

Novel synthesis of substituted 2-trifluoromethyl and 2-perfluoroalkyl *N*-arylpuridinium compounds – mechanistic insights

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Supplementary Information : list of contents

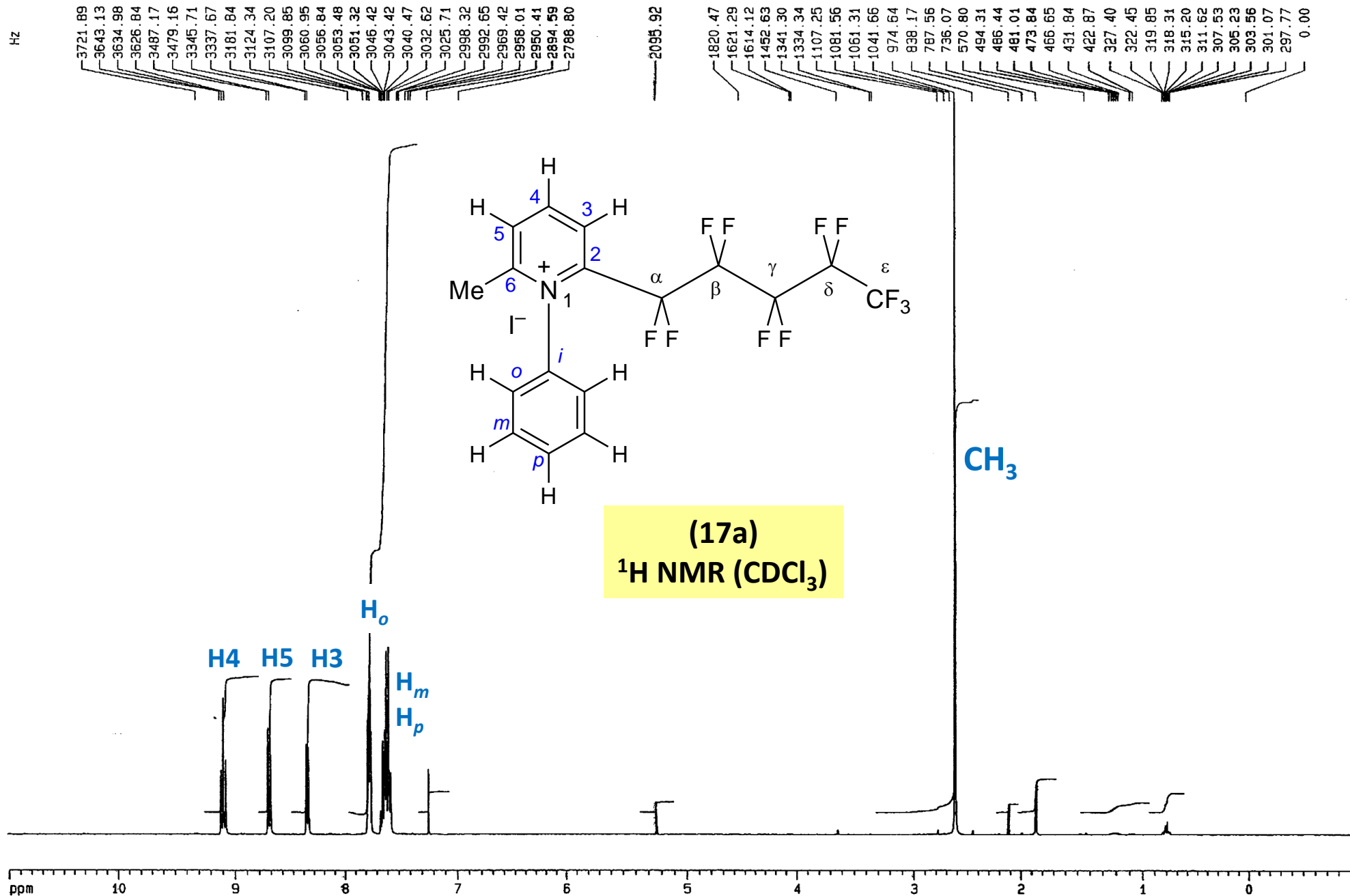
Page 2 : Table S 1. List of described compounds 17–21

Pages 3 to 53: Copies of ¹H, ¹³C, ¹H-¹H COSY, ¹³C-¹H HSQC and ¹⁹F NMR spectrum of compounds : **17a, 17a', 17f, 17h, 17i, 17l, 17m, 17n, 18b, 18l, 18m, 19c, 19d, 19f, 19g, 19i, 19j, 19k, 19l, 19m**

Table S 1. List of described compounds **17–21** with correspondence to substrates **14, 15, 16** substitutions (including some examples previously published in refs 59, 64 of main Article). Examples of **17–21** are numbered after substrates **14–15** substitutions, e.g. **17a** is obtained from **14** and **15a**, or **17n'** is obtained from **14'** and **15n**

ketone (16)		Acetone 16t			Cyclohexanone 16u		Cycloheptanone 16v			
Substrate (14)		14'	14''	14	14'	14	14	14'	14''	14
R _F		CF ₃	C ₃ F ₇	C ₅ F ₁₁	CF ₃	C ₅ F ₁₁	C ₅ F ₁₁	CF ₃	C ₃ F ₇	C ₅ F ₁₁
R (anilines 15)										
H	15a	17a'	17a''	17a	18a'	18a	19a	21a' ^[a]	21a''	21a ^[b]
<i>o</i> -Me	15b			17b		18b				21b
<i>m</i> -Me	15c			17c		18c	19c			21c
<i>p</i> -Me	15d	17d'		17d		18d	19d	21d' ^[a]		21d
<i>o</i> -Et	15e			17e						21e
<i>m</i> -Et	15f			17f			19f			21f
<i>p</i> -Et	15g	17g'		17g		18g	19g	21g'		21g
<i>o</i> -Cl	15h			17h						21h
<i>m</i> -Cl	15i			17i		18i	19i			21i
<i>p</i> -Cl	15j			17j			19j			21j
<i>o</i> -OMe	15k			17k			19k			21k
<i>p</i> -OMe	15l			17l		18l	19l			21l
<i>o</i> -CO ₂ H	15m	17m'		17m		18m	19m	21m'		21m
<i>p</i> -CO ₂ H	15n	17n'		17n		18n		21n'		21n
<i>m</i> -OMe	15o	20o'		20o		20o	20o	21o'		21o

^[a] Spectroscopic characterizations published in ref. 64 of main Article. ^[b] Spectroscopic characterizations published in ref. 59 of main Article.



F2 - Acquisition Parameters

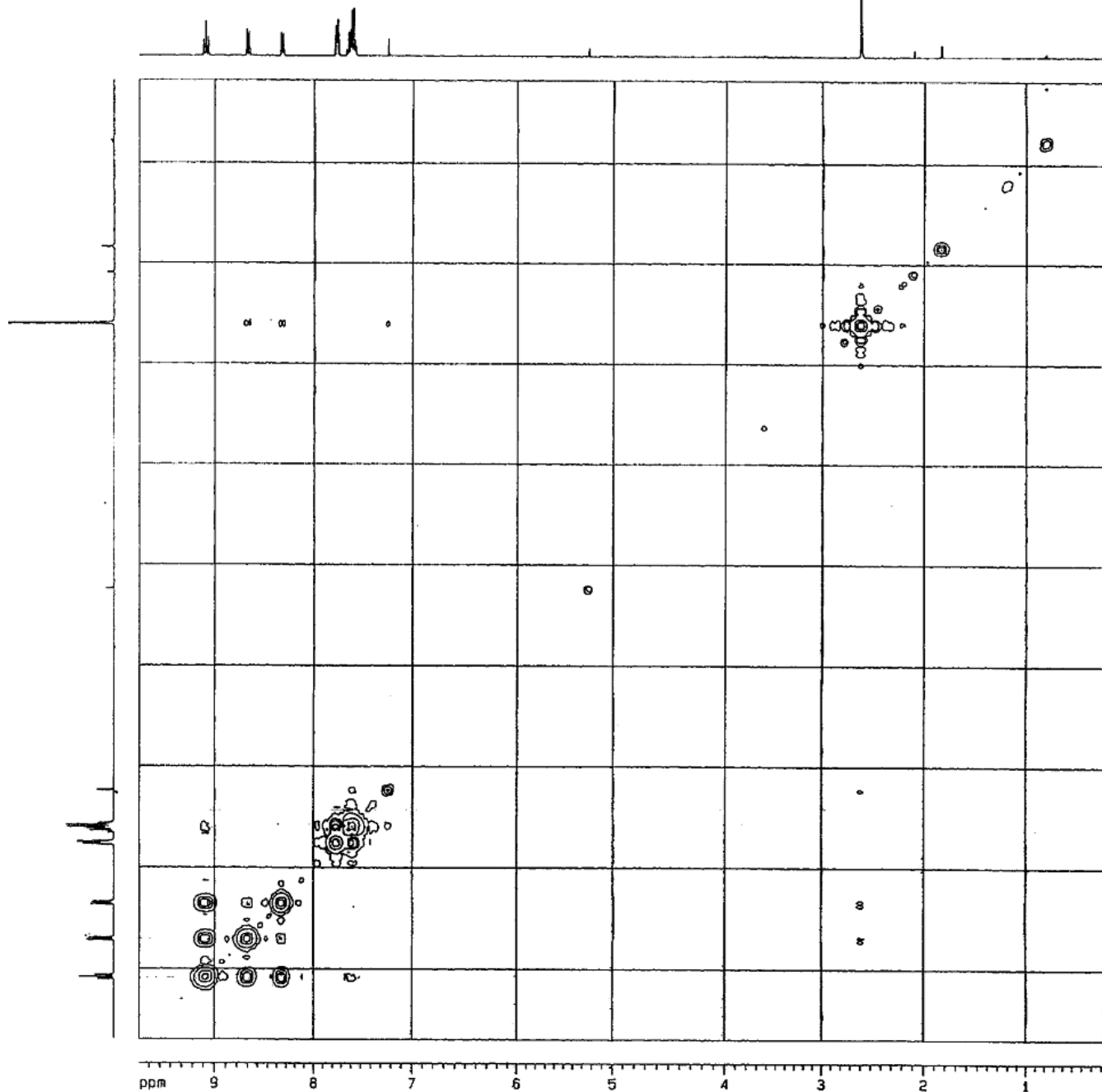
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 FIDRES 0.250967 Hz
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 O1 1.00000000 sec
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 DE 4.50 usec
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 NUC1 1H
 PL1 -6.00 dB

F2 - Processing parameters

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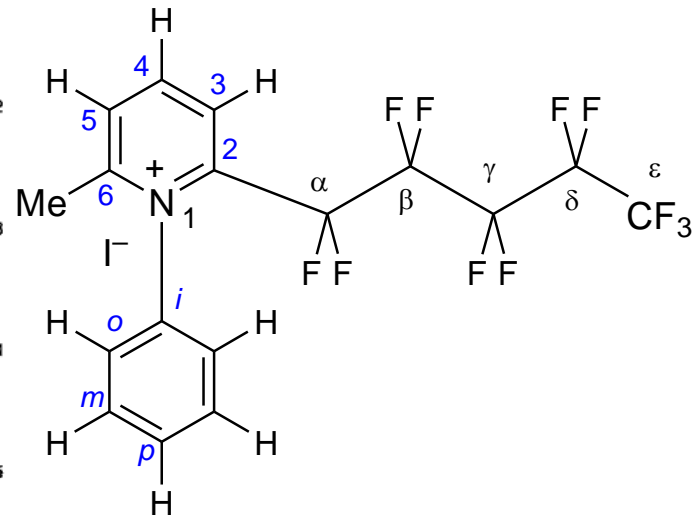
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 F1 4401.43 Hz
 F2P -1.000 ppm
 F2 -400.13 Hz
 PPMCM 0.48000 ppm/cm
 HZCM 160.05202 Hz/cm



F2 - Acquisition Parameters

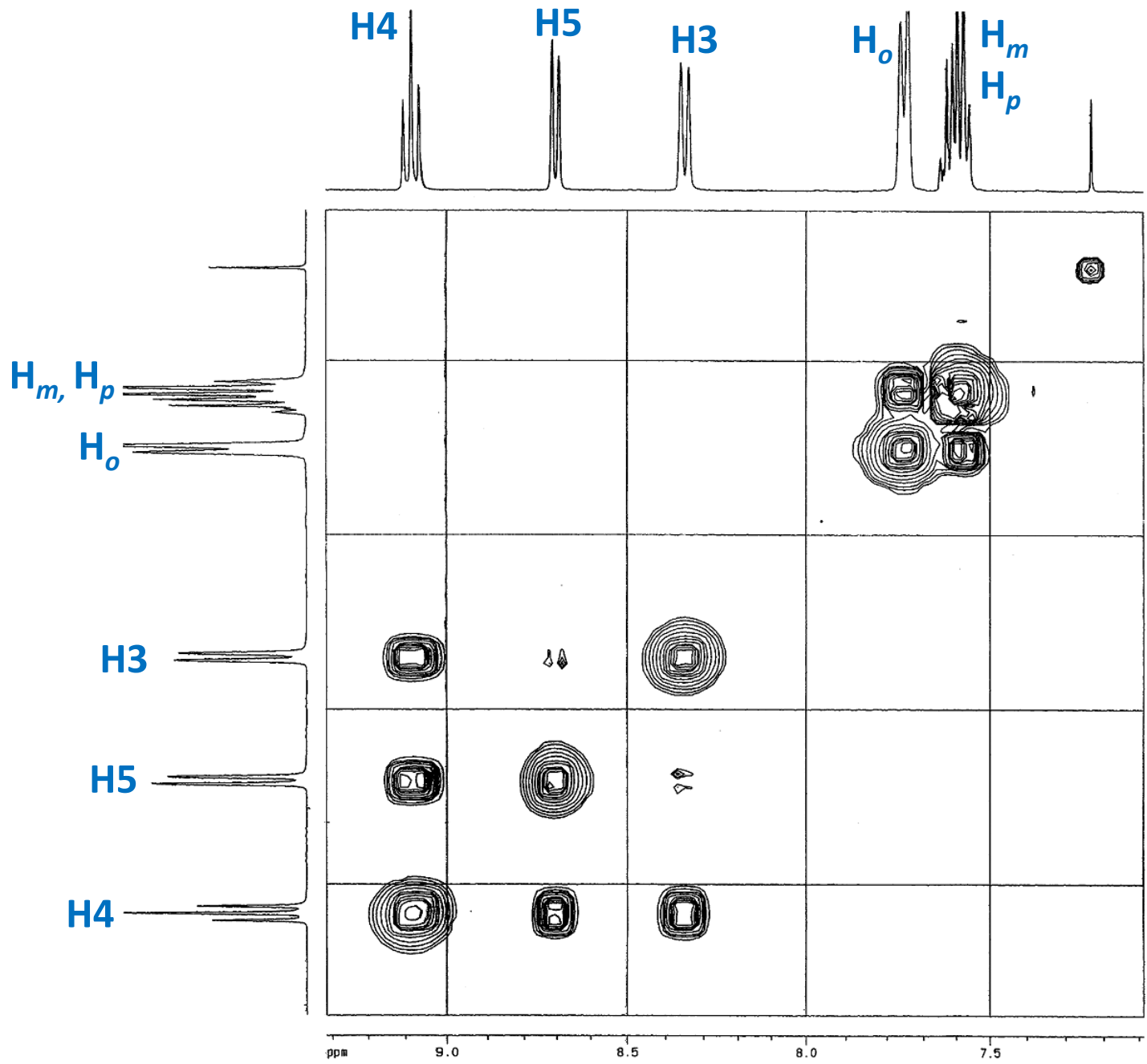
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 TD 1024
 SOLVENT CDCl3



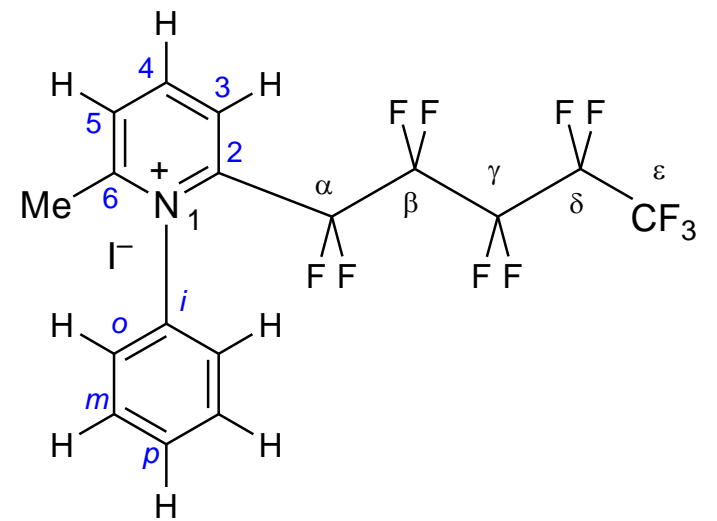
(17a)
COSY ¹H-¹H NMR
(CDCl₃)

WDW SINE
 SSB 0
 LB 0.00 Hz
 GB 0

20 NMR plot parameters
 CX2 20.00 cm
 CX1 20.00 cm
 F2PLO 9.698 ppm
 F2LO 3880.29 Hz
 F2PHI 0.173 ppm
 F2HI 69.34 Hz
 F1PLO 9.698 ppm
 F1LO 3880.29 Hz
 F1PHI 0.173 ppm
 F1HI 69.34 Hz
 F2PPMCH 0.47621 ppm/cm
 F2HZCH 190.54784 Hz/cm
 F1PPMCH 0.47621 ppm/cm
 F1HZCH 190.54784 Hz/cm

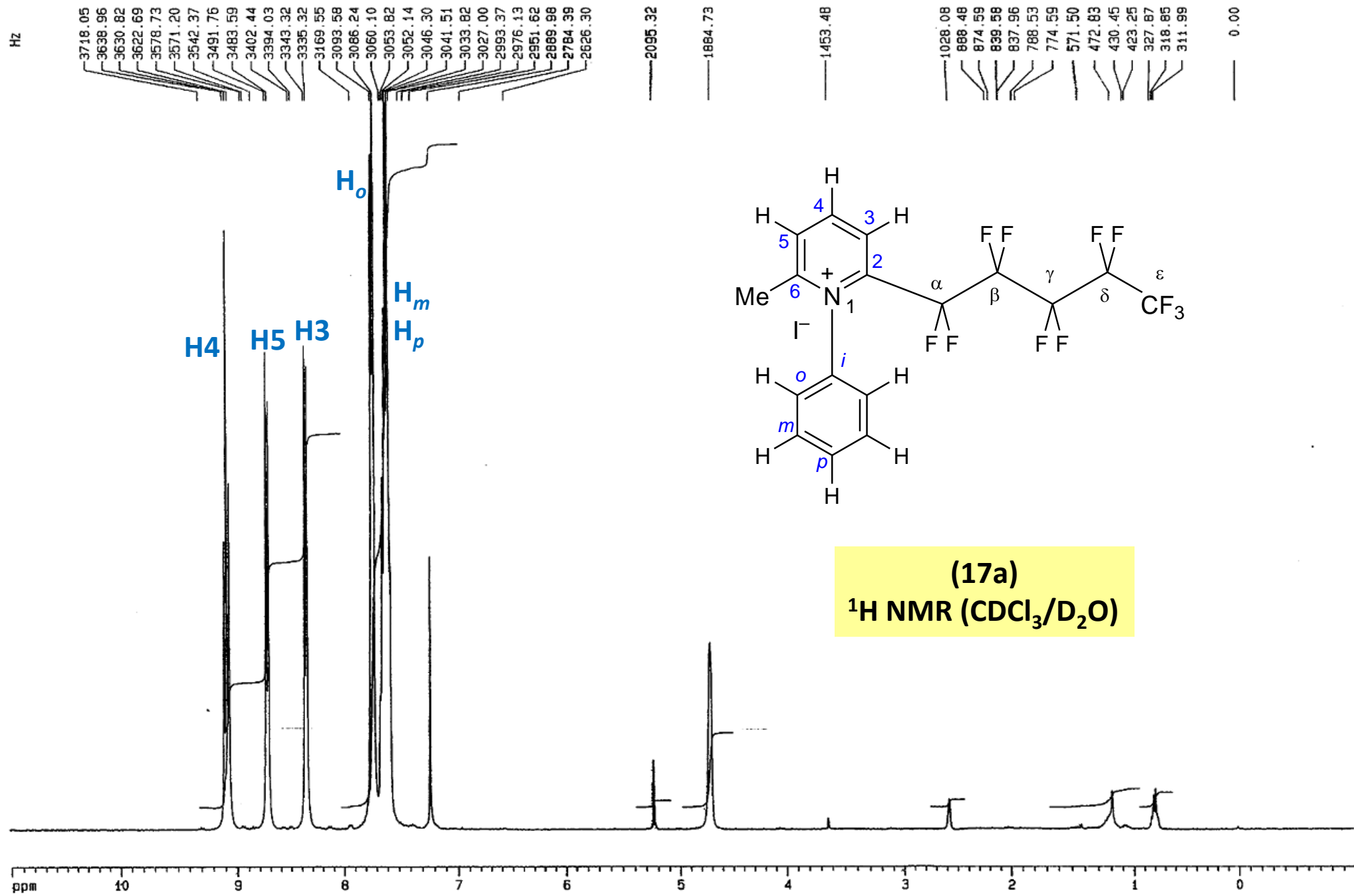


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 PULPROG cosy45
 TO 1024
 SOLVENT CDCl3
 NS 16
 DS 4
 SMH 3810.976 Hz
 FIDRES 3.721656 Hz



(17a)
COSY ¹H-¹H NMR
(CDCl₃)

F2LO 3750.86 Hz
 F2PHI 7.066 ppm
 F2HI 2835.33 Hz
 F1PLO 9.374 ppm
 F1LO 3750.86 Hz
 F1PHI 7.067 ppm
 F1HI 2827.89 Hz
 F2PPMCH 0.11161 ppm/cm
 F2HZCH 44.69987 Hz/cm
 F1PPMCH 0.11533 ppm/cm
 F1HZCH 46.14854 Hz/cm

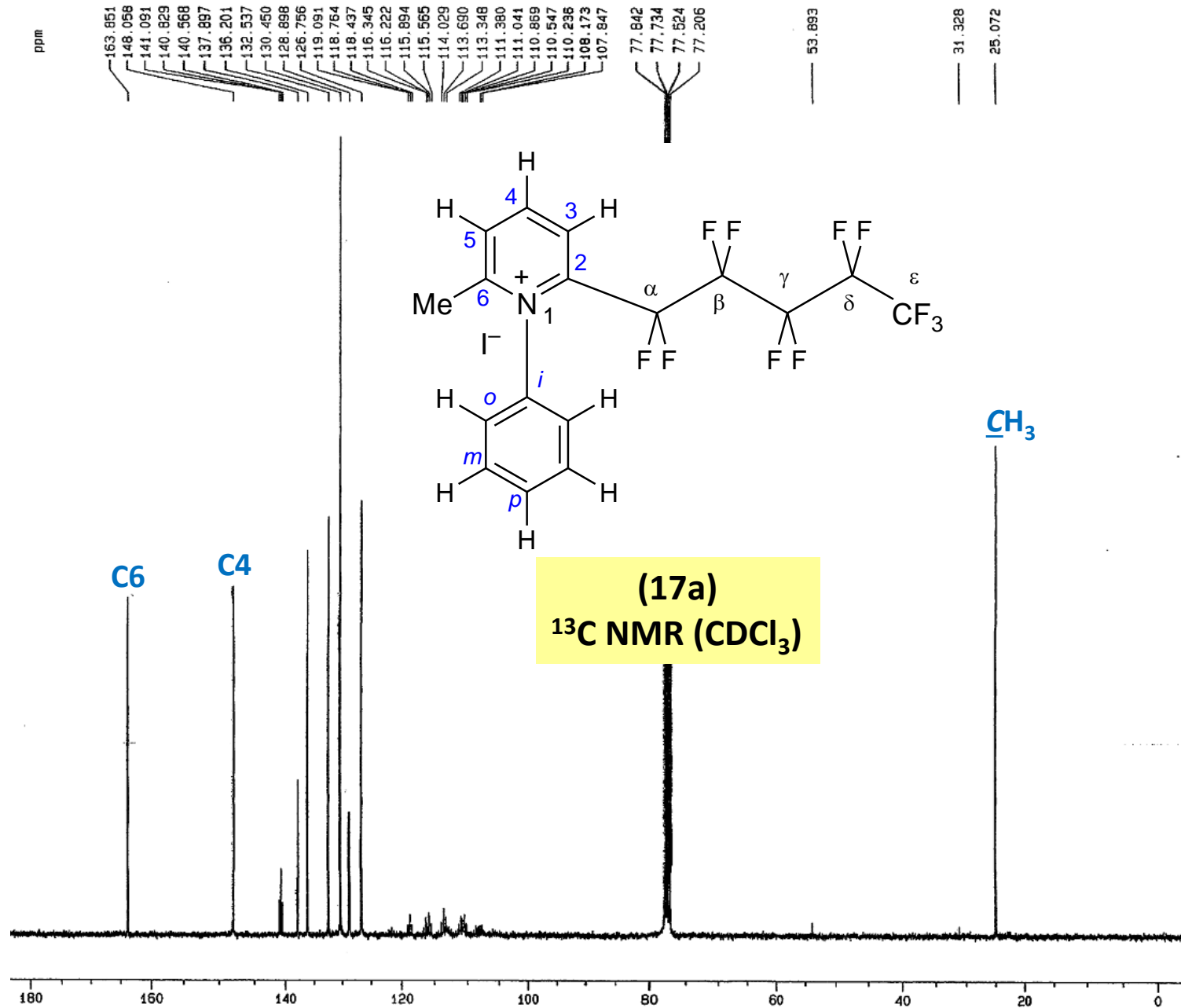


(17a)
¹H NMR (CDCl₃/D₂O)

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 PULPROG zg30
 TD 32768
 SOLVENT CDCl3
 NS 16
 DS 2
 SWH 8223.685 Hz
 FIDRES 0.250967 Hz
 AQ 1.9923444 sec
 RG 362
 DW 60.800 usec
 DE 4.50 usec
 TE 300.0 K
 D1 1.0000000 sec
 P1 10.00 usec
 DE 4.50 usec
 SF01 400.1324710 MHz
 NUC1 1H
 PL1 -6.00 dB

F2 - Processing parameters
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 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00

1D NMR plot parameters
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 F1P 11.000 ppm
 F1 4001.43 Hz
 F2P -1.000 ppm
 F2 -400.13 Hz
 PPMCM 0.40000 ppm/cm
 HZCM 160.05202 Hz/cm



ppm

163.851
148.058
141.091
140.829
140.568
137.897
136.201
132.537
130.450
128.898
126.756
119.091
118.764
118.437
116.345
116.222
115.894
115.565
114.029
113.690
113.348
111.380
111.041
110.869
110.547
110.236
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107.847

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77.524
77.206

53.893

31.328

25.072

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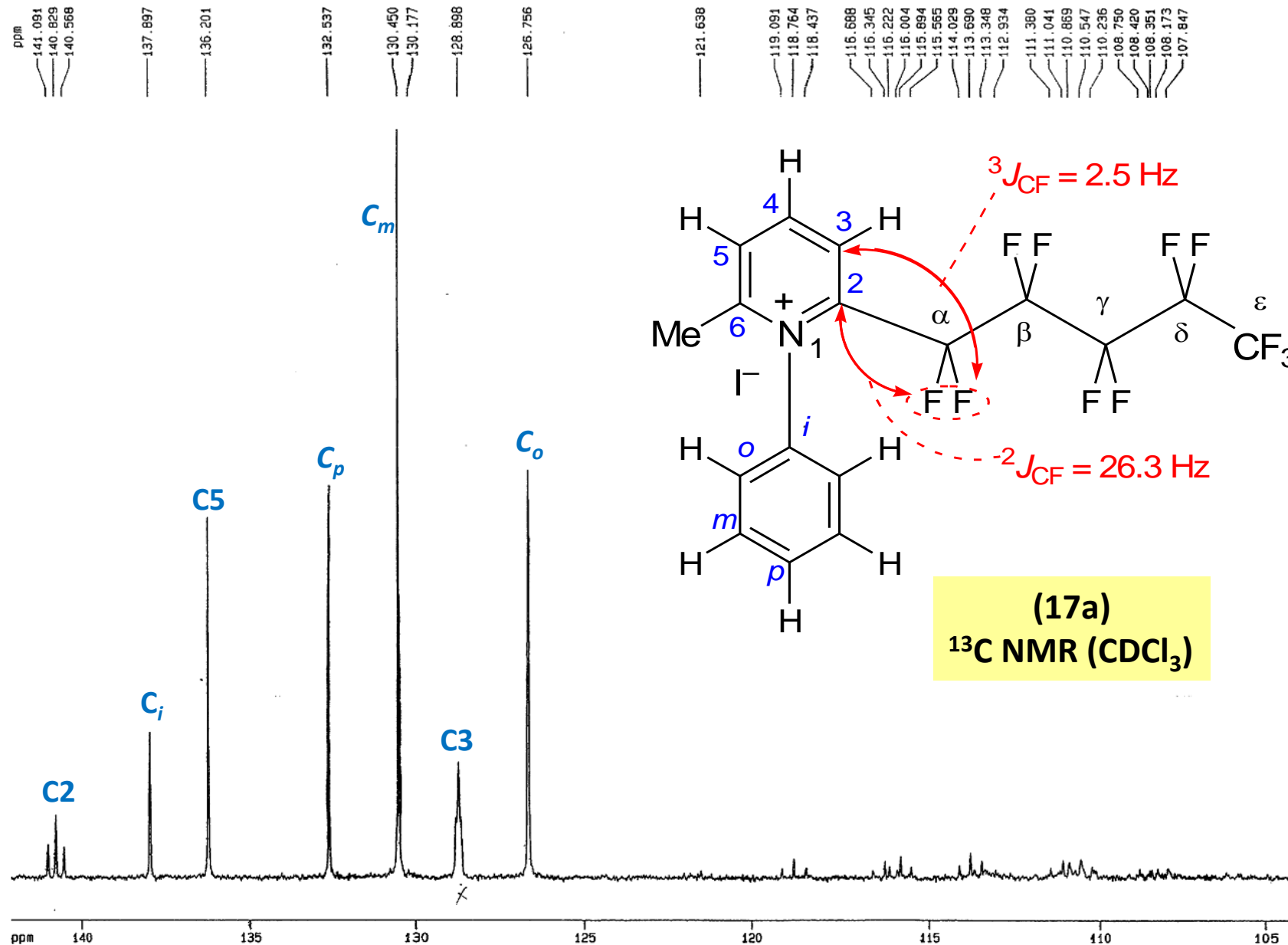
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TD 65536
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NS 6144
DS 2
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FIDRES 0.485949 Hz
AQ 1.0289652 sec
RG 8192
DW 15.700 usec
DE 4.50 usec
TE 300.0 K
D12 0.00002000 sec
PL13 20.00 dB
D1 1.00000000 sec
CPDPRG2 waltz16
PCPD2 100.00 usec
SF02 400.1316005 MHz
NUC2 ¹H
PL2 -6.00 dB
PL12 17.00 dB
P1 6.00 usec
DE 4.50 usec
SF01 100.6254358 MHz
NUC1 ¹³C
PL1 -6.00 dB
D11 0.03000000 sec

F2 - Processing parameters

SI 32768
SF 100.6127290 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

1D NMR plot parameters

CX 30.00 cm
F1P 215.000 ppm
F1 21631.74 Hz
F2P -5.000 ppm
F2 -503.06 Hz
PPMCM 7.33333 ppm/cm
HZCM 737.82672 Hz/cm



F2 - Acquisition Parameters

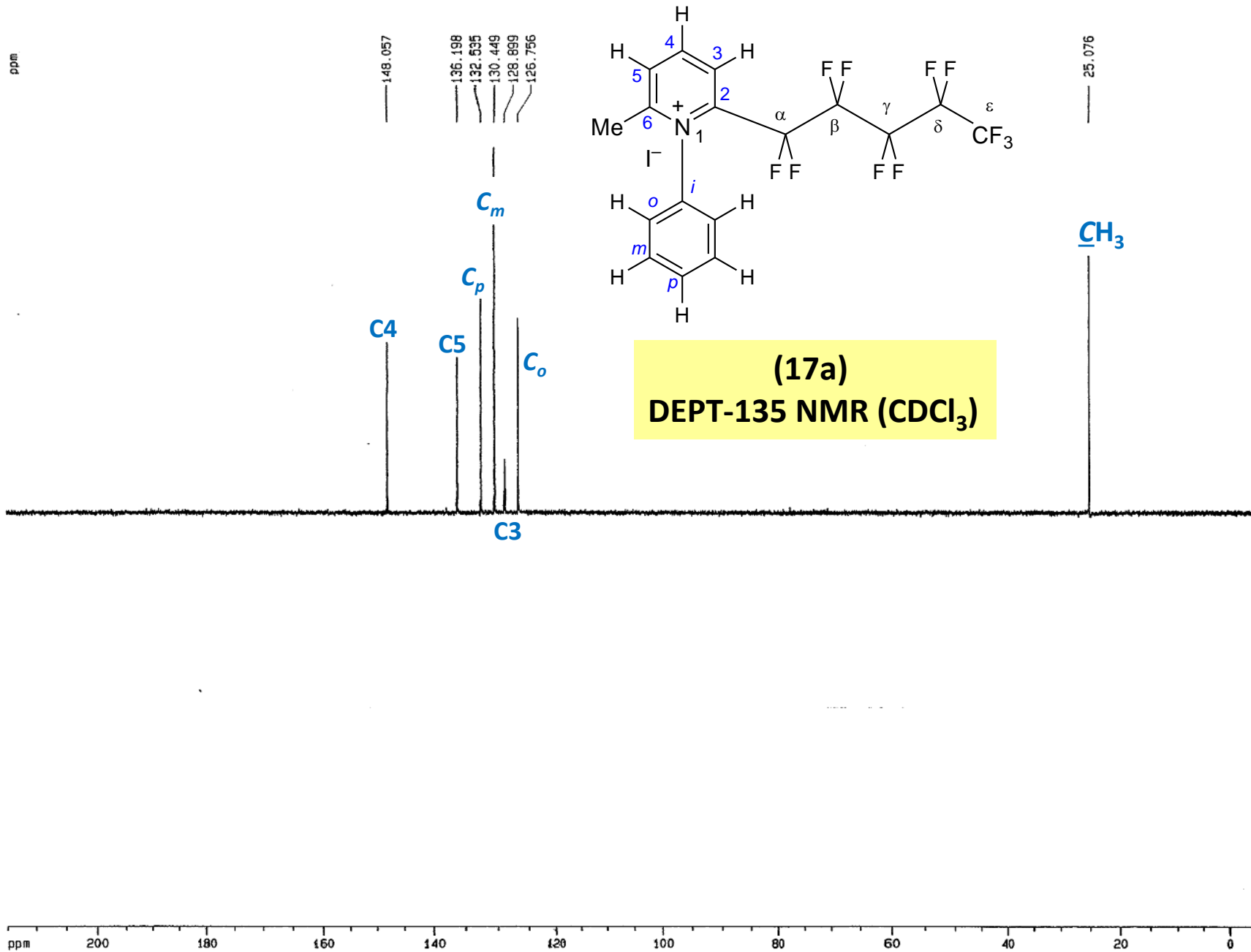
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 TD 65536
 SOLVENT CDCl3
 NS 6144
 DS 2
 SWH 31847.133 Hz
 FIDRES 0.485949 Hz
 AQ 1.0289652 sec
 RG 8192
 DH 15.700 usec
 DE 4.50 usec
 TE 300.0 K
 D12 0.00002000 sec
 PL13 20.00 dB
 D1 1.00000000 sec
 CPDPRG2 waltz16
 PCPD2 100.00 usec
 SF02 400.1316005 MHz
 NUC2 1H
 PL2 -6.00 dB
 PL12 17.00 dB
 P1 6.00 usec
 DE 4.50 usec
 SF01 100.6254358 MHz
 NUC1 13C
 PL1 -6.00 dB
 D11 0.03000000 sec

F2 - Processing parameters

SI 32768
 SF 100.6127290 MHz
 WDW EM
 SSB 0
 LB 1.00 Hz
 GB 0
 PC 1.40

1D NMR plot parameters

CX 30.00 cm
 F1P 142.219 ppm
 F1 14309.00 Hz
 F2P 104.194 ppm
 F2 10483.24 Hz
 PPMCM 1.26749 ppm/cm
 HZCM 127.52564 Hz/cm



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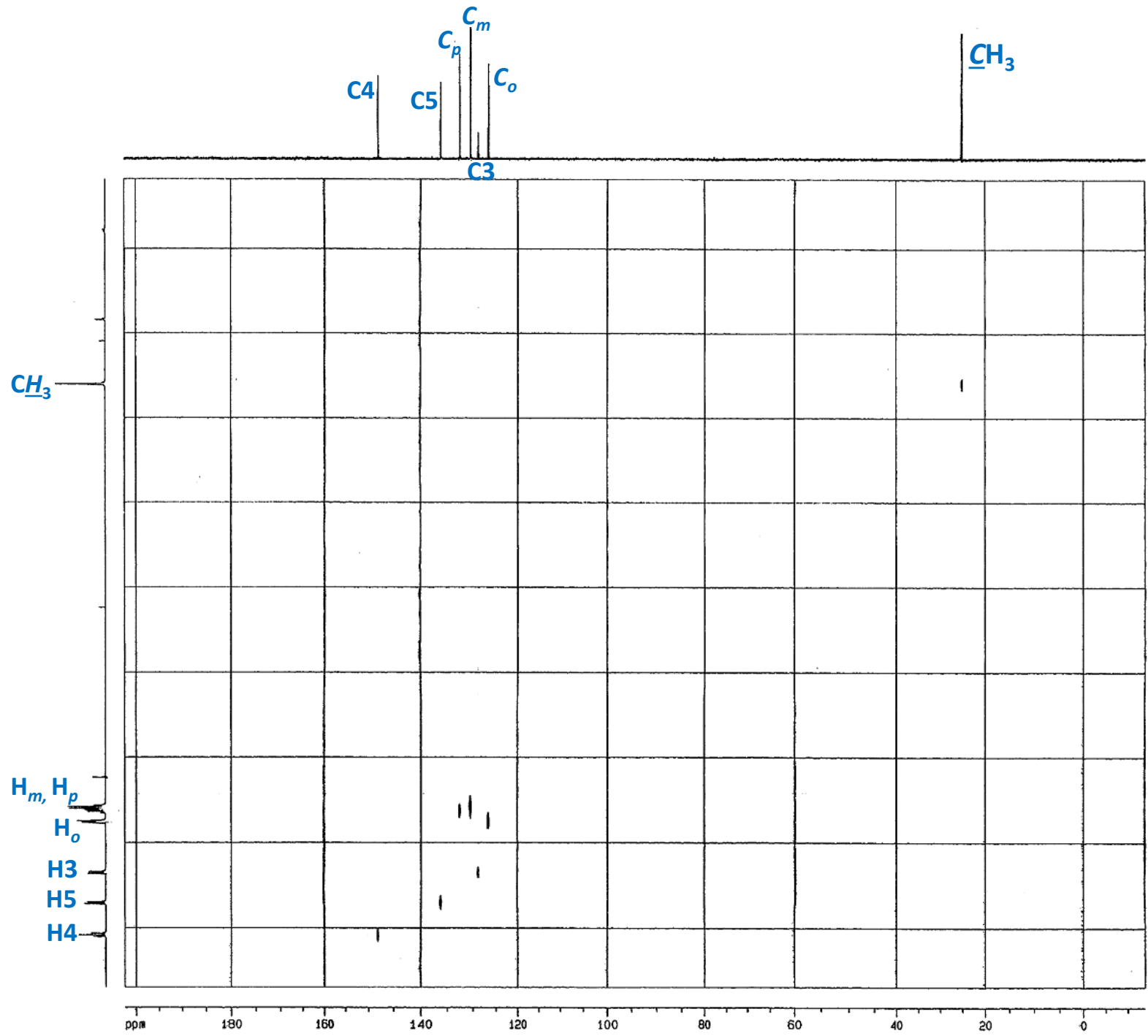
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 PULPROG dept135
 TD 65536
 SOLVENT CDCl3
 NS 2048
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 SWH 31847.133 Hz
 FIDRES 0.485949 Hz
 AQ 1.0289652 sec
 RG 8192
 DW 15.700 usec
 DE 4.50 usec
 TE 300.0 K
 P1 6.00 usec
 DELTA 0.0000076 sec
 D1 1.0000000 sec
 D12 0.0000200 sec
 PL2 -6.00 dB
 P3 9.00 usec
 SFO2 400.1316005 MHz
 NUC2 1H
 D2 0.00357143 sec
 P4 18.00 usec
 SFO1 100.6254358 MHz
 NUC1 13C
 PL1 -6.00 dB
 P2 12.00 usec
 PL12 17.00 dB
 DE 4.50 usec
 CPDPRG2 waltz16
 PCPD2 100.00 usec

F2 - Processing parameters

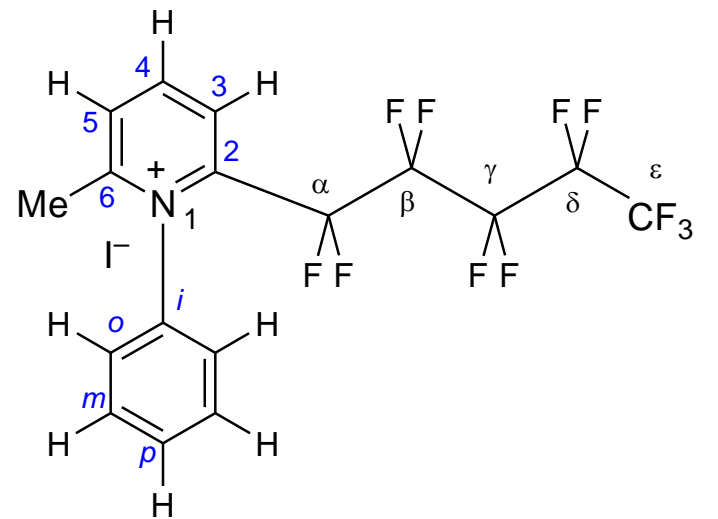
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 MDW EM
 SSB 0
 LB 1.00 Hz
 GB 0
 PC 1.40

1D NMR plot parameters

CX 30.00 cm
 F1P 215.000 ppm
 F1 21631.74 Hz
 F2P -5.000 ppm
 F2 -503.06 Hz
 PPMCM 7.33333 ppm/cm
 HZCM 737.82672 Hz/cm



F2 - Acquisition Parameters
 Date_ 500000
 Time 11.05
 INSTRUM spect
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 PULPROG hxcg
 TD 4096
 SOLVENT CDCl3
 NS 16
 DS 4
 SFO 21786.492 Hz
 FIDRES 5.318968 Hz

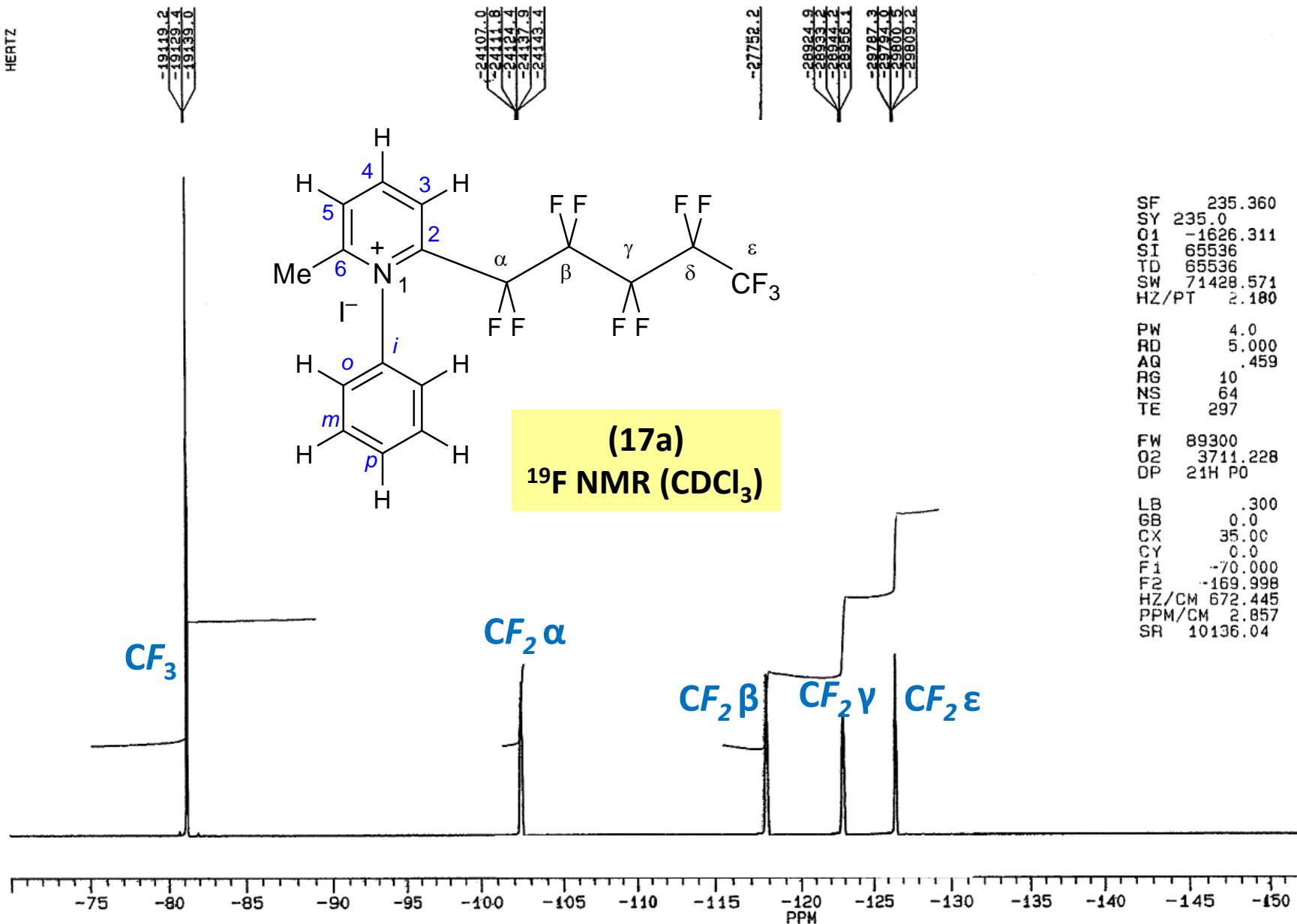


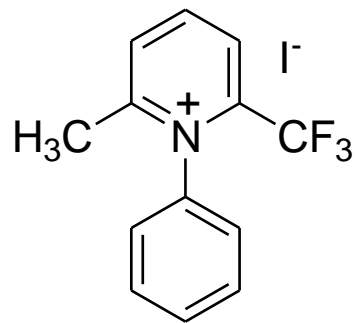
(17a)
HETCOR ¹H-¹³C NMR
(CDCl₃)

MSB 05SINE
 SB 2
 LB 0.00 Hz
 GB 0

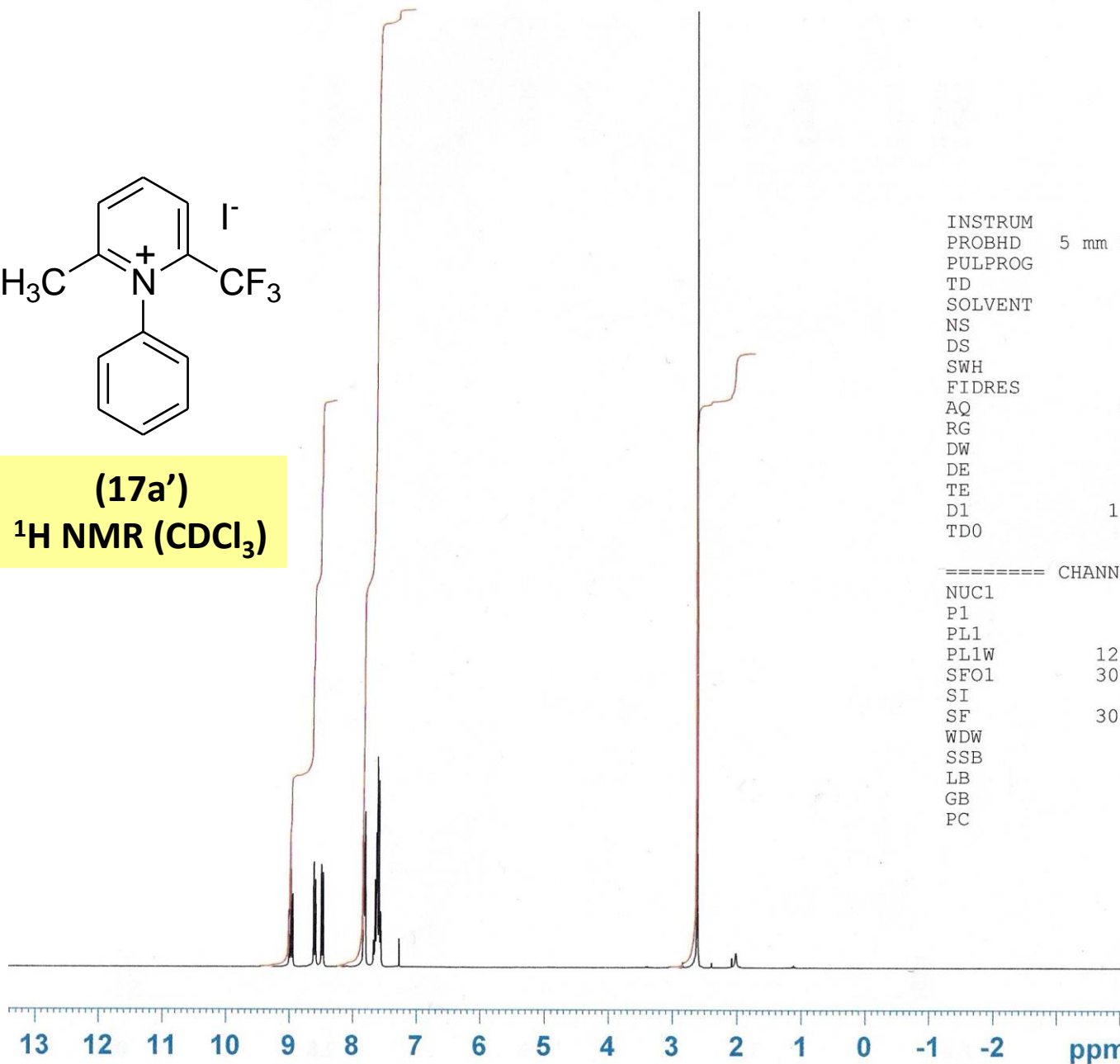
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 CQX 20.00 cm
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 F2ALO 20379.66 Hz
 F2PHI -13.962 ppm
 F2PHI -1404.78 Hz
 F1ALD 9.698 ppm
 F1ALO 3880.29 Hz
 F1PHI 0.173 ppm
 F1PHI 69.34 Hz
 F2PPMCH 8.66071 ppm/cm
 F2HDM 871.37738 Hz/cm
 F1PPMCH 0.47621 ppm/cm

HERTZ





(17a')
¹H NMR (CDCl₃)

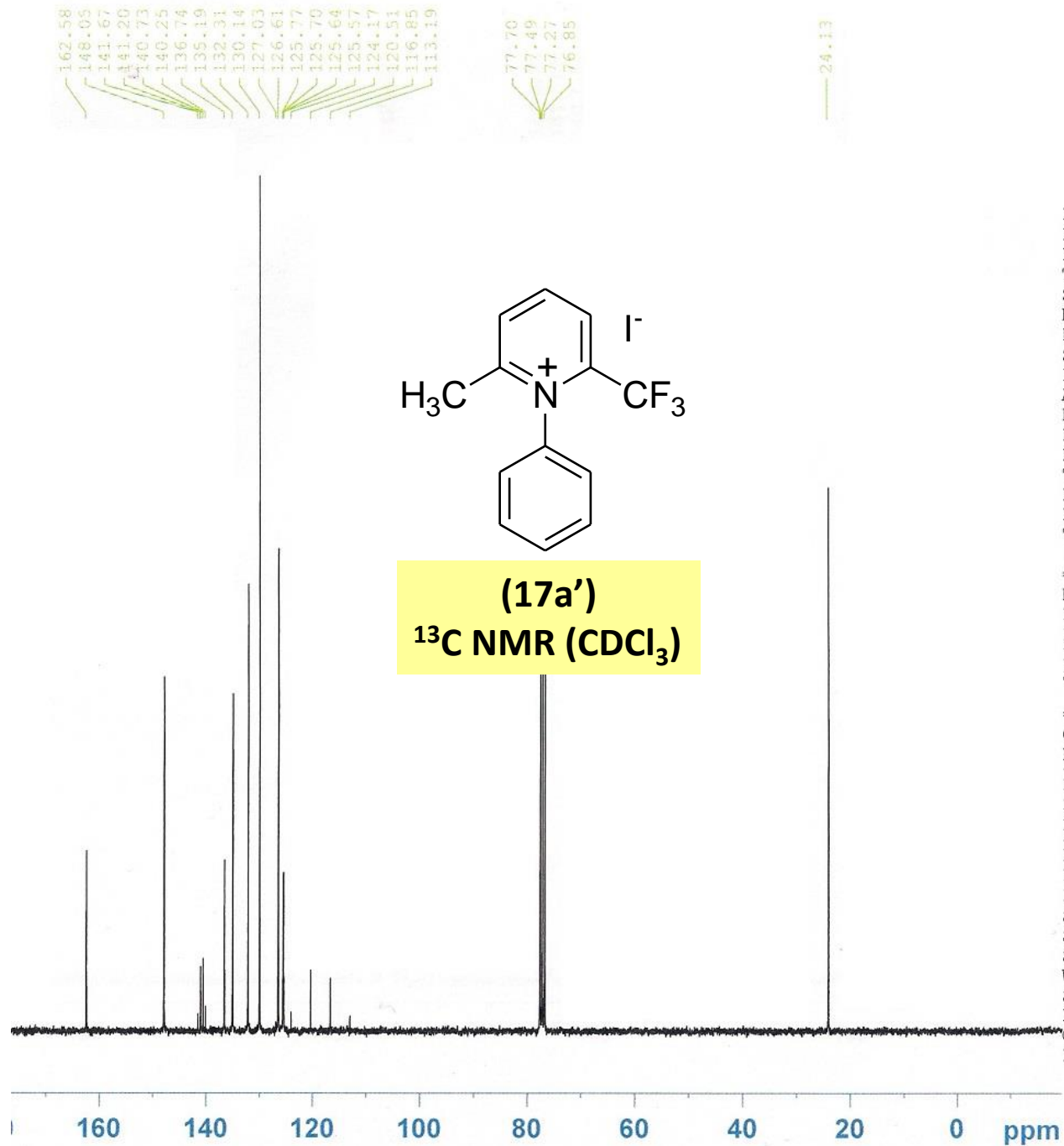


```

INSTRUM      spect
PROBHD       5 mm PABBO BB-
PULPROG      zg30
TD           65536
SOLVENT      CDCl3
NS           16
DS           2
SWH          6188.119 Hz
FIDRES       0.094423 Hz
AQ           5.2953587 sec
RG           45.2
DW           80.800 usec
DE           6.50 usec
TE           300.0 K
D1           1.00000000 sec
TD0          1
  
```

```

===== CHANNEL f1 =====
NUC1         1H
P1           11.00 usec
PL1          0.00 dB
PL1W         12.96133423 W
SFO1         300.1318534 MHz
SI           32768
SF           300.1300000 MHz
WDW          EM
SSB          0
LB           0.30 Hz
GB           0
PC           1.00
  
```



```

INSTRUM      spect
PROBHD       5 mm PABBO BB-
PULPROG      zgpg30
TD           65536
SOLVENT      CDCl3
NS           1024
DS           4
SWH          18028.846 Hz
FIDRES       0.275098 Hz
AQ           1.8175818 sec
RG           2050
DW           27.733 usec
DE           6.50 usec
TE           300.0 K
D1           2.00000000 sec
D11          0.03000000 sec
TD0          1

```

```

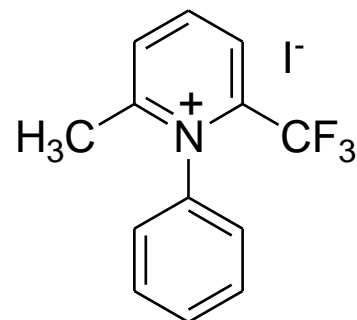
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NUC1         13C
P1           8.50 usec
PL1          -2.00 dB
PL1W         47.61361694 W
SFO1         75.4752953 MHz

```

```

===== CHANNEL f2 =====
CPDPRG2      waltz16
NUC2         1H
PCPD2        100.00 usec
PL2          0.00 dB
PL12         20.00 dB
PL13         20.00 dB
PL2W         12.96133423 W
PL12W        0.12961334 W
PL13W        0.12961334 W
SFO2         300.1312005 MHz
SI           32768
SF           75.4677490 MHz
WDW          EM
SSB          0
LB           1.00 Hz
GB           0
PC           1.40

```



(17a')
¹⁹F NMR (CDCl₃)

```

INSTRUM      spect
PROBHD       5 mm PABBO BB-
PULPROG      zgfhigqn
TD           131072
SOLVENT      CDC13
NS           500
DS           4
SWH          66964.289 Hz
FIDRES       0.510897 Hz
AQ           0.9787210 sec
RG           1030
DW           7.467 usec
DE           6.50 usec
TE           300.0 K
D1           1.0000000 sec
D11          0.0300000 sec
D12          0.0000200 sec
TD0          1
  
```

```

===== CHANNEL f1 =====
NUC1         19F
P1           9.20 usec
PL1          -4.00 dB
PL1W         24.98591042 W
SFO1         282.3761148 MHz
  
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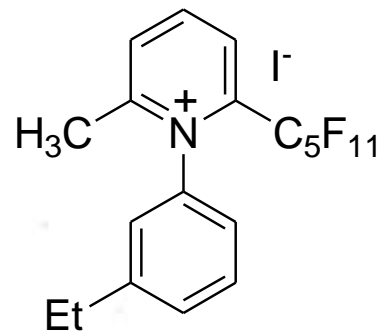
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NUC2         1H
PCPD2        100.00 usec
PL2          0.00 dB
PL12         20.00 dB
PL2W         12.96133423 W
PL12W        0.12961334 W
SFO2         300.1312005 MHz
SI           65536
SF           282.4043550 MHz
WDW          EM
SSB          0
LB           0.30 Hz
GB           0
-PC          1.00
  
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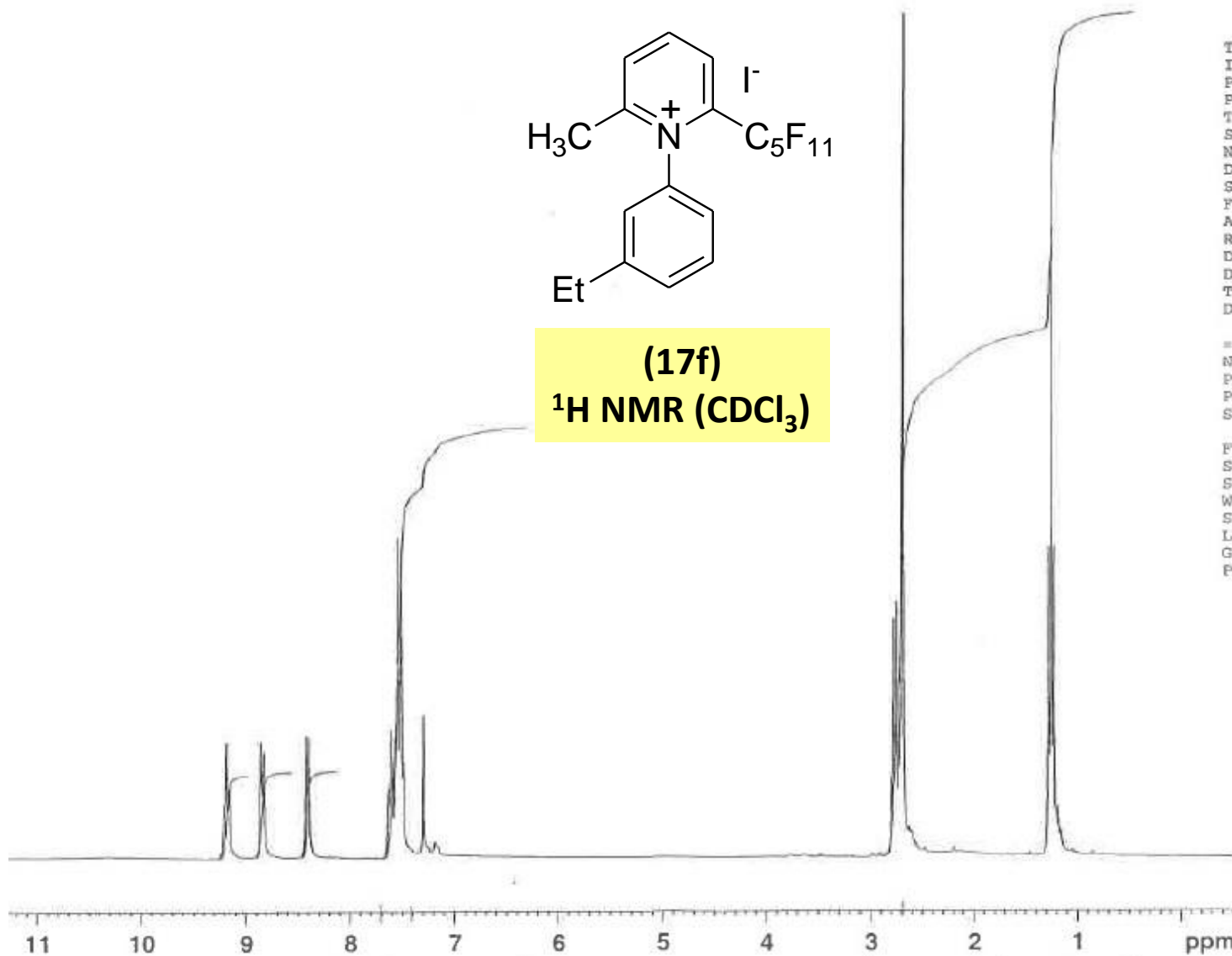
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352.111
341.111



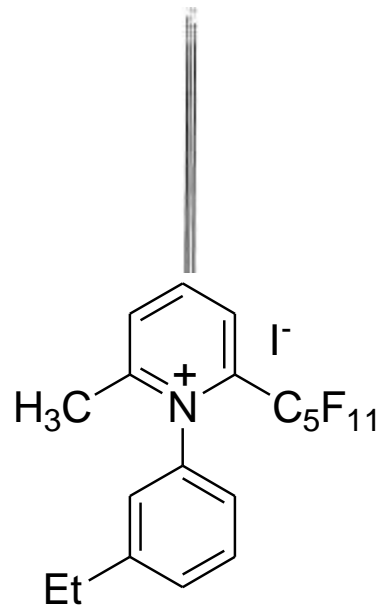
(17f)
¹H NMR (CDCl₃)



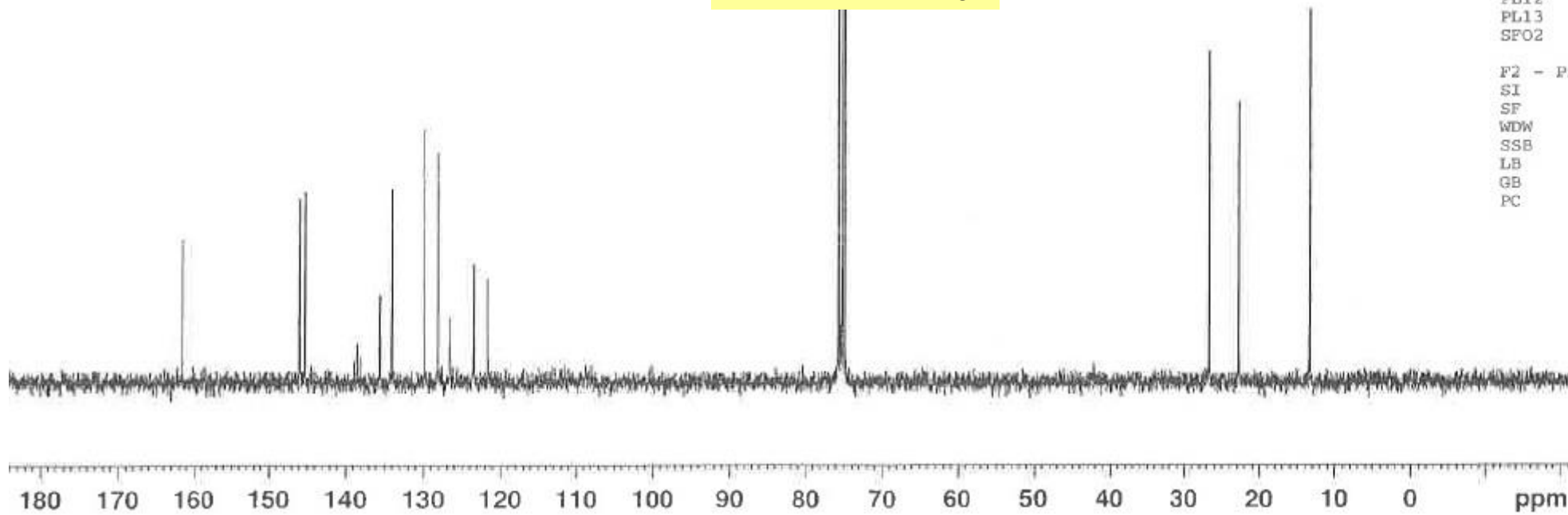
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PROBHD 5 mm QNP 1H/13
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 16
DS 2
SWH 4844.961 Hz
FIDRES 0.147856 Hz
AQ 3.3817077 sec
RG 256
DW 103.200 usec
DE 8.00 usec
TE 300.0 K
D1 1.00000000 sec

***** CHANNEL f1 *****
NUC1 1H
P1 6.50 usec
PL1 -3.00 dB
SFO1 300.1322660 MHz

F2 - Processing parameters
SI 32768
SF 300.1300000 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



(17f)
¹³C NMR (CDCl₃)



```

INSTRUM      spect
PROBHD      5 mm QNP 1H/13
PULPROG      zgpg30
TD          65536
SOLVENT      CDCl3
NS          512
DS          4
SWH         17985.611 Hz
FIDRES      0.274439 Hz
AQ         1.8219508 sec
RG          3251
DW          27.800 usec
DE          8.00 usec
TE          300.0 K
D1          1.00000000 sec
d11         0.03000000 sec
d12         0.00002000 sec
  
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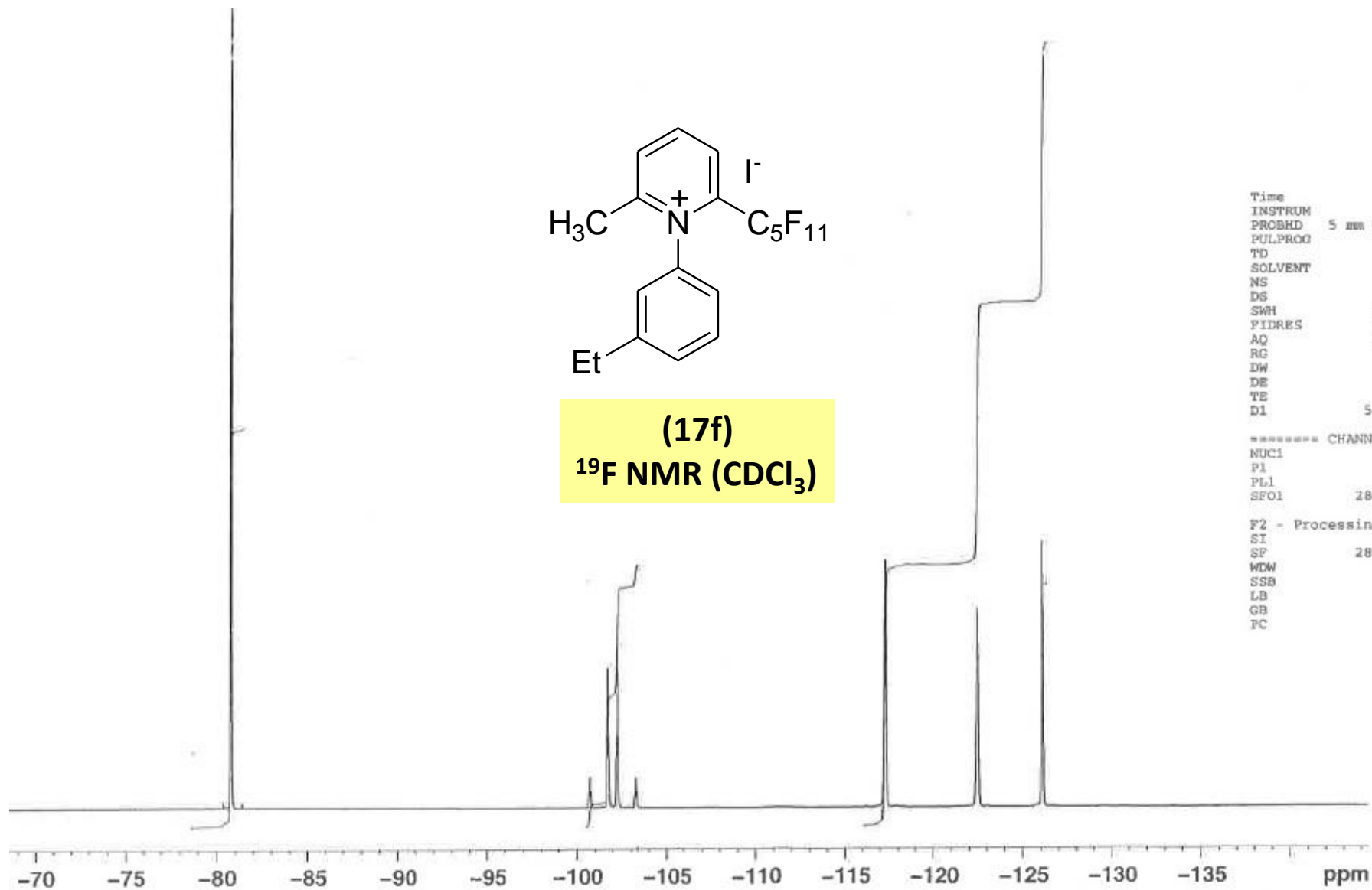
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NUC1         13C
P1           6.70 usec
PL1          -3.00 dB
SFO1         75.4752953 MHz
  
```

```

===== CHANNEL f2 =====
CPDPRG2      waltz16
NUC2         1H
PCPD2        100.00 usec
PL2          0.00 dB
PL12         22.00 dB
PL13         22.00 dB
SFO2         300.1312005 MHz
  
```

```

F2 - Processing parameters
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SSB          0
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GB           0
PC           1.40
  
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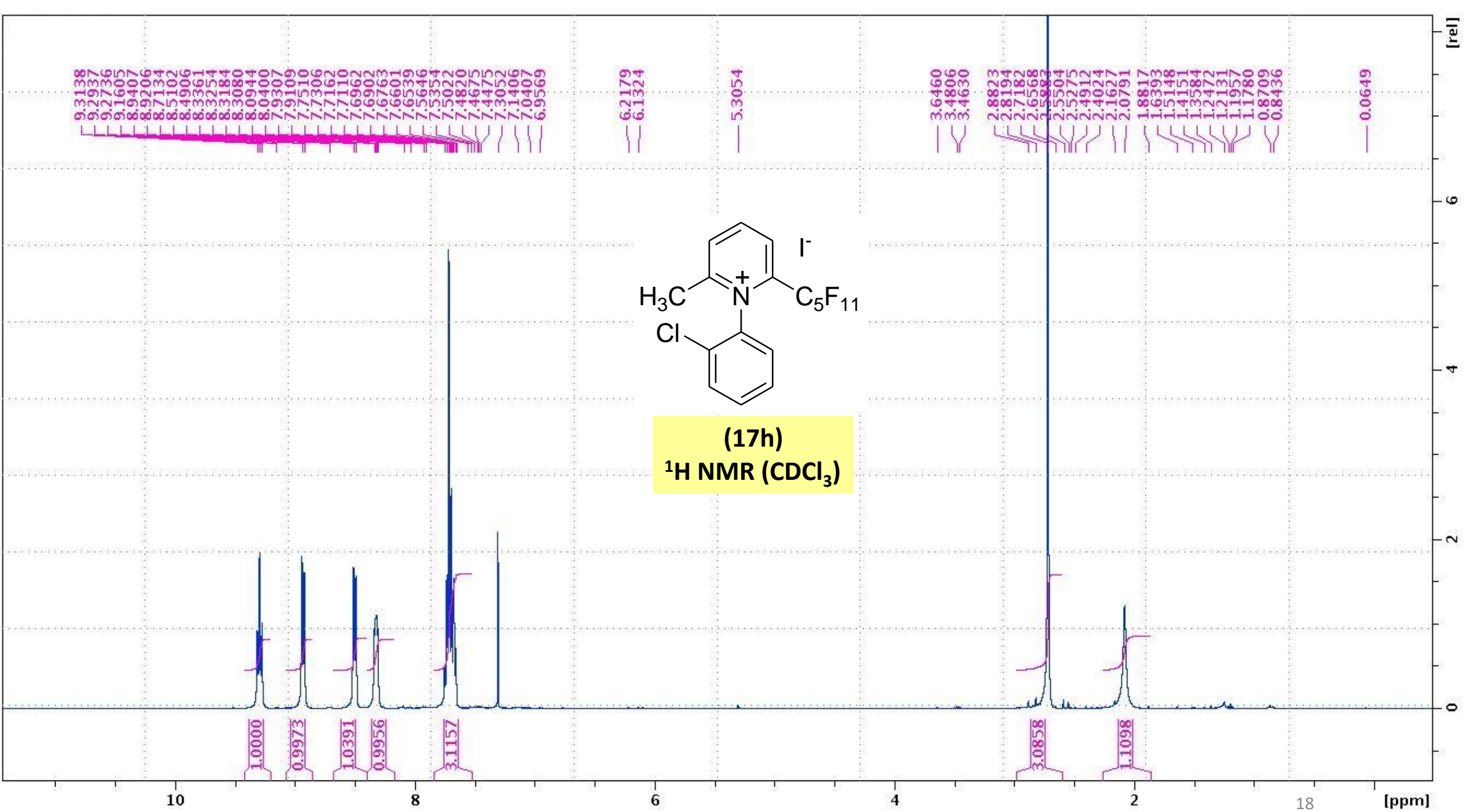
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SOLVENT       CDCl3
NS            16
DS            4
SWH           25062.656 Hz
FIDRES        0.191213 Hz
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DE            8.00 usec
TE            300.0 K
D1            5.0000000 sec
  
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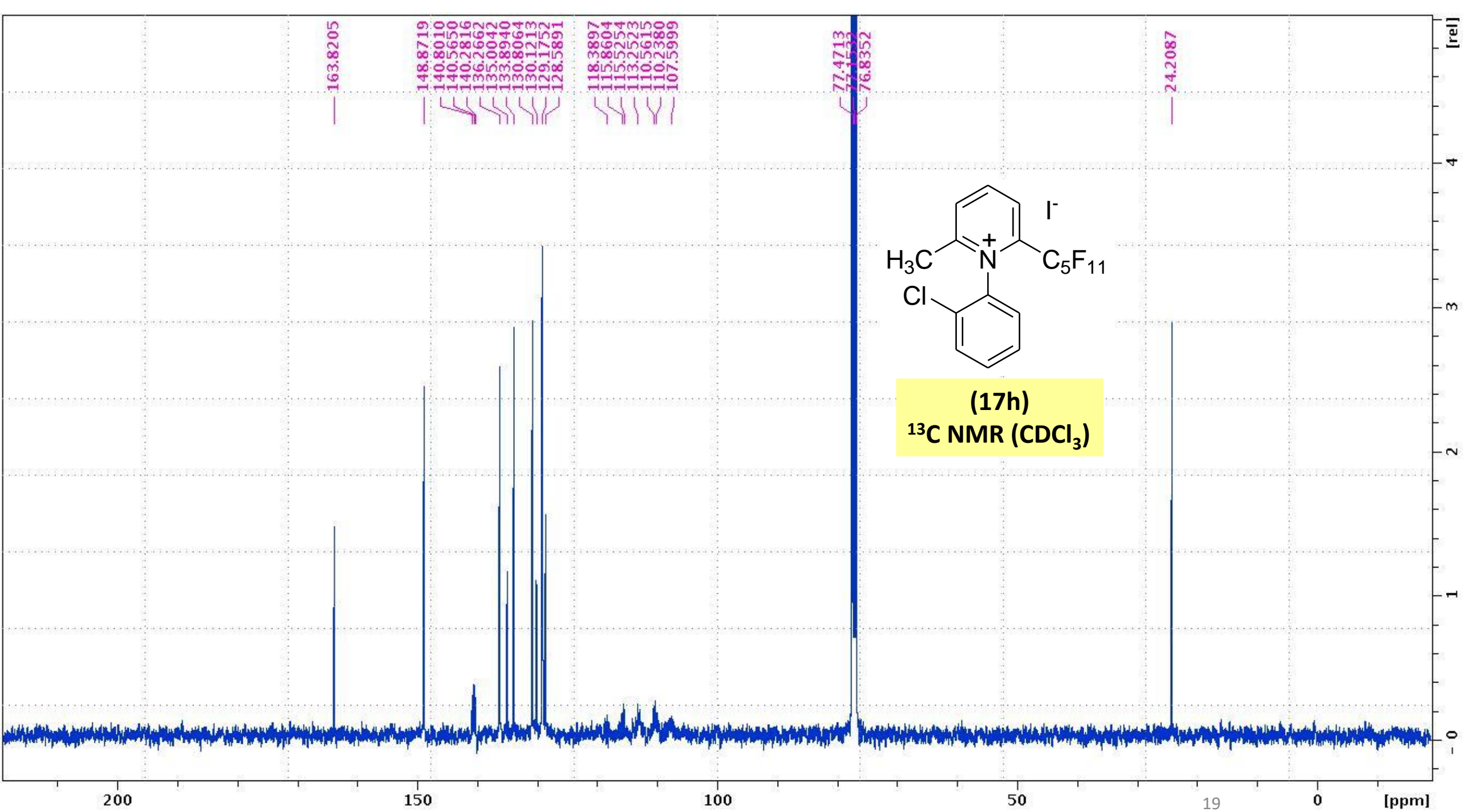
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===== CHANNEL f1 =====
NUC1          19F
P1            9.50 usec
PL1           -6.00 dB
SFO1          282.3761058 MHz
  
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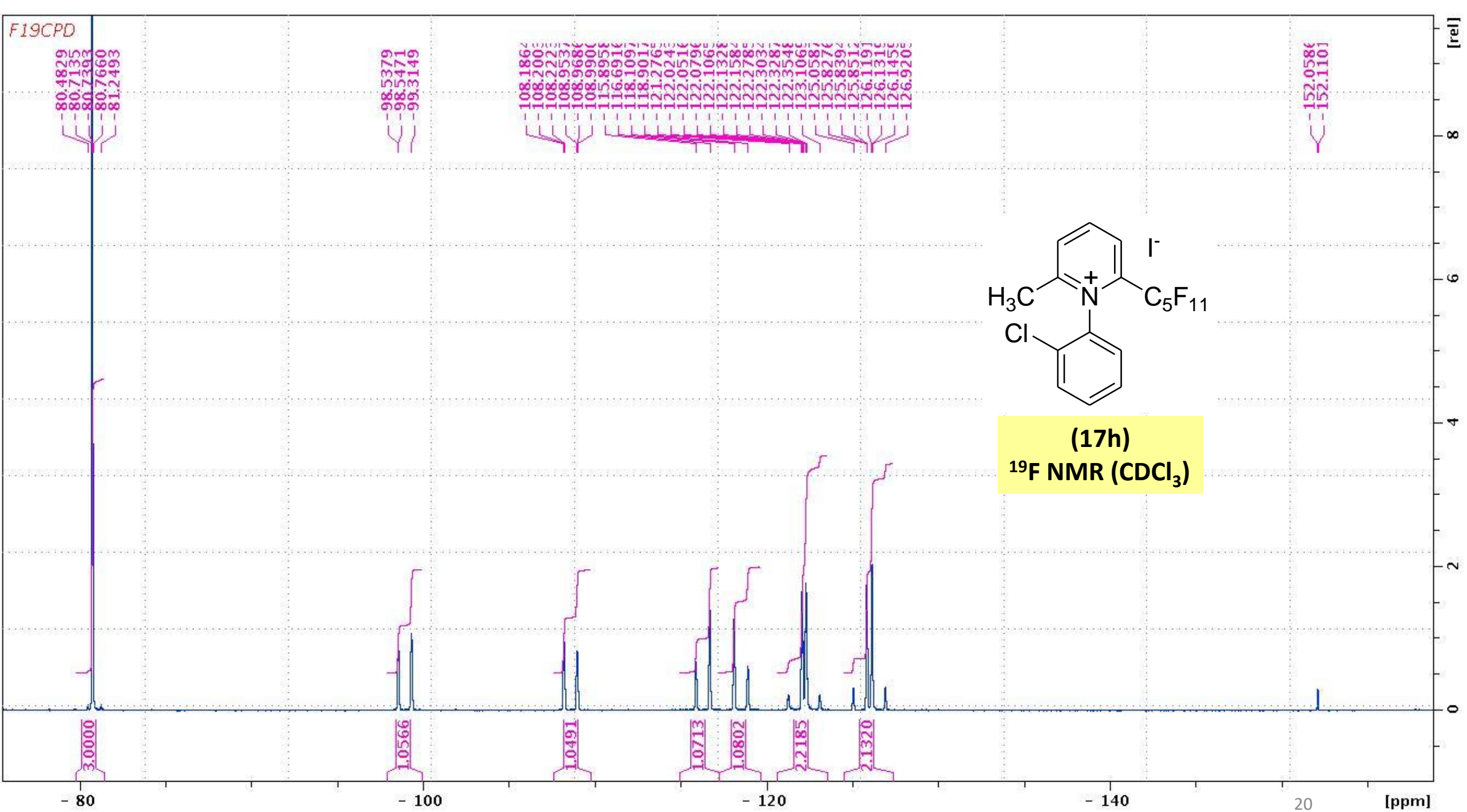
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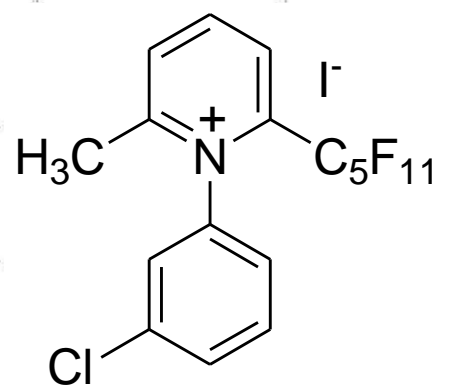
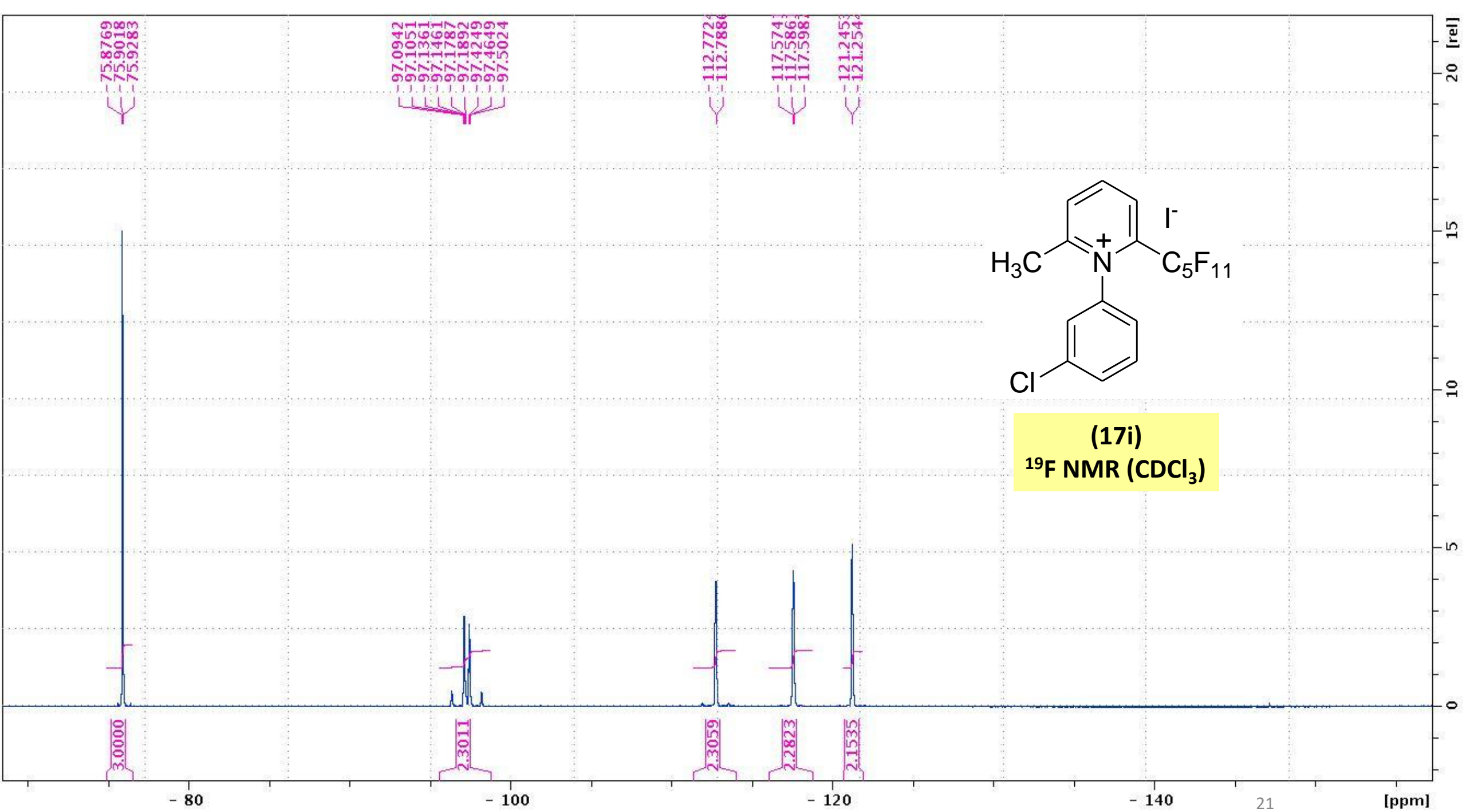
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WDW           EM
SSB           0
LB            0.30 Hz
GB            0
PC            1.00
  
```

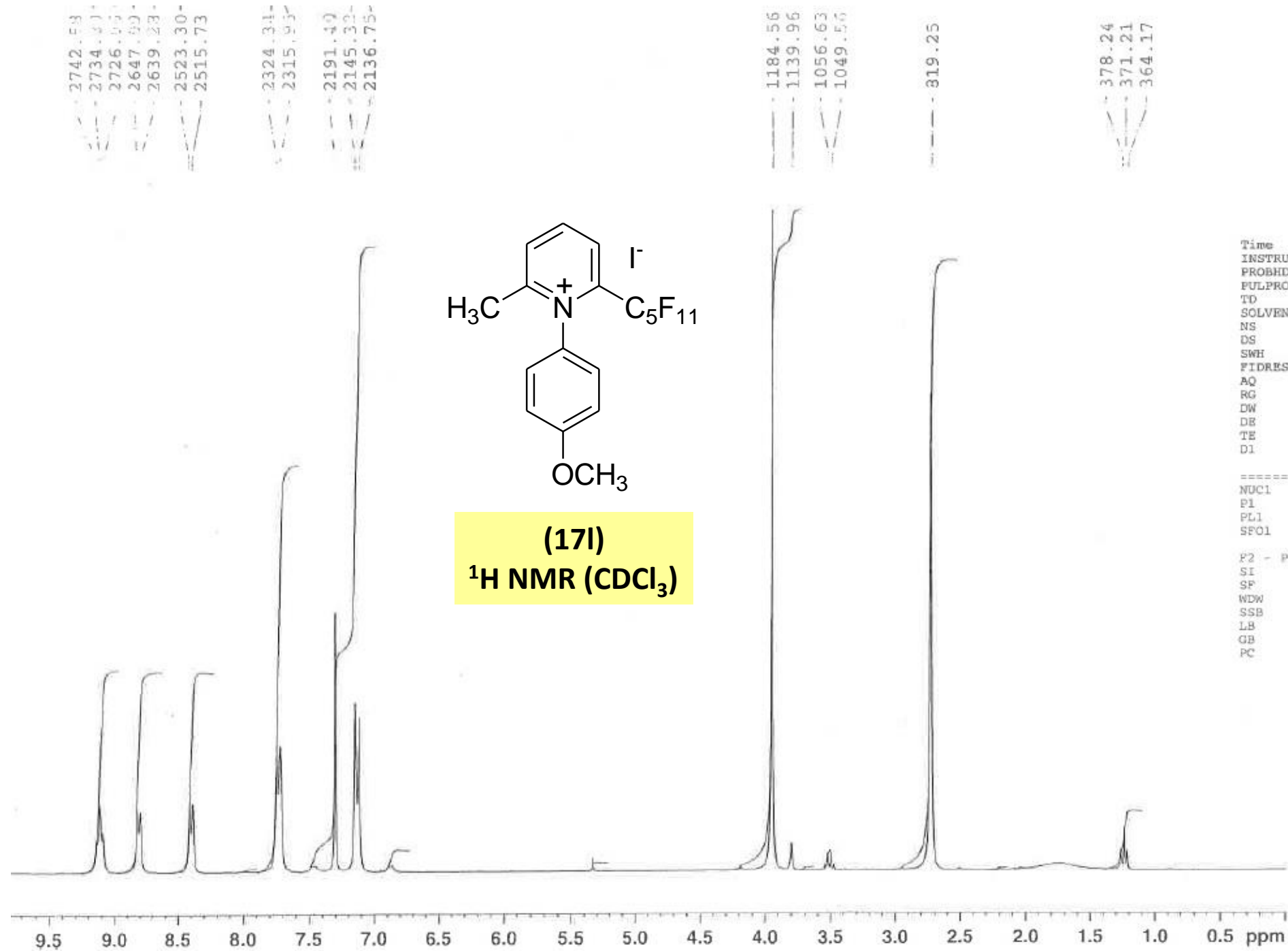




F19CPD



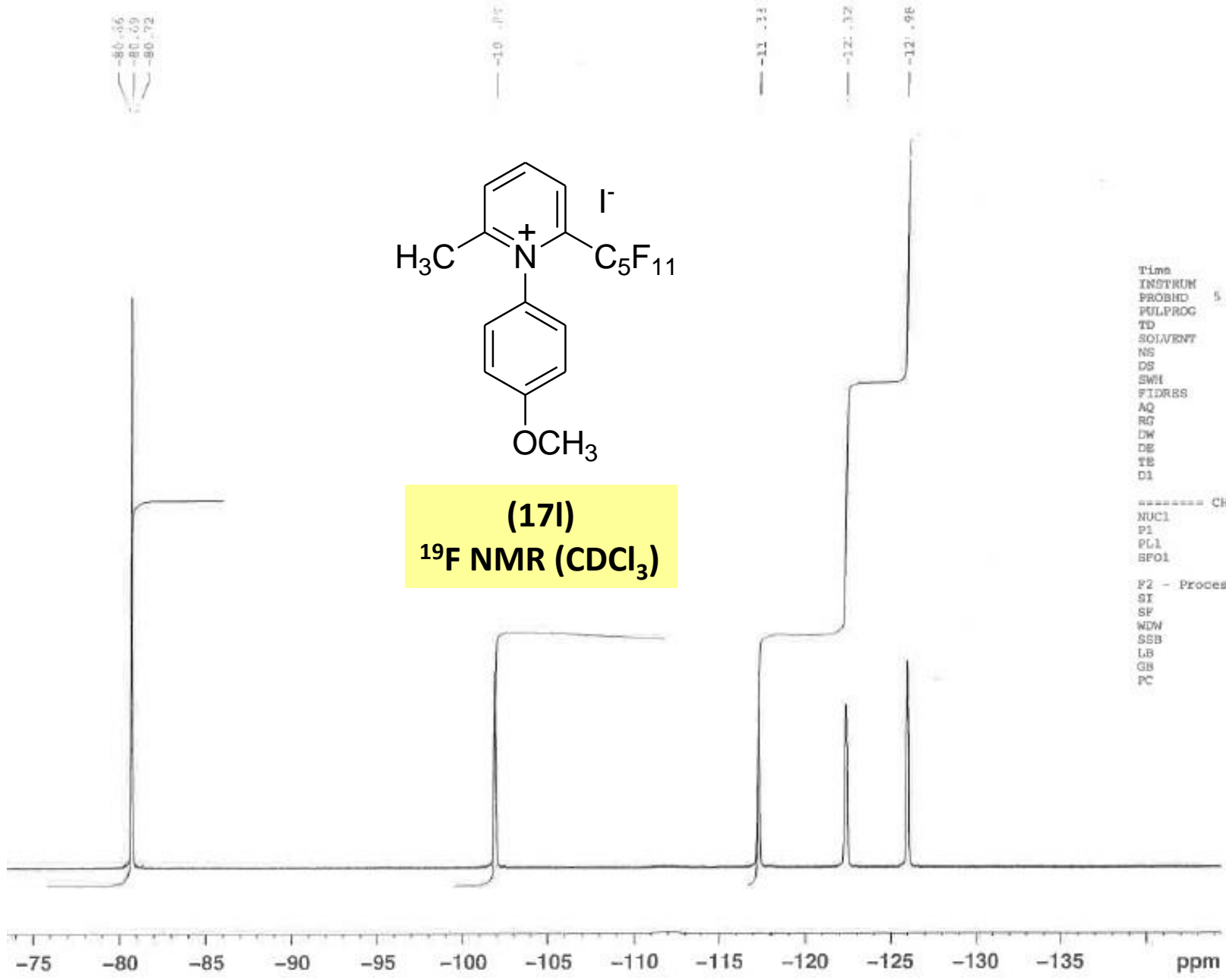




Time 15.22
 INSTRUM spect
 PROBHD 5 mm QNP 1H/13
 FULPROG zg30
 TD 32768
 SOLVENT CDCl3
 NS 16
 DS 2
 SWH 3306.878 Hz
 FIDRES 0.100918 Hz
 AQ 4.9545717 sec
 RG 724.1
 DW 151.200 usec
 DE 8.00 usec
 TE 300.0 K
 D1 1.00000000 sec

===== CHANNEL f1 =====
 NUC1 1H
 P1 6.50 usec
 PL1 -3.00 dB
 SFO1 300.1315007 MHz

P2 - Processing parameters
 SI 32768
 SF 300.1300000 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00

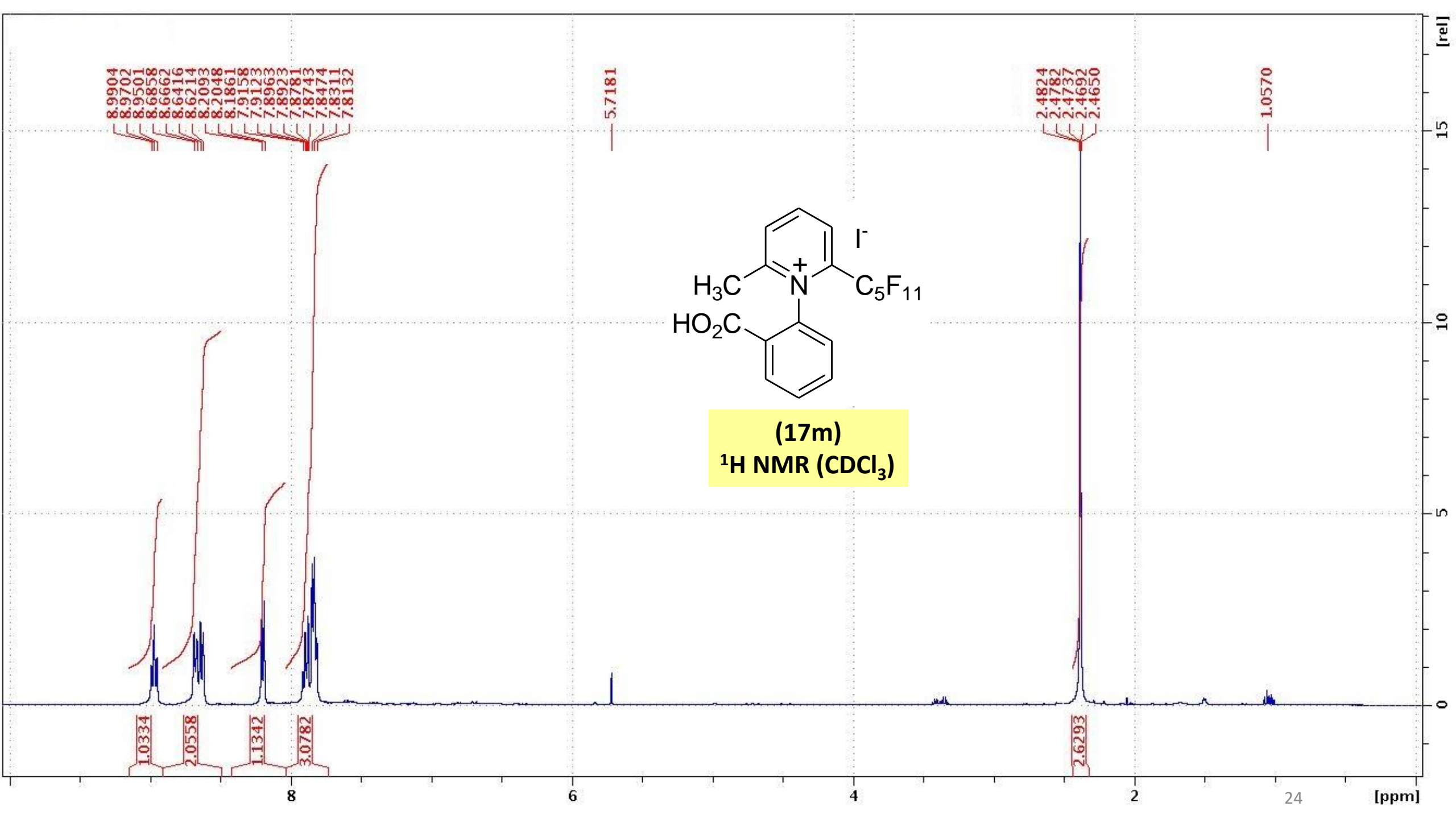


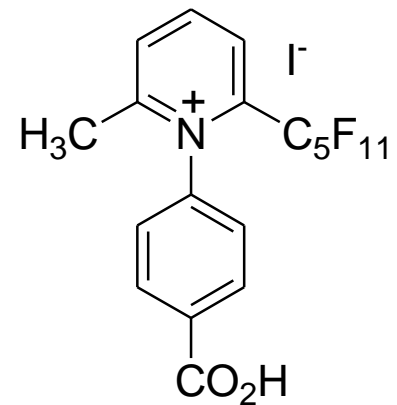
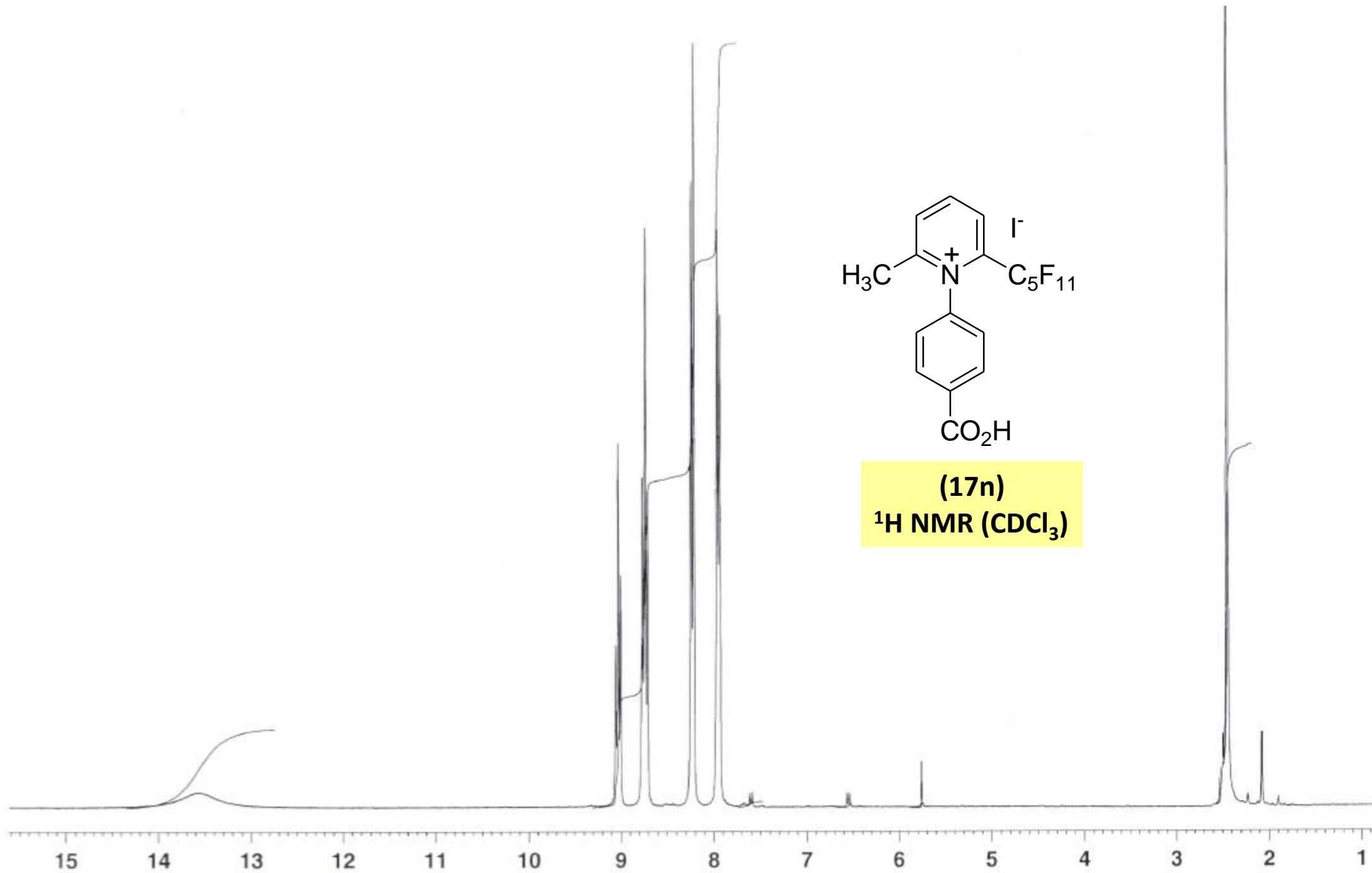
```

Time          14.47
INSTRUM      spect
PROBHD       5 mm QNP 1H/13
PULPROG      zgpg30
TD           131072
SOLVENT      CDCl3
NS           16
DS           4
SWH          25062.656 Hz
FIDRES       0.191213 Hz
AQ           2.6149364 sec
RG           1290.2
DW           19.950 usec
DE           8.00 usec
TE           300.0 K
D1           5.00000000 sec

===== CHANNEL f1 =====
NUC1         19F
P1           3.50 usec
PL1          -6.00 dB
SFO1         282.3761058 MHz

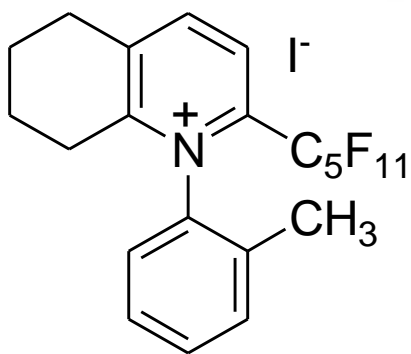
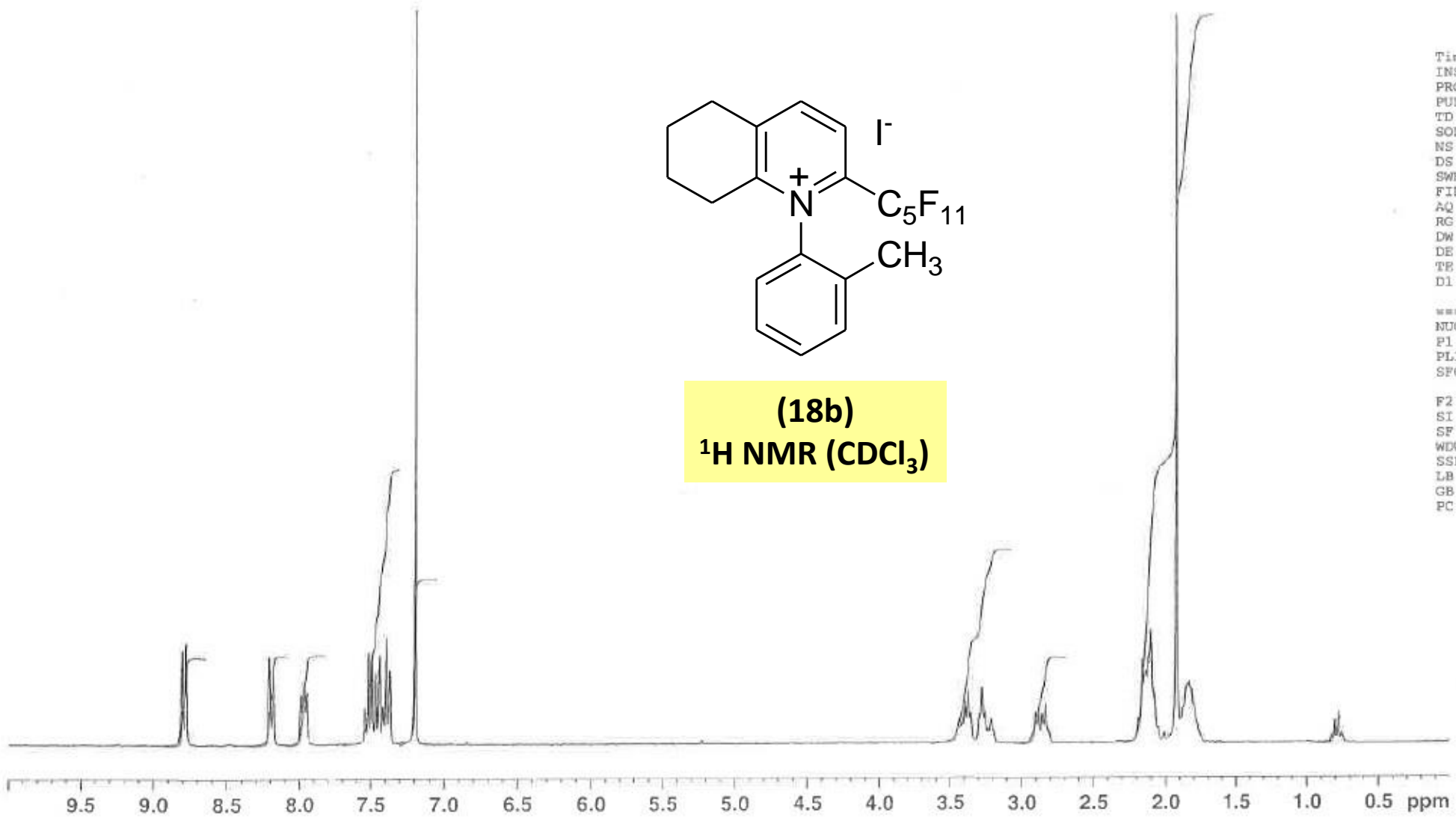
F2 - Processing parameters
SI           65536
SF           282.4043460 MHz
WDW          EM
SSB          0
LB           0.10 Hz
GB           0
PC           1.00
  
```





2642.86
2634.61
2463.48
2455.29
2398.36
2391.15
2386.06
2263.13
2256.56
2249.25
2240.13
2232.49
2225.80
2218.87
2211.33
2159.41

1030.33
1026.17
1019.19
1012.31
1006.46
988.61
983.29
977.30
965.49
870.92
864.53
857.58
850.94
657.11
648.95
641.82
636.38
631.12
623.90
615.49
576.89
563.57
552.74
549.50
541.25
455.42
354.69
348.13
341.11
240.65



(18b)
¹H NMR (CDCl₃)

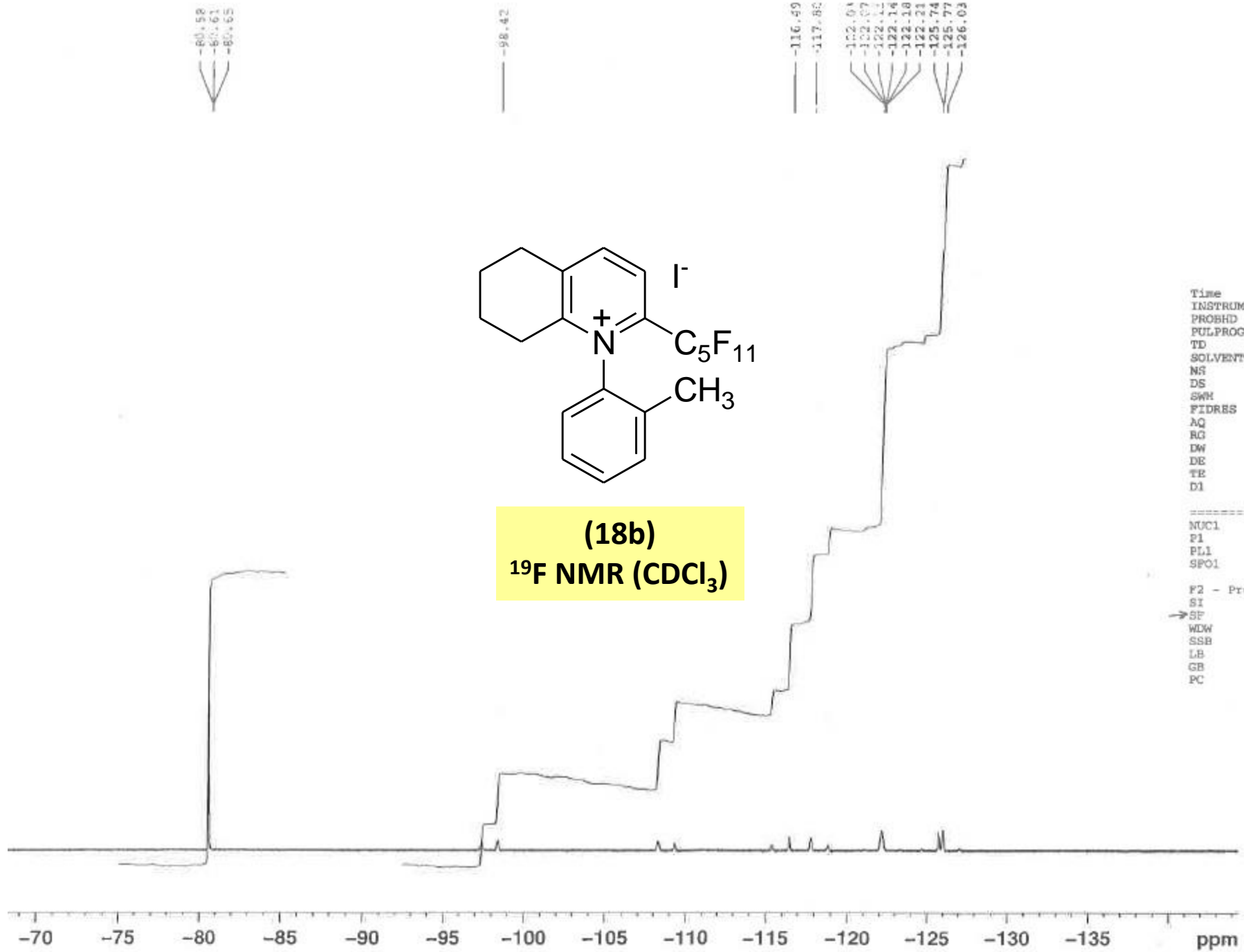
```

Time                8.25
INSTRUM             spect
PROBHD              5 mm QNP 1H/13
PULPROG             zg30
TD                  32768
SOLVENT             CDCl3
NS                  16
DS                  2
SWH                 3306.878 Hz
FIDRES              0.100918 Hz
AQ                  1.9545717 sec
RG                  912.3
DW                  151.200 usec
DE                  8.00 usec
TE                  300.0 K
D1                  1.00000000 sec

===== CHANNEL f1 =====
NUC1                 1H
P1                    6.50 usec
PL1                   -3.00 dB
SFO1                  300.1315007 MHz

F2 - Processing parameters
SI                    32768
SF                    300.1300320 MHz
WDW                   EM
SSB                    0
LB                     0.30 Hz
GB                      0
PC                      1.00

```



```

Time          10.18
INSTRUM      spect
PROBHD      5 mm QNP 1H/13
PULPROG     zgpg30
TD          131072
SOLVENT     CDCl3
NS           16
DS           4
SWH         25062.656 Hz
FIDRES      0.191213 Hz
AQ          2.6149364 sec
RG           1149.4
DW           19.950 usec
DE            8.00 usec
TE           300.0 K
D1           5.00000000 sec
  
```

```

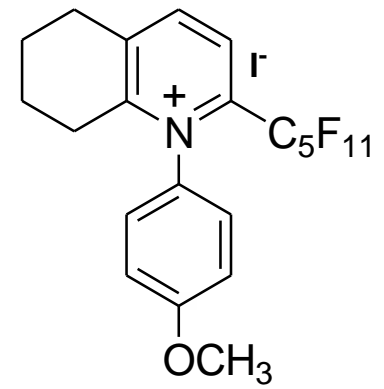
===== CHANNEL f1 =====
NUC1         19F
P1            9.50 usec
PL1          -6.00 dB
SFO1         282.3761058 MHz
  
```

```

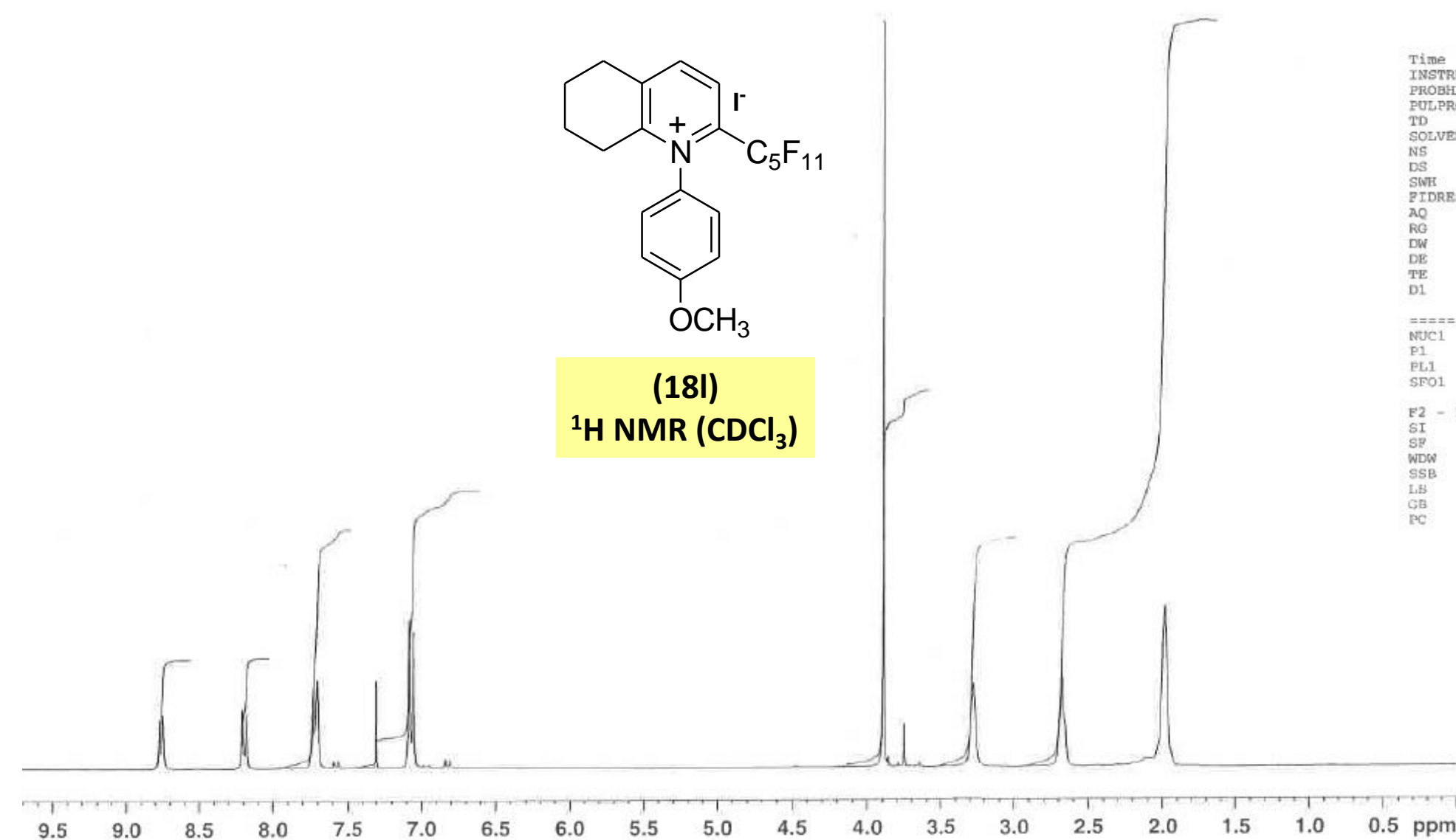
F2 - Processing parameters
SI            65536
SF           282.4043460 MHz
WDW           EM
SSB            0
LB            0.30 Hz
GB            0
PC            1.00
  
```

2632.55
2624.32
2462.87
2454.71
2320.39
2311.76
2191.80
2126.52
2117.65

1168.43
1125.98
983.32
802.83
596.31



(18I)
¹H NMR (CDCl₃)

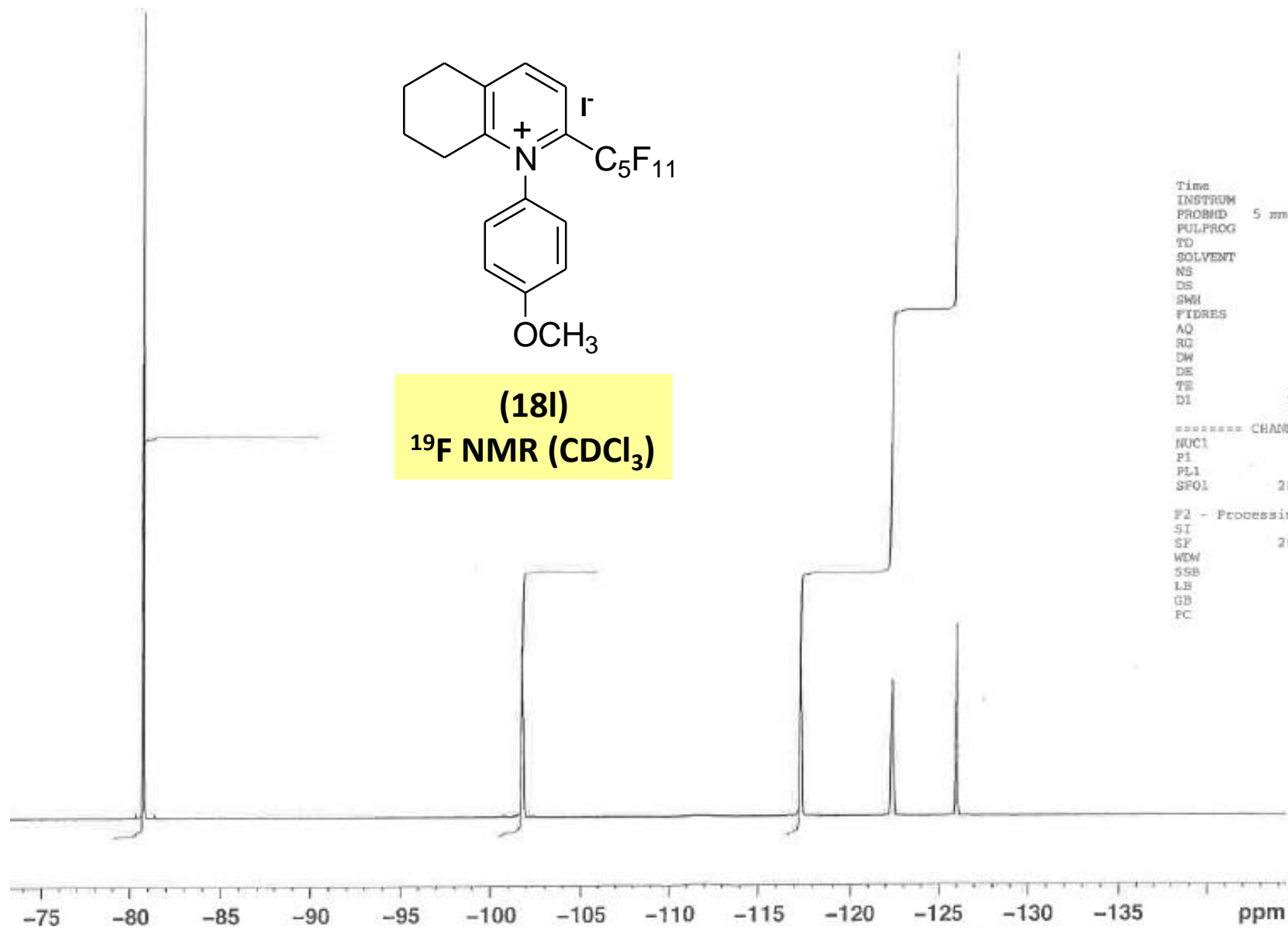


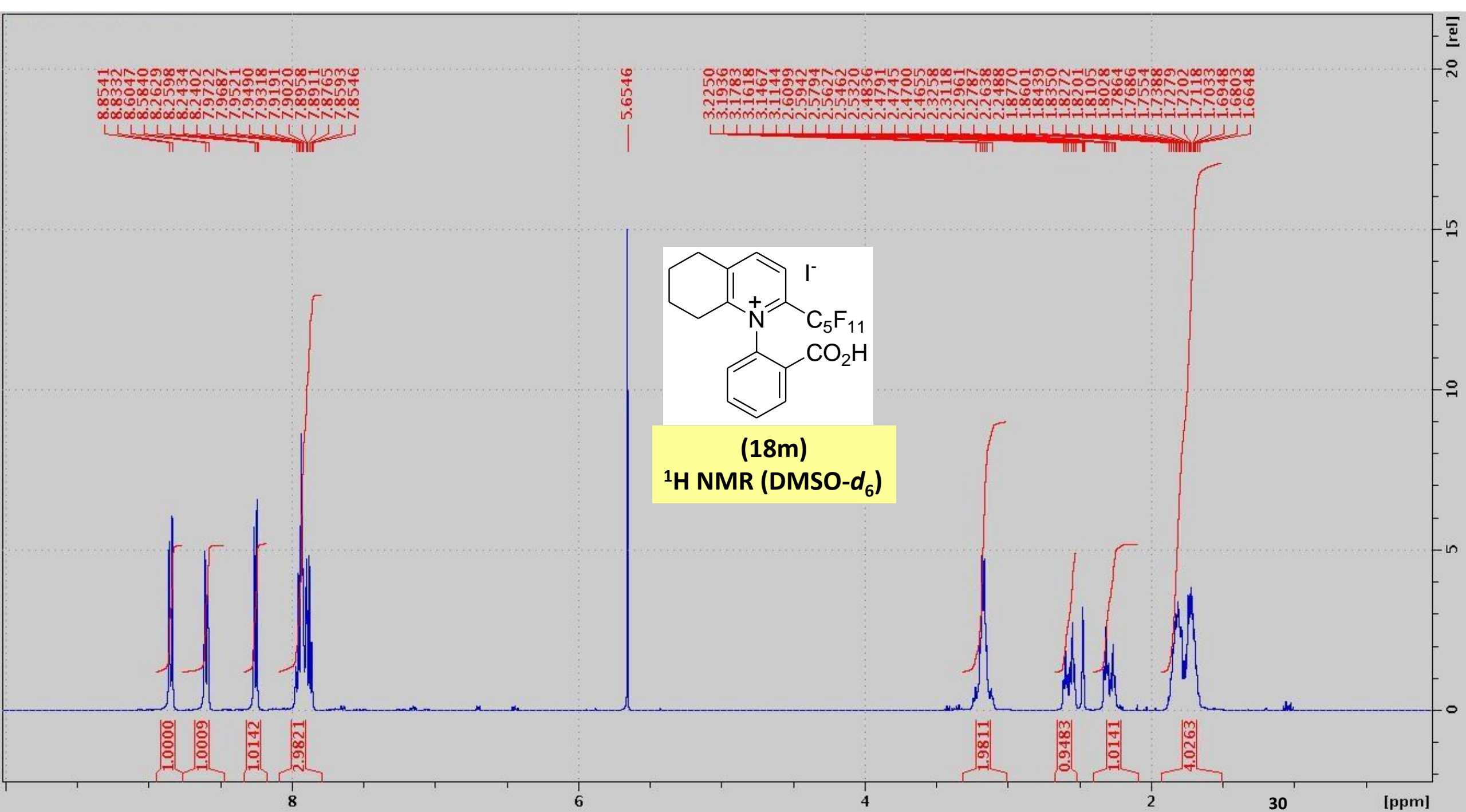
```

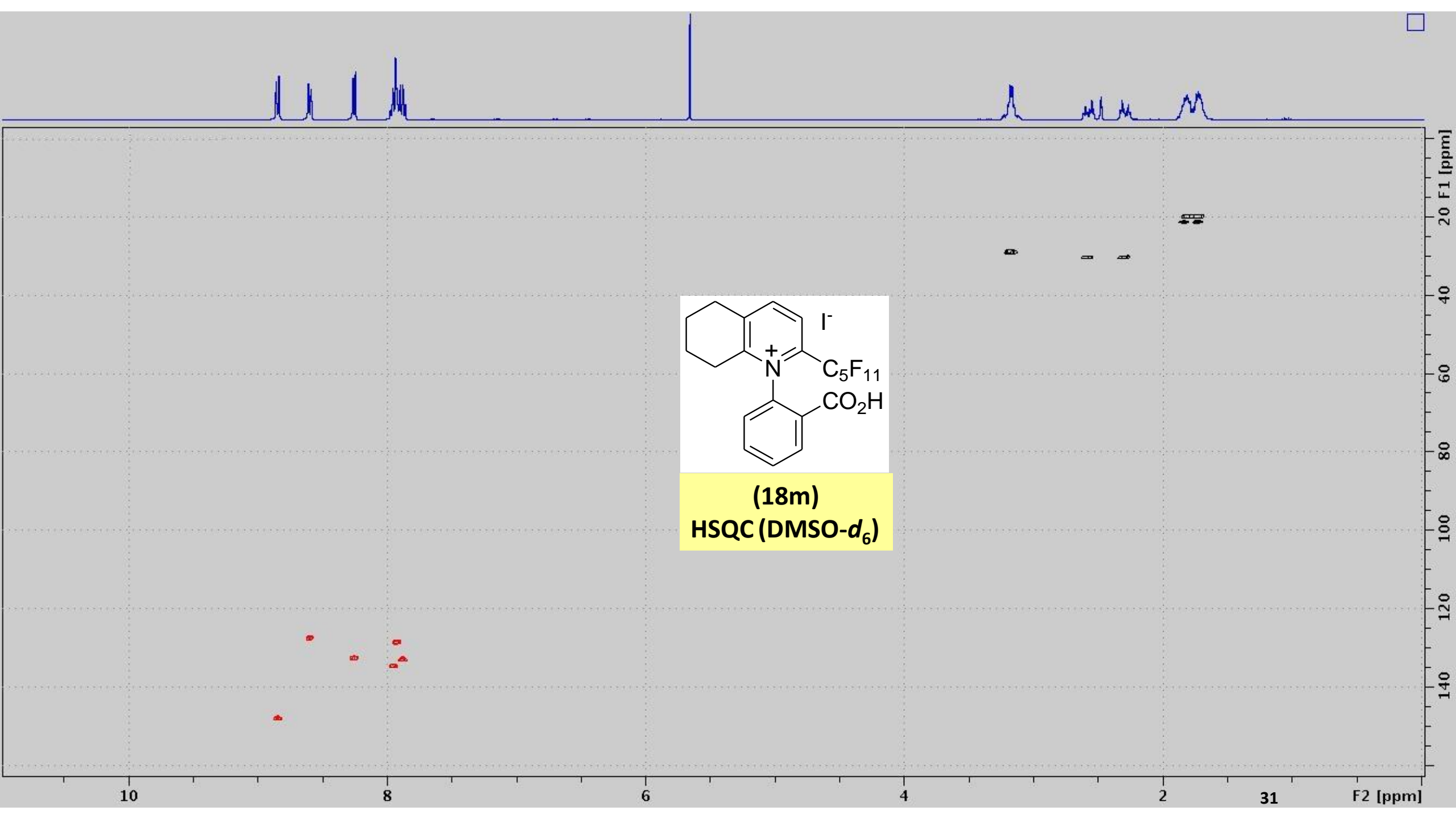
Time 9.00
INSTRUM spect
PROBHD 5 mm QNP 1H/13
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 16
DS 2
SWH 3306.878 Hz
FIDRES 0.100918 Hz
AQ 4.9545717 sec
RG 256
DW 151.200 usec
DE 8.00 usec
TE 300.0 K
D1 1.00000000 sec

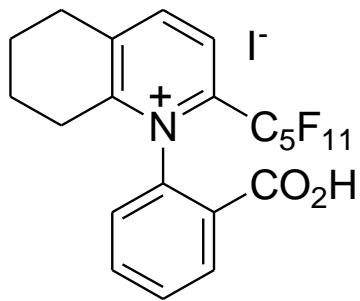
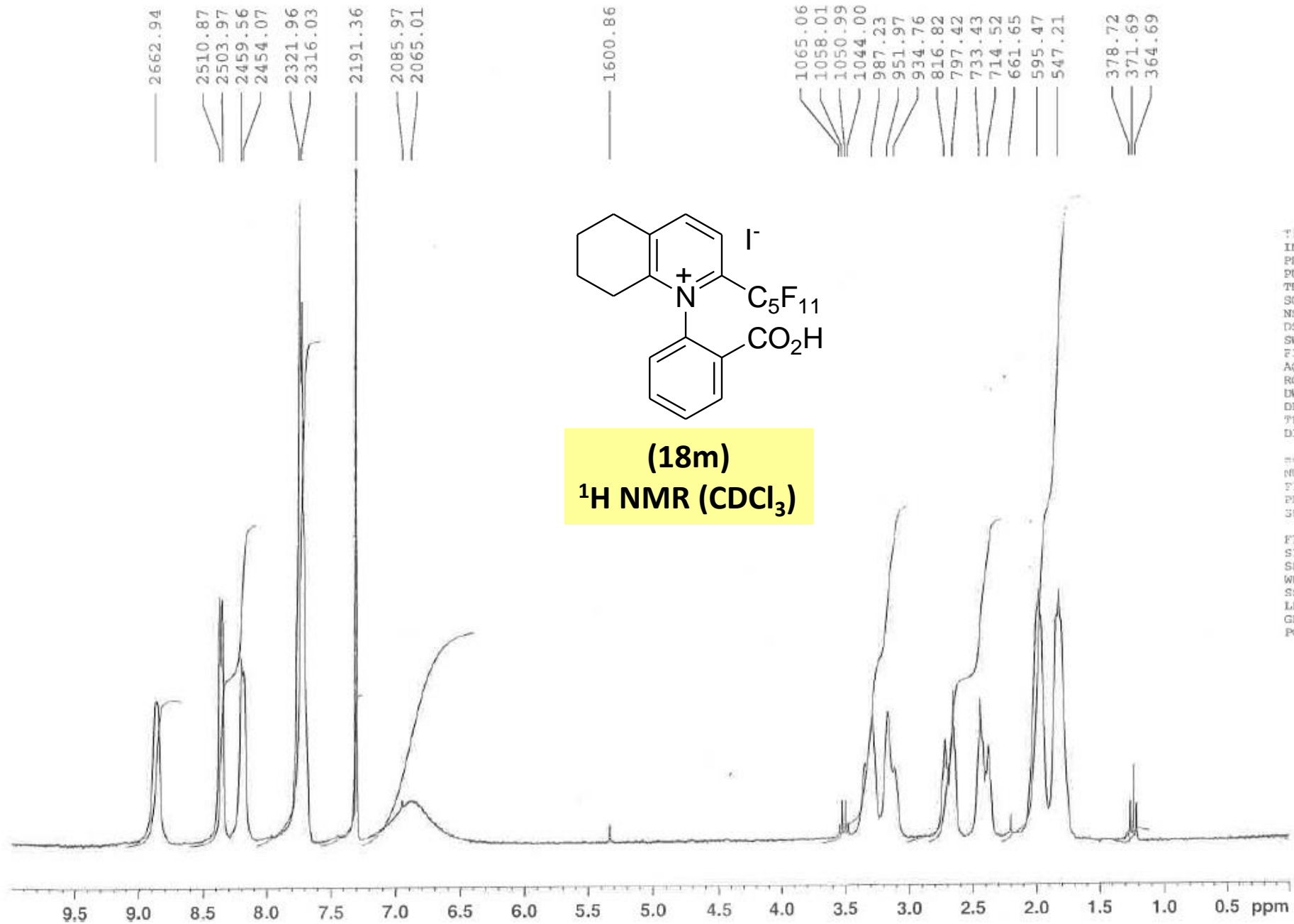
----- CHANNEL f1 -----
NUC1 1H
P1 6.50 usec
PL1 -3.00 dB
SFO1 300.1315007 MHz

F2 - Processing parameters
SI 32768
SF 300.1300000 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
  
```









(18m)
 ^1H NMR (CDCl_3)

```

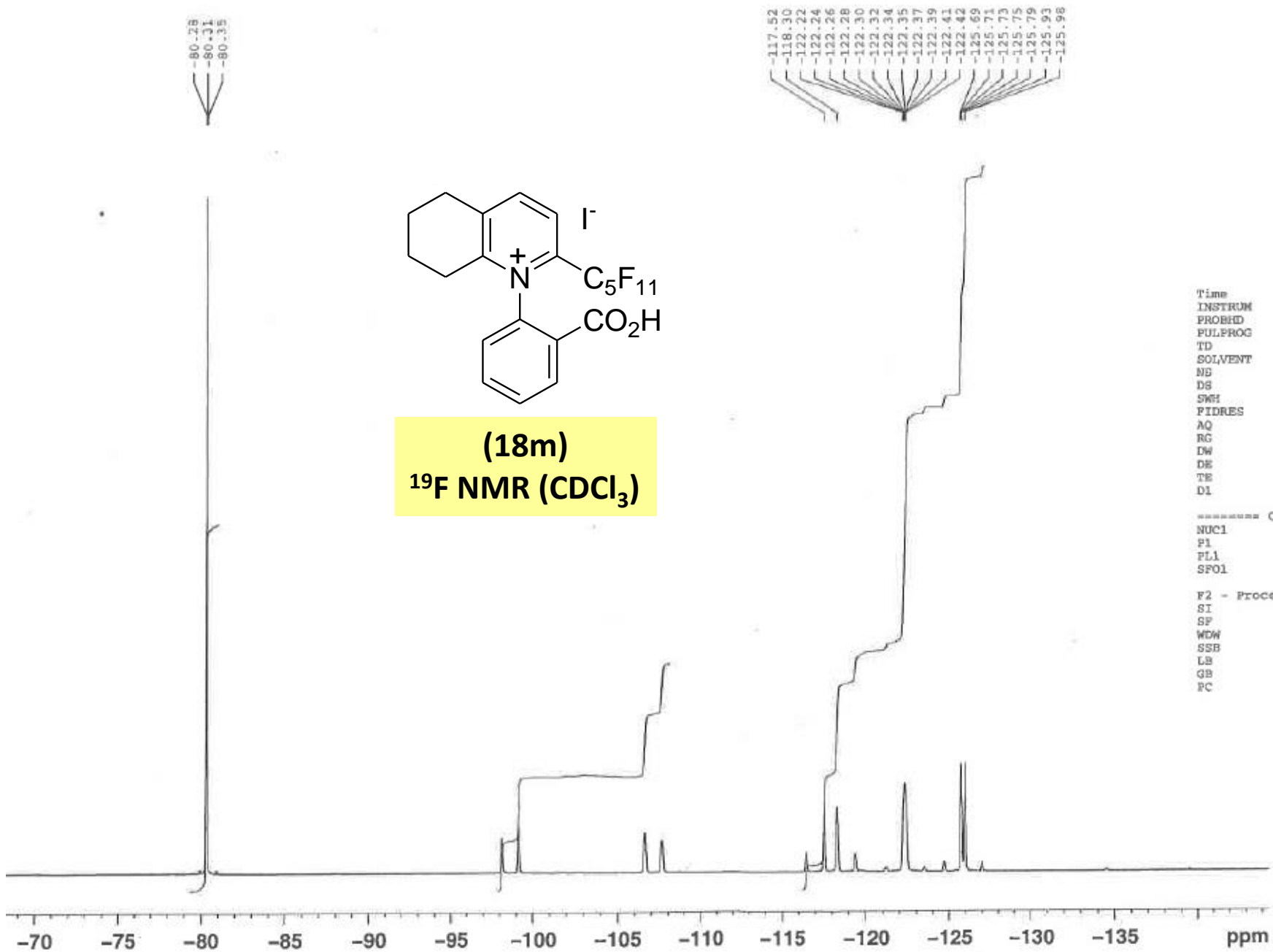
Time          9.02
INSTRUM      spect
PROBHD       5 mm QNP 1H/13
PULPROG      zg30
TD           32768
SOLVENT      CDCl3
NS           16
DS           2
SWH          3306.878 Hz
FIDRES       0.100918 Hz
AQ           4.9545717 sec
RG           724.1
DW           151.200 usec
DE           8.00 usec
TE           300.0 K
D1           1.00000000 sec
  
```

```

===== CHANNEL f1 =====
NUC1         1H
P1           6.50 usec
PL1          -3.00 dB
SFO1         300.1315007 MHz
  
```

```

F2 - Processing parameters
SI           32768
SP           300.1300000 MHz
WDW          EM
SSB          0
LB           0.30 Hz
GB           0
PC           1.00
  
```

```

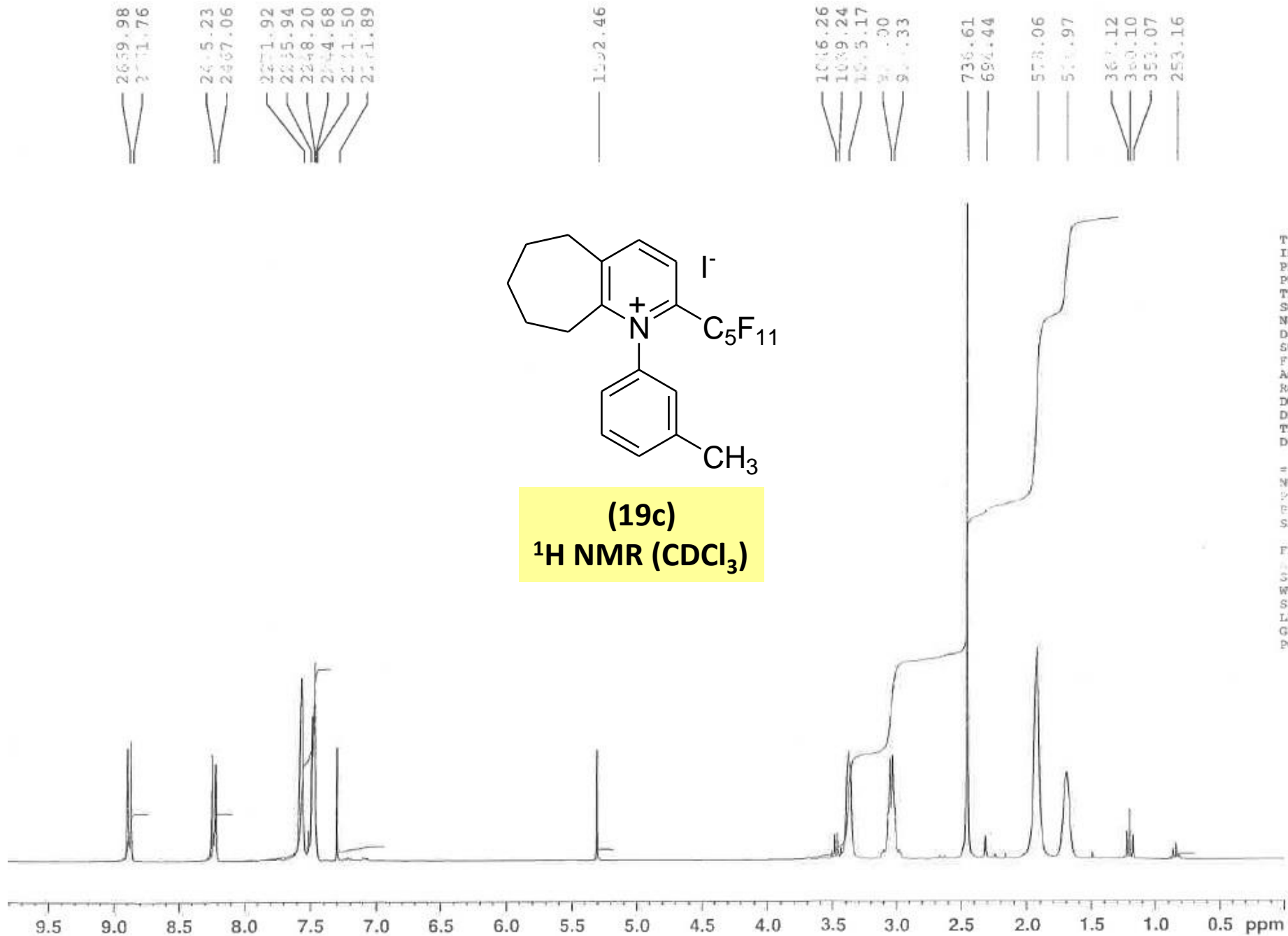
Time          9.45
INSTRUM      spect
PROBHD       5 mm QNP 1H
PULPROG      zgpg30
TD           131072
SOLVENT      DMSO
NS           16
DS           4
SWH          25062.656 Hz
FIDRES       0.191213 Hz
AQ           2.6149364 sec
RG           645.1
DW           19.950 usec
DE           8.00 usec
TE           300.0 K
D1           5.00000000 sec
  
```

```

===== CHANNEL f1 =====
NUC1          19F
P1            6.86 usec
PL1           -6.00 dB
SFO1         282.3761058 MHz
  
```

```

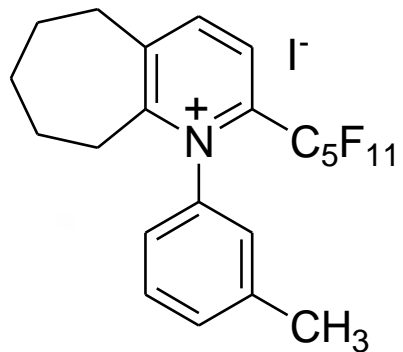
F2 - Processing parameters
SI            65536
SF           282.4043460 MHz
WDW           EM
SSB           0
LB            0.30 Hz
GB            0
PC            1.00
  
```



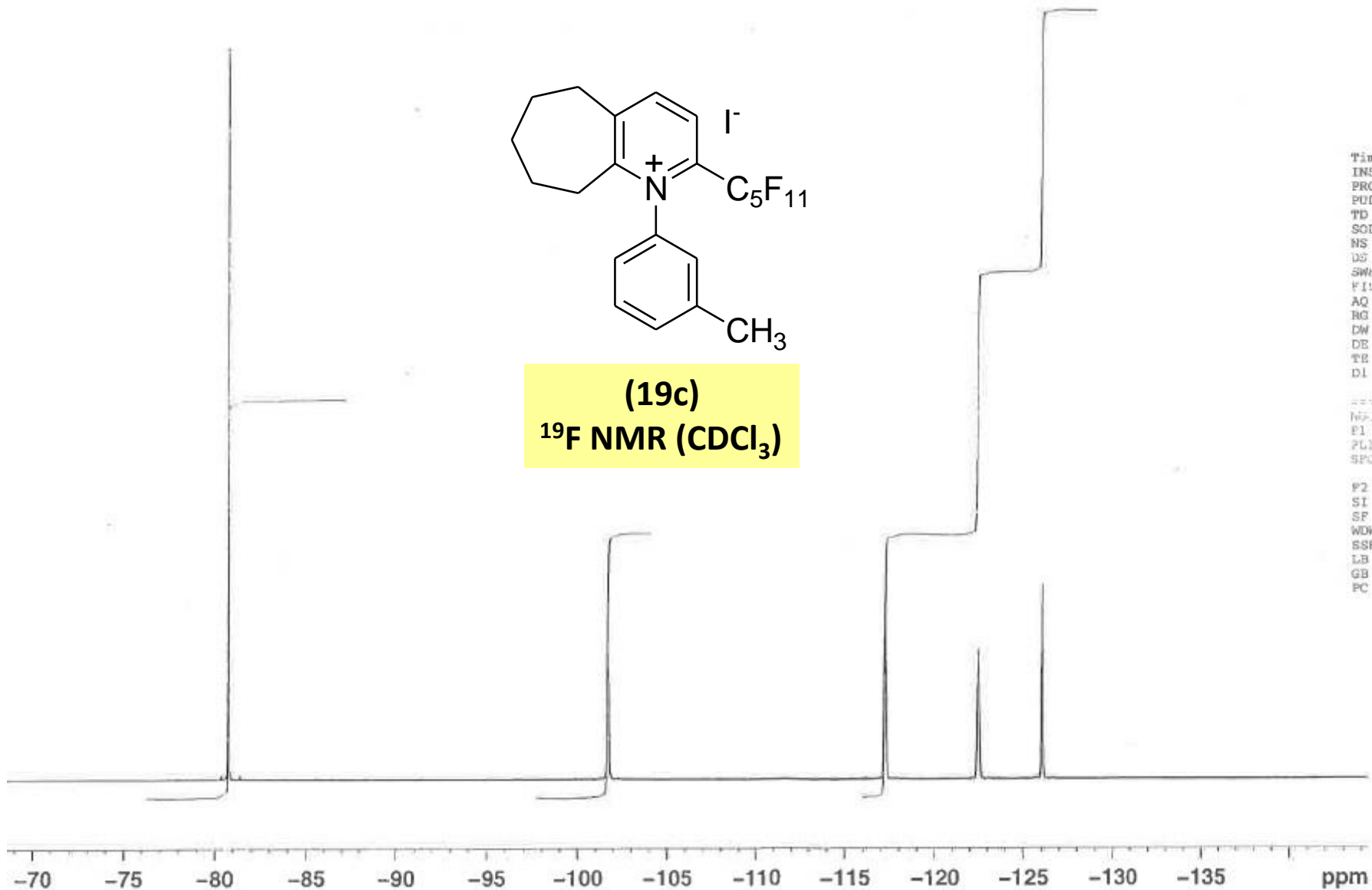
Time 18.53
 INSTRUM spect
 PROBHD 5 mm QNP 1H/13
 PULPROG zg30
 TD 32768
 SOLVENT CDCl3
 NS 16
 DS 2
 SWH 3306.878 Hz
 FIDRES 0.100918 Hz
 AQ 4.9545717 sec
 RG 256
 DW 151.200 usec
 DE 8.00 usec
 TE 300.0 K
 D1 1.00000000 sec

===== CHANNEL f1 =====
 NUC1 1H
 P1 0.50 usec
 PL1 -3.00 dB
 SFO1 300.1315007 MHz

F2 - Processing parameters
 SI 32768
 SF 300.1300000 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00



(19c)
¹⁹F NMR (CDCl₃)



```

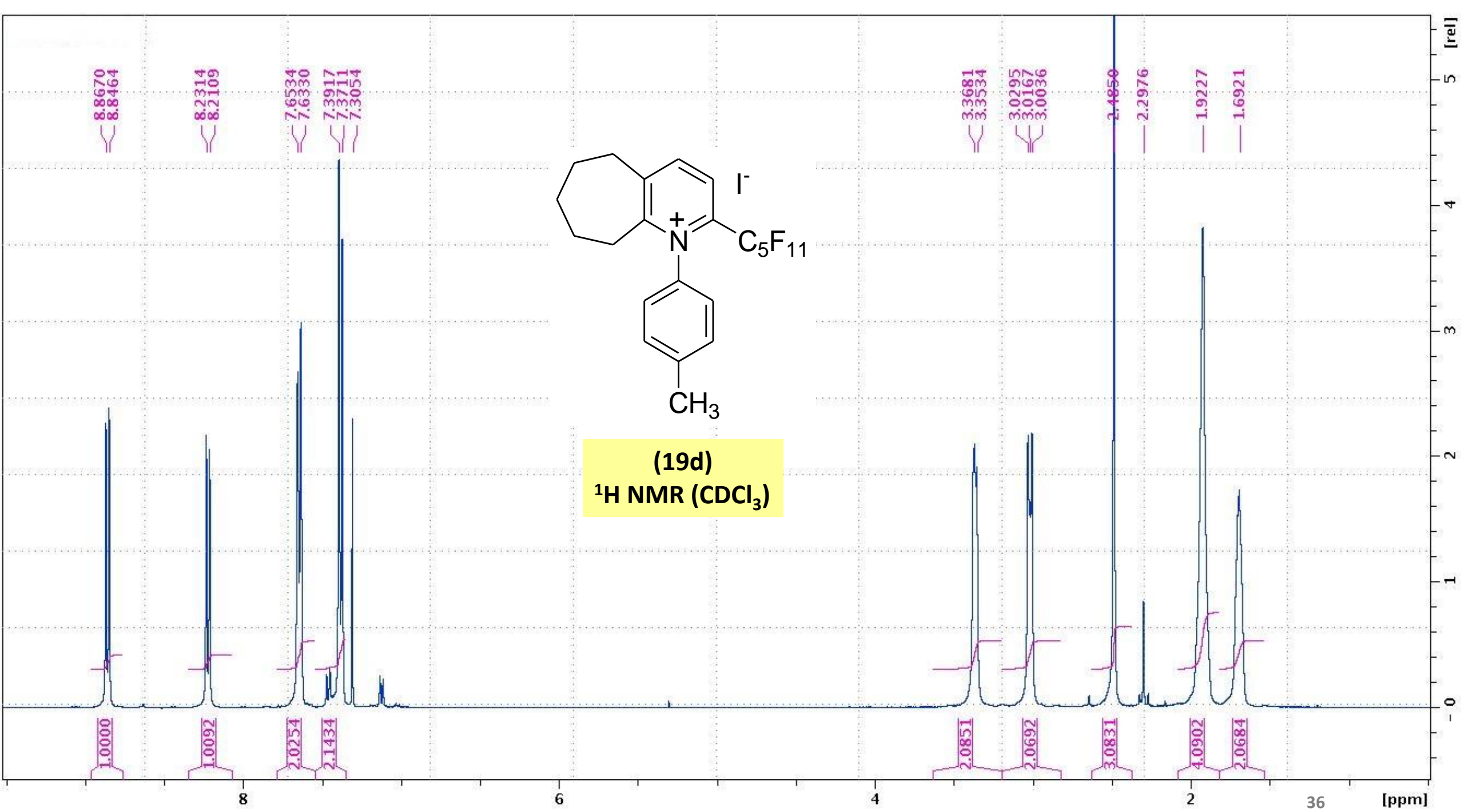
Time          18.51
INSTRUM      spect
PROBHD      5 mm QNP 1H/13
PULPROG      zgpg30
TD          131072
SOLVENT      CDCl3
NS           16
DS           4
SWH         25062.856 Hz
FIDRES      0.191211 Hz
AQ          2.6149364 sec
RG           645.1
DW          19.950 usec
DE           8.00 usec
TE           300.0 K
D1          0.00600000 sec
  
```

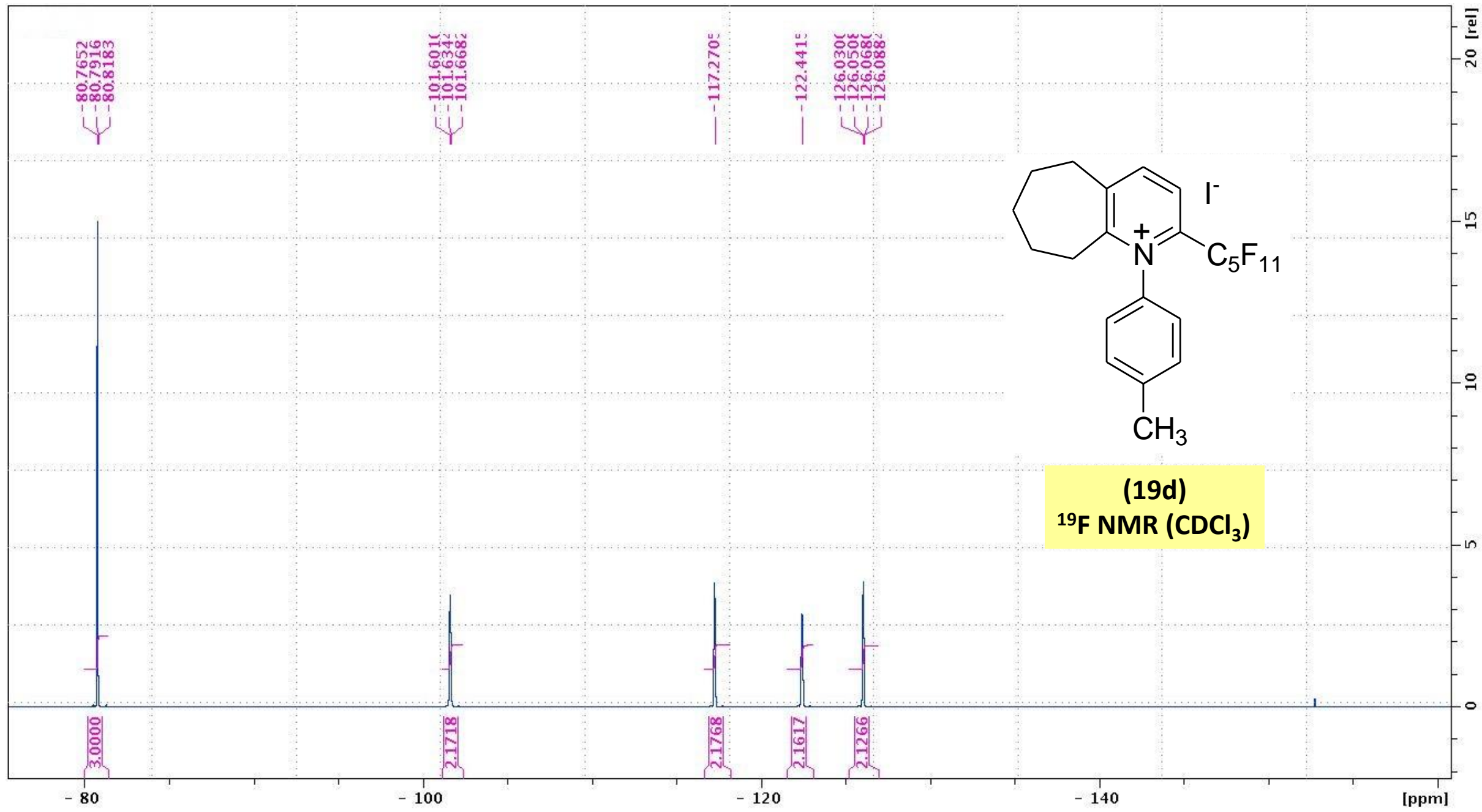
```

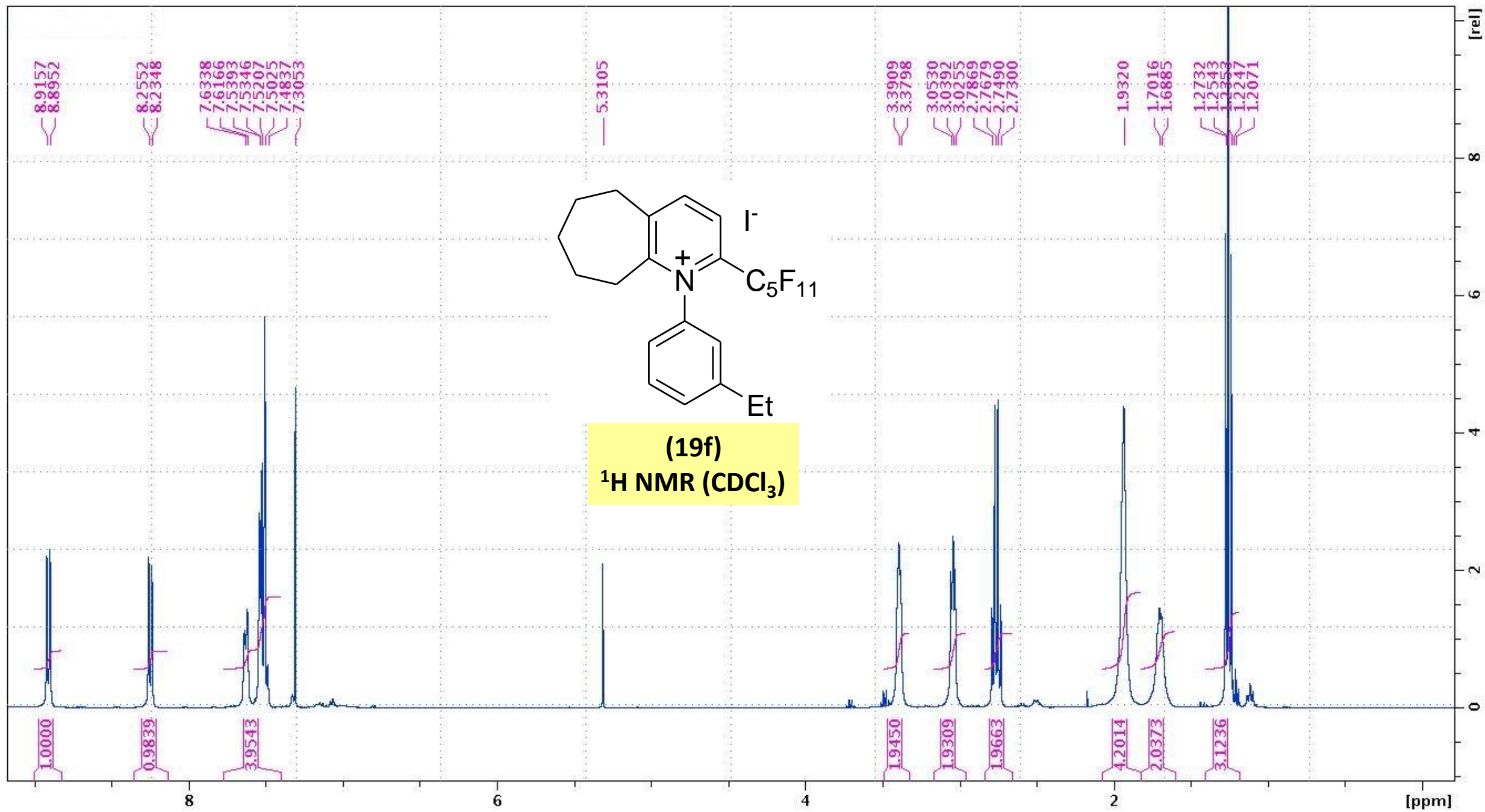
===== CHANNEL F1 =====
NUC1         19F
P1           9.50 usec
PL1          -6.00 dB
SFO1         282.3761058 MHz
  
```

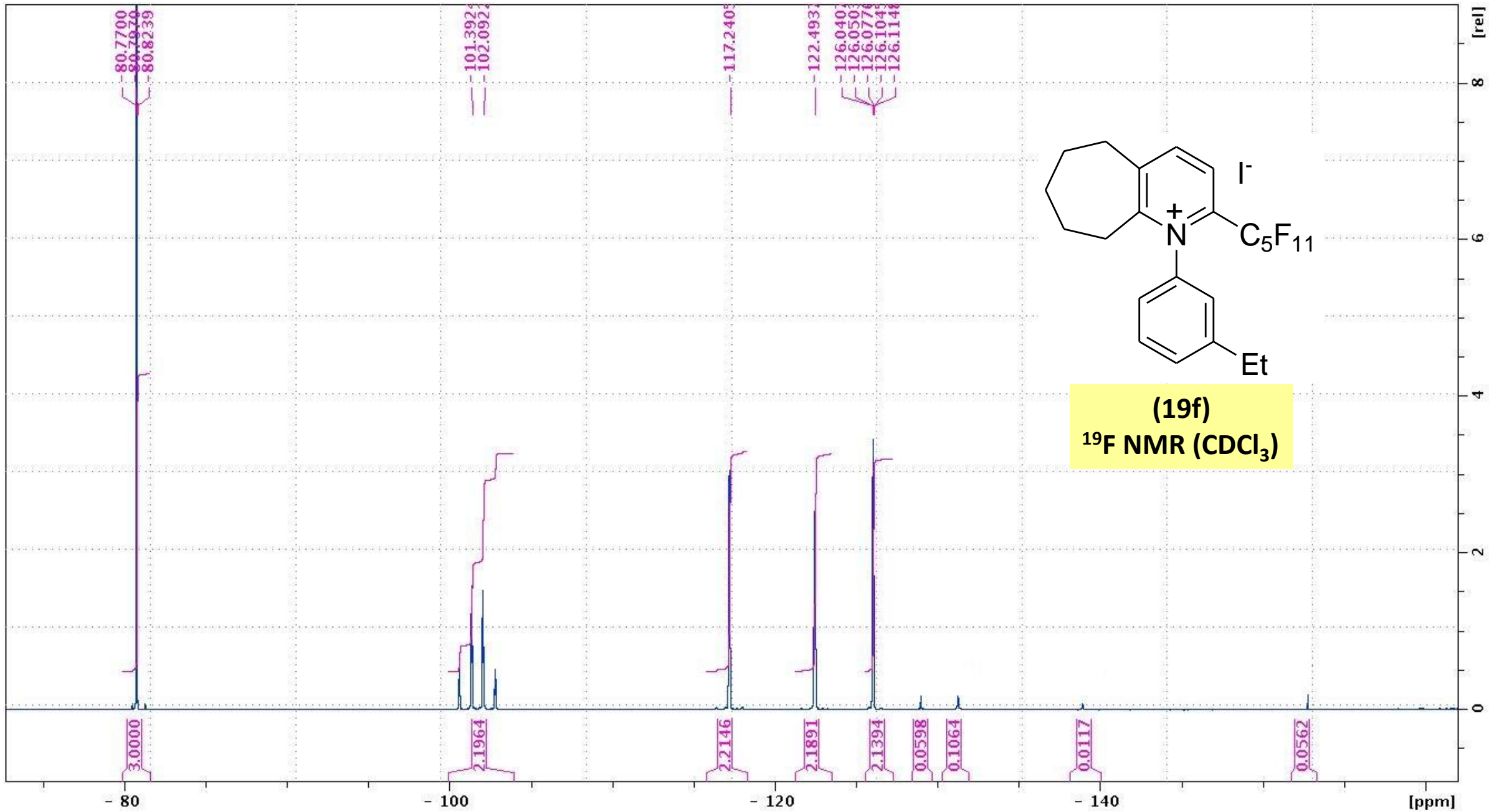
```

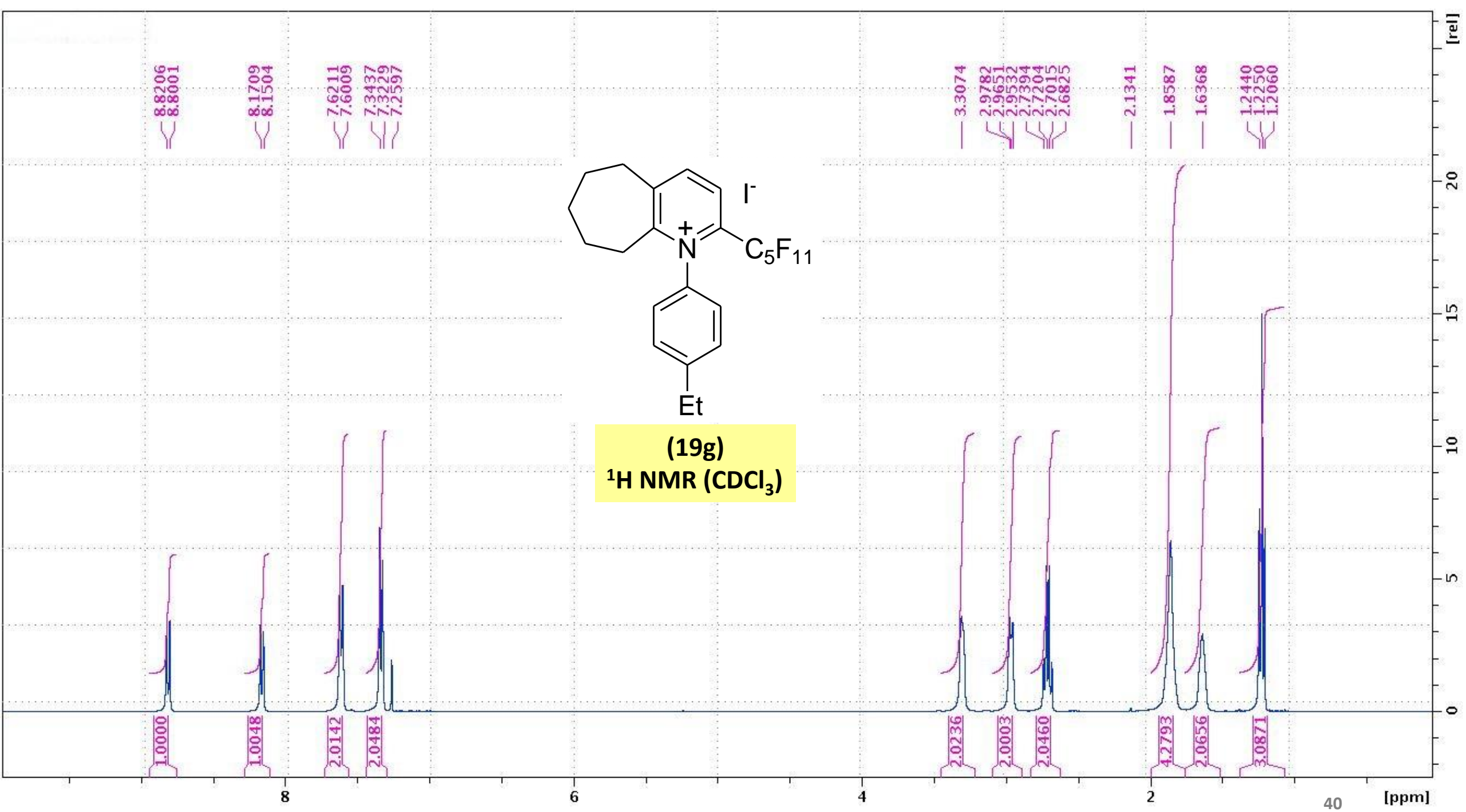
F2 - Processing parameters
SI           65536
SF           282.4043460 MHz
WDW          EM
SSB          0
LB           0.30 Hz
GB           0
PC           1.00
  
```

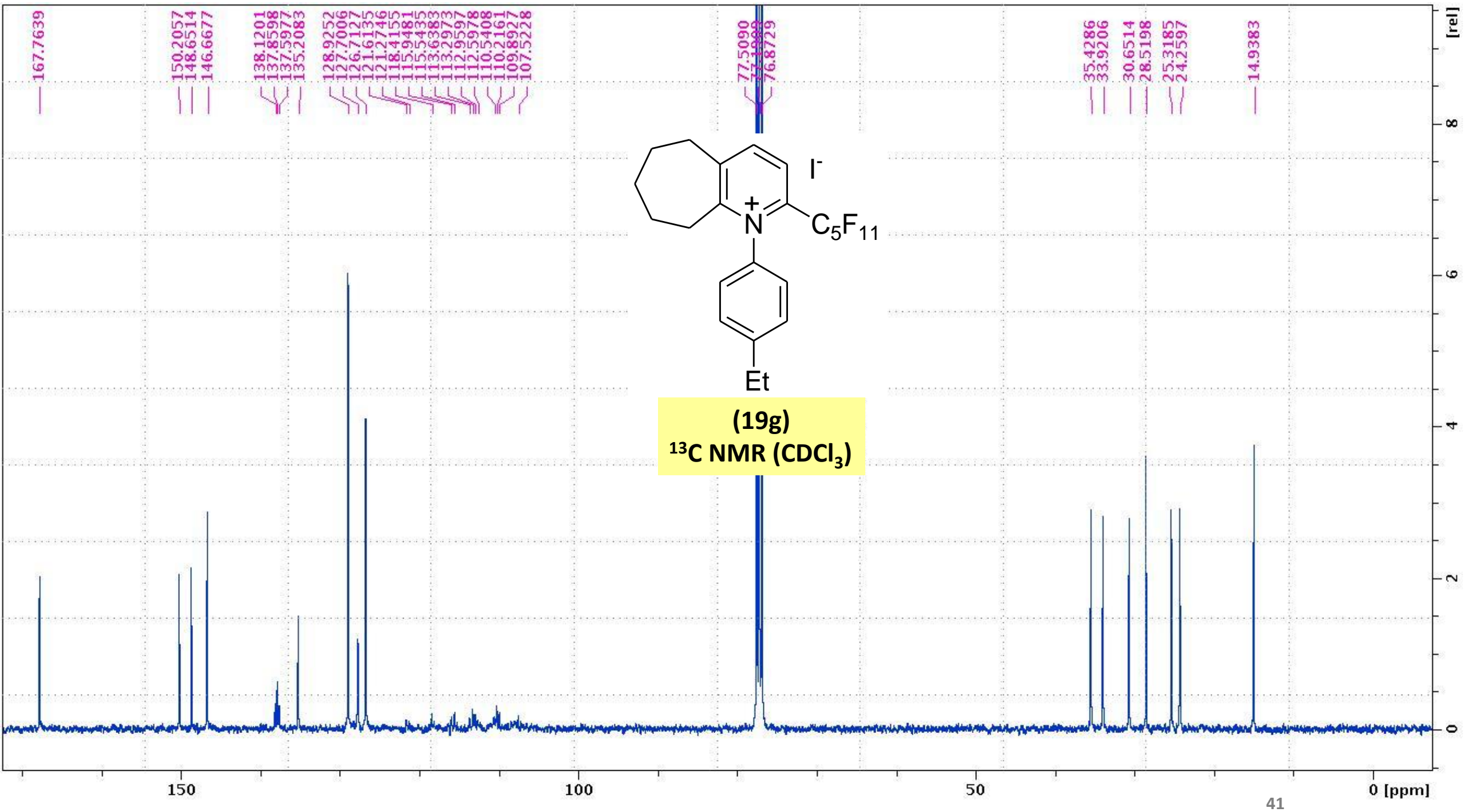


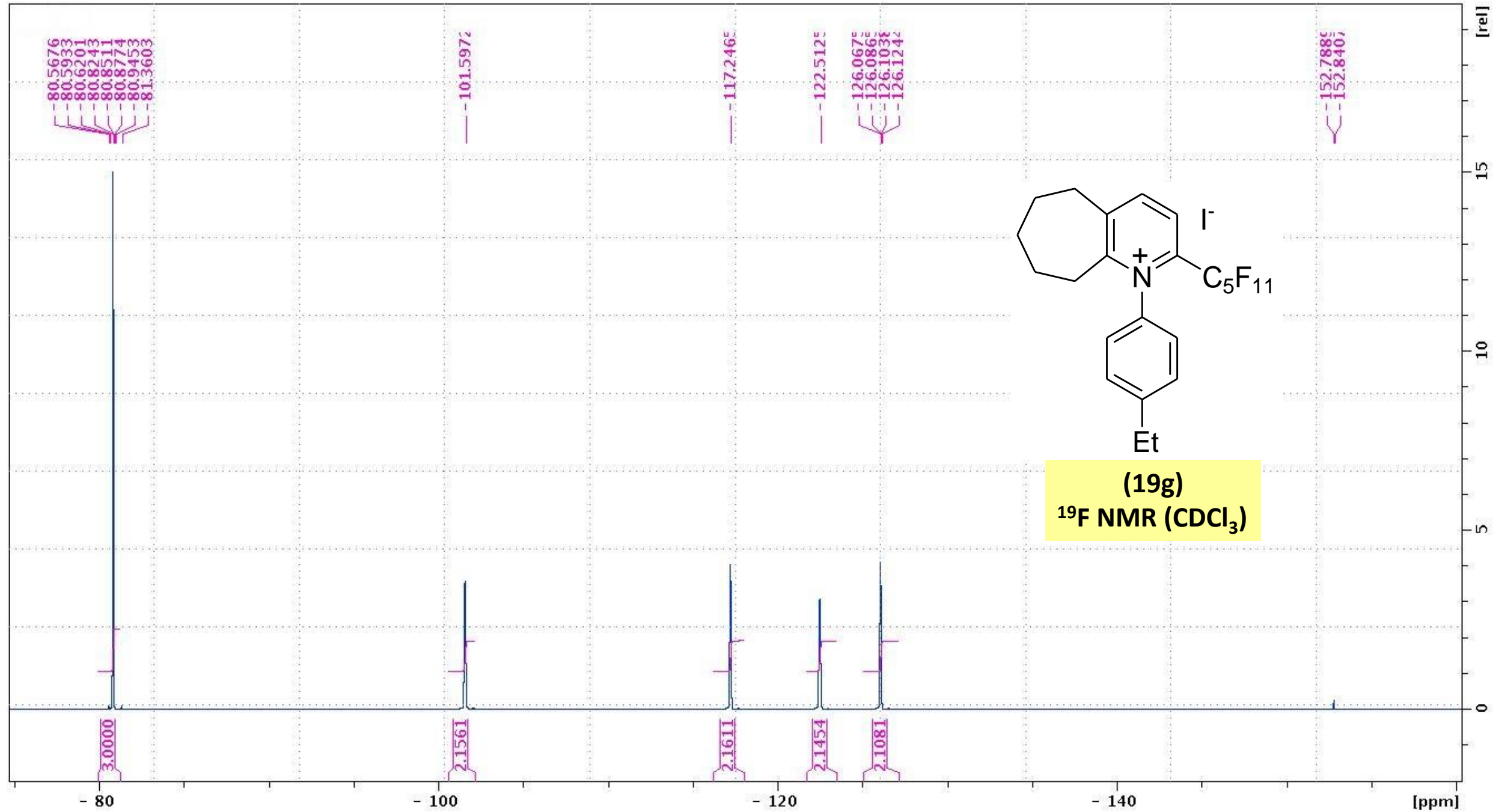






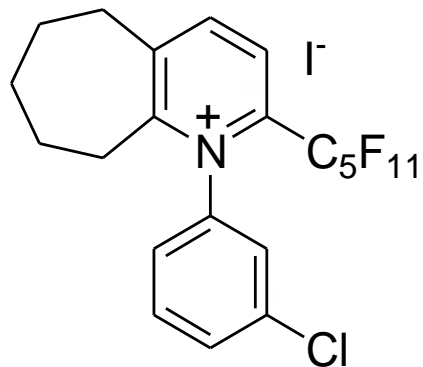




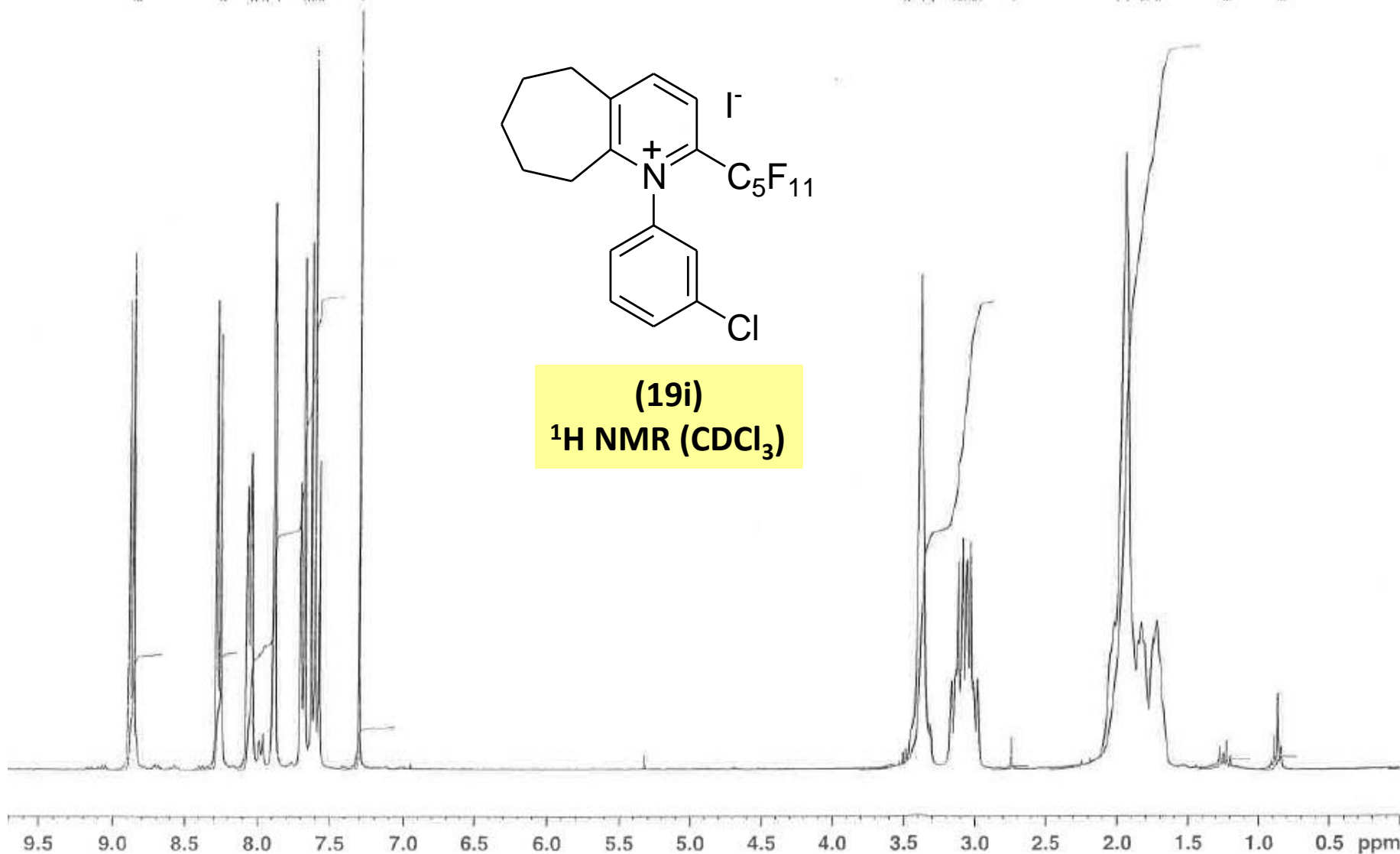


2666.70
2658.48
2651.92
2484.53
2476.35
2420.64
2412.71
2397.39
2389.05
2365.52
2311.49
2303.21
2294.73
2288.95
2280.84
2272.74
2191.56

1052.15
1045.11
1014.66
995.04
950.50
940.66
935.94
927.00
917.43
909.69
903.99
894.87
823.39
606.21
585.12
556.39
550.77
544.30
525.13
517.49
381.11
373.59
366.60
266.10
259.85
257.95
253.34
251.41



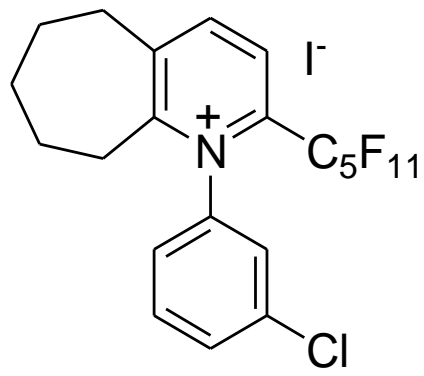
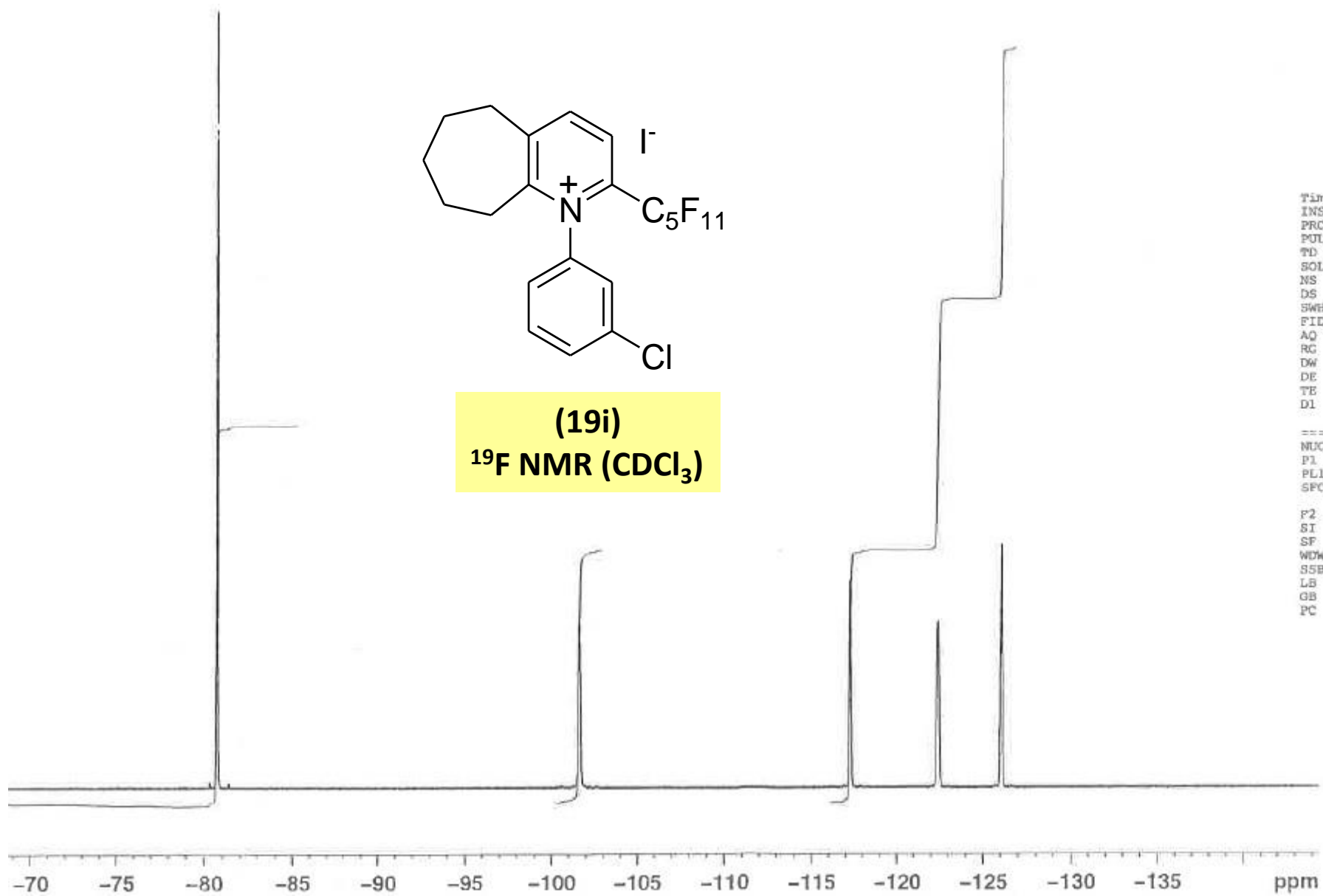
(19i)
¹H NMR (CDCl₃)



Time 17.42
INSTRUM spect
PROBHD 5 mm QNP 1H/13
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 16
DS 2
SWH 3306.878 Hz
FIDRES 0.100918 Hz
AQ 4.9545717 sec
RG 362
DW 151.200 usec
DE 8.00 usec
TE 300.0 K
D1 1.00000000 sec

==== CHANNEL f1 =====
NUC1 1H
P1 6.50 usec
PL1 -3.00 dB
SFO1 300.1315007 MHz

F2 - Processing parameters
SI 32768
SF 300.1300000 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



(19i)
 ^{19}F NMR (CDCl_3)

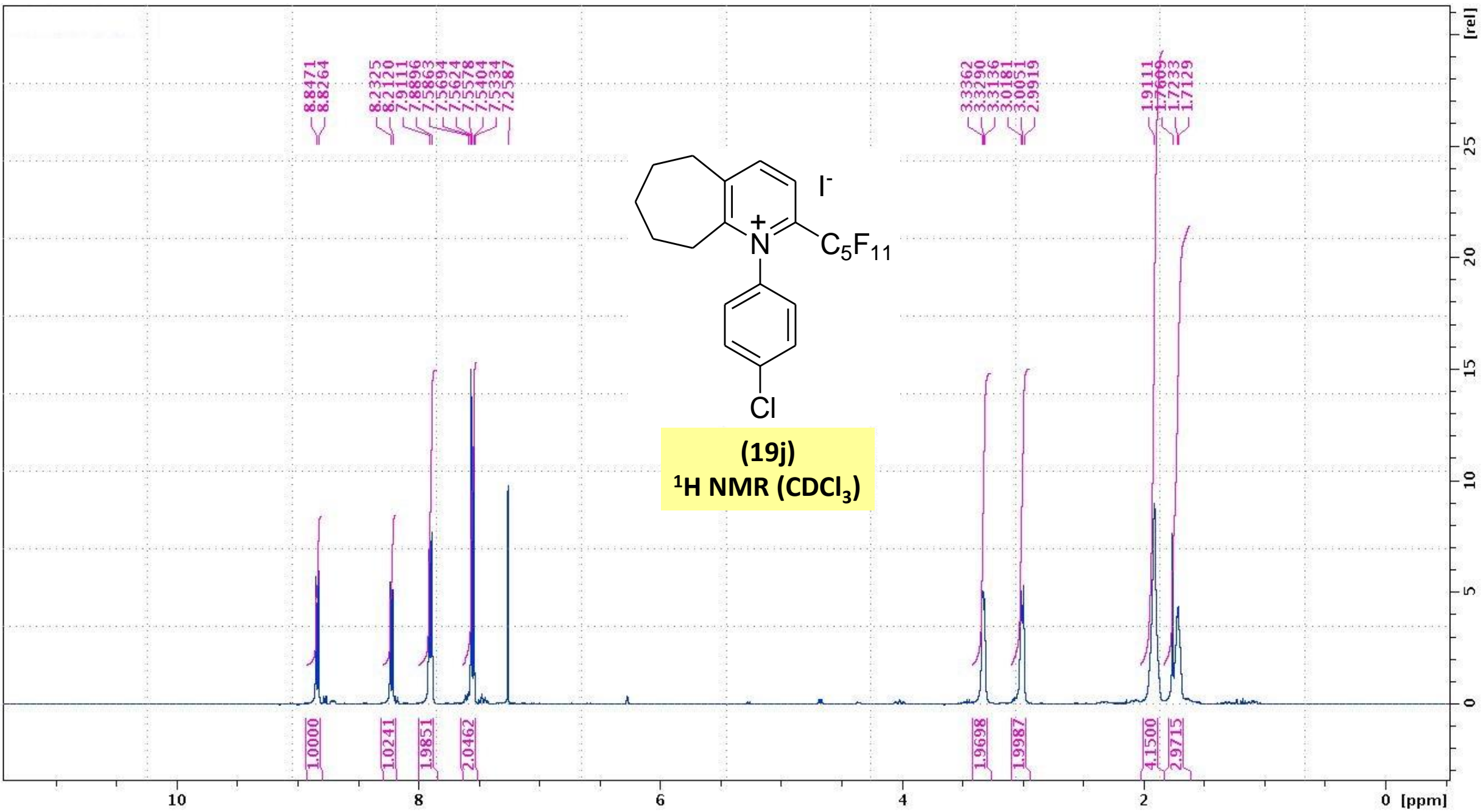
```

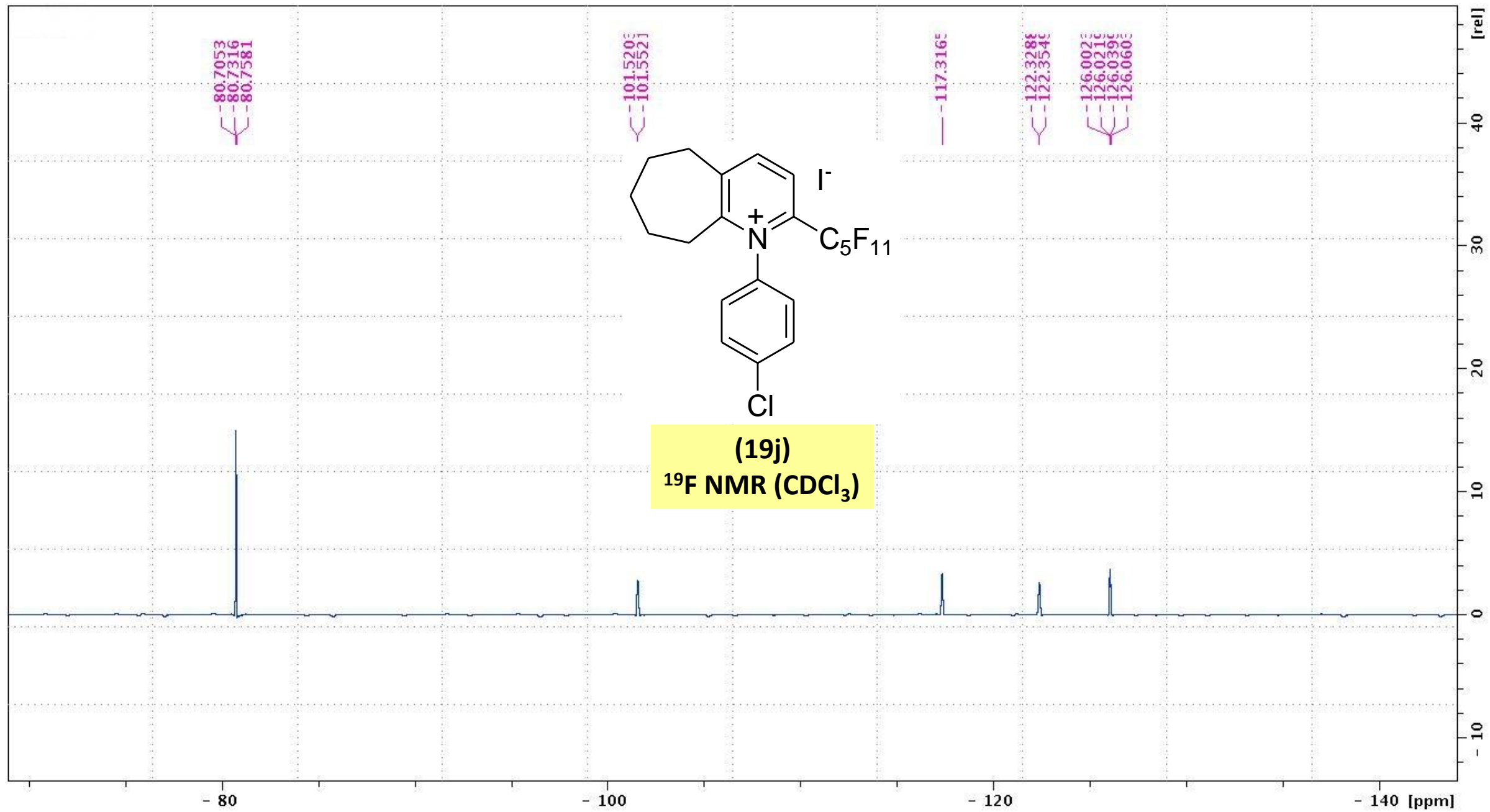
Time          17.39
INSTRUM      spect
PROBHD      5 mm QNP 1H/13
PULPROG      zgpg30
TD          131072
SOLVENT      CDCl3
NS           16
DS           4
SWH         25062.656 Hz
FIDRES      0.191213 Hz
AQ          2.6149364 sec
RG           1290.2
DW          19.950 usec
DE           8.00 usec
TE           300.0 K
D1          5.00000000 sec

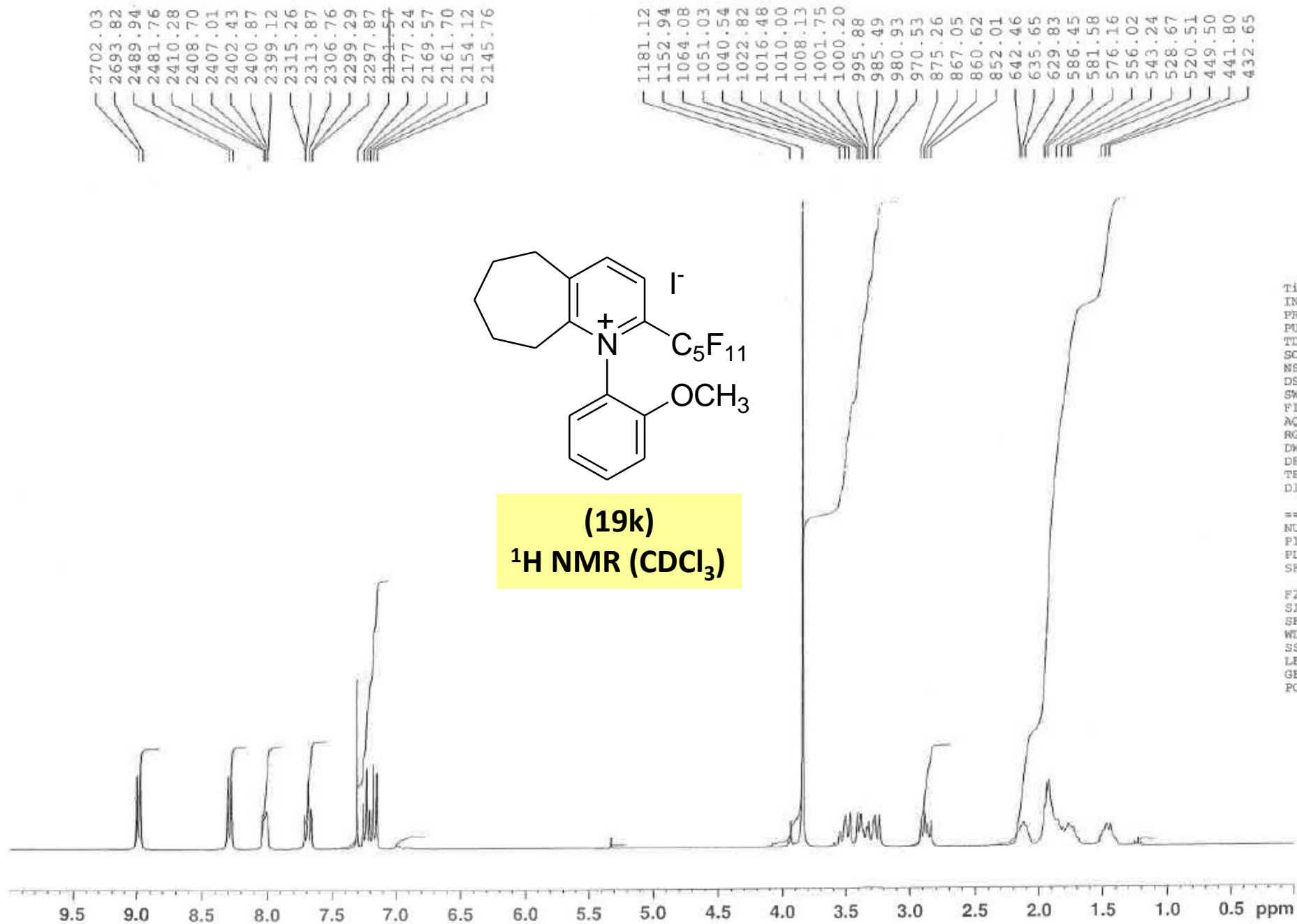
===== CHANNEL f1 =====
NUC1         19F
P1           9.50 usec
PL1          -6.00 dB
SFO1         282.3761058 MHz

F2 - Processing parameters
SI           65536
SF           282.4043460 MHz
WDW          EM
SSB          0
LB           0.30 Hz
GB           0
PC           1.00

```







```

Time 17.26
INSTRUM spect
PROBHD 5 mm QNP
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 16
DS 2
SWH 3306.878 Hz
FIDRES 0.100918 Hz
AQ 4.9545717 sec
RG 456.1
DW 151.200 usec
DE 8.00 usec
TE 300.0 K
D1 1.00000000 sec

```

```

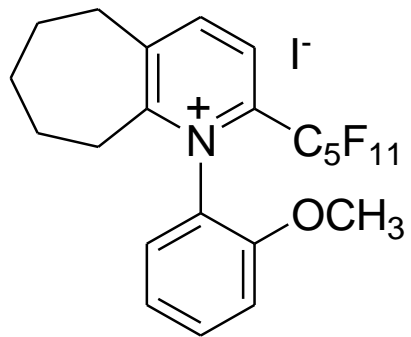
===== CHANNEL f1 =====
NUC1 1H
P1 6.50 usec
PL1 -3.00 dB
SFO1 300.1315007 MHz

```

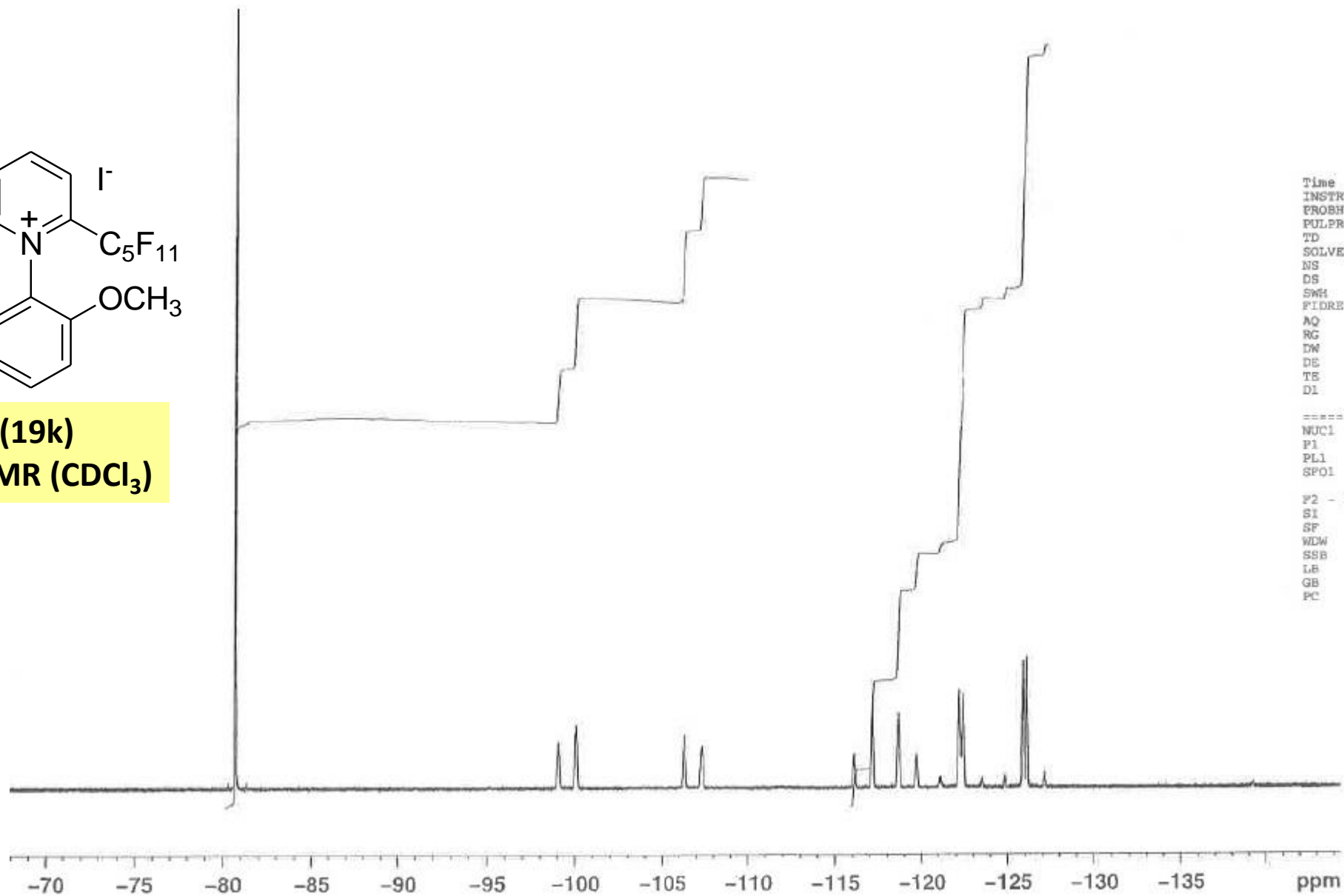
```

F2 - Processing parameters
SI 32768
SF 300.1300000 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

```



(19k)
 ^{19}F NMR (CDCl_3)



```

Time          17.30
INSTRUM       spect
PROBHD        5 mm QNP 1H/13
PULPROG       zgpg30
TD            131072
SOLVENT       CDCl3
NS            16
DS            4
SWH           25062.656 Hz
FIDRES        0.191213 Hz
AQ            2.6149364 sec
RG            2048
DN            19.950 usec
DE            9.00 usec
TE            300.0 K
D1            5.00000000 sec
  
```

```

----- CHANNEL F1 -----
NUC1          19F
P1            9.50 usec
PL1           -6.00 dB
SFO1          282.3761058 MHz
  
```

```

P2 - Processing parameters
SI            65536
SF            282.4043460 MHz
WDW           EM
SSB           0
LB            0.30 Hz
GB            0
PC            1.00
  
```