

Phaeochromycins F–H, three new polyketide metabolites from *Streptomyces* sp. DSS-18

Jian Li, Chun-Hua Lu, Bao-Bing Zhao, Zhong-Hui Zheng* and Yue-Mao Shen

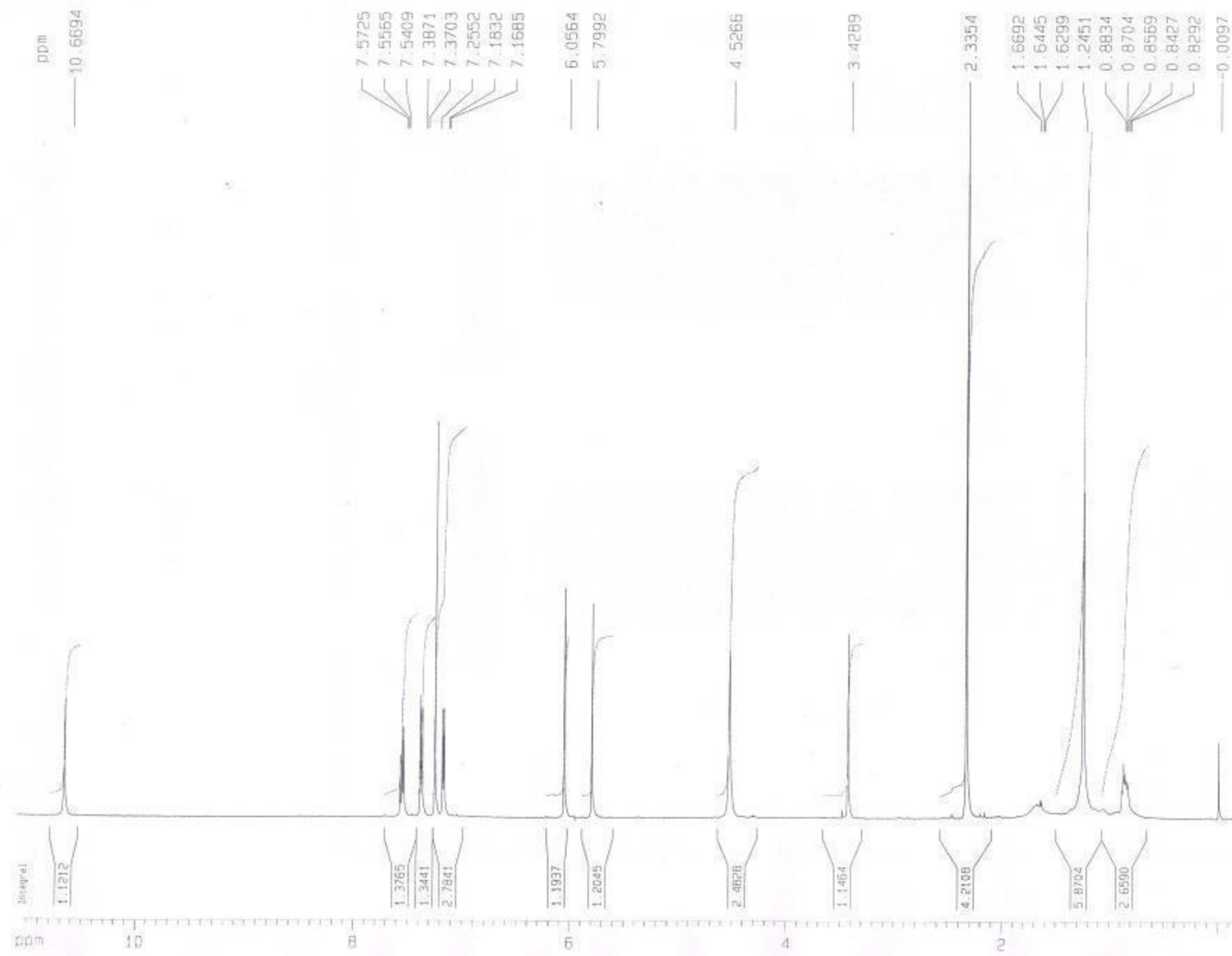
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NMR spectra of compounds **1–3**.

Page SI 19

HPLC data of compound **1** and crude extract.



Current Data Parameters
 NAME mds20
 EXPNO 21
 PROCNO 1

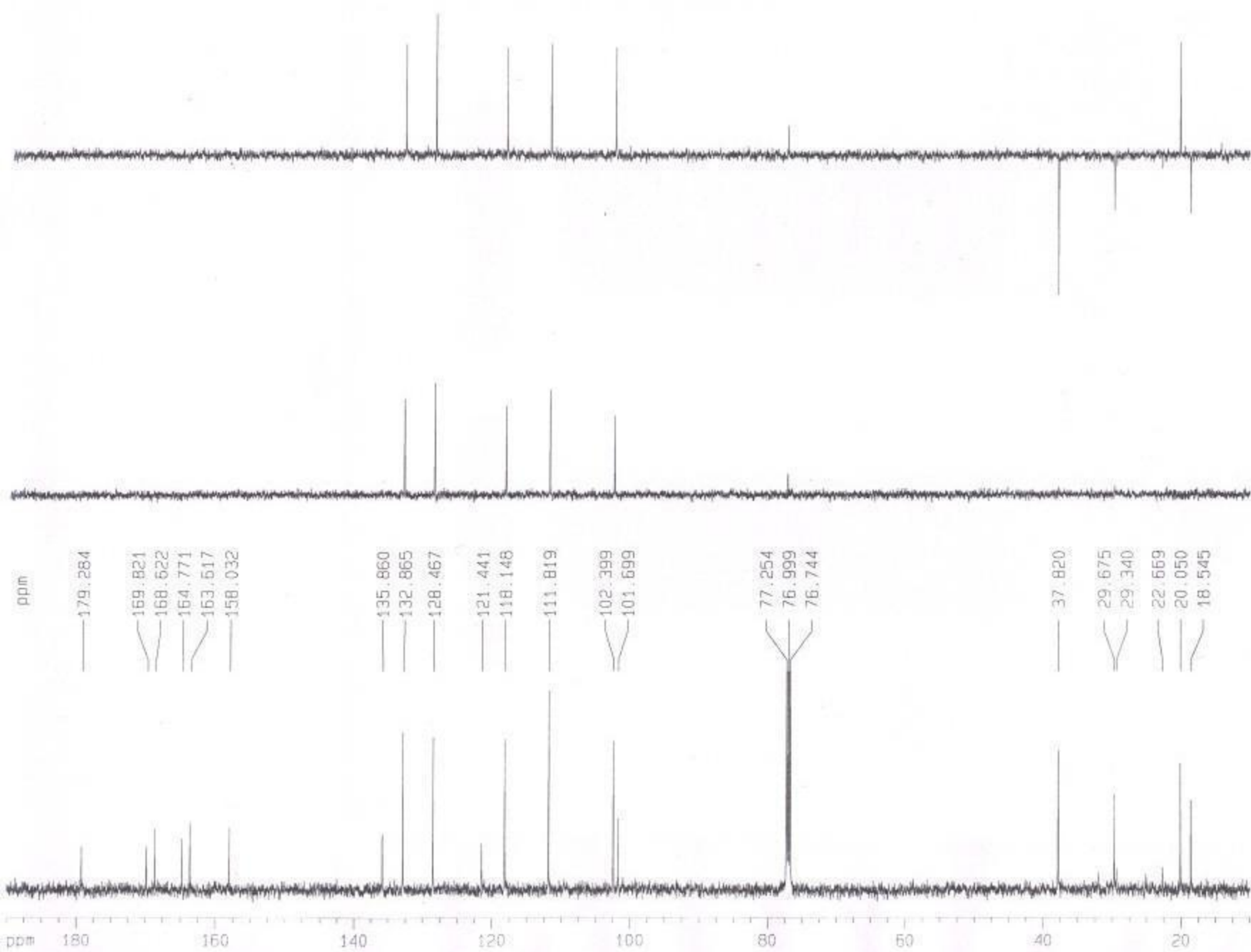
F2 - Acquisition Parameters
 Date_ 20051125
 Time 17.17
 INSTRUM ORX500
 PROBHD 5 mm BBI 1H-88
 PULPROG zg
 TD 32768
 SOLVENT CDCl3
 NS 1
 DS 0
 SWH 6127.451 Hz
 FIDRES 0.186995 Hz
 AQ 2.6739187 sec
 RG 80.6
 DW 81.600 usec
 DE 6.00 usec
 TE 300.0 K
 D1 2.00000000 sec

----- CHANNEL f1 -----
 NUC1 1H
 P1 10.00 usec
 PL1 -4.00 dB
 SF01 500.1329931 MHz

F2 - Processing parameters
 SI 16384
 SF 500.1300160 MHz
 WDM EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00

ID NMR plot parameters
 CX 22.00 cm
 CY 14.00 cm
 F1P 11.095 ppm
 F1 5548.92 Hz
 F2P -0.152 ppm
 F2 -75.93 Hz
 PPMCN 0.51122 ppm/cm
 HZCM 255.67503 Hz/cm

1-DEPT



Current Data Parameters
 NAME inds20
 EXPNO 22
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20051128
 Time 13.48
 INSTRUM DRX500
 PROBHD 5 mm DUL 13C-1
 PULPROG zgpg30
 TD 32768
 SOLVENT COC13
 NS 203
 DS 0
 SMH 29498.525 Hz
 FIDRES 0.900224 Hz
 AQ 0.5554676 sec
 RG 8182
 DM 16.950 usec
 DE 6.00 usec
 TE 300.0 K
 D1 3.0000000 sec
 d11 0.0300000 sec

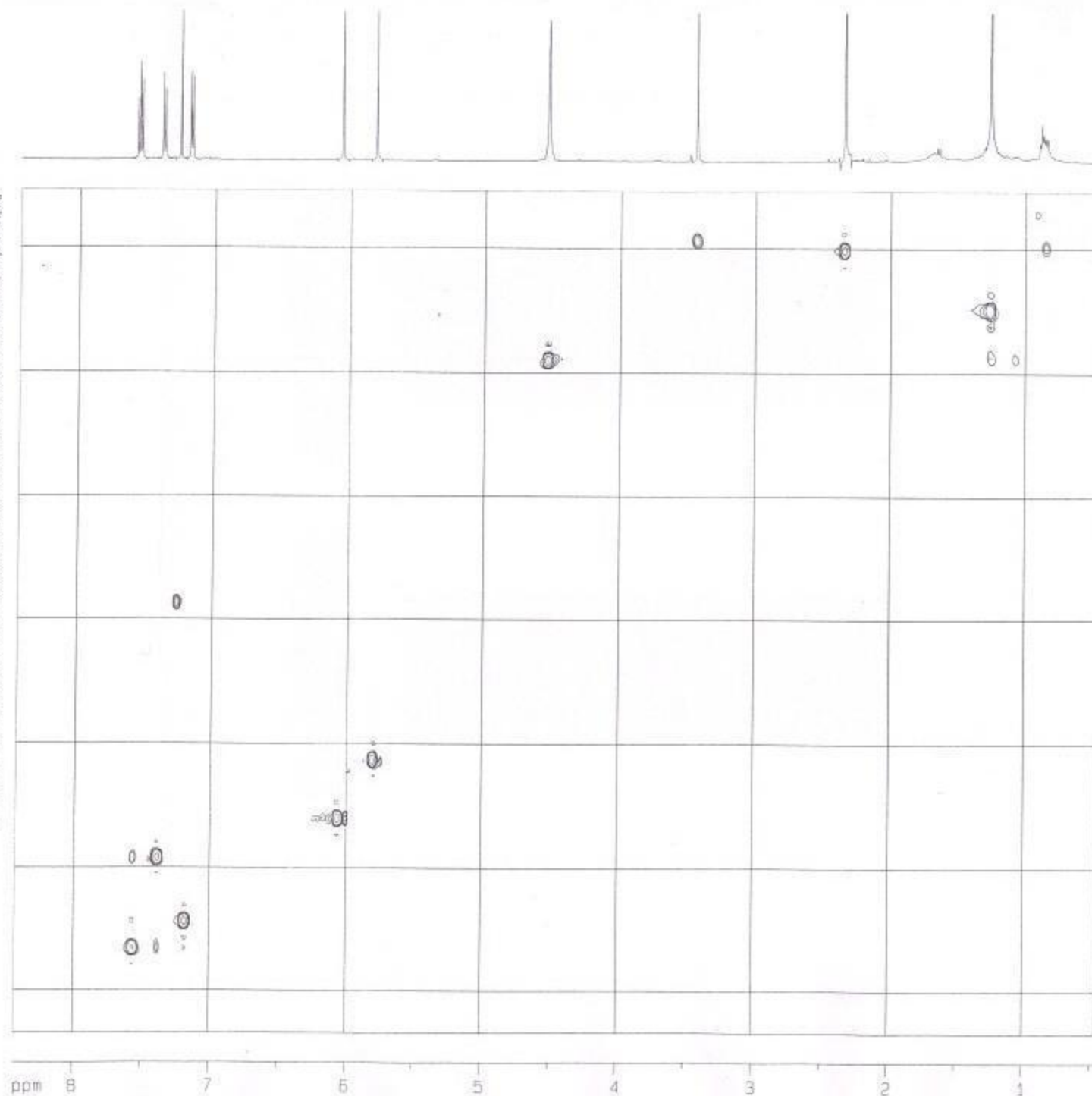
----- CHANNEL f1 -----
 NUC1 13C
 P1 5.90 usec
 PL1 0.00 dB
 SF01 125.7716224 MHz

----- CHANNEL f2 -----
 CPDPRG2 waltz16
 NUC2 1H
 PCPD2 84.00 usec
 PL2 -4.00 dB
 PL12 18.00 dB
 SF02 500.1338510 MHz

F2 - Processing parameters
 SI 16384
 SF 125.7577908 MHz
 NDK EM
 SSB 0
 LB 2.00 Hz
 GB 0
 PC 1.50

1D NMR plot parameters
 CX 22.00 cm
 CY 12.00 cm
 F1P 190.000 ppm
 F1 23893.98 Hz
 F2P 10.000 ppm
 F2 1257.58 Hz
 PPMCM 8.18182 ppm/cm
 HZCM 1028.92737 Hz/cm

1-HSQC



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Current Data Parameters:
NAME      m020
EXPNO    24
PROCNO    1

F2 - Acquisition Parameters
Date_     20051125
Time      18:53
INSTRUM   spect
PROBHD    5 mm BBI 300-
PULPROG   zgpg30
TD        65536
SOLVENT   DMSO
NS        4
DS        4
SWH        8082.800 Hz
FIDRES     0.702037 Hz
AQ         0.7052044 sec
RG         3125
DQ         29.000 usec
DE         0.00 usec
TE         300.0 K
CQGTZ     145.000000
CQO        0.00000000 sec
CQ1        1.20000000 sec
CQ4        0.0017044 sec
CQ11       0.00000000 sec
CQ13       0.00000400 sec
CQ16       0.00000000 sec
CQ4        0.00086200 sec
DELTA     0.0012780 sec
DELTA1    0.0012080 sec
TMR       0.00001720 sec
RGREST    0.00550400 sec
RGMR      0.2166710 sec
STANF     74

***** CHANNEL f3 *****
NUC1       13C
P1         9.00 usec
P2         17.00 usec
P3         20.00 usec
P4         -1.00 dB
PL1        0.00 dB
PL12       15.00 dB
PL12       125.770360 MHz

***** CHANNEL f2 *****
CPROG     zgpg30
NUC2       1H
P1         11.00 usec
P4         23.00 usec
PCPD      75.00 usec
PL2        -1.00 dB
PL12       15.00 dB
PL12       125.770360 MHz

***** GRADIENT CHANNEL *****
GPMAX     SINE 100
GPMIN     SINE 100
SPR1      0.00 %
SPR2      0.00 %
SPR3      0.00 %
SPR4      0.00 %
SPR5      80.00 %
SPR6      20.00 %
P3B       1000.00 usec

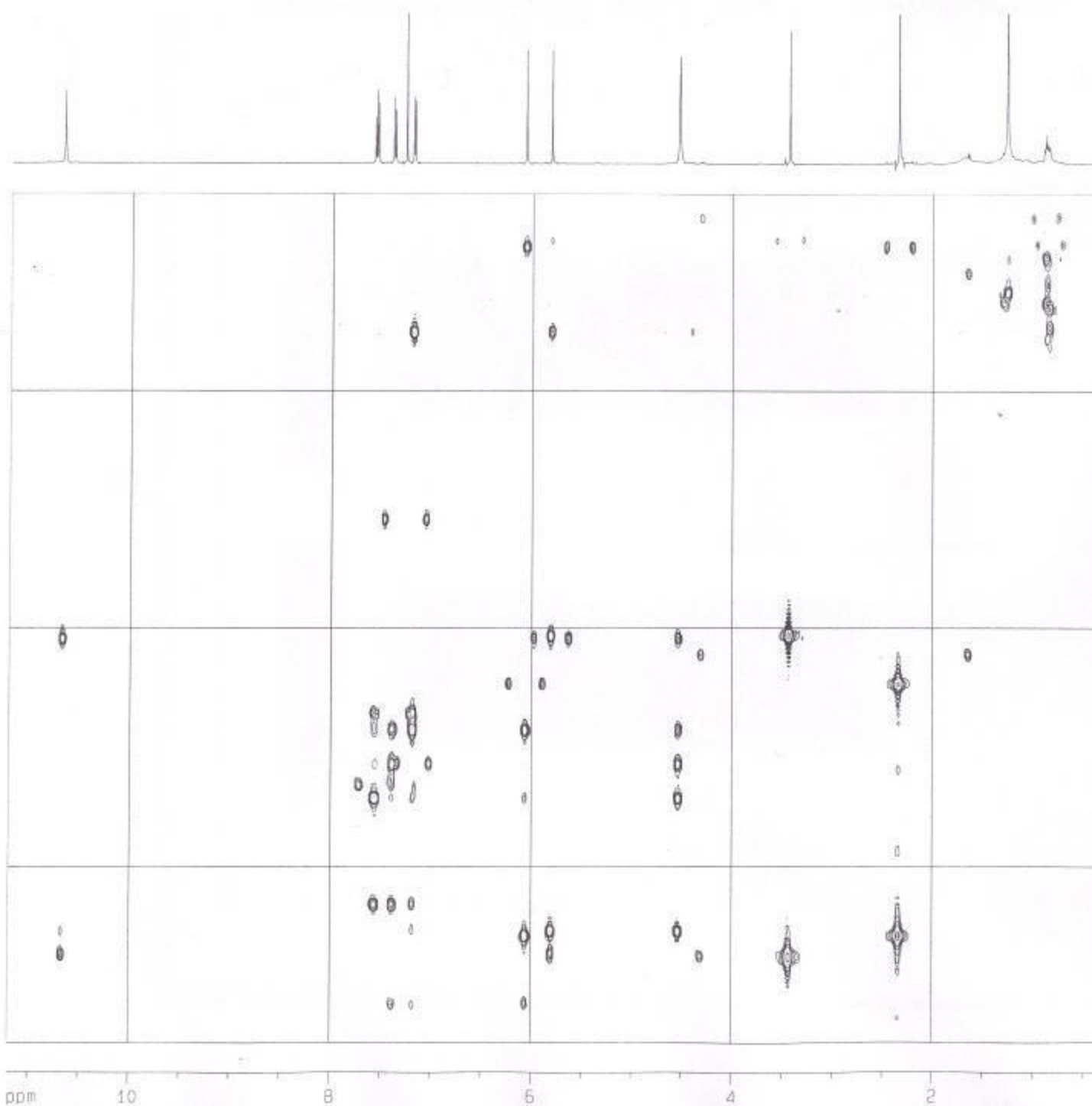
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NUC       13C
TD        65536
SFO1      125.7704 MHz
FIDRES    0.000000 Hz
SW        200.000 MHz
FWDK      65536

f2 - Processing parameters
SI        32768
SF        500.130010 MHz
WDW        SINE
SSB        0
LB         0.00 Hz
GB         0
PC         1.40

f1 - Processing parameters
SI        65536
WDW        hanning
SSB        0
LB         0.00 Hz
GB         0
PC         1.40

30 MHz plot parameters
CX2       18.00 Hz
CK1       14.00 Hz
F0P10     0.425 ppm
F0L0      4018.42 Hz
F0R0      0.463 ppm
F0H1      231.28 Hz
F1P10     143.518 ppm
F1L0      16476.27 Hz
F1R0      10.813 ppm
F1H1      1350.77 Hz
F0PNCN    0.44289 ppm/Hz
F1P10CN   221.58249 Hz/Hz
F1R0CN    0.72181 ppm/Hz
F1H1CN    1222.50253 Hz/Hz
    
```

1-HMBC



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Current Data Parameters
NAME      nmr20
EXPNO    35
PROCNO    1

F2 - Acquisition Parameters
Date_     20031125
Time      18.05
INSTRUM   spect
PROBHD    5 mm BBO 1H-5B
PULPROG   zgpg30
TD         65536
SOLVENT   CDCl3
NS         48
DS         32
SWH        2032.806 Hz
FIDRES     4.397015 Hz
AQ         0.1138188 sec
RG         380.000
DQ         50.000 usec
DE         6.00 usec
TE         300.2 K
CNS12     145.000000
d8         0.00000000 sec
d1         1.29999955 sec
d7         0.0034828 sec
d5         0.00340000 sec
d13        0.00000400 sec
d16        0.00000000 sec
DWO        0.00000000 sec
MCRES1     0.00000000 sec
MCWRE      1.29999955 sec

***** CHANNEL F1 *****
NUC1       1H
P1         8.00 usec
P2         17.00 usec
PL1        -1.00 dB
SFO1       500.1333334 MHz

***** CHANNEL F2 *****
NUC2       13C
P3         11.00 usec
PL2        -1.00 dB
SFO2       125.7702511 MHz

***** GRADIENT CHANNEL *****
SPRM1     S1M: 100
SPRM2     S1M: 100
SPRM3     S1M: 100
GPR1      0.00 %
GPR2      0.00 %
GPR3      0.00 %
GPR4      0.00 %
GPR5      0.00 %
GPR6      0.00 %
GPR7      0.00 %
GPR8      0.00 %
GPR9      0.00 %
GPR10     0.00 %
GPR11     0.00 %
GPR12     0.00 %
GPR13     0.00 %
GPR14     0.00 %
GPR15     0.00 %
GPR16     0.00 %
GPR17     0.00 %
GPR18     0.00 %
GPR19     0.00 %
GPR20     0.00 %
GPR21     0.00 %
GPR22     0.00 %
GPR23     0.00 %
GPR24     0.00 %
GPR25     0.00 %
GPR26     0.00 %
GPR27     0.00 %
GPR28     0.00 %
GPR29     0.00 %
GPR30     0.00 %

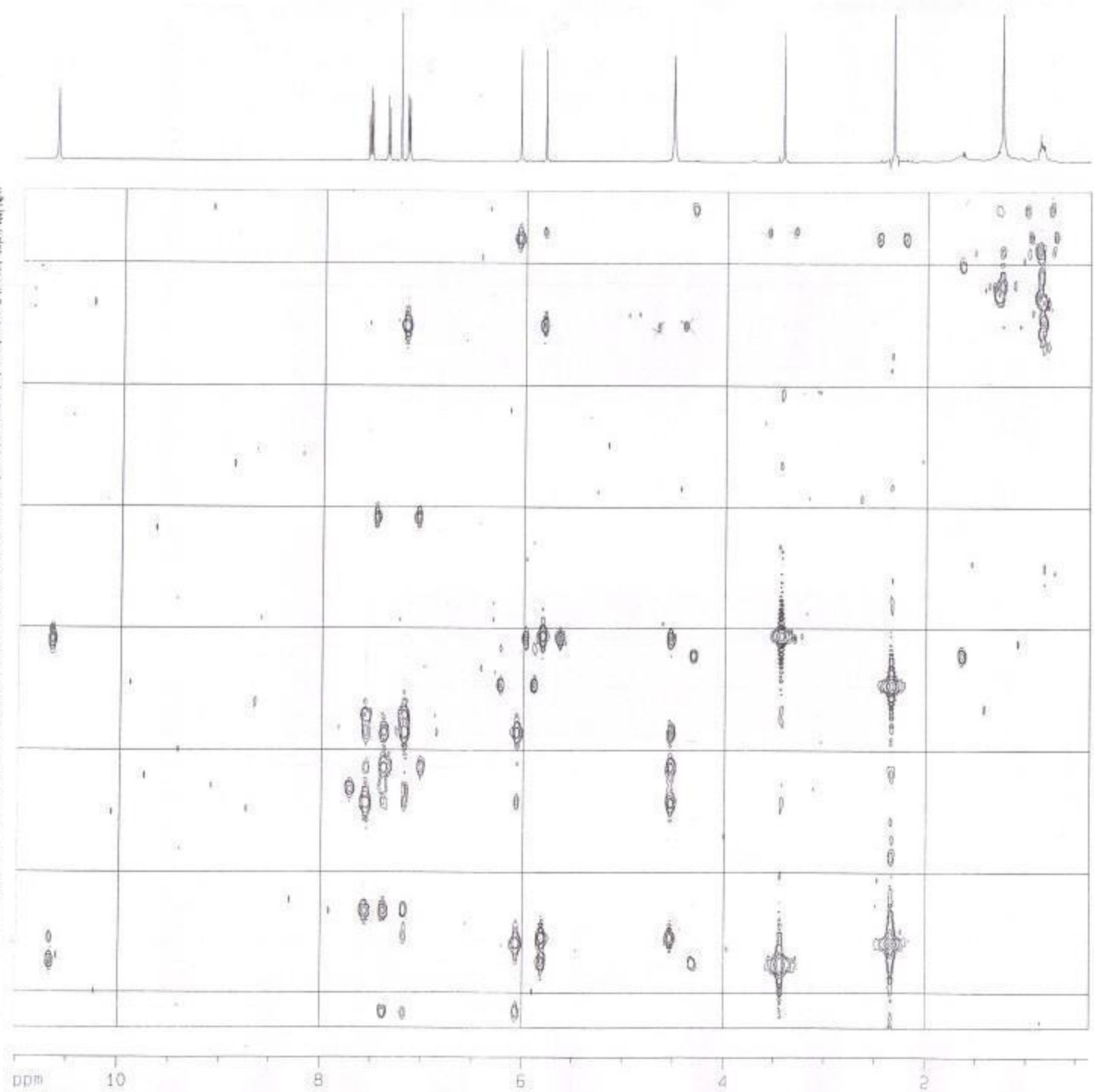
F1 - Acquisition Parameters
NO     2
TD     128
SFO1   125.7723 MHz
FIDRES 231.866216 Hz
SW      235.050 usec
FMODE   OF

F2 - Processing Parameters
SI      1024
SF      500.1330116 MHz
WDW     SINE
SSB     0
LB      0.00 Hz
GB      0
PC      1.40

F1 - Processing Parameters
SI      512
SF      125.7578025 MHz
WDW     SINE
SSB     0
LB      0.00 Hz
GB      0

3D NMR PLOT Parameters
CX2     16.00 cm
CX3     14.00 cm
FPR1D   13.200 cm
FPR1E   3652.01 Hz
FPR1H   0.280 cm
FPR1L   134.00 Hz
FPR1D   167.423 cm
FPR1E   23269.53 Hz
FPR1H   8.813 cm
FPR1L   1106.27 Hz
FPR1MCH 0.00100 cm/cm
FPR2CH  301.92866 Hz/cm
FPR3MCH 13.75789 cm/cm
FPR3CH  1604.49439 Hz/cm
    
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1-HMBC



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Current Data Parameters
NAME      ms20
EXPNO    35
PROCNO   1

F2 - Acquisition Parameters
Date_     2001125
Time      13:35
INSTRUM   spect
PROBHD    5 mm BBI 1H-13
PULPROG   invgpgp1r3dpt
TD         2048
SOLVENT   CDCl3
NS         48
DS         16
SWH        800.000 Hz
FIDRES    4.330119 Hz
AQ         0.3120188 sec
RG         26008
DM         55.600 uSec
DE         6.00 uSec
TE         300.0 K
DMS12     145.000000
d0         0.0000000 sec
d1         1.0000000 sec
d2         0.0014808 sec
d3         0.0000000 sec
d12        0.0000000 sec
d15        0.0000000 sec
d16        0.0000000 sec
d17        0.0000000 sec
d18        0.0000000 sec
d19        0.0000000 sec
d20        0.0000000 sec
d21        0.0000000 sec
d22        0.0000000 sec
d23        0.0000000 sec
d24        0.0000000 sec
d25        0.0000000 sec
d26        0.0000000 sec
d27        0.0000000 sec
d28        0.0000000 sec
d29        0.0000000 sec
d30        0.0000000 sec
d31        0.0000000 sec
d32        0.0000000 sec
d33        0.0000000 sec
d34        0.0000000 sec
d35        0.0000000 sec
d36        0.0000000 sec
d37        0.0000000 sec
d38        0.0000000 sec
d39        0.0000000 sec
d40        0.0000000 sec
d41        0.0000000 sec
d42        0.0000000 sec
d43        0.0000000 sec
d44        0.0000000 sec
d45        0.0000000 sec
d46        0.0000000 sec
d47        0.0000000 sec
d48        0.0000000 sec
d49        0.0000000 sec
d50        0.0000000 sec
d51        0.0000000 sec
d52        0.0000000 sec
d53        0.0000000 sec
d54        0.0000000 sec
d55        0.0000000 sec
d56        0.0000000 sec
d57        0.0000000 sec
d58        0.0000000 sec
d59        0.0000000 sec
d60        0.0000000 sec
d61        0.0000000 sec
d62        0.0000000 sec
d63        0.0000000 sec
d64        0.0000000 sec
d65        0.0000000 sec
d66        0.0000000 sec
d67        0.0000000 sec
d68        0.0000000 sec
d69        0.0000000 sec
d70        0.0000000 sec
d71        0.0000000 sec
d72        0.0000000 sec
d73        0.0000000 sec
d74        0.0000000 sec
d75        0.0000000 sec
d76        0.0000000 sec
d77        0.0000000 sec
d78        0.0000000 sec
d79        0.0000000 sec
d80        0.0000000 sec
d81        0.0000000 sec
d82        0.0000000 sec
d83        0.0000000 sec
d84        0.0000000 sec
d85        0.0000000 sec
d86        0.0000000 sec
d87        0.0000000 sec
d88        0.0000000 sec
d89        0.0000000 sec
d90        0.0000000 sec
d91        0.0000000 sec
d92        0.0000000 sec
d93        0.0000000 sec
d94        0.0000000 sec
d95        0.0000000 sec
d96        0.0000000 sec
d97        0.0000000 sec
d98        0.0000000 sec
d99        0.0000000 sec
d100       0.0000000 sec

***** CHANNEL f1 *****
NUC1      13C
P1         8.00 uSec
PC         17.00 uSec
PL1        -1.00 dB
SFO1      100.6283514 MHz

***** CHANNEL f2 *****
NUC2      1H
P2         15.00 uSec
PC         1.00 dB
SFO2      500.1360514 MHz

***** GRABBER CHANNEL *****
GRAB1     SINE 100
GRAB2     SINE 100
GRAB3     SINE 100
GRAB4     0.00 %
GRAB5     0.00 %
GRAB6     0.00 %
GRAB7     0.00 %
GRAB8     0.00 %
GRAB9     0.00 %
GRAB10    0.00 %
GRAB11    0.00 %
GRAB12    0.00 %
GRAB13    0.00 %
GRAB14    0.00 %
GRAB15    0.00 %
GRAB16    0.00 %
GRAB17    0.00 %
GRAB18    0.00 %
GRAB19    0.00 %
GRAB20    0.00 %
GRAB21    0.00 %
GRAB22    0.00 %
GRAB23    0.00 %
GRAB24    0.00 %
GRAB25    0.00 %
GRAB26    0.00 %
GRAB27    0.00 %
GRAB28    0.00 %
GRAB29    0.00 %
GRAB30    0.00 %
GRAB31    0.00 %
GRAB32    0.00 %
GRAB33    0.00 %
GRAB34    0.00 %
GRAB35    0.00 %
GRAB36    0.00 %
GRAB37    0.00 %
GRAB38    0.00 %
GRAB39    0.00 %
GRAB40    0.00 %
GRAB41    0.00 %
GRAB42    0.00 %
GRAB43    0.00 %
GRAB44    0.00 %
GRAB45    0.00 %
GRAB46    0.00 %
GRAB47    0.00 %
GRAB48    0.00 %
GRAB49    0.00 %
GRAB50    0.00 %
GRAB51    0.00 %
GRAB52    0.00 %
GRAB53    0.00 %
GRAB54    0.00 %
GRAB55    0.00 %
GRAB56    0.00 %
GRAB57    0.00 %
GRAB58    0.00 %
GRAB59    0.00 %
GRAB60    0.00 %
GRAB61    0.00 %
GRAB62    0.00 %
GRAB63    0.00 %
GRAB64    0.00 %
GRAB65    0.00 %
GRAB66    0.00 %
GRAB67    0.00 %
GRAB68    0.00 %
GRAB69    0.00 %
GRAB70    0.00 %
GRAB71    0.00 %
GRAB72    0.00 %
GRAB73    0.00 %
GRAB74    0.00 %
GRAB75    0.00 %
GRAB76    0.00 %
GRAB77    0.00 %
GRAB78    0.00 %
GRAB79    0.00 %
GRAB80    0.00 %
GRAB81    0.00 %
GRAB82    0.00 %
GRAB83    0.00 %
GRAB84    0.00 %
GRAB85    0.00 %
GRAB86    0.00 %
GRAB87    0.00 %
GRAB88    0.00 %
GRAB89    0.00 %
GRAB90    0.00 %
GRAB91    0.00 %
GRAB92    0.00 %
GRAB93    0.00 %
GRAB94    0.00 %
GRAB95    0.00 %
GRAB96    0.00 %
GRAB97    0.00 %
GRAB98    0.00 %
GRAB99    0.00 %
GRAB100   0.00 %

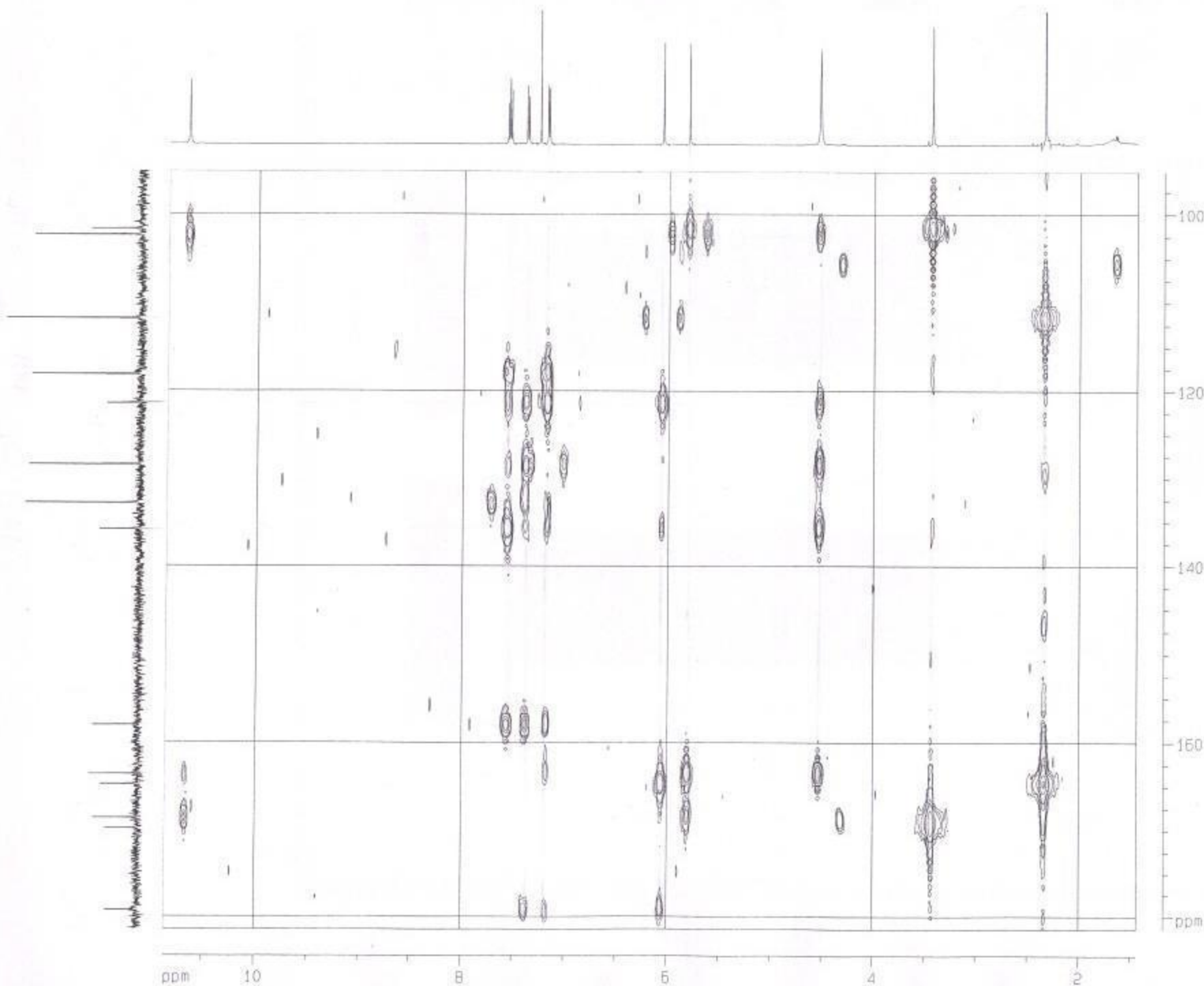
F1 - Acquisition parameters
NUC1      13C
TD         128
SFO1      100.6283514 MHz
SFO2      500.1360514 MHz
SW         230.500000 MHz
FREQDE    0

F2 - Processing parameters
SI         1024
SF         500.1360514 MHz
WDW        SINE
SSB        0
LB         0.00 Hz
GB         0
PC         1.00

F1 - Processing parameters
SI         512
MC2       0
SFO1      100.6283514 MHz
SFO2      500.1360514 MHz
WDW        SINE
SSB        0
LB         0.00 Hz
GB         0

2D NMR plot parameters
CX2       18.00 cm
CX1       14.00 cm
FOP10     11.010 cm
FOP11     5005.21 Hz
FOP12     0.160 cm
FOP13     184.40 Hz
FOP14     180.370 cm
FOP15     20034.76 Hz
FOP16     10.150 cm
FOP17     1201.46 Hz
FOP18     1201.46 Hz
FOP19     0.50117 cm/cm
FOP20     280.80150 Hz/cm
FOP21     17.29076 cm/cm
FOP22     1546.66467 Hz/cm
    
```

1-HMBC



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Current Data Parameters
NAME      nos20
EXPRNO   35
PROCNO    1

F2 - Acquisition Parameters
Date_     2001125
Time      15:06
INSTRUM   spect
PROBHD    5 mm BBI 1H-ES
PULPROG   invgpcpr1nucq1
TD         2048
SOLVENT   CDCl3
NS         48
DS         32
SFO1      500.136091 MHz
FIDRES    4.387018 Hz
AQ        0.1132188 sec
RG         25008
BW         35.400 MHz
DE         0.00 MHz
TE         300.2 K
CAG12     145.0000000
AQ        0.0000300 sec
D1         1.200000000 sec
D2         0.0044028 sec
D3         0.003400000 sec
S12       0.0000400 sec
D16       0.0000000 sec
IN6       0.0001000 sec
MCRET1    0.0000000 sec
MCRET2    1.2000000 sec

***** CHANNEL f1 *****
NUC1       1H
P1         18.00 MHz
P2         17.00 MHz
PL1        -1.00 dB
SFO1       500.1333314 MHz

***** CHANNEL f2 *****
NUC2       13C
P3         125.7720511 MHz
PL3        -1.00 dB
SFO2       125.7720511 MHz

***** GRADIENT CHANNEL *****
GPRM1     SINE 100
GPRM2     SINE 100
GPRM3     SINE 100
GPK1      0.00 %
GPK2      0.00 %
GPK3      0.00 %
GPV1      0.00 %
GPV2      0.00 %
GPV3      0.00 %
SFO2      50.00 %
SFO2      35.00 %
SFO2      40.10 %
P15       1000.00 MHz

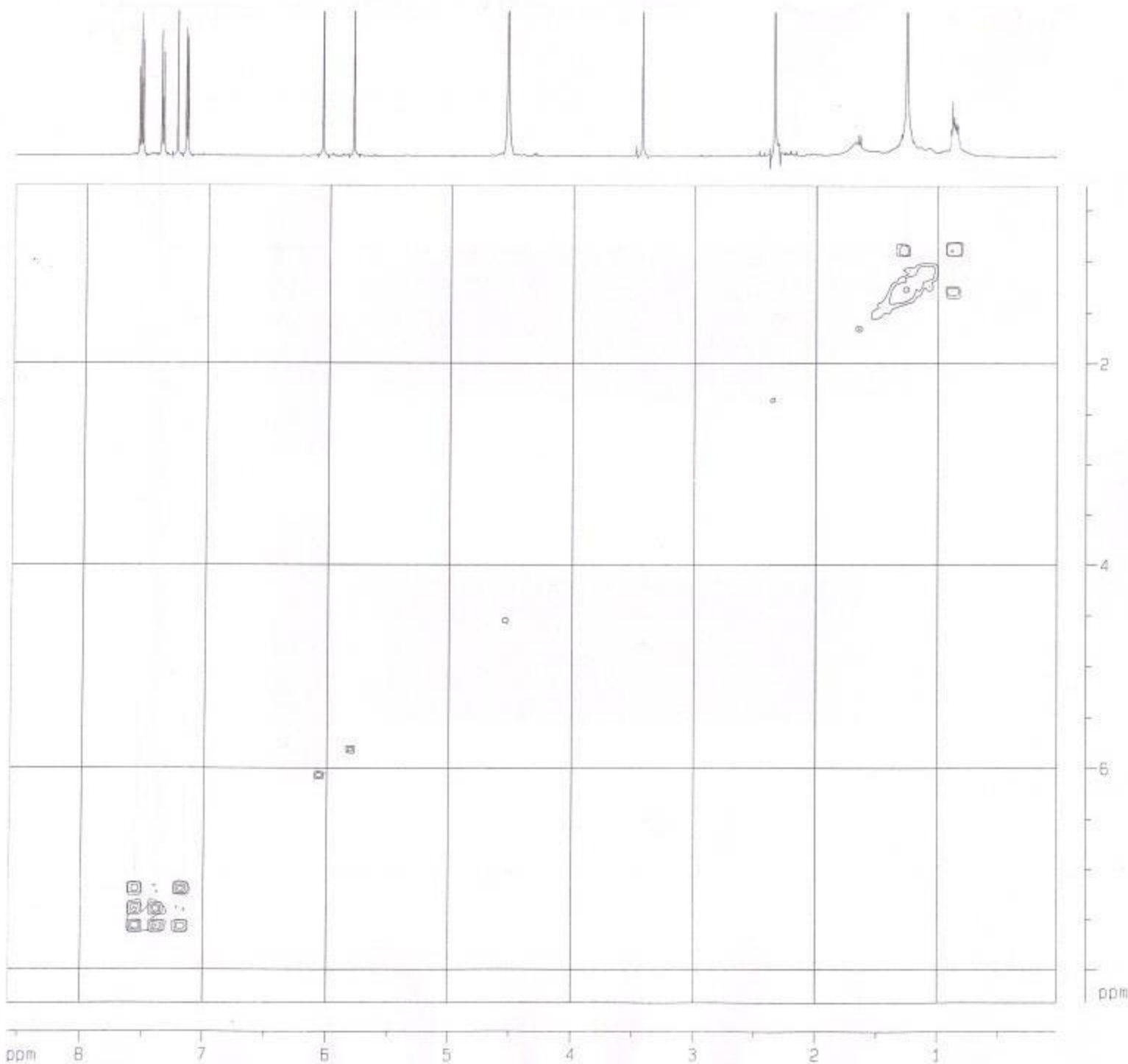
F1 - Acquisition parameters
AQ        2
TD         328
SFO1      125.7723 MHz
FIDRES    230.968216 Hz
SFO2      235.050 MHz
P-MODE    0

F2 - Processing parameters
SI         1024
SF         500.1300158 MHz
WDW        SINE
SSB        0
LB         0.00 Hz
GB         0
PC         1.40

F1 - Processing parameters
SI         512
SF         125.7578045 MHz
WDW        SINE
SSB        0
LB         0.00 Hz
GB         0

2D NMR plot parameters
CQ1        18.00 MHz
CX1        14.00 MHz
F2P1,0     10.869 MHz
F2L,0      5426.05 Hz
F2P1,1     1.040 MHz
F2L,1      720.10 Hz
F2P1,2     181.054 MHz
F2L,2      22819.20 Hz
C1P1,1     35.133 MHz
F1H,1      13863.75 Hz
F2P1,ACK   0.52086 MHz/cm
F2L,ACK    261.80746 Hz/cm
F1P1,ACK   6.16578 MHz/cm
F1L,ACK    775.39459 Hz/cm
    
```

1- H-H- COSY



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Current Data Parameters:
NAME      hns20
EXPNO     33
PROCNO    1

F2 - Acquisition Parameters
Date_     20051125
Time      18.43
INSTRUM   DRX500
PROBHD    5 mm BBI 1H-86
PULPROG   cosygphq1
TD         1024
SOLVENT   DMS-D6
NS         2
DS         36
SWH        8052.820 Hz
FIDRES     7.825020 Hz
AQ         0.0639475 sec
RG         36098
CW         62.400 usec
CE         6.00 usec
TE         300.0 K
C0         0.0000300 sec
C1         2.0000000 sec
d13        0.0000400 sec
D16        0.0002000 sec
JNO        0.00012486 sec
MCREST     0.0000000 sec
MCMRK      2.0000000 sec

***** CHANNEL f1 *****
NUC1       1H
P1         8.50 usec
PL1        -1.00 dB
SFO1       500.1318310 MHz

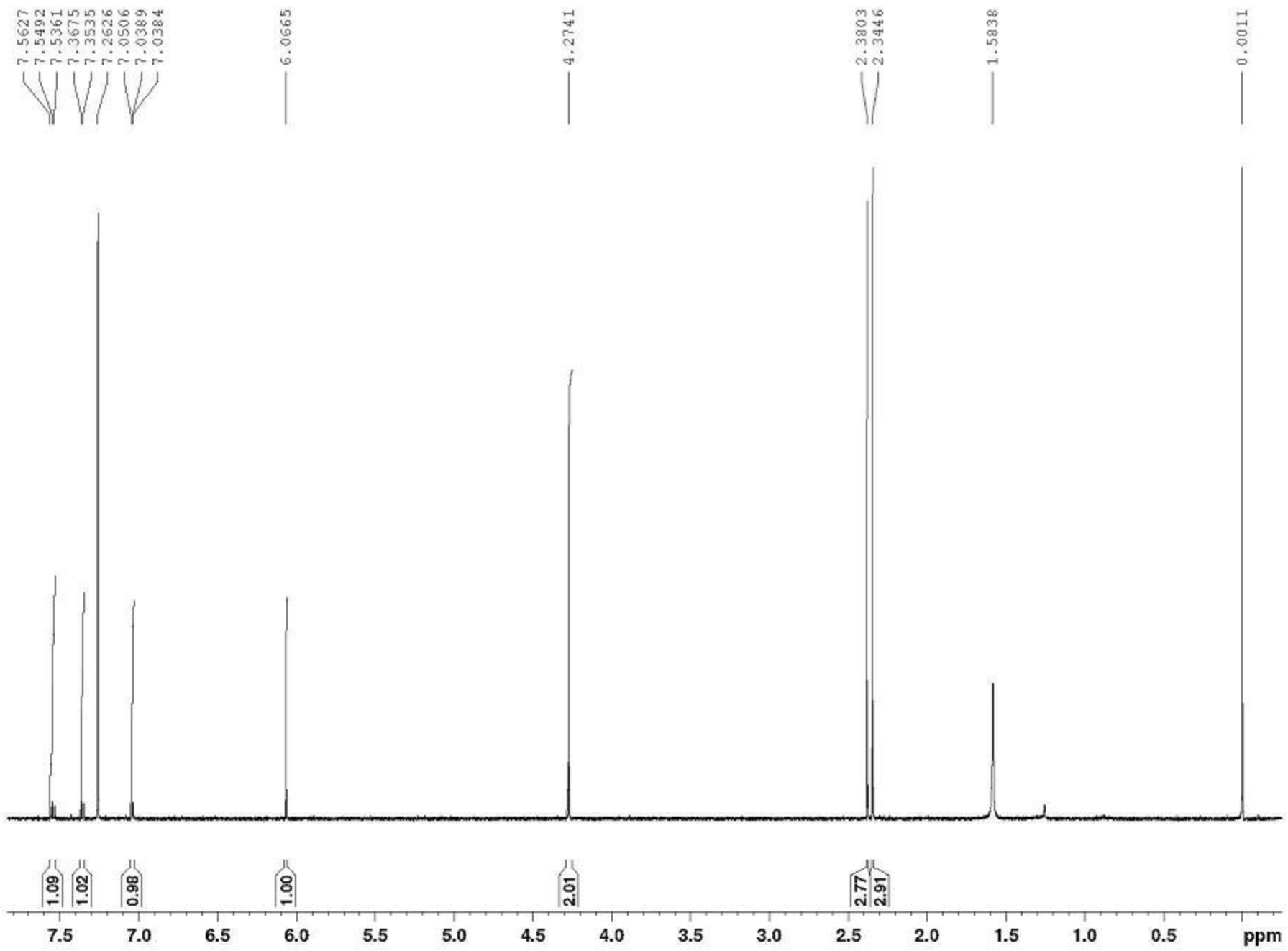
***** GRADIENT CHANNEL *****
GPNAM1     sine.100
GPNAM2     sine.100
GPNAM3     sine.100
GPX1       0.00 %
GPX2       0.00 %
GPX3       0.00 %
GPY1       0.00 %
GPY2       0.00 %
GPY3       0.00 %
GPZ1       10.00 %
GPZ2       10.00 %
GPZ3       30.00 %
P16        1000.00 usec

F1 - Acquisition parameters
NO        1
TD         128
SFO1      500.133 MHz
FIDRES     62.518757 Hz
SW         16.001 ppm
F1MODE     GF

F2 - Processing parameters
SI         1024
SF         500.1300119 MHz
WDW        SINE
SSB        0
LB         0.00 Hz
GB         0
PC         1.00

F1 - Processing parameters
SI         1024
MC2        GF
SF         500.1311765 MHz
WDW        SINE
SSB        0
LB         0.00 Hz
GB         0

2D NMR plot parameters
Ck2        18.00 cm
Ck1         14.00 cm
F2PL0      8.581 ppm
F2L0       4251.83 Hz
F2PHJ      0.023 ppm
F2HJ       11.74 Hz
F1PL0      8.335 ppm
F1L0       4168.78 Hz
F1PHJ      0.257 ppm
F1HJ       128.51 Hz
F2PHCH     0.47546 ppm/cx
F2HCH      257.78367 Hz/cx
F1PHCH     0.5703 ppm/cx
F1HCH      288.59103 Hz/cx
    
```

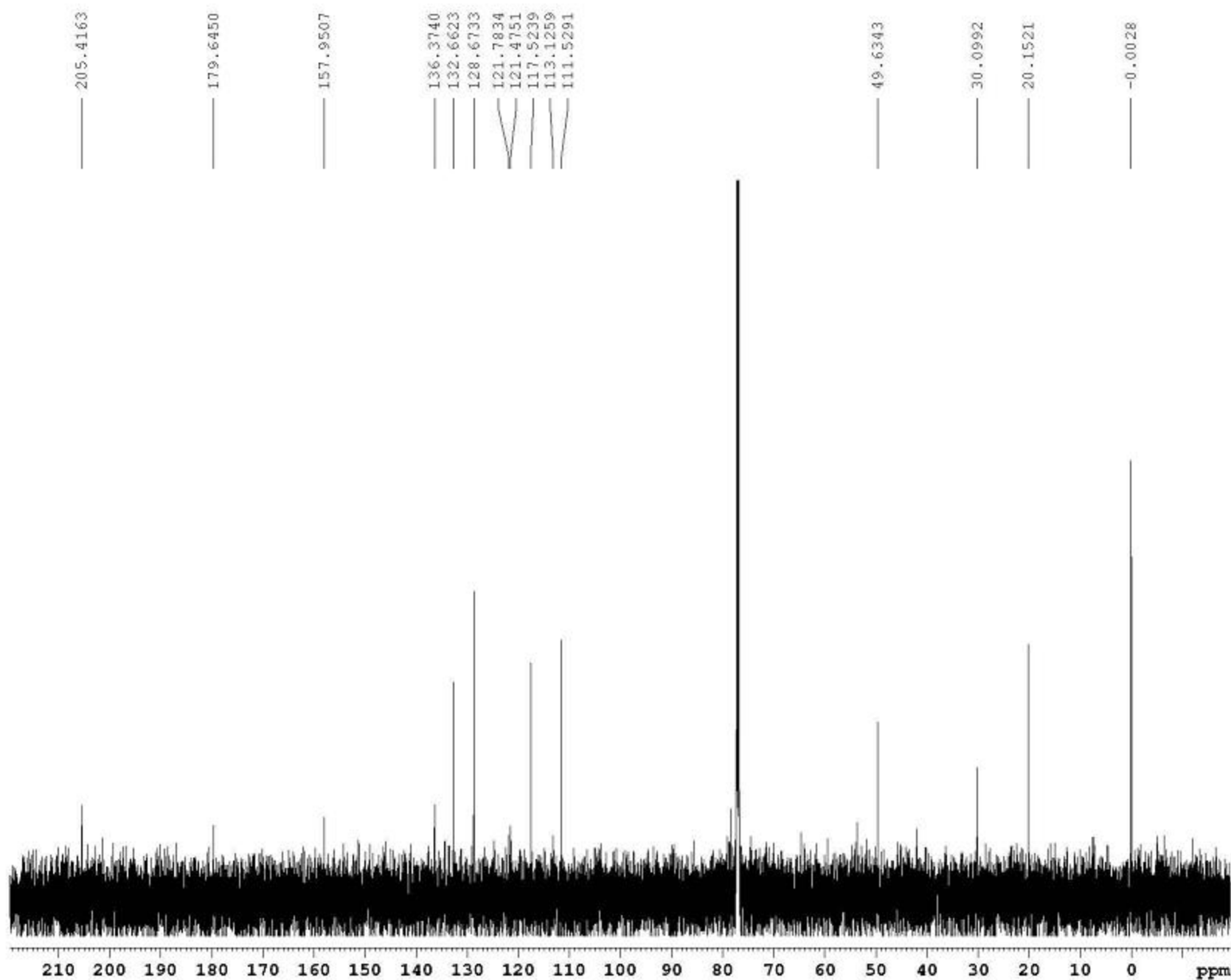



Current Data Parameters
NAME DS-25-1
EXPNO 1
PROCNO 1

F2 - Acquisition Parameters
Date_ 20070828
Time 9.23
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 40
DS 2
SWH 4854.369 Hz
FIDRES 0.074072 Hz
AQ 6.7502580 sec
RG 1150
LW 103.000 usec
DE 6.00 usec
TE 296.2 K
D1 3.0000000 sec
TD0 1

----- CHANNEL f1 -----
NUC1 1H
P1 9.70 usec
PL1 2.00 dB
SFO1 600.1322845 MHz

F2 - Processing parameters
SI 32768
SF 600.1300087 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 1.00



```

Current Data Parameters
NAME      DS-25-1
EXPNO    2
PROCNO    1

F2 - Acquisition Parameters
Date_    20070830
Time     3.09
INSTRUM  spect
PROBHD   5 mm FAEBO BB-
PULPROG  zgpg30
TD       65536
SOLVENT  CDC13
NS       4096
DS       4
SMH      36057.691 Hz
FIDRES   0.550197 Hz
AQ       0.9086159 sec
RG       2050
DM       13.867 usec
DE       6.00 usec
TE       299.9 K
D1       3.0000000 sec
d11      0.0300000 sec
ID0      1

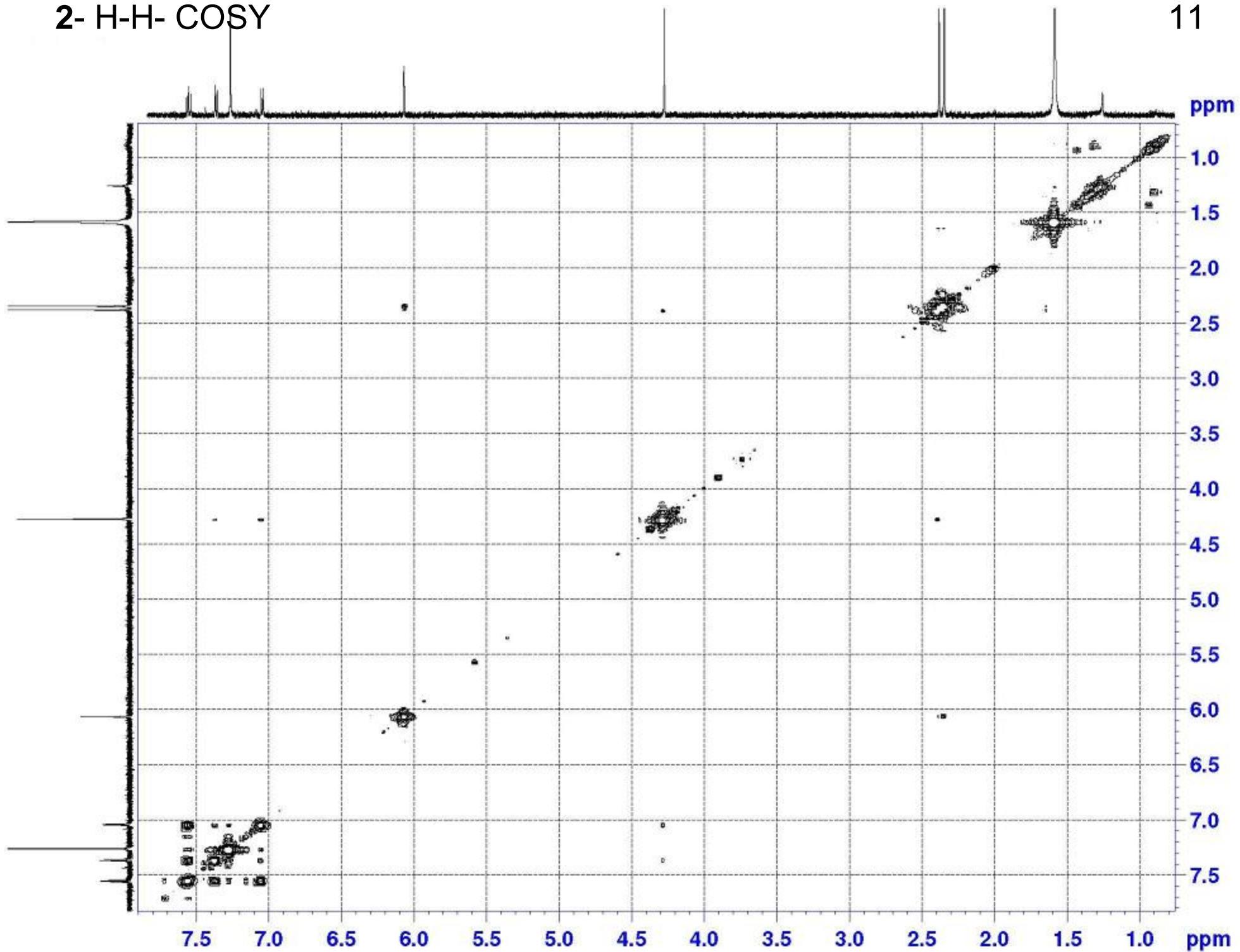
----- CHANNEL f1 -----
NUC1     13C
P1       9.80 usec
PL1      2.00 dB
SFO1     150.9178988 MHz

----- CHANNEL f2 -----
CPDPRG2  waltz16
NUC2     1H
PCPD2    70.00 usec
PL2      12.50 dB
PL2      -1.00 dB
SFO2     600.1324005 MHz

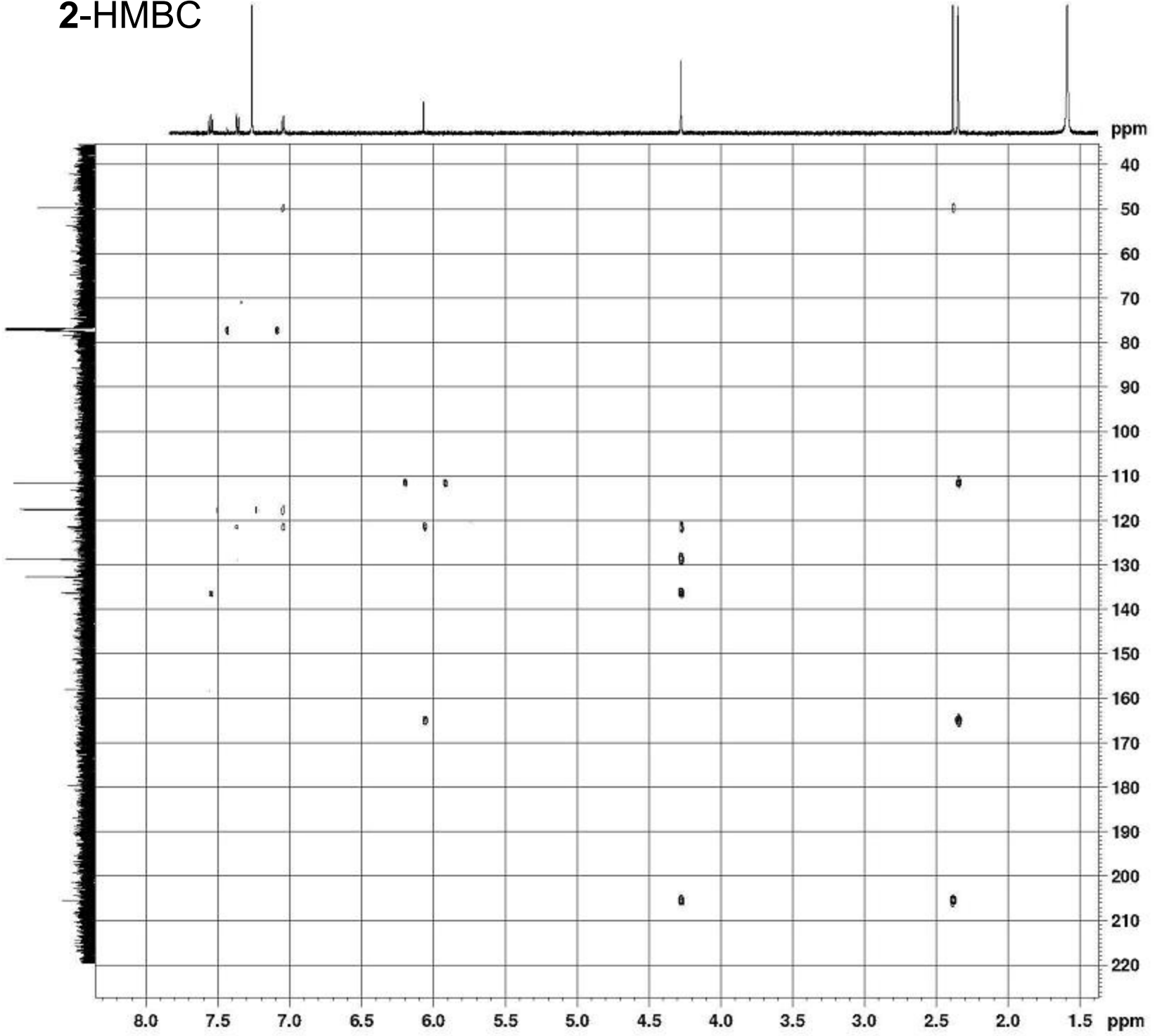
F2 - Processing parameters
SI       32768
SF       150.9028057 MHz
WDW      no
SSB      0
LB       0.00 Hz
GB       0
PC       0.40
    
```

2- H-H- COSY

11



2-HMBC



```

Current Data Parameters
NAME          DS-25-1
EXPNO         7
PROCNO        1

F2 - Acquisition Parameters
Date_         20070830
Time          7.09
INSTRUM       spect
PROBHD        5 mm PABBO BB-
PULPROG       hmbcgpndqf
TD            2048
SOLVENT       CDCl3
NS            16
DS            16
SWH           4854.369 Hz
FIDRES        2.370297 Hz
AQ            0.2109940 sec
RG            2050
DM            103.000 usec
DE            6.00 usec
TE            296.4 K
CNST13        8.0000000
d0            0.00000300 sec
d1            1.50000000 sec
d16           0.00020000 sec
d6            0.06250000 sec
IN0           0.00001490 sec

----- CHANNEL f1 -----
NUC1          1H
P1            14.90 usec
p2            29.80 usec
PL1           -1.00 dB
SFO1          600.1322758 MHz

----- CHANNEL f2 -----
NUC2          13C
P3            9.80 usec
PL2           2.00 dB
SFO2          150.9178748 MHz

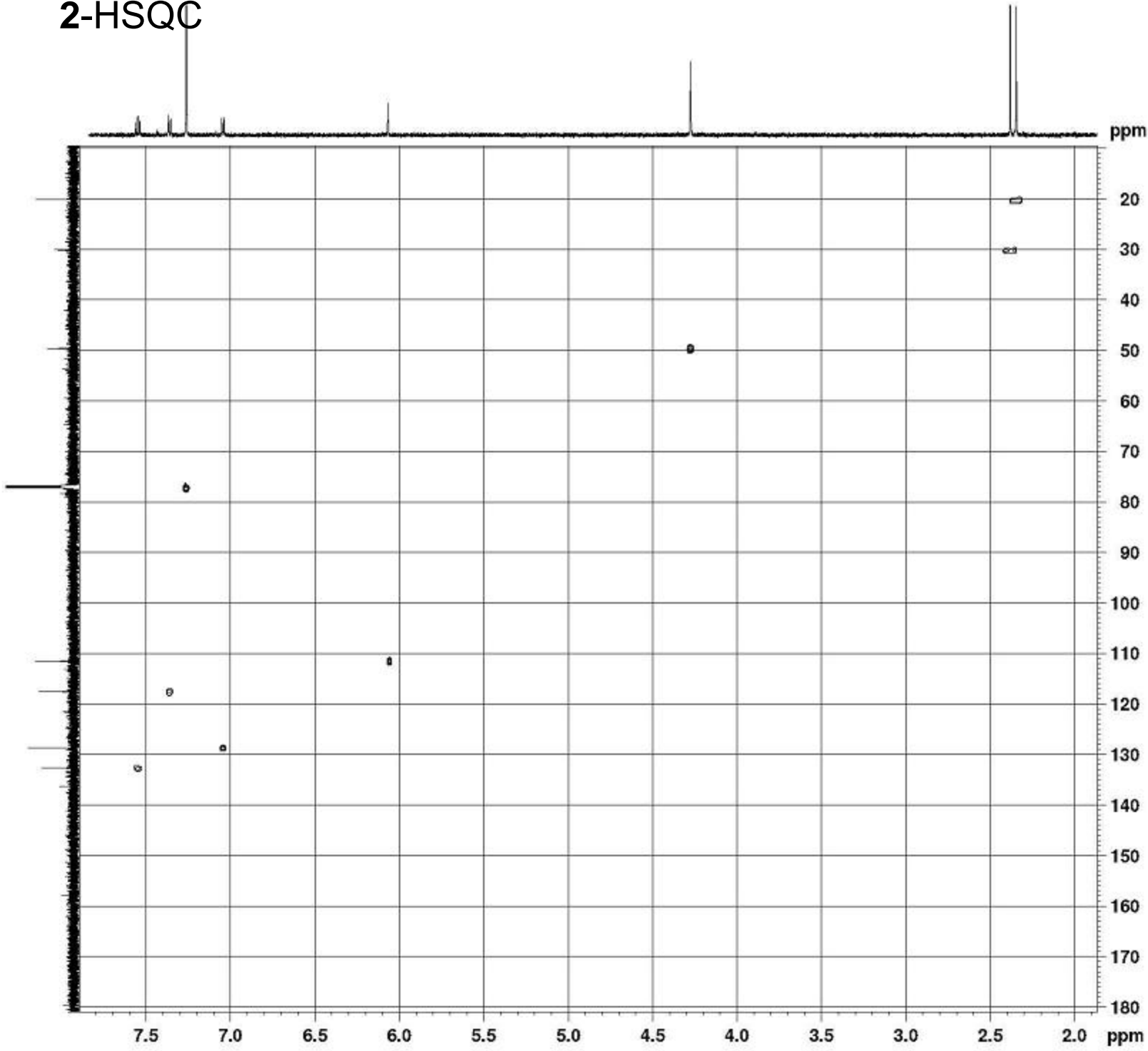
----- GRADIENT CHANNEL -----
GPNAM1        SINE.100
GPNAM2        SINE.100
GPNAM3        SINE.100
GPZ1          50.00 %
GPZ2          30.00 %
GPZ3          40.10 %
P16           1000.00 usec

F1 - Acquisition parameters
ND0           2
TD            175
SFO1          150.9179 MHz
FIDRES        191.754547 Hz
SW            223.353 ppm
PrnMODE       QF

F2 - Processing parameters
SI            1024
SF            600.1300056 MHz
MDW          SINE
SSB           0
LB            0.00 Hz
GB            0
PC            1.40

F1 - Processing parameters
SI            1024
MC2          QF
SF            150.9028035 MHz
MDW          SINE
SSB           0
LB            0.00 Hz
GB            0
    
```

2-HSQC



```

Current Data Parameters
NAME      DS-25-1
EXPNO    6
PROCNO   1

F2 - Acquisition Parameters
Date_    20070830
Time     9.18
INSTRUM  spect
PROBHD   5 mm PABBO BB-
PULPROG  hsqcetgp
ID       1024
SOLVENT  CDCl3
NS       16
DS       16
SWH      4850.369 Hz
FIDRES   4.740595 Hz
AQ       0.1055220 sec
RG       2050
EM       103.000 usec
DE       6.00 usec
TE       296.5 K
CNS12    145.0000000
d0       0.00000300 sec
D1       1.50000000 sec
d11      0.03000000 sec
d13      0.00000400 sec
D16      0.00020000 sec
d4       0.00172014 sec
DELTA    0.00123500 sec
DELTA1   0.00071614 sec
IN0      0.00001440 sec
ST1CHT   128
ZGOFINS

----- CHANNEL f1 -----
NUC1     1H
P1       14.90 usec
p2       29.80 usec
P20      1000.00 usec
PL1      -1.00 dB
SFO1     600.1322758 MHz

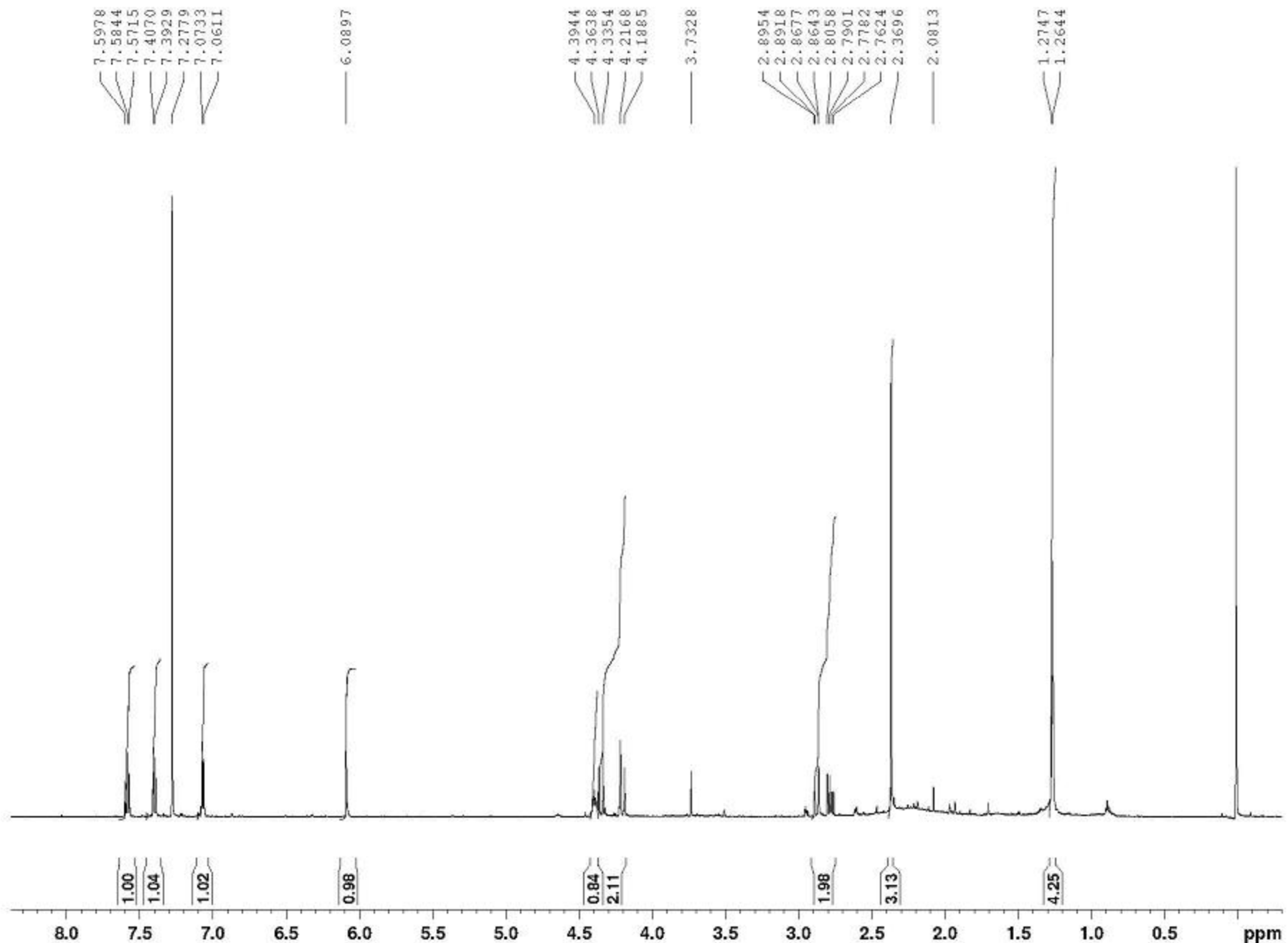
----- CHANNEL f2 -----
CPDPRG2  gqip
NUC2     13C
P3       9.80 usec
p4       19.60 usec
PCPD2    70.00 usec
PL12     19.00 dB
PL2      2.00 dB
SFO2     150.9171448 MHz

----- GRADIENT CHANNEL -----
GPRM1    SINE.100
GPRM2    SINE.100
CP21     80.00 %
CP22     20.10 %
P16      1000.00 usec

F1 - Acquisition parameters
ND0      2
ID       256
SFO1     150.9171 MHz
FIDRES   135.633682 Hz
SW       230.075 ppm
F2CODE   Echo-Antiecho

F2 - Processing parameters
SI       1024
SF       600.1300043 MHz
WDW      QSINE
SSB      2
LB       0.00 Hz
GB       0
PC       1.40

F1 - Processing parameters
SI       1024
MC2      echo-antiecho
SF       150.5027805 MHz
WDW      QSINE
SSB      2
LB       0.00 Hz
GB       0
  
```



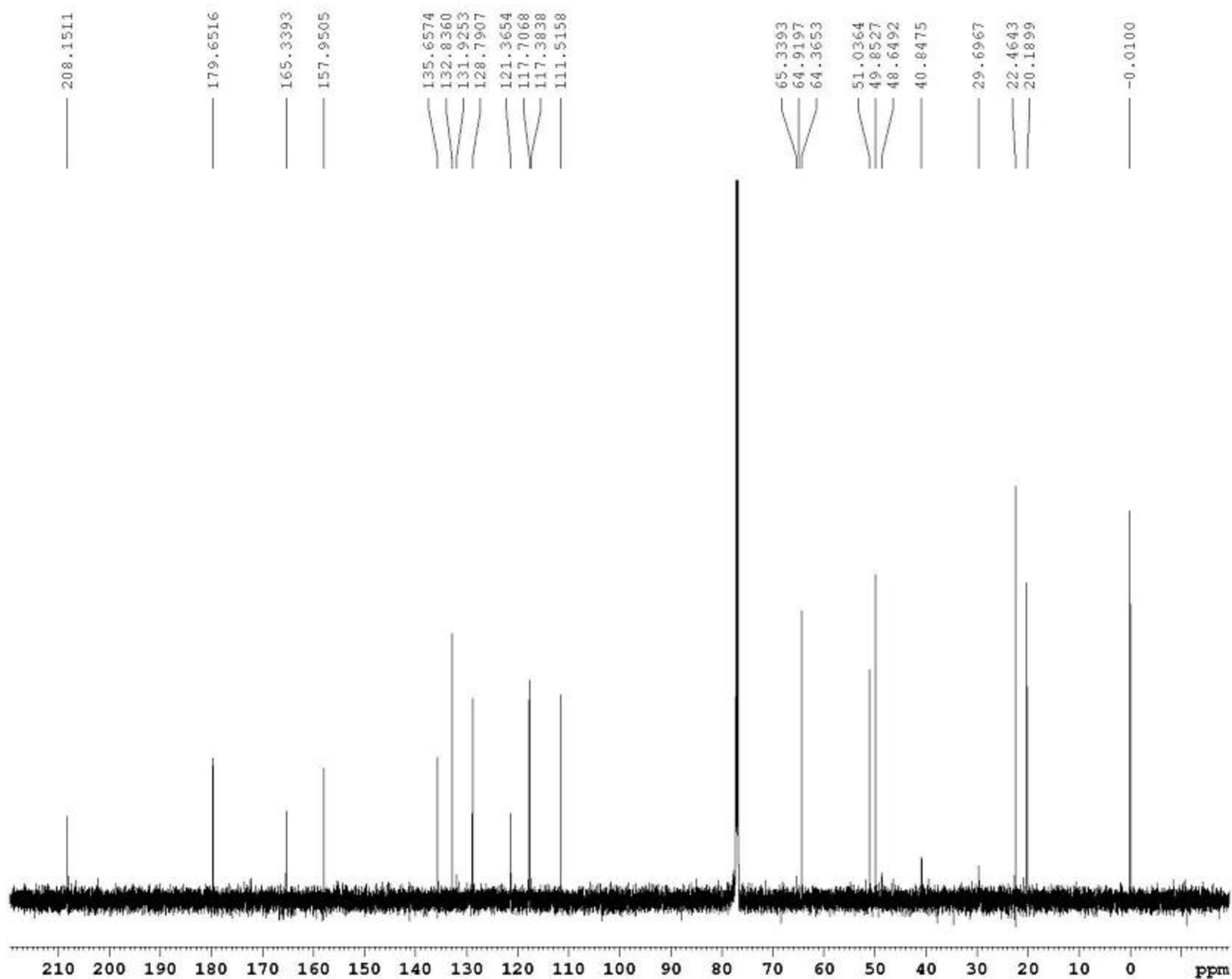
```

Current Data Parameters
NAME      DS-27-all-CDCl3
EXNO      1
PROCNO    1

F2 - Acquisition Parameters
Date_     20070409
Time      8.12
INSTRUM   spect
PROCBD    5 mm PAQXI 1H
PULPROG   zg30
TD         65536
SOLVENT   CDCl3
NS         32
DS         2
SWH        12335.526 Hz
FIDRES     0.168225 Hz
AQ         2.6564426 sec
RG         256
DA         40.533 usec
DE         6.00 usec
TE         292.9 K
D1         3.0000000 sec
TD0        1

----- CHANNEL f1 -----
NUC1       1H
P1         9.70 usec
PL1        2.00 dB
SFO1       600.1337060 MHz

F2 - Processing parameters
SI         32768
SF         600.1300000 MHz
WDW        no
SSB        0
LB         0.00 Hz
GB         0
PC         1.00
    
```



```

Current Data Parameters
NAME          DS-27
EXPNO        2
PROCNO       1

F2 - Acquisition Parameters
Date_        20070409
Time         11.57
INSTRUM      spect
PROBHD       5 mm FAREO BB-
PULPROG      zgpg30
TD           65536
SOLVENT      CDCl3
NS           19841
DS           4
SMH          36057.691 Hz
FIDRES       0.550197 Hz
AQ           0.9086159 sec
RG           2050
DM           13.867 usec
DE           6.00 usec
TE           296.1 K
D1           2.0000000 sec
d11          0.0300000 sec
ID0          1

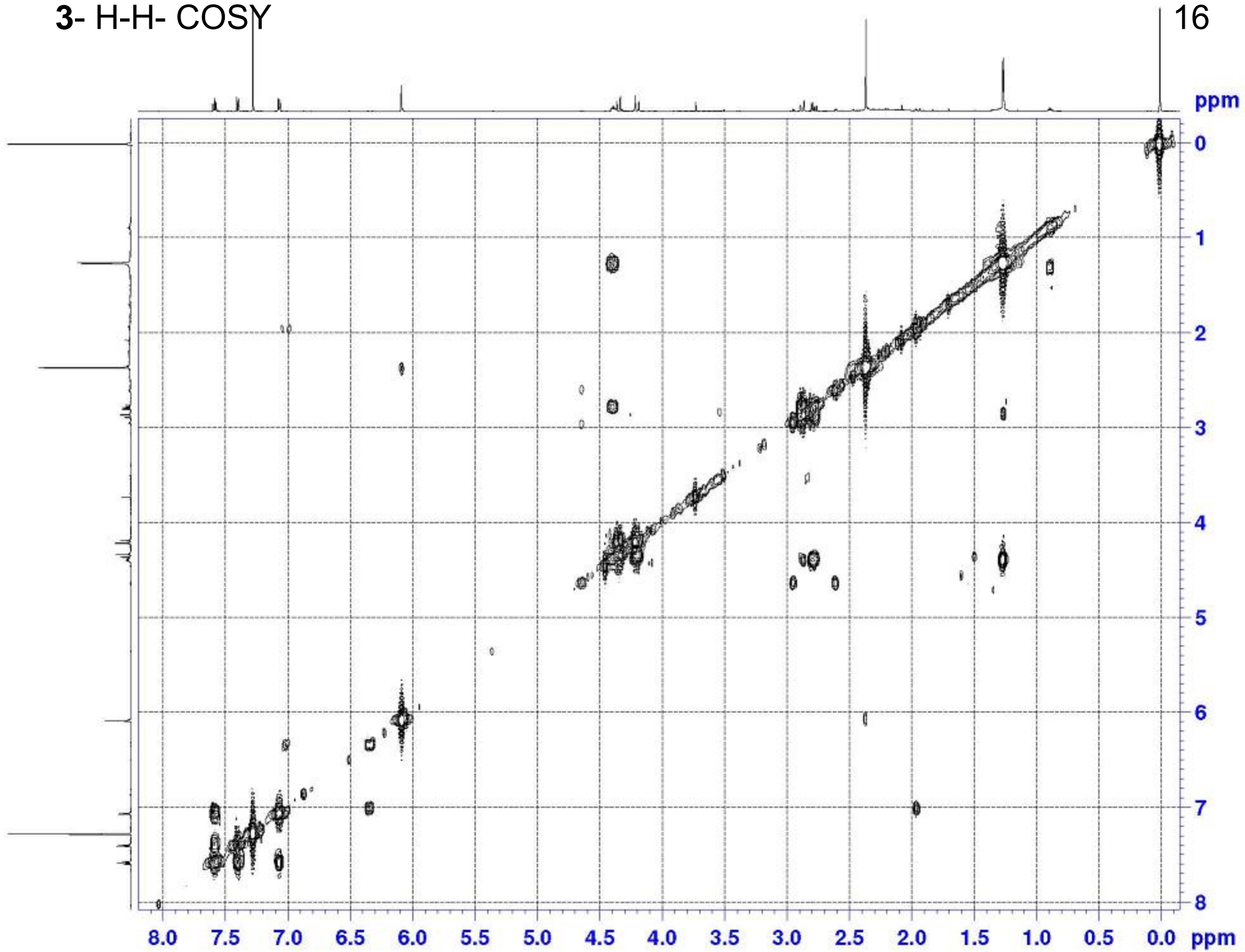
----- CHANNEL f1 -----
NUC1          13C
P1           9.80 usec
PL1          2.00 dB
SFO1         150.9178908 MHz

----- CHANNEL f2 -----
PCPD2        waltz16
NUC2          1H
PCPD2        70.00 usec
PL12         12.50 dB
PL2          -1.00 dB
SFO2         600.1324005 MHz

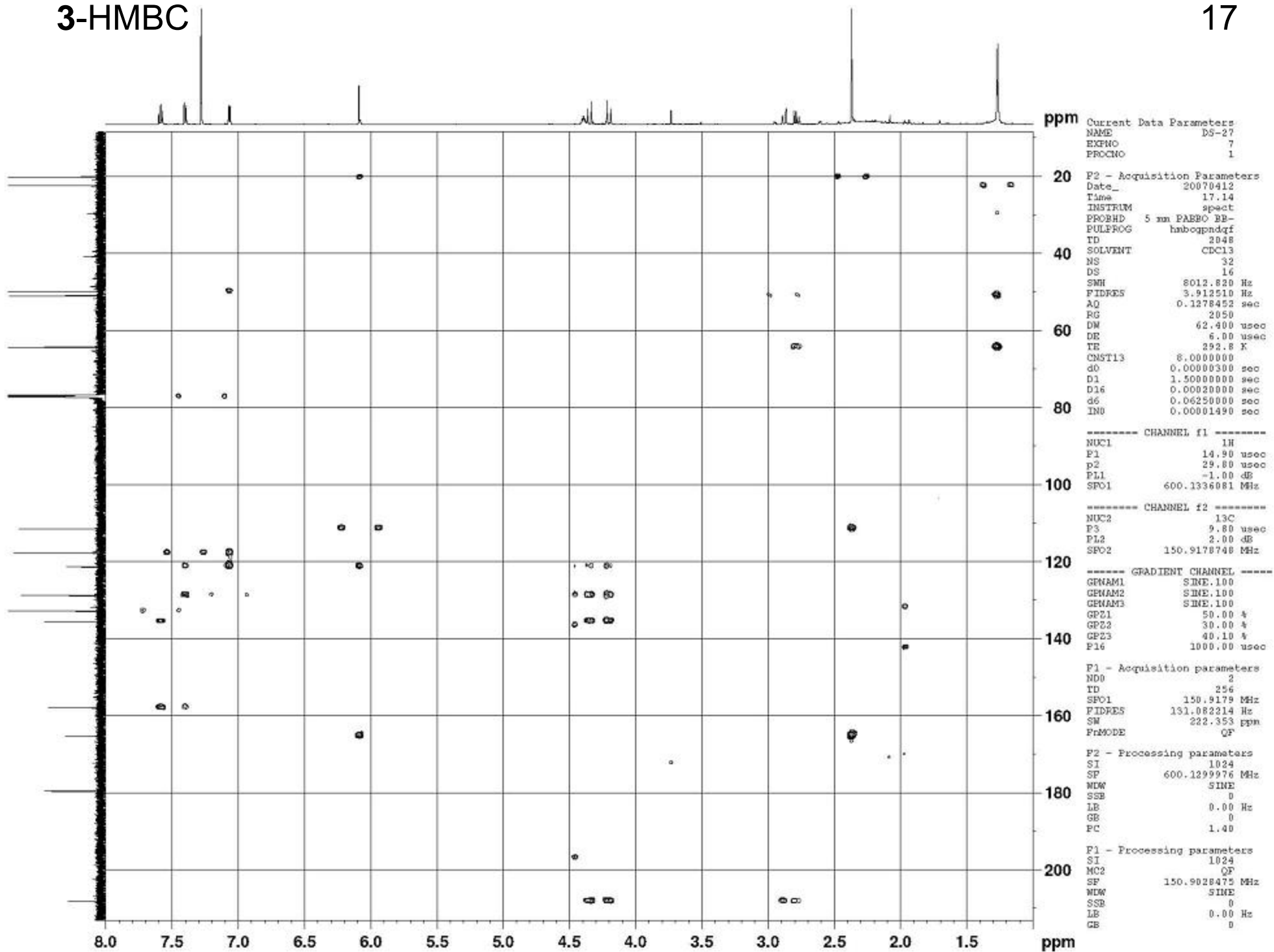
F2 - Processing parameters
SI           32768
SF           150.9026090 MHz
WDW          no
SSB          0
LB           0.00 Hz
GB           0
PC           1.40

```

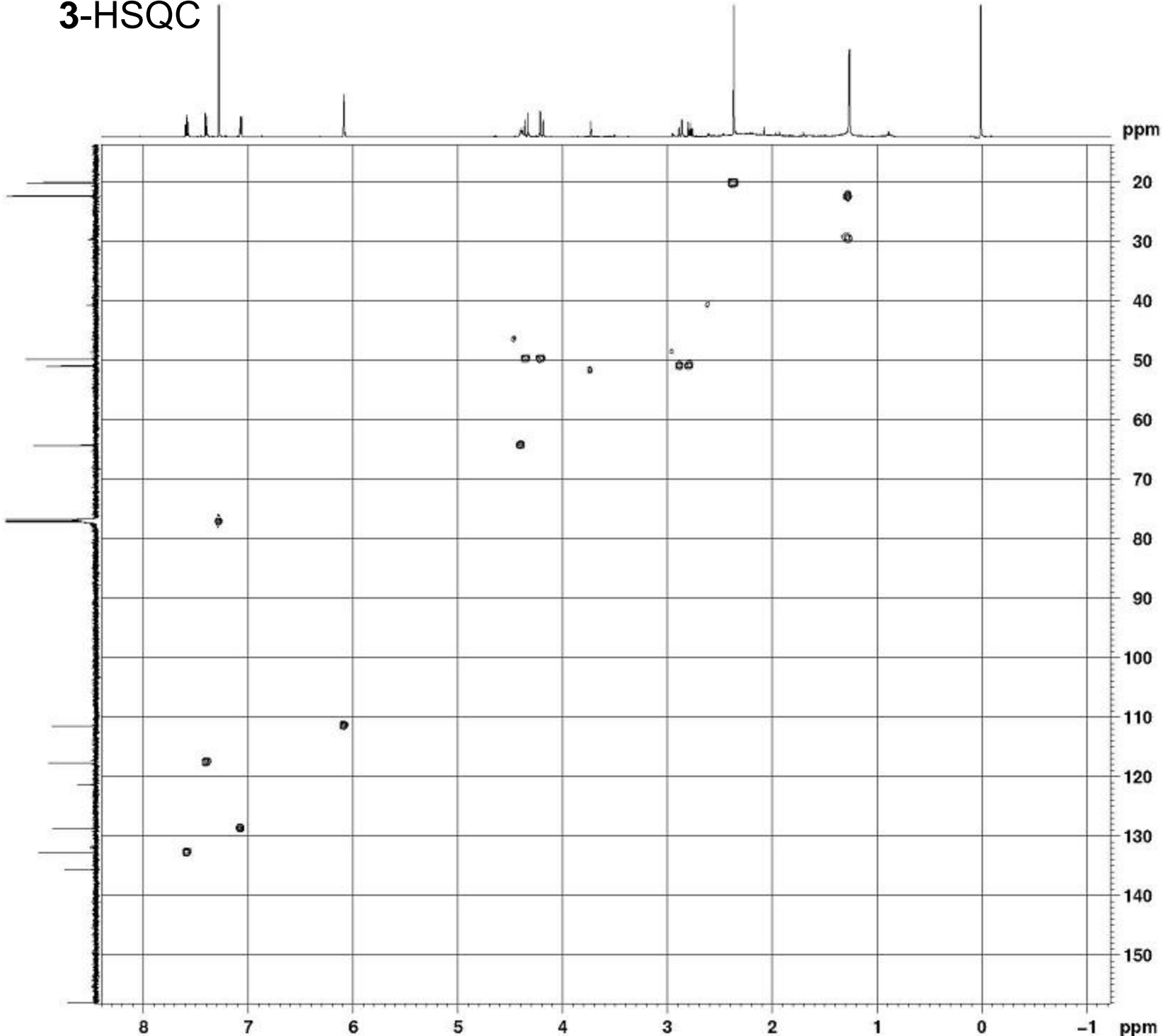
3- H-H- COSY



3-HMBC



3-HSQC



Current Data Parameters
NAME DS-27
EXPNO 6
PROCNO 1

F2 - Acquisition Parameters
Date_ 20070412
Time 14.32
INSTRUM spect
PROBHD 5 mm F4BBO BB-
PULPROG hsqcetgp
TD 1024
SOLVENT CDC13
NS 24
DS 16
SMB 8012.820 Hz
FIDRES 7.825020 Hz
AQ 0.0639476 sec
RG 2050
DM 62.400 usec
DE 6.00 usec
TE 293.2 K
CMST2 145.000000
d0 0.00000300 sec
d1 1.50000000 sec
d11 0.03000000 sec
d12 0.00000400 sec
d16 0.00020000 sec
d4 0.00172414 sec
DELTA 0.00123580 sec
DELTA1 0.00071614 sec
IN0 0.00001655 sec
STCNT 128
ZOOPTMS

----- CHANNEL f1 -----
NUC1 1H
P1 14.90 usec
P2 29.80 usec
P28 1000.00 usec
PL1 -1.00 dB
SFO1 600.1336081 MHz

----- CHANNEL f2 -----
CPDPRG2 garp
NUC2 13C
P3 9.80 usec
P4 19.60 usec
PCPD2 70.00 usec
PL12 19.00 dB
PL2 2.00 dB
SFO2 150.9171948 MHz

----- GRADIENT CHANNEL -----
GRAM1 SINE.100
GRAM2 SINE.100
GPE1 80.00 %
GPE2 20.10 %
P16 1000.00 usec

F1 - Acquisition parameters
ND0 2
TD 256
SFO1 150.9171 MHz
FIDRES 110.013596 Hz
SM 200.186 ppm
FRMODE Echo-Antiecho

F2 - Processing parameters
SI 1024
SF 600.1299935 MHz
WM QSINE
SSB 2
LB 0.00 Hz
GB 0
PC 1.40

F1 - Processing parameters
SI 1024
MC2 echo-antiecho
SF 150.9028276 MHz
WM QSINE
SSB 2
LB 0.00 Hz
GB 0

Compound **1** was examined by reversed-phase HPLC on a 4.6 × 250 mm C-18 (5 μm) column (Merck) with CH₃CN from 50% to 100% in 15 min (1 mL/min flow rate, 254 nm detection) with a retention time of 11.3 min. Crude extract was examined by the same method. The peak of compound **1** was detected with a retention time of 11.3 min.

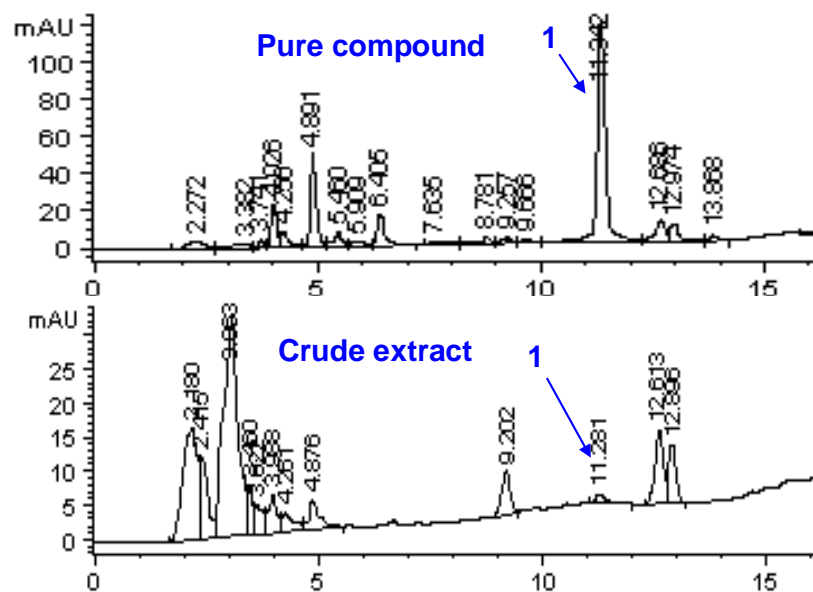


Figure 1: The HPLC result of compound **1** and crude extract.