

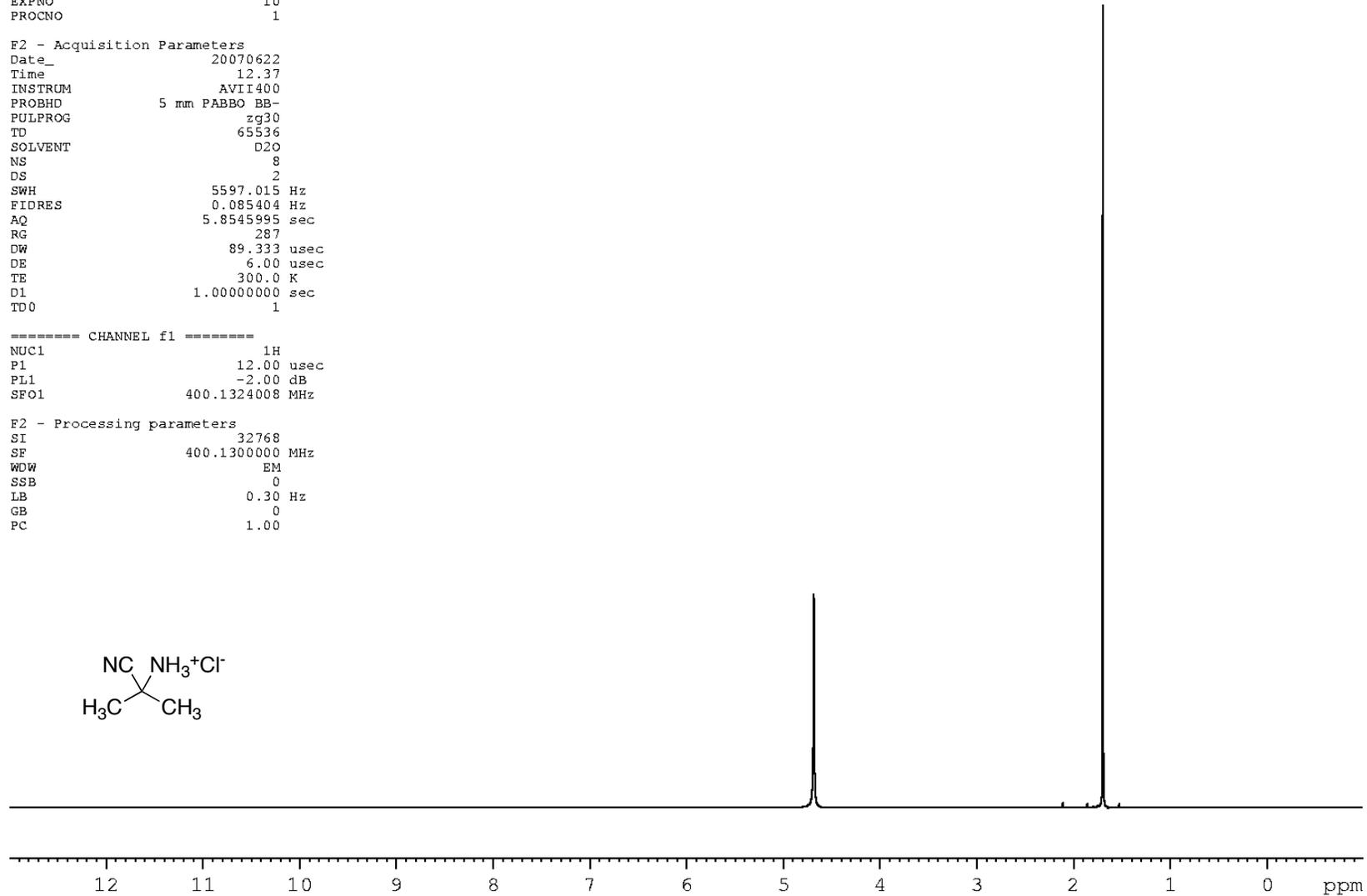
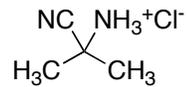
2-Amino-2-methylpropionitrile (1) ¹H NMR spectrum

Current Data Parameters
NAME 06222007-2-rossM
EXPNO 10
PROCNO 1

F2 - Acquisition Parameters
Date_ 20070622
Time 12.37
INSTRUM AVII400
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT D2O
NS 8
DS 2
SWH 5597.015 Hz
FIDRES 0.085404 Hz
AQ 5.8545995 sec
RG 287
DW 89.333 usec
DE 6.00 usec
TE 300.0 K
D1 1.00000000 sec
TD0 1

----- CHANNEL f1 -----
NUC1 1H
P1 12.00 usec
PL1 -2.00 dB
SF01 400.1324008 MHz

F2 - Processing parameters
SI 32768
SF 400.1300000 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



2-Amino-2-methylpropionitrile (1) ¹³C NMR spectrum

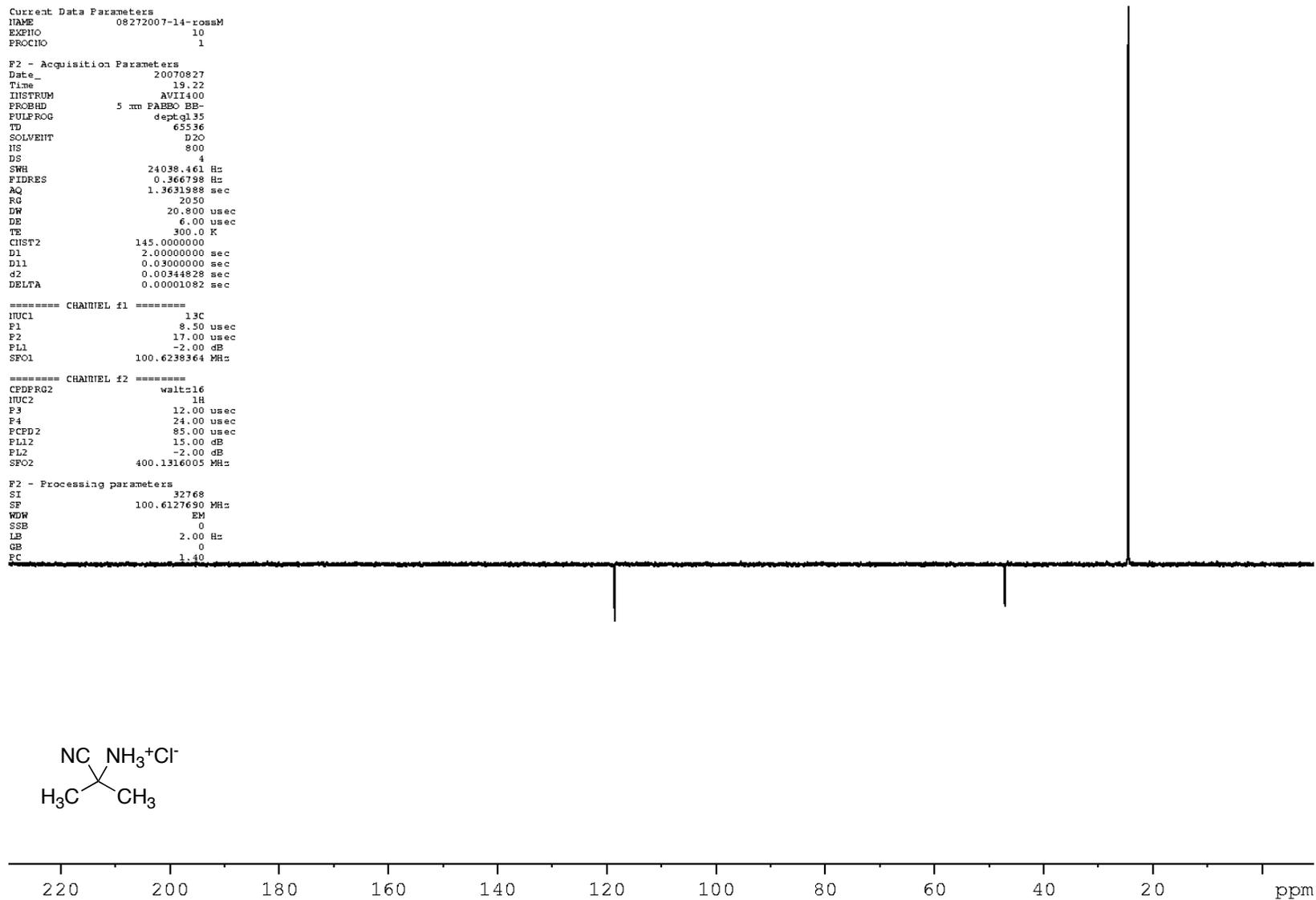
Current Data Parameters
 NAME 08272007-14-rossM
 EXPNO 10
 PROCNO 1

F2 - Acquisition Parameters
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 Time_ 19.22
 INSTRUM AVII400
 PROBHD 5 mm PABBO BB-
 PULPROG zgpg30
 TD 65536
 SOLVENT D2O
 NS 800
 DS 4
 SWH 24038.461 Hz
 FIDRES 0.366798 Hz
 AQ 1.3631988 sec
 RG 2050
 DW 20.800 usec
 DE 6.00 usec
 TE 300.0 K
 CHST2 145.0000000
 D1 2.0000000 sec
 D11 0.0300000 sec
 d2 0.00344828 sec
 DELTA 0.00001082 sec

==== CHANNEL f1 =====
 NUCL 13C
 P1 8.50 usec
 P2 17.00 usec
 PL1 -2.00 dB
 SFO1 100.6238364 MHz

==== CHANNEL f2 =====
 CPDPRG2 waltz16
 NUCL 1H
 P3 12.00 usec
 P4 24.00 usec
 PCPD2 85.00 usec
 PL12 15.00 dB
 PL2 -2.00 dB
 SFO2 400.1316005 MHz

F2 - Processing parameters
 SI 32768
 SF 100.6127690 MHz
 WDW EM
 SSB 0
 LB 2.00 Hz
 GB 0
 EC 1.40



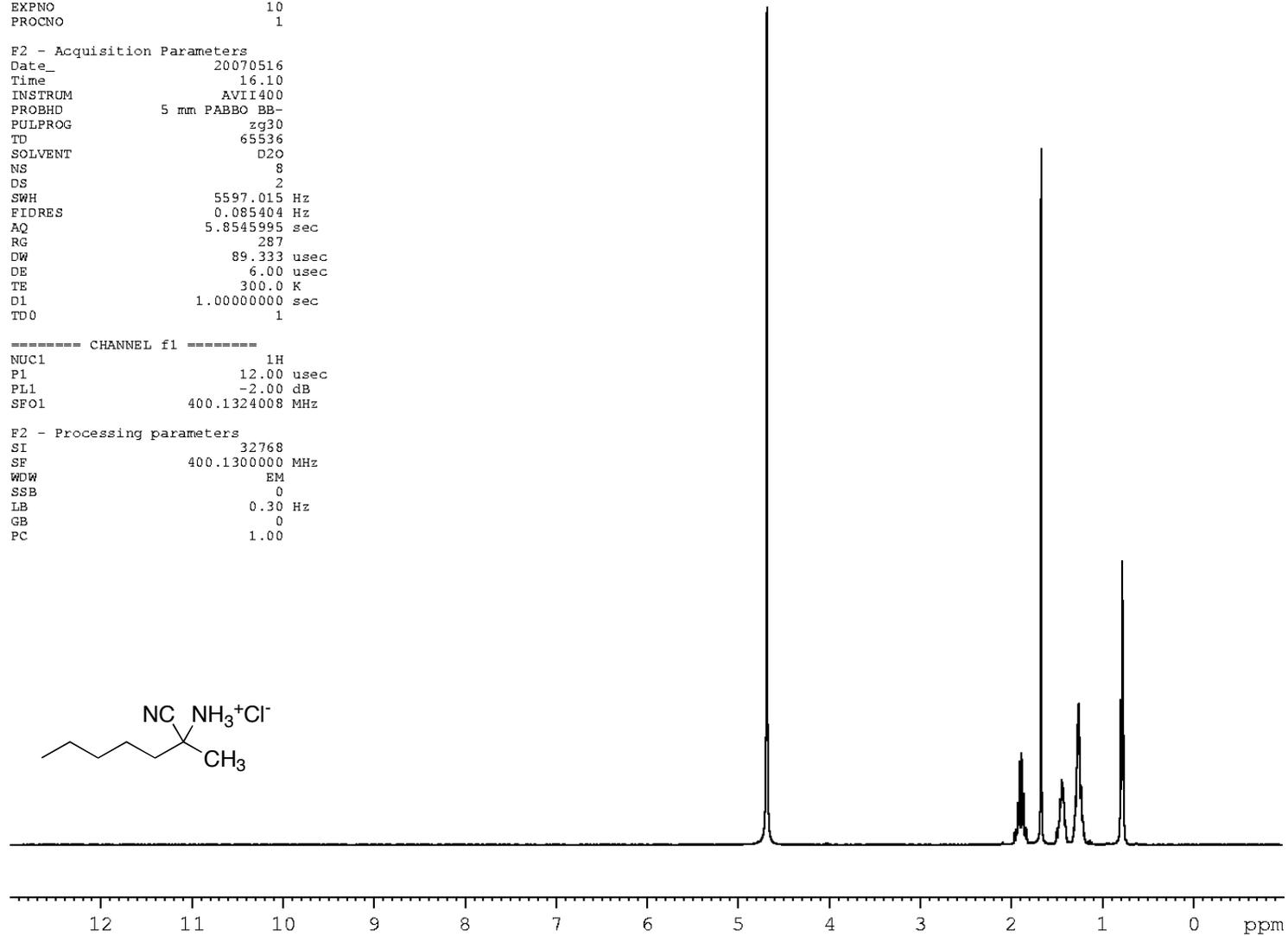
2-Amino-2-methylheptanonitrile hydrochloride (5) ¹H NMR spectrum

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Current Data Parameters
NAME      05162007-6-rossM
EXPNO     10
PROCNO    1

F2 - Acquisition Parameters
Date_     20070516
Time      16.10
INSTRUM   AVI400
PROBHD    5 mm PABBO BB-
PULPROG   zg30
TD        65536
SOLVENT   D2O
NS         8
DS         2
SWH       5597.015 Hz
FIDRES    0.085404 Hz
AQ        5.8545995 sec
RG         287
DW        89.333 usec
DE         6.00 usec
TE        300.0 K
D1        1.00000000 sec
TD0       1

===== CHANNEL f1 =====
NUC1      1H
P1        12.00 usec
PL1       -2.00 dB
SFO1      400.1324008 MHz

F2 - Processing parameters
SI        32768
SF        400.1300000 MHz
WDW       EM
SSB       0
LB        0.30 Hz
GB        0
PC        1.00
```



2-Amino-2-methylheptanonitrile hydrochloride (5) ¹³C NMR spectrum

```

Current Data Parameters
NAME      11182006-25-rossR
EXPNO     10
PROCNO    1

F2 - Acquisition Parameters
Date_     20061118
Time      16.48
INSTRUM   vcp300
PROBHD    5 mm FAPBO BE-
PULPROG   pendant.new
TD         65536
SOLVENT   D2O
NS         800
DS         8
SWH        18115.941 Hz
FIDRES     0.276427 Hz
AQ         1.8088436 sec
RG         18390.4
DR         27.600 usec
DE         6.00 usec
TE         296.4 K
CHST2     145.0000000
CHST3     1.0000000
CHST4     5.0000000
D1         1.50000000 sec
d2         0.00172414 sec
d3         0.00431034 sec
D12       0.00002000 sec
D13       0.00000400 sec
    
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```

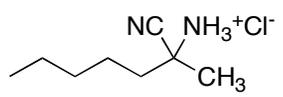
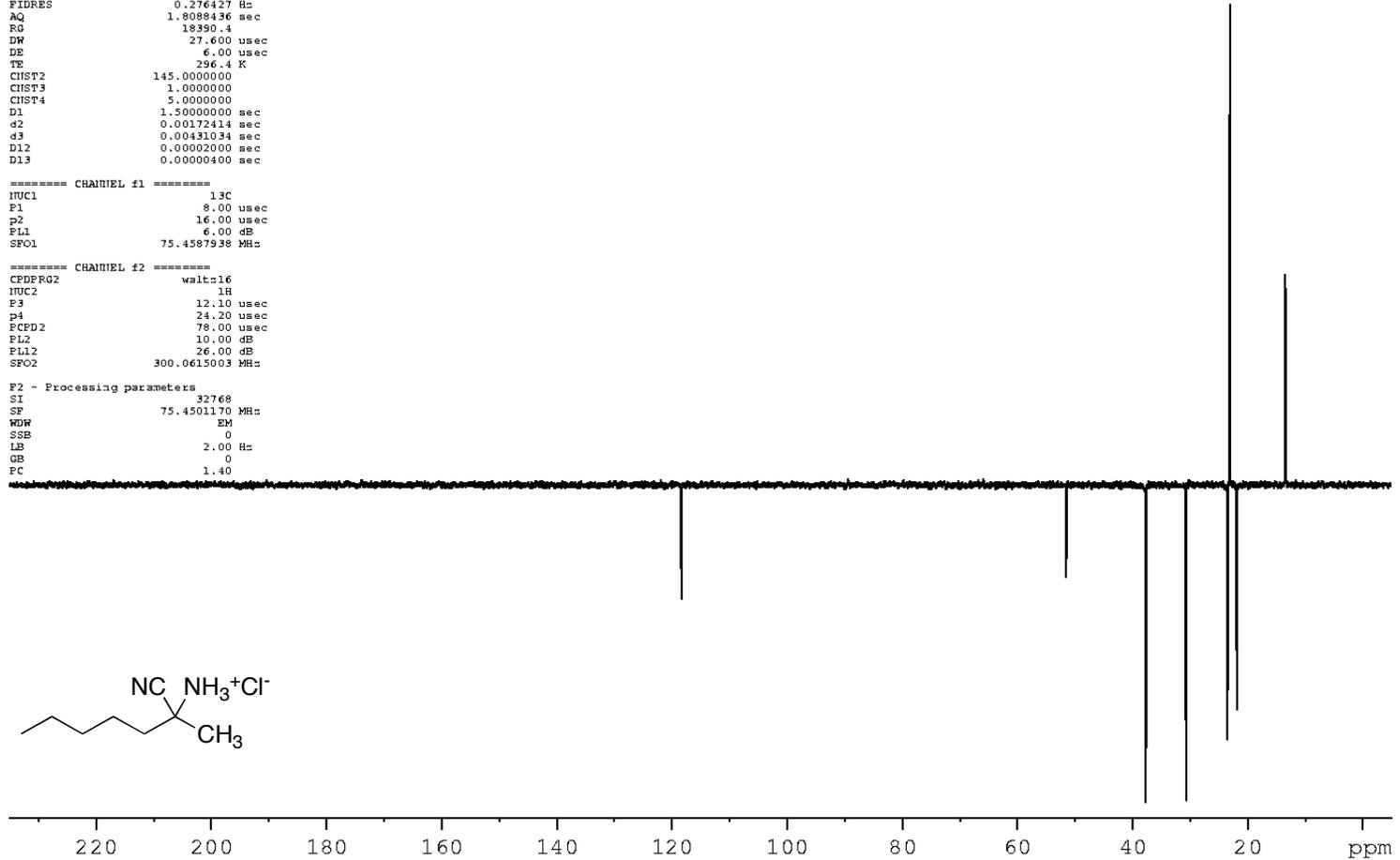
===== CHANNEL f1 =====
NUC1      13C
P1         9.00 usec
p2        16.00 usec
PL1        6.00 dB
SFO1      75.4587938 MHz
    
```

```

===== CHANNEL f2 =====
CPDPRG2   waltz16
NUC2      1H
P3         12.10 usec
p4         24.20 usec
PCPD2     78.00 usec
PL2        10.00 dB
PLL2       26.00 dB
SFO2      300.0615003 MHz
    
```

```

F2 - Processing parameters
SI         32768
SF         75.4501170 MHz
WDW        EM
SSB        0
LB         2.00 Hz
GB         0
FC         1.40
    
```



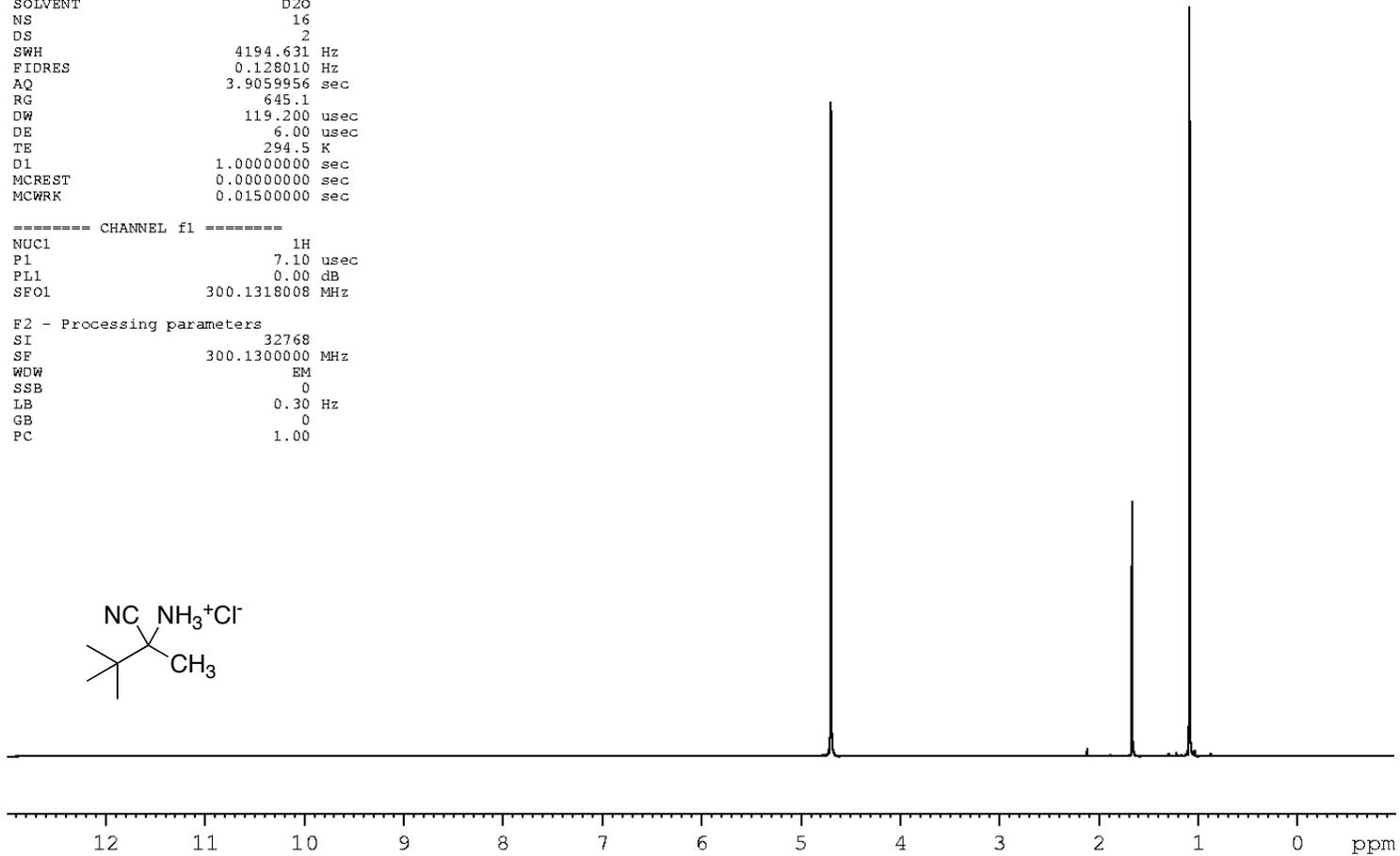
2-Amino-2,3,3-trimethylbutyronitrile hydrochloride (6) ¹H NMR spectrum

Current Data Parameters
NAME 11172006-6-ross
EXPNO 10
PROCNO 1

F2 - Acquisition Parameters
Date_ 20061117
Time 11.29
INSTRUM av300
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT D2O
NS 16
DS 2
SWH 4194.631 Hz
FIDRES 0.128010 Hz
AQ 3.9059956 sec
RG 645.1
DW 119.200 usec
DE 6.00 usec
TE 294.5 K
D1 1.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec

----- CHANNEL f1 -----
NUC1 1H
P1 7.10 usec
PL1 0.00 dB
SFO1 300.1318008 MHz

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



2-Amino-2,3,3-trimethylbutyronitrile hydrochloride (6) ¹³C NMR spectrum

```

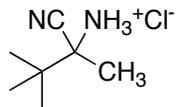
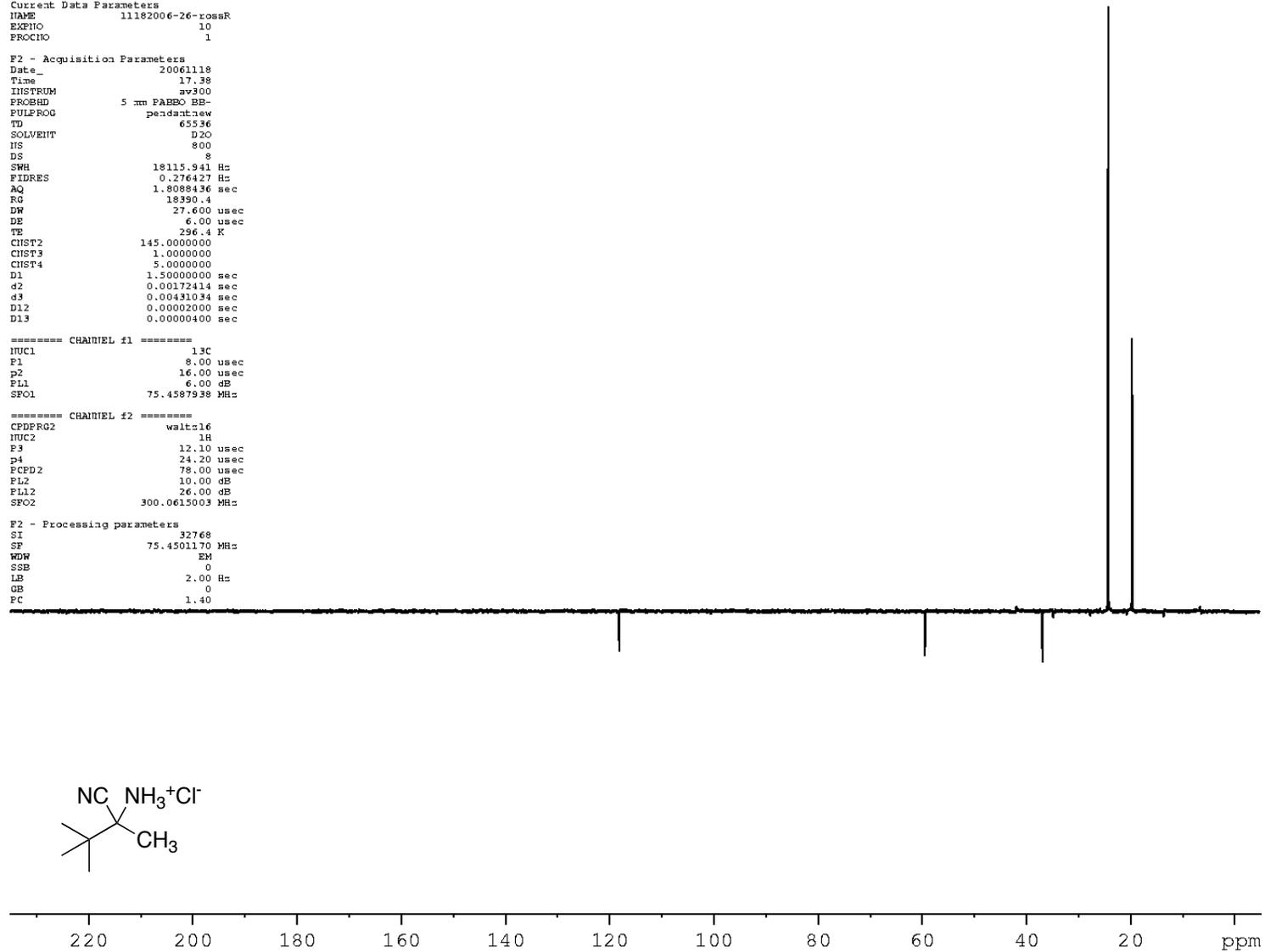
Current Data Parameters
NAME      11182006-26-rossR
EXPNO     10
PROCNO    1

F2 - Acquisition Parameters
Date_     20061118
Time      17.38
INSTRUM   sv300
PROBHD    5 mm FAPBO BE-
PULPROG   pendant.new
TD         65536
SOLVENT   D2O
NS         800
DS         8
SWH        18115.941 Hz
FIDRES     0.276427 Hz
AQ         1.8088436 sec
RG         18390.4
DR         27.600 usec
DE         6.00 usec
TE         296.4 K
CHST2     145.0000000
CHST3     1.0000000
CHST4     5.0000000
D1         1.50000000 sec
d2         0.00172414 sec
d3         0.00431034 sec
D12       0.00002000 sec
D13       0.00000400 sec

===== CHANNEL f1 =====
NUC1       13C
P1         9.00 usec
p2         16.00 usec
PL1        6.00 dB
SFO1       75.4587938 MHz

===== CHANNEL f2 =====
CPDPRG2   waltz16
NUC2       1H
P3         12.10 usec
p4         24.20 usec
PCPD2     78.00 usec
PL2        10.00 dB
PLL2       26.00 dB
SFO2       300.0615003 MHz

F2 - Processing parameters
SI         32768
SF         75.4501170 MHz
WDW        EM
SSB        0
LB         2.00 Hz
GB         0
FC         1.40
    
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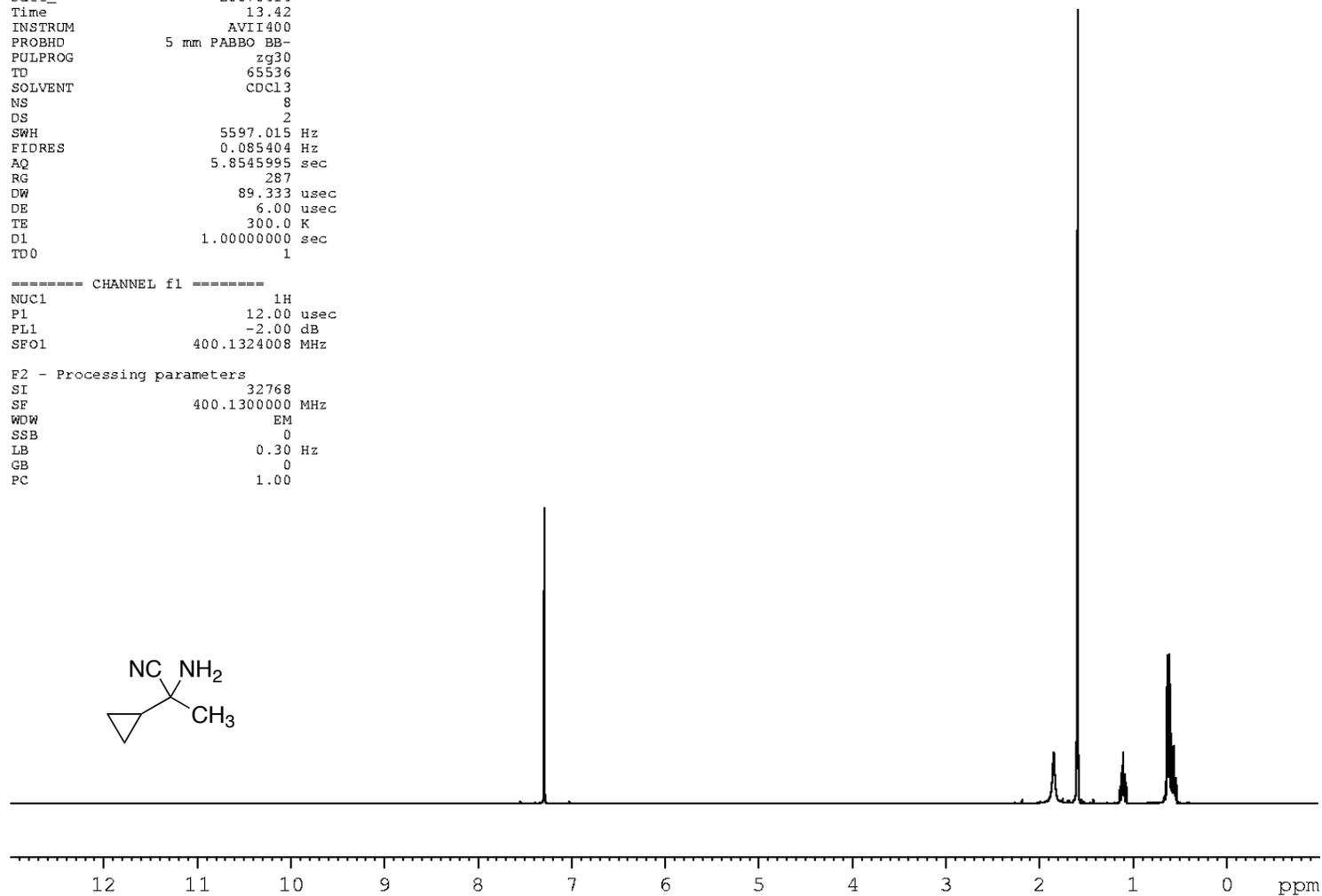
2-Amino-2-cyclopropylpropionitrile (2a) ^1H NMR spectrum

Current Data Parameters
NAME 06162007-25-rossM
EXPNO 10
PROCNO 1

F2 - Acquisition Parameters
Date_ 20070616
Time 13.42
INSTRUM AVII400
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 8
DS 2
SWH 5597.015 Hz
FIDRES 0.085404 Hz
AQ 5.8545995 sec
RG 287
DW 89.333 usec
DE 6.00 usec
TE 300.0 K
D1 1.0000000 sec
TD0 1

===== CHANNEL f1 =====
NUC1 1H
P1 12.00 usec
PL1 -2.00 dB
SFO1 400.1324008 MHz

F2 - Processing parameters
SI 32768
SF 400.130000 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



2-Amino-2-cyclopropylpropionitrile (2a) ^{13}C NMR spectrum

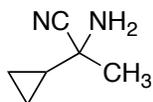
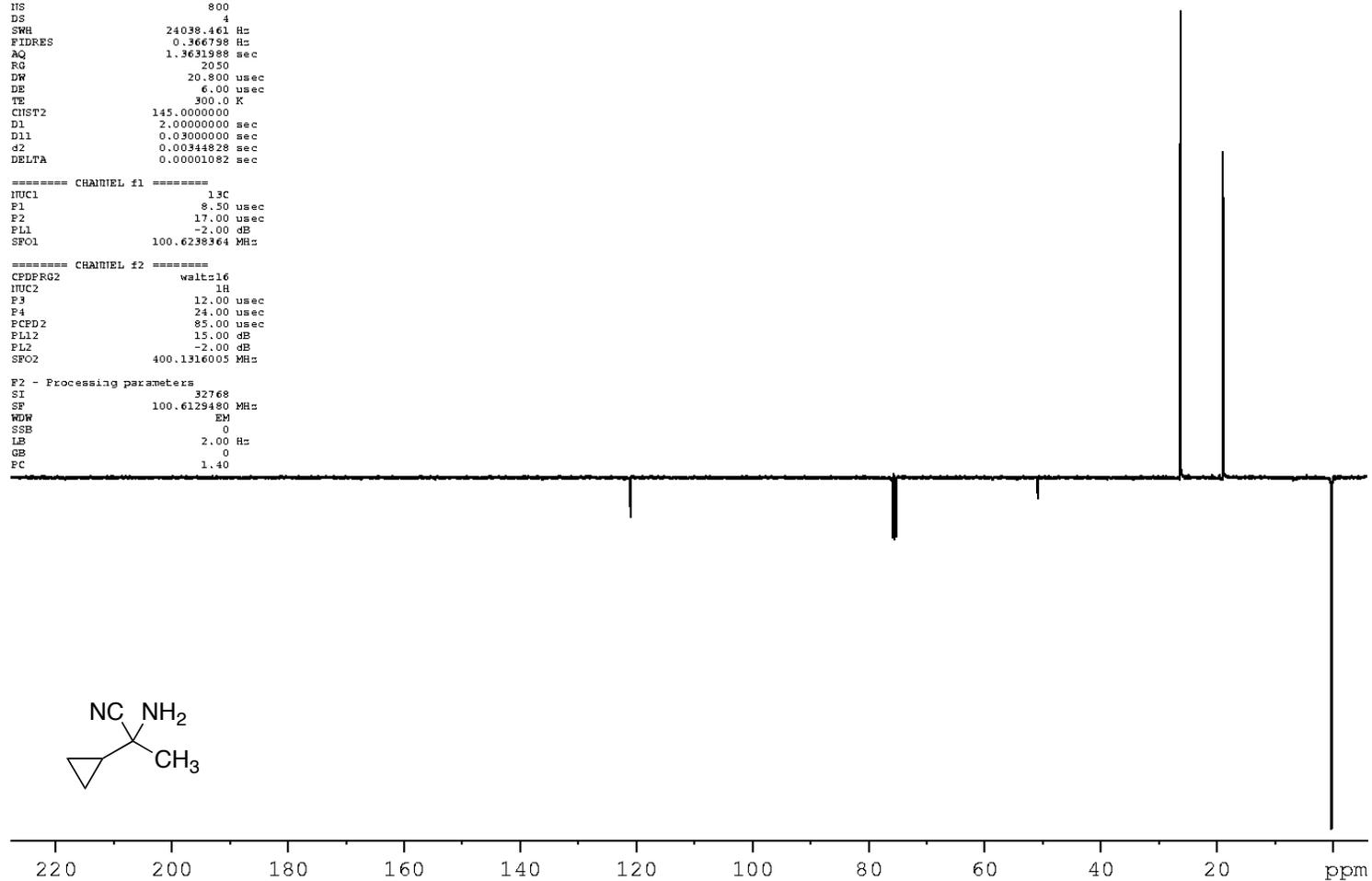
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Current Data Parameters
NAME      06162007-29-rossM
EXPNO     10
PROCNO    1

F2 - Acquisition Parameters
Date_     20070616
Time      15.46
INSTRUM   AVI400
PROBHD    5 mm PABBO BE-
PULPROG   deptq135
TD         65536
SOLVENT   CDCl3
NS         800
DS         4
SWH        24038.461 Hz
FIDRES     0.366798 Hz
AQ         1.3631988 sec
RG         2050
DR         20.800 usec
DE         6.00 usec
TE         300.0 K
CHST2     145.0000000
D1         2.00000000 sec
D11        0.03000000 sec
d2         0.00344828 sec
DELTA     0.00001082 sec
```

```
===== CHANNEL f1 =====
NUC1       13C
P1         8.50 usec
P2         17.00 usec
PL1        -2.00 dB
SFO1       100.6238364 MHz
```

```
===== CHANNEL f2 =====
CEDEFG2   waltz16
NUC2       1H
F3         12.00 usec
P4         24.00 usec
PCPD2     85.00 usec
PL12       15.00 dB
PL2        -2.00 dB
SFO2       400.1316005 MHz
```

```
F2 - Processing parameters
SI         32768
SF         100.6129480 MHz
WDW        EM
SSB        0
LB         2.00 Hz
GB         0
PC         1.40
```



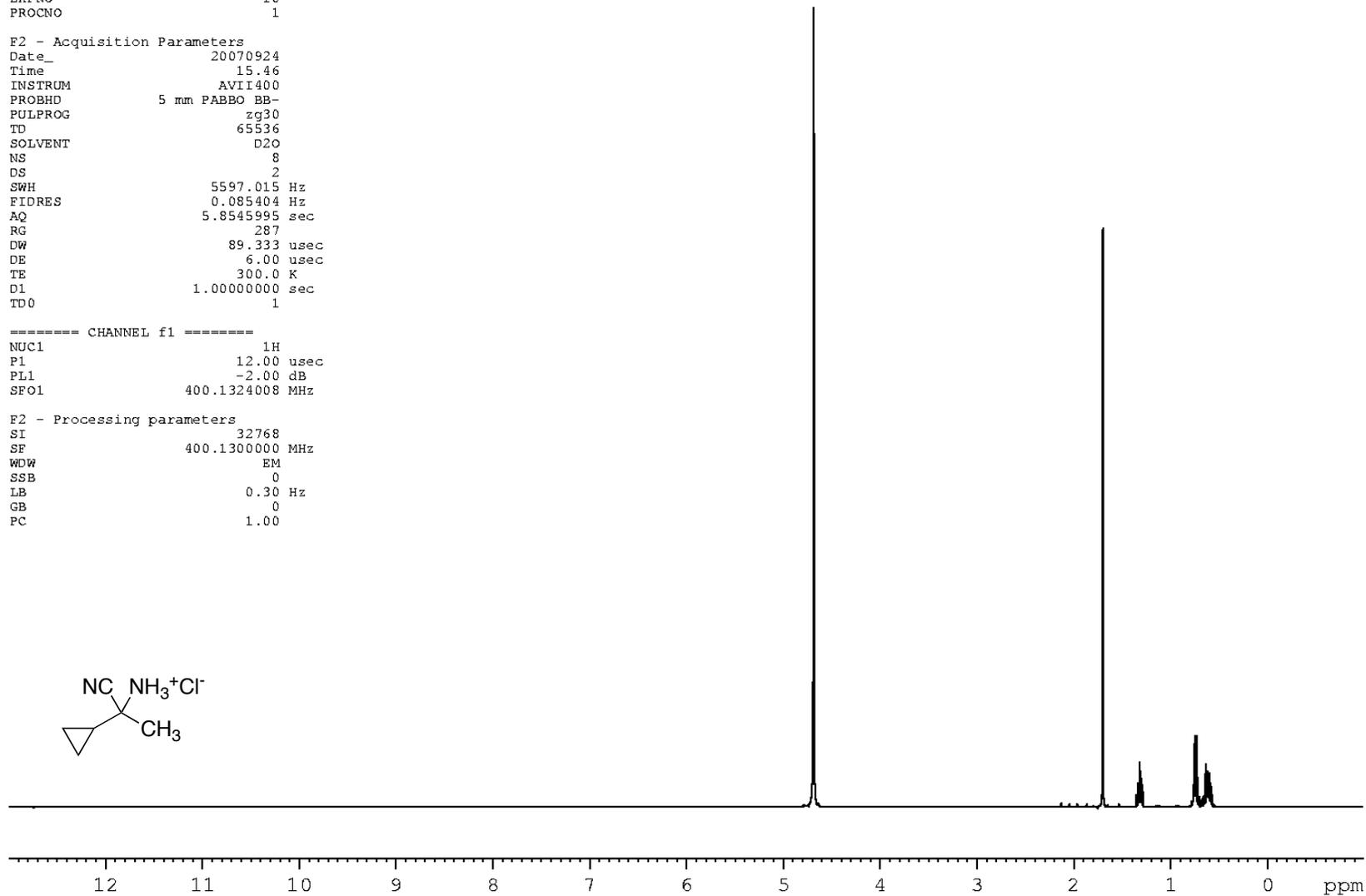
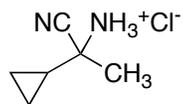
2-Amino-2-cyclopropylpropionitrile (2b) ¹H NMR spectrum

Current Data Parameters
NAME 09242007-31-rossM
EXPNO 10
PROCNO 1

F2 - Acquisition Parameters
Date_ 20070924
Time 15.46
INSTRUM AVII400
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT D2O
NS 8
DS 2
SWH 5597.015 Hz
FIDRES 0.085404 Hz
AQ 5.8545995 sec
RG 287
DW 89.333 usec
DE 6.00 usec
TE 300.0 K
D1 1.00000000 sec
TD0 1

----- CHANNEL f1 -----
NUC1 1H
P1 12.00 usec
PL1 -2.00 dB
SFO1 400.1324008 MHz

F2 - Processing parameters
SI 32768
SF 400.1300000 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



2-Amino-2-cyclopropylpropionitrile (2b) ^{13}C NMR spectrum

```

Current Data Parameters
NAME      11022007-7-rossI
EXPNO     10
PROCNO    1

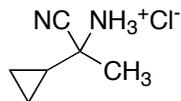
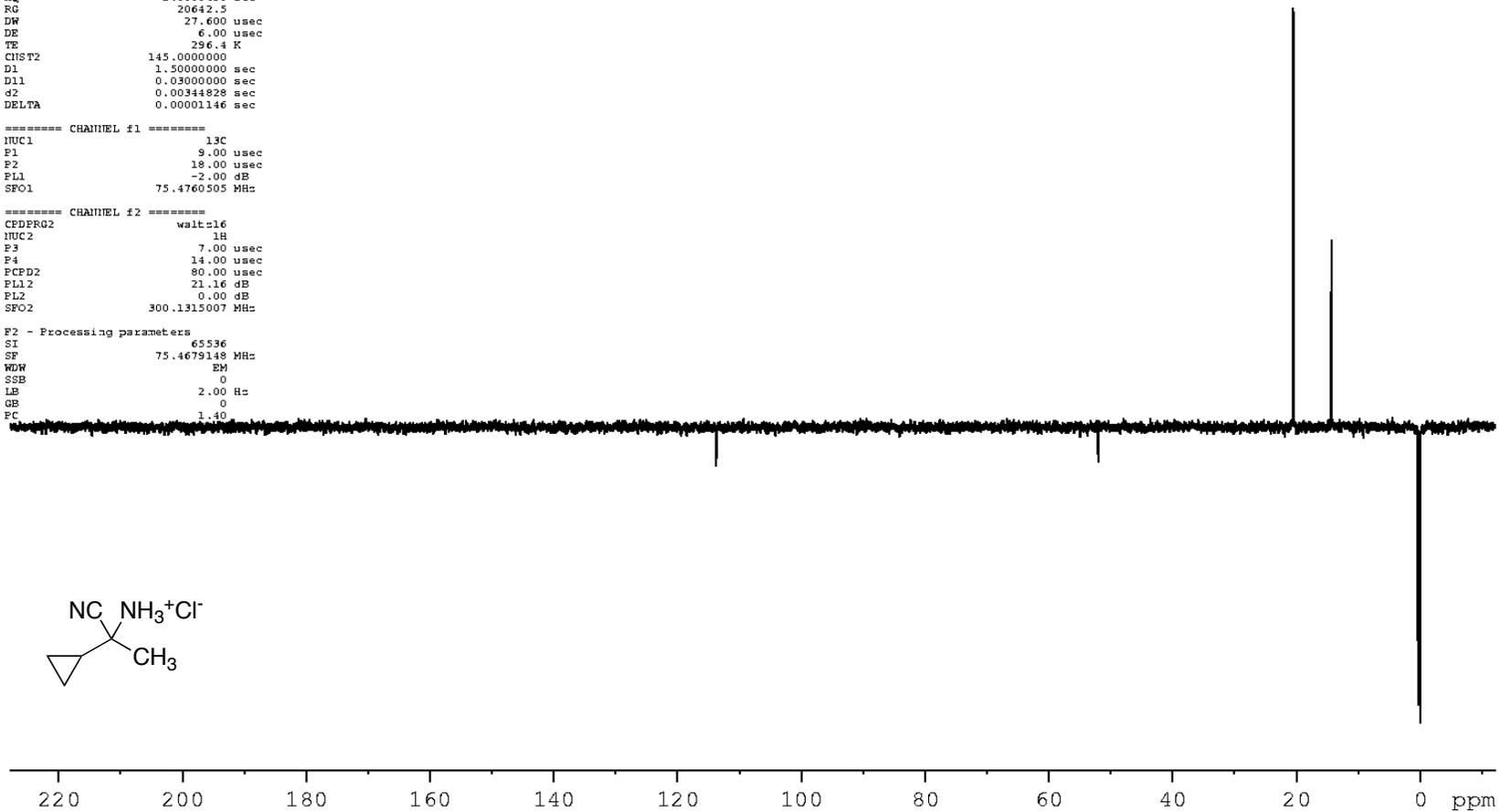
F2 - Acquisition Parameters
Date_     20071102
Time      15.35
INSTRUM   av300
PROBHD    5 mm QNP 1H/13
PULPROG   zgpg135
TD         65536
SOLVENT   D2O
NS         800
DS         4
SWH        18115.941 Hz
FIDRES     0.276427 Hz
AQ         1.8088436 sec
RG         20642.5
DW         27.600 usec
DE         6.00 usec
TE         296.4 K
CHST2     145.0000000
D1         1.50000000 sec
D11        0.03000000 sec
d2         0.00344828 sec
DELTA     0.00001146 sec

===== CHANNEL f1 =====
NUC1       13C
P1         9.00 usec
P2         18.00 usec
PL1        -2.00 dB
SFO1       75.4760505 MHz

===== CHANNEL f2 =====
CPDPRG2    waltz16
NUC2       1H
P3         7.00 usec
P4         14.00 usec
PCPD2      80.00 usec
PL12       21.16 dB
PL2        0.00 dB
SFO2       300.1315007 MHz

F2 - Processing parameters
SI         65536
SF         75.4679148 MHz
WDW        EM
SSB        0
LB         2.00 Hz
GB         0
PC         1.40

```



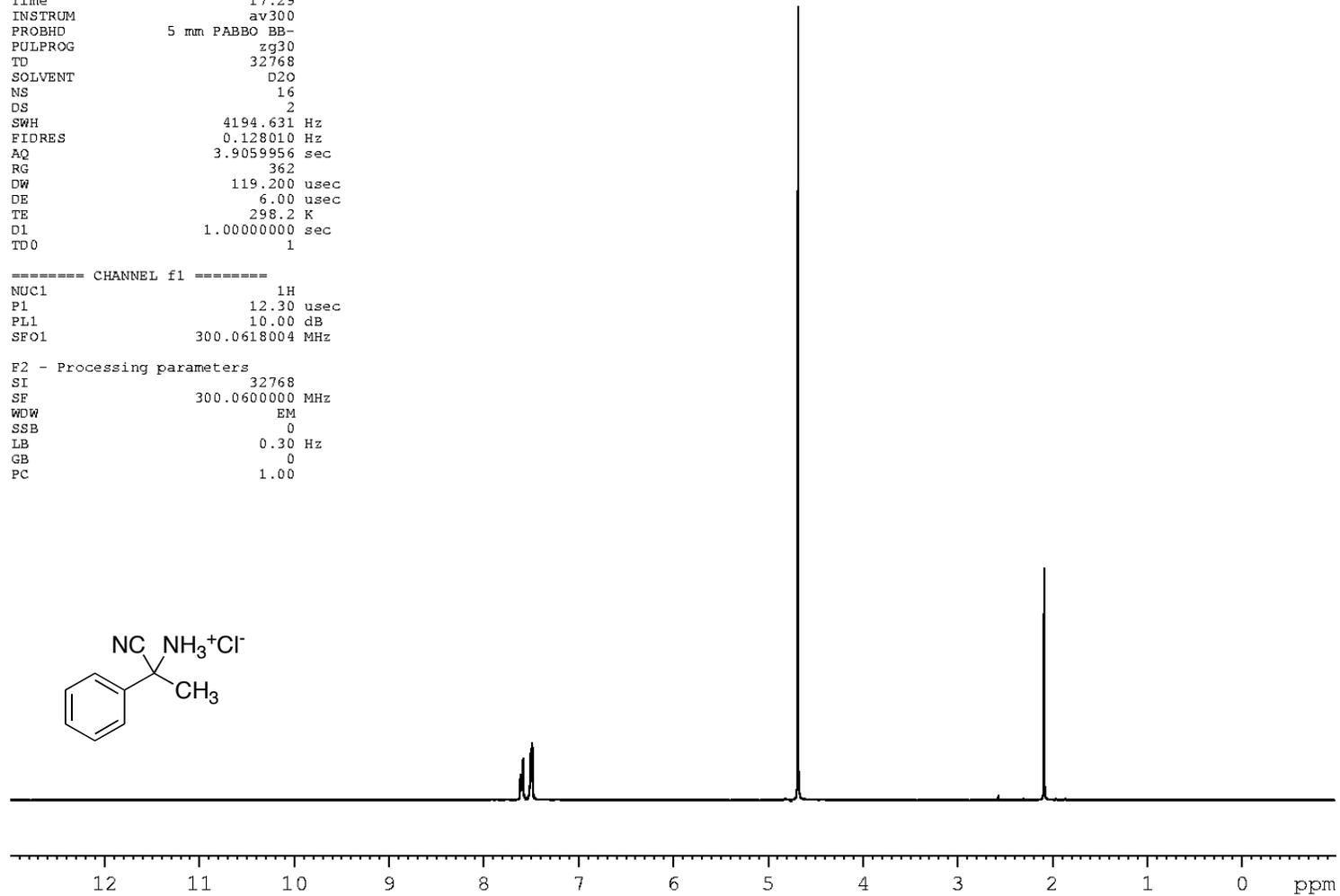
2-Amino-2-phenylpropionitrile hydrochloride (7) ¹H NMR spectrum

Current Data Parameters
NAME 08212006-2-ross
EXPNO 10
PROCNO 1

F2 - Acquisition Parameters
Date_ 20060821
Time 17.29
INSTRUM av300
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 32768
SOLVENT D2O
NS 16
DS 2
SWH 4194.631 Hz
FIDRES 0.128010 Hz
AQ 3.9059956 sec
RG 362
DW 119.200 usec
DE 6.00 usec
TE 298.2 K
D1 1.00000000 sec
TD0 1

===== CHANNEL f1 =====
NUC1 1H
P1 12.30 usec
PL1 10.00 dB
SFO1 300.0618004 MHz

F2 - Processing parameters
SI 32768
SF 300.0600000 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



2-Amino-2-phenylpropionitrile hydrochloride (7) ¹³C NMR spectrum

```

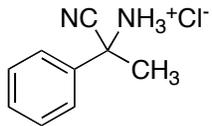
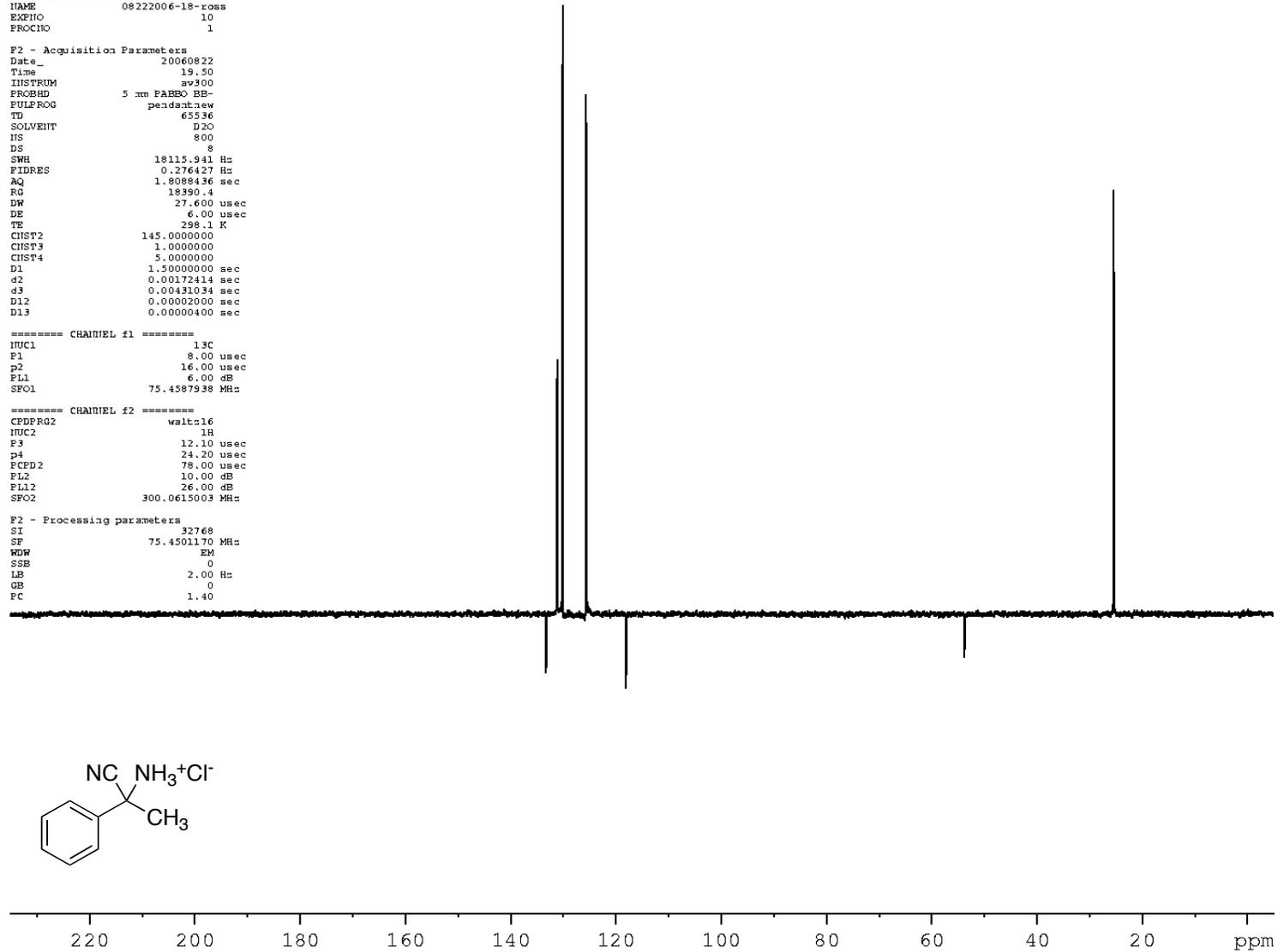
Current Data Parameters
NAME      08222006-18-ross
EXPNO    10
PROCNO    1

F2 - Acquisition Parameters
Date_     20060822
Time      19.50
INSTRUM   sv300
PROBHD    5 mm FAPBO BE-
PULPROG   pendant.new
TD        65536
SOLVENT   D2O
NS        800
DS        8
SWH       18115.941 Hz
FIDRES    0.276427 Hz
AQ        1.8088436 sec
RG        18390.4
DR        27.600 usec
DE        6.00 usec
TE        298.1 K
CHST2     145.0000000
CHST3     1.0000000
CHST4     5.0000000
D1        1.50000000 sec
d2        0.00172414 sec
d3        0.00431034 sec
D12       0.00002000 sec
D13       0.00000400 sec

===== CHANNEL f1 =====
NUC1      13C
P1        9.00 usec
p2        16.00 usec
PL1       6.00 dB
SFO1      75.4587938 MHz

===== CHANNEL f2 =====
CPDPRG2   waltz16
NUC2      1H
P3        12.10 usec
p4        24.20 usec
PCPD2     78.00 usec
PL2       10.00 dB
PL12      26.00 dB
SFO2      300.0615003 MHz

F2 - Processing parameters
SI        32768
SF        75.4501170 MHz
WDW       EM
SSB       0
LB        2.00 Hz
GB        0
PC        1.40
    
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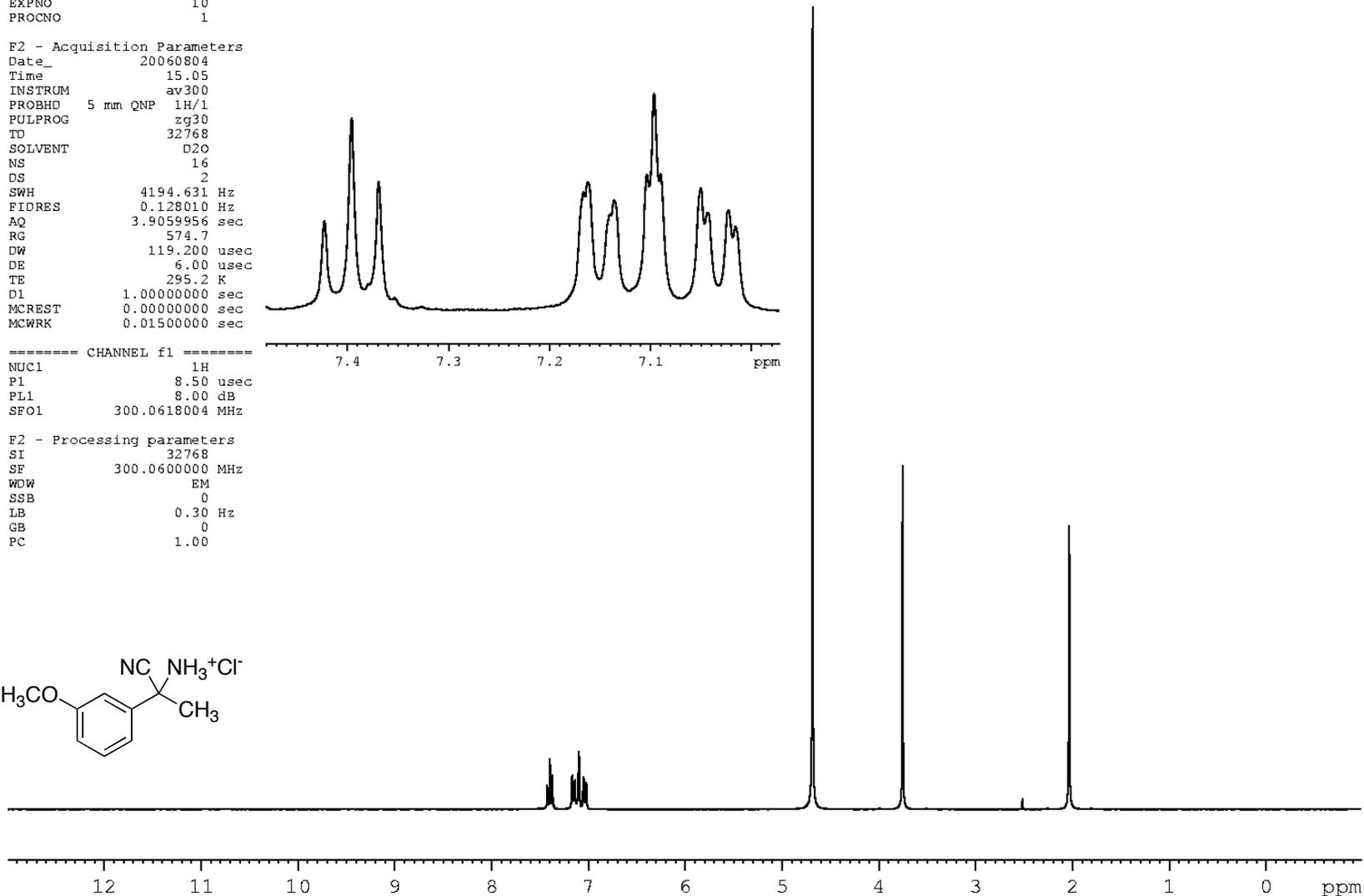
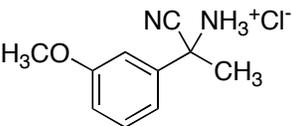
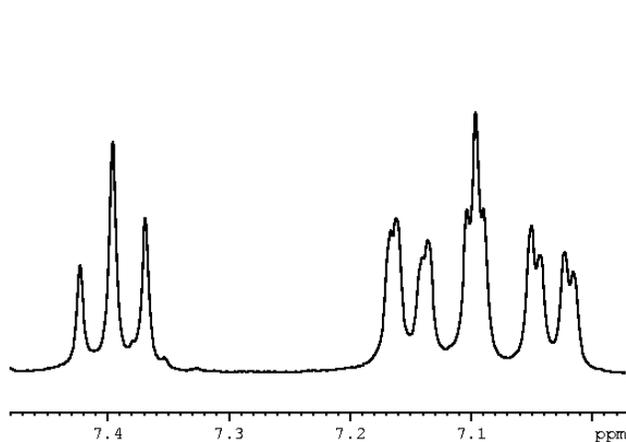
2-Amino-2-(3'-methoxyphenyl)propionitrile hydrochloride (8) ¹H NMR spectrum

Current Data Parameters
 NAME 08042006-28-ross
 EXPNO 10
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20060804
 Time 15.05
 INSTRUM av300
 PROBHD 5 mm QNP 1H/1
 PULPROG zg30
 TD 32768
 SOLVENT D2O
 NS 16
 DS 2
 SWH 4194.631 Hz
 FIDRES 0.128010 Hz
 AQ 3.9059956 sec
 RG 574.7
 DW 119.200 usec
 DE 6.00 usec
 TE 295.2 K
 D1 1.00000000 sec
 MCREST 0.00000000 sec
 MCWRK 0.01500000 sec

===== CHANNEL f1 =====
 NUC1 1H
 P1 8.50 usec
 PL1 8.00 dB
 SFO1 300.0618004 MHz

F2 - Processing parameters
 SI 32768
 SF 300.0600000 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00



Crude 2-amino-2-(3'-methoxyphenyl)propionitrile hydrochloride (**8**) ^{13}C NMR spectrum

```

Current Data Parameters
NAME      H78
EXPNO    1
PROCNO   1

F2 - Acquisition Parameters
Date_    20071106
Time     10.58
INSTRUM  av300
PROBHD   5 mm QNP 1H/13
PULPROG  dept-ql35
TD       65536
SOLVENT  D2O
NS       3146
DS       4
SWH      18115.941 Hz
FIDRES   0.276427 Hz
AQ       1.8088436 sec
RG       20642.5
DW       27.600 usec
DE       6.00 usec
TE       295.5 K
CINST2   145.0000000
D1       1.5000000 sec
D11      0.0300000 sec
d2       0.00344828 sec
DELTA    0.00001146 sec

```

```

===== CHANNEL f1 =====
NUC1     13C
P1       9.00 usec
P2       18.00 usec
PL1      -2.00 dB
SFO1     75.4760505 MHz

```

```

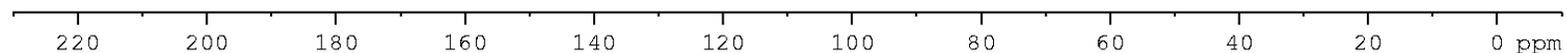
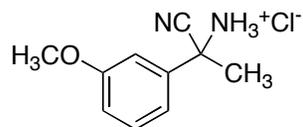
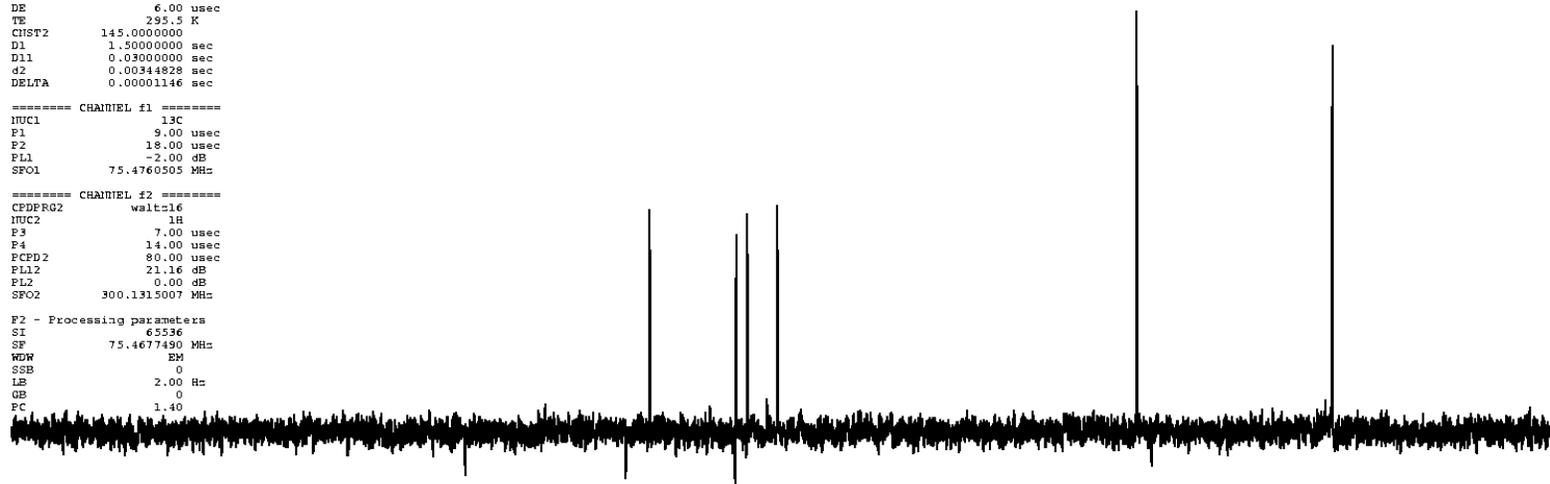
===== CHANNEL f2 =====
CPDPRG2  waltz16
NUC2     1H
P3       7.00 usec
P4       14.00 usec
PCPD2    80.00 usec
PL12     21.16 dB
PL2      0.00 dB
SFO2     300.1315007 MHz

```

```

F2 - Processing parameters
SI       65536
SF       75.4677490 MHz
WDW      EM
SSB      0
LB       2.00 Hz
GB       0
FC       1.40

```



It proved difficult to obtain a clean ^{13}C spectrum of 2-amino-2-(3'-methoxyphenyl)propionitrile hydrochloride (**8**), most likely due to degradation of the compound while the spectrum was being obtained.

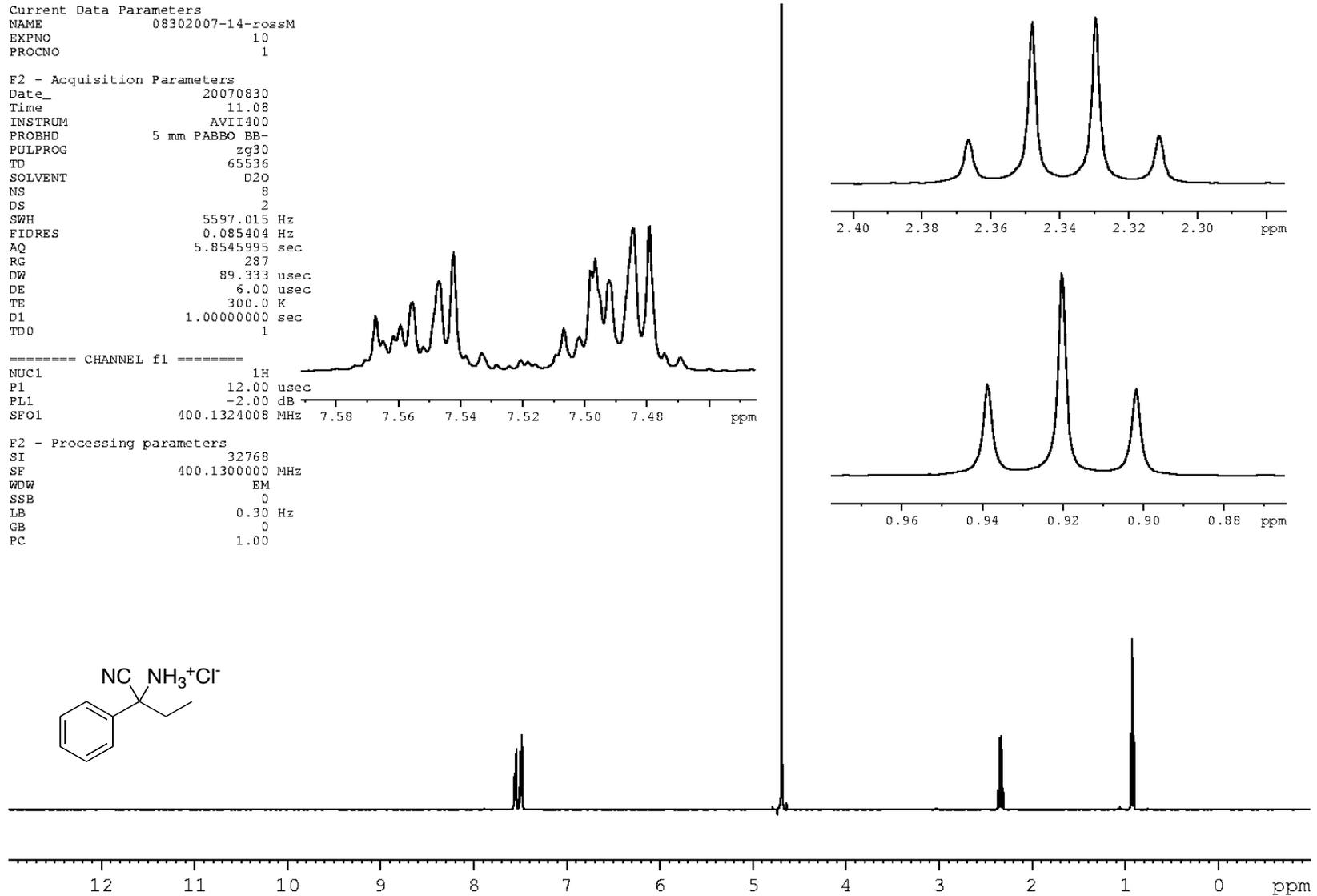
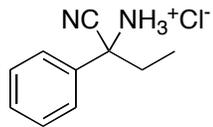
2-Amino-2-phenylbutyronitrile hydrochloride (9) ¹H NMR spectrum

Current Data Parameters
 NAME 08302007-14-rossM
 EXPNO 10
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20070830
 Time 11.08
 INSTRUM AVII400
 PROBHD 5 mm PABBO BB-
 PULPROG zg30
 TD 65536
 SOLVENT D2O
 NS 8
 DS 2
 SWH 5597.015 Hz
 FIDRES 0.085404 Hz
 AQ 5.8545995 sec
 RG 287
 DW 89.333 usec
 DE 6.00 usec
 TE 300.0 K
 D1 1.00000000 sec
 TD0 1

----- CHANNEL f1 -----
 NUC1 1H
 P1 12.00 usec
 PL1 -2.00 dB
 SFO1 400.1324008 MHz

F2 - Processing parameters
 SI 32768
 SF 400.1300000 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00



2-Amino-2-phenylbutyronitrile hydrochloride (9) ^{13}C NMR spectrum

```

Current Data Parameters
NAME      11052007-2-rossI
EXPNO     10
PROCNO    1

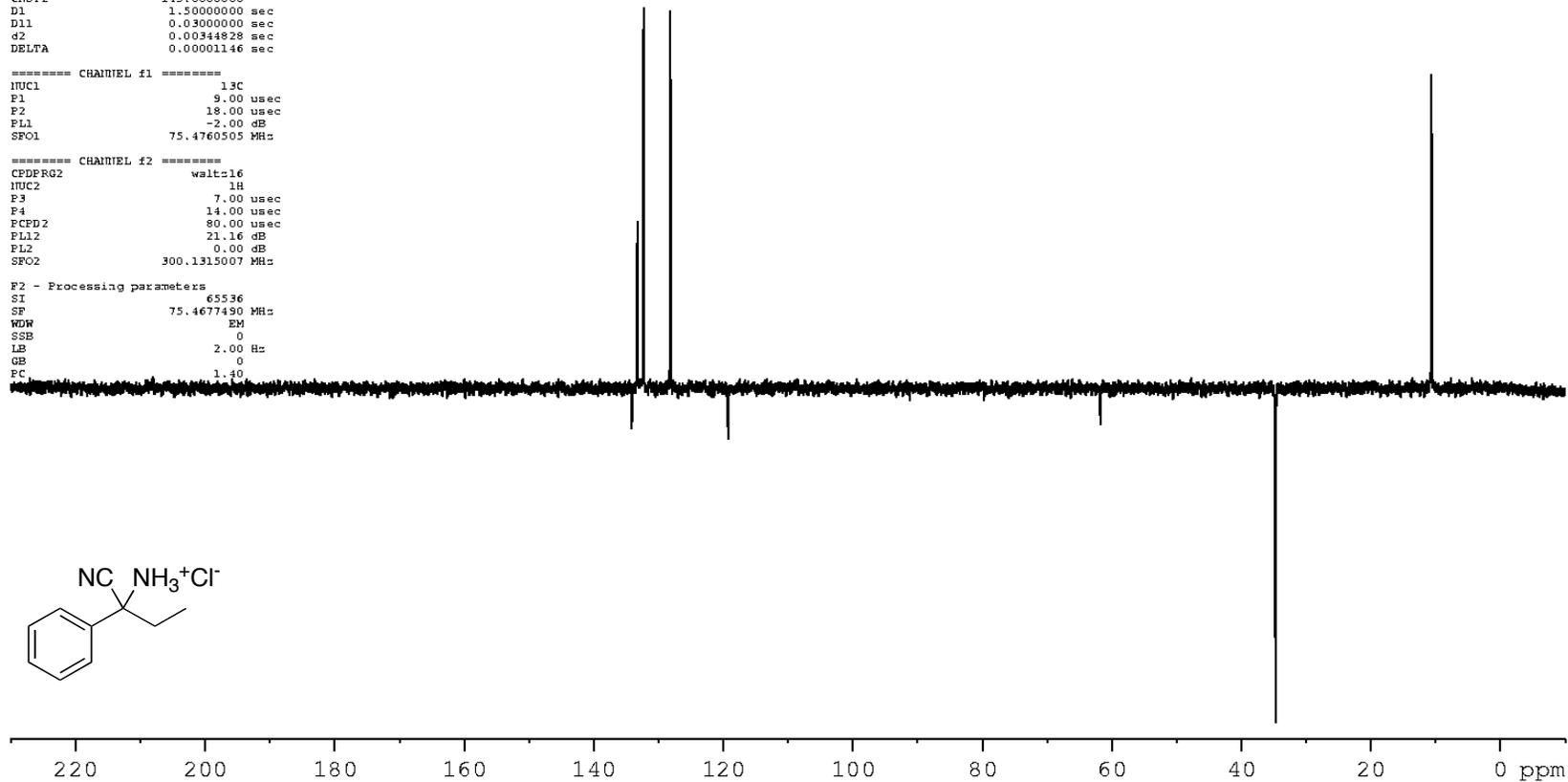
F2 - Acquisition Parameters
Date_     20071105
Time      11.19
INSTRUM   av300
PROBHD    5 mm QNP 1H/13
PULPROG   zgpg30
TD         65536
SOLVENT   CDCl3
NS         800
DS         4
SWH       18115.941 Hz
FIDRES    0.276427 Hz
AQ         1.8088436 sec
RG         20642.5
DW         27.600 usec
DE         6.00 usec
TE         296.1 K
CHST2     145.0000000
D1         1.5000000 sec
D11        0.0300000 sec
d2         0.00344828 sec
DELTA     0.00001146 sec

===== CHANNEL f1 =====
NUC1       13C
P1         9.00 usec
P2         18.00 usec
PL1        -2.00 dB
SFO1       75.4760505 MHz

===== CHANNEL f2 =====
CPDPRG2   waltz16
NUC2       1H
P3         7.00 usec
P4         14.00 usec
PCPD2     80.00 usec
PL12      21.16 dB
PL2        0.00 dB
SFO2       300.1315007 MHz

F2 - Processing parameters
SI         65536
SF         75.4677490 MHz
WDW        EM
SSB        0
LB         2.00 Hz
GB         0
EC         1.40

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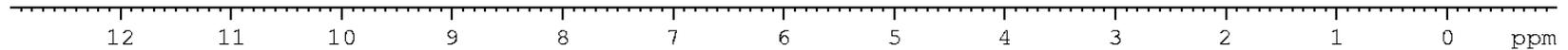
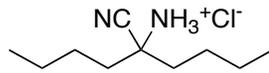
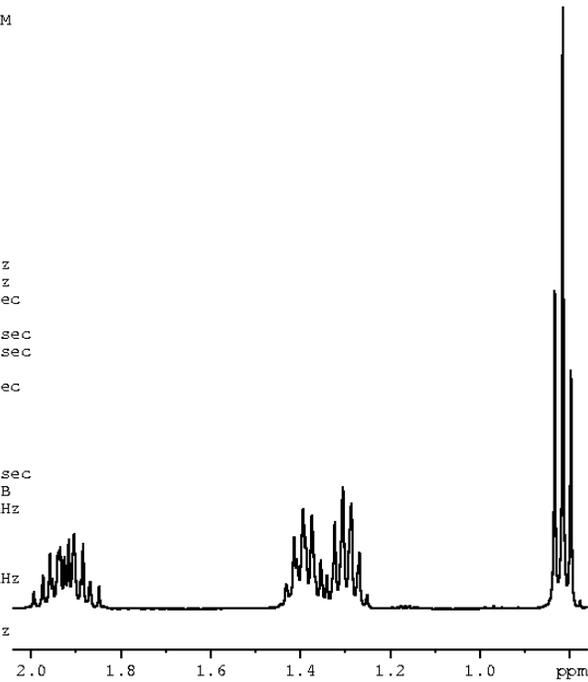
2-Amino-2-n-butylhexanenitrile hydrochloride (10) ¹H NMR spectrum

Current Data Parameters
 NAME 08302007-24-rossM
 EXPNO 10
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20070831
 Time 10.02
 INSTRUM AVII400
 PROBHD 5 mm PABBO BB-
 PULPROG zg30
 TD 65536
 SOLVENT D2O
 NS 8
 DS 2
 SWH 5597.015 Hz
 FIDRES 0.085404 Hz
 AQ 5.8545995 sec
 RG 287
 DW 89.333 usec
 DE 6.00 usec
 TE 300.0 K
 D1 1.00000000 sec
 TD0 1

----- CHANNEL f1 -----
 NUC1 1H
 P1 12.00 usec
 PL1 -2.00 dB
 SF01 400.1324008 MHz

F2 - Processing parameters
 SI 32768
 SF 400.1300000 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00



2-Amino-2-n^obutylhexanenitrile hydrochloride (10) ¹³C NMR spectrum

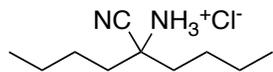
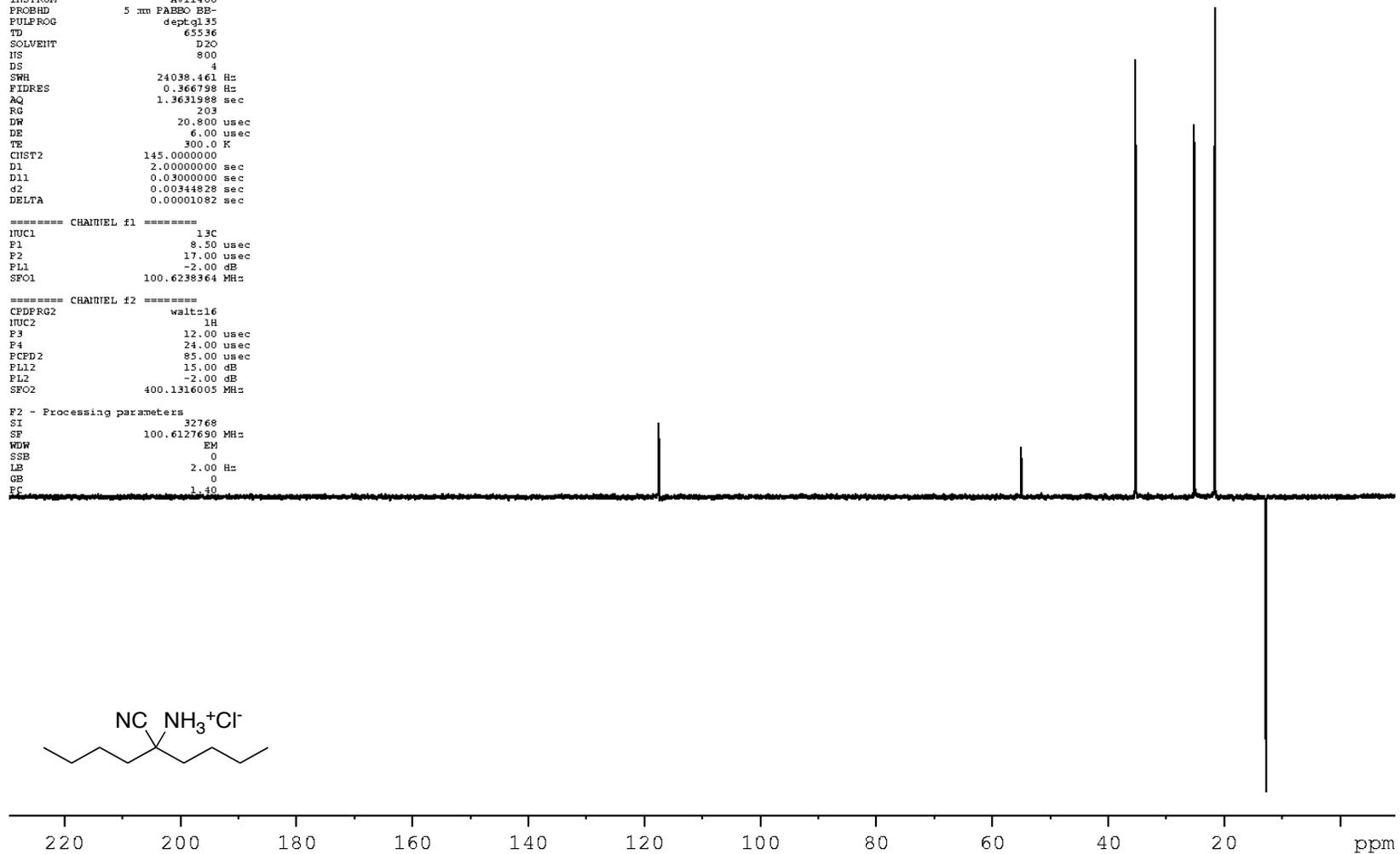
Current Data Parameters
 NAME 11012007-19-rossM
 EXPNO 10
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20071101
 Time 17.06
 INSTRUM AVII400
 PROBHD 5 mm PABBO BB-
 PULPROG zgpg30
 TD 65536
 SOLVENT D2O
 NS 800
 DS 4
 SWH 24038.461 Hz
 FIDRES 0.366798 Hz
 AQ 1.3631988 sec
 RG 203
 DW 20.800 usec
 DE 6.00 usec
 TE 300.0 K
 CHST2 145.0000000
 D1 2.0000000 sec
 D11 0.0300000 sec
 d2 0.00344828 sec
 DELTA 0.00001082 sec

==== CHANNEL f1 =====
 NUCL 13C
 P1 8.50 usec
 P2 17.00 usec
 FL1 -2.00 dB
 SFO1 100.6238364 MHz

==== CHANNEL f2 =====
 CPDPRG2 waltz16
 NUCL 1H
 P3 12.00 usec
 P4 24.00 usec
 FCFD2 85.00 usec
 FL12 15.00 dB
 FL2 -2.00 dB
 SFO2 400.1316005 MHz

F2 - Processing parameters
 SI 32768
 SF 100.6127690 MHz
 WDW EM
 SSB 0
 LB 2.00 Hz
 GB 0
 EC 1.40



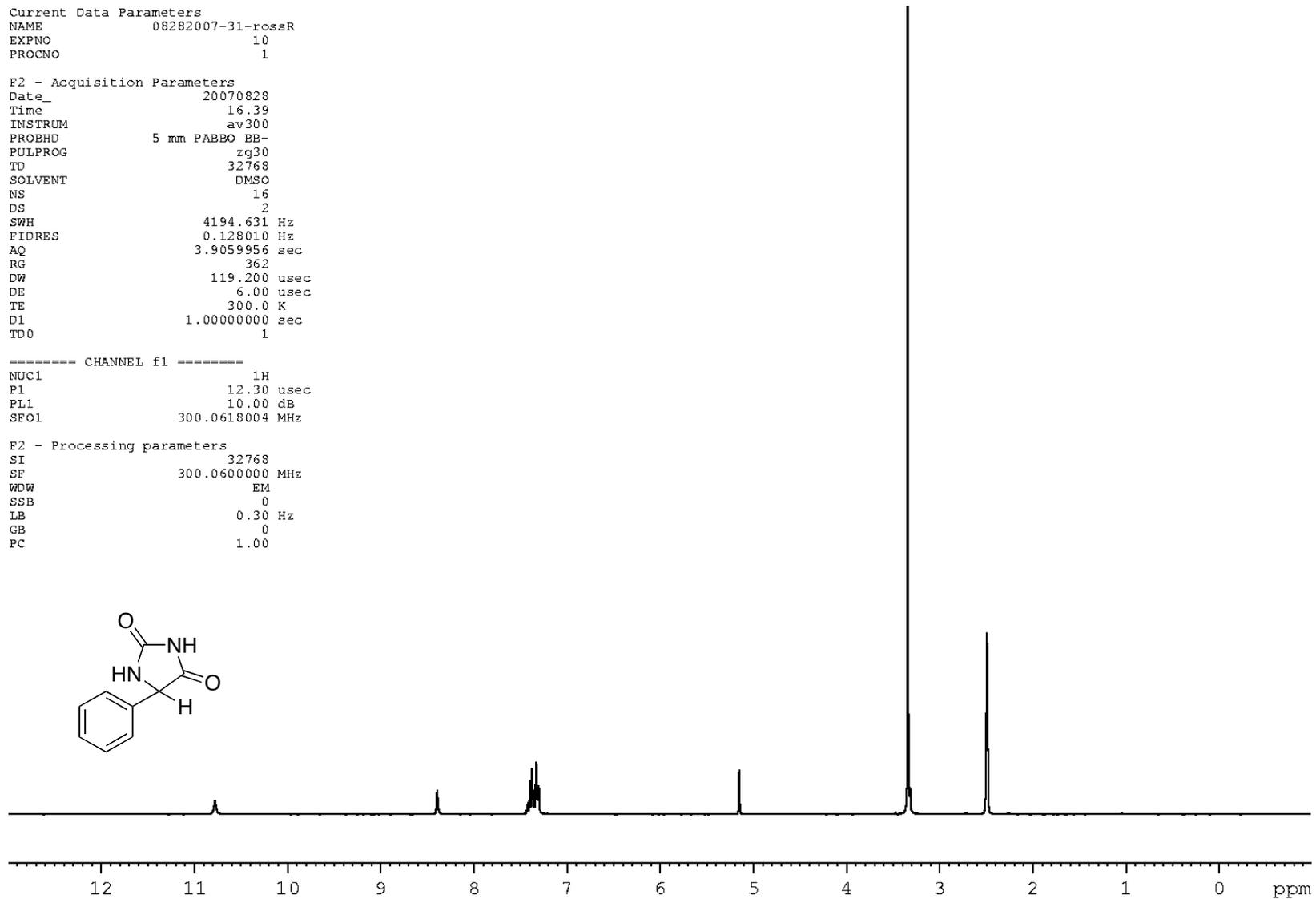
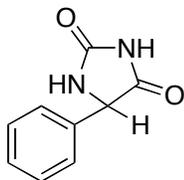
5-Phenylimidazolidine-2,4-dione (10) ¹H NMR spectrum

Current Data Parameters
NAME 08282007-31-rossR
EXPNO 10
PROCNO 1

F2 - Acquisition Parameters
Date_ 20070828
Time 16.39
INSTRUM av300
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 32768
SOLVENT DMSO
NS 16
DS 2
SWH 4194.631 Hz
FIDRES 0.128010 Hz
AQ 3.9059956 sec
RG 362
DW 119.200 usec
DE 6.00 usec
TE 300.0 K
D1 1.00000000 sec
TD0 1

----- CHANNEL f1 -----
NUC1 1H
P1 12.30 usec
PL1 10.00 dB
SFO1 300.0618004 MHz

F2 - Processing parameters
SI 32768
SF 300.0600000 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



5-Phenylimidazolidine-2,4-dione (10) ^{13}C NMR spectrum

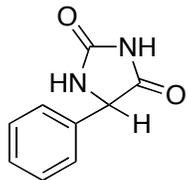
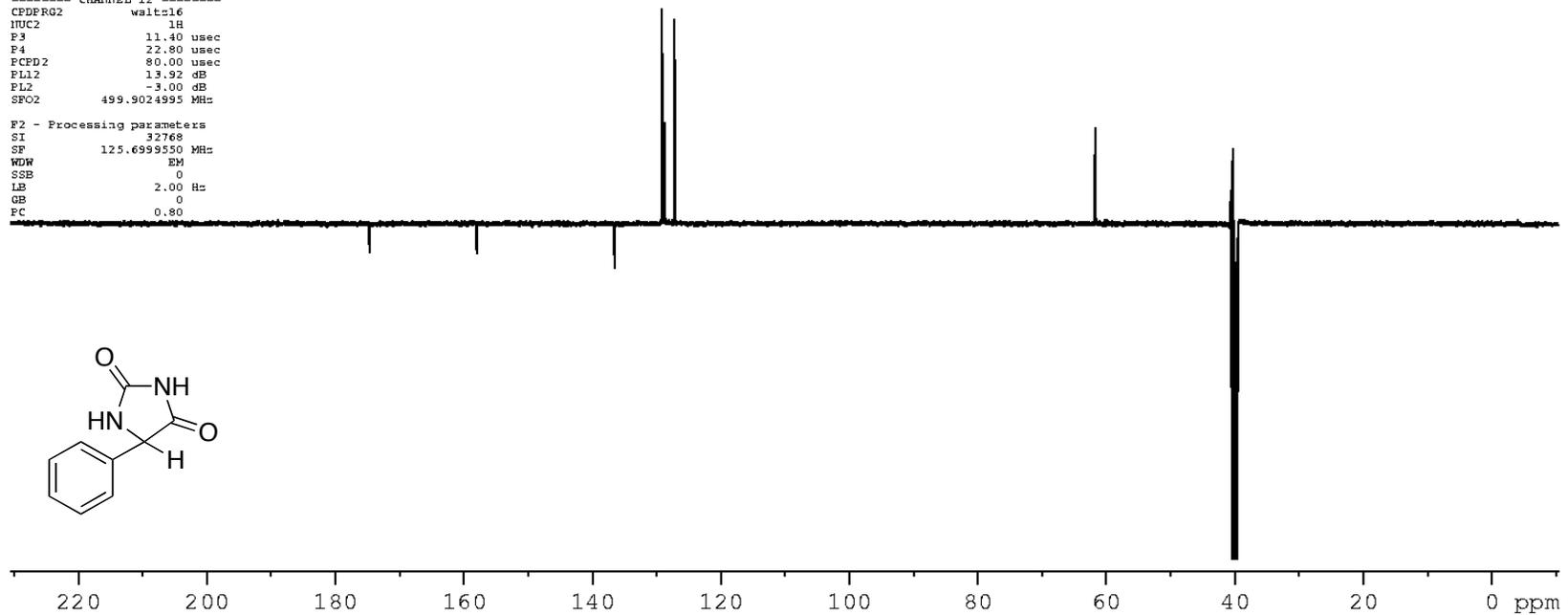
Current Data Parameters
 NAME H109
 EXPNO 2
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20071101
 Time 16.47
 INSTRUM spect
 PROBHD 5 mm QNP 1H/13
 PULPROG zgpg30
 TD 65536
 SOLVENT DMSO
 NS 18784
 DS 4
 SWH 30303.031 Hz
 FIDRES 0.462388 Hz
 AQ 1.0814105 sec
 RG 23170.5
 DW 16.500 usec
 DE 6.00 usec
 TE 292.6 K
 CHST2 145.0000000
 D1 2.0000000 sec
 D11 0.0300000 sec
 d2 0.0034828 sec
 DELTA 0.00001146 sec

===== CHANNEL f1 =====
 NUCL 13C
 P1 9.00 usec
 P2 18.00 usec
 PL1 0.00 dB
 SFO1 125.7137820 MHz

===== CHANNEL f2 =====
 CPDPRG2 waltz16
 NUCL2 1H
 P3 11.40 usec
 P4 22.80 usec
 PCPD2 80.00 usec
 PL12 13.92 dB
 PL2 -3.00 dB
 SFO2 499.9024995 MHz

F2 - Processing parameters
 SI 32768
 SF 125.6999550 MHz
 WDW EM
 SSB 0
 LB 2.00 Hz
 GB 0
 EC 0.80



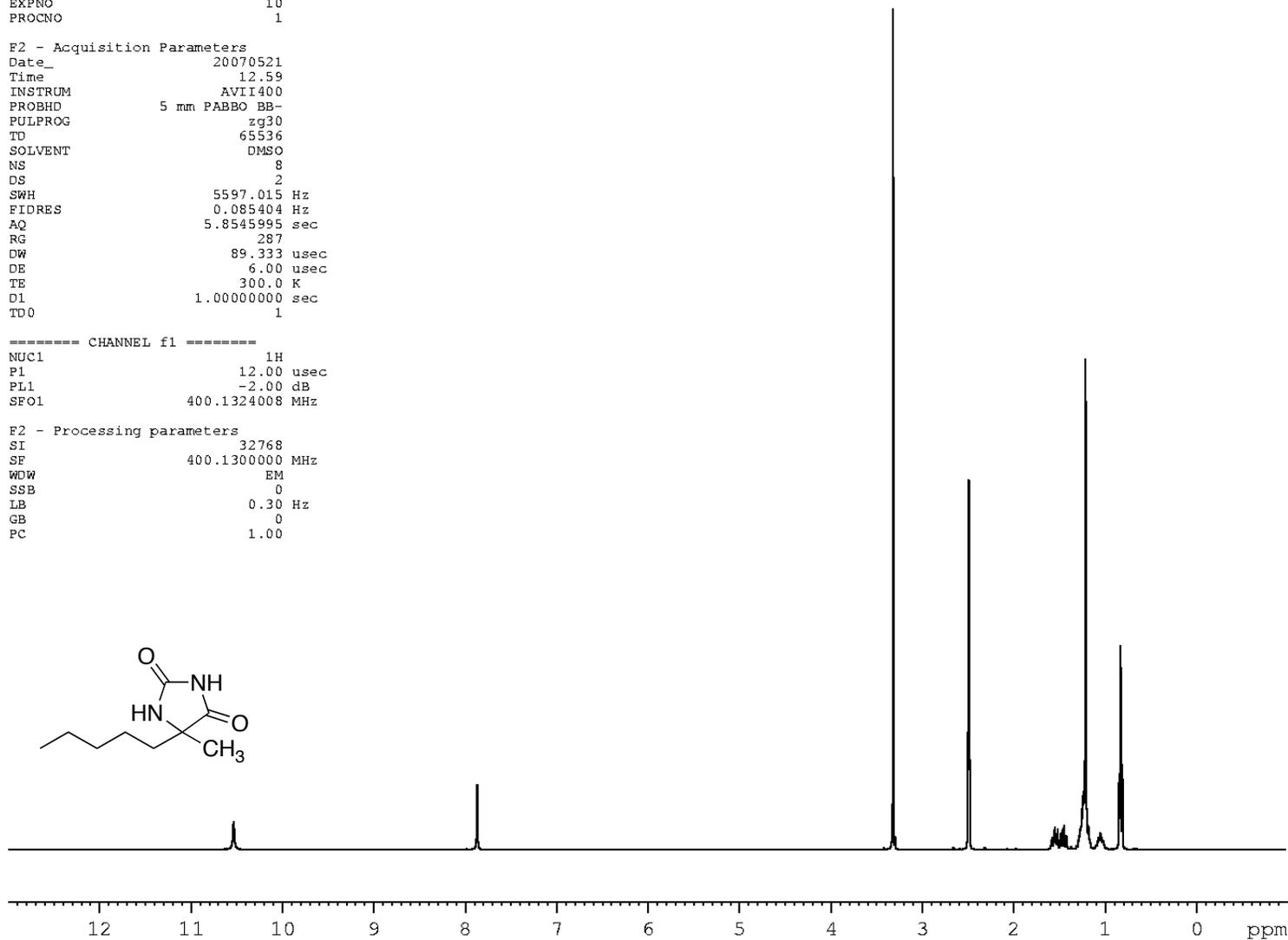
5-Methyl-5-pentylimidazolidine-2,4-dione (12) ¹H NMR spectrum

Current Data Parameters
NAME 05212007-17-rossM
EXPNO 10
PROCNO 1

F2 - Acquisition Parameters
Date_ 20070521
Time 12.59
INSTRUM AVII400
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT DMSO
NS 8
DS 2
SWH 5597.015 Hz
FIDRES 0.085404 Hz
AQ 5.8545995 sec
RG 287
DW 89.333 usec
DE 6.00 usec
TE 300.0 K
D1 1.0000000 sec
TD0 1

===== CHANNEL f1 =====
NUC1 1H
P1 12.00 usec
PL1 -2.00 dB
SFO1 400.1324008 MHz

F2 - Processing parameters
SI 32768
SF 400.1300000 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



5-Methyl-5-pentylimidazolidine-2,4-dione (12) ^{13}C NMR spectrum

```

Current Data Parameters
NAME      11152006-24-rossR
EXPNO    10
PROCNO    1

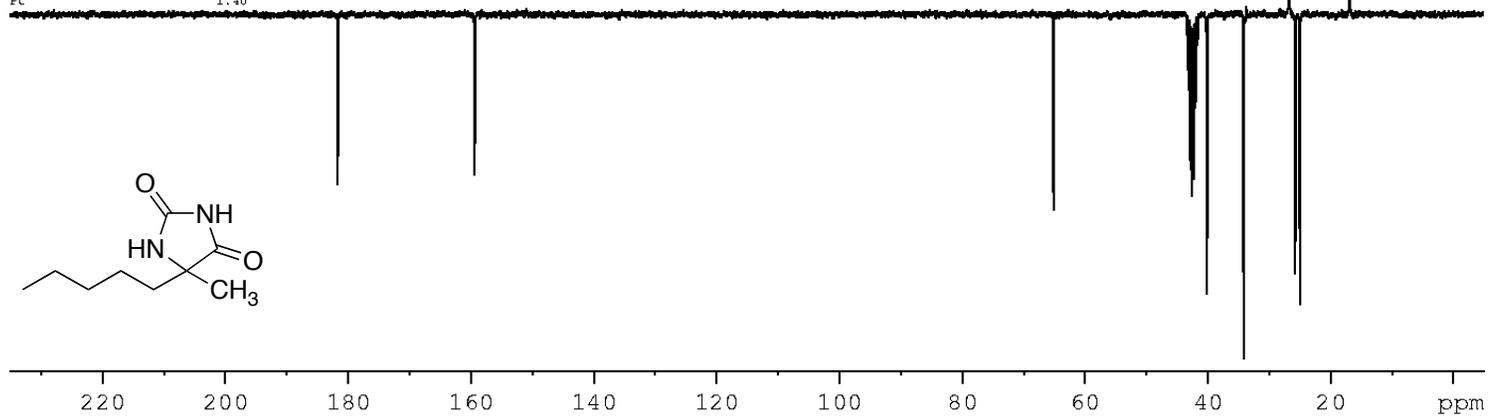
F2 - Acquisition Parameters
Date_     20061115
Time      22.47
INSTRUM   sv300
PROBHD    5 mm FAPBO BE-
PULPROG   pendant.new
TD        65536
SOLVENT   D2O
NS        800
DS        8
SWH       18115.941 Hz
FIDRES    0.276427 Hz
AQ        1.8088436 sec
RG        18390.4
DR        27.600 usec
DE        6.00 usec
TE        296.5 K
CHST2     145.0000000
CHST3     1.0000000
CHST4     5.0000000
D1        1.50000000 sec
d2        0.00172414 sec
d3        0.00431034 sec
D12       0.00002000 sec
D13       0.00000400 sec

===== CHANNEL f1 =====
NUC1      13C
P1        9.00 usec
p2        16.00 usec
PL1       6.00 dB
SFO1      75.4587938 MHz

===== CHANNEL f2 =====
CPDPRG2   waltz16
NUC2      1H
P3        12.10 usec
p4        24.20 usec
PCPD2     78.00 usec
PL2       10.00 dB
PL12      26.00 dB
SFO2      300.0615003 MHz

F2 - Processing parameters
SI        32768
SF        75.4501170 MHz
WDW       EM
SSB       0
LB        2.00 Hz
GB        0
PC        1.40

```



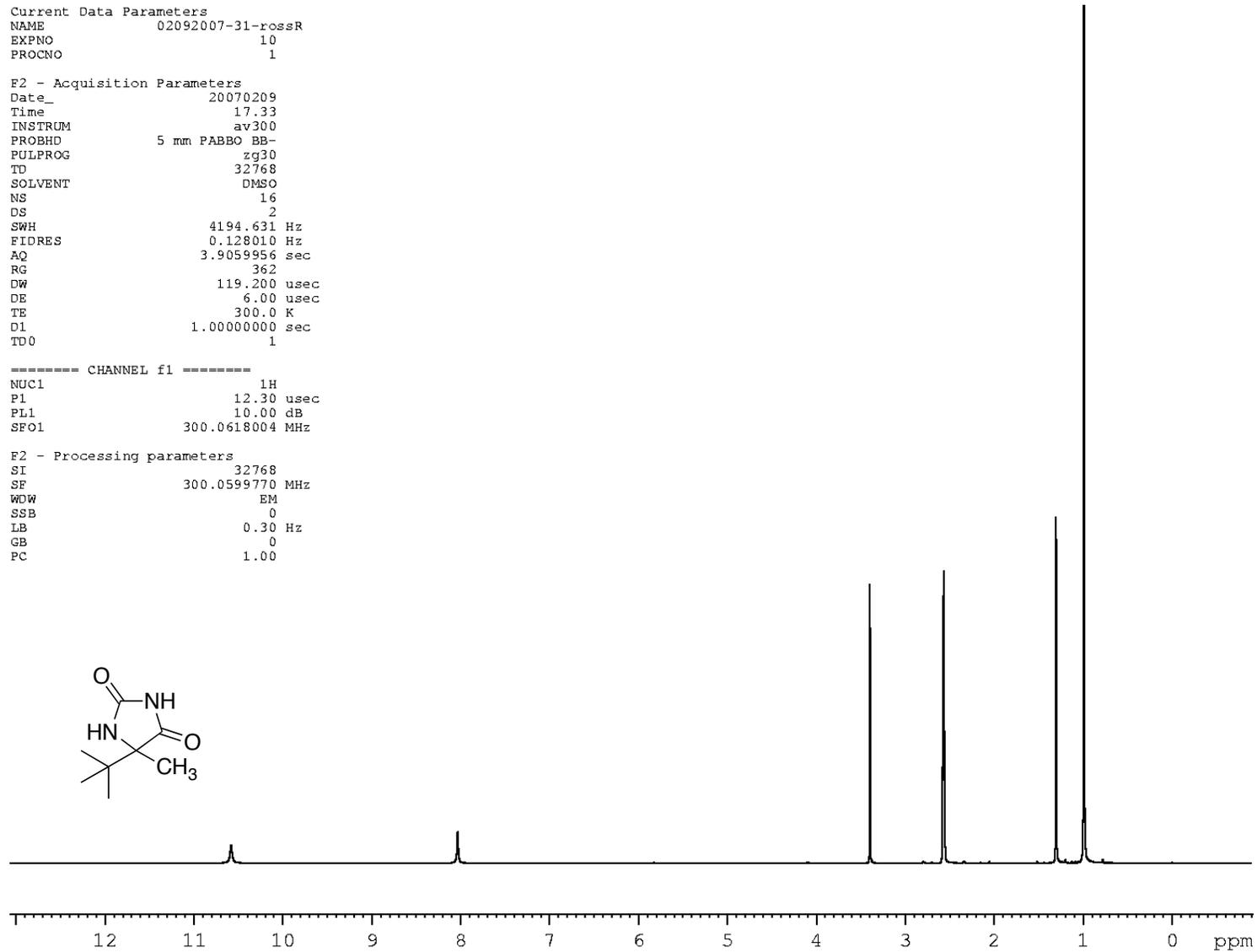
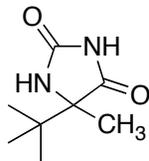
5-^tButyl-5-methylimidazolidine-2,4-dione (13) ¹H NMR spectrum

Current Data Parameters
NAME 02092007-31-rossR
EXPNO 10
PROCNO 1

F2 - Acquisition Parameters
Date_ 20070209
Time 17.33
INSTRUM av300
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 32768
SOLVENT DMSO
NS 16
DS 2
SWH 4194.631 Hz
FIDRES 0.128010 Hz
AQ 3.9059956 sec
RG 362
DW 119.200 usec
DE 6.00 usec
TE 300.0 K
D1 1.00000000 sec
TD0 1

===== CHANNEL f1 =====
NUC1 1H
P1 12.30 usec
PL1 10.00 dB
SFO1 300.0618004 MHz

F2 - Processing parameters
SI 32768
SF 300.0599770 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



5-^tButyl-5-methylimidazolidine-2,4-dione (13) ¹³C NMR spectrum

```

Current Data Parameters
NAME      01112007-10-rossI
EXPNO     10
PROCNO    1

F2 - Acquisition Parameters
Date_     20070112
Time      0.38
INSTRUM   sv300
PROBHD    5 mm QNP 1H/13
PULPROG   deptq135
TD         65536
SOLVENT   DMSO
NS         800
DS         4
SWH        18115.941 Hz
FIDRES     0.276427 Hz
AQ         1.8088436 sec
RG         16384
DR         27.600 usec
DE         6.00 usec
TE         300.0 K
CHST2     145.0000000
D1         1.50000000 sec
D11        0.03000000 sec
d2         0.00344828 sec
DELTA     0.00001146 sec
    
```

```

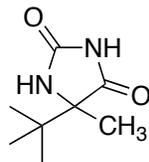
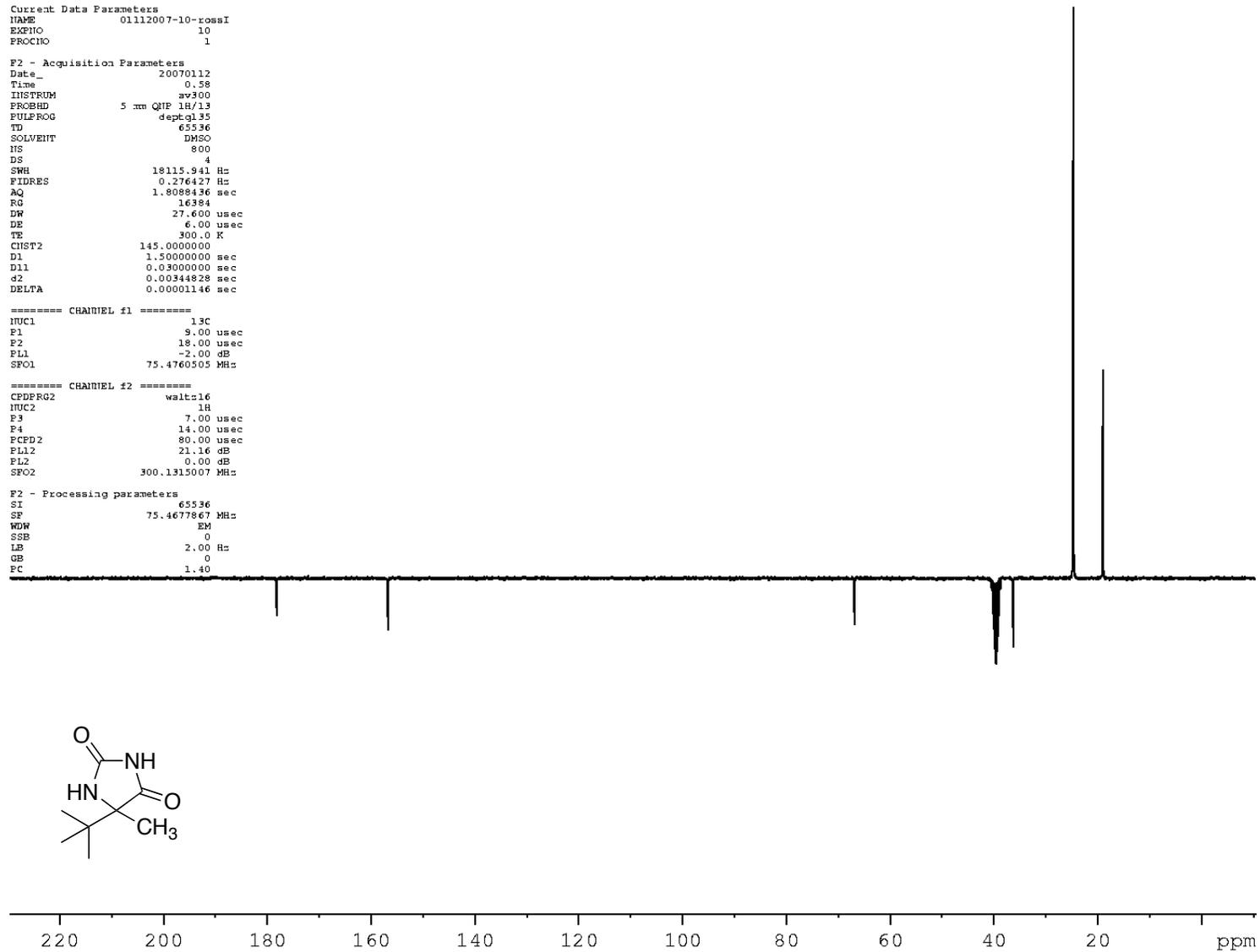
===== CHANNEL f1 =====
NUC1       13C
P1         9.00 usec
P2         18.00 usec
PL1        -2.00 dB
SFO1       75.476505 MHz
    
```

```

===== CHANNEL f2 =====
CEDEPRG2  waltz16
NUC2       1H
P3         7.00 usec
P4         14.00 usec
PCPD2     80.00 usec
PL12       21.16 dB
PL2        0.00 dB
SFO2       300.1315007 MHz
    
```

```

F2 - Processing parameters
SI         65536
SF         75.4677867 MHz
WDW        EM
SSB        0
LB         2.00 Hz
GB         0
PC         1.40
    
```



5-Cyclopropyl-5-methylimidazolidine-2,4-dione (4) ¹H NMR spectrum

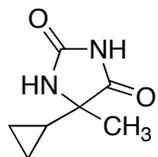
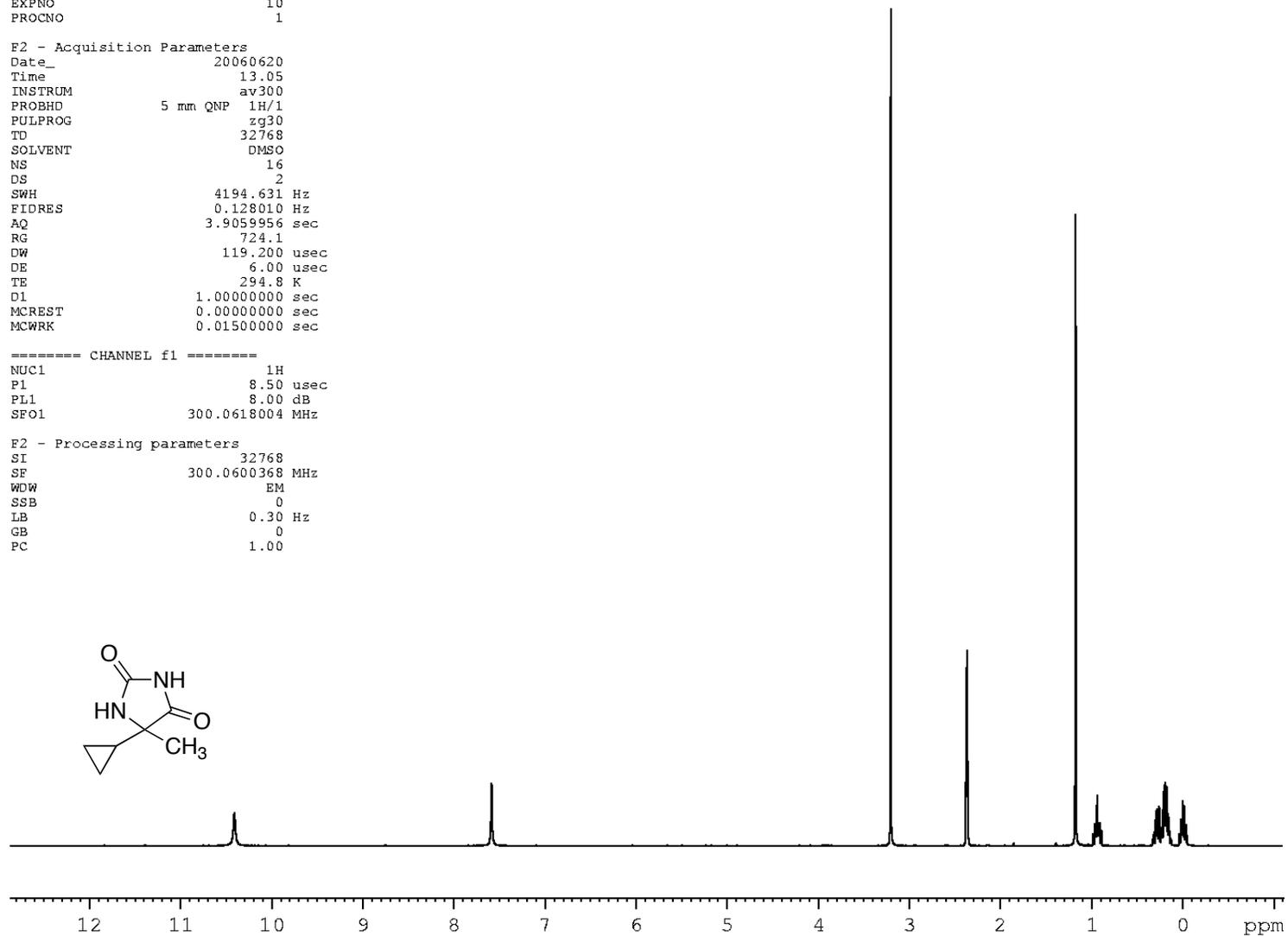
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Current Data Parameters
NAME          06202006-19-ross
EXPNO         10
PROCNO        1

F2 - Acquisition Parameters
Date_         20060620
Time          13.05
INSTRUM       av300
PROBHD        5 mm QNP 1H/1
PULPROG       zg30
TD            32768
SOLVENT       DMSO
NS            16
DS            2
SWH           4194.631 Hz
FIDRES        0.128010 Hz
AQ            3.9059956 sec
RG            724.1
DW            119.200 usec
DE            6.00 usec
TE            294.8 K
D1            1.00000000 sec
MCREST        0.00000000 sec
MCWRK         0.01500000 sec

===== CHANNEL f1 =====
NUC1          1H
P1            8.50 usec
PL1           8.00 dB
SF01          300.0618004 MHz

F2 - Processing parameters
SI            32768
SF            300.0600368 MHz
WDW           EM
SSB           0
LB            0.30 Hz
GB            0
PC            1.00
    
```



5-Cyclopropyl-5-methylimidazolidine-2,4-dione (4) ¹³C NMR spectrum

```

Current Data Parameters
NAME      03132006-14-ross
EXPNO     10
PROCNO    1

F2 - Acquisition Parameters
Date_     20060313
Time      21.02
INSTRUM   sv300
PROBHD    5 mm QNP 1H/1
PULPROG   pendantnew
TD         65536
SOLVENT   DMSO
NS        800
DS         8
SWH        18115.941 Hz
FIDRES     0.276427 Hz
AQ         1.8088436 sec
RG         20642.5
DR         27.600 usec
DE         6.00 usec
TE         295.0 K
CHST2     145.0000000
CHST3     1.0000000
CHST4     5.0000000
D1        1.50000000 sec
d2        0.00172414 sec
d3        0.00431034 sec
D12       0.00002000 sec
D13       0.00000400 sec

```

```

===== CHANNEL f1 =====
NUC1      13C
P1        7.50 usec
p2        15.00 usec
PL1       5.00 dB
SFO1      75.4587938 MHz

```

```

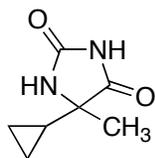
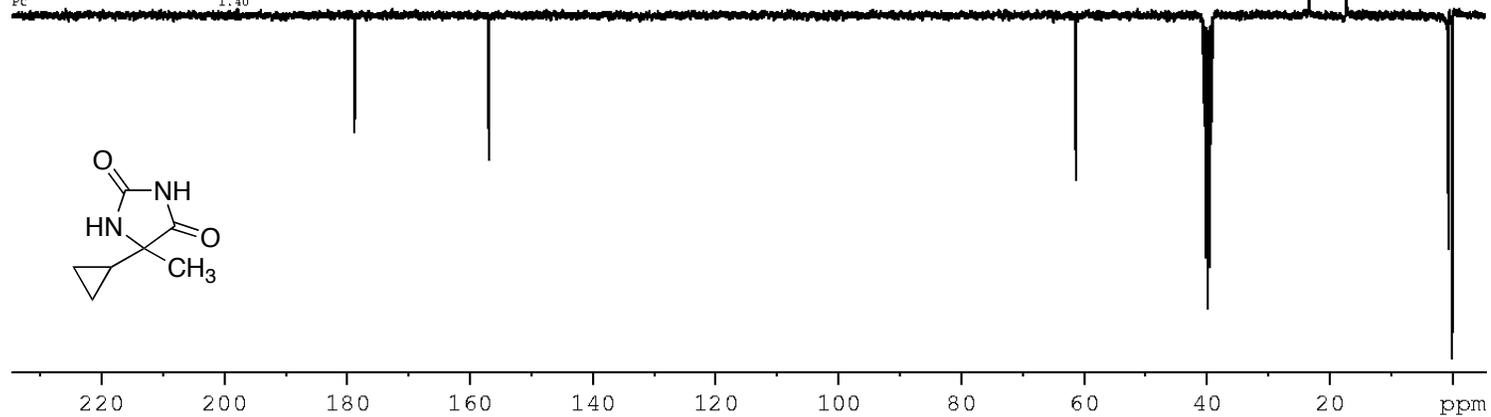
===== CHANNEL f2 =====
CPDPRG2   waltz16
NUC2      1H
P3        8.50 usec
p4        17.00 usec
PCPD2     80.00 usec
PL2       8.00 dB
PL12      27.47 dB
SFO2      300.0615003 MHz

```

```

F2 - Processing parameters
SI        32768
SF        75.4501537 MHz
WDW       EM
SSB       0
LB        2.00 Hz
GB        0
PC        1.40

```



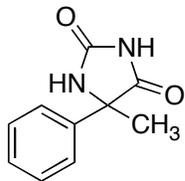
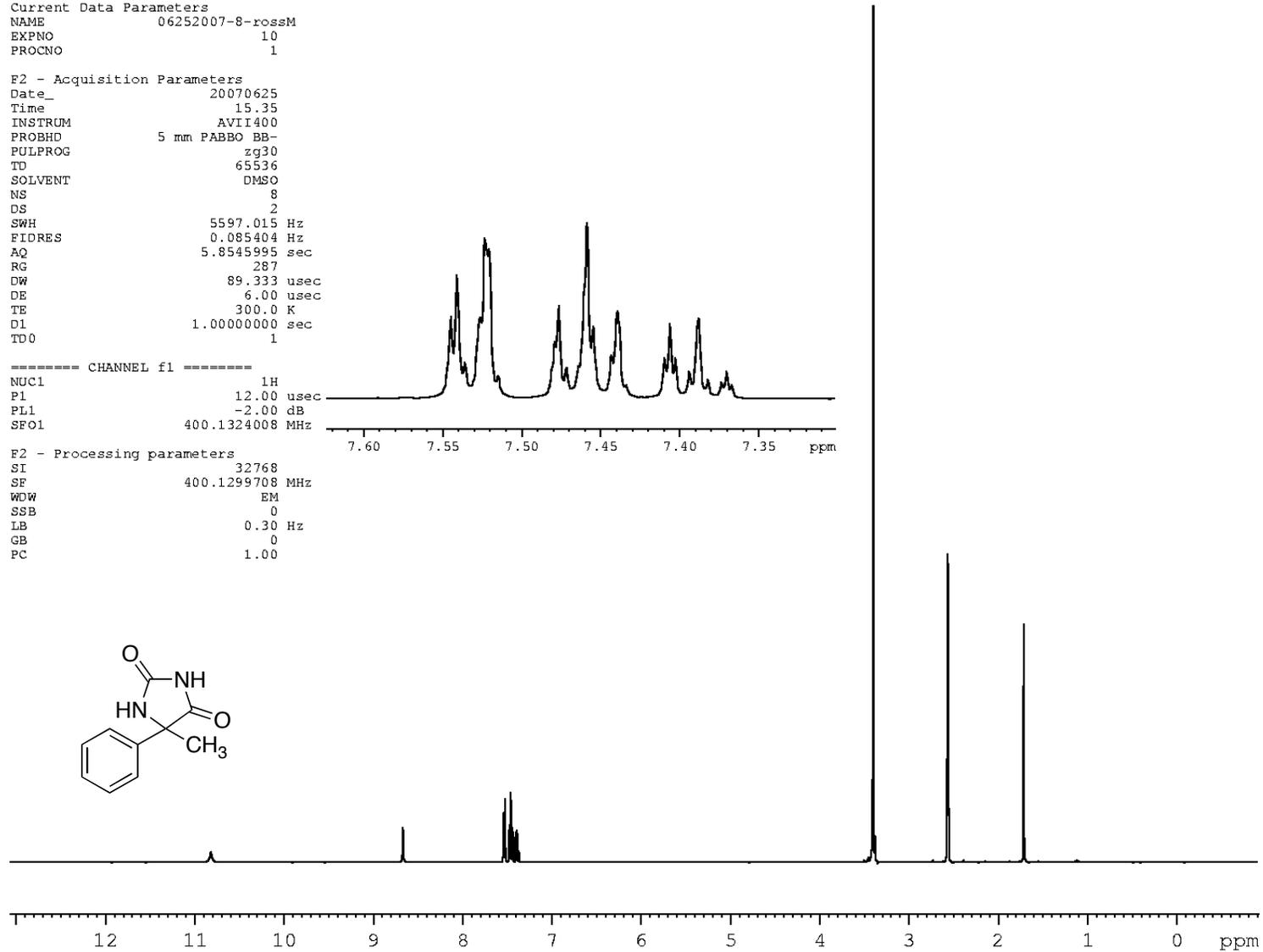
5-Methyl-5-phenylimidazolidine-2,4-dione (14) ¹H NMR spectrum

Current Data Parameters
NAME 06252007-8-rossM
EXPNO 10
PROCNO 1

F2 - Acquisition Parameters
Date_ 20070625
Time 15.35
INSTRUM AVII400
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT DMSO
NS 8
DS 2
SWH 5597.015 Hz
FIDRES 0.085404 Hz
AQ 5.8545995 sec
RG 287
DW 89.333 usec
DE 6.00 usec
TE 300.0 K
D1 1.00000000 sec
TD0 1

----- CHANNEL f1 -----
NUC1 1H
P1 12.00 usec
PL1 -2.00 dB
SFO1 400.1324008 MHz

F2 - Processing parameters
SI 32768
SF 400.1299708 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



5-Methyl-5-phenylimidazolidine-2,4-dione (14) ^{13}C NMR spectrum

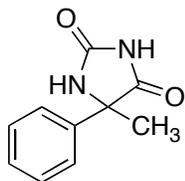
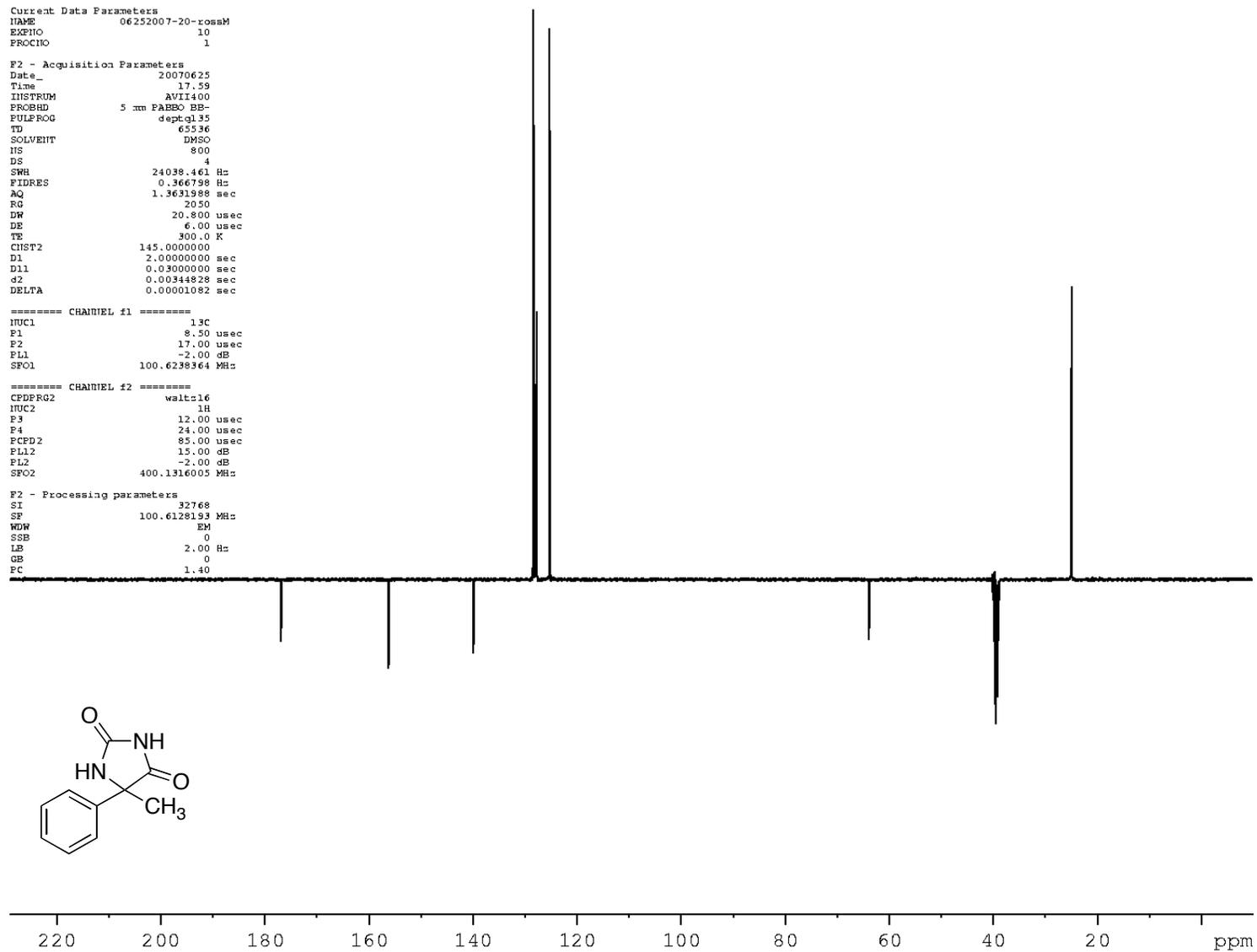
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Current Data Parameters
NAME      06252007-20-rossM
EXPNO     10
PROCNO    1

F2 - Acquisition Parameters
Date_     20070625
Time      17.59
INSTRUM   AVI400
PROBHD    5 mm PABBO BE-
PULPROG   deptq135
TD         65536
SOLVENT   DMSO
NS         800
DS         4
SWH        24038.461 Hz
FIDRES     0.366798 Hz
AQ         1.3631988 sec
RG         2050
DR         20.800 usec
DE         6.00 usec
TE         300.0 K
CHST2     145.0000000
D1         2.00000000 sec
D11        0.03000000 sec
d2         0.00344828 sec
DELTA     0.00001082 sec
```

```
===== CHANNEL f1 =====
NUC1       13C
P1         8.50 usec
P2         17.00 usec
PL1        -2.00 dB
SFO1       100.6238364 MHz
```

```
===== CHANNEL f2 =====
CEDEFG2   waltz16
NUC2       1H
F3         12.00 usec
P4         24.00 usec
PCPD2     85.00 usec
PL12       15.00 dB
PL2        -2.00 dB
SFO2       400.1316005 MHz
```

```
F2 - Processing parameters
SI         32768
SF         100.6128133 MHz
WDW        EM
SSB        0
LB         2.00 Hz
GB         0
FC         1.40
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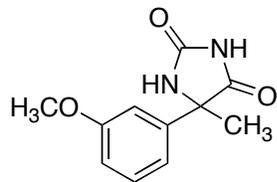
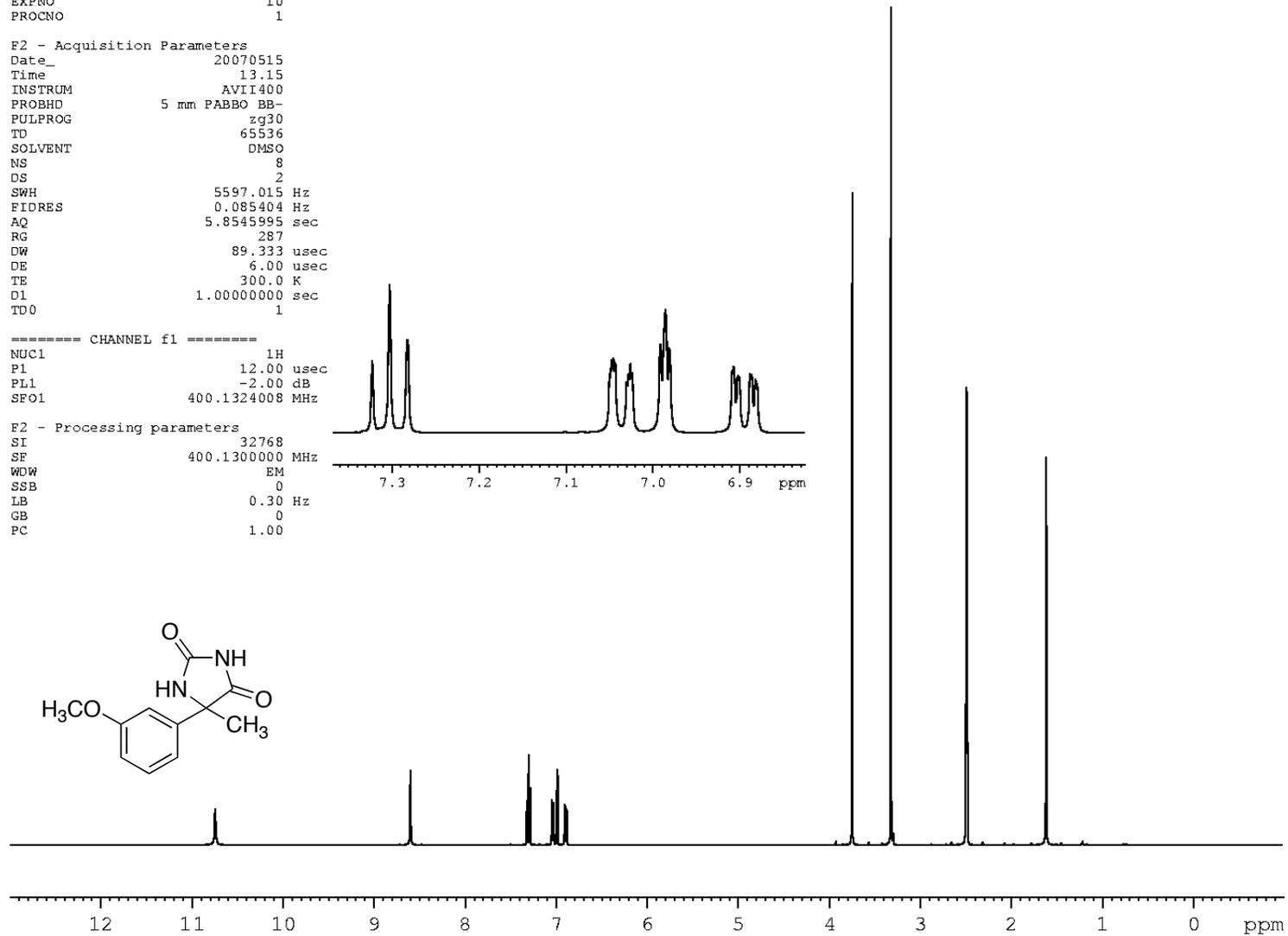
5-(3'Methoxyphenyl)-5-methylimidazolidine-2,4-dione (15) ¹H NMR spectrum

Current Data Parameters
 NAME 05152007-14-rossM
 EXPNO 10
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20070515
 Time 13.15
 INSTRUM AVII400
 PROBHD 5 mm PABBO BB-
 PULPROG zg30
 TD 65536
 SOLVENT DMSO
 NS 8
 DS 2
 SWH 5597.015 Hz
 FIDRES 0.085404 Hz
 AQ 5.8545995 sec
 RG 287
 DW 89.333 usec
 DE 6.00 usec
 TE 300.0 K
 D1 1.00000000 sec
 TDO 1

----- CHANNEL f1 -----
 NUC1 1H
 P1 12.00 usec
 PL1 -2.00 dB
 SFO1 400.1324008 MHz

F2 - Processing parameters
 SI 32768
 SF 400.1300000 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00



5-(3'Methoxyphenyl)-5-methylimidazolidine-2,4-dione (15) ¹³C NMR spectrum

```

Current Data Parameters
NAME      08212006-3-cross
EXPNO    10
PROCNO    1

F2 - Acquisition Parameters
Date_     20060821
Time      18.18
INSTRUM   sv300
PROBHD    5 mm PABBO BE-
PULPROG   pendantnew
TD        65536
SOLVENT   DMSO
NS        800
DS         8
SWH       18115.941 Hz
FIDRES    0.276427 Hz
AQ        1.8088436 sec
RG        18390.4
DR        27.600 usec
DE        6.00 usec
TE        298.2 K
CHST2     145.0000000
CHST3     1.0000000
CHST4     5.0000000
D1        1.50000000 sec
d2        0.00172414 sec
d3        0.00431034 sec
D12       0.00002000 sec
D13       0.00000400 sec

```

```

===== CHANNEL f1 =====
NUC1      13C
P1        9.00 usec
p2        16.00 usec
PL1       6.00 dB
SFO1      75.4587938 MHz

```

```

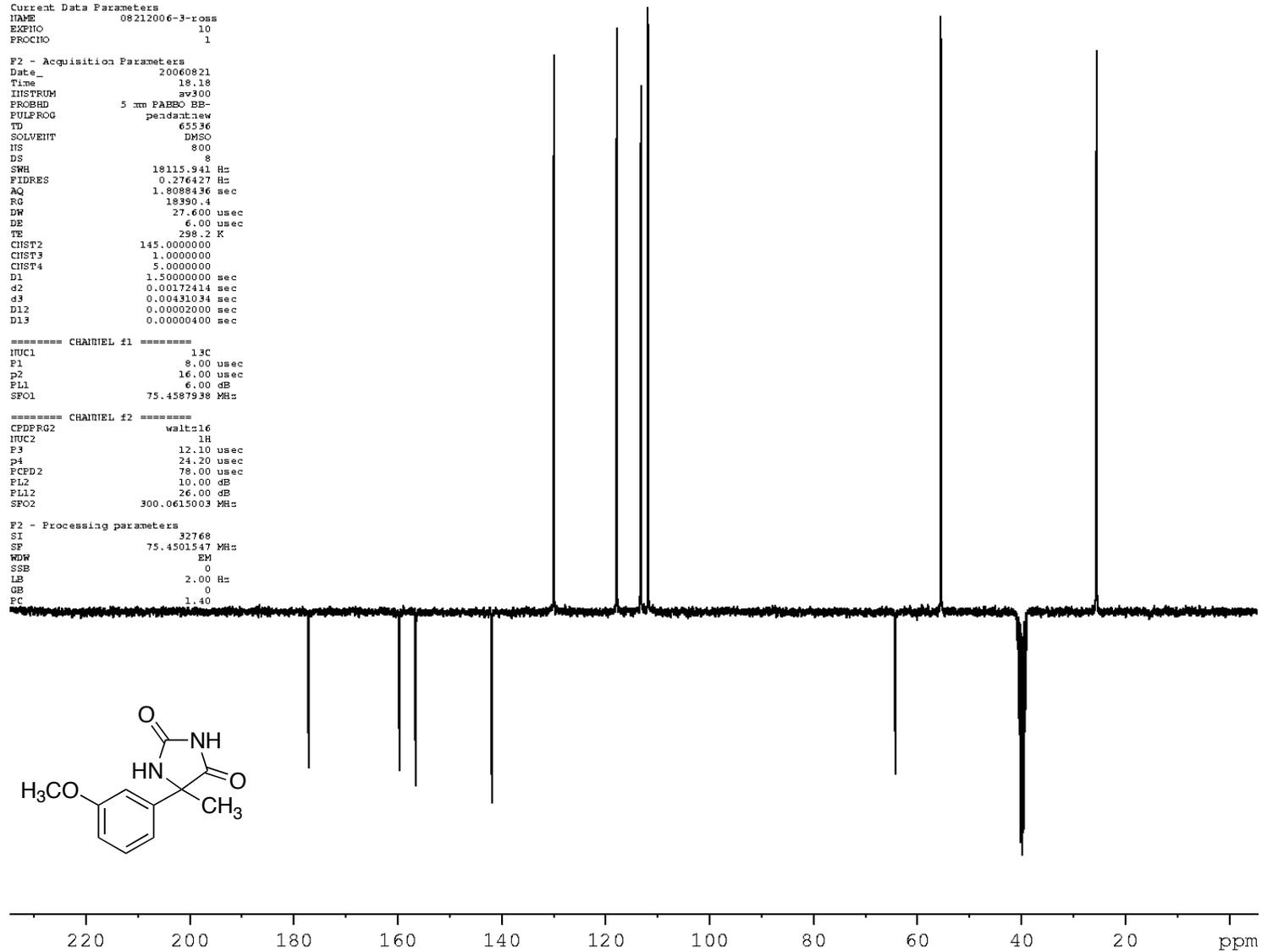
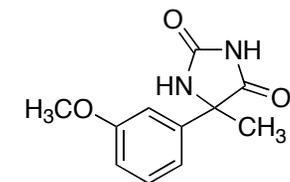
===== CHANNEL f2 =====
CPDPRG2   waltz16
NUC2      1H
P3        12.10 usec
p4        24.20 usec
PCPD2     78.00 usec
PL2       10.00 dB
PL12      26.00 dB
SFO2      300.0615003 MHz

```

```

F2 - Processing parameters
SI        32768
SF        75.4501547 MHz
WDW       EM
SSB       0
LB        2.00 Hz
GB        0
PC        1.40

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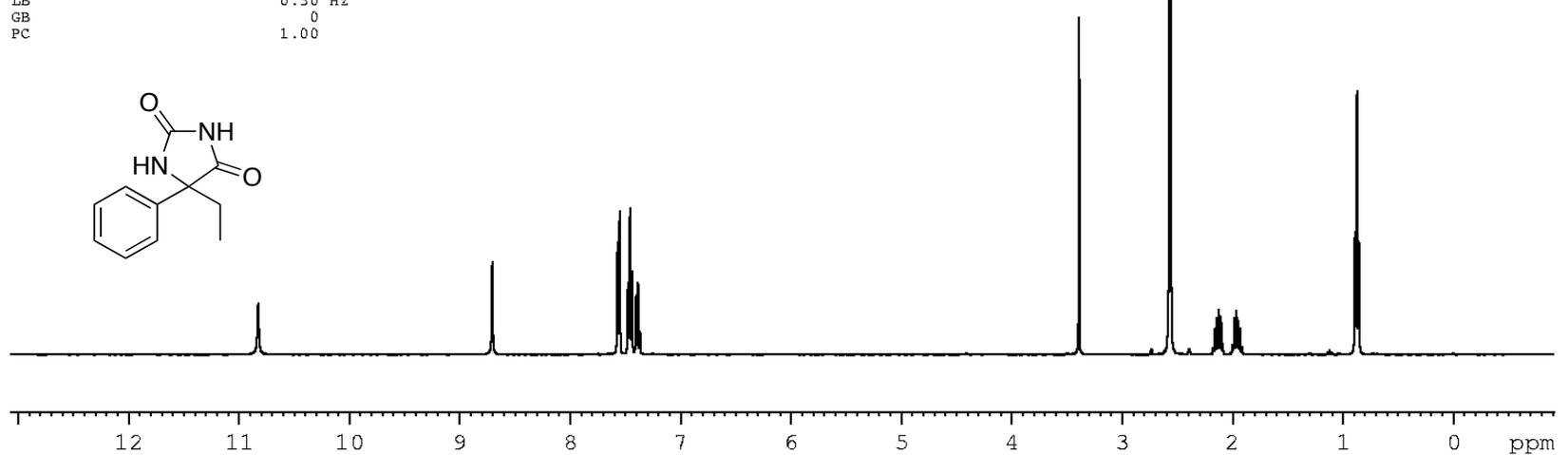
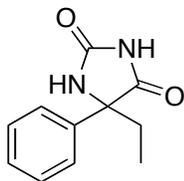
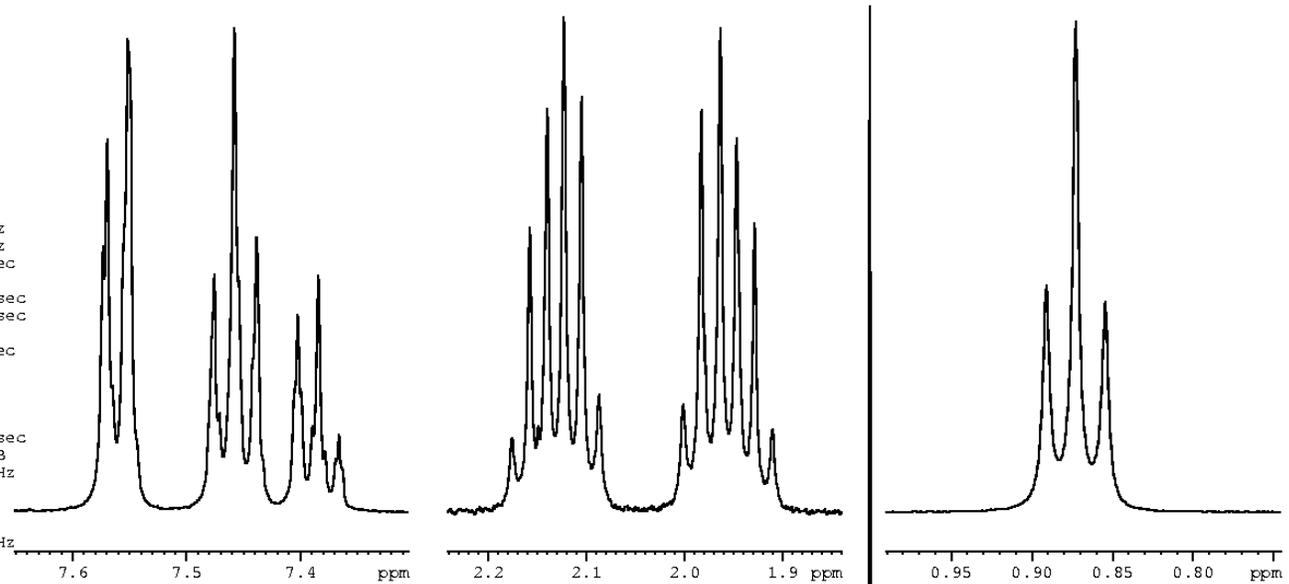
5-Ethyl-5-phenylimidazolidine-2,4-dione (16) ¹H NMR spectrum

Current Data Parameters
 NAME 09032007-8-rossM
 EXPNO 10
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20070903
 Time 10.56
 INSTRUM AVII400
 PROBHD 5 mm PABBO BB-
 PULPROG zg30
 TD 65536
 SOLVENT DMSO
 NS 8
 DS 2
 SWH 5597.015 Hz
 FIDRES 0.085404 Hz
 AQ 5.8545995 sec
 RG 287
 DW 89.333 usec
 DE 6.00 usec
 TE 300.0 K
 D1 1.0000000 sec
 TD0 1

----- CHANNEL f1 -----
 NUC1 1H
 P1 12.00 usec
 PL1 -2.00 dB
 SFO1 400.1324008 MHz

F2 - Processing parameters
 SI 32768
 SF 400.1299700 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00



5-Ethyl-5-phenylimidazolidine-2,4-dione (16) ¹³C NMR spectrum

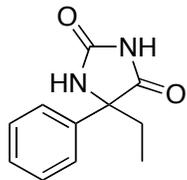
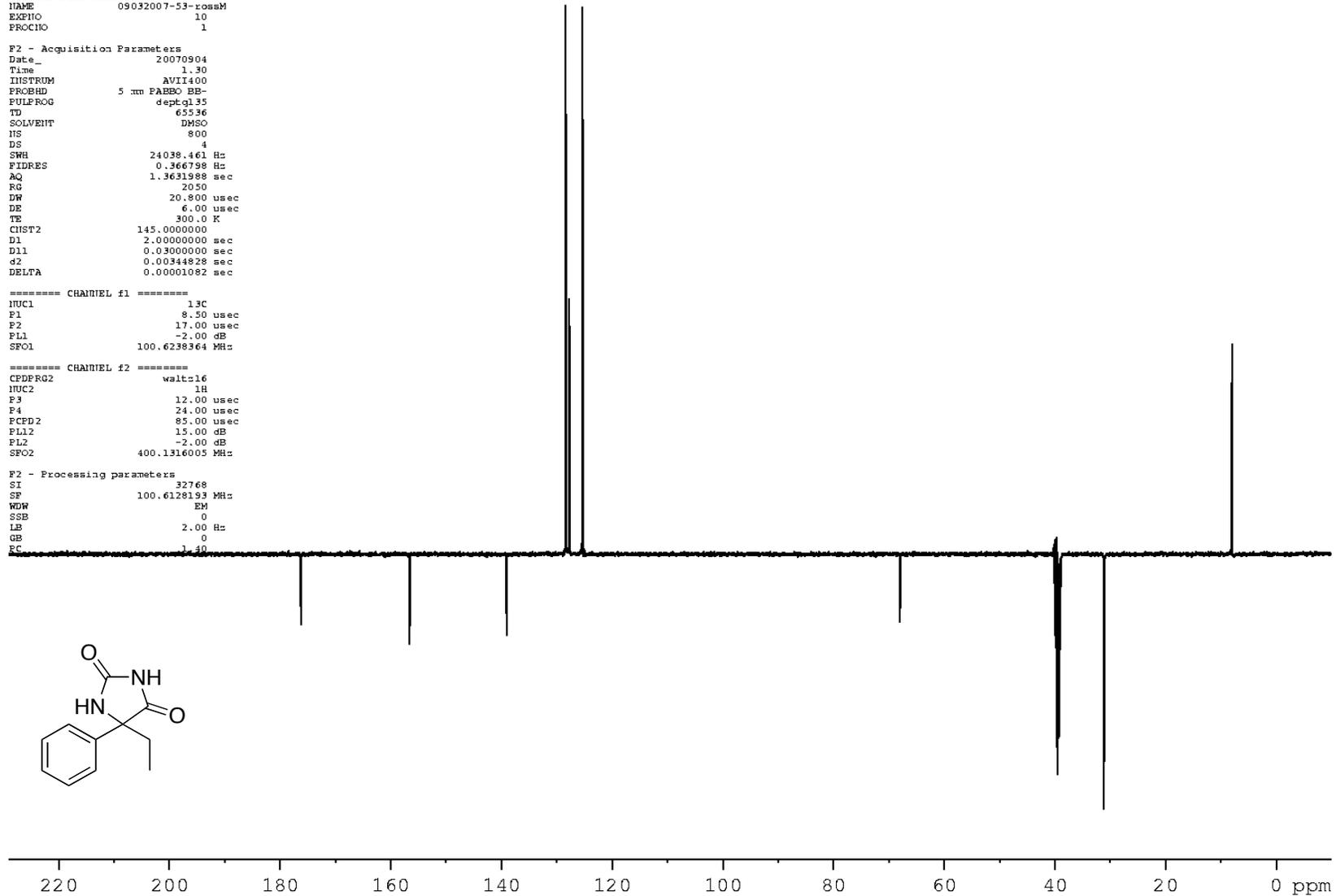
Current Data Parameters
 NAME 09032007-53-rossM
 EXPNO 10
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20070904
 Time 1.30
 INSTRUM AVII400
 PROBHD 5 mm PABBO BB-
 PULPROG zgpg30
 TD 65536
 SOLVENT DMSO
 NS 800
 DS 4
 SWH 24038.461 Hz
 FIDRES 0.366798 Hz
 AQ 1.3631988 sec
 RG 2050
 DW 20.800 usec
 DE 6.00 usec
 TE 300.0 K
 CHST2 145.0000000
 D1 2.0000000 sec
 D11 0.0300000 sec
 d2 0.00344828 sec
 DELTA 0.00001082 sec

===== CHANNEL f1 =====
 NUCL 13C
 P1 8.50 usec
 P2 17.00 usec
 PL1 -2.00 dB
 SFO1 100.6238364 MHz

===== CHANNEL f2 =====
 CPDPRG2 waltz16
 NUCL2 1H
 P3 12.00 usec
 P4 24.00 usec
 PCPD2 85.00 usec
 PL12 15.00 dB
 PL2 -2.00 dB
 SFO2 400.1316005 MHz

F2 - Processing parameters
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 SF 100.6128193 MHz
 WDW EM
 SSB 0
 LB 2.00 Hz
 GB 0
 EC 1.40



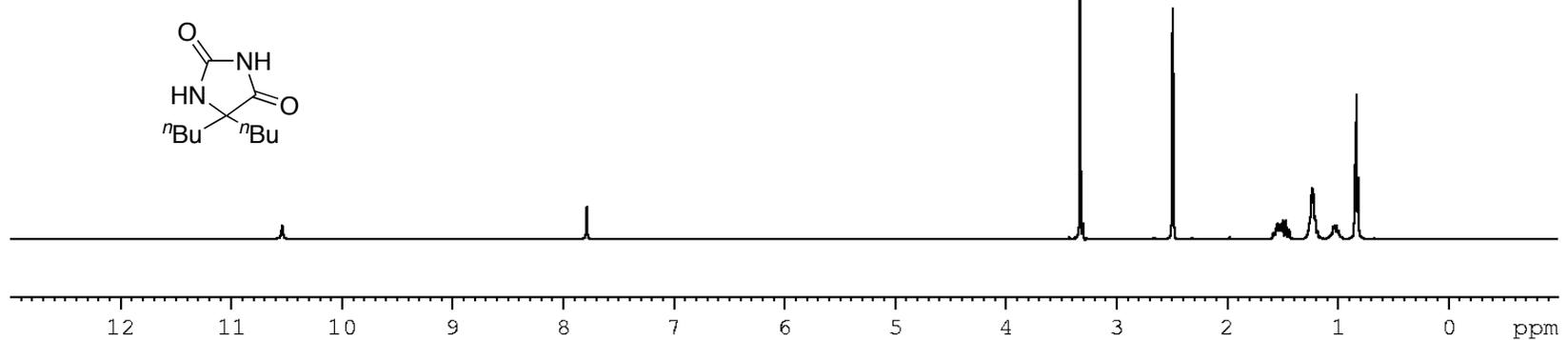
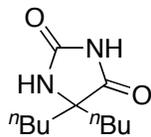
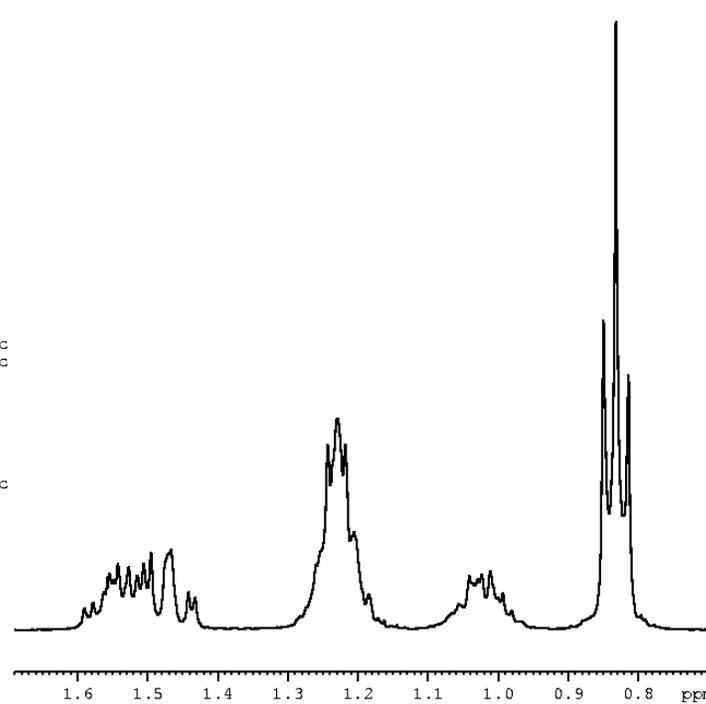
5,5-Di-(ⁿbutyl)imidazolidine-2,4-dione (17) ¹H NMR spectrum

Current Data Parameters
 NAME 08272007-17-rossM
 EXPNO 10
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20070827
 Time 18.32
 INSTRUM AVII400
 PROBHD 5 mm PABBO BB-
 PULPROG zg30
 TD 65536
 SOLVENT DMSO
 NS 8
 DS 2
 SWH 5597.015 Hz
 FIDRES 0.085404 Hz
 AQ 5.8545995 sec
 RG 287
 DW 89.333 usec
 DE 6.00 usec
 TE 300.0 K
 D1 1.00000000 sec
 TD0 1

----- CHANNEL f1 -----
 NUC1 1H
 P1 12.00 usec
 PL1 -2.00 dB
 SFO1 400.1324008 MHz

F2 - Processing parameters
 SI 32768
 SF 400.1300000 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00



5,5-Di-(*n*-butyl)imidazolidine-2,4-dione (17) ^{13}C NMR spectrum

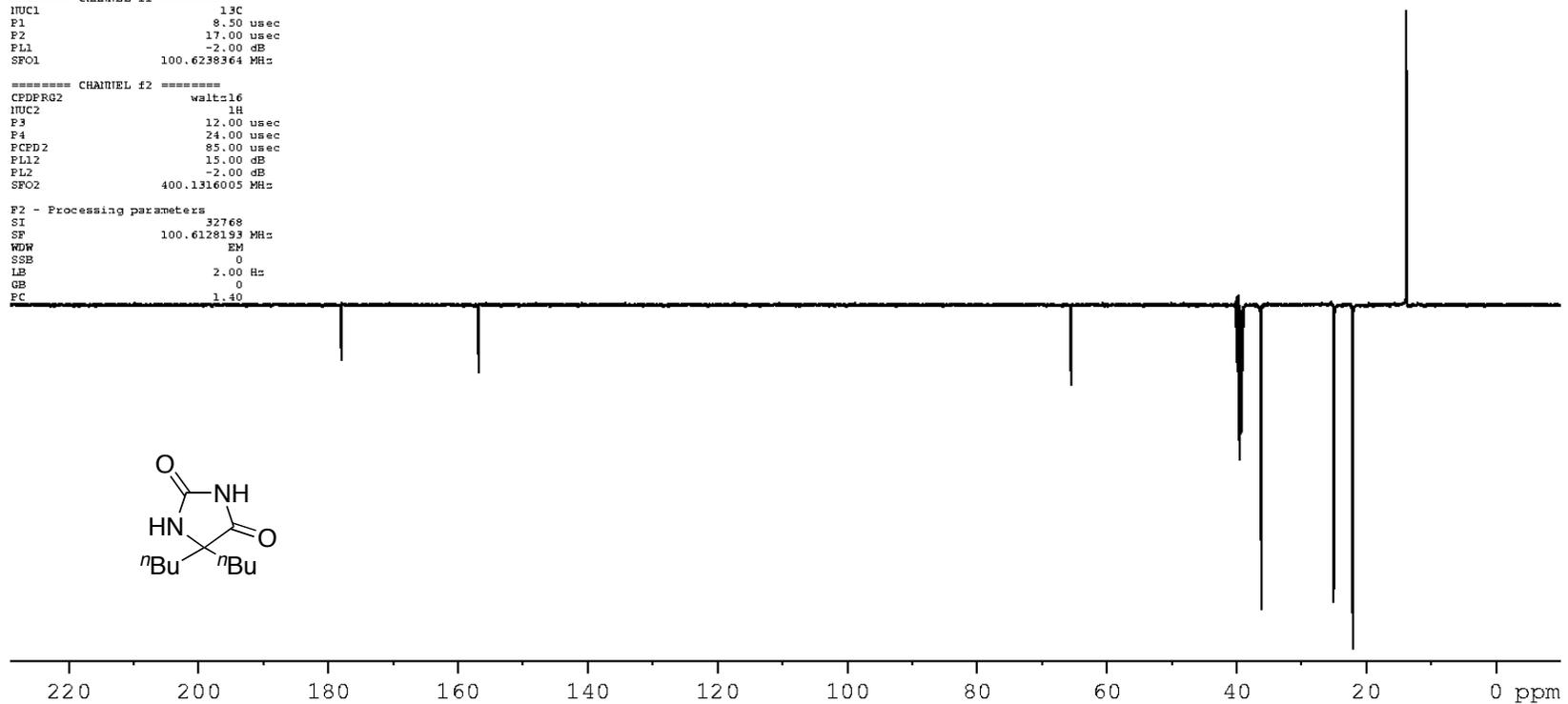
Current Data Parameters
 NAME 07052007-18-rossM
 EXPNO 10
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20070705
 Time 20.39
 INSTRUM AVII400
 PROBHD 5 mm PABBO BB-
 PULPROG zgpg30
 TD 65536
 SOLVENT DMSO
 NS 800
 DS 4
 SWH 24038.461 Hz
 FIDRES 0.366798 Hz
 AQ 1.3631988 sec
 RG 2050
 DW 20.800 usec
 DE 6.00 usec
 TE 300.0 K
 CHST2 145.0000000
 D1 2.0000000 sec
 D11 0.0300000 sec
 d2 0.00344828 sec
 DELTA 0.00001082 sec

===== CHANNEL f1 =====
 NUCL 13C
 P1 8.50 usec
 P2 17.00 usec
 PL1 -2.00 dB
 SFO1 100.6238364 MHz

===== CHANNEL f2 =====
 CPDPRG2 waltz16
 NUCL2 1H
 P3 12.00 usec
 P4 24.00 usec
 PCPD2 85.00 usec
 PL12 15.00 dB
 PL2 -2.00 dB
 SFO2 400.1316005 MHz

F2 - Processing parameters
 SI 32768
 SF 100.6128193 MHz
 WDW EM
 SSB 0
 LB 2.00 Hz
 GB 0
 EC 1.40



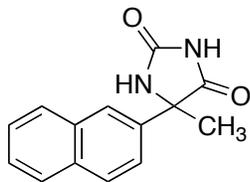
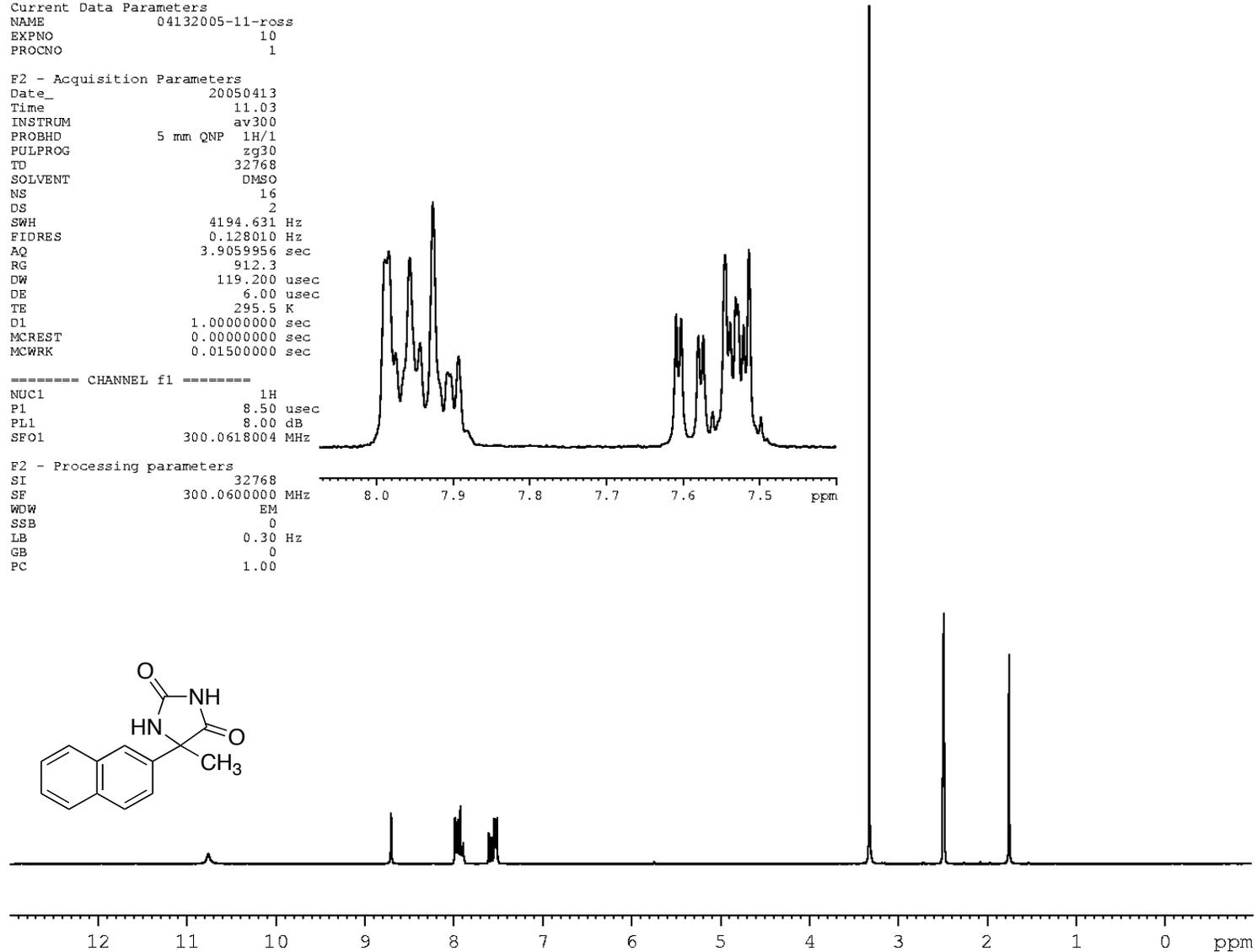
5-Methyl-5-(naphthyl)imidazolidine-2,4-dione (19) ¹H NMR spectrum

Current Data Parameters
 NAME 04132005-11-ross
 EXPNO 10
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20050413
 Time 11.03
 INSTRUM av300
 PROBHD 5 mm QNP 1H/1
 PULPROG zg30
 TD 32768
 SOLVENT DMSO
 NS 16
 DS 2
 SWH 4194.631 Hz
 FIDRES 0.128010 Hz
 AQ 3.9059956 sec
 RG 912.3
 DW 119.200 usec
 DE 6.00 usec
 TE 295.5 K
 D1 1.00000000 sec
 MCREST 0.00000000 sec
 MCWRK 0.01500000 sec

----- CHANNEL f1 -----
 NUC1 1H
 P1 8.50 usec
 PL1 8.00 dB
 SF01 300.0618004 MHz

F2 - Processing parameters
 SI 32768
 SF 300.0600000 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00



5-Methyl-5-(naphthyl)imidazolidine-2,4-dione (19) ¹³C NMR spectrum

```

Current Data Parameters
NAME      05102005-19-ross
EXPNO    10
PROCNO    1

F2 - Acquisition Parameters
Date_     20050511
Time      2.08
INSTRUM   vpr300
PROBHD    5 mm QNP 1H/1
PULPROG   pendantnew
TD        65536
SOLVENT   DMSO
NS        800
DS         8
SWH       18115.941 Hz
FIDRES    0.276427 Hz
AQ        1.8088436 sec
RG        18390.4
DR        27.600 usec
DE        6.00 usec
TE        294.2 K
CHST2     145.0000000
CHST3     1.0000000
CHST4     5.0000000
D1        1.50000000 sec
d2        0.00172414 sec
d3        0.00431034 sec
D12       0.00002000 sec
D13       0.00000400 sec
    
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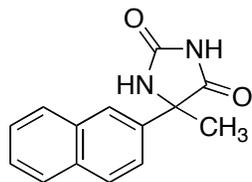
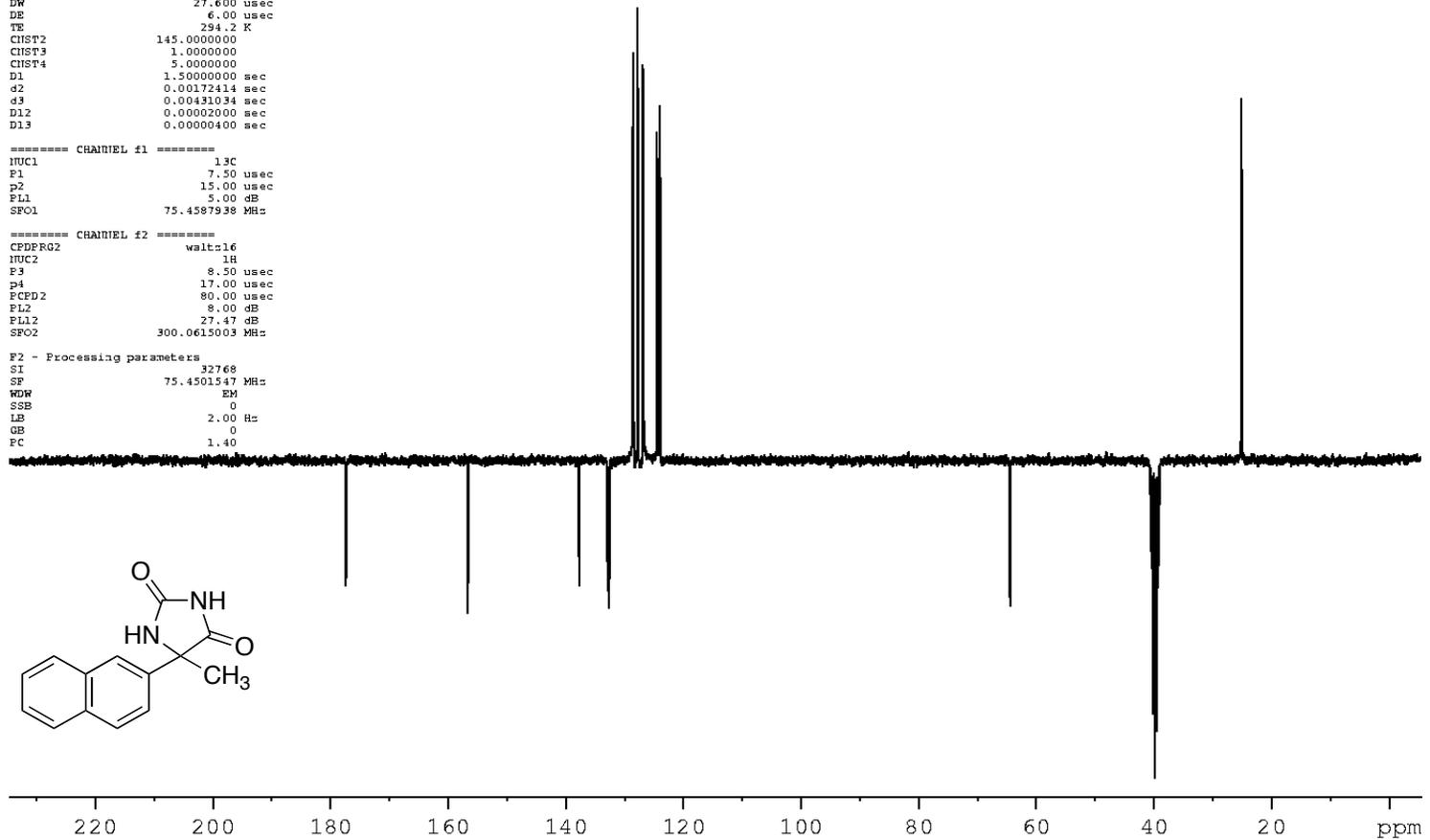
===== CHANNEL f1 =====
NUC1      13C
P1        7.50 usec
p2        15.00 usec
PL1       5.00 dB
SFO1      75.4587938 MHz
    
```

```

===== CHANNEL f2 =====
CPDPRG2   waltz16
NUC2      1H
P3        8.50 usec
p4        17.00 usec
PCPD2     80.00 usec
PL2       8.00 dB
PLL2      27.47 dB
SFO2      300.0615003 MHz
    
```

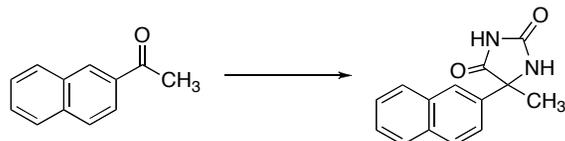
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F2 - Processing parameters
SI         32768
SF         75.4501547 MHz
WDW        EM
SSB        0
LB         2.00 Hz
GB         0
PC         1.40
    
```



Optimisation of the one-pot reaction

The reaction was conducted by condensing liquid ammonia into a solution of the ketone and gallium (III) triflate in dichloromethane at -78 °C, followed by stirring either at room temperature or -78 °C for the time shown. A solution of hydrogen cyanide was preformed by stirring TMS cyanide in methanol for 2 h. This solution was then added to the reaction mixture, either with ammonia present (reactions at -78 °C) or after the ammonia had evaporated (room temperature reactions). The Hünig's base was then added and carbon dioxide bubbled through the reaction for the time shown.



Entry	Imine formation conditions	Amino nitrile formation conditions	Hydantoin formation conditions	Recovered ketone	Yield
1	Ga(OTf) ₃ , CH ₂ Cl ₂ , NH ₃ (l), -78 °C, 3 h	HCN solution, RT 14 h	Hünig's base, CO ₂ (g), 8 h, RT	60 %	18 %
2	Ga(OTf) ₃ , CH ₂ Cl ₂ , NH ₃ (l), -78 °C, 24 h	HCN solution, RT 24 h	Hünig's base, CO ₂ (g), 3 h, RT	39 %	27 %
3	Ga(OTf) ₃ , CH ₂ Cl ₂ , NH ₃ (l), -78 °C then warmed to RT, 24 h	HCN solution, RT 24 h	Hünig's base, CO ₂ (g), 8 h, RT	88 %	3 %
4	Ga(OTf) ₃ , CH ₂ Cl ₂ , NH ₃ (l), -78 °C, 24 h	HCN solution, -78 °C, 30 min then RT 24 h	Hünig's base, CO ₂ (g), 6 h, RT	38 %	53 %
5	Ga(OTf) ₃ , CH ₂ Cl ₂ , NH ₃ (l), -78 °C, 3 h	HCN solution, -78 °C, 30 min then RT 24 h	Hünig's base, CO ₂ (g), 6 h, RT	-	47-50 % (n = 2)
6	Ga(OTf) ₃ , CH ₂ Cl ₂ , NH ₃ (l), -78 °C, 24 h	HCN solution, -78 °C, 24 h	Hünig's base, CO ₂ (g), 6 h, RT	70 %	5 %
7	CH ₂ Cl ₂ , NH ₃ (l), -78 °C, 24 h	HCN solution, -78 °C, 24 h	Hünig's base, CO ₂ (g), 8 h, RT	94 %	0 %
8	CH ₂ Cl ₂ , NH ₃ (l), -78 °C, TMSCN, MeOH, 10 h		Hünig's base, CO ₂ (g), 8 h, RT	87 %	9 %