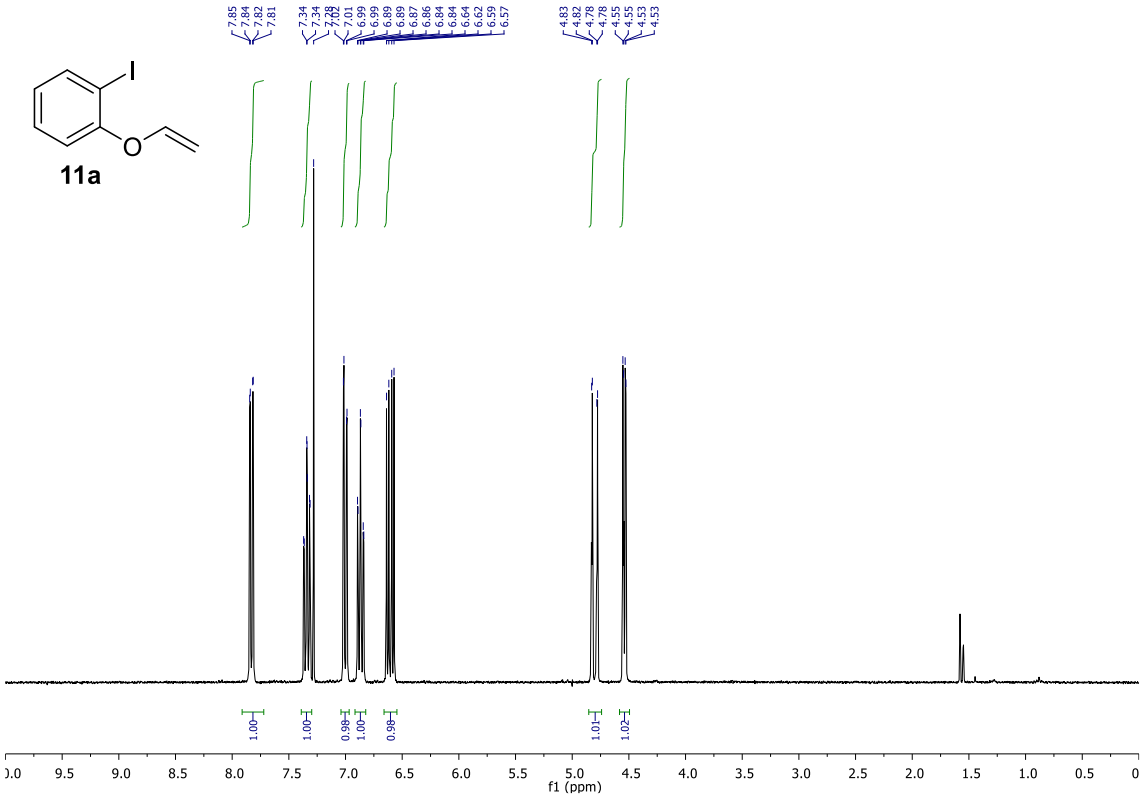
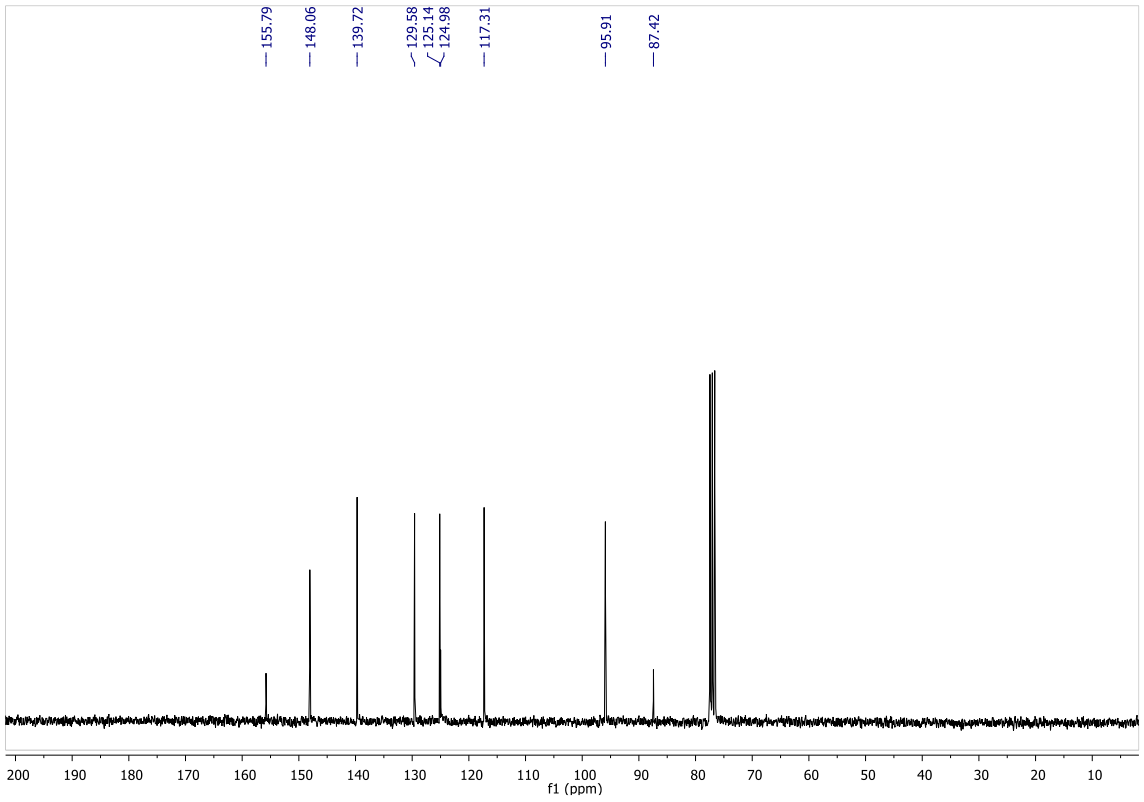
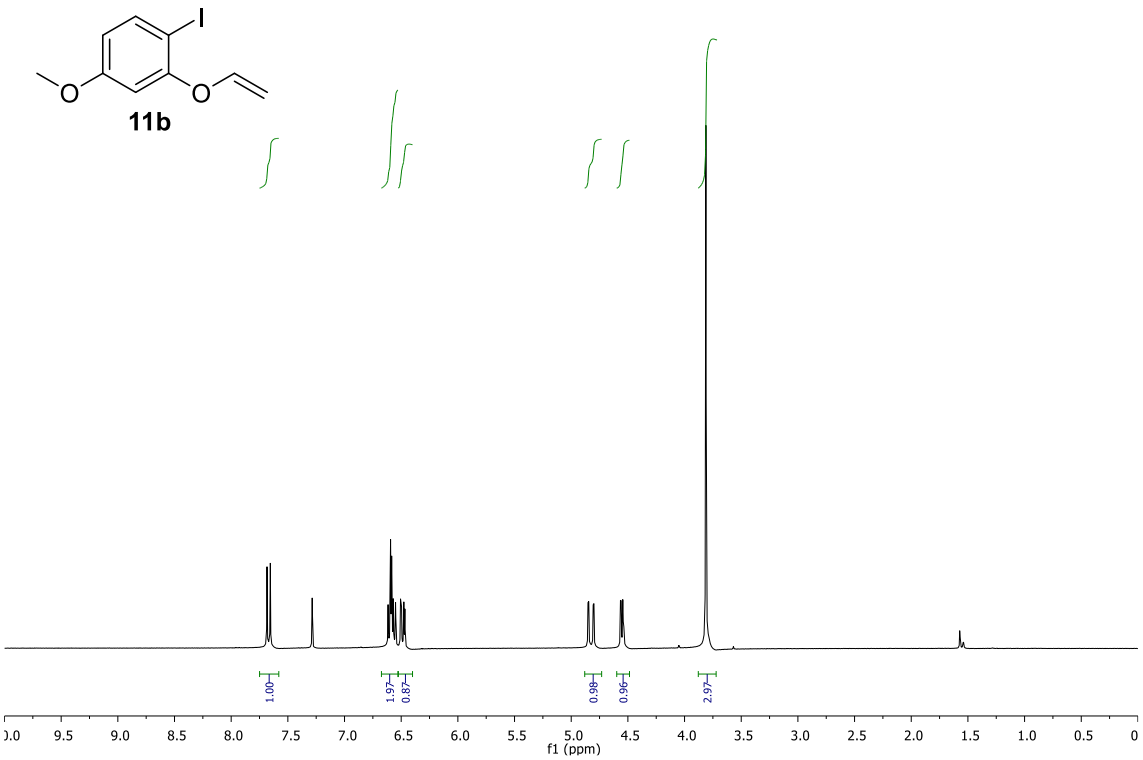
# Copies of $^{1}H$, $^{13}C$, $^{19}F$ NMR spectra

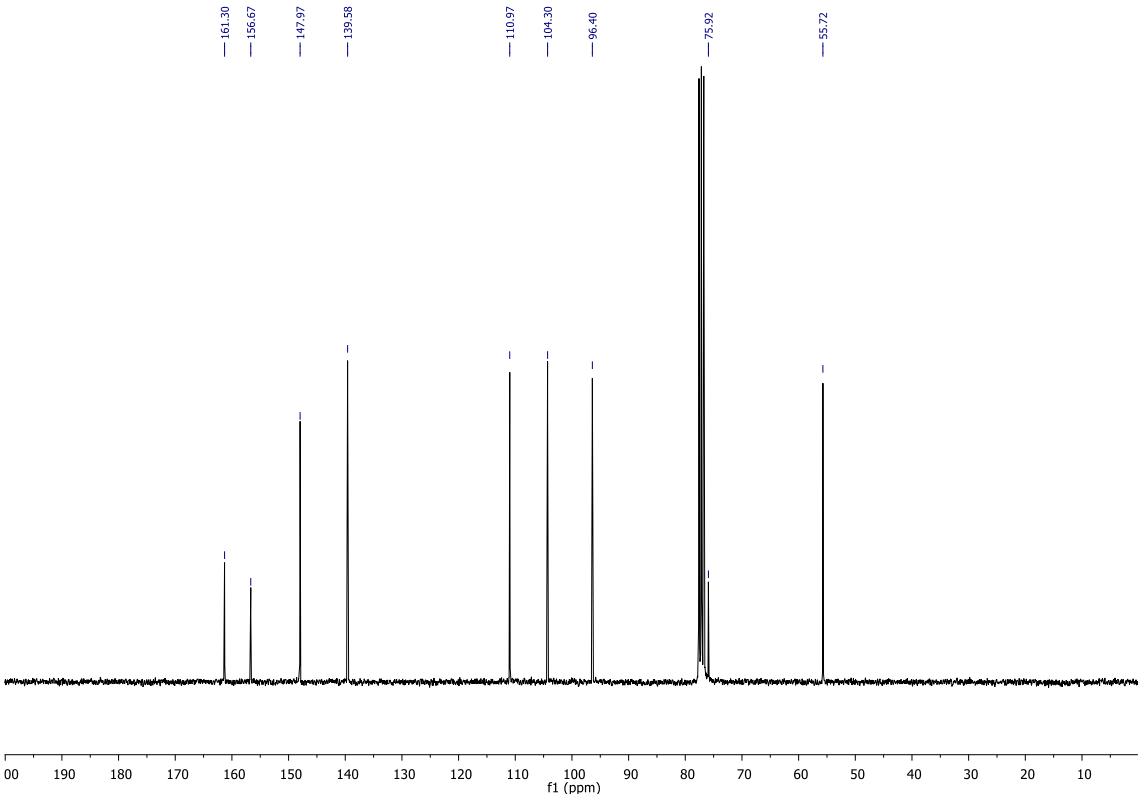
1-Iodo-2-(vinyloxy)benzene **11a**



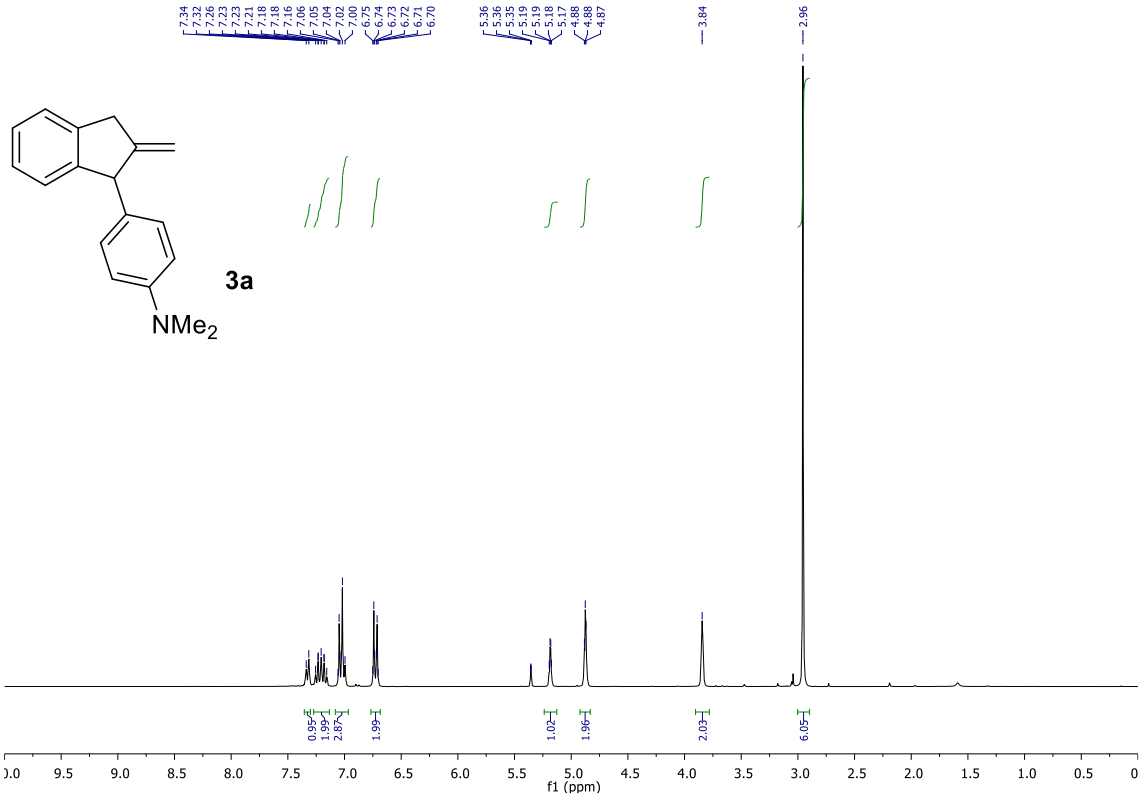



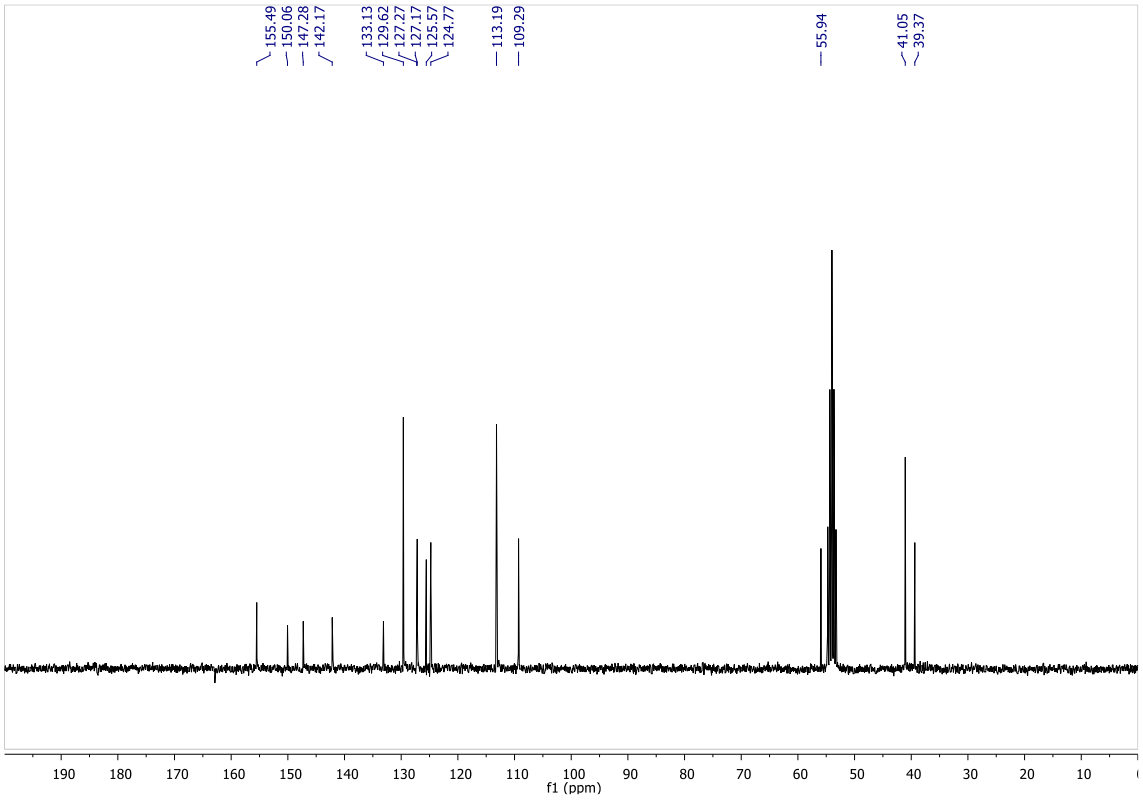
1-Iodo-4-methoxy-2-(vinyloxy)benzene **11b**



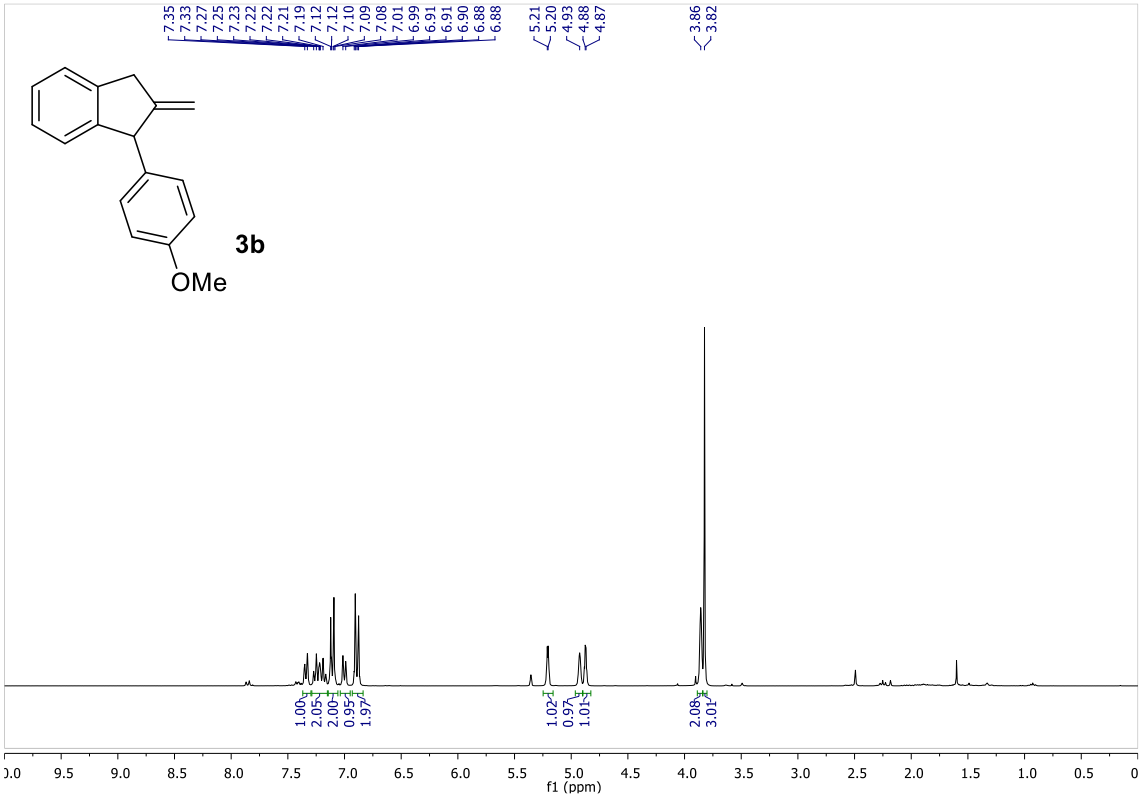



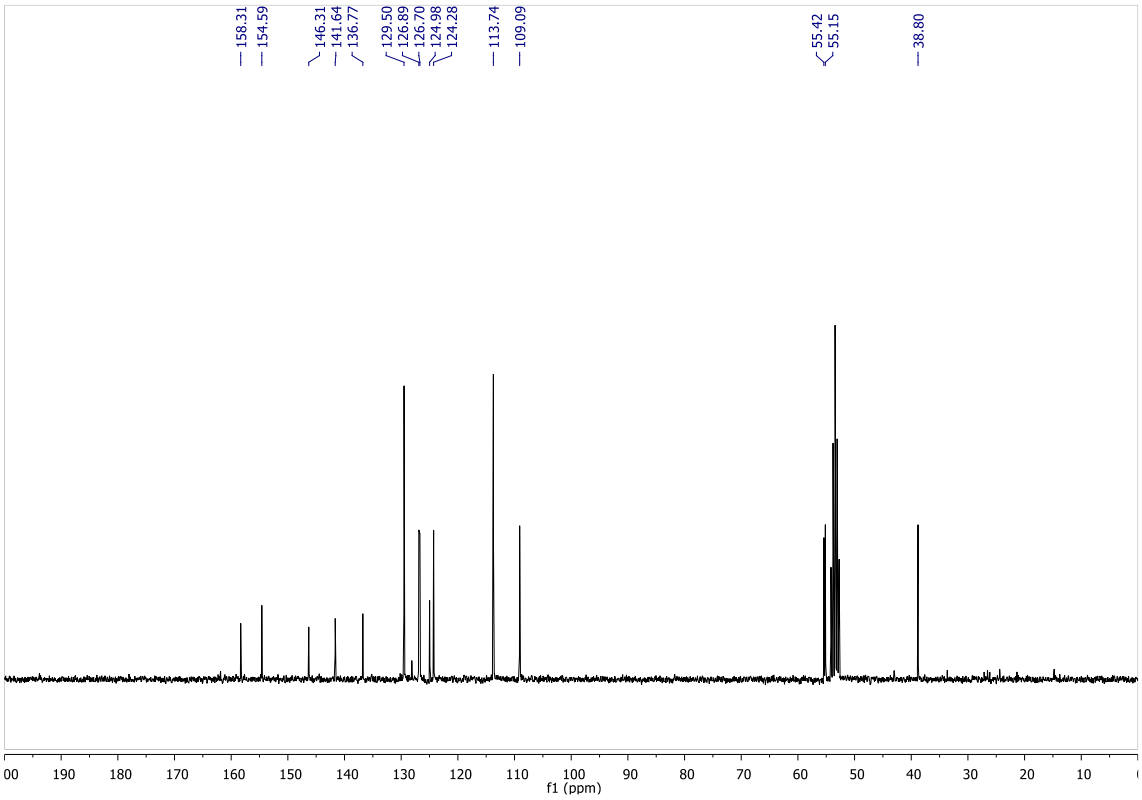
*N,N*-Dimethyl-4-(2-methylene-2,3-dihydro-1*H*-inden-1-yl)aniline **3a**



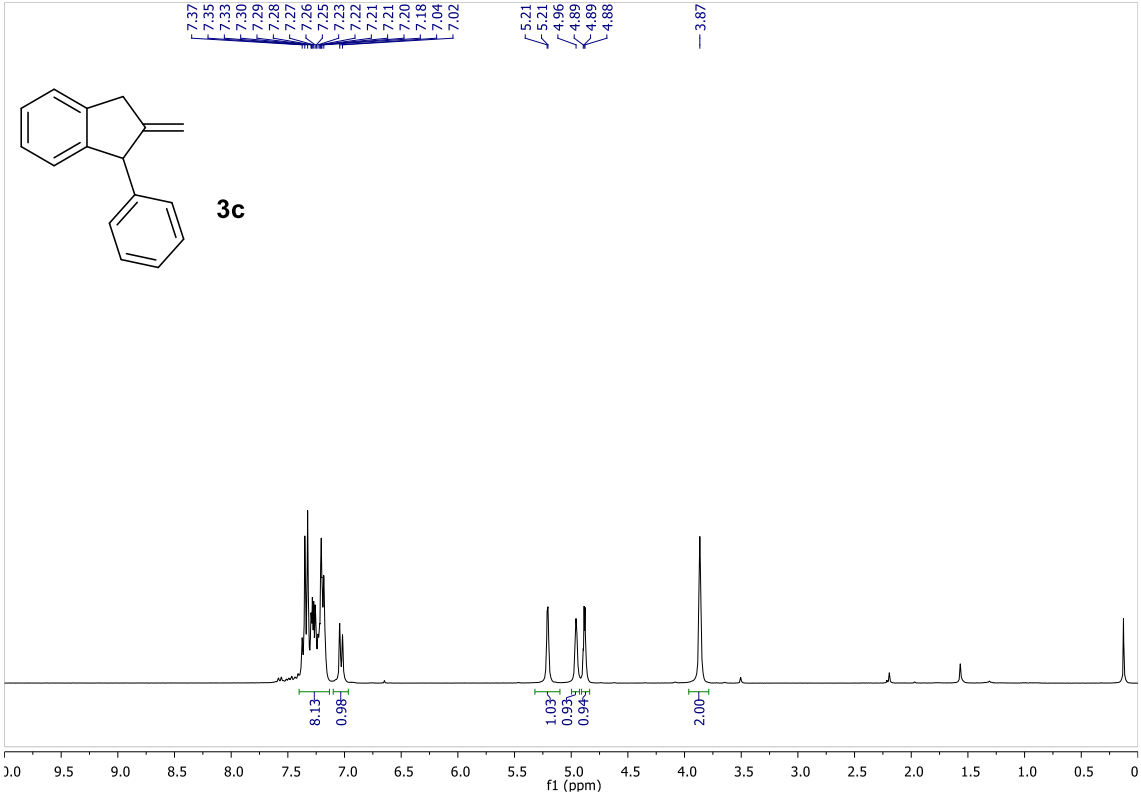



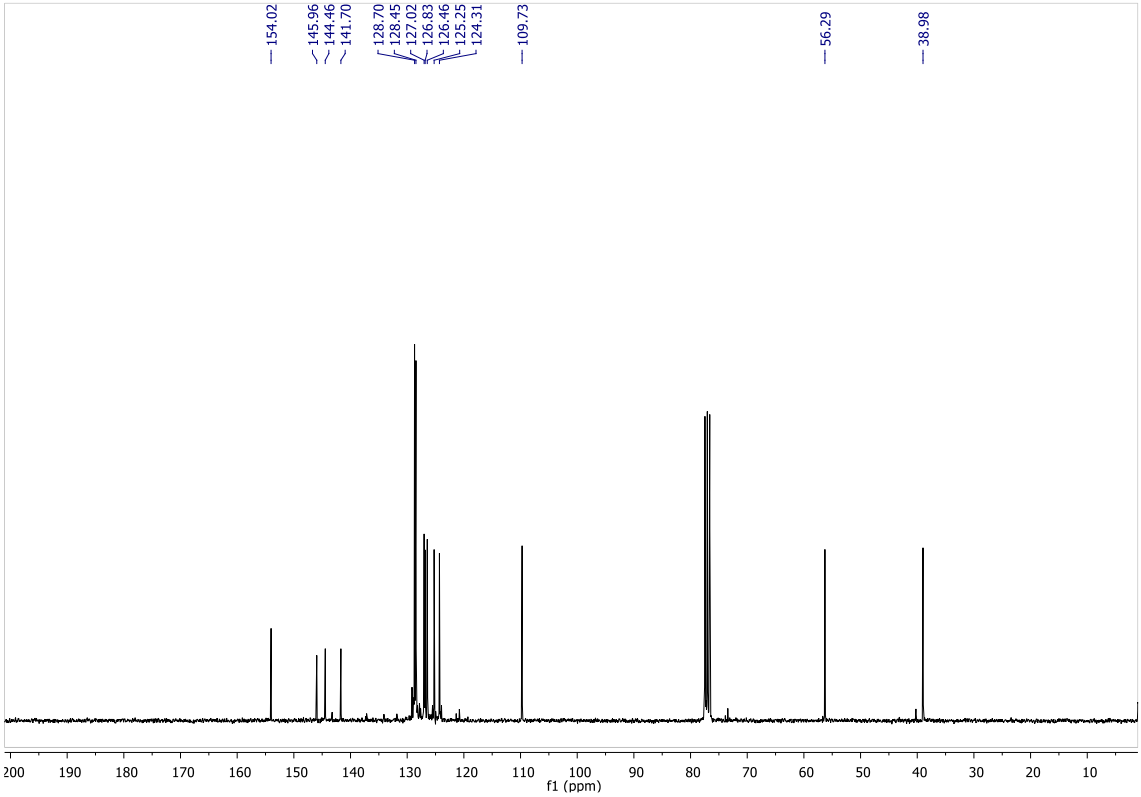
1-(4-Methoxyphenyl)-2-methylene-2,3-dihydro-1*H*-indene **3b**



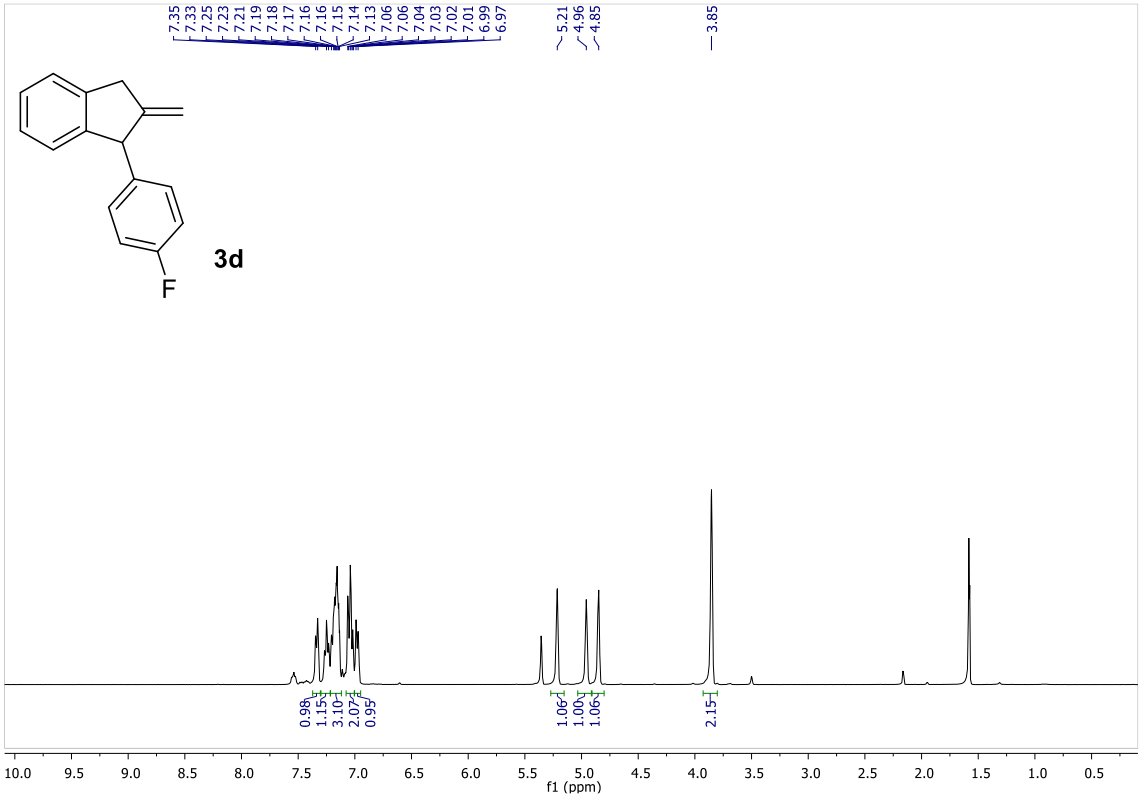



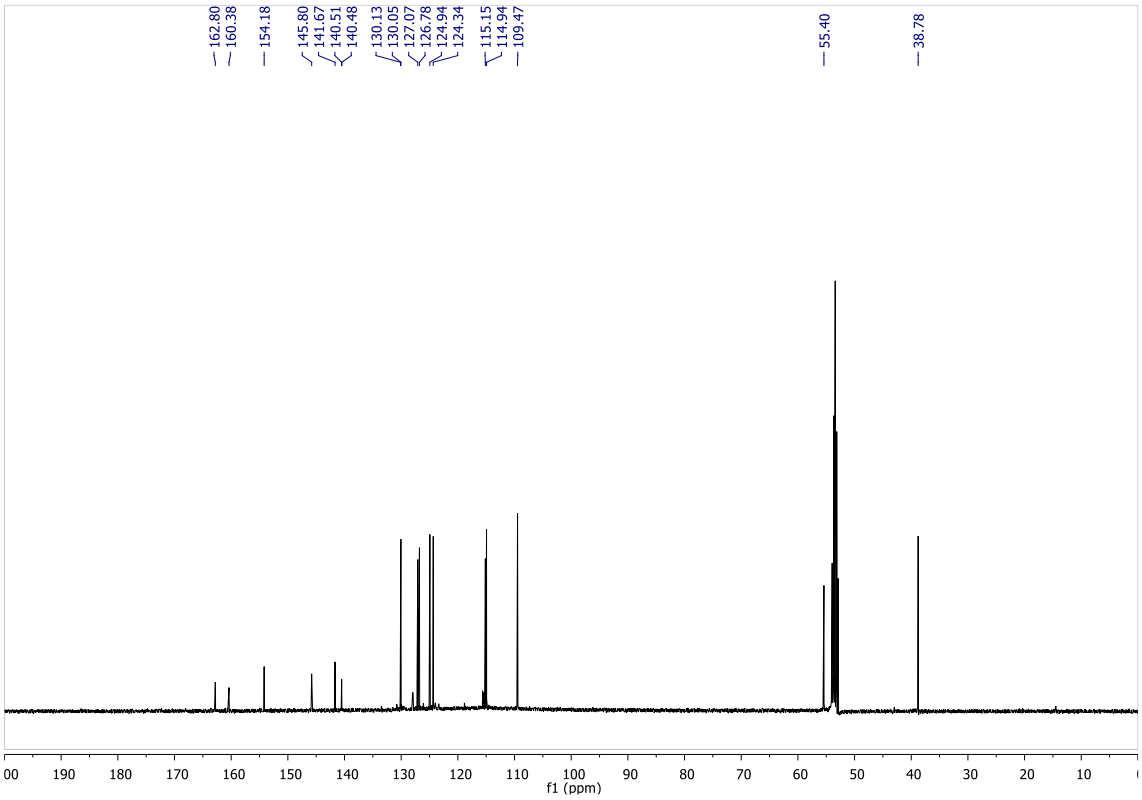
2-Methylene-1-phenyl-2,3-dihydro-1*H*-indene **3c**



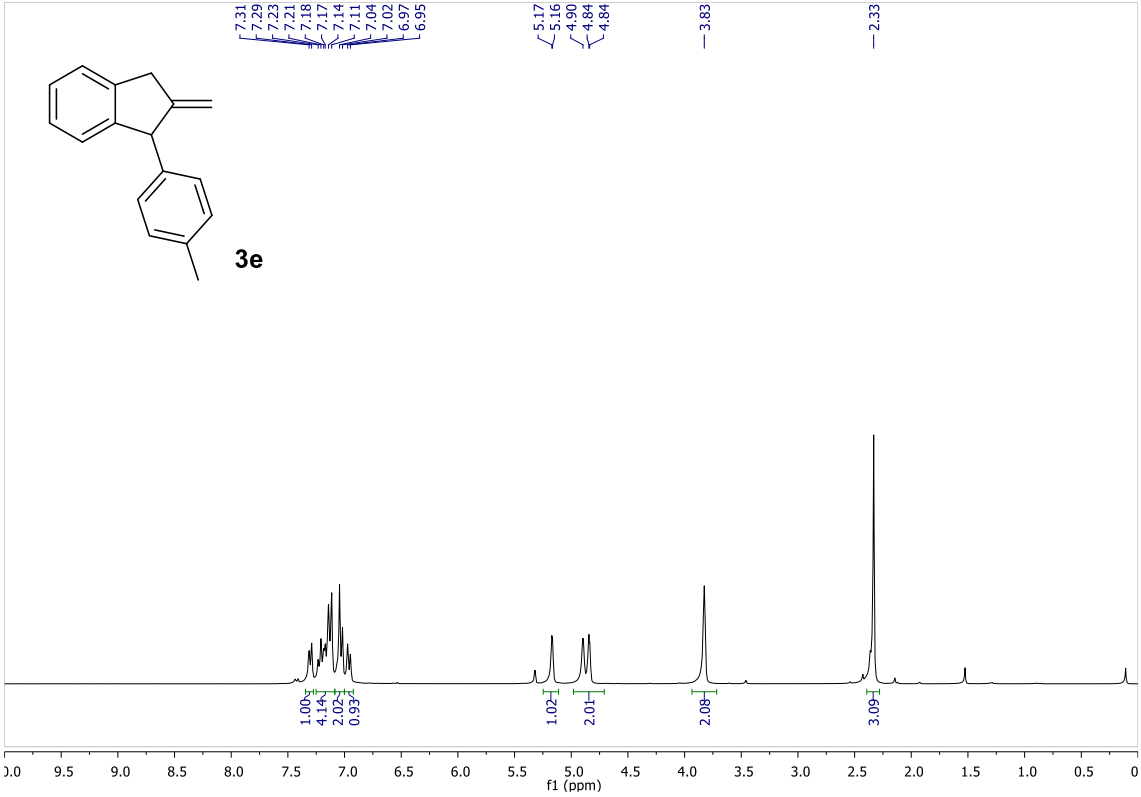



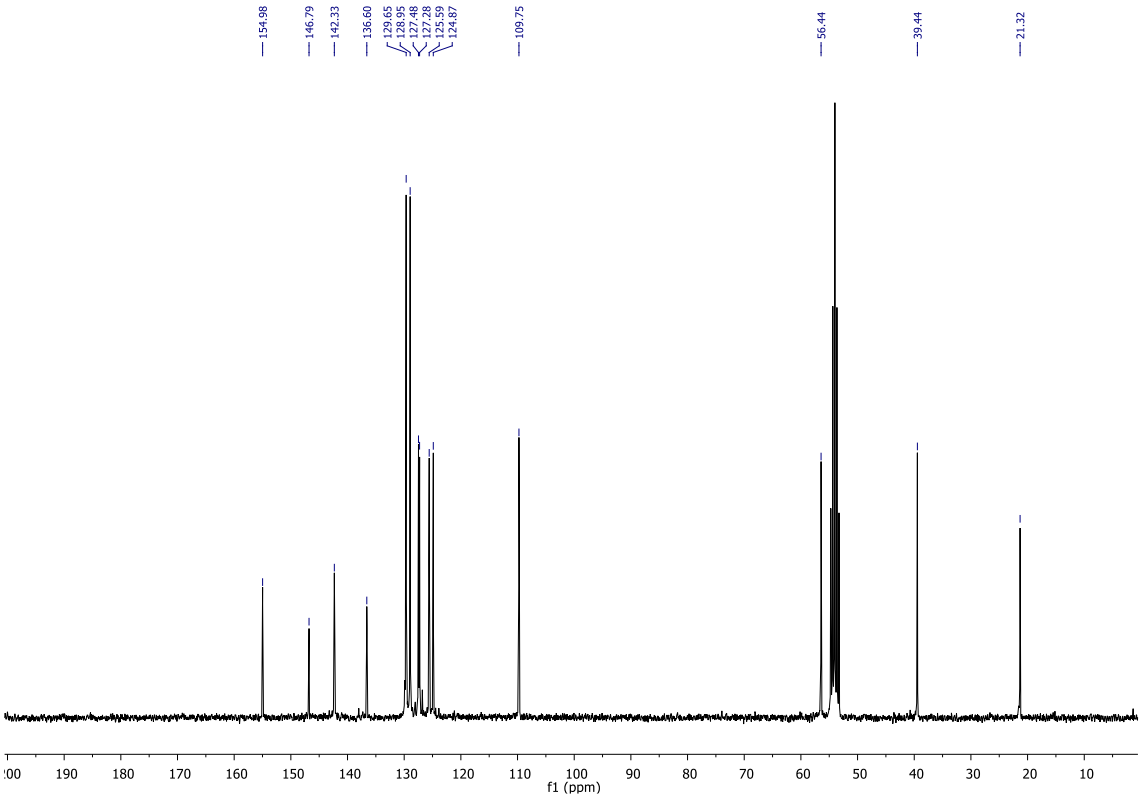
1-(4-Fluorophenyl)-2-methylene-2,3-dihydro-1*H*-indene **3d**



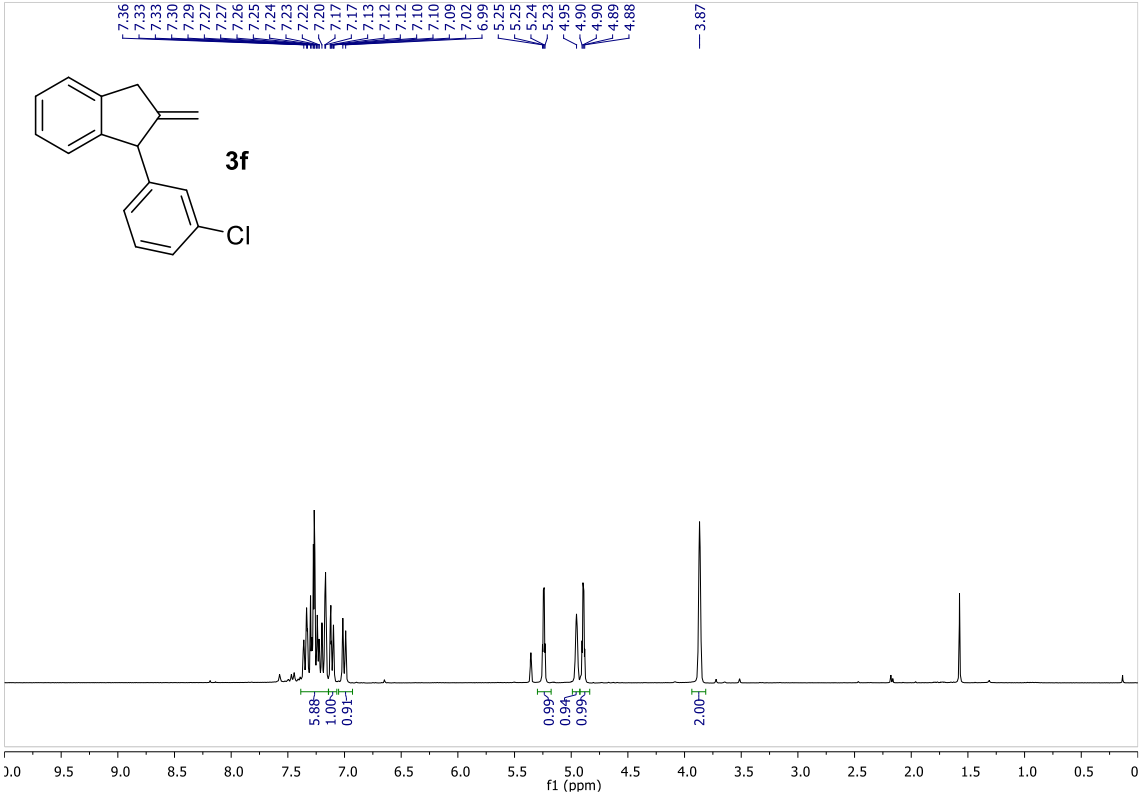



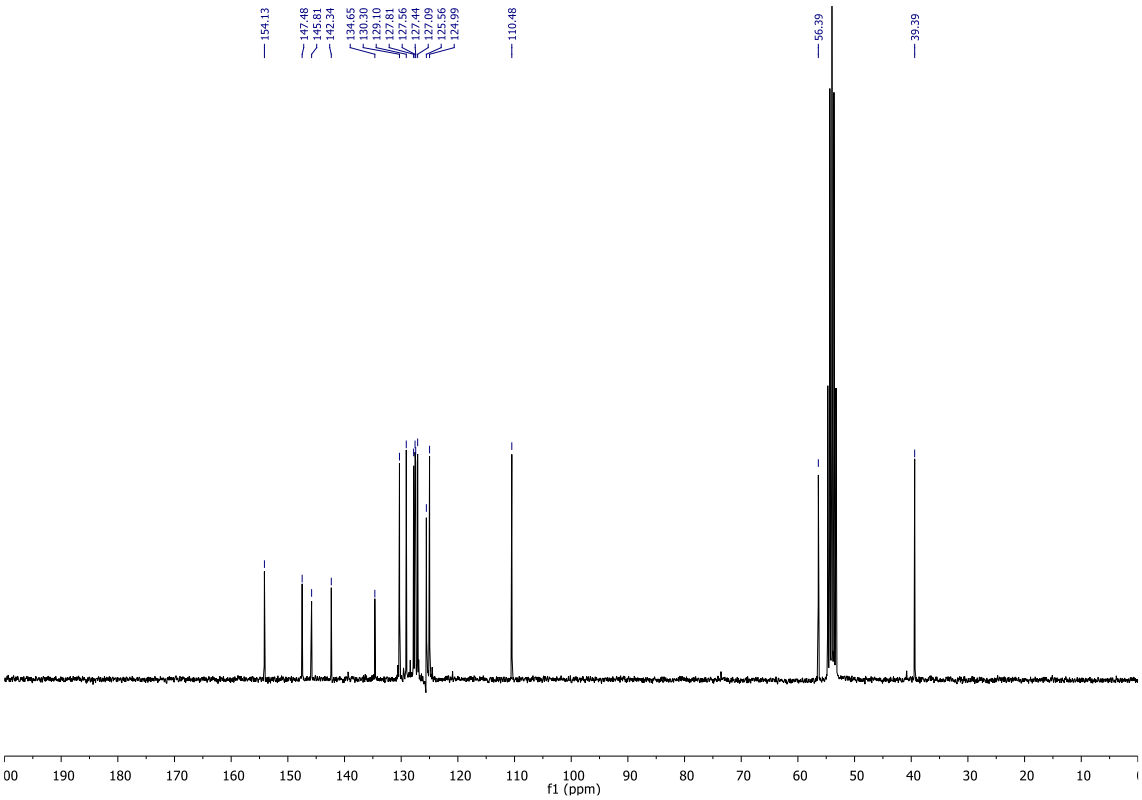
2-Ethylene-1-(*p*-tolyl)-2,3-dihydro-1*H*-indene **3e**



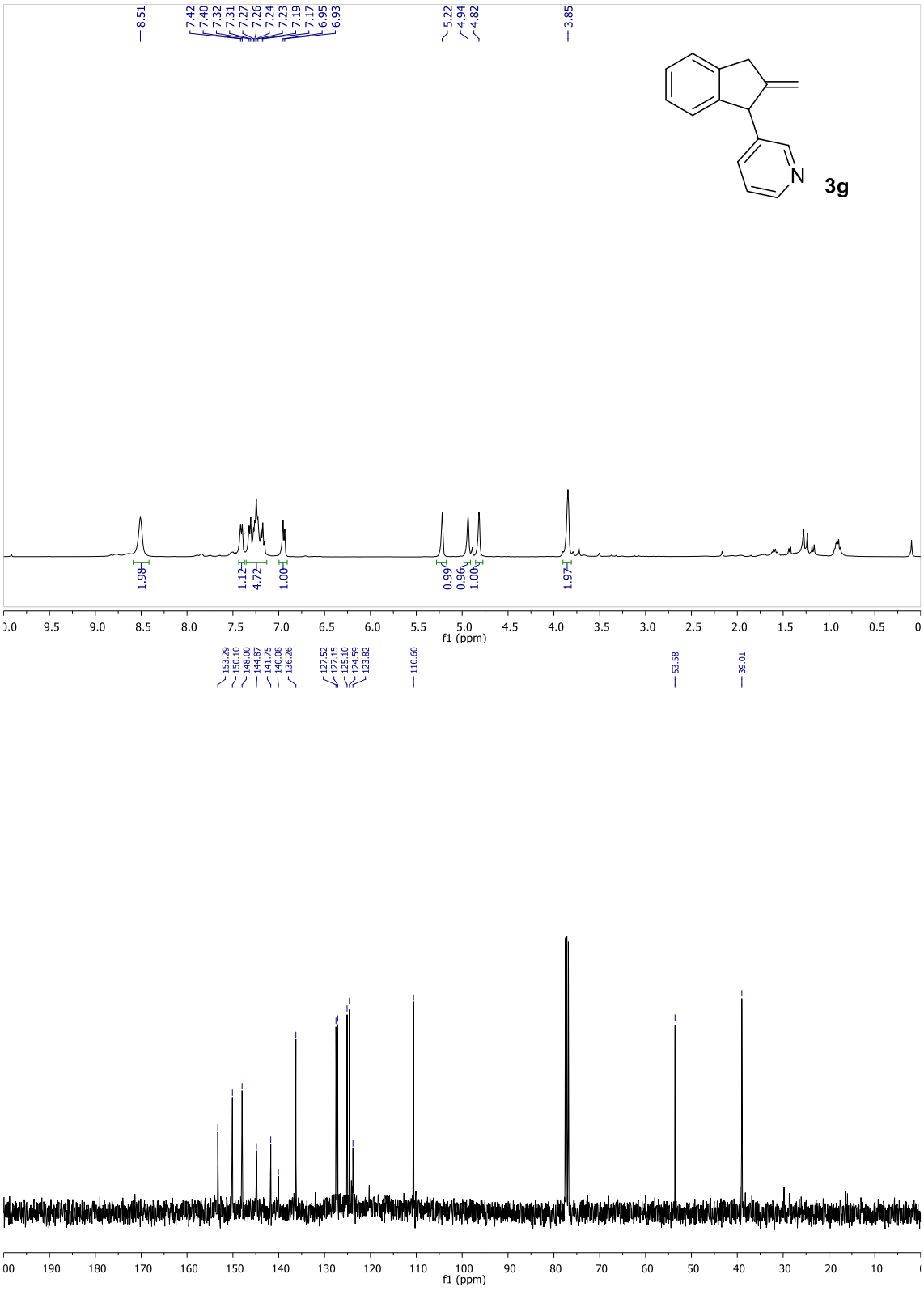



1-(3-Chlorophenyl)-2-methylene-2,3-dihydro-1*H*-indene **3f**

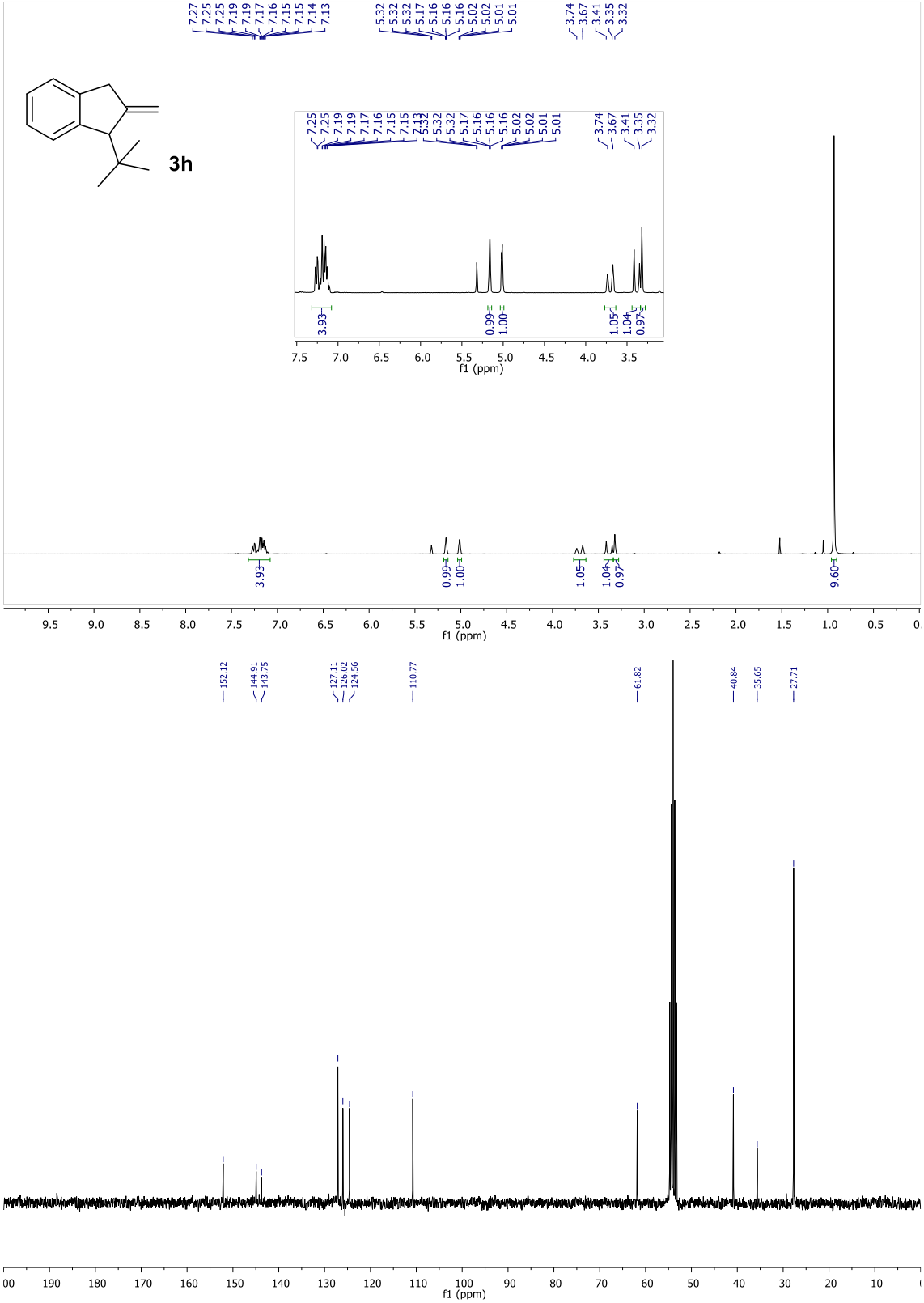


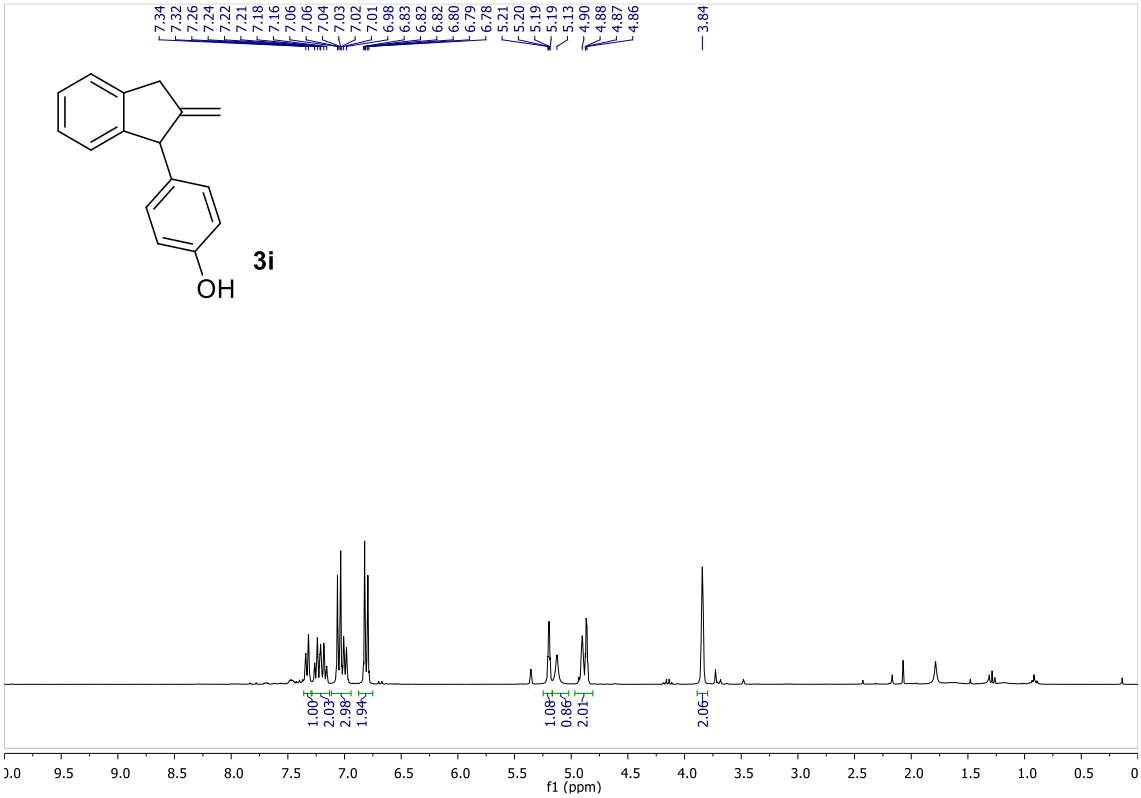
3-(2-Methylene-2,3-dihydro-1*H*-inden-1-yl)pyridine **3g**

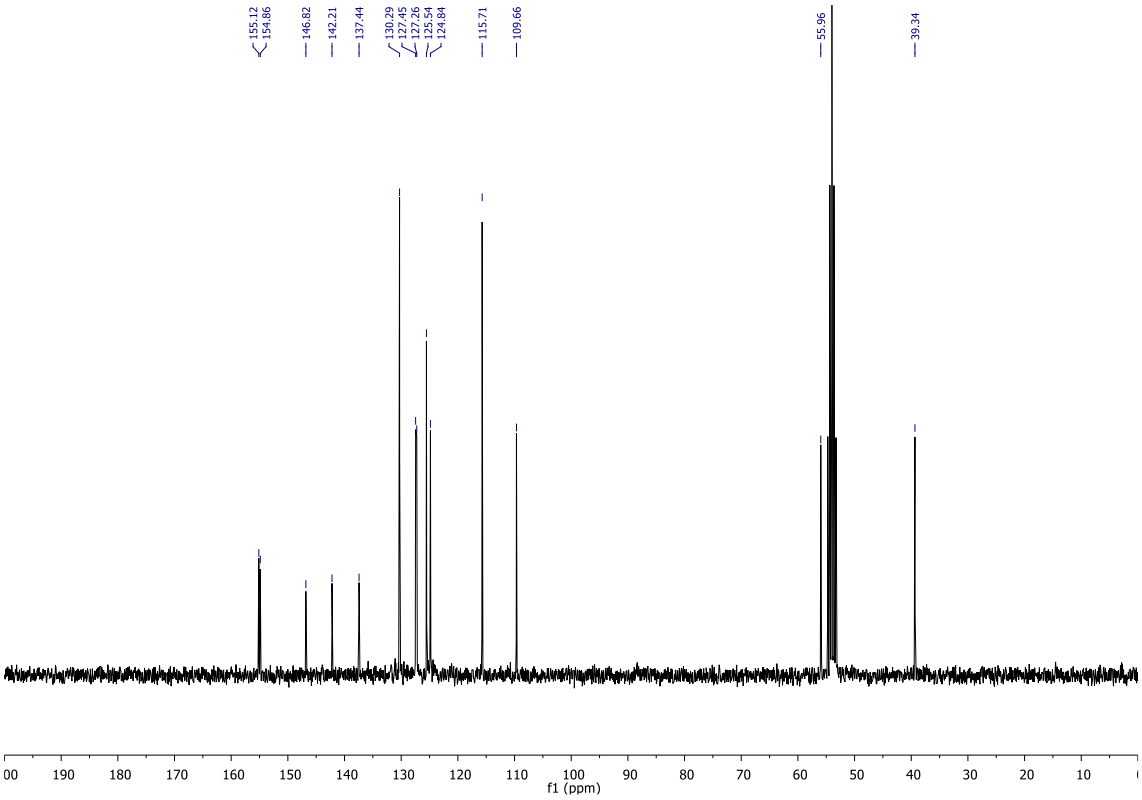


1-(*tert*-Butyl)-2-methylene-2,3-dihydro-1*H*-indene **3h**

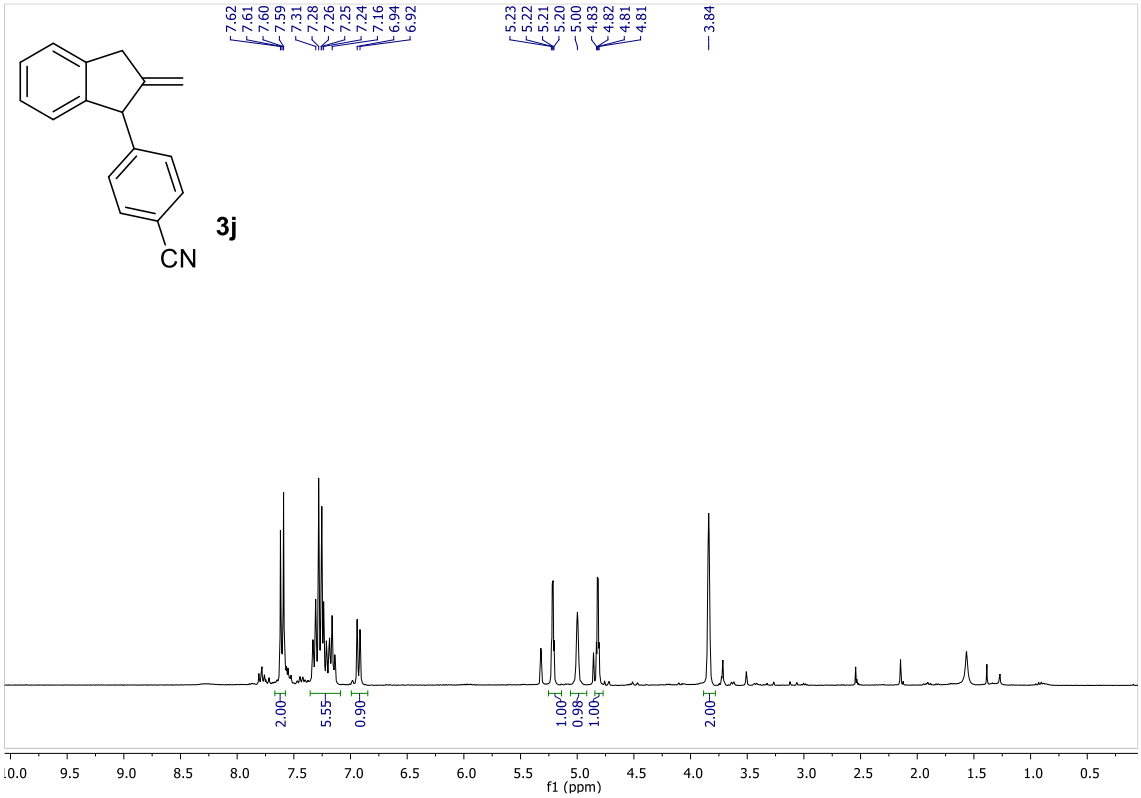


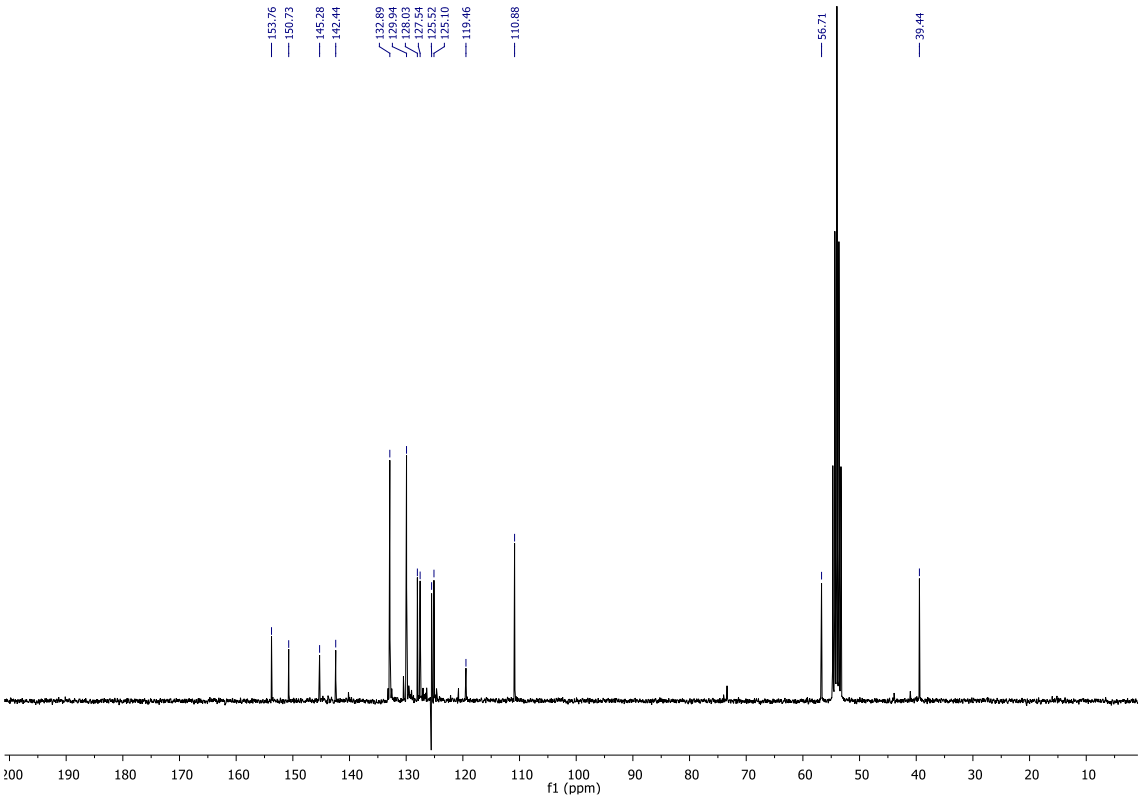
4-(2-Methylene-2,3-dihydro-1*H*-inden-1-yl)phenol **3i**



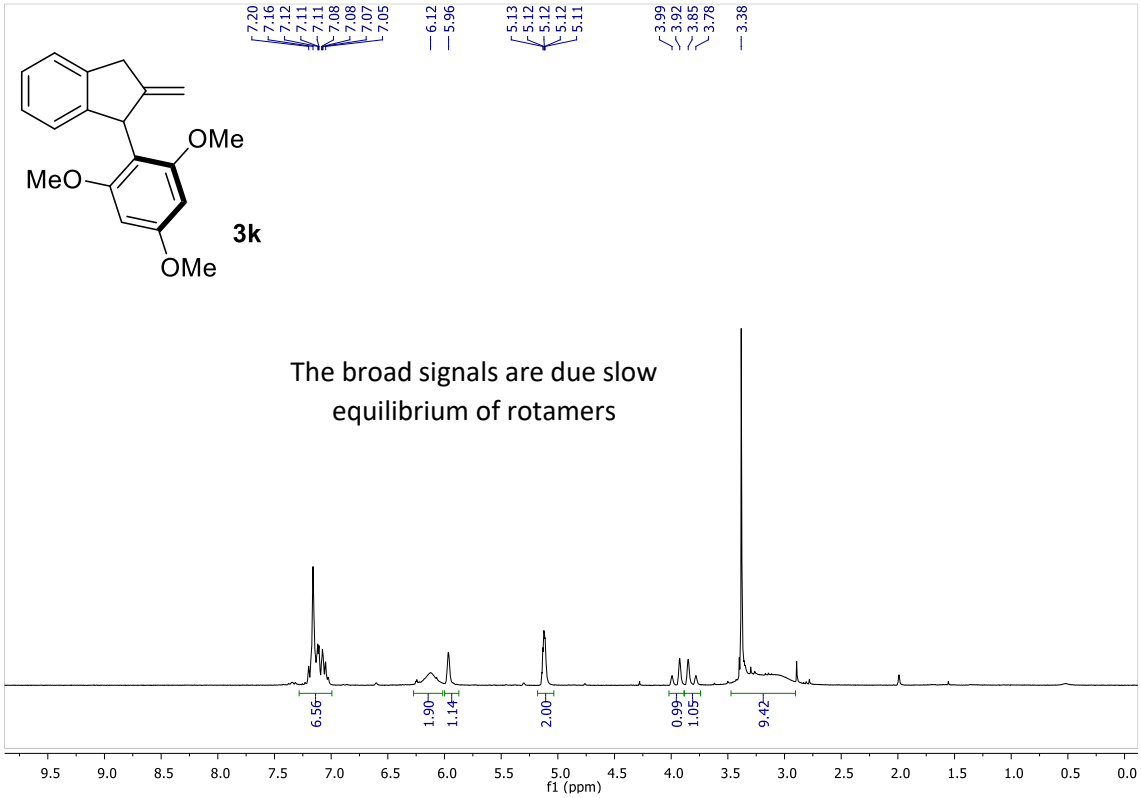



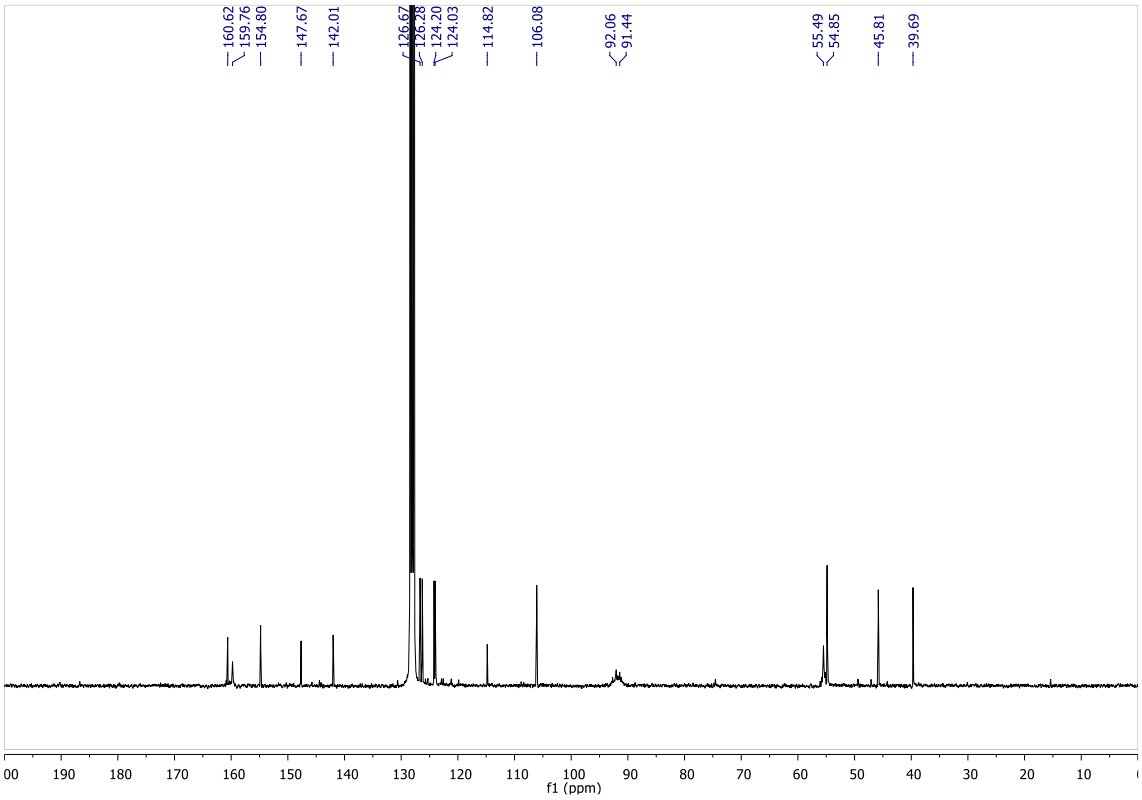
4-(2-Methylene-2,3-dihydro-1*H*-inden-1-yl)benzonitrile **3j**



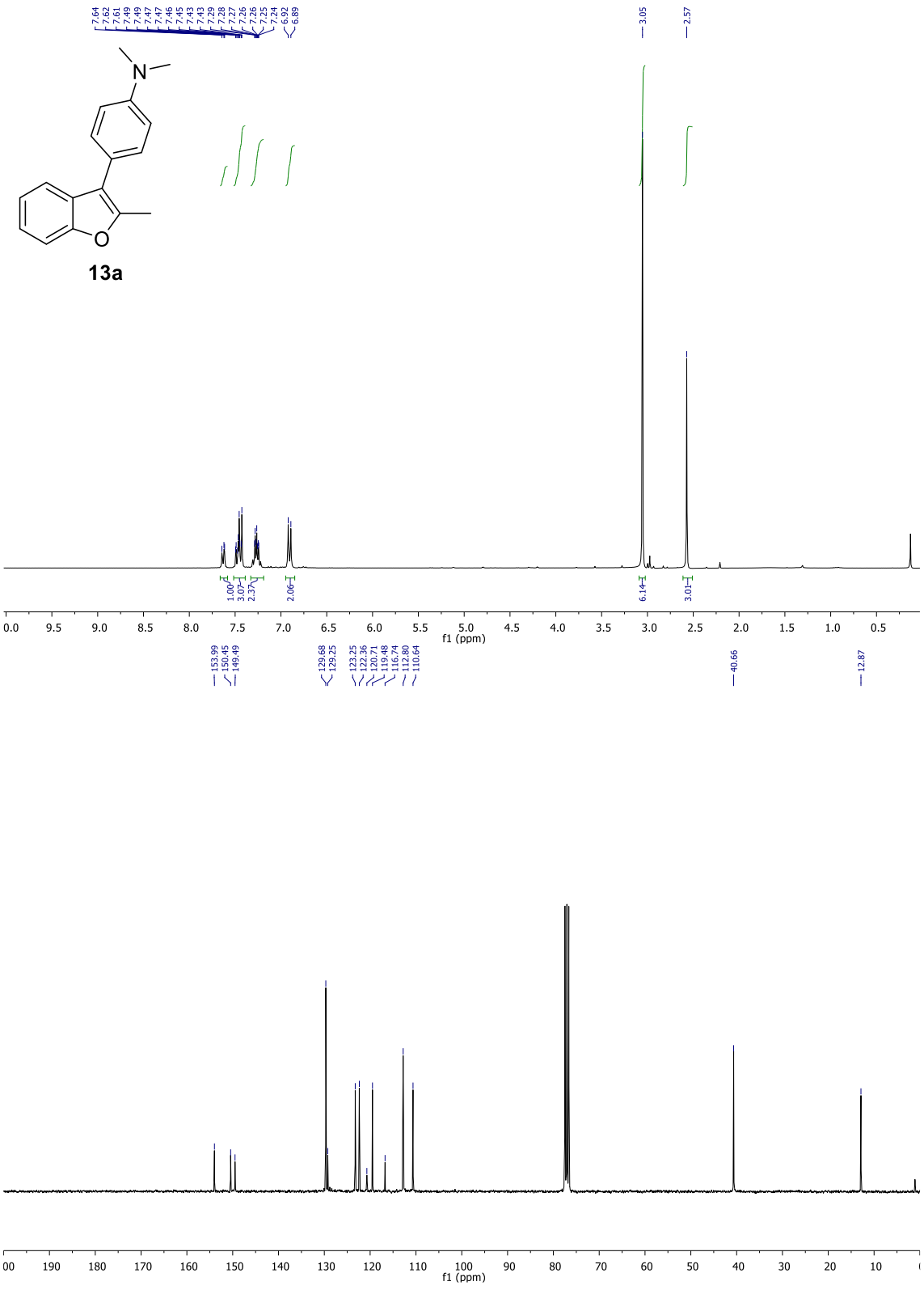



2-Methylene-1-(2,4,6-trimethoxyphenyl)-2,3-dihydro-1*H*-indene **3k**

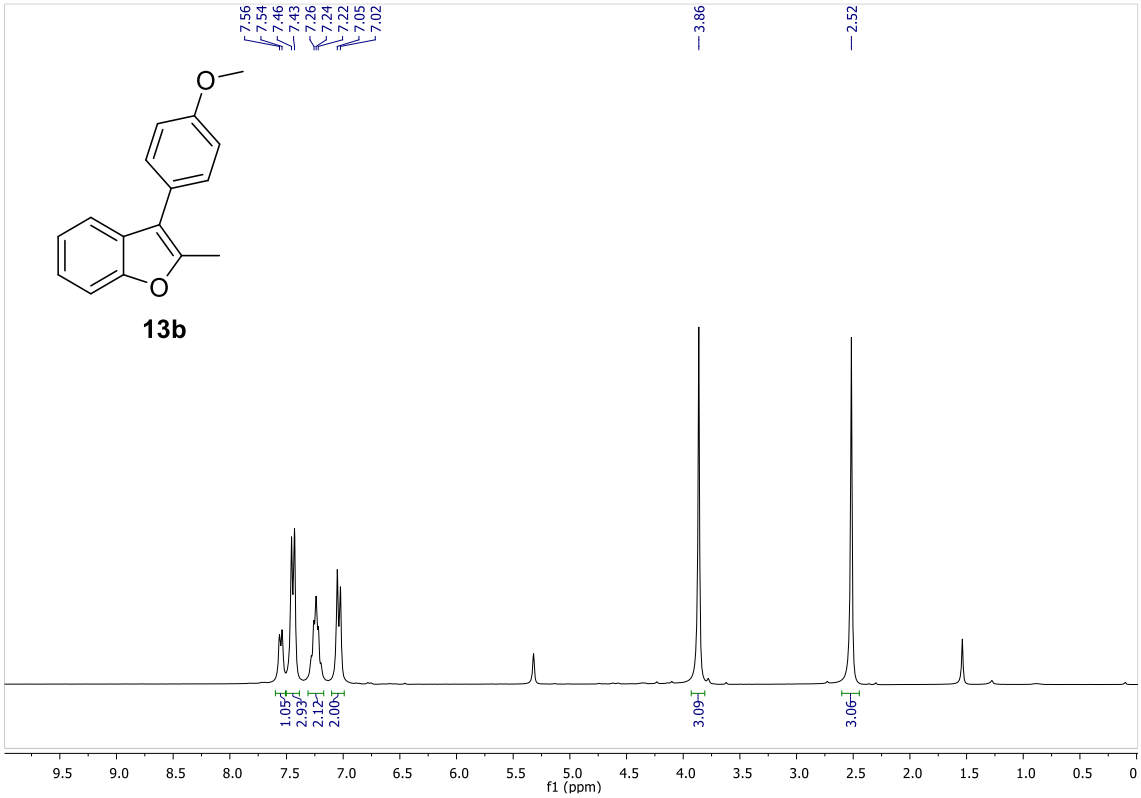


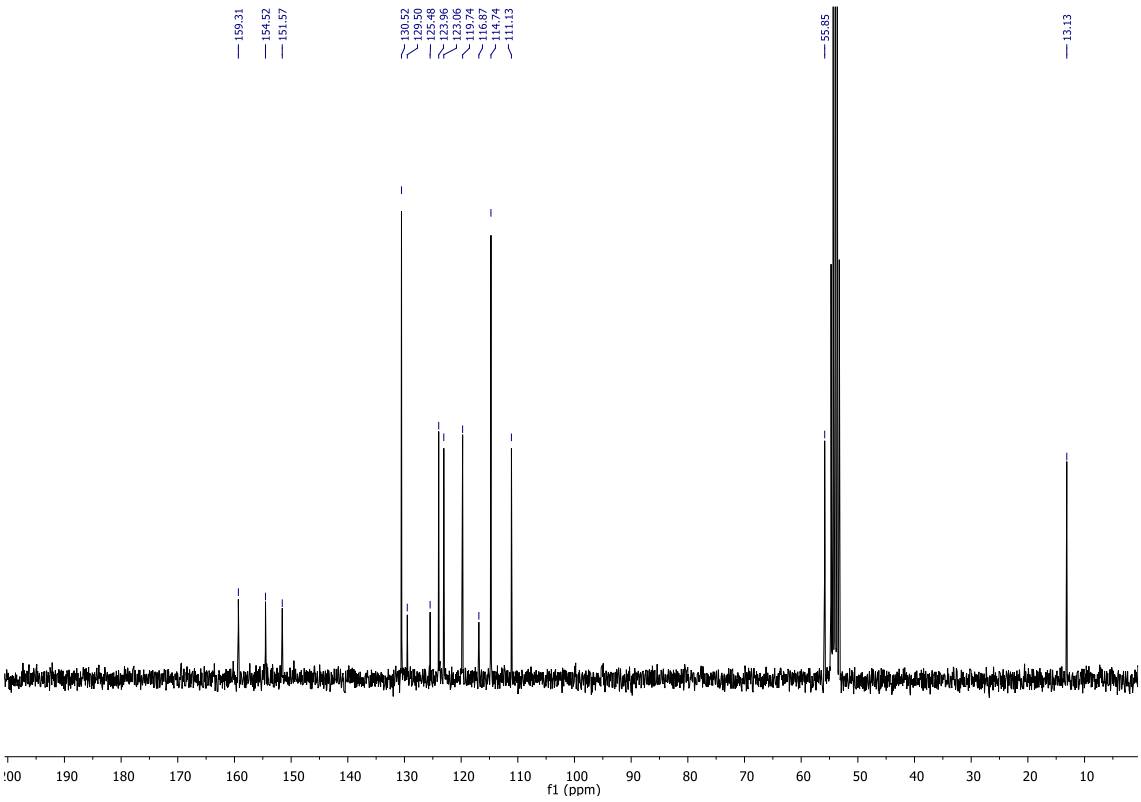



*N,N*-Dimethyl-4-(2-methylbenzofuran-3-yl)aniline **13a**

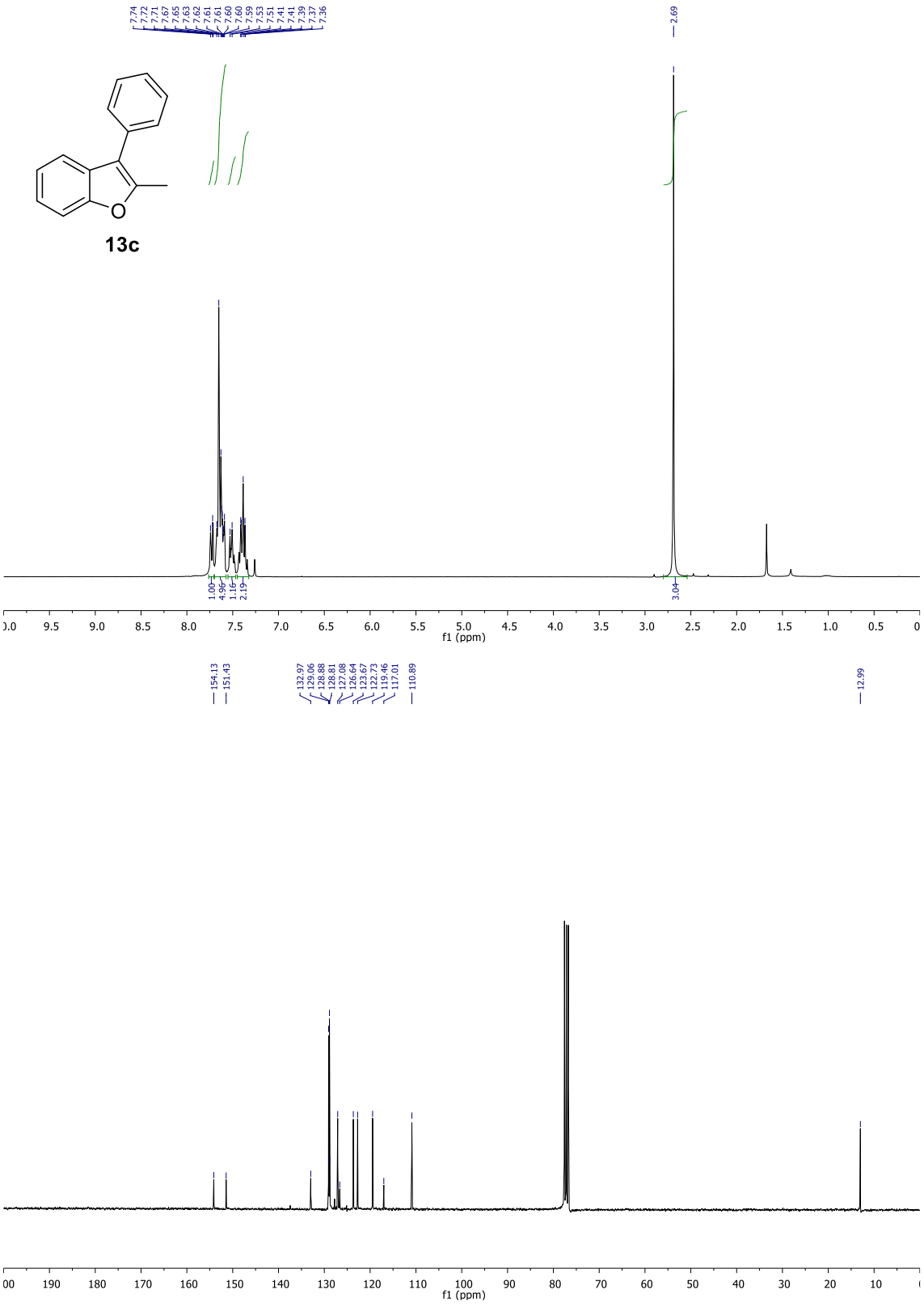


3-(4-Methoxyphenyl)-2-methylbenzofuran **13b**

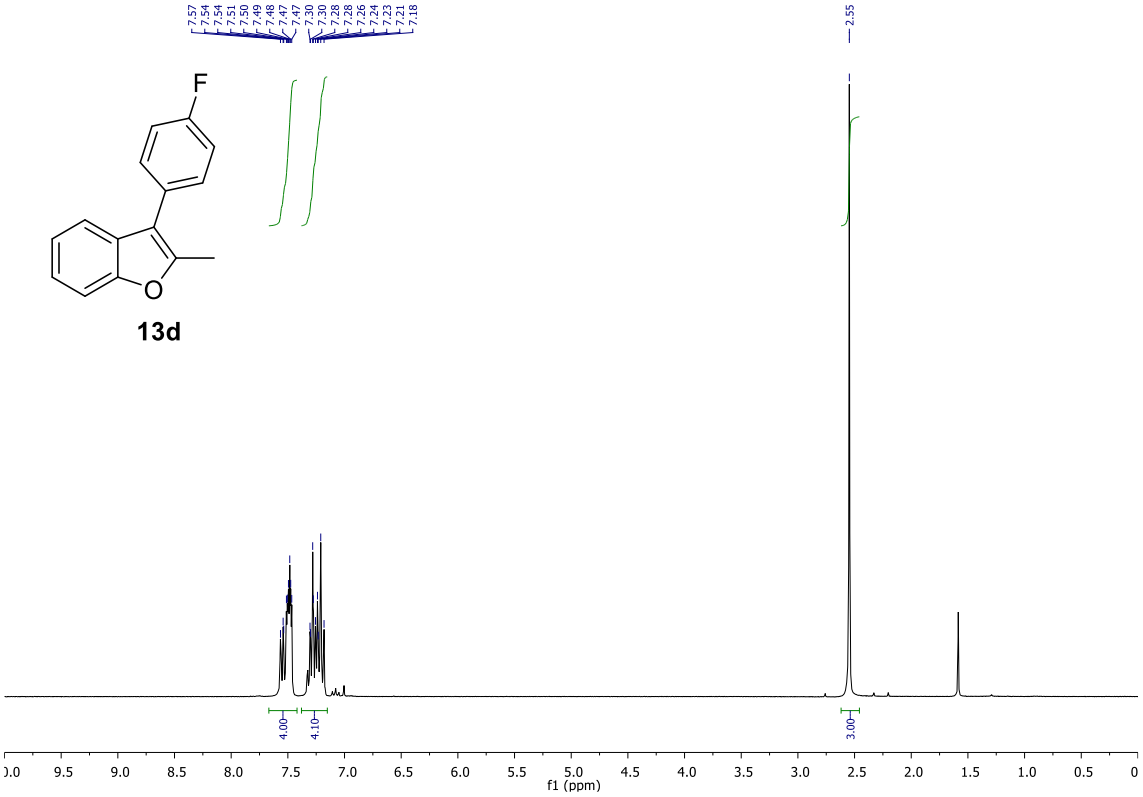


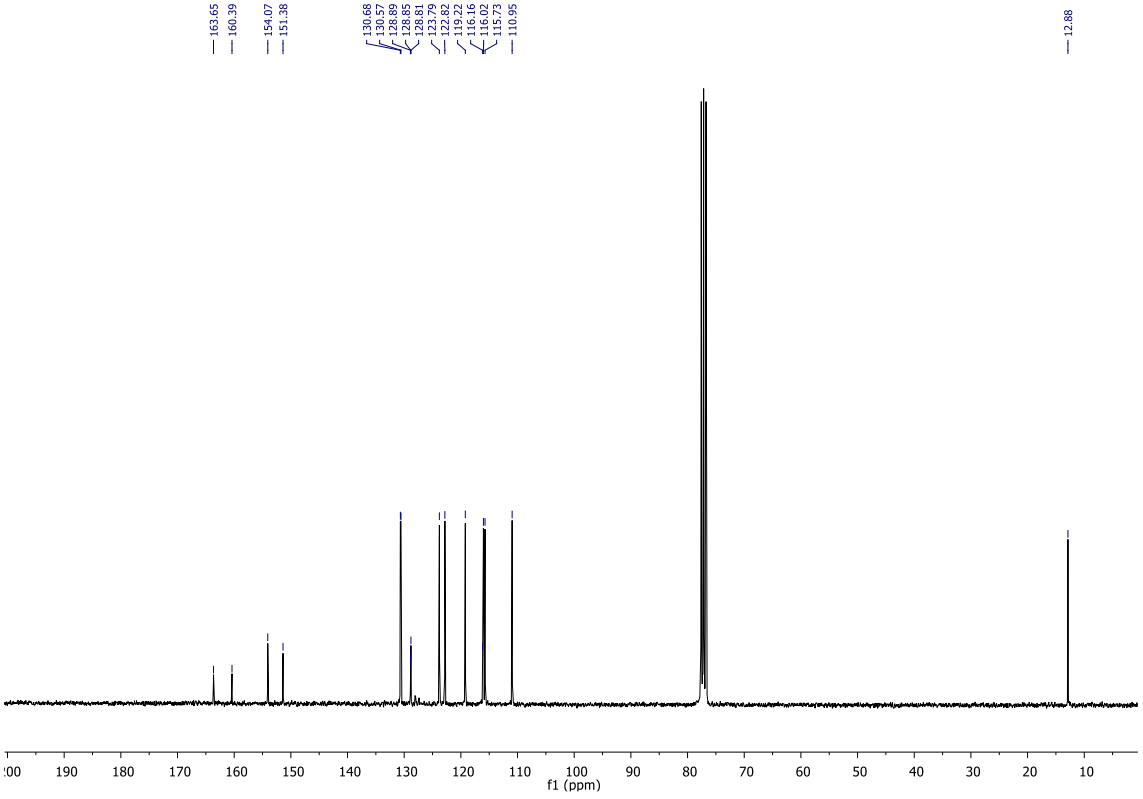



2-Methyl-3-phenylbenzofuran **13c**

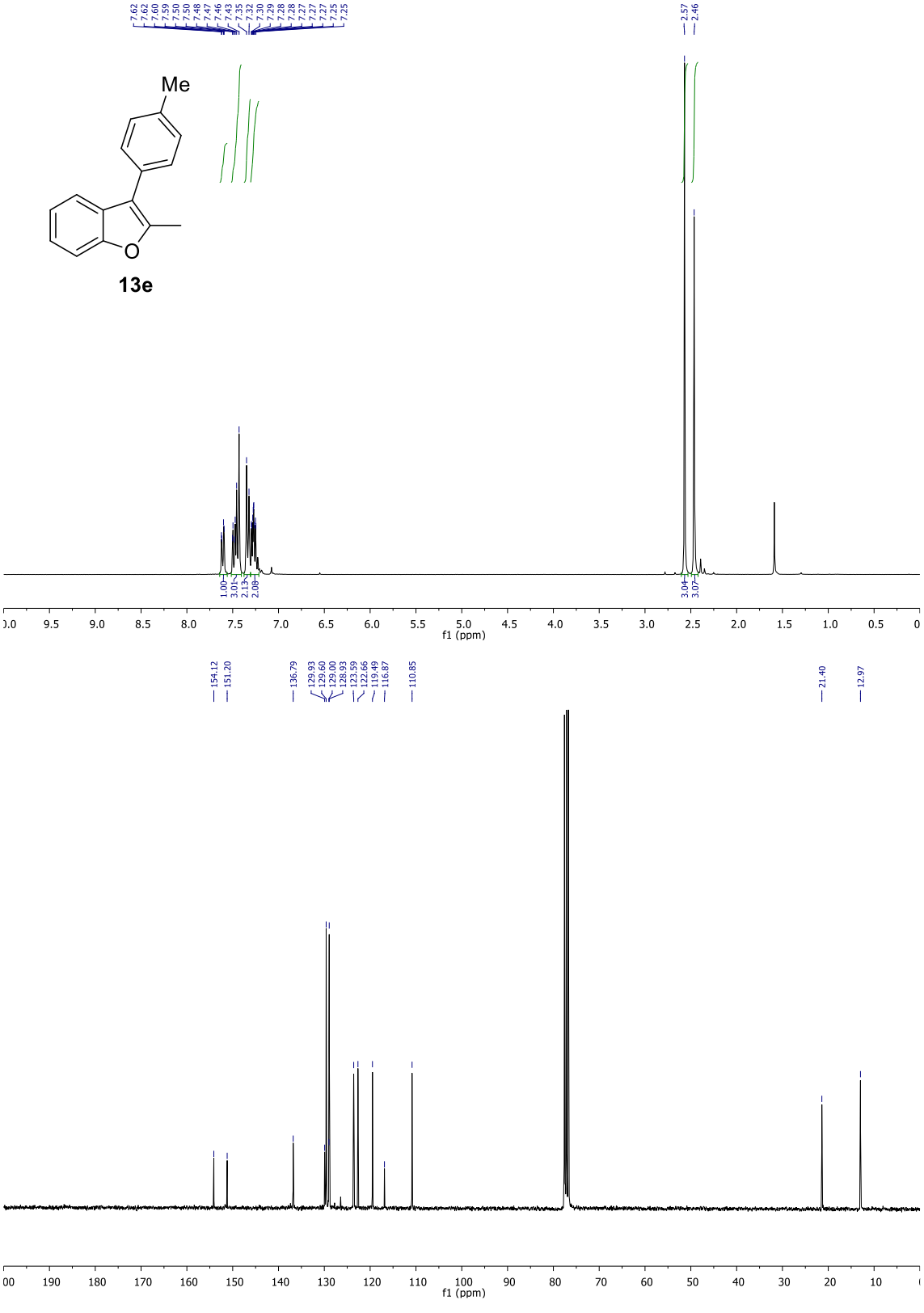


3-(4-Fluorophenyl)-2-methylbenzofuran **13d**

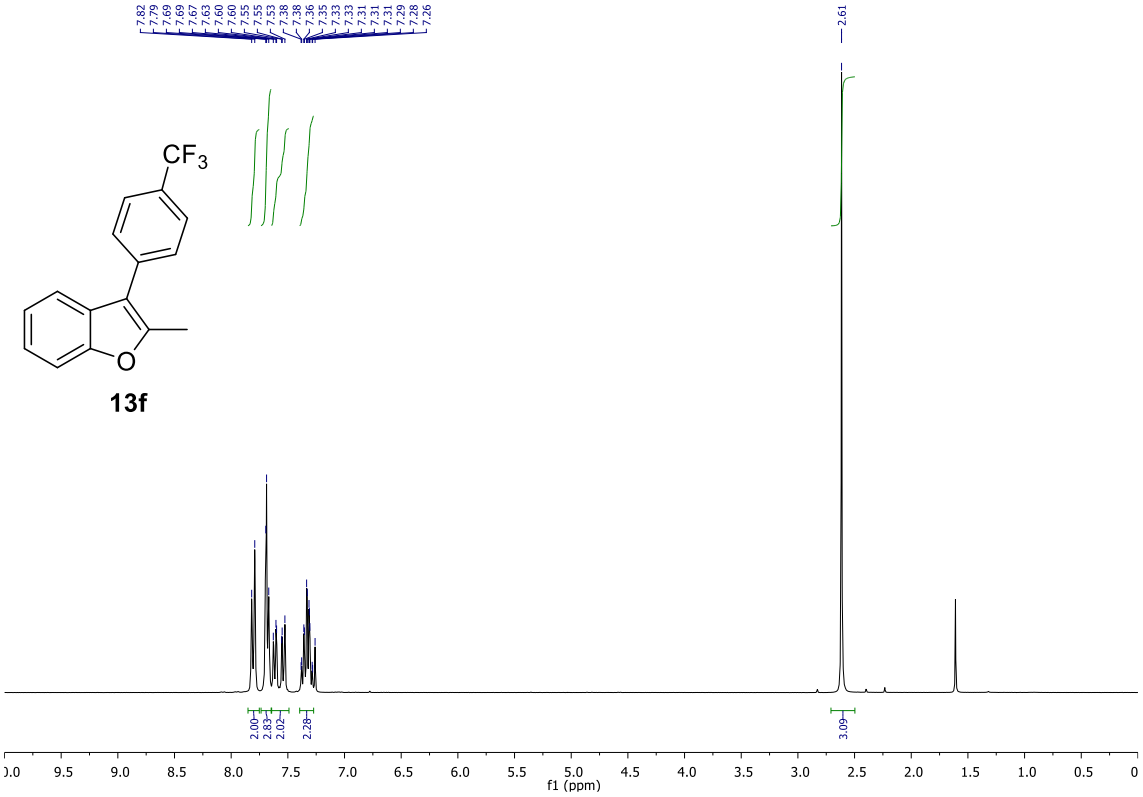


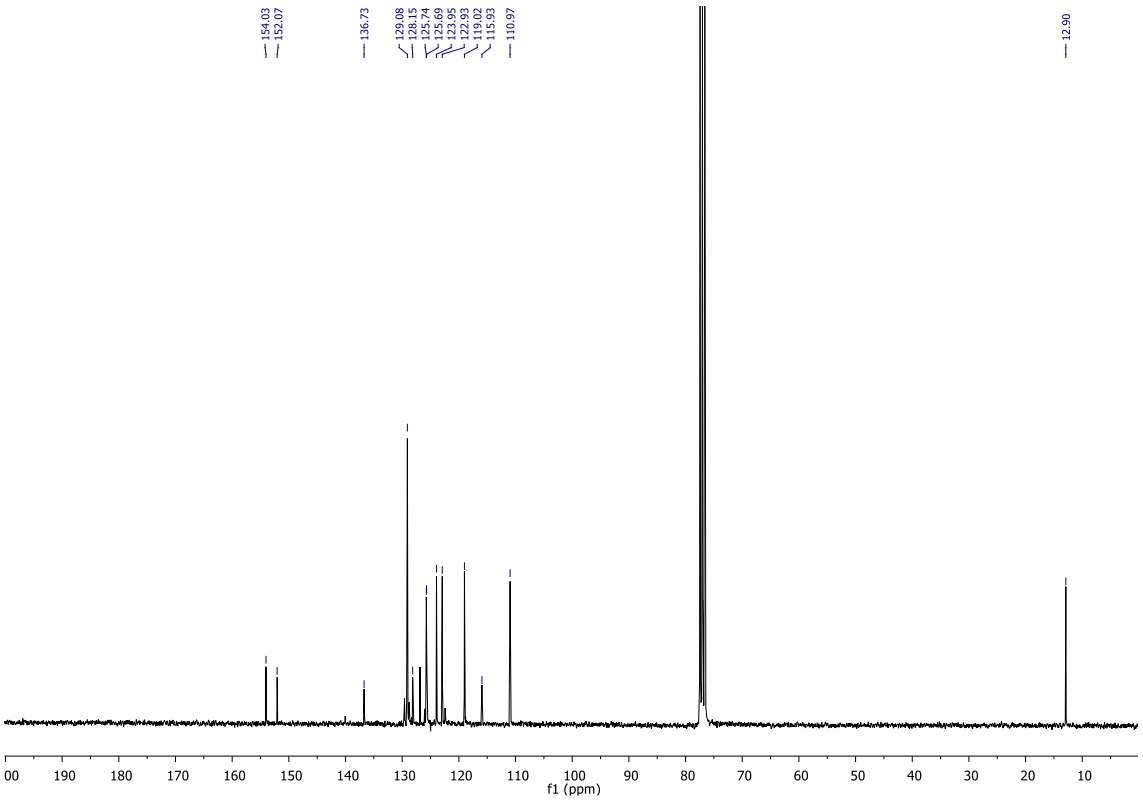



2-Methyl-3-(*p*-tolyl)benzofuran **13e**

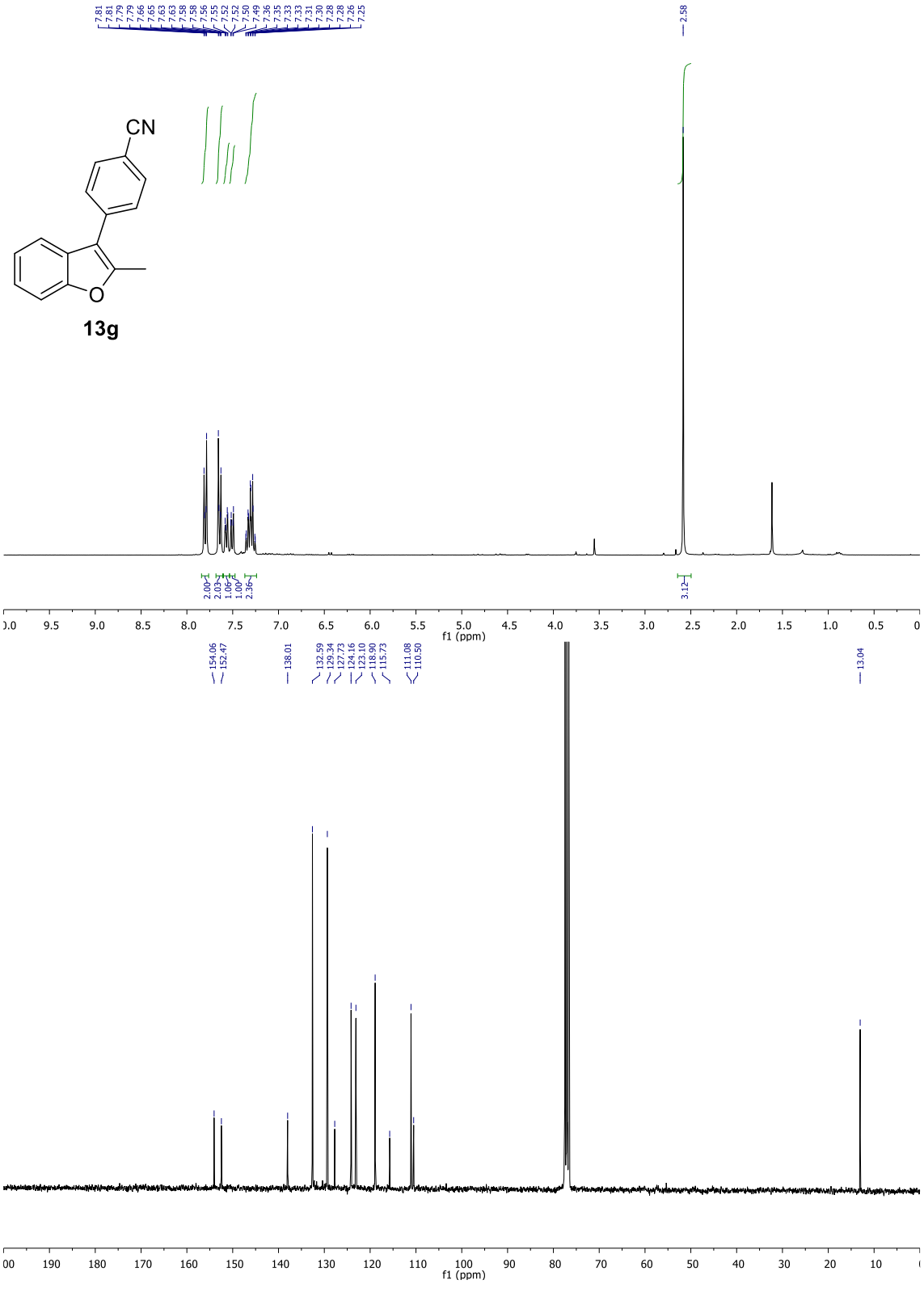


2-Methyl-3-(4-(trifluoromethyl)phenyl)benzofuran **13f**

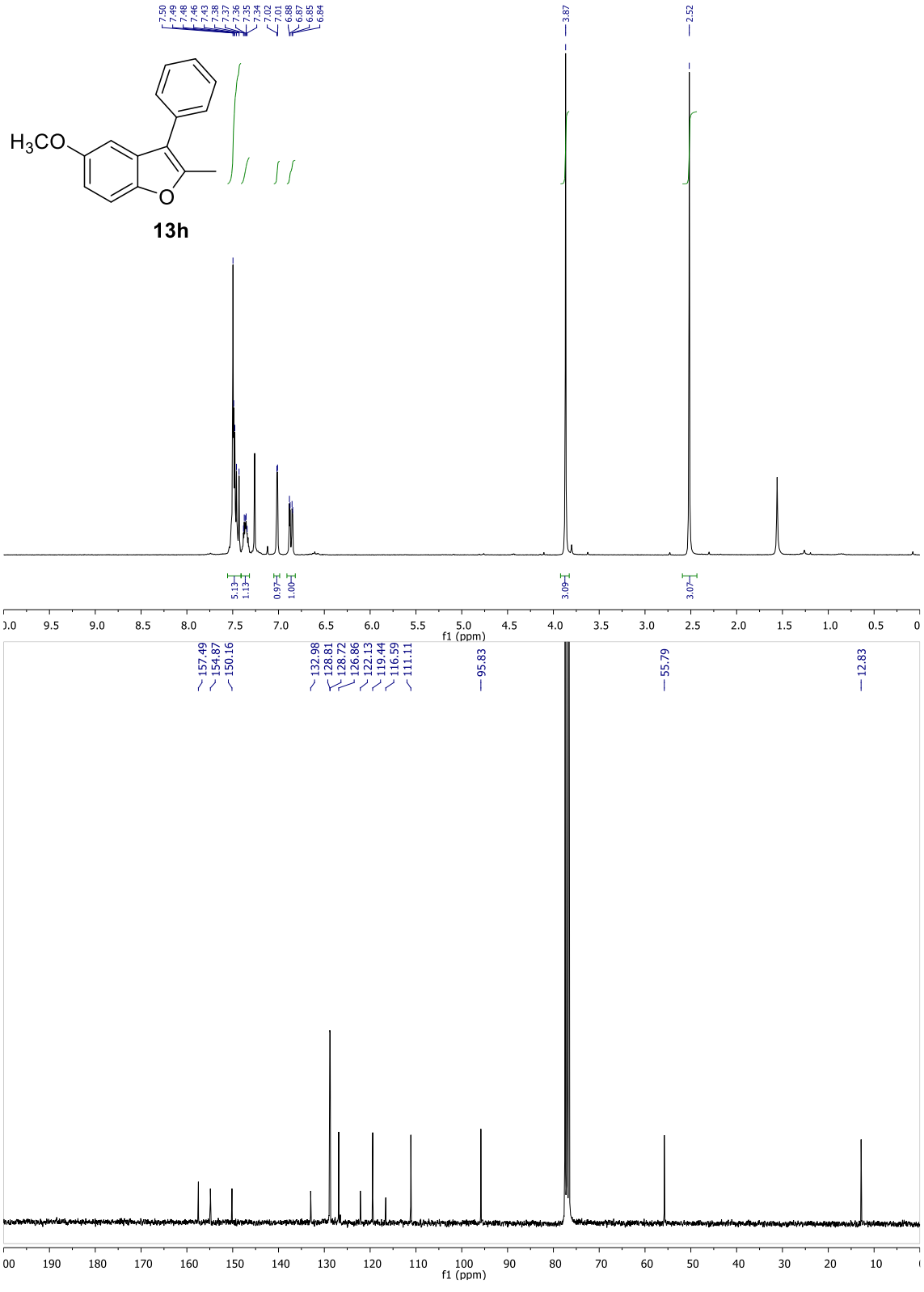


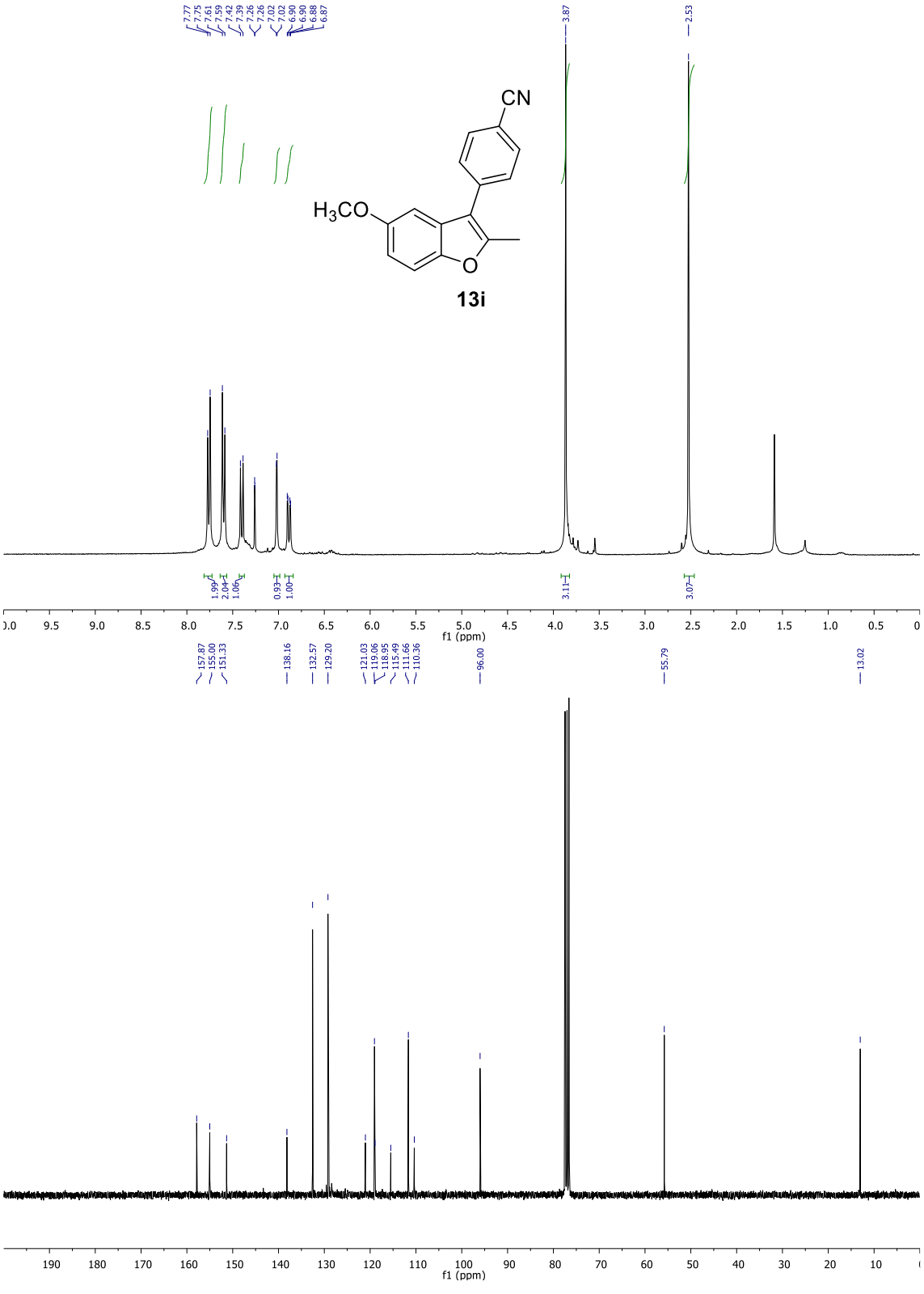
4-(2-Methylbenzofuran-3-yl)benzonitrile **13g**



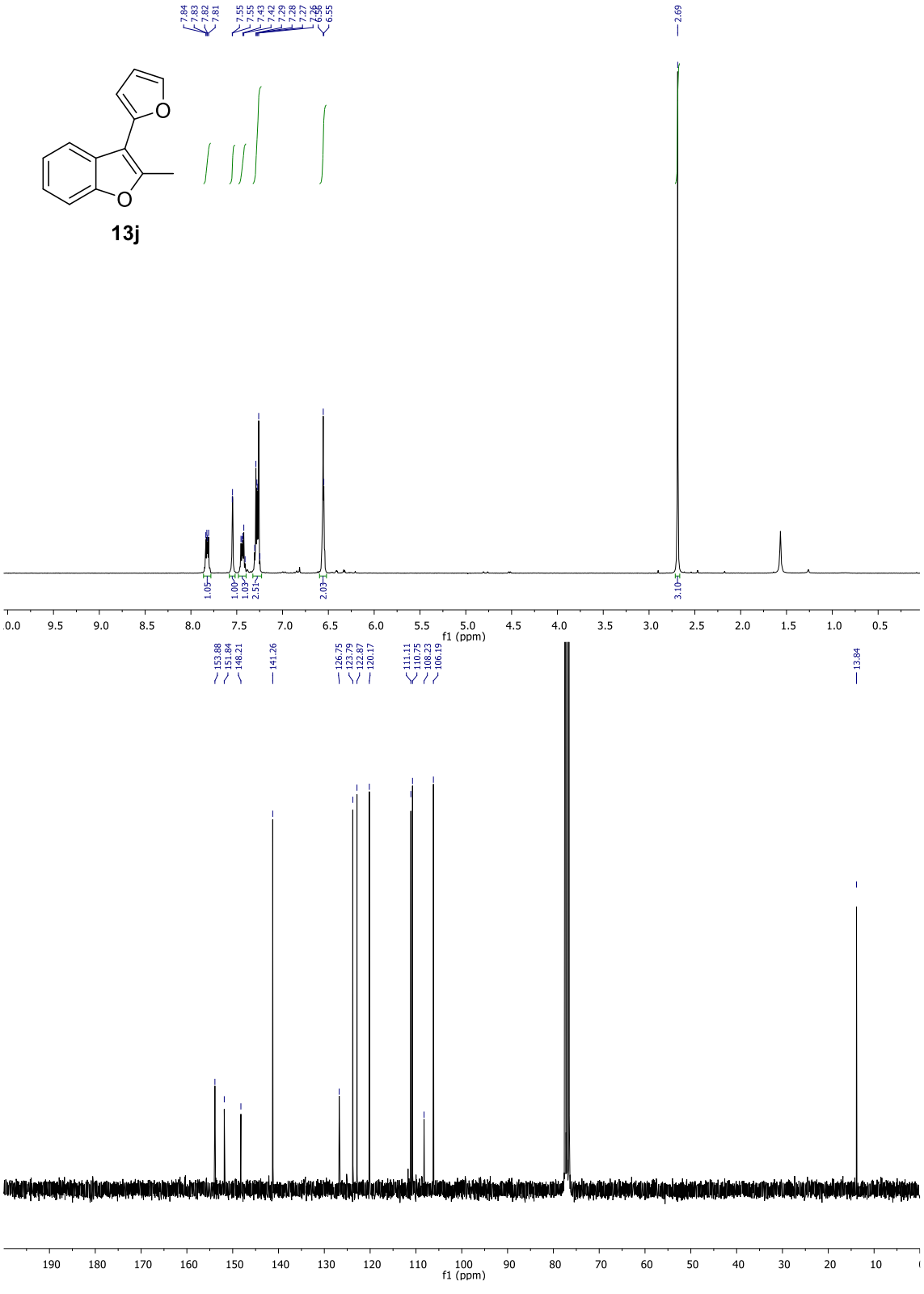
5-Methoxy-2-methyl-3-phenylbenzofuran **13h**



4-(5-Methoxy-2-methylbenzofuran-3-yl)benzonitrile **13i**

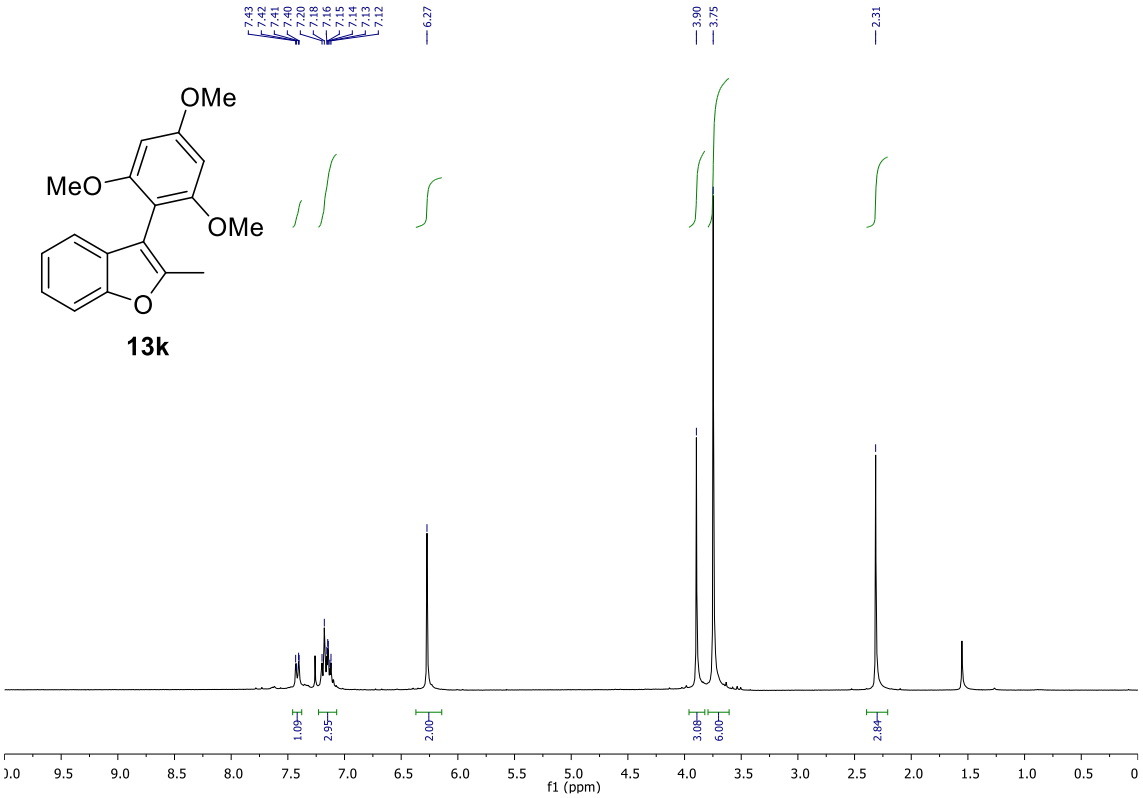


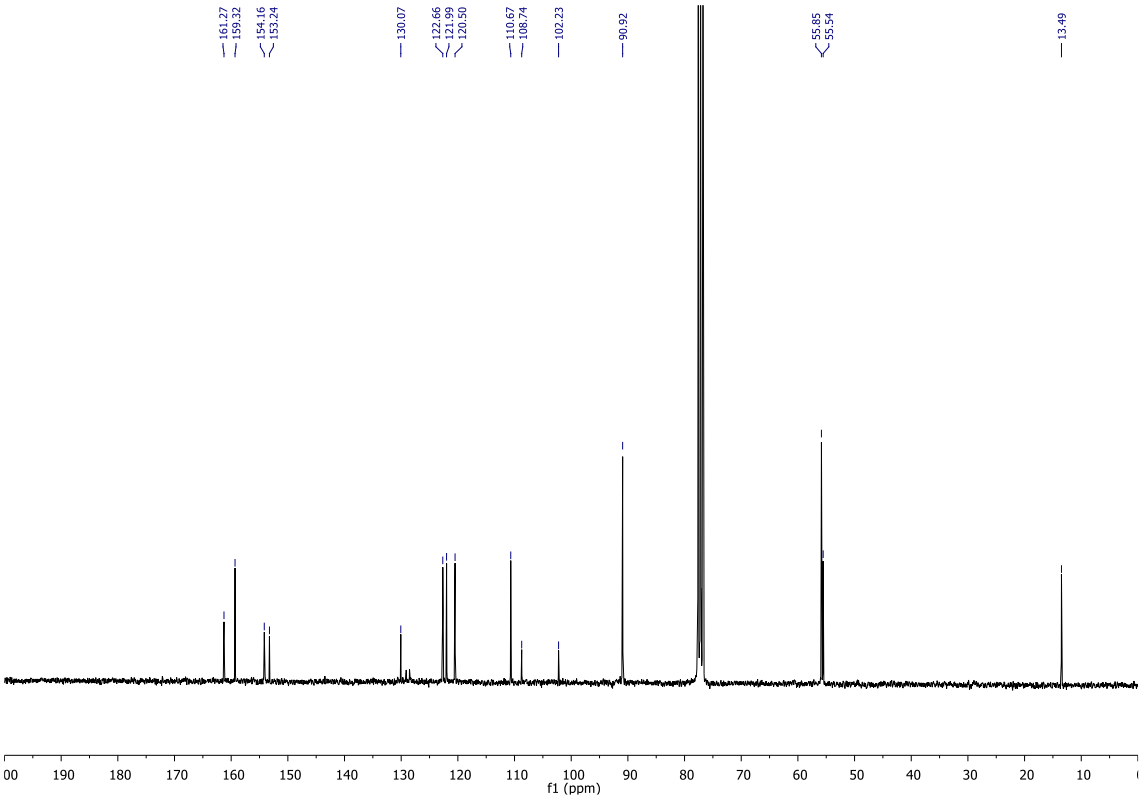
3-(Furan-2-yl)-2-methylbenzofuran **13j**



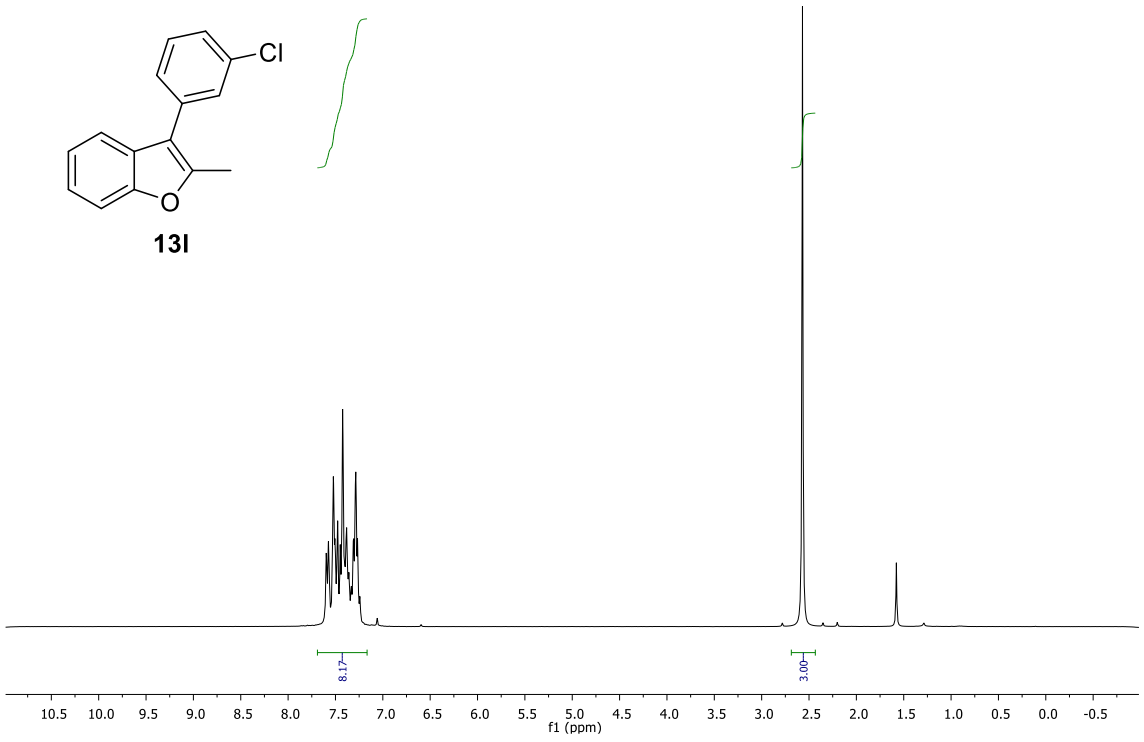

13j

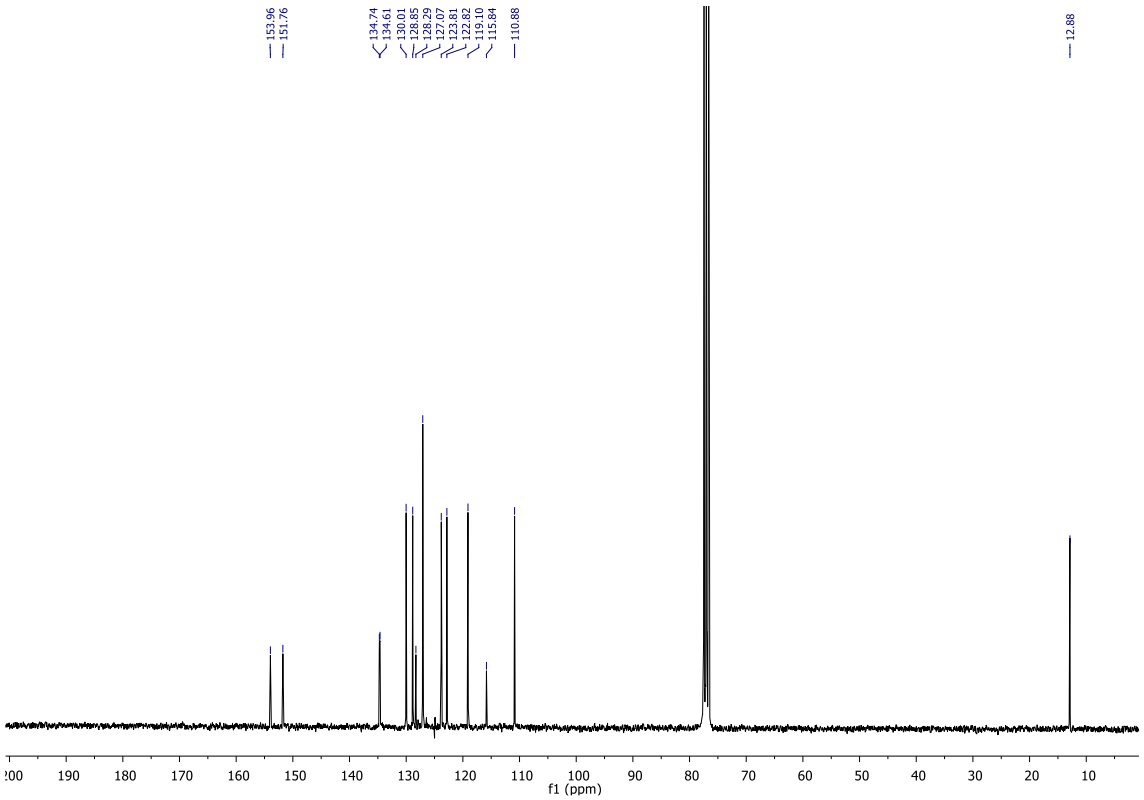
2-Methyl-3-(2,4,6-trimethoxyphenyl)benzofuran **13k**



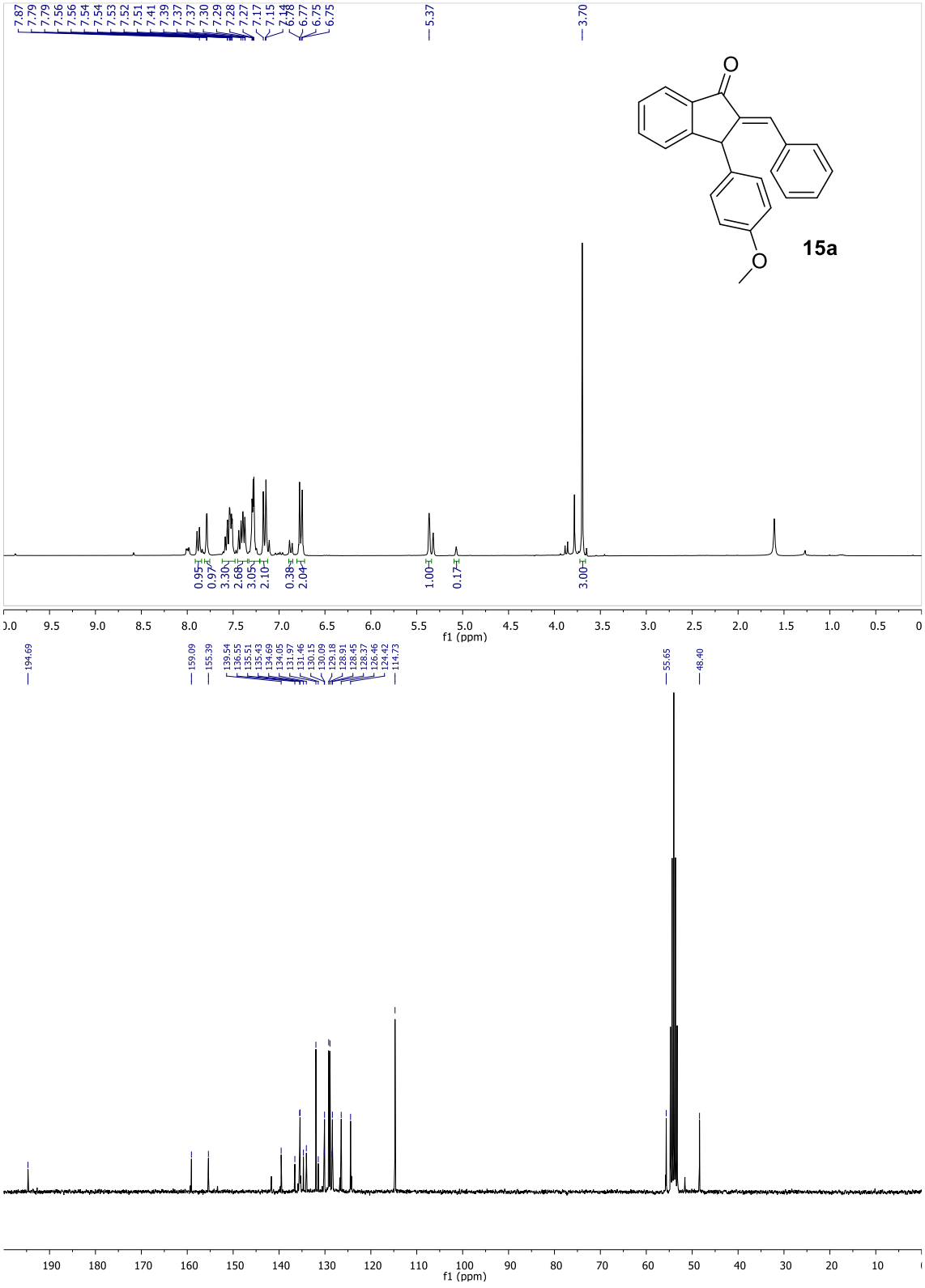



3-(3-Chlorophenyl)-2-methylbenzofuran **13l**

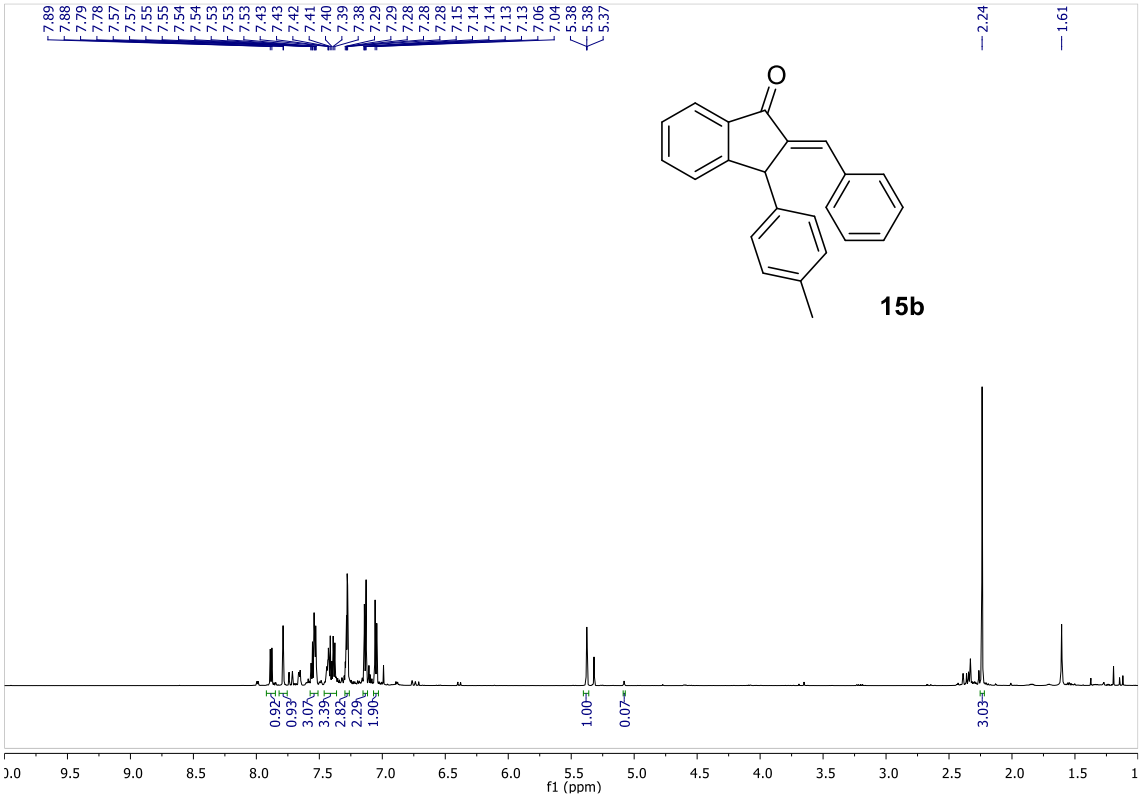


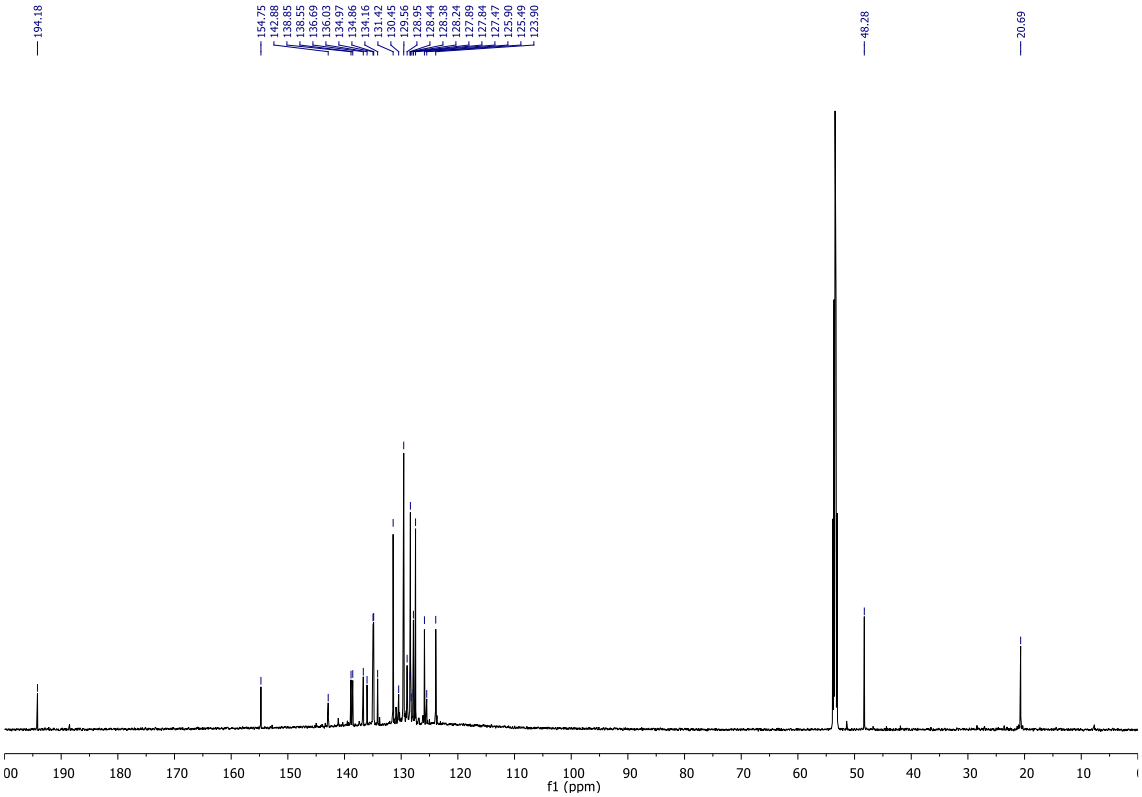



(*E*)-2-Benzylidene-3-(4-methoxyphenyl)-2,3-dihydro-1*H*-inden-1-one **15a** (5.8:1 mixture of *E/Z* isomers)

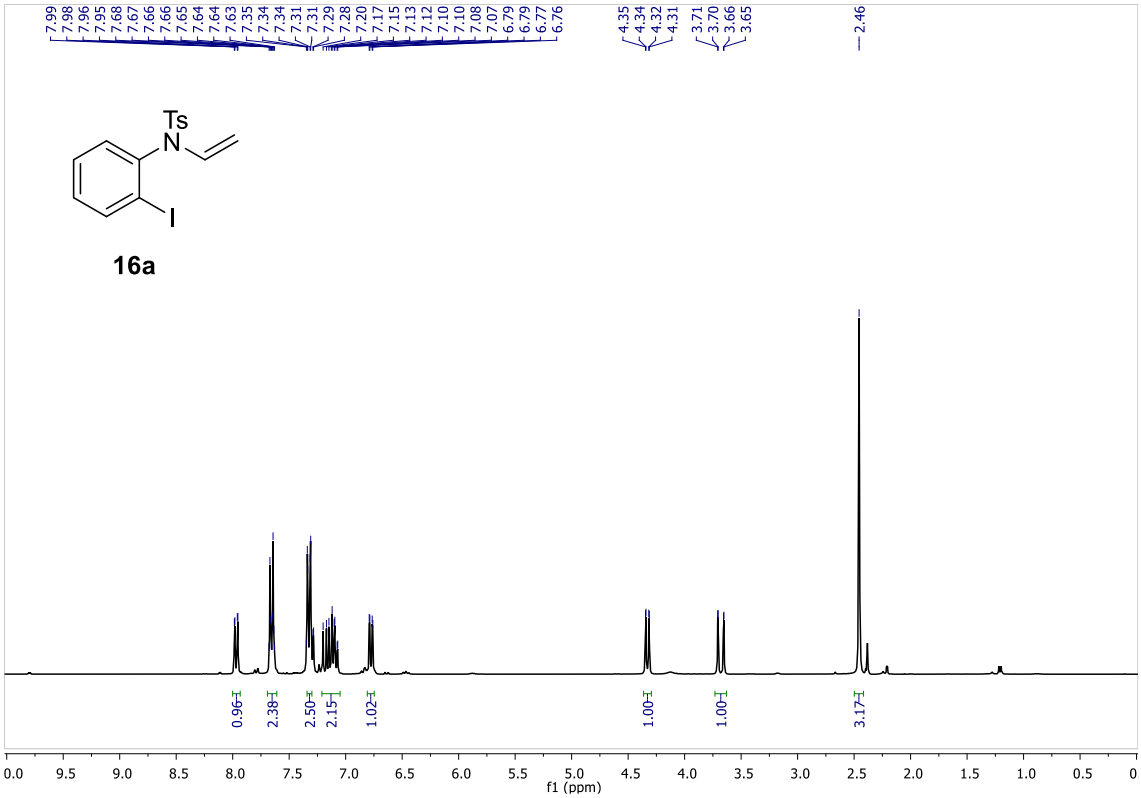


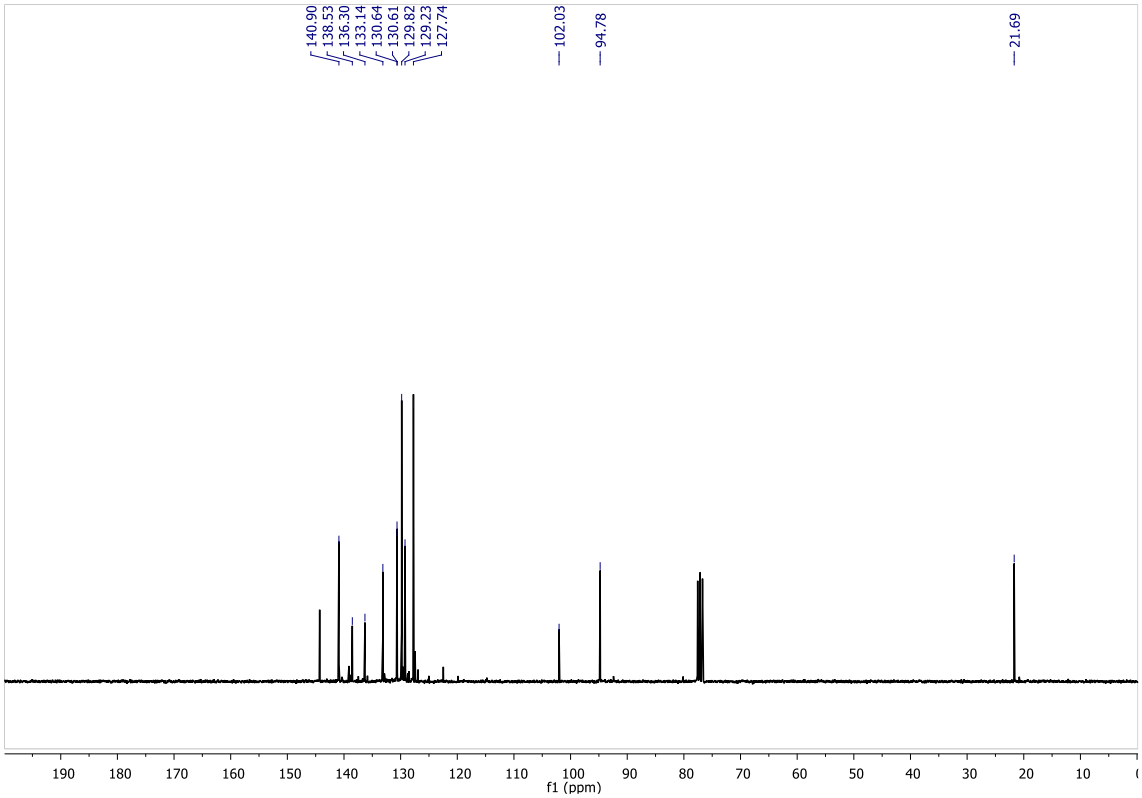
(*E*)-2-Benzylidene-3-(*p*-tolyl)-2,3-dihydro-1*H*-inden-1-one **15b** (14: 1 mixture of E/Z isomers)



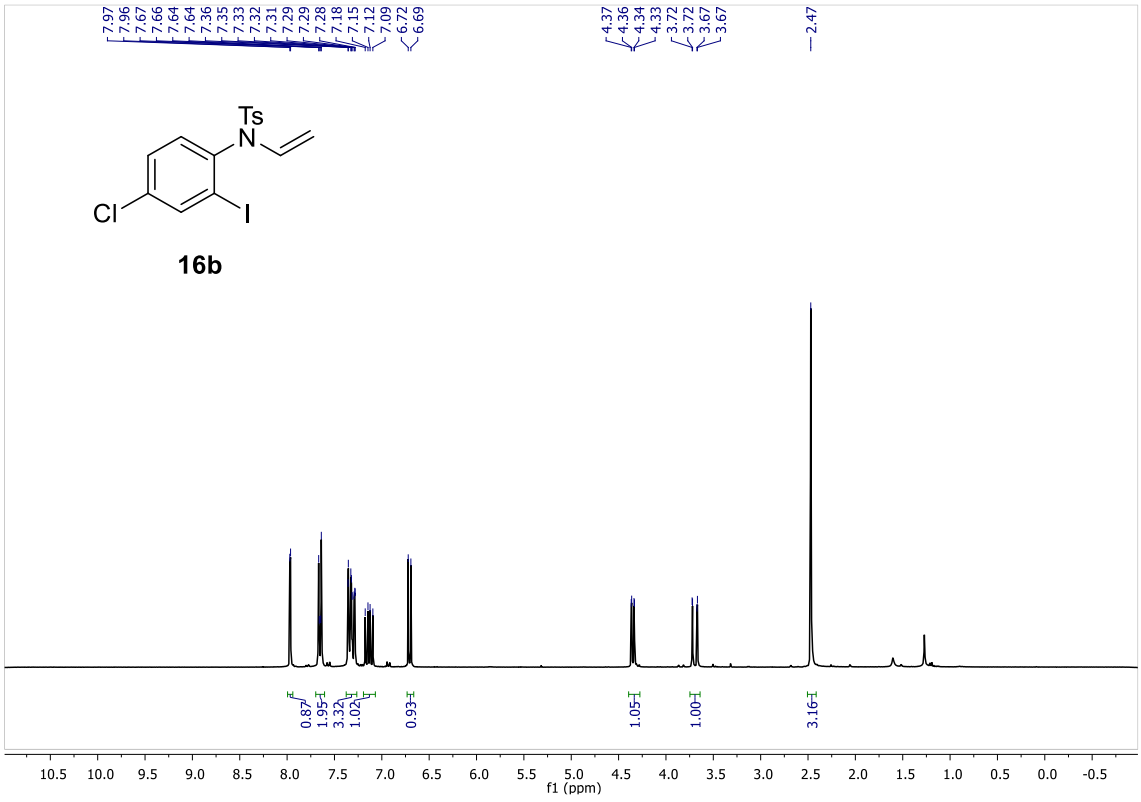



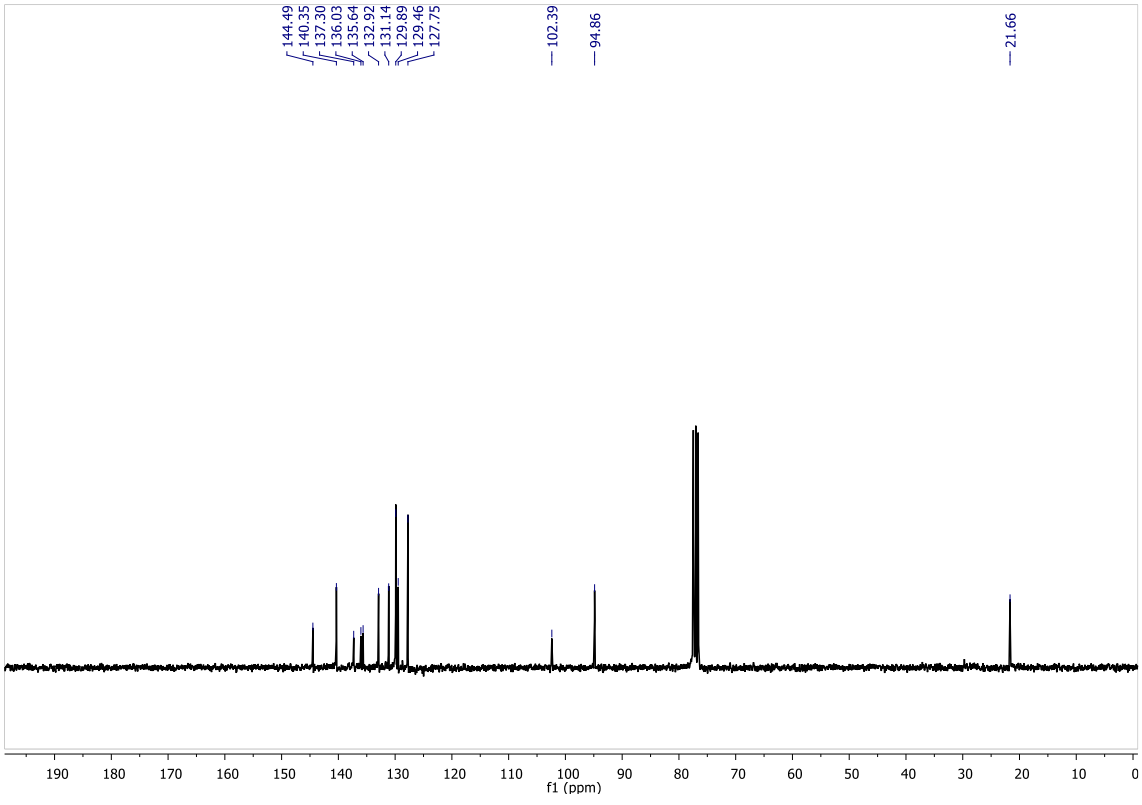
*N*-(2-Iodophenyl)-4-methyl-*N*-vinylbenzenesulfonamide **16a**



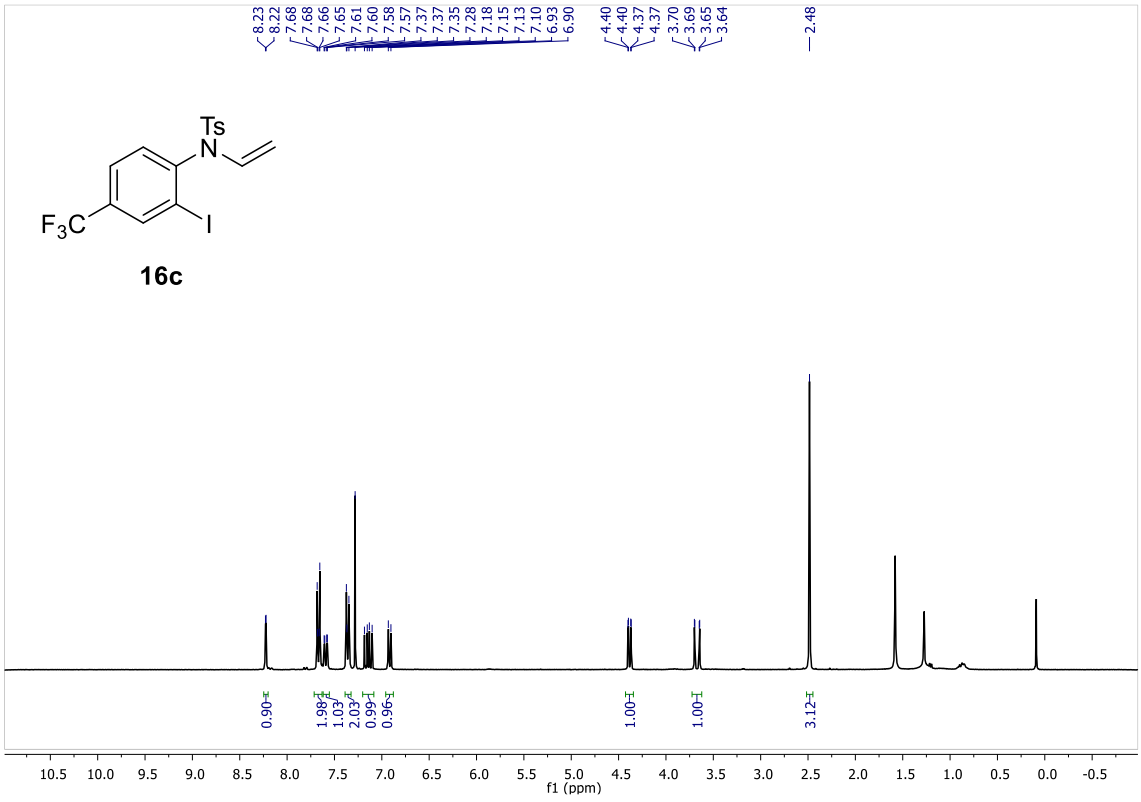



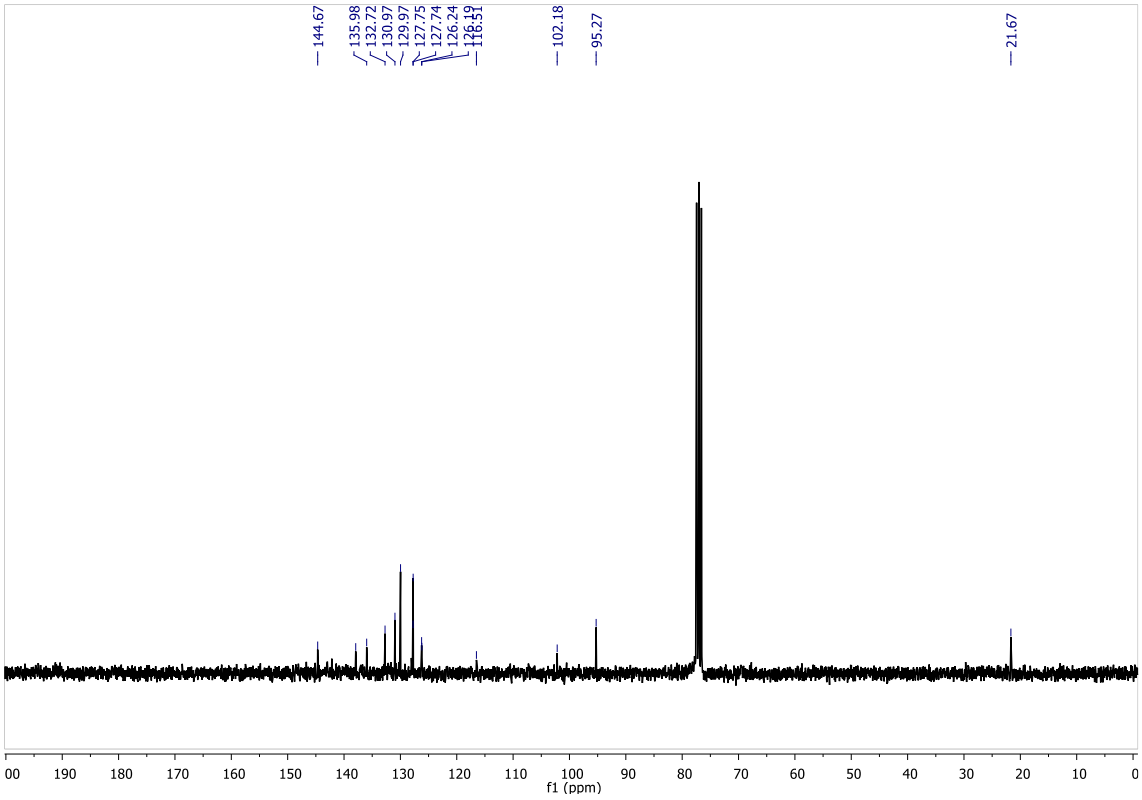
*N*-(4-Chloro-2-iodophenyl)-4-methyl-*N*-vinylbenzenesulfonamide **16b**

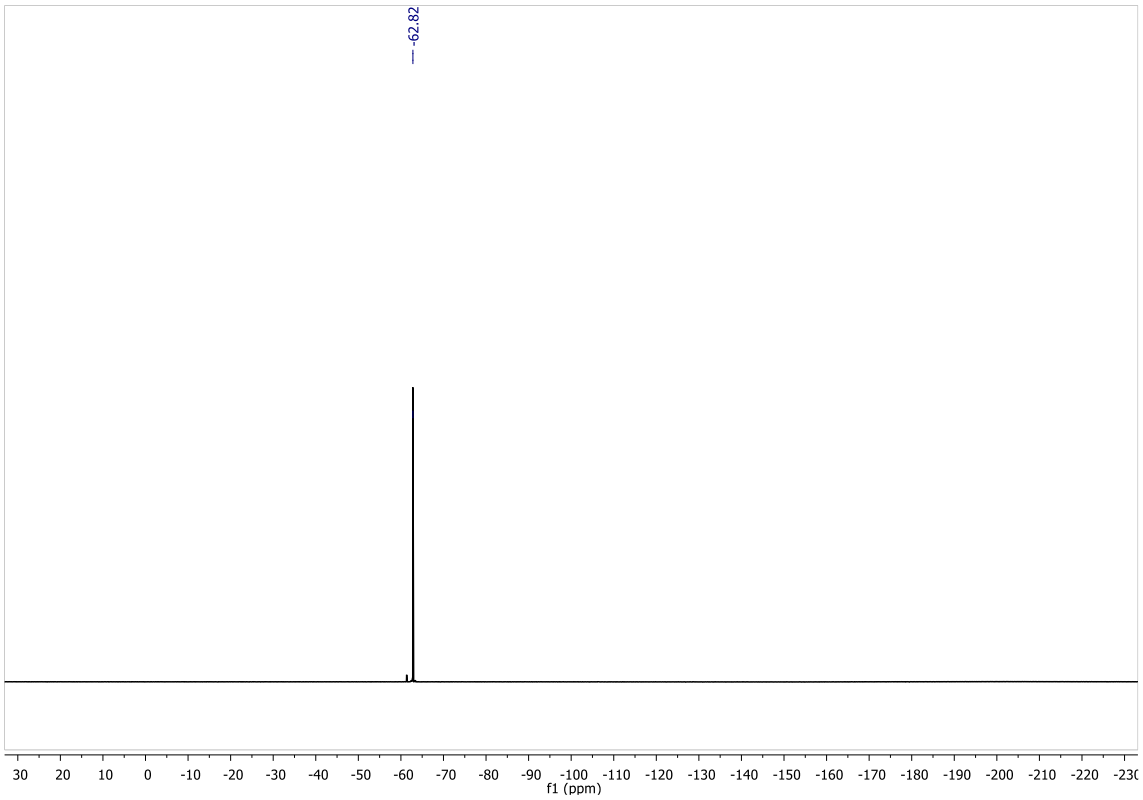


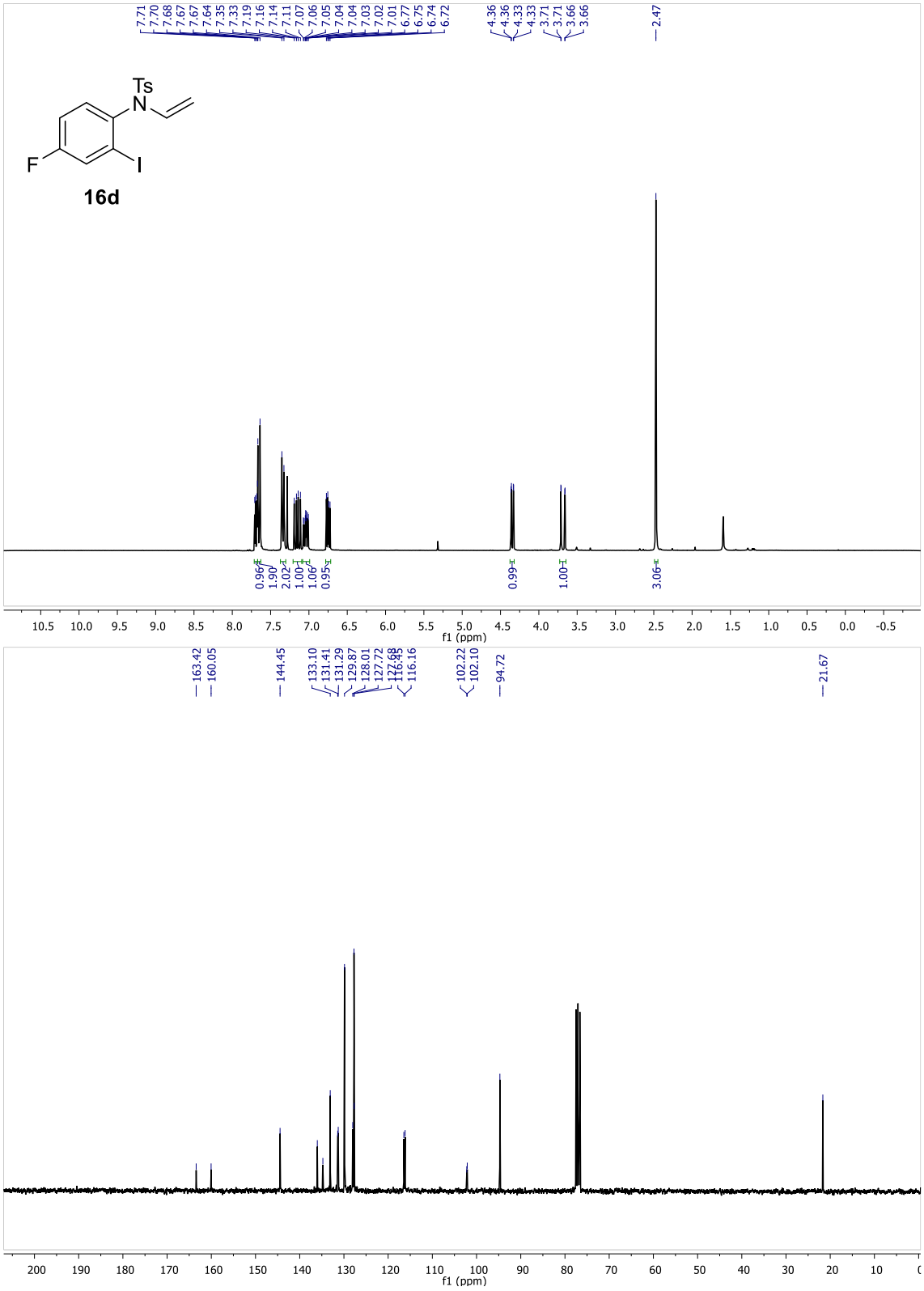
*N*-(2-Iodo-4-(trifluoromethyl)phenyl)-4-methyl-*N*-vinylbenzenesulfonamide **16c**



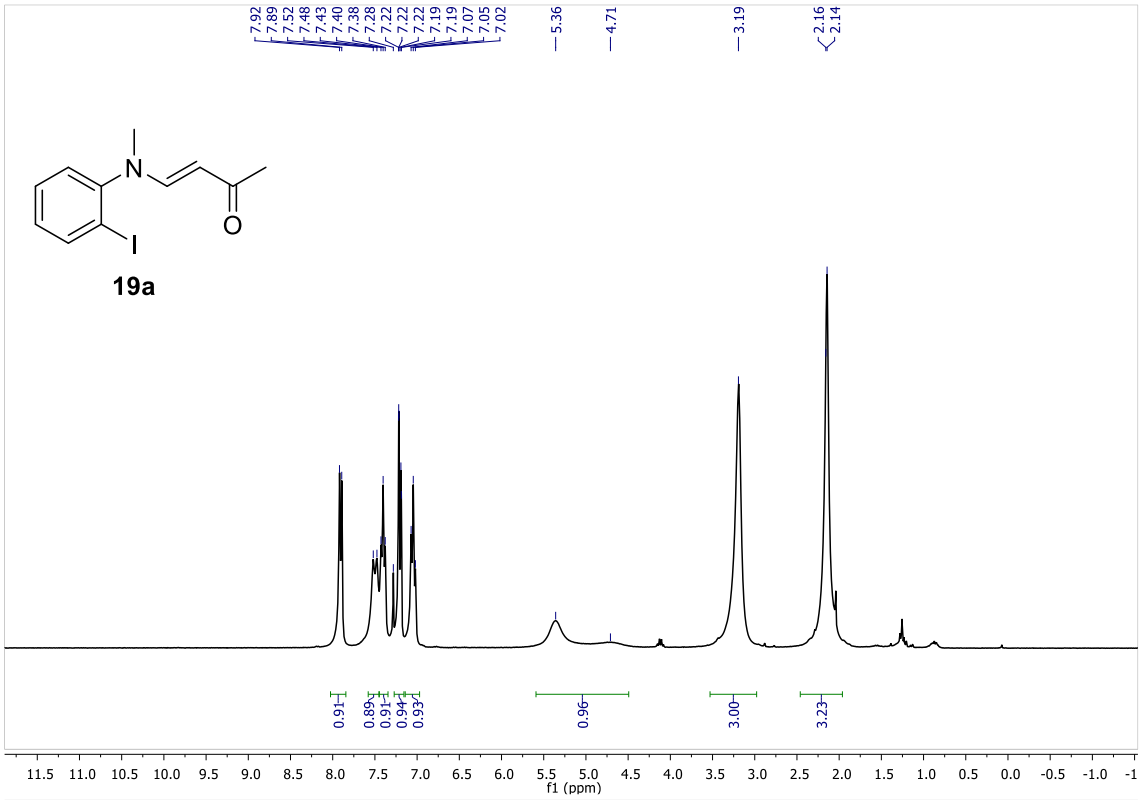



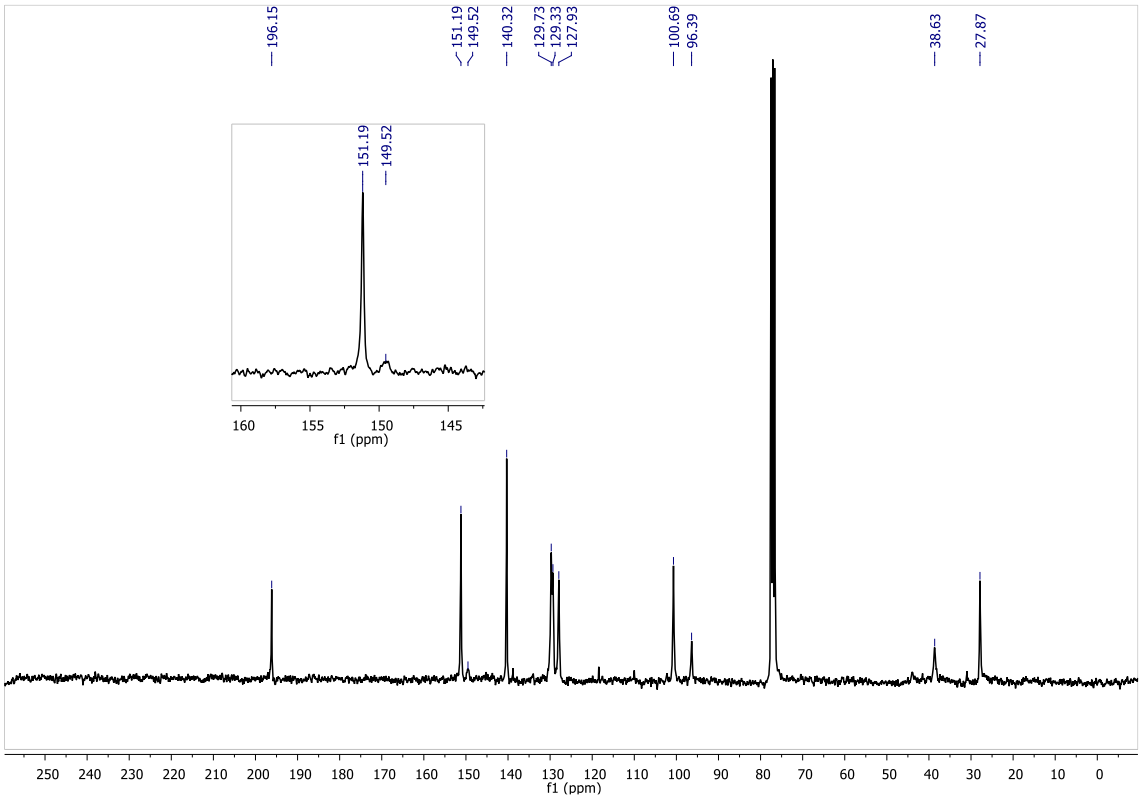

-62.82
30 20 10 0 -10 -20 -30 -40 -50 -60 -70 -80 -90 -100 -110 -120 -130 -140 -150 -160 -170 -180 -190 -200 -210 -220 -230
f1 (ppm)

*N*-(4-Fluoro-2-iodophenyl)-4-methyl-*N*-vinylbenzenesulfonamide **16d**

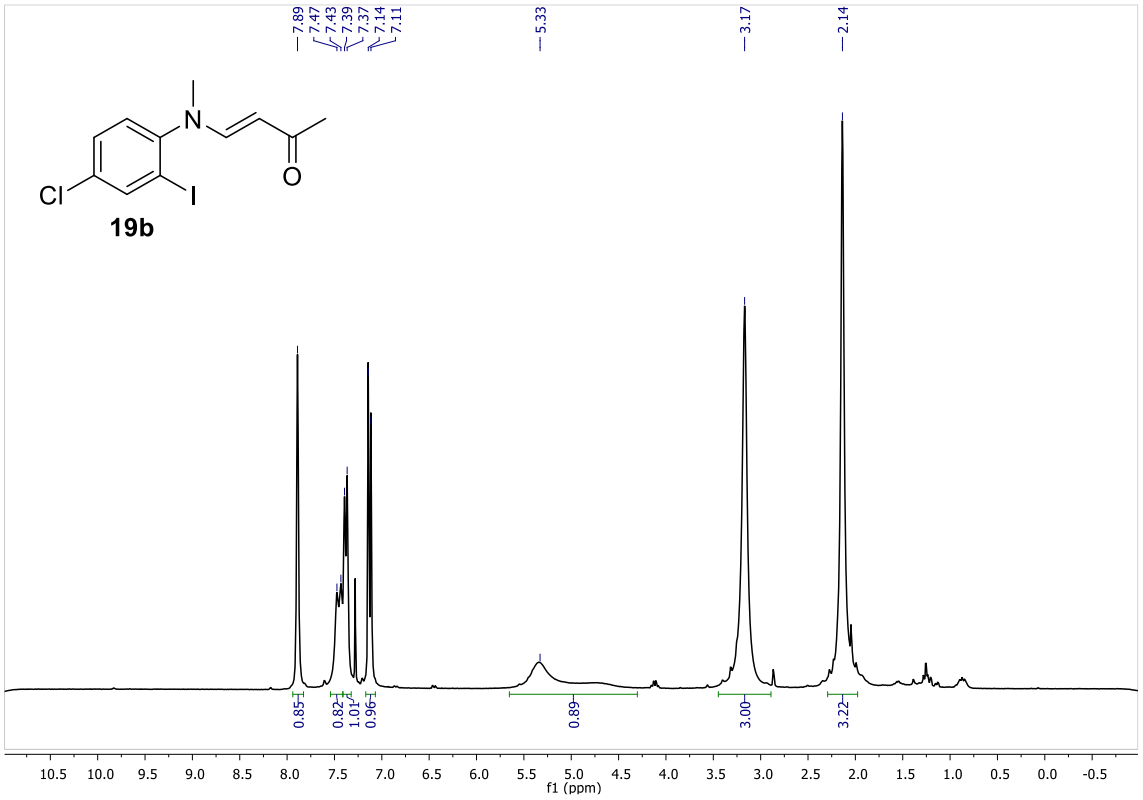


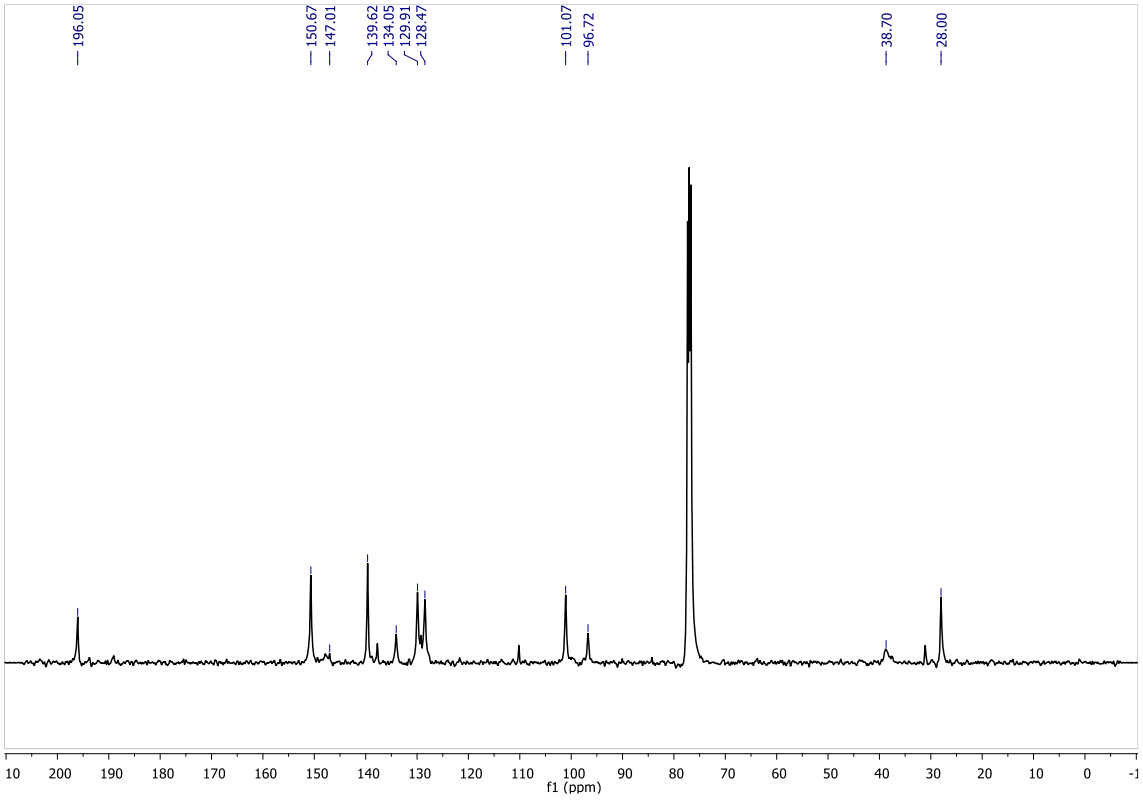
(*E*)-4-((2-Iodophenyl)(methyl)amino)but-3-en-2-one **19a**



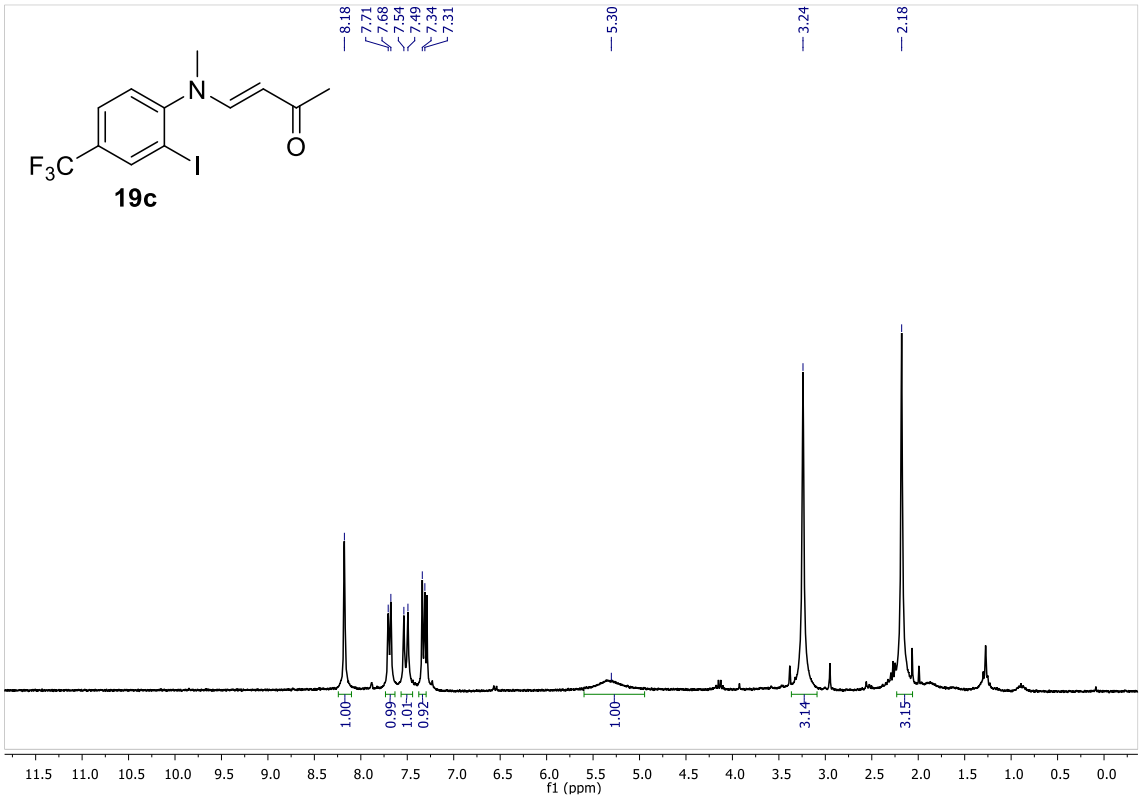



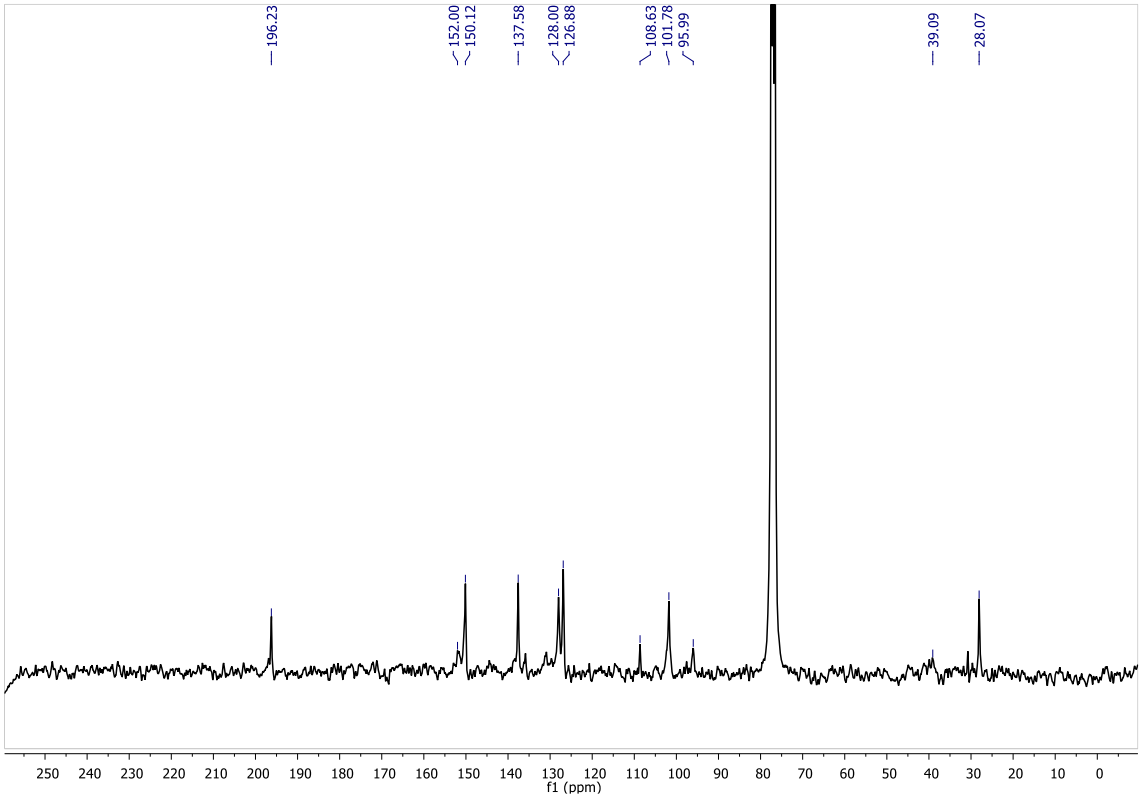
(*E*)-4-((4-Chloro-2-iodophenyl)(methyl)amino)but-3-en-2-one **19b**



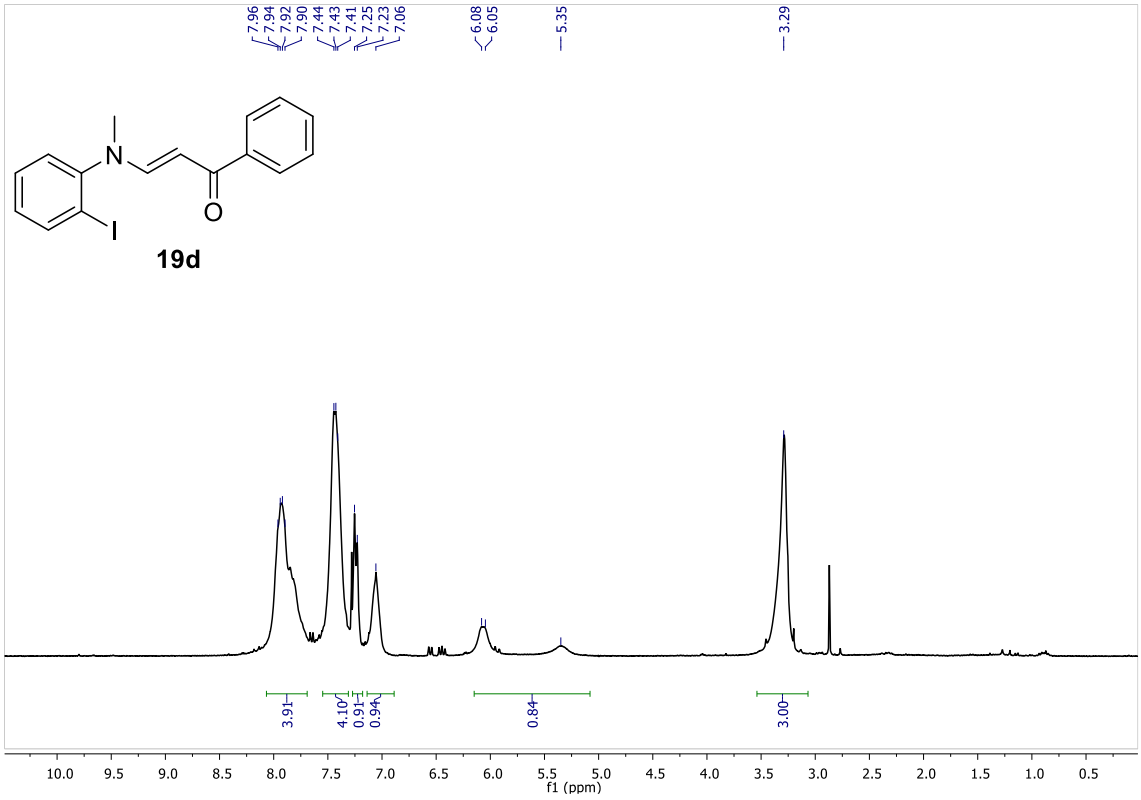



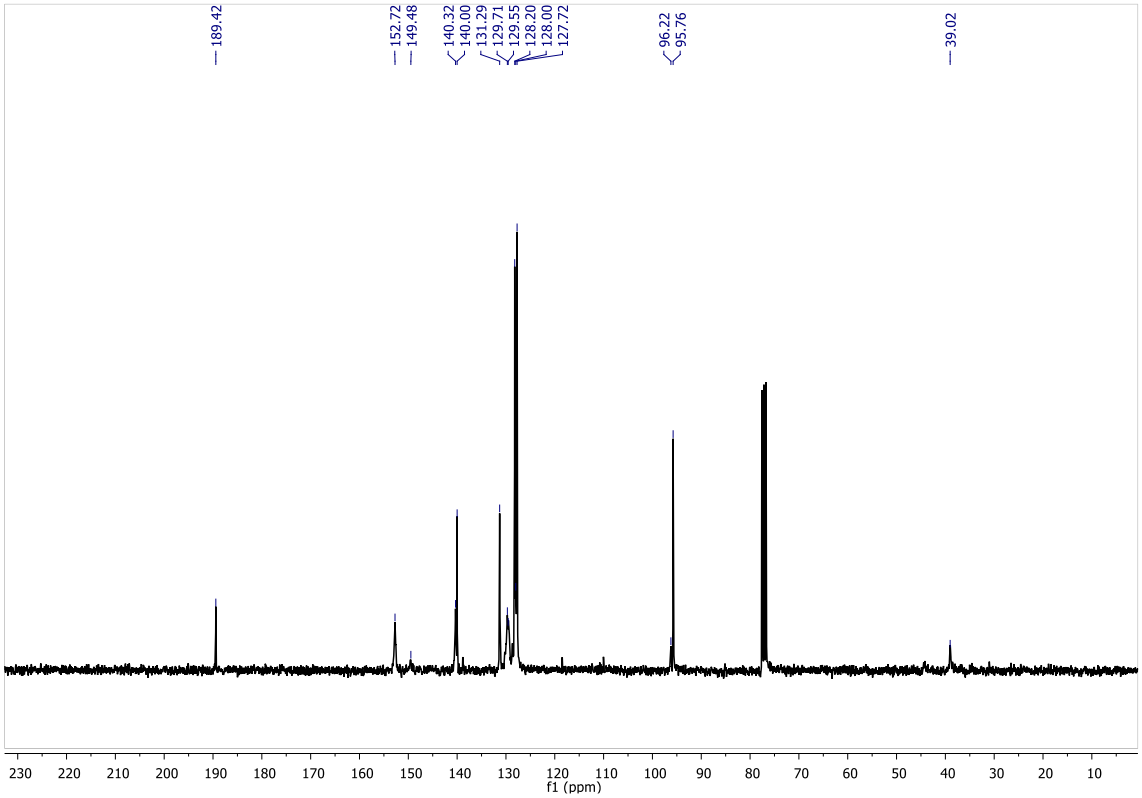
(*E*)-4-((2-Iodo-4-(trifluoromethyl)phenyl)(methyl)amino)but-3-en-2-one **19c**



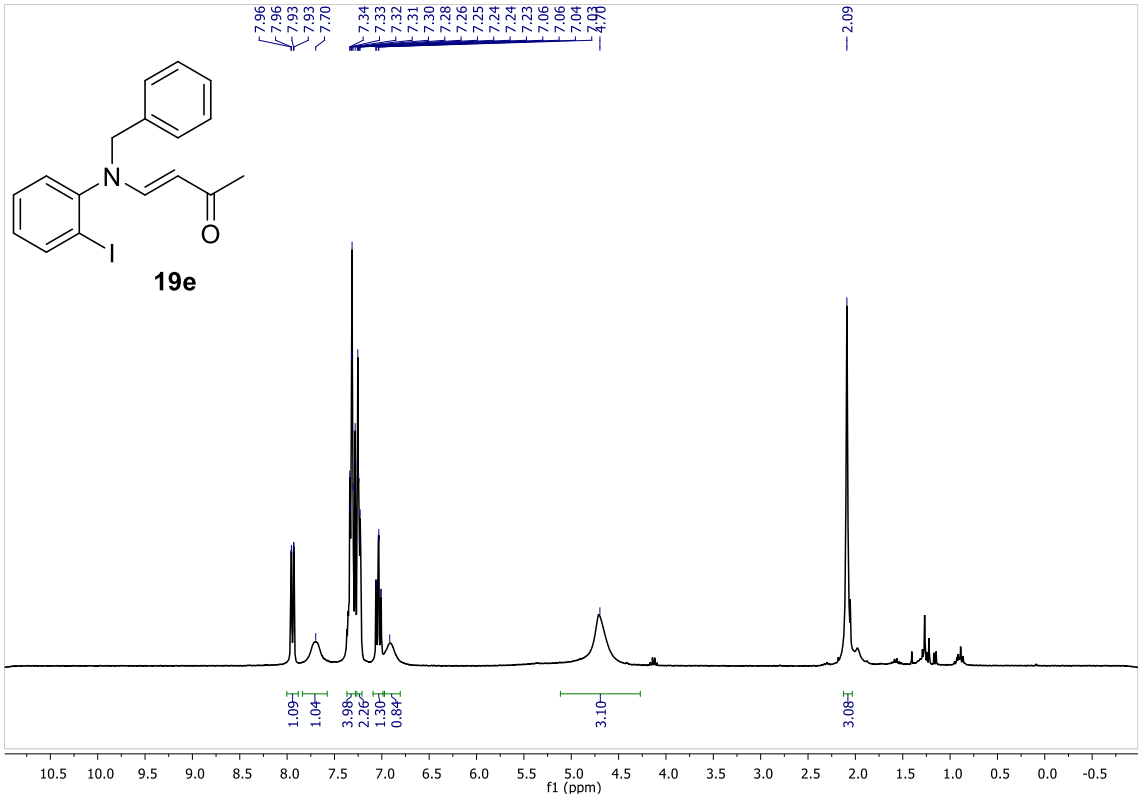



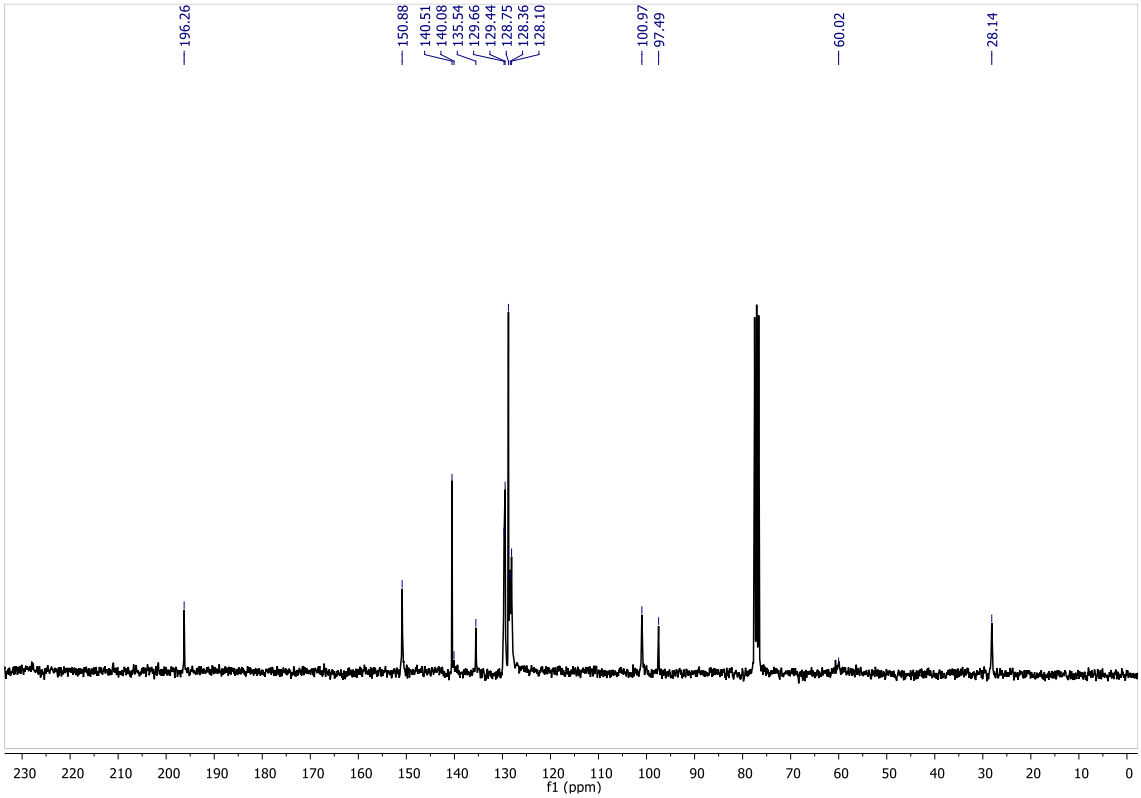
(*E*)-3-((2-Iodophenyl)(methyl)amino)-1-phenylprop-2-en-1-one **19d**



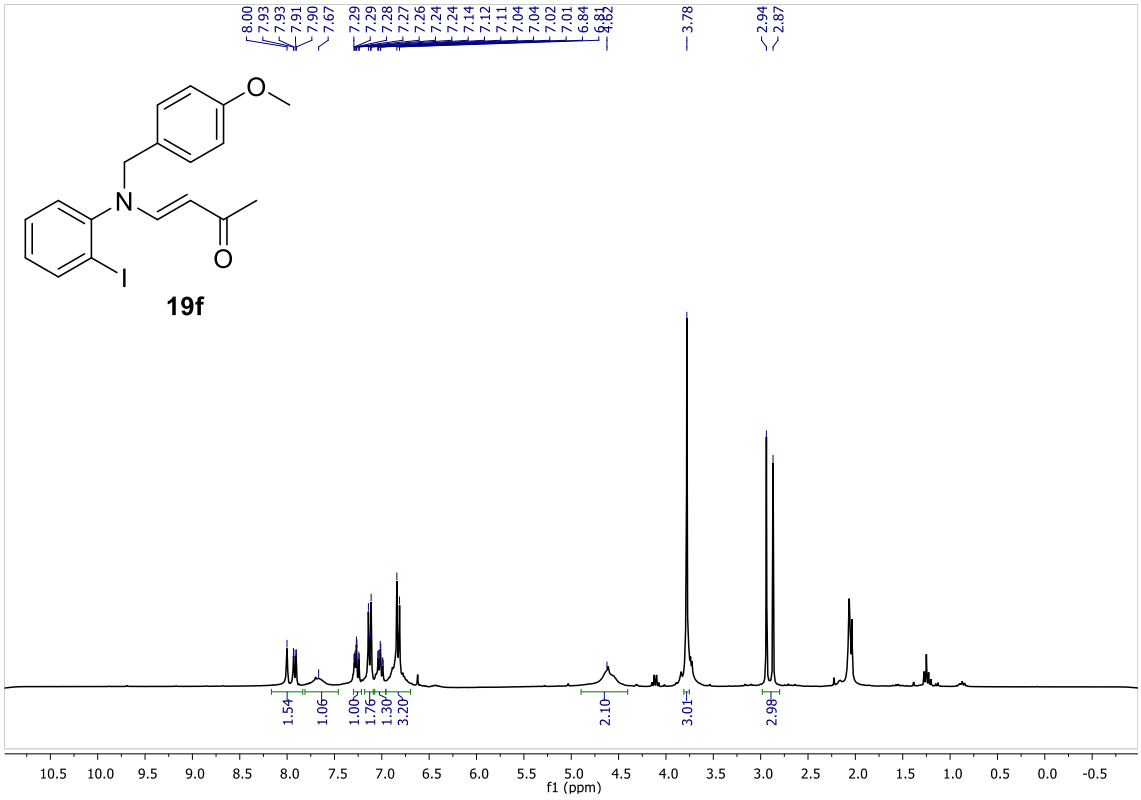



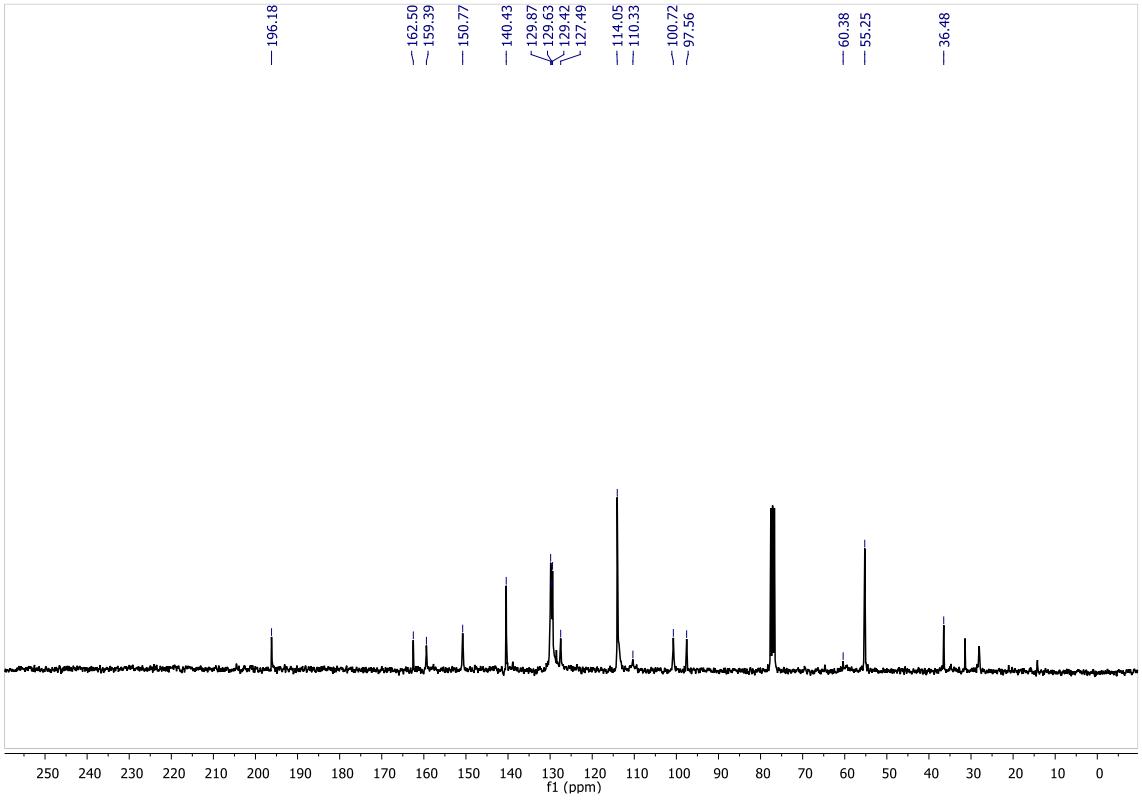
(*E*)-4-(Benzyl(2-iodophenyl)amino)but-3-en-2-one **19e**



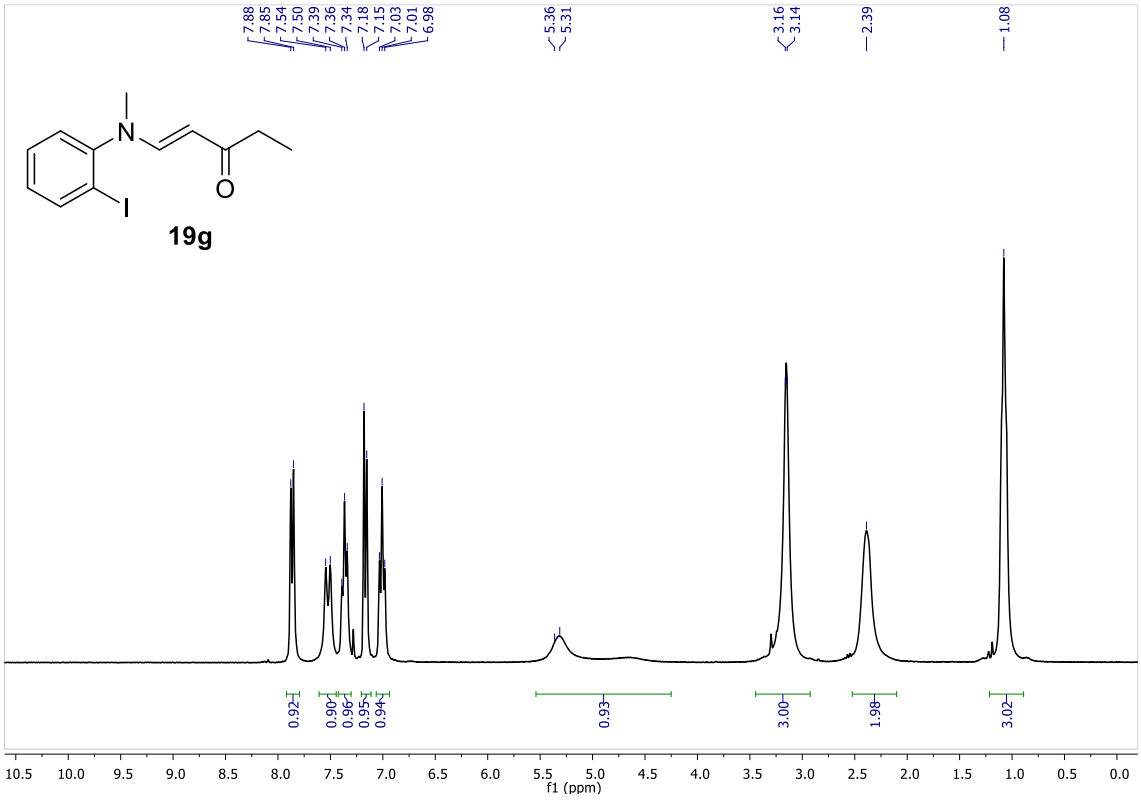



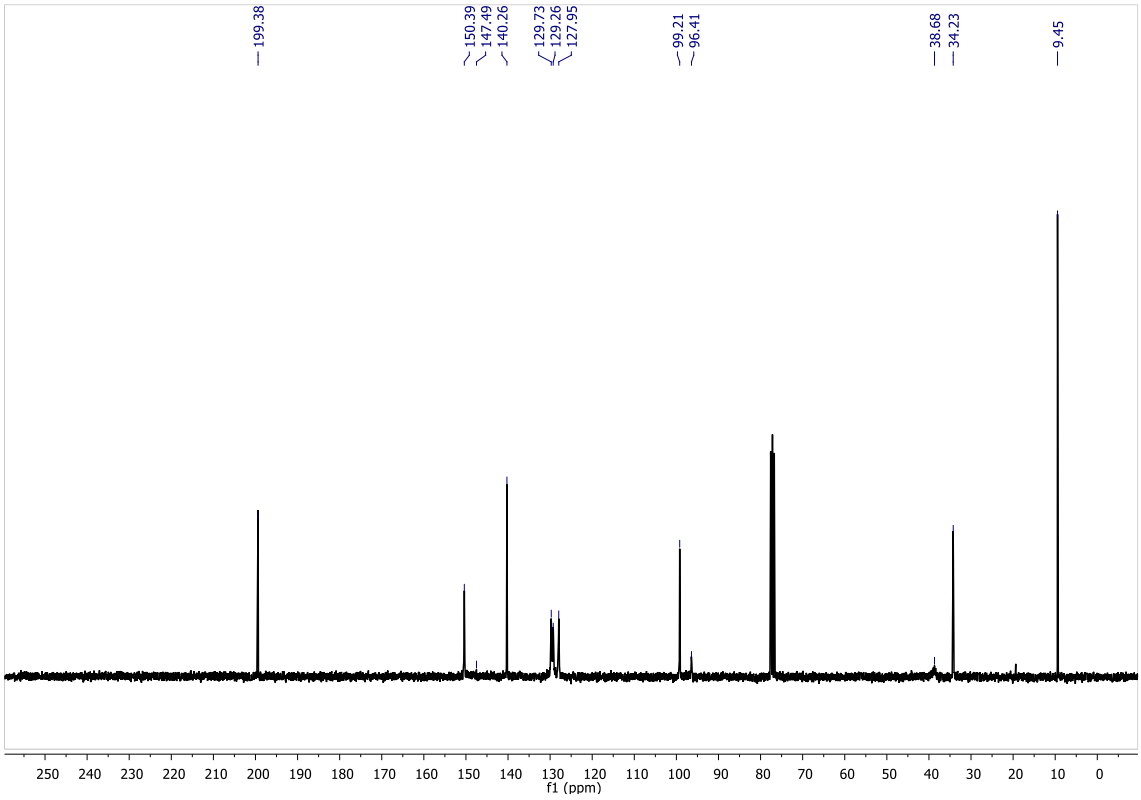
(*E*)-4-((2-Iodophenyl)(4-methoxybenzyl)amino)but-3-en-2-one **19f**



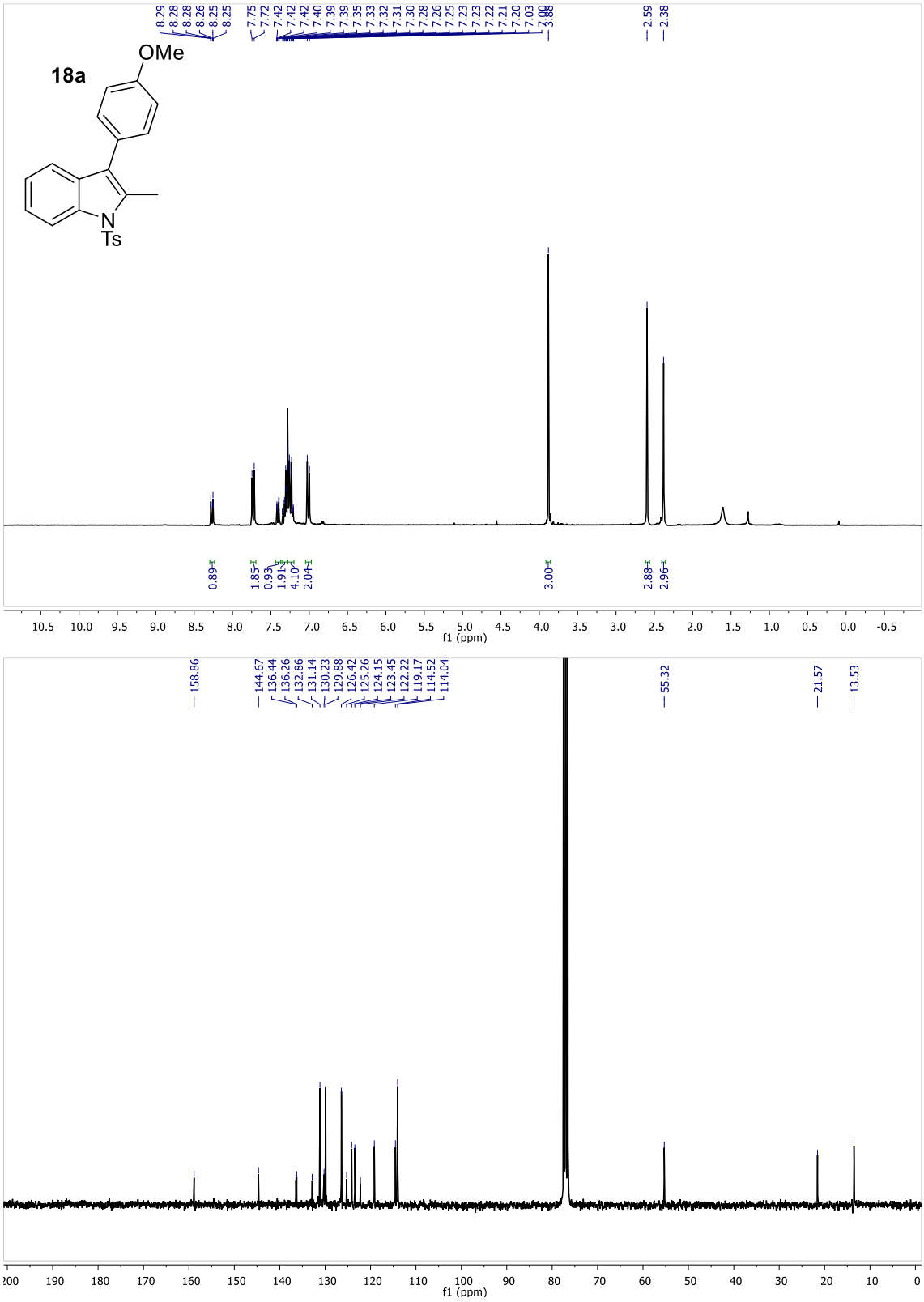



(*E*)-1-((2-Iodophenyl)(methyl)amino)pent-1-en-3-one **19g**

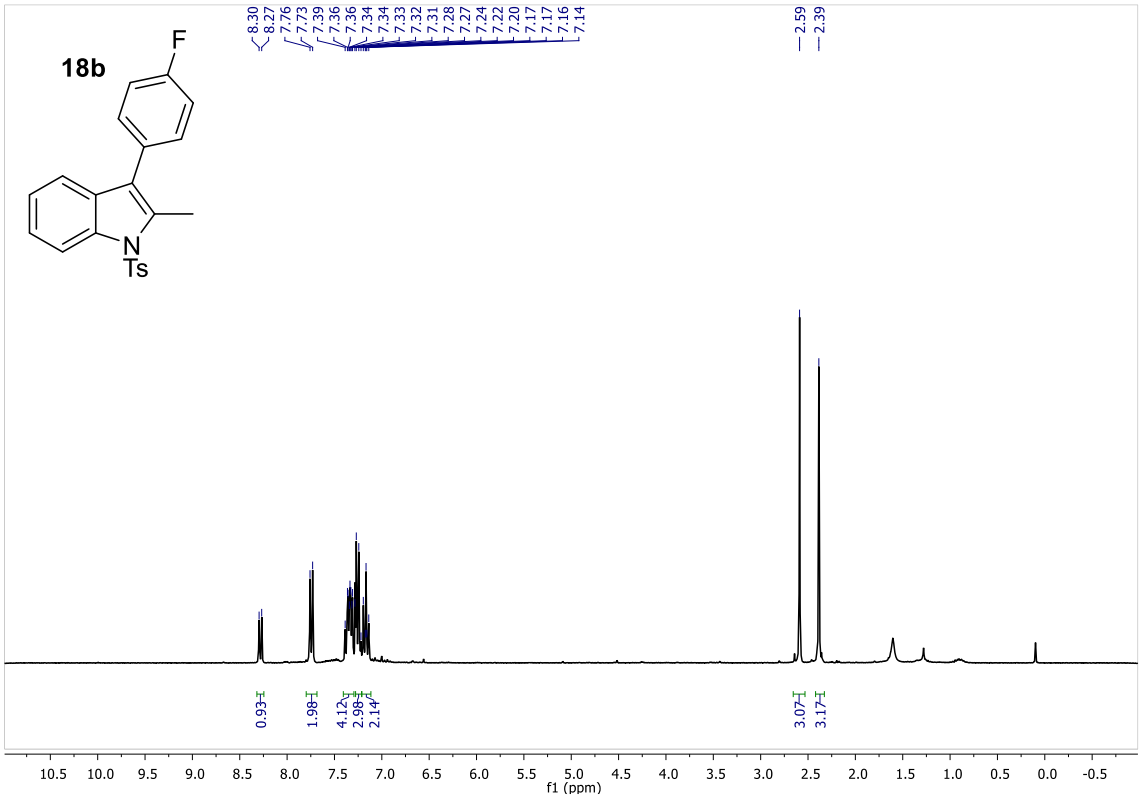


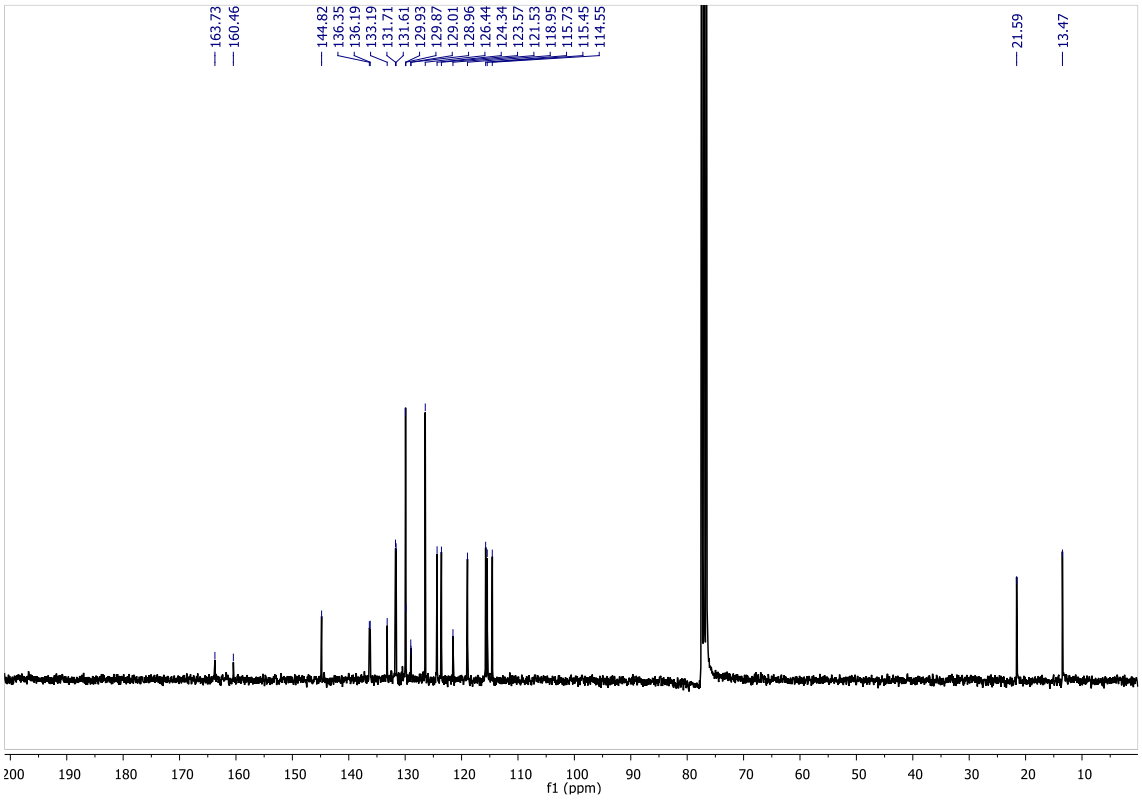



3-(4-Methoxyphenyl)-2-methyl-1-tosyl-1*H*-indole **18a**

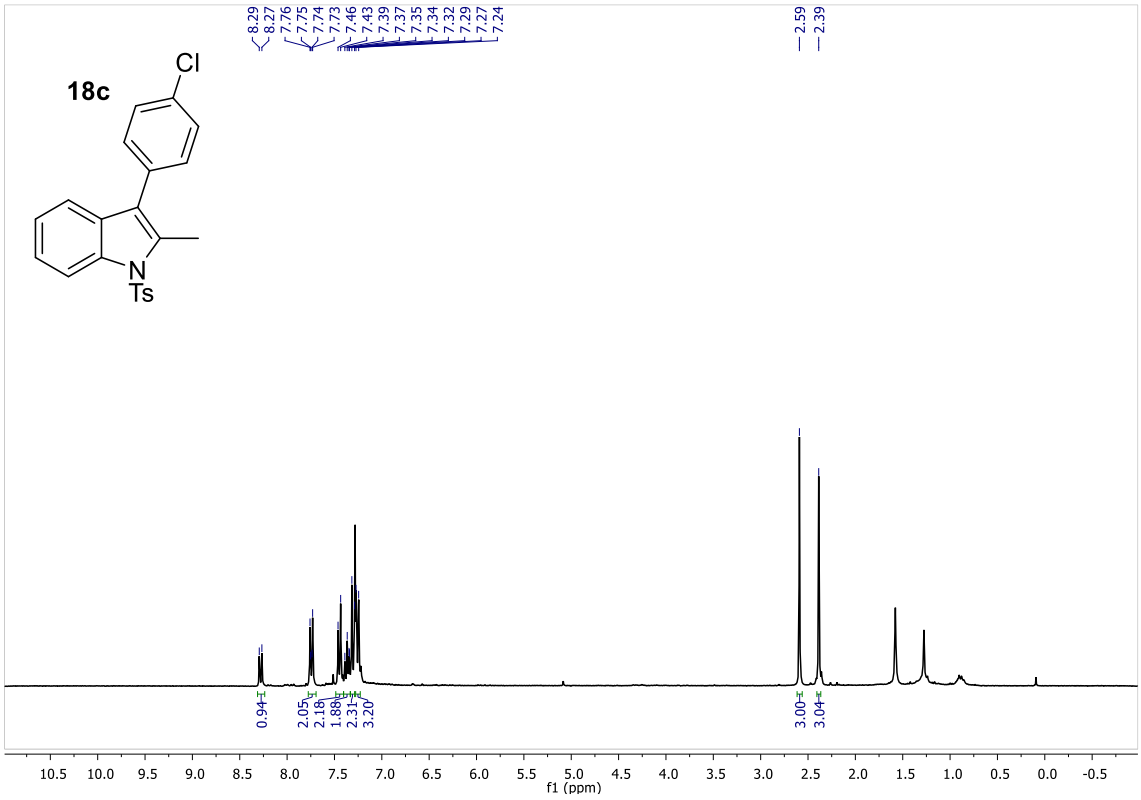


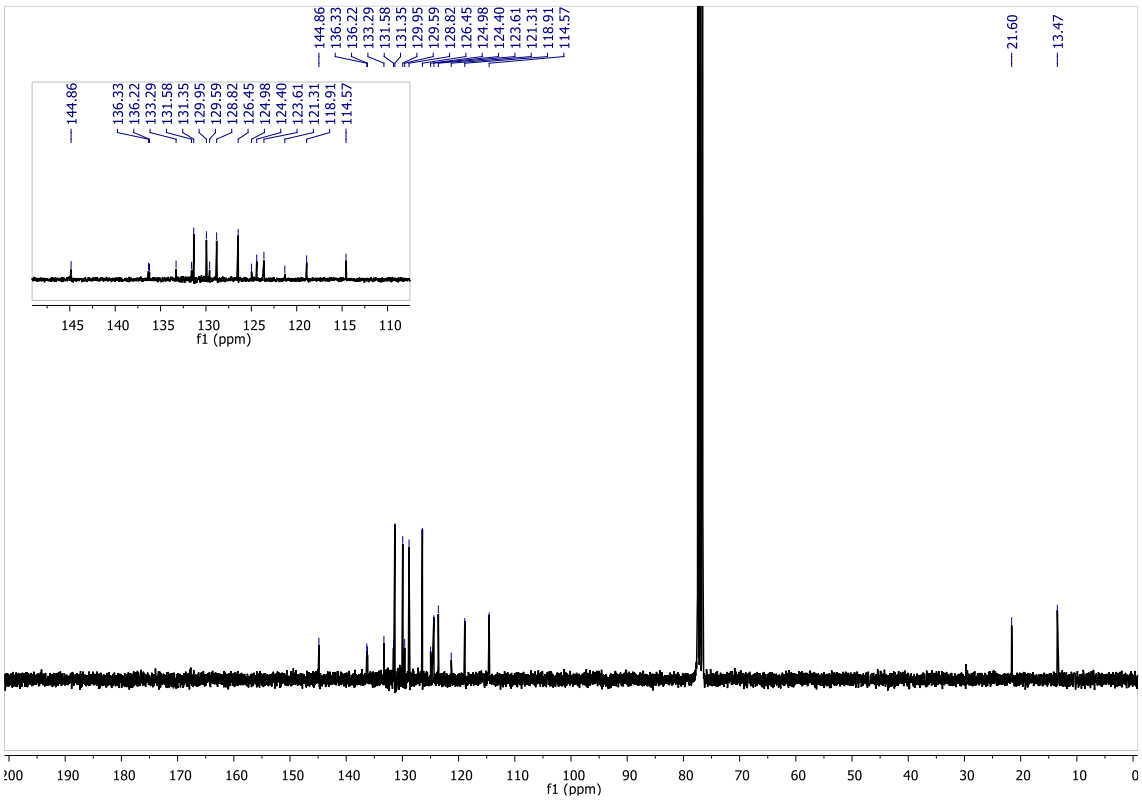
3-(4-Fluorophenyl)-2-methyl-1-tosyl-1*H*-indole **18b**



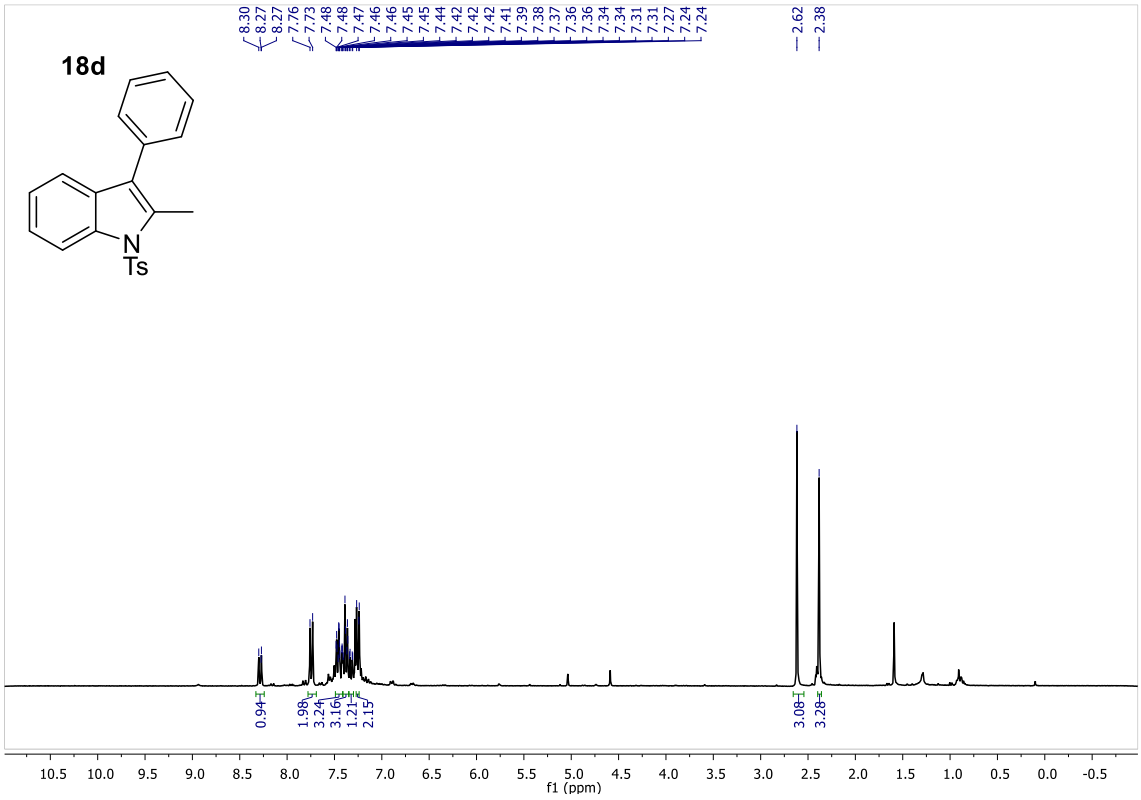



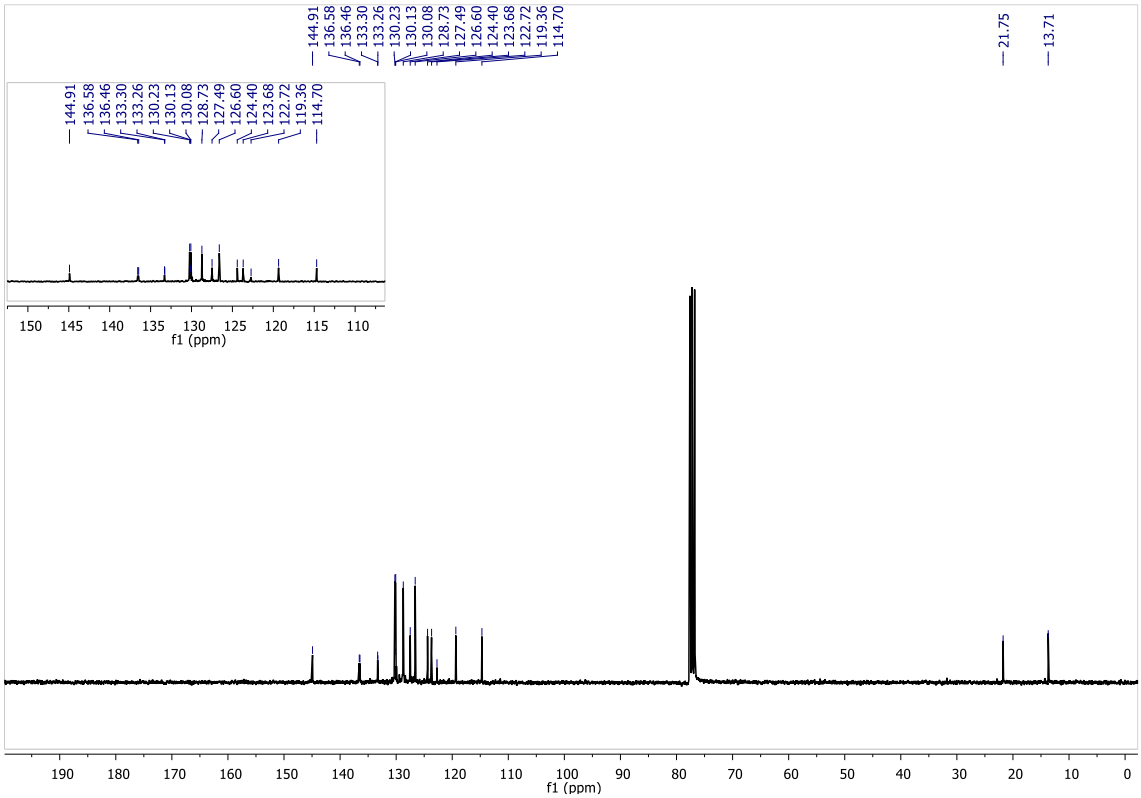
3-(4-Chlorophenyl)-2-methyl-1-tosyl-1*H*-indole **18c**



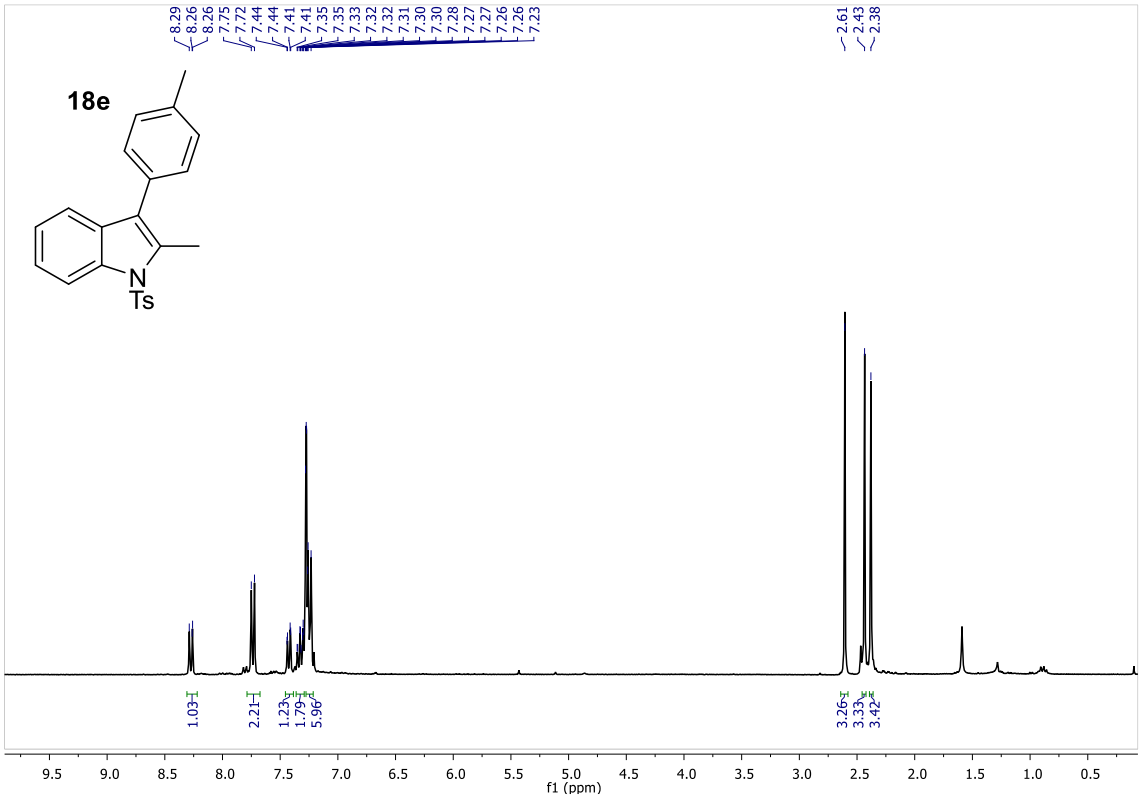



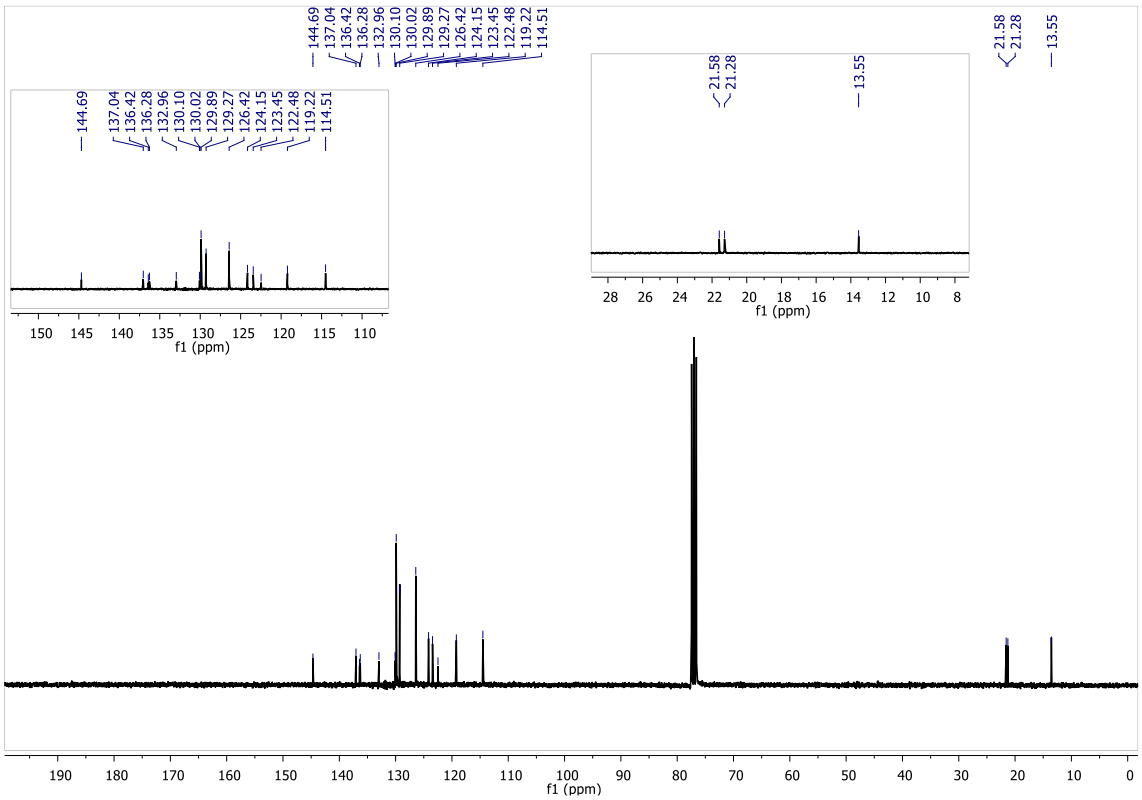
2-Methyl-3-phenyl-1-tosyl-1*H*-indole **18d**



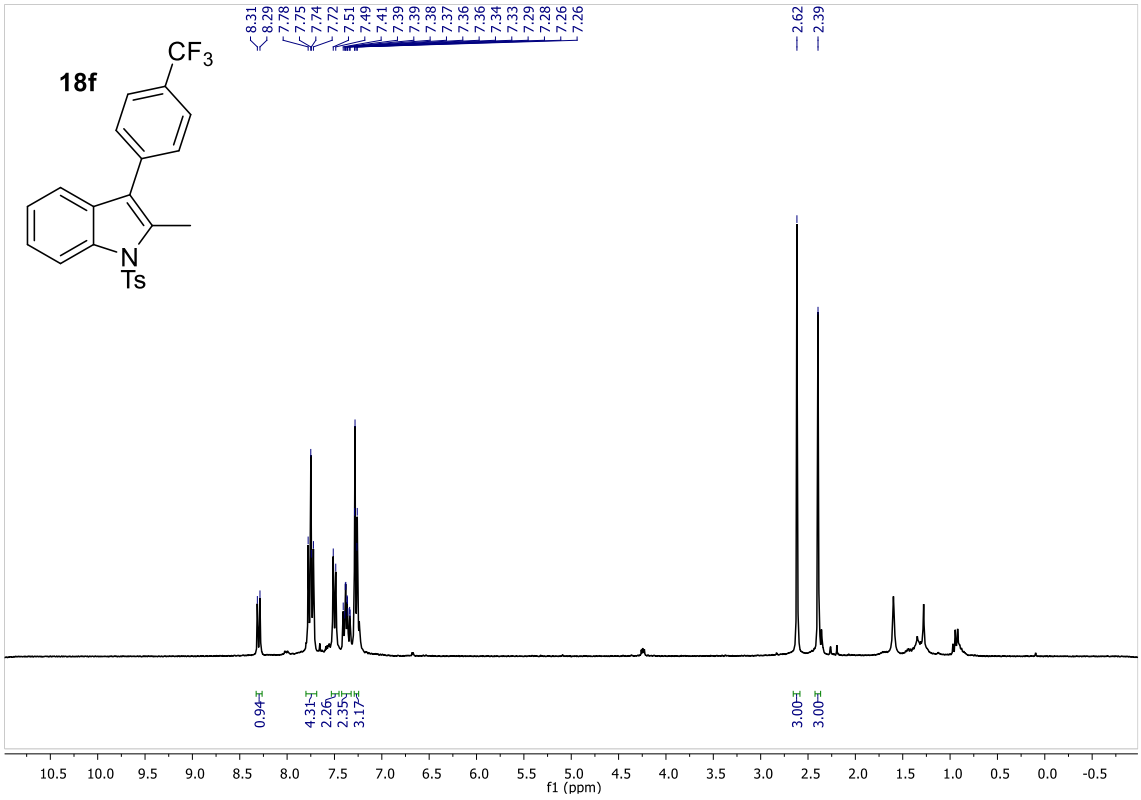



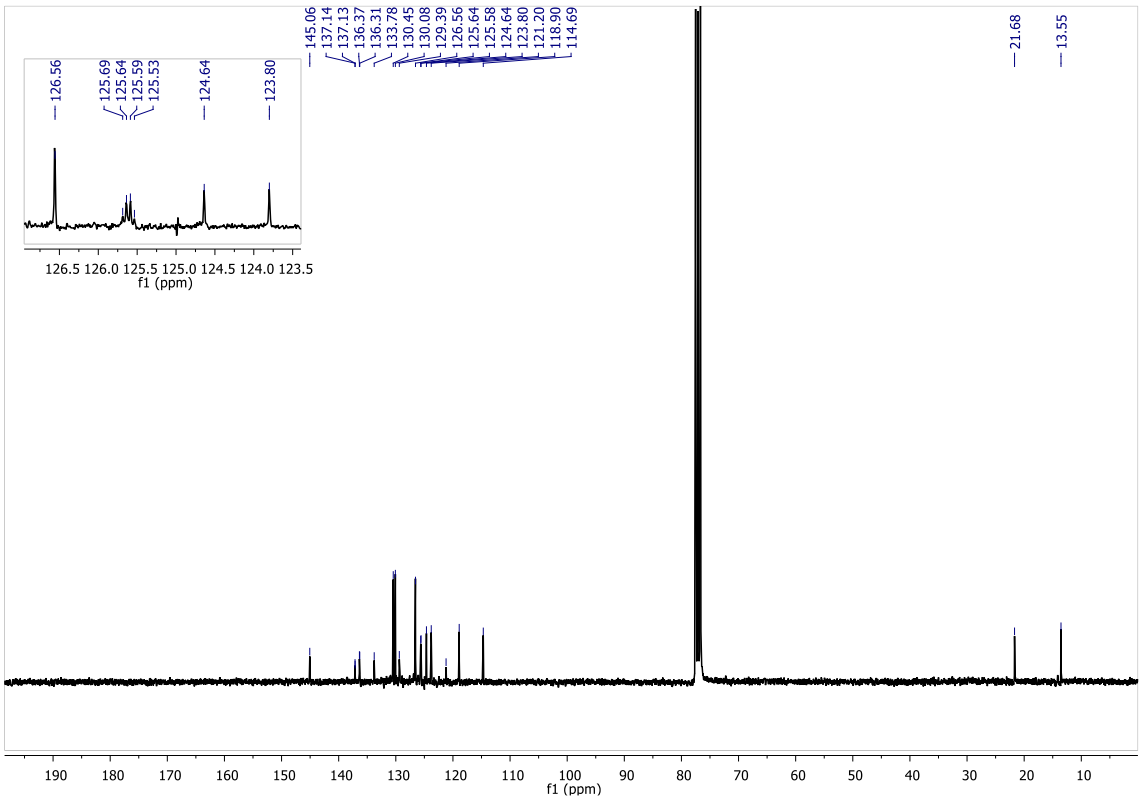
2-Methyl-3-(*p*-tolyl)-1-tosyl-1*H*-indole **18e**



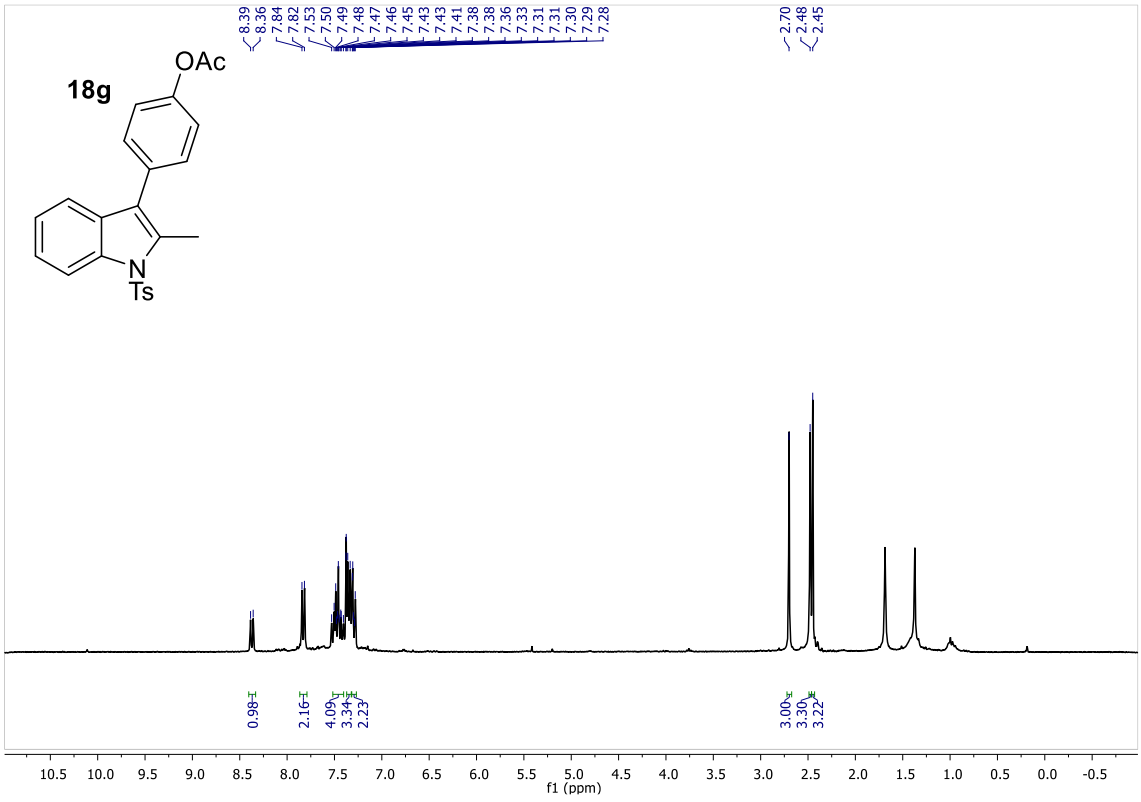



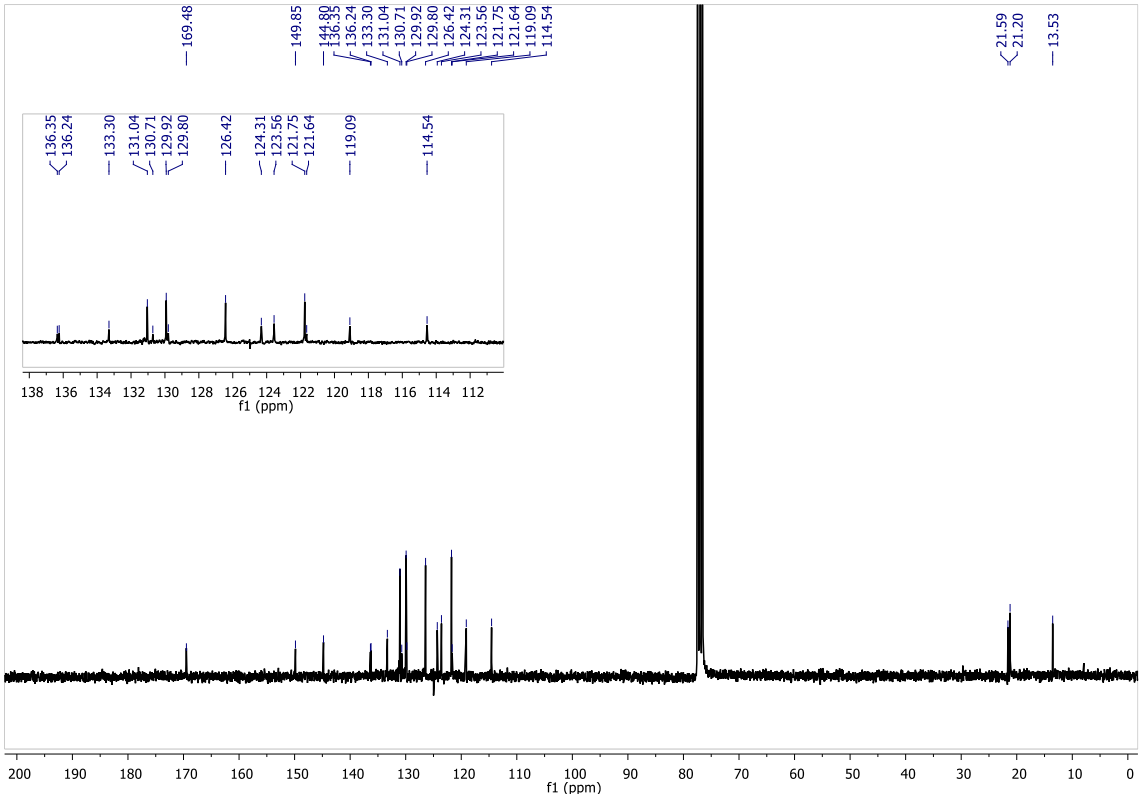
2-Methyl-1-tosyl-3-(4-(trifluoromethyl)phenyl)-1*H*-indole **18f**



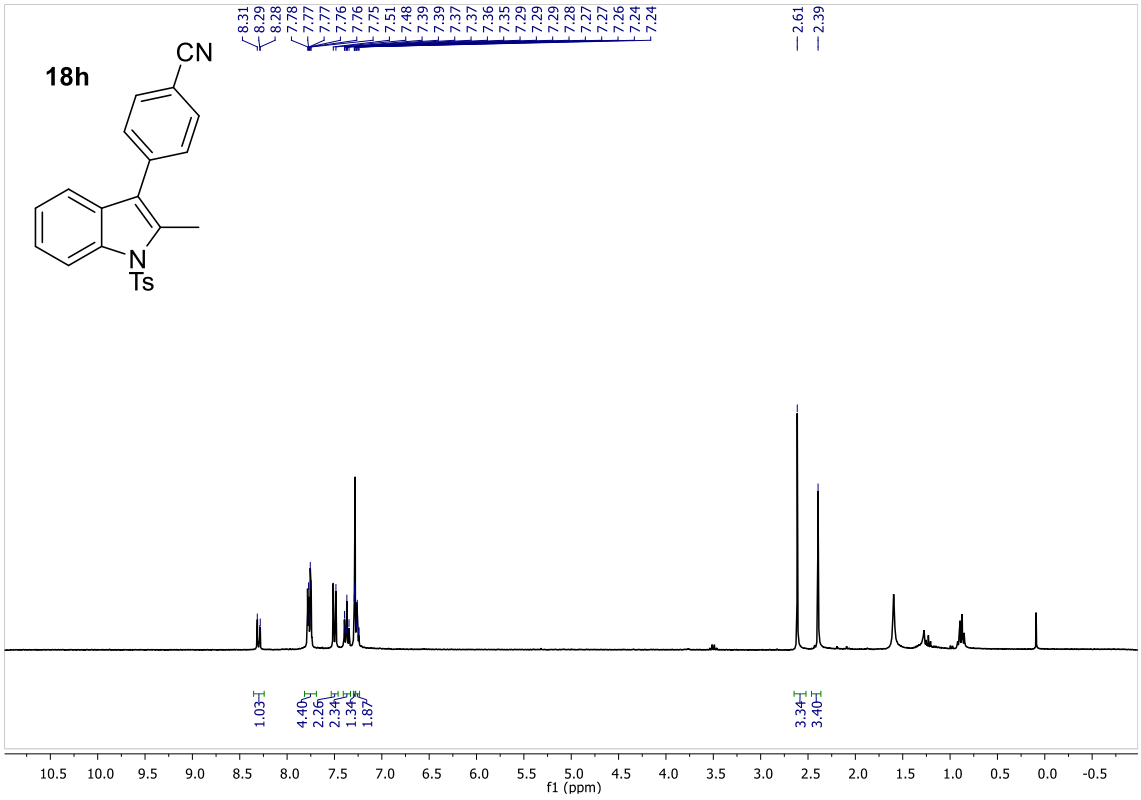



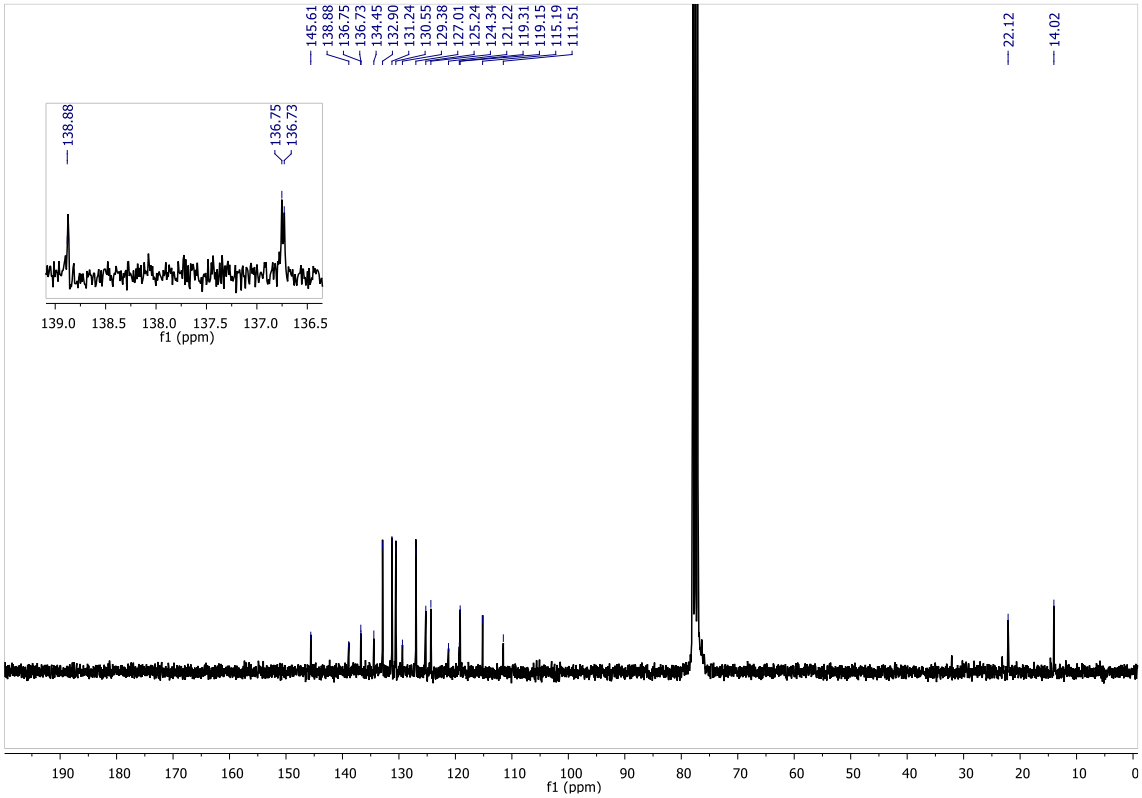
4-(2-Methyl-1-tosyl-1*H*-indol-3-yl)phenyl acetate **18g**



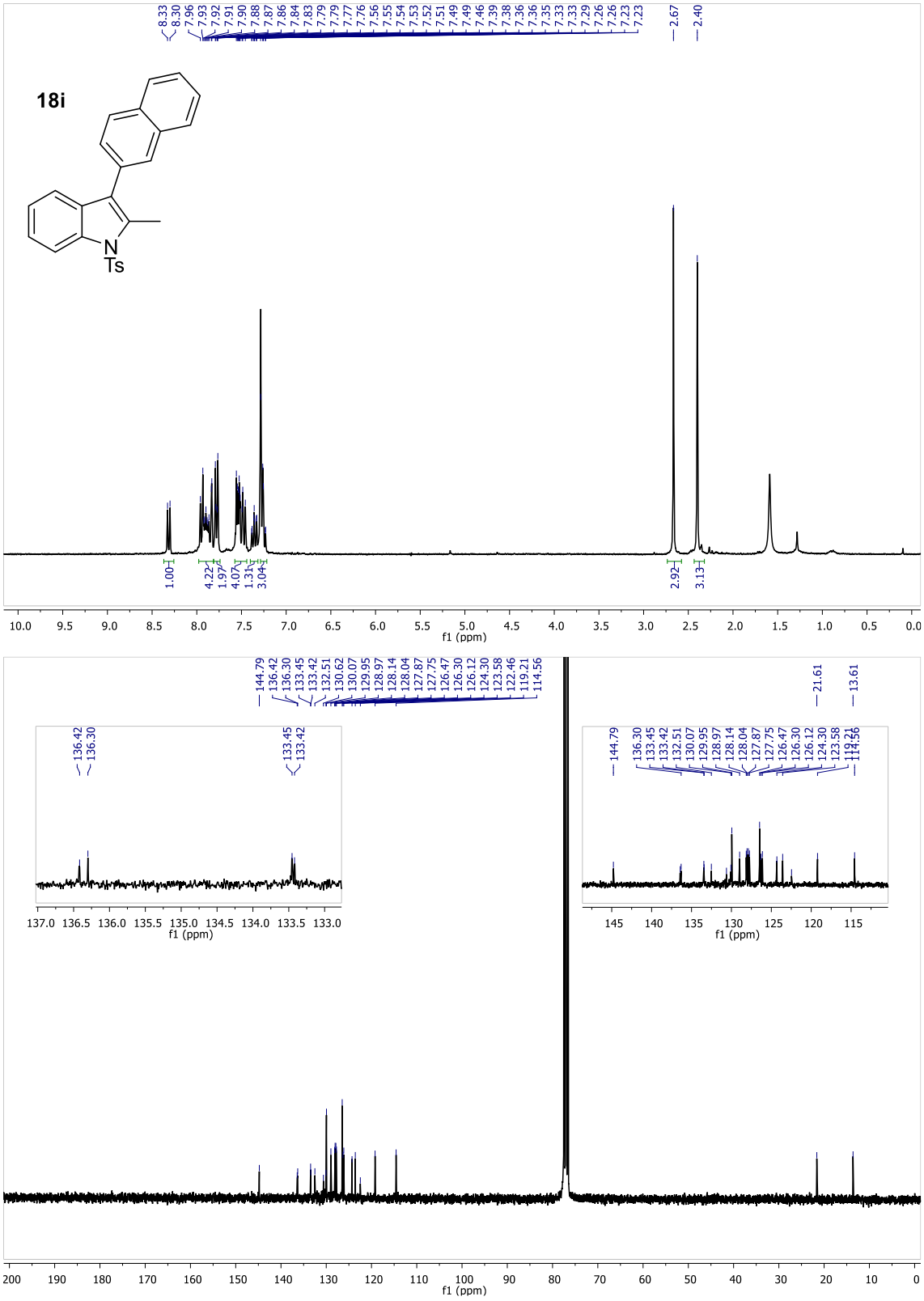



4-(2-Methyl-1-tosyl-1*H*-indol-3-yl)benzonitrile **18h**

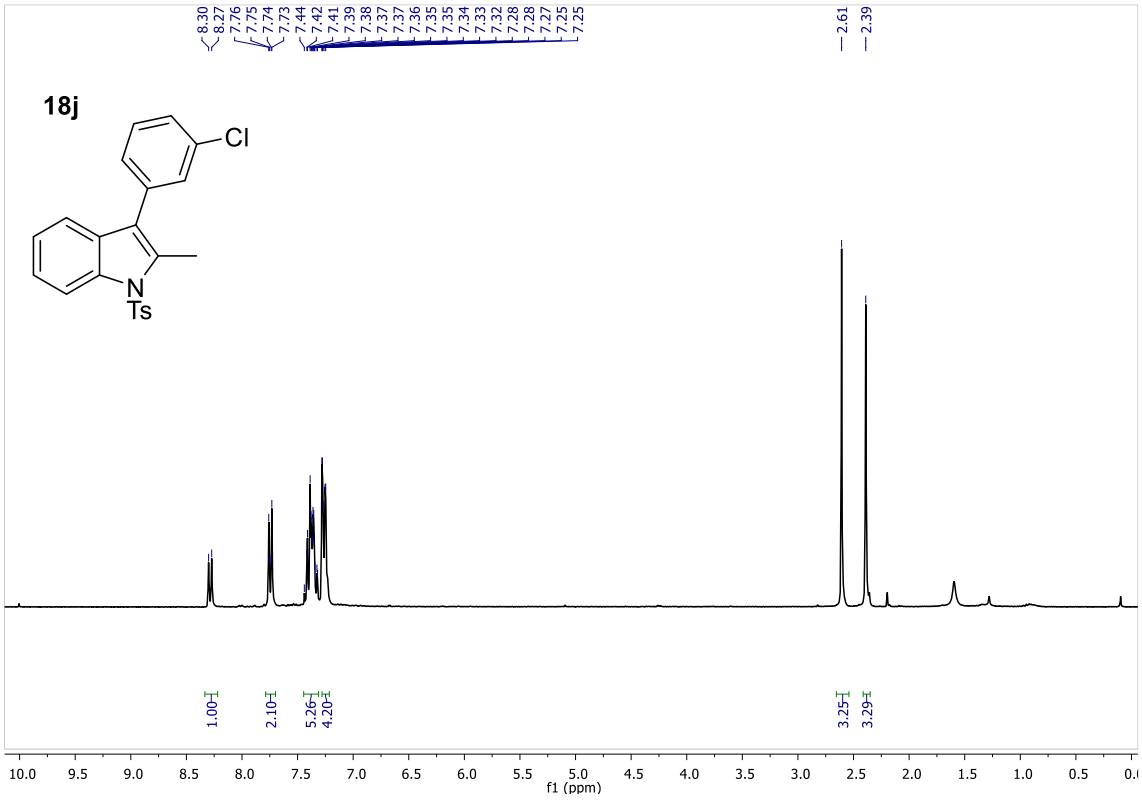


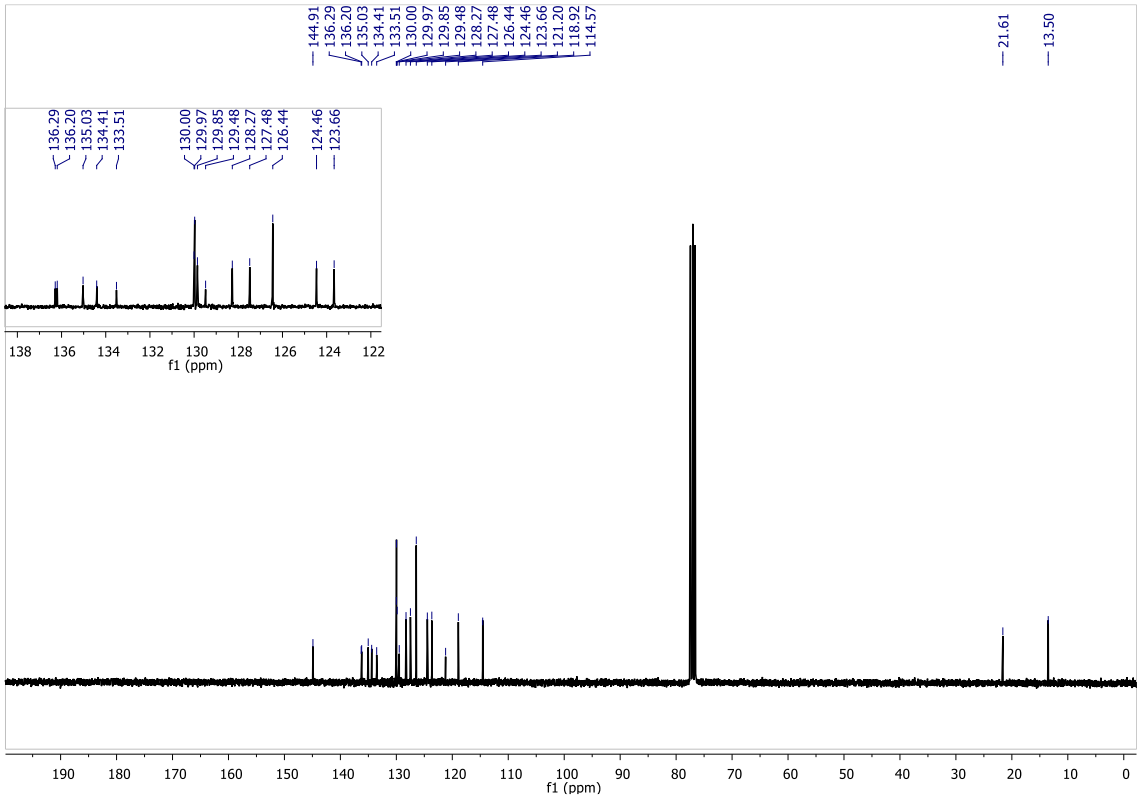



2-Methyl-3-(naphthalen-2-yl)-1-tosyl-1*H*-indole **18i**

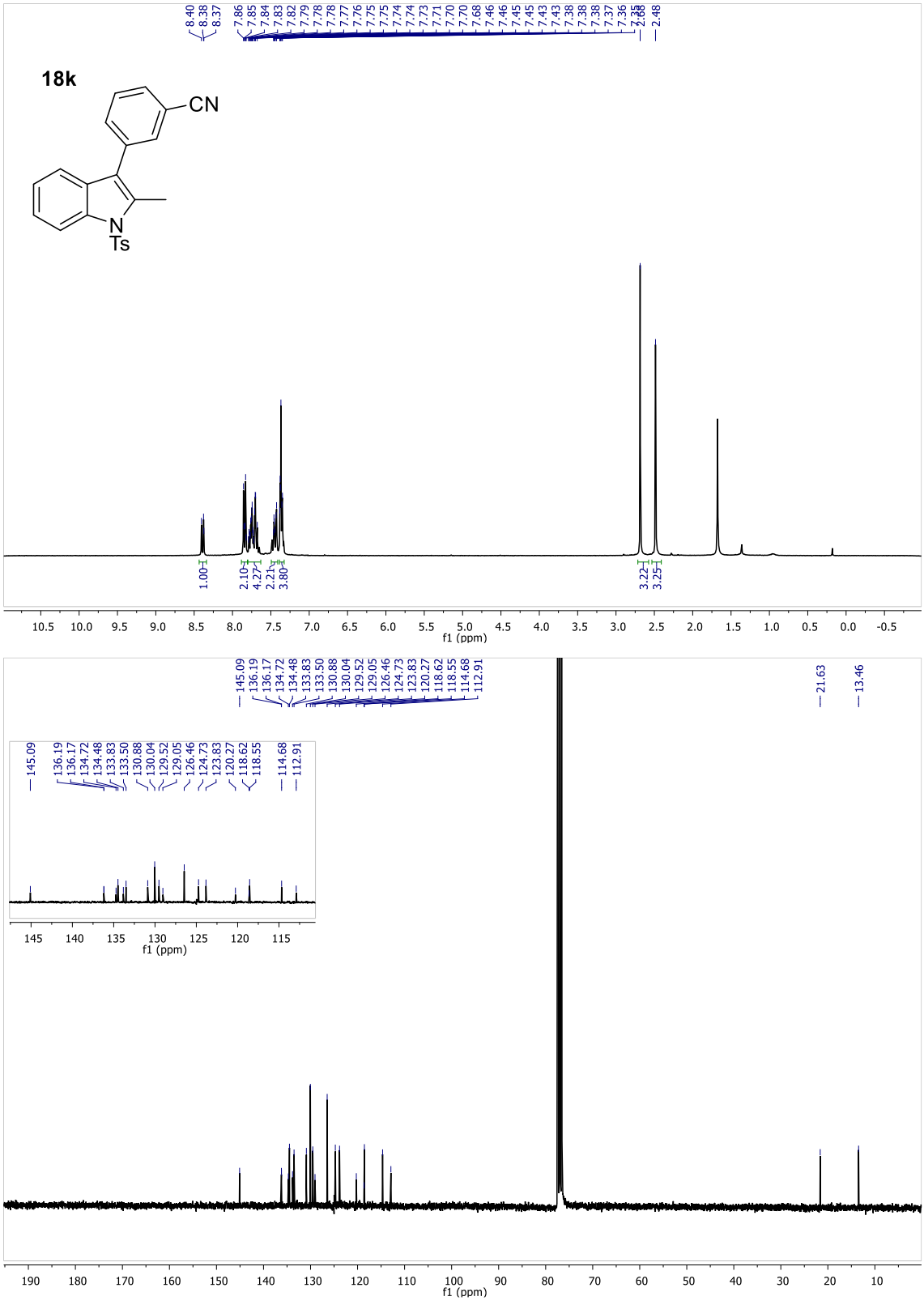


3-(3-Chlorophenyl)-2-methyl-1-tosyl-1*H*-indole **18j**

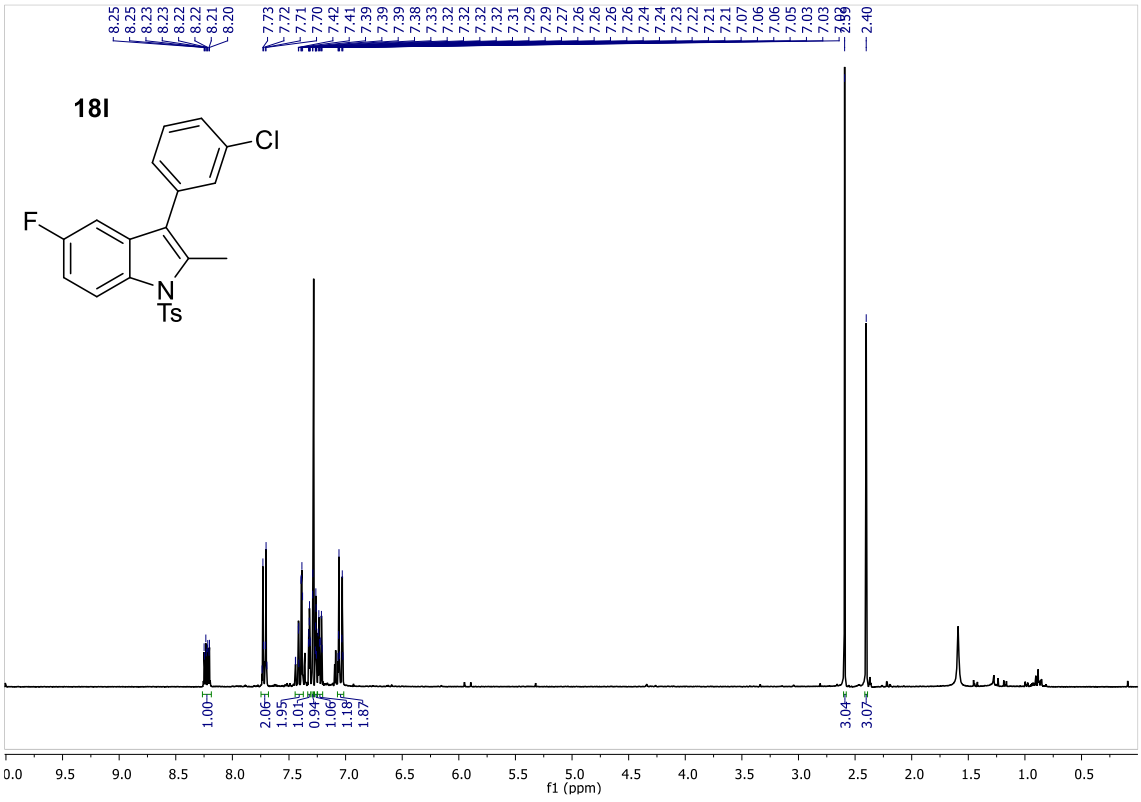


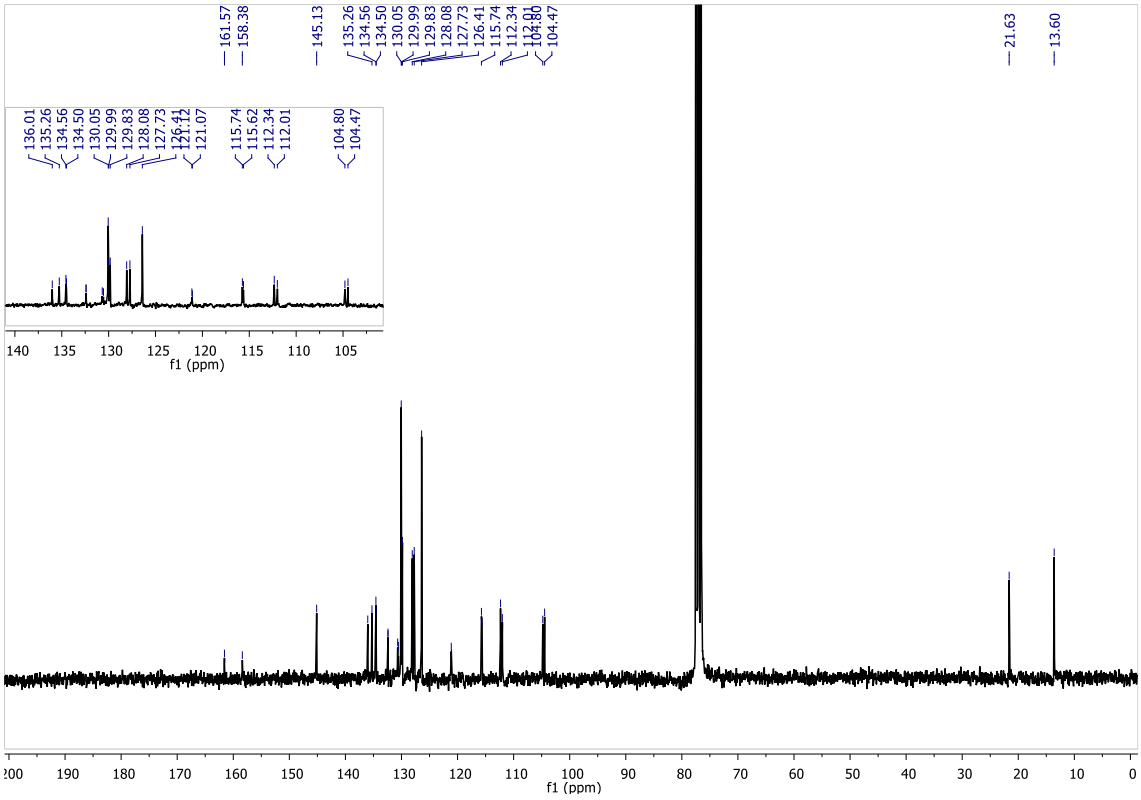



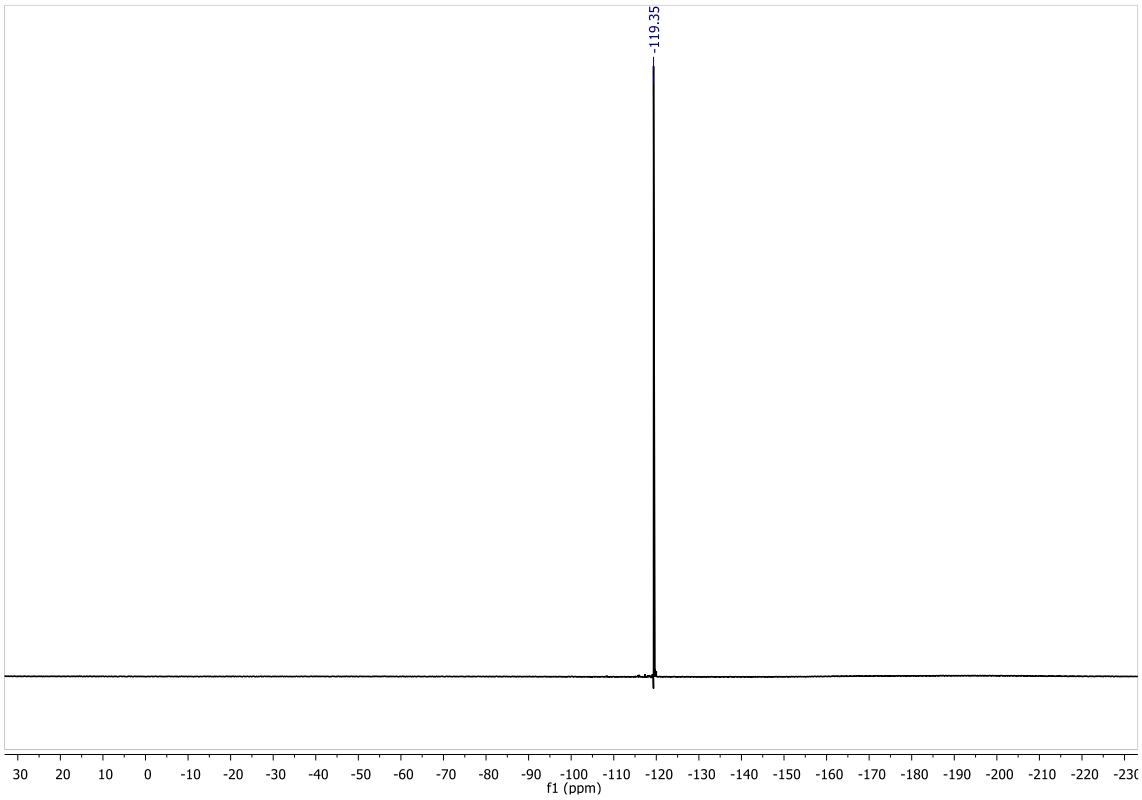
3-(2-Methyl-1-tosyl-1*H*-indol-3-yl)benzonitrile **18k**



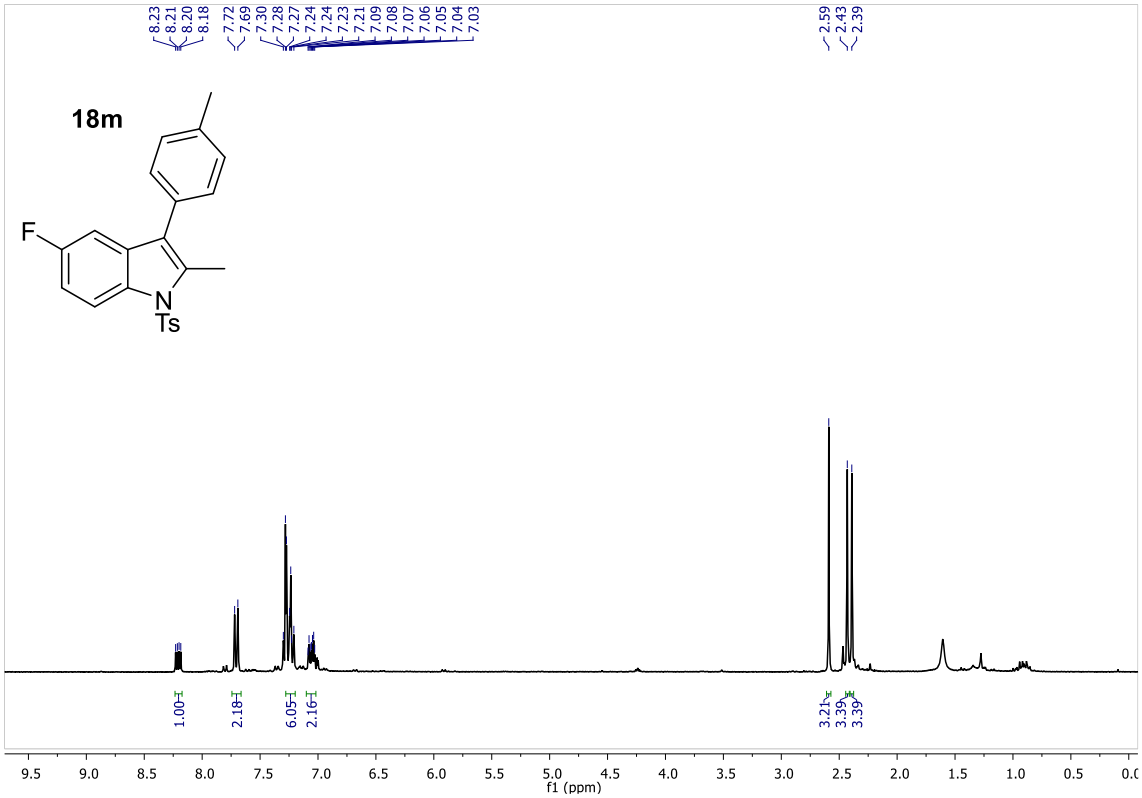
3-(3-Chlorophenyl)-5-fluoro-2-methyl-1-tosyl-1*H*-indole **18l**

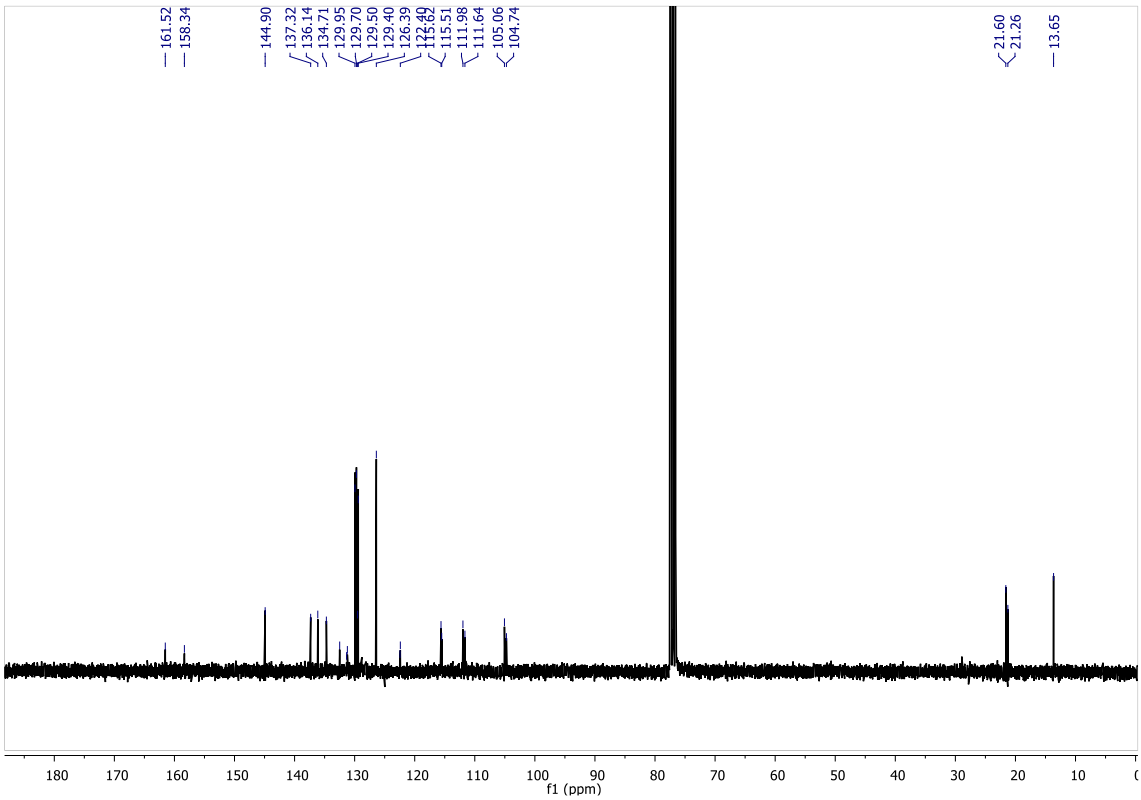


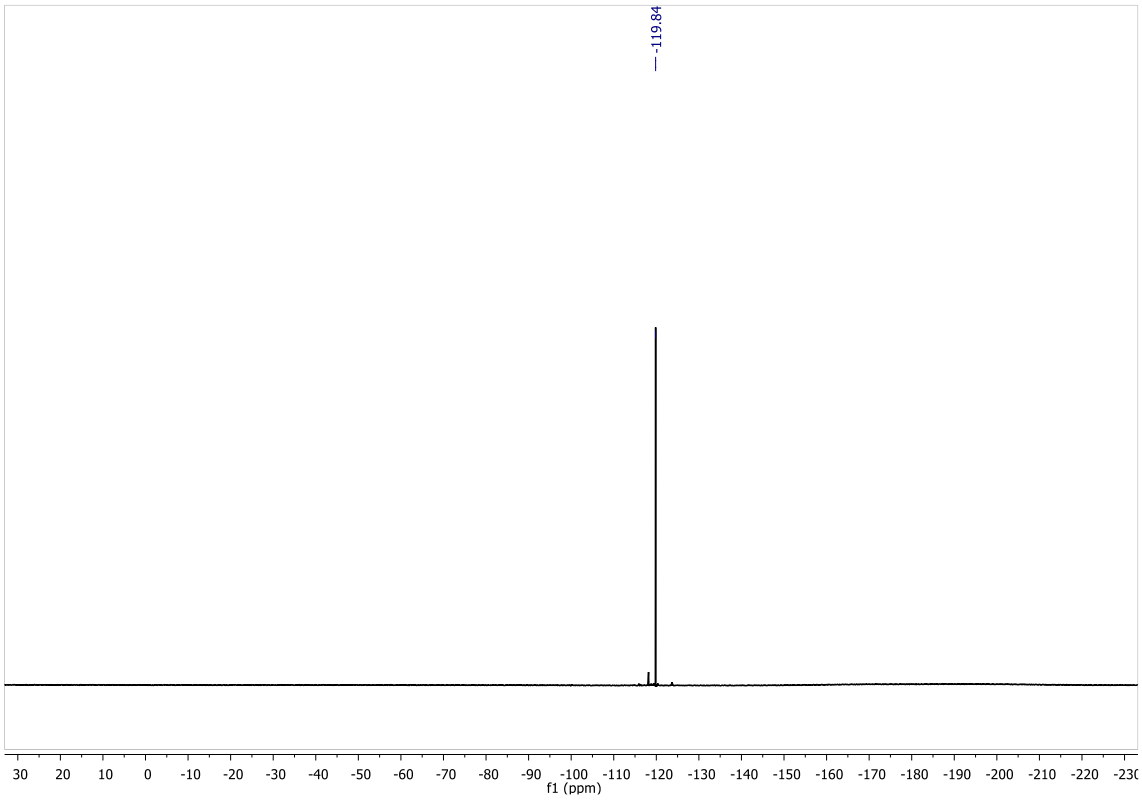




-119.35
30 20 10 0 -10 -20 -30 -40 -50 -60 -70 -80 -90 -100 -110 -120 -130 -140 -150 -160 -170 -180 -190 -200 -210 -220 -230
f1 (ppm)

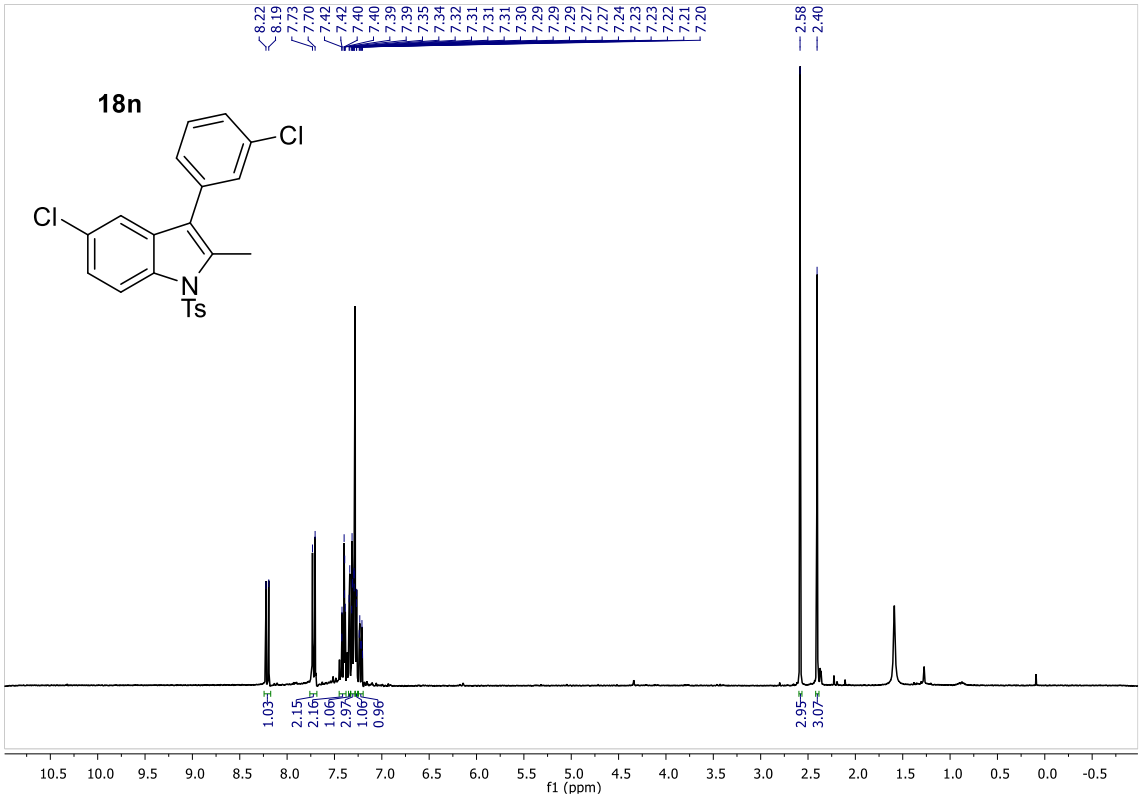
5-Fluoro-2-methyl-3-(*p*-tolyl)-1-tosyl-1*H*-indole **18m**

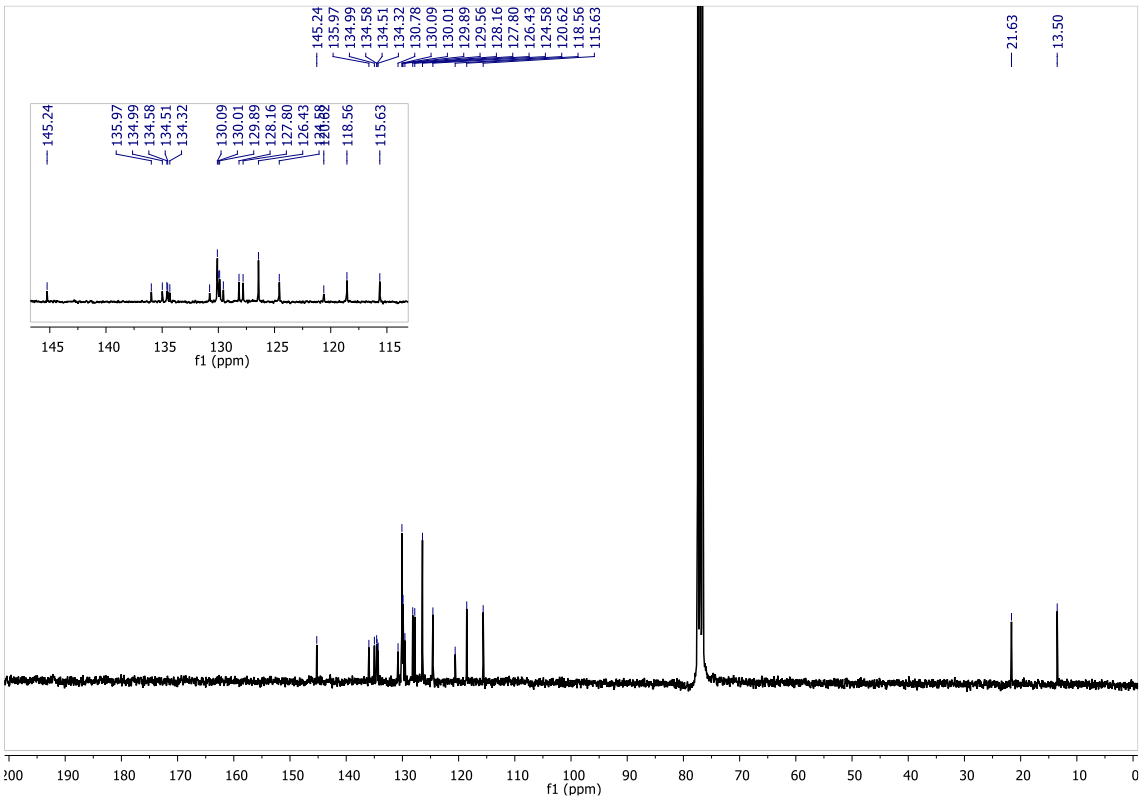


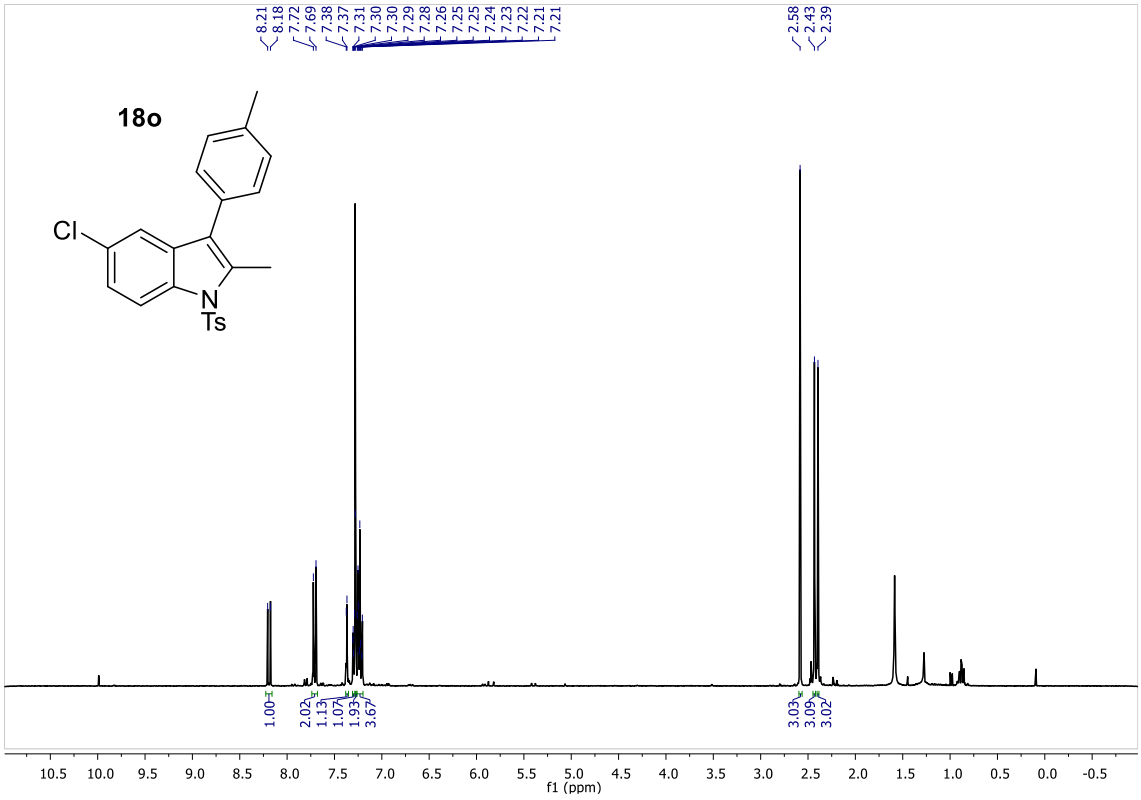

-119.84
30 20 10 0 -10 -20 -30 -40 -50 -60 -70 -80 -90 -100 -110 -120 -130 -140 -150 -160 -170 -180 -190 -200 -210 -220 -230
f1 (ppm)

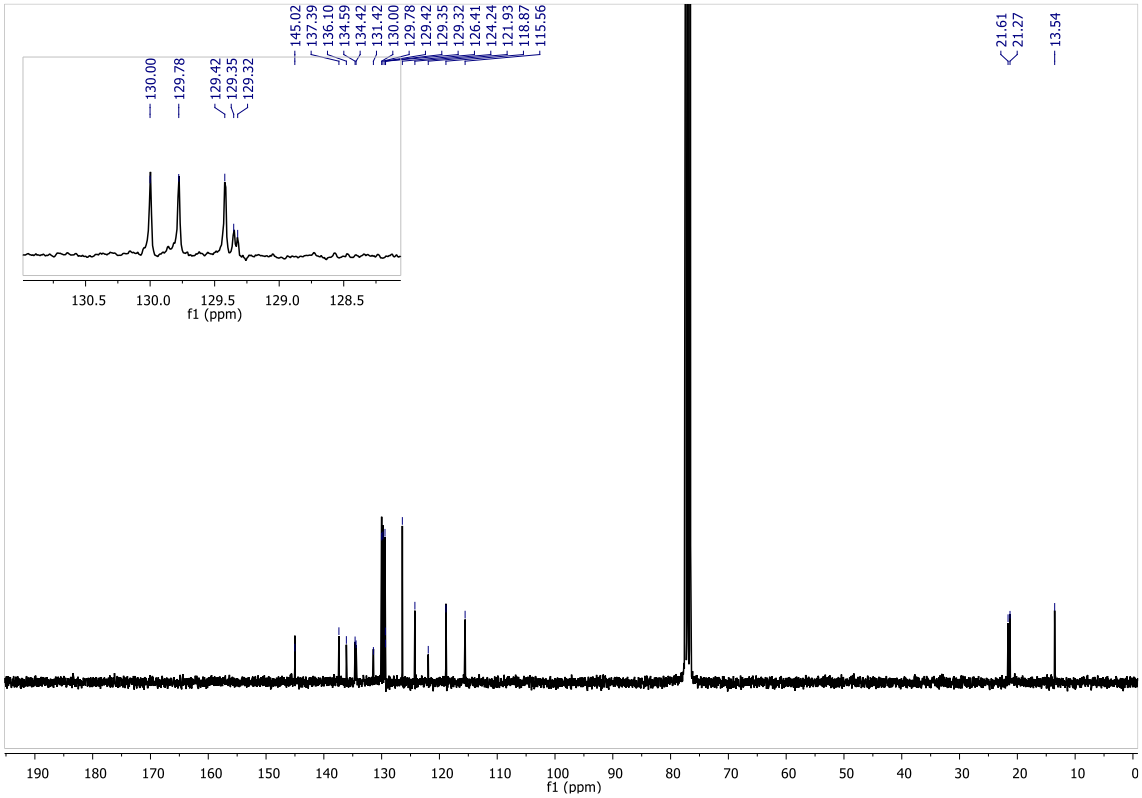
5-Chloro-3-(3-chlorophenyl)-2-methyl-1-tosyl-1*H*-indole **18n**



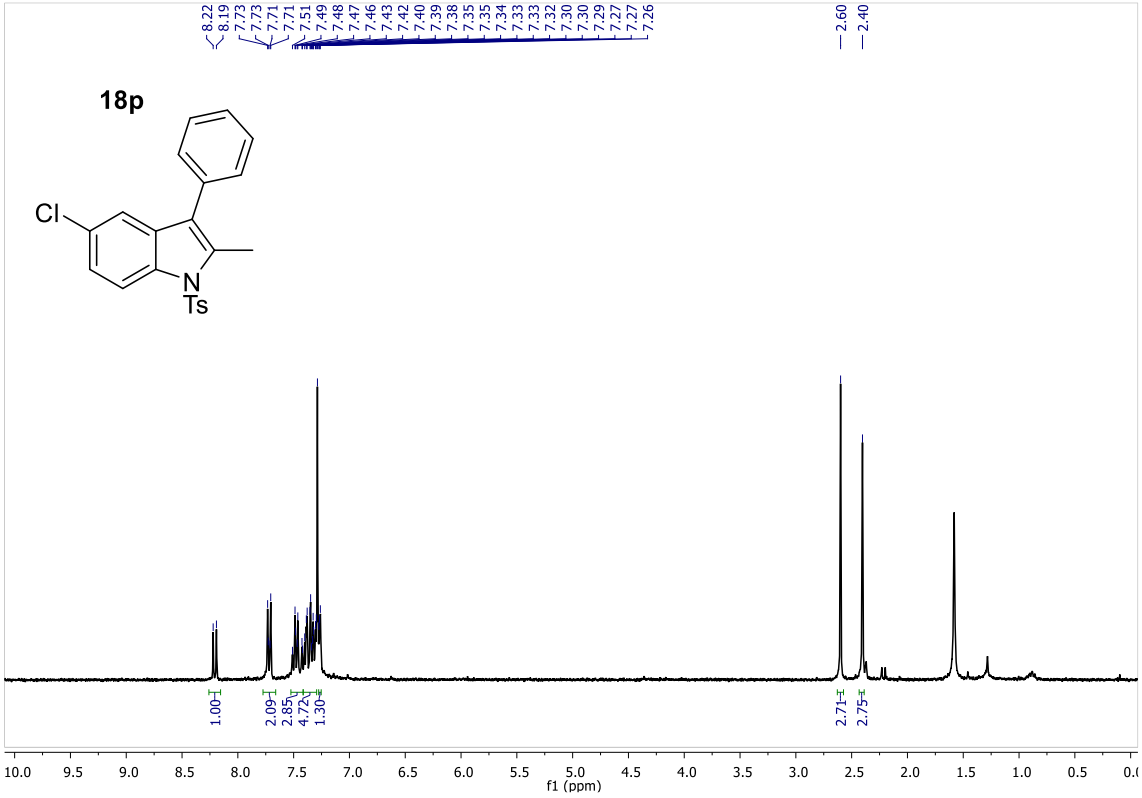



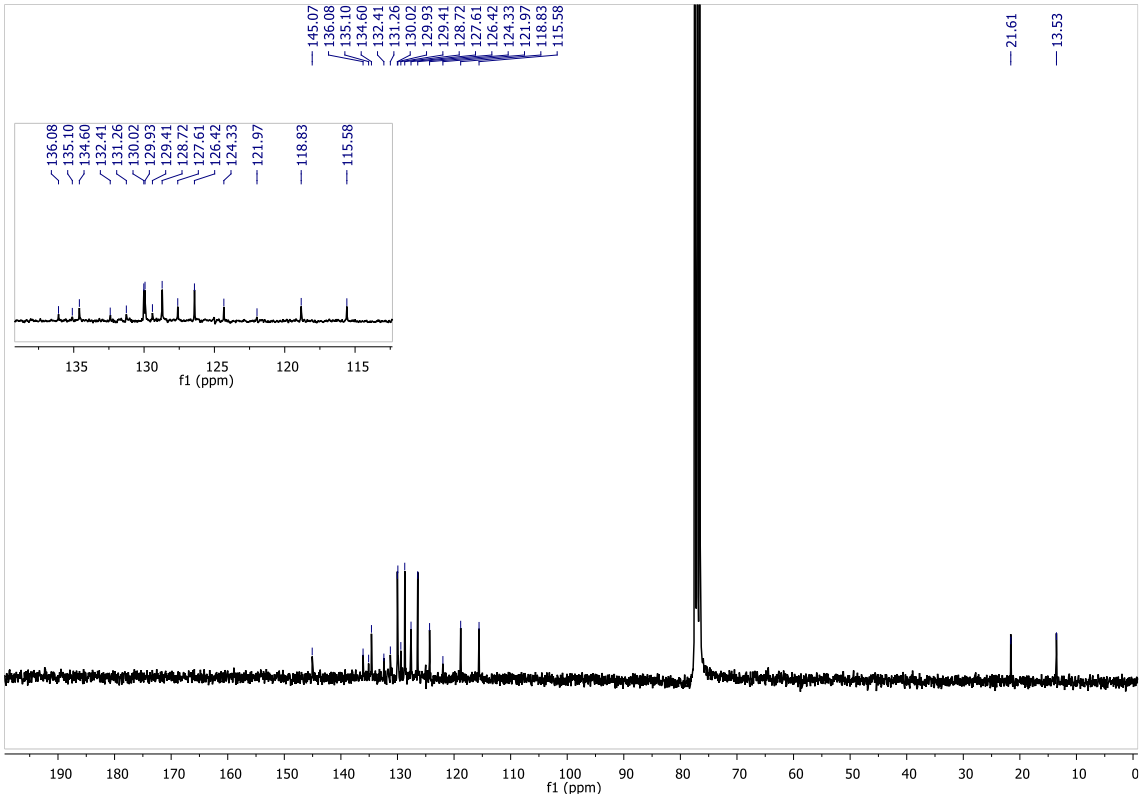
5-Chloro-2-methyl-3-(*p*-tolyl)-1-tosyl-1*H*-indole **18o**



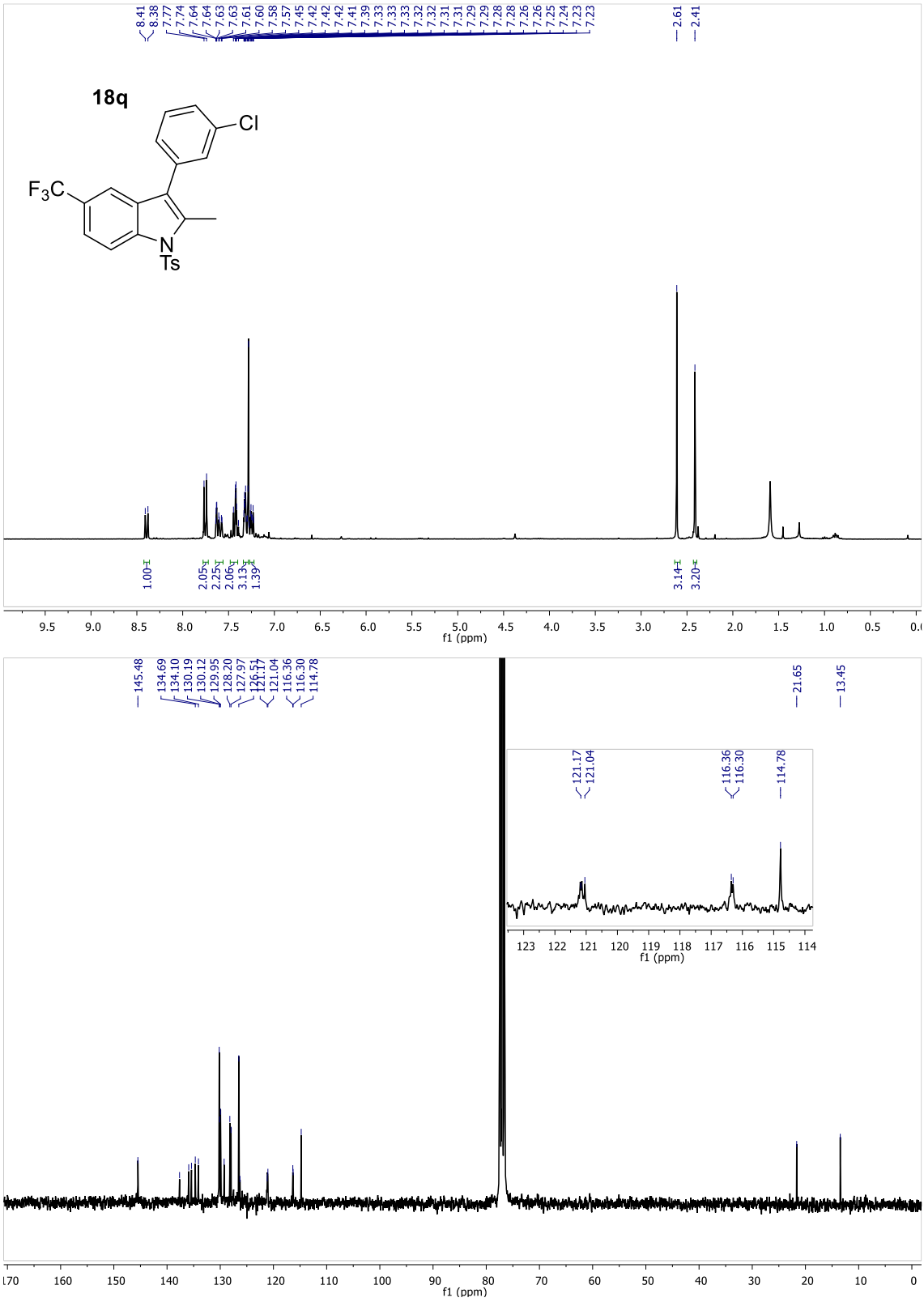



5-Chloro-2-methyl-3-phenyl-1-tosyl-1*H*-indole **18p**

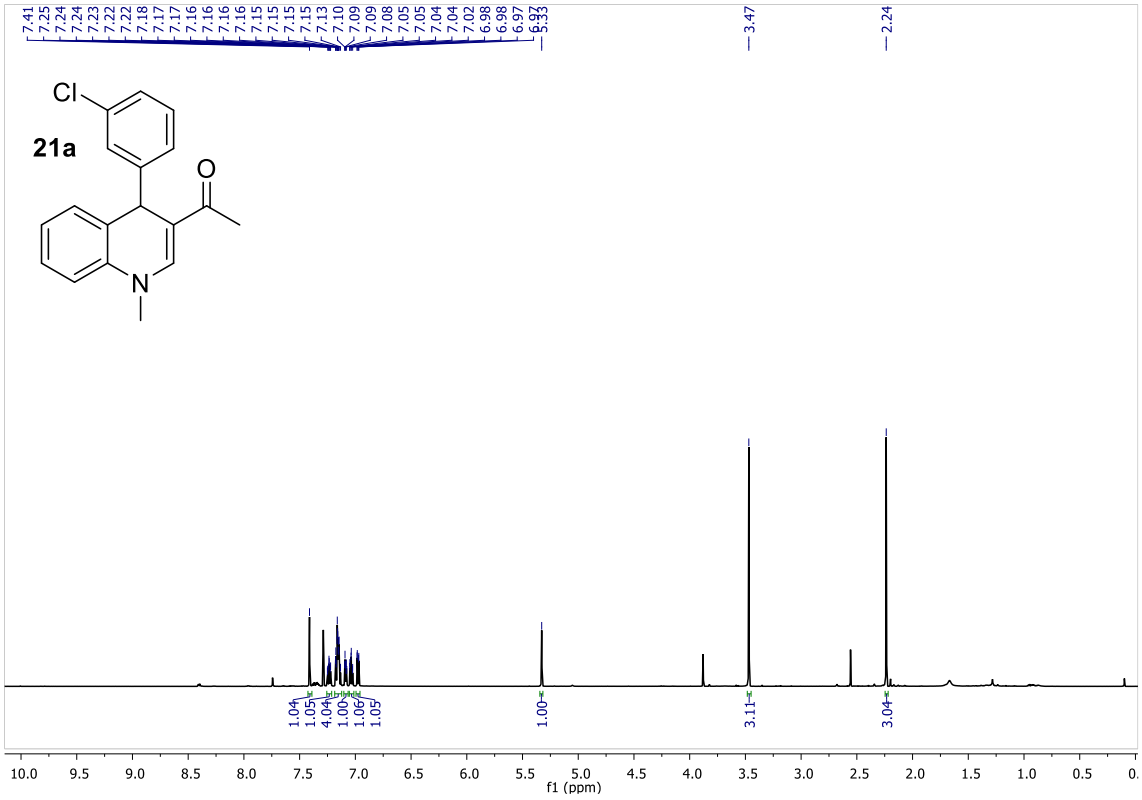


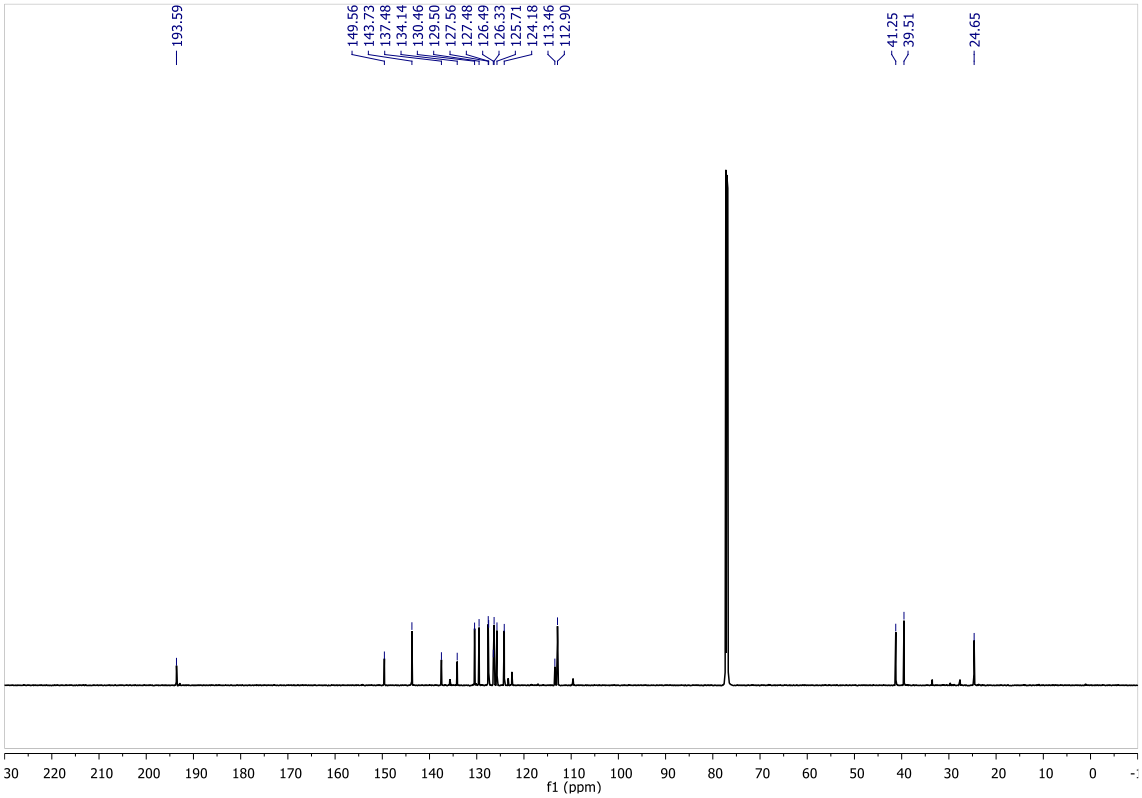



3-(3-Chlorophenyl)-2-methyl-1-tosyl-5-(trifluoromethyl)-1*H*-indole **18q**

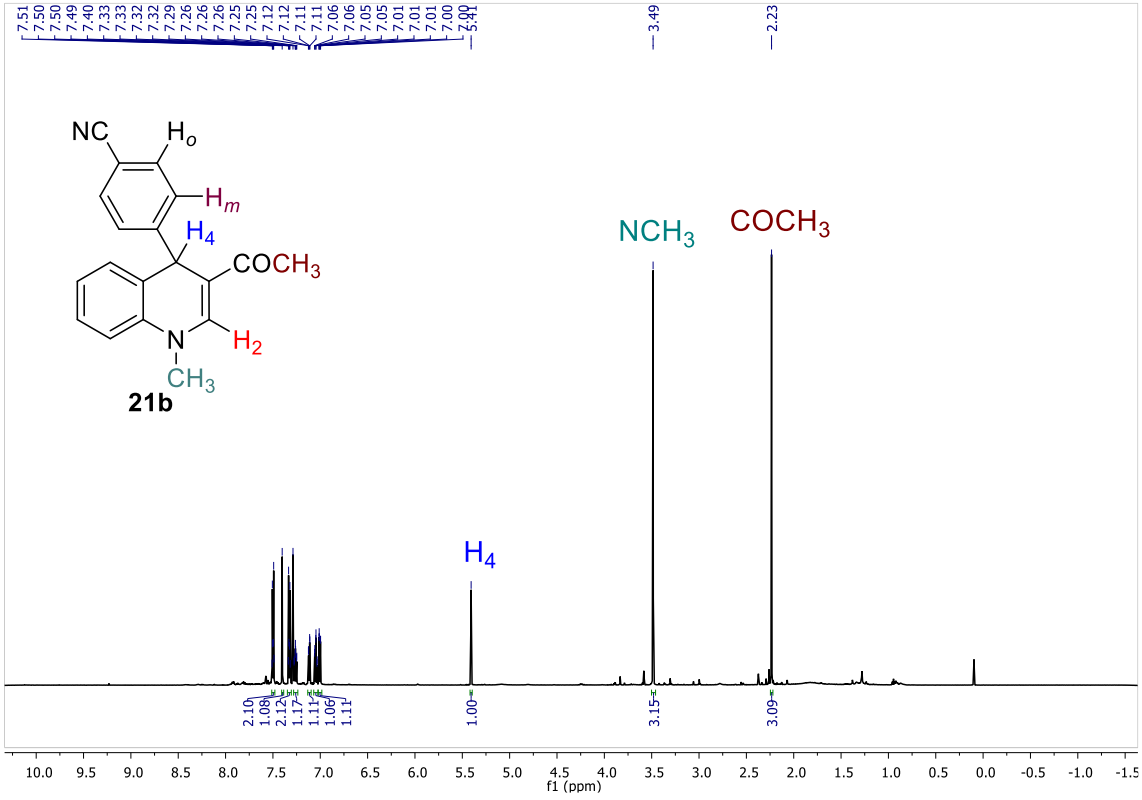


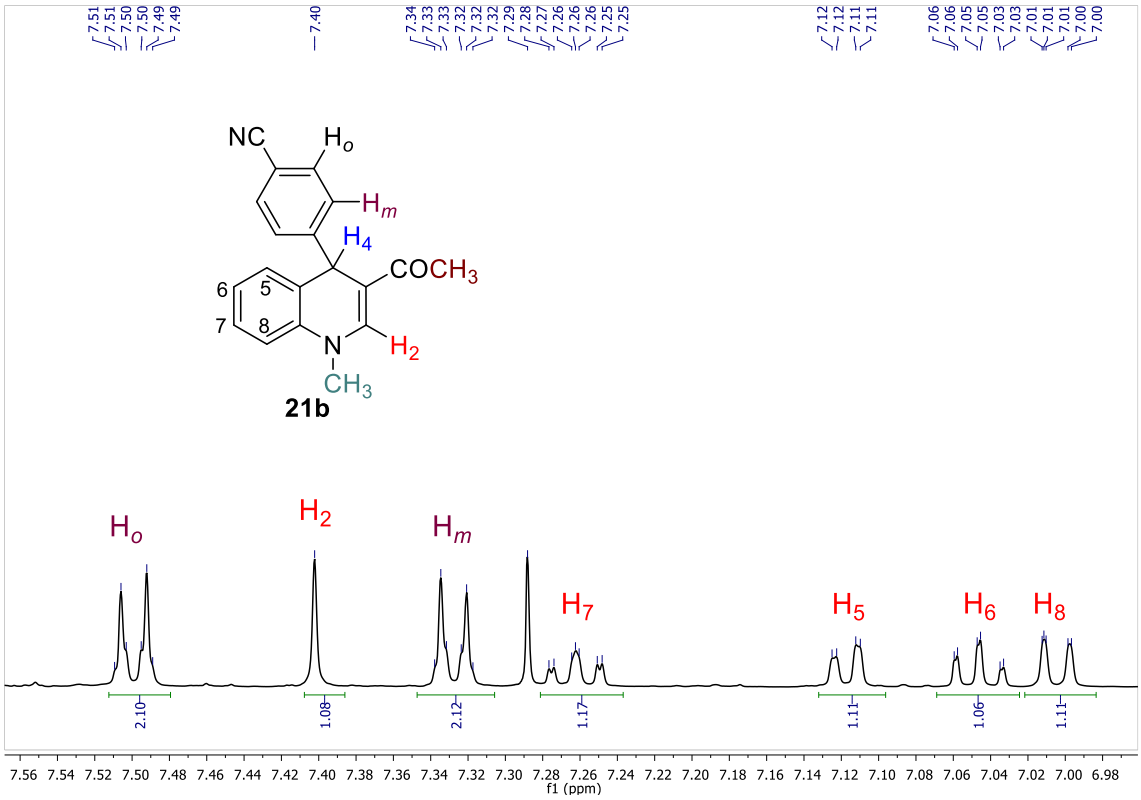
1-(4-(3-Chlorophenyl)-1-methyl-1,4-dihydroquinolin-3-yl)ethan-1-one **21a**

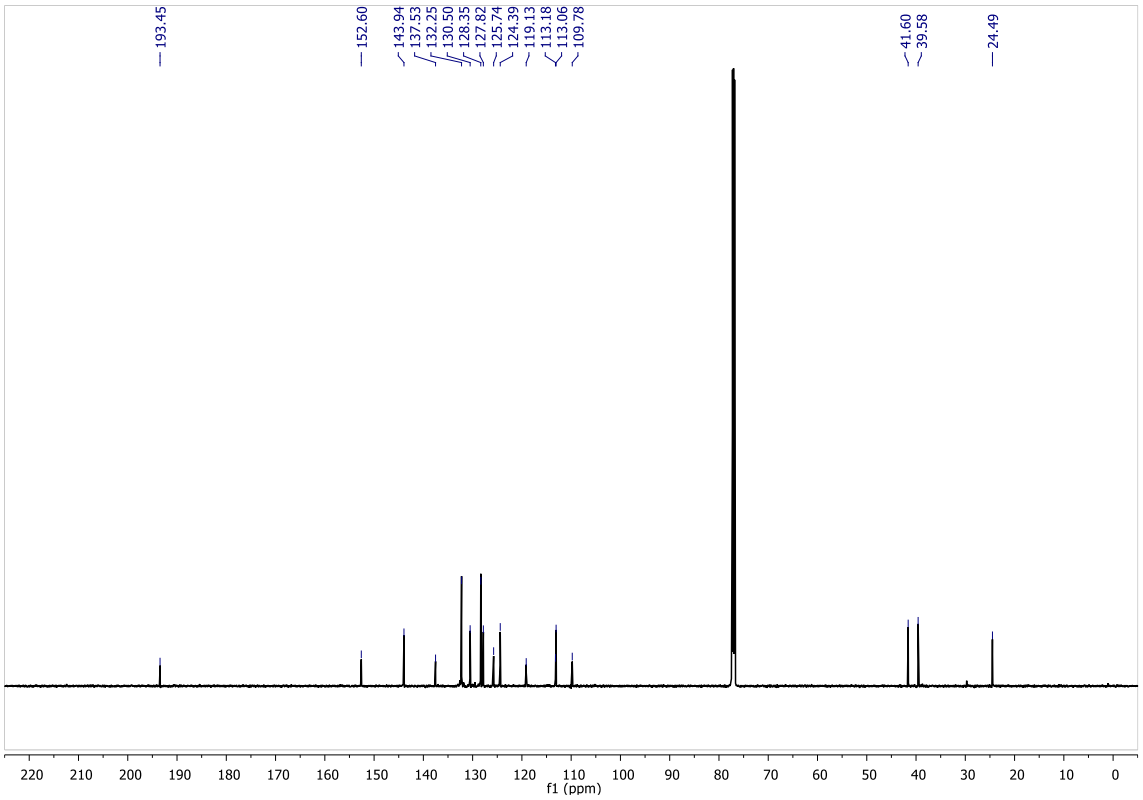


4-(3-Acetyl-1-methyl-1,4-dihydroquinolin-4-yl)benzonitrile **21b**




193.45
152.60
143.94
137.53
132.25
130.50
128.35
127.82
125.74
124.39
119.13
113.18
113.06
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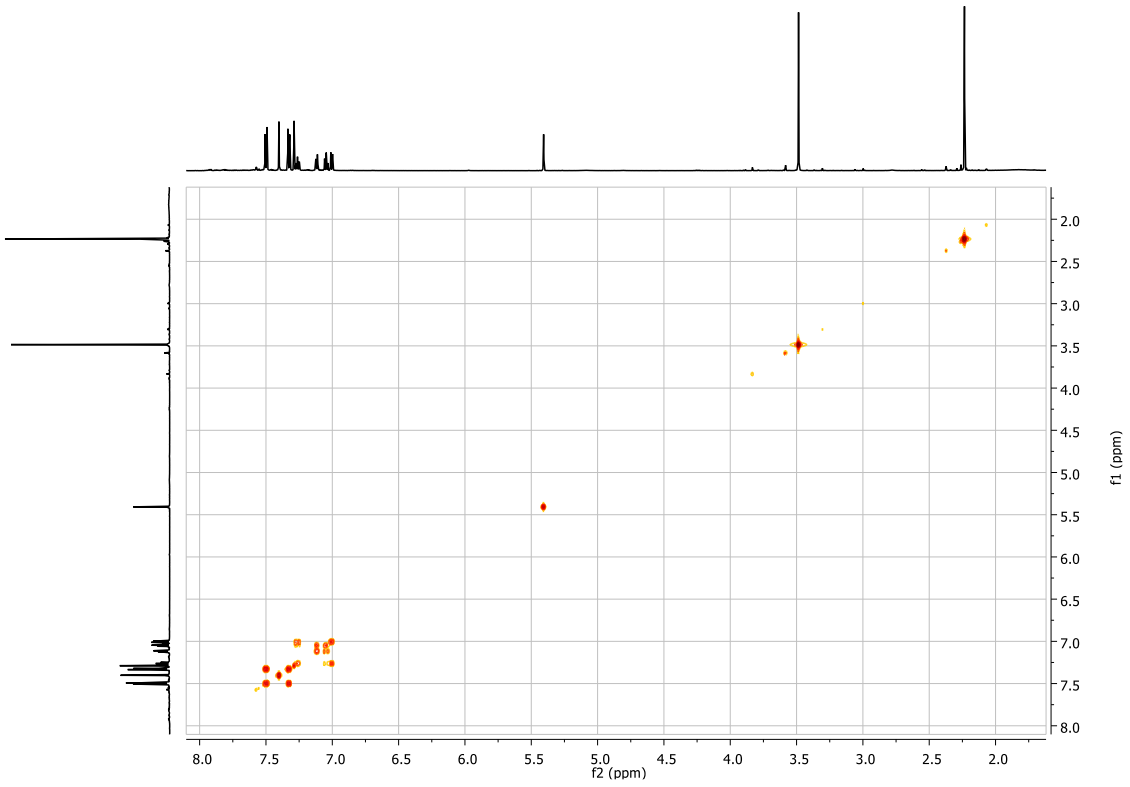
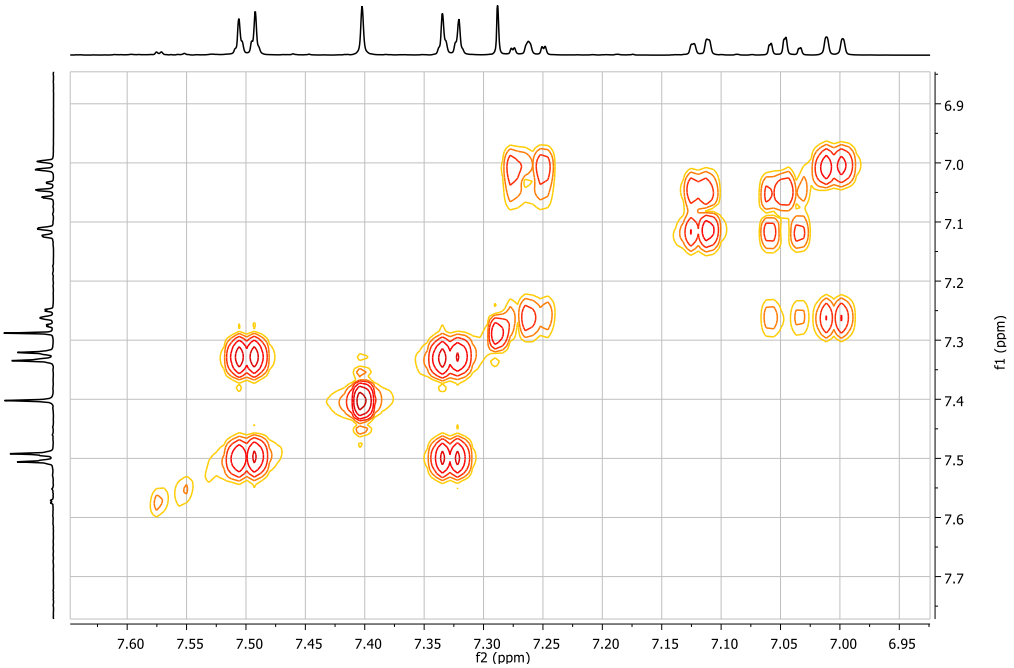
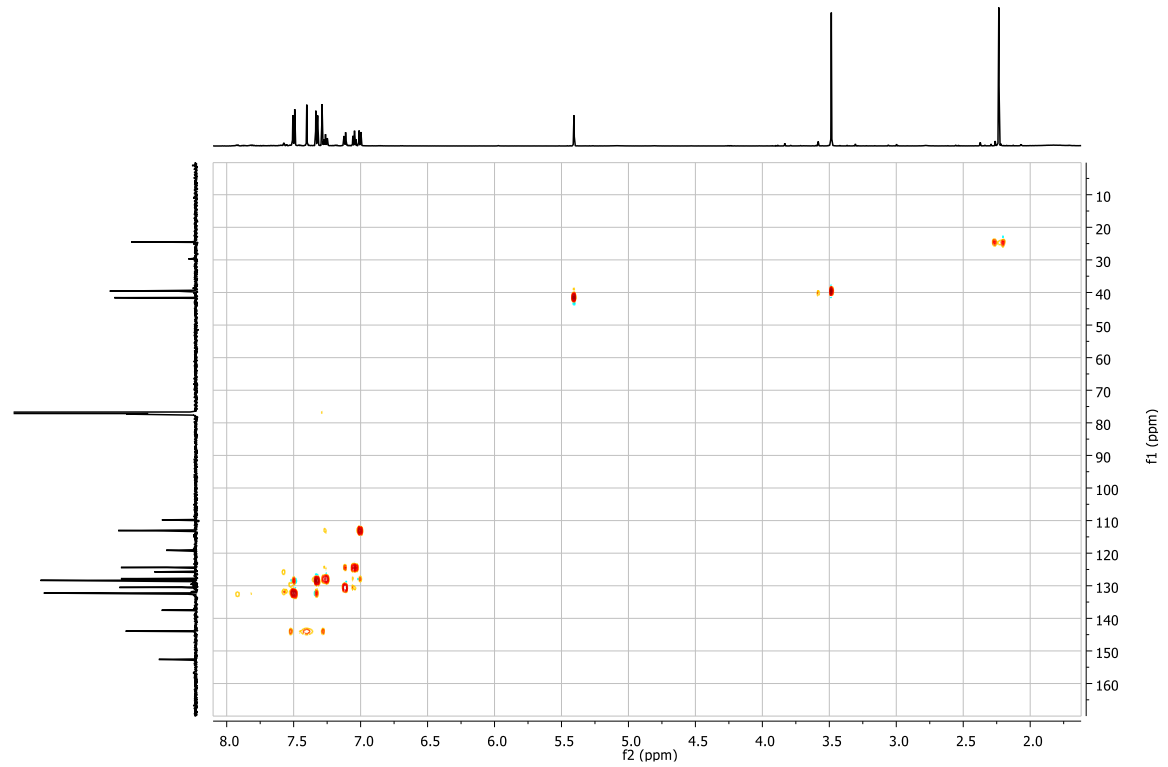
39.58
24.49
220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0
f1 (ppm)

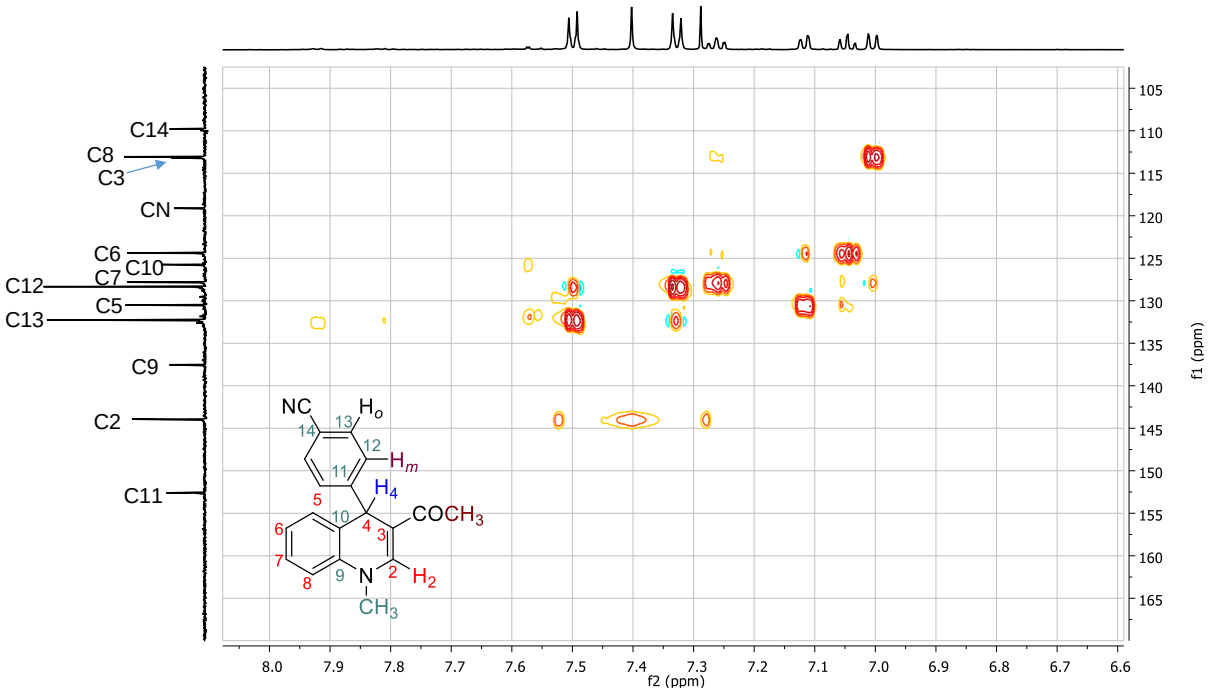
COSY



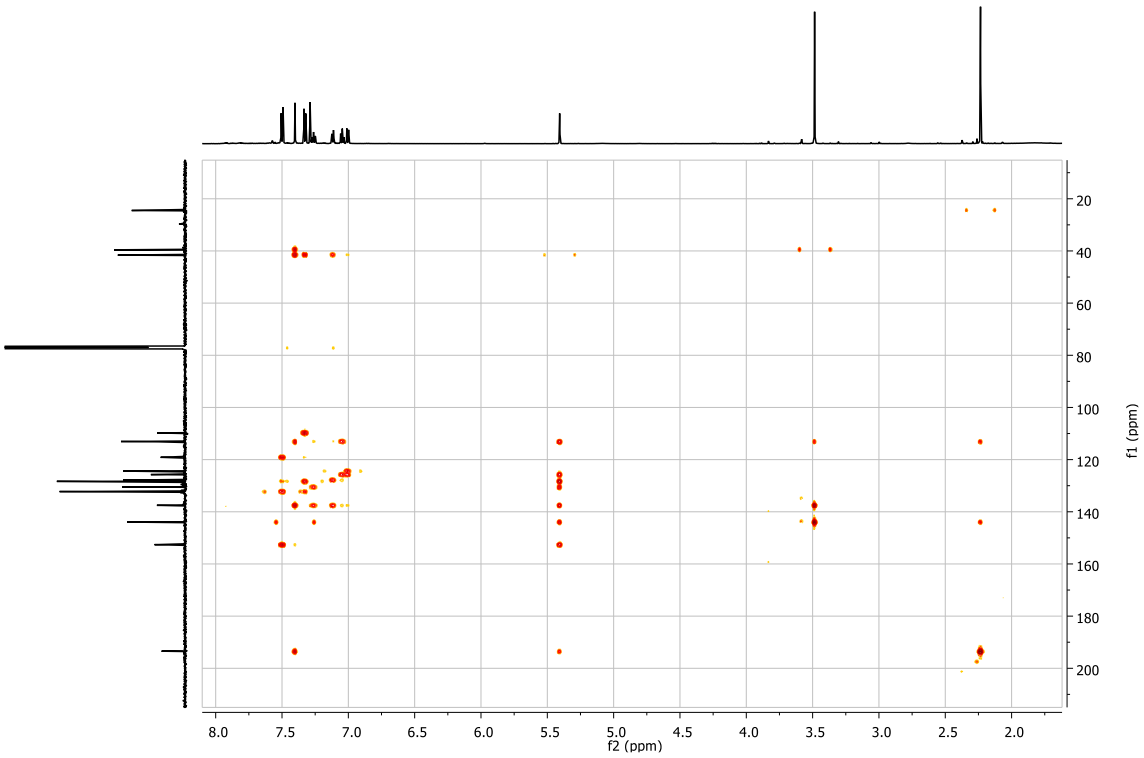



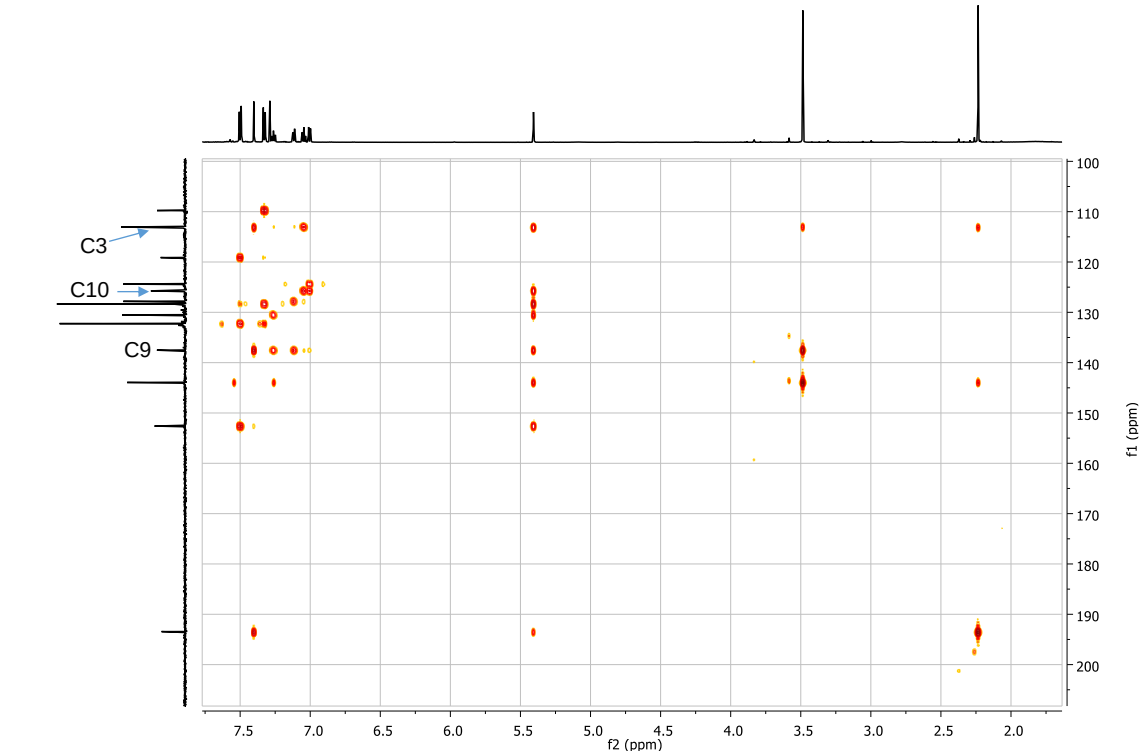
HSQC


f2 (ppm)
f1 (ppm)

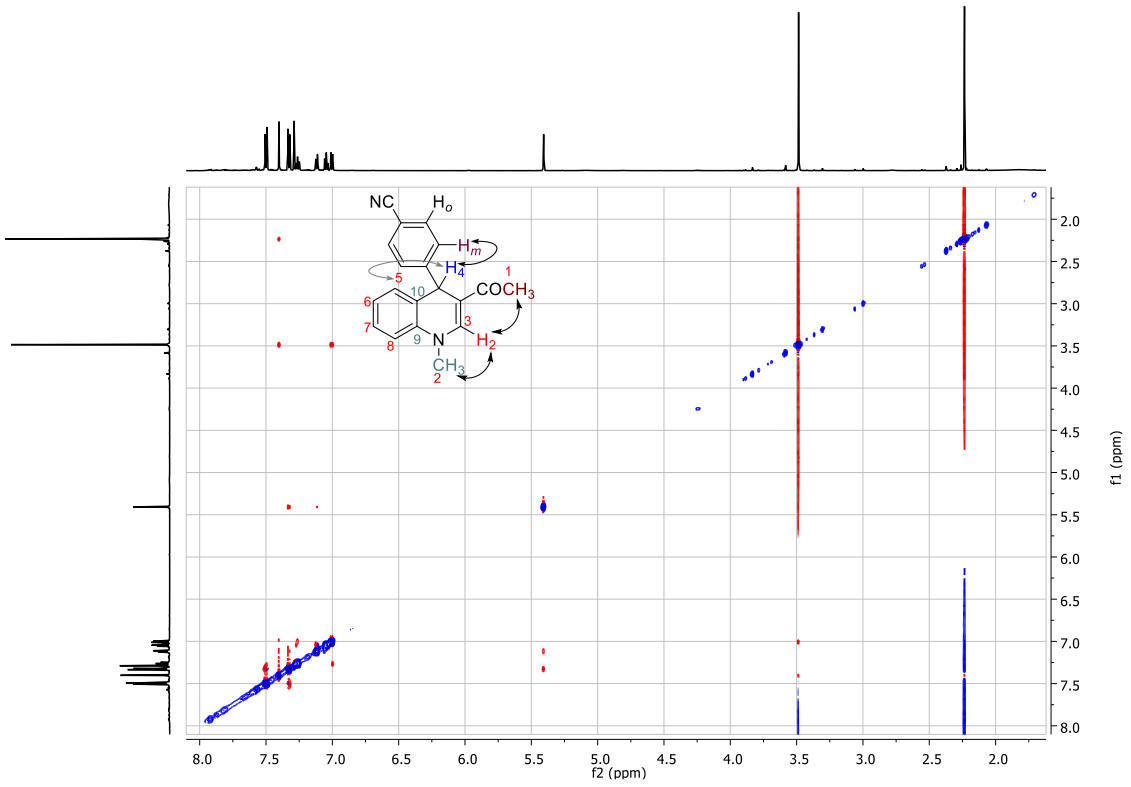

C14
C8
C3
CN
C6
C10
C7
C12
C5
C13
C9
C2
C11
NC
H$_o$
H$_m$
H$_4$
COCH$_3$
H$_2$
CH$_3$
N
f2 (ppm)
f1 (ppm)

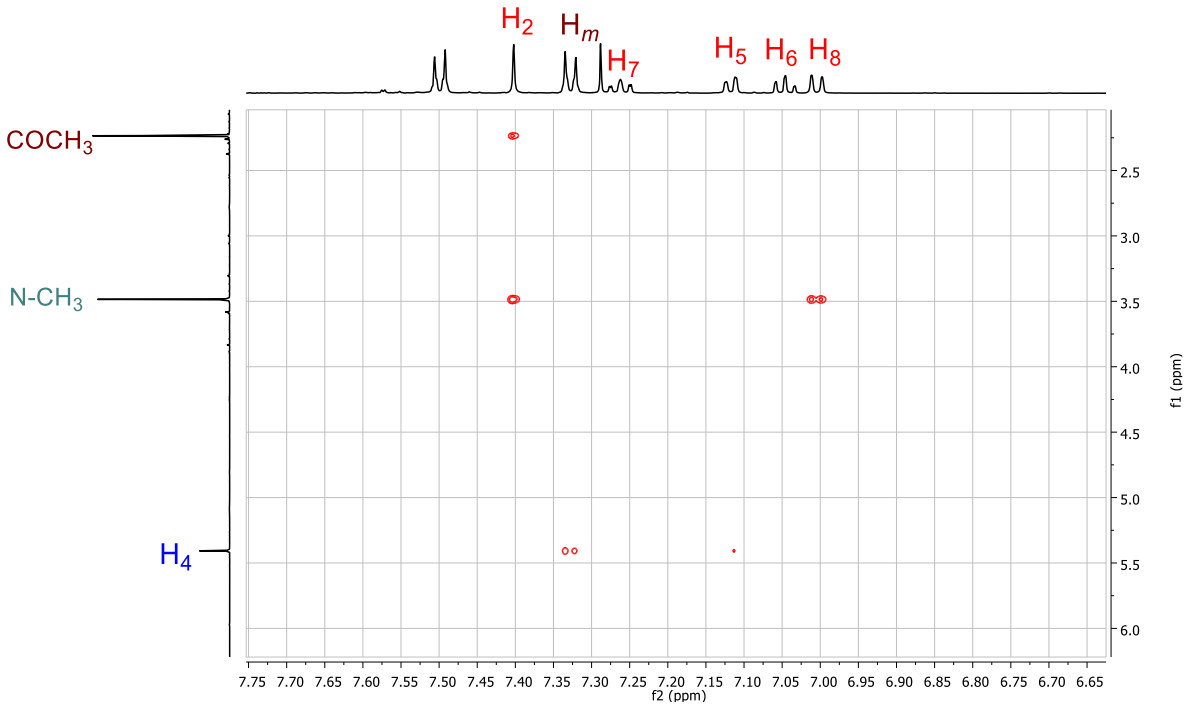
HMBC



NOESY


NC
$H_o$
$H_m$
$H_4$
$COCH_3$
$H_2$
$CH_3$
f2 (ppm)
f1 (ppm)

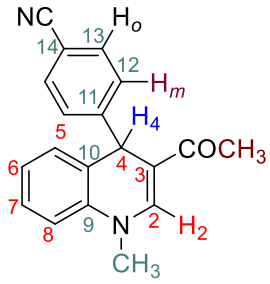

$H_2$
$H_m$
$H_7$
$H_5$
$H_6$
$H_8$
$COCH_3$
N-$CH_3$
$H_4$
f2 (ppm)
f1 (ppm)

The structure proposed is supported by the 2D NMR experiments presented above.

Some characteristic signals to establish the connectivity:

HMBC:

Cross-peaks between H4 (5.41 ppm) and C3 (113.18 ppm), C10 (125.7 ppm), C9 (134.7 ppm), C2 (143.9 ppm) and the carbonyl carbon (109.3 ppm).

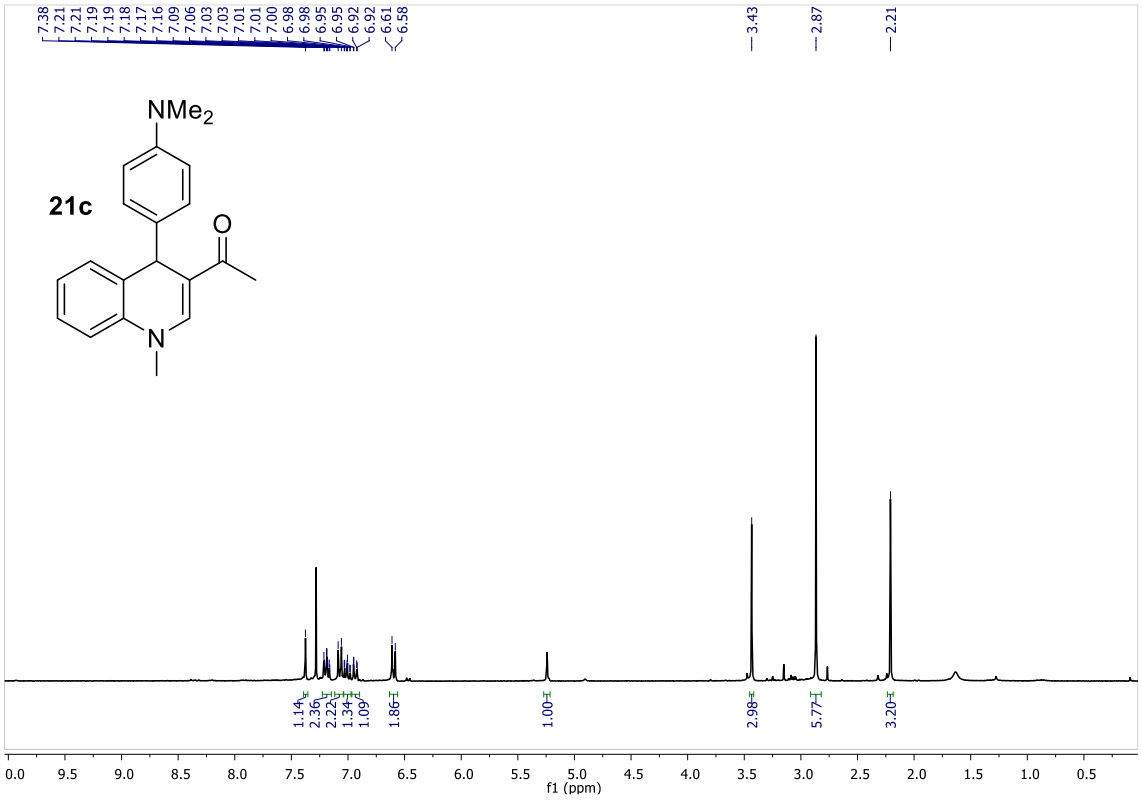


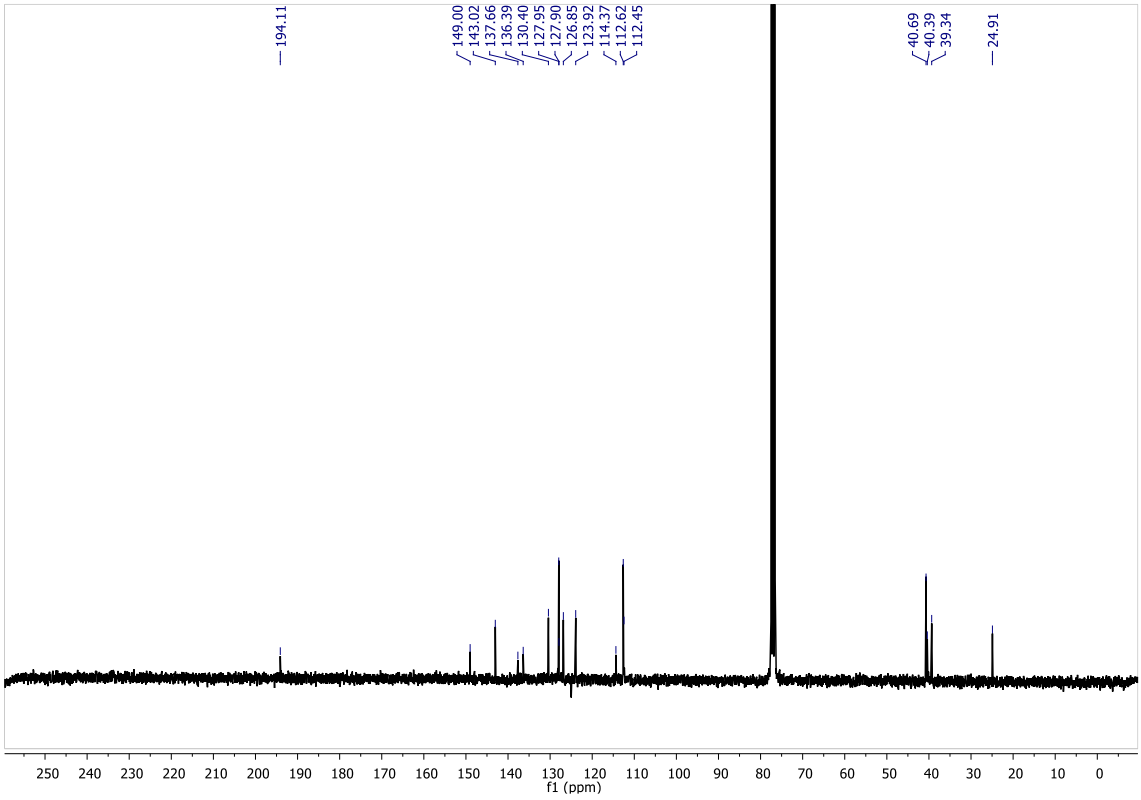

NOESY:

Cross-peaks between H4 (5.41 ppm) and $H_m$ (7.33 ppm) and $H_5$ (7.11 ppm) respectively.

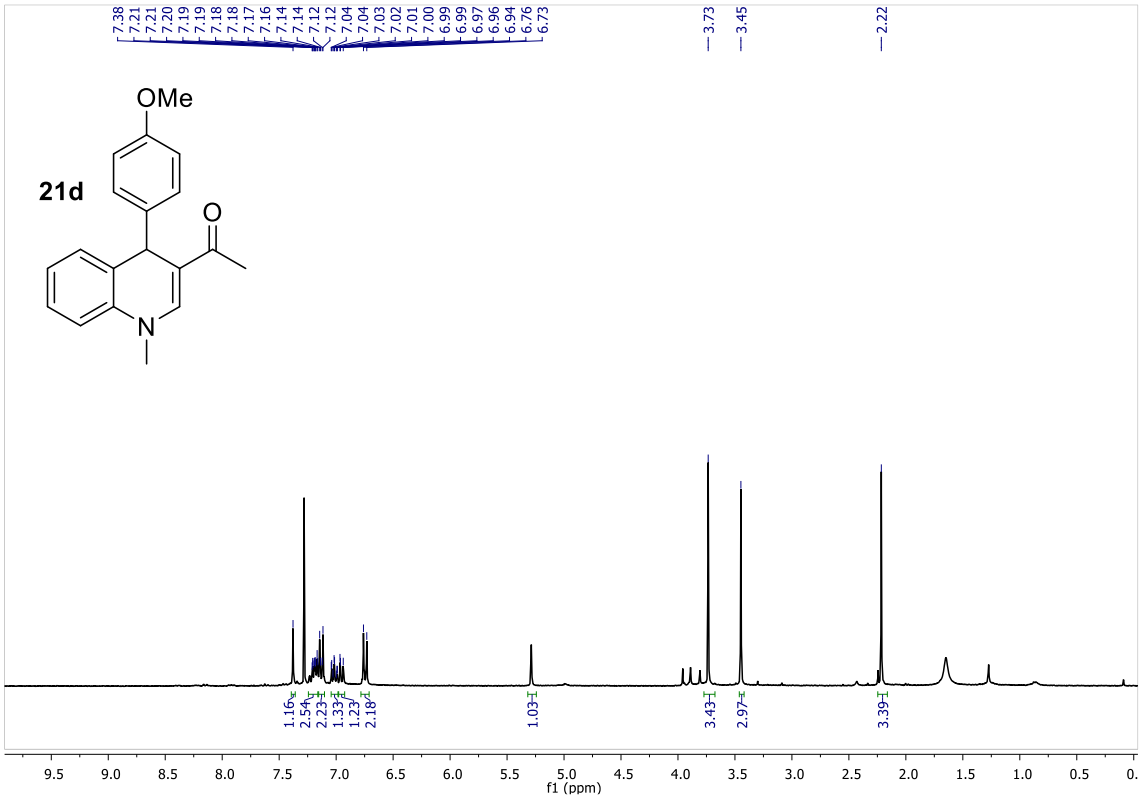
Cross-peaks between $H_2$ (7.40 ppm) and N-C$\boldsymbol{H}_3$ (3.49 ppm) and COC$\boldsymbol{H}_3$ (2.23 ppm) respectively.

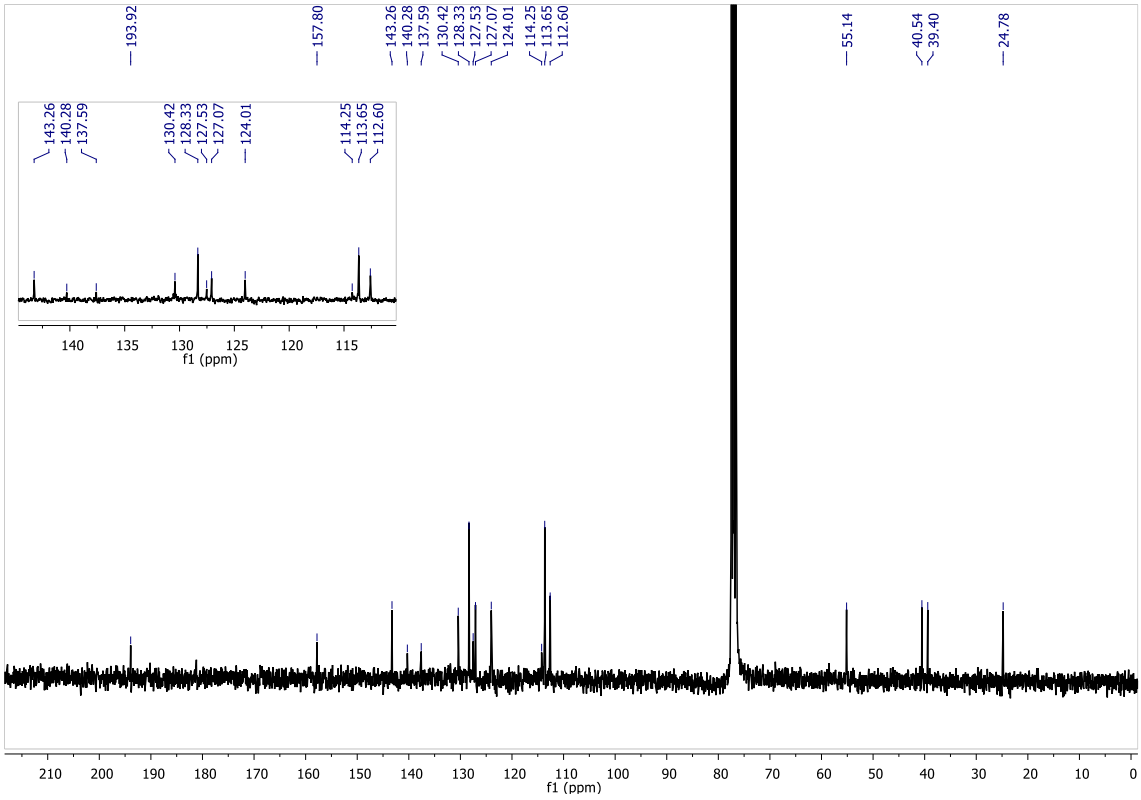
1-(4-(4-(Dimethylamino)phenyl)-1-methyl-1,4-dihydroquinolin-3-yl)ethan-1-one **21c**



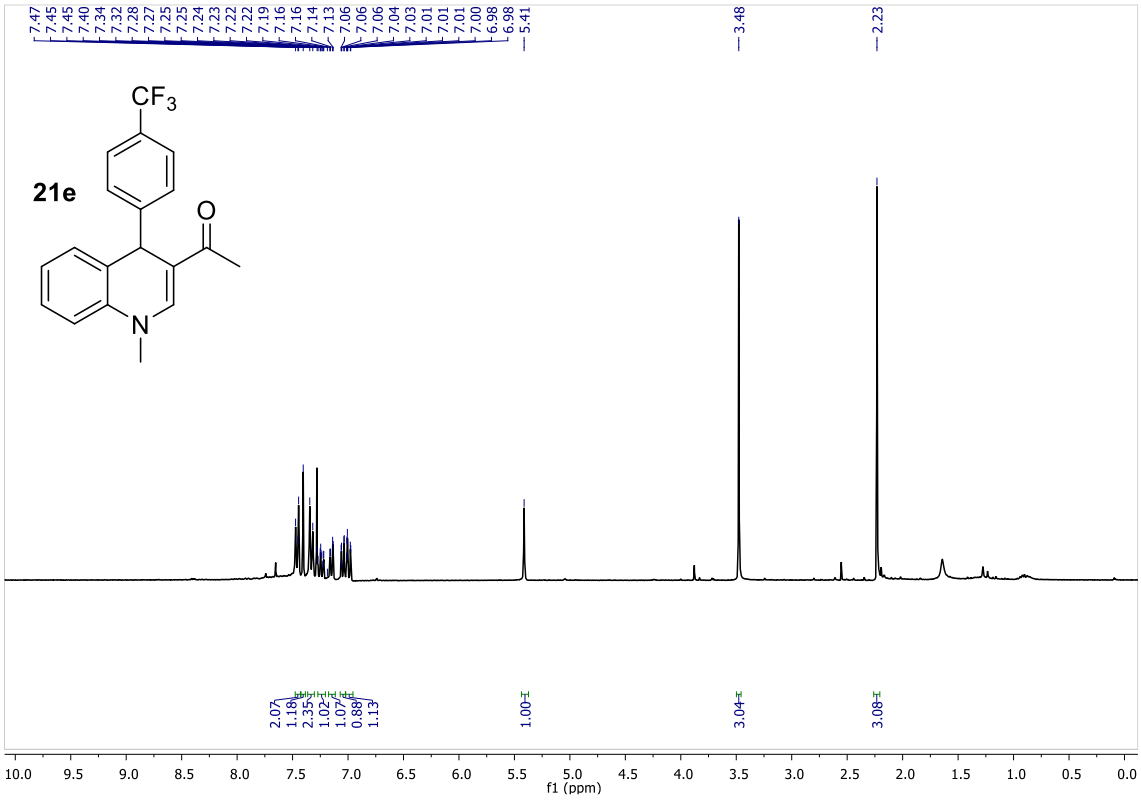



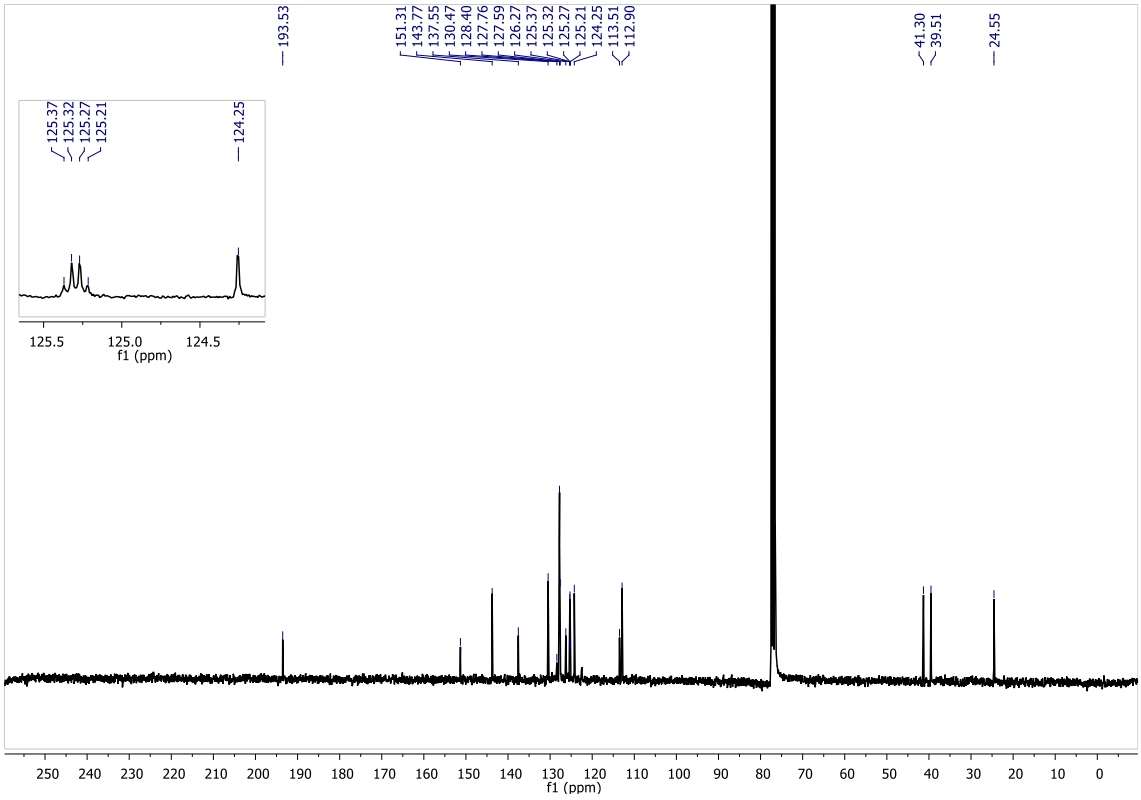
1-(4-(4-Methoxyphenyl)-1-methyl-1,4-dihydroquinolin-3-yl)ethan-1-one **21d**

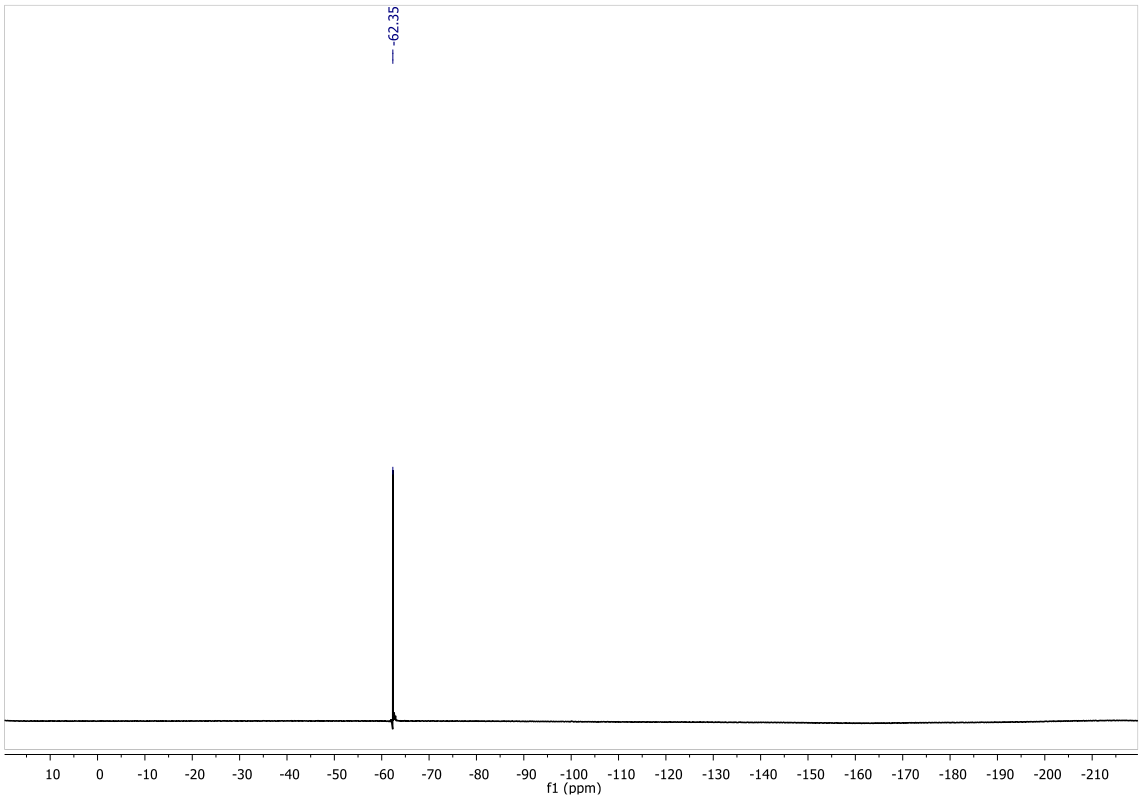


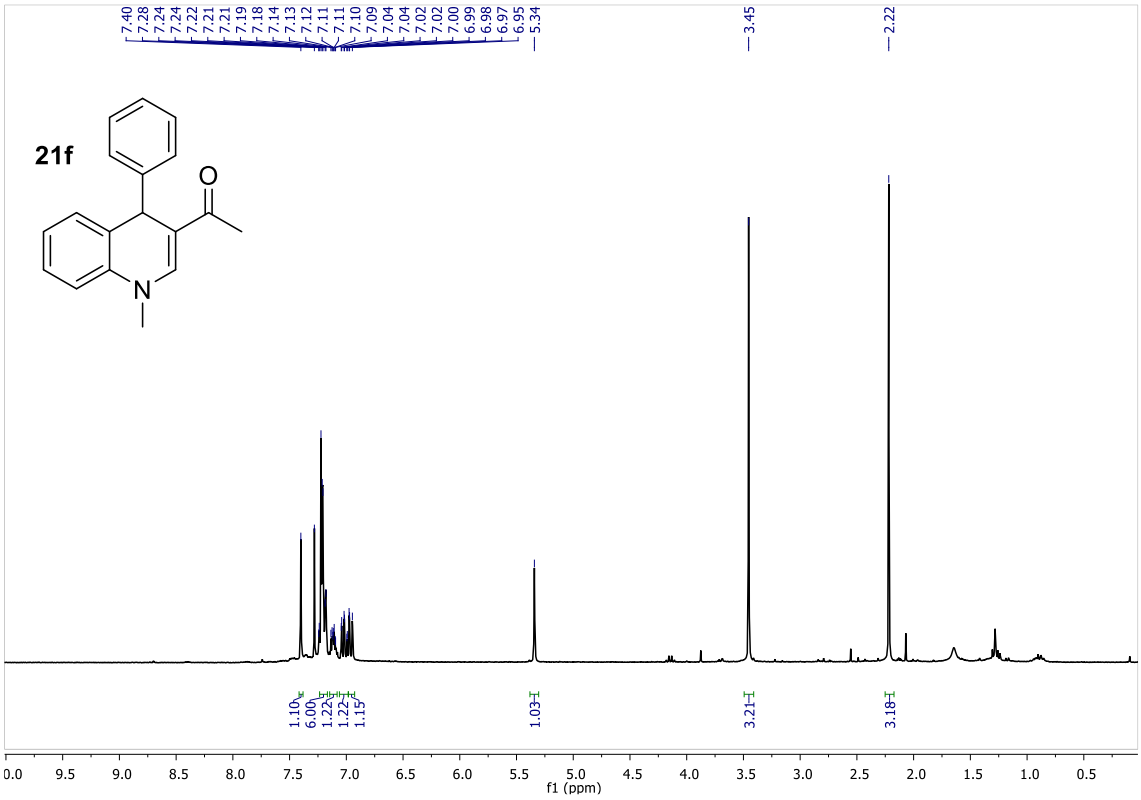
1-(1-Methyl-4-(4-(trifluoromethyl)phenyl)-1,4-dihydroquinolin-3-yl)ethan-1-one **21e**

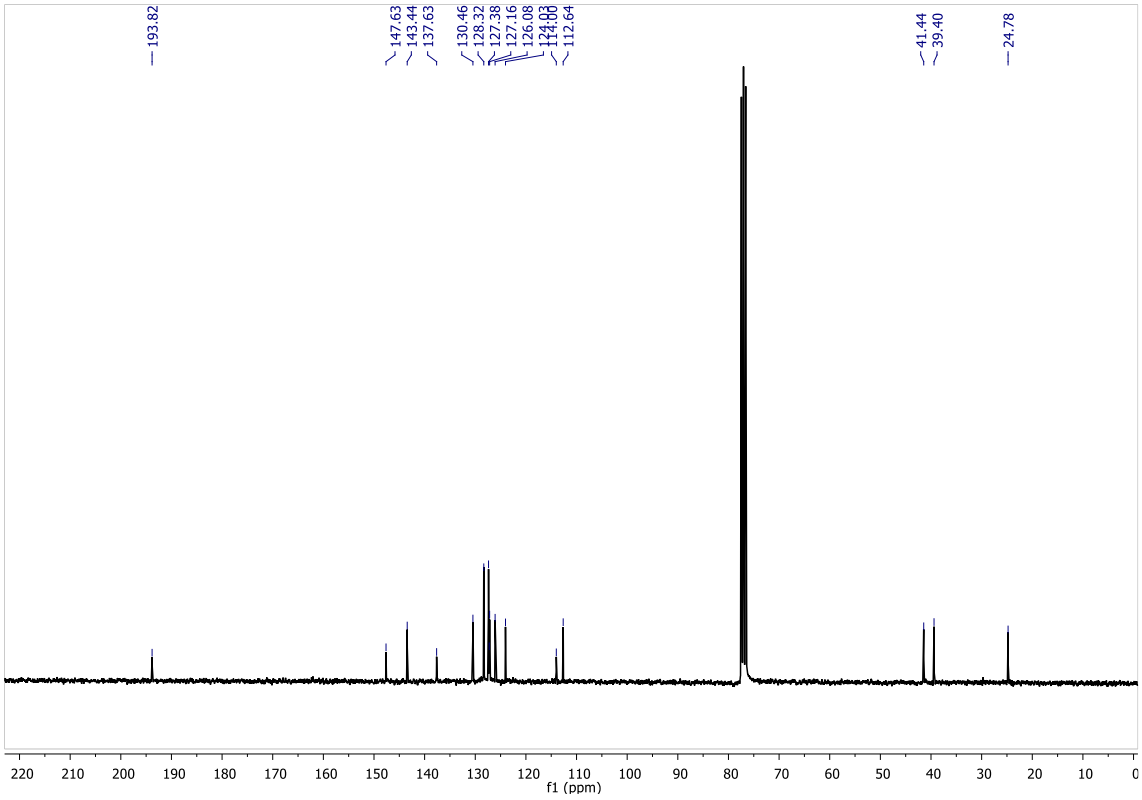


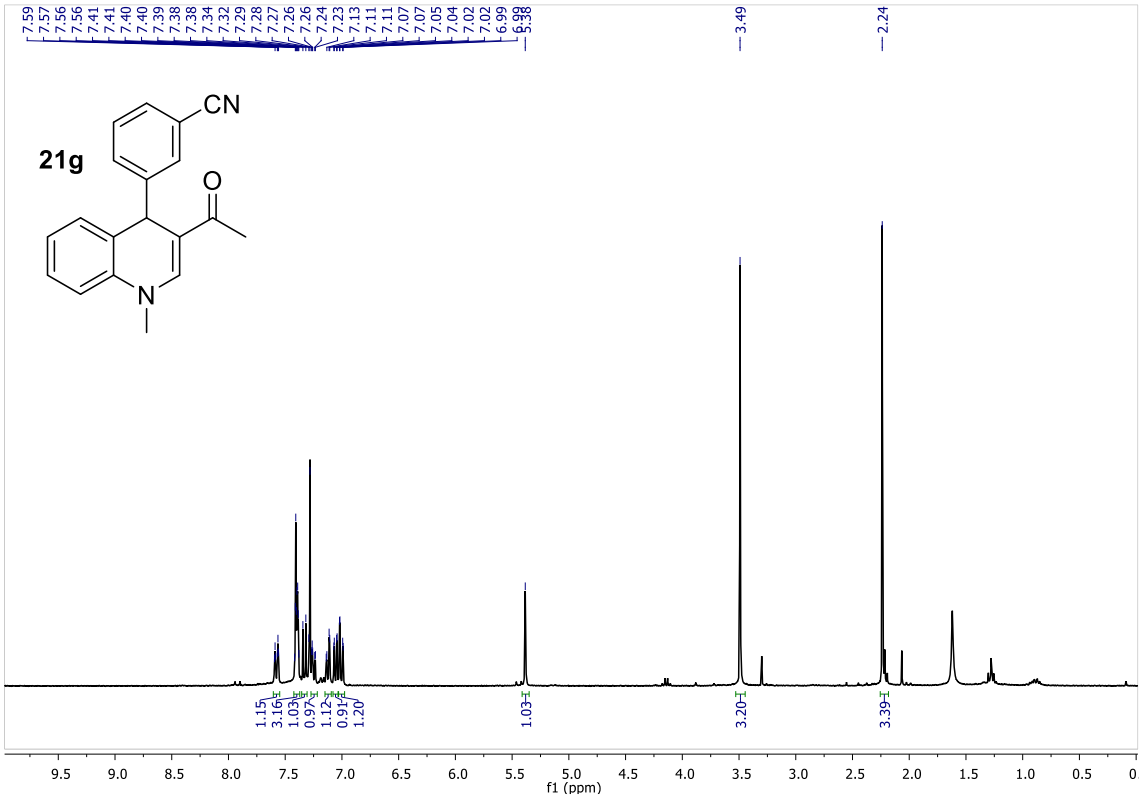

-62.35
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
-160
-170
-180
-190
-200
-210
f1 (ppm)

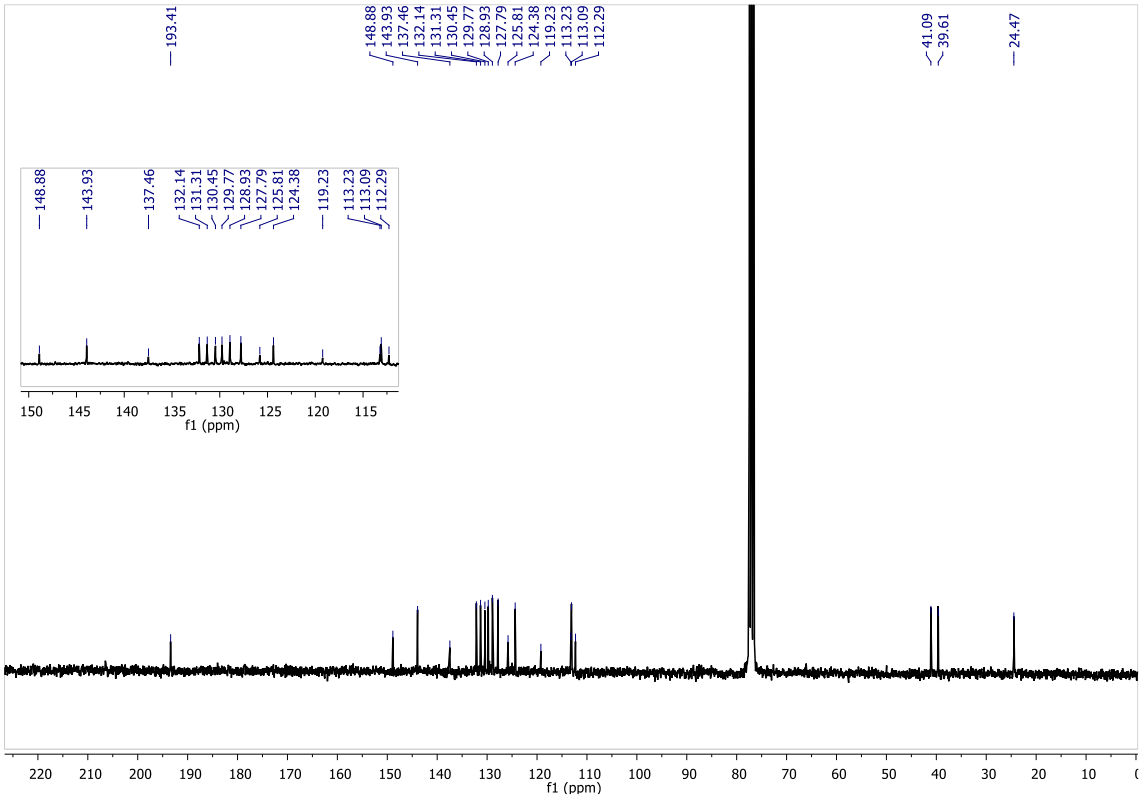
1-(1-Methyl-4-phenyl-1,4-dihydroquinolin-3-yl)ethan-1-one **21f**



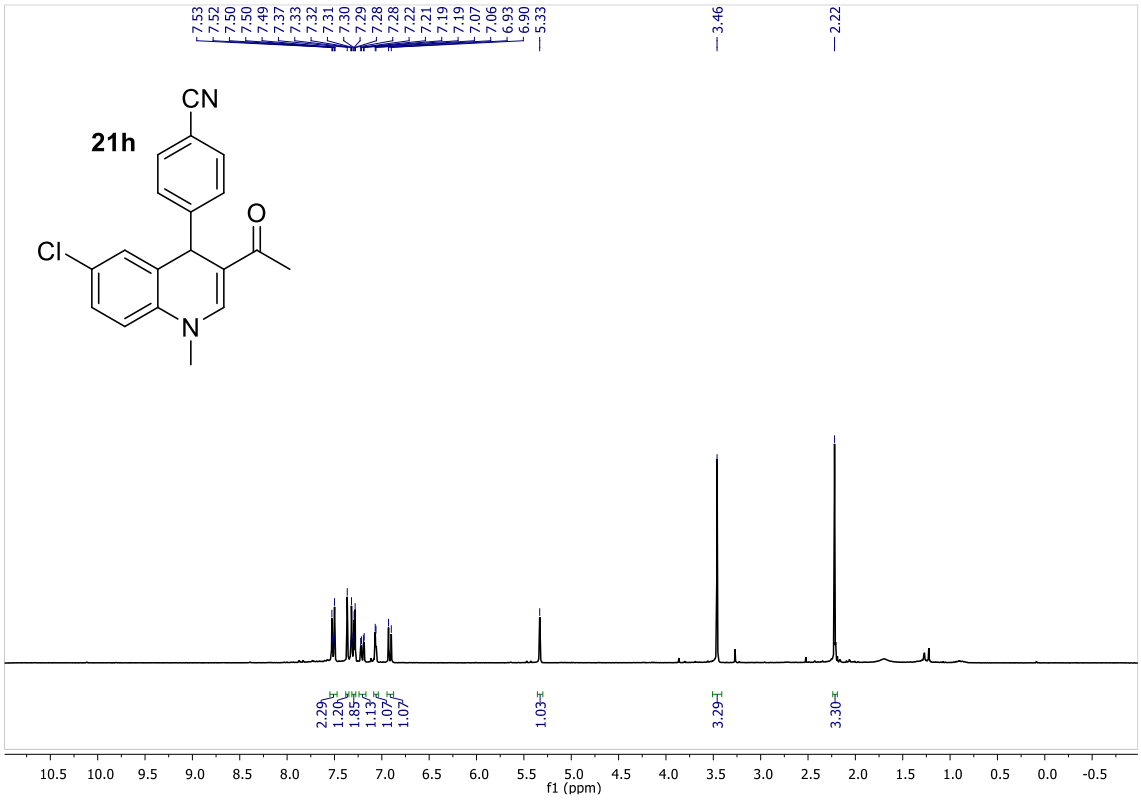



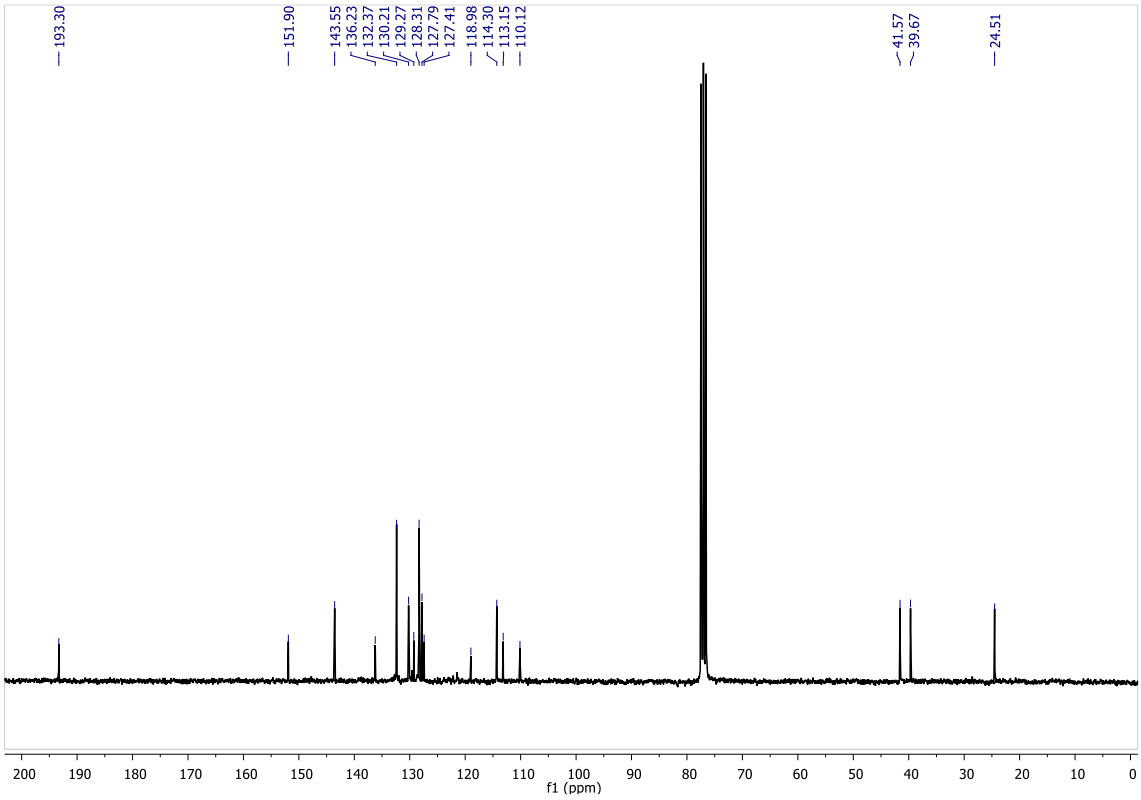
3-(3-Acetyl-1-methyl-1,4-dihydroquinolin-4-yl)benzonitrile **21g**



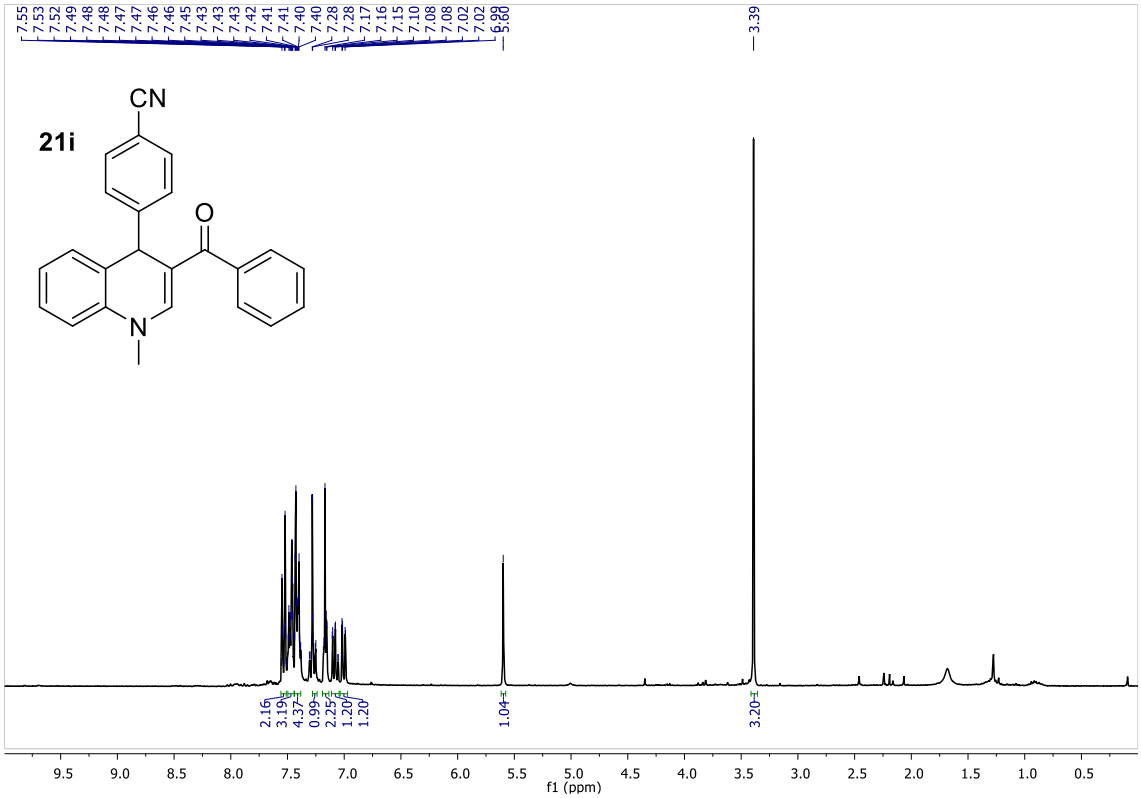



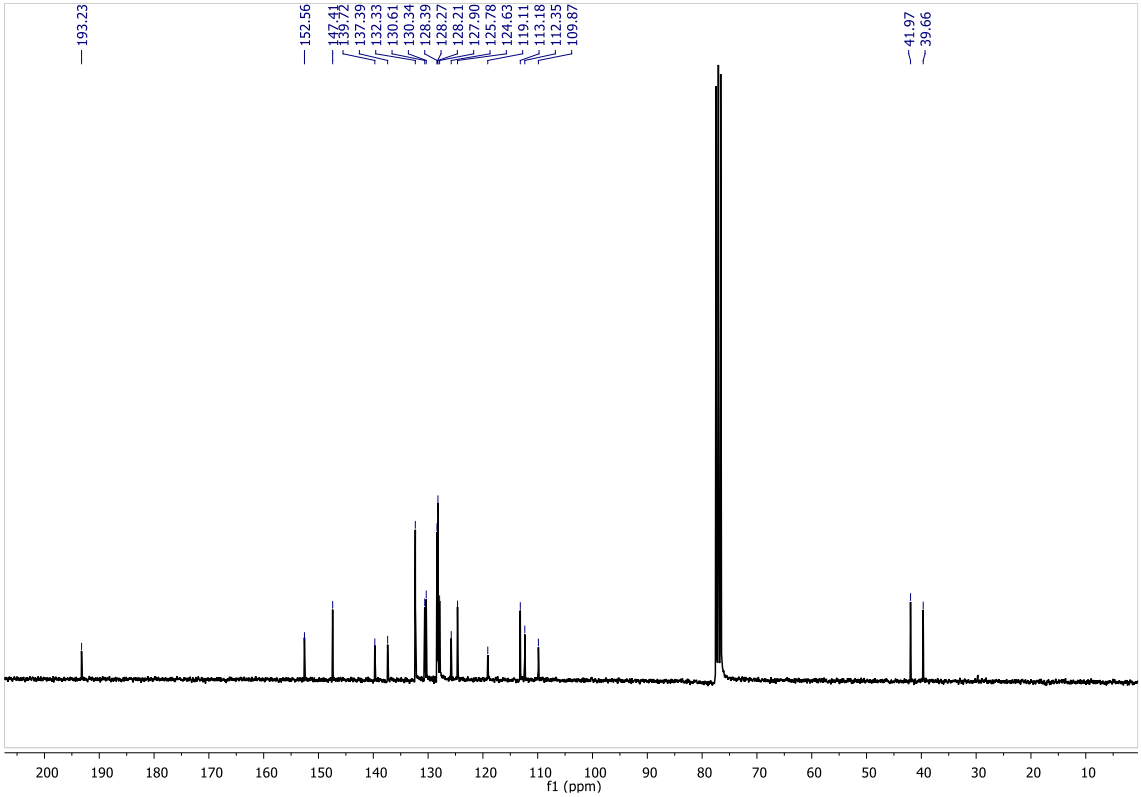
4-(3-Acetyl-6-chloro-1-methyl-1,4-dihydroquinolin-4-yl)benzonitrile **21h**



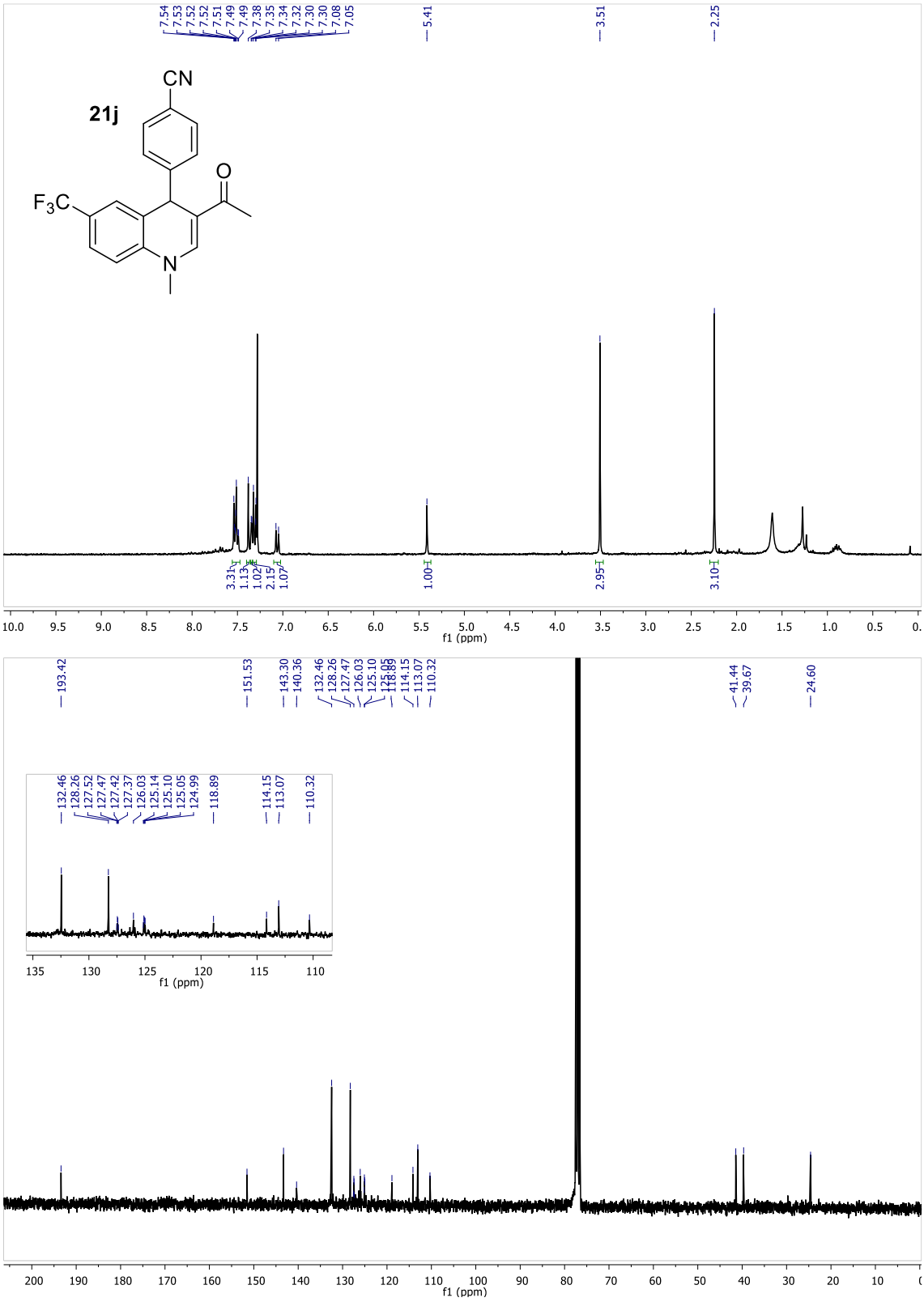



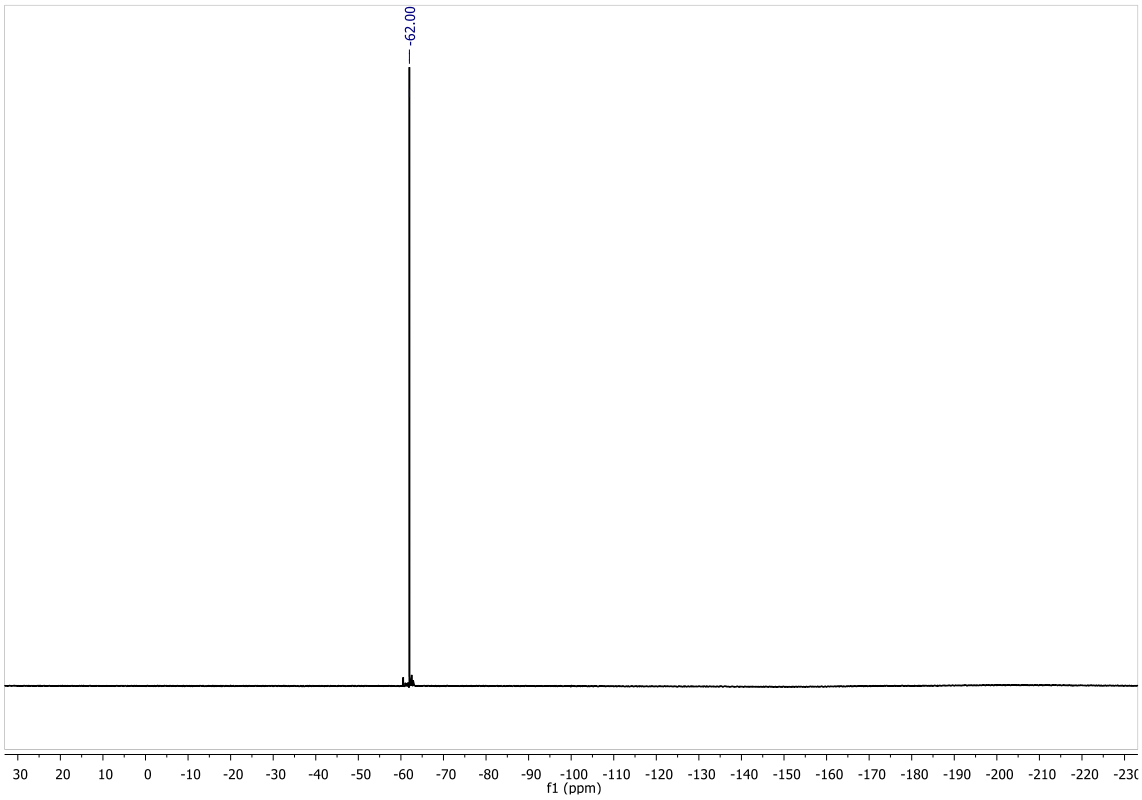
4-(3-Benzoyl-1-methyl-1,4-dihydroquinolin-4-yl)benzonitrile **21i**



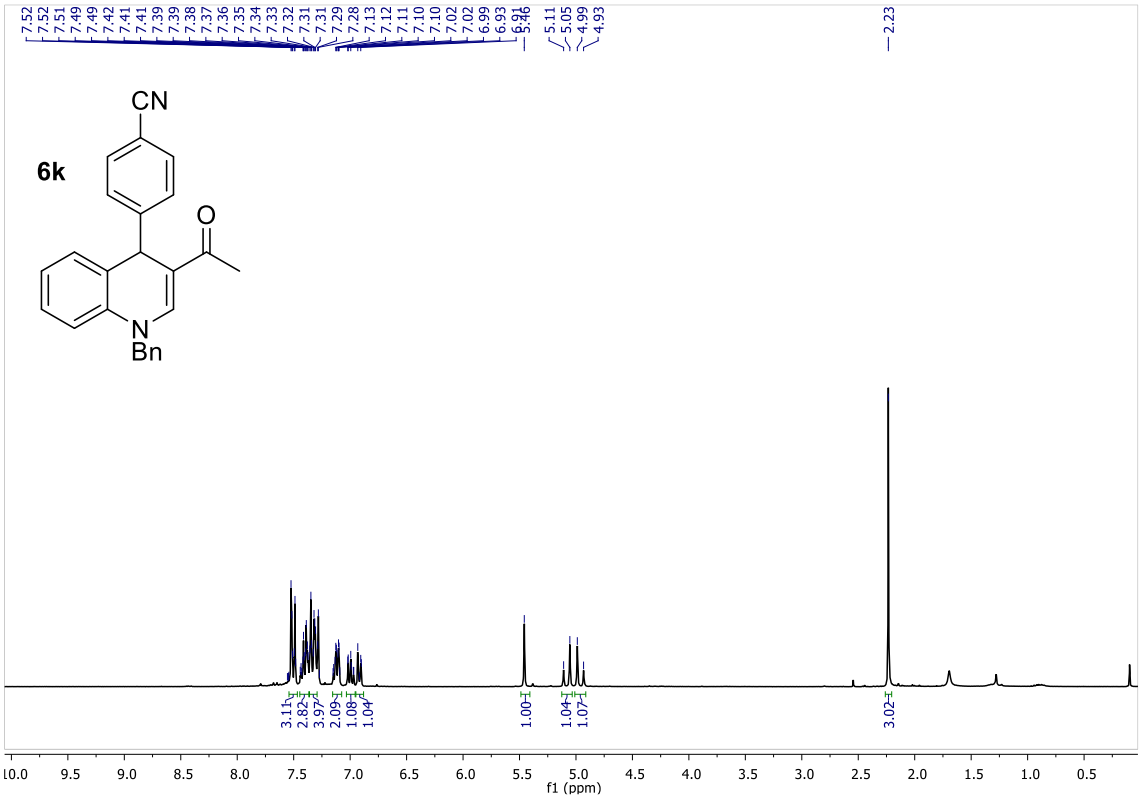



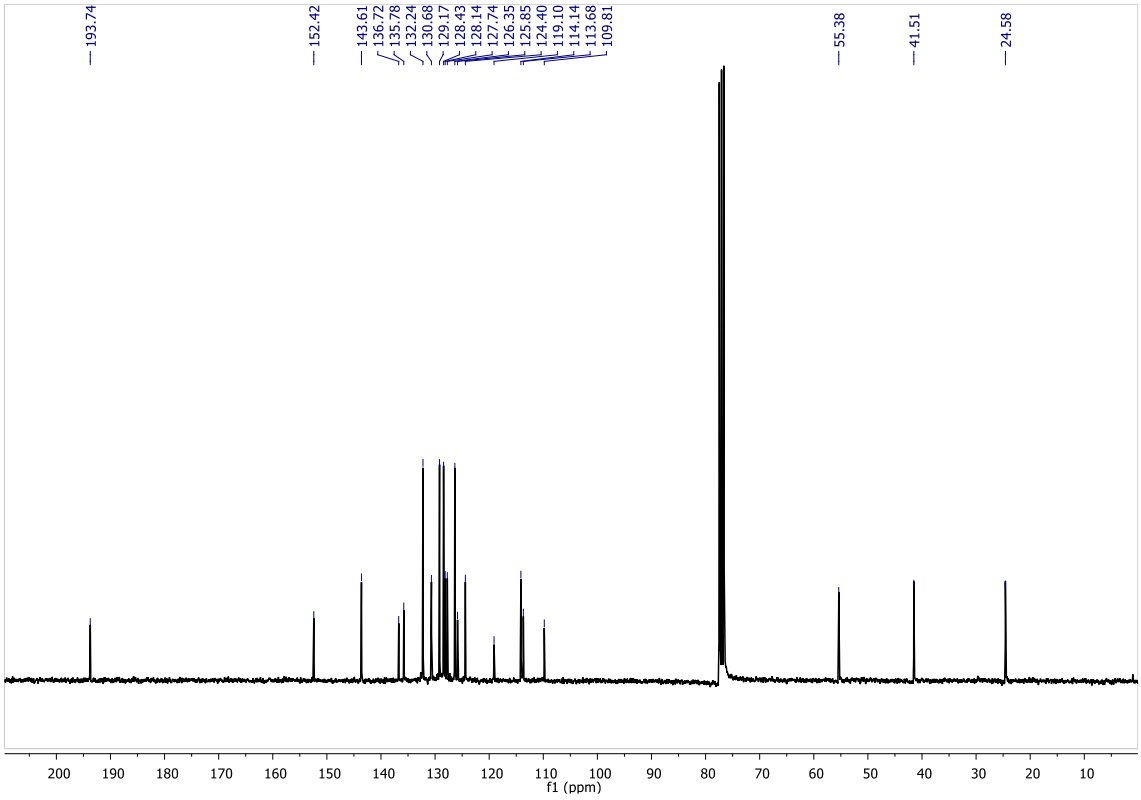
4-(3-Acetyl-1-methyl-6-(trifluoromethyl)-1,4-dihydroquinolin-4-yl)benzonitrile **21j**



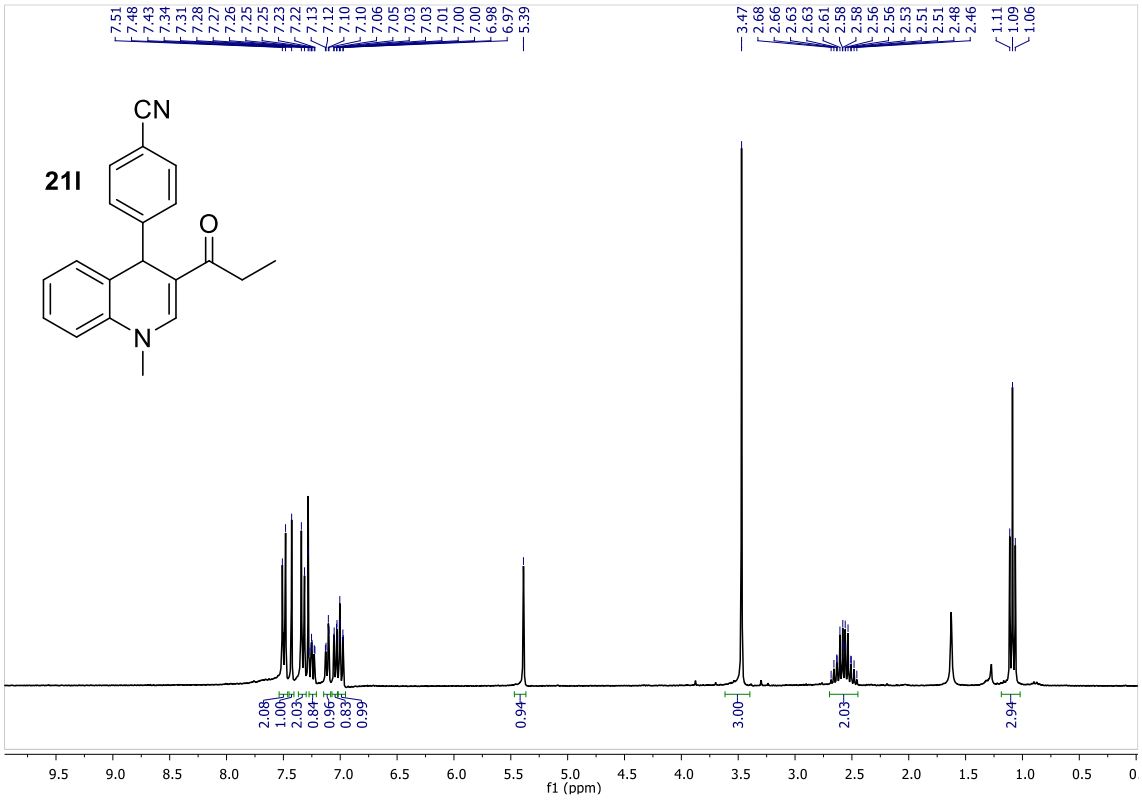

-62.00
30 20 10 0 -10 -20 -30 -40 -50 -60 -70 -80 -90 -100 -110 -120 -130 -140 -150 -160 -170 -180 -190 -200 -210 -220 -230
f1 (ppm)

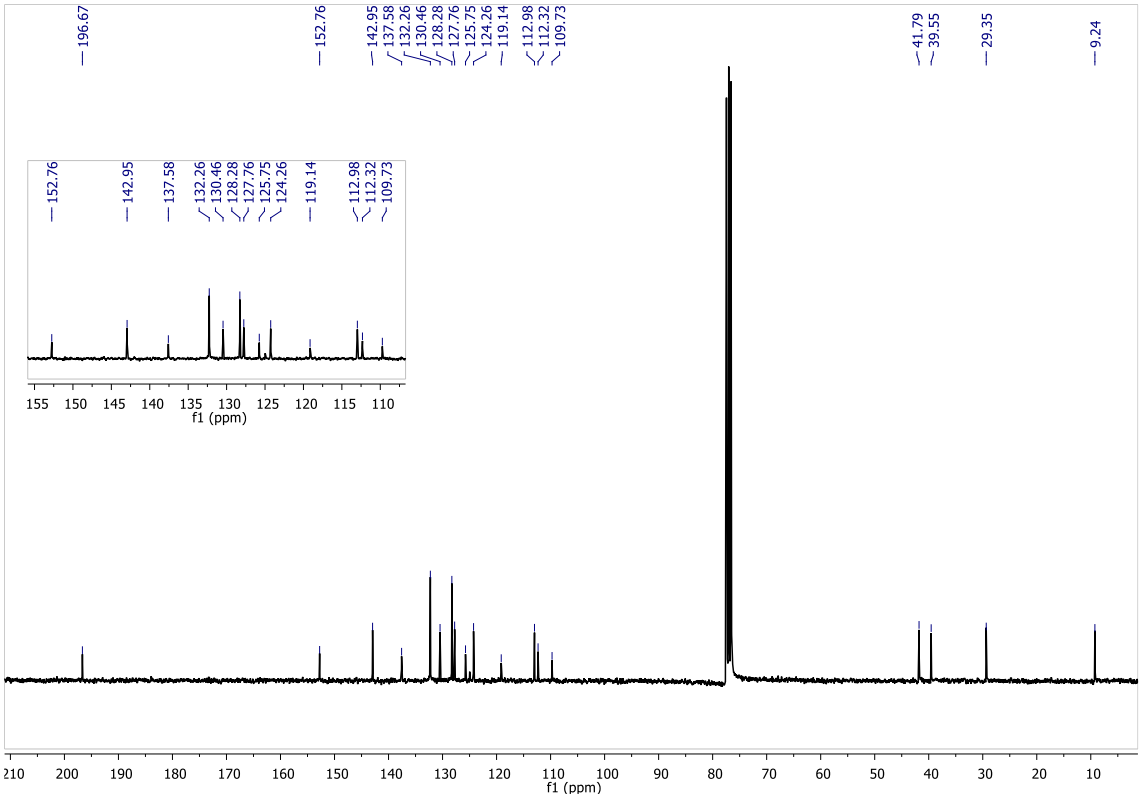
4-(3-Acetyl-1-benzyl-1,4-dihydroquinolin-4-yl)benzonitrile **21k**



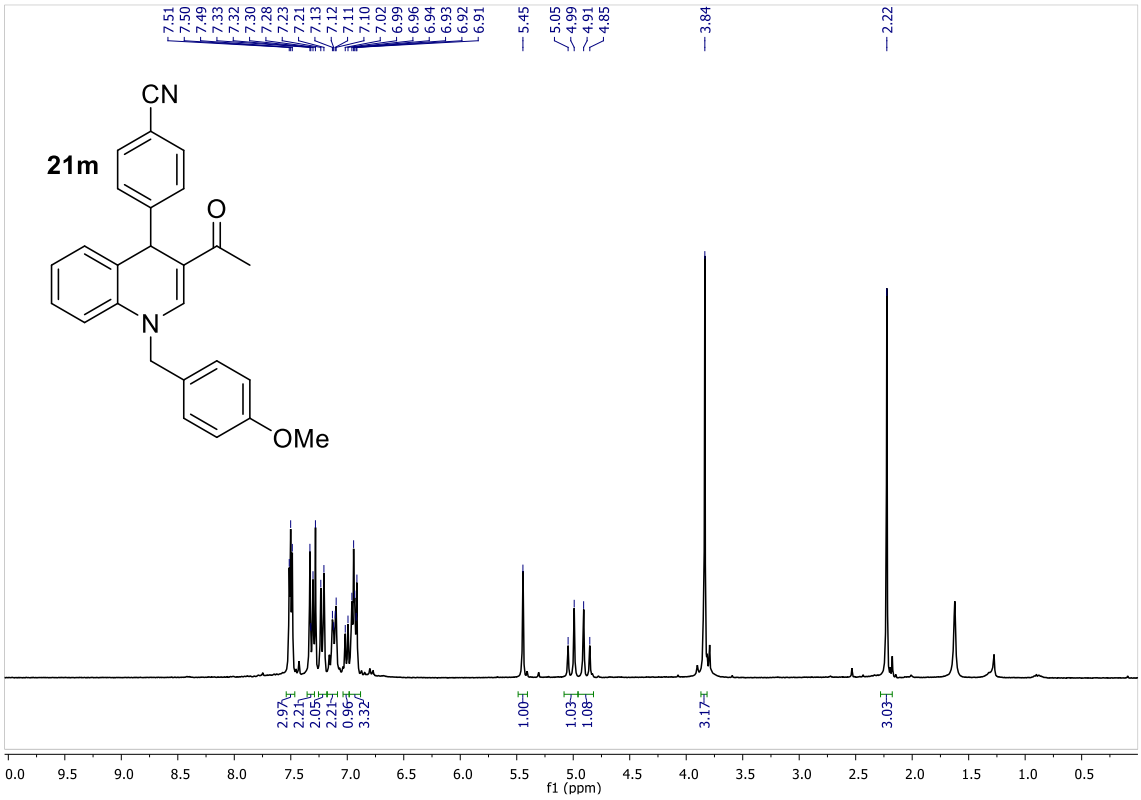



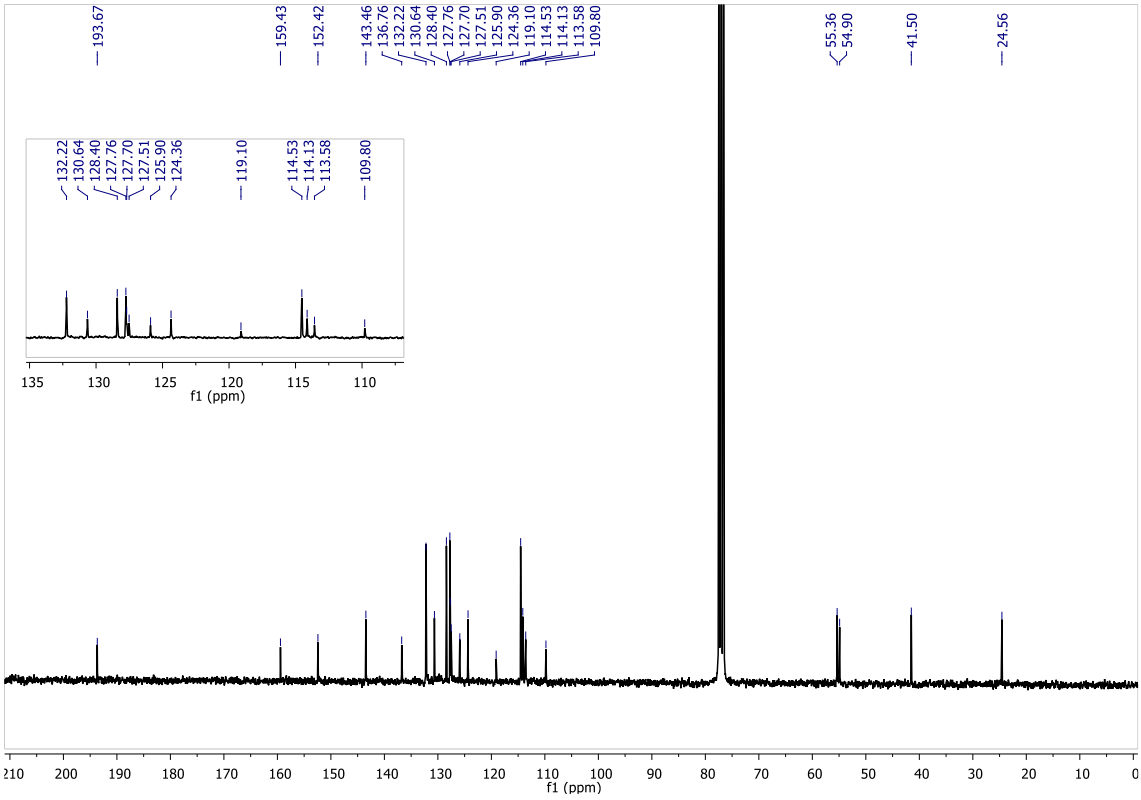
4-(1-Methyl-3-propionyl-1,4-dihydroquinolin-4-yl)benzonitrile **21l**



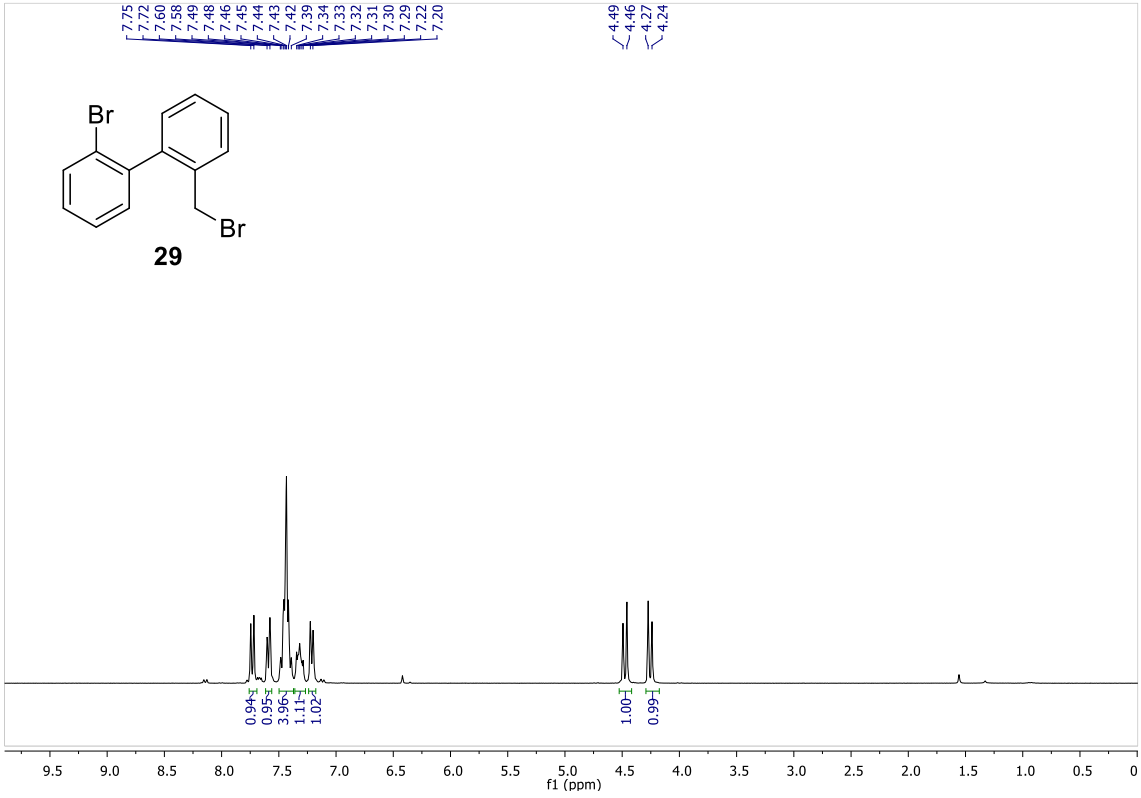



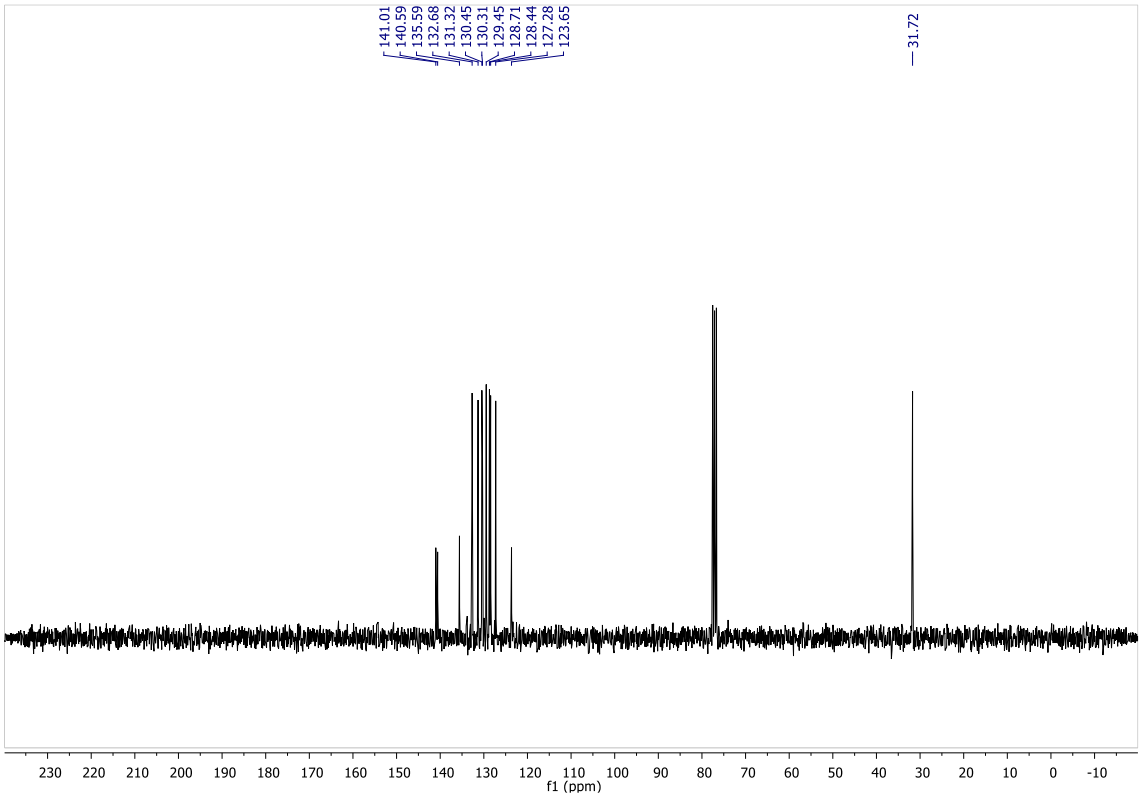
4-(3-Acetyl-1-(4-methoxybenzyl)-1,4-dihydroquinolin-4-yl)benzonitrile **21m**



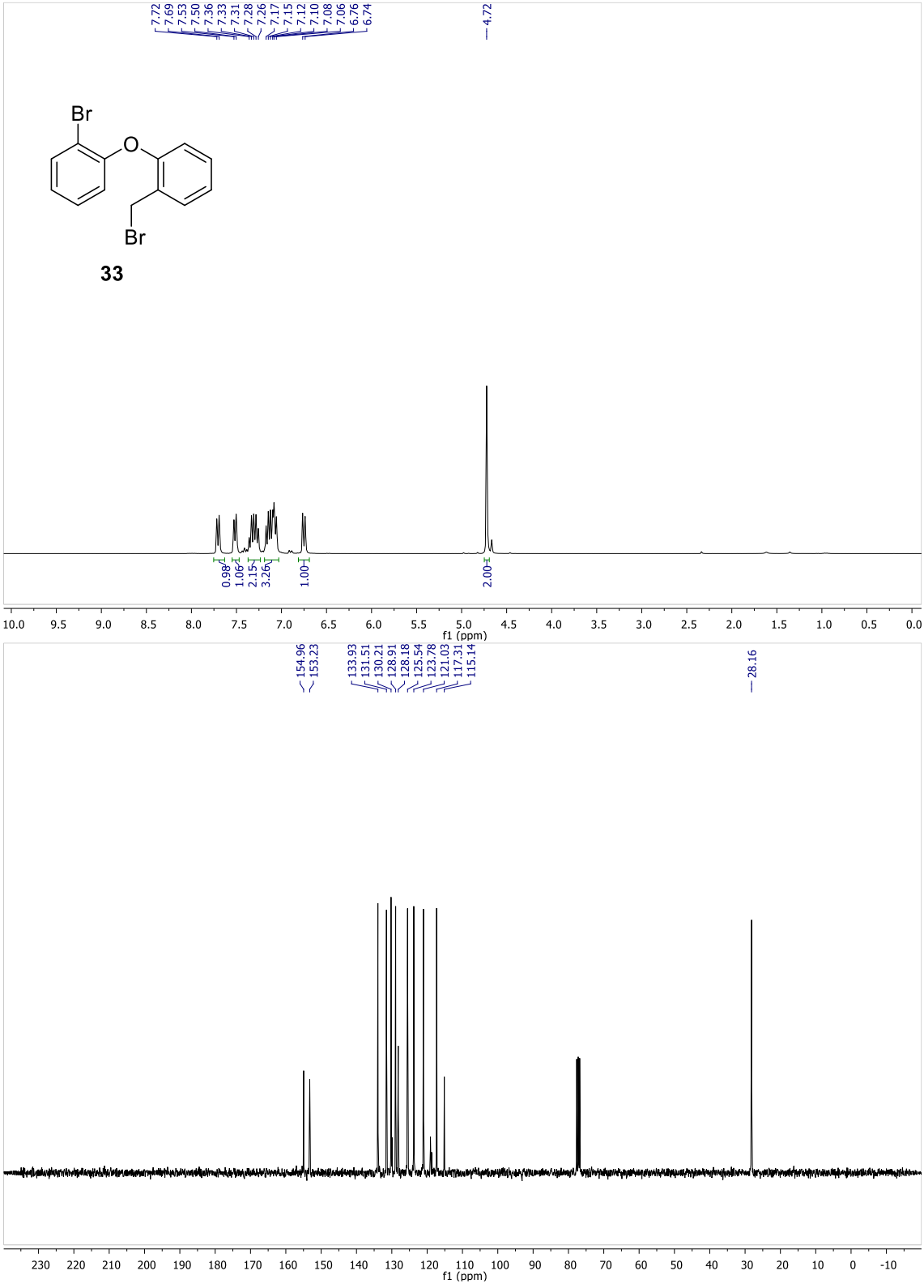



2-Bromo-2'-(bromomethyl)-1,1'-biphenyl **29**

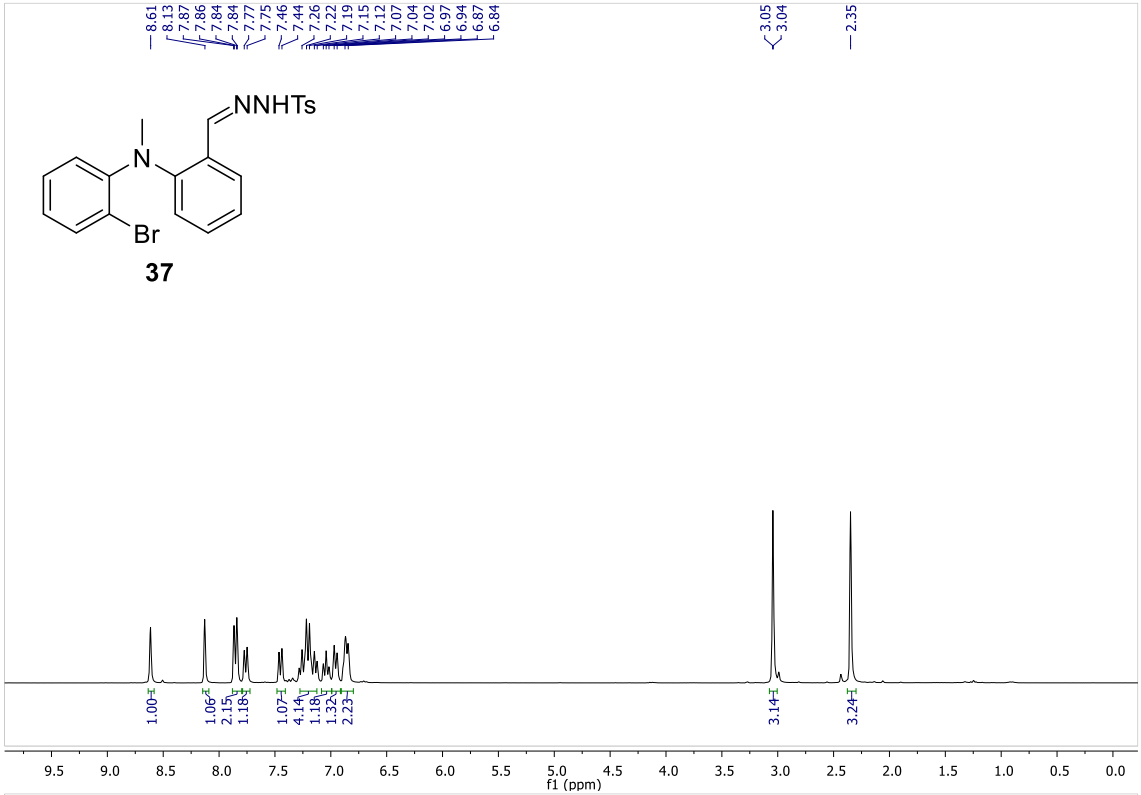


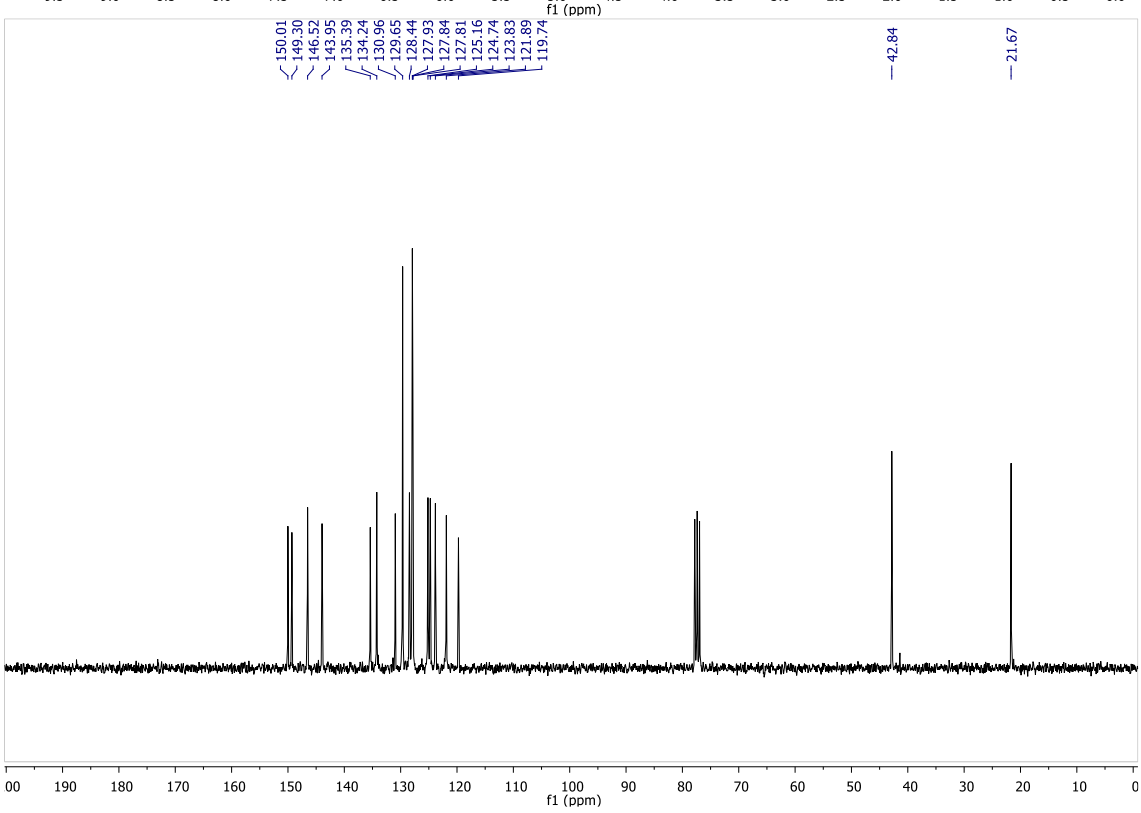



1-Bromo-2-(2-(bromomethyl)phenoxy)benzene **33**

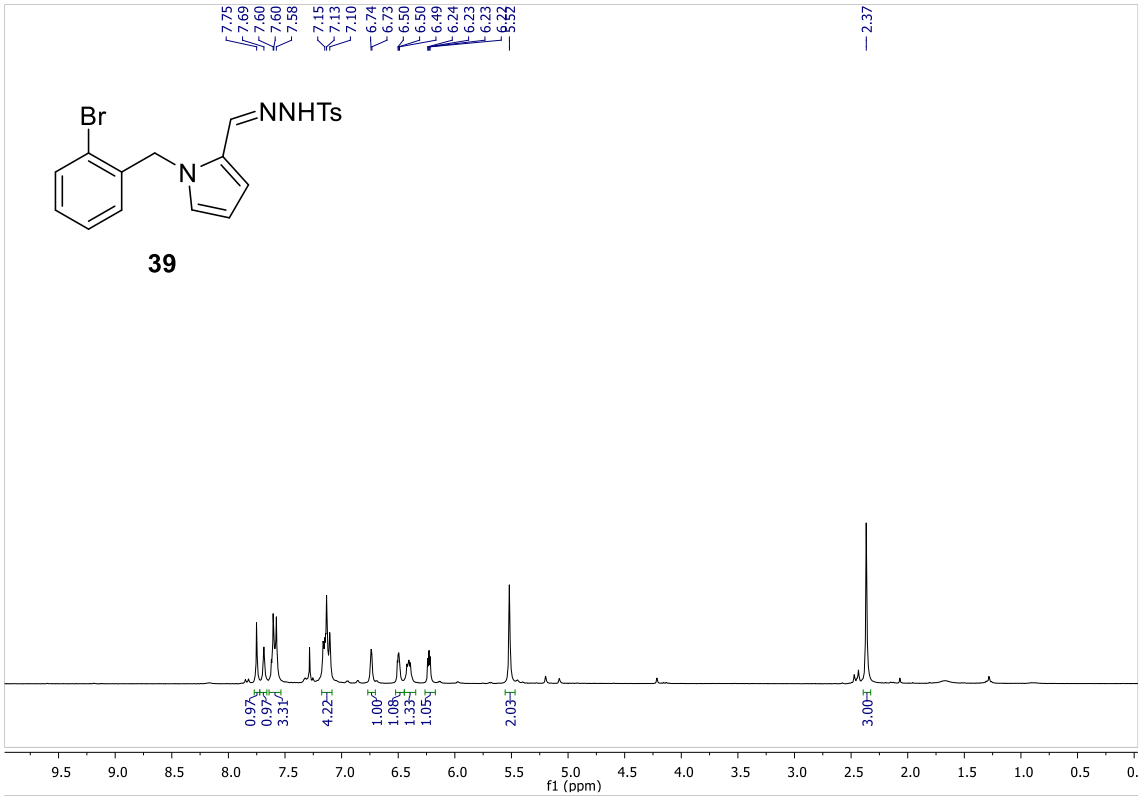


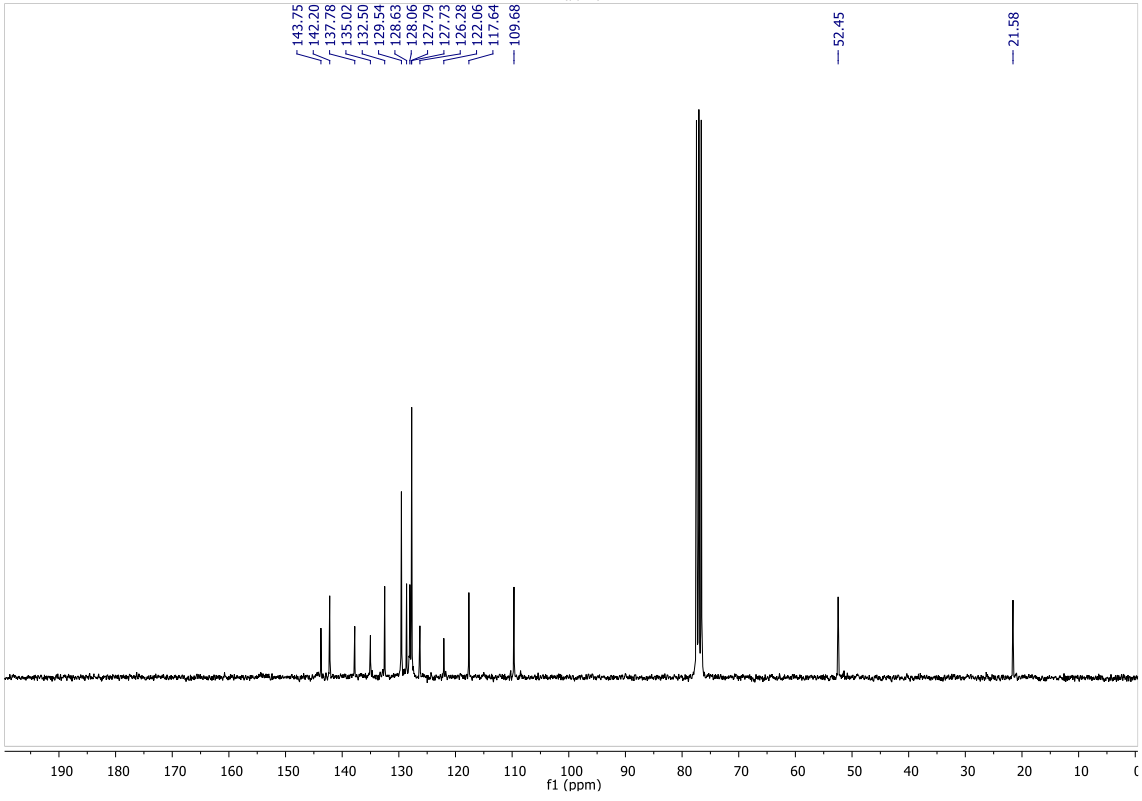
(*E*)-*N'*-(2-((2-Bromophenyl)(methyl)amino)benzylidene)-4-methylbenzenesulfonohydrazide **37**



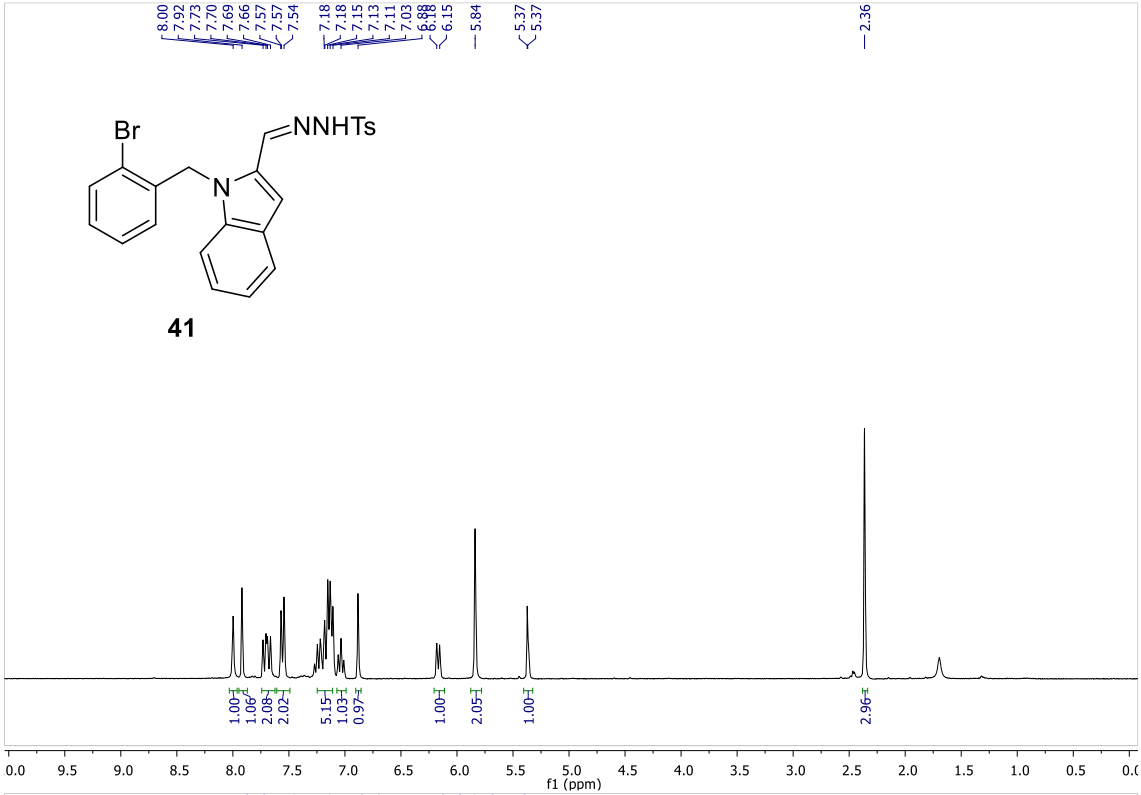



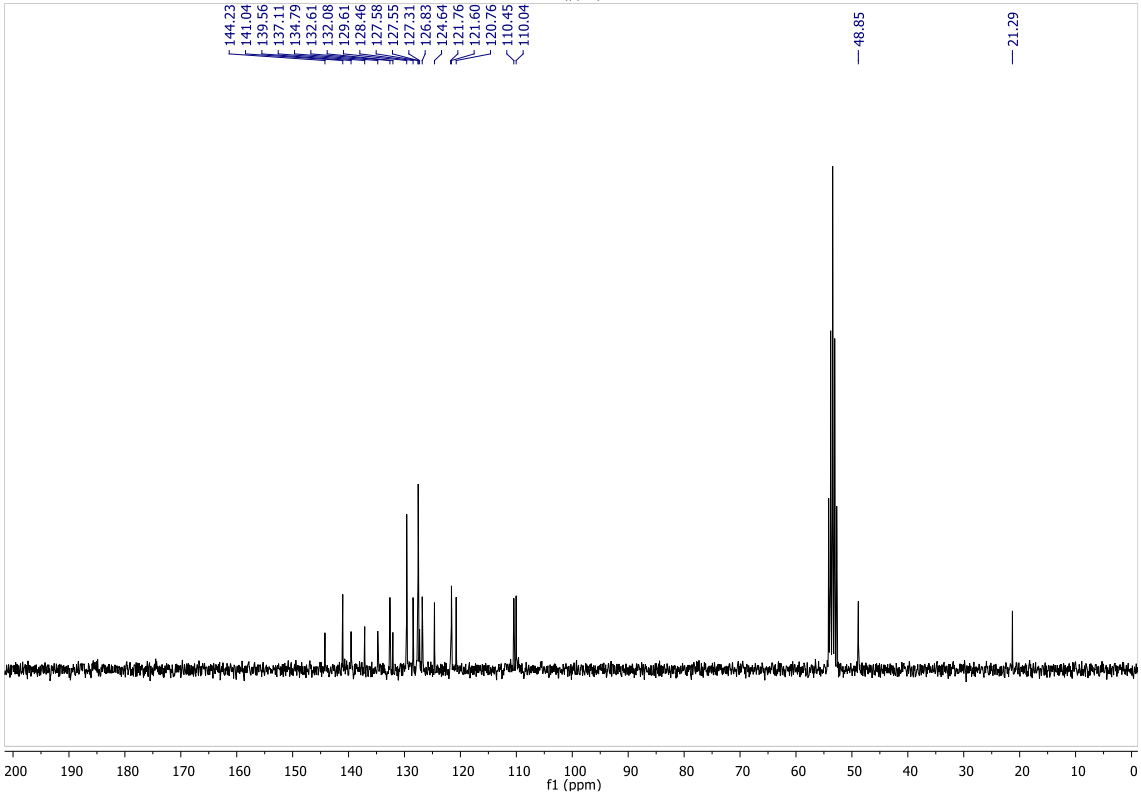
*N*'-((1-(2-Bromobenzyl)-1*H*-pyrrol-2-yl)methylene)-4-methylbenzenesulfonohydrazide **39**



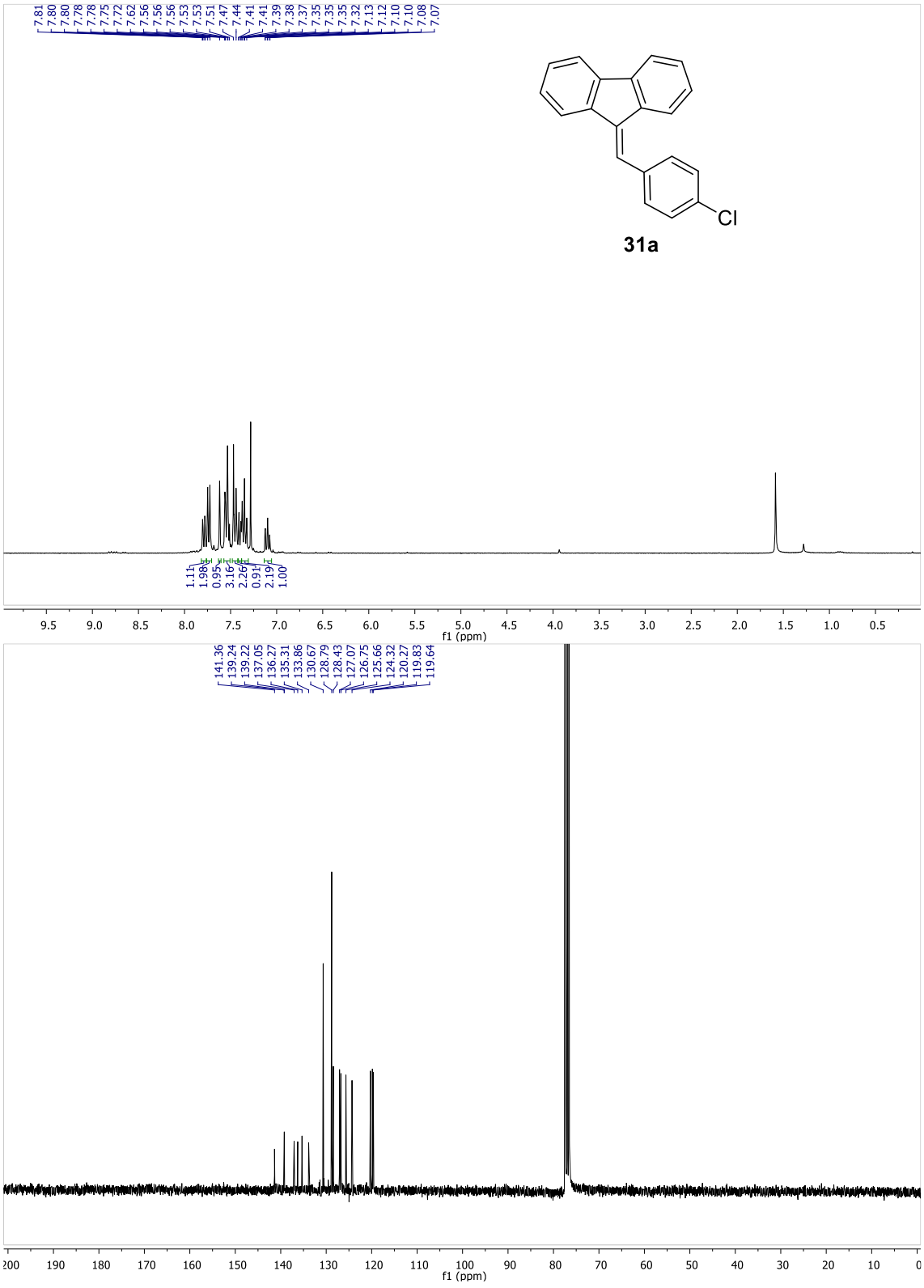



*N*'-((1-(2-Bromobenzyl)-1*H*-indol-2-yl)methylene)-4-methylbenzenesulfonohydrazide **41**

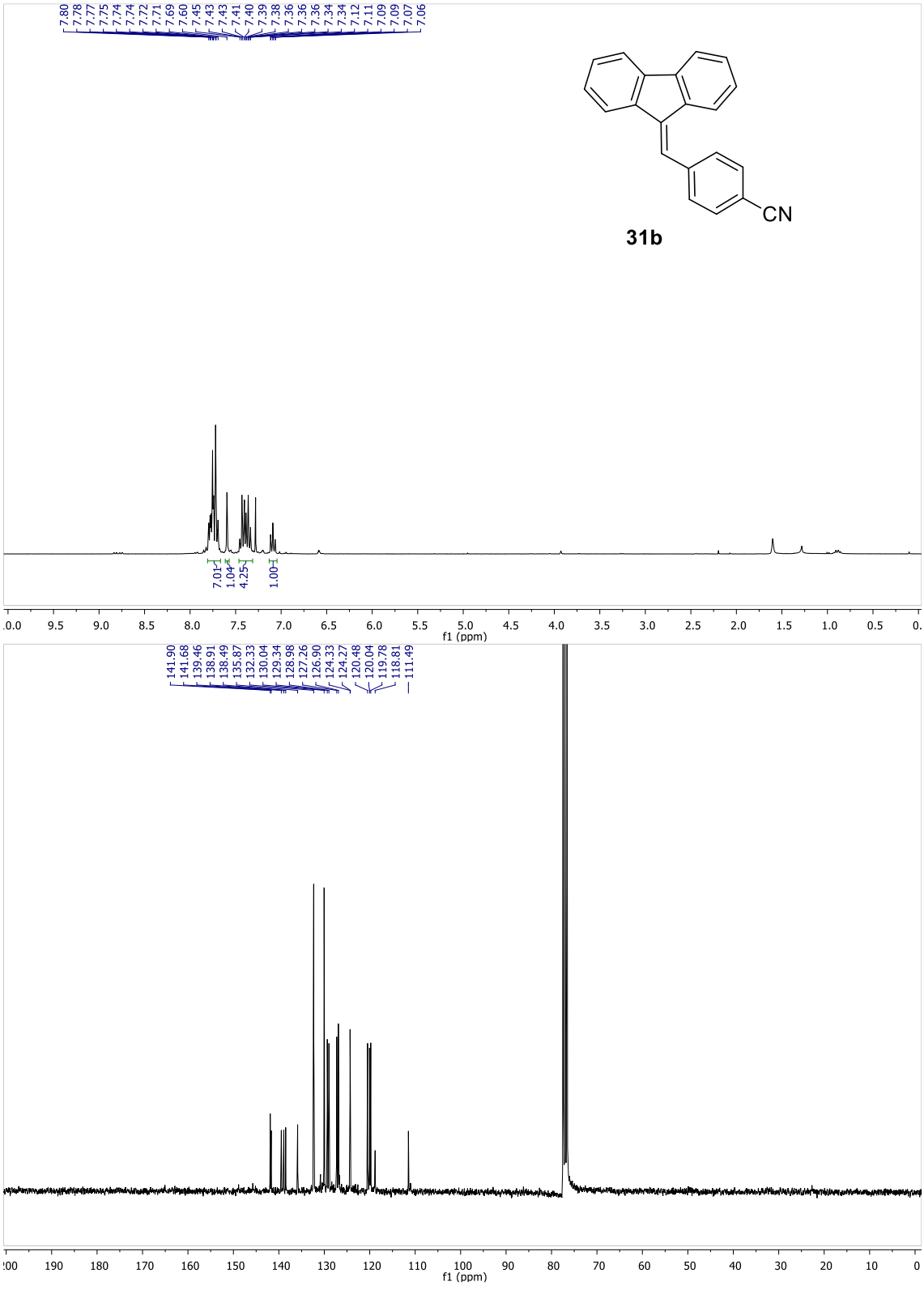


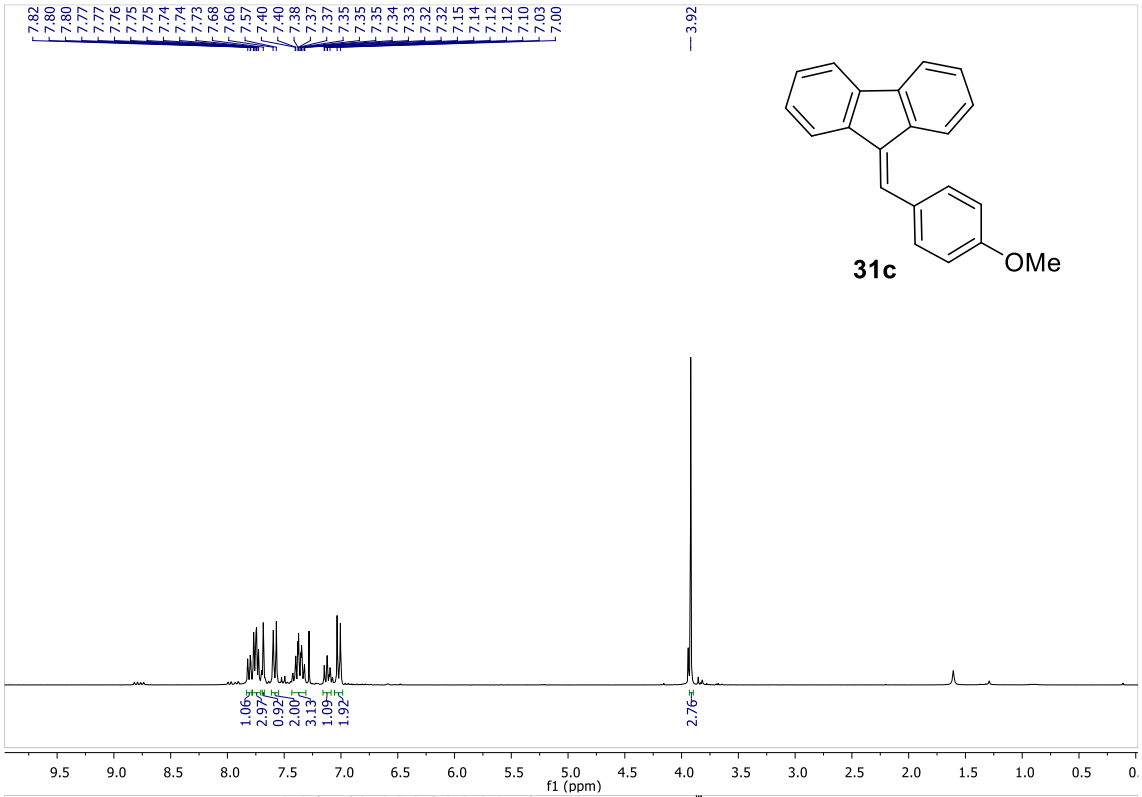
9-(4-Chlorobenzylidene)-9*H*-fluorene (**31a**)

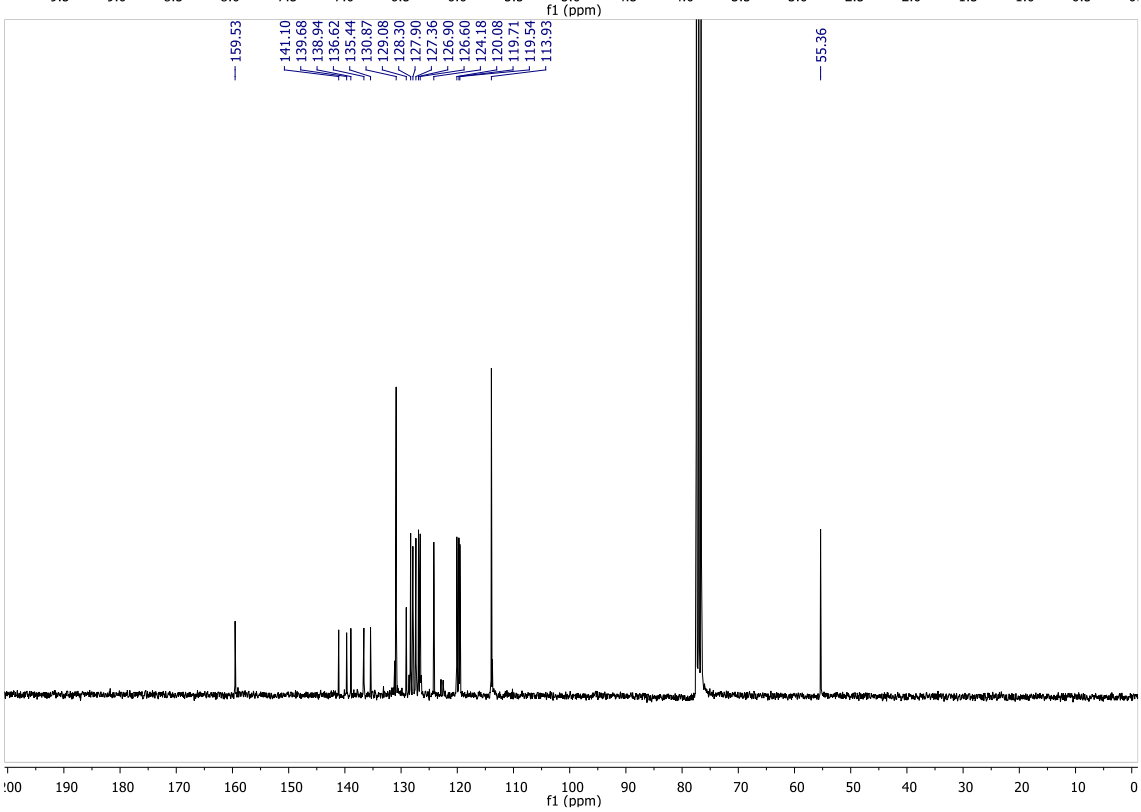


4-((9*H*-Fluoren-9-ylidene)methyl)benzonitrile (**31b**)

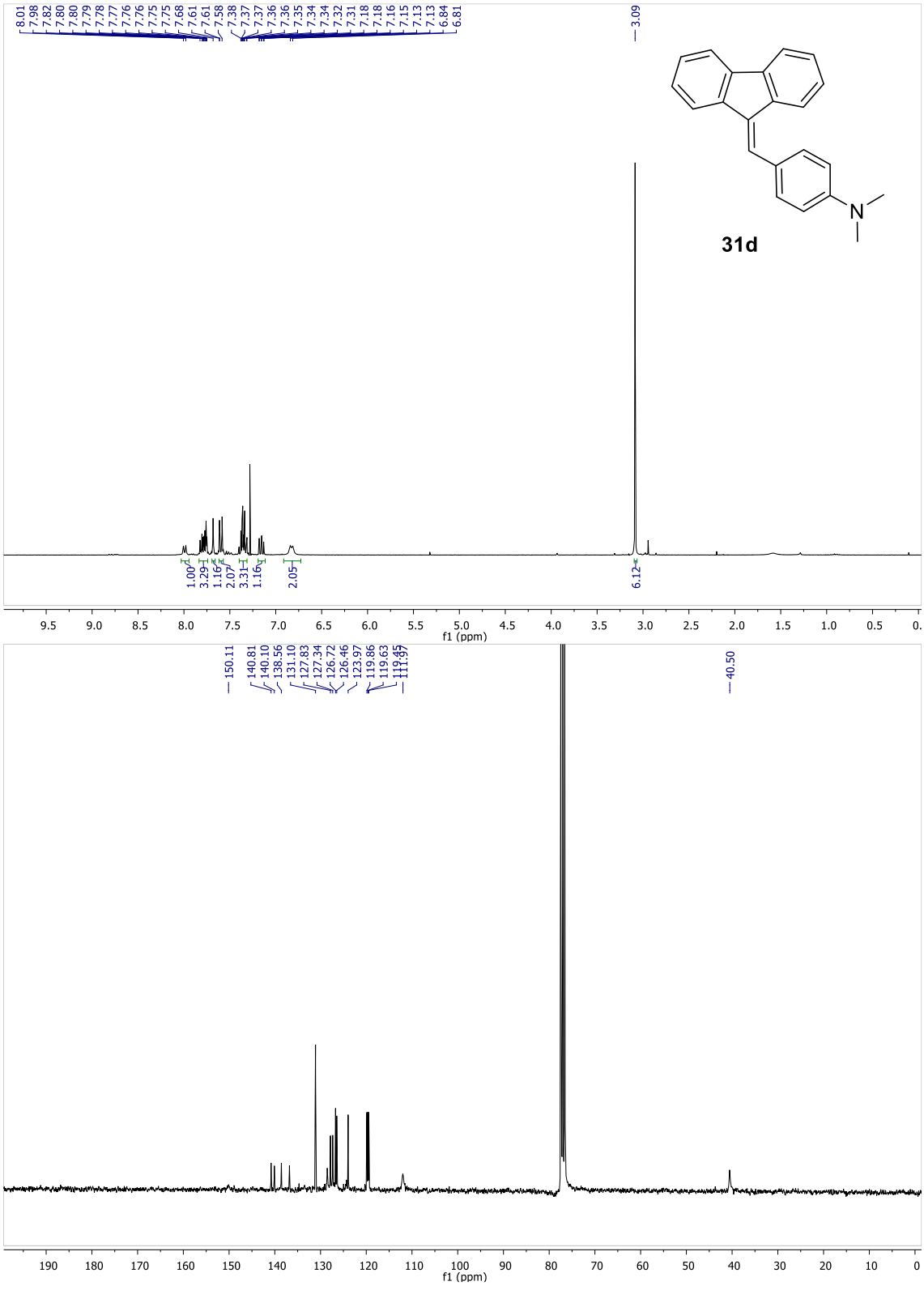


9-(4-Methoxybenzylidene)-9*H*-fluorene (**31c**)

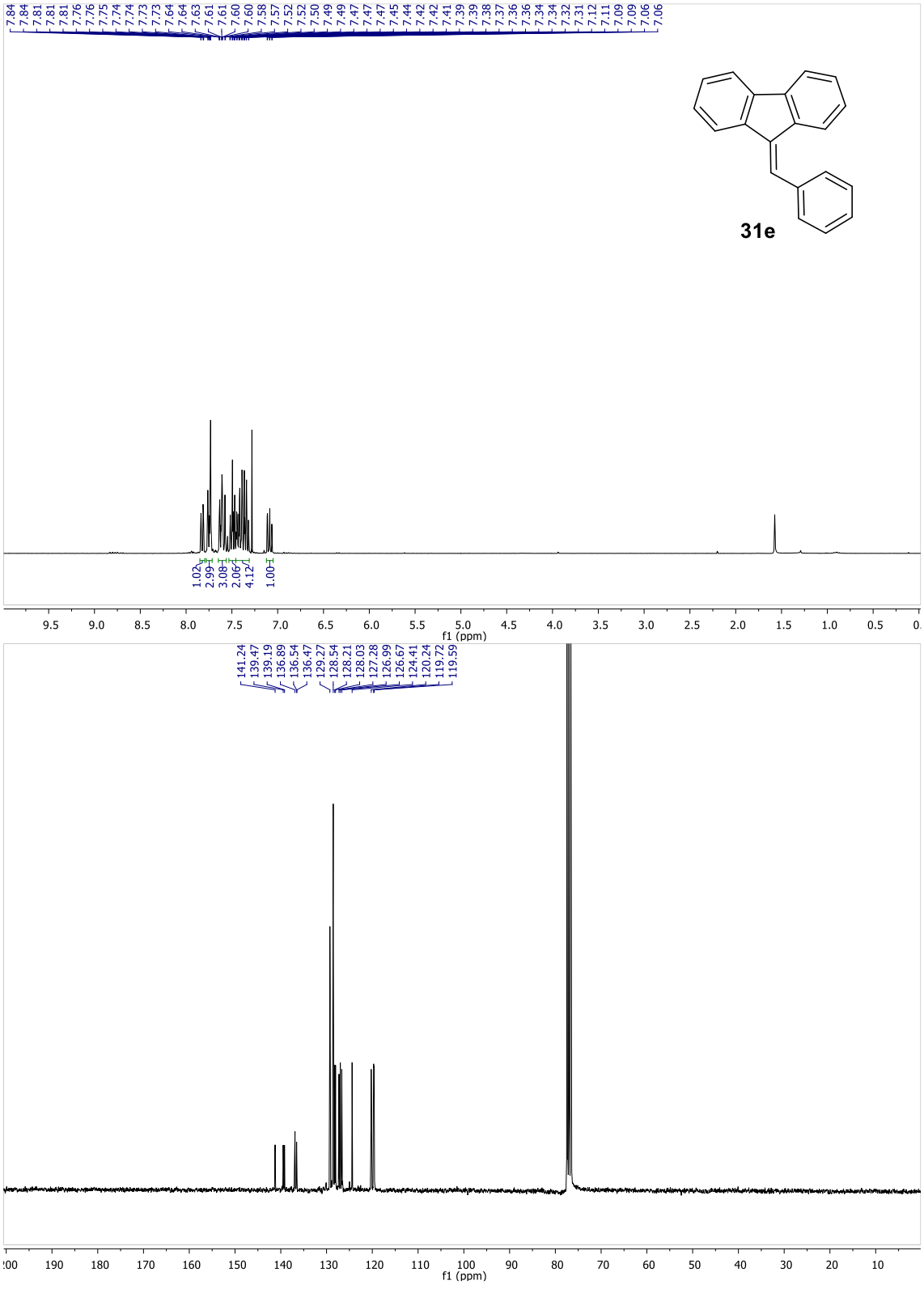


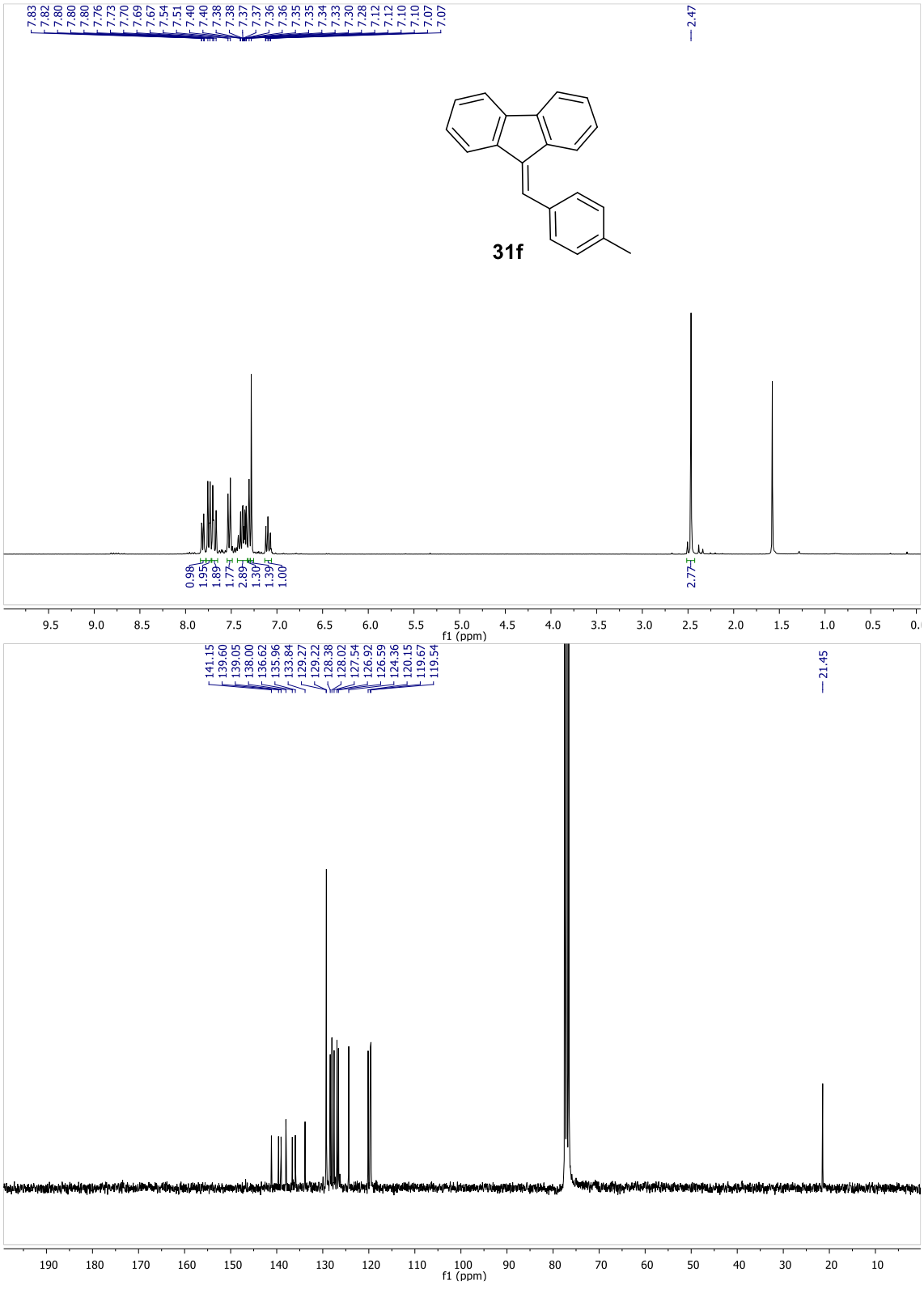
4-((9*H*-Fluoren-9-ylidene)methyl)-*N*,*N*-dimethylaniline (**31d**)



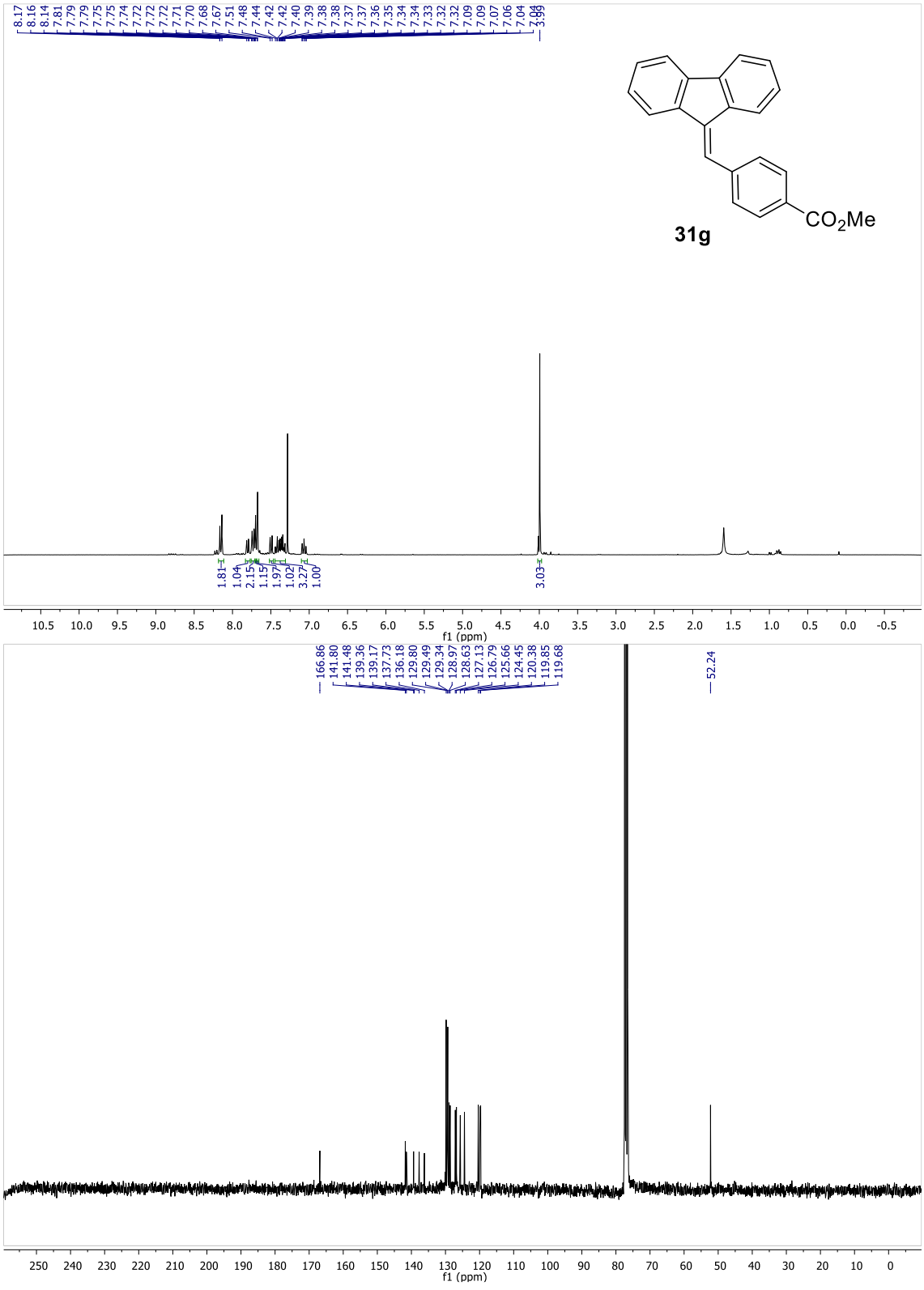
9-Benzylidene-9*H*-fluorene (**31e**)



9-(4-Methylbenzylidene)-9*H*-fluorene (**31f**)



Methyl 4-((9*H*-fluoren-9-ylidene)methyl)benzoate (**31g**)

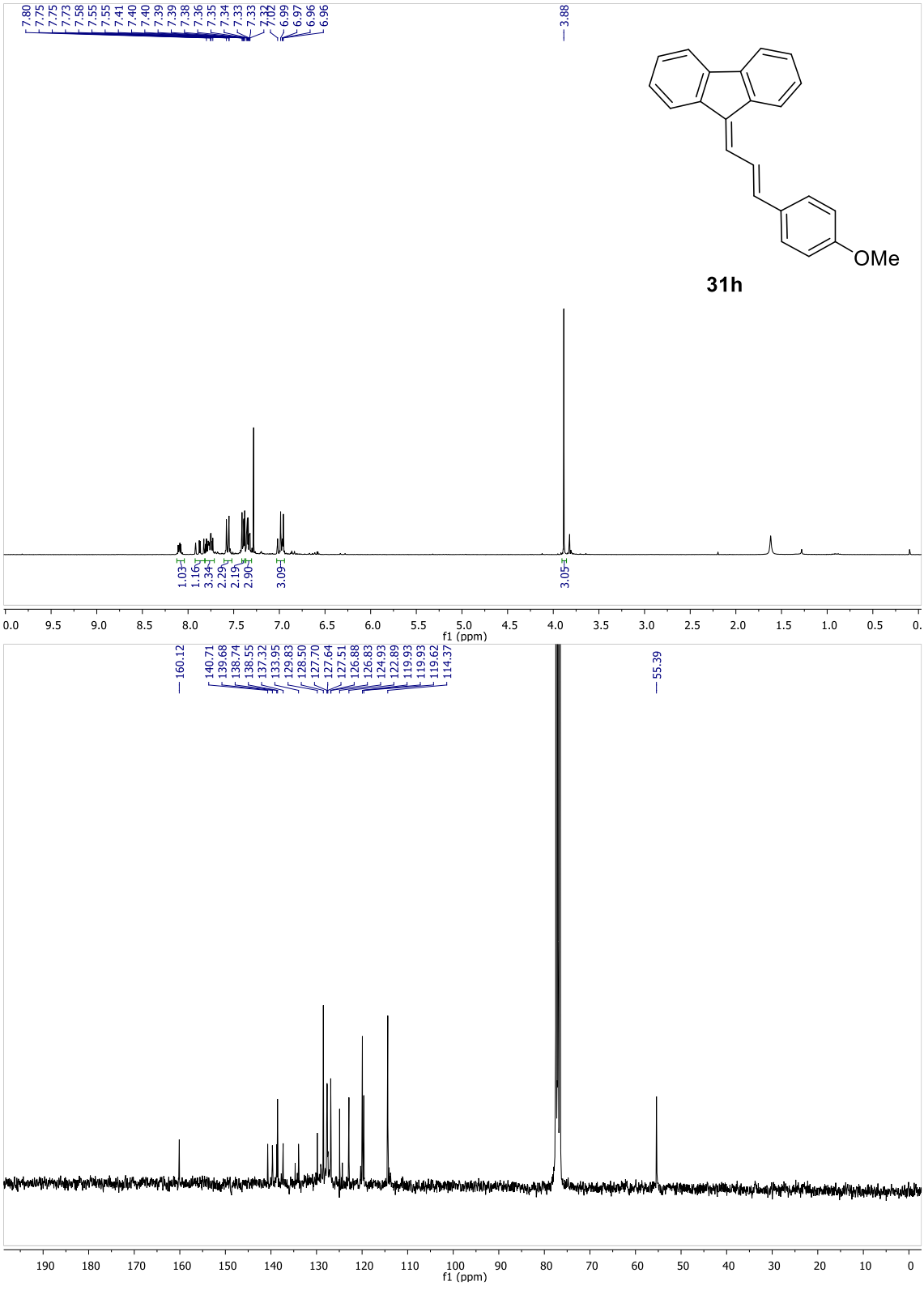




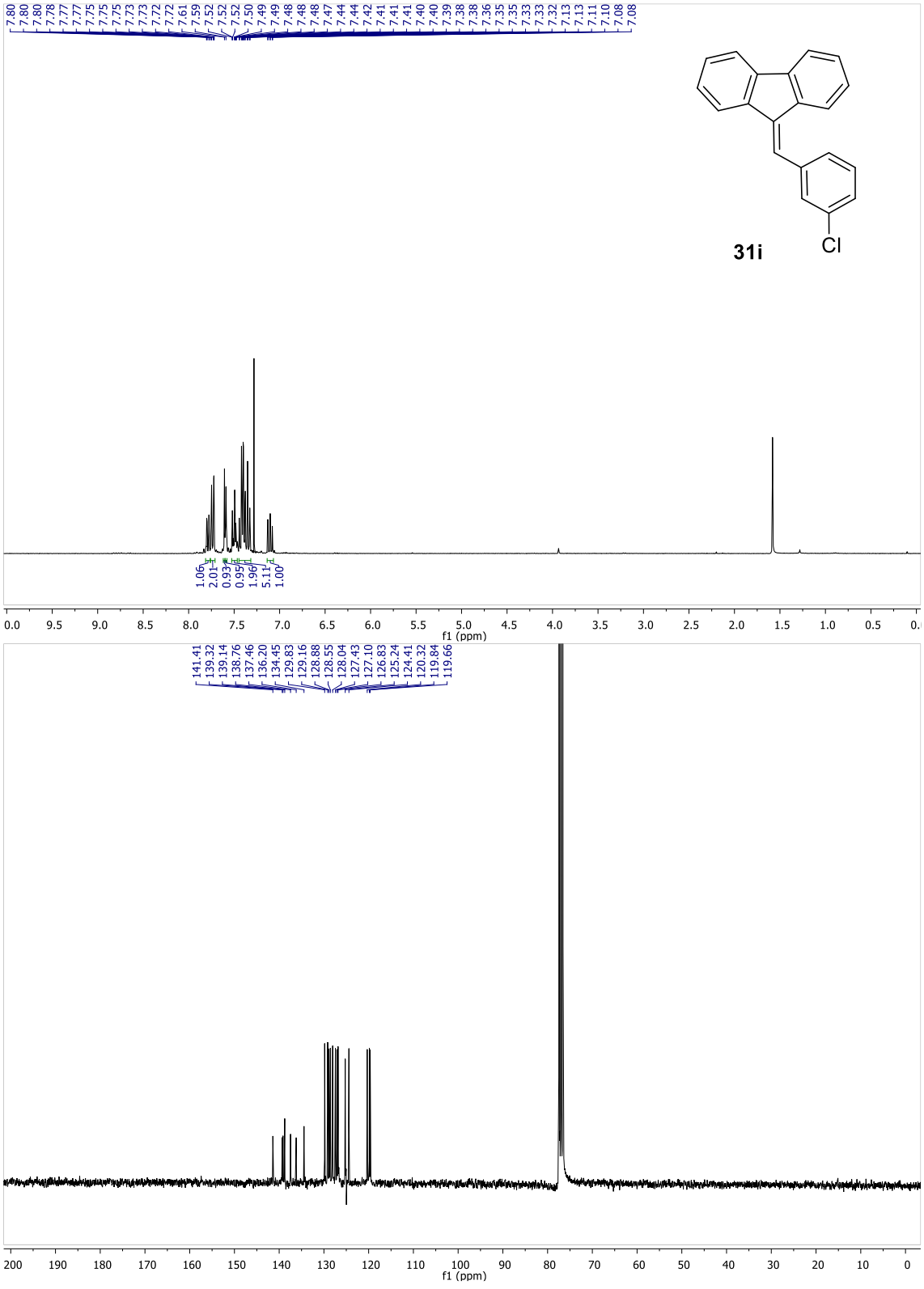


**31g**

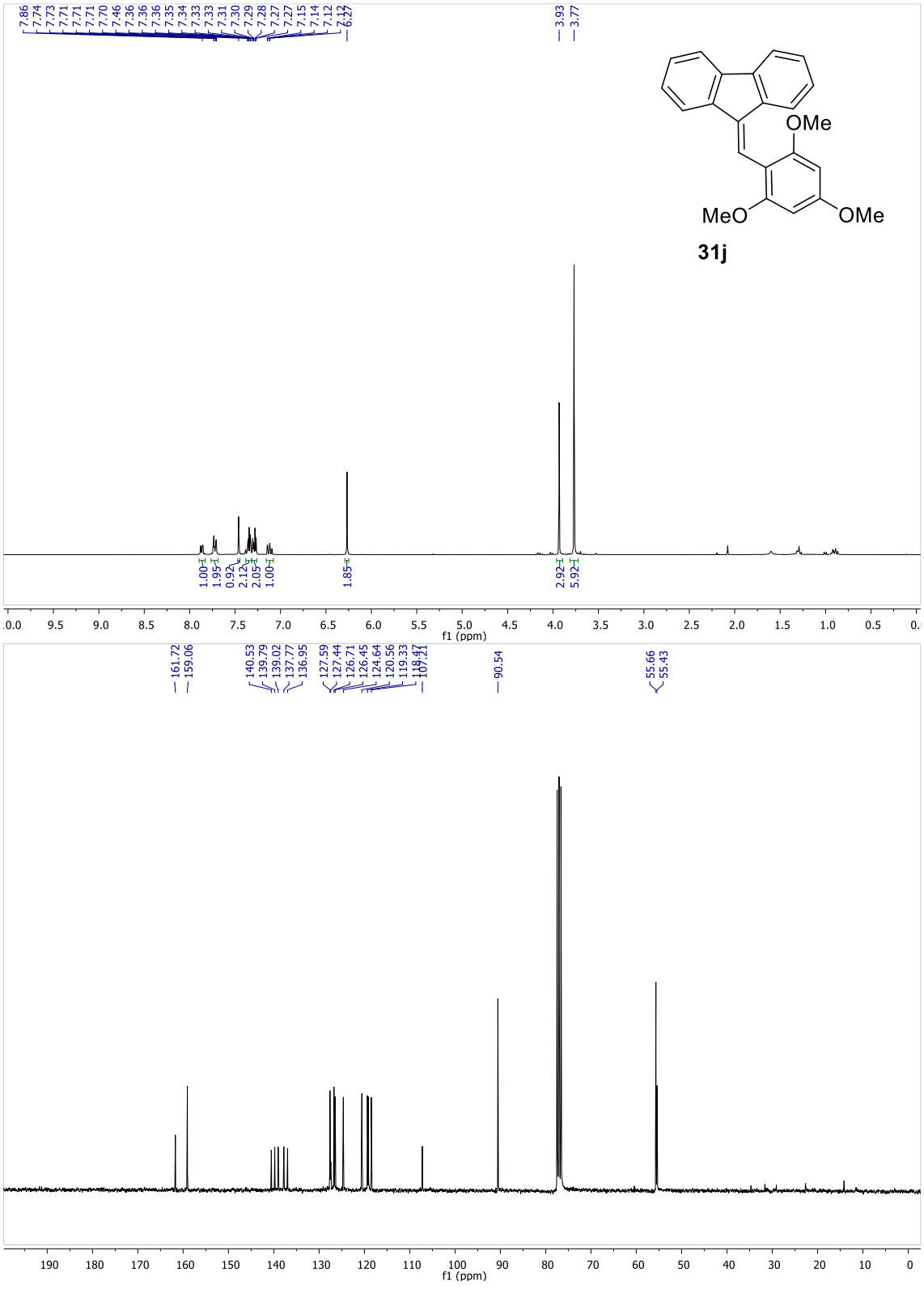
(*E*)-9-(3-(4-Methoxyphenyl)allylidene)-9*H*-fluorene (**31h**)



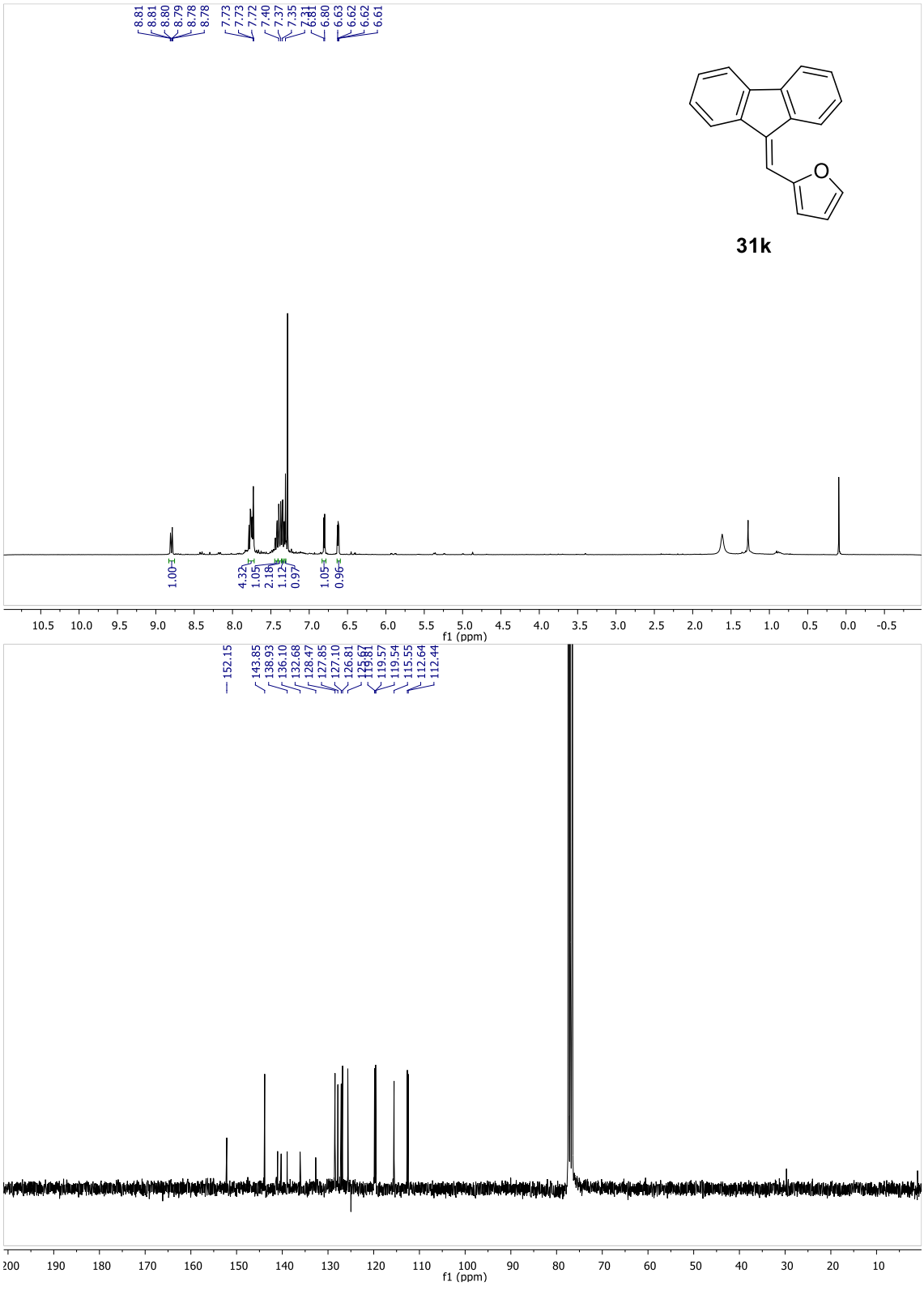
9-(3-Chlorobenzylidene)-9*H*-fluorene (**31i**)



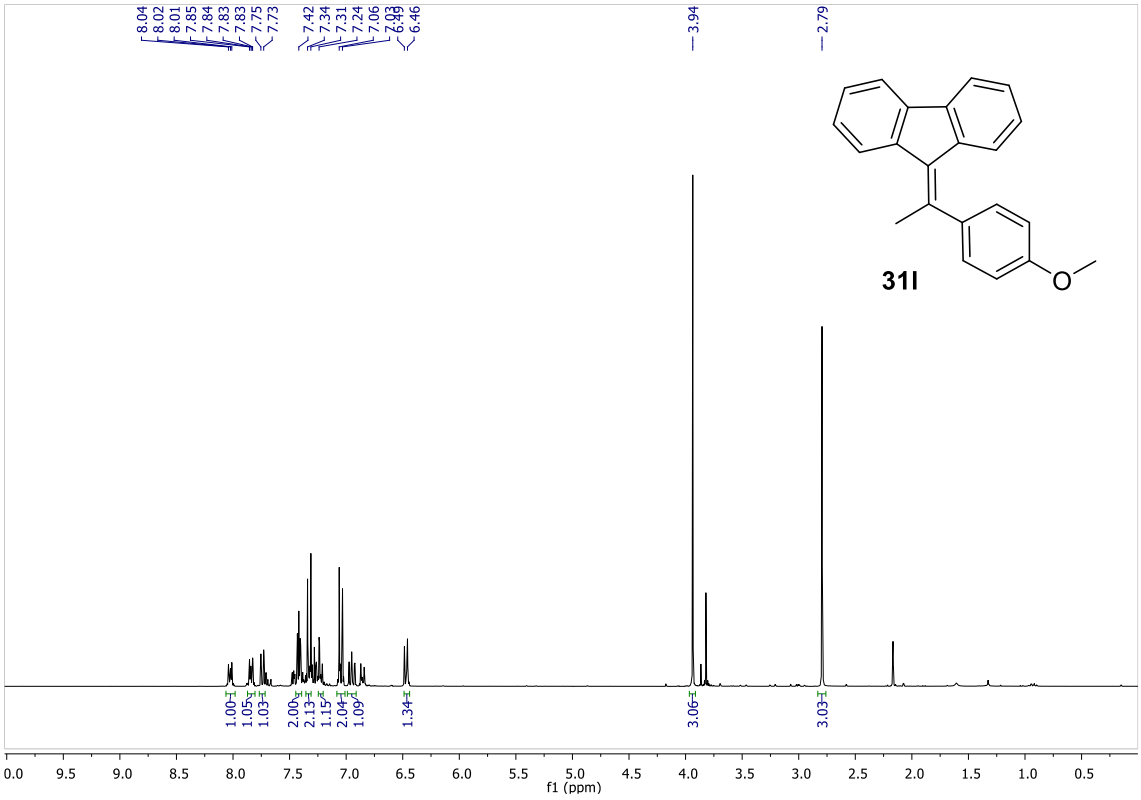
9-(2,4,6-Trimethoxybenzylidene)-9*H*-fluorene (**31j**)

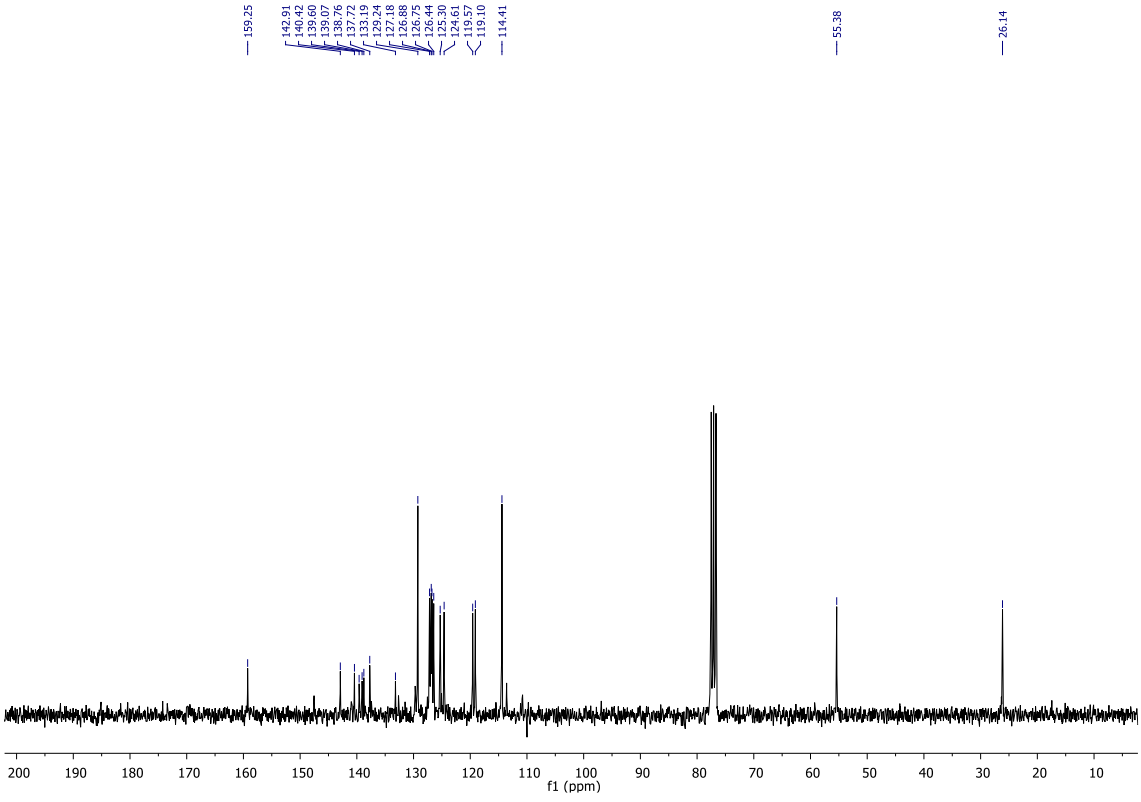


2-((9*H*-Fluoren-9-ylidene)methyl)furan (**31k**)

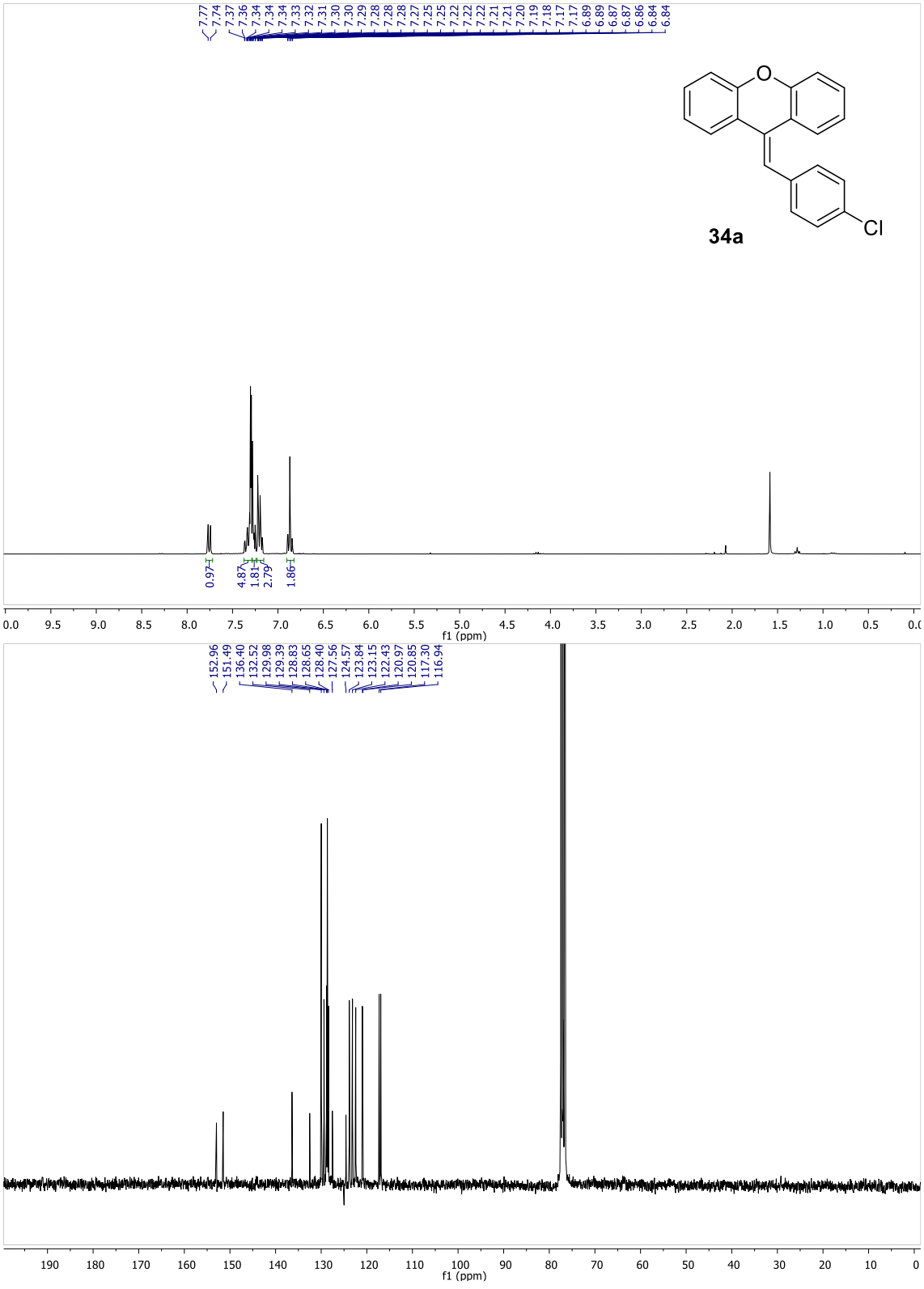


9-(1-(4-Methoxyphenyl)ethylidene)-9*H*-fluorene (**31l**)

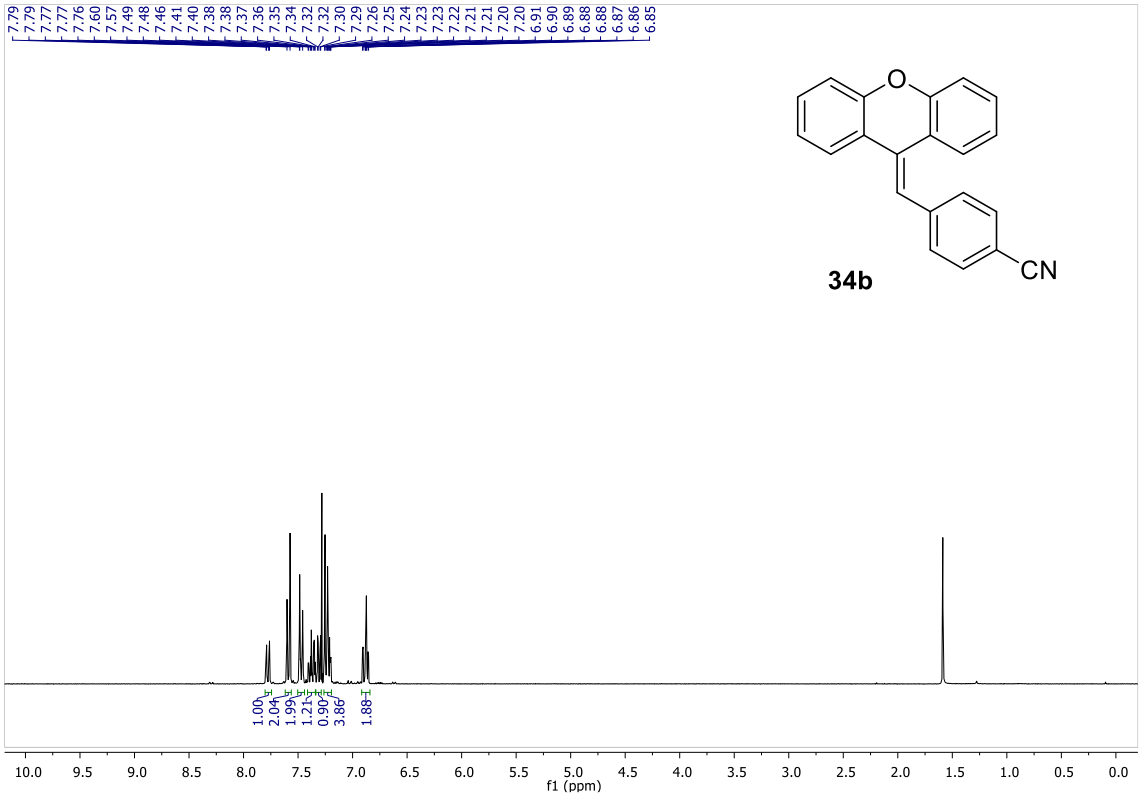


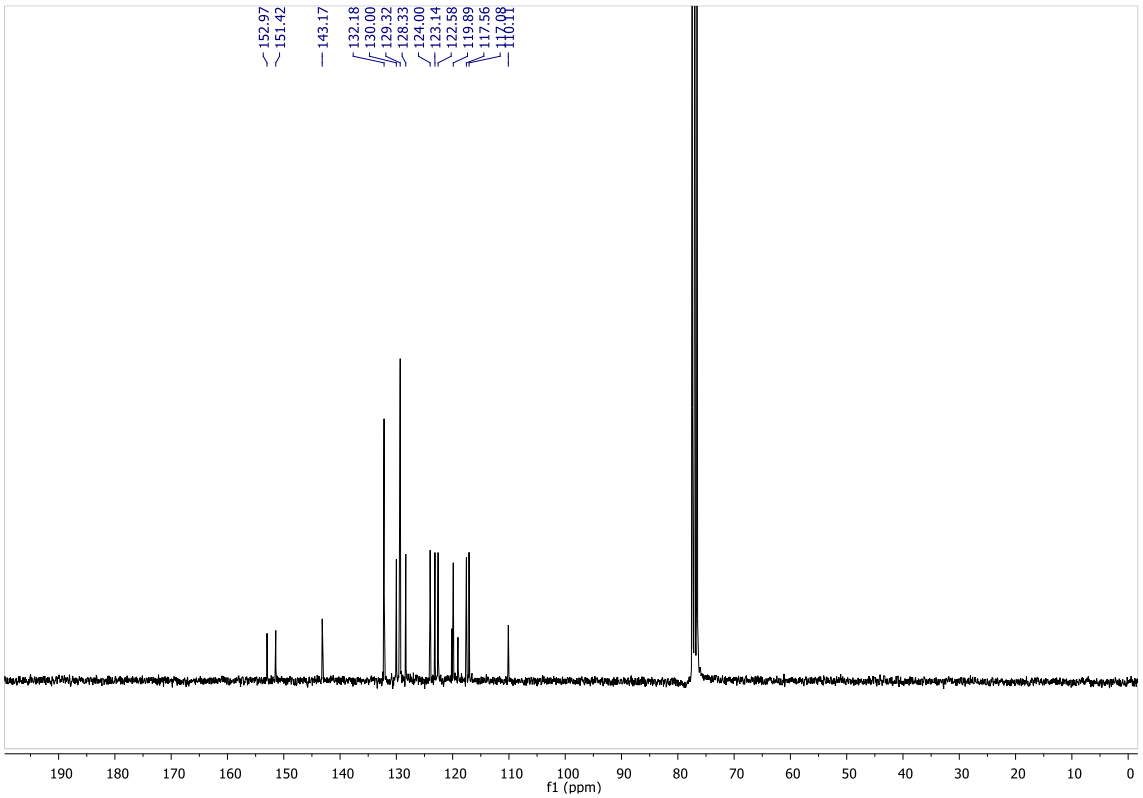



9-(4-Chlorobenzylidene)-9*H*-xanthene (**34a**)

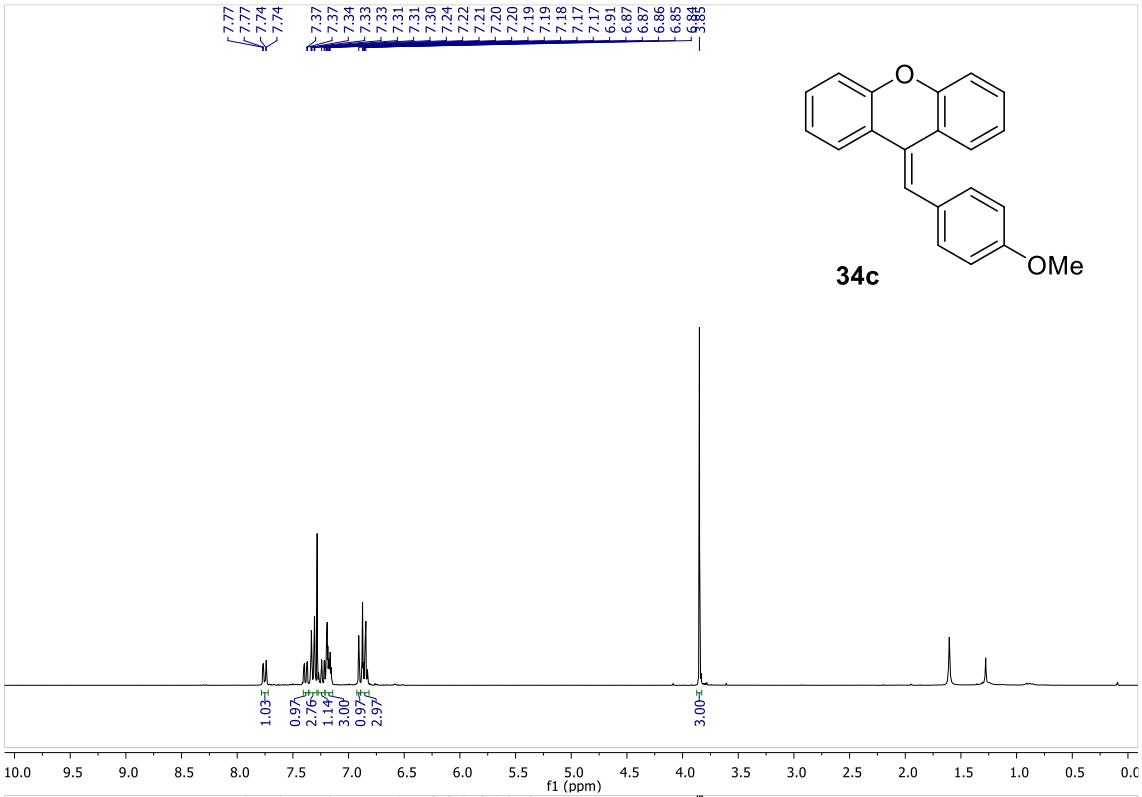


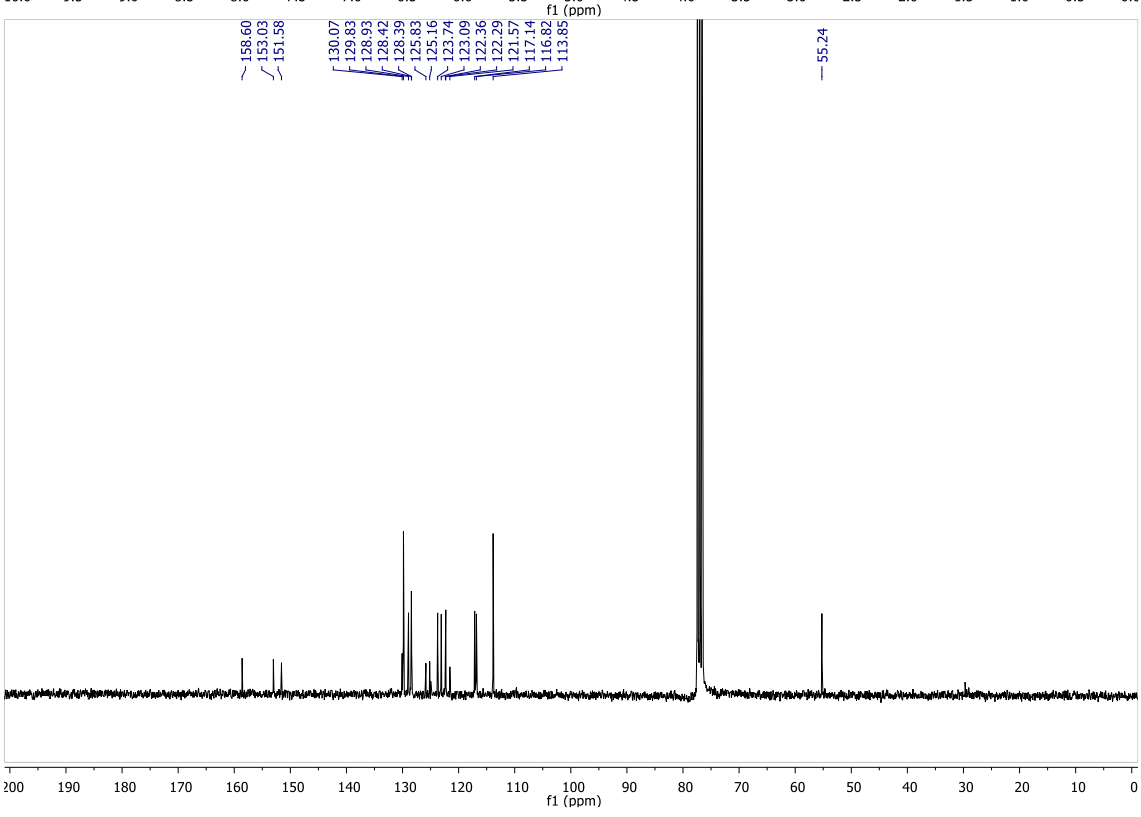
4-((9*H*-Xanthen-9-ylidene)methyl)benzonitrile (**34b**)



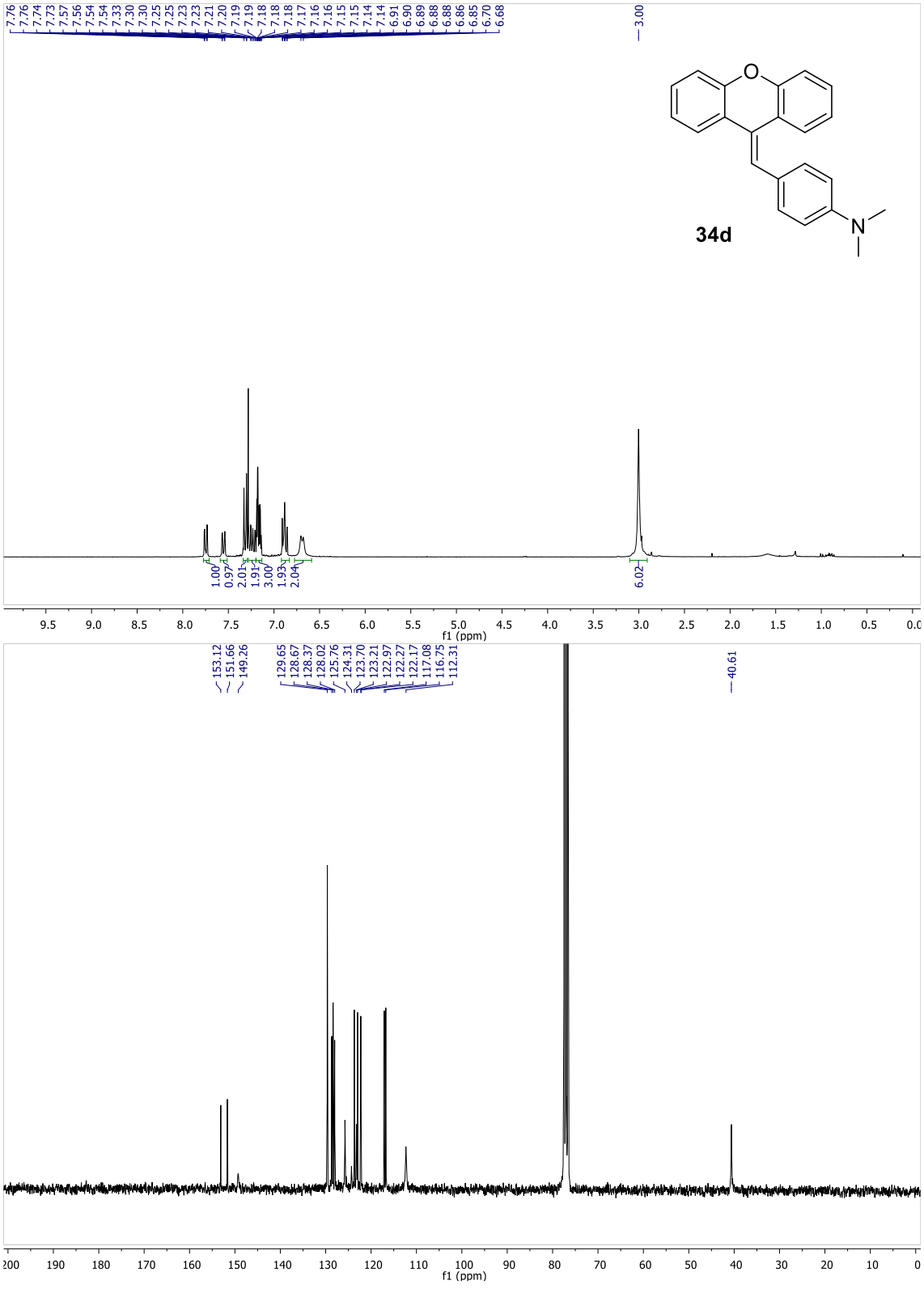



9-(4-Methoxybenzylidene)-9*H*-xanthene (**34c**)

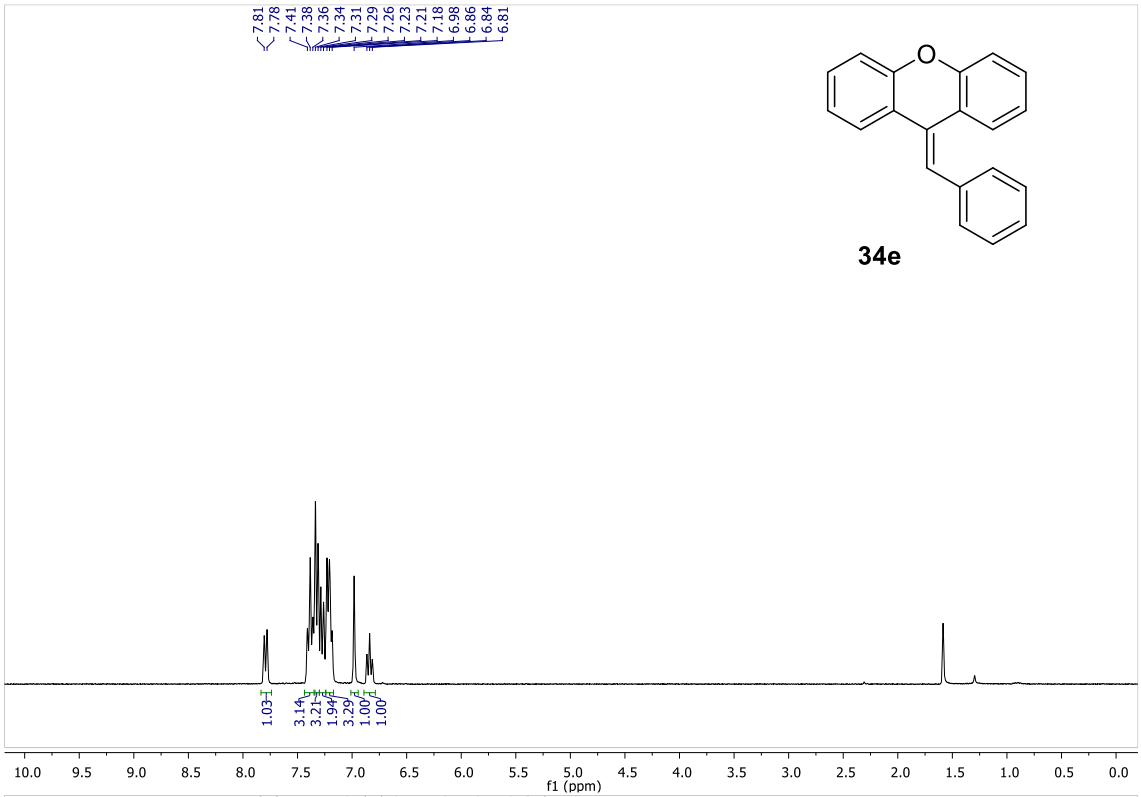


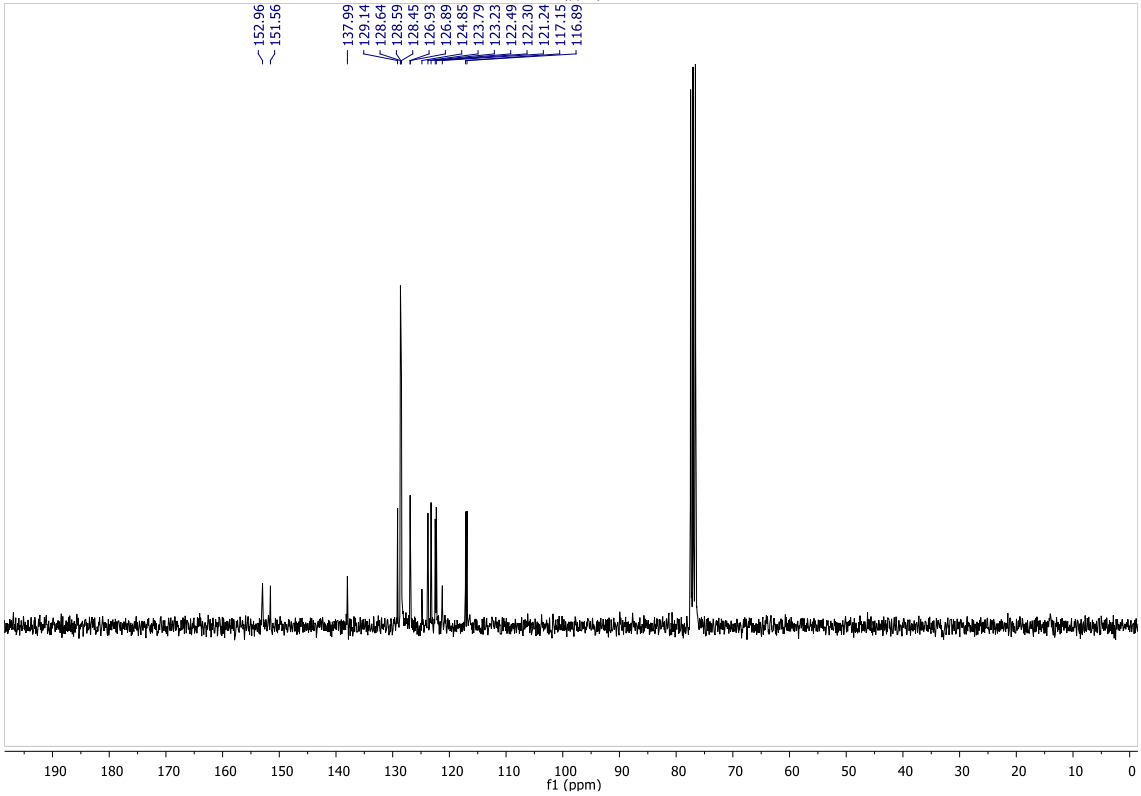



4-((9*H*-Xanthen-9-ylidene)methyl)-*N*,*N*-dimethylaniline (**34d**)

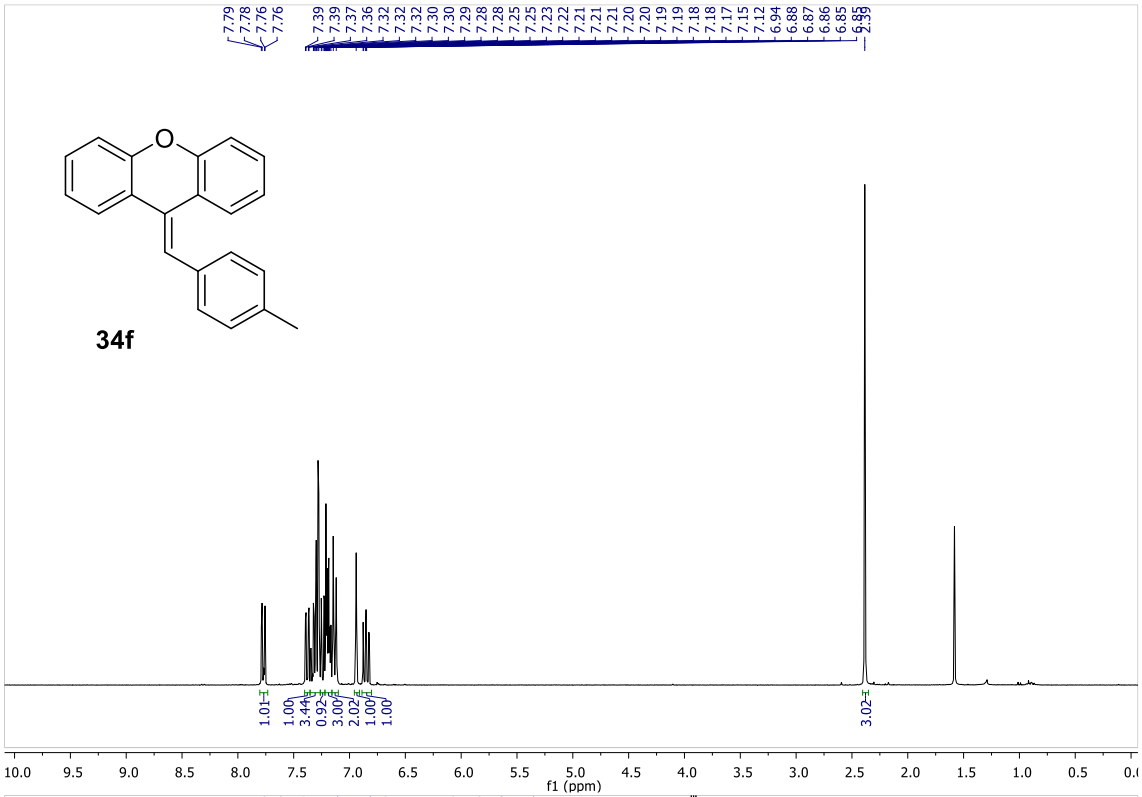


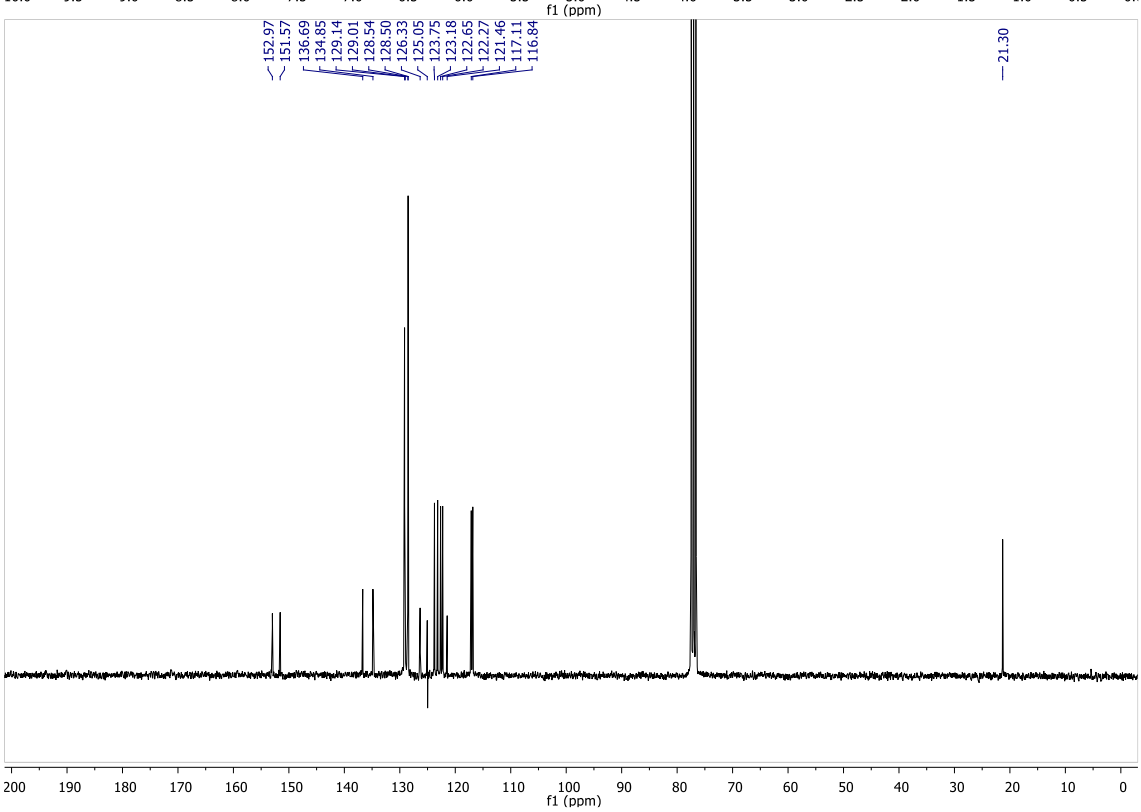
9-Benzylidene-9*H*-xanthene (**34e**)



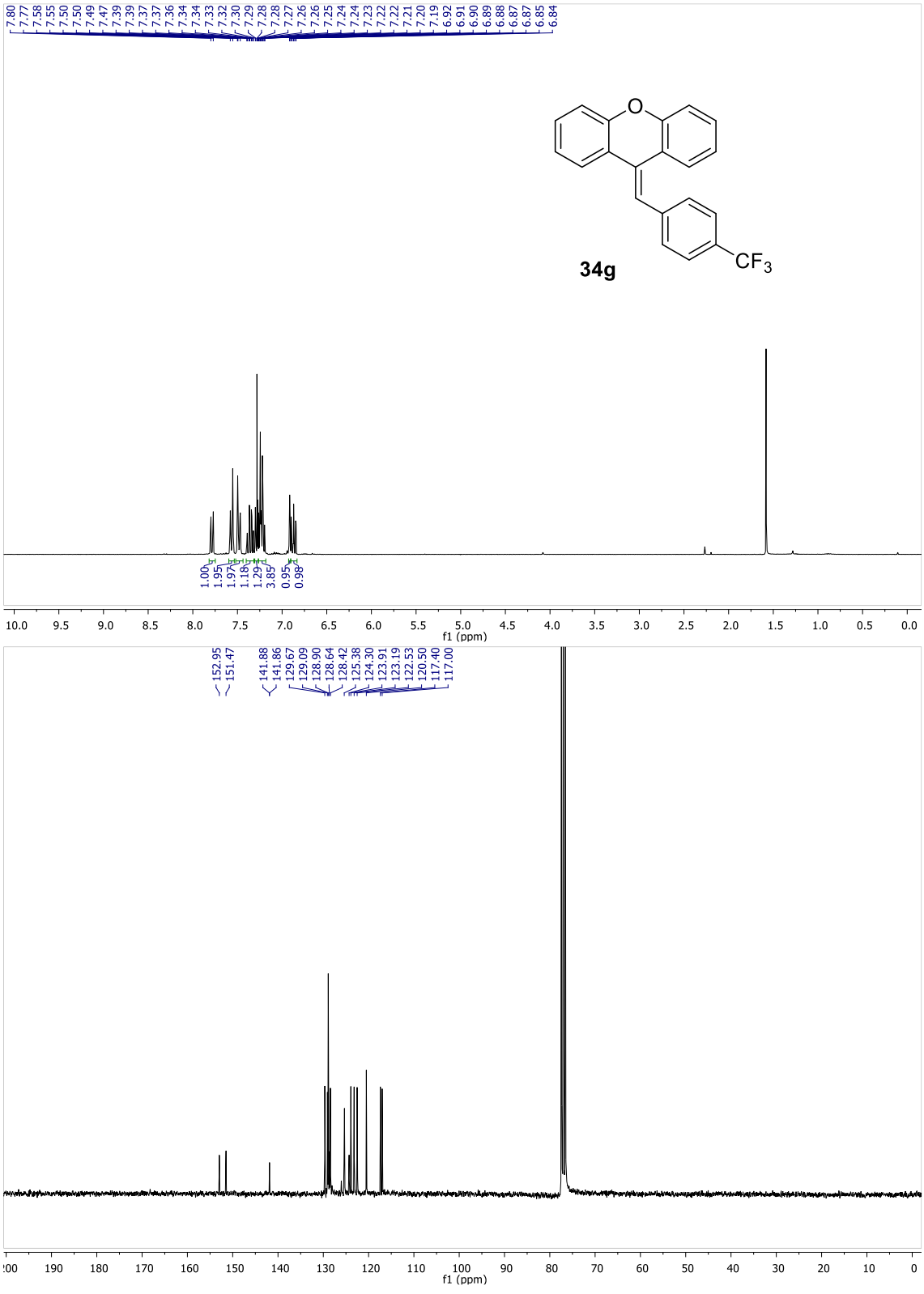



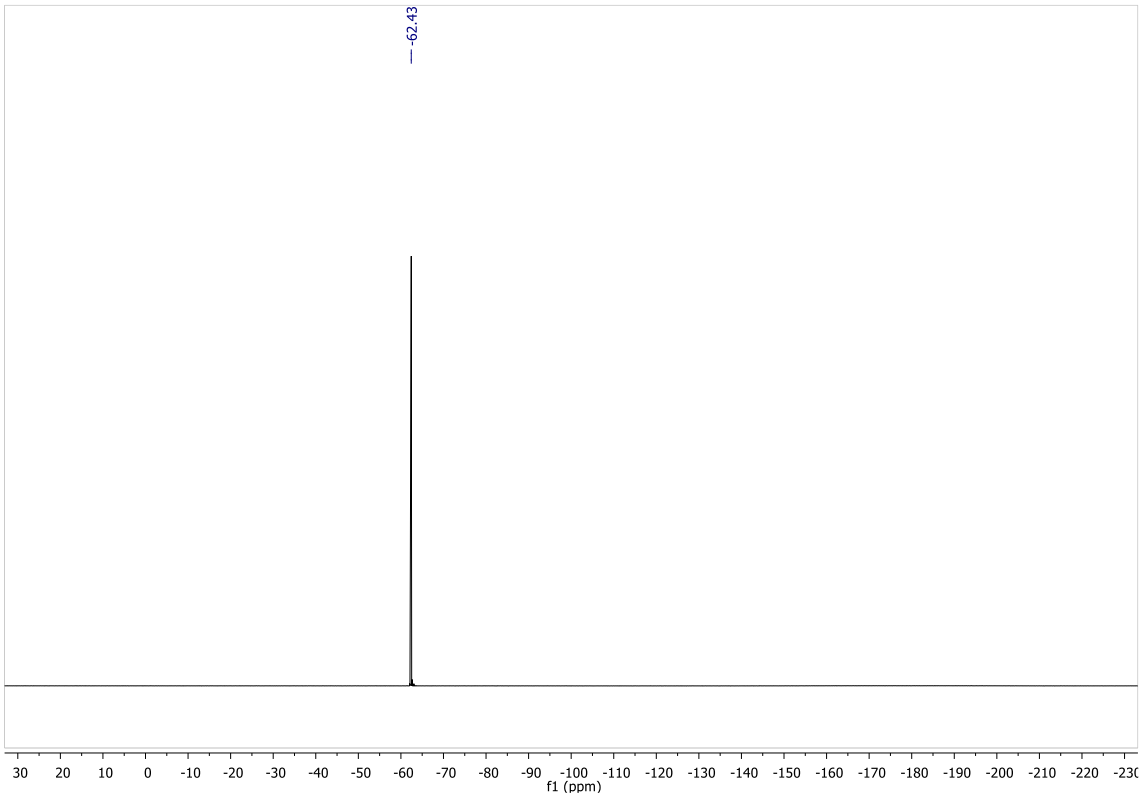
9-(4-Methylbenzylidene)-9*H*-xanthene (**34f**)



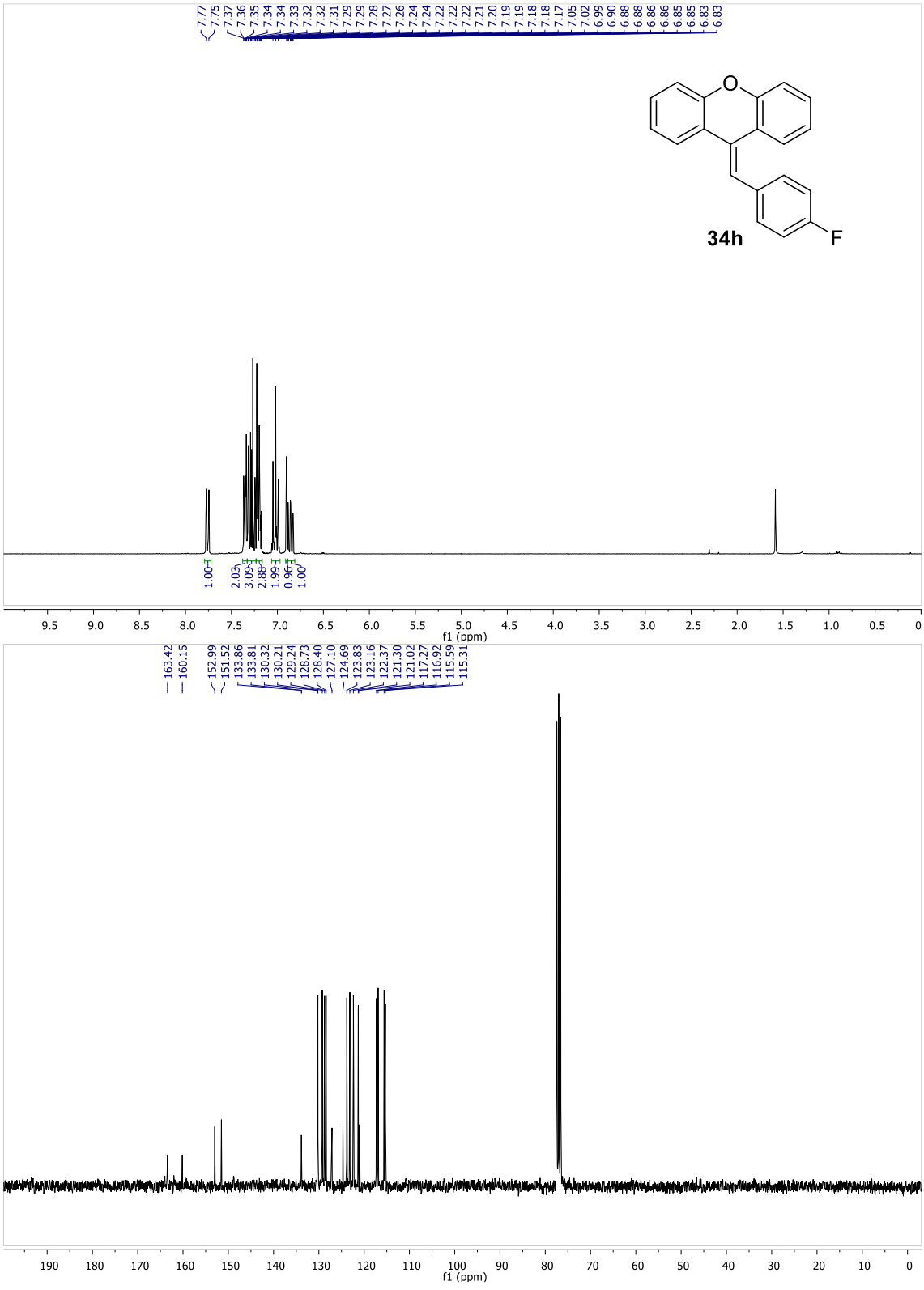



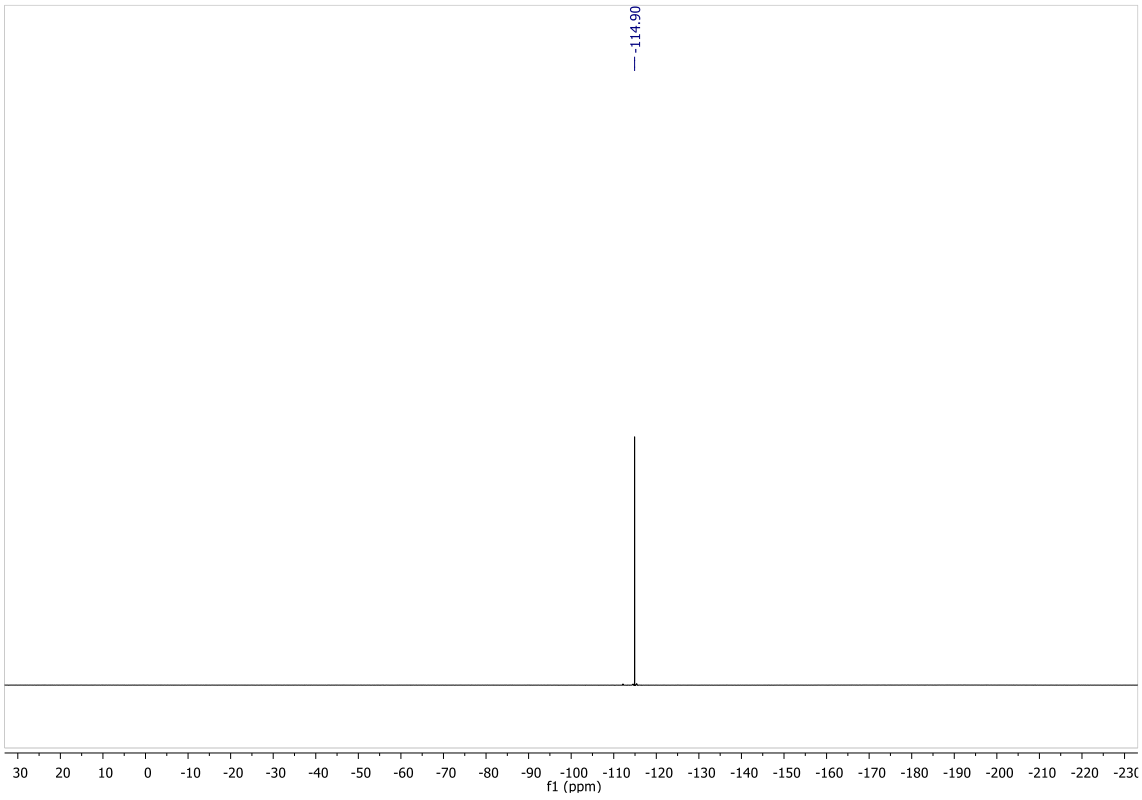
9-(4-(Trifluoromethyl)benzylidene)-9*H*-xanthene (**34g**)



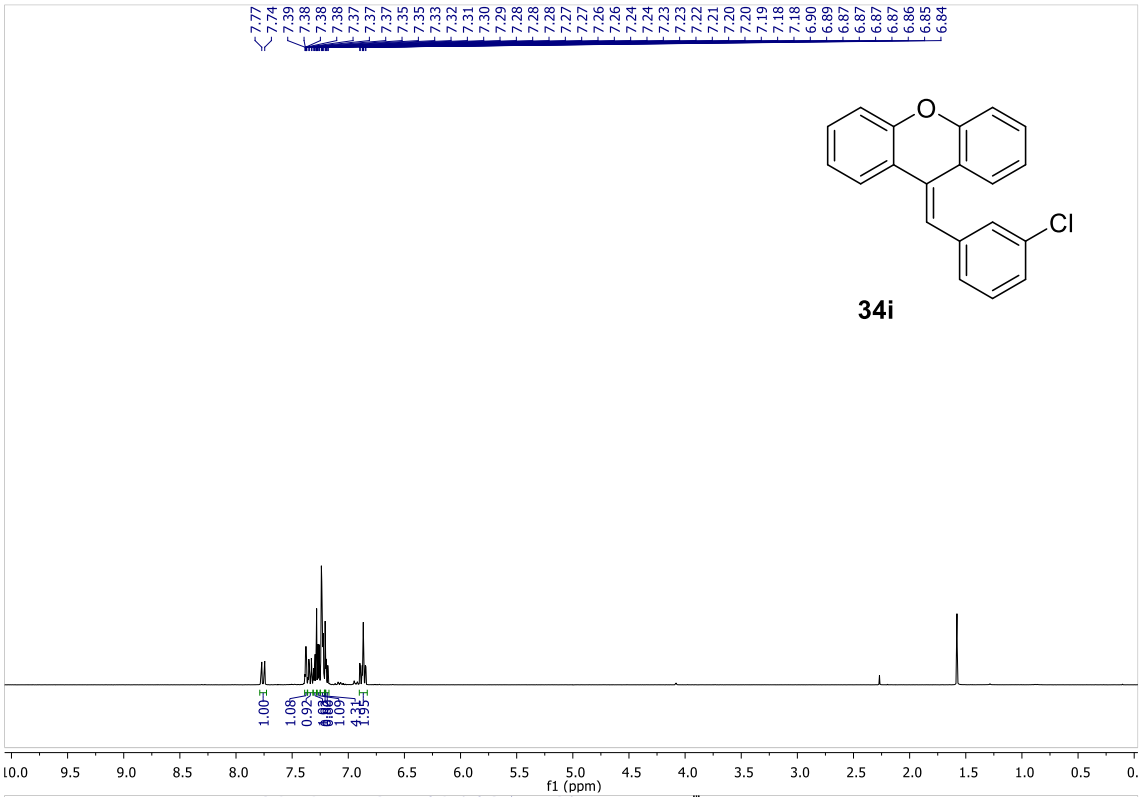

-62.43
30 20 10 0 -10 -20 -30 -40 -50 -60 -70 -80 -90 -100 -110 -120 -130 -140 -150 -160 -170 -180 -190 -200 -210 -220 -230
f1 (ppm)

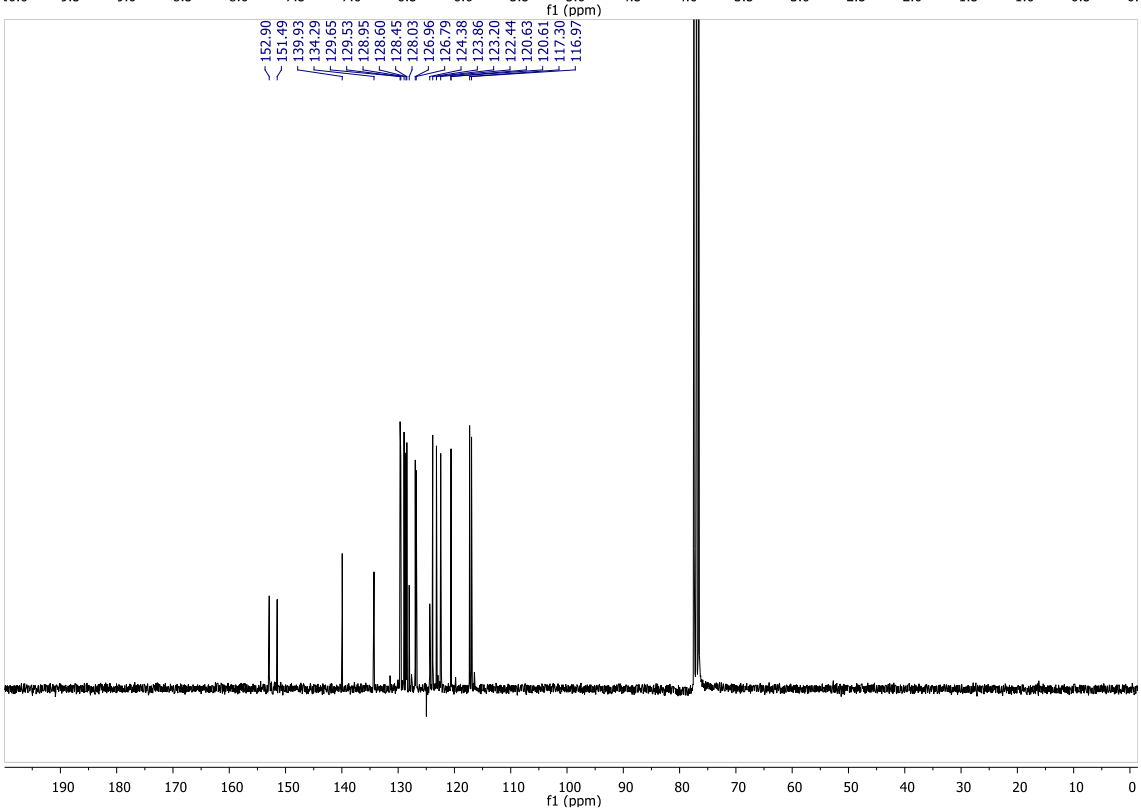
9-(4-Fluorobenzylidene)-9*H*-xanthene (**34h**)



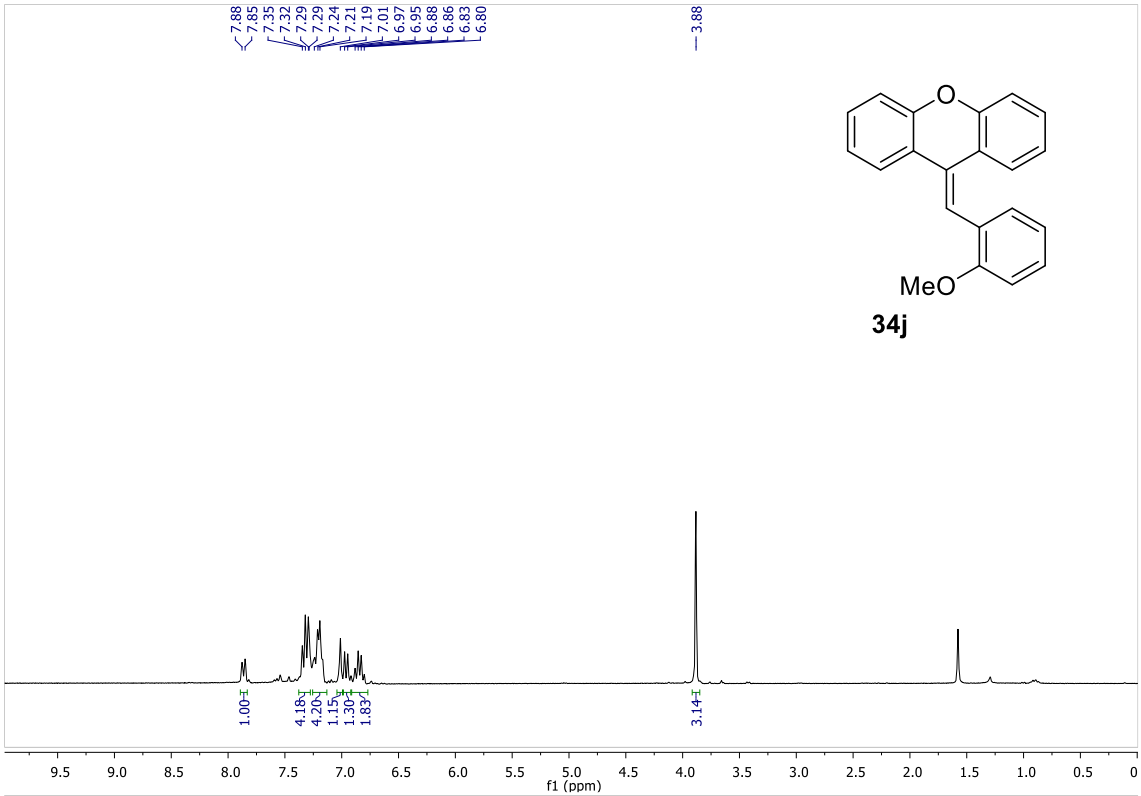

-114.90
30 20 10 0 -10 -20 -30 -40 -50 -60 -70 -80 -90 -100 -110 -120 -130 -140 -150 -160 -170 -180 -190 -200 -210 -220 -230
f1 (ppm)

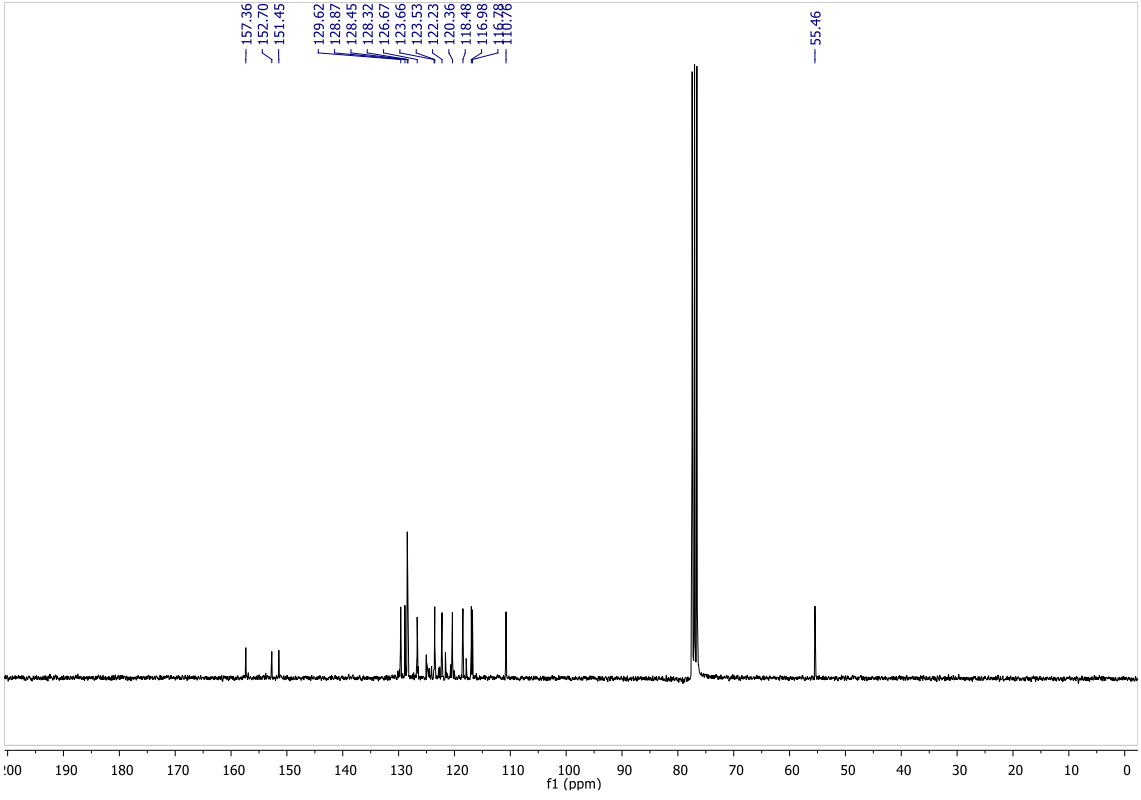
9-(3-Chlorobenzylidene)-9*H*-xanthene (**34i**)



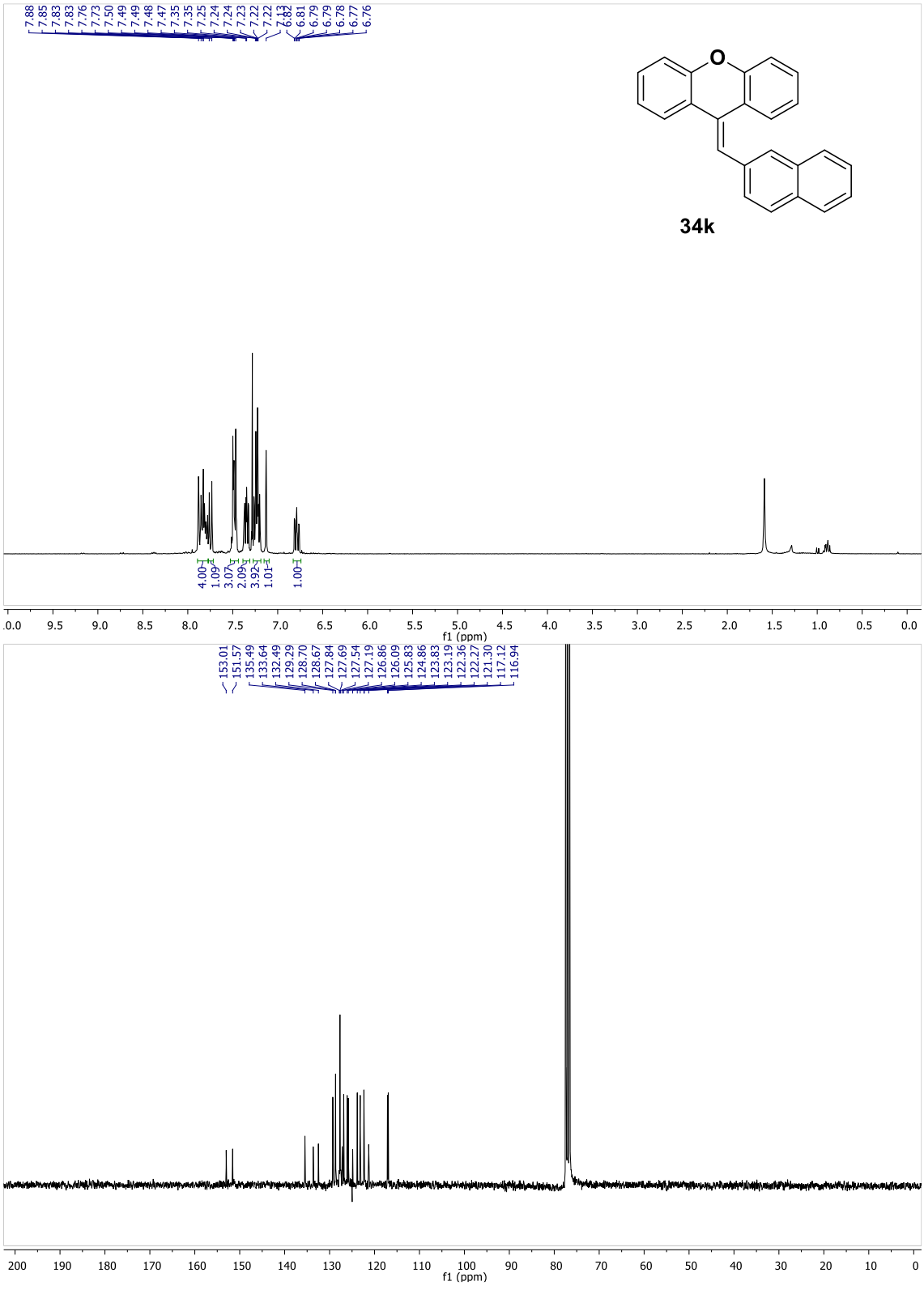



9-(2-Methoxybenzylidene)-9*H*-xanthene (**34j**)

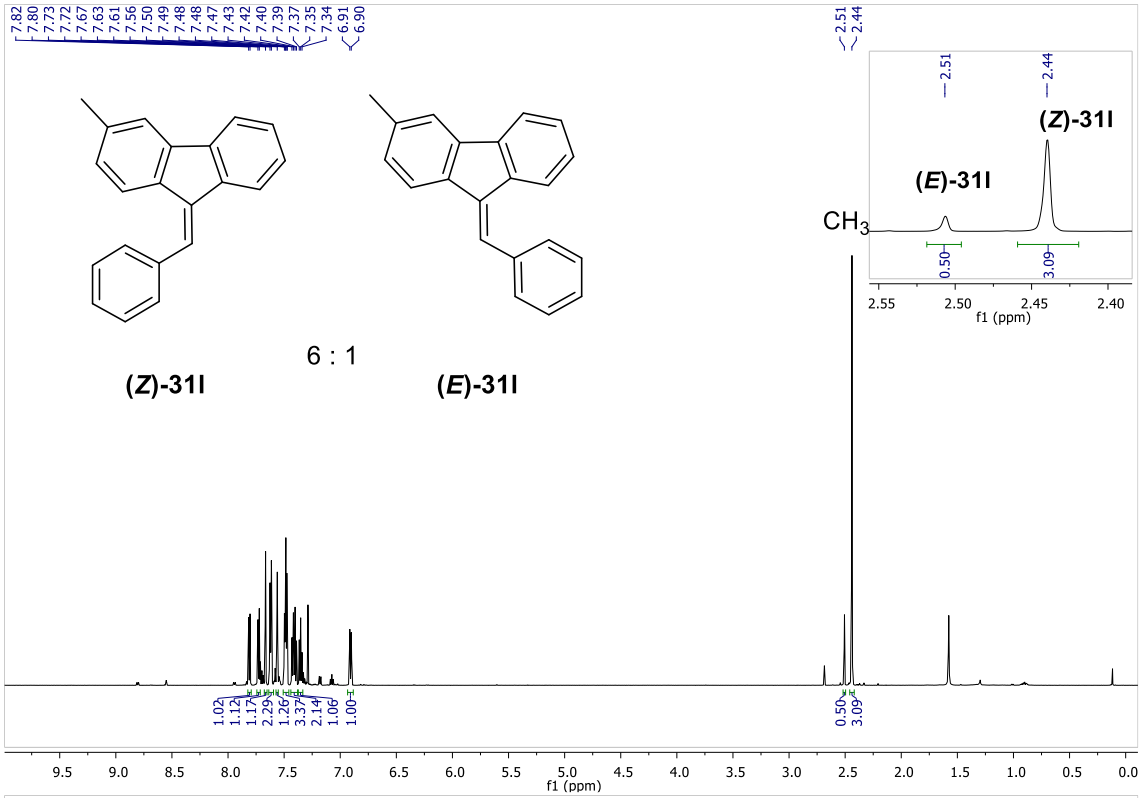


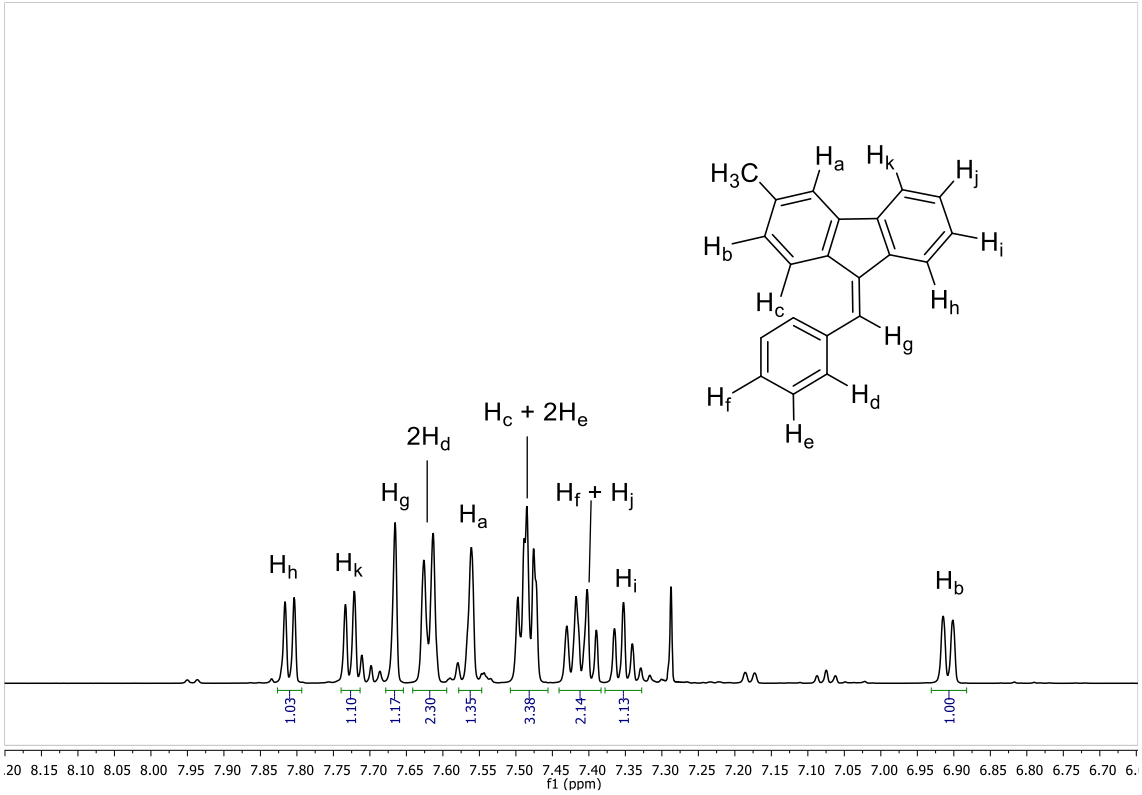



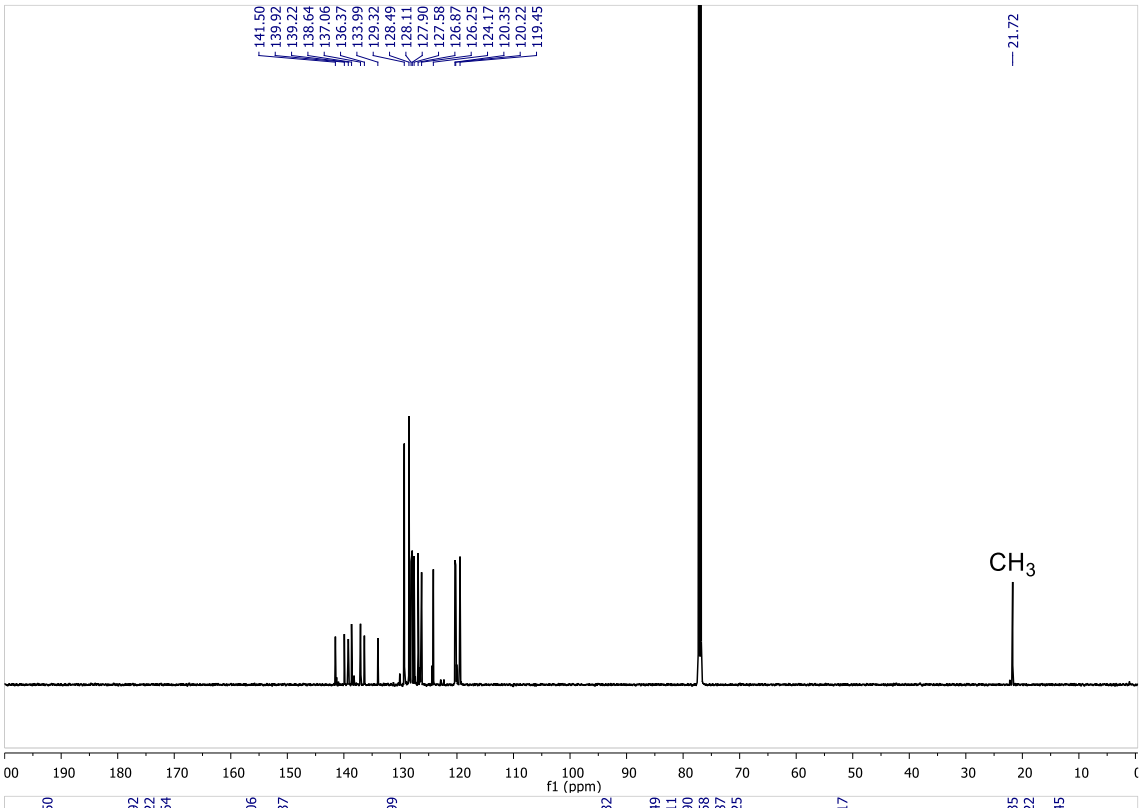
9-(Naphthalen-2-ylmethylene)-9*H*-xanthene (**34k**)

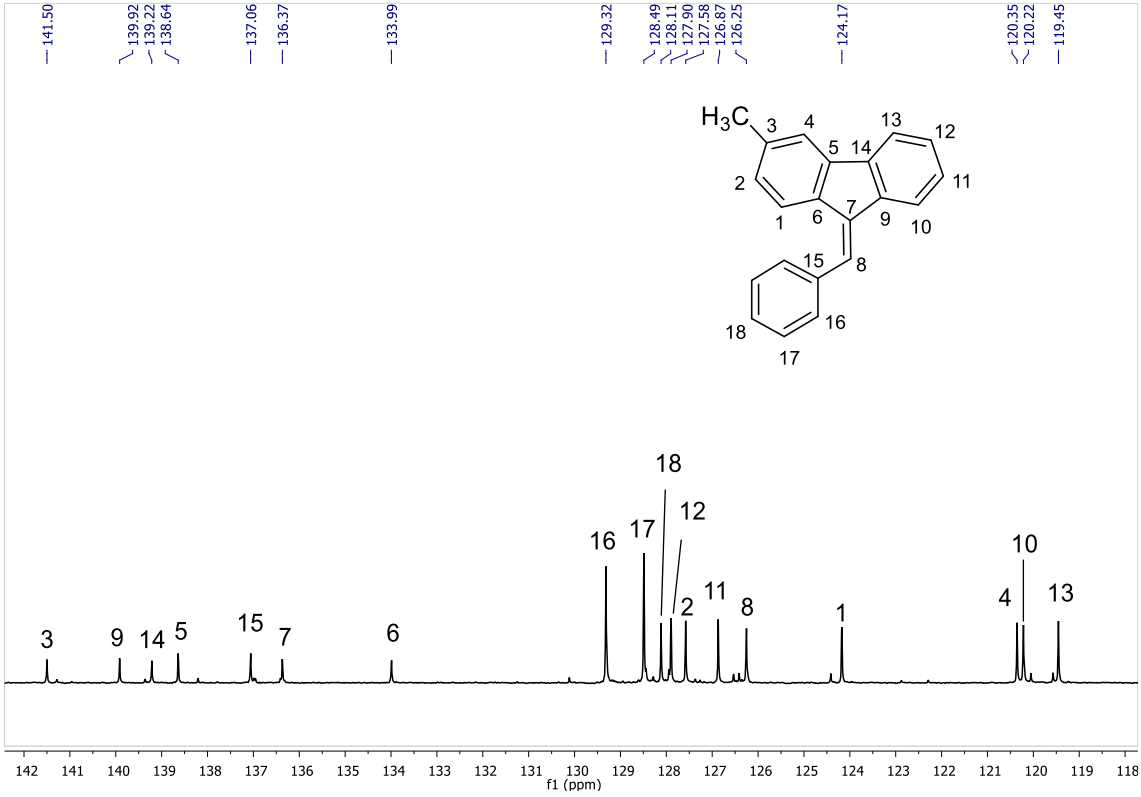


9-Benzylidene-3-methyl-9*H*-fluorene (**31l**) (*Z*)/(*E*), 6: 1

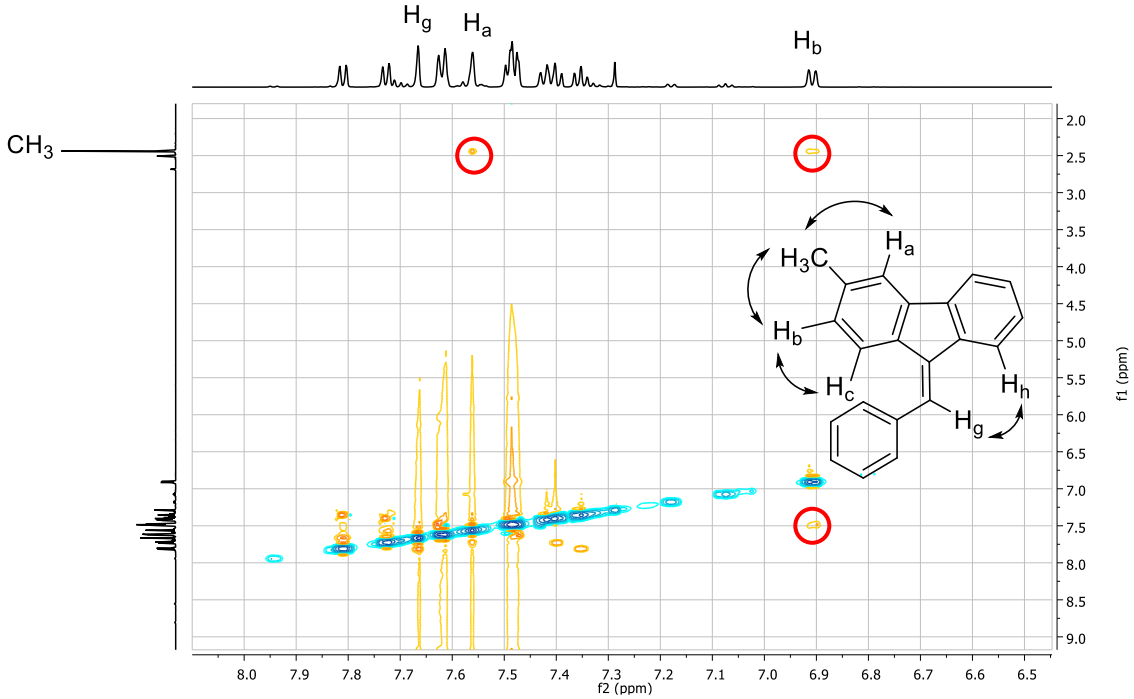


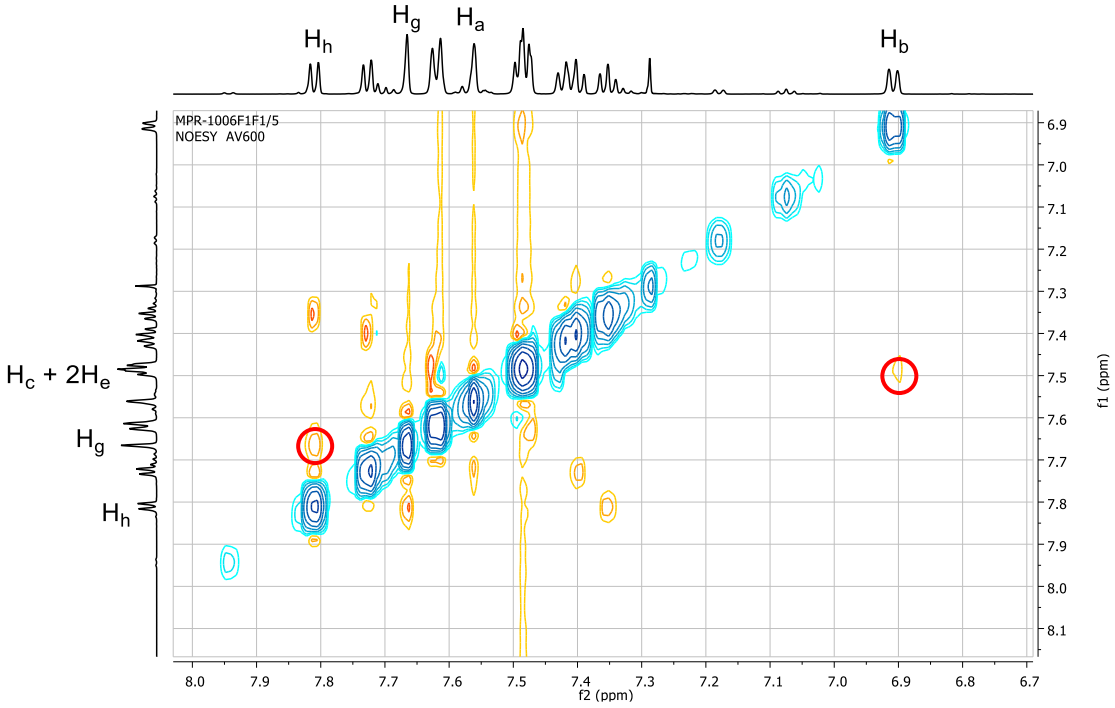




141.50
139.92
139.22
138.64
137.06
136.37
133.99
129.32
128.49
128.11
127.90
127.58
126.87
126.25
124.17
120.35
120.22
119.45
21.72
CH3
f1 (ppm)

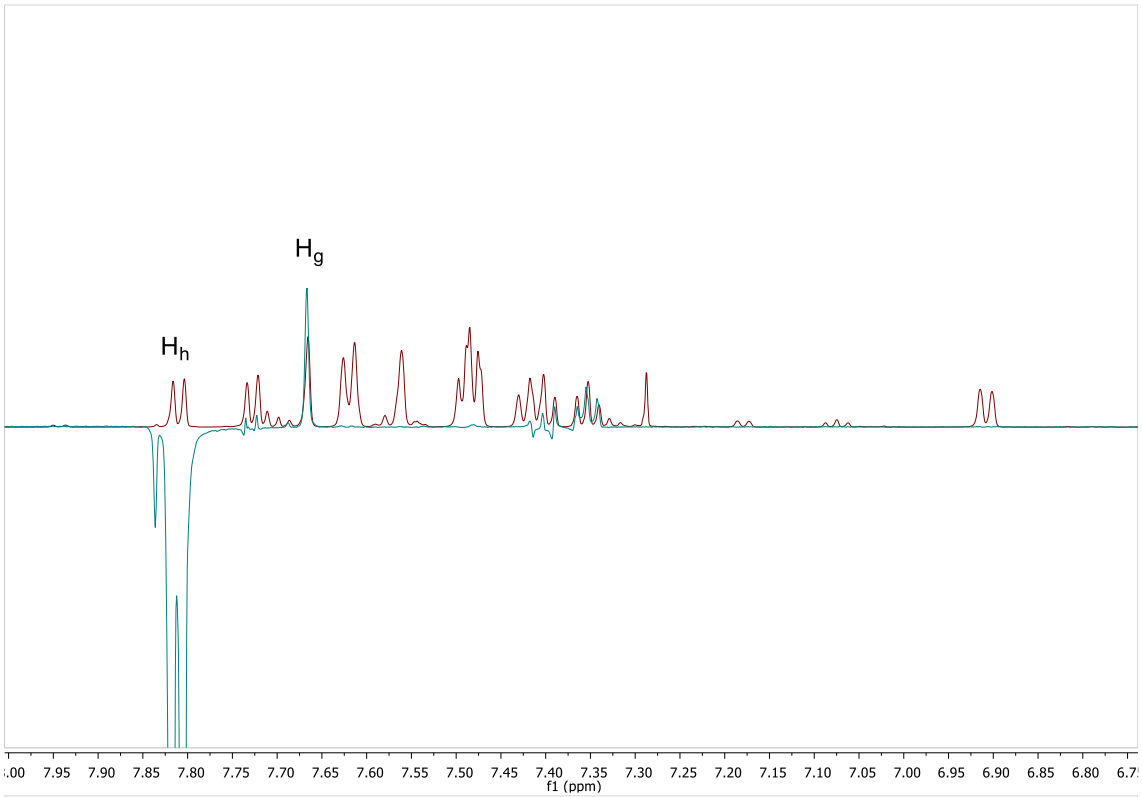

141.50
139.92
139.22
138.64
137.06
136.37
133.99
129.32
128.49
128.11
127.90
127.58
126.87
126.25
124.17
120.35
120.22
119.45
H3C
3
4
5
14
13
12
11
2
1
6
7
9
10
15
8
16
18
17
3
9
14
5
15
7
6
16
17
18
12
2
11
8
1
4
10
13
f1 (ppm)

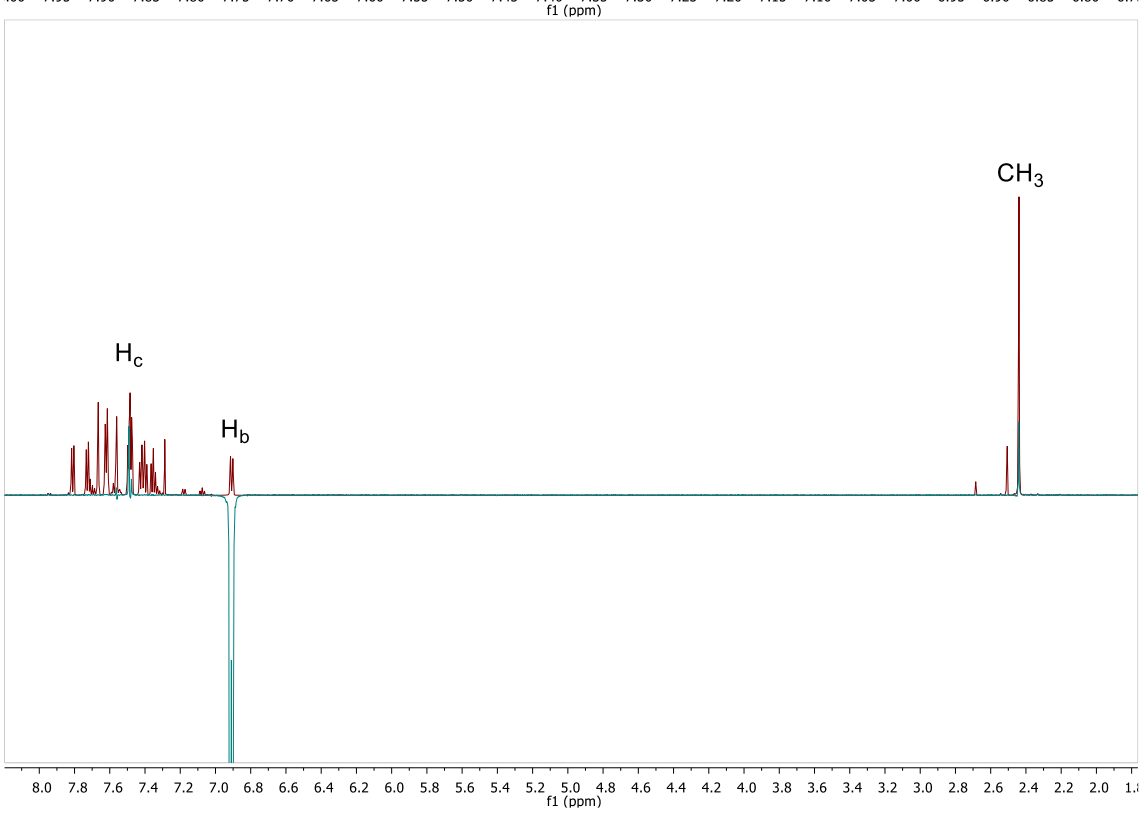
NOESY

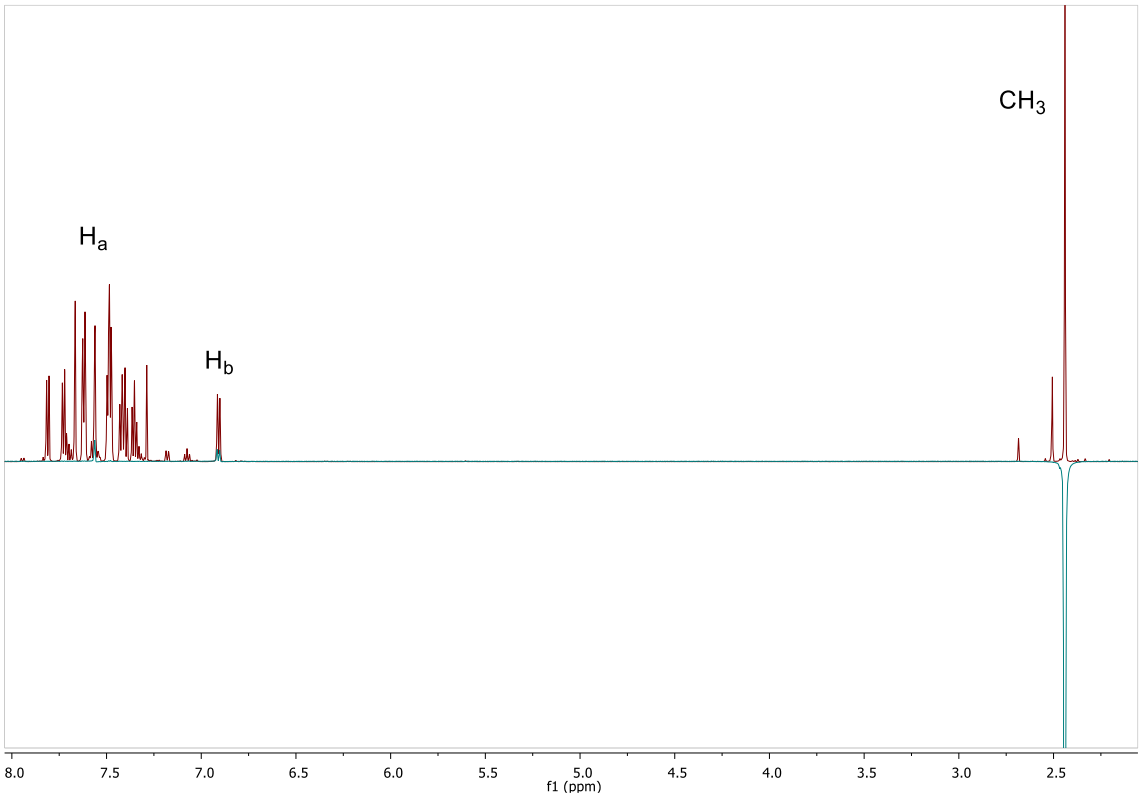

Hg
Ha
Hb
CH3
H3C
Ha
Hb
Hc
Hh
Hg
f1 (ppm)
f2 (ppm)


Hh
Hg
Ha
Hb
MPR-1006F1F1/5
NOESY AV600
Hc + 2He
Hg
Hh
f1 (ppm)
f2 (ppm)

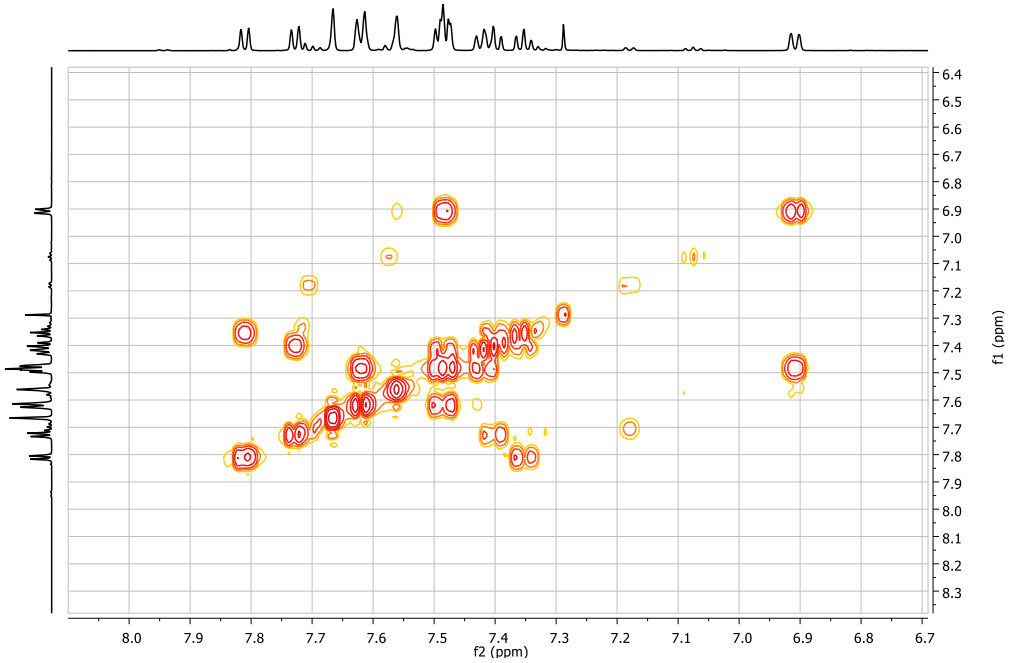
Selective NOE



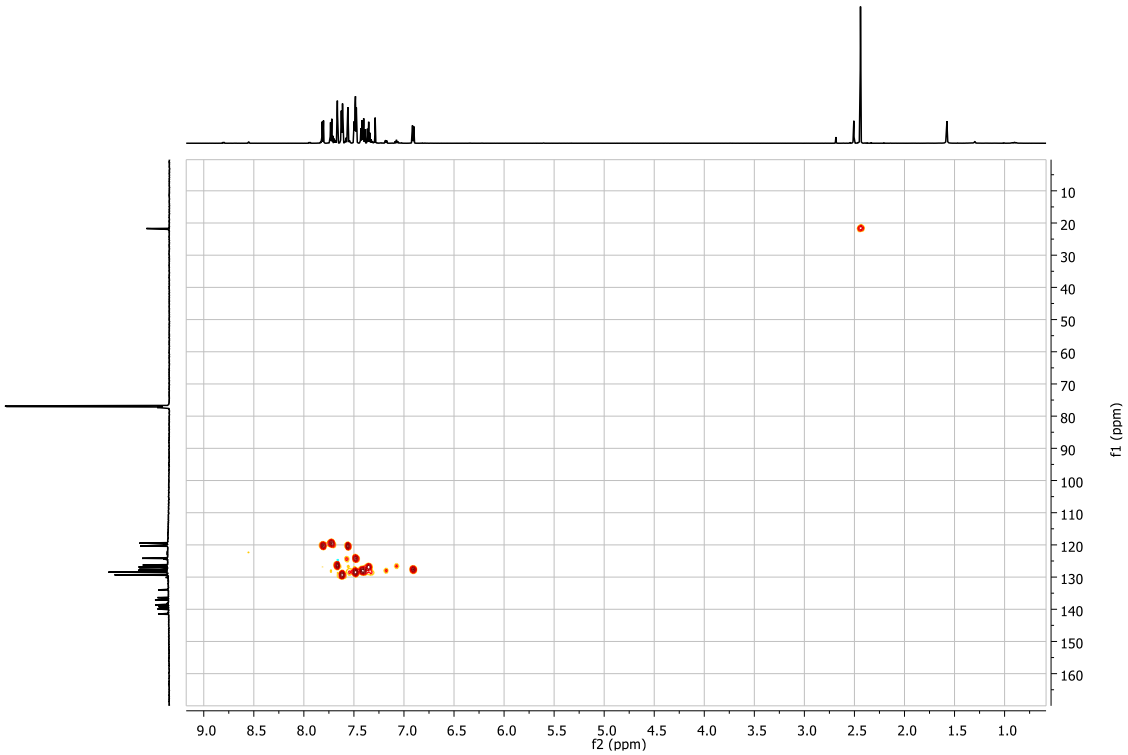



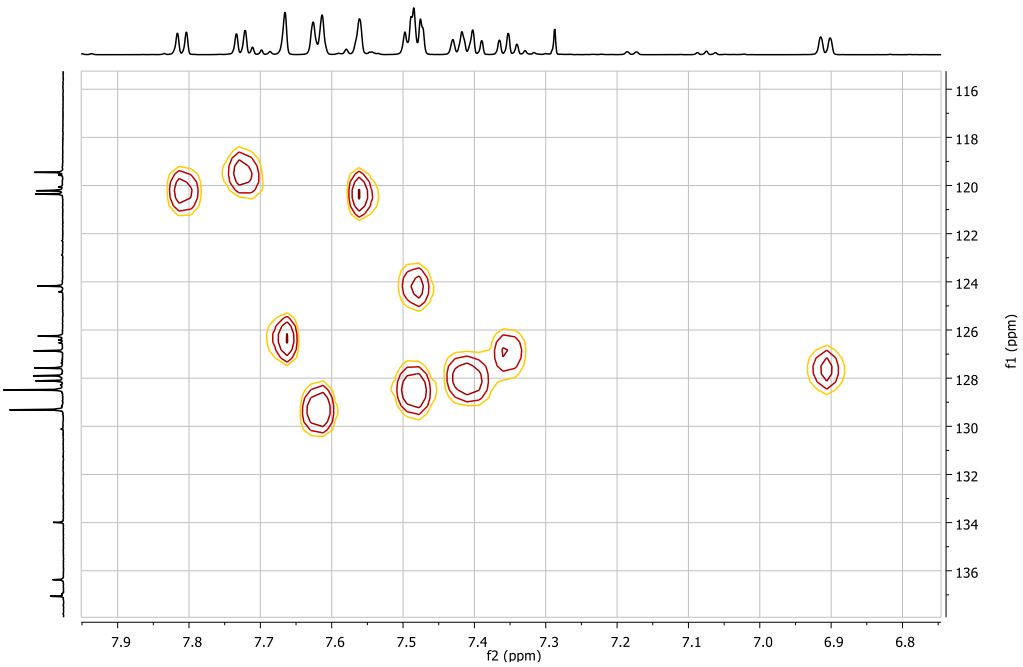

CH3
Ha
Hb
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
f1 (ppm)

COSY

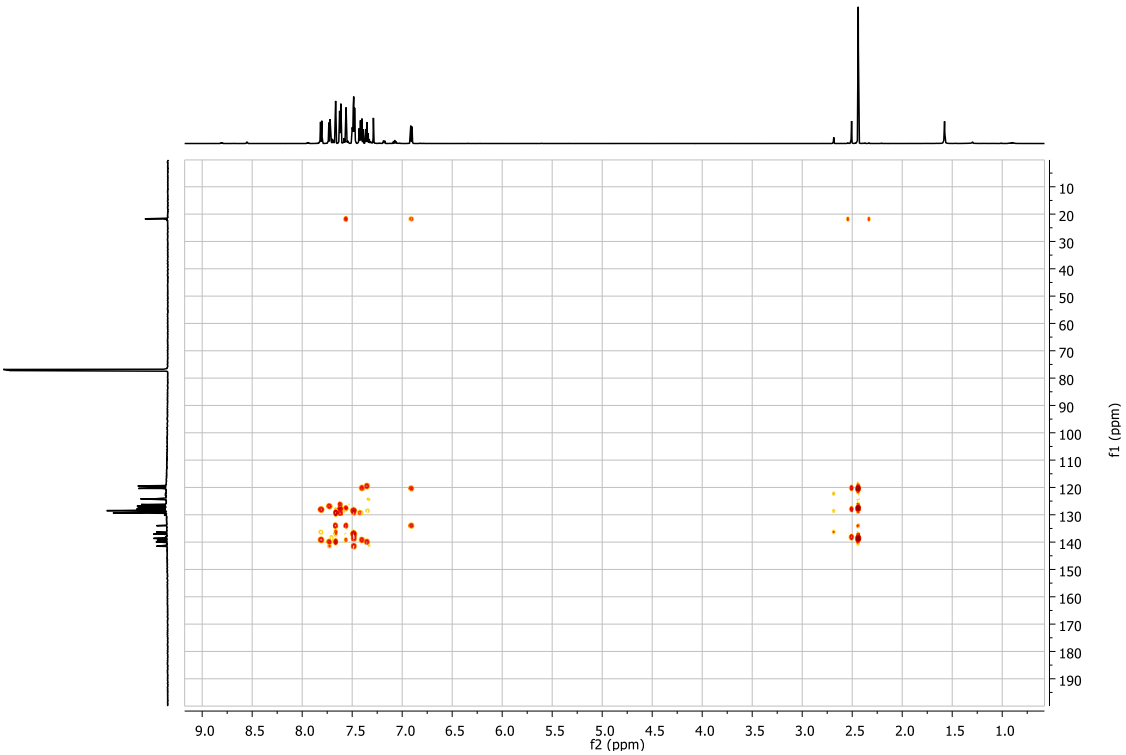

6.4
6.5
6.6
6.7
6.8
6.9
7.0
7.1
7.2
7.3
7.4
7.5
7.6
7.7
7.8
7.9
8.0
8.1
8.2
8.3
f1 (ppm)
8.0
7.9
7.8
7.7
7.6
7.5
7.4
7.3
7.2
7.1
7.0
6.9
6.8
6.7
f2 (ppm)

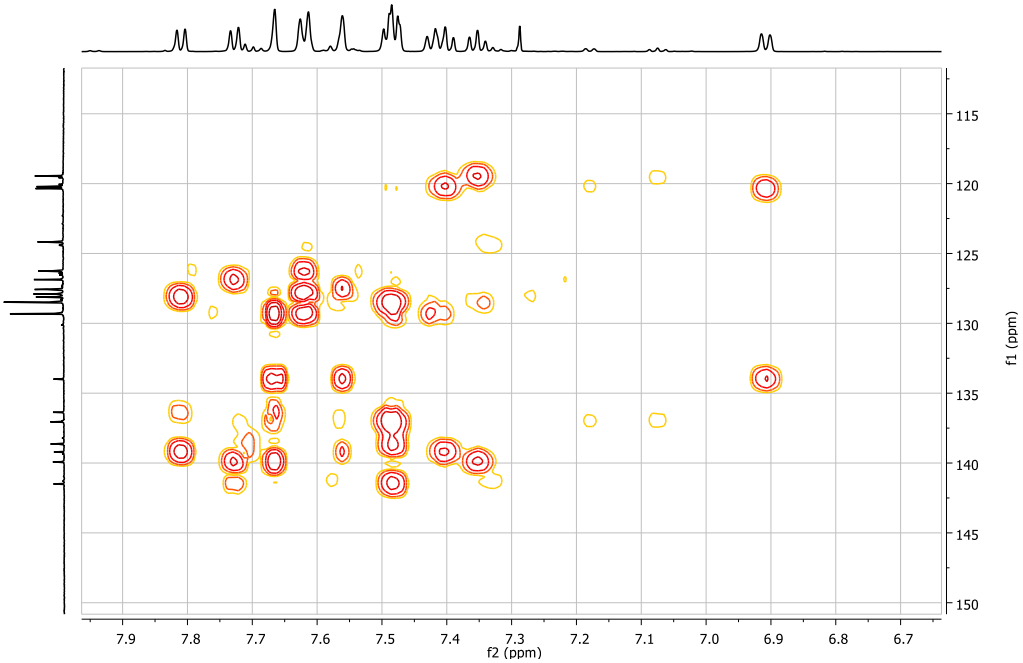
HSQC



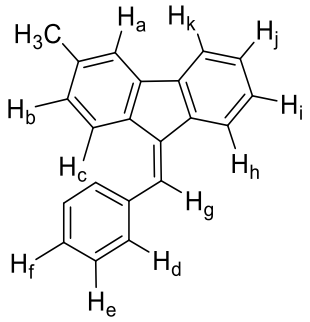



HMBC


10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190
f1 (ppm)
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
f2 (ppm)


115
120
125
130
135
140
145
150
f1 (ppm)
7.9
7.8
7.7
7.6
7.5
7.4
7.3
7.2
7.1
7.0
6.9
6.8
6.7
f2 (ppm)

The proposal of the stereochemistry of the (*Z*)-isomer as the major diastereoisomer is supported by the 2D NMR experiments presented above.




Some representative signals from NOESY and Selective NOE experiments:

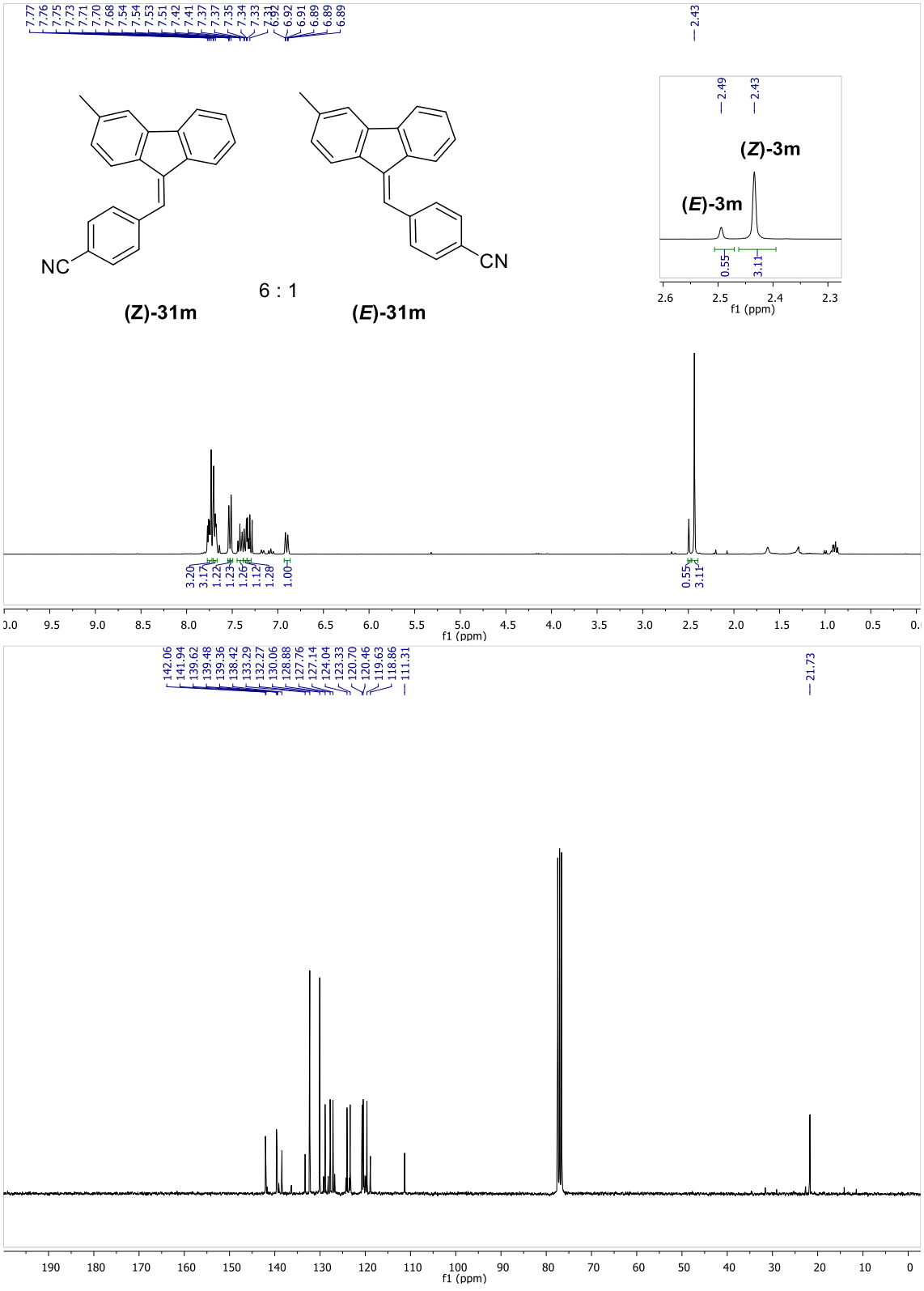
Cross-peaks between $CH_3$ (2.44 ppm) and $H_a$ (7.56 ppm) and $H_b$ (6.90 ppm) respectively.

Cross-peaks between $H_b$ (6.90 ppm) and $CH_3$ (2.44 ppm) and $H_c$ (7.49 ppm) respectively.

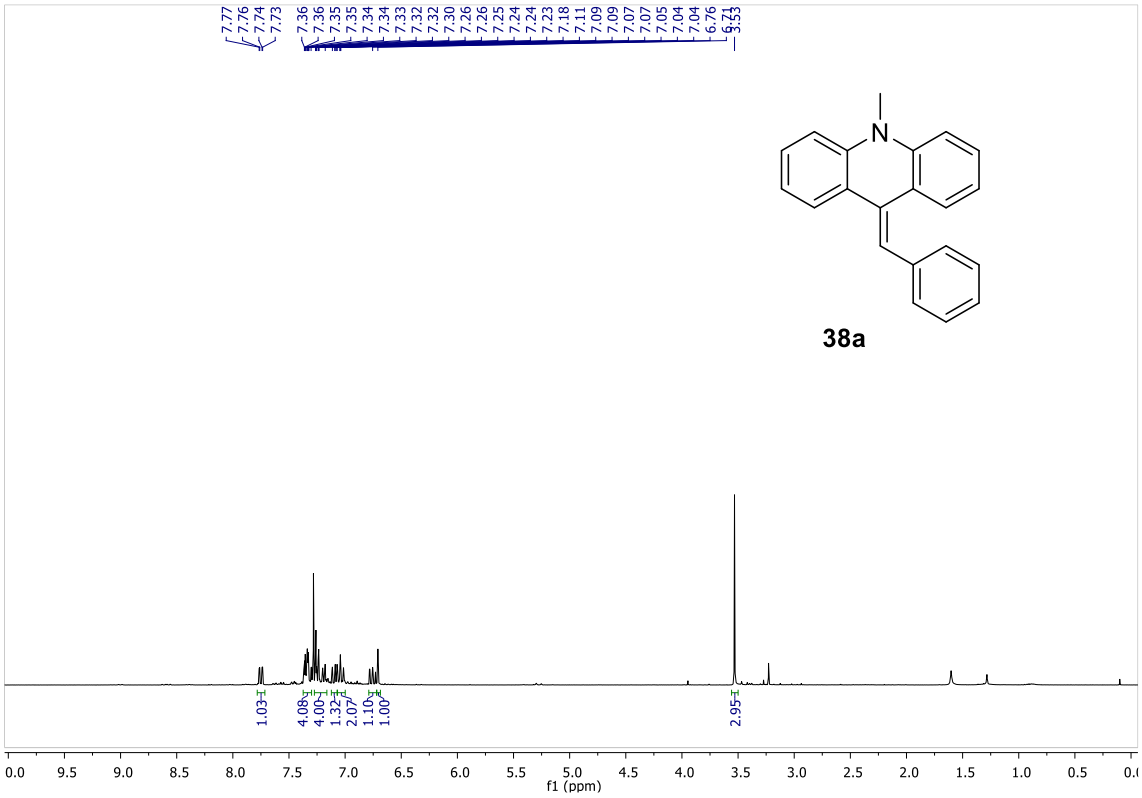
Cross-peaks between $H_h$ (7.80 ppm) and $H_g$ (7.67 ppm) respectively.

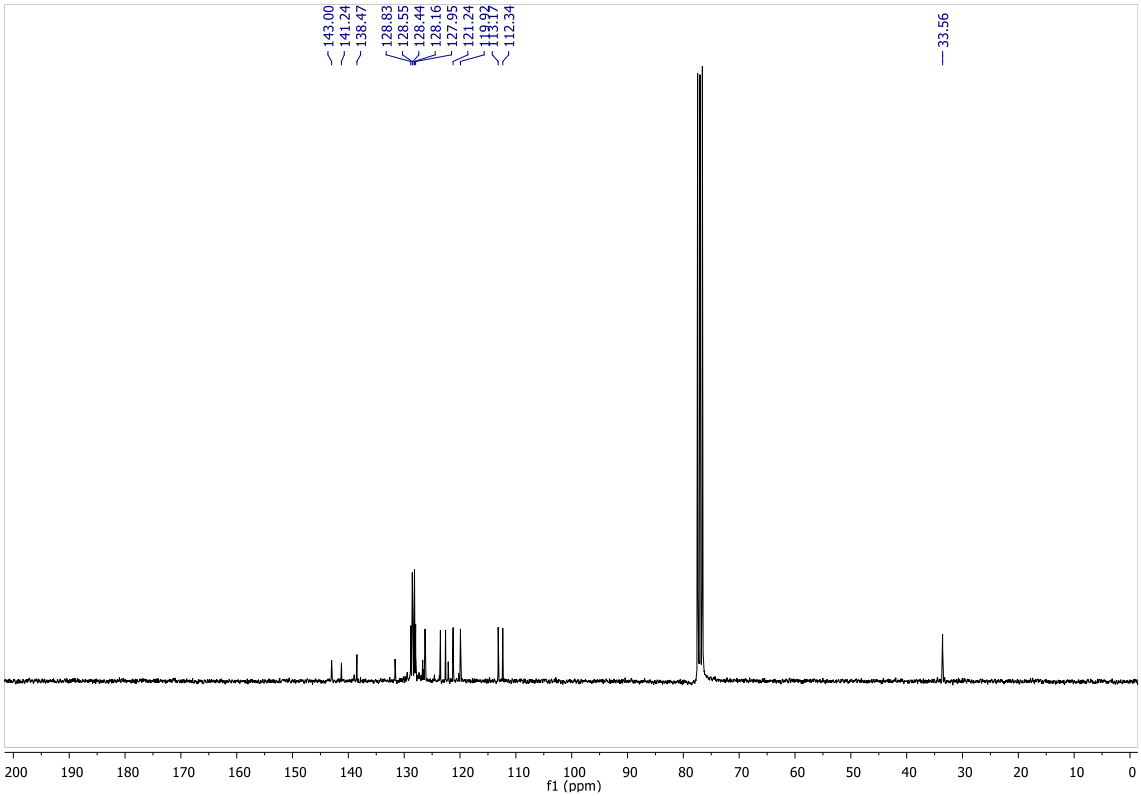
The presence of NOE between $H_g$-$H_h$ establishes the (*Z*) configuration for the major isomer.

4-((3-Methyl-9*H*-fluoren-9-ylidene)methyl)benzonitrile (**31m**)

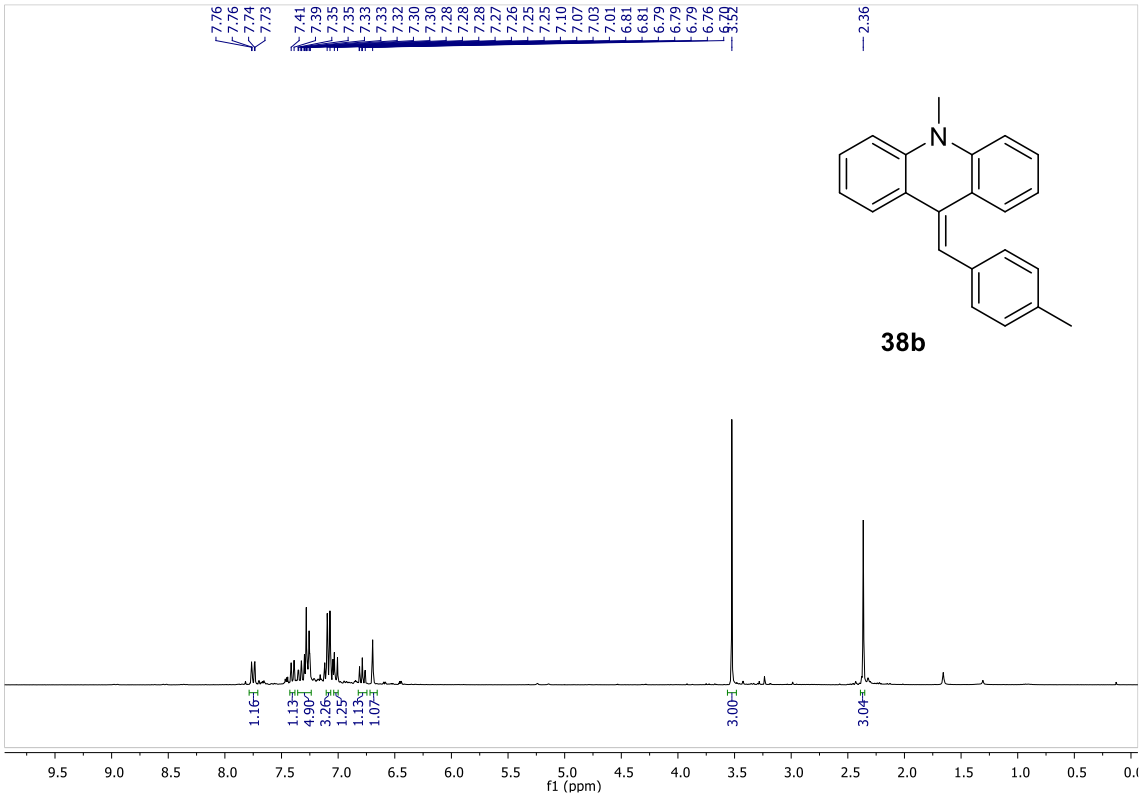


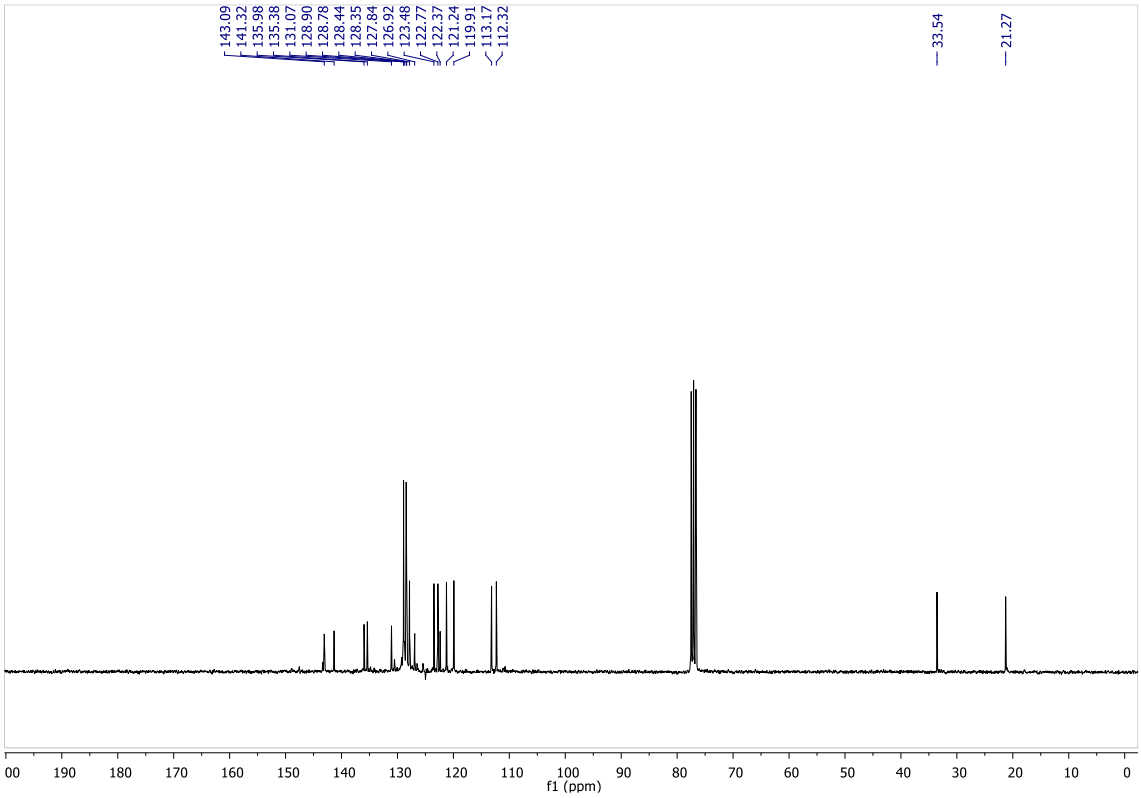
9-Benzylidene-10-methyl-9,10-dihydroacridine (**38a**)



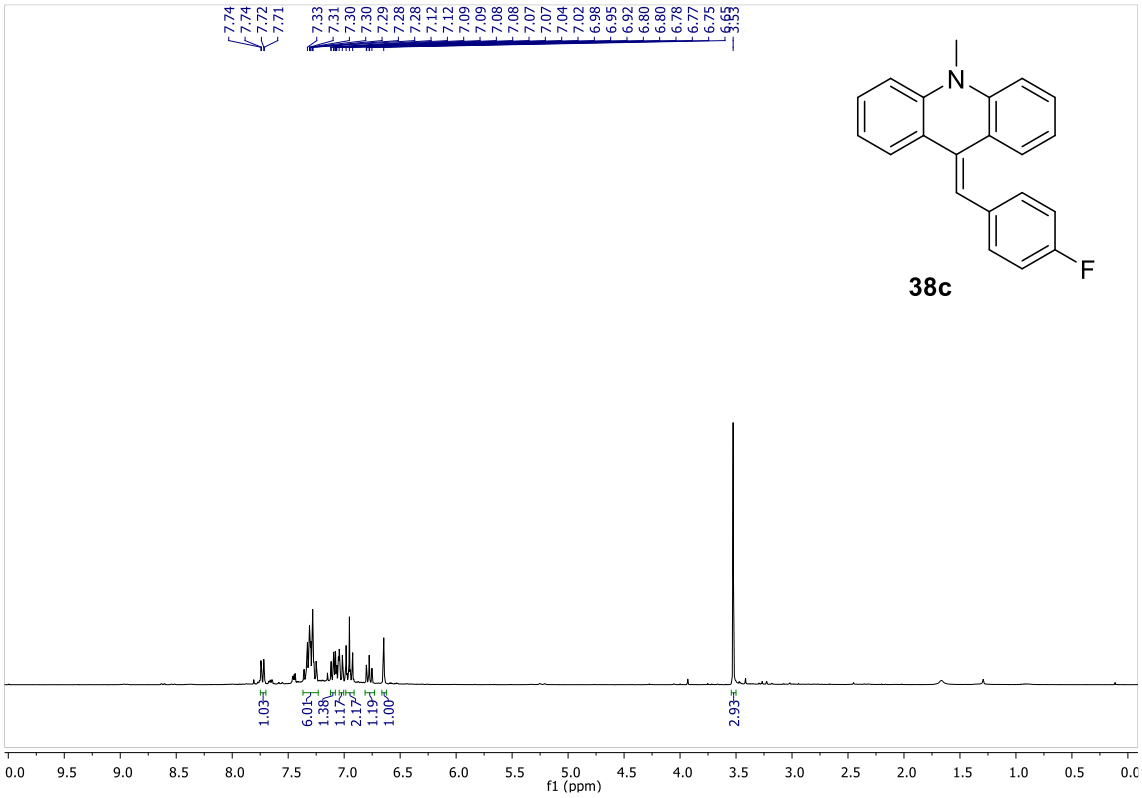



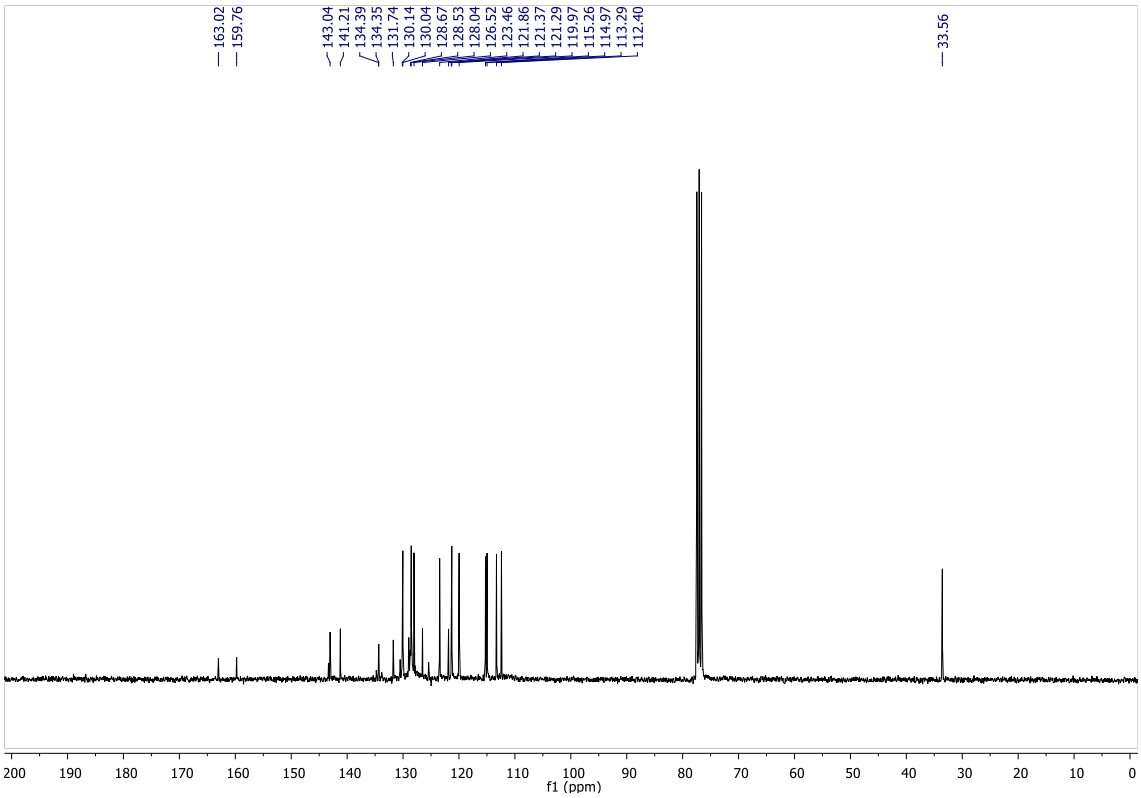
10-Methyl-9-(4-methylbenzylidene)-9,10-dihydroacridine (**38b**)

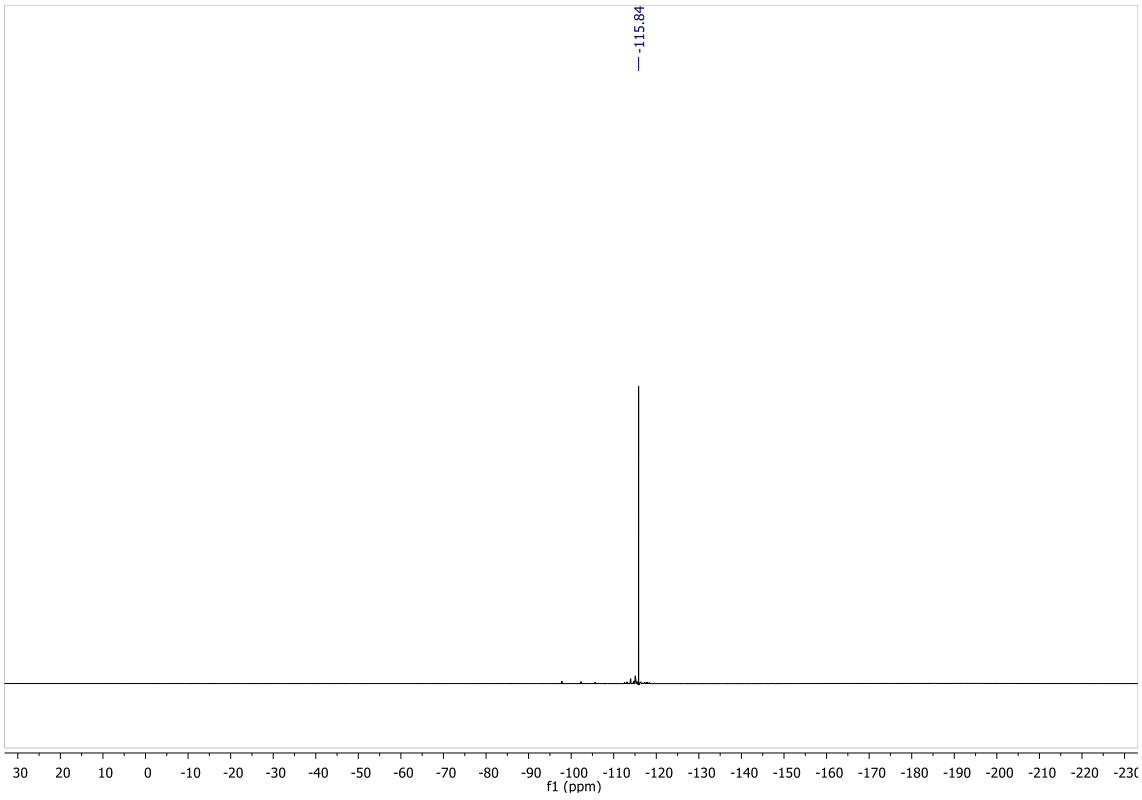


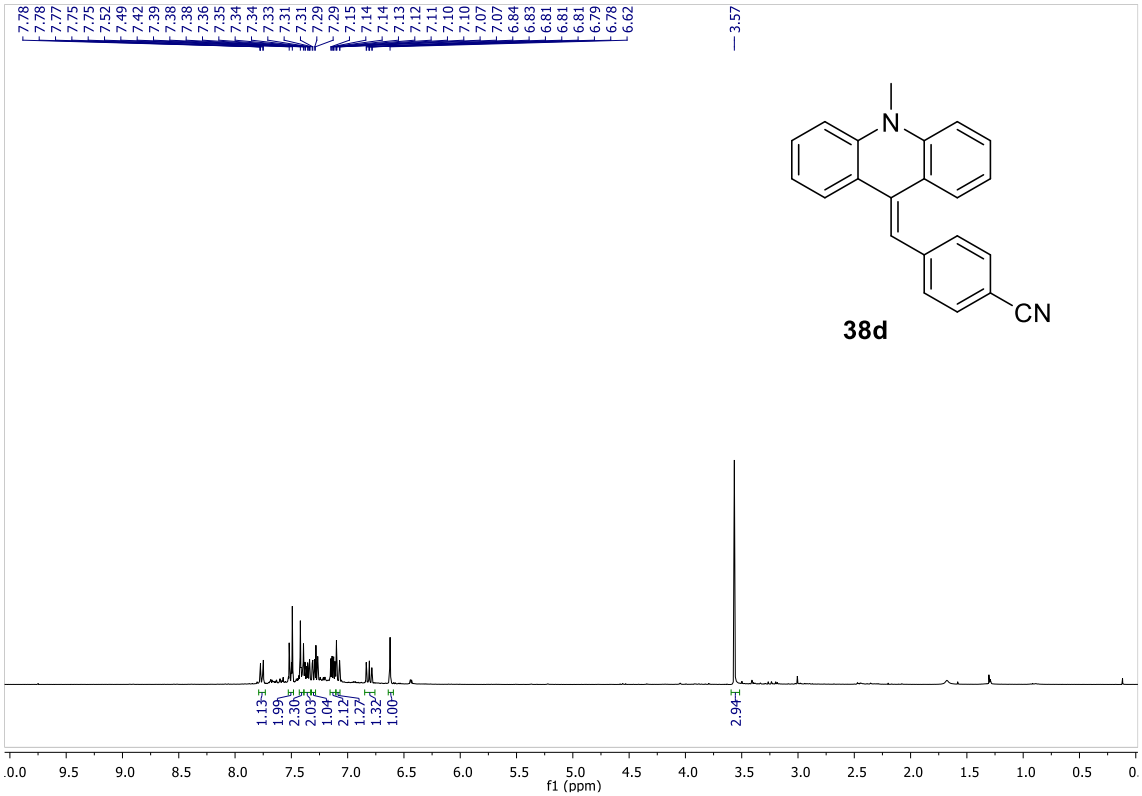
9-(4-Fluorobenzylidene)-10-methyl-9,10-dihydroacridine (**38c**)

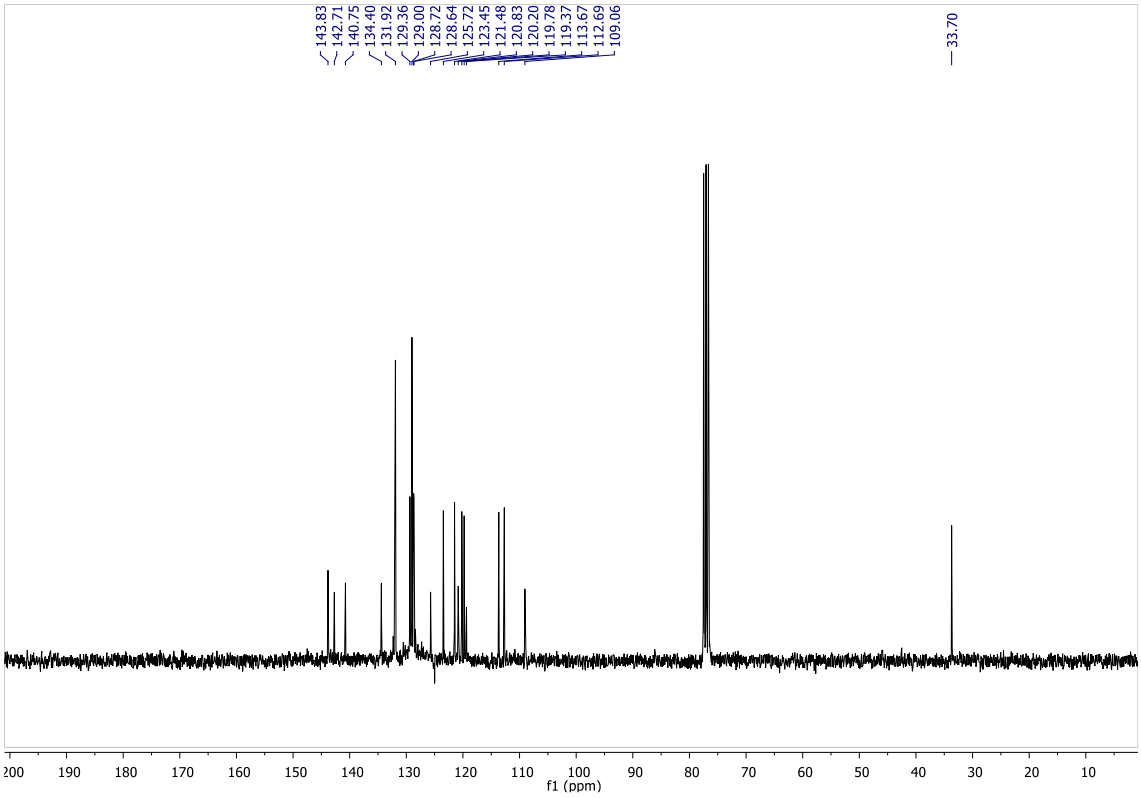


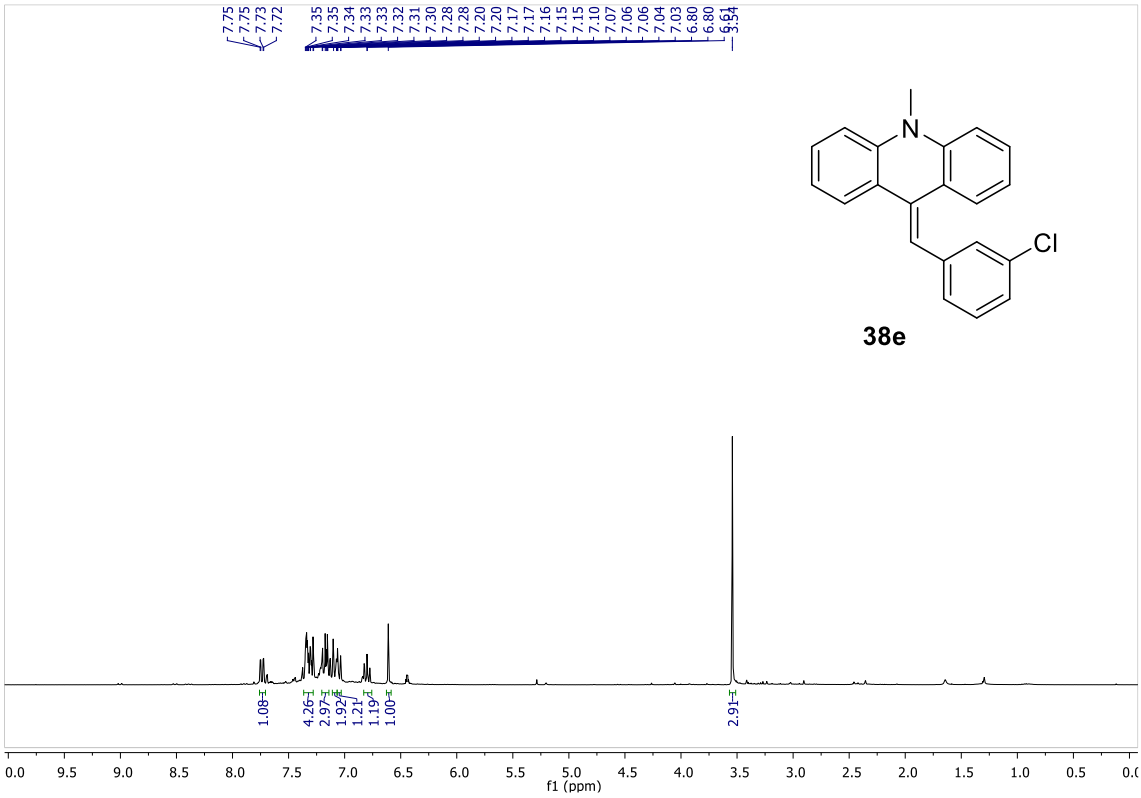

-115.84
30 20 10 0 -10 -20 -30 -40 -50 -60 -70 -80 -90 -100 -110 -120 -130 -140 -150 -160 -170 -180 -190 -200 -210 -220 -230
f1 (ppm)

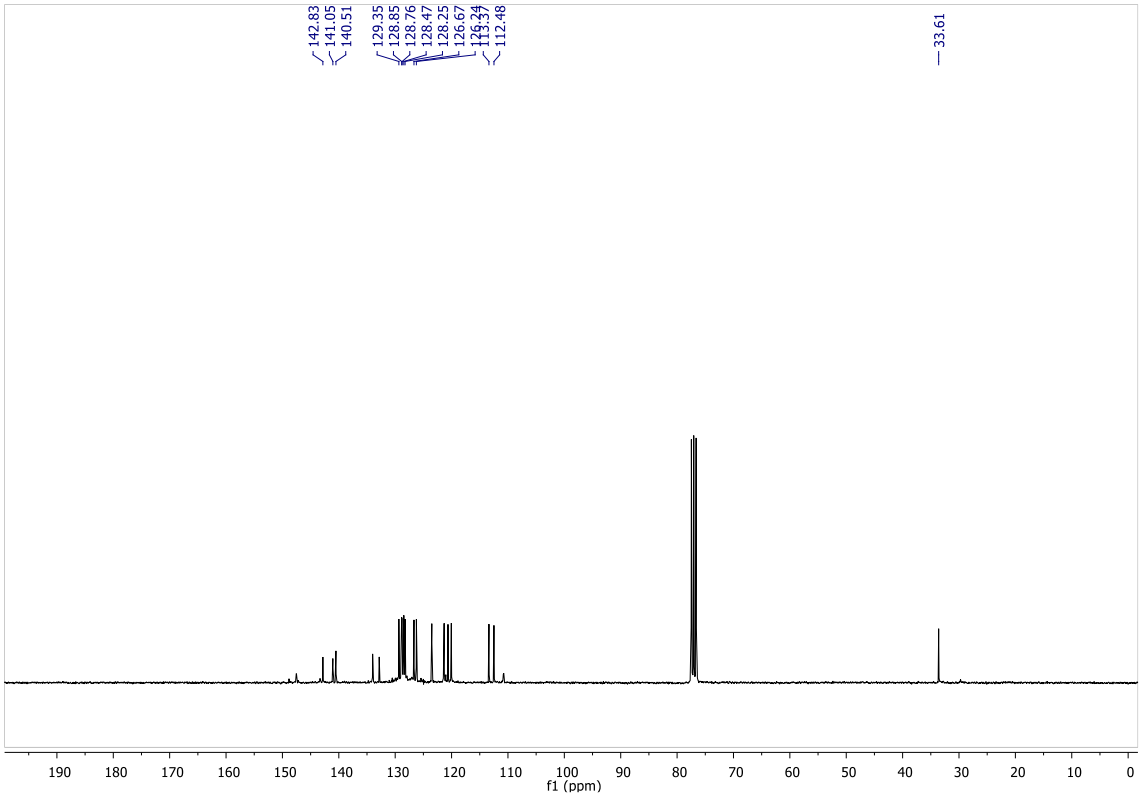
4-((10-Methylacridin-9(10*H*)-ylidene)methyl)benzonitrile (**38d**)



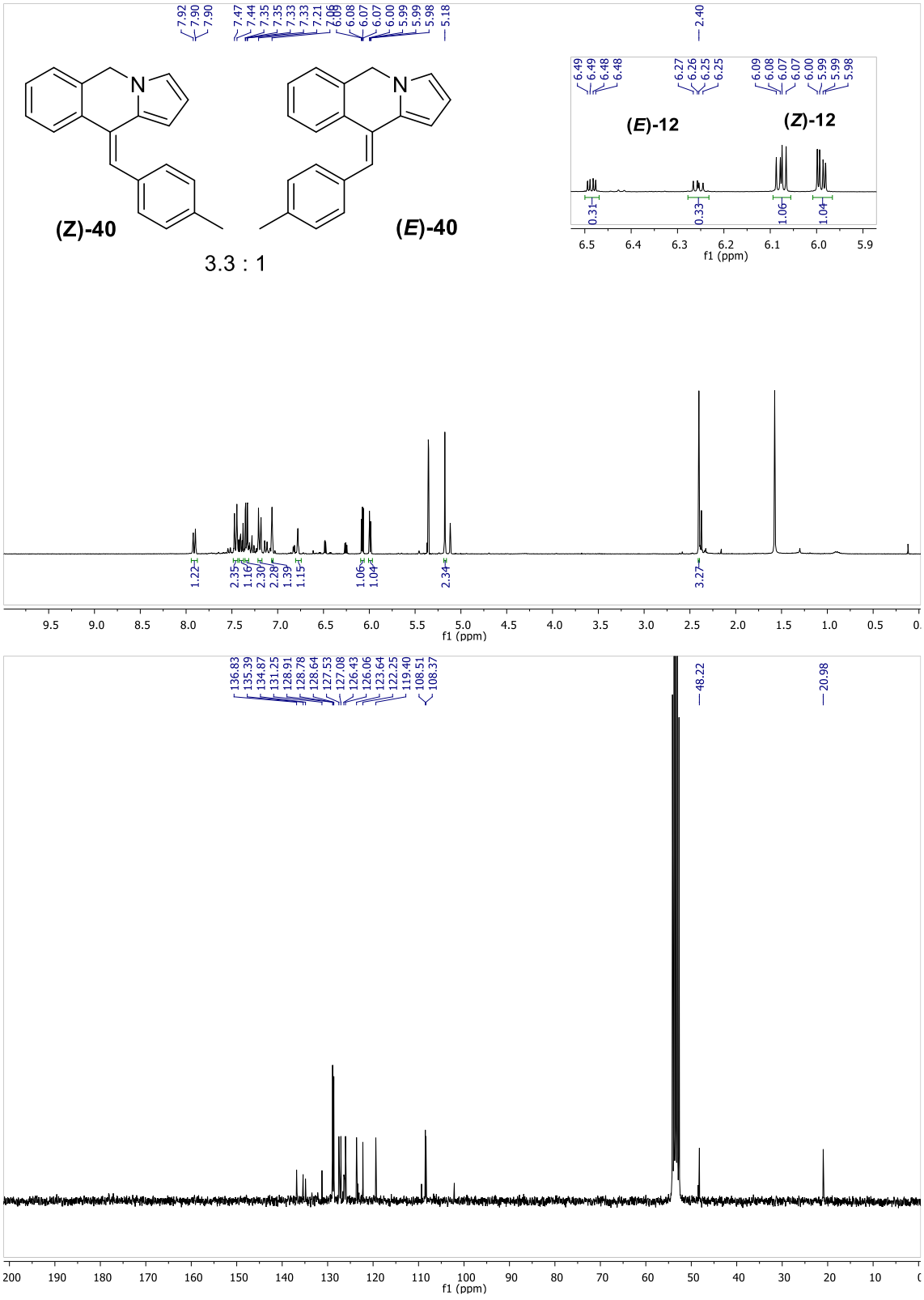



9-(3-Chlorobenzylidene)-10-methyl-9,10-dihydroacridine (**38e**)

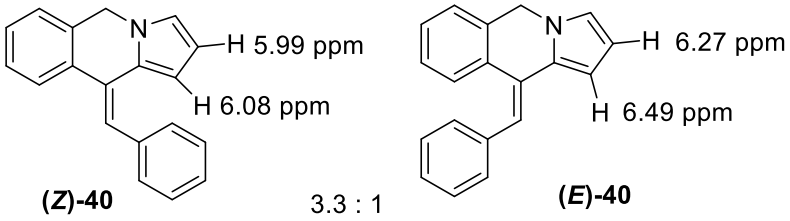


10-(4-Methylbenzylidene)-5,10-dihydropyrrolo[1,2-b]isoquinoline (**40**)

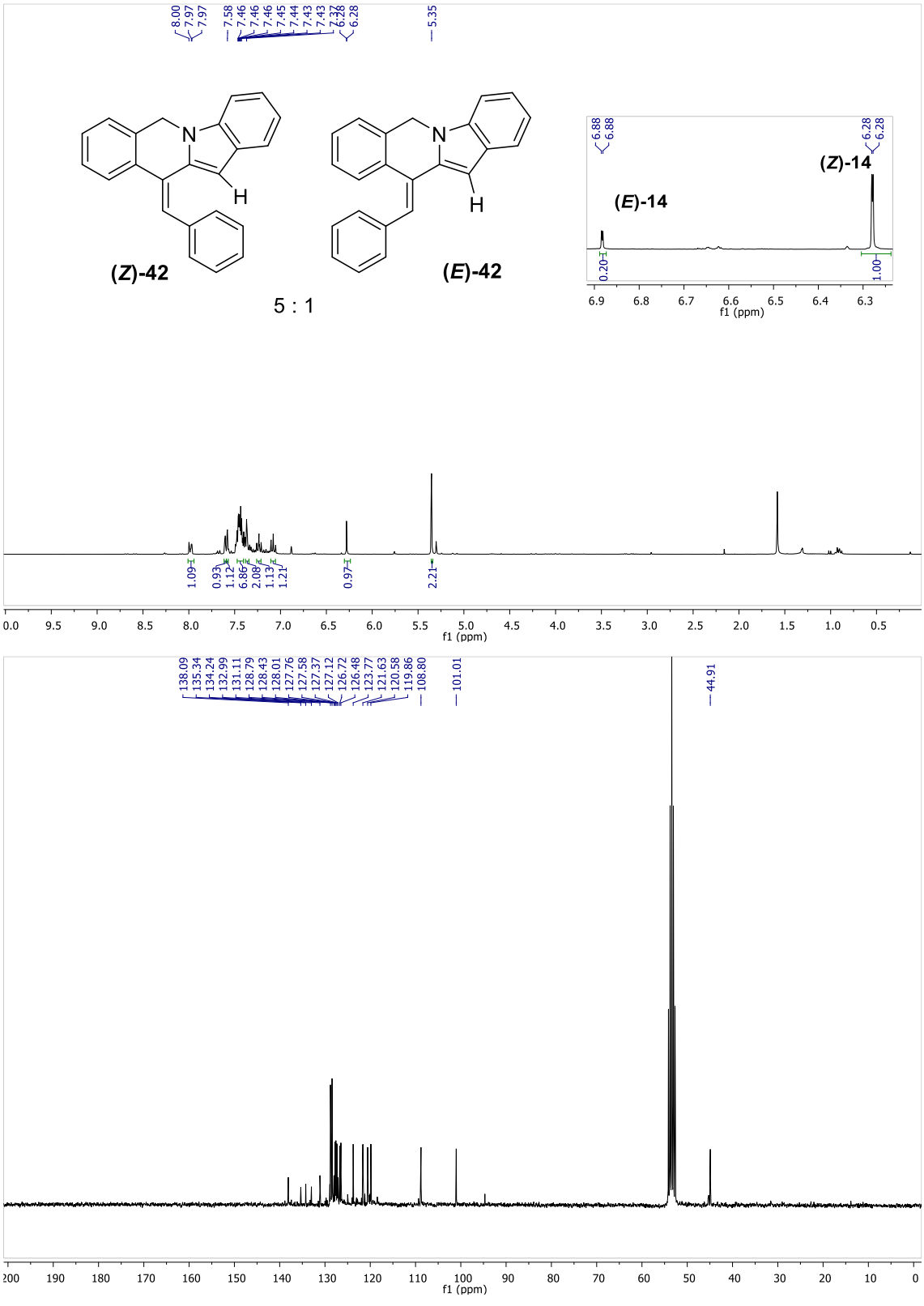


The stereochemistry of the major isomer was established by analogy with the results of compounds **31**. Moreover, the higher shielding observed in the $^{1}H$ NMR spectra for the signals of the pyrrole ring in the major isomer (5.99 and 6.08 major isomer, 6.26 and 6.48 minor isomer) is consistent of the shielding effect due to the presence of the phenyl ring in the same side, and therefore supports the stereochemistry proposed.

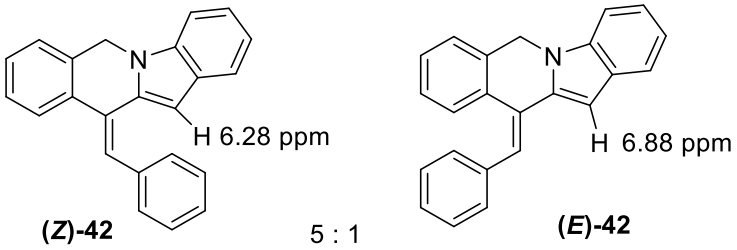



(*Z*)-40 3.3 : 1 (*E*)-40

11-Benzylidene-6,11-dihydroindolo[1,2-b]isoquinoline (**42**)

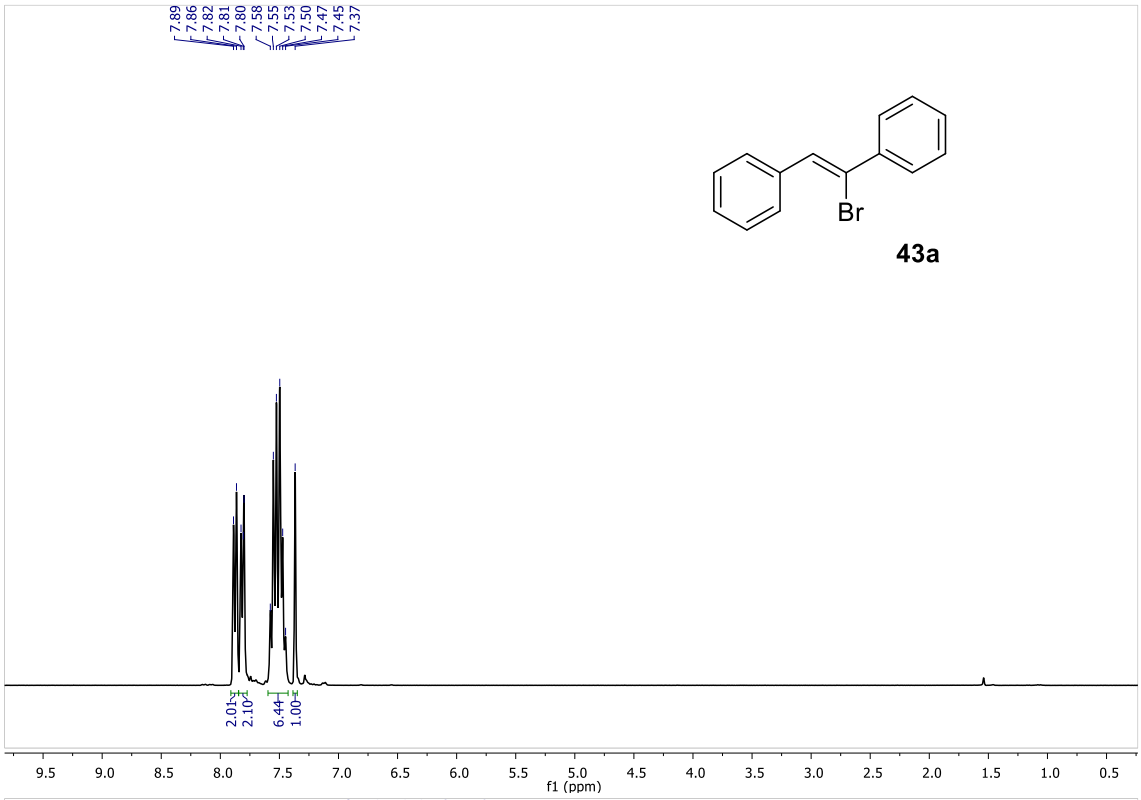


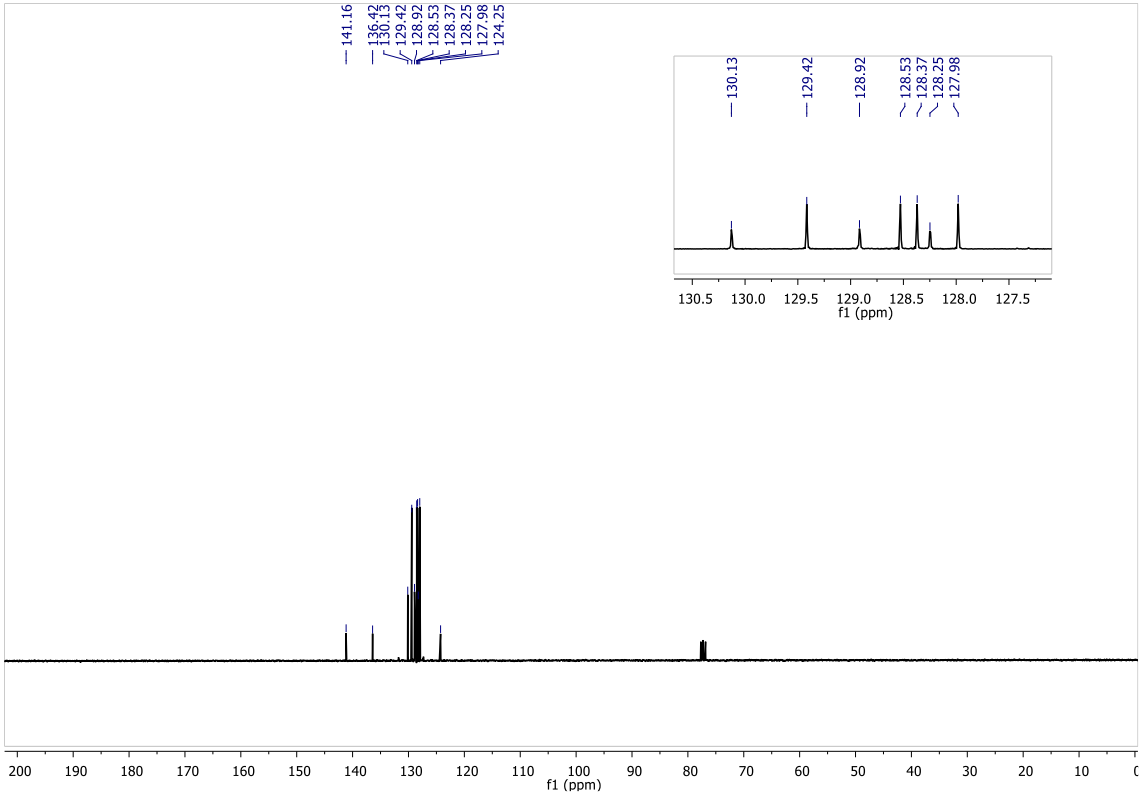
The stereochemistry of the major isomer was established by analogy with the results of compounds **31**. Moreover, the higher shielding observed in the $^{1}$H NMR spectra for the signal at C12 in the major isomer (6.28 major isomer, 6.88 minor isomer) is consistent of the shielding effect due to the presence of the phenyl ring in the same side, and therefore supports the stereochemistry proposed.



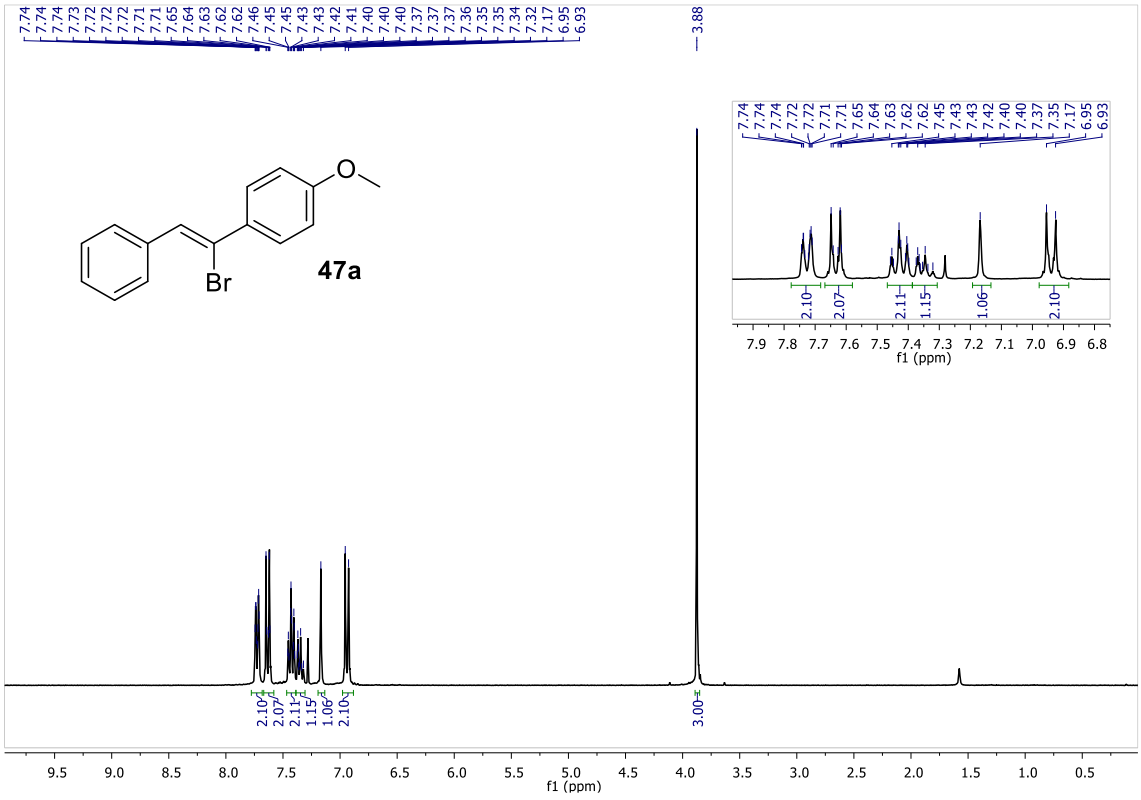

(*Z*)-42 5 : 1 (*E*)-42

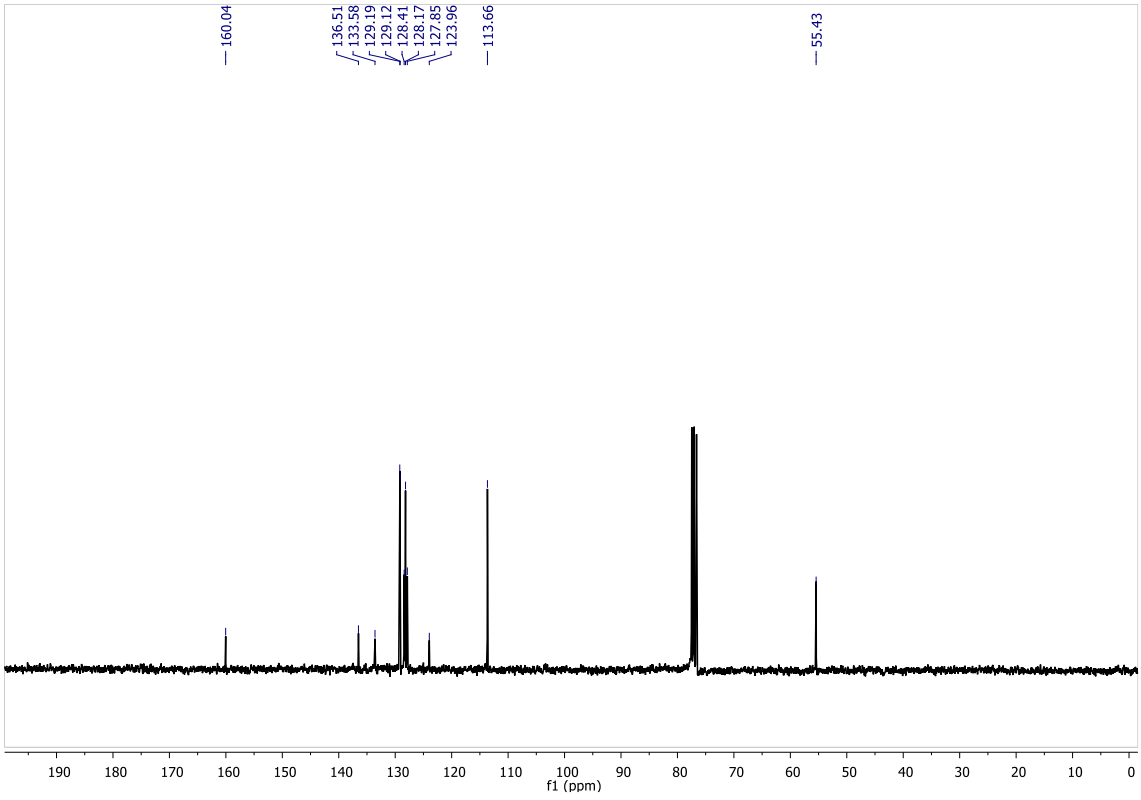
(*Z*)-(1-Bromoethene-1,2-diyl)dibenzene **43a**



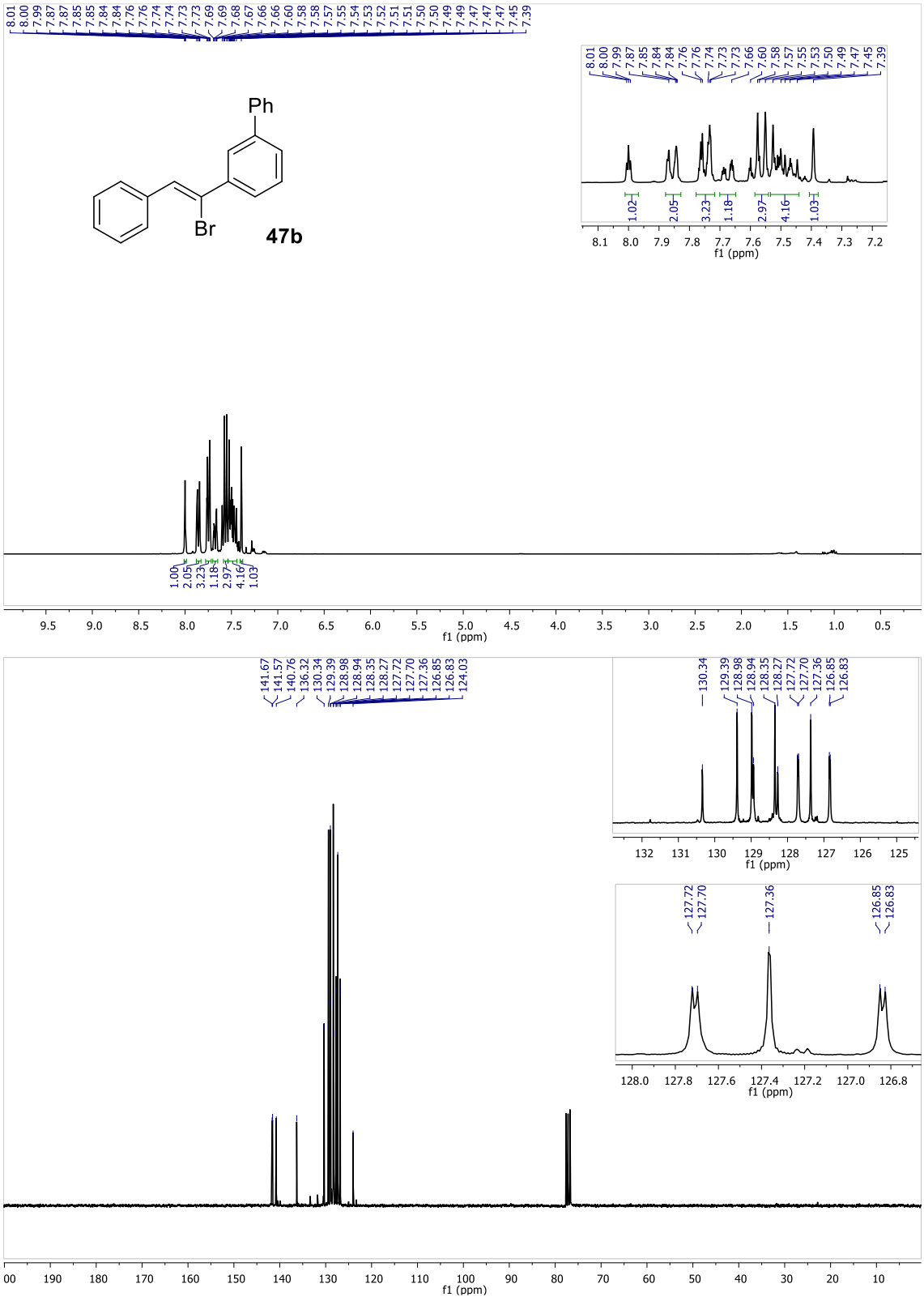



(*Z*)-1-(1-Bromo-2-phenylvinyl)-4-methoxybenzene **47a**

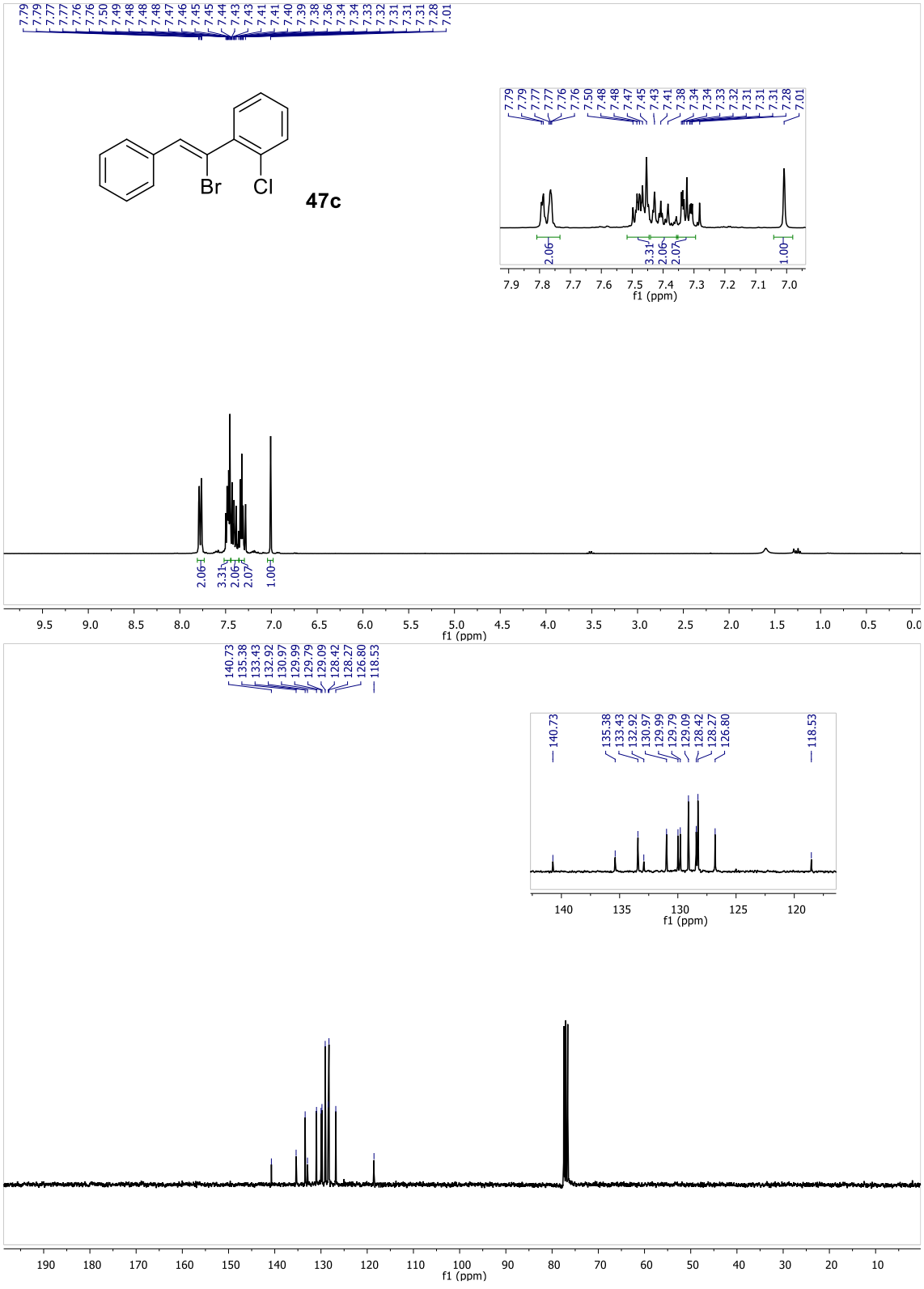


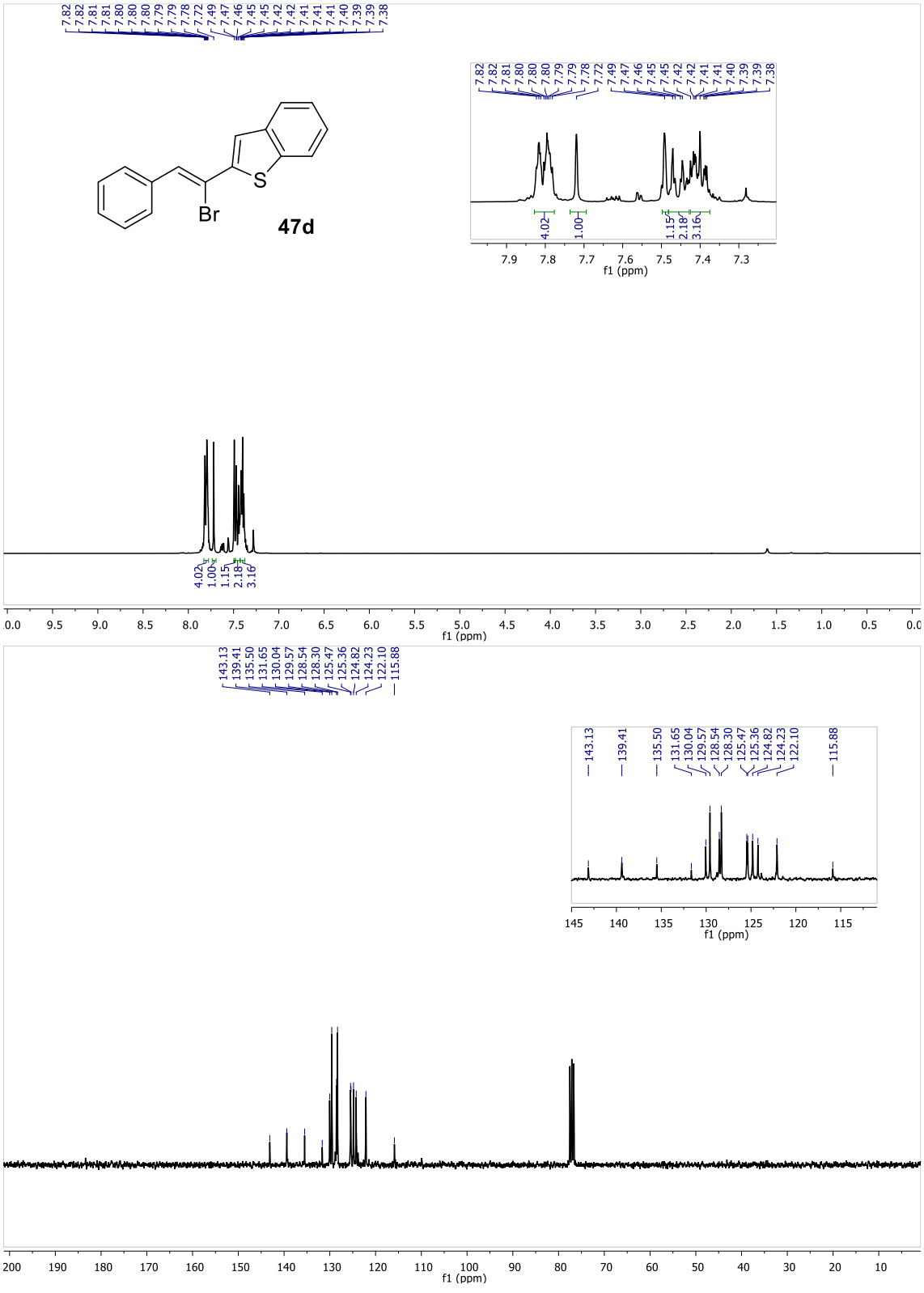
(*Z*)-3-(1-Bromo-2-phenylvinyl)-1,1'-biphenyl **47b**



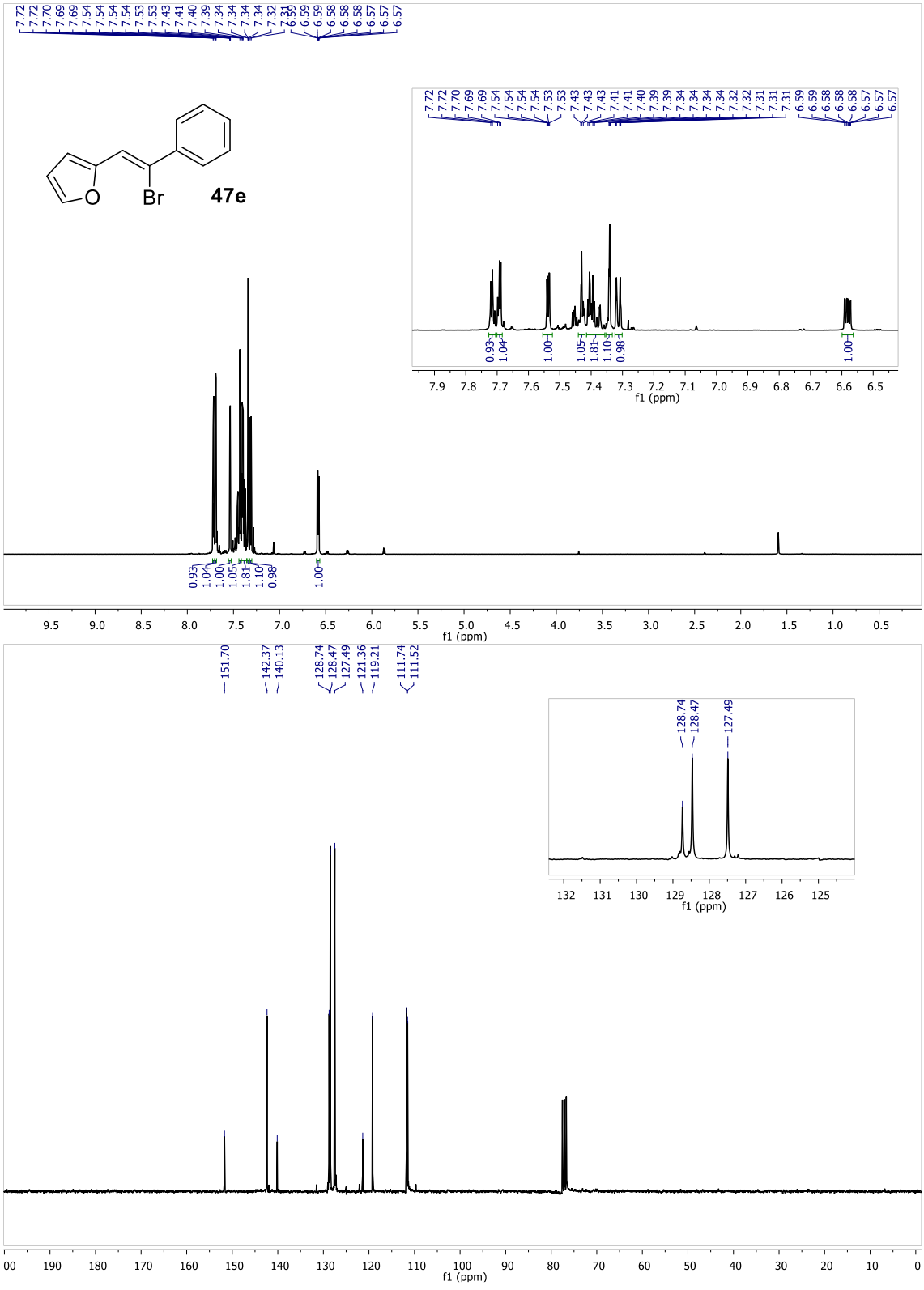
(*Z*)-1-(1-Bromo-2-phenylvinyl)-2-chlorobenzene **47c**



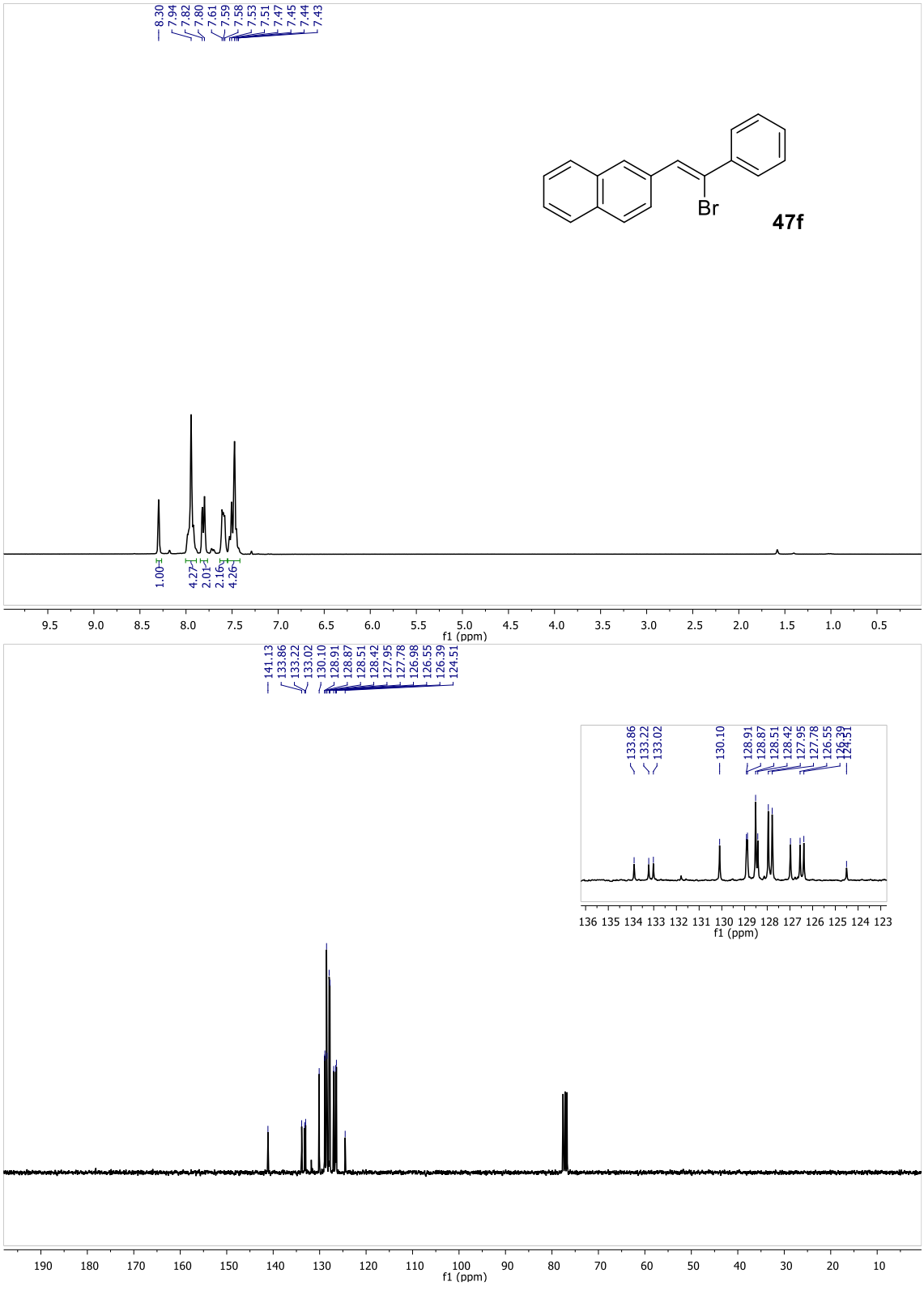
(*Z*)-2-(1-Bromo-2-phenylvinyl)benzo[*b*]thiophene **47d**



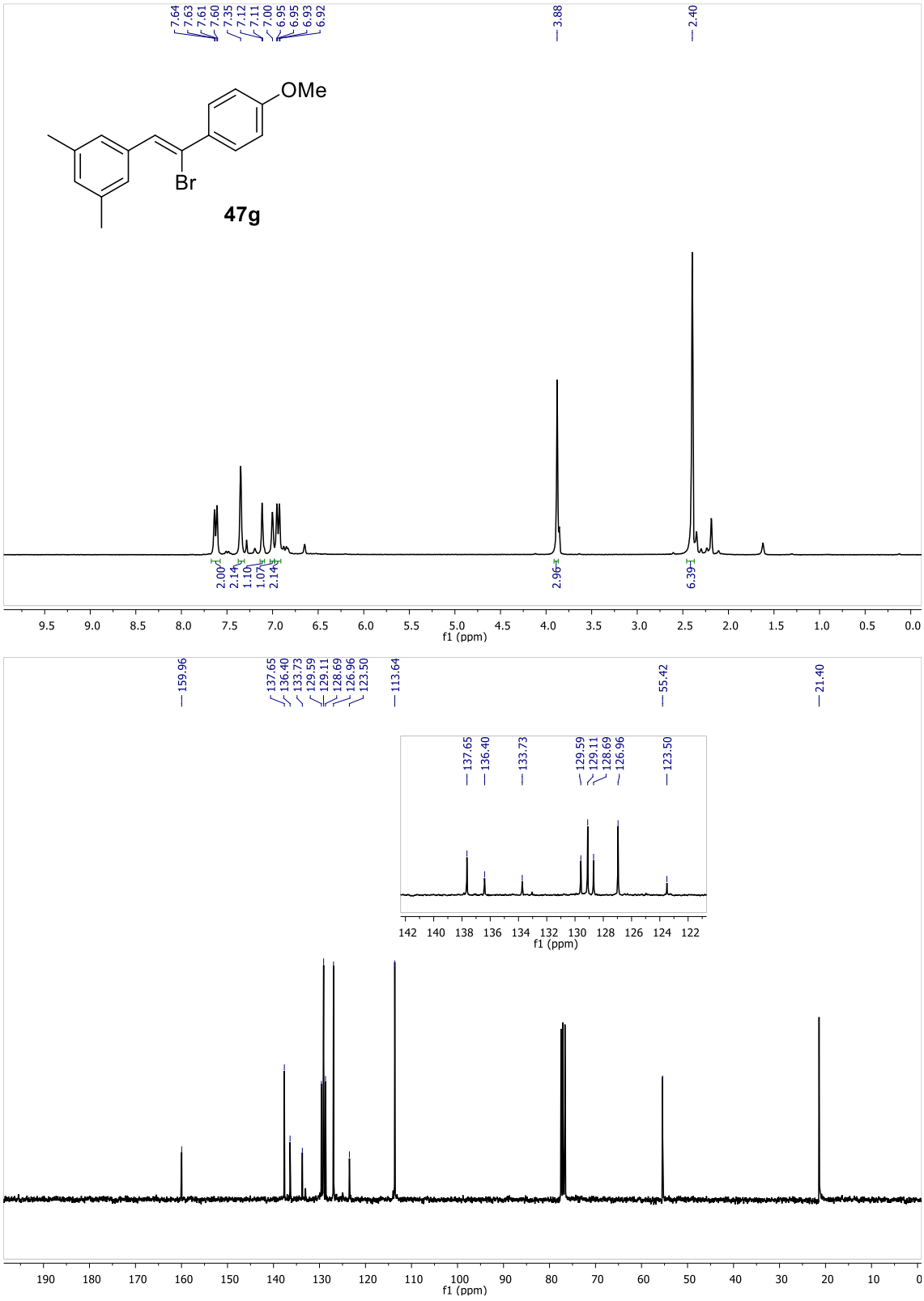
(*Z*)-2-(2-Bromo-2-phenylvinyl)furan **47e**



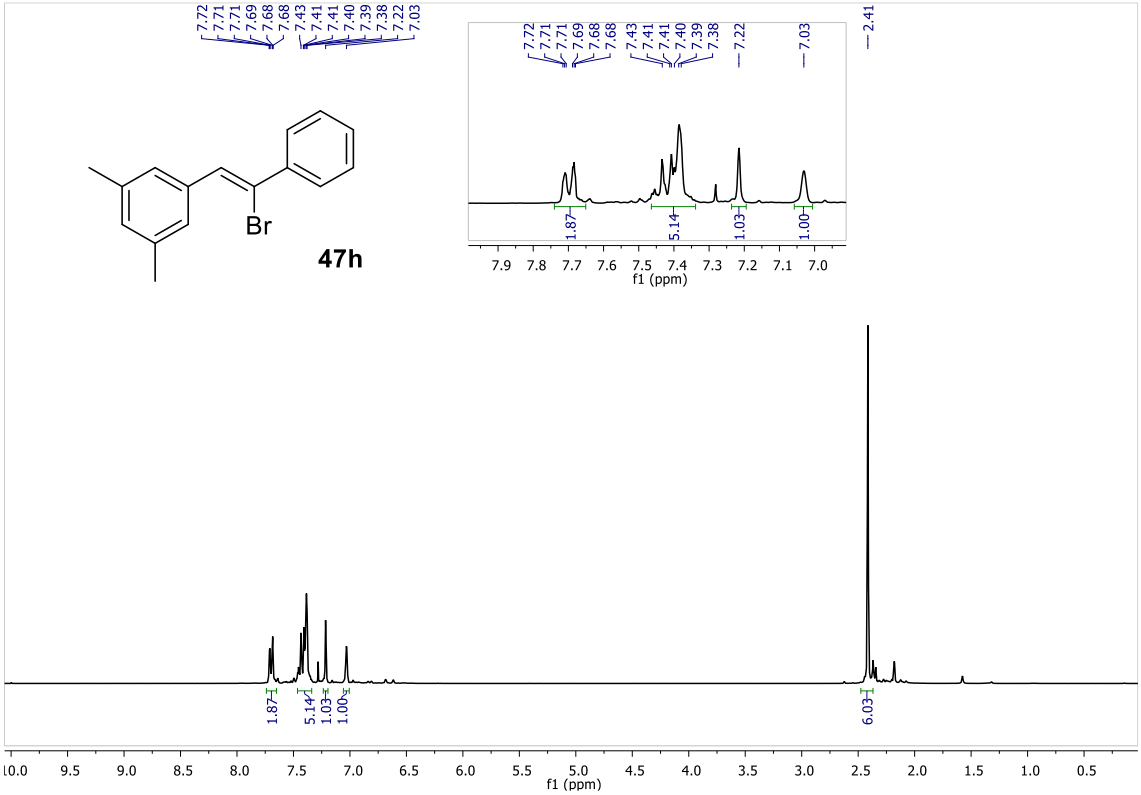
(*Z*)-2-(2-bromo-2-phenylvinyl)naphthalene **47f**

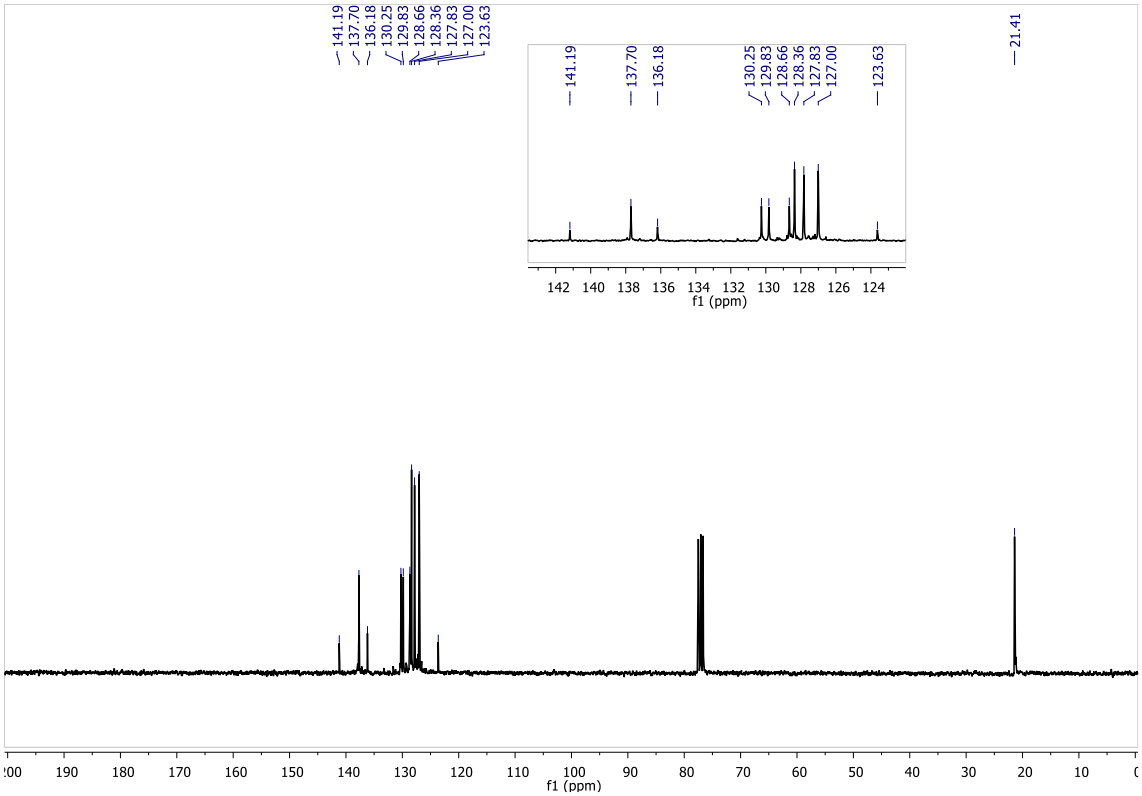


(*Z*)-1-(2-Bromo-2-(4-methoxyphenyl)vinyl)-3,5-dimethylbenzene **47g**

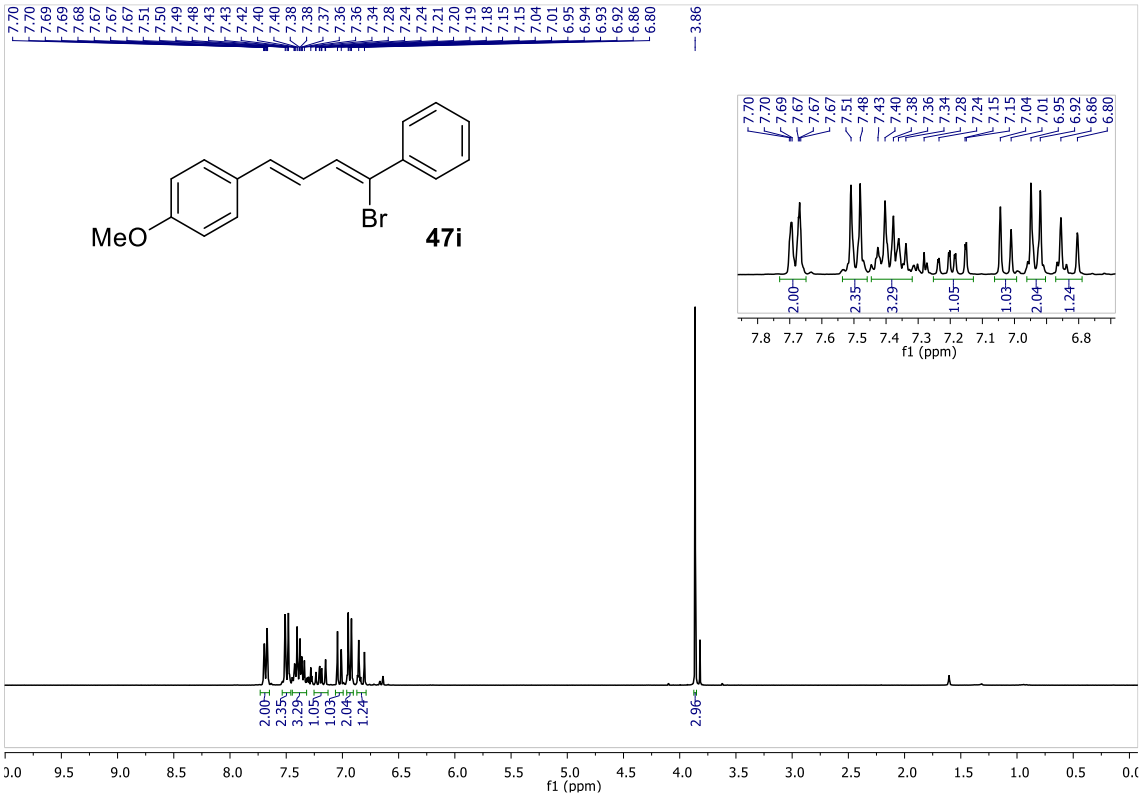


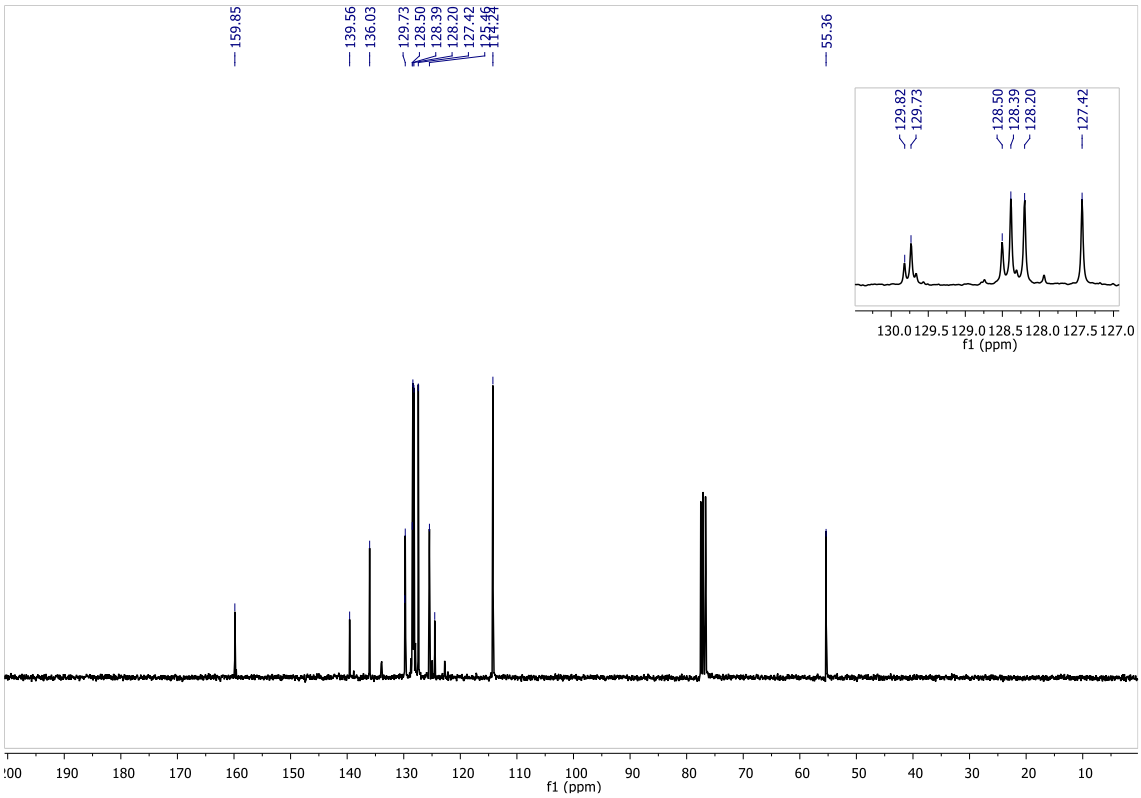
(*Z*)-1-(2-Bromo-2-phenylvinyl)-3,5-dimethylbenzene **47h**



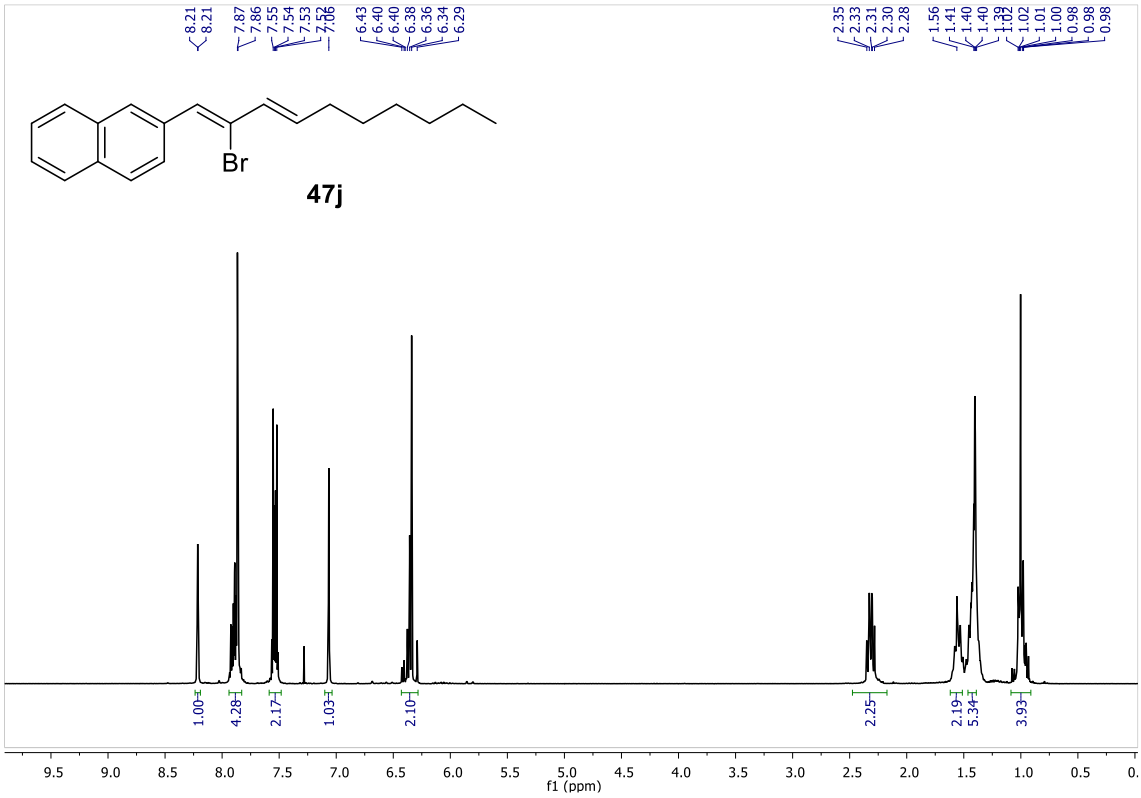



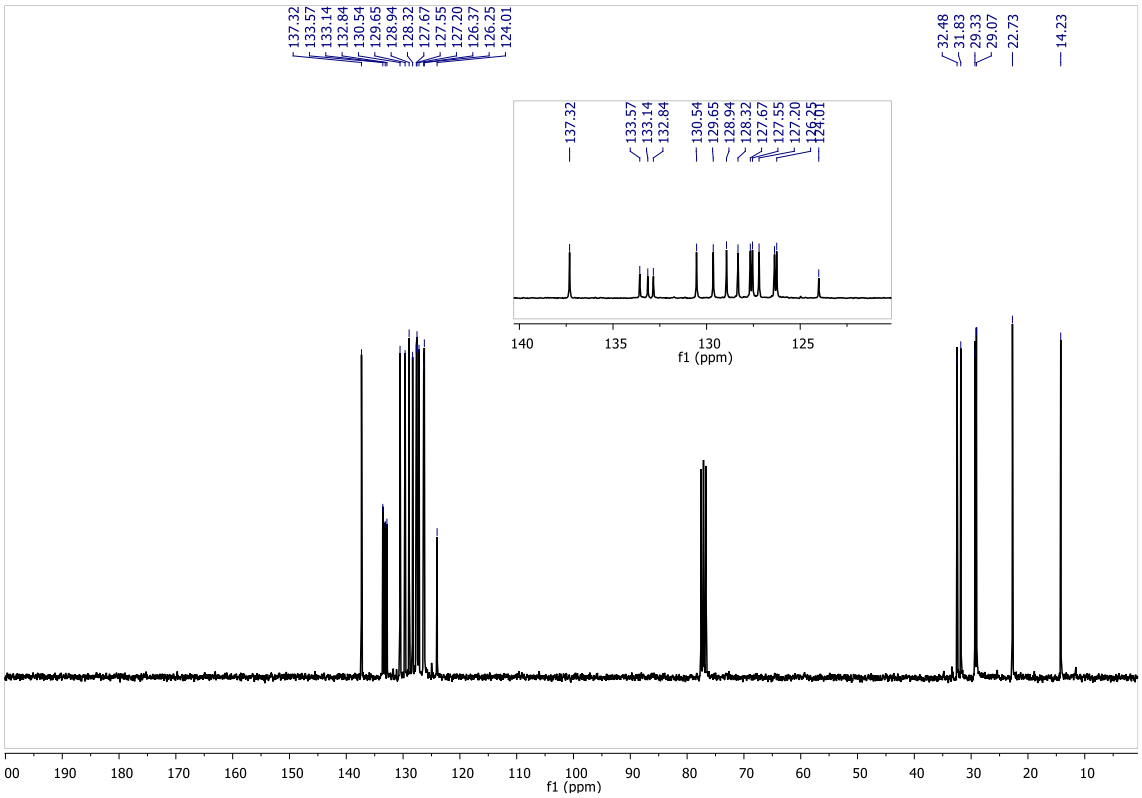
1-((1*E*,3*Z*)-4-Bromo-4-phenylbuta-1,3-dien-1-yl)-4-methoxybenzene **47i**



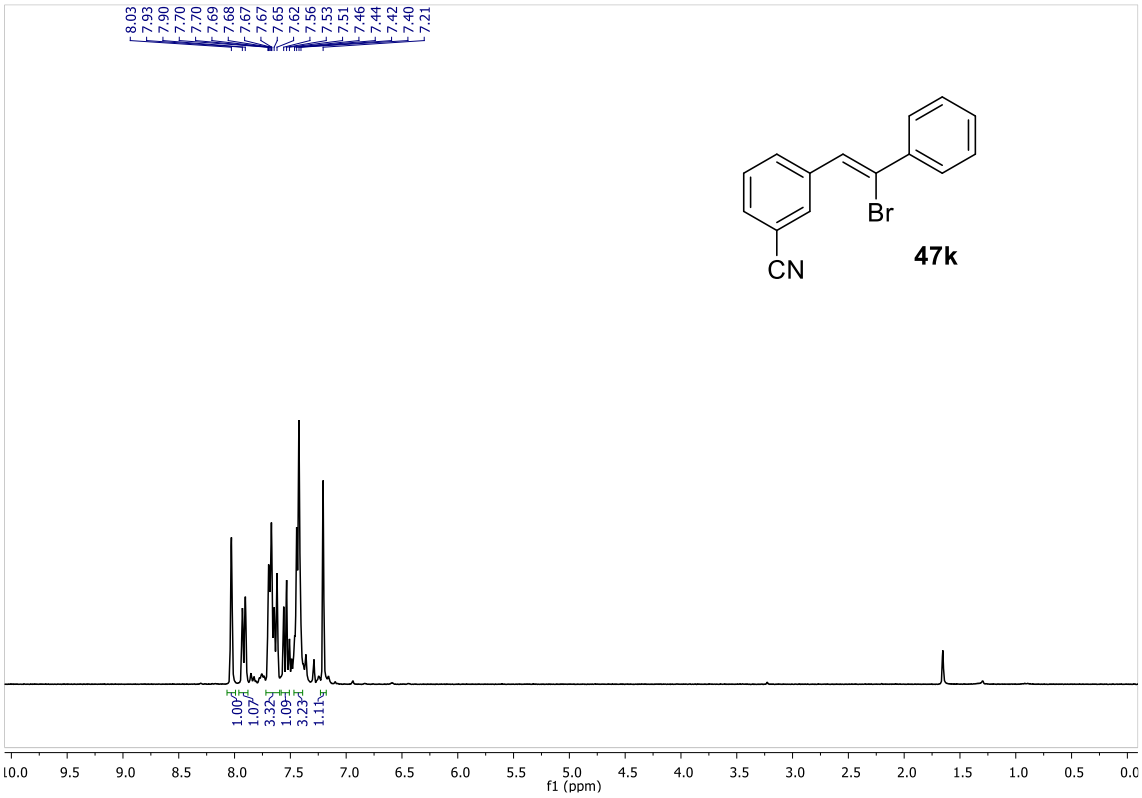



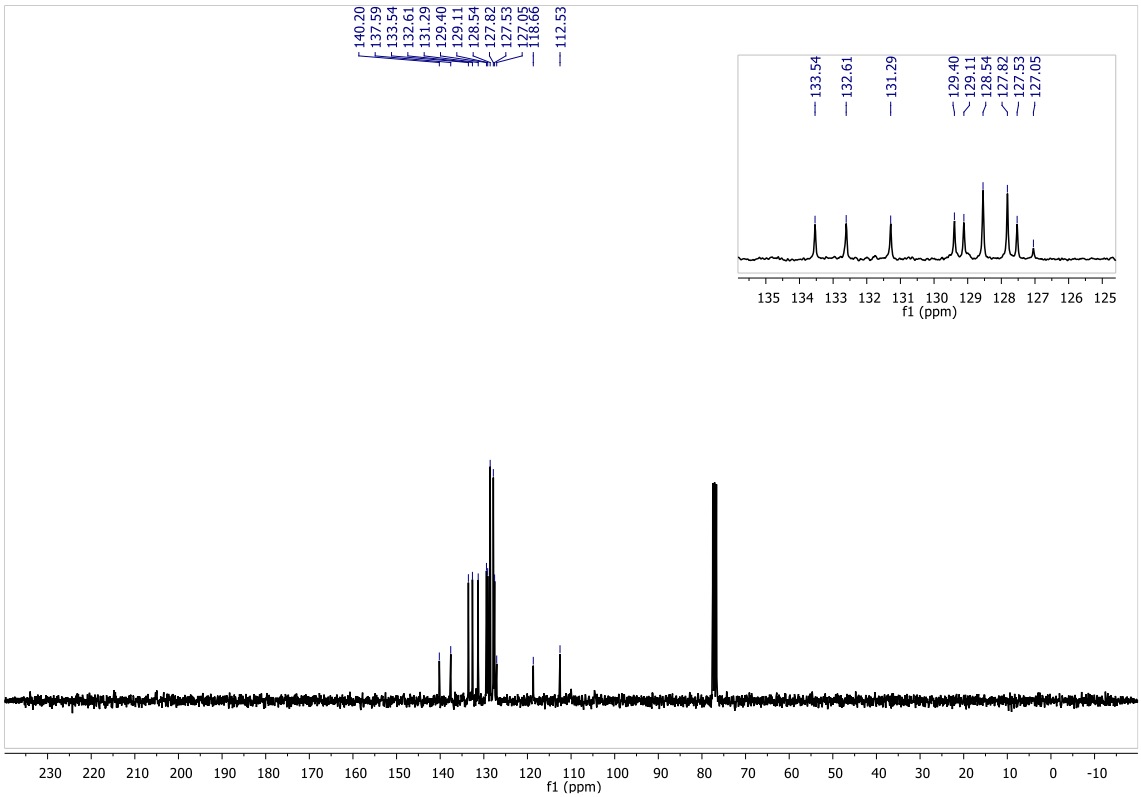
2-((1Z,3E)-2-bromodeca-1,3-dien-1-yl)naphthalene **47j**



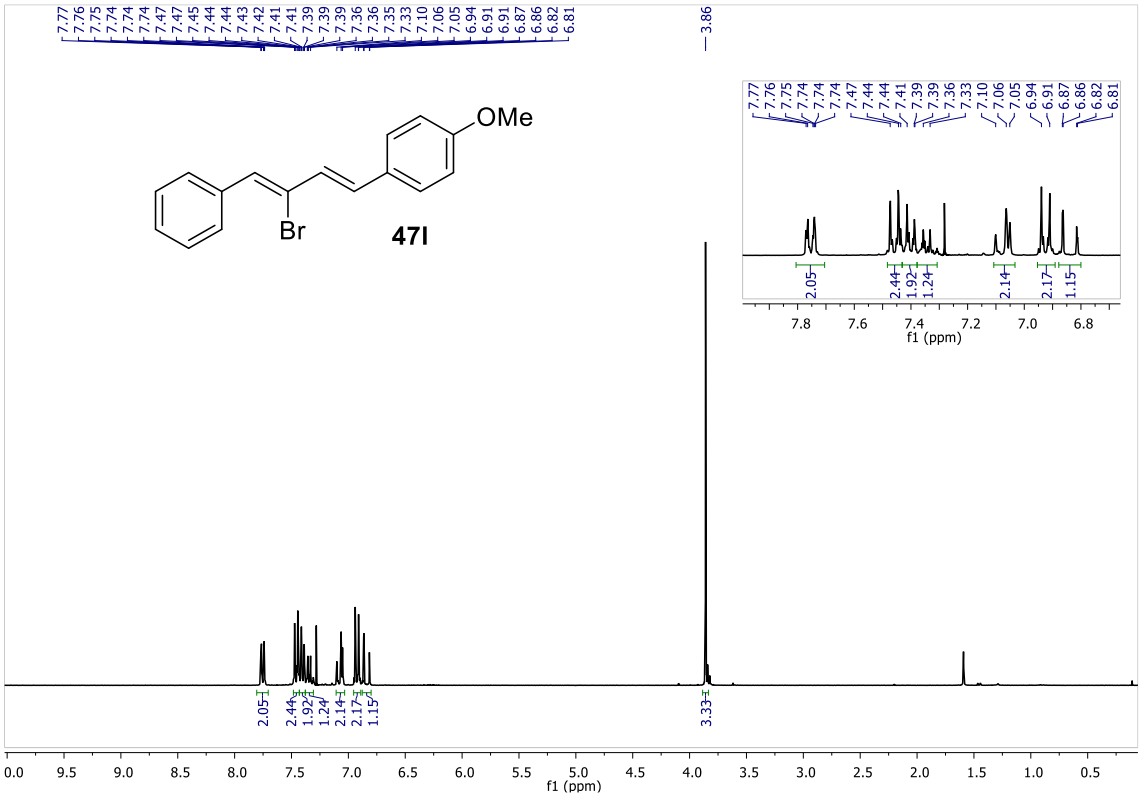



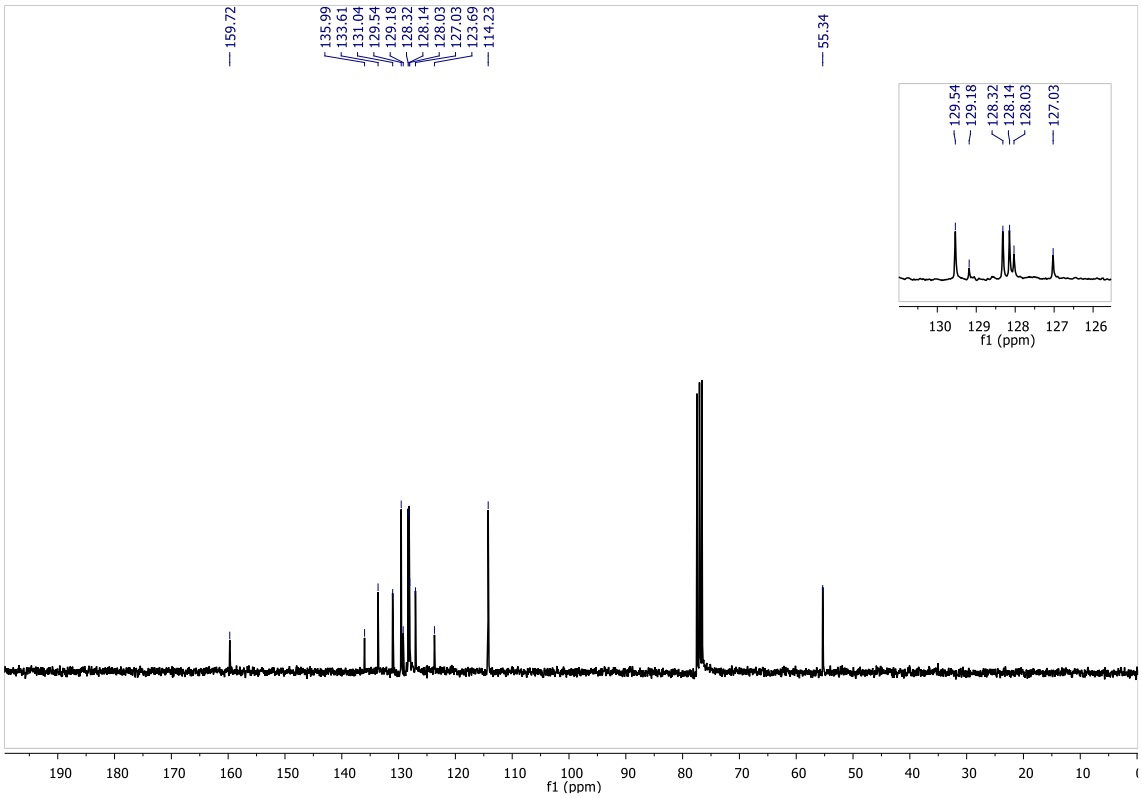
(*Z*)-3-(2-Bromo-2-phenylvinyl)benzonitrile **47k**



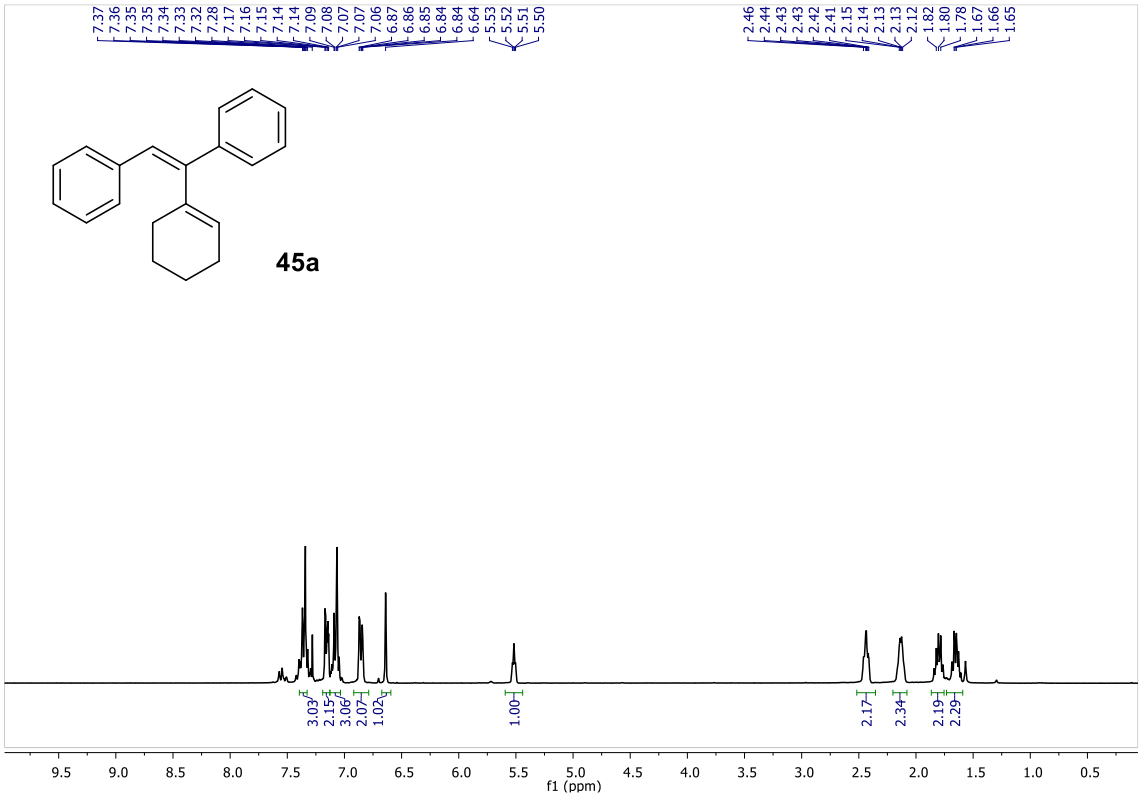



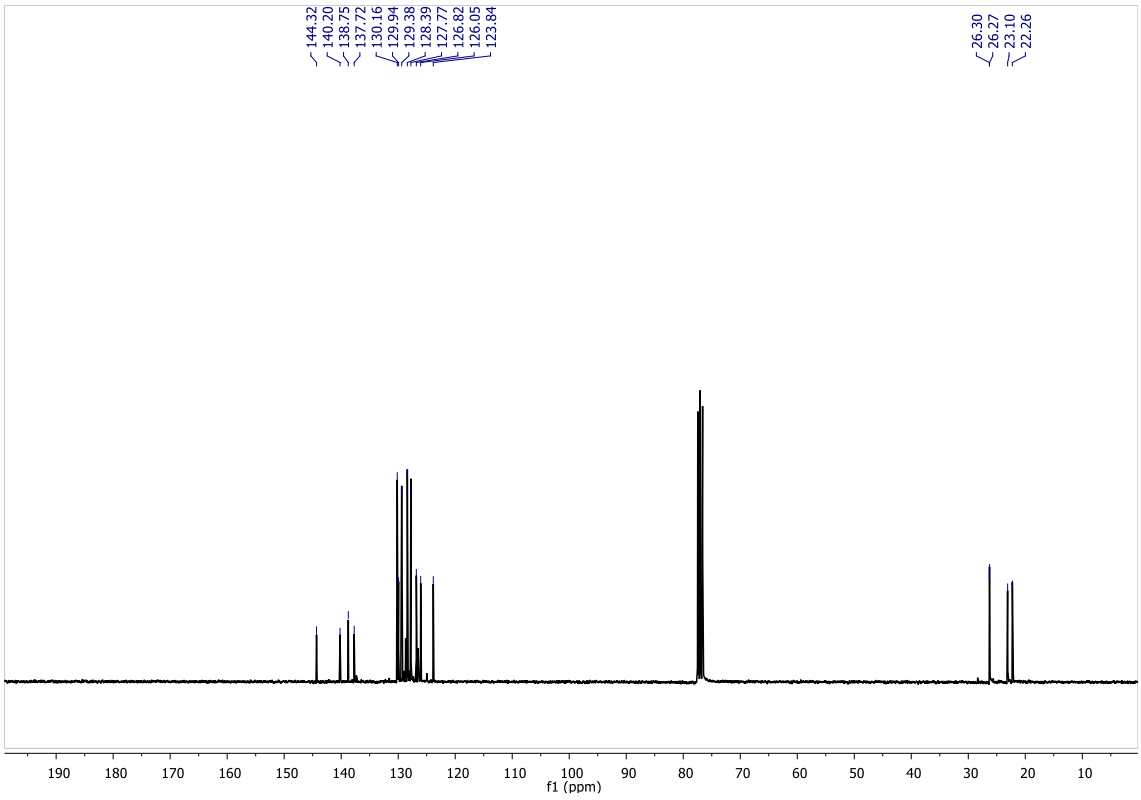
1-((1*E*,3*Z*)-3-Bromo-4-phenylbuta-1,3-dien-1-yl)-4-methoxybenzene **47l**



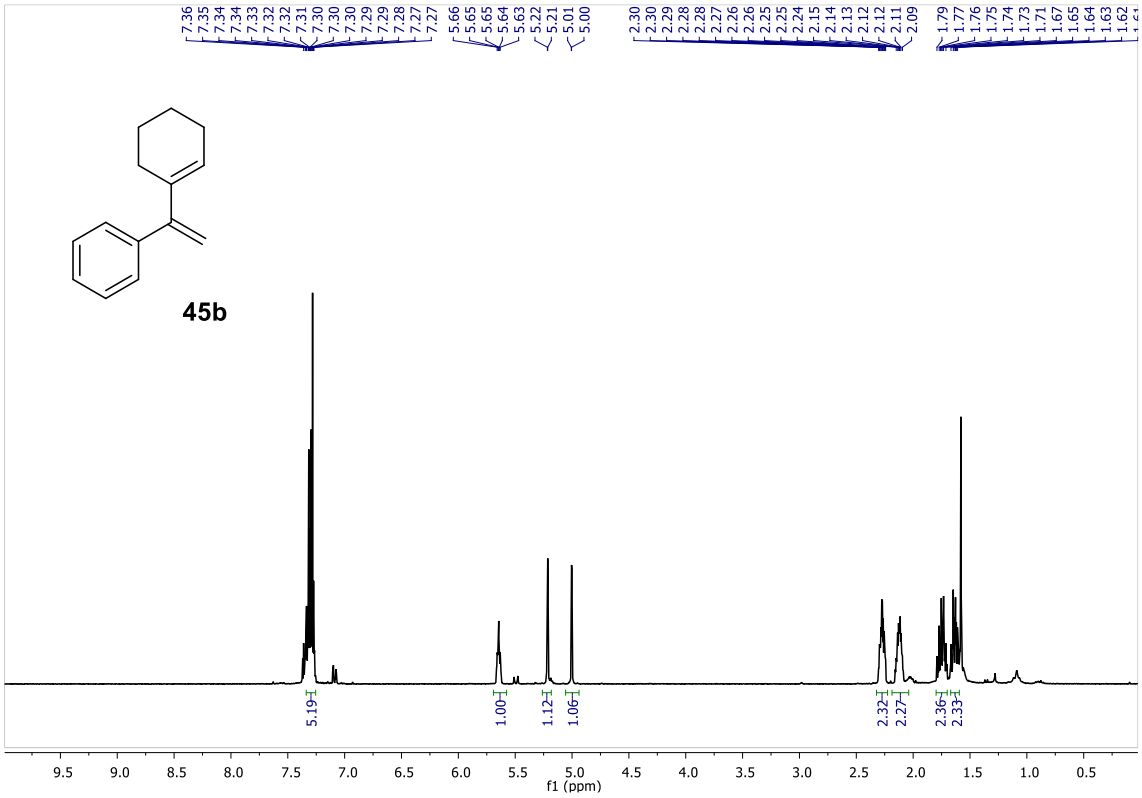



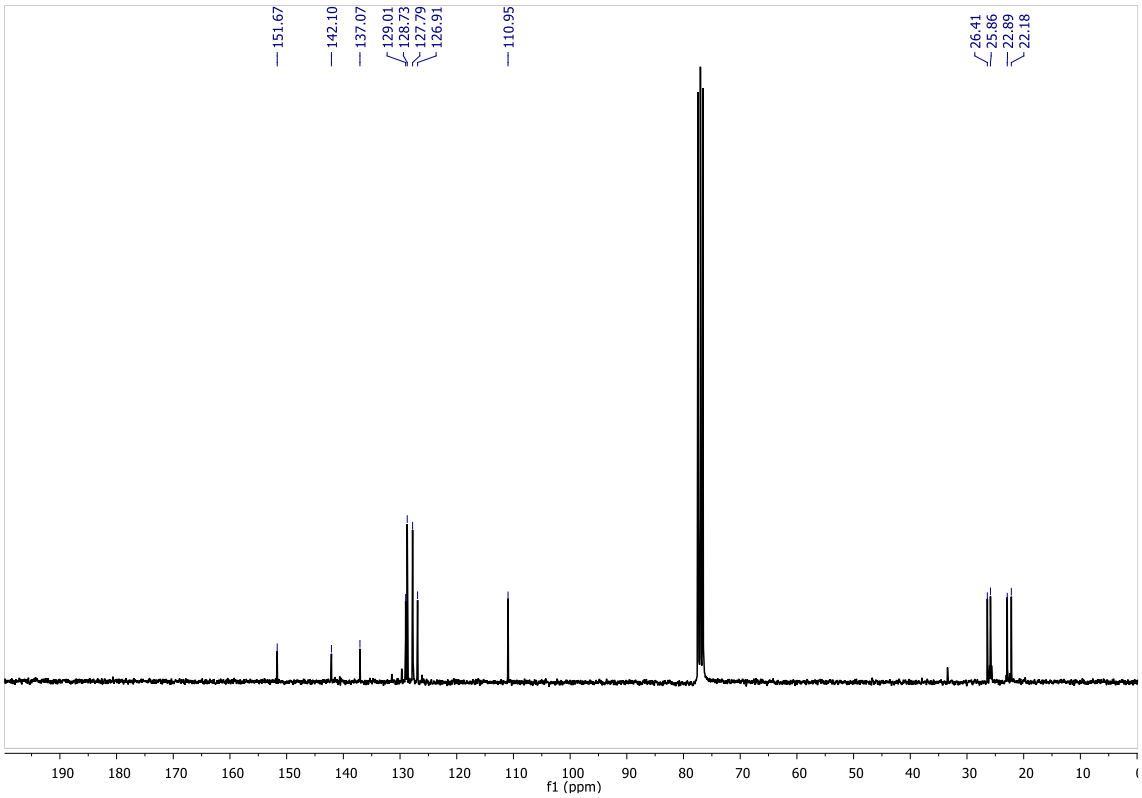
(*E*)-(1-(Cyclohex-1-en-1-yl)ethene-1,2-diyl)dibenzene **45a**



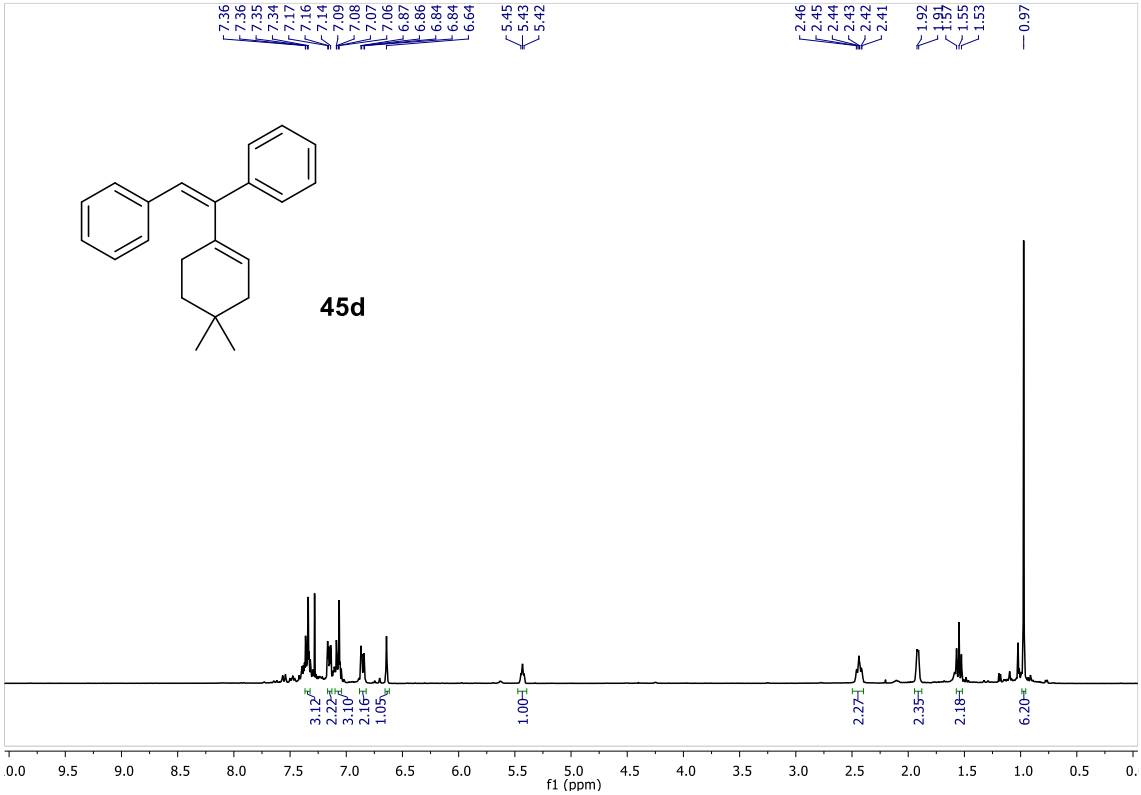



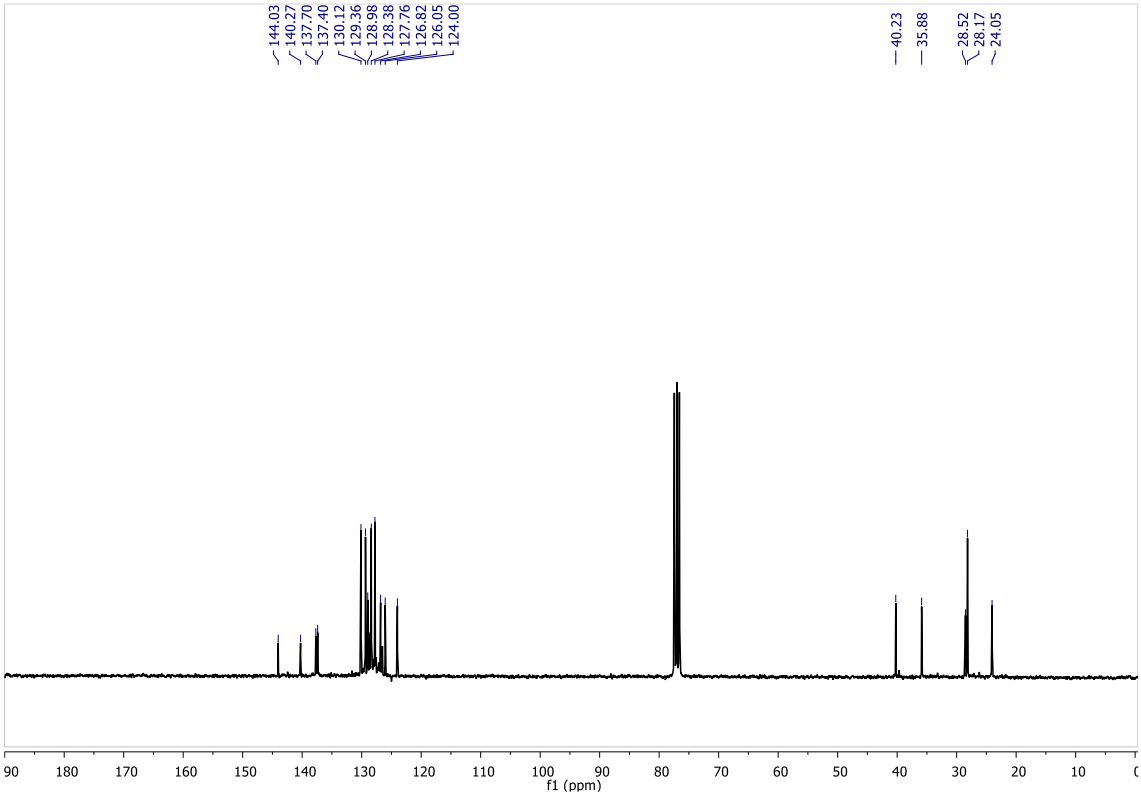
(1-(Cyclohex-1-en-1-yl)vinyl)benzene **45b**



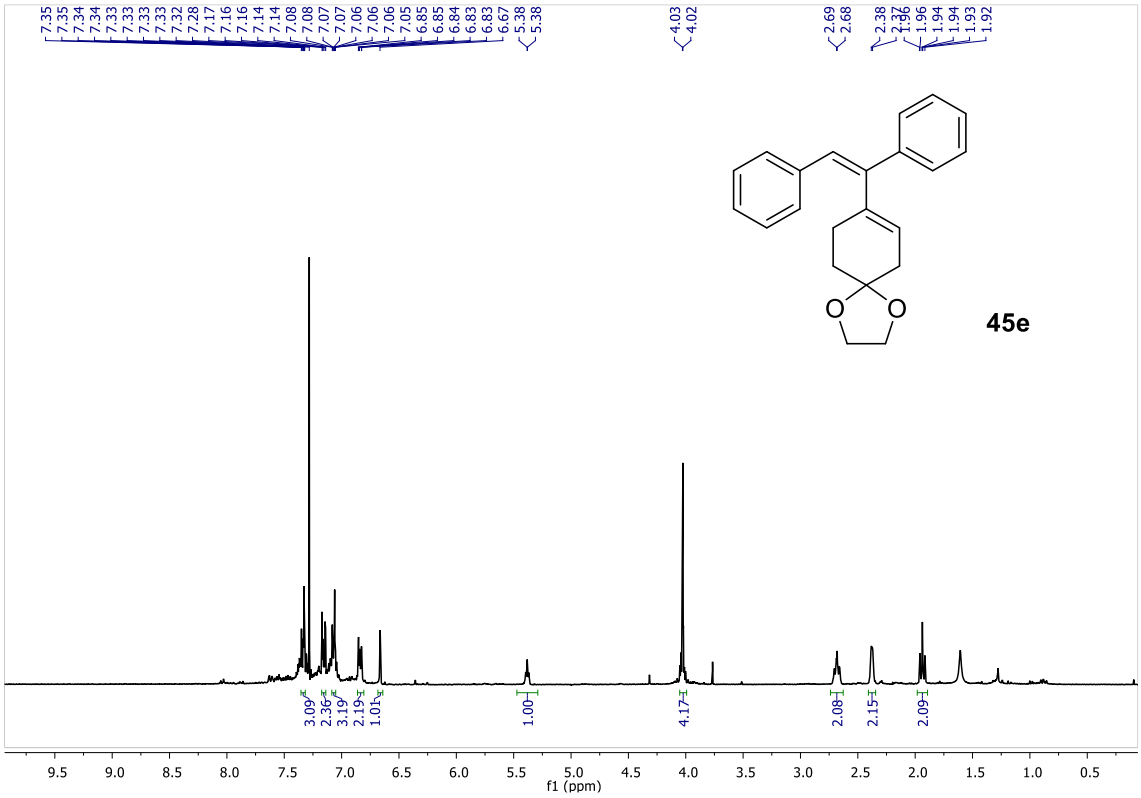



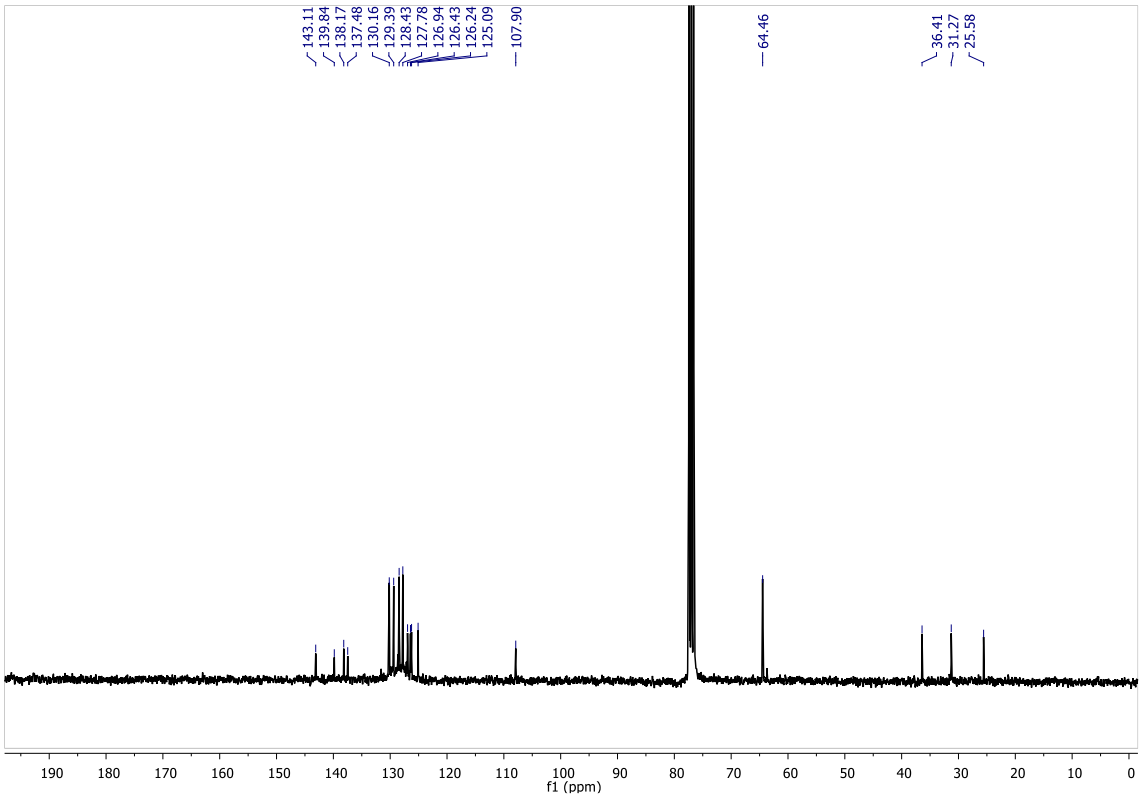
(*E*)-(1-(4,4-Dimethylcyclohex-1-en-1-yl)ethene-1,2-diyl)dibenzene **45d**



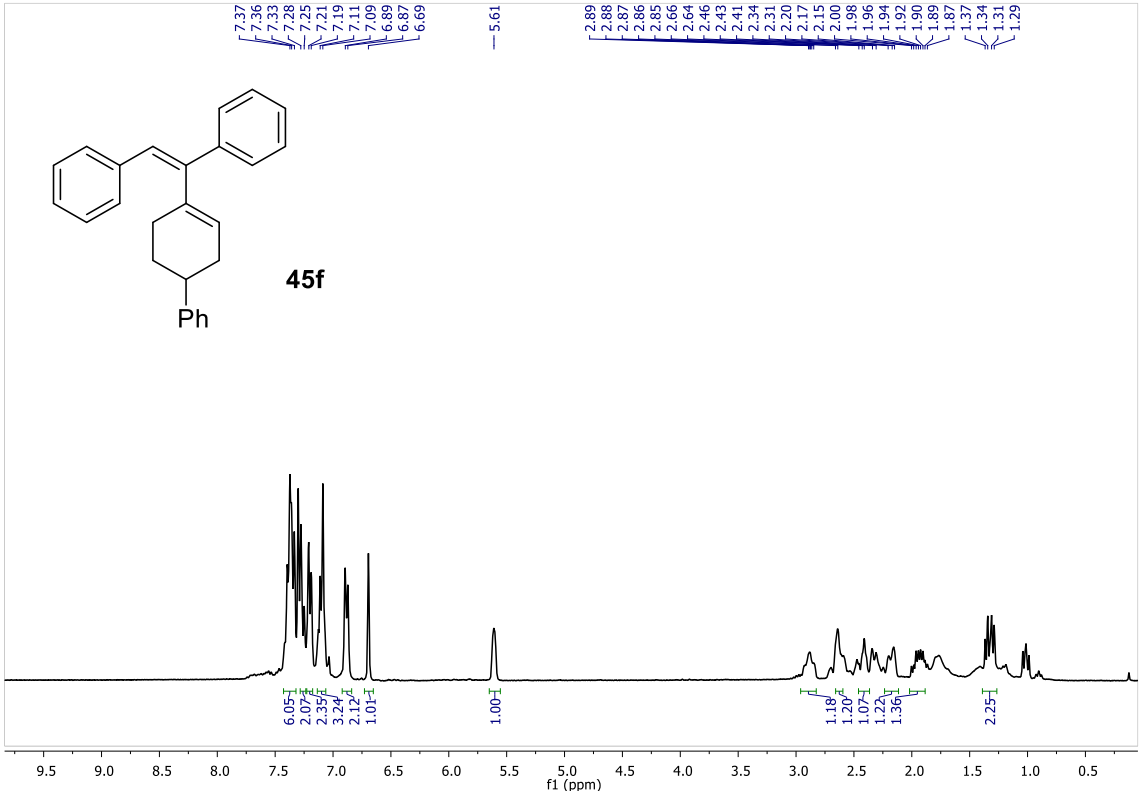



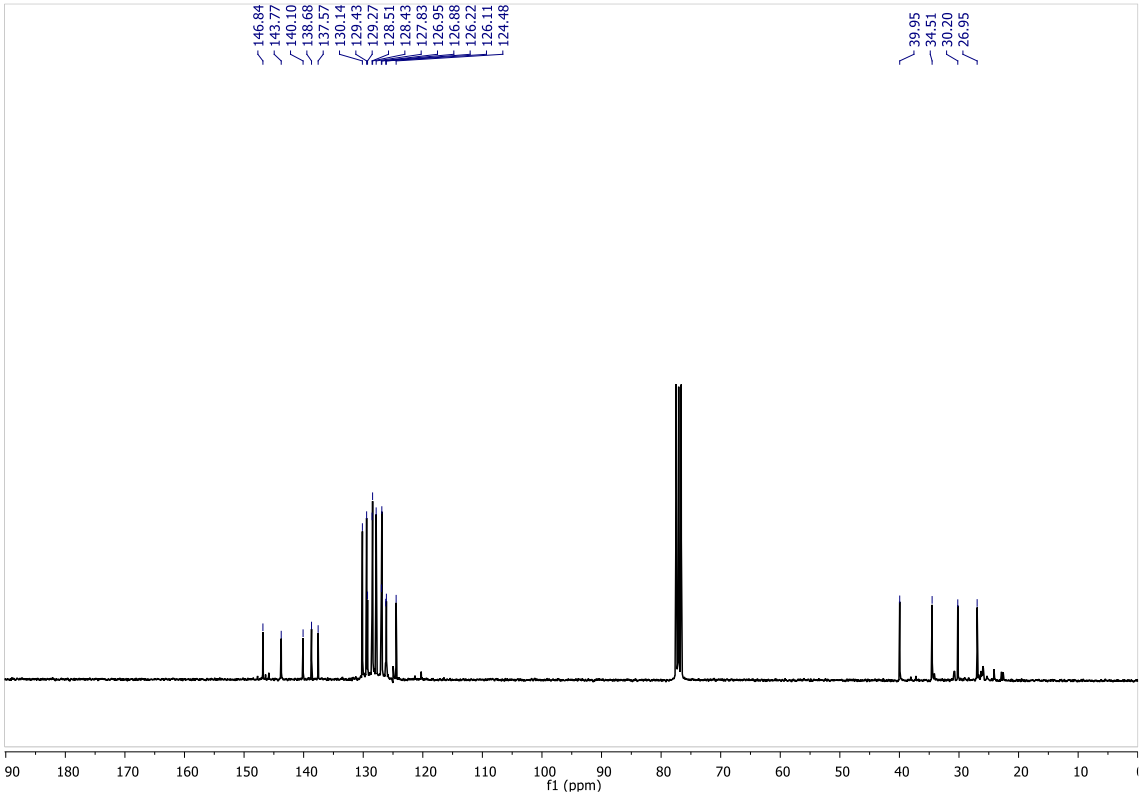
(*E*)-8-(1,2-Diphenylvinyl)-1,4-dioxaspiro[4.5]dec-7-ene **45e**



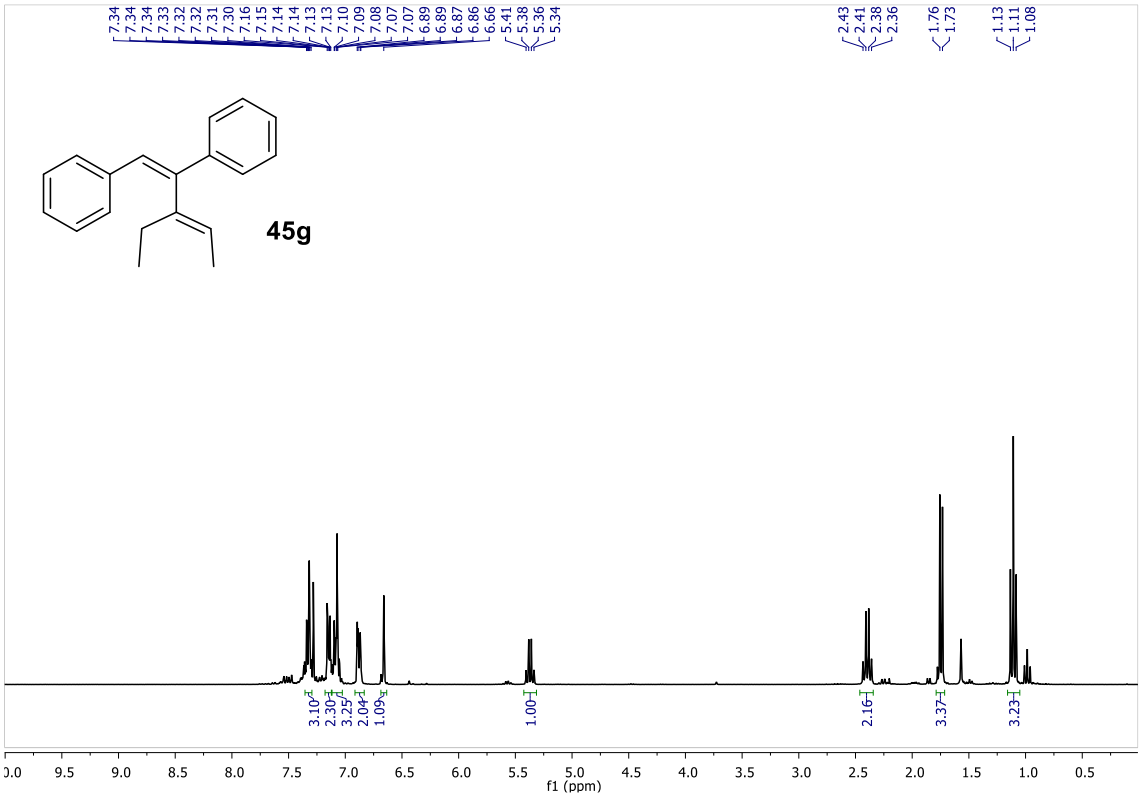



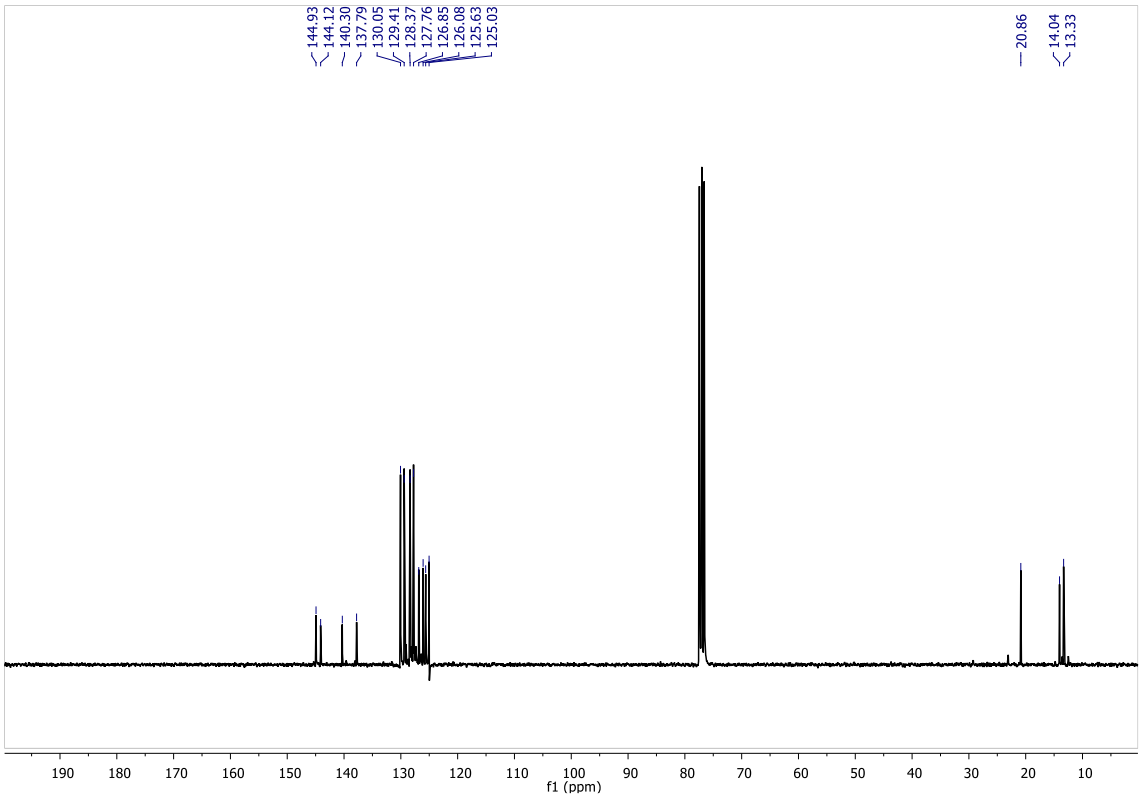
(*E*)-4-(1,2-Diphenylvinyl)-1,2,3,6-tetrahydro-1,1'-biphenyl **45f**



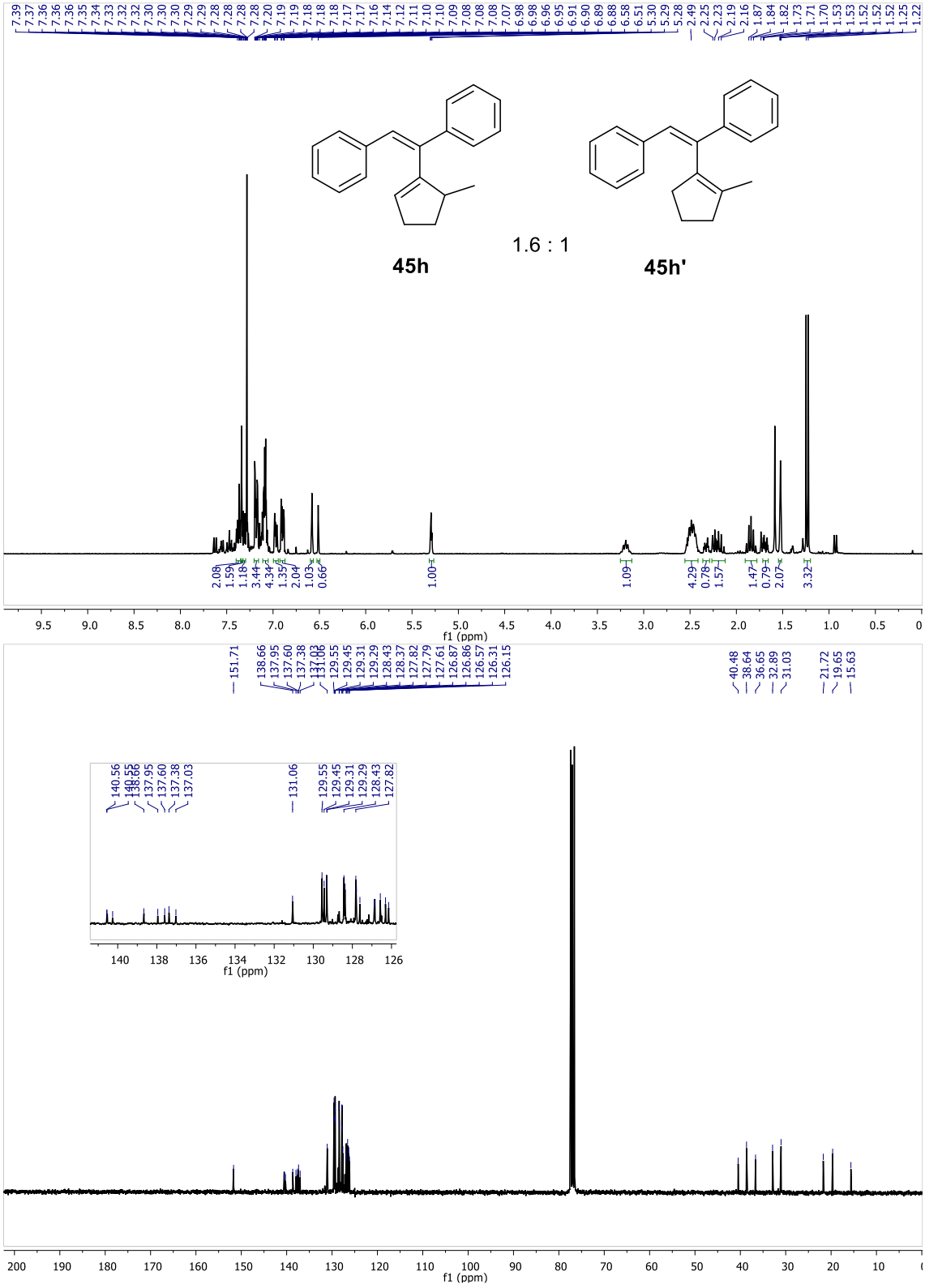



((1*E*,3*E*)-3-Ethylpenta-1,3-diene-1,2-diyl)dibenzene **45g**

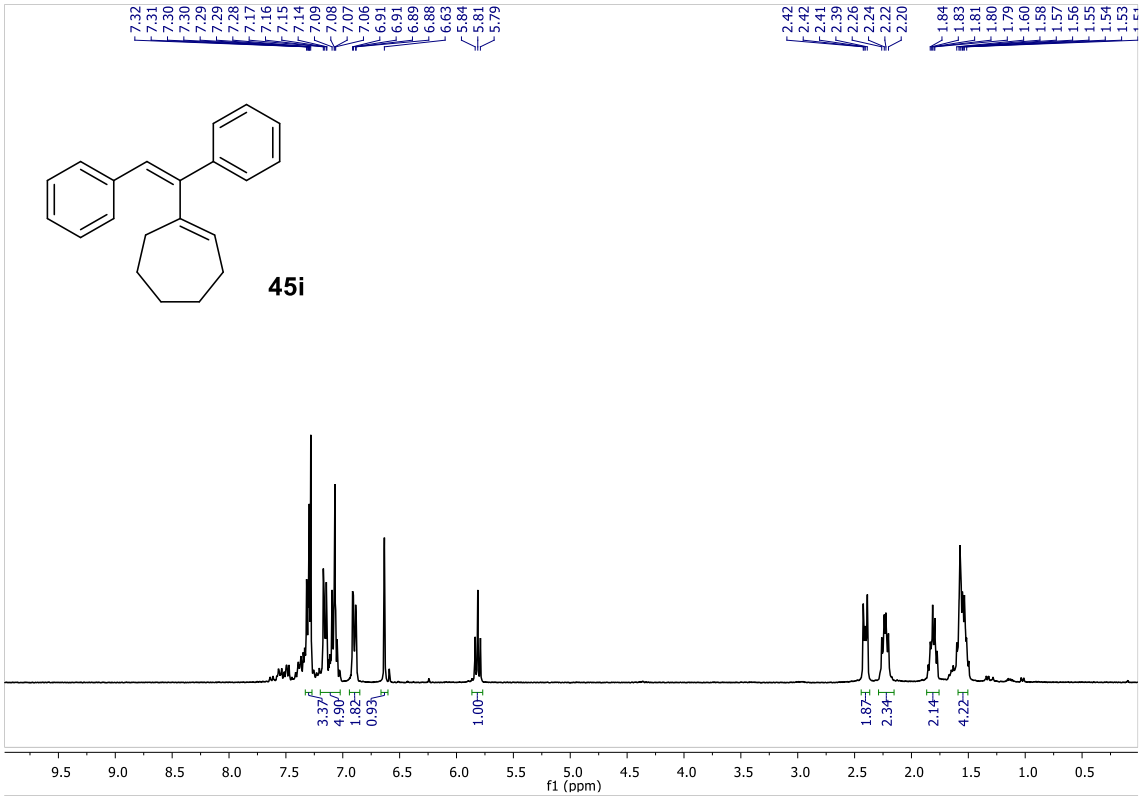


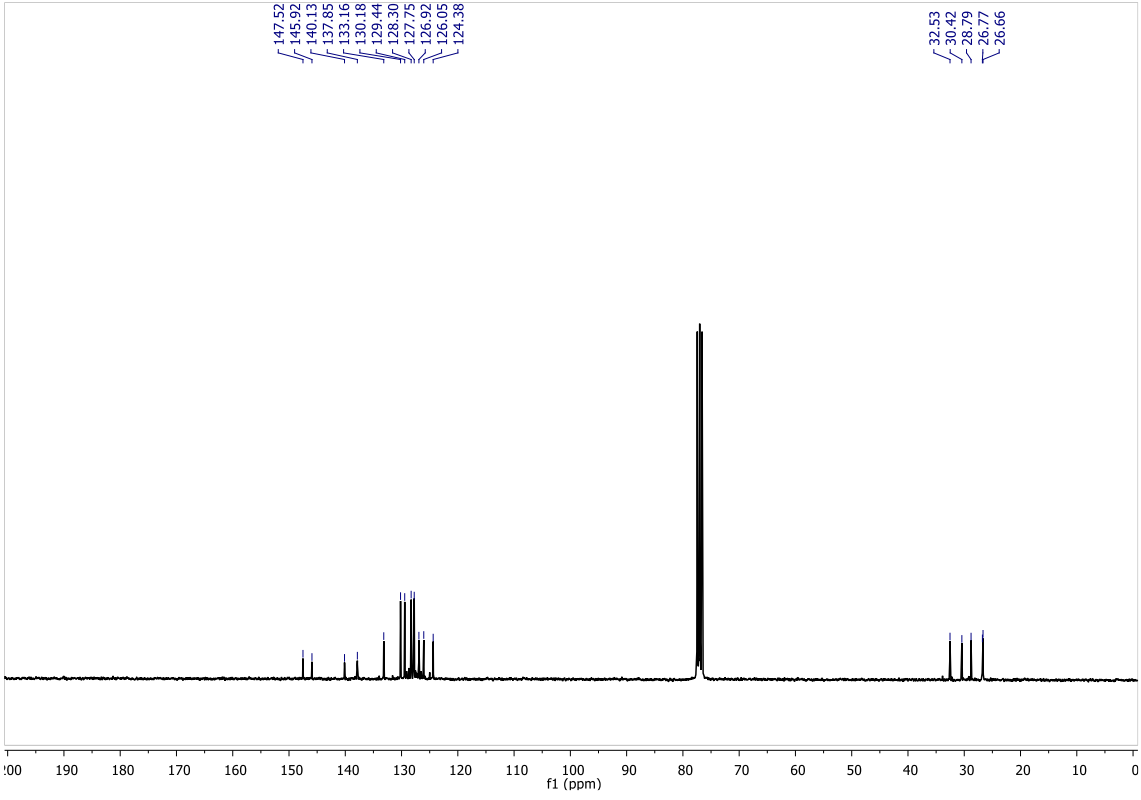



(*E*)-(1-(5-Methylcyclopent-1-en-1-yl)ethene-1,2-diyl)dibenzene **45h** and (*Z*)-(1-(2-Methylcyclopent-1-en-1-yl)ethene-1,2-diyl)dibenzene **45h'**

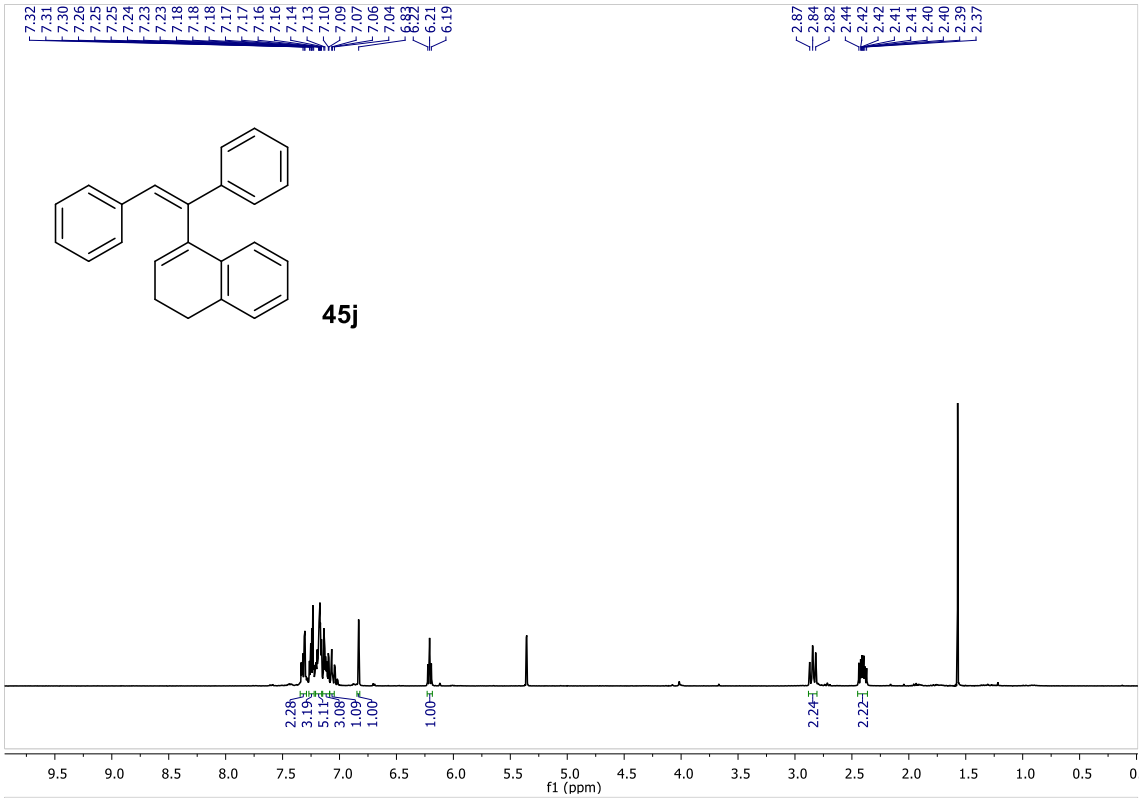


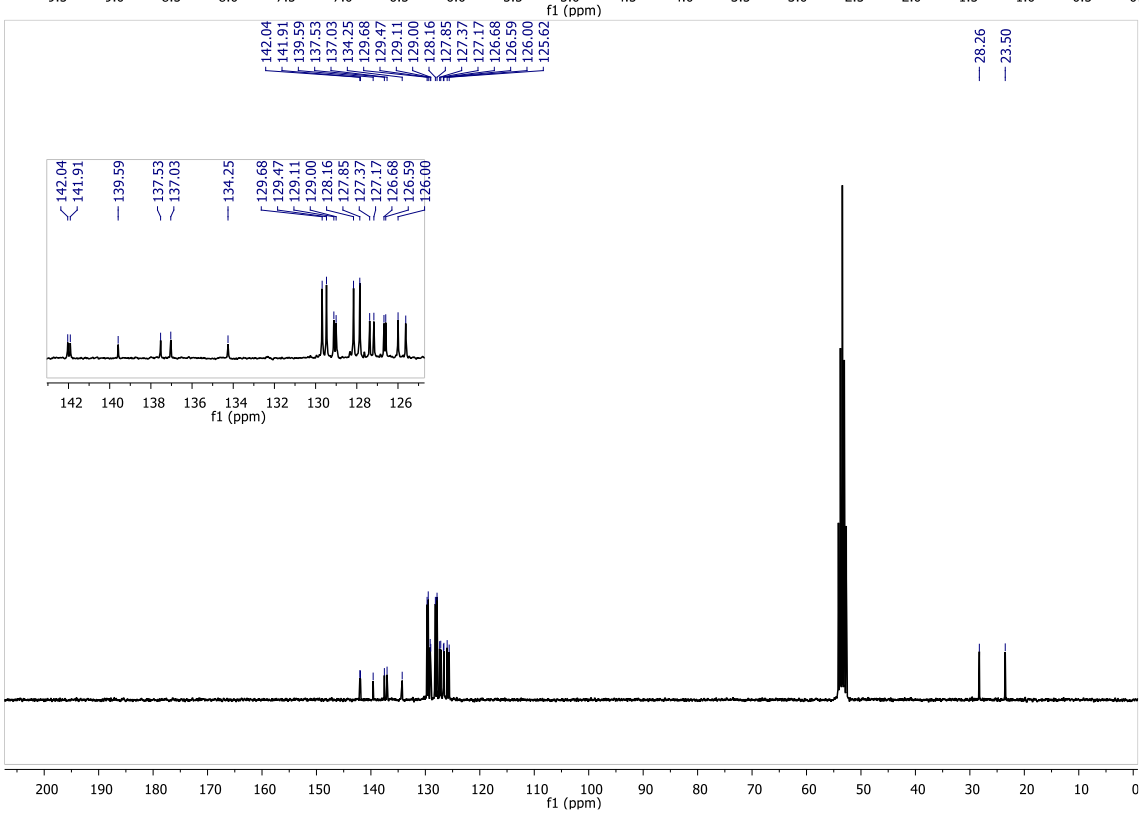
(*E*)-1-(1,2-Diphenylvinyl)cycloheptene **45i**



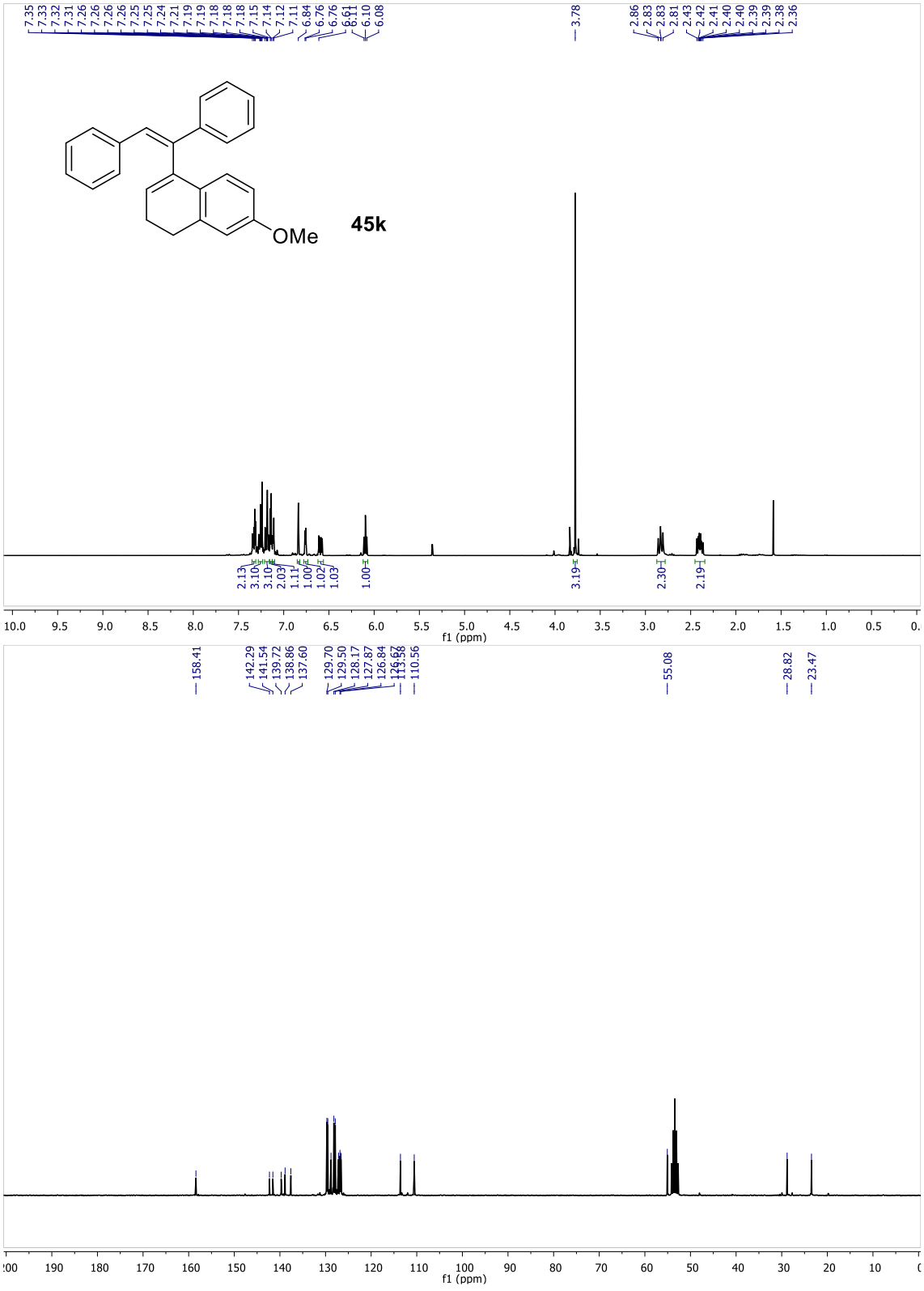



(*Z*)-4-(1,2-Diphenylvinyl)-1,2-dihydronaphthalene **45j**

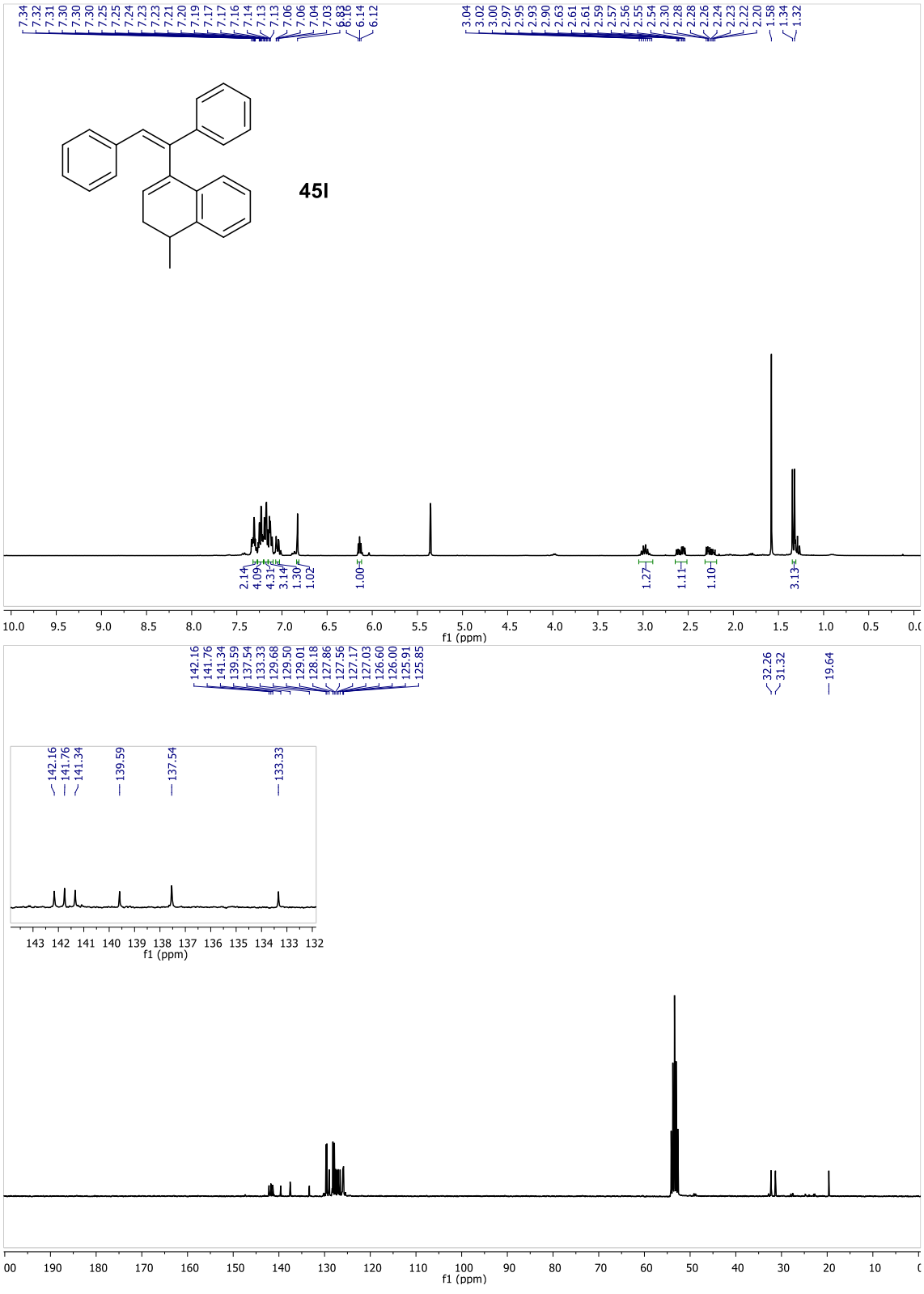


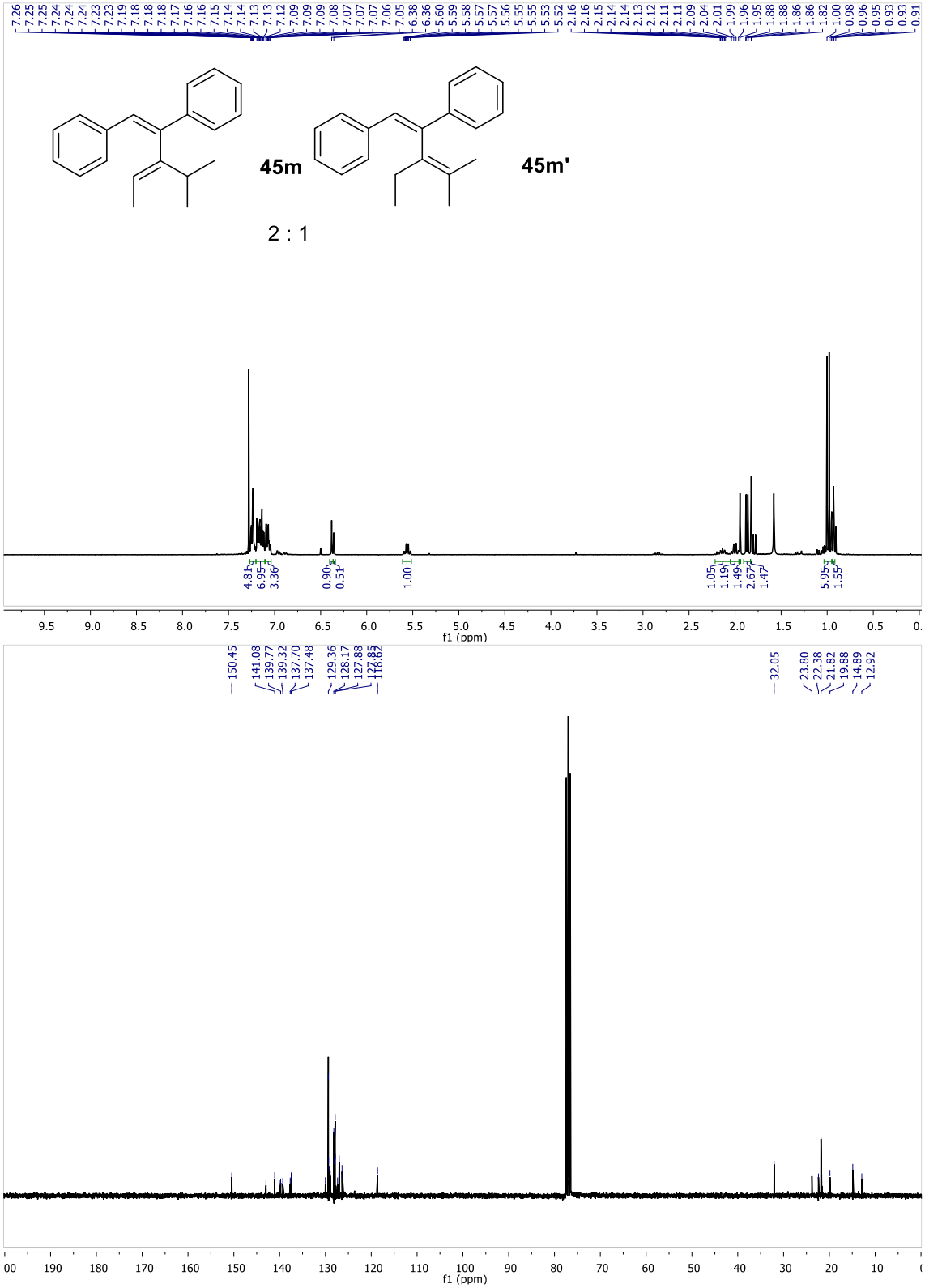
(*Z*)-4-(1,2-Diphenylvinyl)-7-methoxy-1,2-dihydronaphthalene **45k**



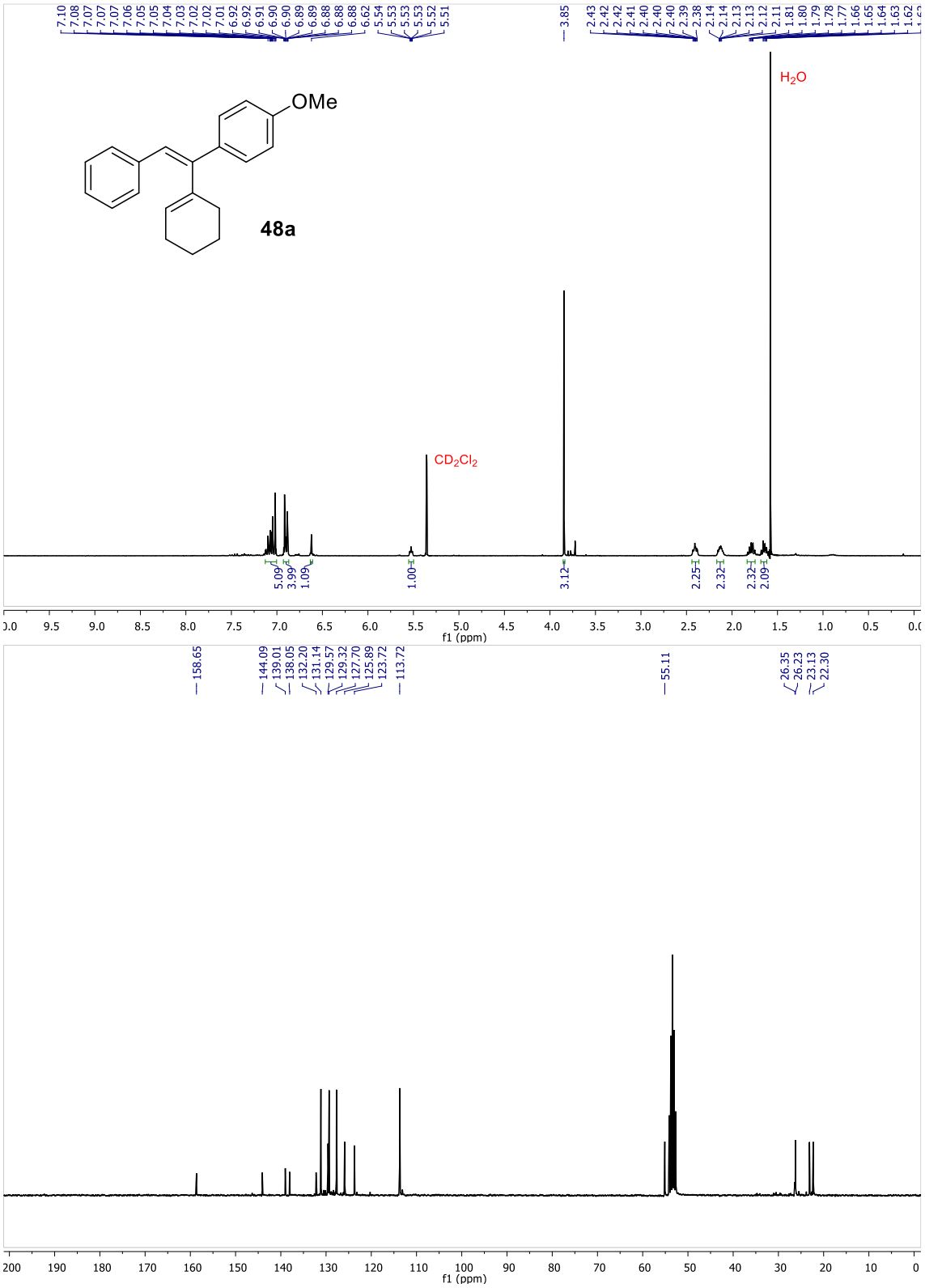
(*Z*)-4-(1,2-Diphenylvinyl)-1-methyl-1,2-dihydronaphthalene **45l**



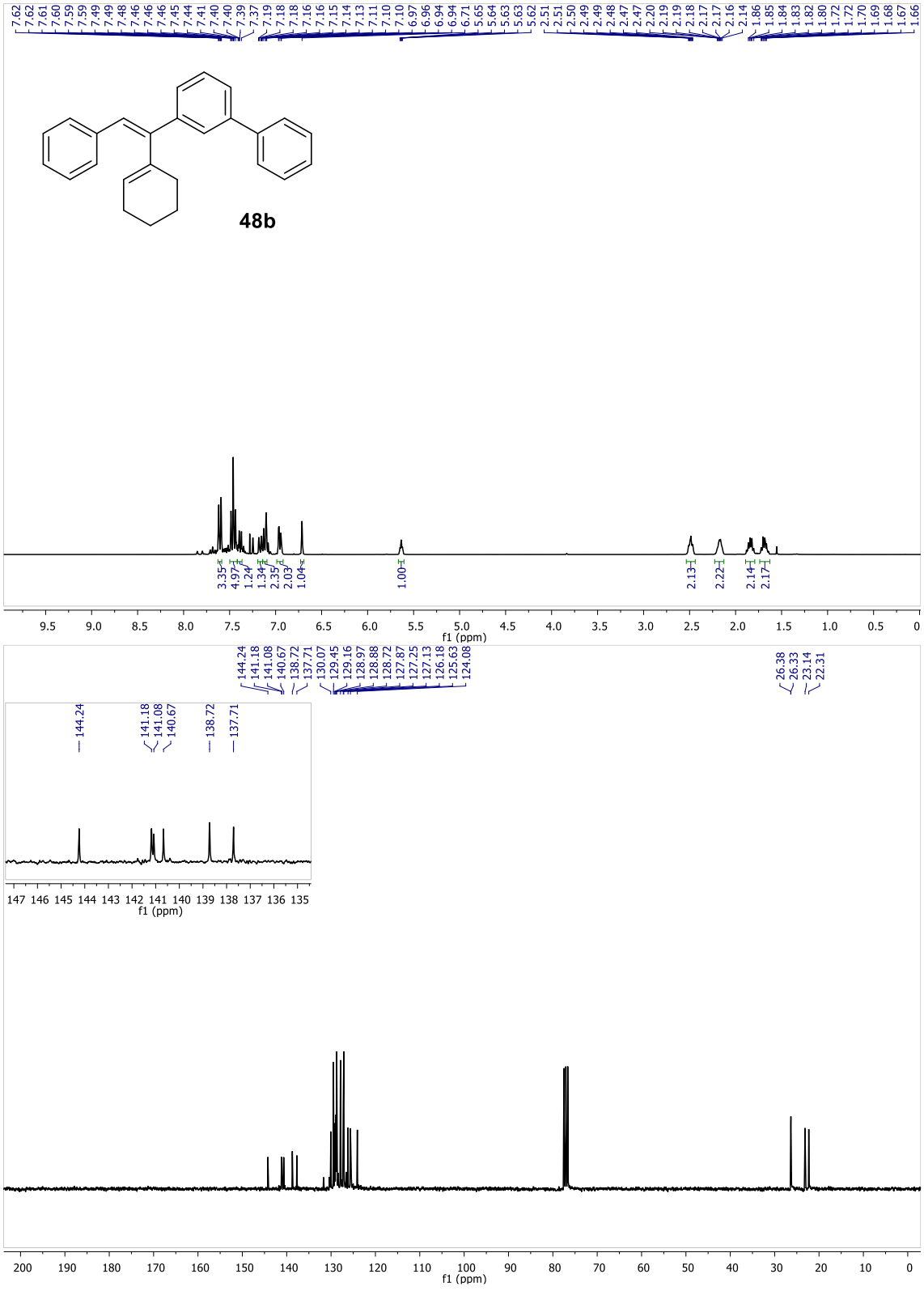
((1*E*,3*E*)-3-Isopropylpenta-1,3-diene-1,2-diyl)dibenzene **45m** and (*Z*)-(3-Ethyl-4-methylpenta-1,3-diene-1,2-diyl)dibenzene **45m'**



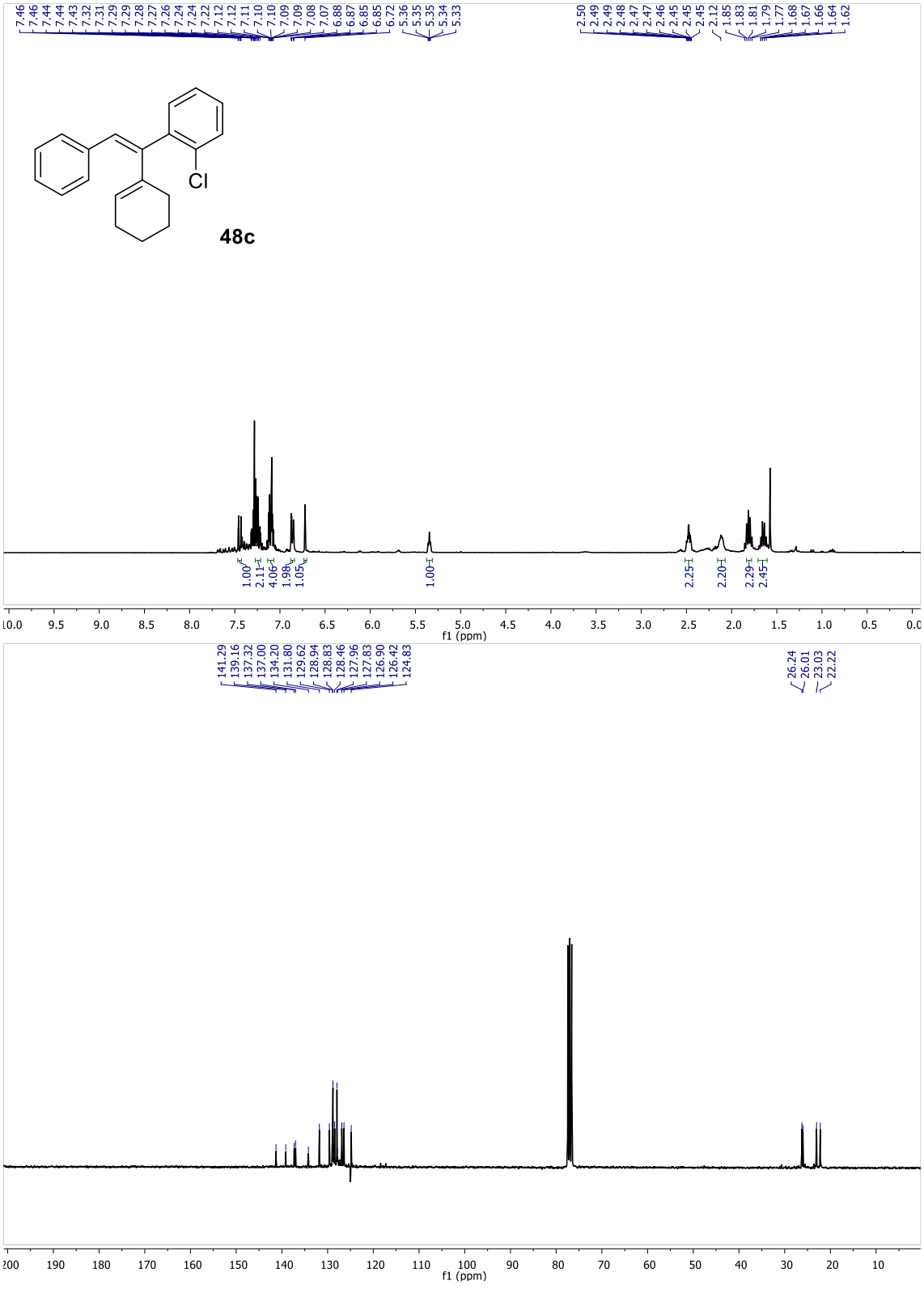
(*E*)-1-(1-(Cyclohex-1-en-1-yl)-2-phenylvinyl)-4-methoxybenzene **48a**



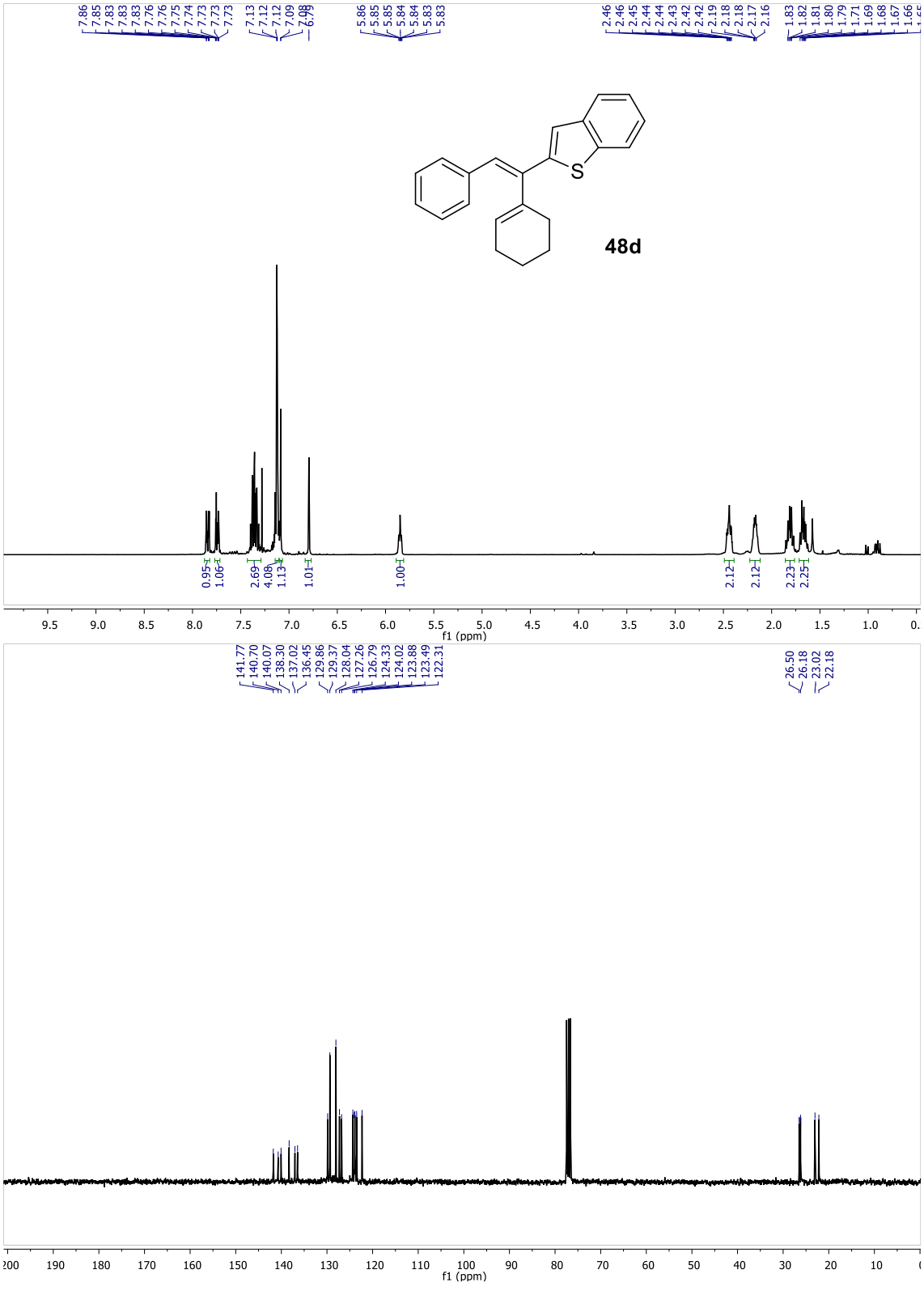
(*E*)-3-(1-(Cyclohex-1-en-1-yl)-2-phenylvinyl)-1,1'-biphenyl **48b**



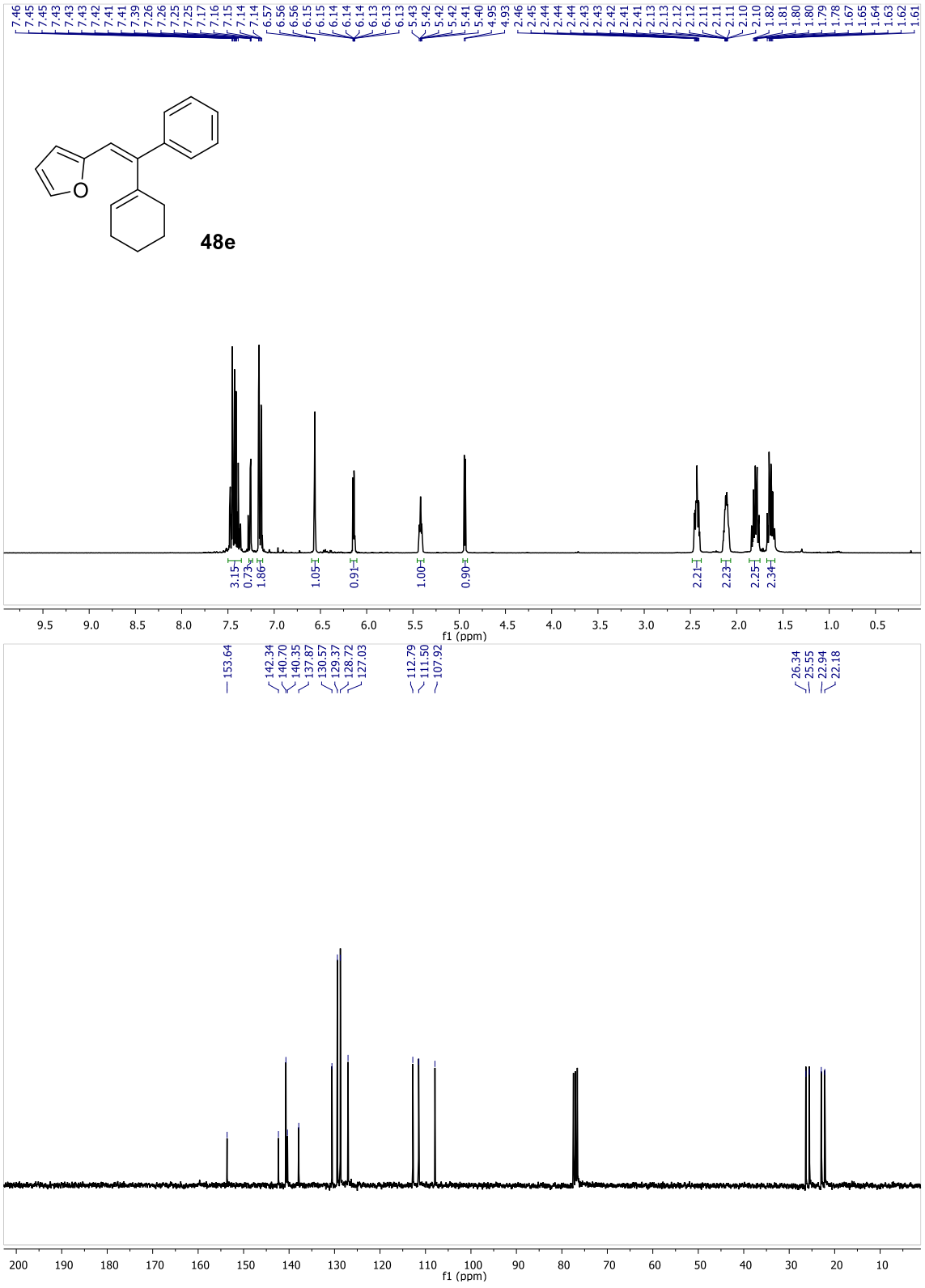
(*E*)-1-Chloro-2-(1-(cyclohex-1-en-1-yl)-2-phenylvinyl)benzene **48c**



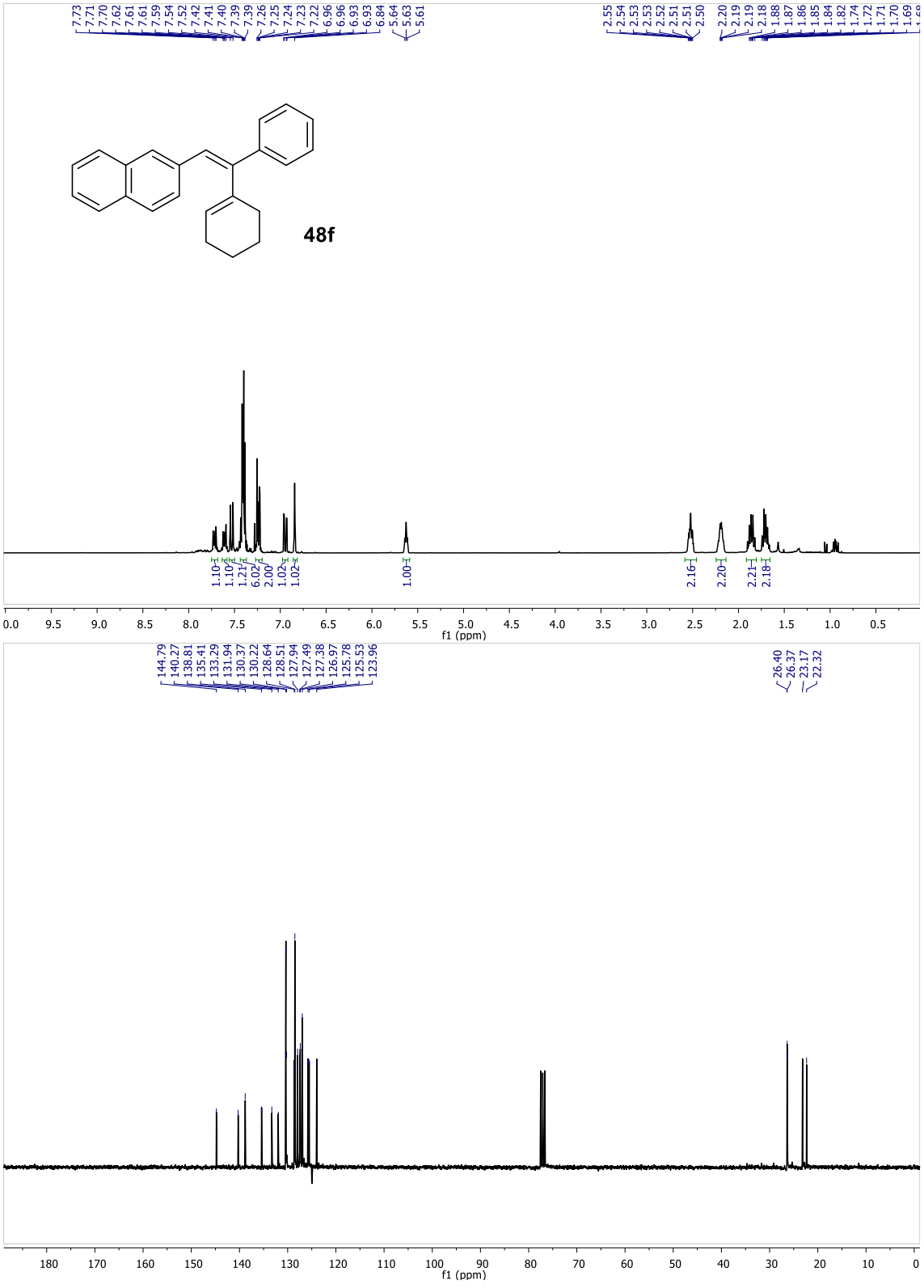
(*E*)-2-(1-(Cyclohex-1-en-1-yl)-2-phenylvinyl)benzo[b]thiophene **48d**



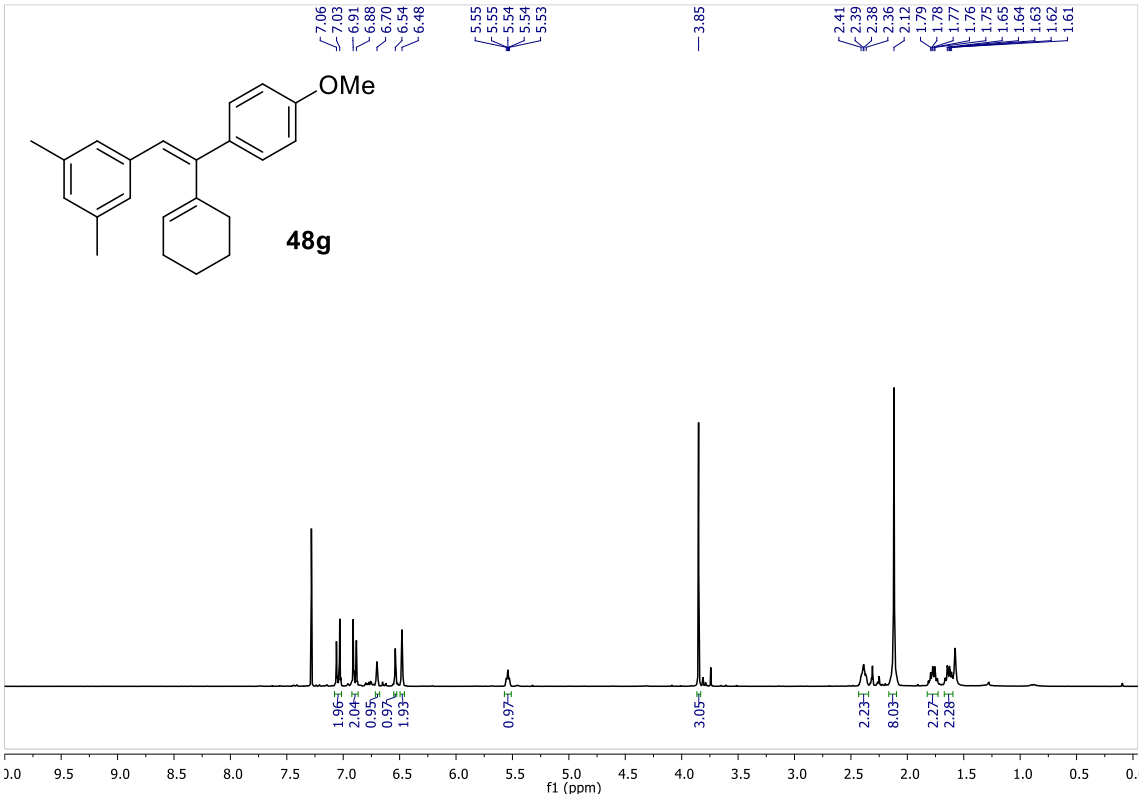
(*E*)-2-(2-(Cyclohex-1-en-1-yl)-2-phenylvinyl)furan **48e**

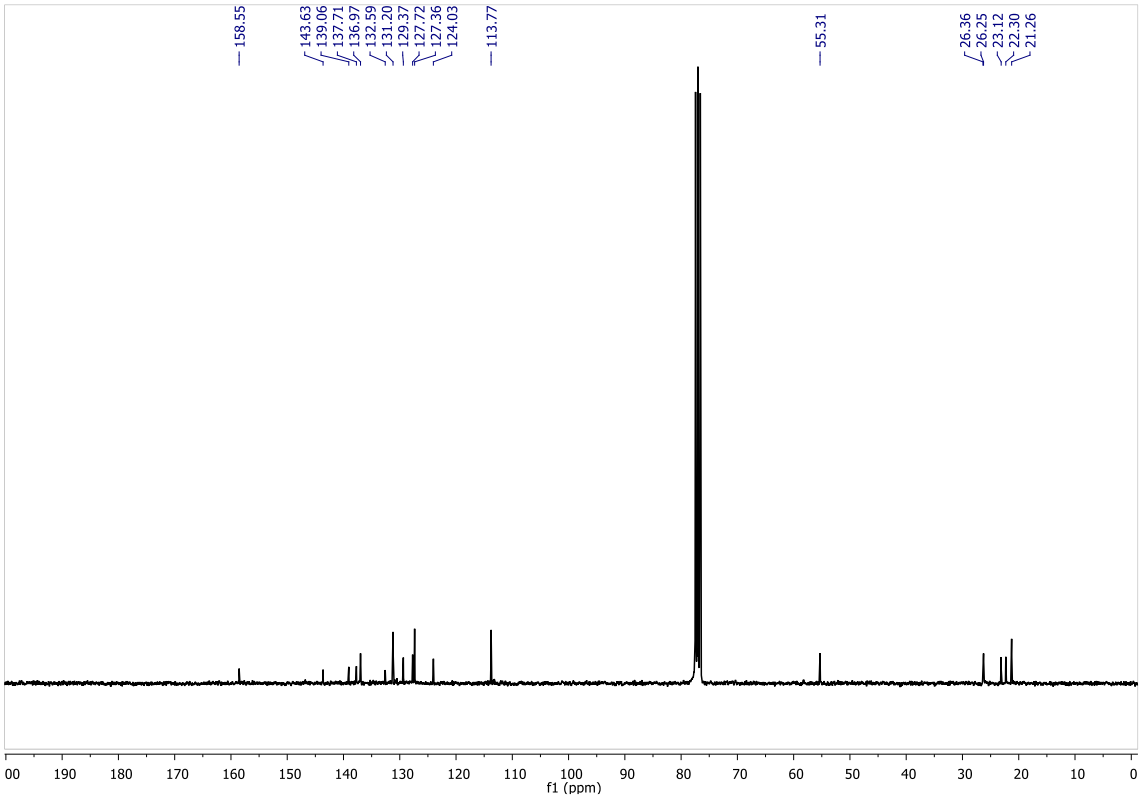


(*E*)-2-(2-(Cyclohex-1-en-1-yl)-2-phenylvinyl)naphthalene **48f**

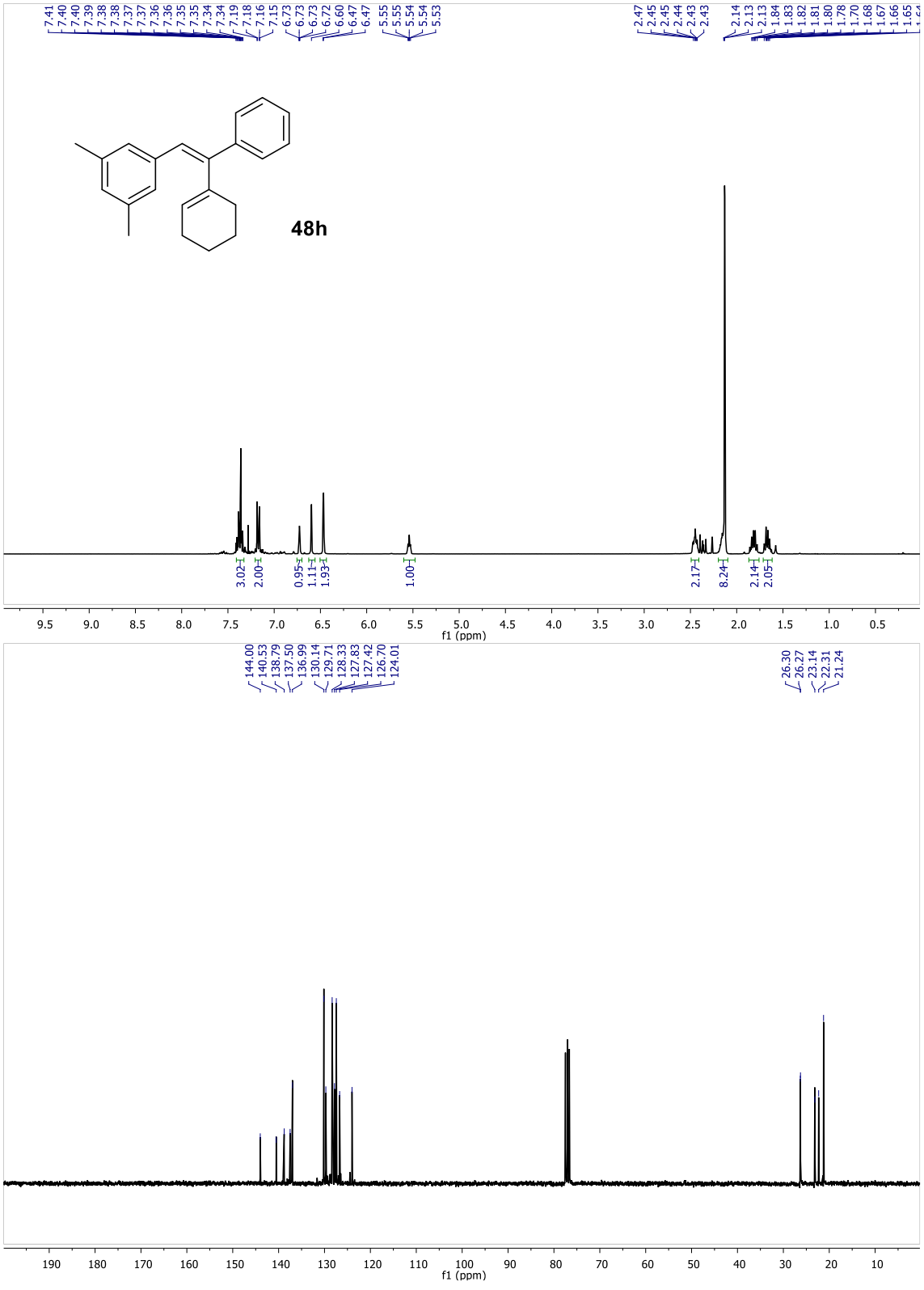


(*E*)-1-(2-(Cyclohex-1-en-1-yl)-2-(4-methoxyphenyl)vinyl)-3,5-dimethylbenzene **48g**

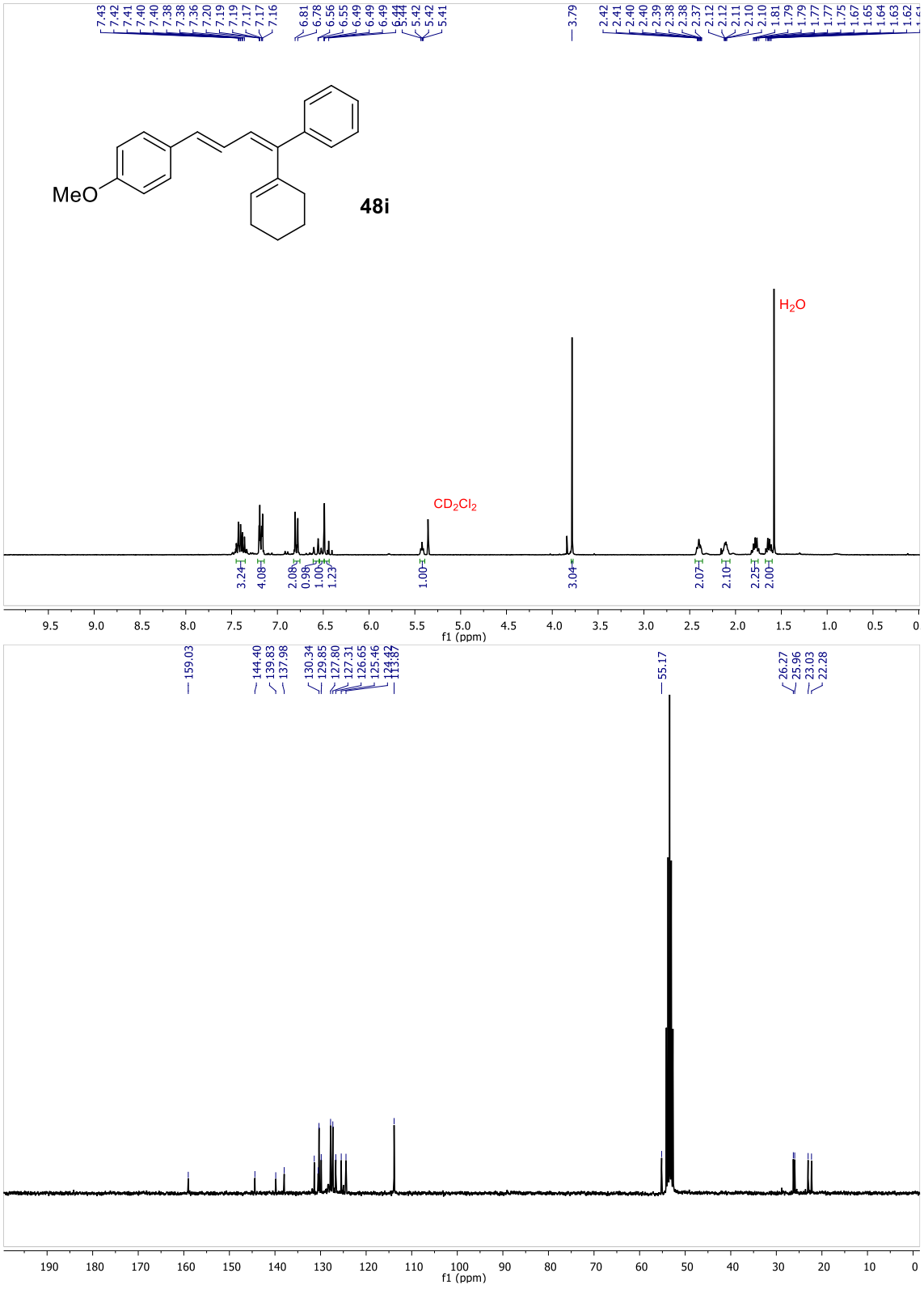


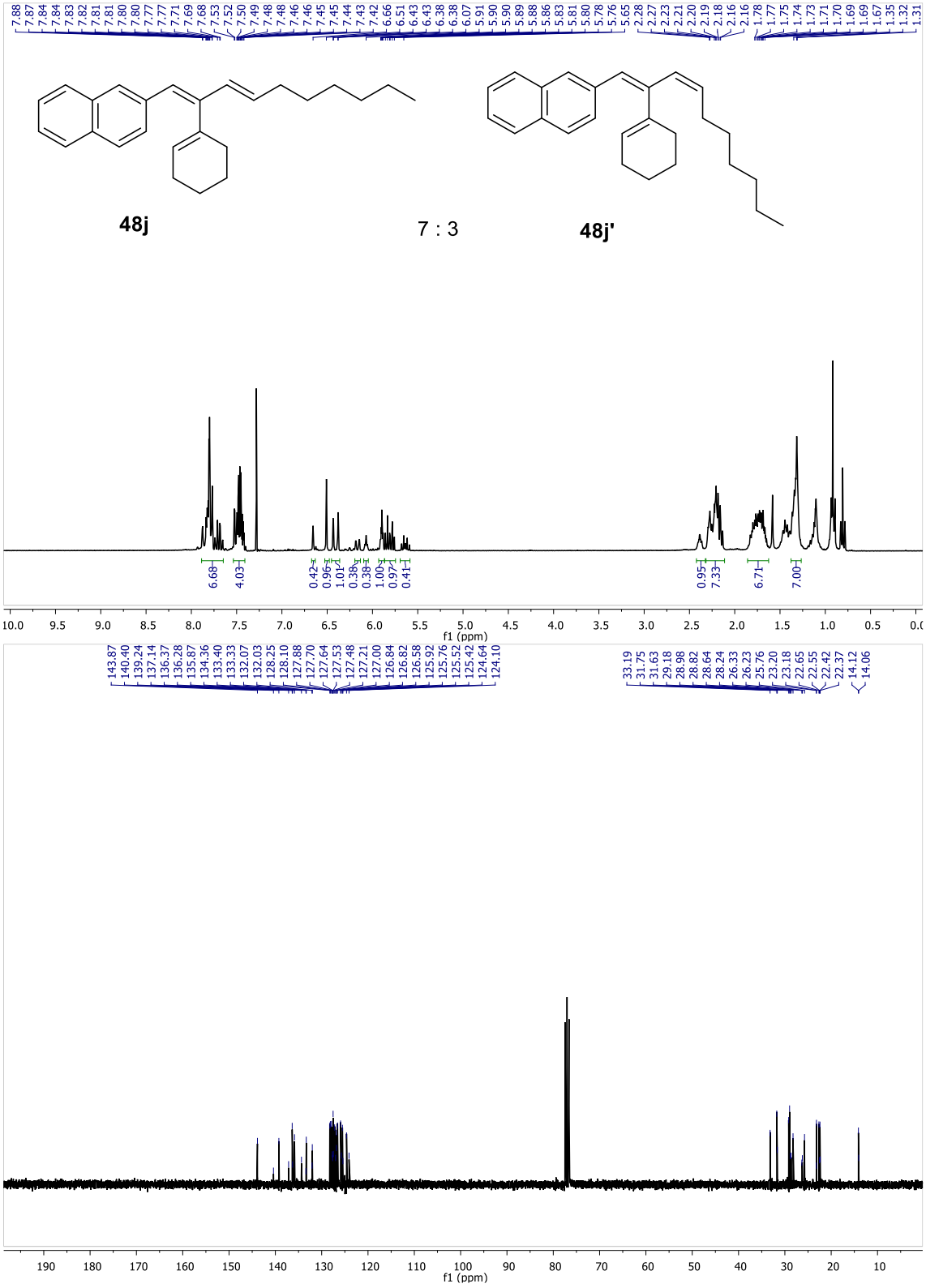
(*E*)-1-(2-(Cyclohex-1-en-1-yl)-2-phenylvinyl)-3,5-dimethylbenzene **48h**



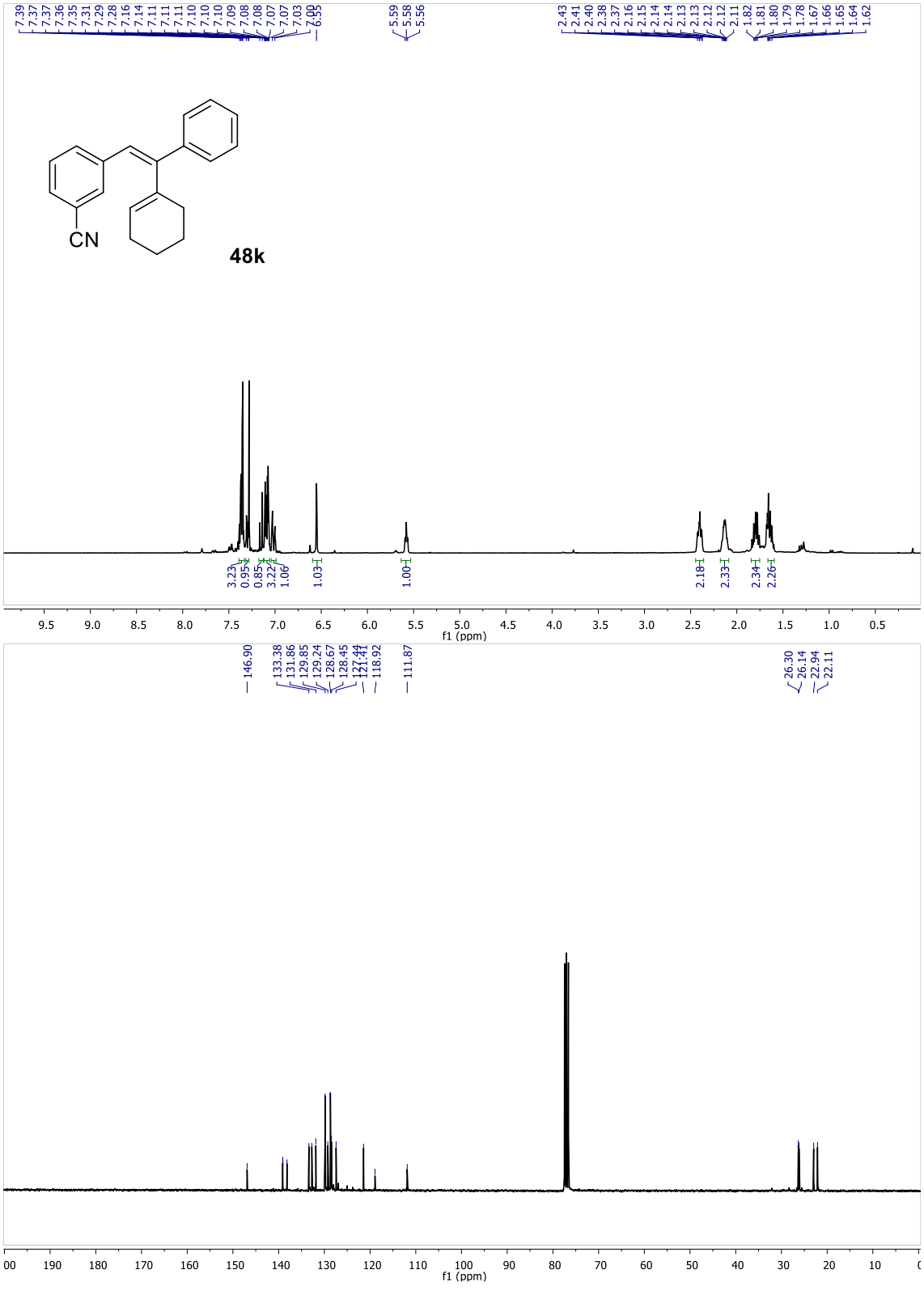
1-((1*E*,3*E*)-4-(Cyclohex-1-en-1-yl)-4-phenylbuta-1,3-dien-1-yl)-4-methoxybenzene **48i**



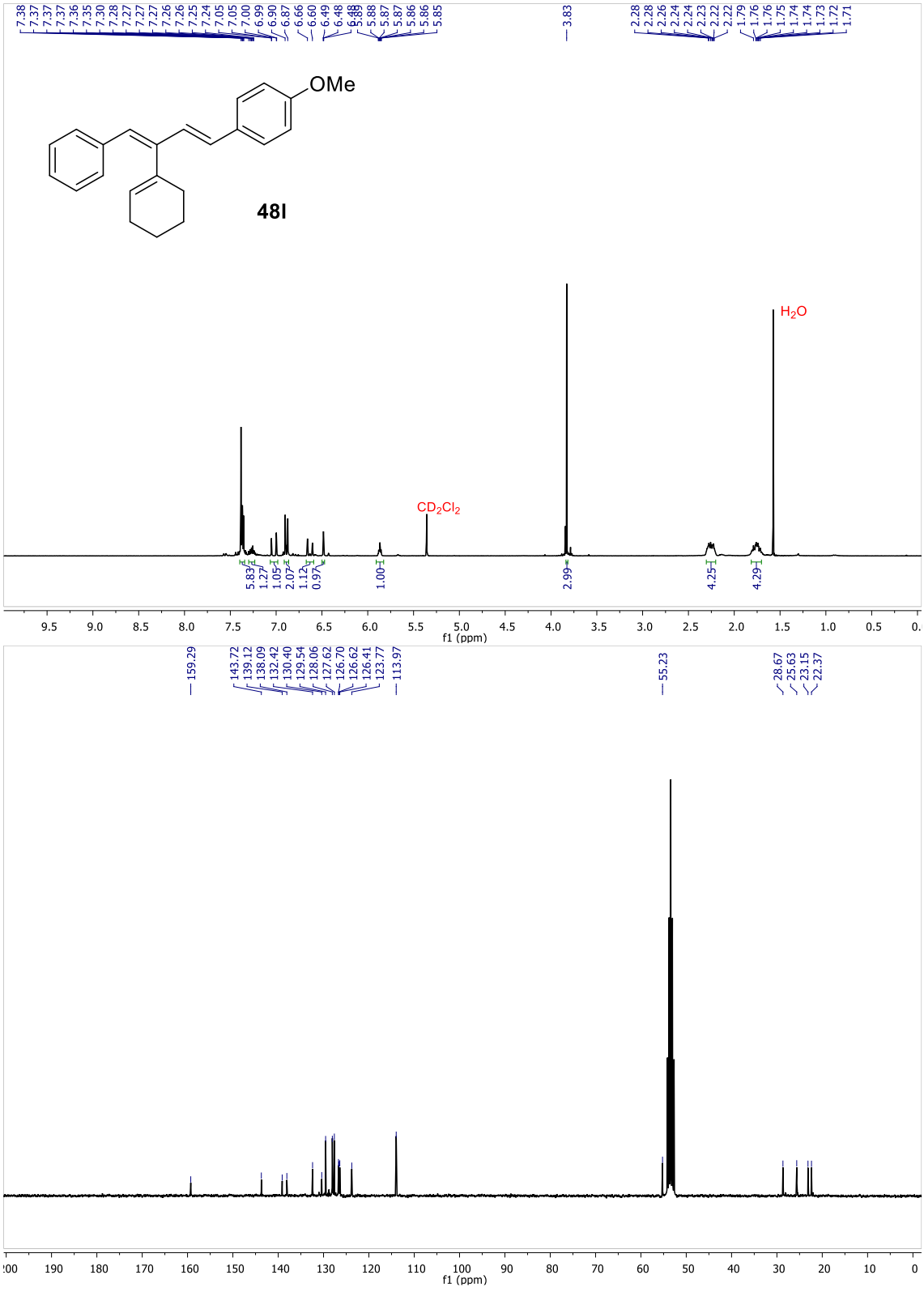
2-((1*Z*,3*E*)-2-(Cyclohex-1-en-1-yl)deca-1,3-dien-1-yl)naphthalene **48j** 2-((1*Z*,3*Z*)-2-(Cyclohex-1-en-1-yl)deca-1,3-dien-1-yl)naphthalene **48j'**



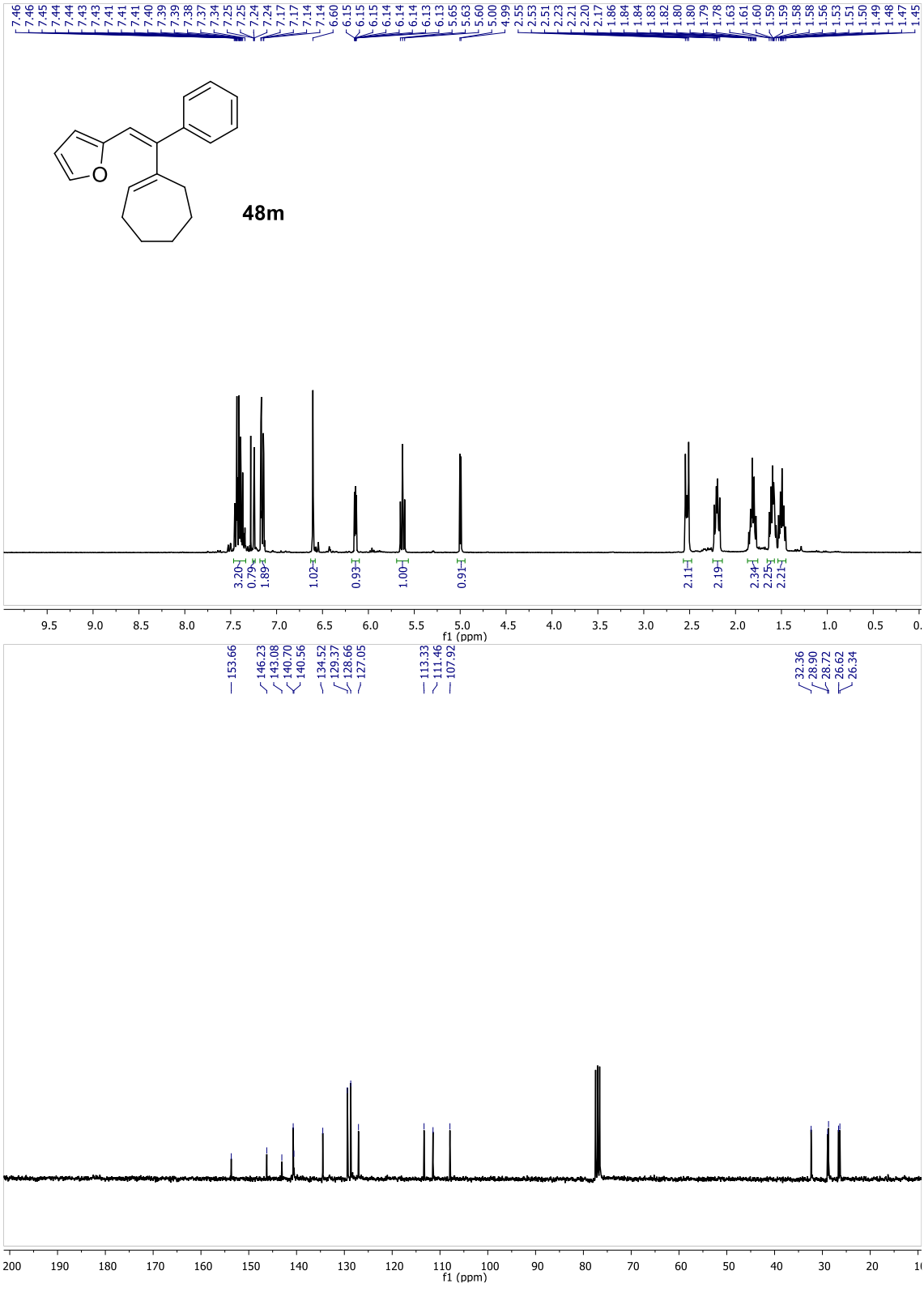
(*E*)-3-(2-(Cyclohex-1-en-1-yl)-2-phenylvinyl)benzonitrile **48k**



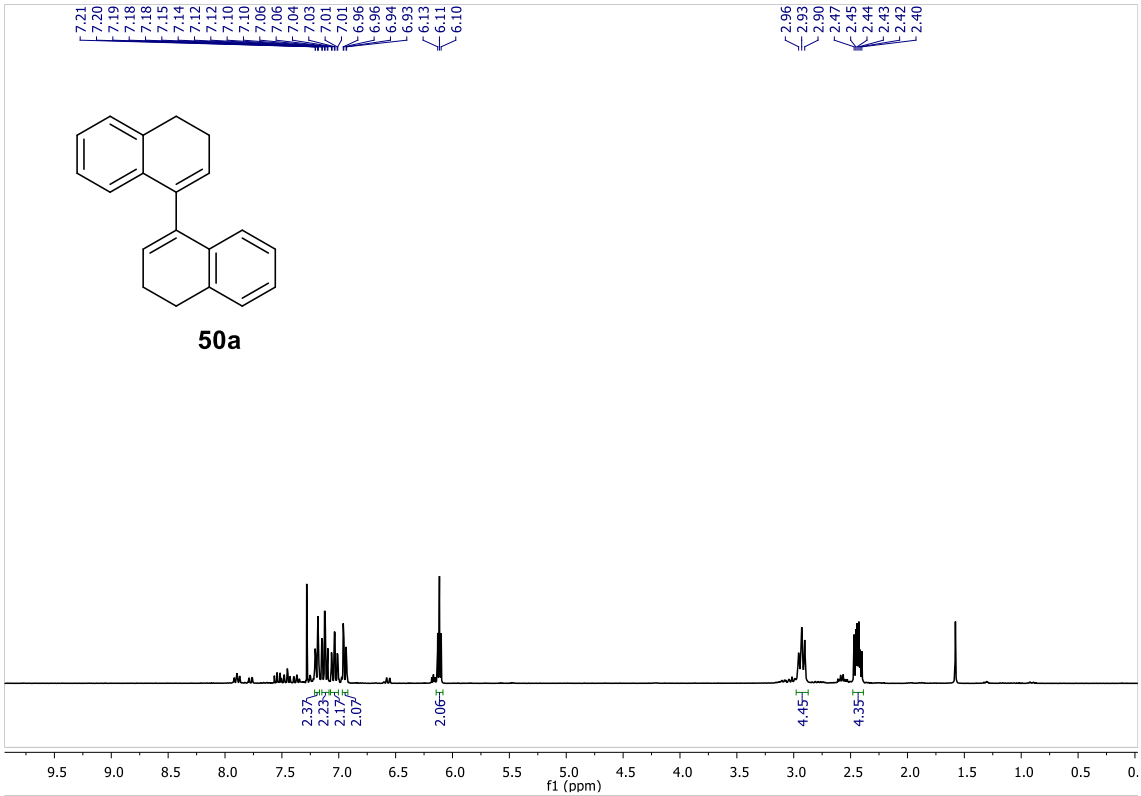
1-((1*E*,3*Z*)-3-(Cyclohex-1-en-1-yl)-4-phenylbuta-1,3-dien-1-yl)-4-methoxybenzene **48l**

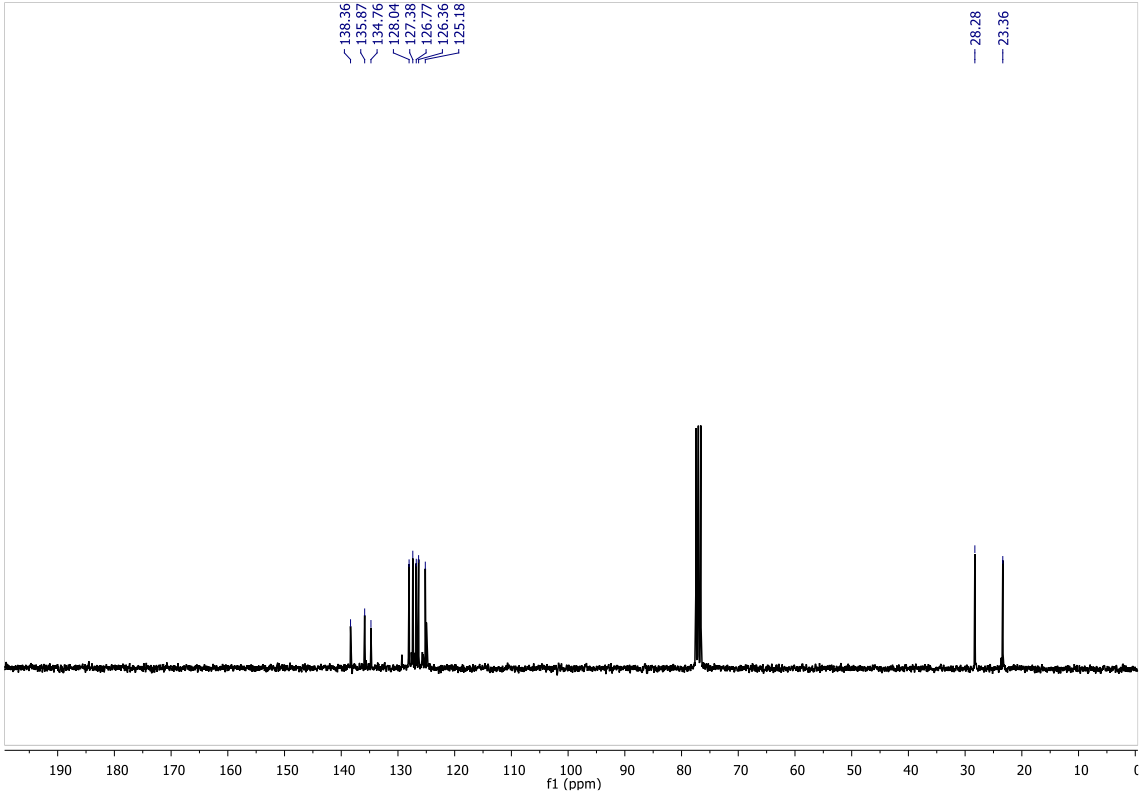


(*E*)-2-(2-(Cyclohept-1-en-1-yl)-2-phenylvinyl)furan **48m**

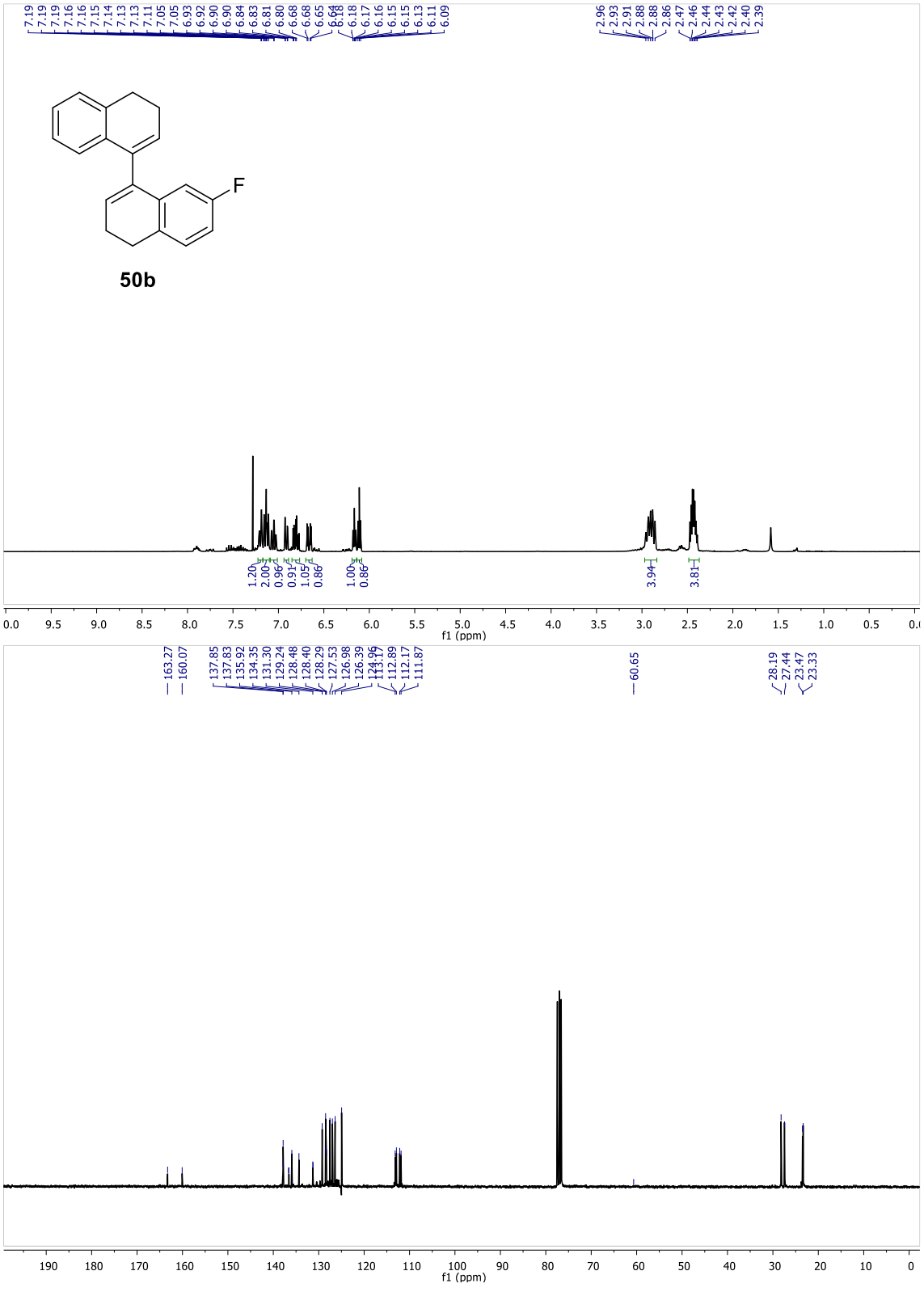


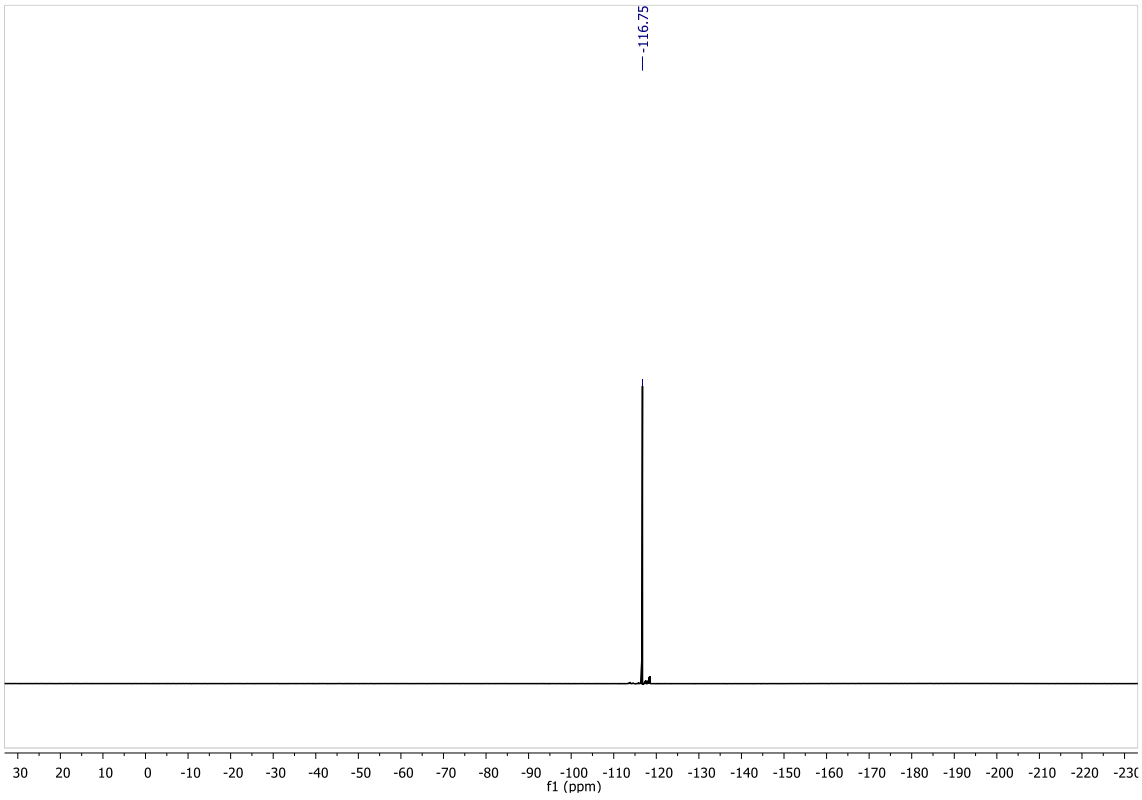
3,3',4,4'-Tetrahydro-1,1'-binaphthalene **50a**



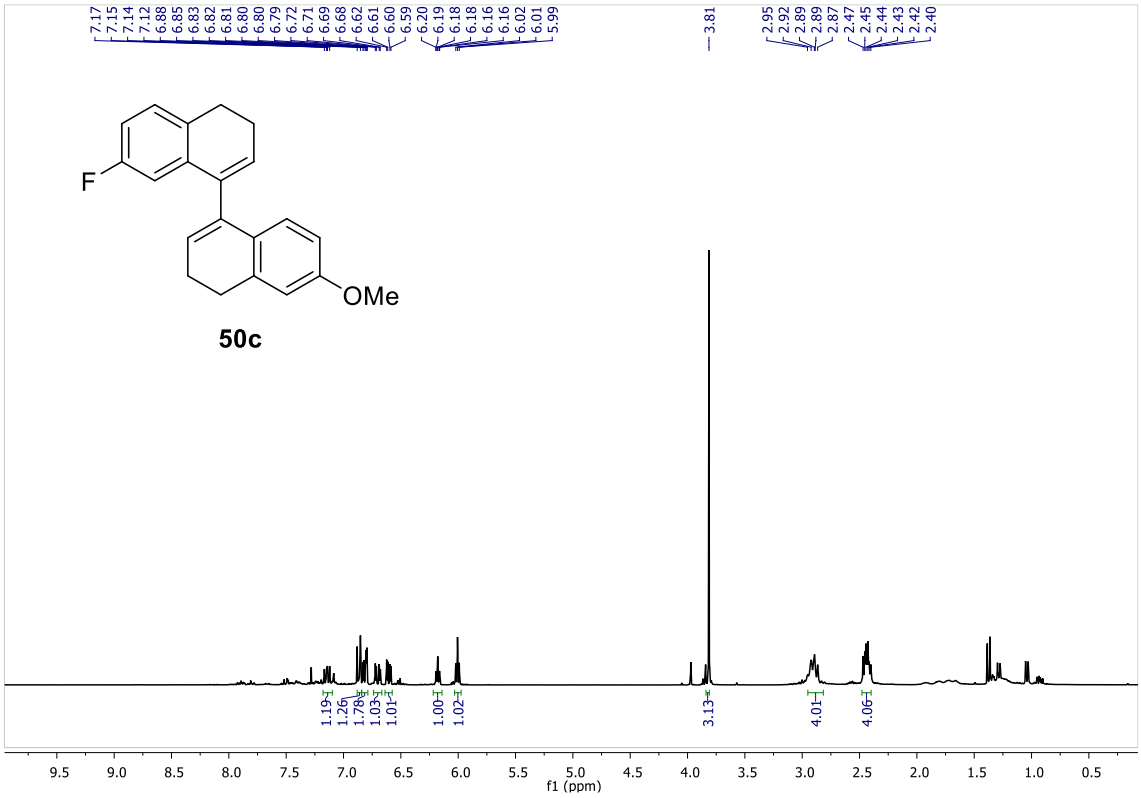



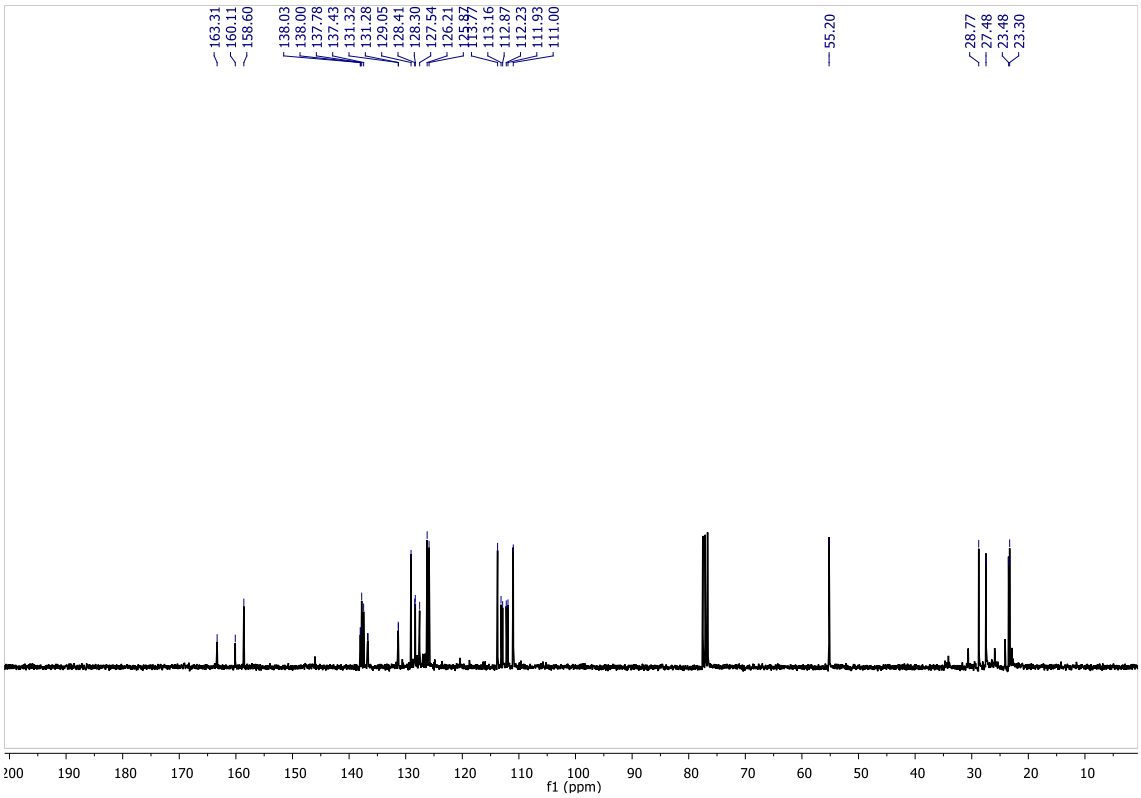
7-Fluoro-3,3',4,4'-tetrahydro-1,1'-binaphthalene **50b**

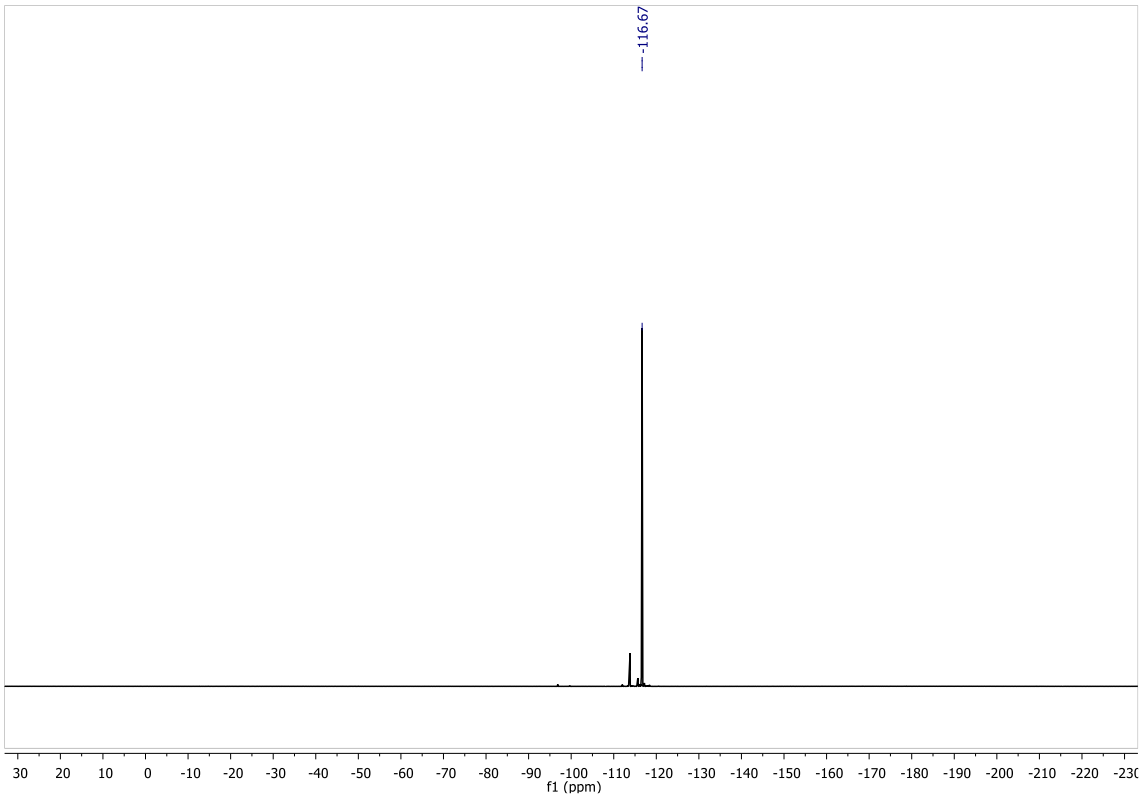



-116.75
30 20 10 0 -10 -20 -30 -40 -50 -60 -70 -80 -90 -100 -110 -120 -130 -140 -150 -160 -170 -180 -190 -200 -210 -220 -230
f1 (ppm)

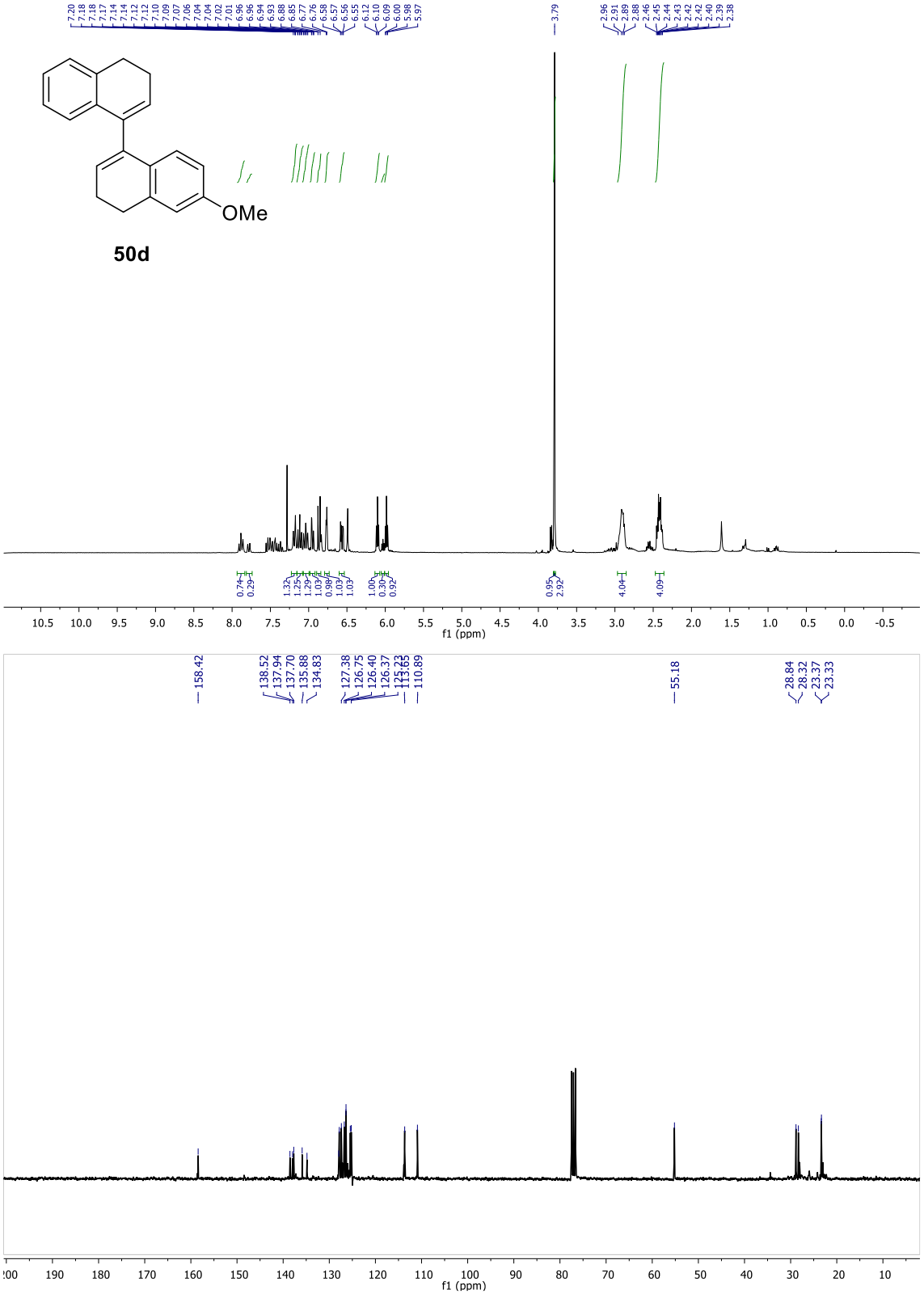
7'-Fluoro-6-methoxy-3,3',4,4'-tetrahydro-1,1'-binaphthalene **50c**



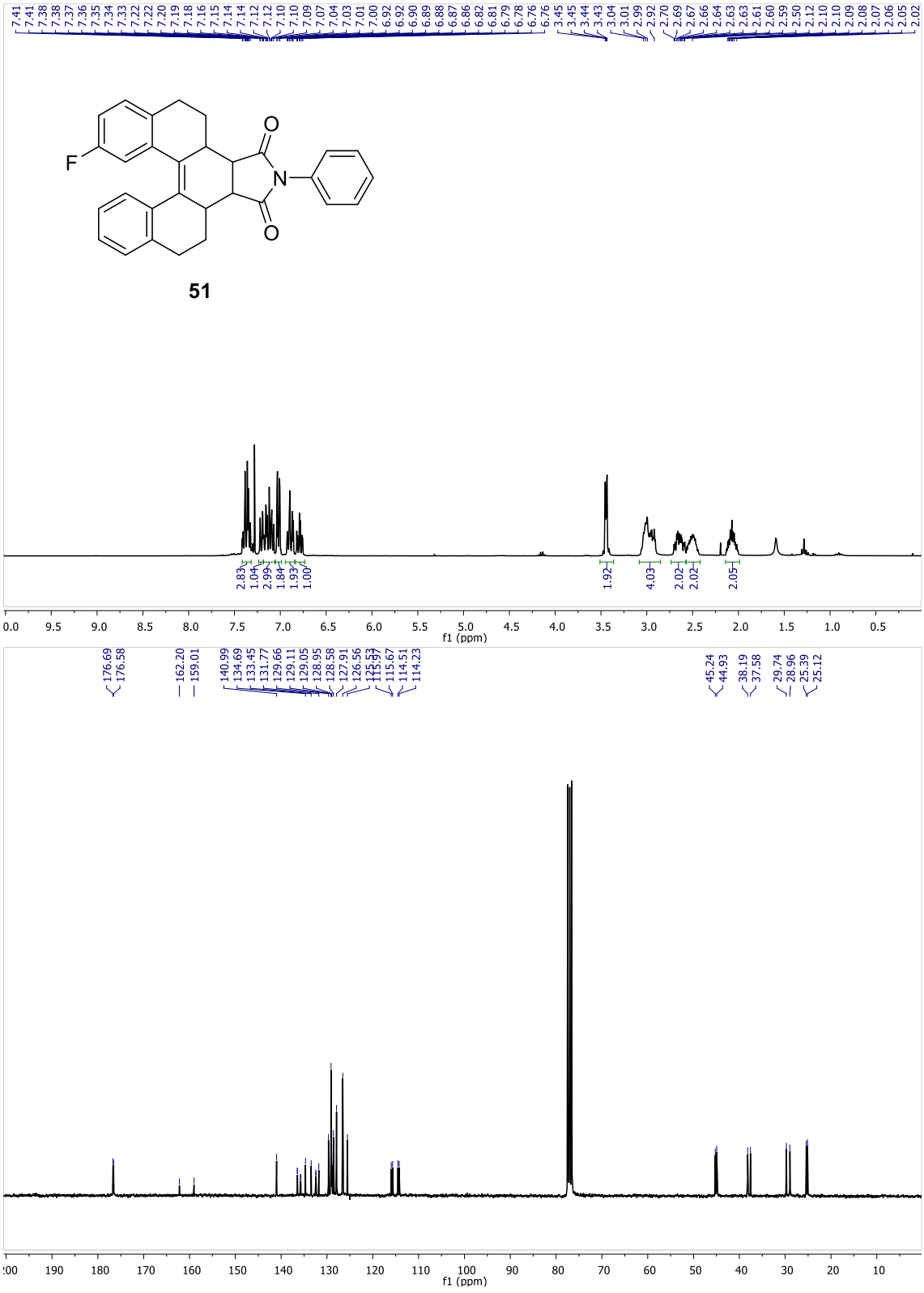



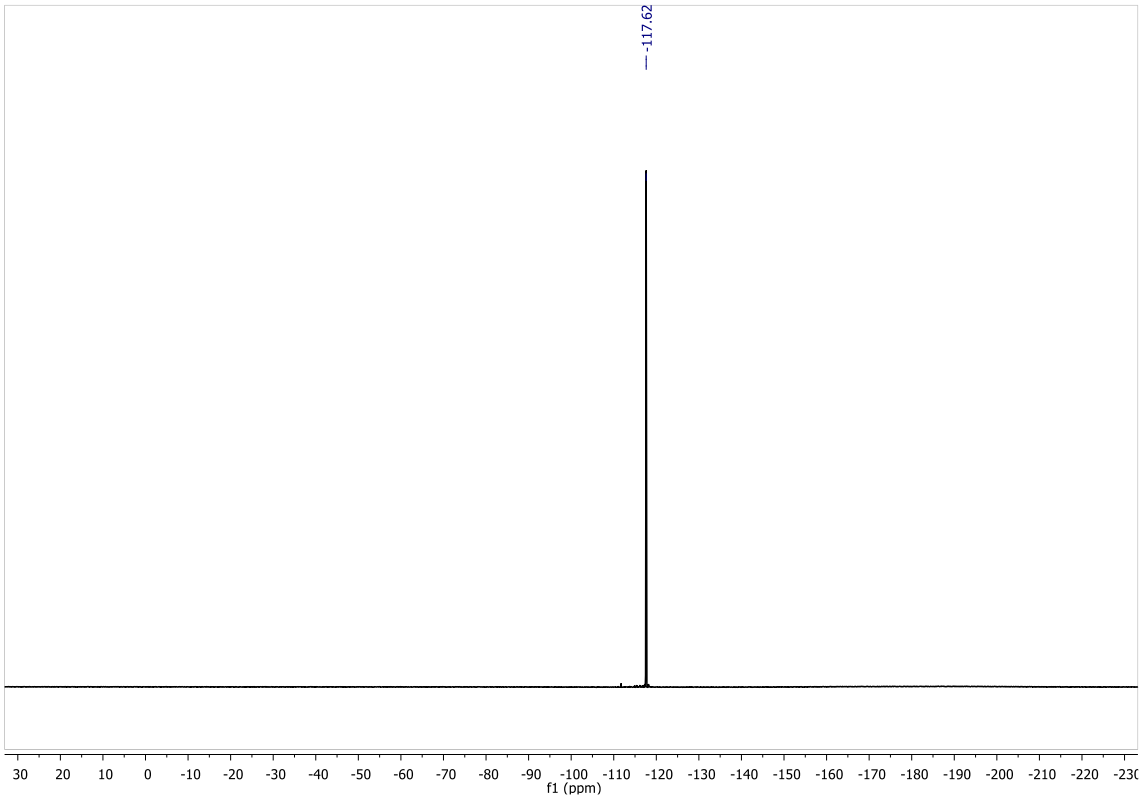

-116.67
30 20 10 0 -10 -20 -30 -40 -50 -60 -70 -80 -90 -100 -110 -120 -130 -140 -150 -160 -170 -180 -190 -200 -210 -220 -230
f1 (ppm)

6-Methoxy-3,3',4,4'-tetrahydro-1,1'-binaphthalene **50d**



8-Fluoro-2-phenyl-3a,3b,4,5,14,15,15*a*,15*b*-octahydro-1*H*-dinaphtho[2,1-*e*:1',2'-*g*]isoindole-1,3(2*H*)-dione **51**




-117.62
30 20 10 0 -10 -20 -30 -40 -50 -60 -70 -80 -90 -100 -110 -120 -130 -140 -150 -160 -170 -180 -190 -200 -210 -220 -230
f1 (ppm)