Supporting Information for:

Synthesis and Properties of Fluorescence Dyes: Tetracyclic Pyrazolo[3,4-*b*]Pyridine-based Coumarin Chromophores with Intramolecular Charge Transfer Character

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[§] These authors contributed equally to this manuscript.

SI-1 Crystallographic data

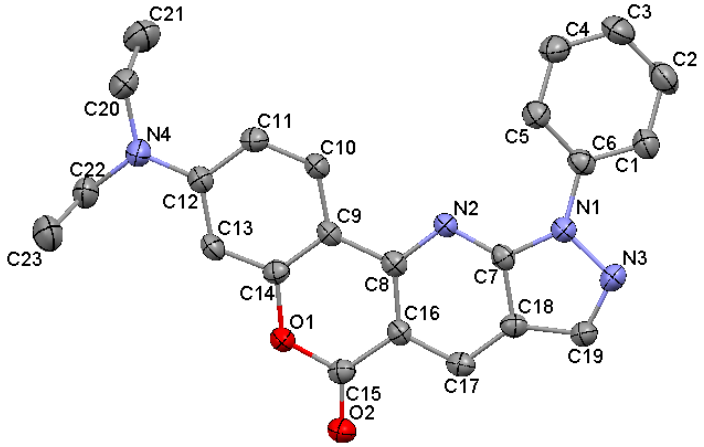

Figure S1. Crystal structures of **1a** with ellipsoids shown at the 50% probability level (hydrogen atoms are omitted for clarity).

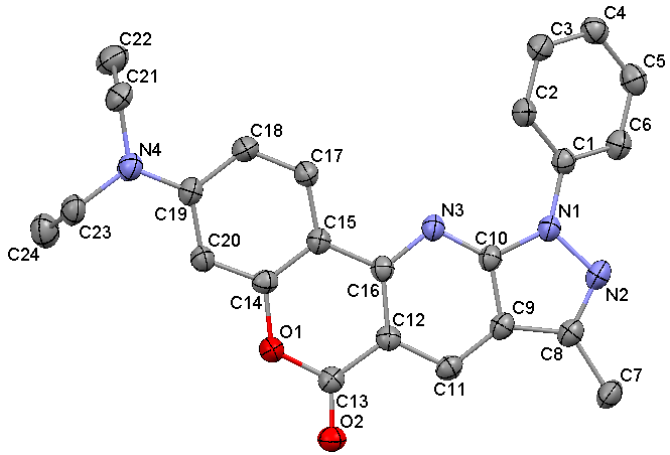

Figure S2. Crystal structures of **1b** with ellipsoids shown at the 50% probability level (hydrogen atoms are omitted for clarity).

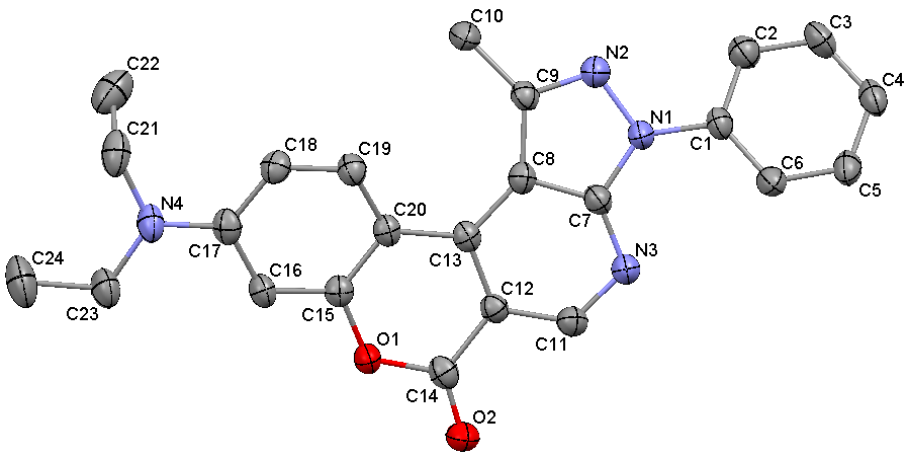

Figure S3. Crystal structures of **2b** with ellipsoids shown at the 50% probability level (hydrogen atoms are omitted for clarity).

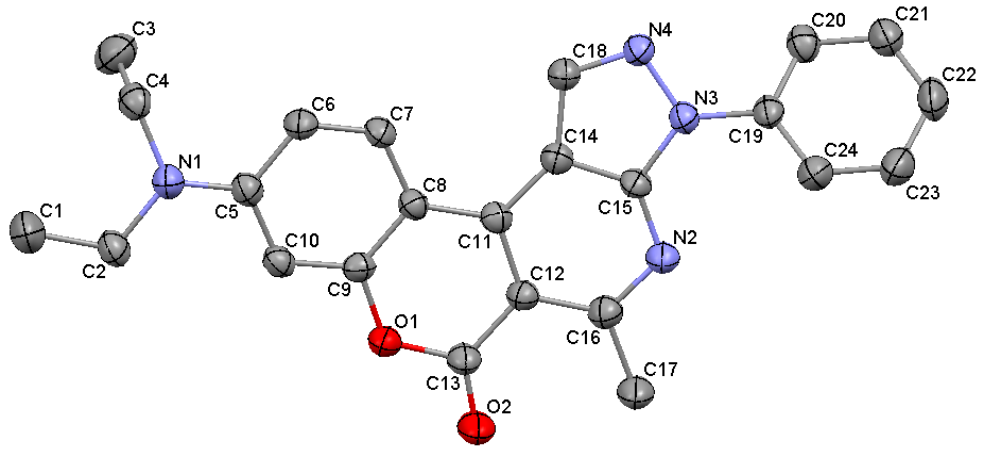

Figure S4. Crystal structures of **4a** with ellipsoids shown at the 50% probability level (hydrogen atoms are omitted for clarity).

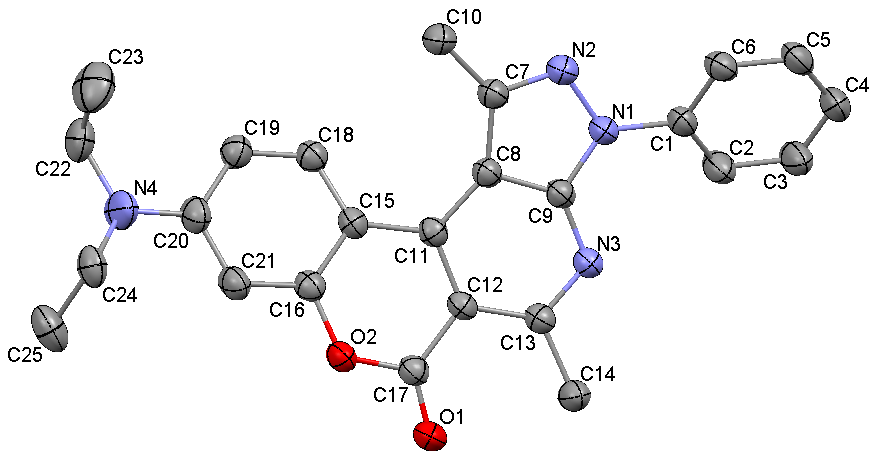

Figure S5. Crystal structures of **4b** with ellipsoids shown at the 50% probability level (hydrogen atoms are omitted for clarity).

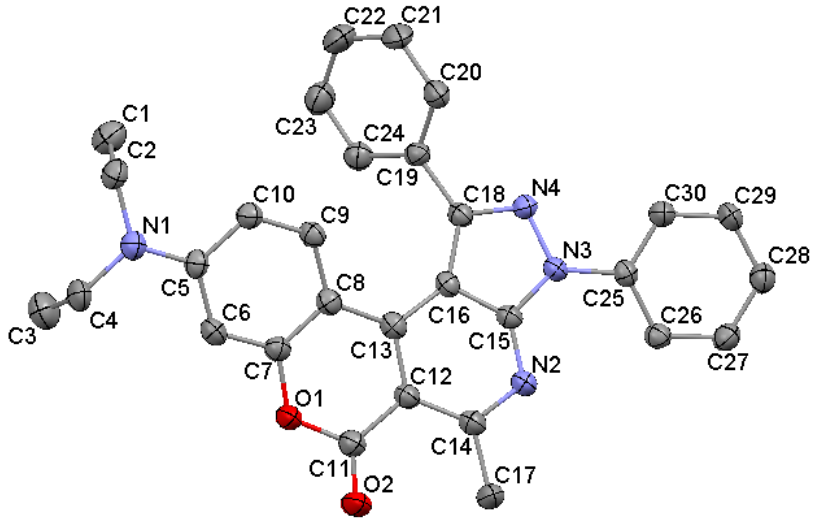

Figure S6. Crystal structures of **4c** with ellipsoids shown at the 50% probability level (hydrogen atoms are omitted for clarity).

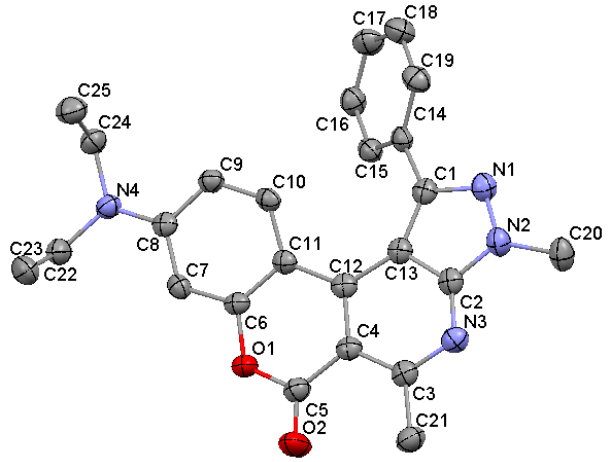

Figure S7. Crystal structures of **4d** with ellipsoids shown at the 50% probability level (hydrogen atoms are omitted for clarity).

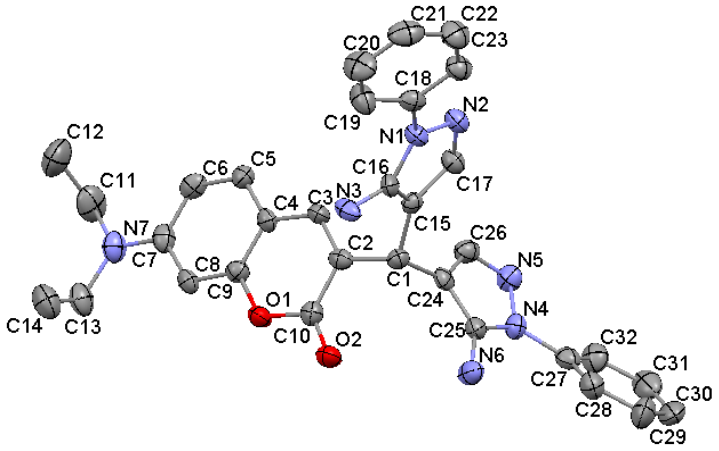

Figure S8. Crystal structures of **9** with ellipsoids shown at the 50% probability level (hydrogen atoms are omitted for clarity).

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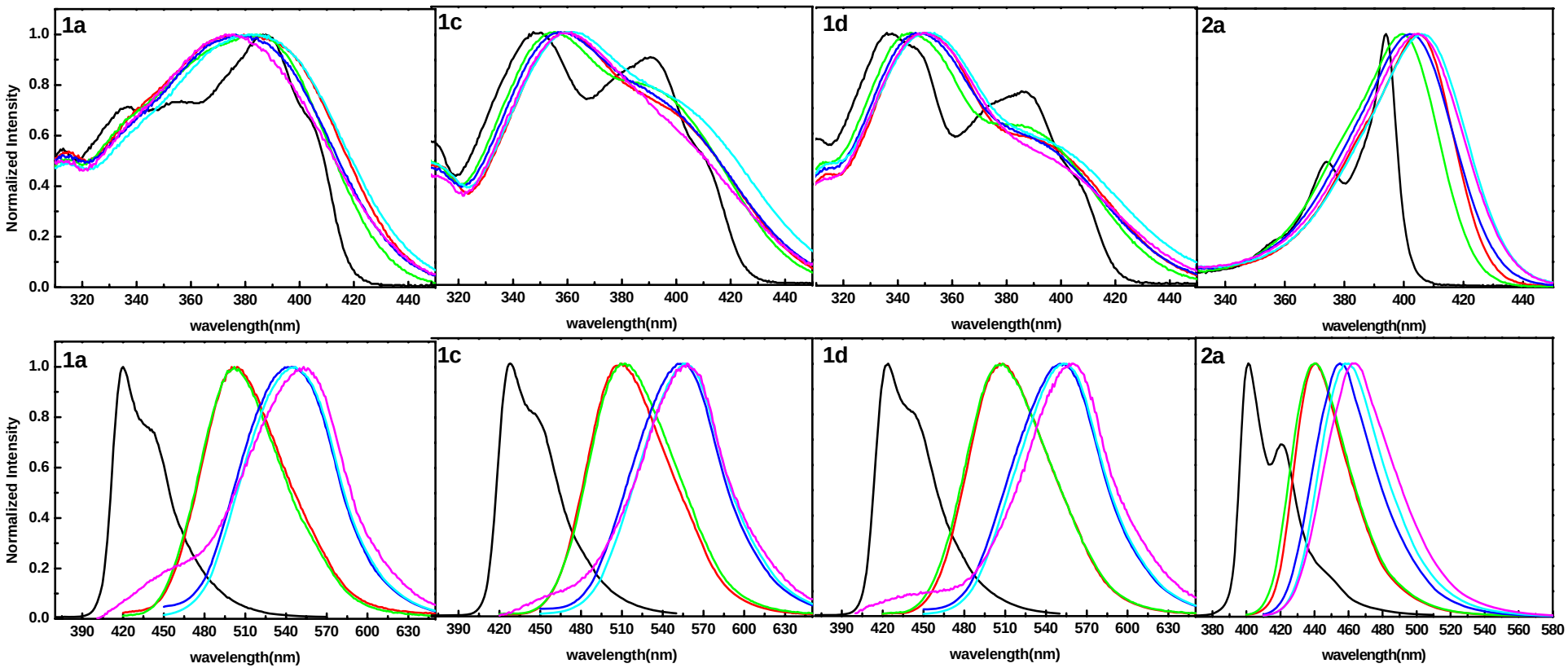


Figure S9. Absorption (top) and fluorescence (bottom) spectra of compounds **1a**, **1c**, **1d** and **2a** in different solvents: black (cyclohexane), red (CH_2Cl_2), green (EA), blue (CH_3CN), cyan (DMF), and magenta (CH_3OH).

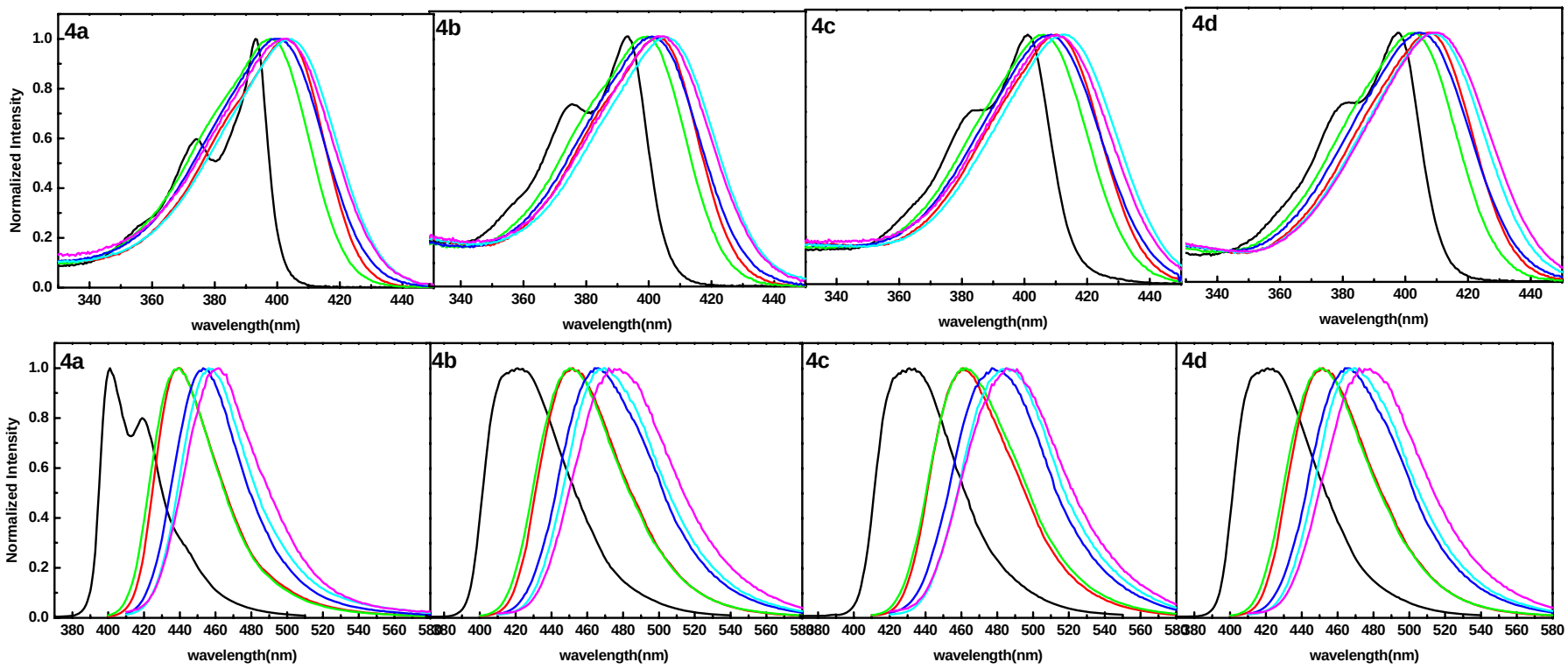


Figure S10. Absorption (top) and fluorescence (bottom) spectra of compounds **4a**, **4b**, **4c** and **4d** in different solvents: black (cyclohexane), red (CH_2Cl_2), green (EA), blue (CH_3CN), cyan (DMF), and magenta (CH_3OH).

SI-3 Electrochemical data

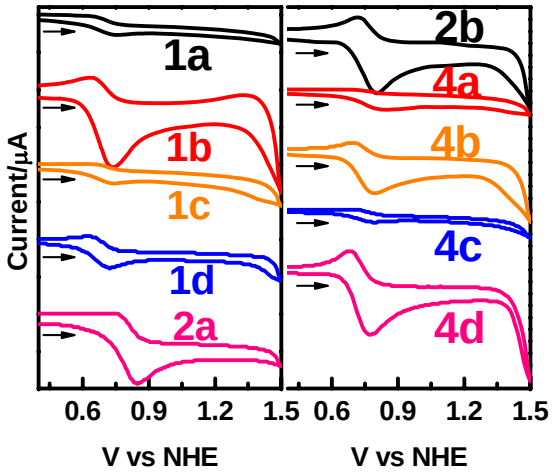
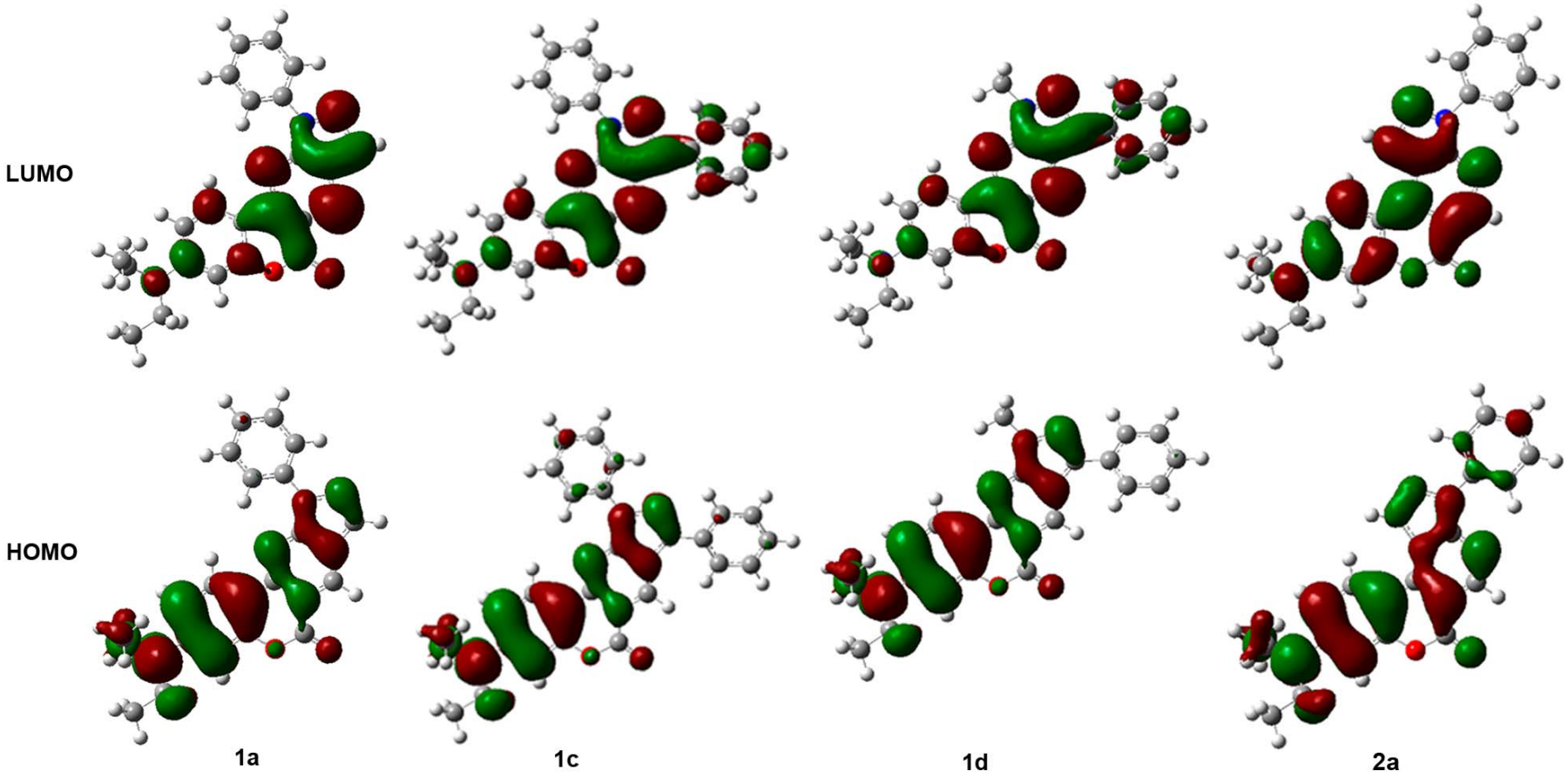
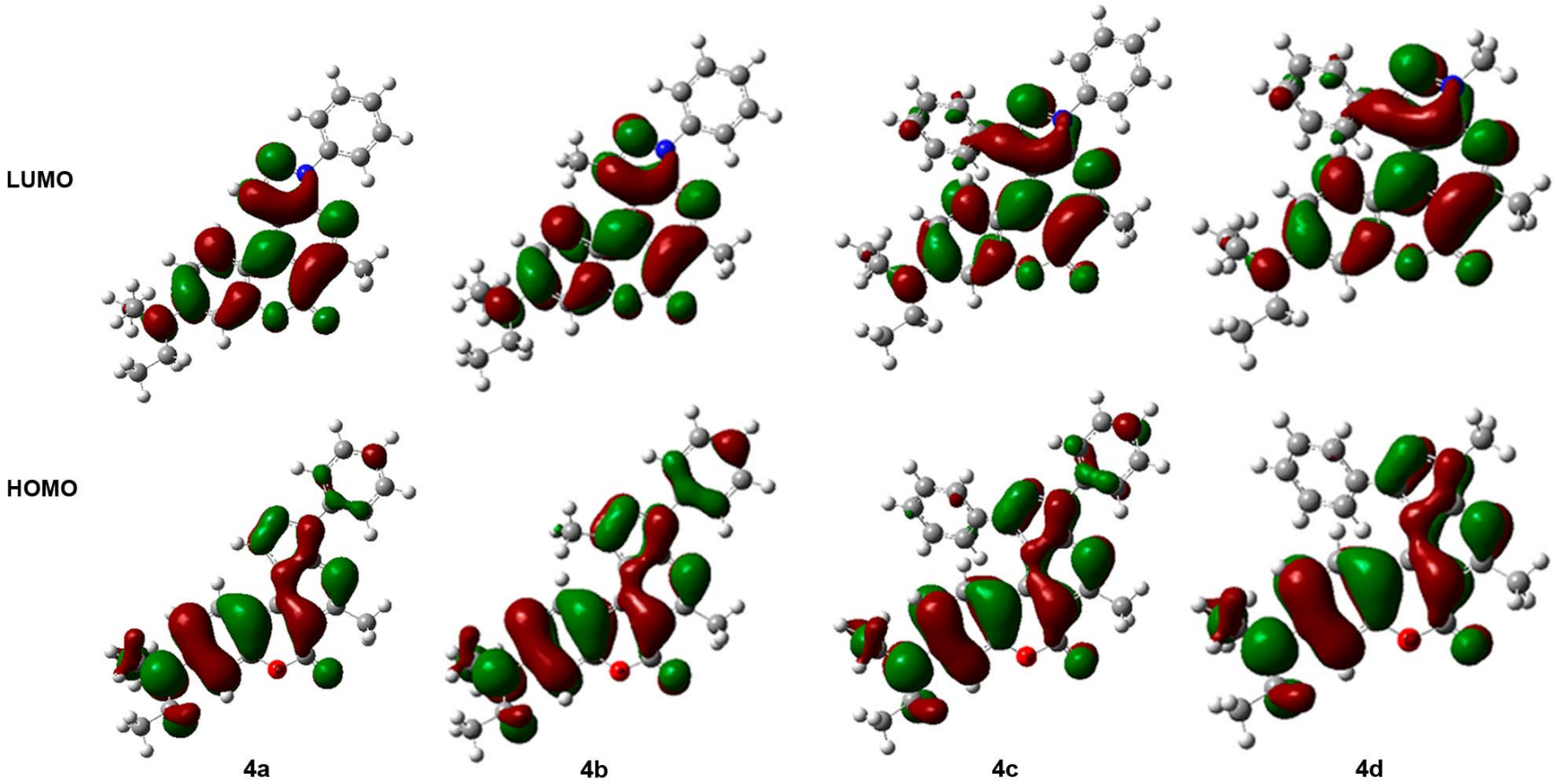


Figure S11. Cyclic voltammograms of compounds **1a-1d**, **2a**, **2b** and **4a-4d** in CH_3CN.

SI-4 Computational data



Figrue S12. The calculated HOMOs and LUMOs of **1a**, **1c**, **1d** and **2a**.



Figrue S13. The calculated HOMOs and LUMOs of **4a-4d**.

SI-5 Spectrum of 1a with different proportion of water

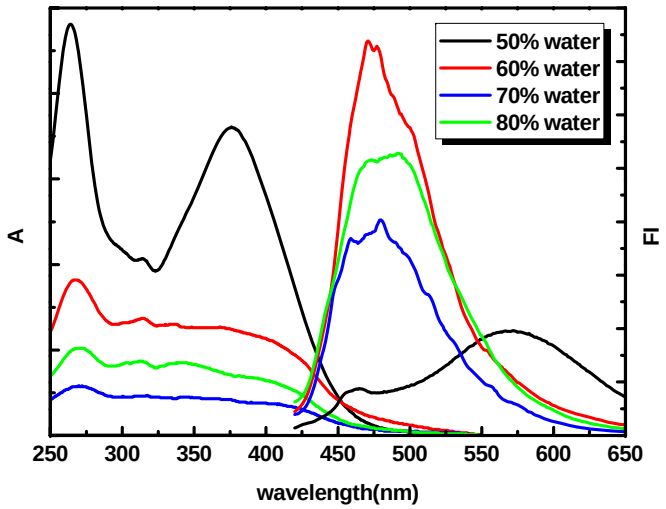
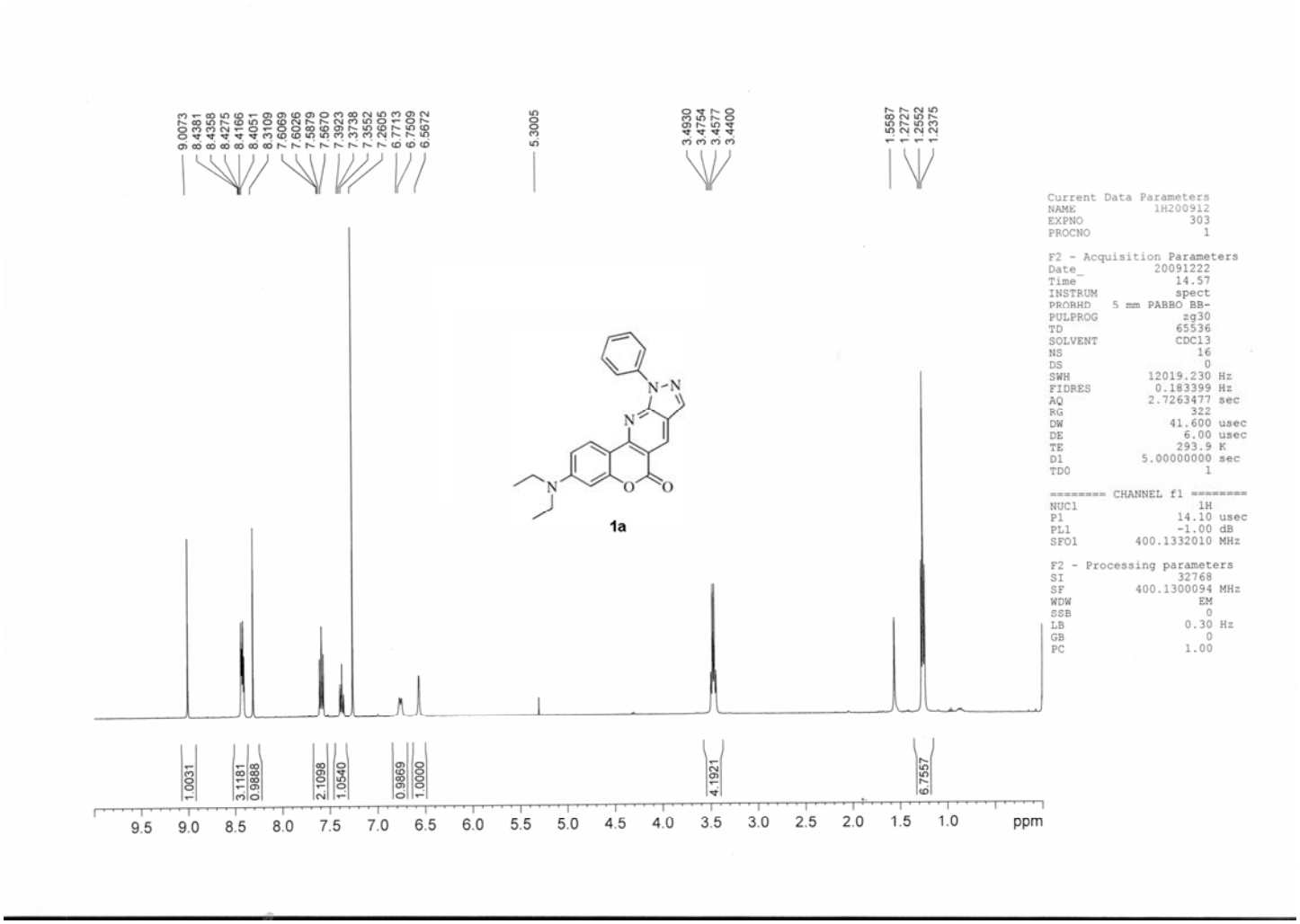
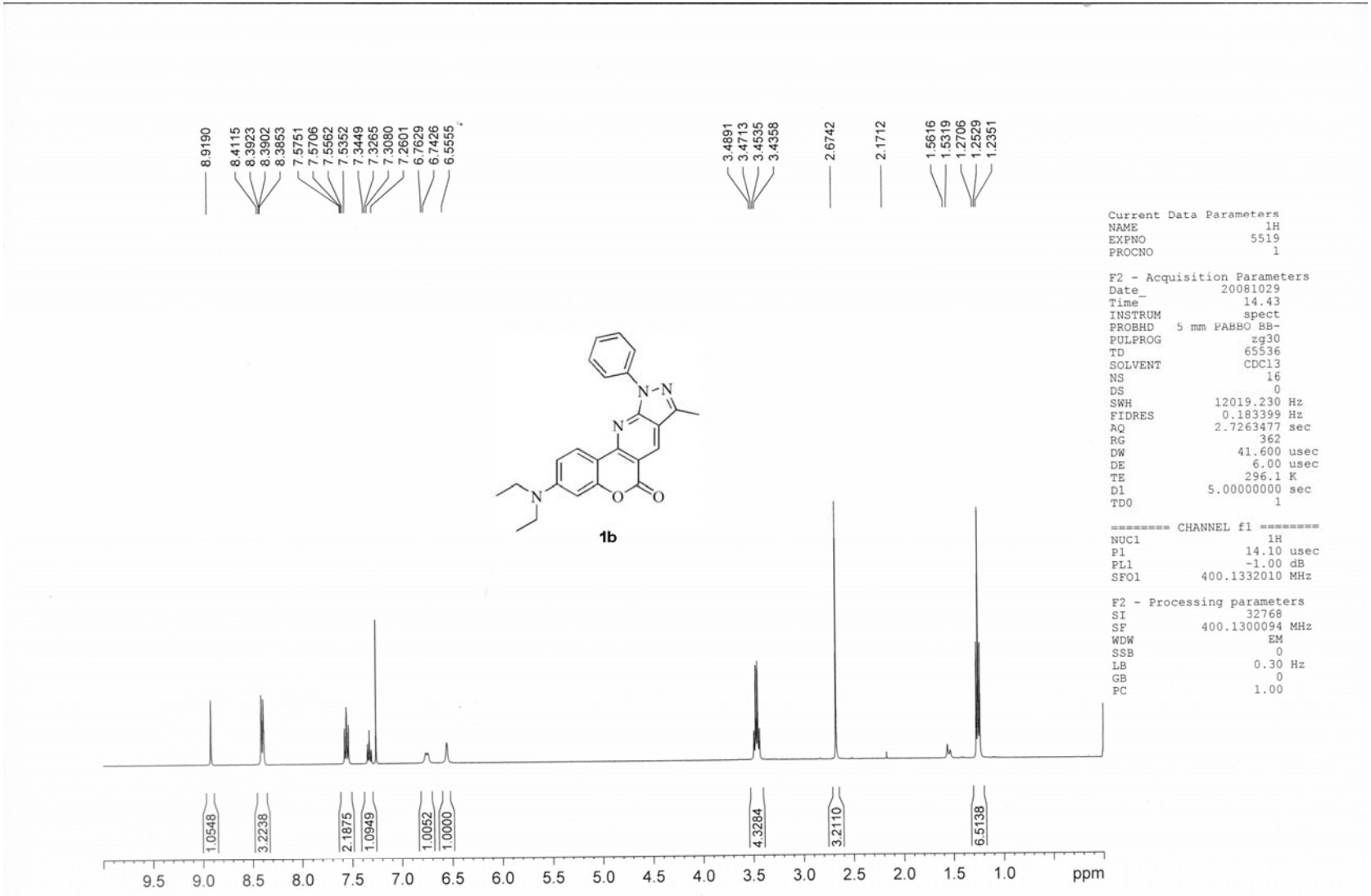


Figure S14. Absorption and fluorescence spectra of compound **1a** (10μM) in different proportion of water and C_2H_5OH.

SI-6 NMR spectra

^{1}H NMR spectra of new compounds.

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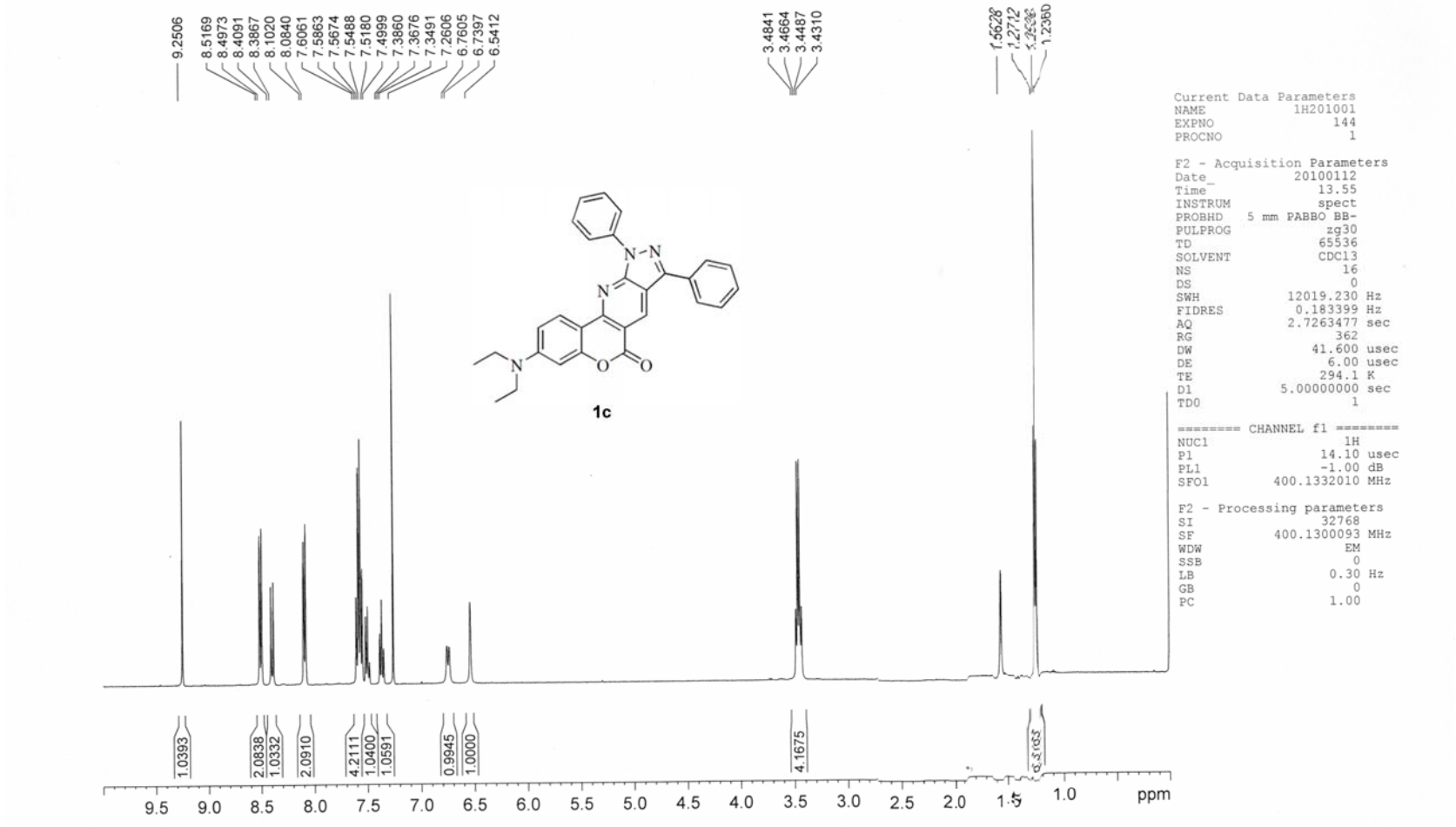
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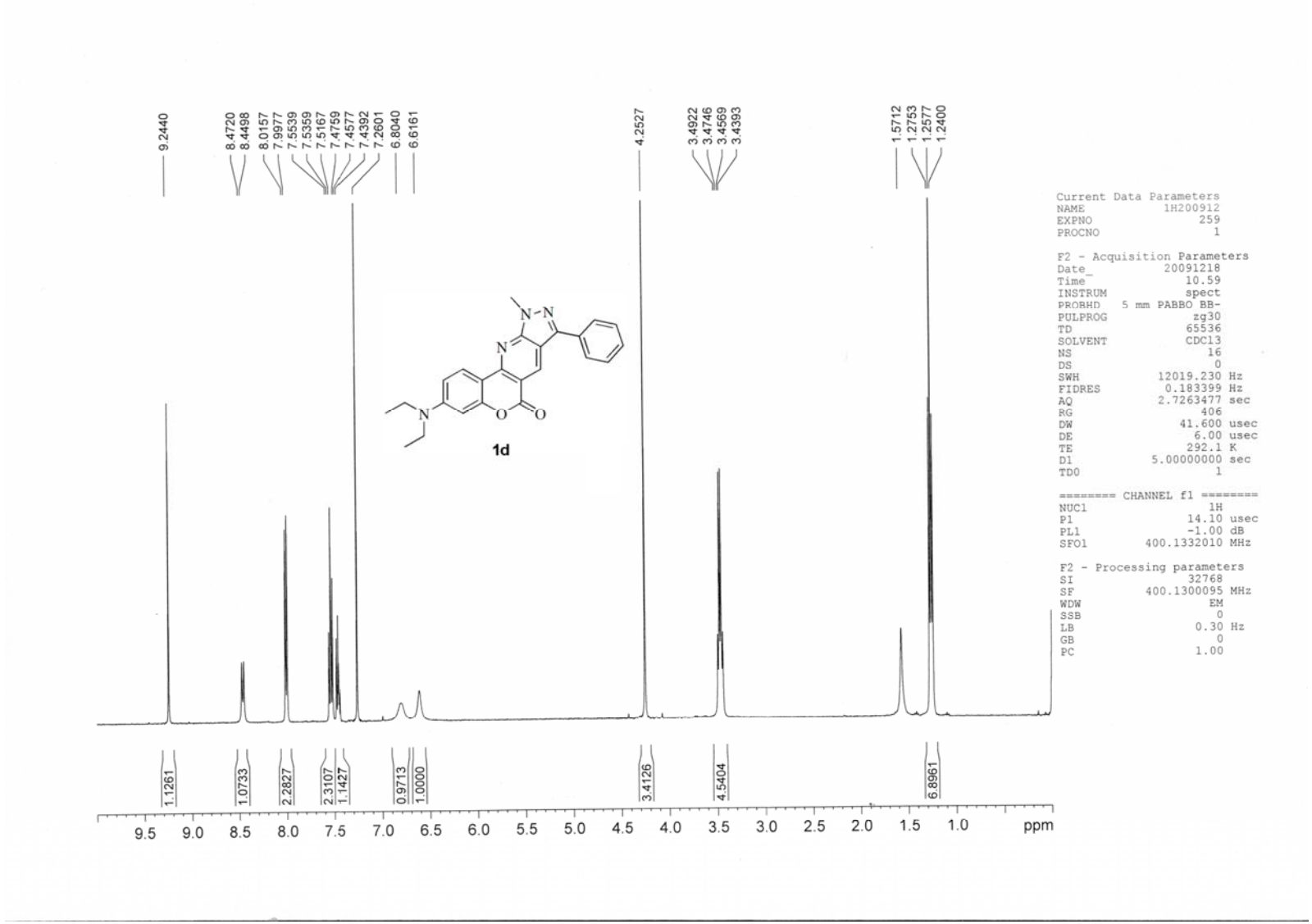
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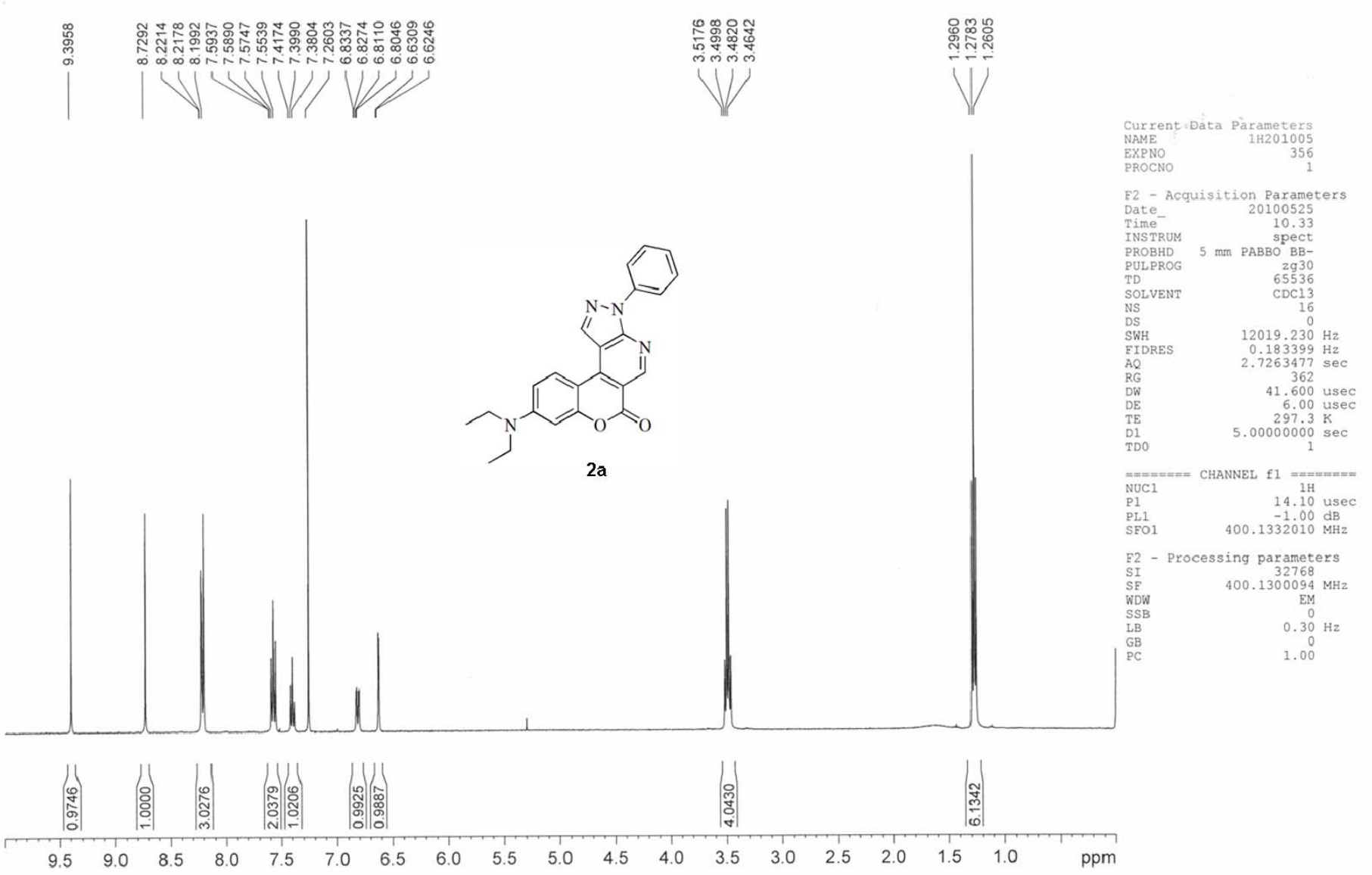
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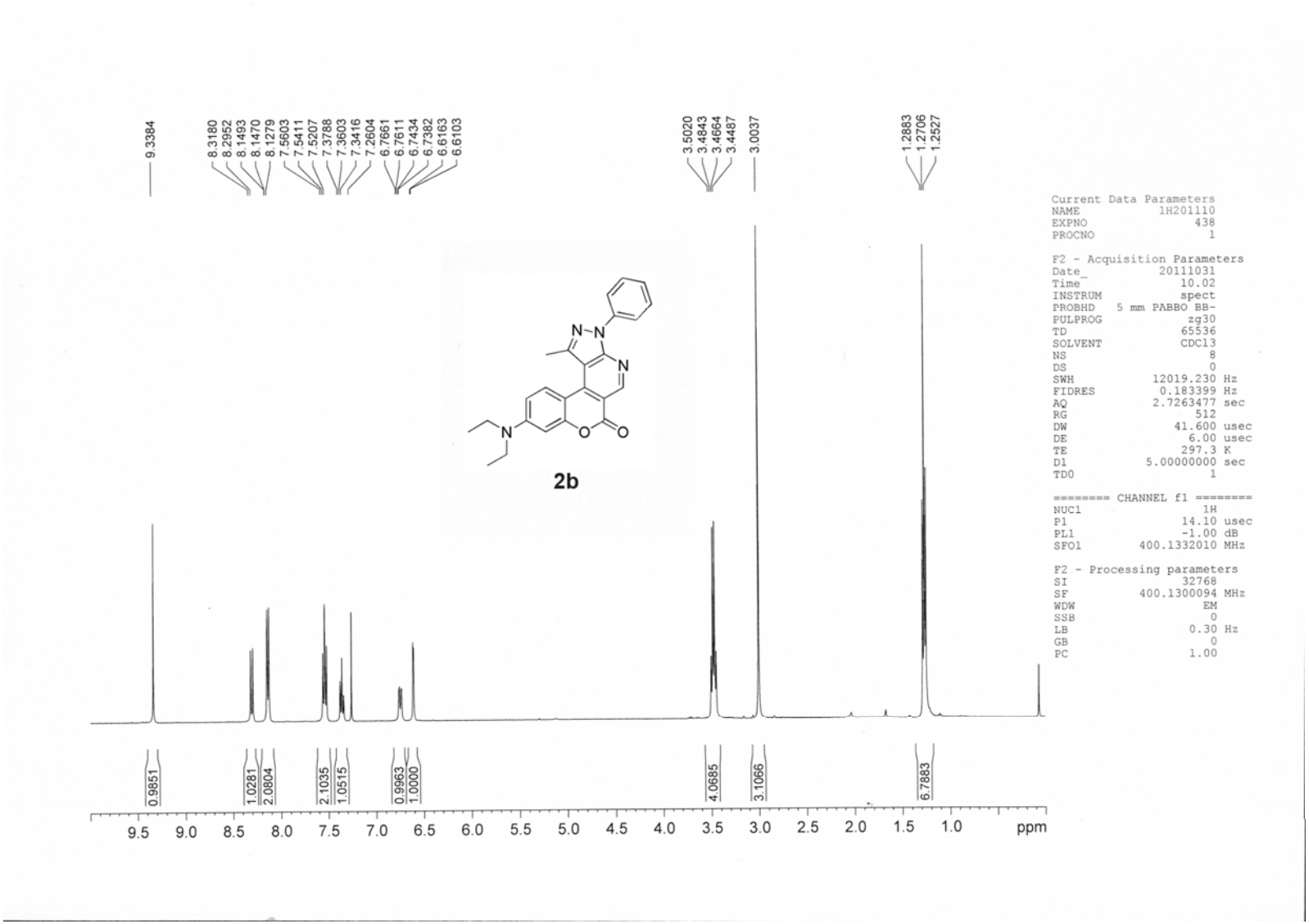


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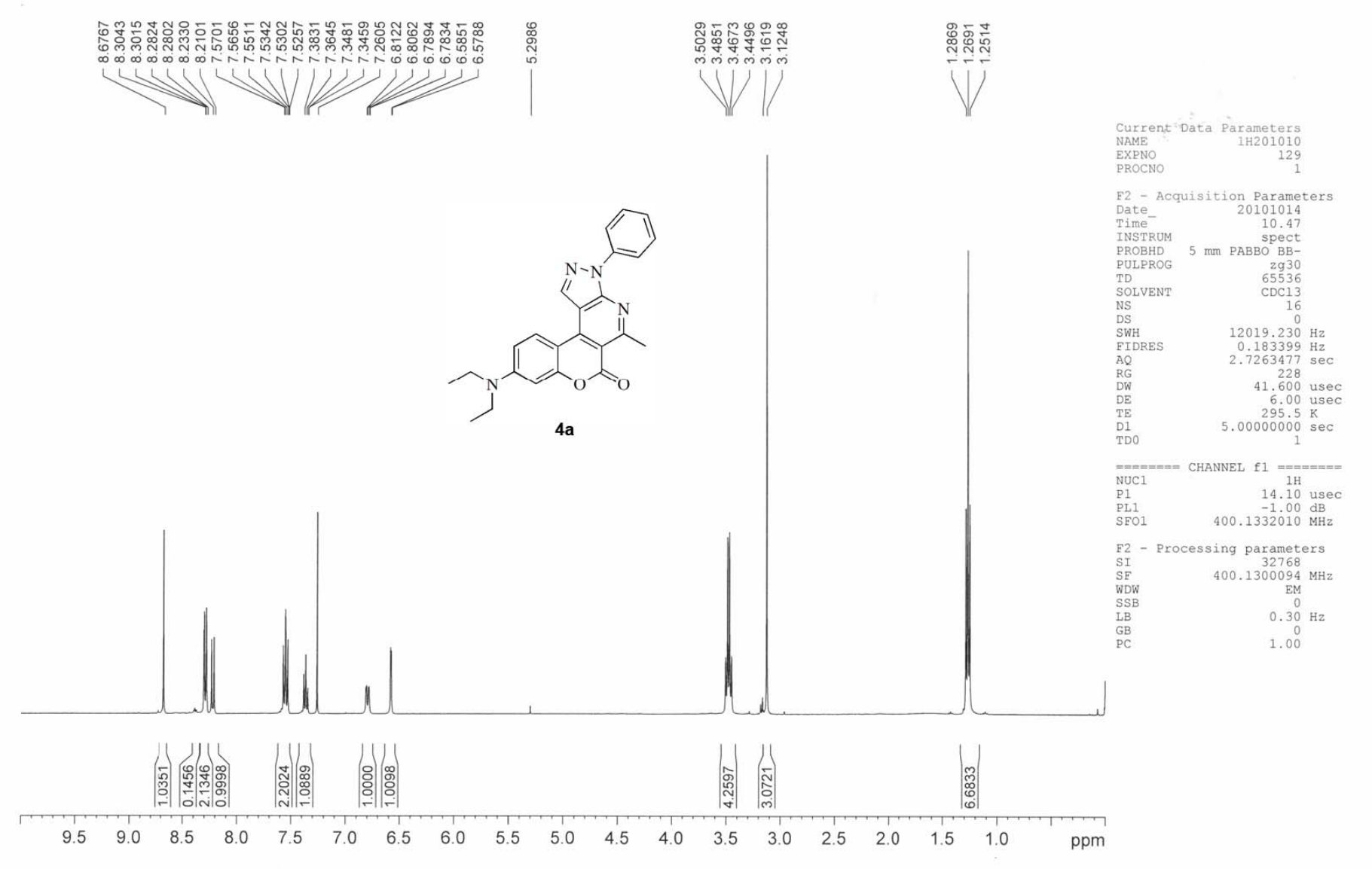
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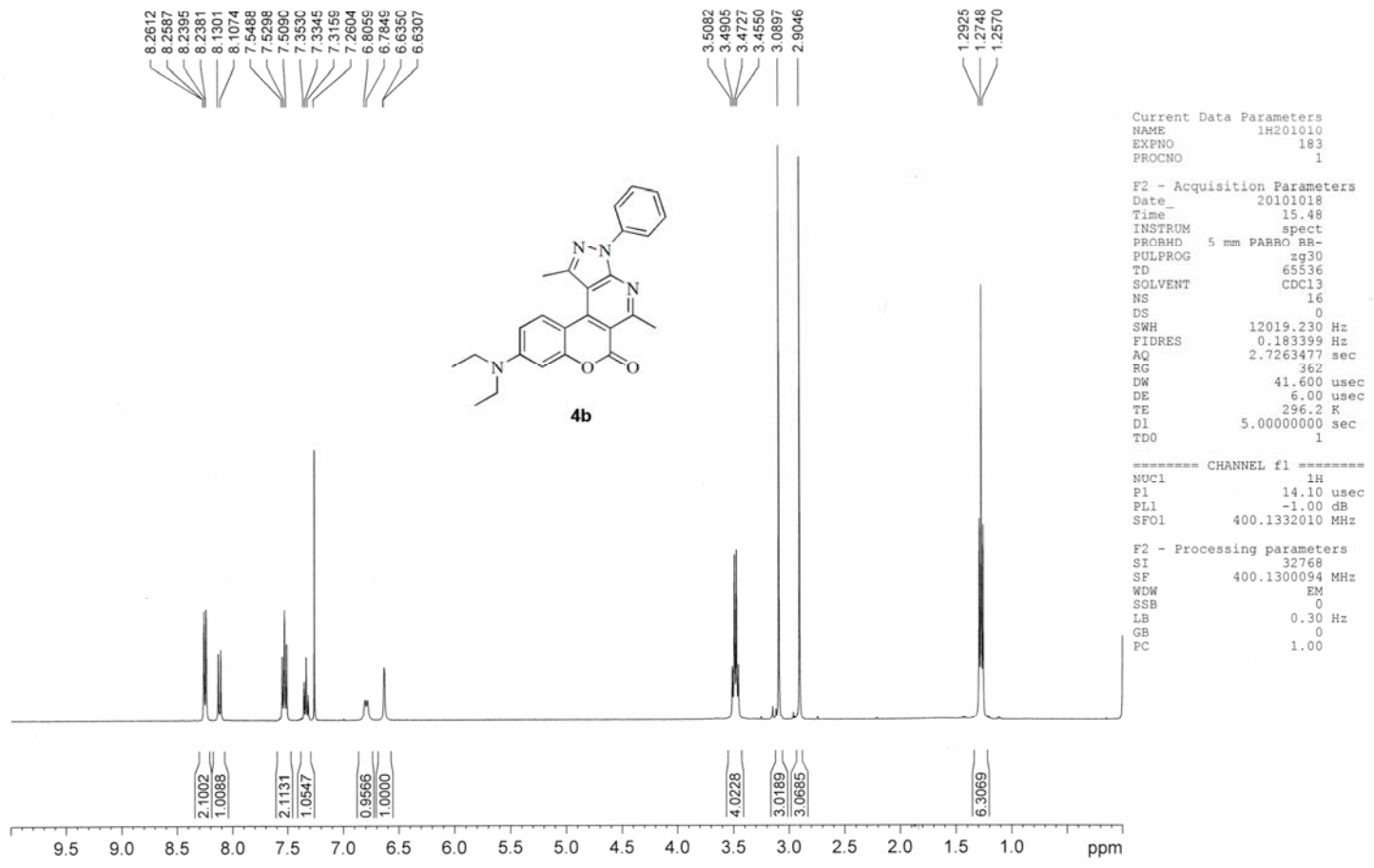
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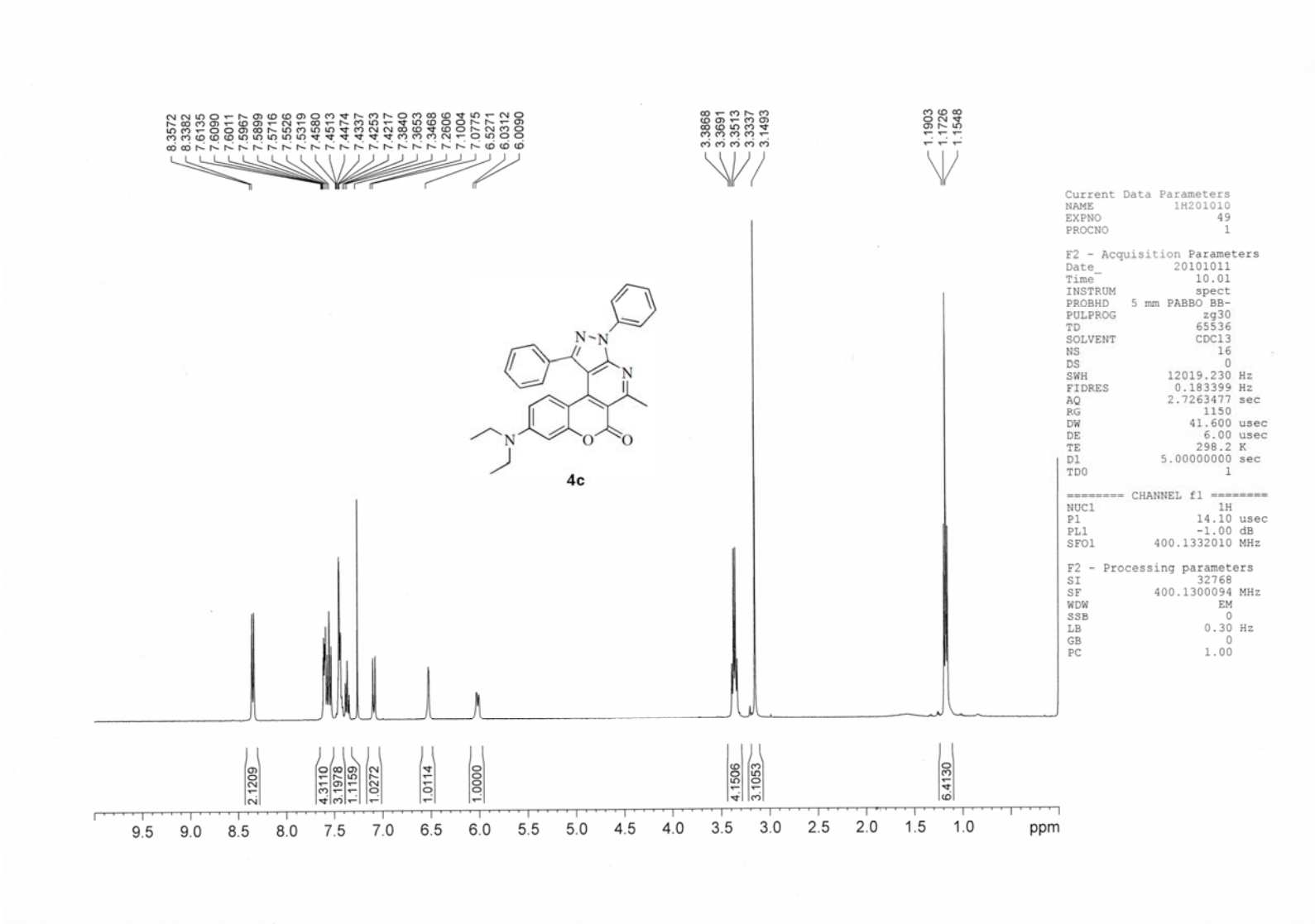
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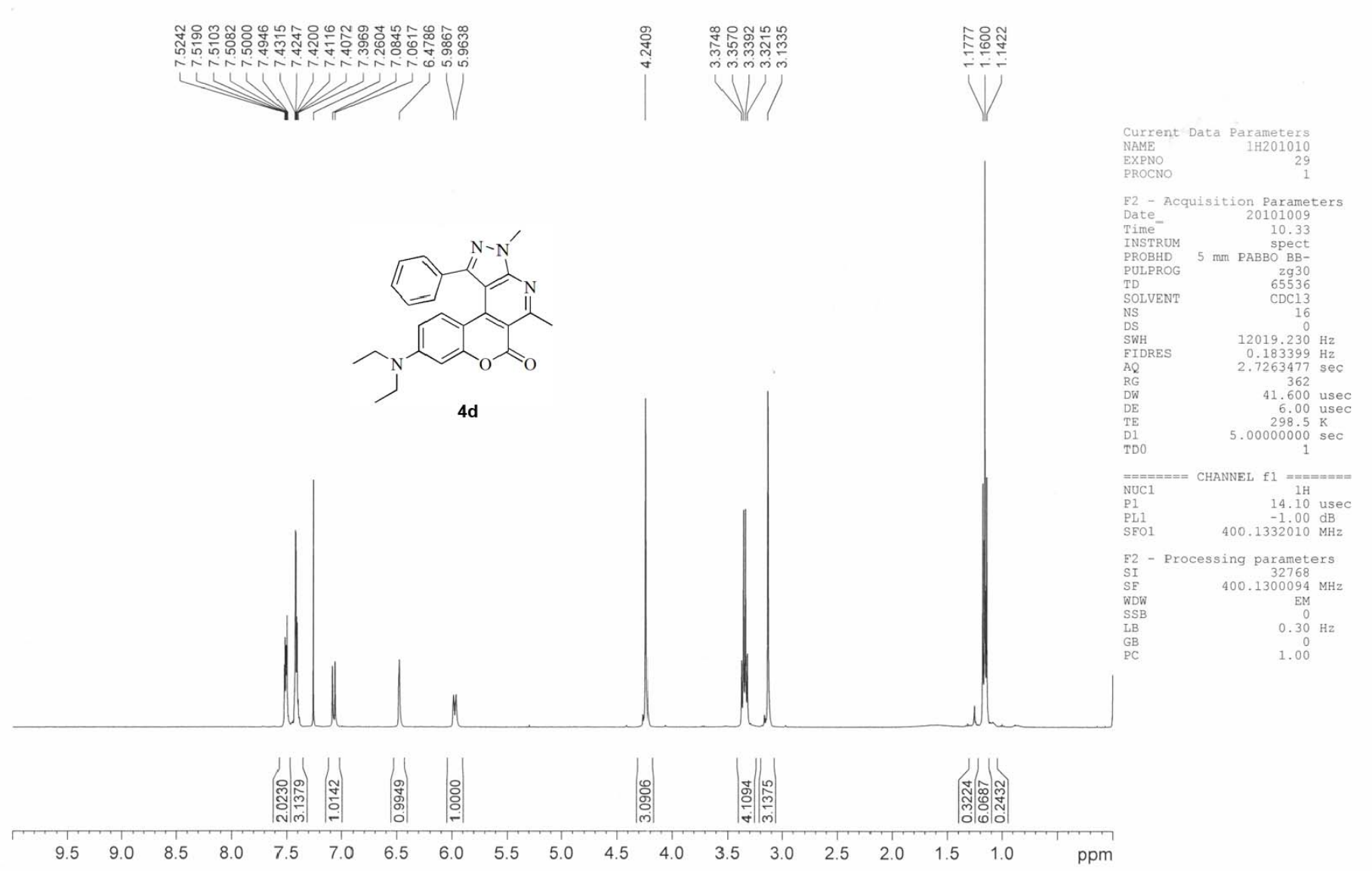
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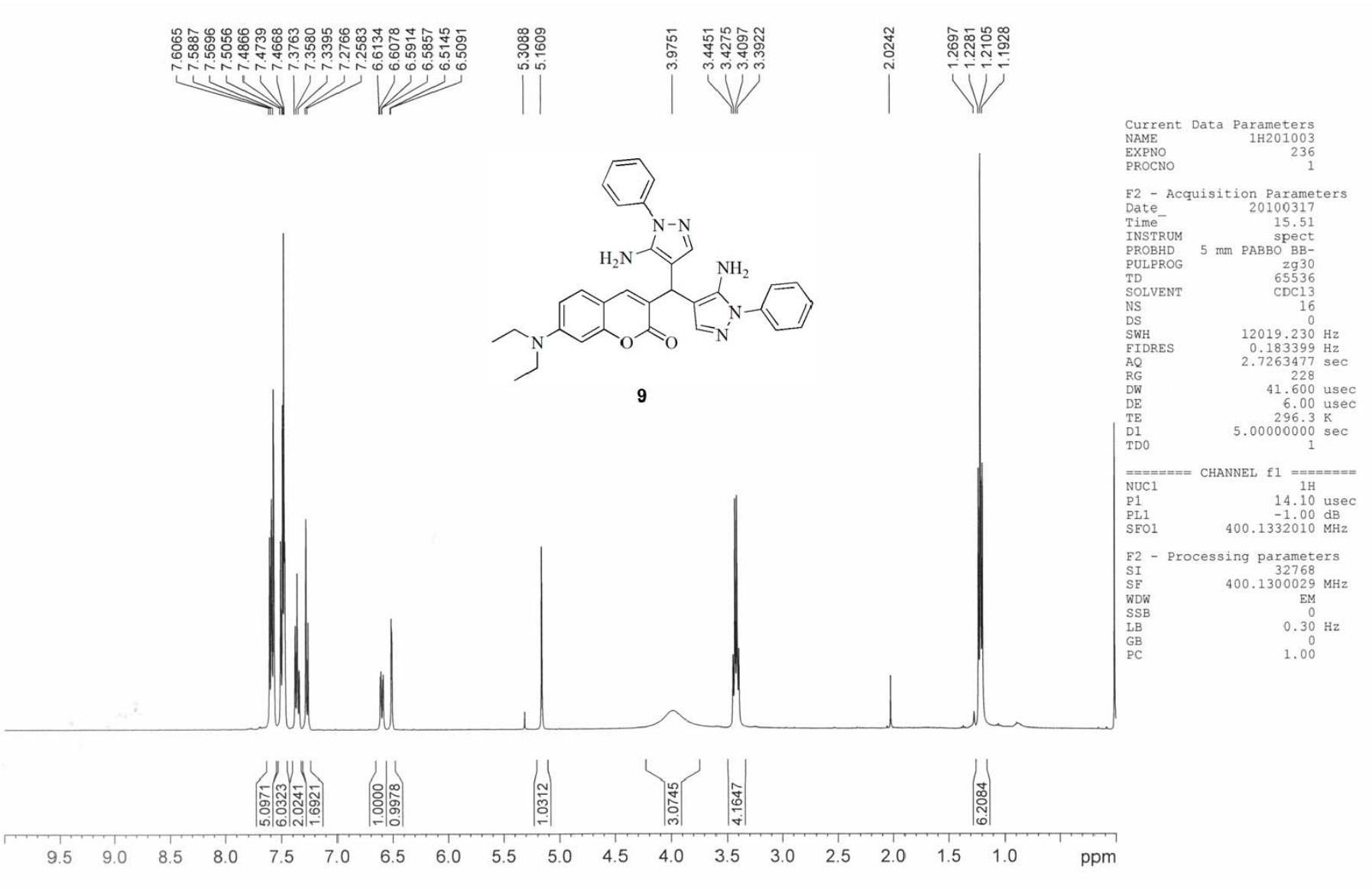
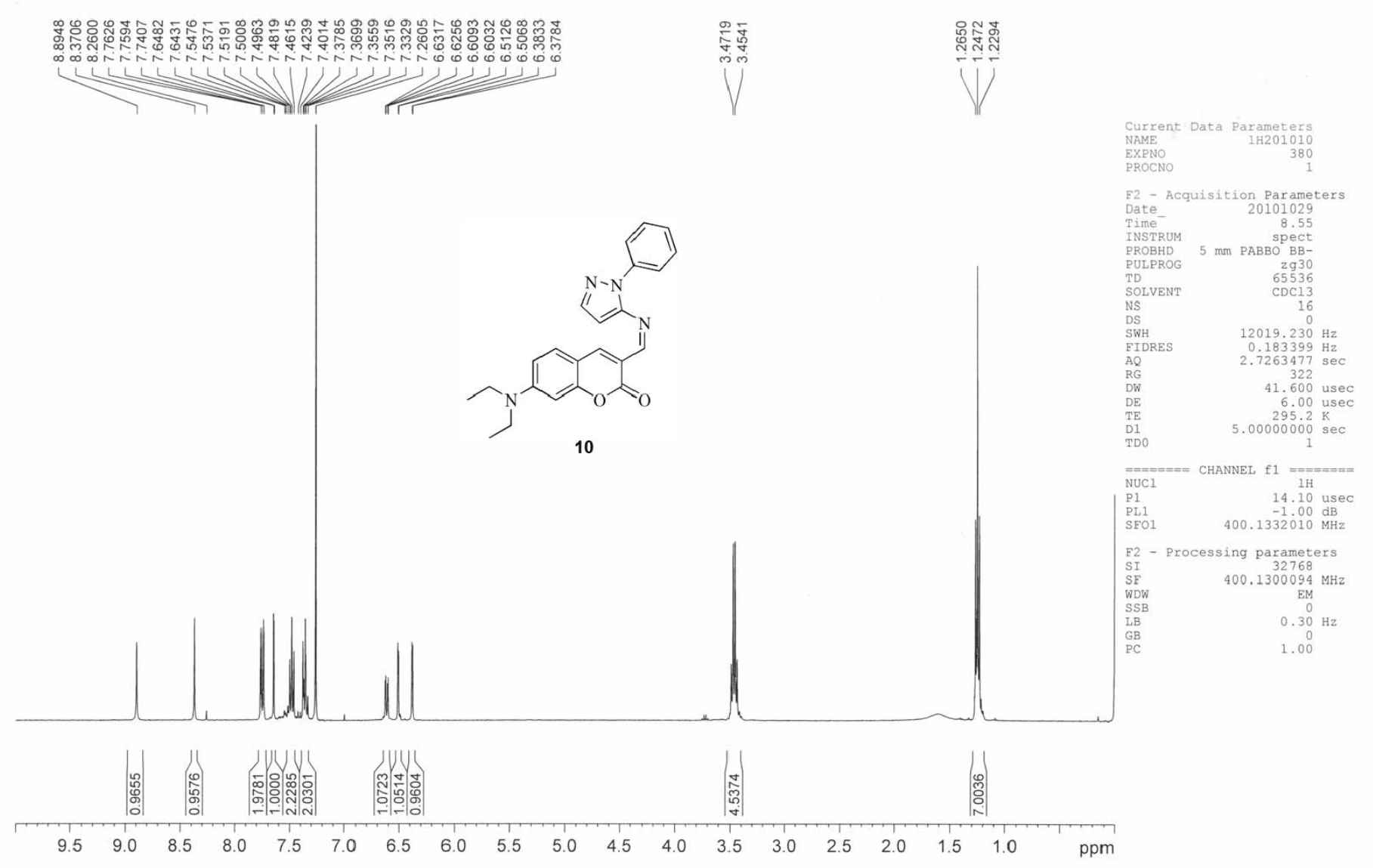
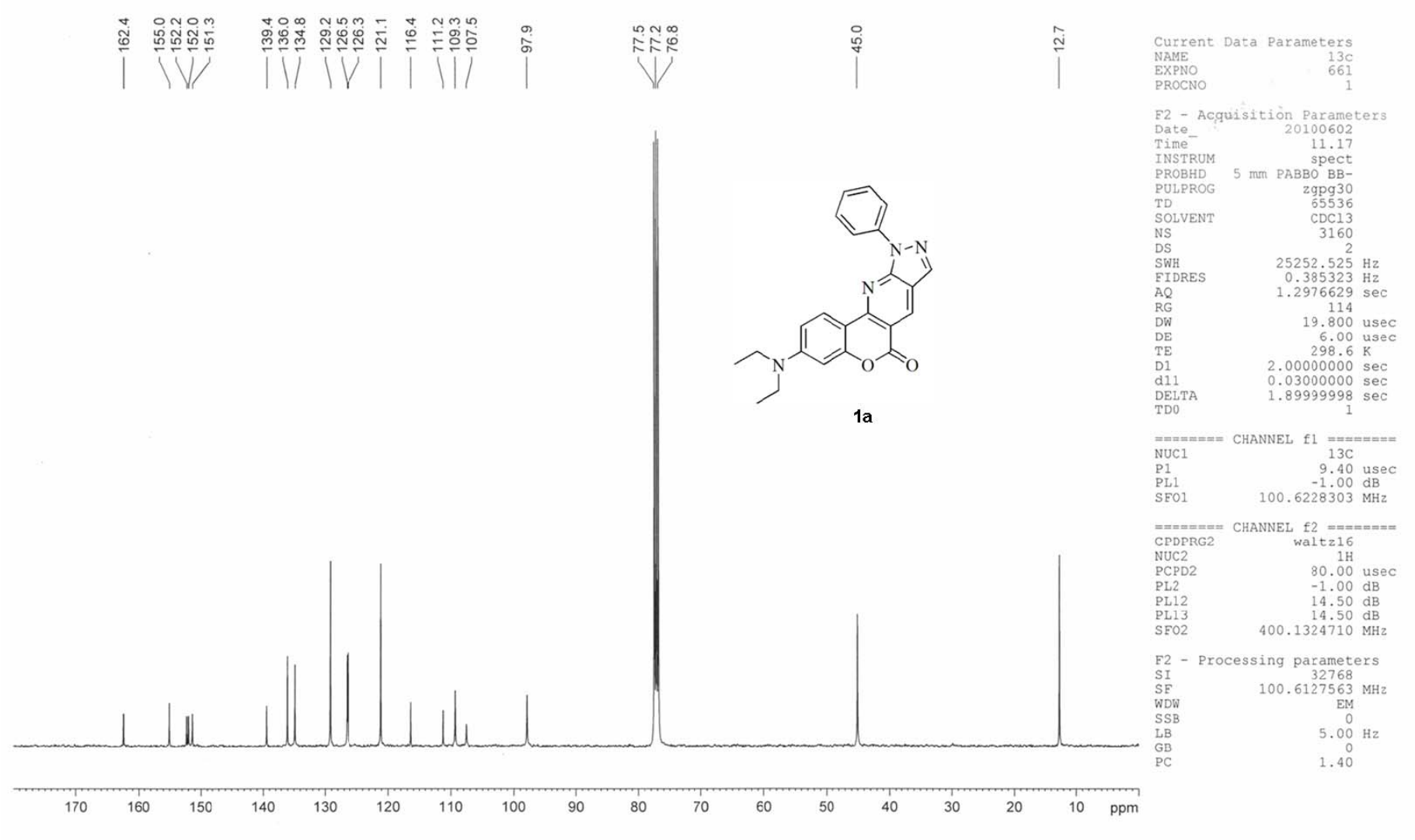
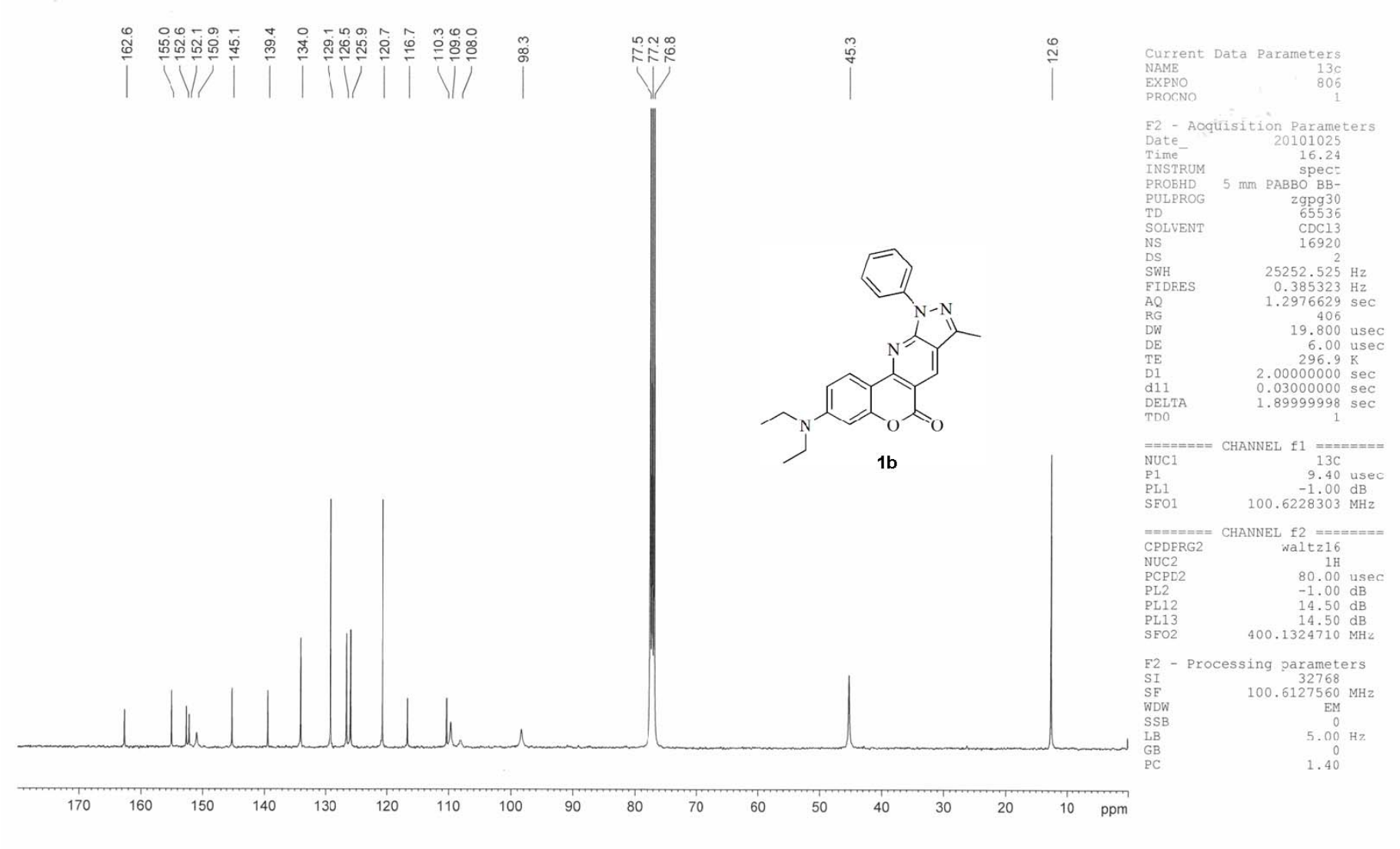
Time 10.33
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 0
SWH 12019.230 Hz
FIDRES 0.183399 Hz
AQ 2.7263477 sec
RG 362
DW 41.600 usec
DE 6.00 usec
TE 298.5 K
D1 5.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 14.10 usec
PL1 -1.00 dB
SFO1 400.1332010 MHz
F2 - Processing parameters
SI 32768
SF 400.1300094 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
2.0230
3.1379
1.0142
0.9949
1.0000
3.0906
4.1094
3.1375
0.3224
6.0687
0.2432
9.5 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
ppm


7.6065
7.5887
7.5696
7.5056
7.4866
7.4739
7.4668
7.3763
7.3580
7.3395
7.2766
7.2583
6.6134
6.6078
6.5914
6.5857
6.5145
6.5091
5.3088
5.1609
3.9751
3.4451
3.4275
3.4097
3.3922
2.0242
1.2697
1.2281
1.2105
1.1928
9
Current Data Parameters
NAME 1H201003
EXPNO 236
PROCNO 1
F2 - Acquisition Parameters
Date_ 20100317
Time 15.51
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 0
SWH 12019.230 Hz
FIDRES 0.183399 Hz
AQ 2.7263477 sec
RG 228
DW 41.600 usec
DE 6.00 usec
TE 296.3 K
D1 5.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 14.10 usec
PL1 -1.00 dB
SFO1 400.1332010 MHz
F2 - Processing parameters
SI 32768
SF 400.1300029 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
5.0971
6.0323
2.0241
1.6921
1.0000
0.9978
1.0312
3.0745
4.1647
6.2084
9.5 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
ppm

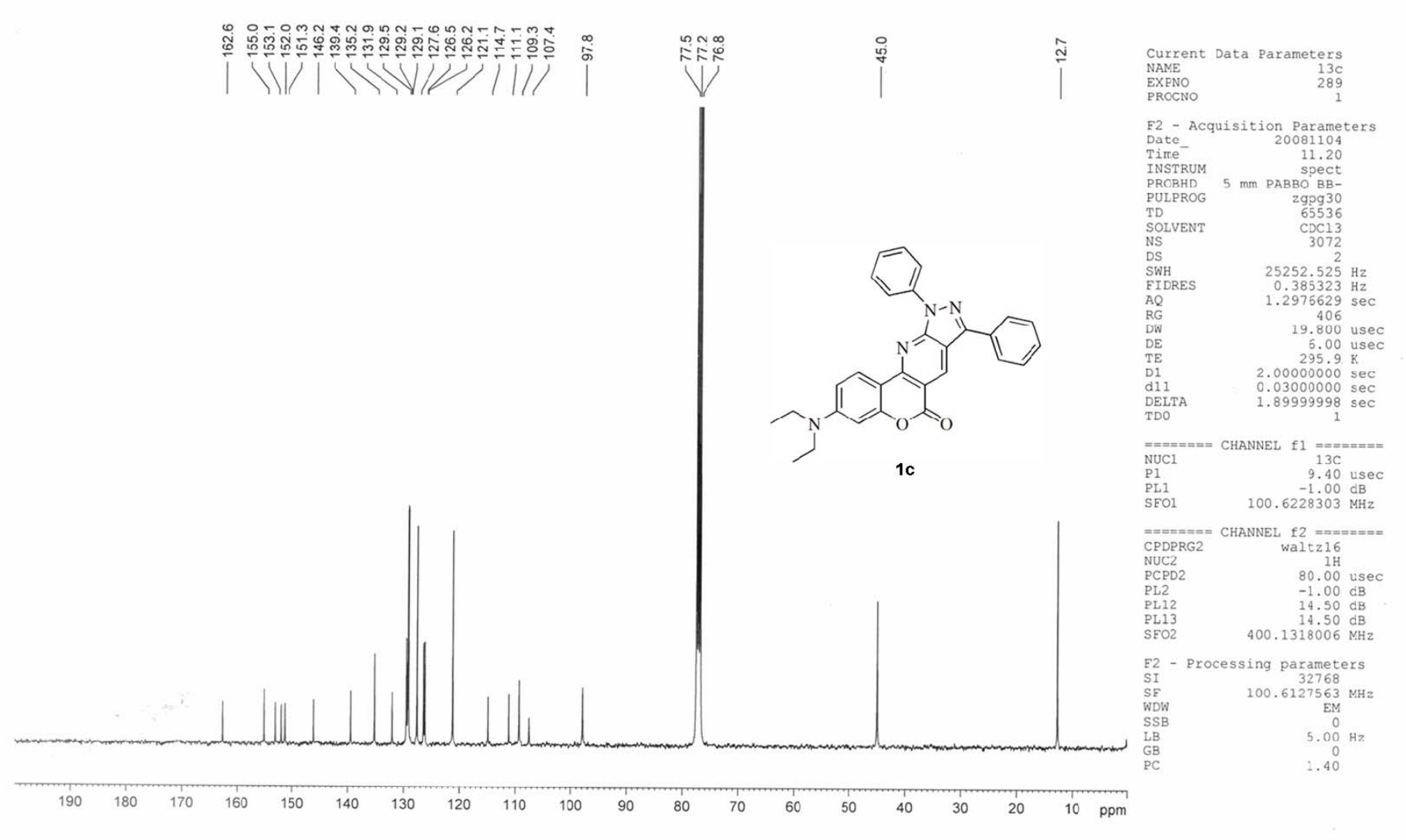

8.8948
8.3706
8.2600
7.7626
7.7594
7.7407
7.6482
7.6431
7.5476
7.5371
7.5191
7.5008
7.4963
7.4819
7.4615
7.4239
7.4014
7.3785
7.3699
7.3559
7.3516
7.3329
7.2605
6.6317
6.6256
6.6093
6.6032
6.5126
6.5068
6.3833
6.3784
3.4719
3.4541
1.2650
1.2472
1.2294
10
Current Data Parameters
NAME 1H201010
EXPNO 380
PROCNO 1
F2 - Acquisition Parameters
Date_ 20101029
Time 8.55
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 0
SWH 12019.230 Hz
FIDRES 0.183399 Hz
AQ 2.7263477 sec
RG 322
DW 41.600 usec
DE 6.00 usec
TE 295.2 K
D1 5.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 14.10 usec
PL1 -1.00 dB
SFO1 400.1332010 MHz
F2 - Processing parameters
SI 32768
SF 400.1300094 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
0.9655
0.9576
1.9781
1.0000
2.2285
2.0301
1.0723
1.0514
0.9604
4.5374
7.0036
9.5 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
ppm

^{13}C NMR spectra of new compounds.



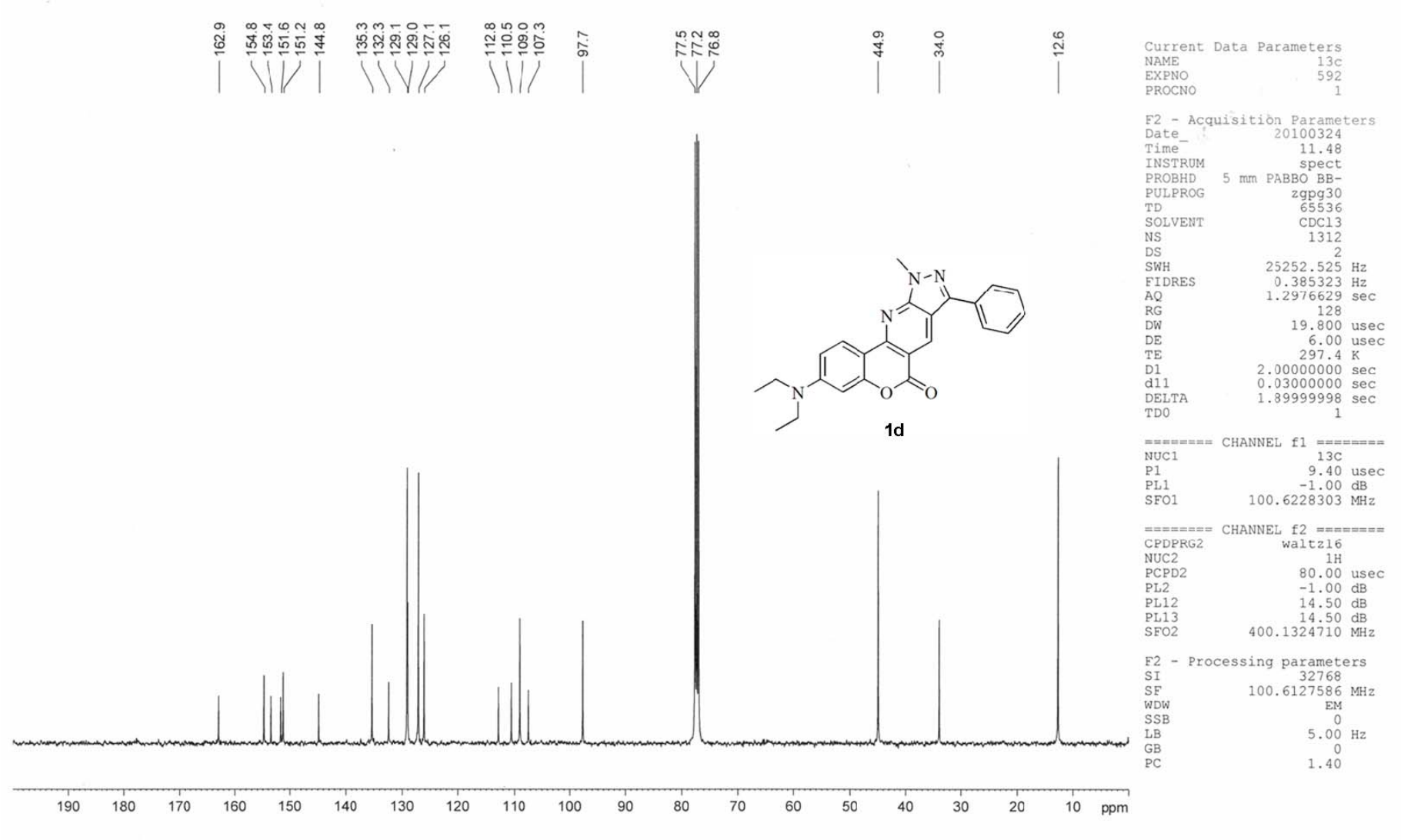



```
Current Data Parameters
NAME                  13c
EXPNO                 806
PROCNO                  1

F2 - Acquisition Parameters
Date_              20101025
Time                 16.24
INSTRUM              spect
PROBHD    5 mm PABBO BB-
PULPROG           zgpg30
TD                 65536
SOLVENT             CDCl3
NS                  16920
DS                      2
SWH             25252.525 Hz
FIDRES          0.385323 Hz
AQ              1.2976629 sec
RG                    406
DW                19.800 usec
DE                 6.00 usec
TE                296.9 K
D1             2.00000000 sec
d11            0.03000000 sec
DELTA          1.89999998 sec
TD0                     1

======== CHANNEL f1 ========
NUC1                  13C
P1                 9.40 usec
PL1               -1.00 dB
SFO1         100.6228303 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                  1H
PCPD2             80.00 usec
PL2               -1.00 dB
PL12              14.50 dB
PL13              14.50 dB
SFO2         400.1324710 MHz

F2 - Processing parameters
SI                 32768
SF           100.6127560 MHz
WDW                   EM
SSB                    0
LB                  5.00 Hz
GB                     0
PC                  1.40
```

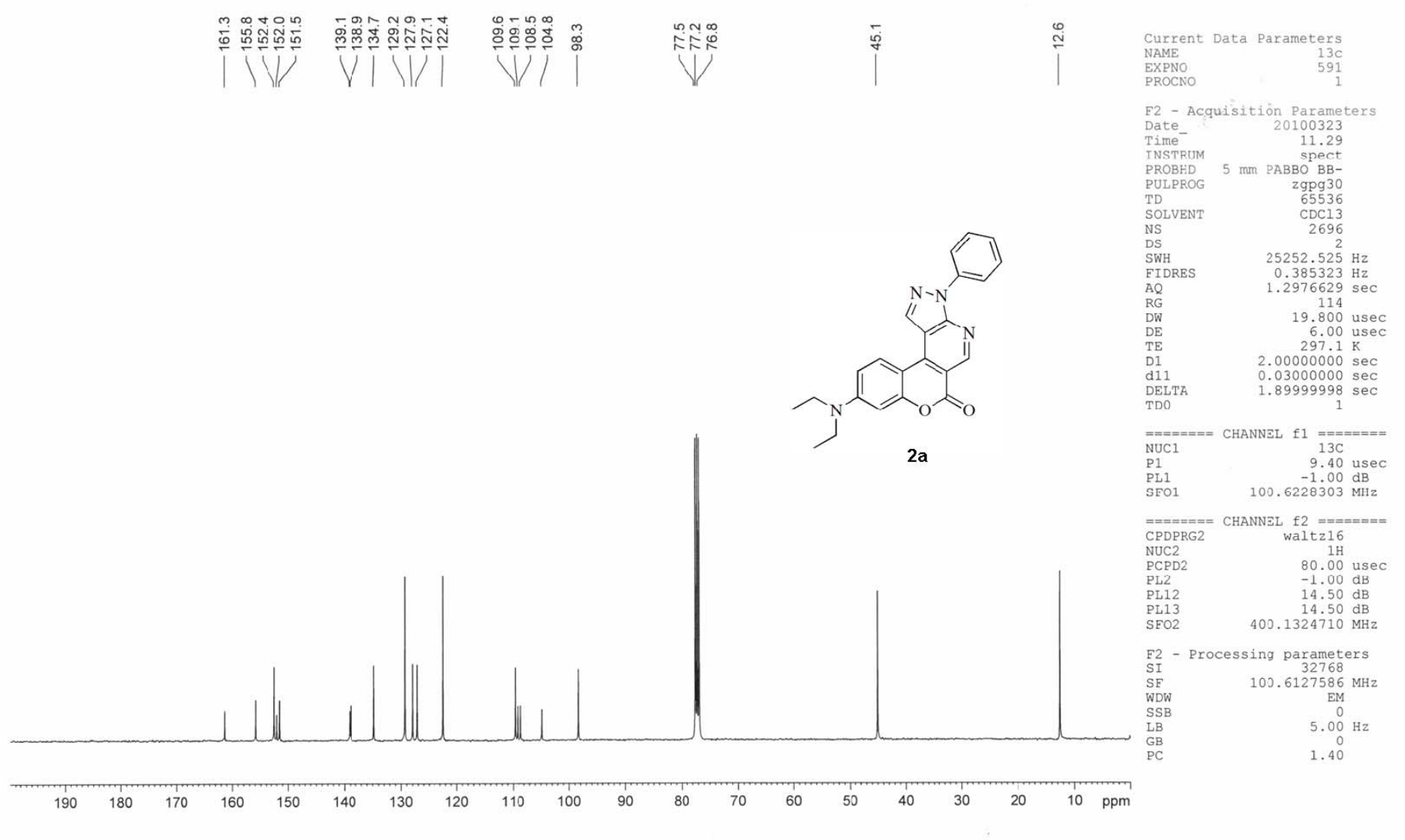


1c

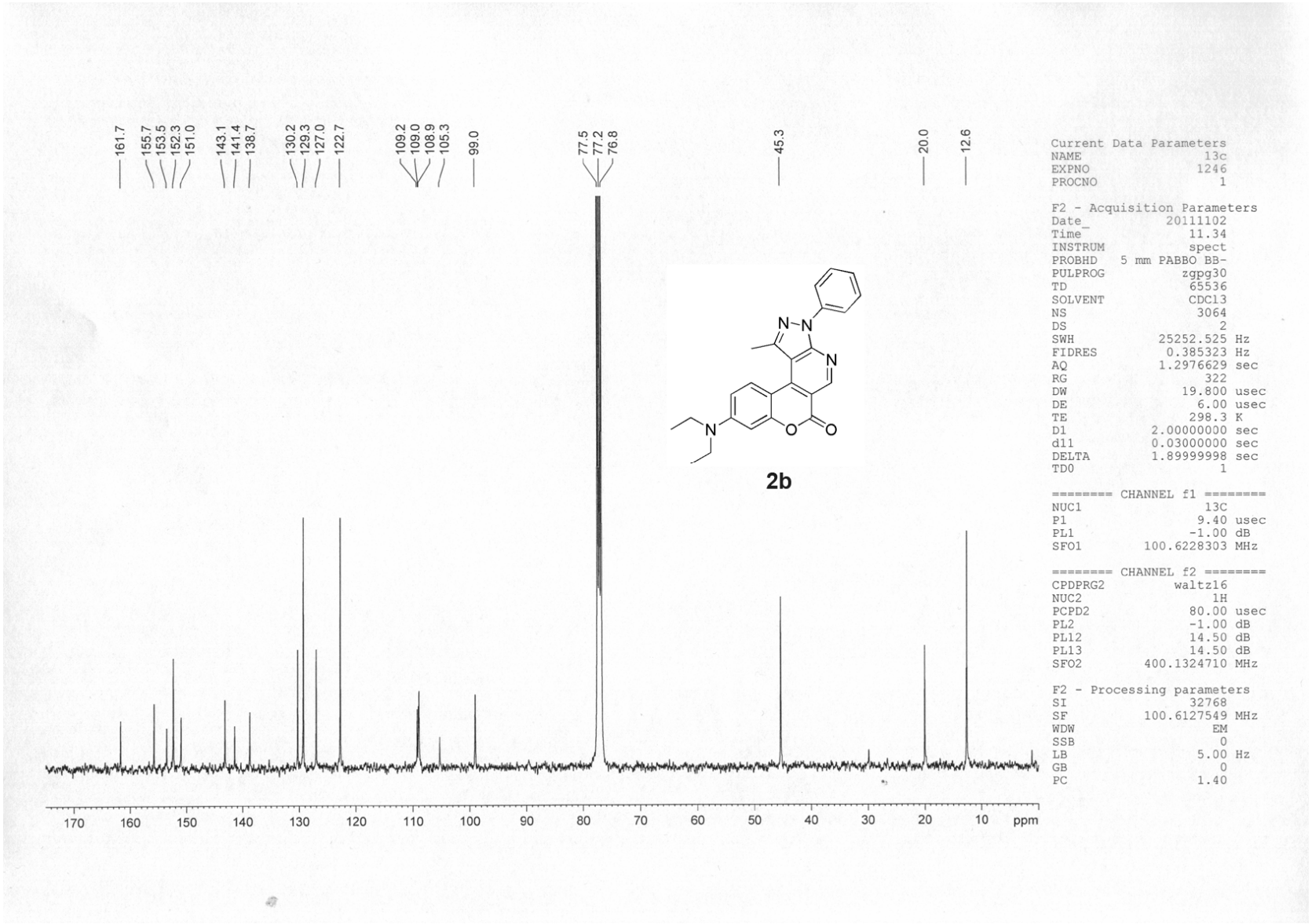
```
Current Data Parameters
NAME                  13c
EXPNO                 289
PROCNO                  1

F2 - Acquisition Parameters
Date_              20081104
Time                 11.20
INSTRUM              spect
PROBHD    5 mm PABBO BB-
PULPROG           zgpg30
TD                 65536
SOLVENT            CDCl3
NS                  3072
DS                     2
SWH            25252.525 Hz
FIDRES         0.385323 Hz
AQ             1.2976629 sec
RG                   406
DW                19.800 usec
DE                 6.00 usec
TE                295.9 K
D1             2.00000000 sec
d11            0.03000000 sec
DELTA          1.89999998 sec
TD0                    1

======== CHANNEL f1 ========
NUC1                 13C
P1                  9.40 usec
PL1                -1.00 dB
SFO1         100.6228303 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                 1H
PCPD2              80.00 usec
PL2                -1.00 dB
PL12               14.50 dB
PL13               14.50 dB
SFO2         400.1318006 MHz

F2 - Processing parameters
SI                 32768
SF           100.6127563 MHz
WDW                  EM
SSB                   0
LB                 5.00 Hz
GB                    0
PC                 1.40
```



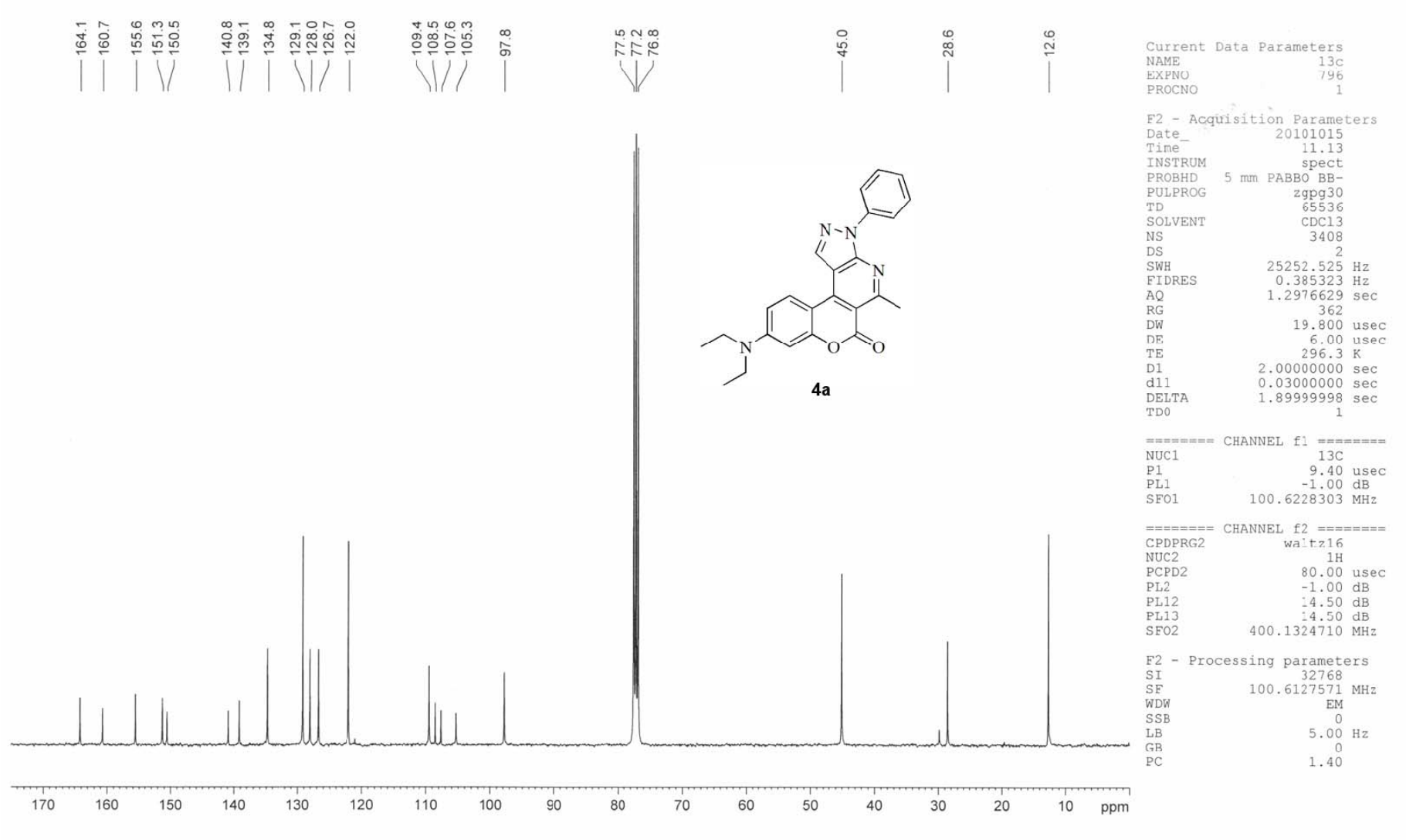

```
Current Data Parameters
NAME                  13c
EXPNO                 592
PROCNO                  1

F2 - Acquisition Parameters
Date_              20100324
Time                 11.48
INSTRUM              spect
PROBHD   5 mm PABBO BB-
PULPROG             zgpg30
TD                   65536
SOLVENT              CDCl3
NS                    1312
DS                       2
SWH              25252.525 Hz
FIDRES           0.385323 Hz
AQ               1.2976629 sec
RG                     128
DW                19.800 usec
DE                 6.00 usec
TE                 297.4 K
D1            2.00000000 sec
d11           0.03000000 sec
DELTA         1.89999998 sec
TD0                      1

======== CHANNEL f1 ========
NUC1                   13C
P1                  9.40 usec
PL1                -1.00 dB
SFO1         100.6228303 MHz

======== CHANNEL f2 ========
CPDPRG2            waltz16
NUC2                   1H
PCPD2              80.00 usec
PL2                -1.00 dB
PL12               14.50 dB
PL13               14.50 dB
SFO2         400.1324710 MHz

F2 - Processing parameters
SI                    32768
SF           100.6127586 MHz
WDW                      EM
SSB                       0
LB                 5.00 Hz
GB                        0
PC                     1.40
```



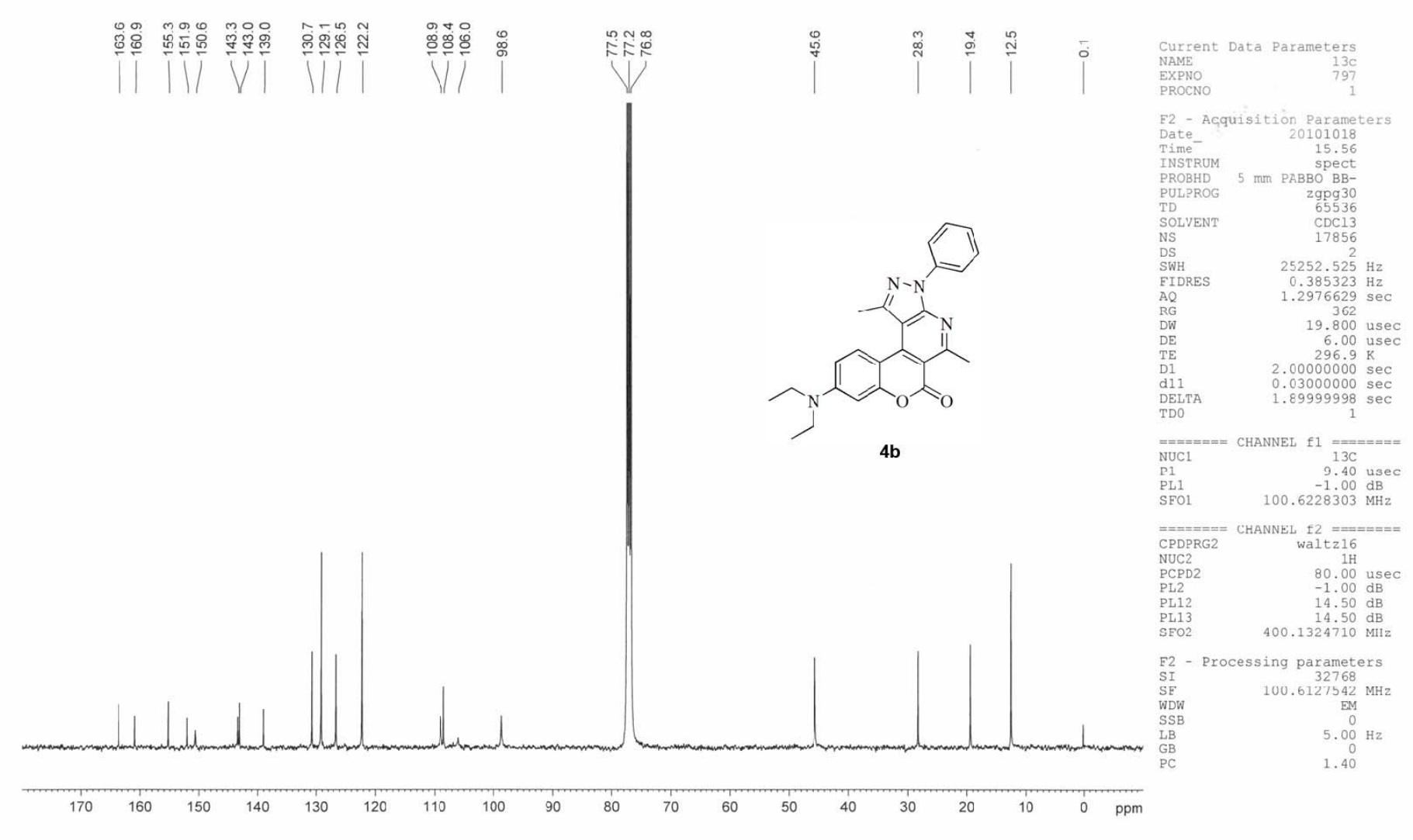

```
Current Data Parameters
NAME                  13c
EXPNO                 591
PROCNO                  1

F2 - Acquisition Parameters
Date_              20100323
Time                 11.29
INSTRUM              spect
PROBHD   5 mm PABBO BB-
PULPROG             zgpg30
TD                   65536
SOLVENT              CDCl3
NS                    2696
DS                       2
SWH              25252.525 Hz
FIDRES           0.385323 Hz
AQ               1.2976629 sec
RG                     114
DW                19.800 usec
DE                 6.00 usec
TE                 297.1 K
D1             2.00000000 sec
d11            0.03000000 sec
DELTA          1.89999998 sec
TD0                      1

======== CHANNEL f1 ========
NUC1                   13C
P1                  9.40 usec
PL1                -1.00 dB
SFO1         100.6228303 MHz

======== CHANNEL f2 ========
CPDPRG2            waltz16
NUC2                   1H
PCPD2              80.00 usec
PL2                -1.00 dB
PL12               14.50 dB
PL13               14.50 dB
SFO2         400.1324710 MHz

F2 - Processing parameters
SI                    32768
SF           100.6127586 MHz
WDW                    EM
SSB                     0
LB                 5.00 Hz
GB                      0
PC                   1.40
```

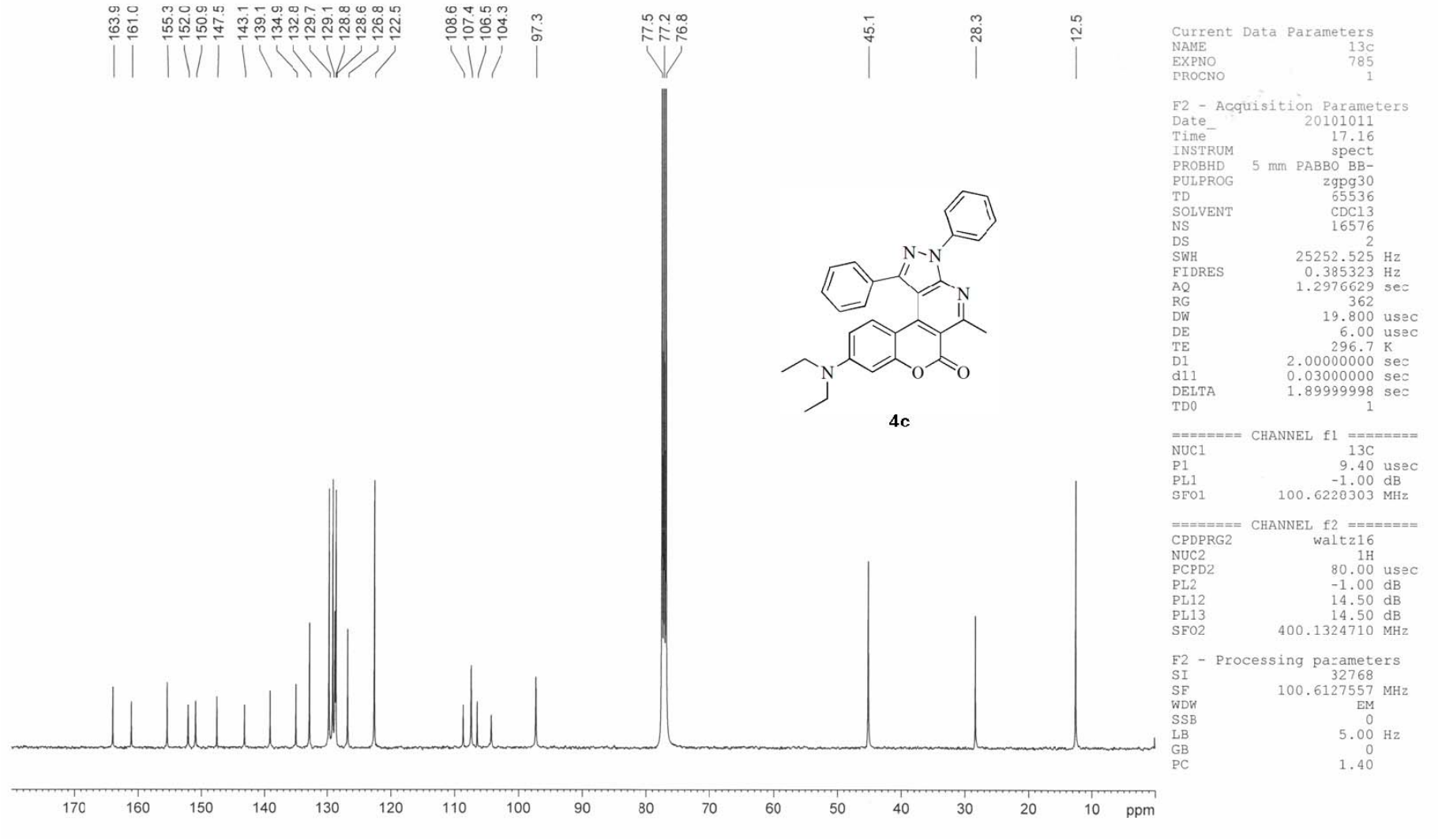


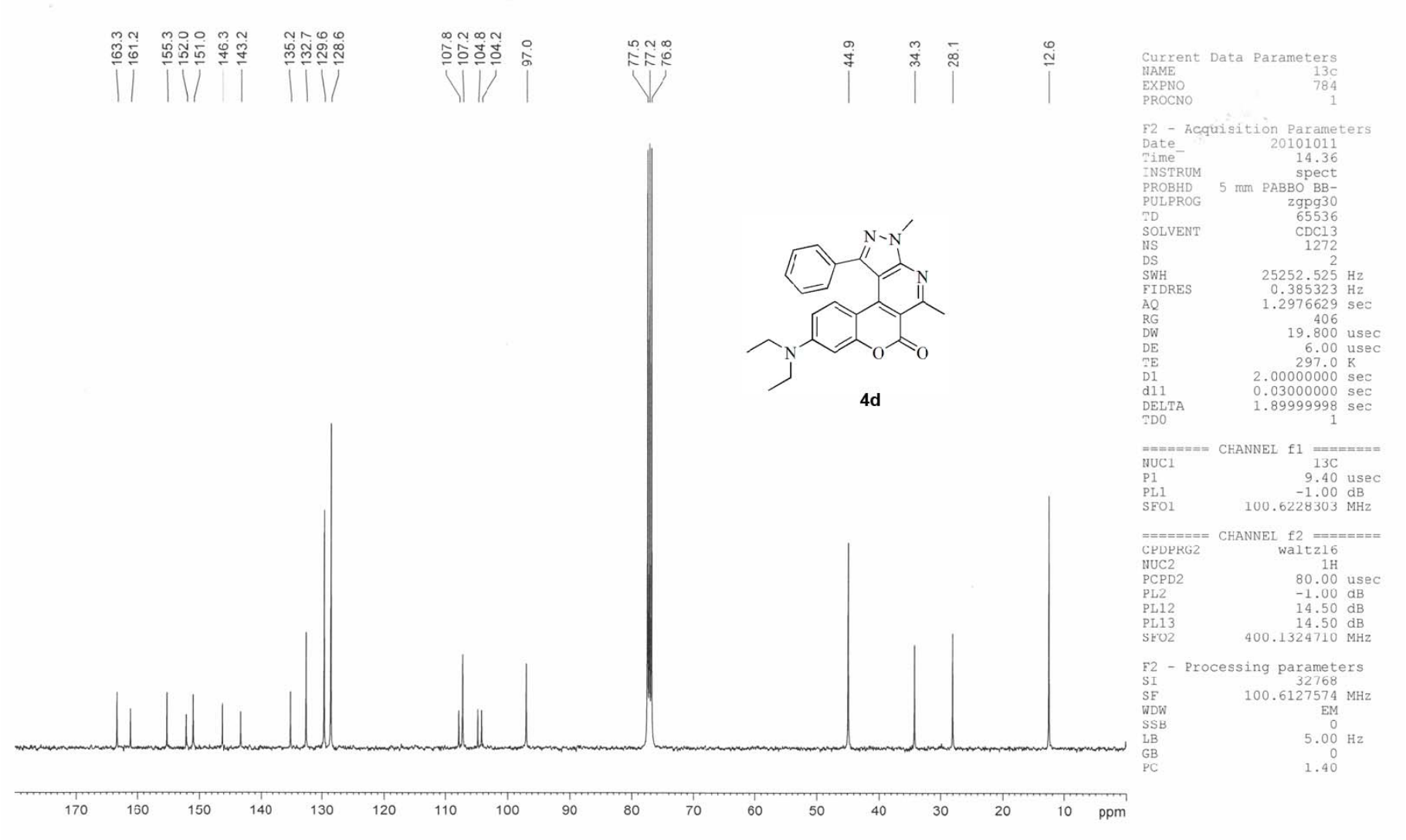

```
Current Data Parameters
NAME                  13c
EXPNO                1246
PROCNO                  1

F2 - Acquisition Parameters
Date_              20111102
Time                 11.34
INSTRUM              spect
PROBHD    5 mm PABBO BB-
PULPROG             zgpg30
TD                   65536
SOLVENT              CDCl3
NS                    3064
DS                       2
SWH             25252.525 Hz
FIDRES          0.385323 Hz
AQ              1.2976629 sec
RG                     322
DW                19.800 usec
DE                 6.00 usec
TE                 298.3 K
D1              2.00000000 sec
d11             0.03000000 sec
DELTA           1.89999998 sec
TD0                      1

======== CHANNEL f1 ========
NUC1                   13C
P1                    9.40 usec
PL1                  -1.00 dB
SFO1          100.6228303 MHz

======== CHANNEL f2 ========
CPDPRG2             waltz16
NUC2                    1H
PCPD2                80.00 usec
PL2                  -1.00 dB
PL12                 14.50 dB
PL13                 14.50 dB
SFO2          400.1324710 MHz

F2 - Processing parameters
SI                    32768
SF            100.6127549 MHz
WDW                      EM
SSB                       0
LB                     5.00 Hz
GB                        0
PC                     1.40
```

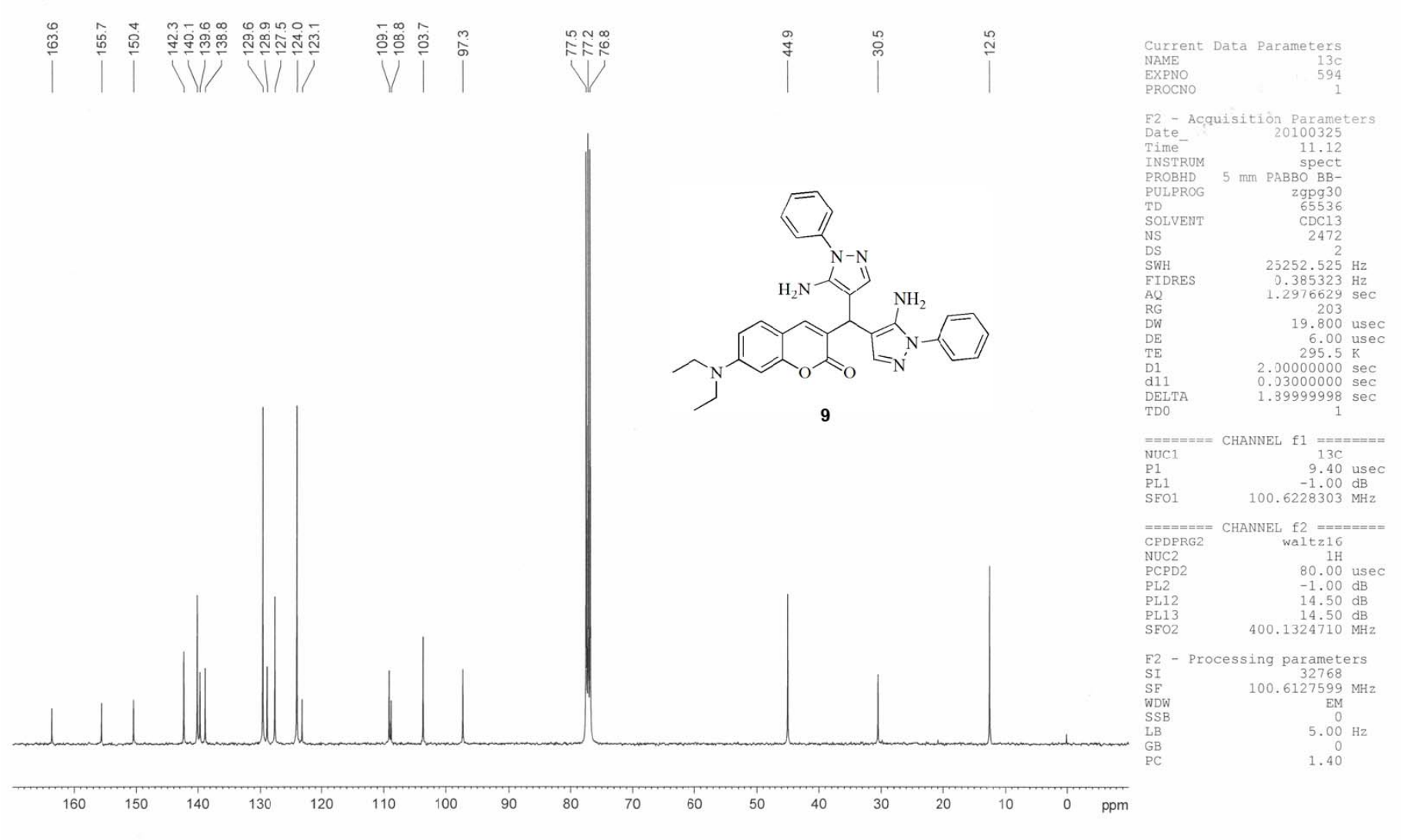



```
Current Data Parameters
NAME                  13c
EXPNO                 796
PROCNO                  1

F2 - Acquisition Parameters
Date_              20101015
Time                 11.13
INSTRUM              spect
PROBHD   5 mm PABBO BB-
PULPROG             zgpg30
TD                   65536
SOLVENT              CDCl3
NS                    3408
DS                       2
SWH              25252.525 Hz
FIDRES           0.385323 Hz
AQ               1.2976629 sec
RG                     362
DW                19.800 usec
DE                 6.00 usec
TE                296.3 K
D1             2.00000000 sec
d11            0.03000000 sec
DELTA          1.89999998 sec
TD0                      1

======== CHANNEL f1 ========
NUC1                   13C
P1                  9.40 usec
PL1                -1.00 dB
SFO1         100.6228303 MHz

======== CHANNEL f2 ========
CPDPRG2            waltz16
NUC2                   1H
PCPD2              80.00 usec
PL2                -1.00 dB
PL12               14.50 dB
PL13               14.50 dB
SFO2         400.1324710 MHz

F2 - Processing parameters
SI                    32768
SF           100.6127571 MHz
WDW                    EM
SSB                     0
LB                 5.00 Hz
GB                      0
PC                   1.40
```


163.6
160.9
155.3
151.9
150.6
143.3
143.0
139.0
130.7
129.1
126.5
122.2
108.9
108.4
106.0
98.6
77.5
77.2
76.8
45.6
28.3
19.4
12.5
0.1
4b
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
ppm
Current Data Parameters
NAME 13c
EXPNO 797
PROCNO 1
F2 - Acquisition Parameters
Date_ 20101018
Time 15.56
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 17856
DS 2
SWH 25252.525 Hz
FIDRES 0.385323 Hz
AQ 1.2976629 sec
RG 362
DW 19.800 usec
DE 6.00 usec
TE 296.9 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 9.40 usec
PL1 -1.00 dB
SFO1 100.6228303 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 -1.00 dB
PL12 14.50 dB
PL13 14.50 dB
SFO2 400.1324710 MHz
F2 - Processing parameters
SI 32768
SF 100.6127542 MHz
WDW EM
SSB 0
LB 5.00 Hz
GB 0
PC 1.40

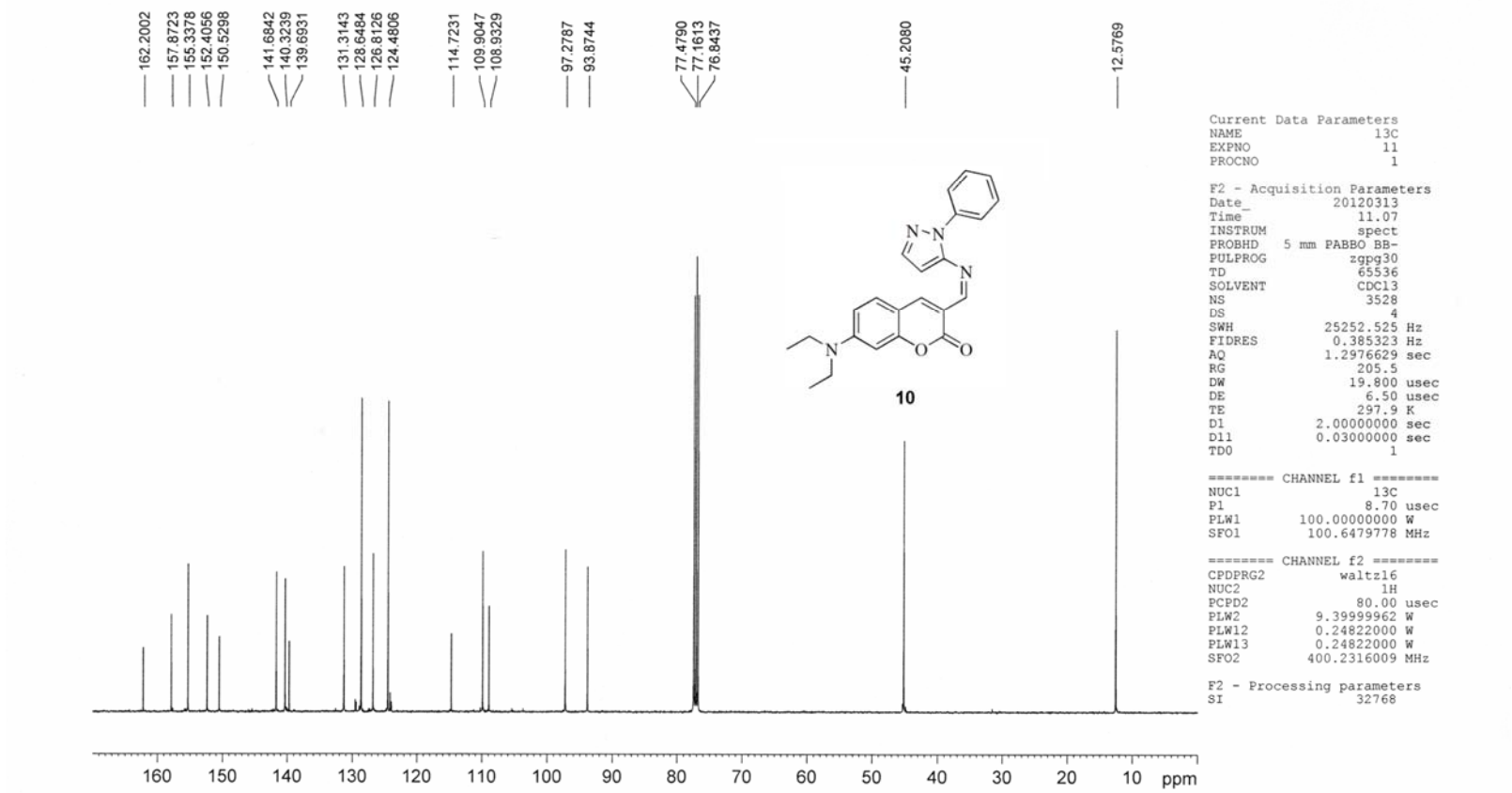

163.9
161.0
155.3
152.0
150.9
147.5
143.1
139.1
134.9
132.8
129.7
129.1
128.8
128.6
126.8
122.5
108.6
107.4
106.5
104.3
97.3
77.5
77.2
76.8
45.1
28.3
12.5
4c
Current Data Parameters
NAME 13c
EXPNO 785
PROCNO 1
F2 - Acquisition Parameters
Date_ 20101011
Time 17.16
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 16576
DS 2
SWH 25252.525 Hz
FIDRES 0.385323 Hz
AQ 1.2976629 sec
RG 362
DW 19.800 usec
DE 6.00 usec
TE 296.7 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 9.40 usec
PL1 -1.00 dB
SFO1 100.6228303 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 -1.00 dB
PL12 14.50 dB
PL13 14.50 dB
SFO2 400.1324710 MHz
F2 - Processing parameters
SI 32768
SF 100.6127557 MHz
WDW EM
SSB 0
LB 5.00 Hz
GB 0
PC 1.40
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
ppm


163.3
161.2
155.3
152.0
151.0
146.3
143.2
135.2
132.7
129.6
128.6
107.8
107.2
104.8
104.2
97.0
77.5
77.2
76.8
44.9
34.3
28.1
12.6
4d
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
ppm
Current Data Parameters
NAME 13c
EXPNO 784
PROCNO 1
F2 - Acquisition Parameters
Date_ 20101011
Time 14.36
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 1272
DS 2
SWH 25252.525 Hz
FIDRES 0.385323 Hz
AQ 1.2976629 sec
RG 406
DW 19.800 usec
DE 6.00 usec
TE 297.0 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 9.40 usec
PL1 -1.00 dB
SFO1 100.6228303 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 -1.00 dB
PL12 14.50 dB
PL13 14.50 dB
SFO2 400.1324710 MHz
F2 - Processing parameters
SI 32768
SF 100.6127574 MHz
WDW EM
SSB 0
LB 5.00 Hz
GB 0
PC 1.40



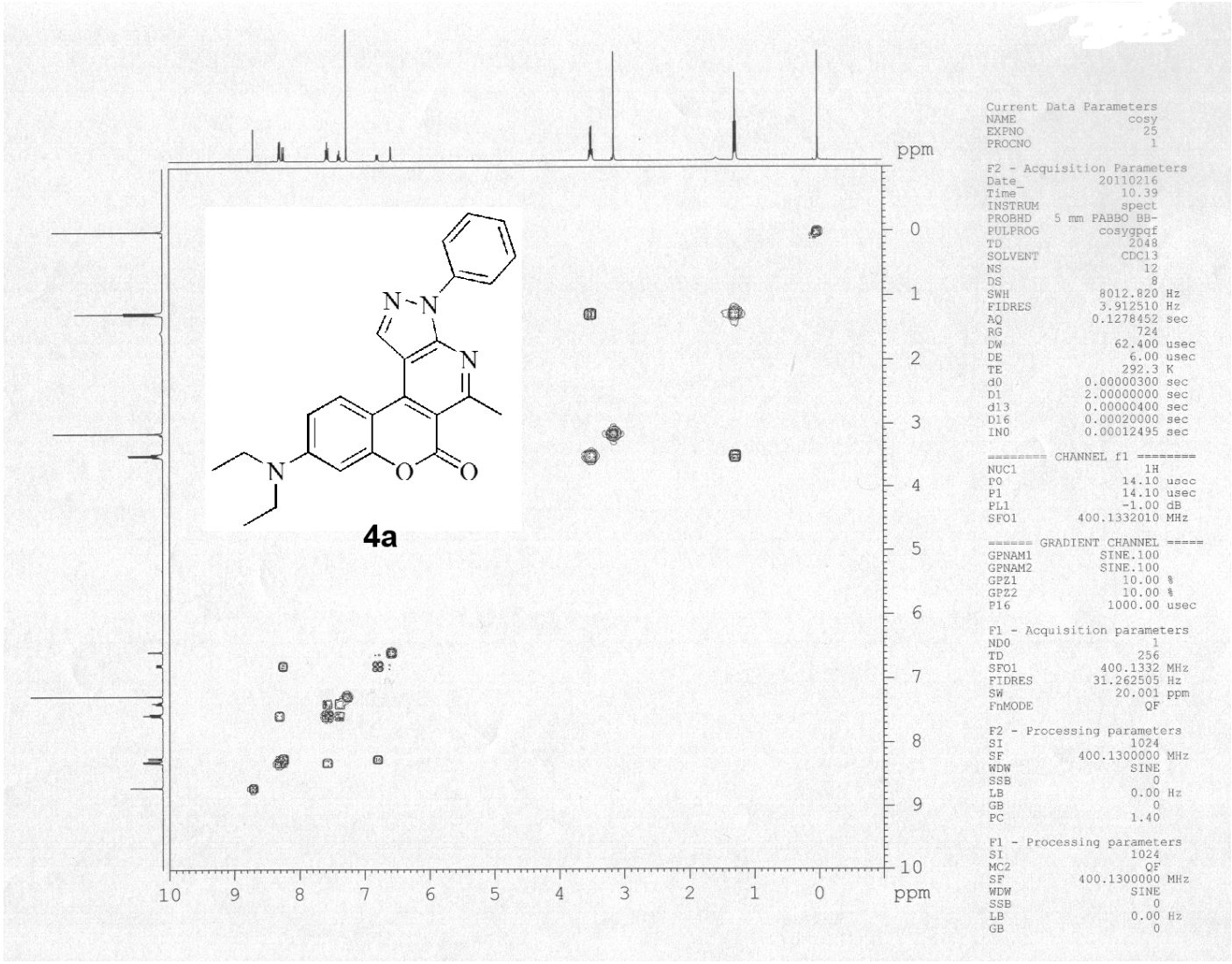
9

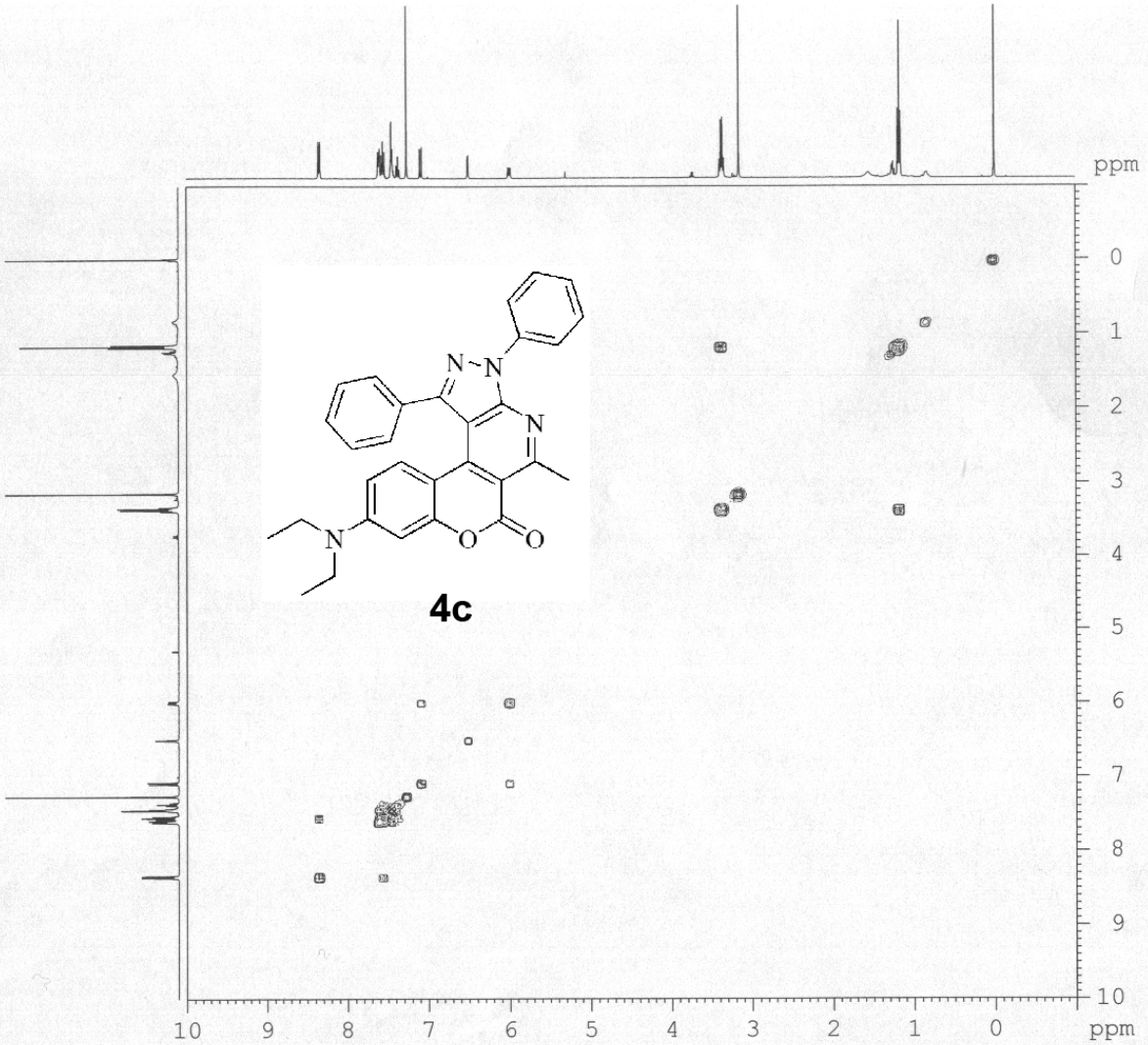
```
Current Data Parameters
NAME                  13c
EXPNO                 594
PROCNO                  1

F2 - Acquisition Parameters
Date_              20100325
Time                 11.12
INSTRUM              spect
PROBHD   5 mm PABBO BB-
PULPROG            zgpg30
TD                  65536
SOLVENT             CDCl3
NS                   2472
DS                      2
SWH              25252.525 Hz
FIDRES           0.385323 Hz
AQ               1.2976629 sec
RG                    203
DW                19.800 usec
DE                 6.00 usec
TE                 295.5 K
D1            2.00000000 sec
d11           0.03000000 sec
DELTA         1.39999998 sec
TD0                     1

======== CHANNEL f1 ========
NUC1                  13C
P1                 9.40 usec
PL1                -1.00 dB
SFO1         100.6228303 MHz

======== CHANNEL f2 ========
CPDPRG2           waltz16
NUC2                  1H
PCPD2             80.00 usec
PL2                -1.00 dB
PL12               14.50 dB
PL13               14.50 dB
SFO2         400.1324710 MHz

F2 - Processing parameters
SI                   32768
SF           100.6127599 MHz
WDW                    EM
SSB                     0
LB                 5.00 Hz
GB                      0
PC                   1.40
```




```
Current Data Parameters
NAME                  13C
EXPNO                  11
PROCNO                  1

F2 - Acquisition Parameters
Date_           20120313
Time               11.07
INSTRUM            spect
PROBHD   5 mm PABBO BB-
PULPROG         zgpg30
TD                65536
SOLVENT           CDCl3
NS                 3528
DS                    4
SWH           25252.525 Hz
FIDRES        0.385323 Hz
AQ            1.2976629 sec
RG                205.5
DW               19.800 usec
DE                6.50 usec
TE                297.9 K
D1            2.00000000 sec
D11           0.03000000 sec
TD0                   1

======== CHANNEL f1 ========
NUC1                 13C
P1                  8.70 usec
PLW1       100.00000000 W
SFO1        100.6479778 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                 1H
PCPD2              80.00 usec
PLW2          9.39999962 W
PLW12         0.24822000 W
PLW13         0.24822000 W
SFO2        400.2316009 MHz

F2 - Processing parameters
SI                 32768
```

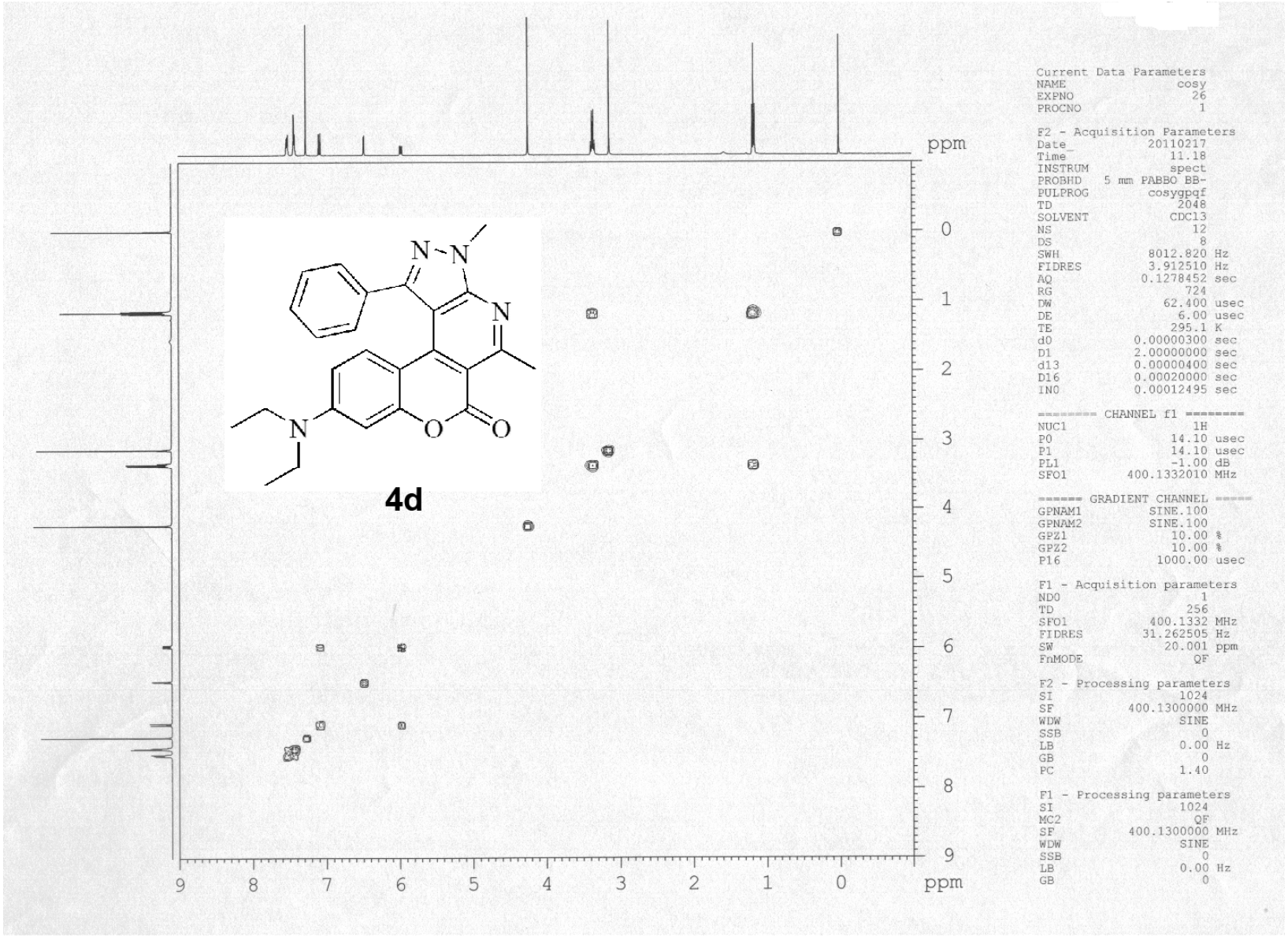
2D H-H COSY of compounds 4a, 4c and 4d





4c

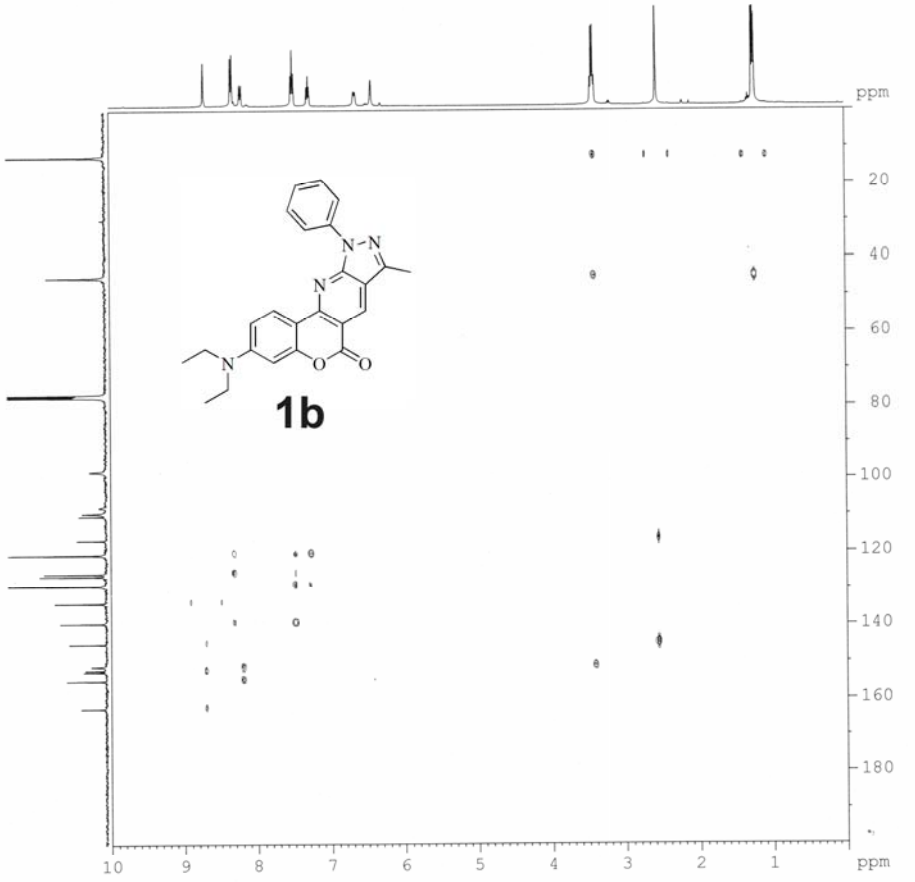
```
Current Data Parameters
NAME                  cosy
EXPNO                   27
PROCNO                   1

F2 - Acquisition Parameters
Date_              20110218
Time                  11.10
INSTRUM               spect
PROBHD   5 mm PABBO BB-
PULPROG           cosygpqf
TD                    2048
SOLVENT               CDCl3
NS                       12
DS                        8
SWH                8012.820 Hz
FIDRES             3.912510 Hz
AQ                 0.1278452 sec
RG                      724
DW                   62.400 usec
DE                    6.00 usec
TE                   294.9 K
d0                0.00000300 sec
D1                2.00000000 sec
d13               0.00000400 sec
D16               0.00020000 sec
IN0               0.00012495 sec

======== CHANNEL f1 ========
NUC1                     1H
P0                    14.10 usec
P1                    14.10 usec
PL1                   -1.00 dB
SFO1          400.1332010 MHz

====== GRADIENT CHANNEL =====
GPNAM1             SINE.100
GPNAM2             SINE.100
GPZ1                 10.00 %
GPZ2                 10.00 %
P16                1000.00 usec

F1 - Acquisition parameters
ND0                      1
TD                     256
SFO1            400.1332 MHz
FIDRES         31.262505 Hz
SW                 20.001 ppm
FnMODE                  QF

F2 - Processing parameters
SI                    1024
SF            400.1300000 MHz
WDW                   SINE
SSB                      0
LB                    0.00 Hz
GB                       0
PC                    1.40

F1 - Processing parameters
SI                    1024
MC2                     QF
SF            400.1300000 MHz
WDW                   SINE
SSB                      0
LB                    0.00 Hz
GB                       0
```



4d

```
Current Data Parameters
NAME                  cosy
EXPNO                   26
PROCNO                   1

F2 - Acquisition Parameters
Date_              20110217
Time                  11.18
INSTRUM                spect
PROBHD    5 mm PABBO BB-
PULPROG           cosygpqf
TD                    2048
SOLVENT               CDCl3
NS                       12
DS                        8
SWH                8012.820 Hz
FIDRES             3.912510 Hz
AQ                 0.1278452 sec
RG                      724
DW                   62.400 usec
DE                    6.00 usec
TE                   295.1 K
d0                0.00000300 sec
D1                2.00000000 sec
d13               0.00000400 sec
D16               0.00020000 sec
IN0               0.00012495 sec

======== CHANNEL f1 ========
NUC1                     1H
P0                    14.10 usec
P1                    14.10 usec
PL1                   -1.00 dB
SFO1           400.1332010 MHz

====== GRADIENT CHANNEL =====
GPNAM1             SINE.100
GPNAM2             SINE.100
GPZ1                 10.00 %
GPZ2                 10.00 %
P16                1000.00 usec

F1 - Acquisition parameters
ND0                      1
TD                     256
SFO1             400.1332 MHz
FIDRES          31.262505 Hz
SW                  20.001 ppm
FnMODE                  QF

F2 - Processing parameters
SI                     1024
SF             400.1300000 MHz
WDW                    SINE
SSB                       0
LB                     0.00 Hz
GB                        0
PC                     1.40

F1 - Processing parameters
SI                     1024
MC2                     QF
SF             400.1300000 MHz
WDW                    SINE
SSB                       0
LB                     0.00 Hz
GB                        0
```

2D C-H COSY of compounds 1b




```
Current Data Parameters
NAME                  hmbc
EXPNO                    8
PROCNO                   1

F2 - Acquisition Parameters
Date_              20111130
Time                 11.43
INSTRUM              spect
PROBHD   5 mm PABBO BB-
PULPROG     hmbcgplpndqf
TD                   4096
SOLVENT             CDCl3
NS                     16
DS                     16
SWH               4854.369 Hz
FIDRES            1.185149 Hz
AQ                0.4219380 sec
RG                    2050
DW                 103.000 usec
DE                   8.00 usec
TE                  296.8 K
CNST2           145.0000000
CNST13           10.0000000
d0               0.00000300 sec
D1               1.47132802 sec
d2               0.00344828 sec
d6               0.05000000 sec
D16              0.00020000 sec
IN0              0.00002240 sec

======== CHANNEL f1 ========
NUC1                    1H
P1                   13.50 usec
p2                   27.00 usec
PL1                   0.00 dB
SFO1          400.1319247 MHz

======== CHANNEL f2 ========
NUC2                   13C
P3                   10.00 usec
PL2                  -3.00 dB
SFO2          100.6228138 MHz

====== GRADIENT CHANNEL =====
GPNAM1            SINE.100
GPNAM2            SINE.100
GPNAM3            SINE.100
GPZ1                 50.00 %
GPZ2                 30.00 %
GPZ3                 40.10 %
P16                1000.00 usec

F1 - Acquisition parameters
ND0                     2
TD                    128
SFO1           100.6228 MHz
FIDRES         174.386154 Hz
SW                221.833 ppm
FnMODE                 QF

F2 - Processing parameters
SI                   2048
SF            400.1300074 MHz
WDW                  SINE
```