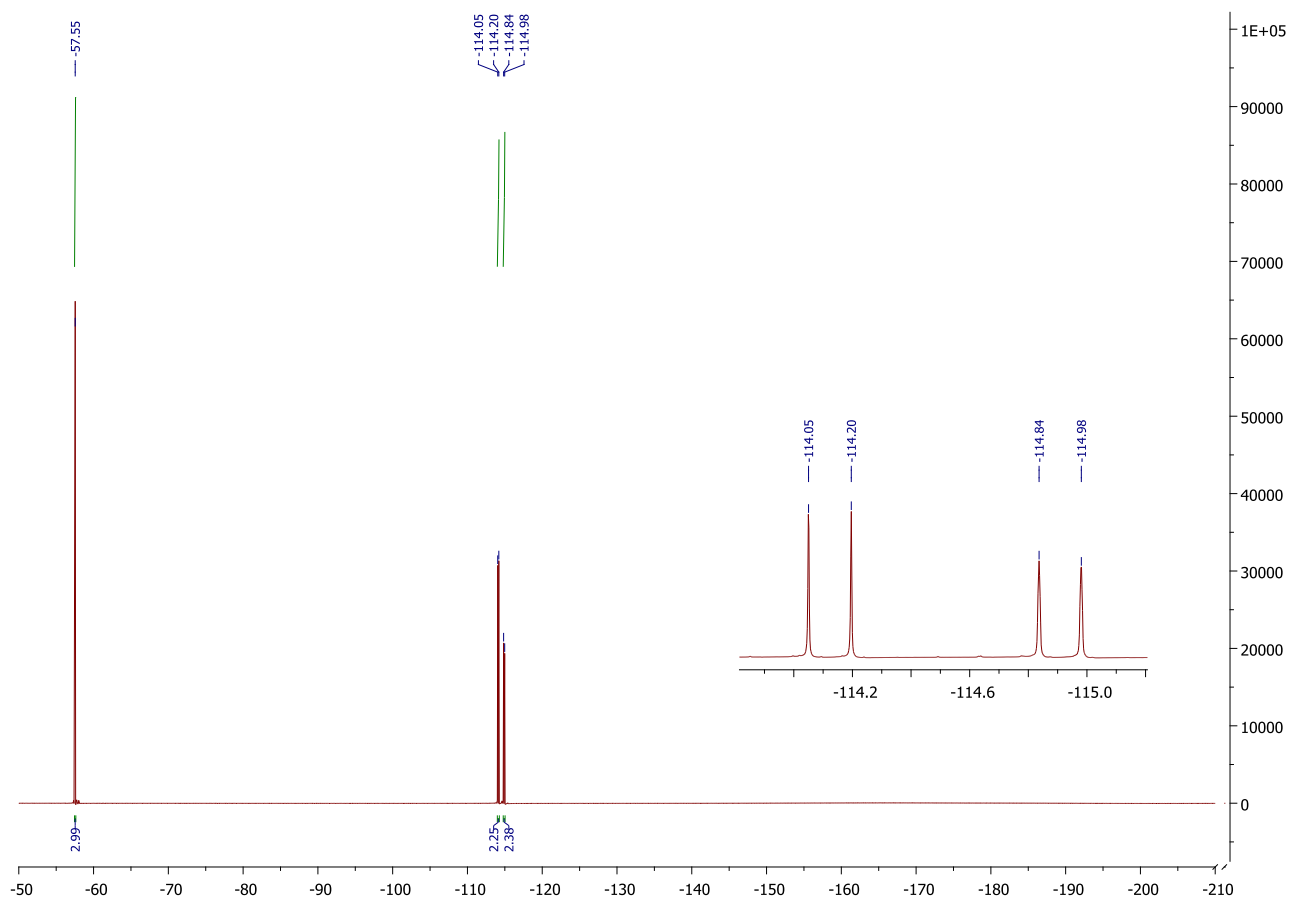
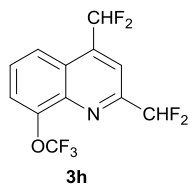
3gii



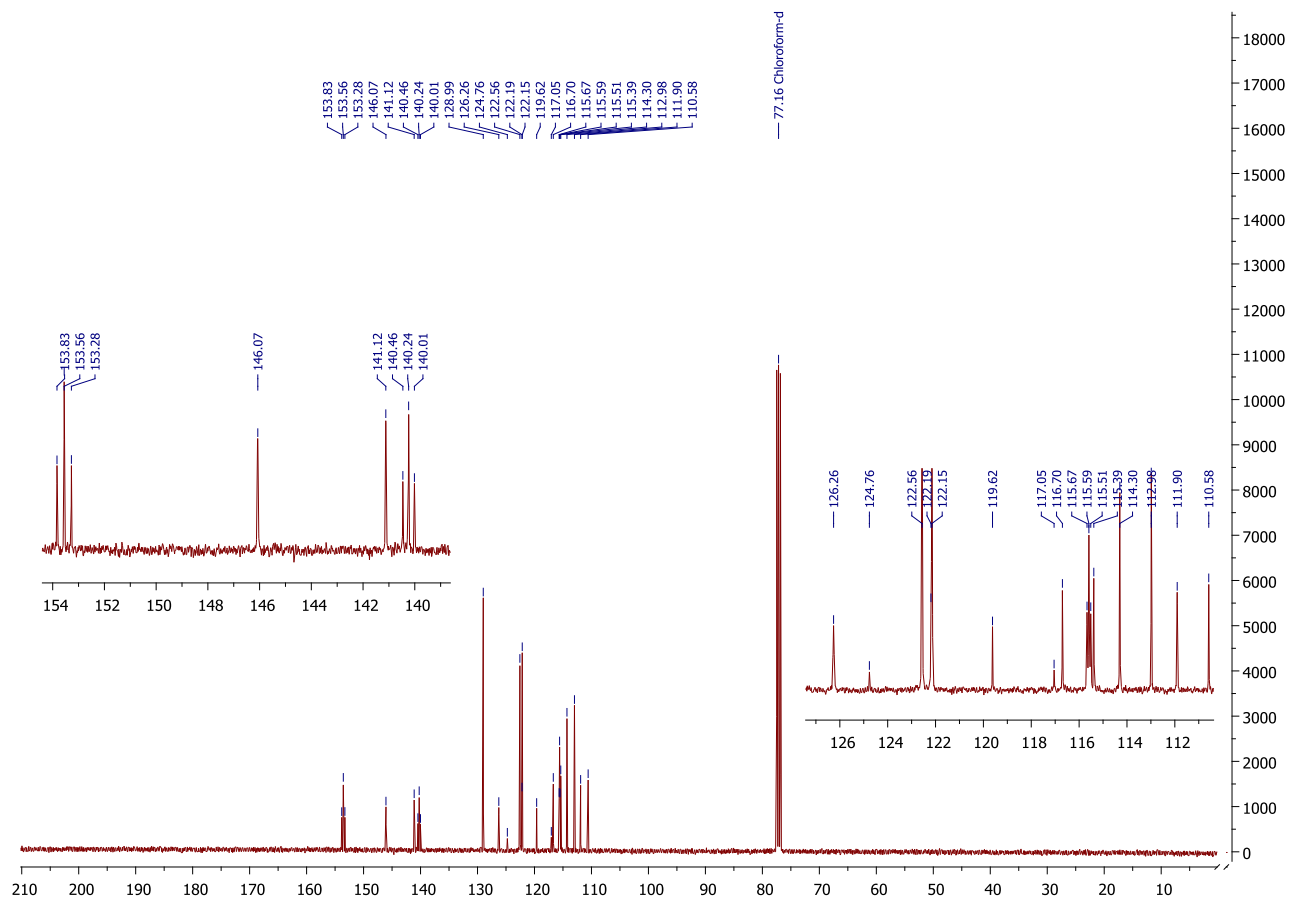
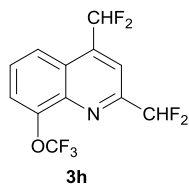
2,4-Bis(difluoromethyl)-8-(trifluoromethoxy)quinoline (3h) - ^1H NMR (400 MHz, CDCl_3)



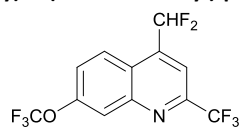
2,4-Bis(difluoromethyl)-8-(trifluoromethoxy)quinoline (3h) - ^{19}F NMR (376 MHz, CDCl_3)



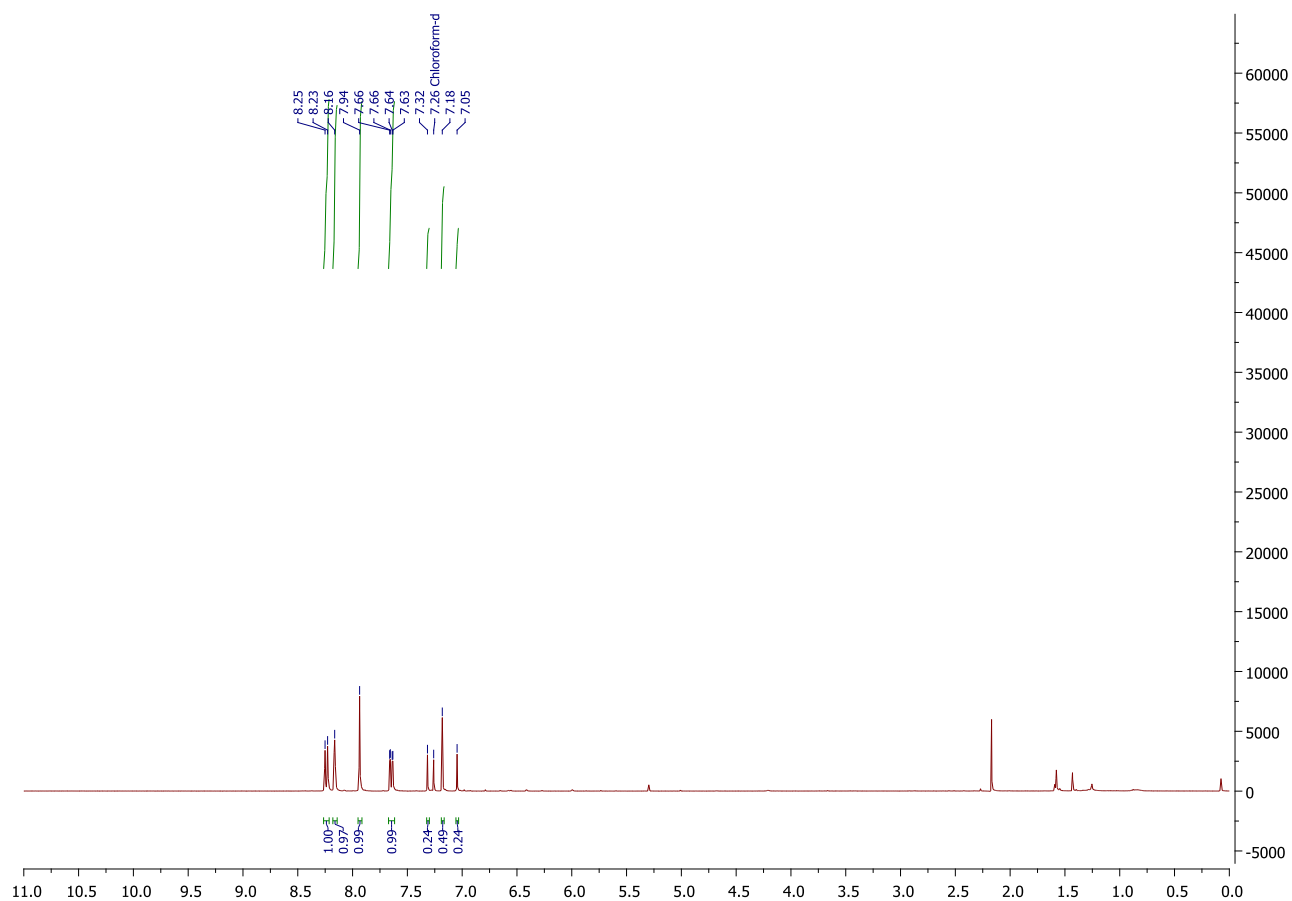
2,4-Bis(difluoromethyl)-8-(trifluoromethoxy)quinoline (3h) - ^{13}C NMR (101 MHz, CDCl_3)



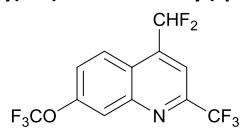
4-(Difluoromethyl)-7-(trifluoromethoxy)-2-(trifluoromethyl)quinoline (2h) - ^1H NMR (400 MHz, CDCl_3)



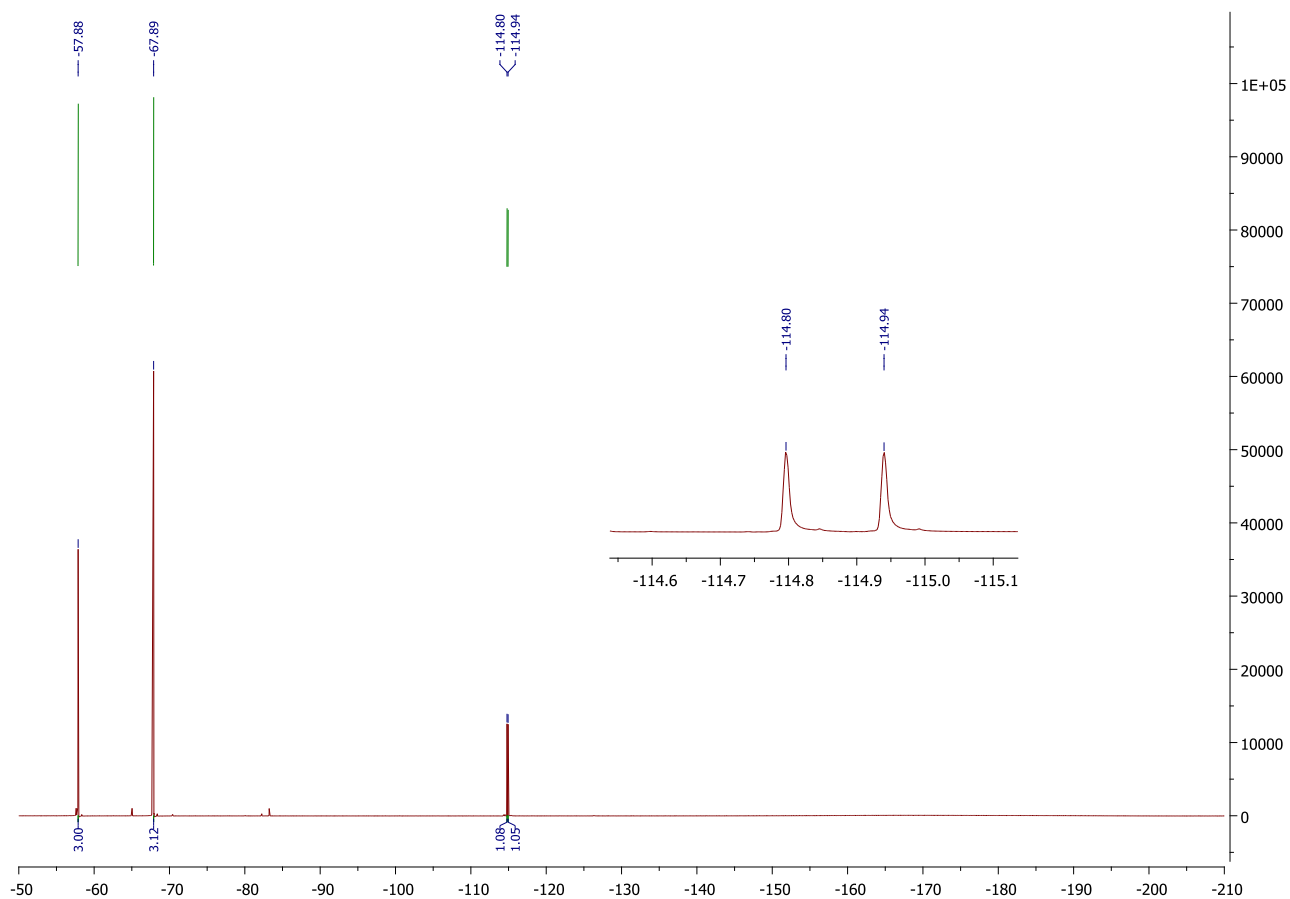
2h



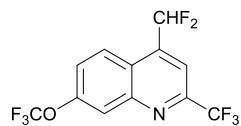
4-(Difluoromethyl)-7-(trifluoromethoxy)-2-(trifluoromethyl)quinoline (2h)-¹⁹F NMR (376 MHz, CDCl₃)



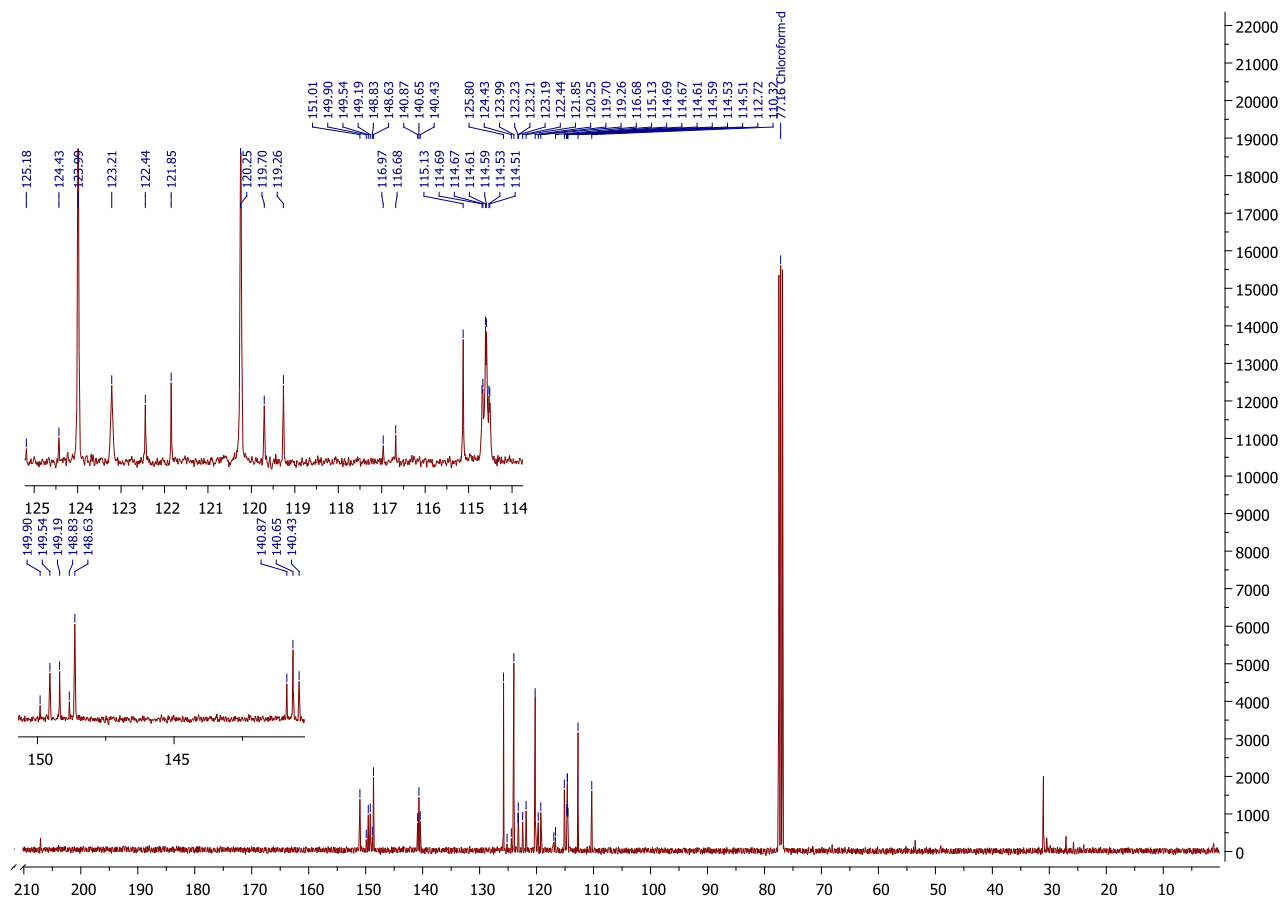
2h



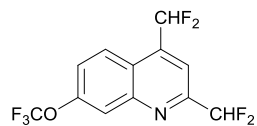
4-(Difluoromethyl)-7-(trifluoromethoxy)-2-(trifluoromethyl)quinoline (2h) - ^{13}C NMR (101 MHz, CDCl_3)



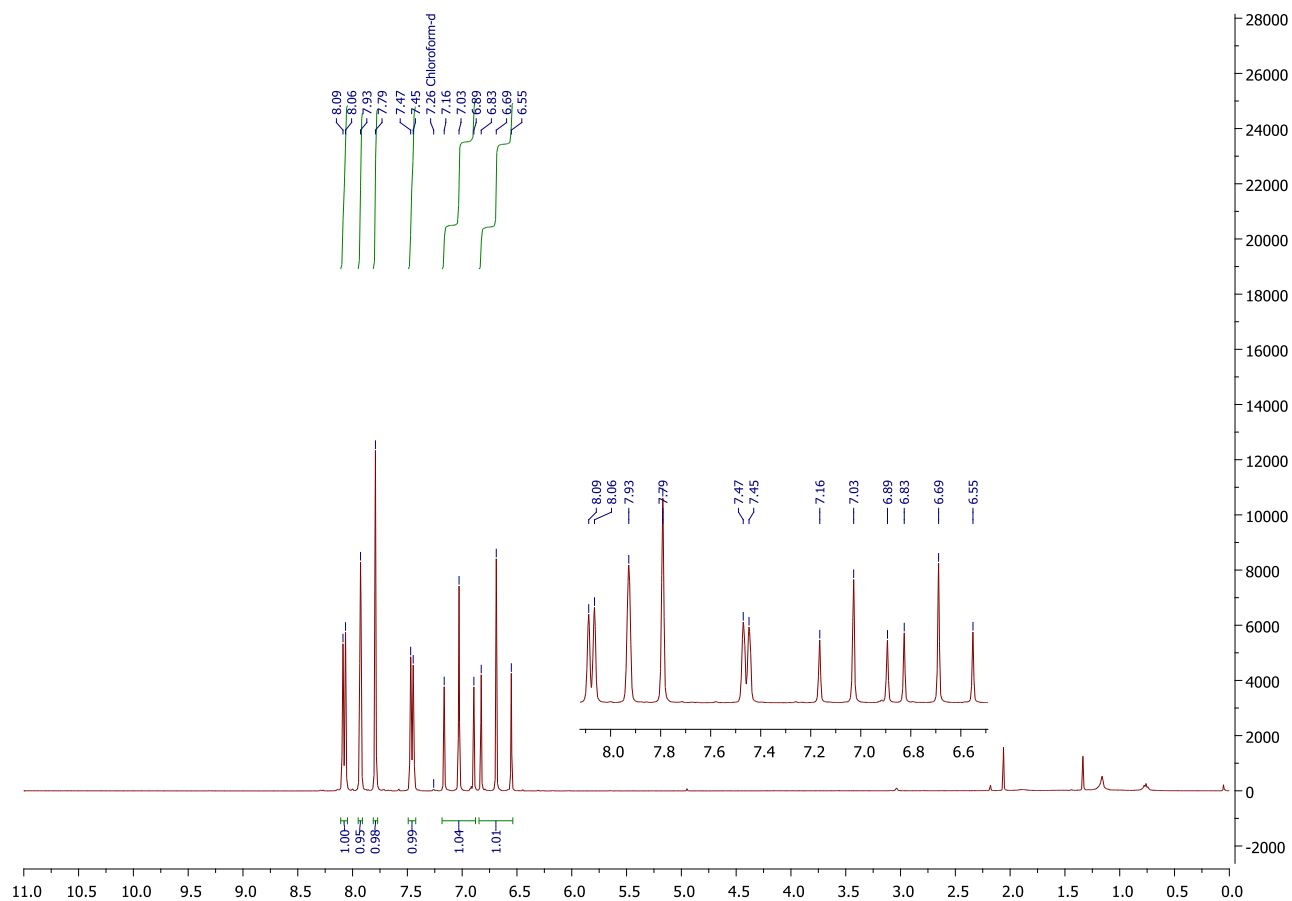
2h



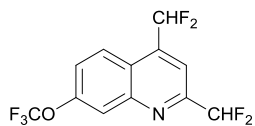
2,4-Bis(difluoromethyl)-7-(trifluoromethoxy)quinoline (3i) - ^1H NMR (400 MHz, CDCl_3)



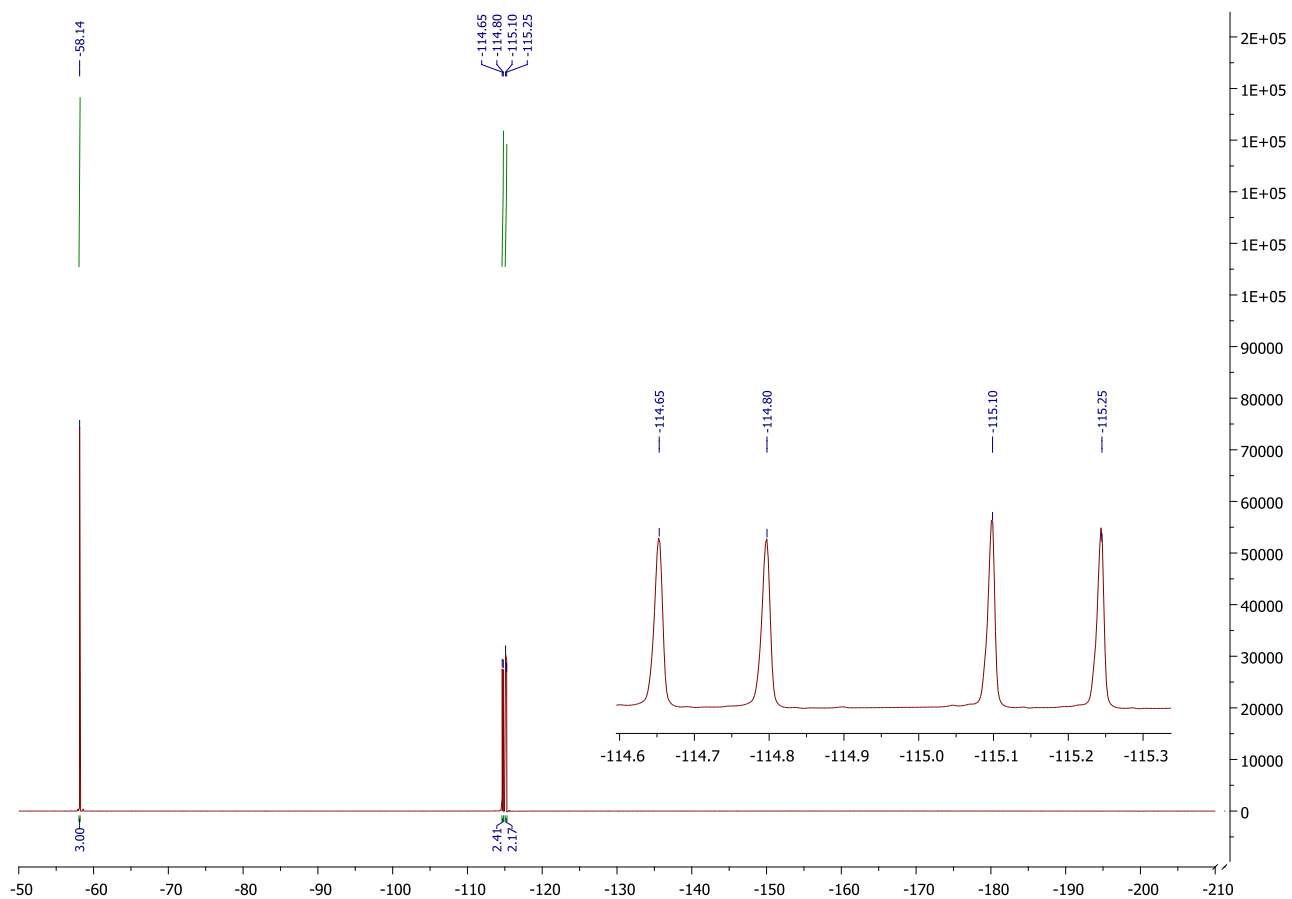
3i



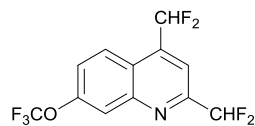
2,4-Bis(difluoromethyl)-7-(trifluoromethoxy)quinoline (3i) - ^{19}F NMR (376 MHz, CDCl_3)



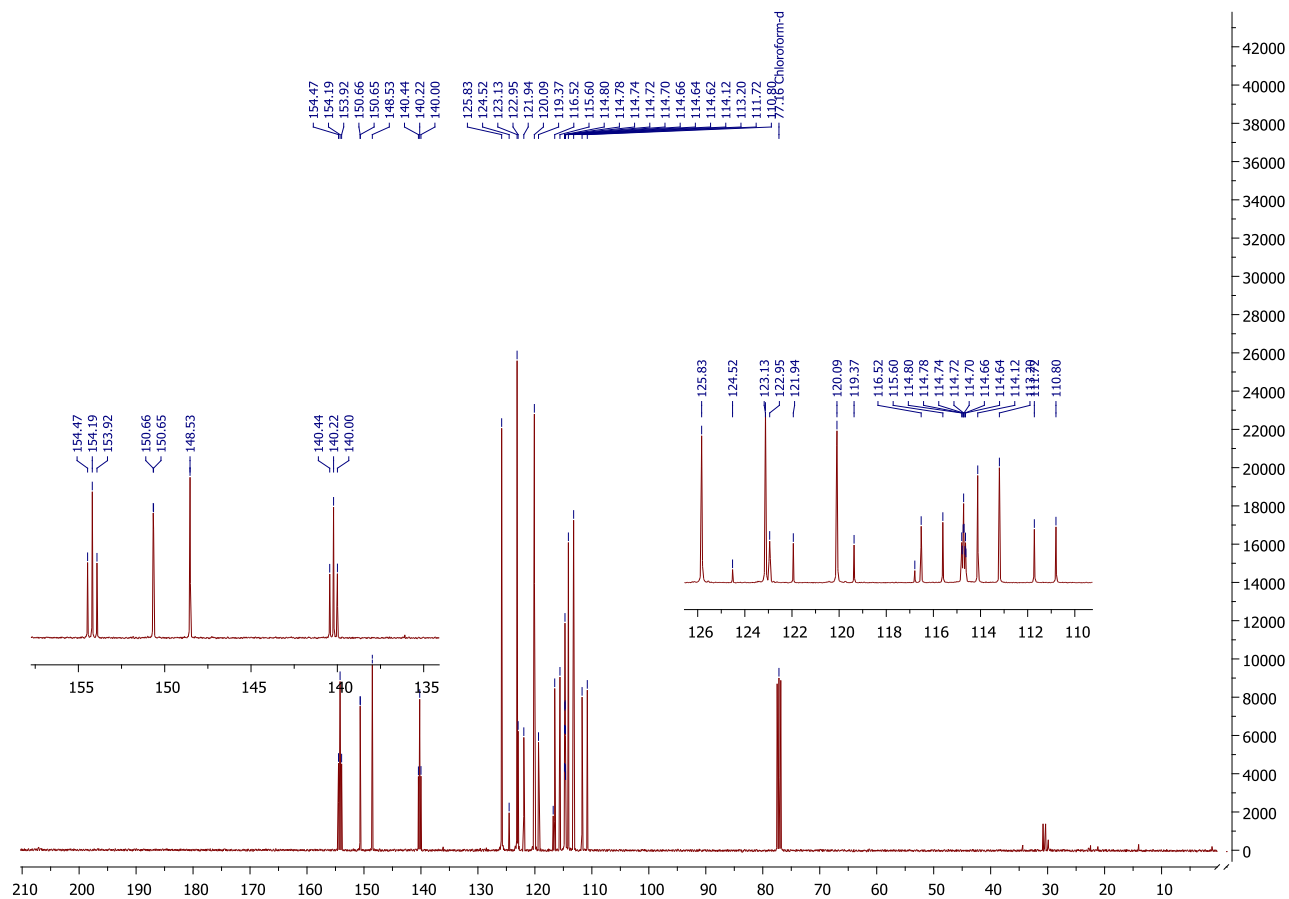
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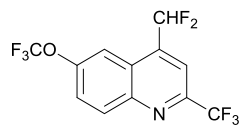
2,4-Bis(difluoromethyl)-7-(trifluoromethoxy)quinoline (3i) - ^{13}C NMR (101 MHz, CDCl_3)



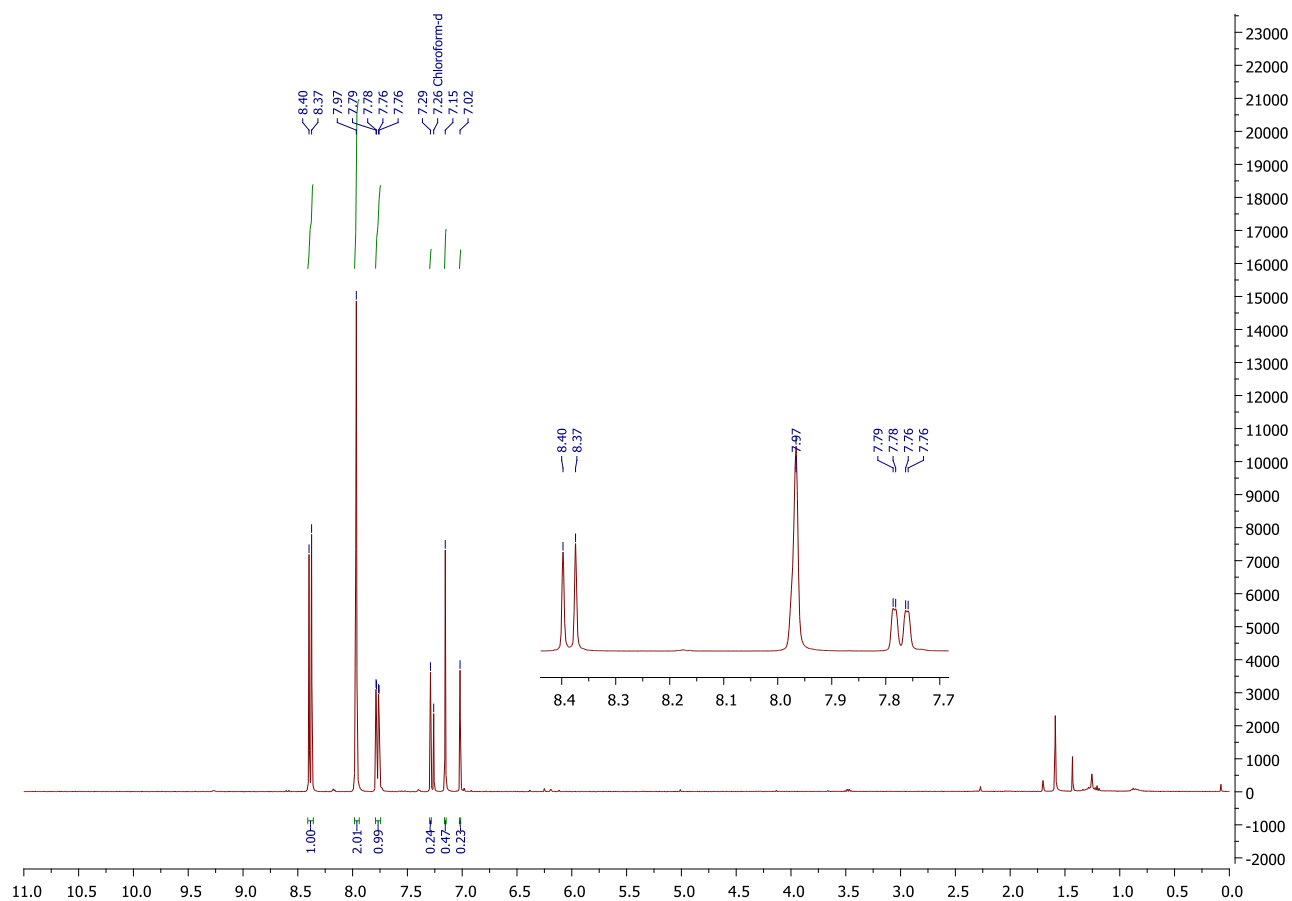
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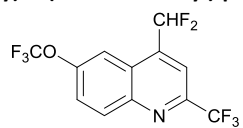
4-(Difluoromethyl)-6-(trifluoromethoxy)-2-(trifluoromethyl)quinoline (2i) - ^1H NMR (400 MHz, CDCl_3)



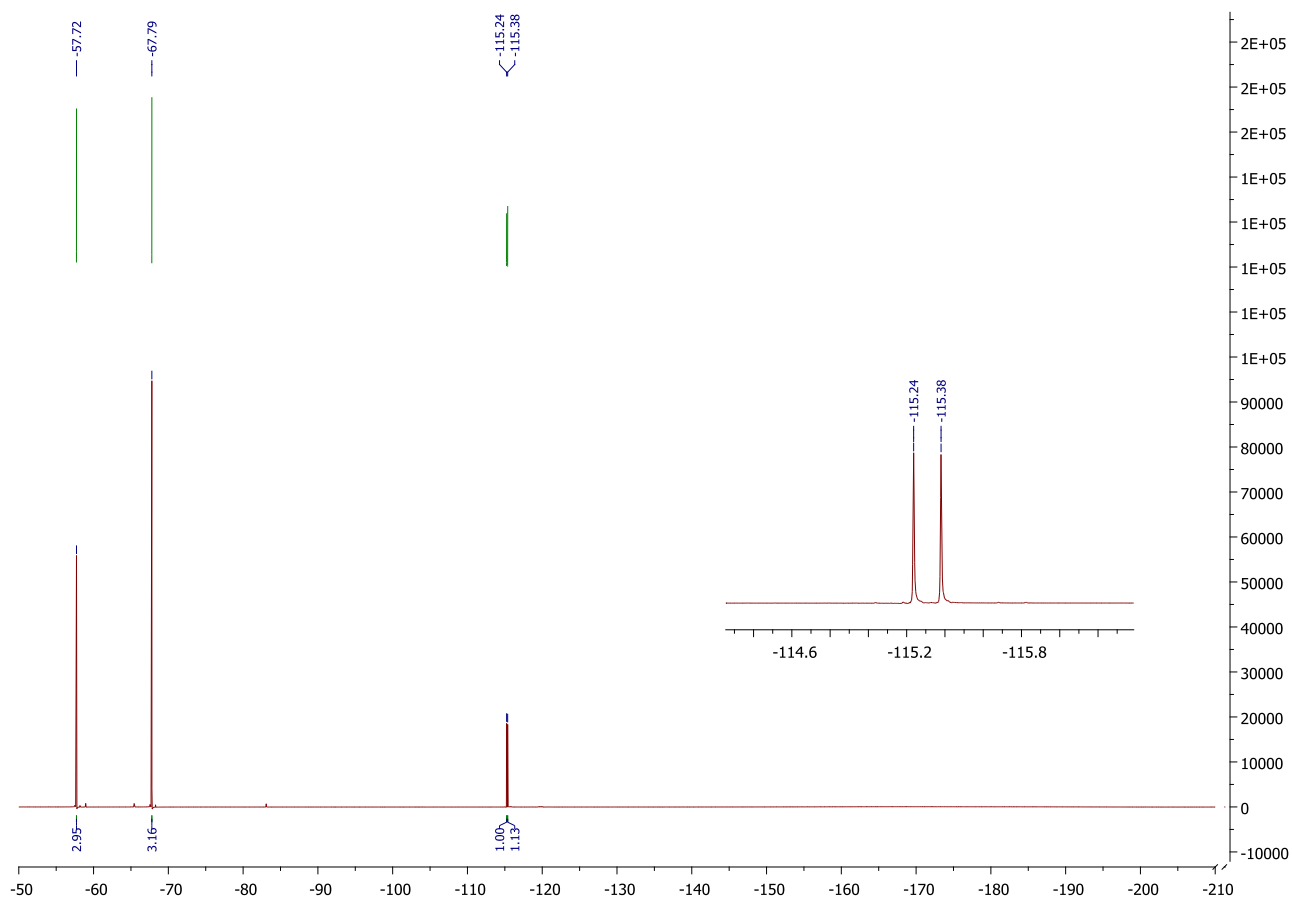
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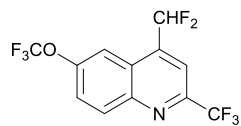
4-(Difluoromethyl)-6-(trifluoromethoxy)-2-(trifluoromethyl)quinoline (2i) - ^{19}F NMR (376 MHz, CDCl_3)



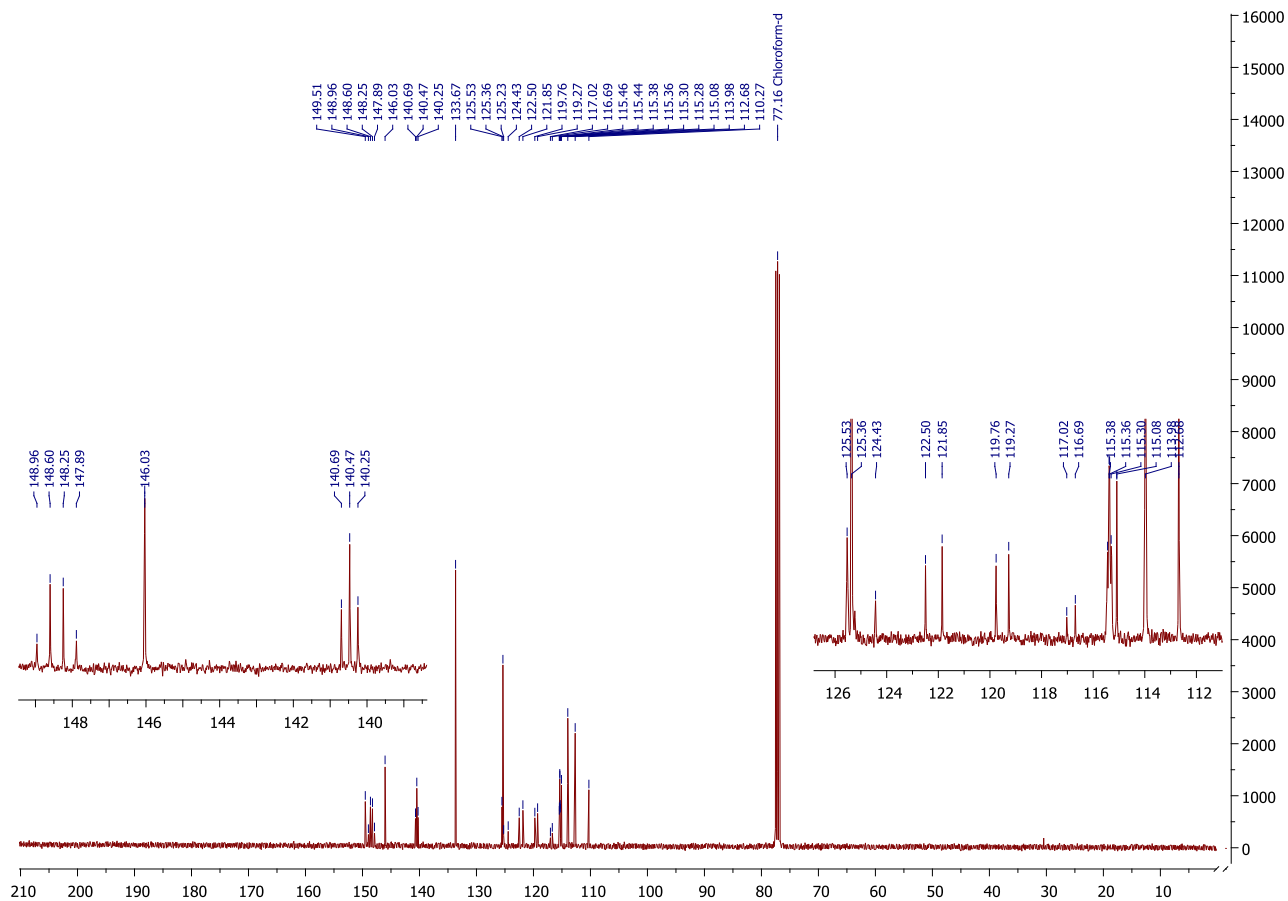
2i



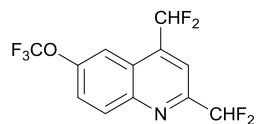
4-(Difluoromethyl)-6-(trifluoromethoxy)-2-(trifluoromethyl)quinoline (2i) - ^{13}C NMR (101 MHz, CDCl_3)



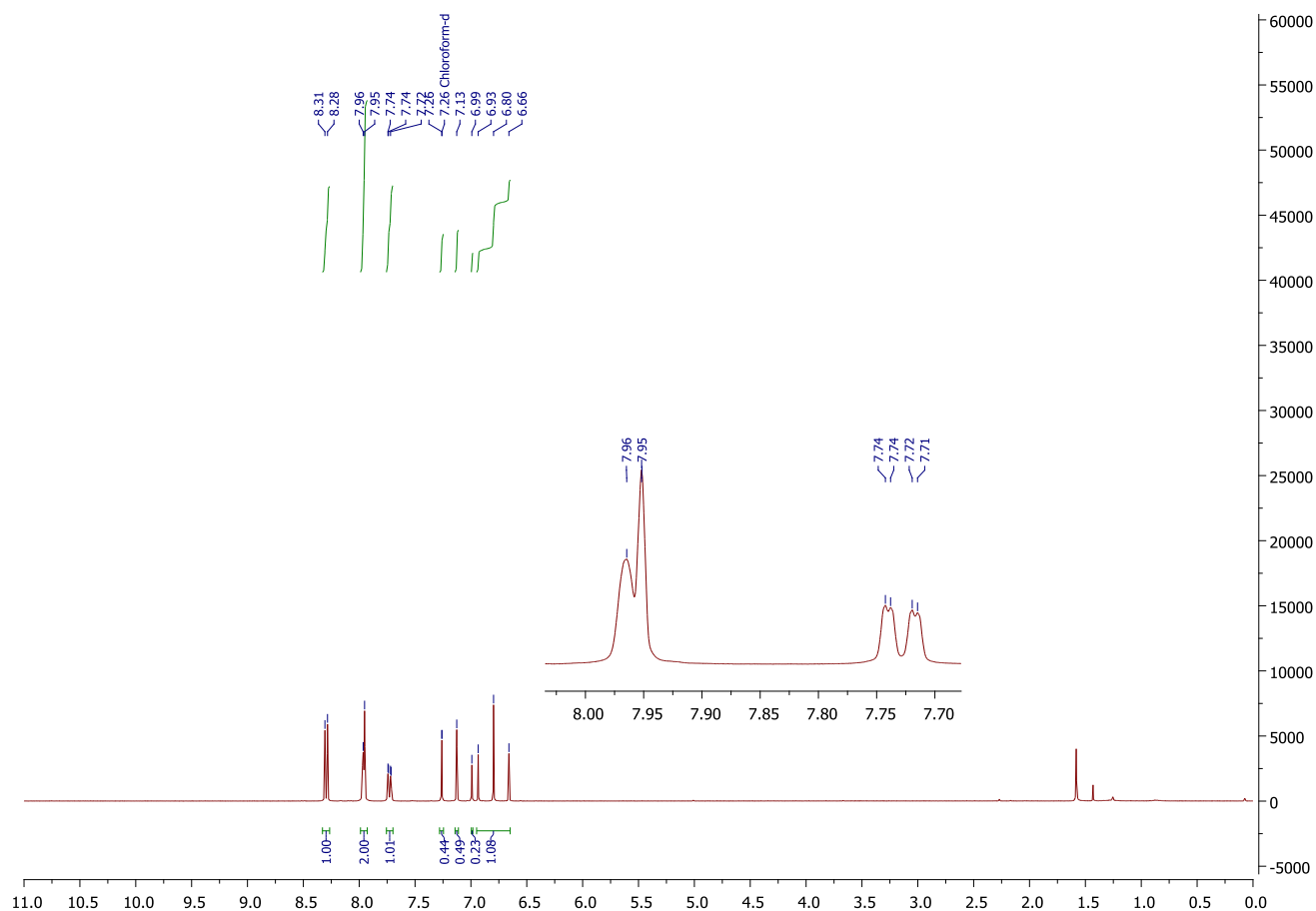
2i



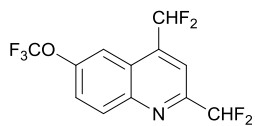
2,4-Bis(difluoromethyl)-6-(trifluoromethoxy)quinoline (3j) - ^1H NMR (400 MHz, CDCl_3)



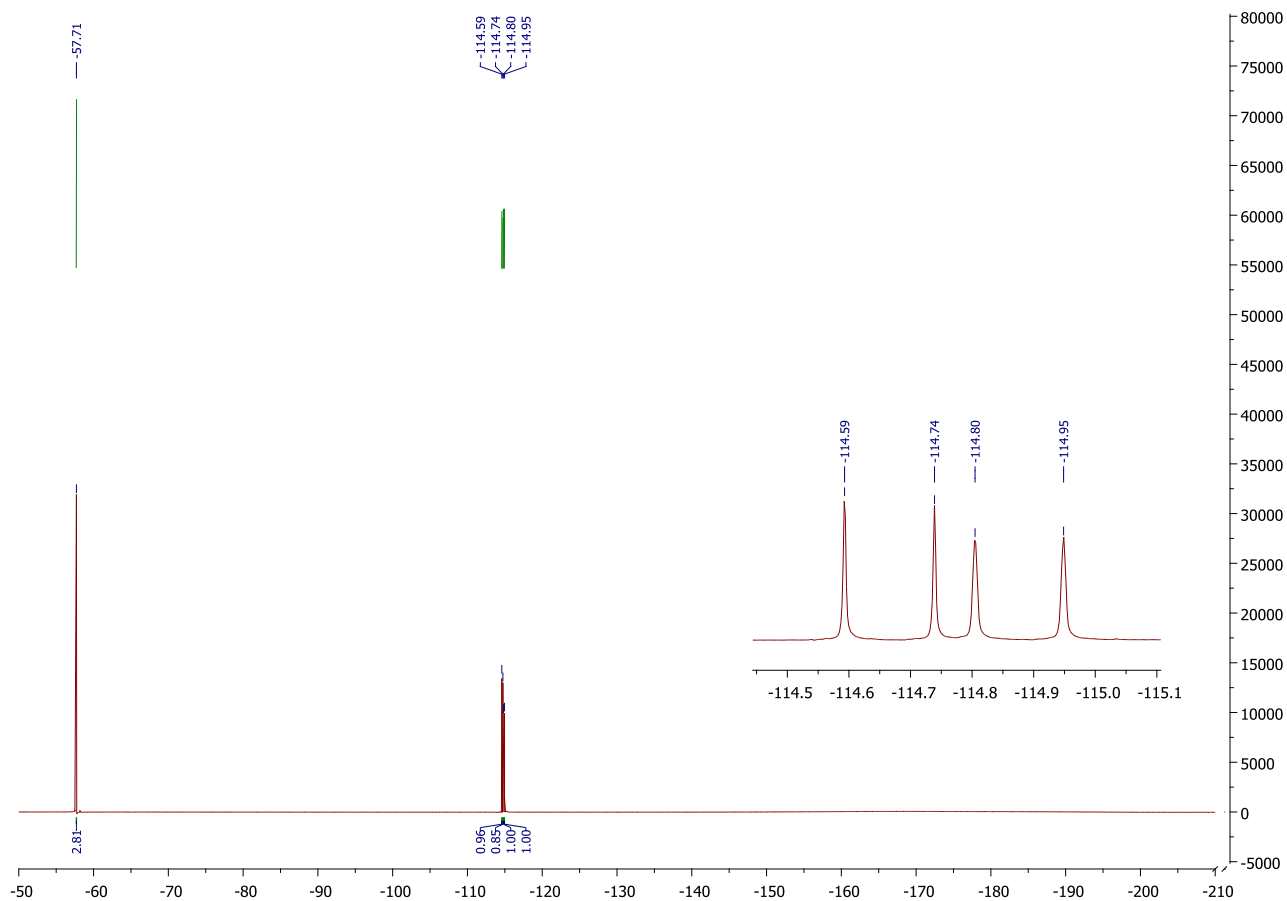
3j



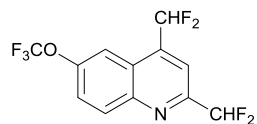
2,4-Bis(difluoromethyl)-6-(trifluoromethoxy)quinoline (3j) - ^{19}F NMR (376 MHz, CDCl_3)



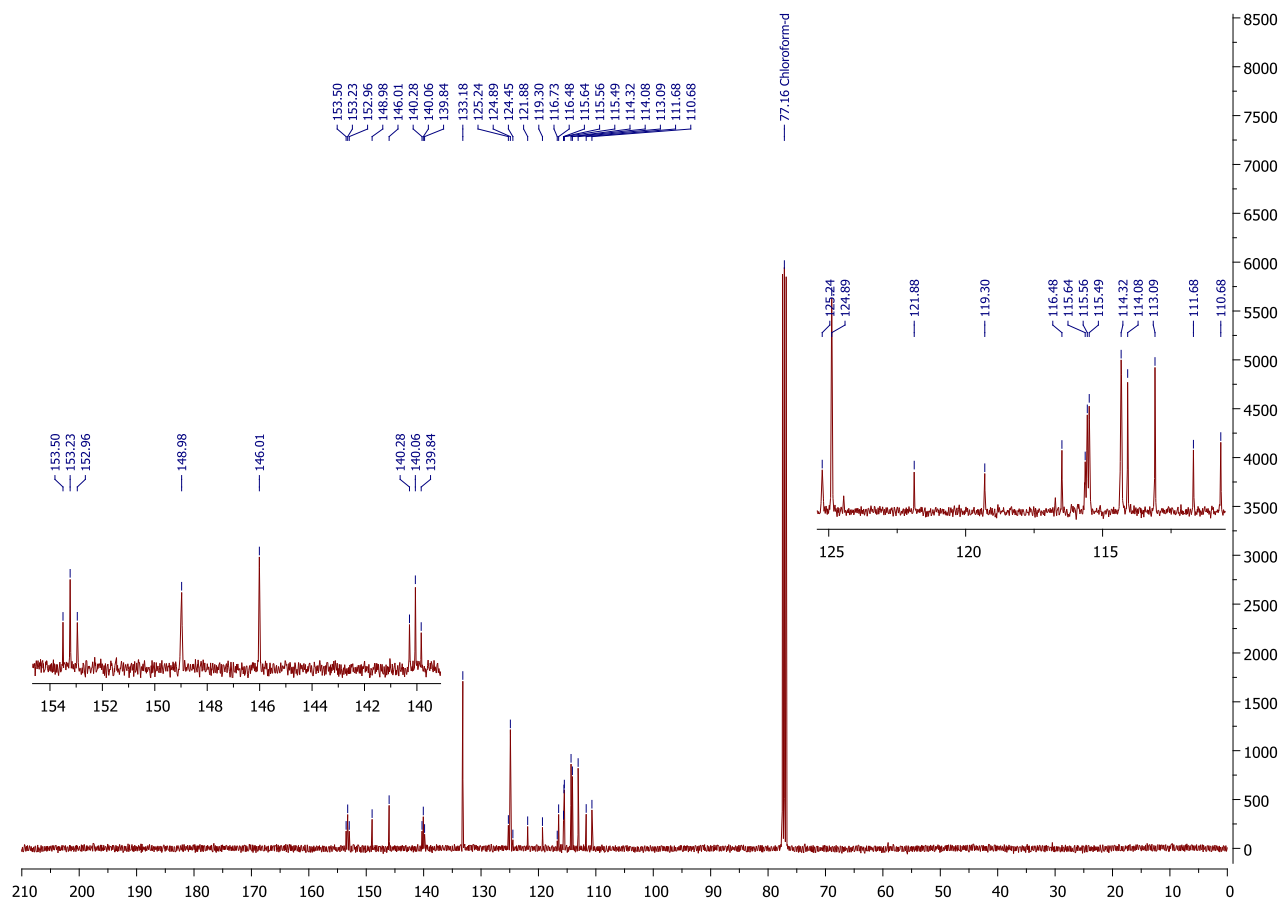
3j



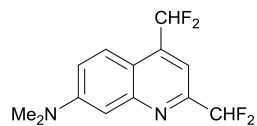
2,4-Bis(difluoromethyl)-6-(trifluoromethoxy)quinoline (3j)- ^{13}C NMR (101 MHz, CDCl_3)



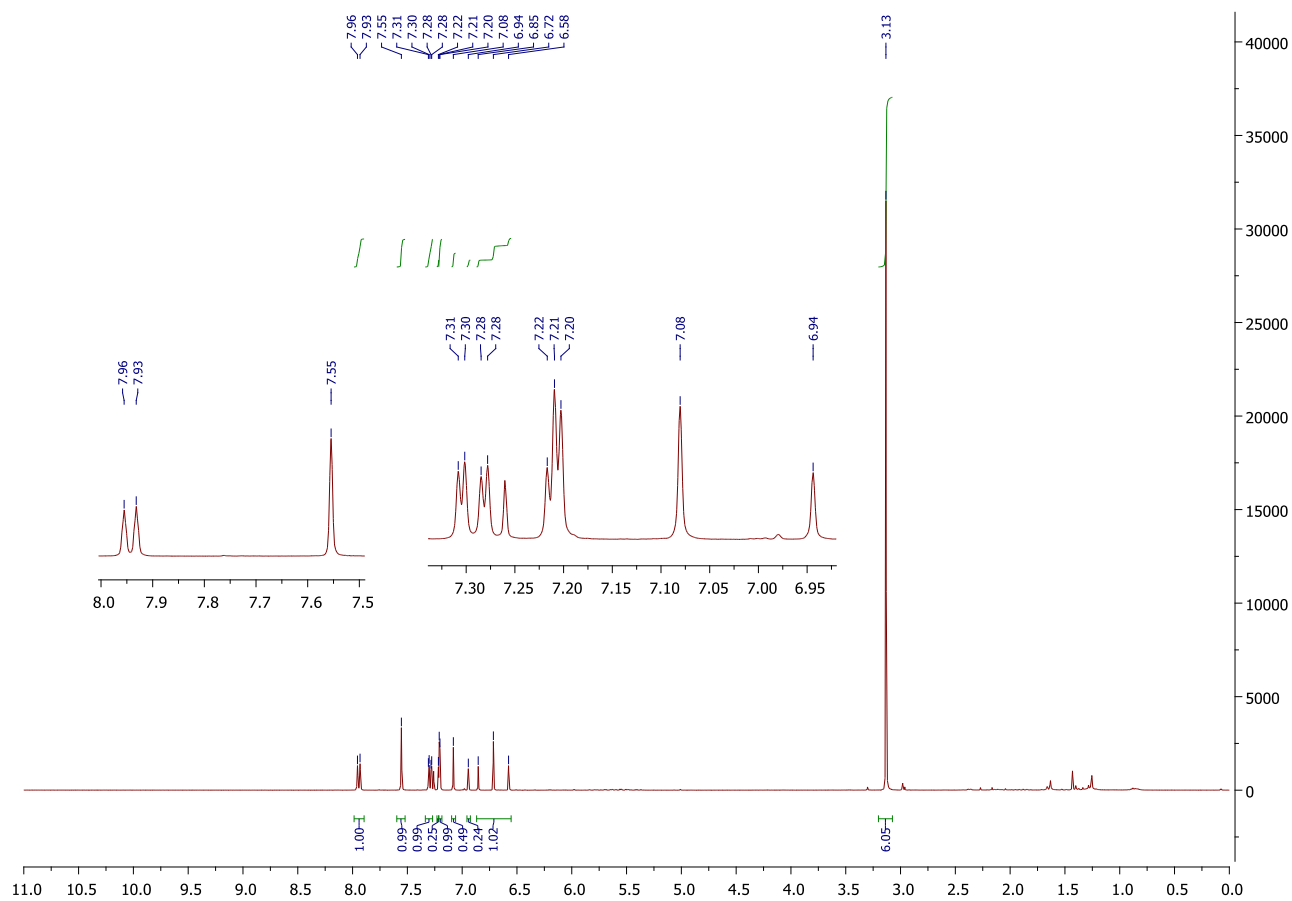
3j



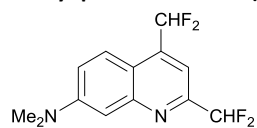
2,4-Bis(difluoromethyl)-*N,N*-dimethylquinolin-7-amine (3k) - ^1H NMR (400 MHz, CDCl_3)



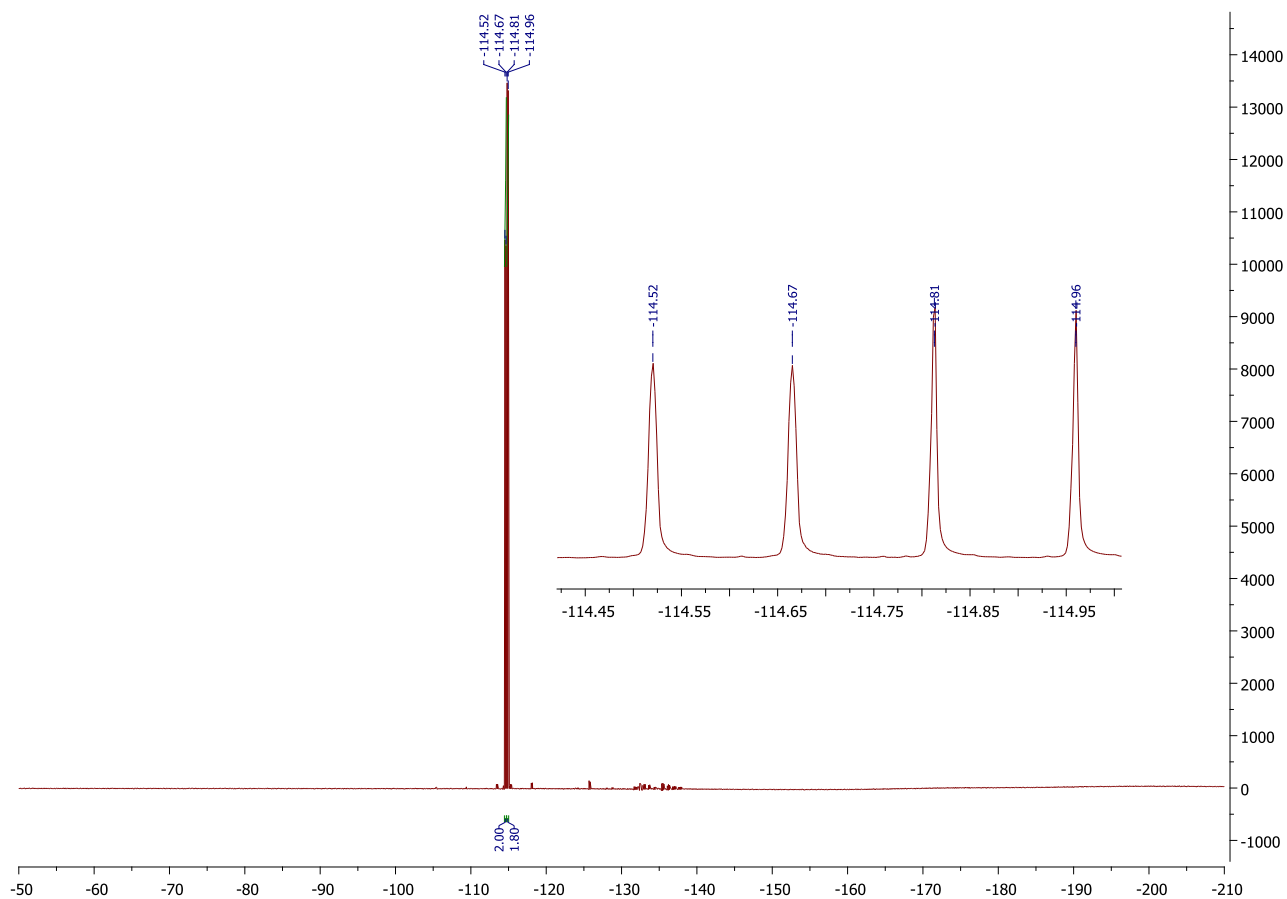
3k



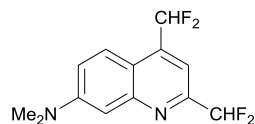
2,4-Bis(difluoromethyl)-*N,N*-dimethylquinolin-7-amine (3k) - ^{19}F NMR (376 MHz, CDCl_3)



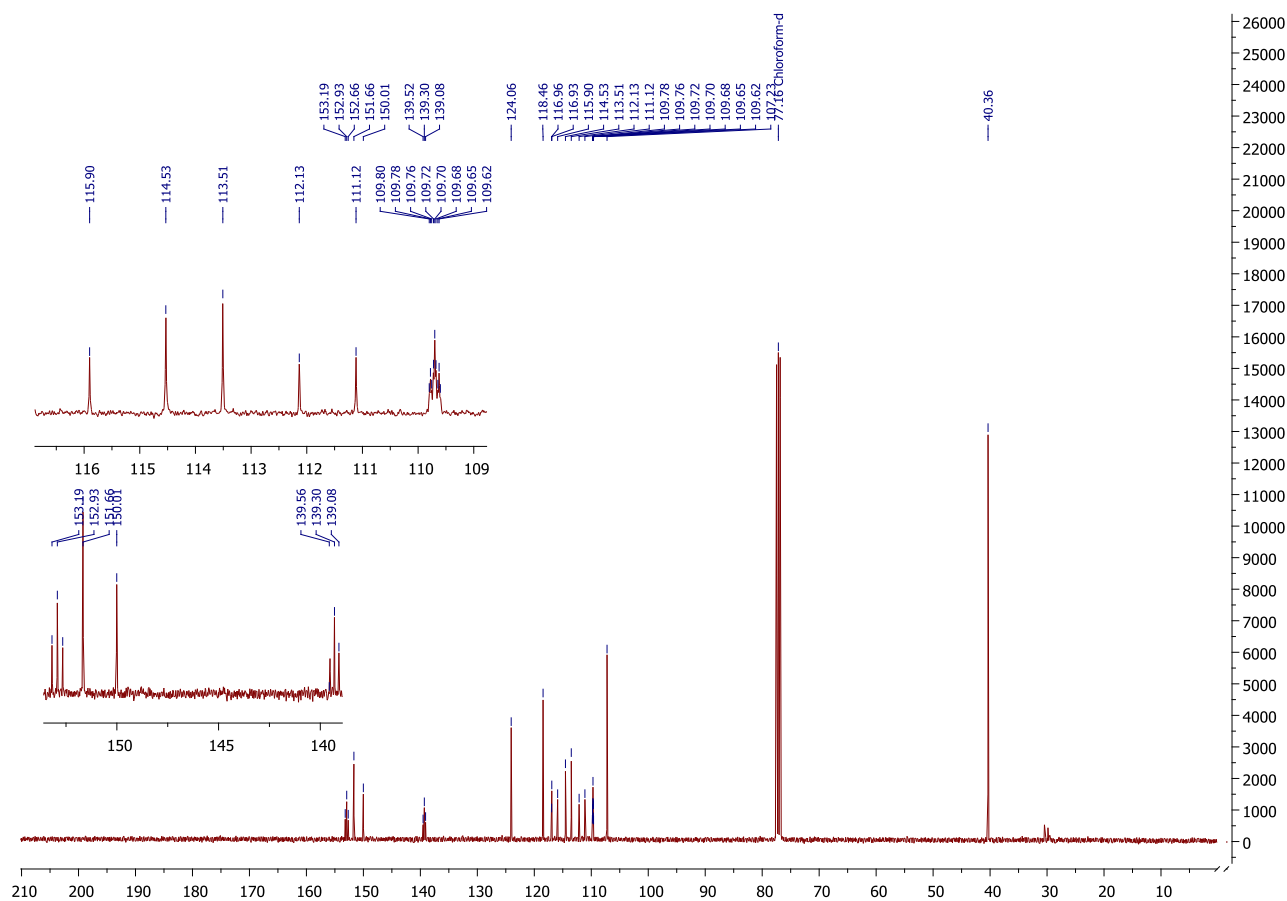
3k



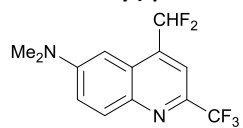
2,4-Bis(difluoromethyl)-*N,N*-dimethylquinolin-7-amine (3k) - ^{13}C NMR (101 MHz, CDCl_3)



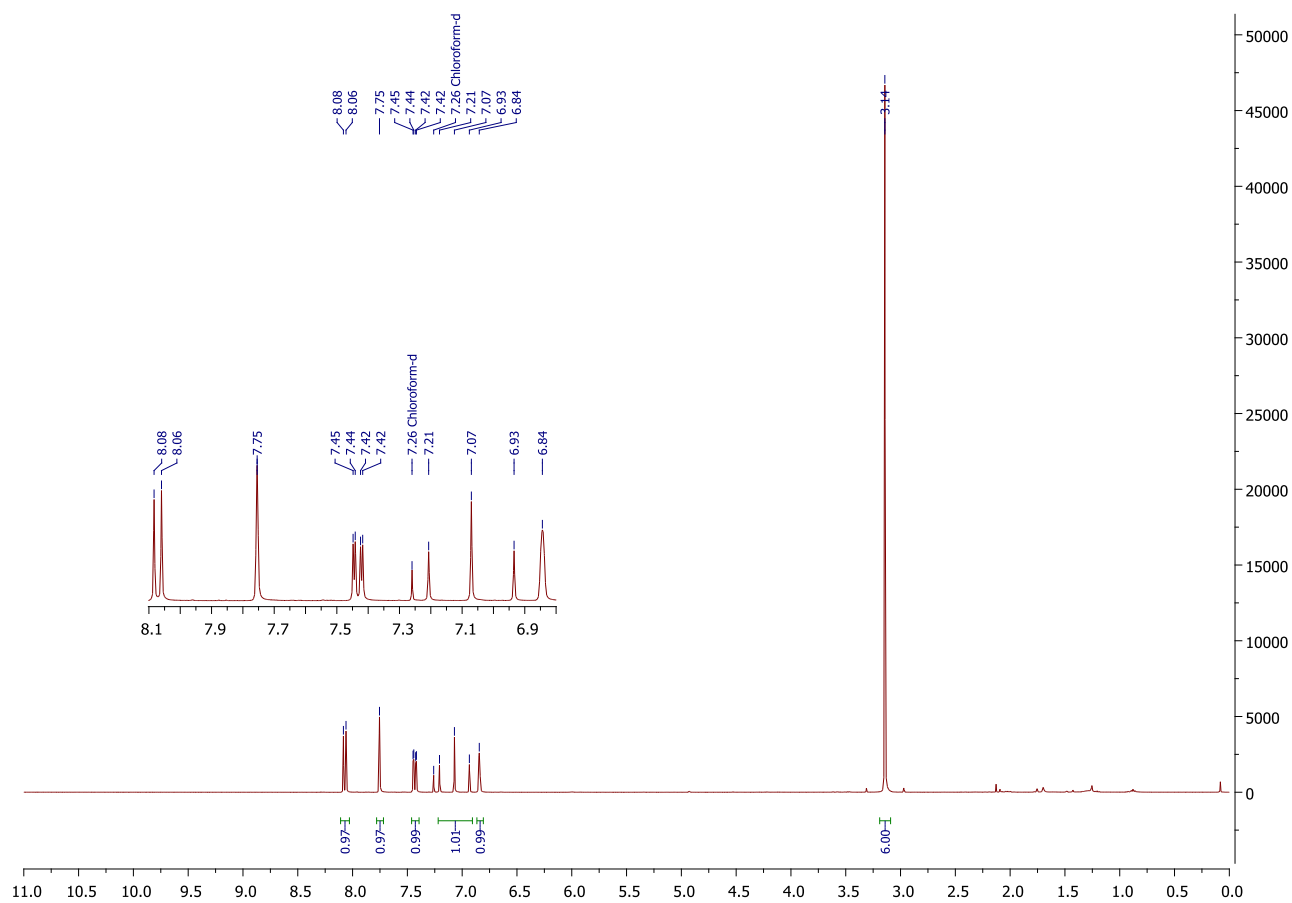
3k



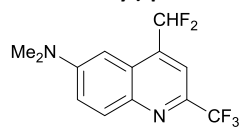
4-(Difluoromethyl)-*N,N*-dimethyl-2-(trifluoromethyl)quinolin-6-amine (2j) - ^1H NMR (400 MHz, CDCl_3)



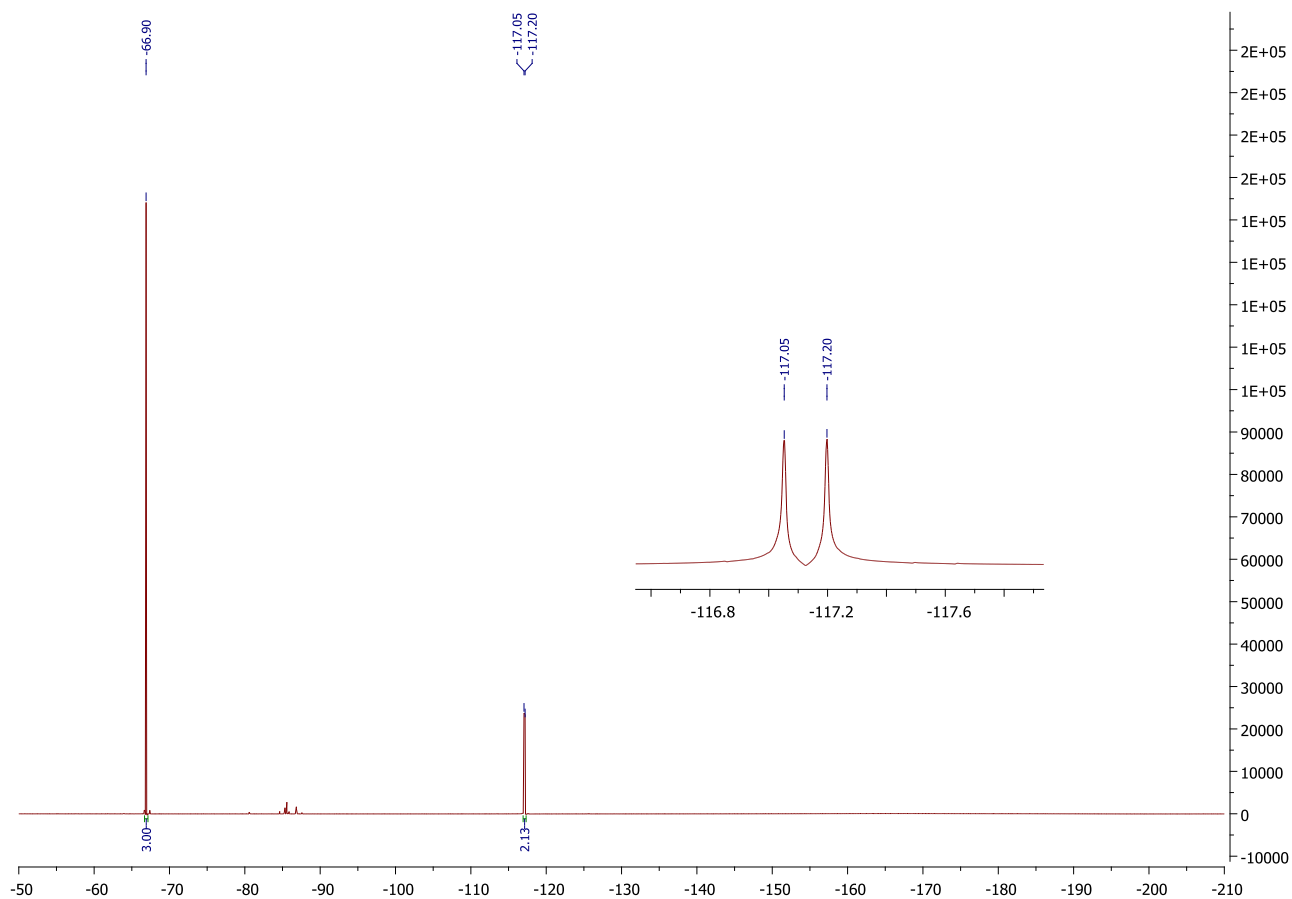
2j



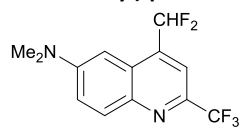
4-(Difluoromethyl)-*N,N*-dimethyl-2-(trifluoromethyl)quinolin-6-amine (2j) - ^{19}F NMR (376 MHz, CDCl_3)



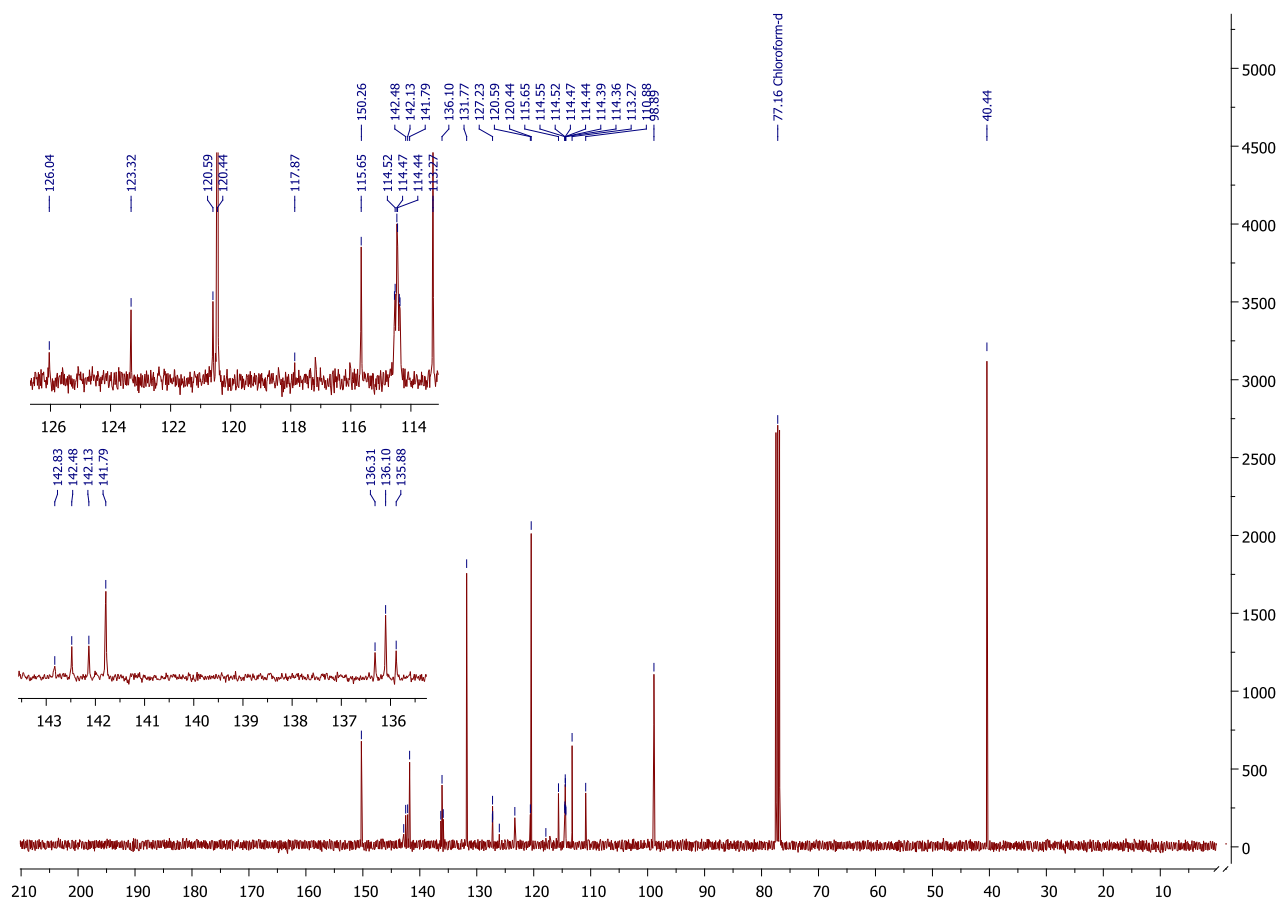
2j



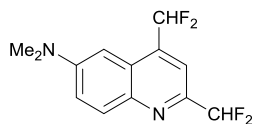
4-(Difluoromethyl)-*N,N*-dimethyl-2-(trifluoromethyl)quinolin-6-amine (2j) - ^{13}C NMR (101 MHz, CDCl_3)



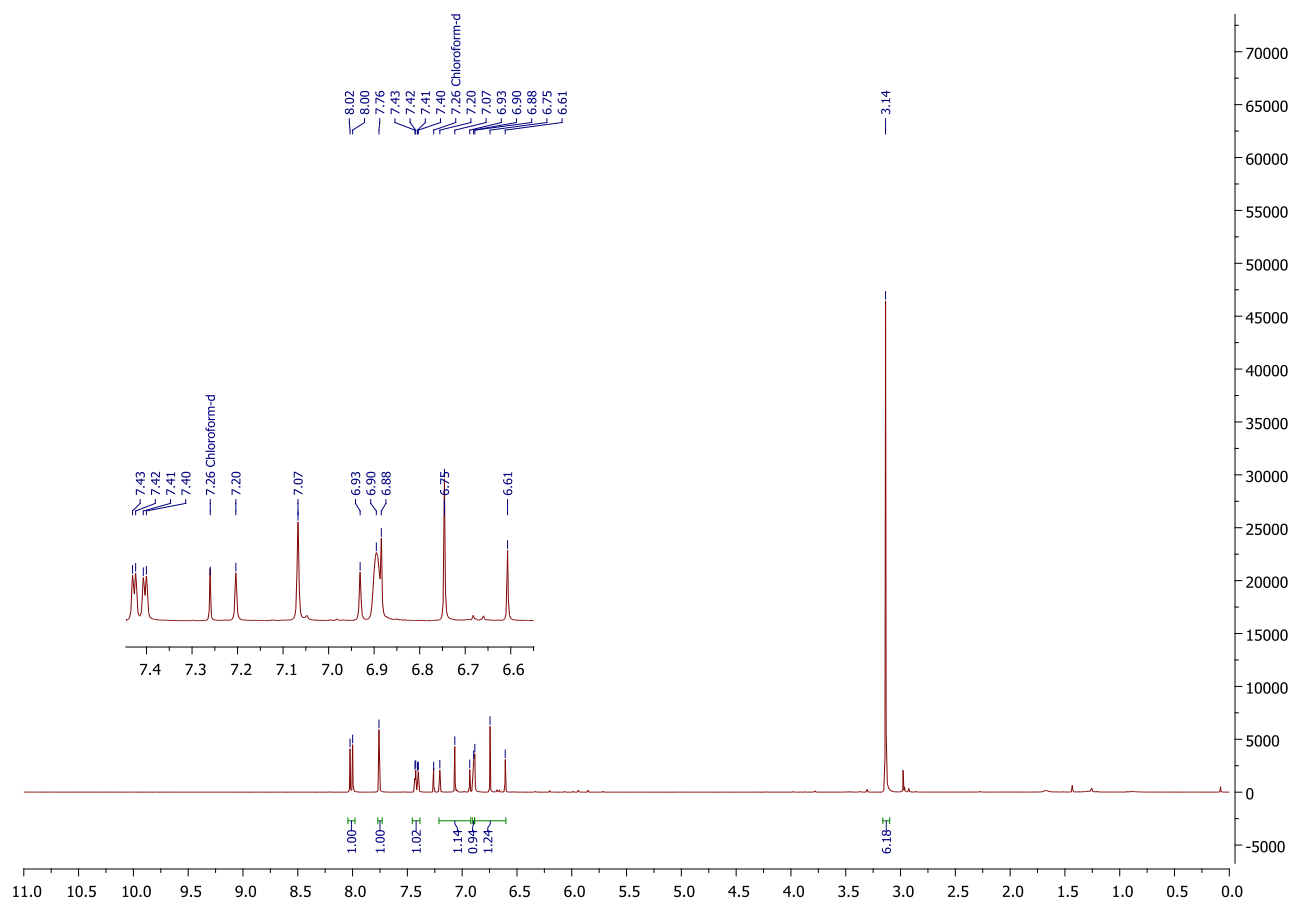
2j



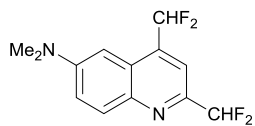
2,4-Bis(difluoromethyl)-*N,N*-dimethylquinolin-6-amine (3I) - ^1H NMR (400 MHz, CDCl_3)



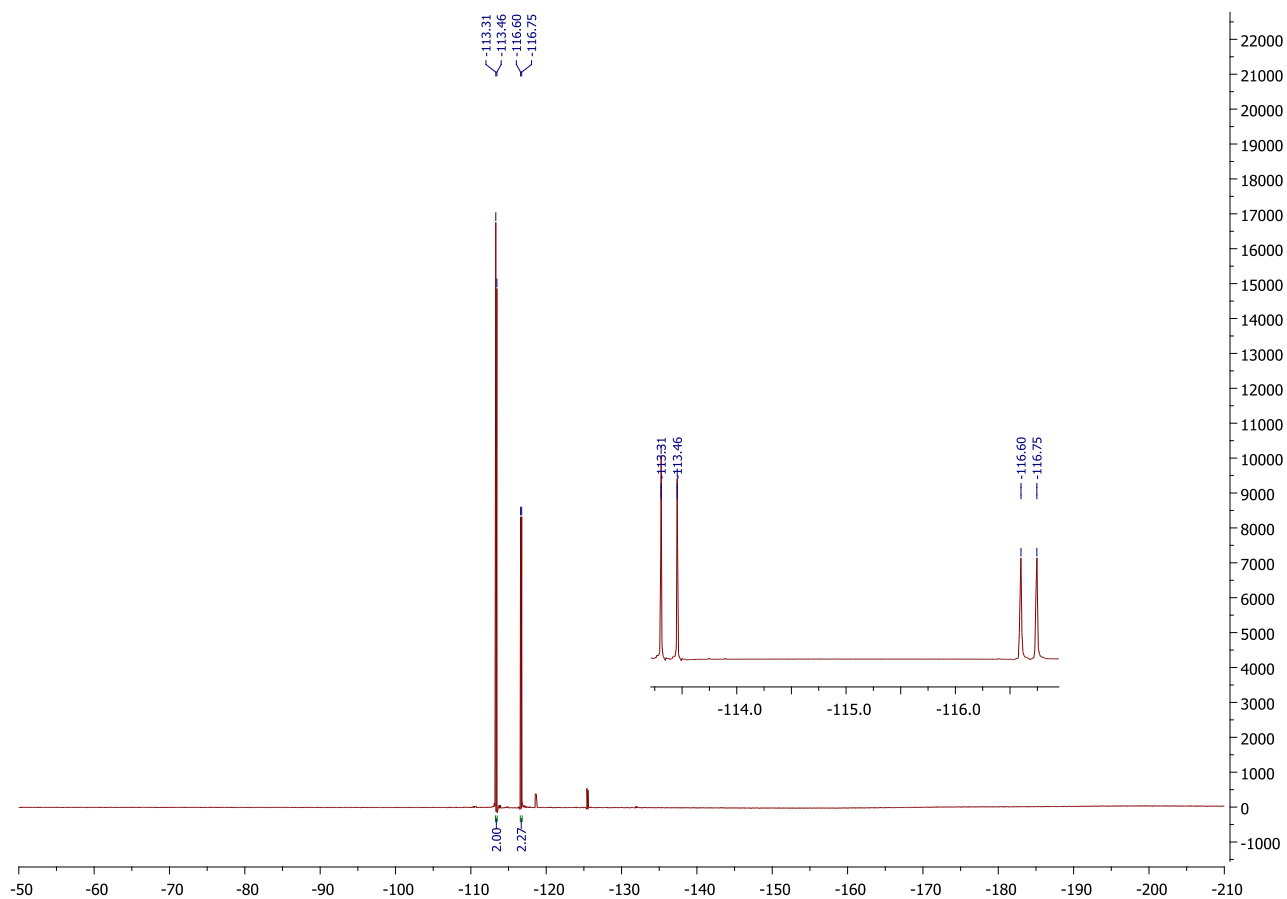
3I



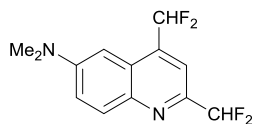
2,4-Bis(difluoromethyl)-*N,N*-dimethylquinolin-6-amine (3l) - ^{19}F NMR (376 MHz, CDCl_3)



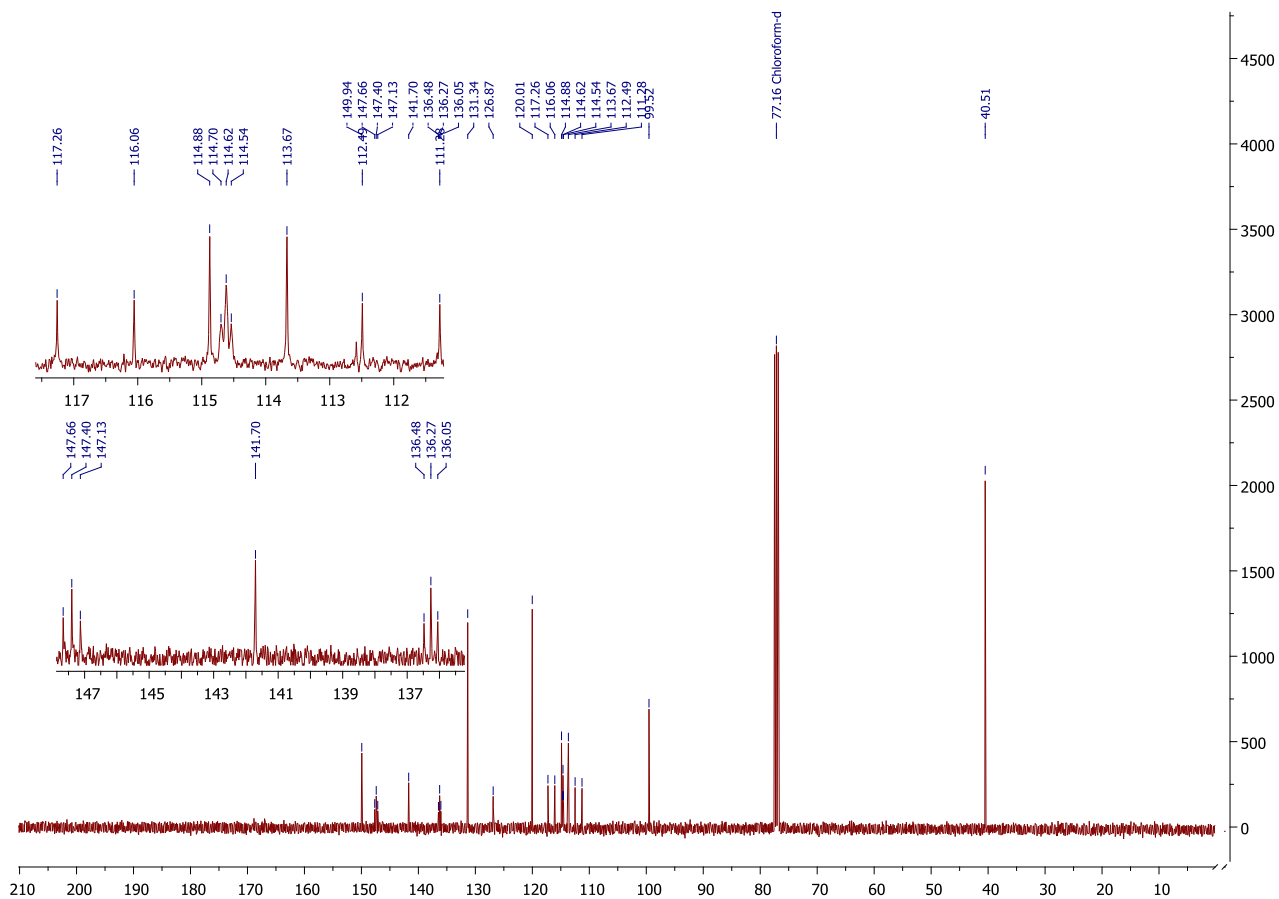
3l



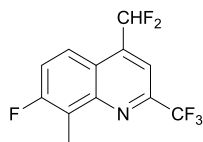
2,4-Bis(difluoromethyl)-*N,N*-dimethylquinolin-6-amine (3I) - ^{13}C NMR (101 MHz, CDCl_3)



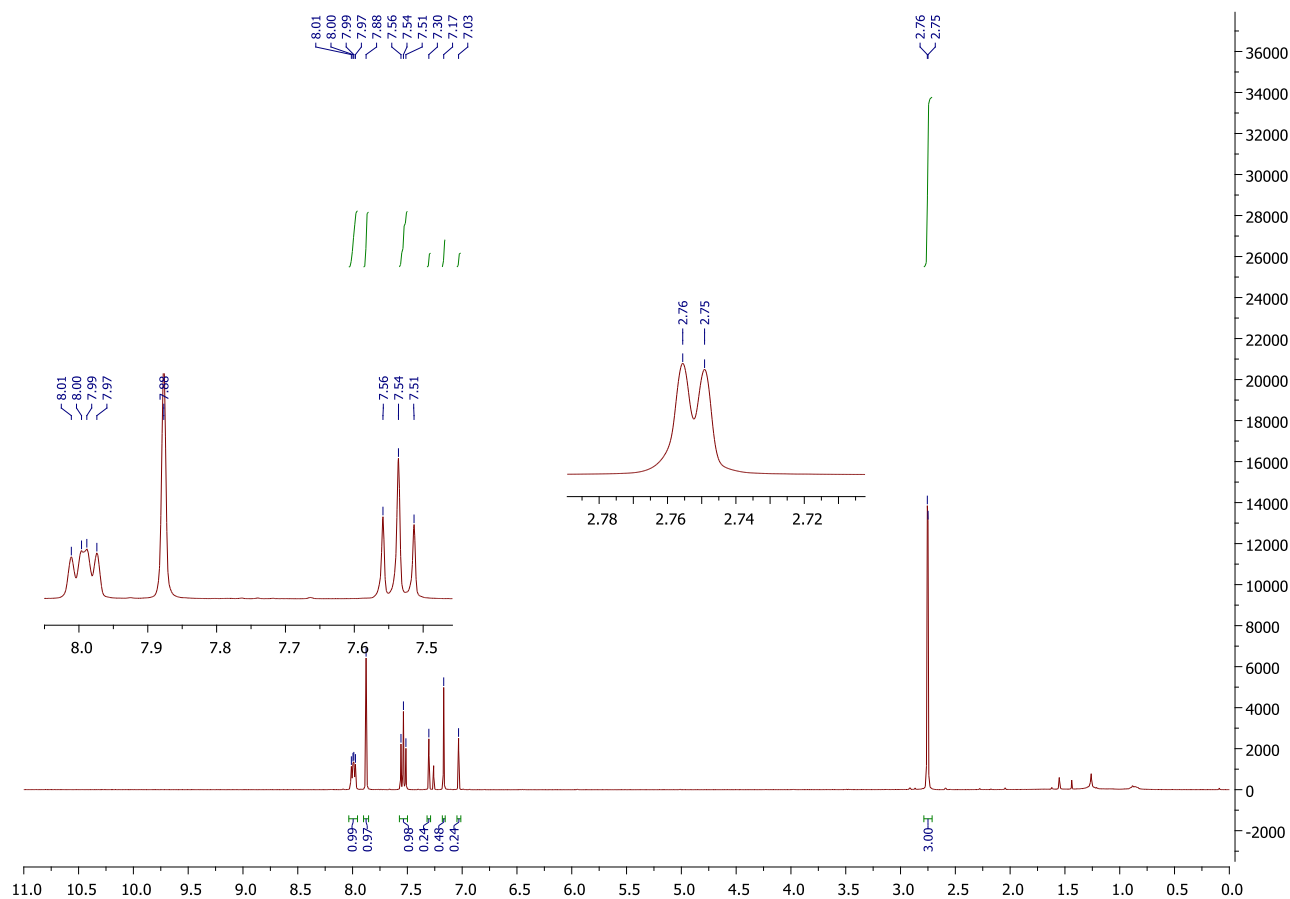
3I



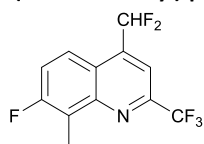
4-(Difluoromethyl)-7-fluoro-8-methyl-2-(trifluoromethyl)quinoline (2k) - ^1H NMR (400 MHz, CDCl_3)



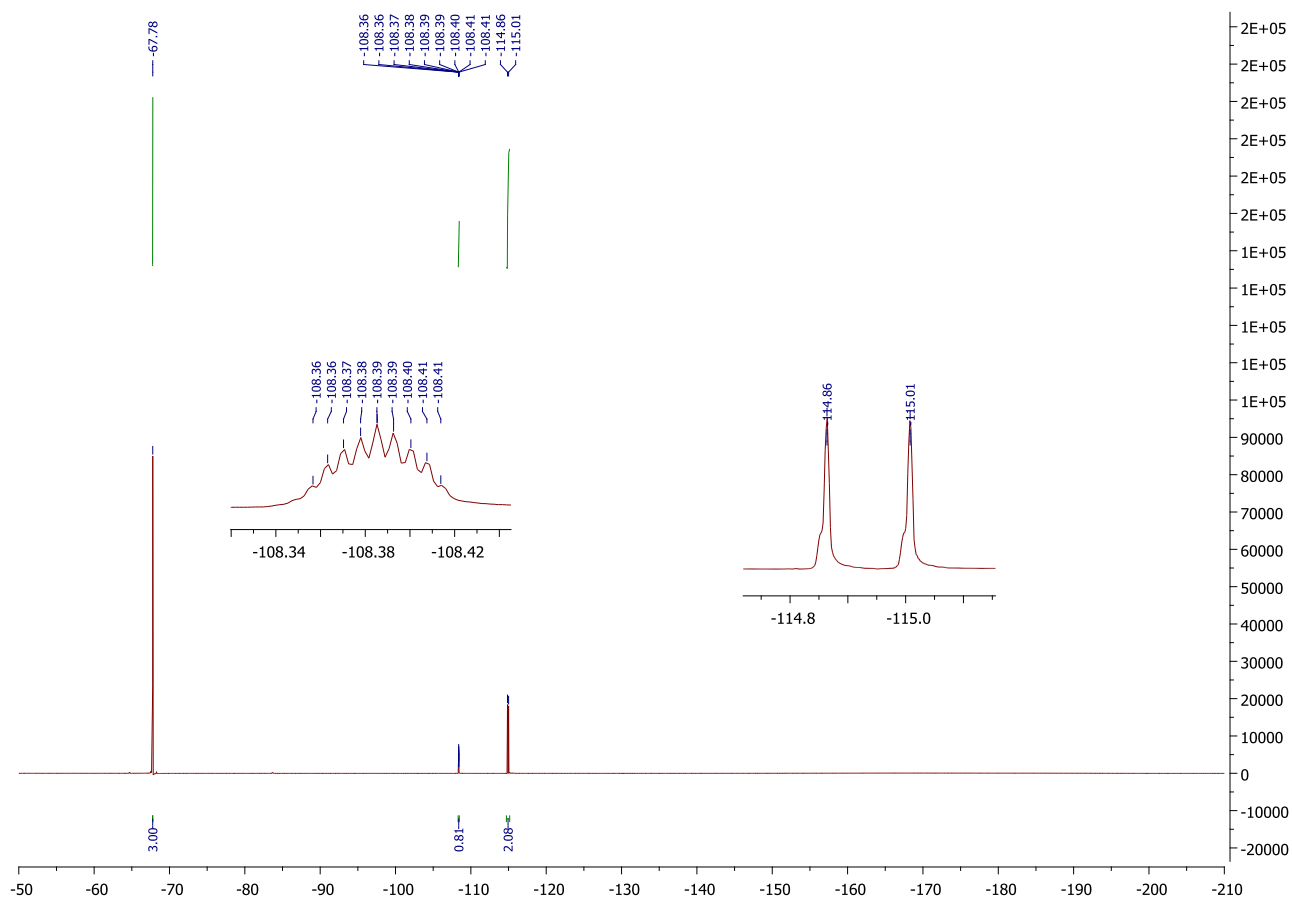
2k



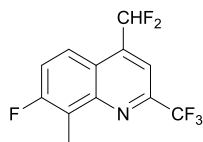
4-(Difluoromethyl)-7-fluoro-8-methyl-2-(trifluoromethyl)quinoline (2k) - ^{19}F NMR (376 MHz, CDCl_3)



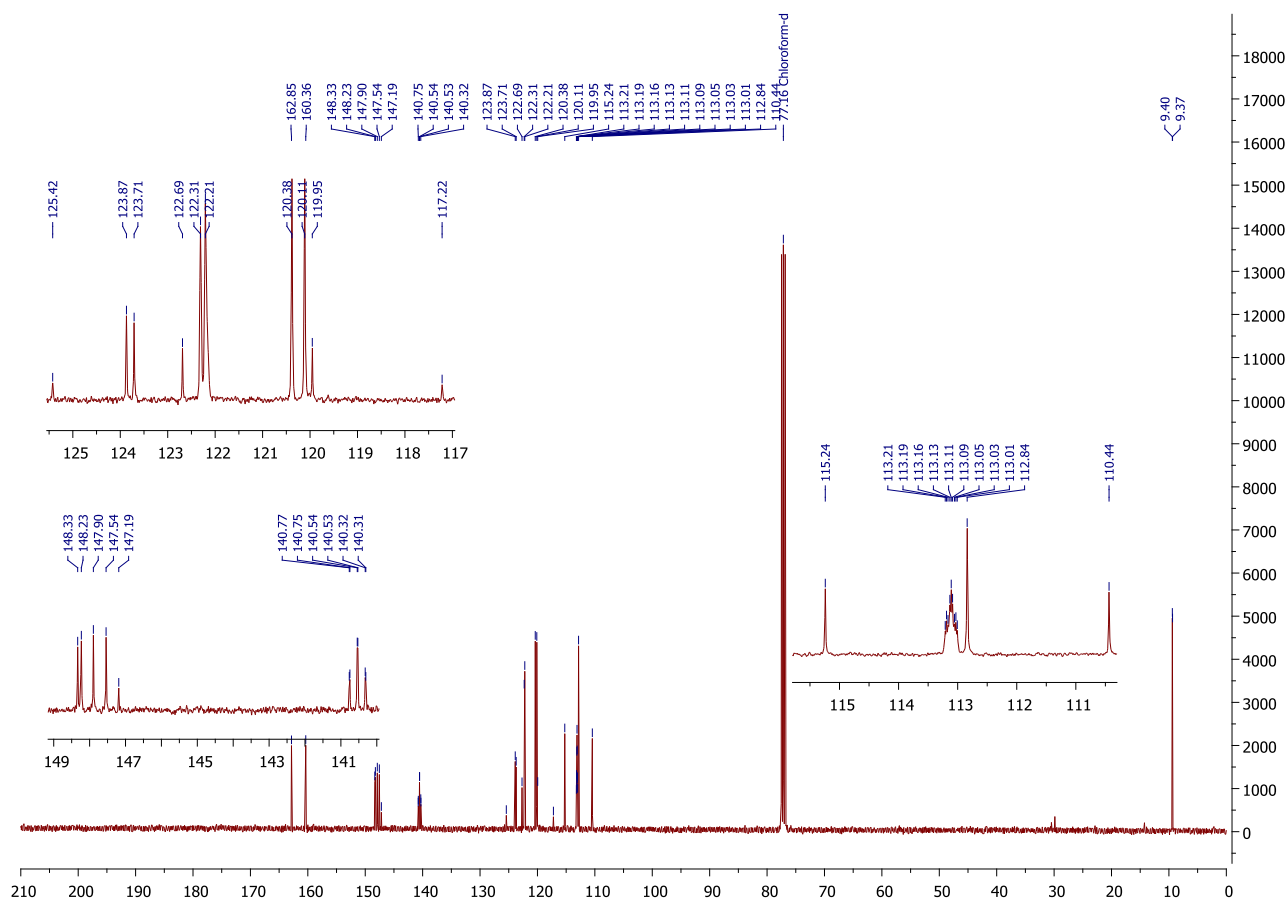
2k



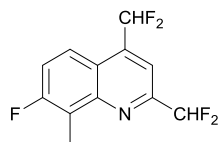
4-(Difluoromethyl)-7-fluoro-8-methyl-2-(trifluoromethyl)quinoline (2k) - ^{13}C NMR (101 MHz, CDCl_3)



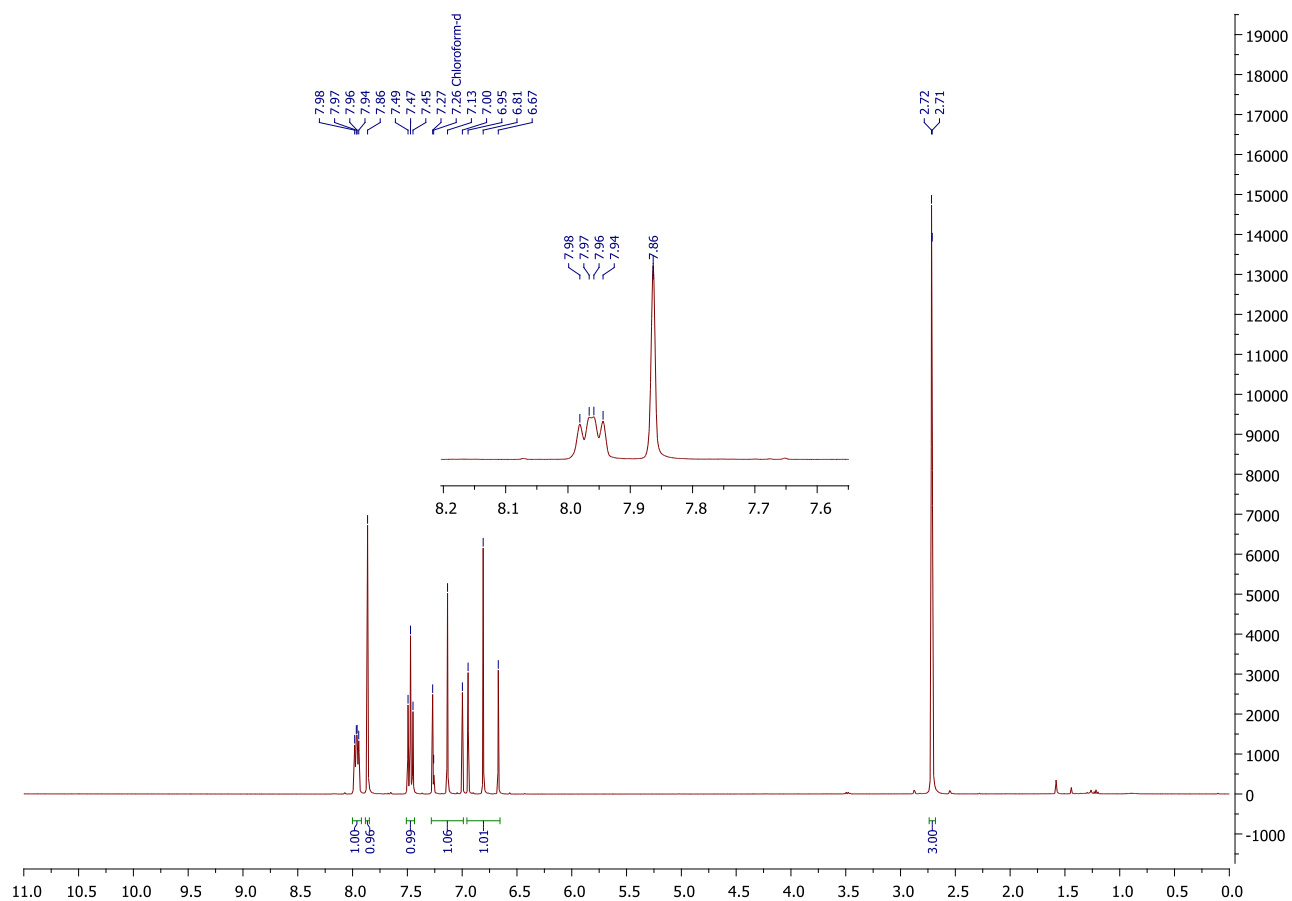
2k



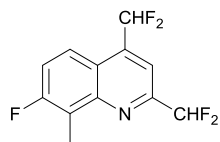
2,4-Bis(difluoromethyl)-7-fluoro-8-methylquinoline (3m) - ^1H NMR (400 MHz, CDCl_3)



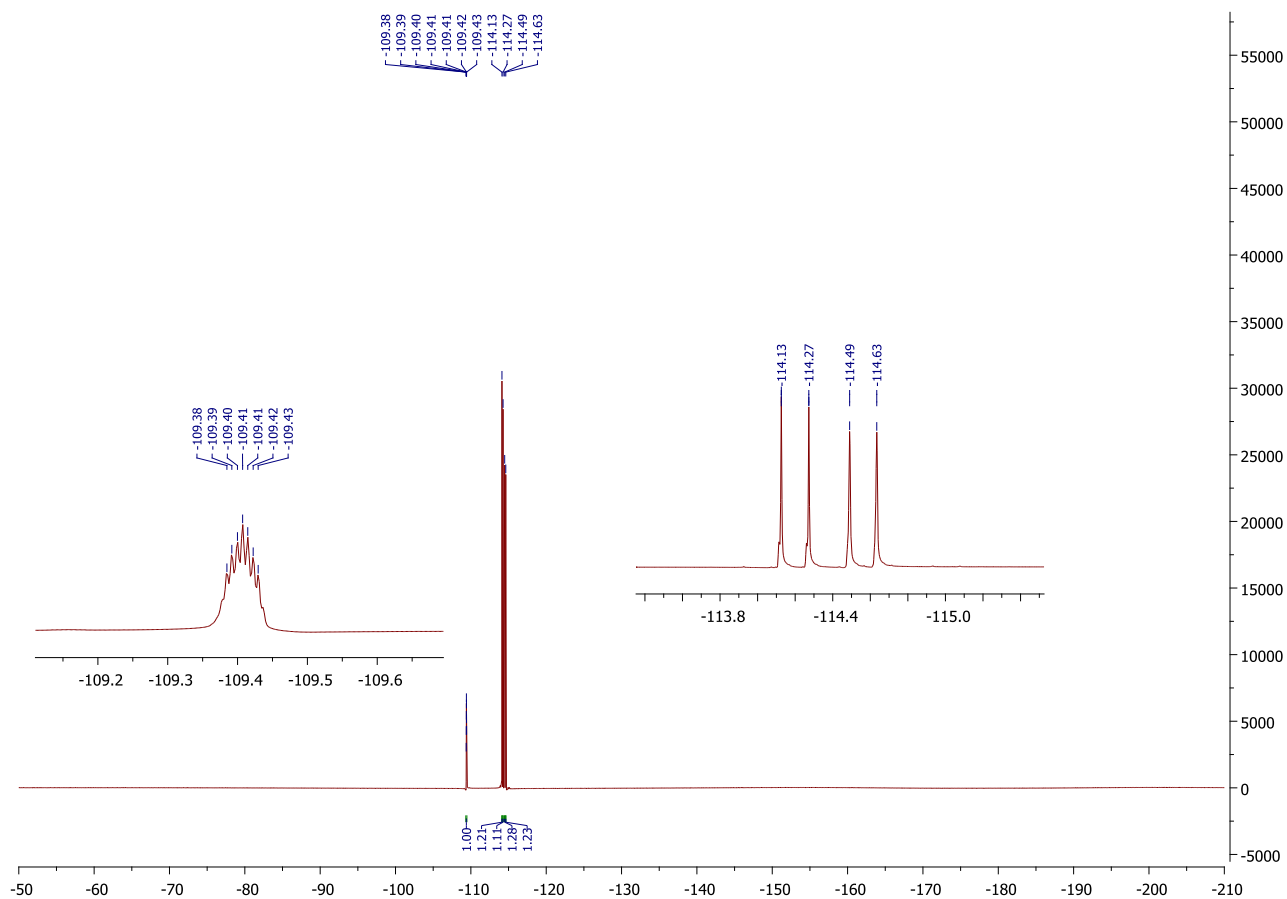
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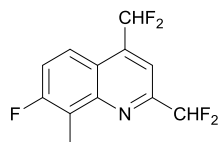
2,4-Bis(difluoromethyl)-7-fluoro-8-methylquinoline (3m) - ^{19}F NMR (376 MHz, CDCl_3)



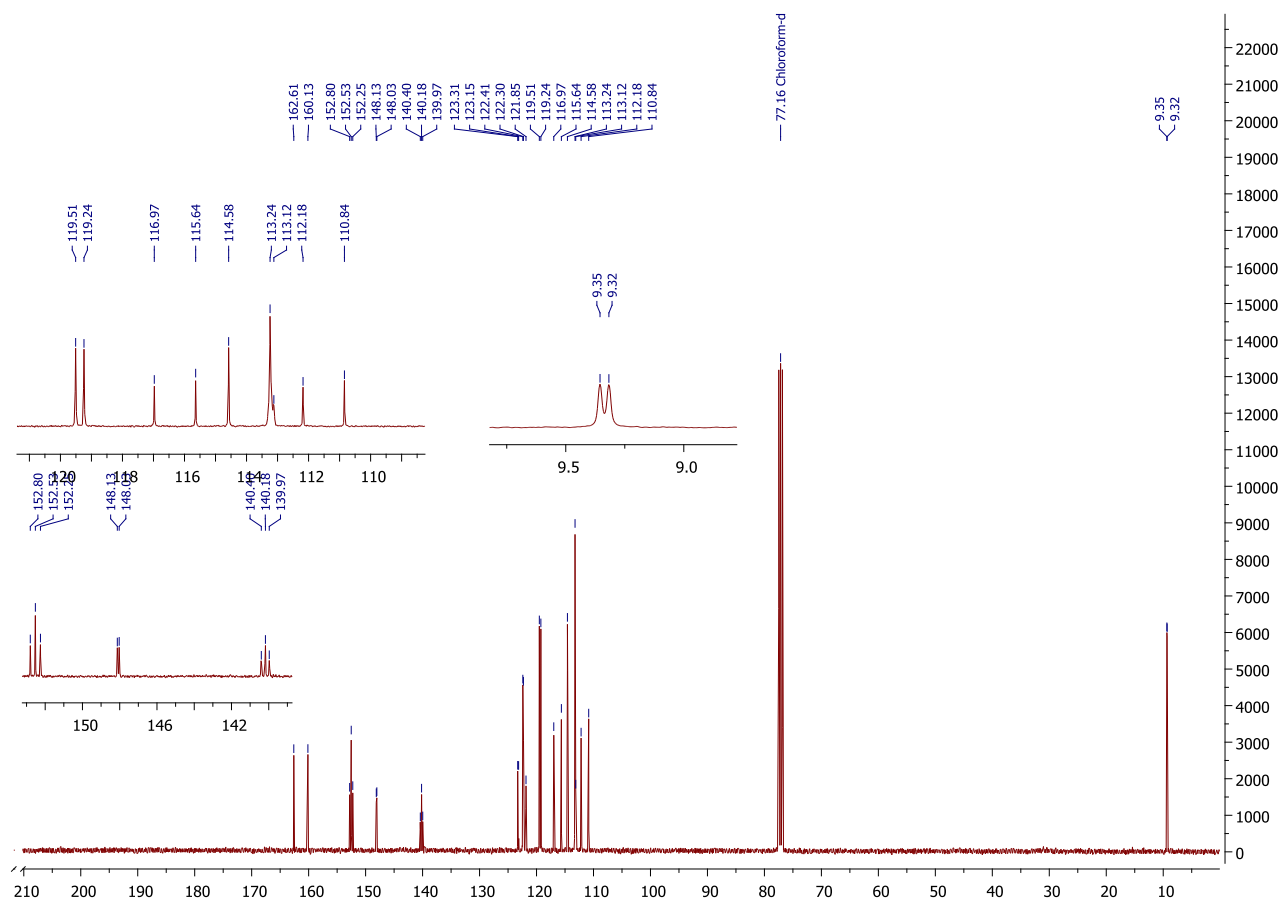
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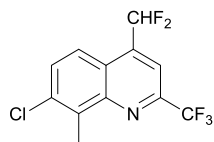
2,4-Bis(difluoromethyl)-7-fluoro-8-methylquinoline (3m) - ^{13}C NMR (101 MHz, CDCl_3)



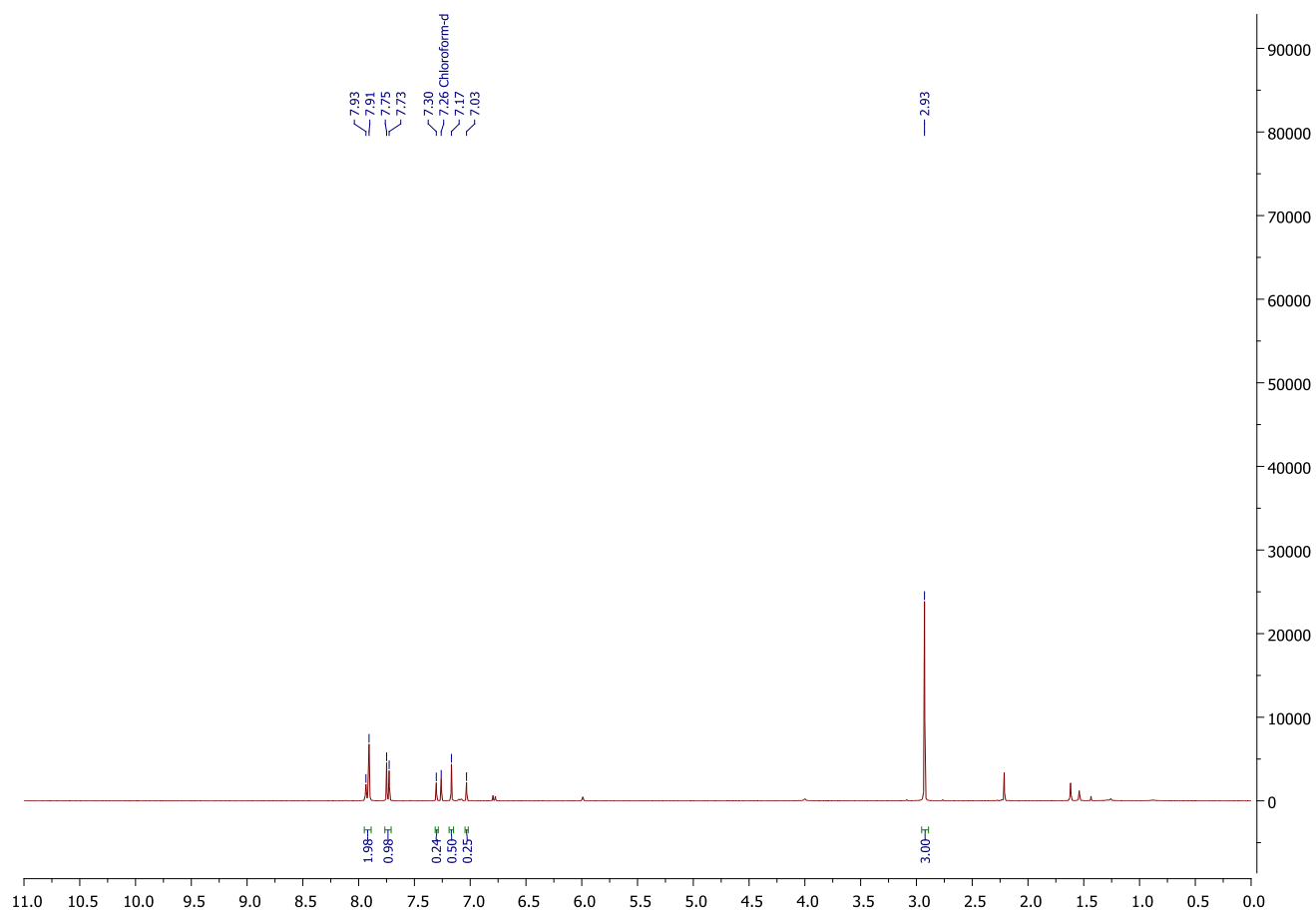
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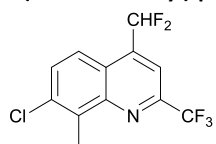
7-Chloro-4-(difluoromethyl)-8-methyl-2-(trifluoromethyl)quinoline (2l) - ^1H NMR (400 MHz, CDCl_3)



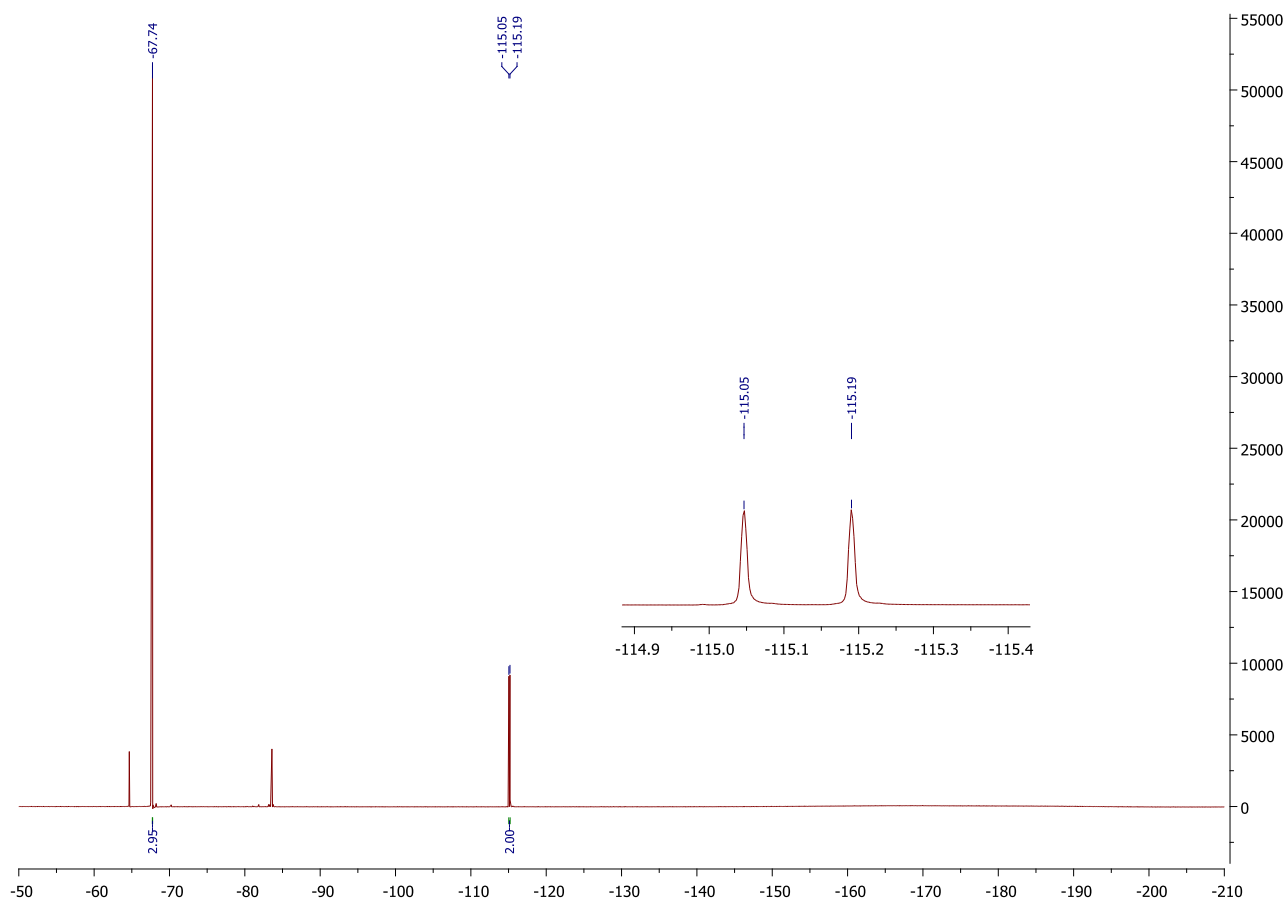
2l



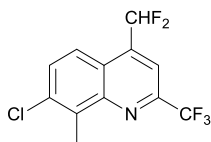
7-Chloro-4-(difluoromethyl)-8-methyl-2-(trifluoromethyl)quinoline (2I) - ^{19}F NMR (376 MHz, CDCl_3)



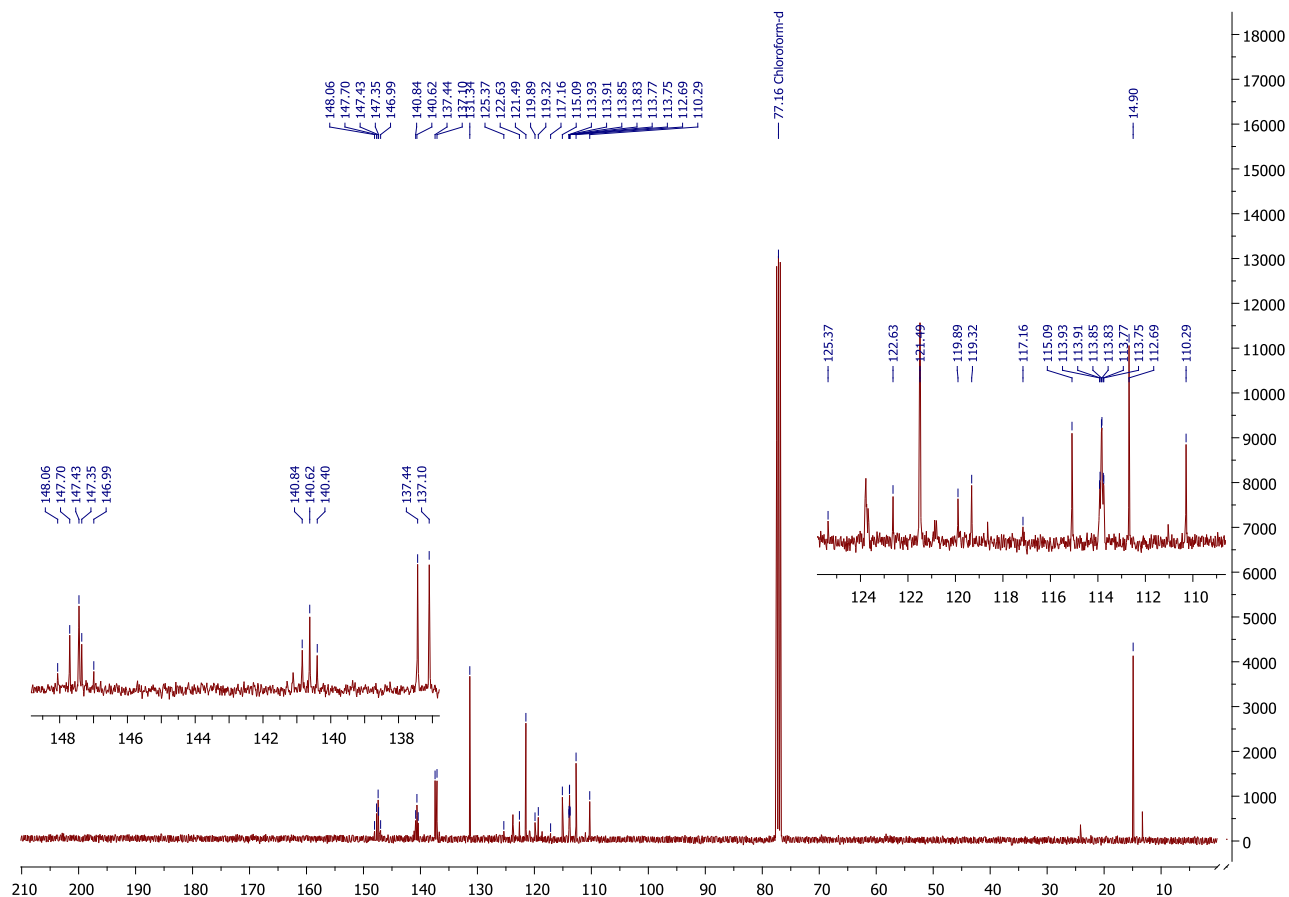
2I



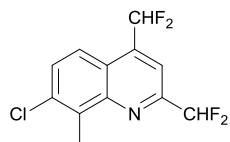
7-Chloro-4-(difluoromethyl)-8-methyl-2-(trifluoromethyl)quinoline (2I)- ^{13}C NMR (101 MHz, CDCl_3)



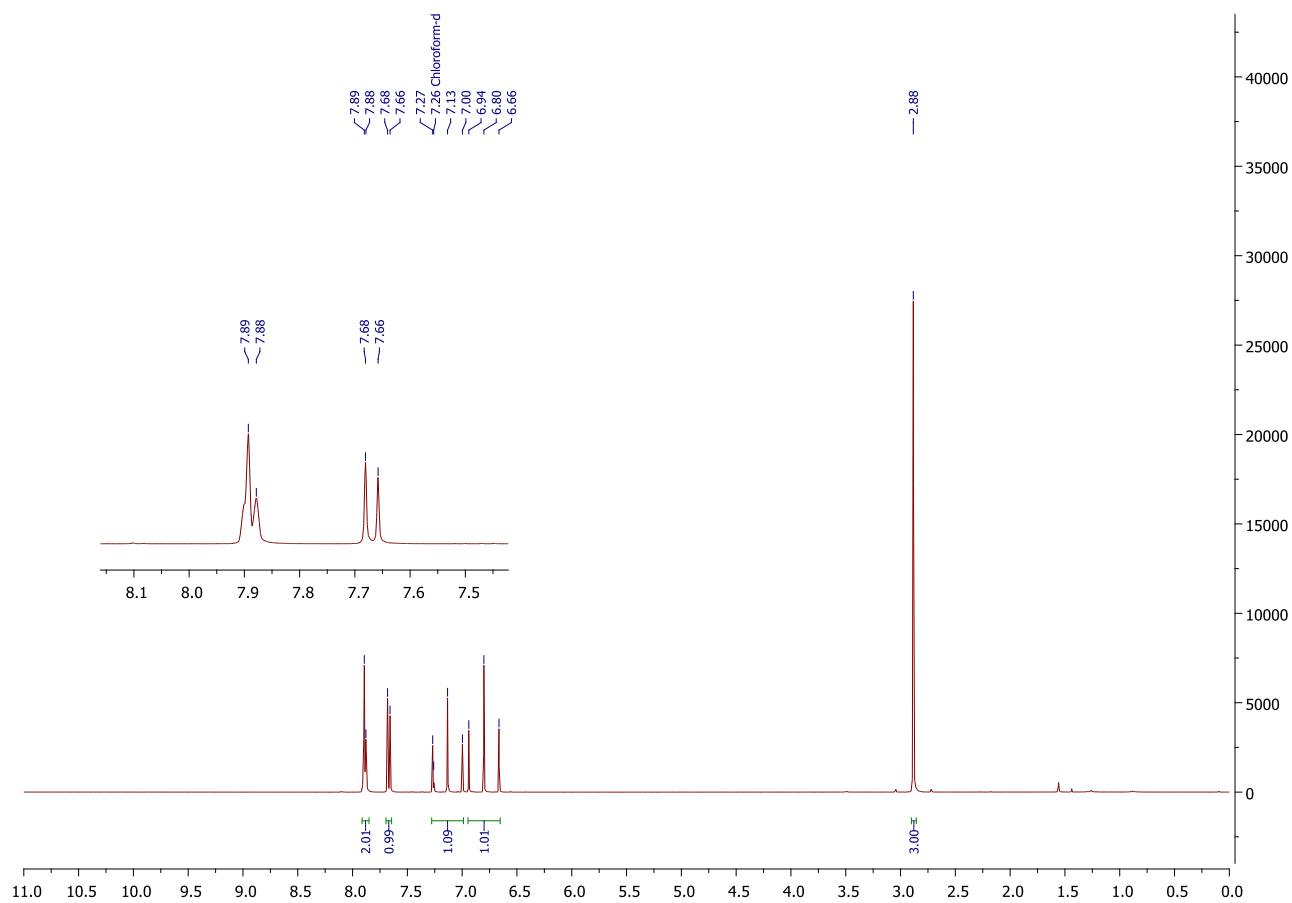
2I



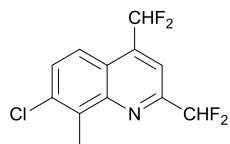
7-Chloro-2,4-bis(difluoromethyl)-8-methylquinoline (3n) - ^1H NMR (400 MHz, CDCl_3)



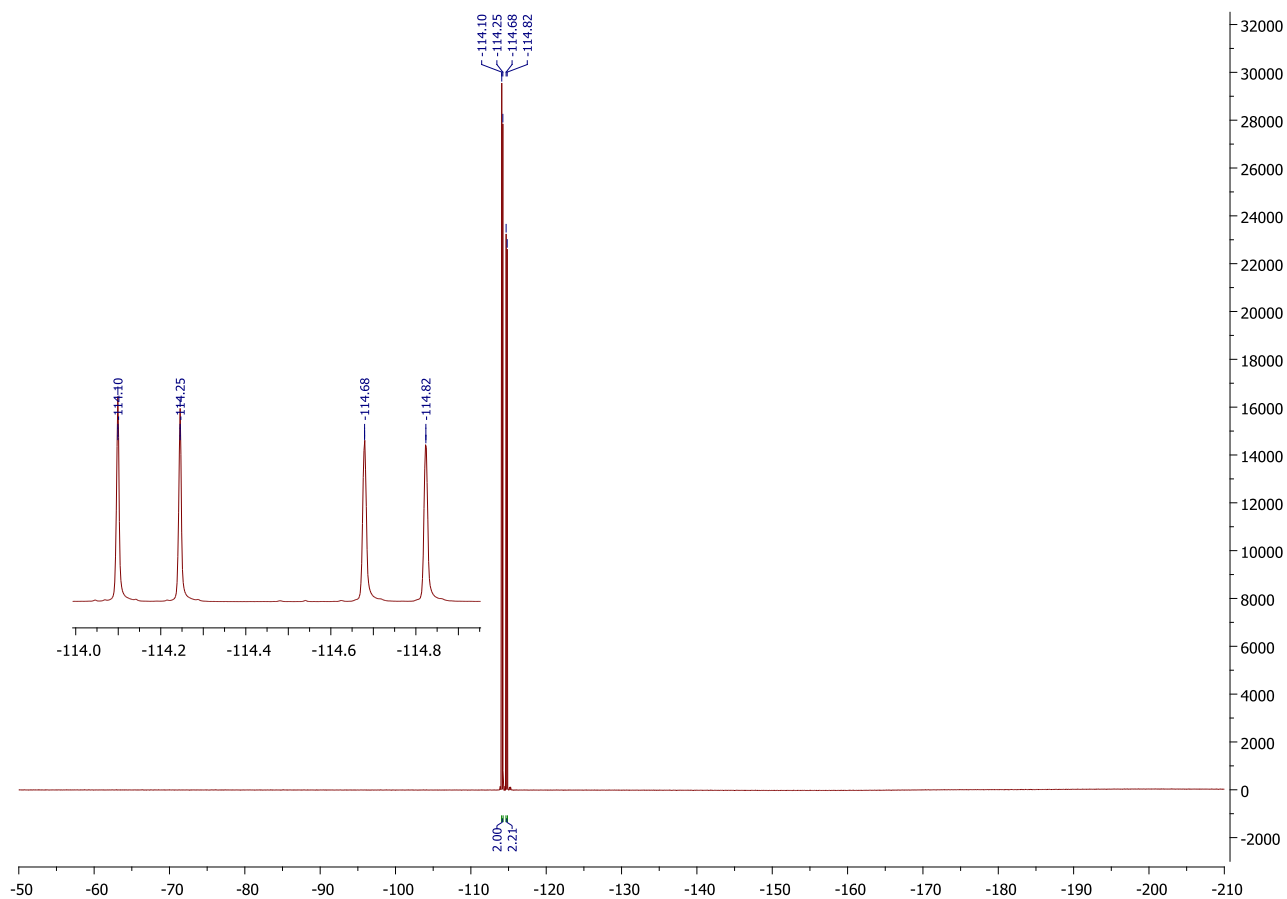
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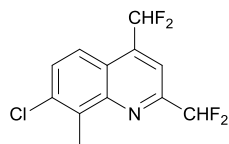
7-Chloro-2,4-bis(difluoromethyl)-8-methylquinoline (3n) - ^{19}F NMR (376 MHz, CDCl_3)



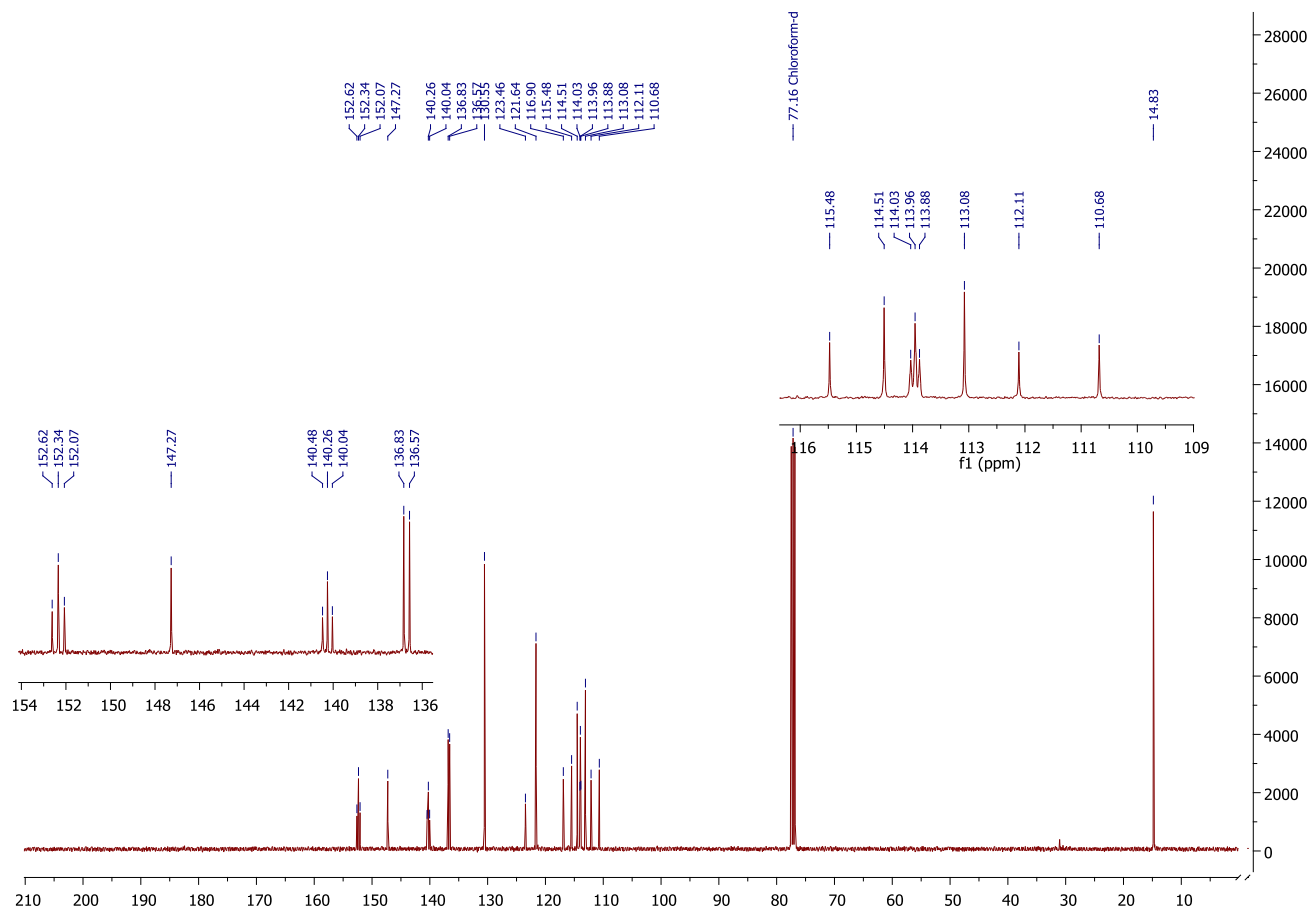
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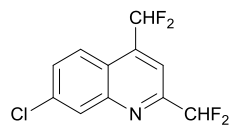
7-Chloro-2,4-bis(difluoromethyl)-8-methylquinoline (3n) - ^{13}C NMR (101 MHz, CDCl_3)



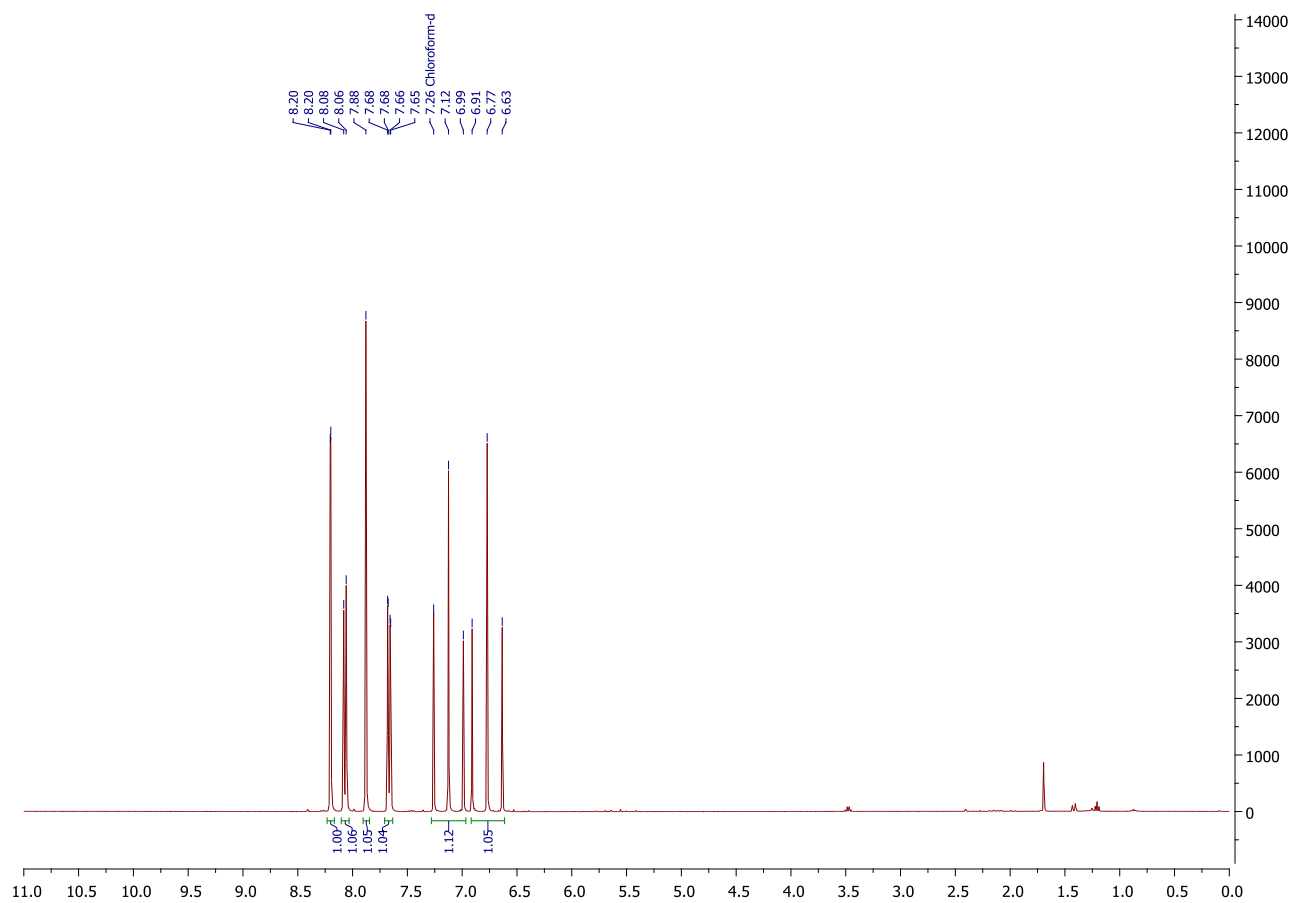
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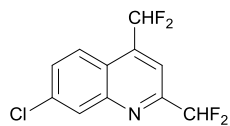
7-Chloro-2,4-bis(difluoromethyl)quinoline (3o) - ^1H NMR (400 MHz, CDCl_3)



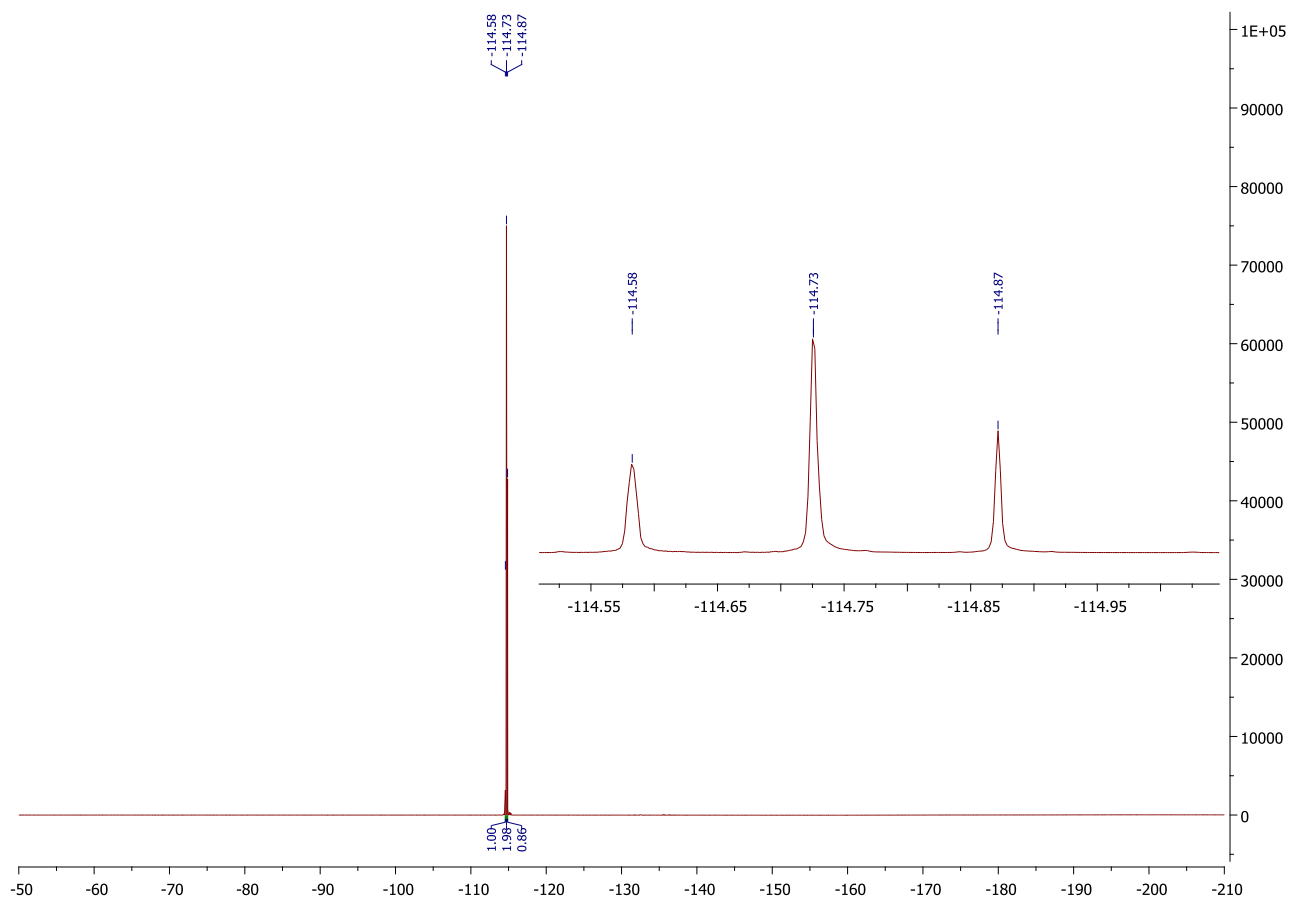
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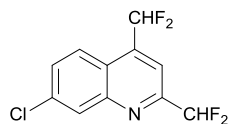
7-Chloro-2,4-bis(difluoromethyl)quinoline (3o) - ^{19}F NMR (376 MHz, CDCl_3)



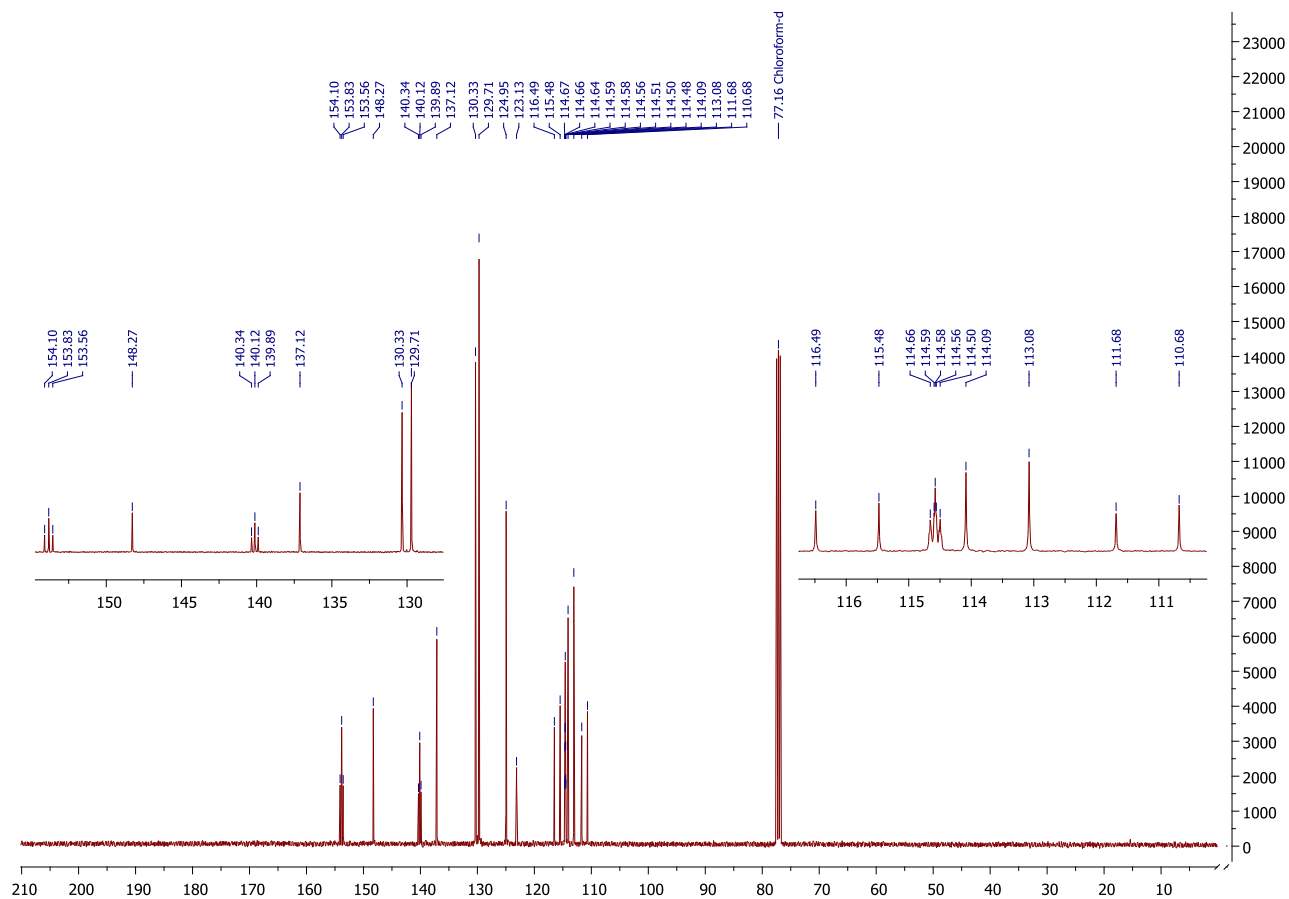
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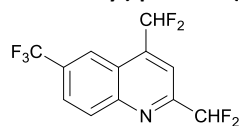
7-Chloro-2,4-bis(difluoromethyl)quinoline (3o) - ^{13}C NMR (101 MHz, CDCl_3)



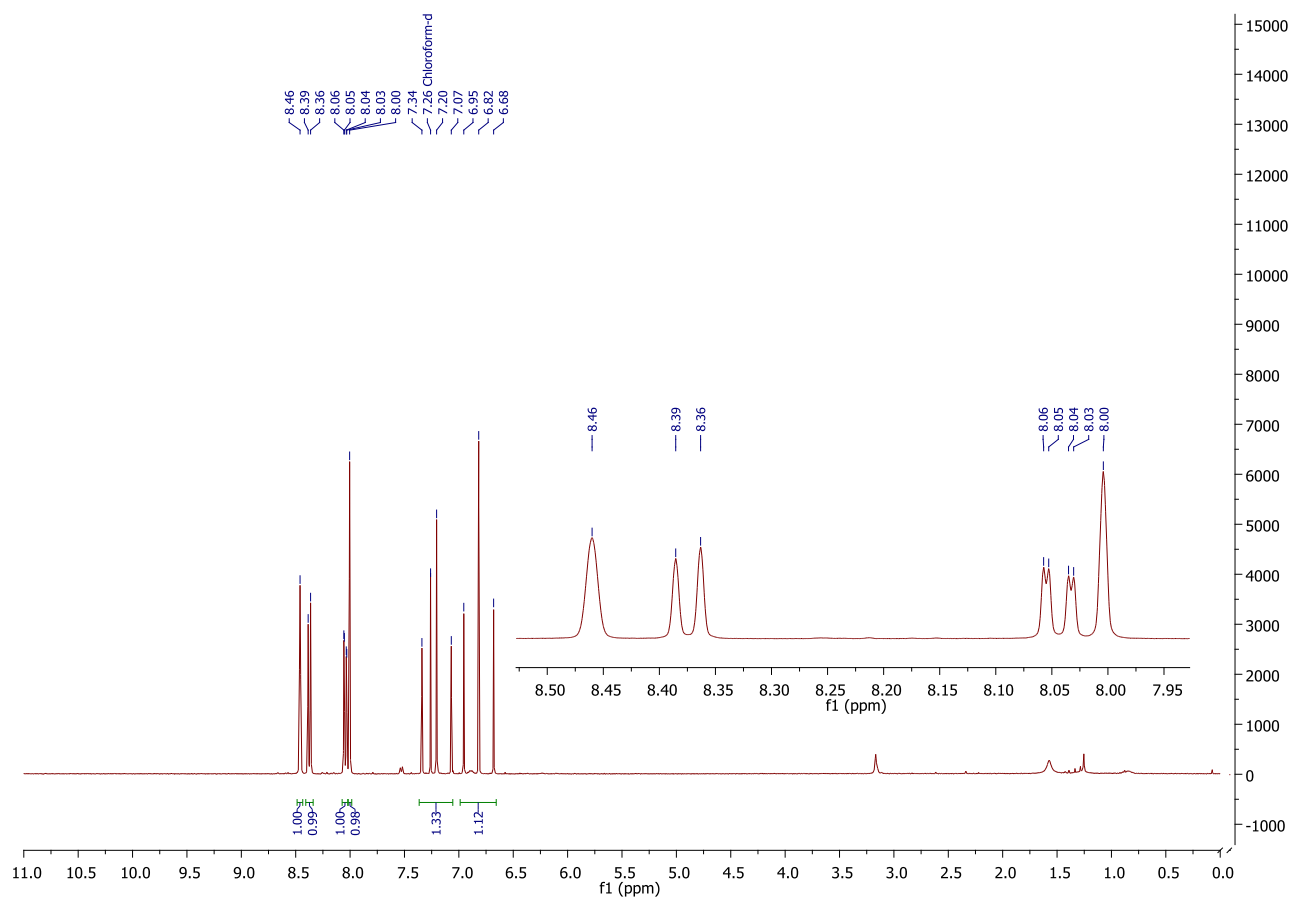
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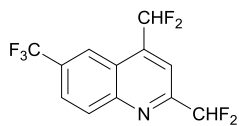
2,4-Bis(difluoromethyl)-6-(trifluoromethyl)quinoline (3p) - ^1H NMR (400 MHz, CDCl_3)



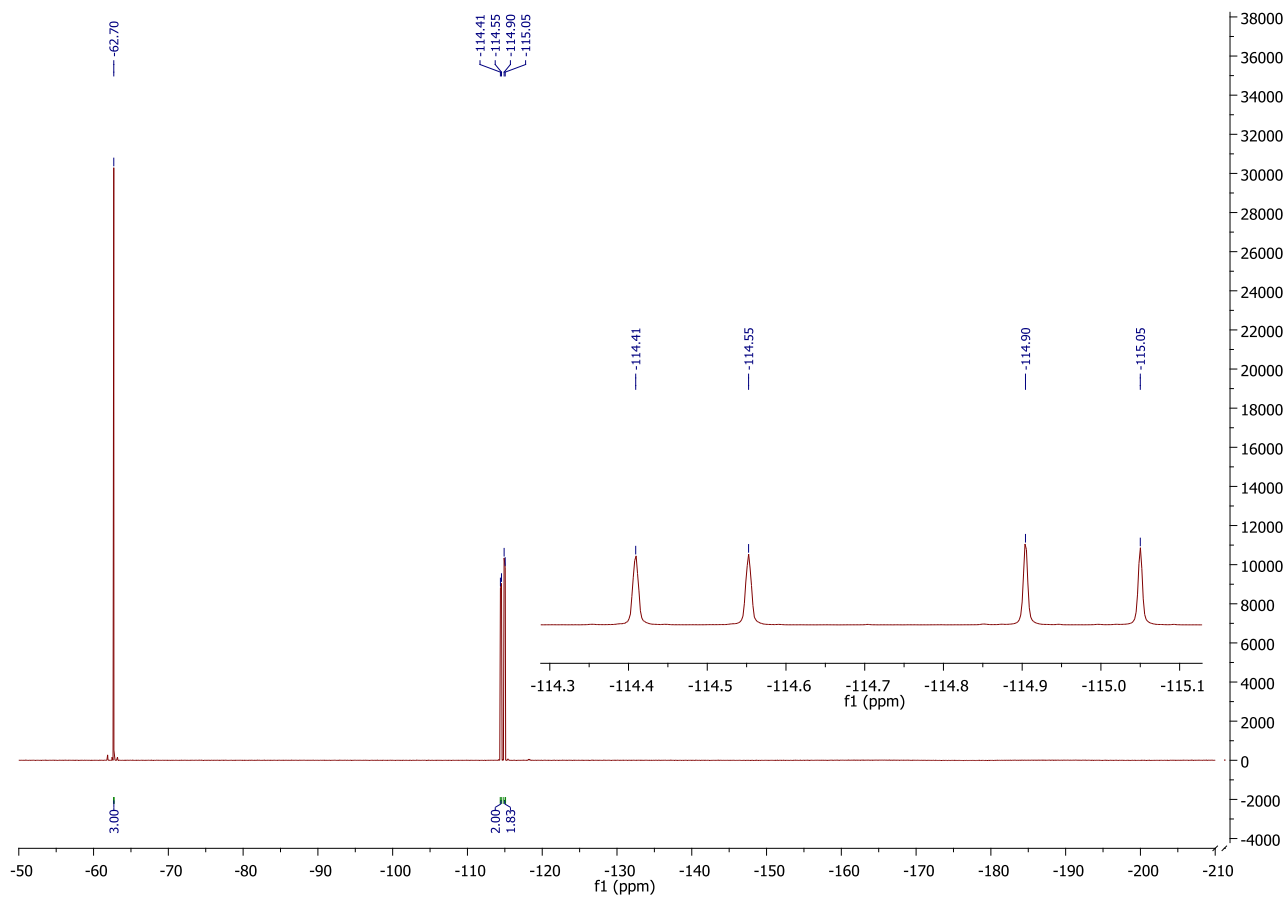
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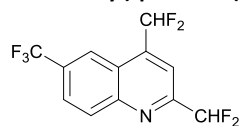
2,4-Bis(difluoromethyl)-6-(trifluoromethyl)quinoline (3p)- ^{19}F NMR (376 MHz, CDCl_3)



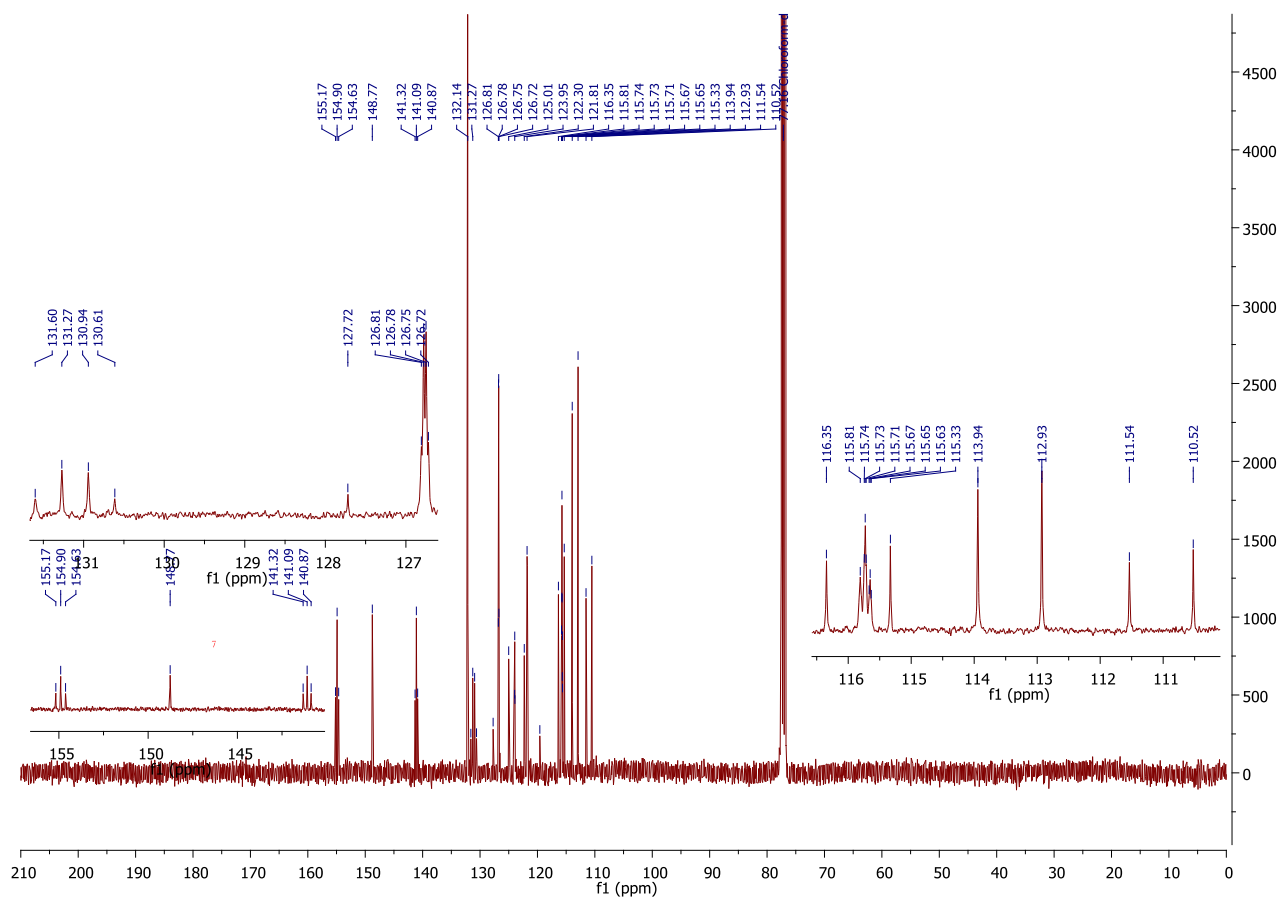
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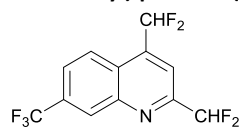
2,4-Bis(difluoromethyl)-6-(trifluoromethyl)quinoline (3p)- ^{13}C NMR (101 MHz, CDCl_3)



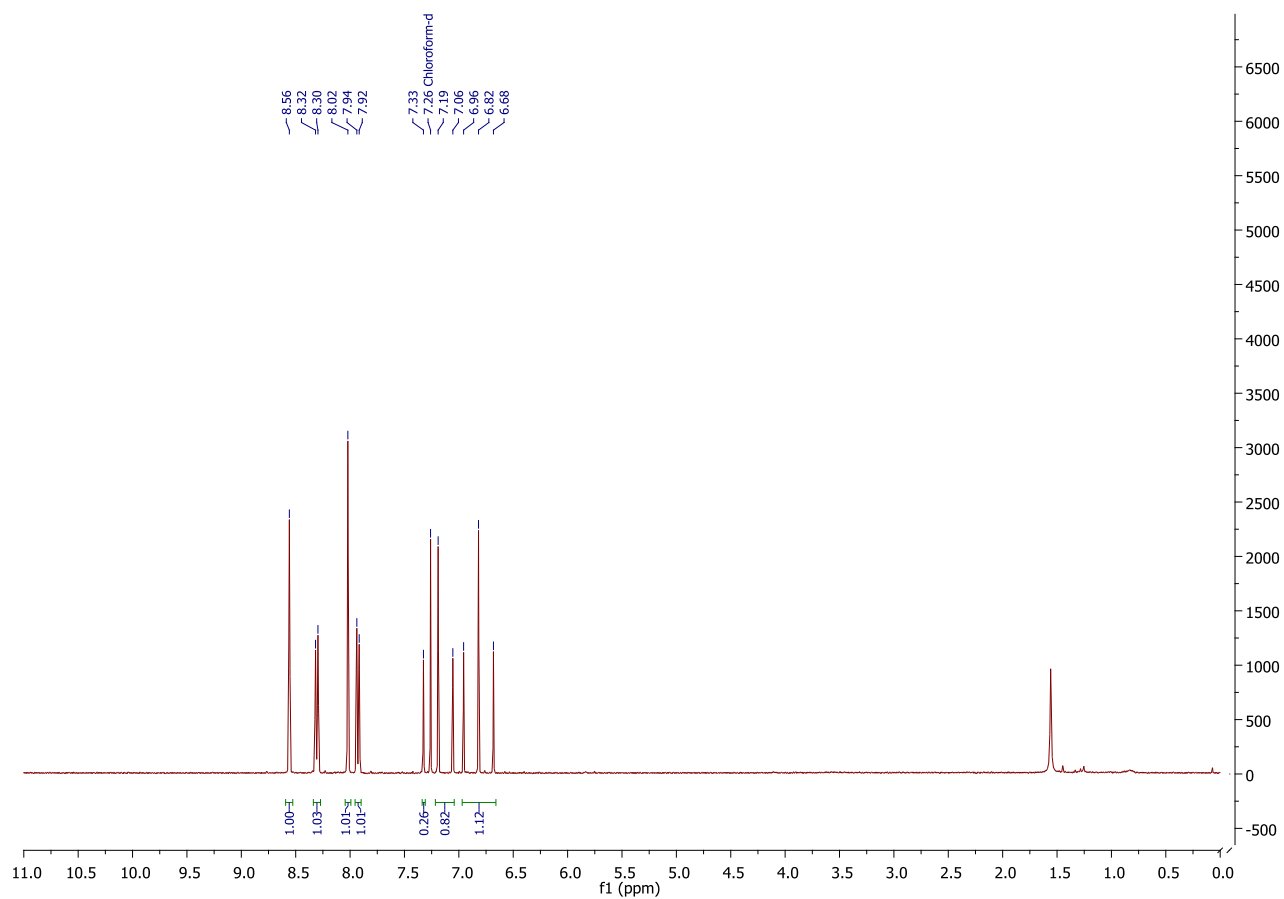
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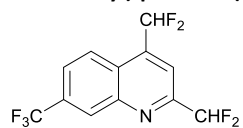
2,4-Bis(difluoromethyl)-7-(trifluoromethyl)quinoline (3q) - ^1H NMR (400 MHz, CDCl_3)



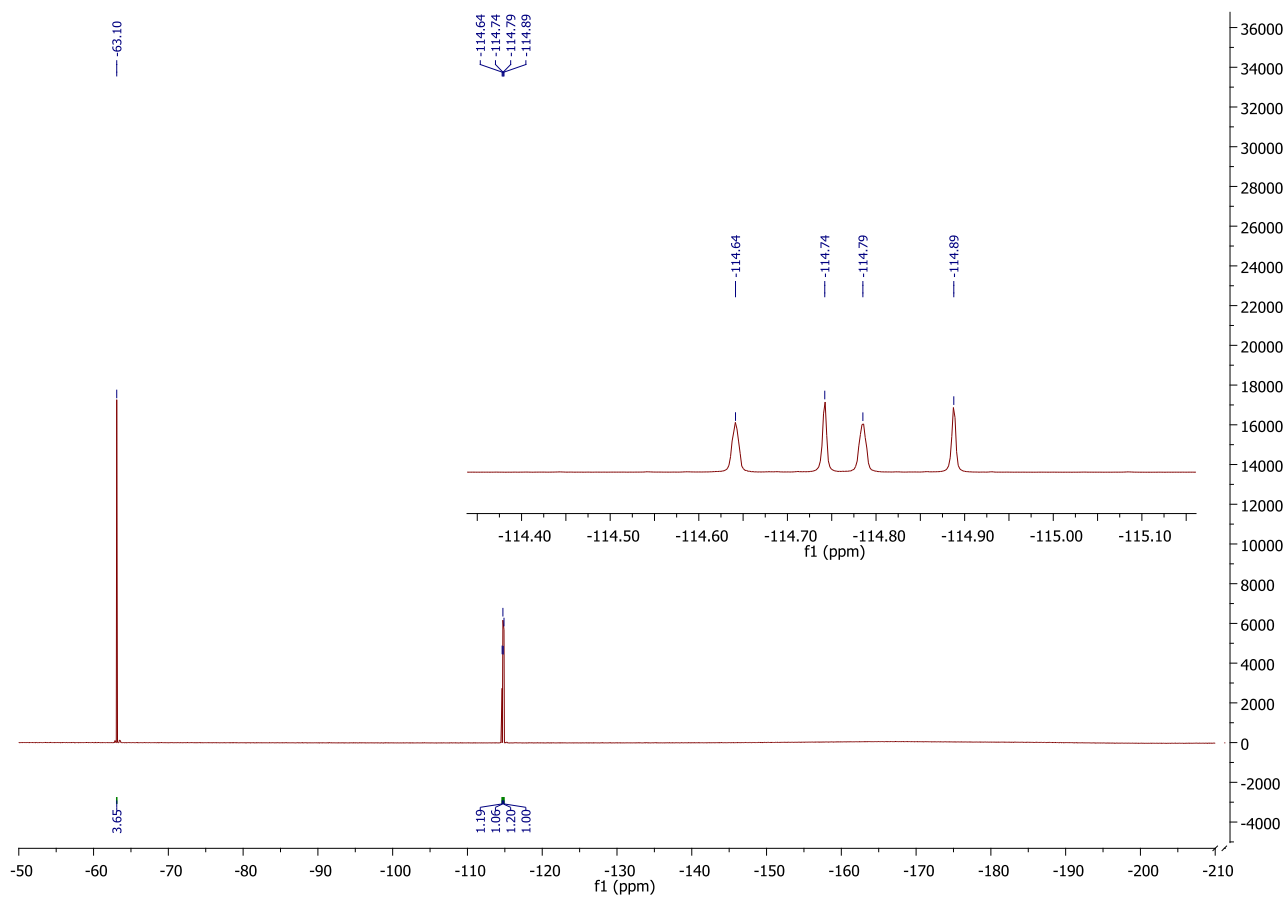
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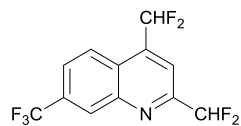
2,4-Bis(difluoromethyl)-7-(trifluoromethyl)quinoline (3q)- ^{19}F NMR (376 MHz, CDCl_3)



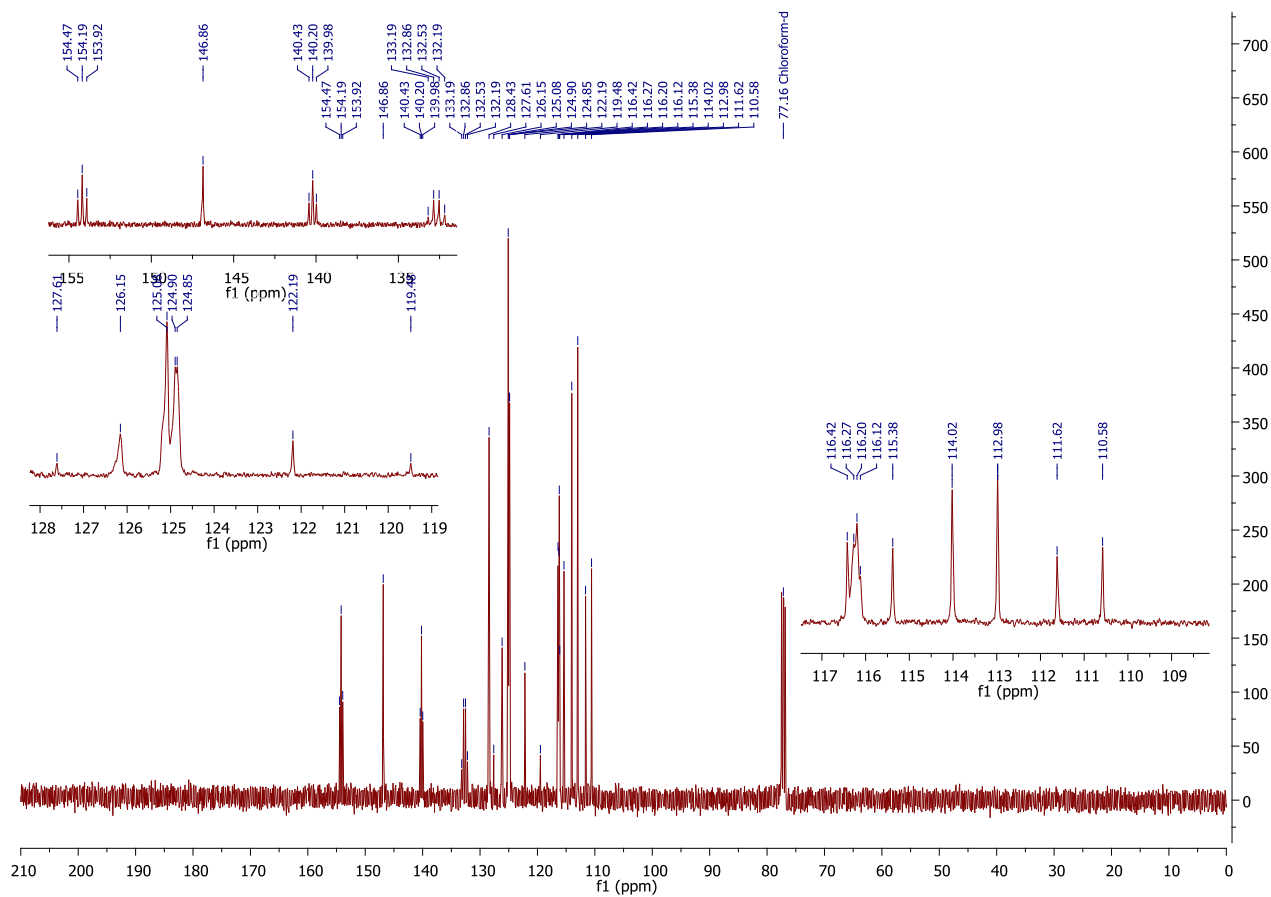
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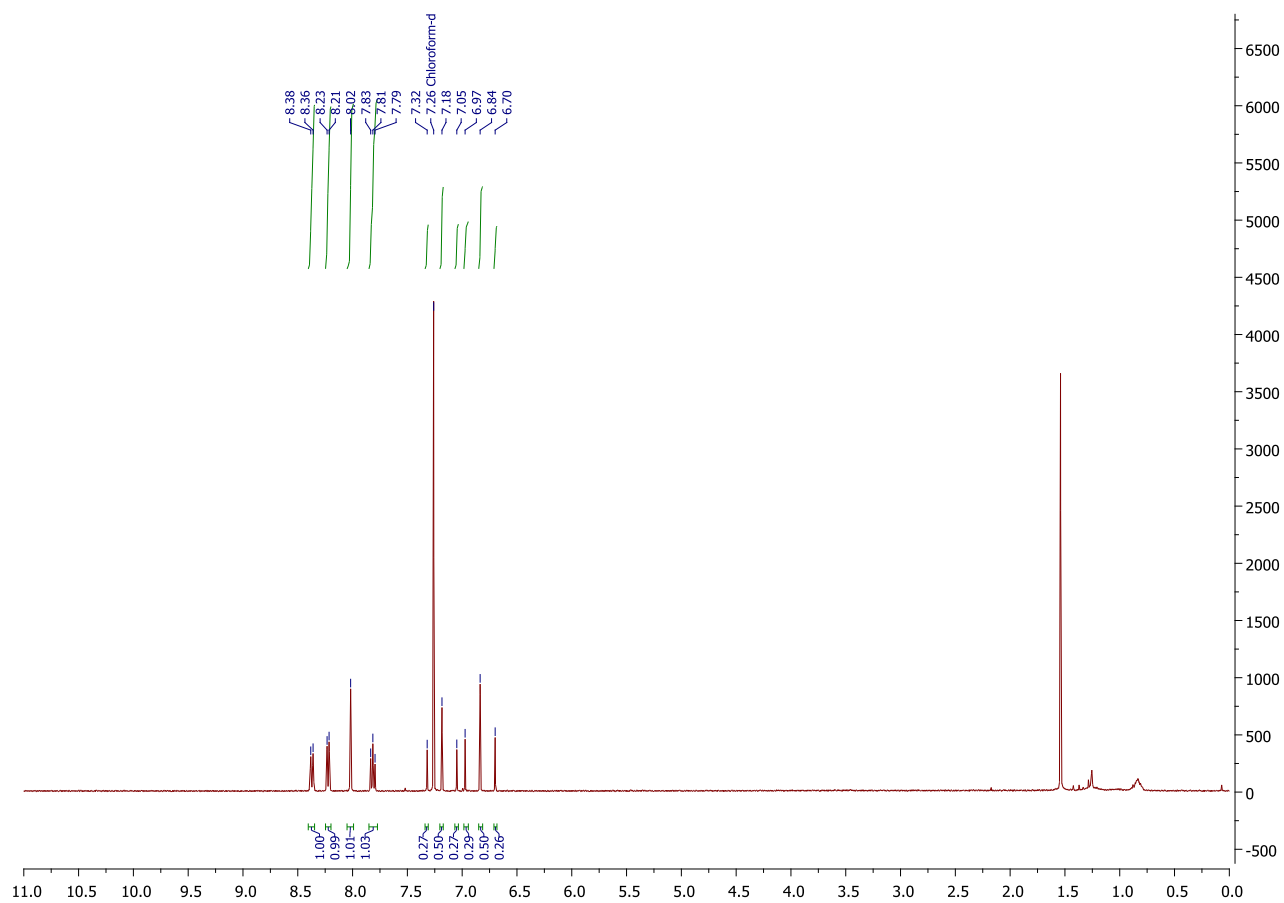
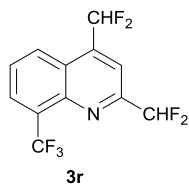
2,4-Bis(difluoromethyl)-7-(trifluoromethyl)quinoline (3q) - ^{13}C NMR (101 MHz, CDCl_3)



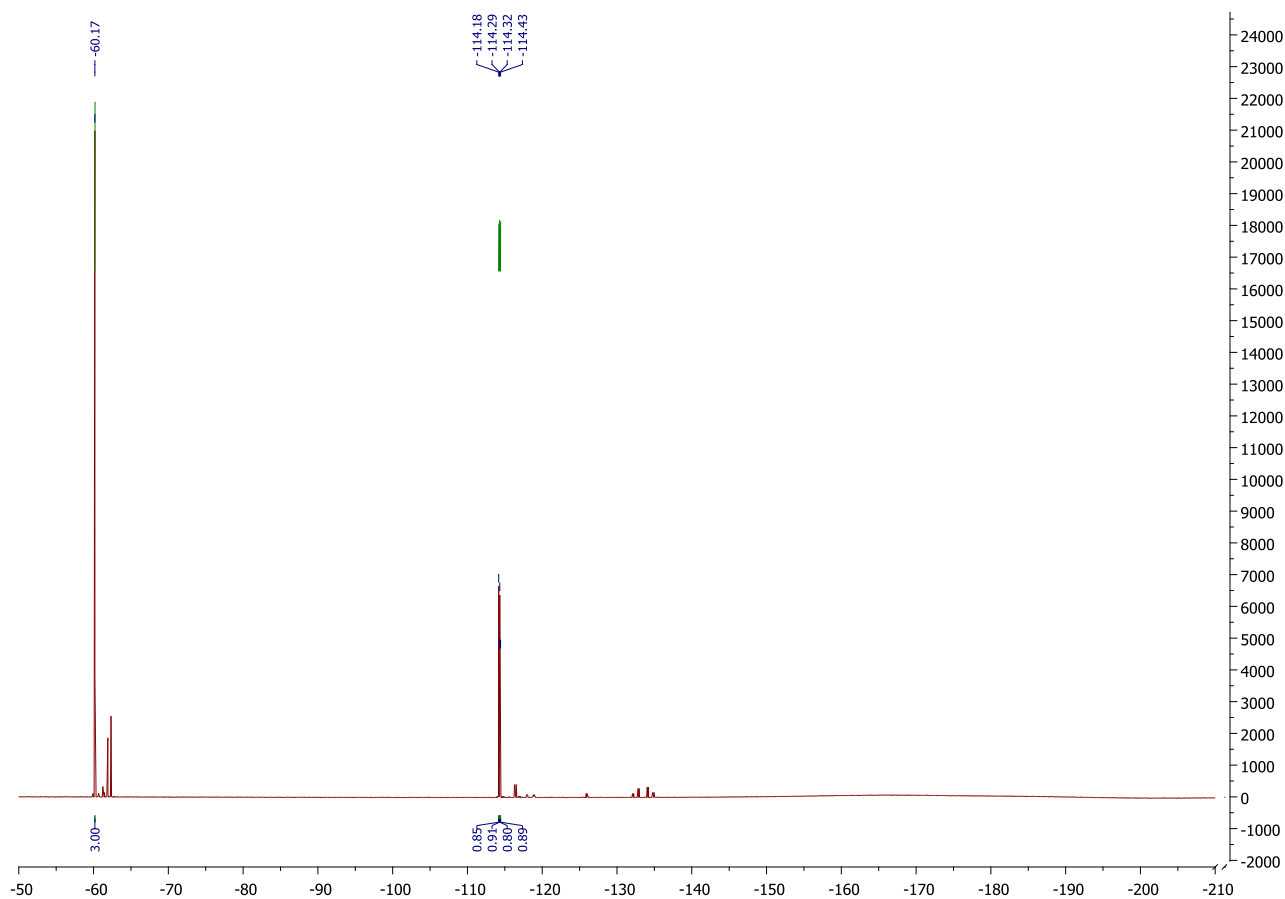
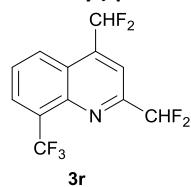
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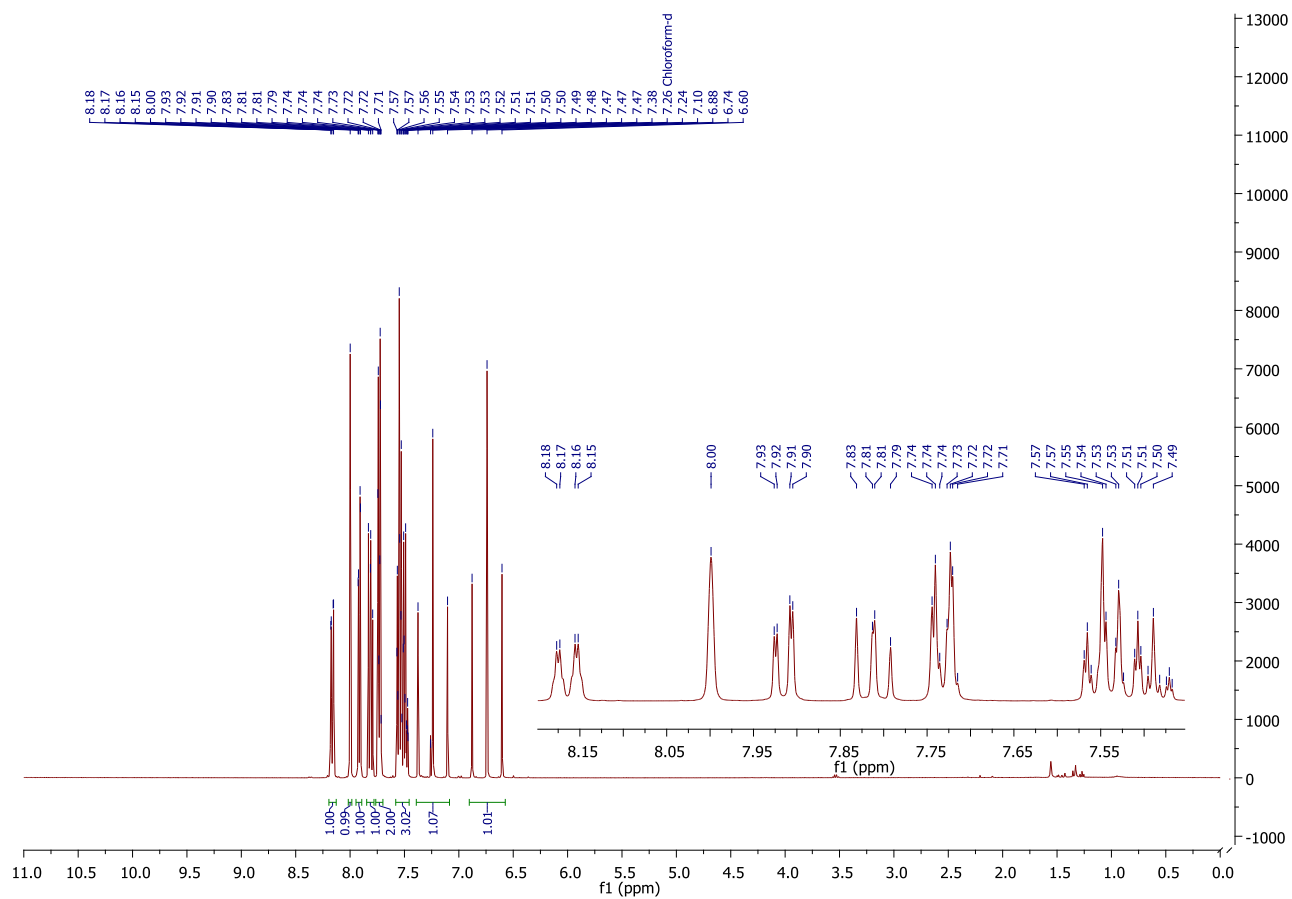
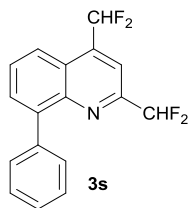
2,4-Bis(difluoromethyl)-8-(trifluoromethyl)quinoline (3r) - ^1H NMR (400 MHz, CDCl_3)



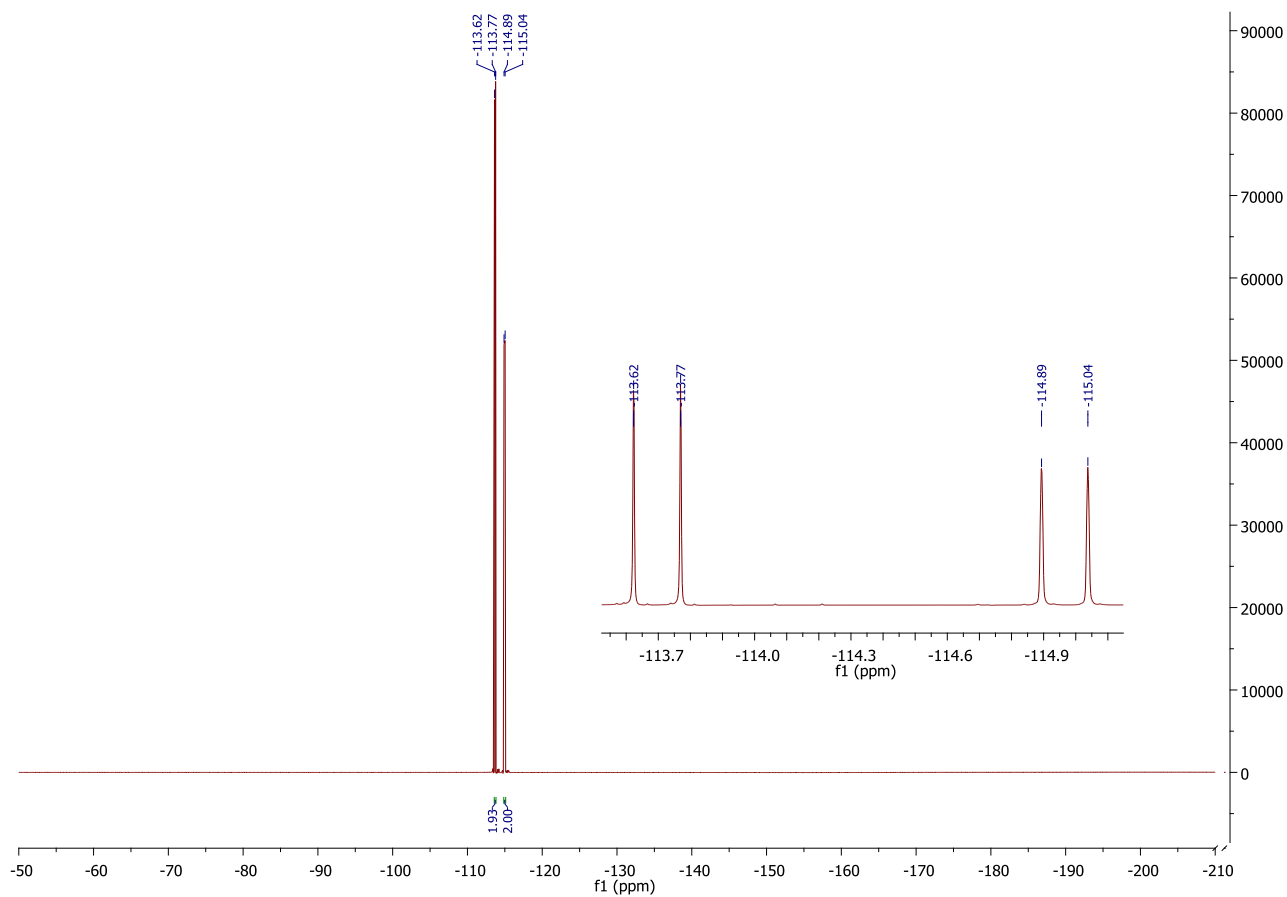
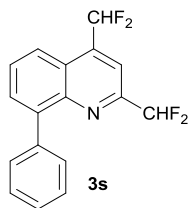
2,4-Bis(difluoromethyl)-8-(trifluoromethyl)quinoline (3r) - ^{19}F NMR (376 MHz, CDCl_3)



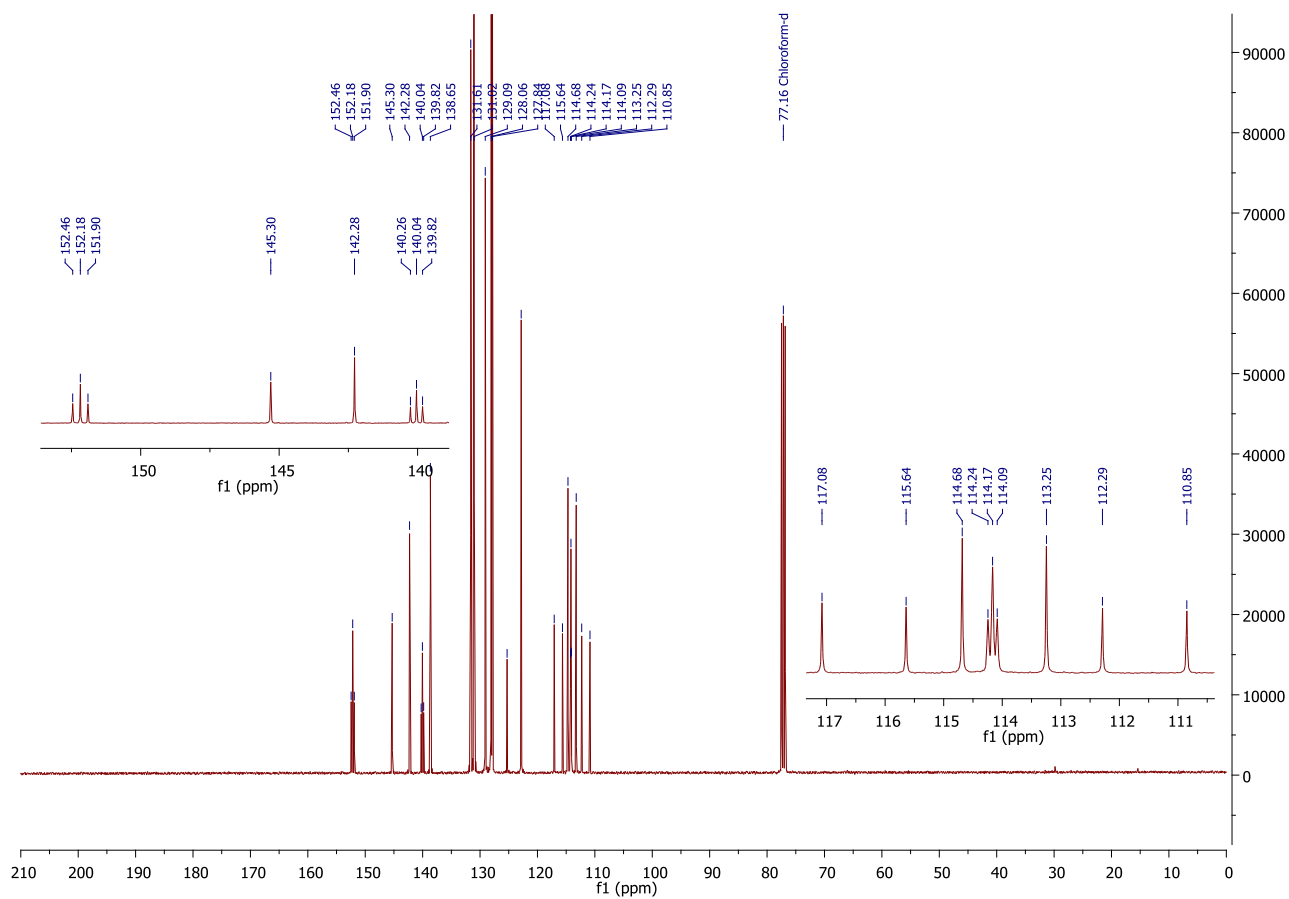
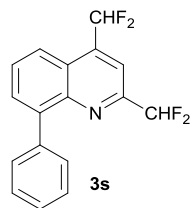
2,4-Bis(difluoromethyl)-8-phenylquinoline (3s) - ^1H NMR (400 MHz, CDCl_3)



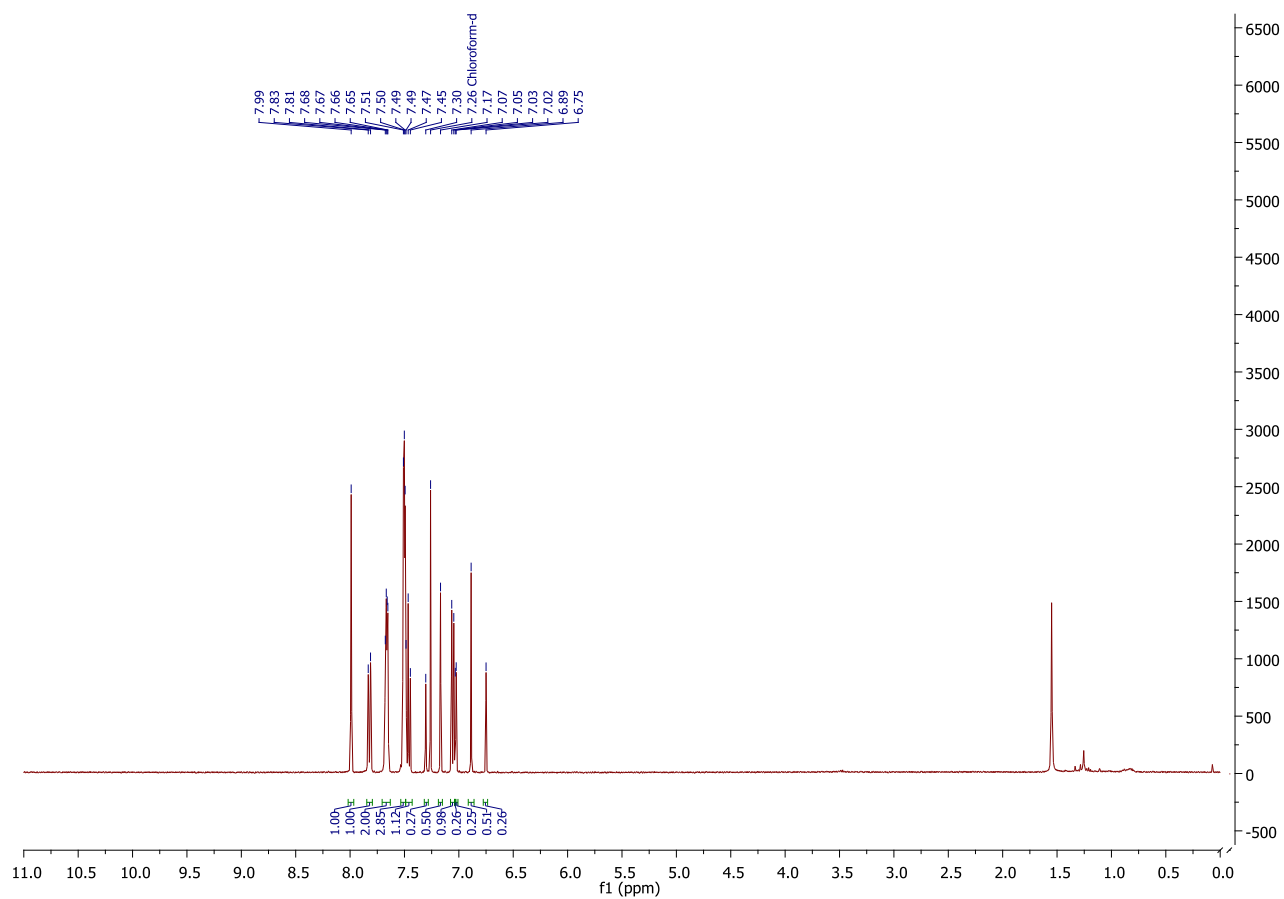
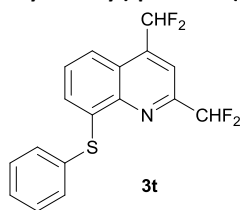
2,4-Bis(difluoromethyl)-8-phenylquinoline (3s) - ^{19}F NMR (376 MHz, CDCl_3)



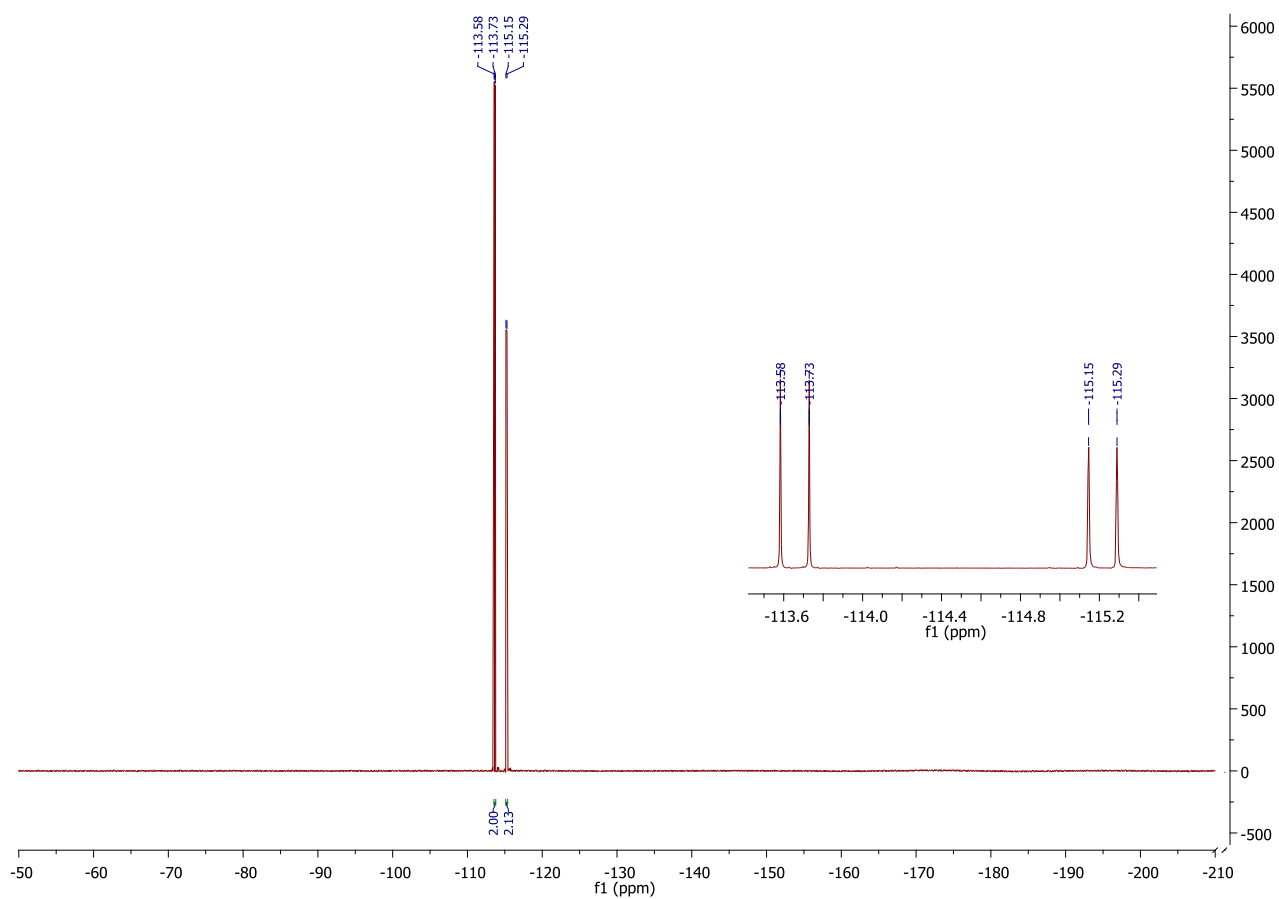
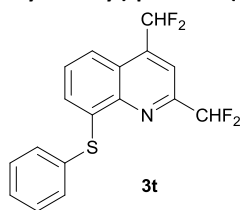
2,4-Bis(difluoromethyl)-8-phenylquinoline (3s) - ^{13}C NMR (101 MHz, CDCl_3)



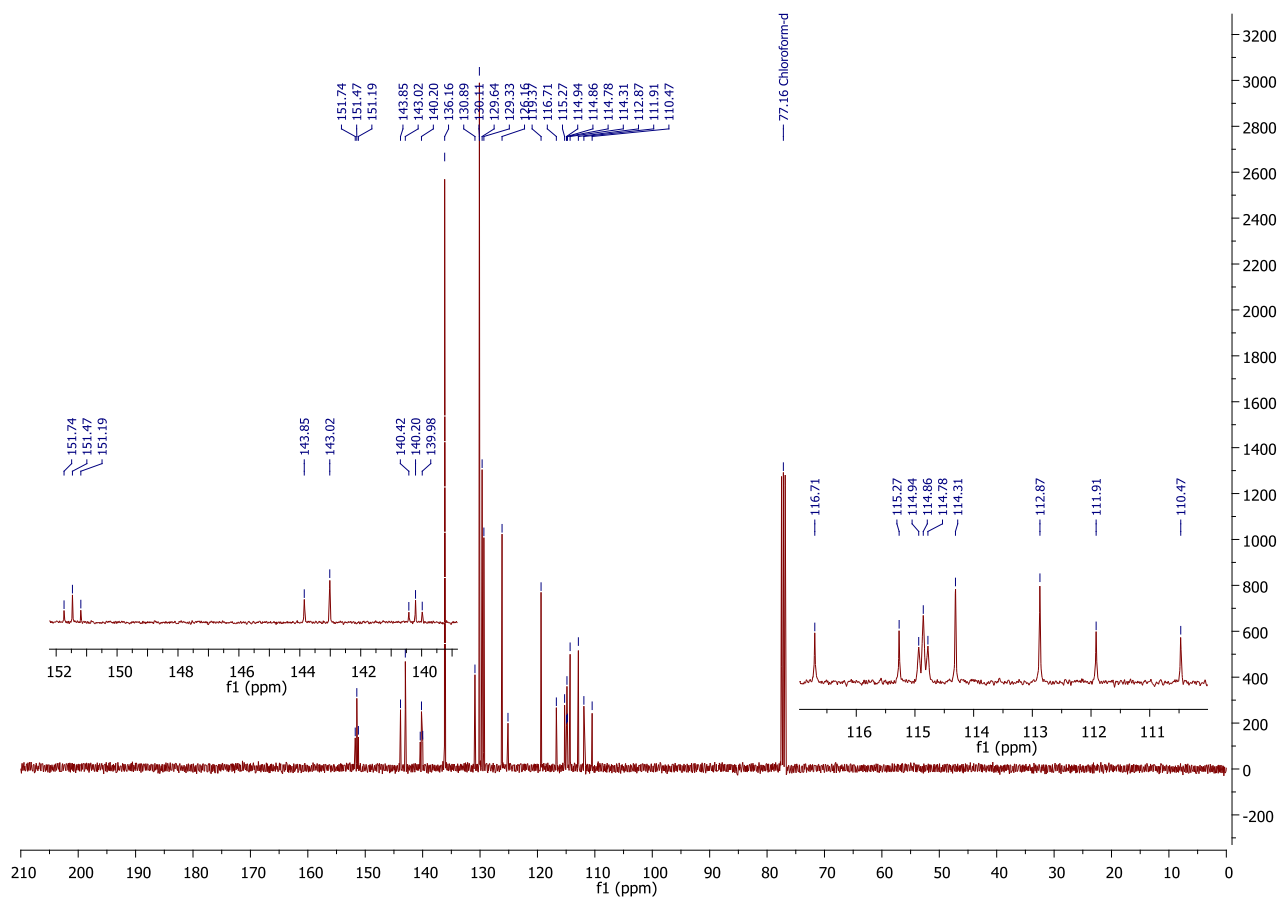
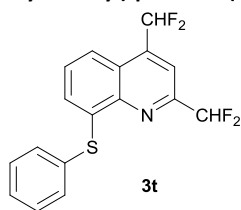
2,4-Bis(difluoromethyl)-8-(phenylsulfanyl)quinoline (3t) - ^1H NMR (400 MHz, CDCl_3)



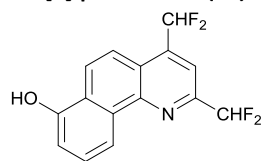
2,4-Bis(difluoromethyl)-8-(phenylsulfanyl)quinoline (3t) - ^{19}F NMR (376 MHz, CDCl_3)



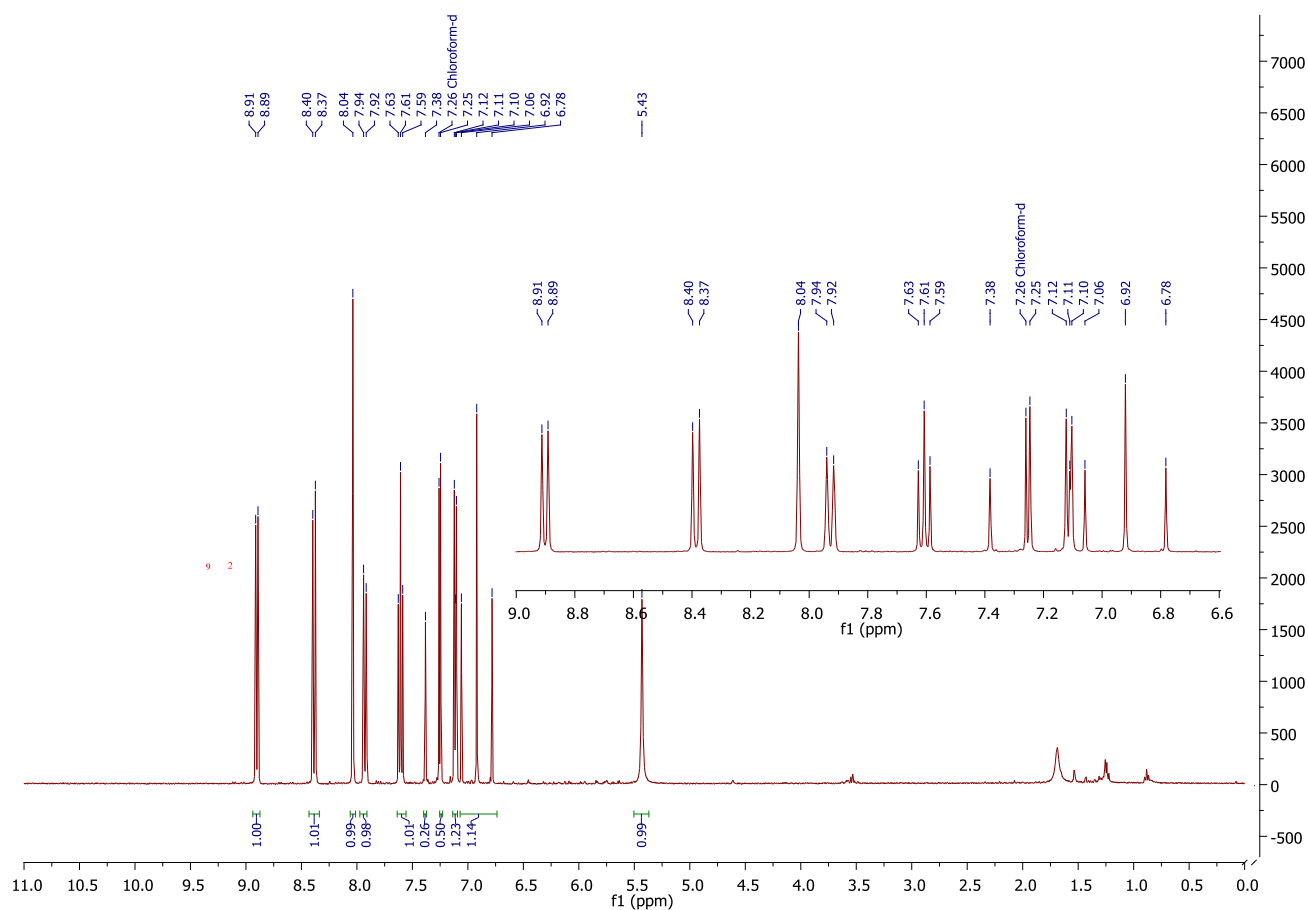
2,4-Bis(difluoromethyl)-8-(phenylsulfanyl)quinoline (3t) - ^{13}C NMR (101 MHz, CDCl_3)



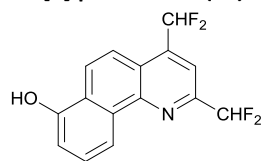
2,4-Bis(difluoromethyl)benzo[h]quinolin-7-ol (3u) - ^1H NMR (400 MHz, CDCl_3)



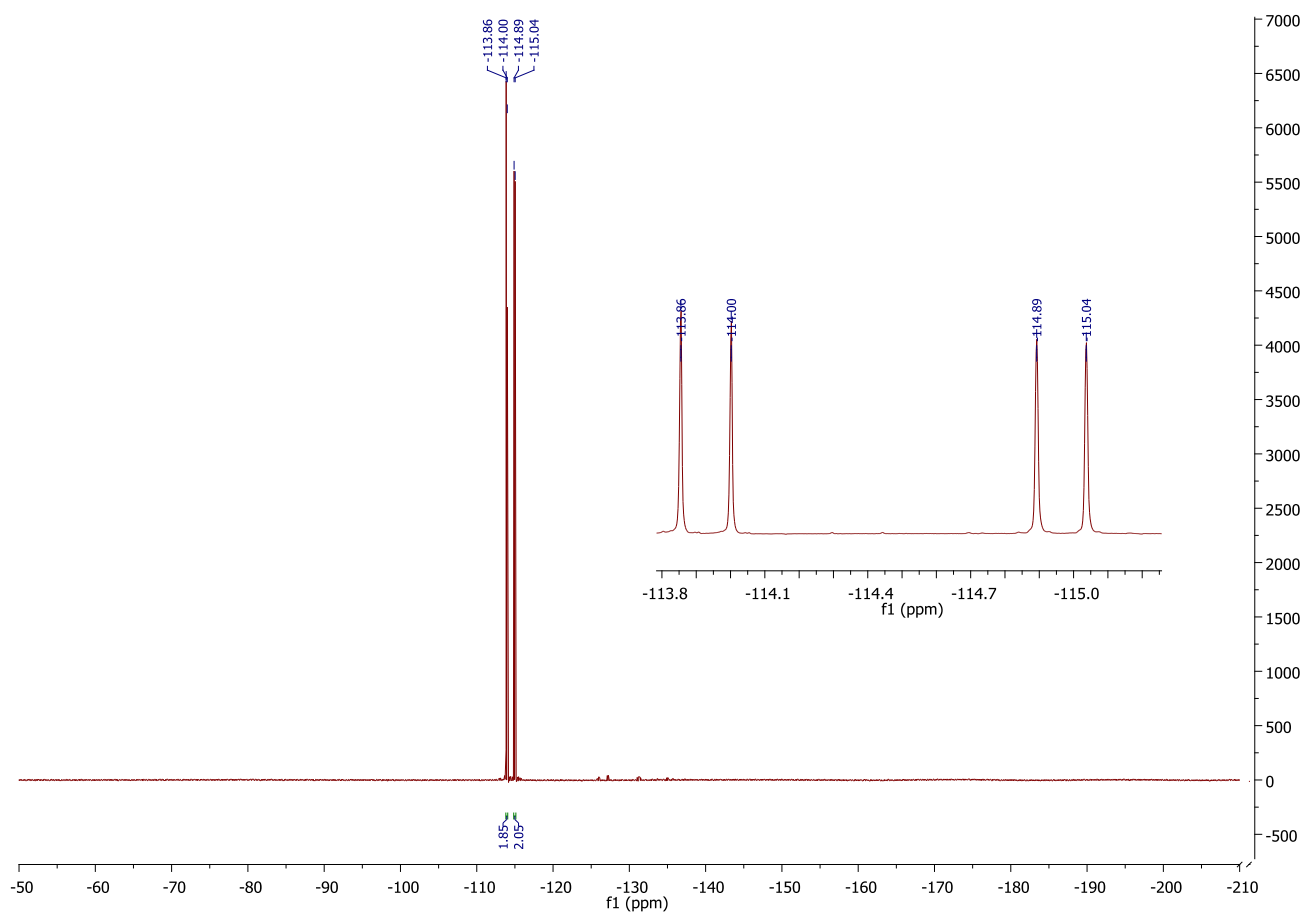
3u



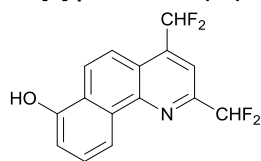
2,4-Bis(difluoromethyl)benzo[h]quinolin-7-ol (3u) - ^{19}F NMR (376 MHz, CDCl_3)



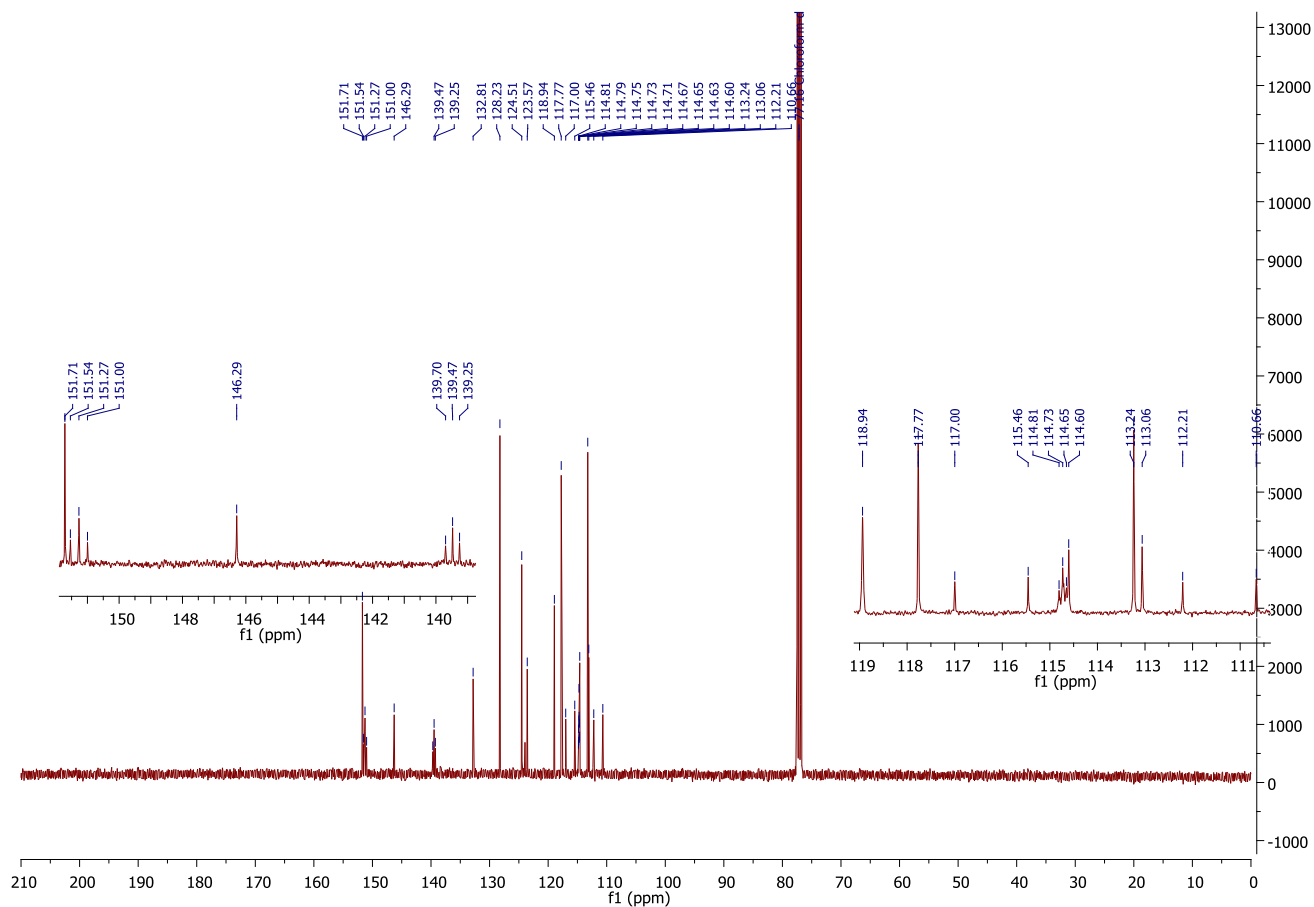
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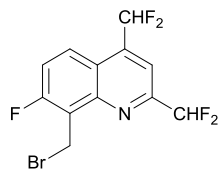
2,4-Bis(difluoromethyl)benzo[h]quinolin-7-ol (3u) - ^{13}C NMR (101 MHz, CDCl_3)



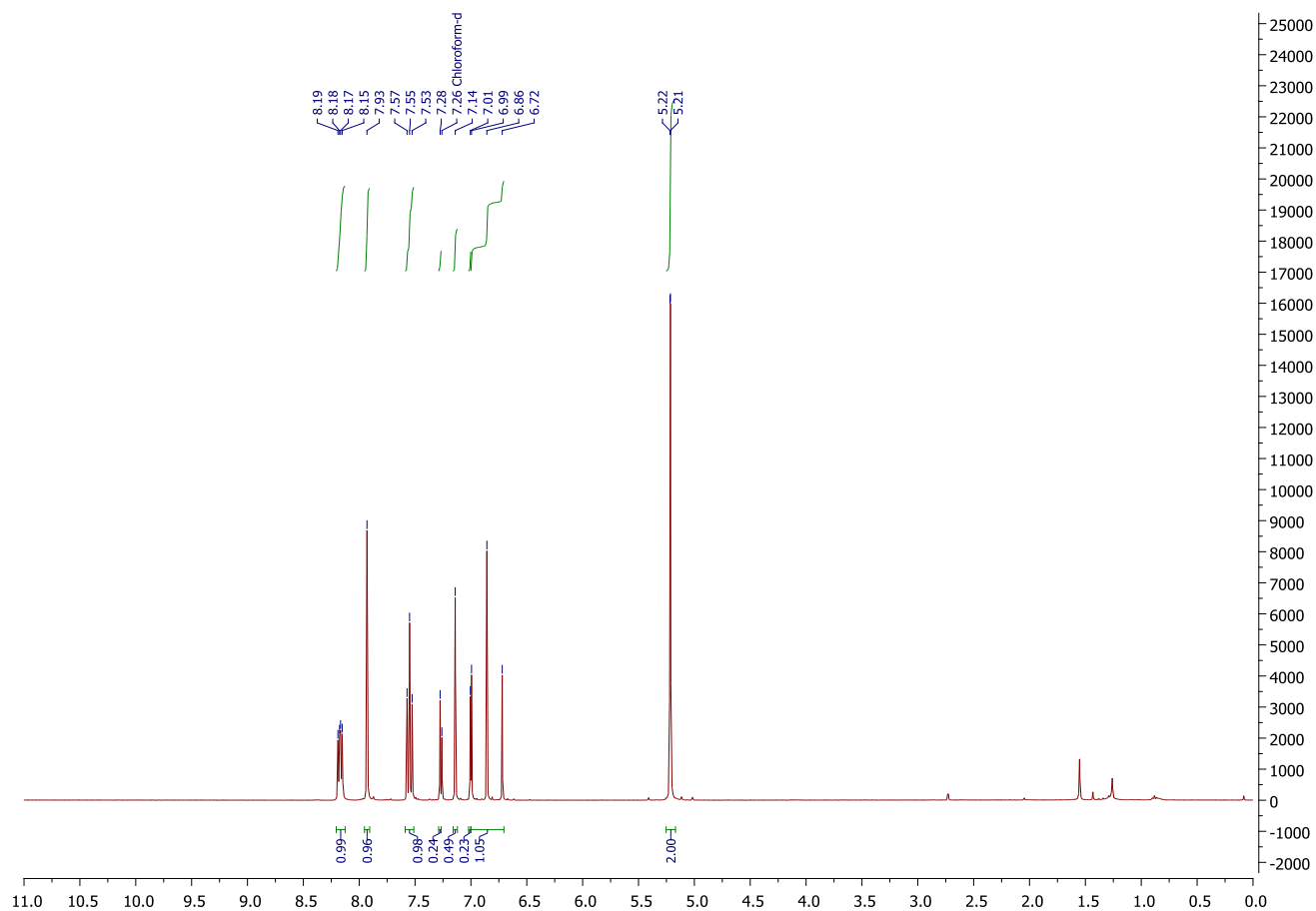
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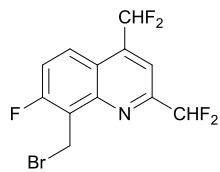
8-(Bromomethyl)-2,4-bis(difluoromethyl)-7-fluoroquinoline (7) - ^1H NMR (400 MHz, CDCl_3)



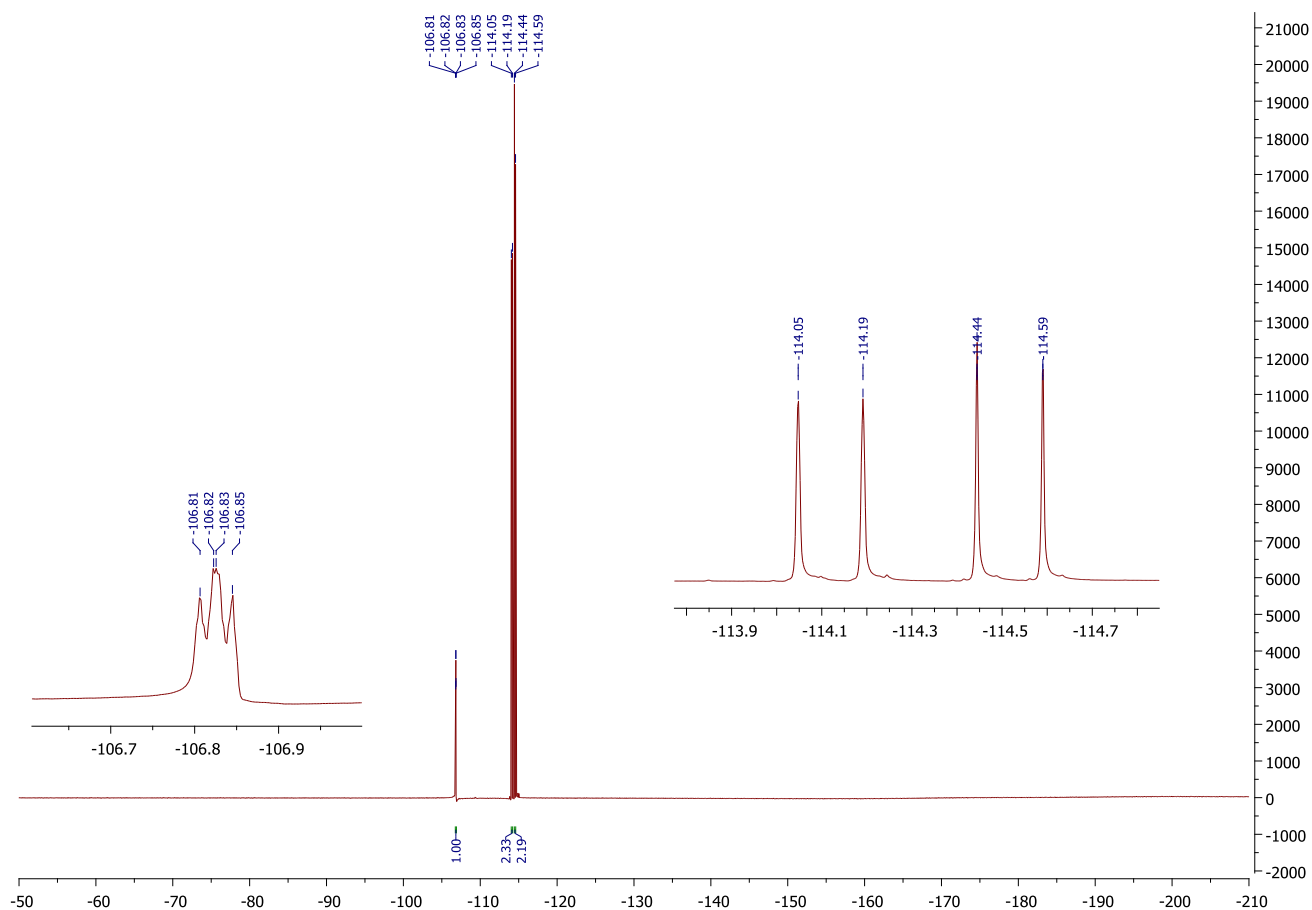
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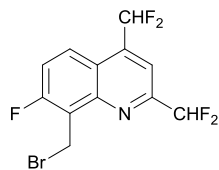
8-(Bromomethyl)-2,4-bis(difluoromethyl)-7-fluoroquinoline (7) - ^{19}F NMR (376 MHz, CDCl_3)



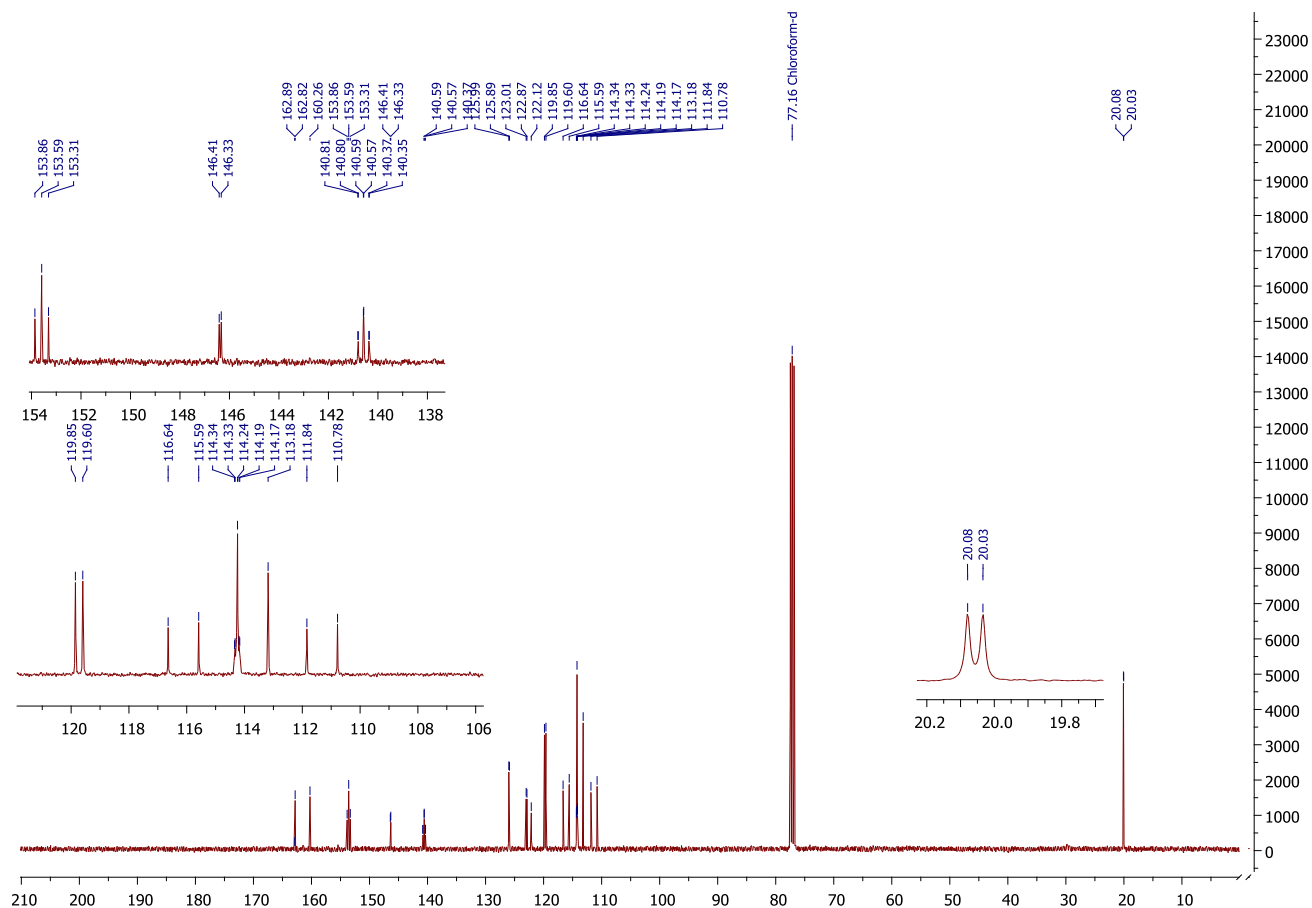
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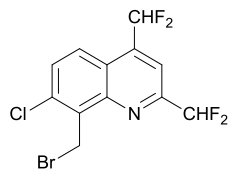
8-(Bromomethyl)-2,4-bis(difluoromethyl)-7-fluoroquinoline (7) - ^{13}C NMR (101 MHz, CDCl_3)



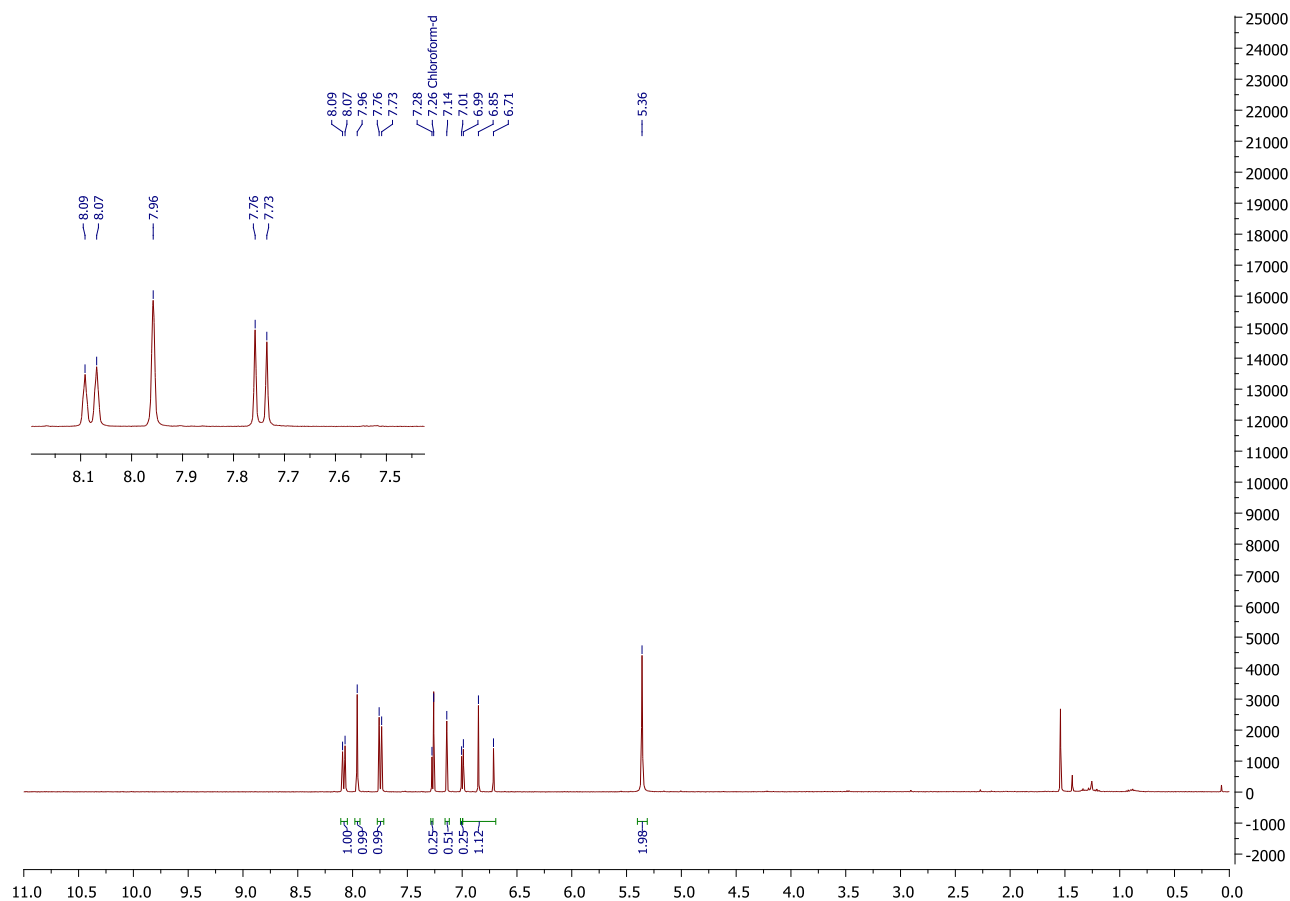
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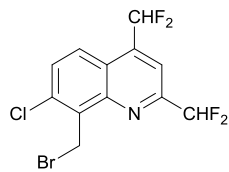
8-(Bromomethyl)-7-chloro-2,4-bis(difluoromethyl)quinoline (8) - ^1H NMR (400 MHz, CDCl_3)



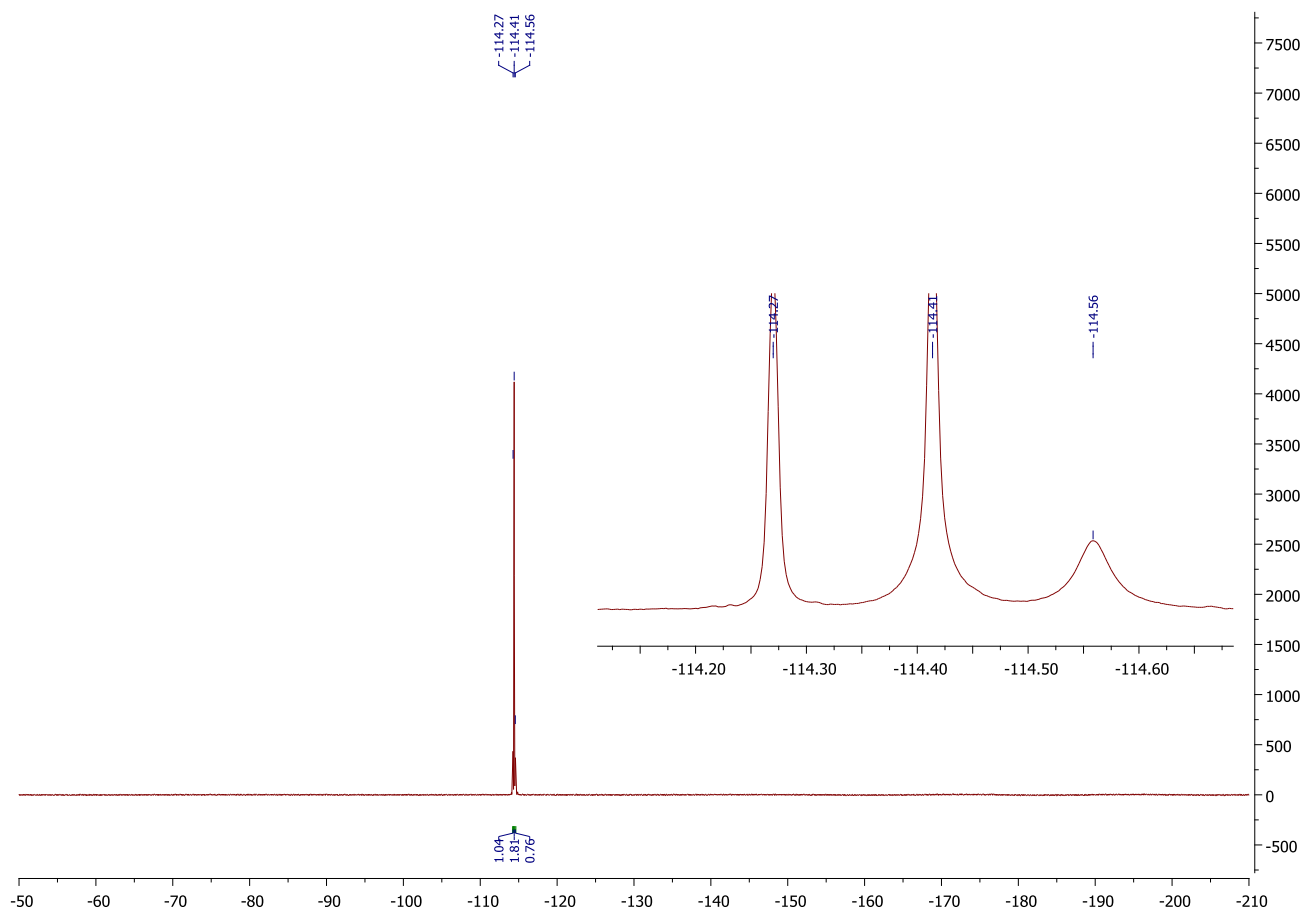
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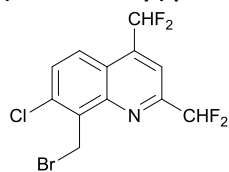
8-(Bromomethyl)-7-chloro-2,4-bis(difluoromethyl)quinoline (8) - ^{19}F NMR (376 MHz, CDCl_3)



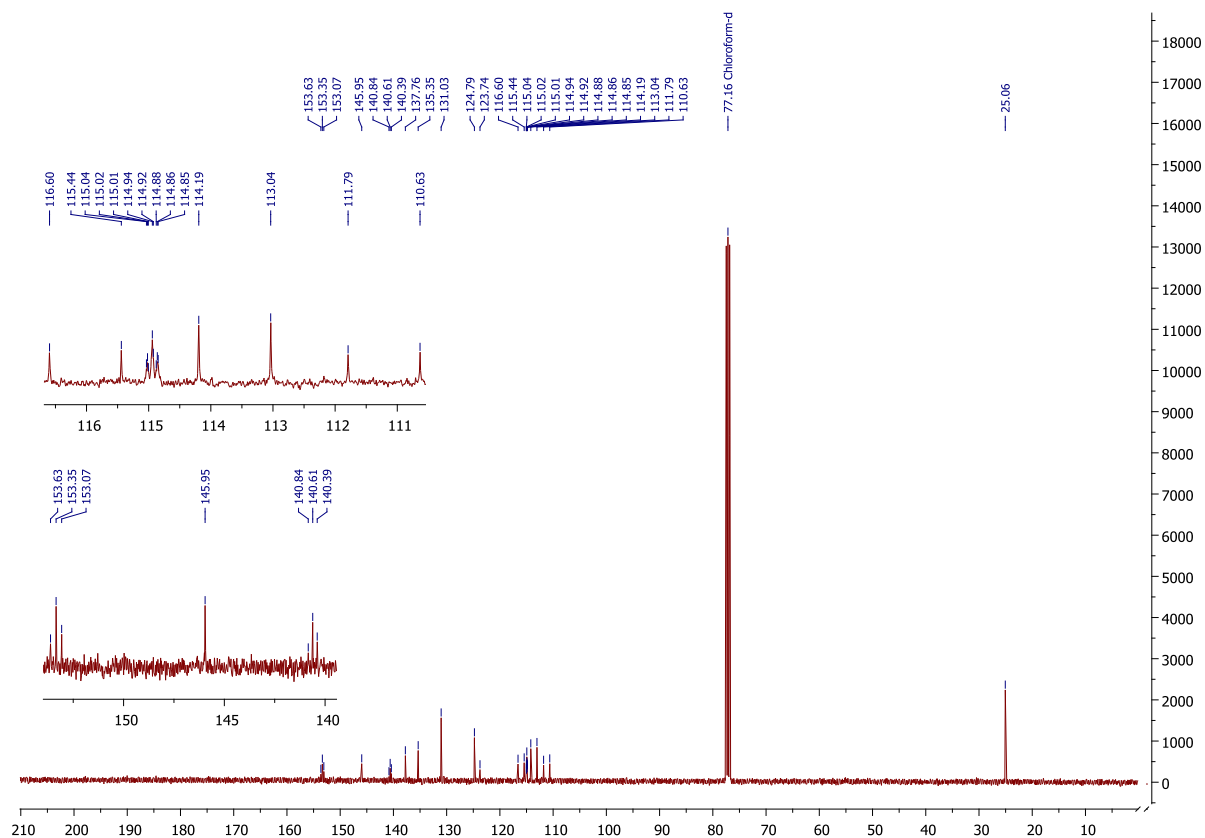
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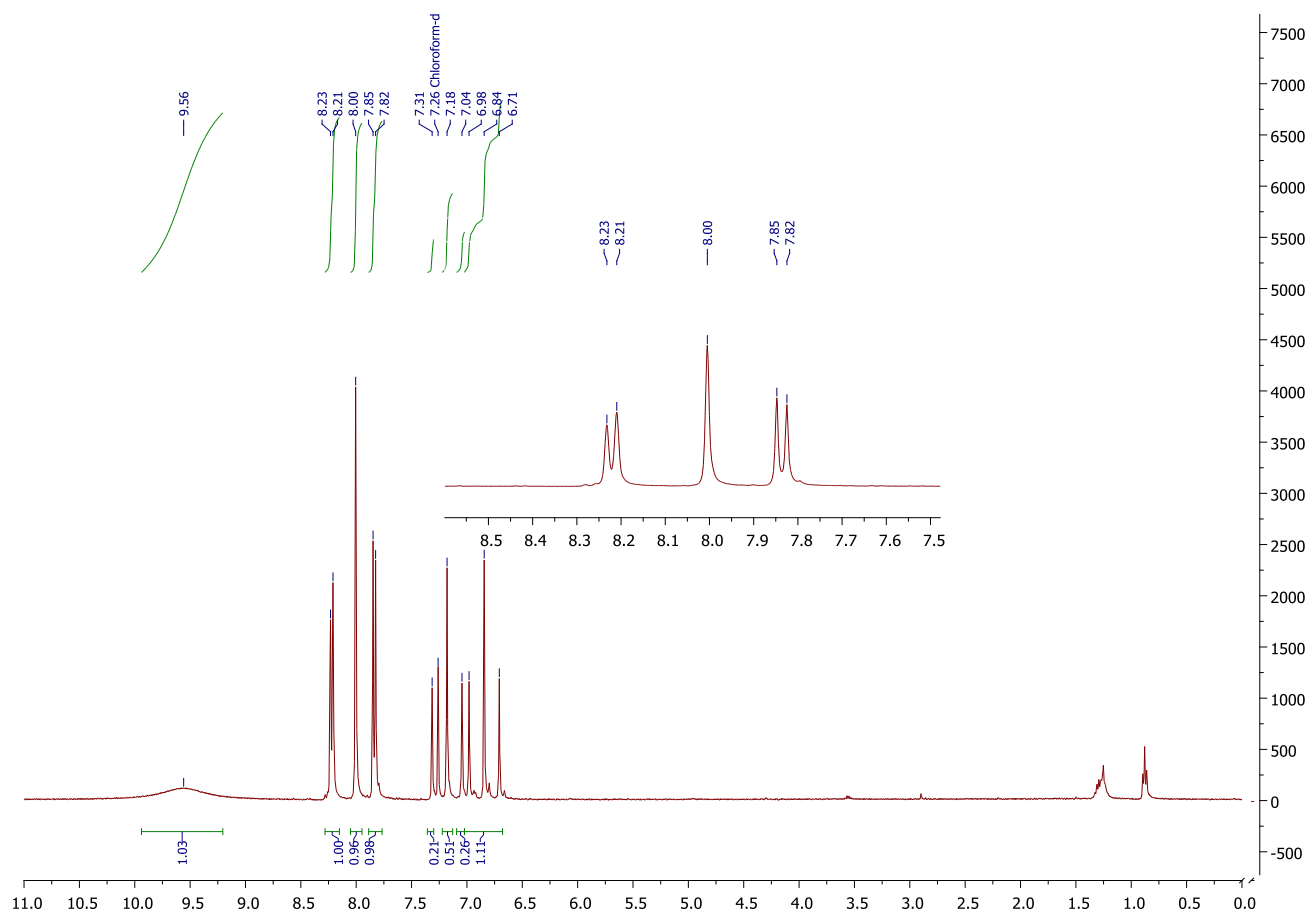
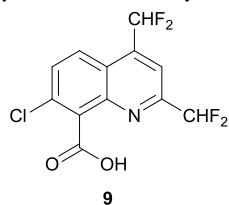
8-(Bromomethyl)-7-chloro-2,4-bis(difluoromethyl)quinoline (8) - ^{13}C NMR (101 MHz, CDCl_3)



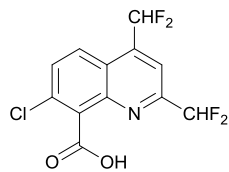
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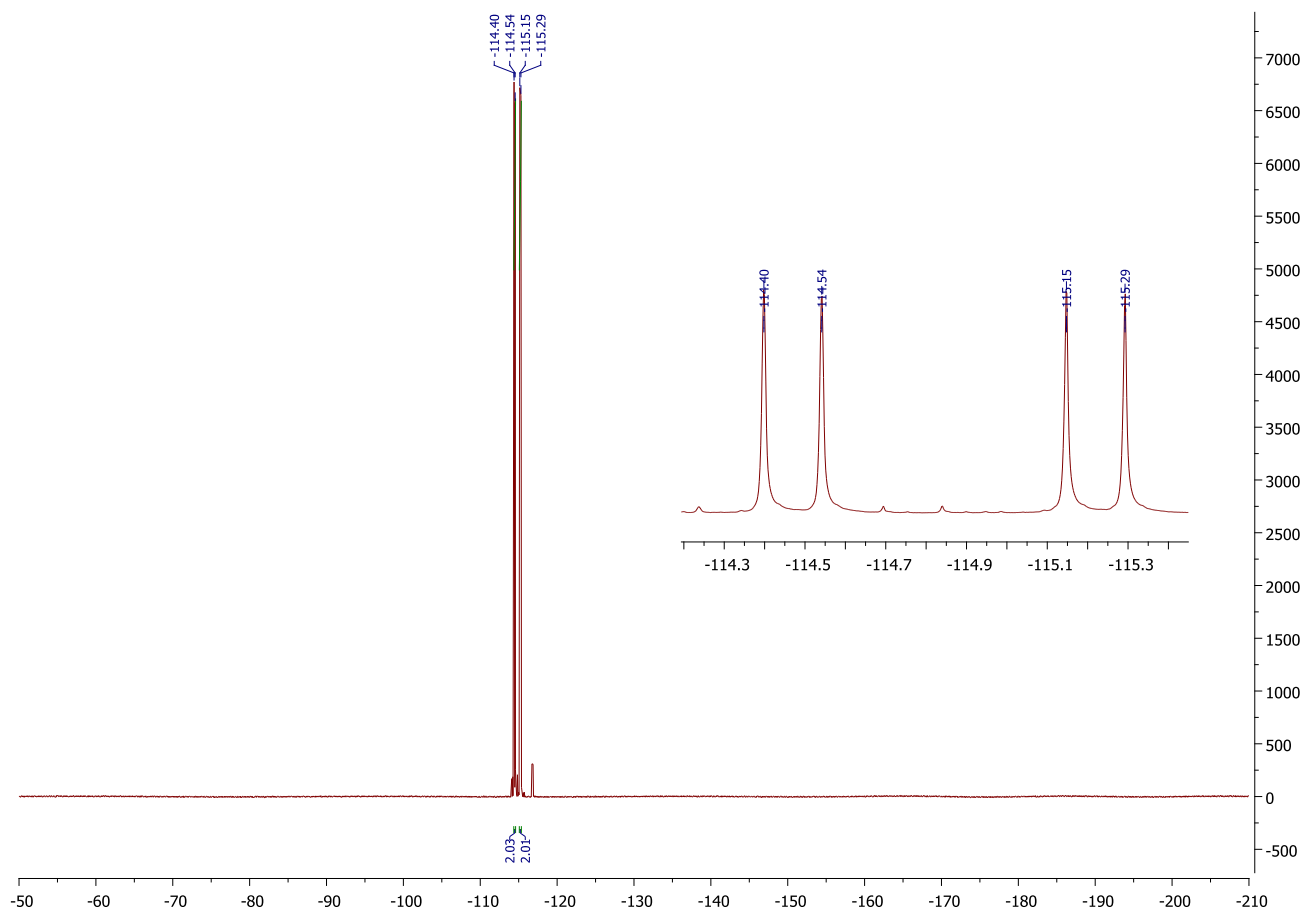
7-Chloro-2,4-bis(difluoromethyl)quinoline-8-carboxylic acid (**9**) - ^1H NMR (400 MHz, CDCl_3)



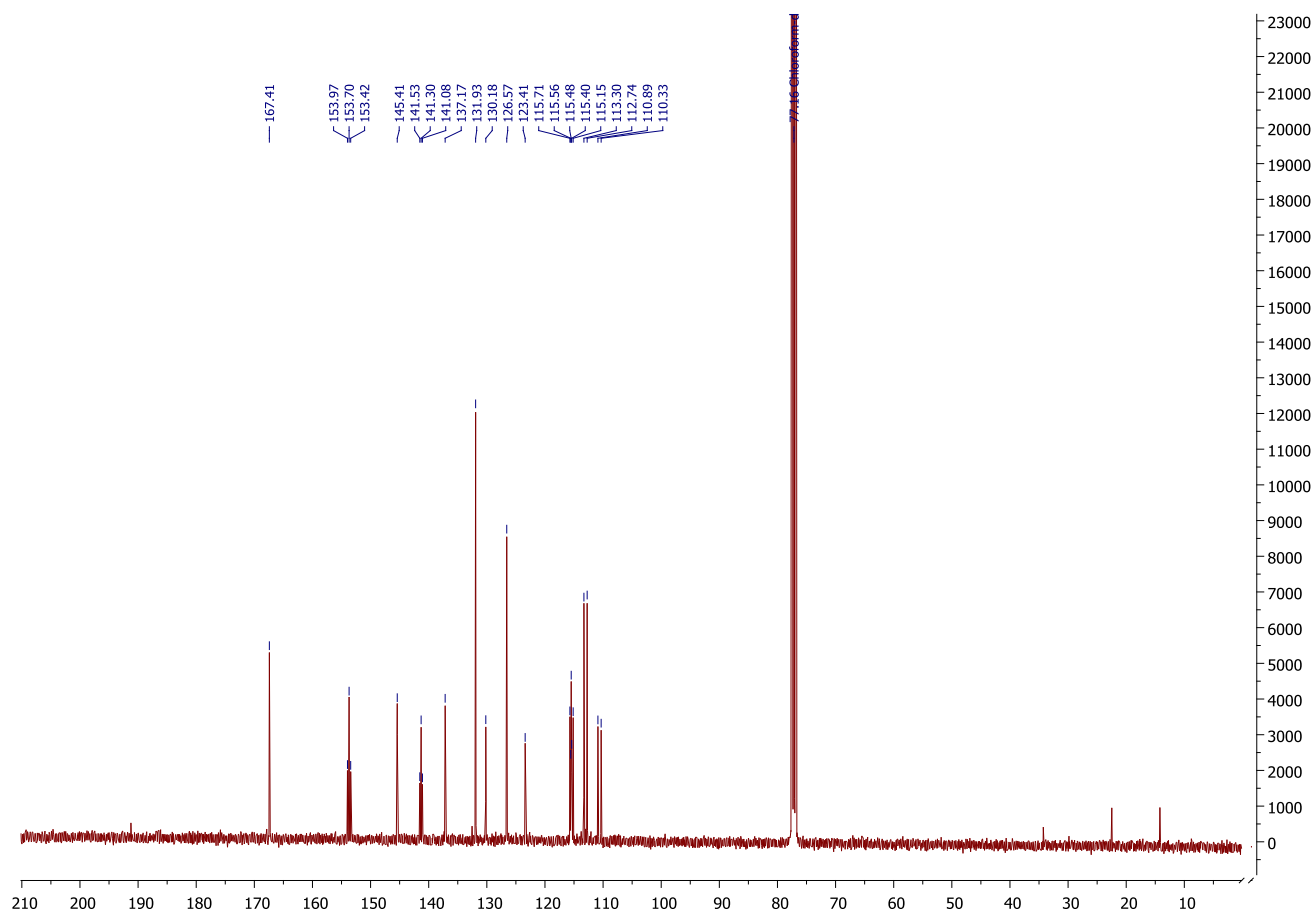
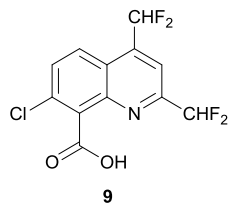
7-Chloro-2,4-bis(difluoromethyl)quinoline-8-carboxylic acid (9) - ^{19}F NMR (376 MHz, CDCl_3)



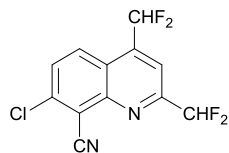
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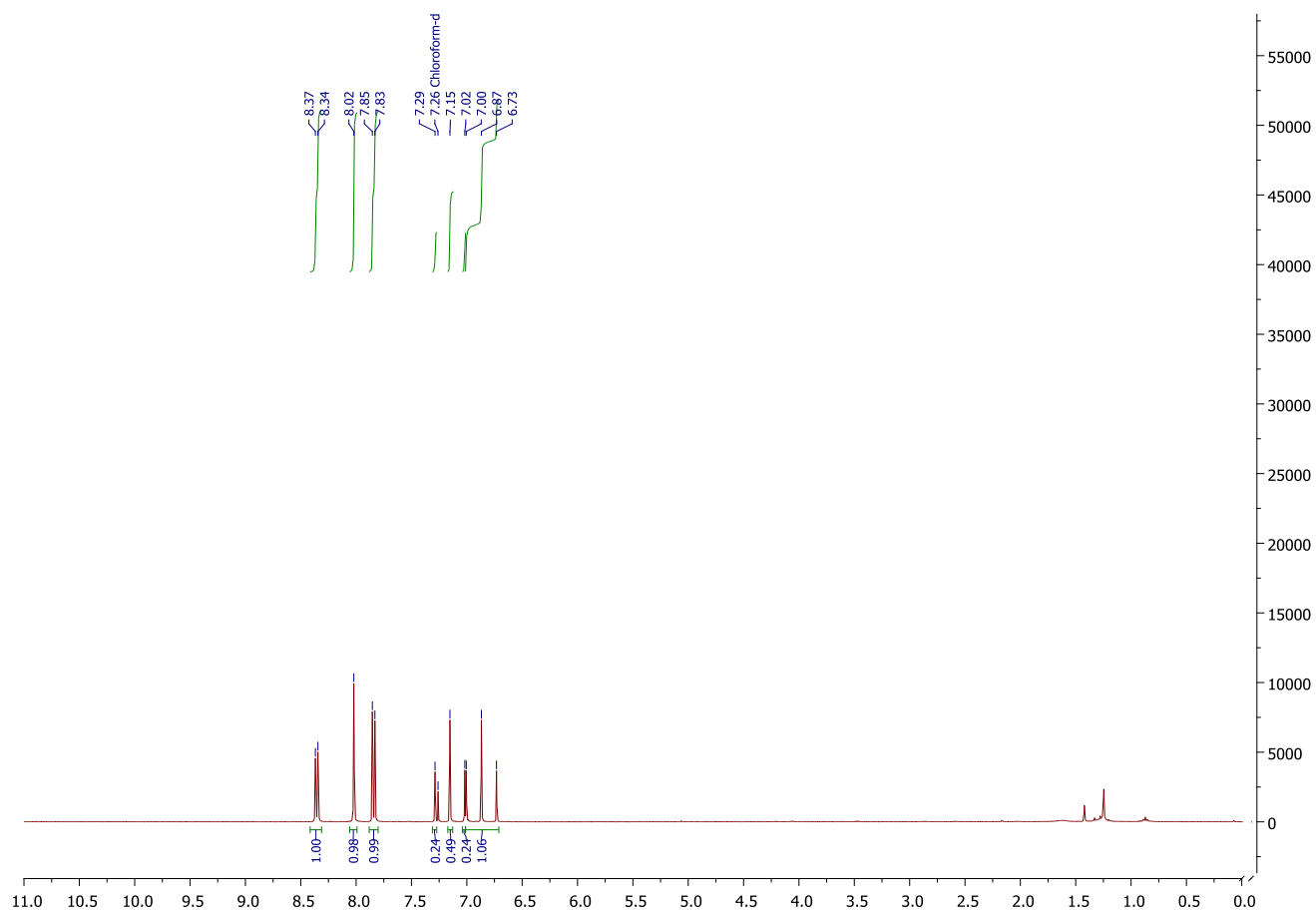
7-Chloro-2,4-bis(difluoromethyl)quinoline-8-carboxylic acid (9) - ^{13}C NMR (101 MHz, CDCl_3)



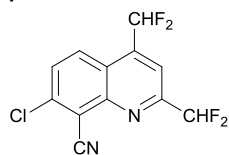
7-Chloro-2,4-bis(difluoromethyl)quinoline-8-carbonitrile (**10**) - ^1H NMR (400 MHz, CDCl_3)



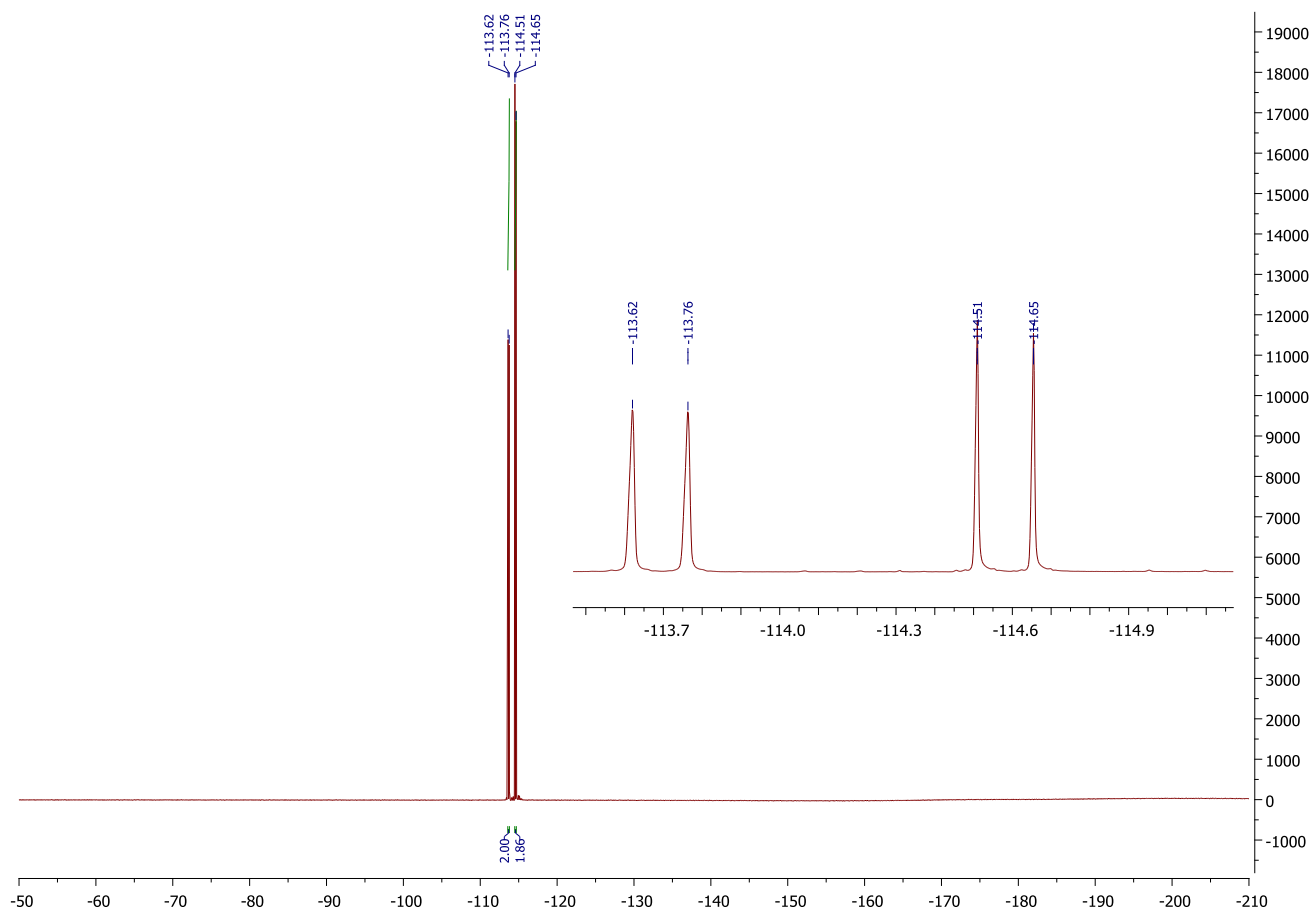
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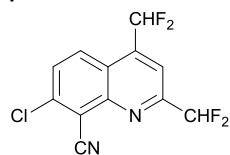
7-Chloro-2,4-bis(difluoromethyl)quinoline-8-carbonitrile (**10**) - ^{19}F NMR (376 MHz, CDCl_3)



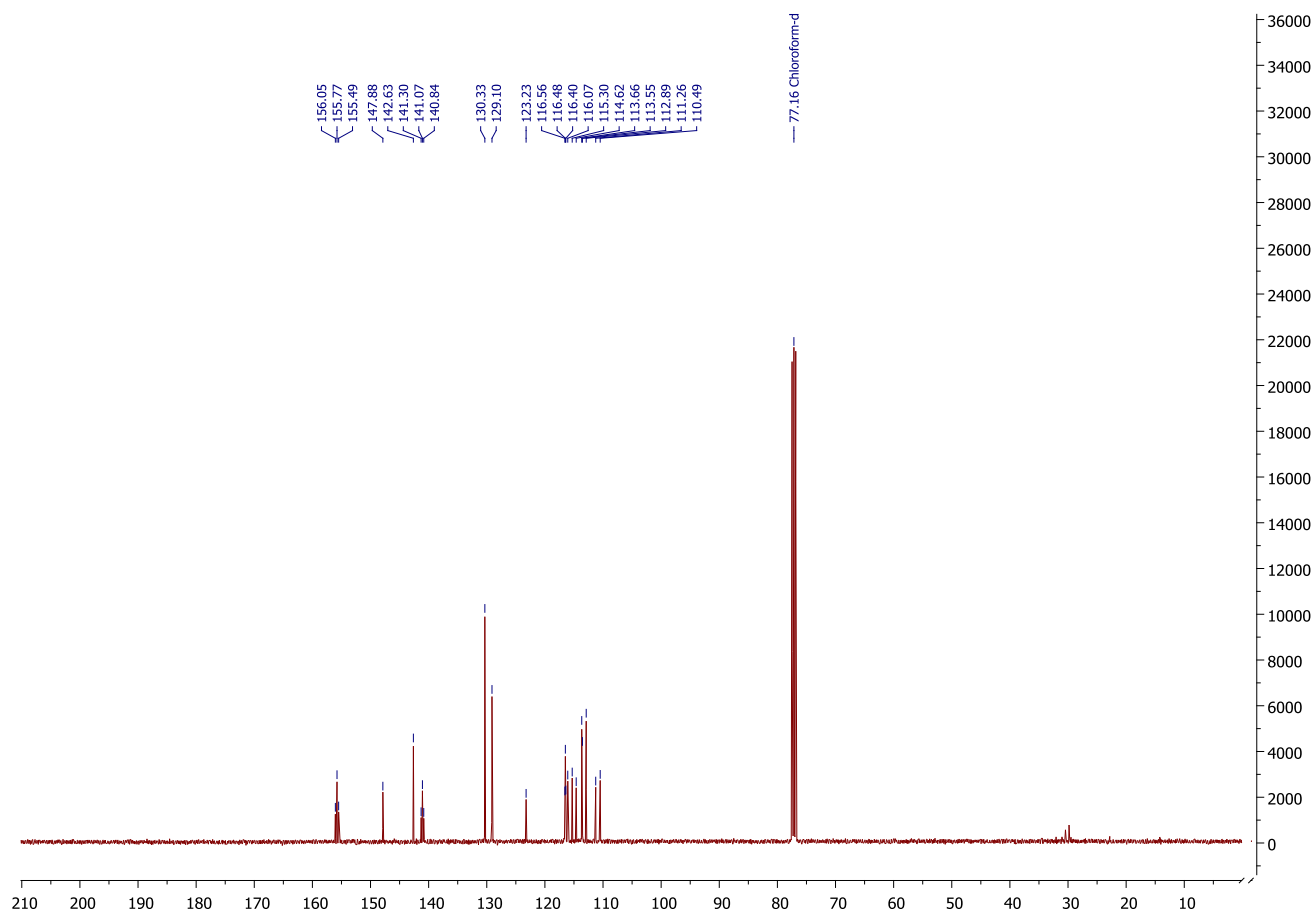
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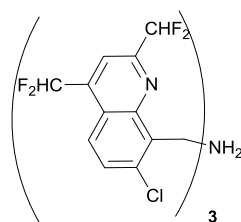
7-Chloro-2,4-bis(difluoromethyl)quinoline-8-carbonitrile (**10**) - ^{13}C NMR (101 MHz, CDCl_3)



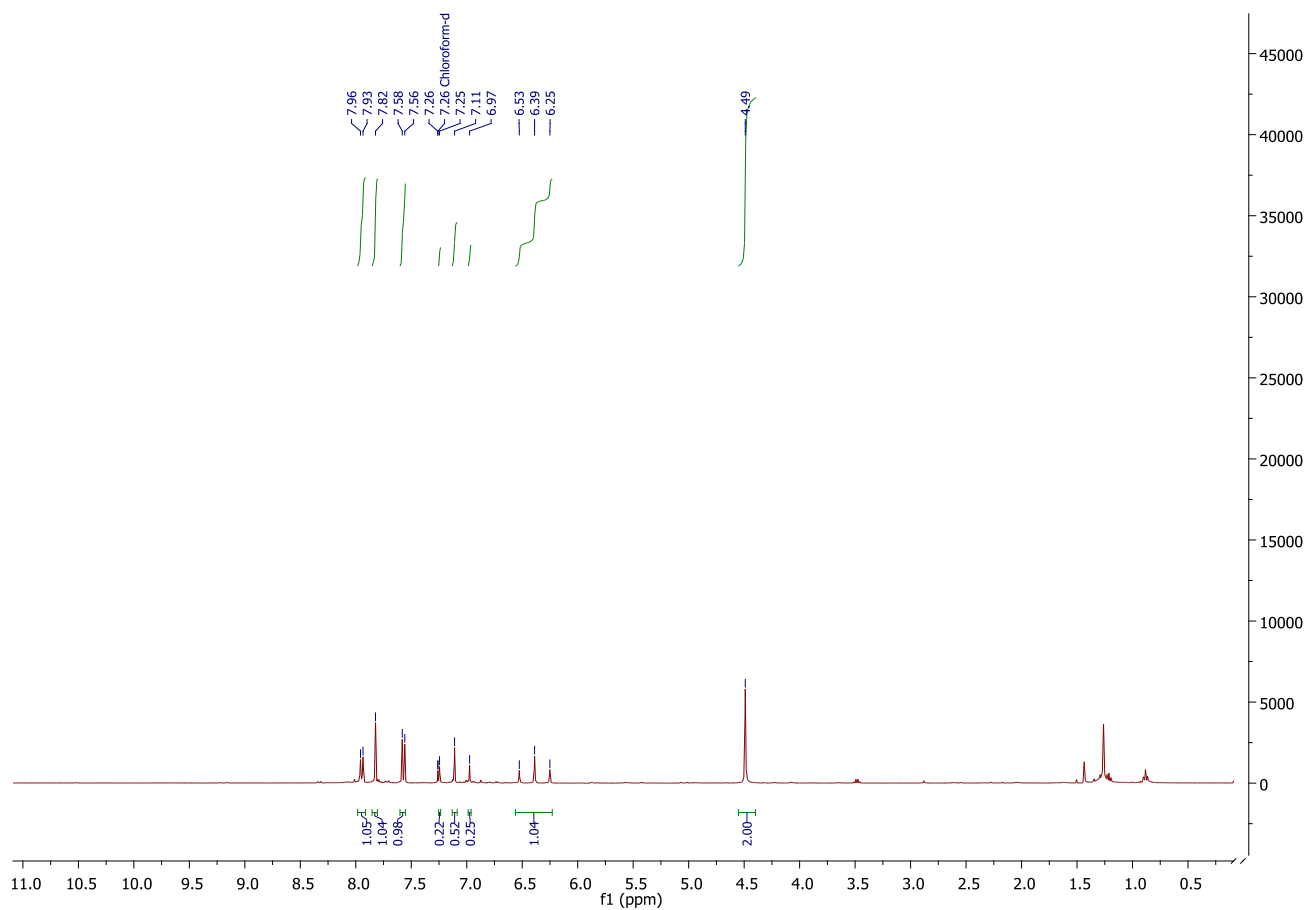
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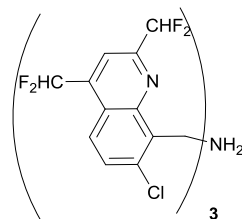
Tris({[7-chloro-2,4-bis(difluoromethyl)quinolin-8-yl]methyl})amine (11) - ^1H NMR (400 MHz, CDCl_3)



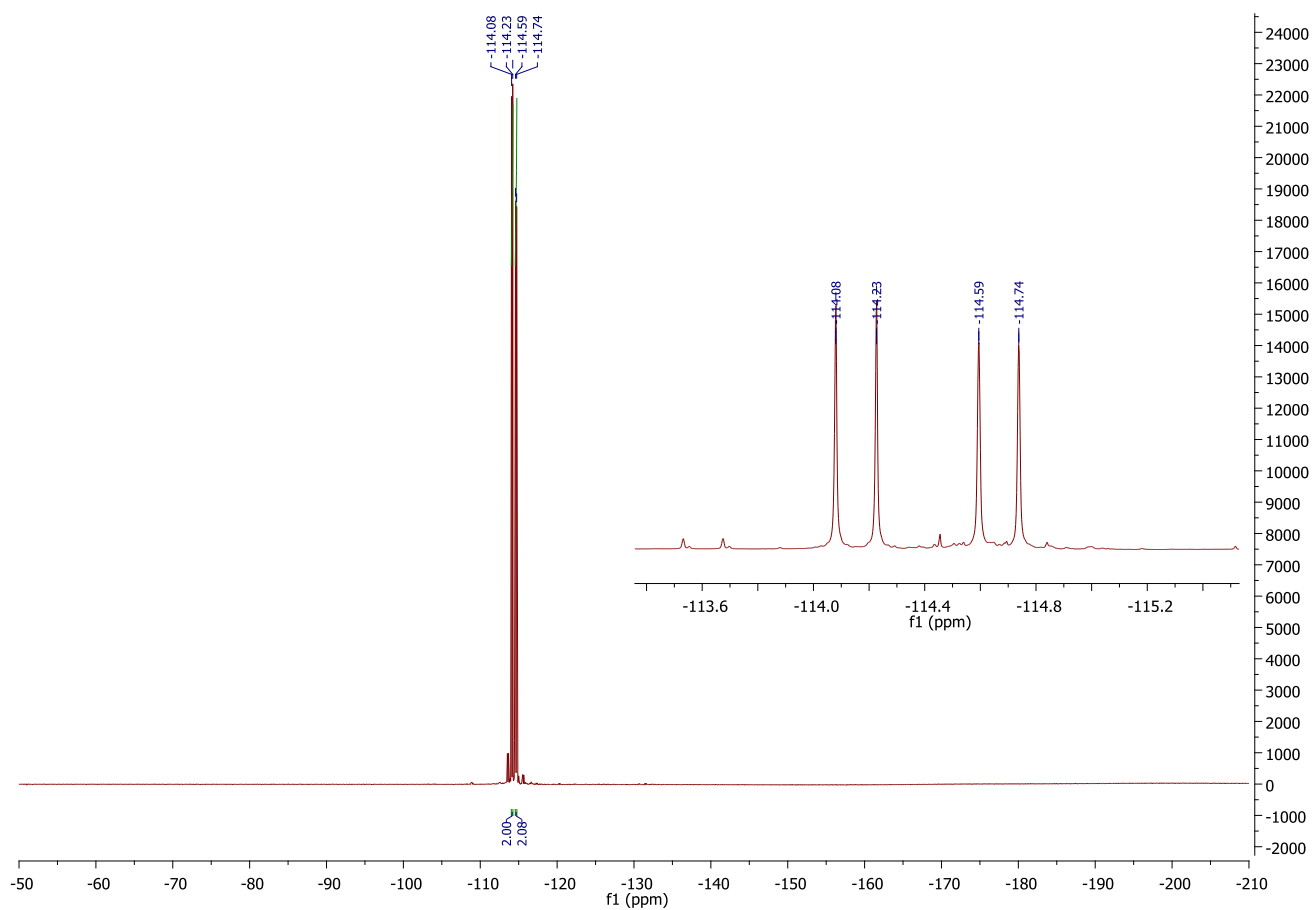
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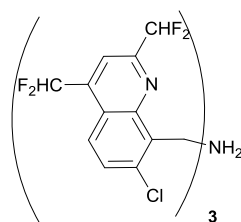
Tris([7-chloro-2,4-bis(difluoromethyl)quinolin-8-yl]methyl)amine (11) - ^{19}F NMR (376 MHz, CDCl_3)



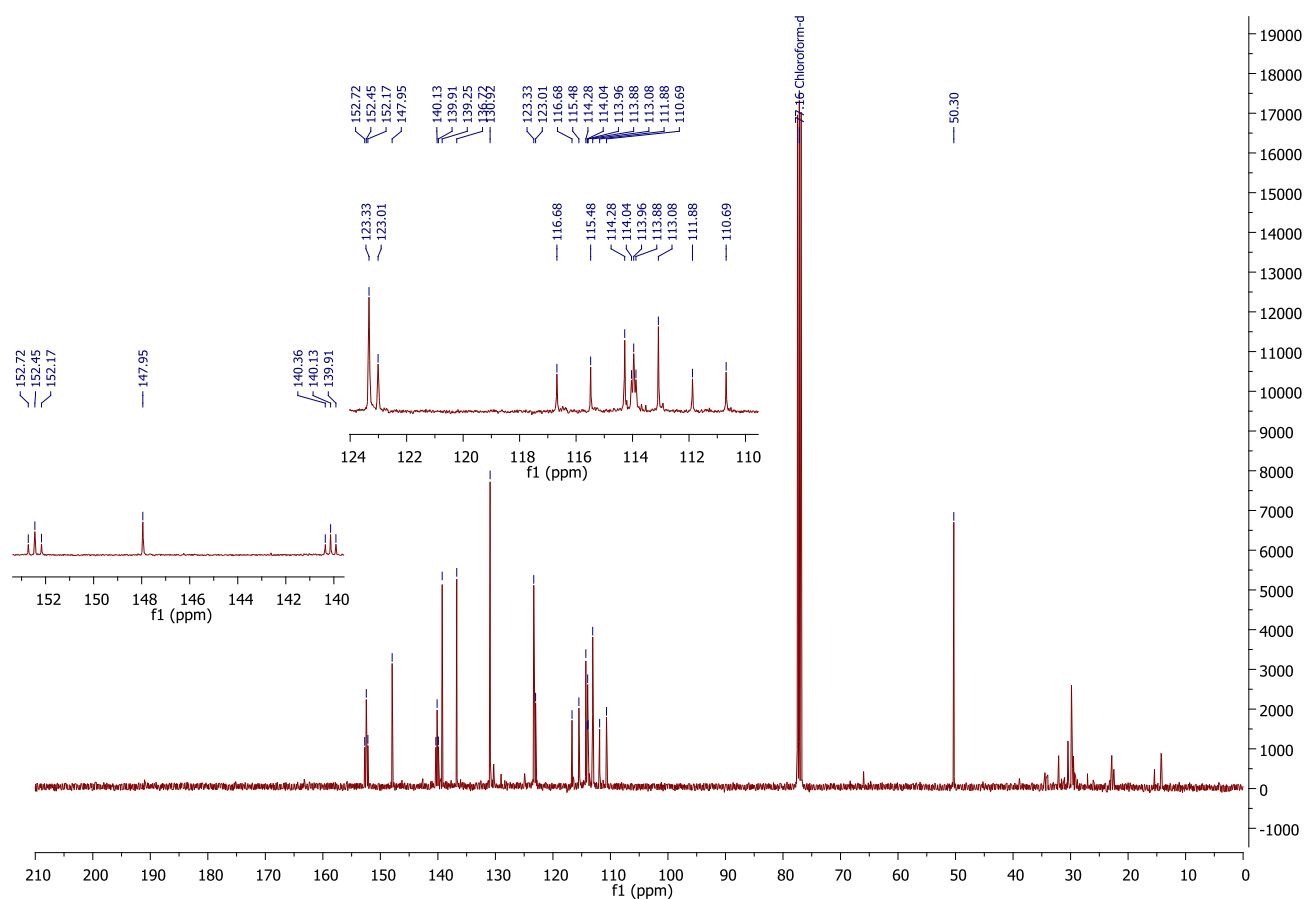
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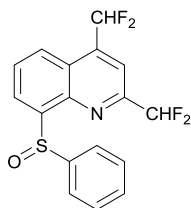
Tris([7-chloro-2,4-bis(difluoromethyl)quinolin-8-yl]methyl)amine (11) - ^{13}C NMR (101 MHz, CDCl_3)



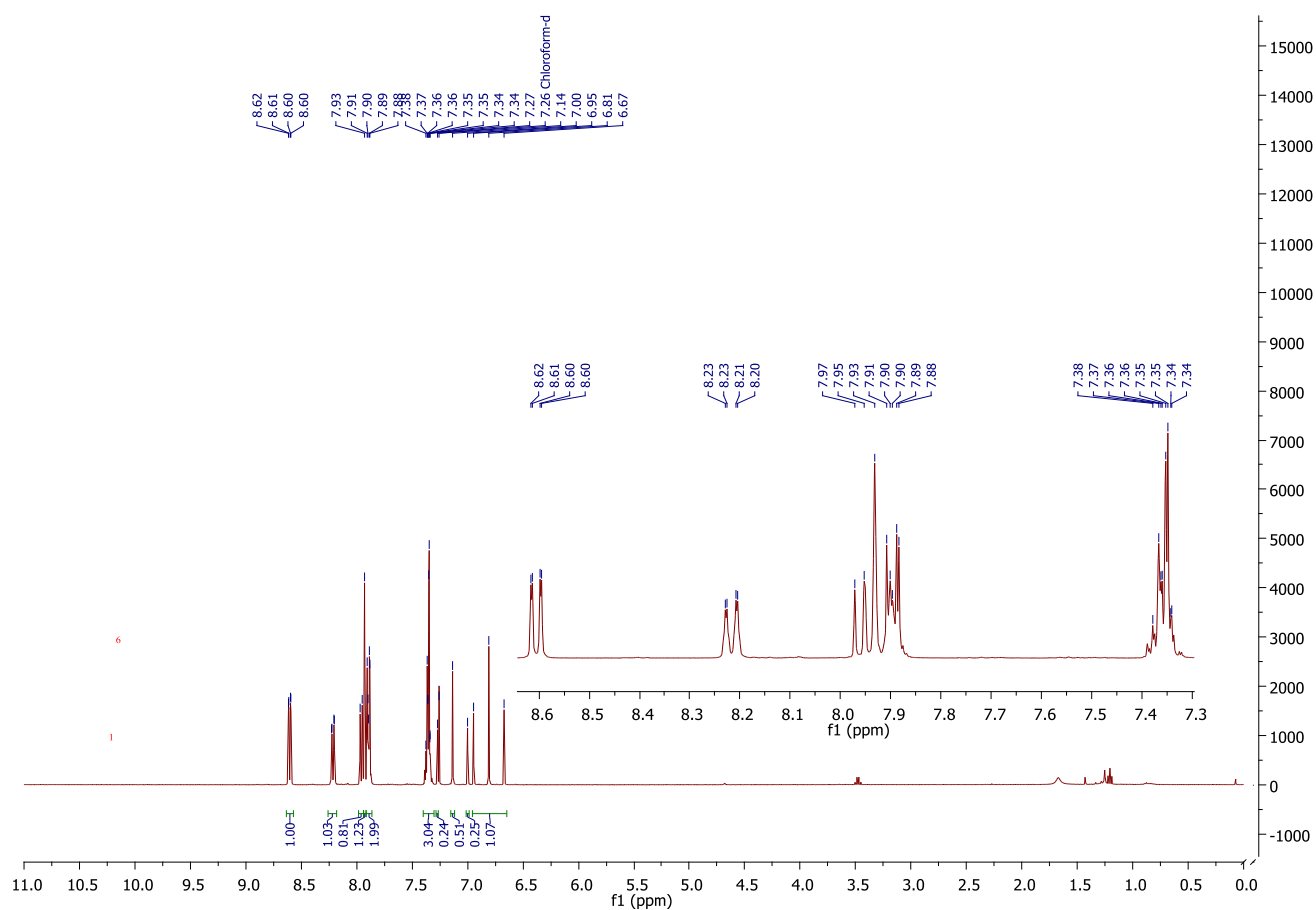
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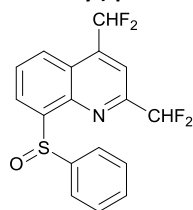
8-(Benzenesulfinyl)-2,4-bis(difluoromethyl)quinoline (13) - ^1H NMR (400 MHz, CDCl_3)



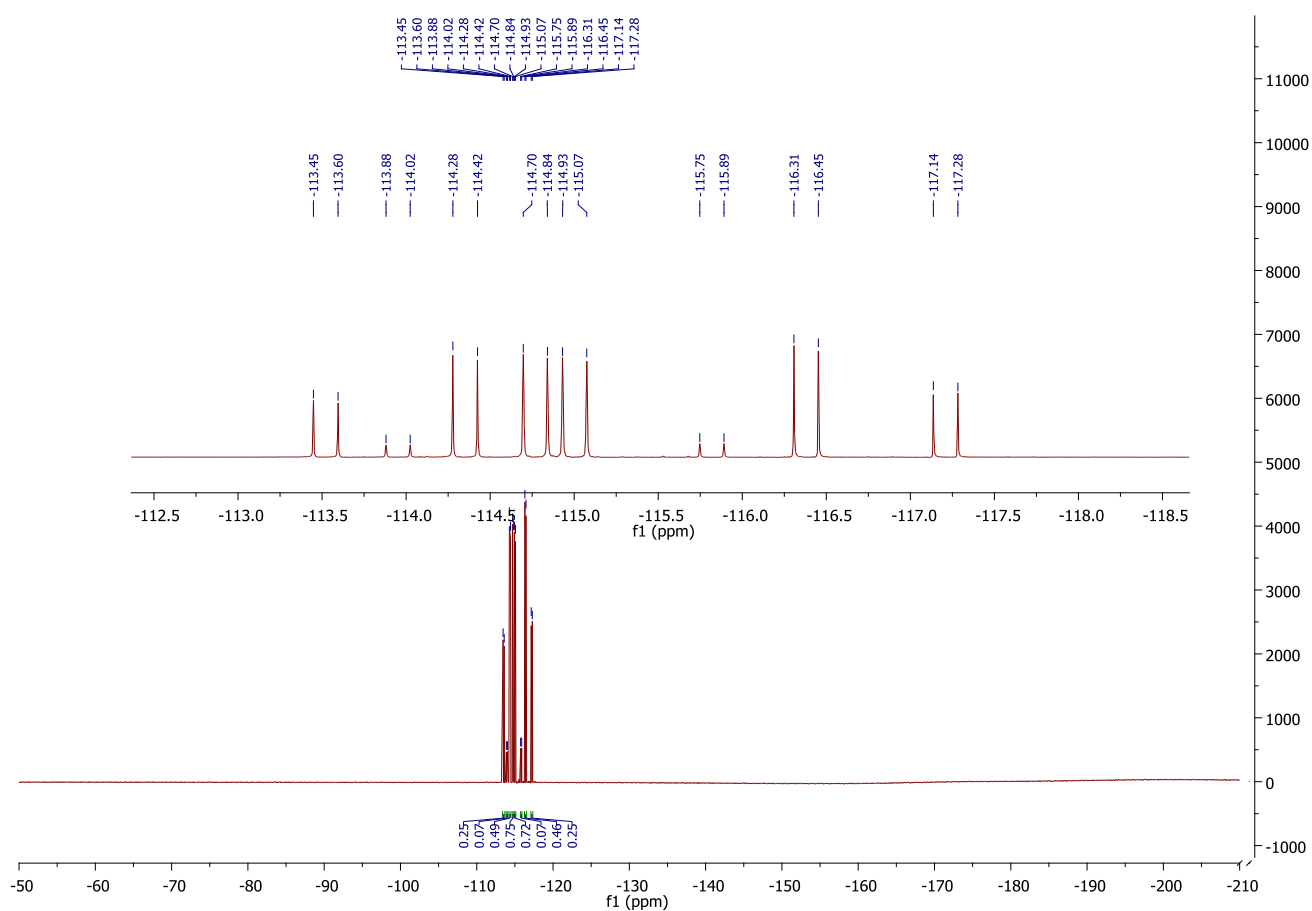
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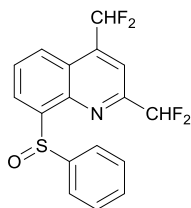
8-(Benzenesulfinyl)-2,4-bis(difluoromethyl)quinoline (13) - ^{19}F NMR (376 MHz, CDCl_3)



13



8-(Benzenesulfinyl)-2,4-bis(difluoromethyl)quinoline amine (13) - ^{13}C NMR (101 MHz, CDCl_3)



13

