Microbial Biotransformation of the Sesquiterpene Carotol: Generation of Hydroxylated Metabolites with Potential Cytotoxic and Target-Specific Binding Activities

Hanan G. Sary [1,2], Mohammed A. Khedr [1,3], Mohamed M. Radwan [4,5], Mickey Vinodh [6], and Khaled Y. Orabi [1]*

[1] Department of Pharmaceutical Chemistry, College of Pharmacy, Kuwait University, Safat 13110, Kuwait; hanan.sary@ku.edu.kw, mohammed.khedr@ku.edu.kw, ky.orabi@ku.edu.kw
[2] Department of Pharmacognosy, Faculty of Pharmacy, Ain-Shams University, Cairo, Egypt; hanangaber@pharma.asu.edu.eg
[3] Department of Pharmaceutical Chemistry, Faculty of Pharmacy, Helwan University, Ain Helwan, Cairo 11795, Egypt
[4] Department of Biomolecular Sciences, School of Pharmacy, The University of Mississippi, University, MS 38677, USA; mradwan@olemiss.edu
[5] National Center for Natural Products Research, School of Pharmacy, The University of Mississippi, University, MS 38677, USA; mradwan@olemiss.edu
[6] Research Sector Project Units, Faculty of Science, Kuwait University, Safat 13060, Kuwait; miky.findo@ku.edu.kw
* Correspondence: ky.orabi@ku.edu.kw; Tel.: +965-2463-6048

Table S1. IC_{50} values (mean ± 95% CI) of carotol, its metabolites, and *cis*-platin.

Cell line[a]	IC_{50} (μM) ± CI				
	Carotol	CM1	CM2	CM3	*Cis*-platin
HepG-2	52.34 ± 10.51	220.74 ± 30.43	154.45 ± 23.33	195.53 ± 26.23	11.96 ± 3.06
HCT-116	25.68 ± 1.32	339.38 ± 38.65	180.64 ± 24.72	226.38 ± 27.38	17.96 ± 4.37
MCF-7	68.38 ± 15.00	400.75 ± 50.38	212.85 ± 34.05	242.14 ± 38.96	19.03 ± 5.21
A-549	28.65 ± 6.83	225.38 ± 33.32	138.21 ± 22.85	205.24 ± 26.36	24.53 ± 5.61
MRC-5	175.61 ± 27.17	466.17 ± 50.49	247.62 ± 27.93	316.36 ± 37.70	N/A

[a] *HepG-2: hepatocellular carcinoma, HCT-116: colon carcinoma, MCF-7: breast carcinoma, A-549: lung carcinoma, MRC-5: normal human lung fibroblasts.*

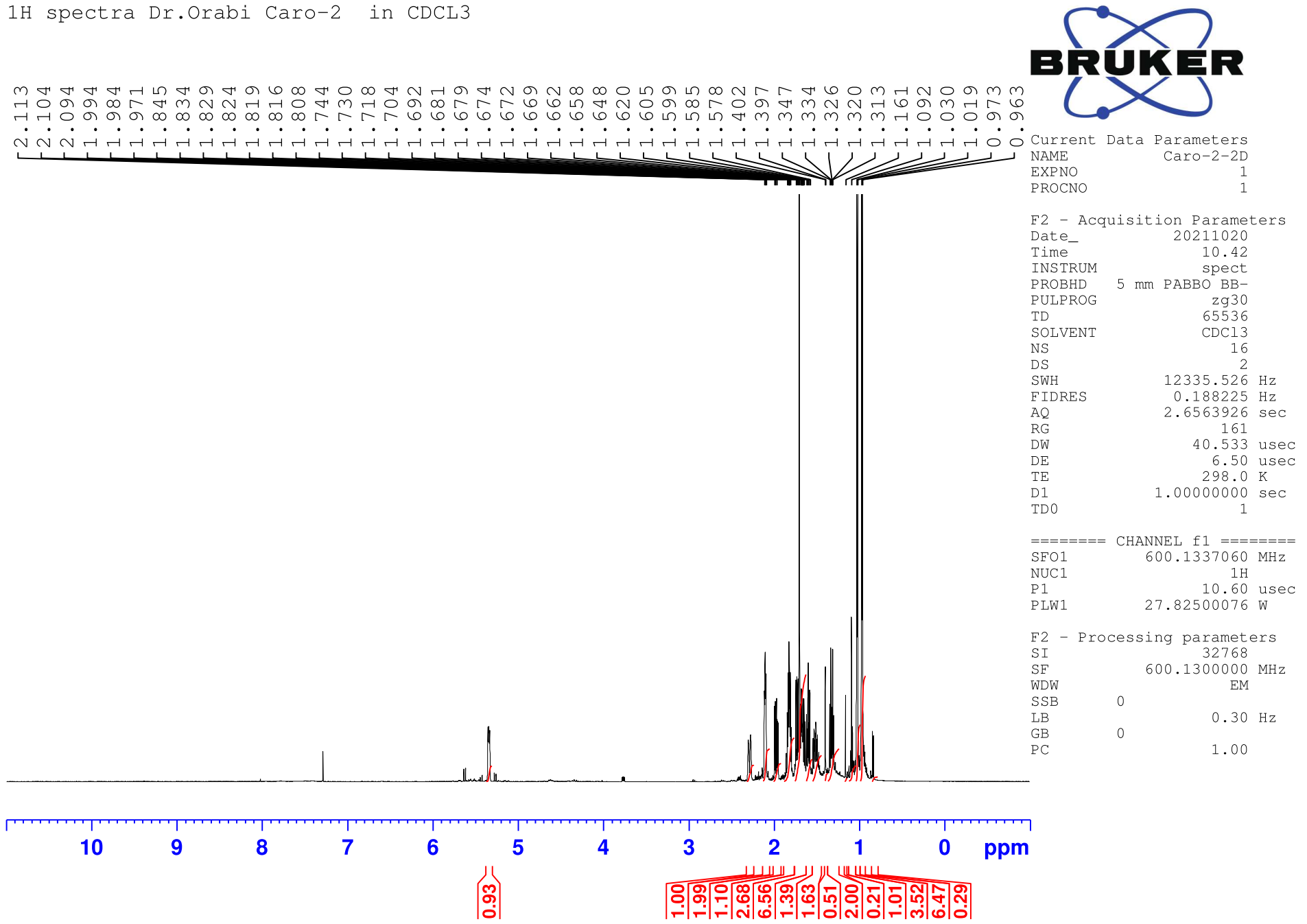
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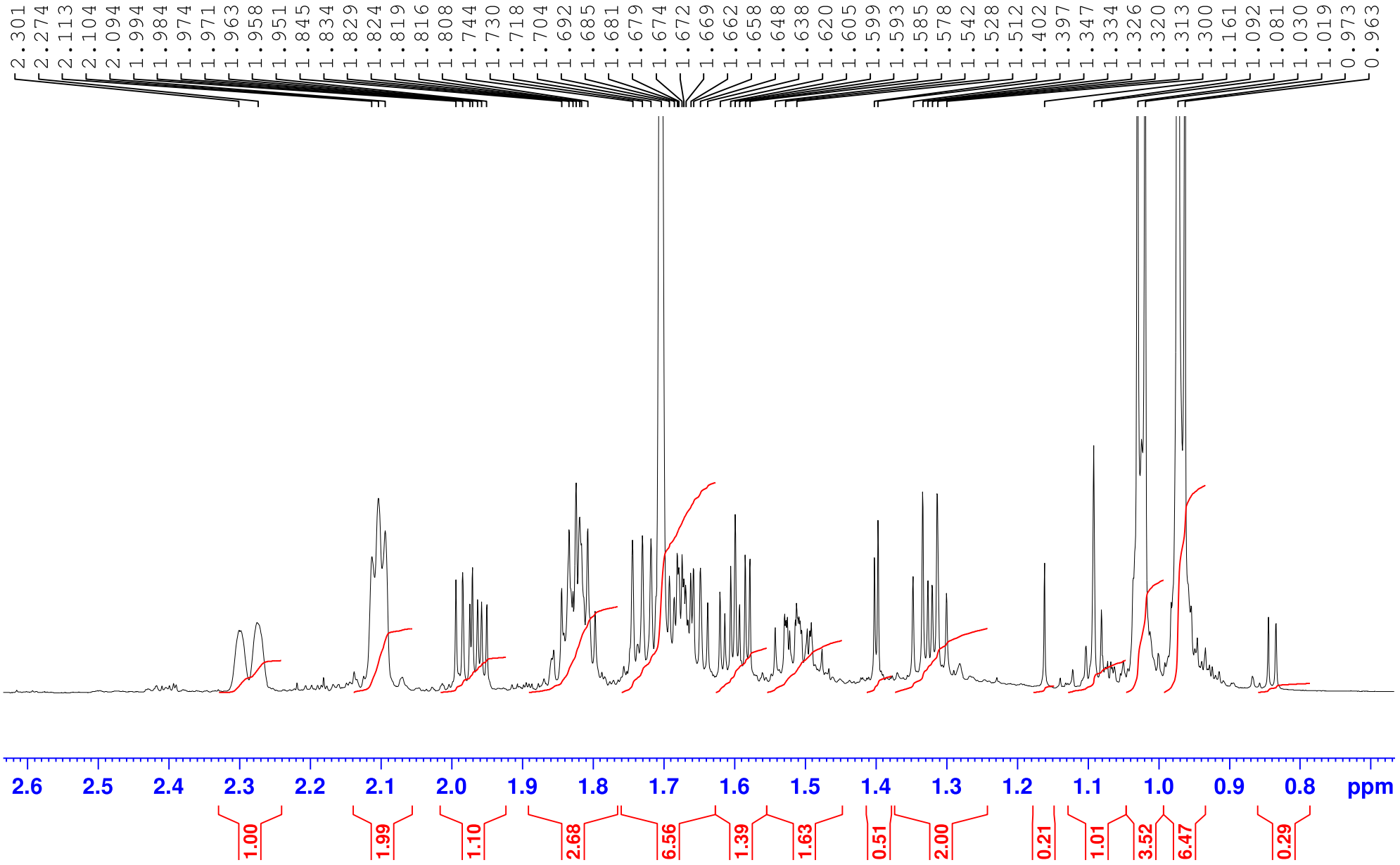
Figure S1

Carotol



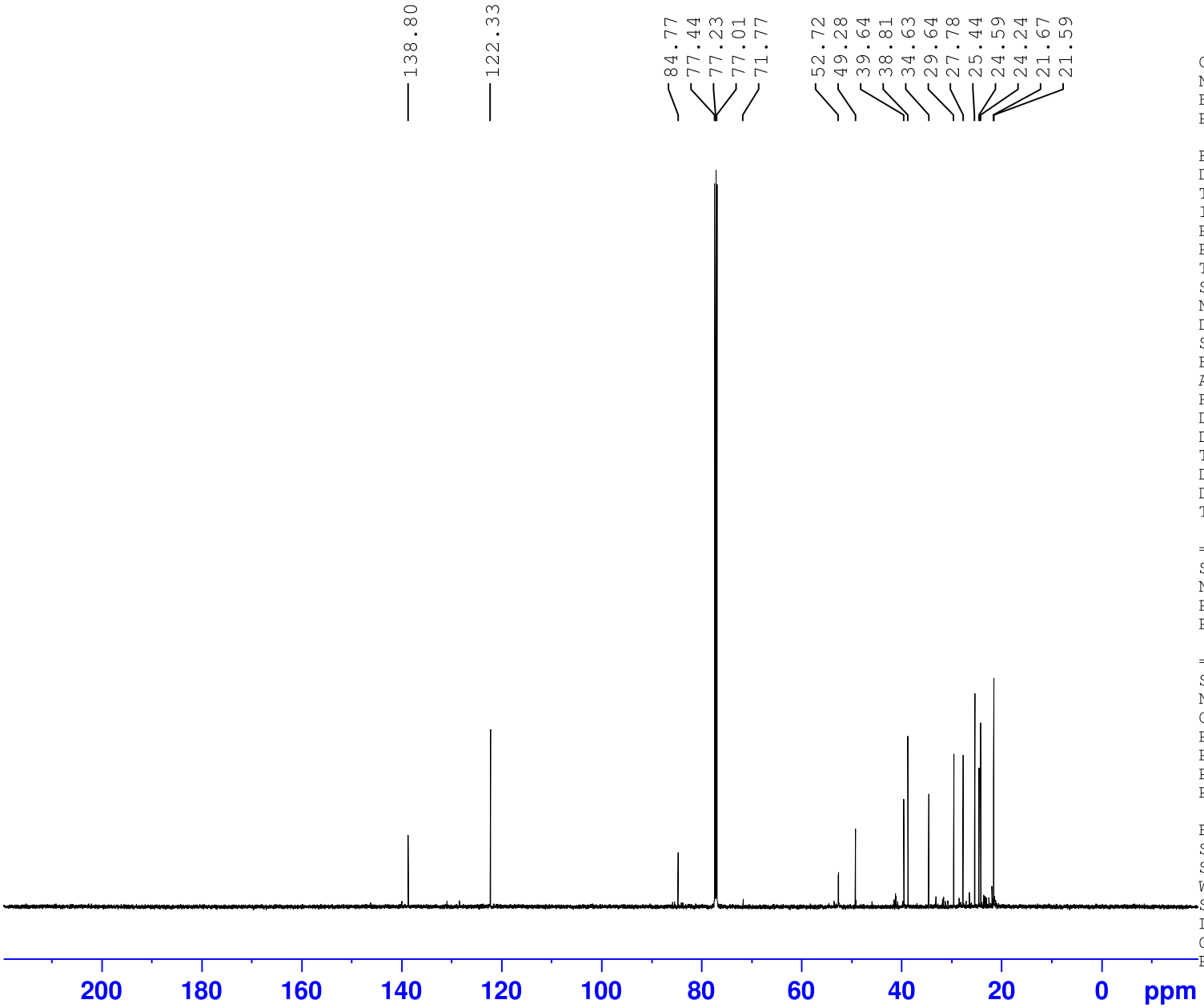
Carotol

1H spectra Dr.Orabi Caro-2 in CDCL3



Carotol

13C decoupled spectra Dr.Orabi Caro-2 in CDCL3



Current Data Parameters
NAME Caro-2-2D
EXPNO 2
PROCNO 1

F2 - Acquisition Parameters
Date_ 20211021
Time 4.59
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 2048
DS 4
SWH 36057.691 Hz
FIDRES 0.550197 Hz
AQ 0.9087659 sec
RG 203
DW 13.867 usec
DE 50.00 usec
TE 299.0 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1

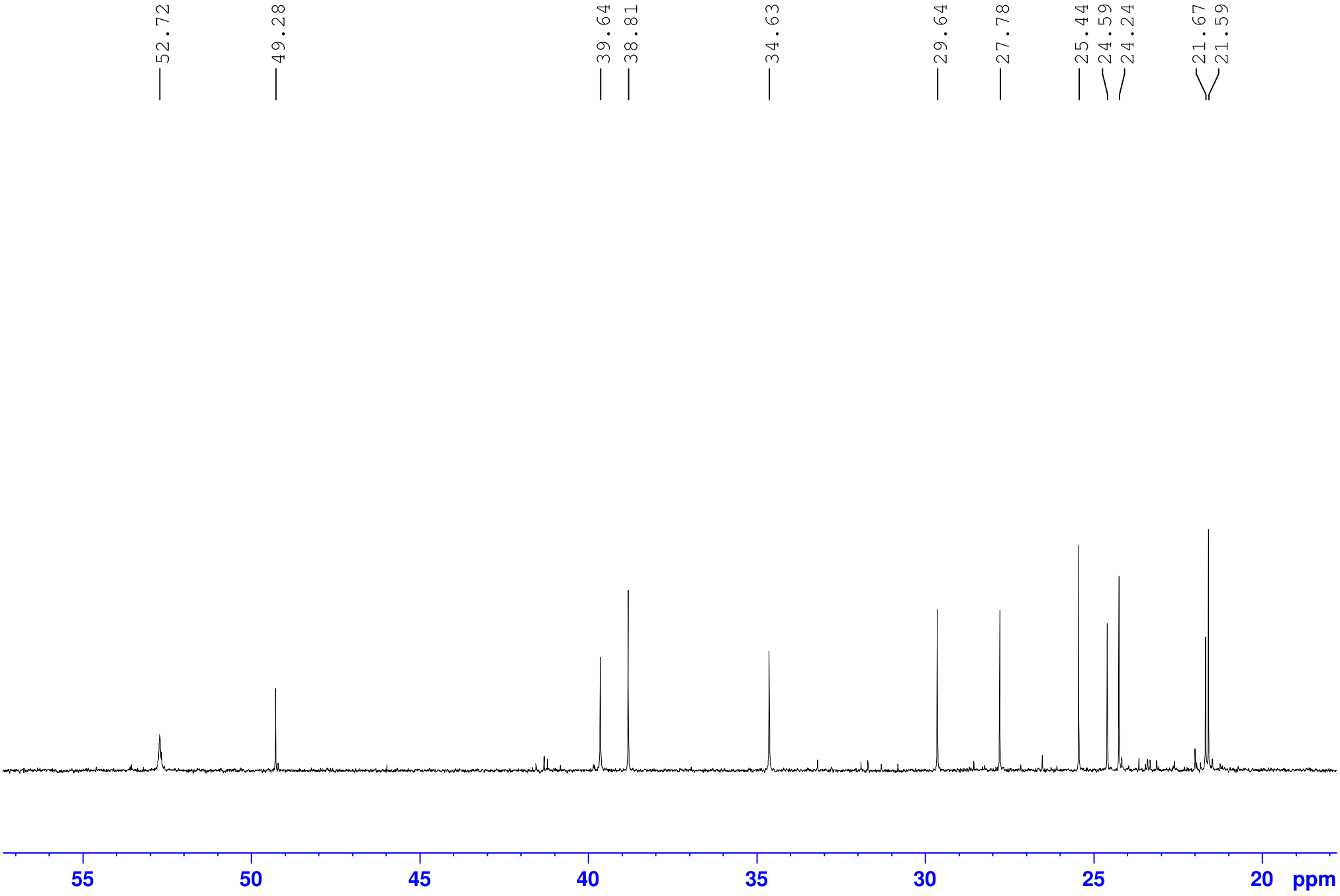
======== CHANNEL f1 ========
SFO1 150.9178979 MHz
NUC1 13C
P1 8.80 usec
PLW1 78.13500214 W

======== CHANNEL f2 ========
SFO2 600.1324005 MHz
NUC2 1H
CPDPRG[2 waltz65
PCPD2 70.00 usec
PLW2 27.82500076 W
PLW12 0.63804001 W
PLW13 0.32093000 W

F2 - Processing parameters
SI 32768
SF 150.9027774 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

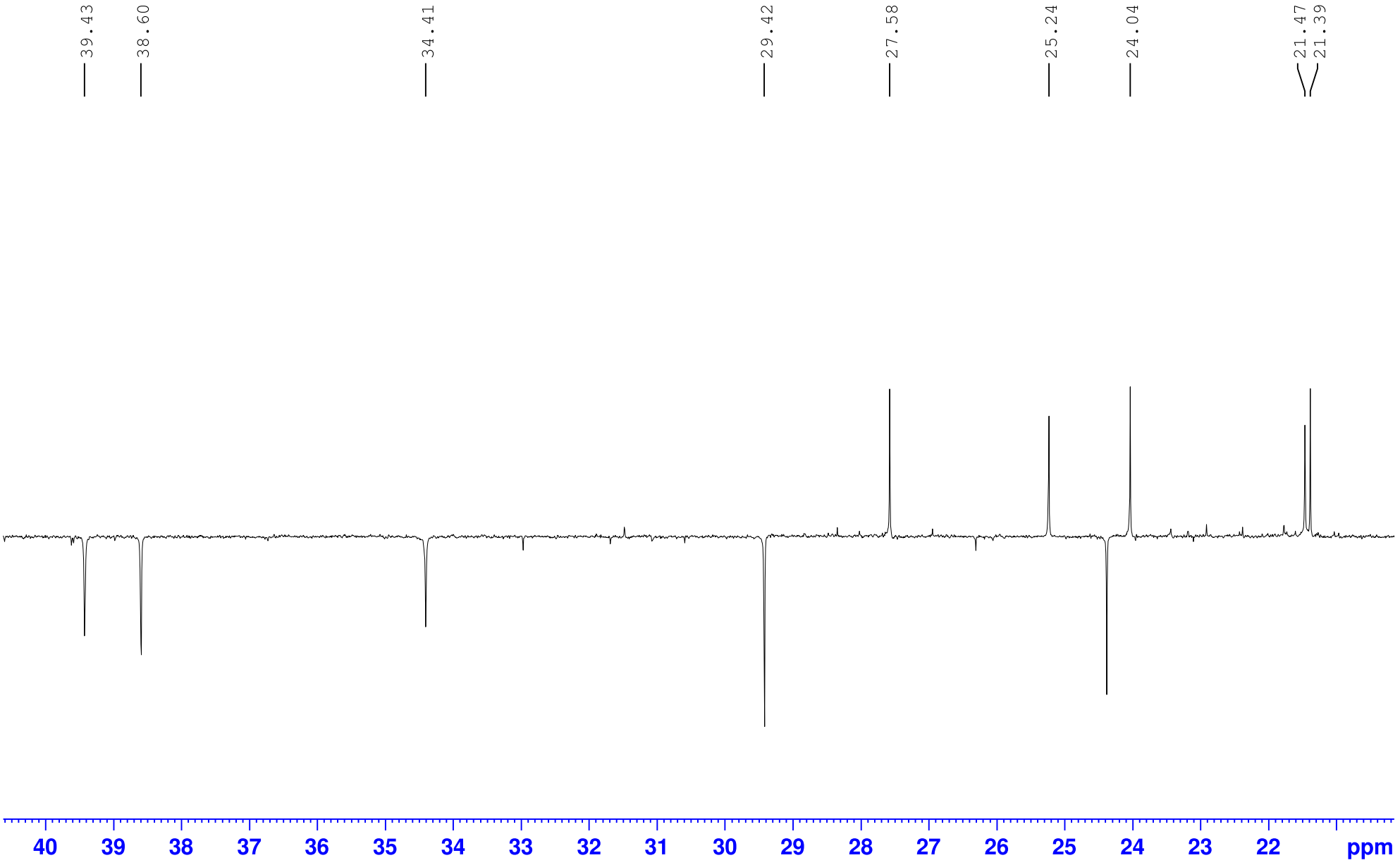
Carotol

13C decoupled spectra Dr.Orabi Caro-2 in CDCL3



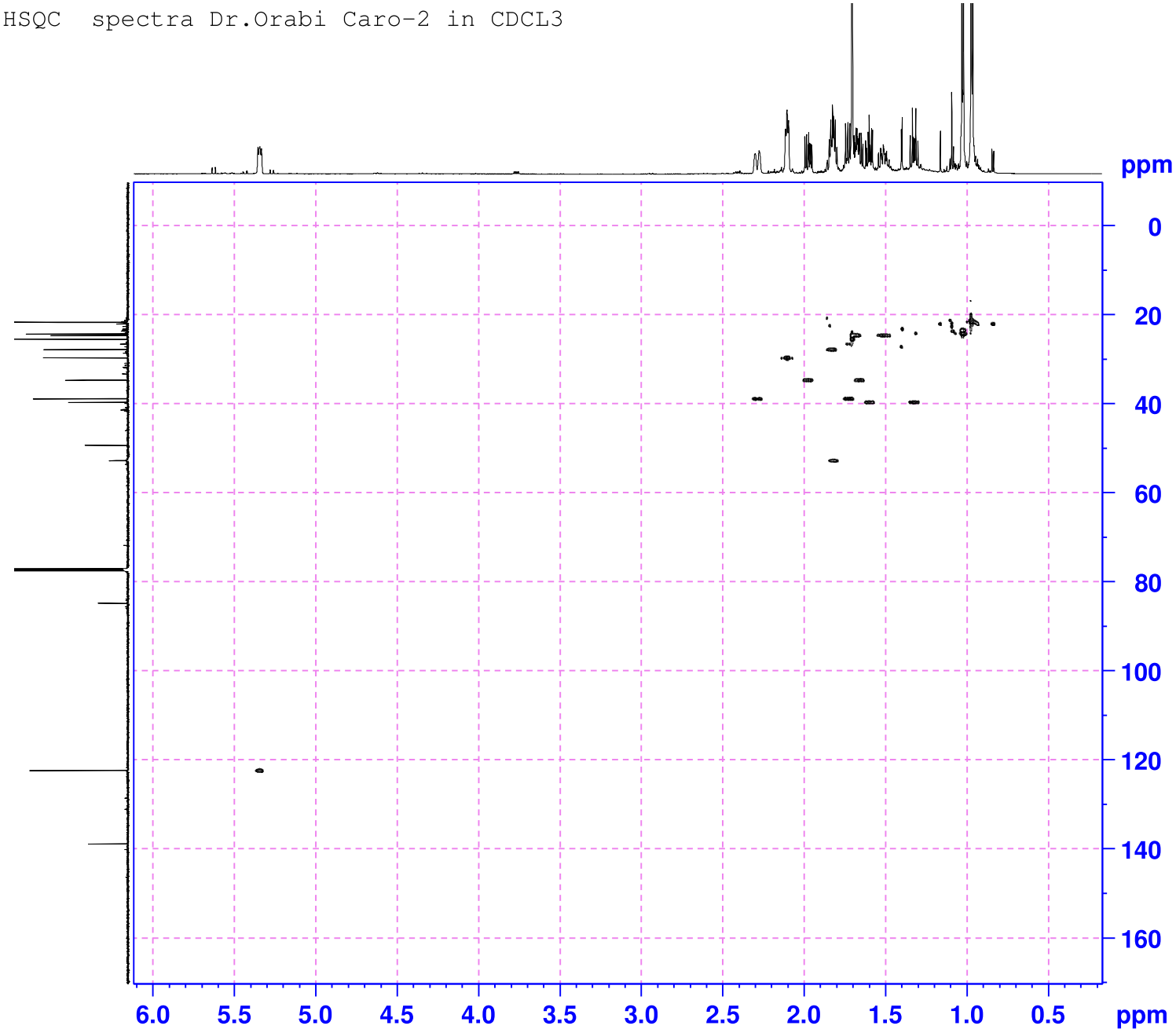
Carotol

DEPT 135 spectra Dr.Orabi Caro-1 in CDCL3



Carotol

13C HSQC spectra Dr.Orabi Caro-2 in CDCL3



BRUKER

```
Current Data Parameters
NAME            Caro-2-2D
EXPNO                   4
PROCNO                  1

F2 - Acquisition Parameters
Date_            20211021
Time                5.26
INSTRUM            spect
PROBHD    5 mm PABBO BB-
PULPROG    hsqcetgpsp.2
TD                  2048
SOLVENT             CDCl3
NS                     8
DS                    16
SWH             3571.428 Hz
FIDRES          1.743862 Hz
AQ              0.2867200 sec
RG                   203
DW                140.000 usec
DE                  6.50 usec
TE                 298.5 K
CNST2         145.0000000
D0              0.00000300 sec
D1              1.81977606 sec
D4              0.00172414 sec
D11             0.03000000 sec
D16             0.00020000 sec
IN0             0.00001840 sec
ZGOPTNS

======== CHANNEL f1 ========
SFO1          600.1318862 MHz
NUC1                    1H
P1                   10.60 usec
P2                   21.20 usec
P28                1000.00 usec
PLW1          27.82500076 W

======== CHANNEL f2 ========
SFO2          150.9148803 MHz
NUC2                   13C
CPDPRG[2             garp4
P3                    8.80 usec
P14                 500.00 usec
P24                2000.00 usec
PCPD2                60.00 usec
PLW0      0 W
PLW2          78.13500214 W
PLW12          1.68079996 W
SPNAM[3] Crp60,0.5,20.1
SPOAL3               0.500
SPOFFS3   0 Hz
SPW3           9.24489975 W
SPNAM[7]     Crp60comp.4
SPOAL7               0.500
SPOFFS7   0 Hz
SPW7           9.24489975 W

====== GRADIENT CHANNEL =====
GPNAM[1]         SINE.100
GPNAM[2]         SINE.100
GPZ1                80.00 %
GPZ2                20.10 %
P16               1000.00 usec

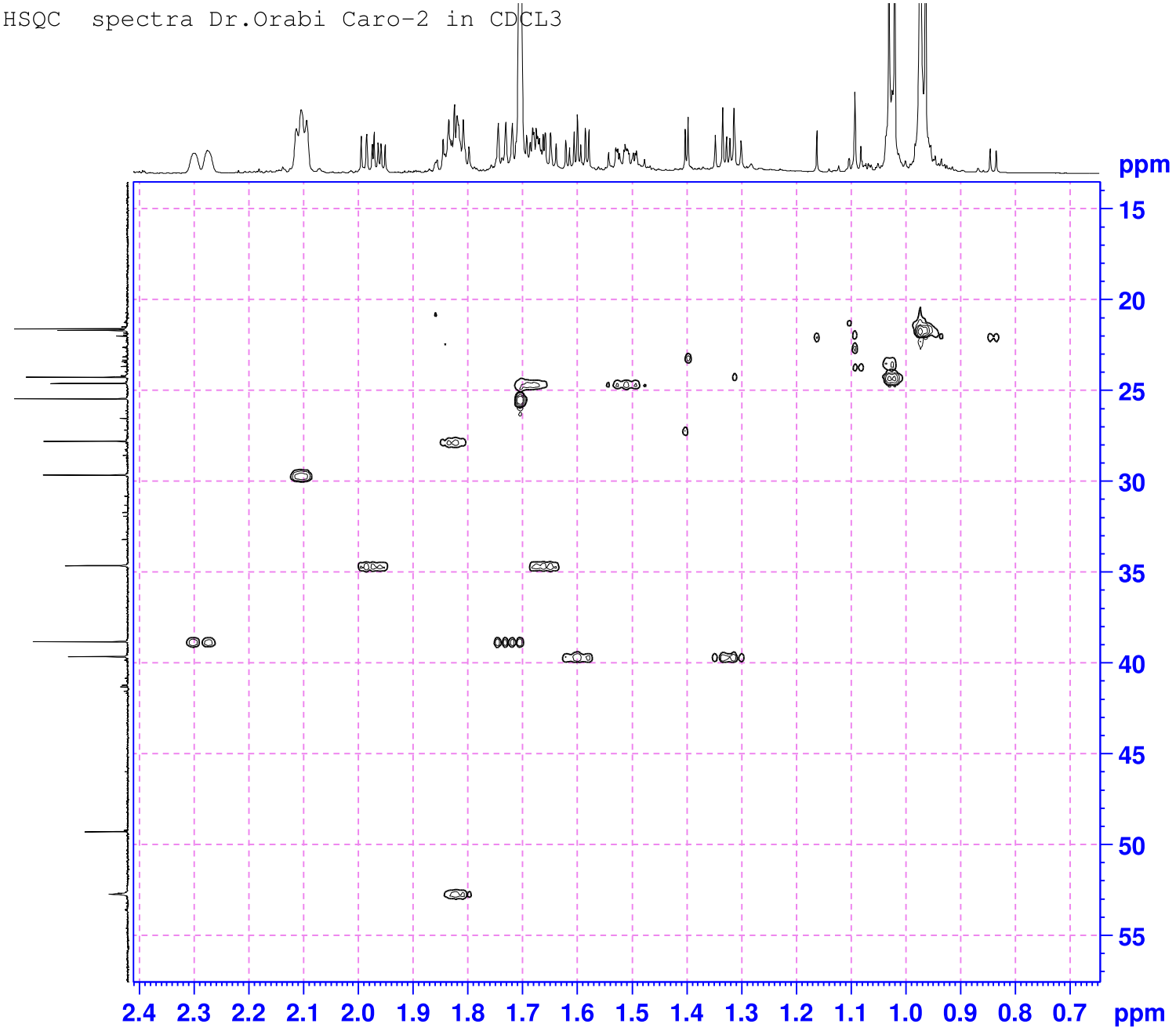
F1 - Acquisition parameters
TD                    512
SFO1            150.9149 MHz
FIDRES          53.074047 Hz
SW                180.061 ppm
FnMODE     Echo-Antiecho

F2 - Processing parameters
SI                   2048
SF            600.1300000 MHz
WDW                  QSINE
SSB                      2
LB        0 Hz
GB        0
PC                    1.40

F1 - Processing parameters
SI                   1024
MC2         echo-antiecho
SF            150.9027685 MHz
WDW                  QSINE
SSB                      2
LB        0 Hz
GB        0
```

Carotol

13C HSQC spectra Dr.Orabi Caro-2 in CDCL3




```
Current Data Parameters
NAME            Caro-2-2D
EXPNO                   4
PROCNO                  1

F2 - Acquisition Parameters
Date_            20211021
Time                5.26
INSTRUM            spect
PROBHD    5 mm PABBO BB-
PULPROG    hsqcetgpsp.2
TD                  2048
SOLVENT            CDCl3
NS                     8
DS                    16
SWH              3571.428 Hz
FIDRES           1.743862 Hz
AQ               0.2867200 sec
RG                   203
DW                140.000 usec
DE                  6.50 usec
TE                 298.5 K
CNST2          145.0000000
D0              0.00000300 sec
D1              1.81977606 sec
D4              0.00172414 sec
D11             0.03000000 sec
D16             0.00020000 sec
IN0             0.00001840 sec
ZGOPTNS

======== CHANNEL f1 ========
SFO1           600.1318862 MHz
NUC1                   1H
P1                  10.60 usec
P2                  21.20 usec
P28               1000.00 usec
PLW1           27.82500076 W

======== CHANNEL f2 ========
SFO2           150.9148803 MHz
NUC2                  13C
CPDPRG[2             garp4
P3                   8.80 usec
P14                500.00 usec
P24               2000.00 usec
PCPD2               60.00 usec
PLW0       0 W
PLW2           78.13500214 W
PLW12           1.68079996 W
SPNAM[3] Crp60,0.5,20.1
SPOAL3               0.500
SPOFFS3  0 Hz
SPW3            9.24489975 W
SPNAM[7]     Crp60comp.4
SPOAL7               0.500
SPOFFS7  0 Hz
SPW7            9.24489975 W

====== GRADIENT CHANNEL =====
GPNAM[1]         SINE.100
GPNAM[2]         SINE.100
GPZ1                80.00 %
GPZ2                20.10 %
P16               1000.00 usec

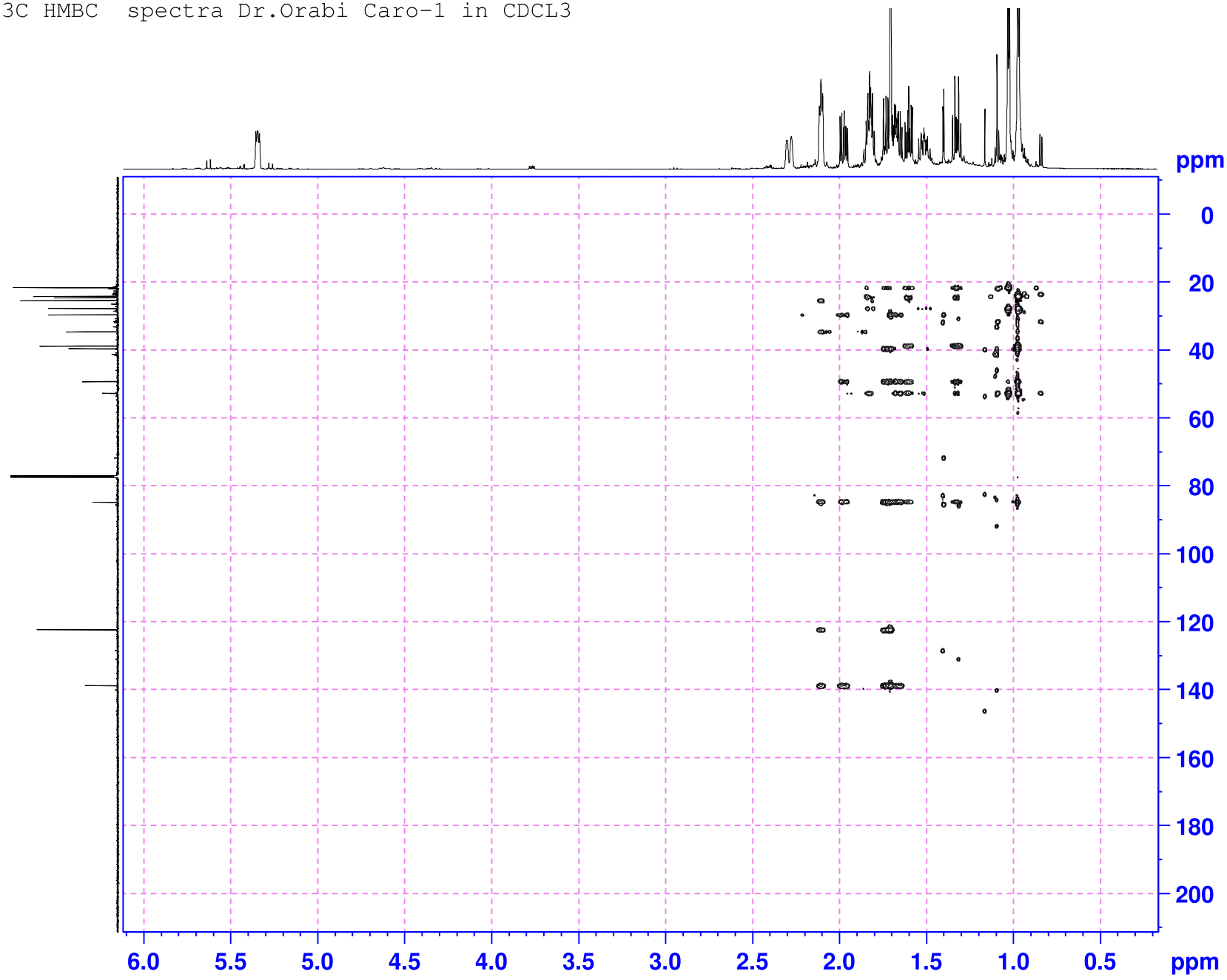
F1 - Acquisition parameters
TD                    512
SFO1            150.9149 MHz
FIDRES          53.074047 Hz
SW                180.061 ppm
FnMODE     Echo-Antiecho

F2 - Processing parameters
SI                   2048
SF            600.1300000 MHz
WDW                  QSINE
SSB                      2
LB        0 Hz
GB        0
PC                    1.40

F1 - Processing parameters
SI                   1024
MC2         echo-antiecho
SF            150.9027685 MHz
WDW                  QSINE
SSB                      2
LB        0 Hz
GB        0
```

Carotol

13C HMBC spectra Dr.Orabi Caro-1 in CDCL3




```
Current Data Parameters
NAME                  Caro-2-2D
EXPNO                         5
PROCNO                        1

F2 - Acquisition Parameters
Date_                  20211021
Time                       7.55
INSTRUM                   spect
PROBHD    5 mm PABBO BB-
PULPROG     hmbcetgpl2nd
TD                         2048
SOLVENT                   CDCl3
NS                           32
DS                           16
SWH                  3571.428 Hz
FIDRES               1.743862 Hz
AQ                   0.2867200 sec
RG                         203
DW                   140.000 usec
DE                     6.50 usec
TE                     297.9 K
CNST6               125.0000000
CNST7               165.0000000
CNST13               10.0000000
CNST30                0.5981148
D0                    0.00000300 sec
D1                    1.34435201 sec
D6                    0.05000000 sec
D16                   0.00020000 sec
IN0                   0.00001490 sec

======== CHANNEL f1 ========
SFO1                600.1318862 MHz
NUC1                        1H
P1                       10.60 usec
P2                       21.20 usec
PLW1                27.82500076 W

======== CHANNEL f2 ========
SFO2                150.9178738 MHz
NUC2                        13C
P3                        8.80 usec
P24                    2000.00 usec
PLW2                78.13500214 W
SPNAM[7]            Crp60comp.4
SPOAL7                    0.500
SPOFFS7   0 Hz
SPW7                 9.24489975 W

====== GRADIENT CHANNEL =====
GPNAM[1]               SINE.100
GPNAM[3]               SINE.100
GPNAM[4]               SINE.100
GPNAM[5]               SINE.100
GPZ1                      80.00 %
GPZ3                      15.00 %
GPZ4                     -10.00 %
GPZ5                      -5.00 %
P16                    1000.00 usec

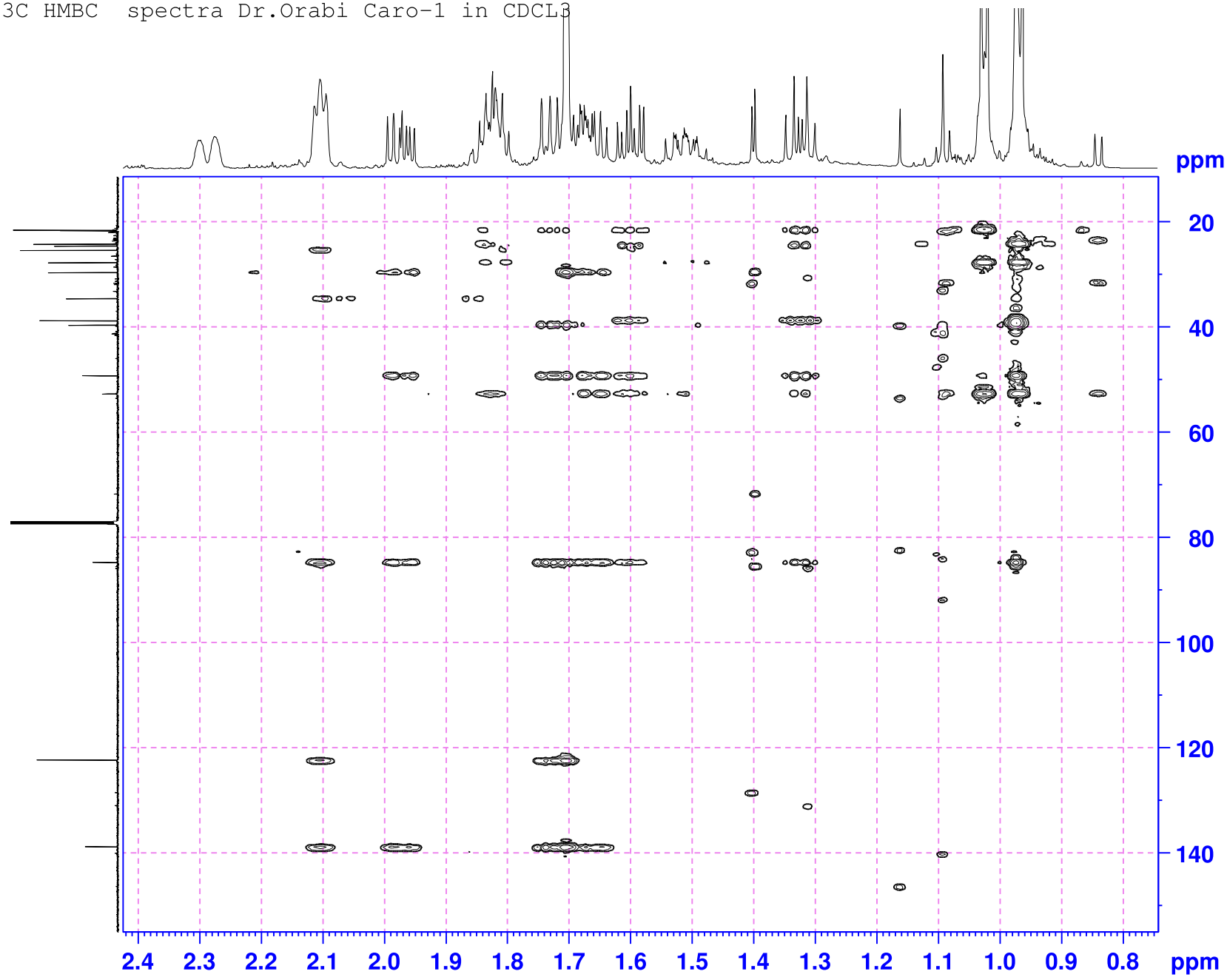
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TD                           256
SFO1                 150.9179 MHz
FIDRES               131.082214 Hz
SW                   222.353 ppm
FnMODE            Echo-Antiecho

F2 - Processing parameters
SI                         2048
SF                  600.1300000 MHz
WDW                        SINE
SSB          0
LB           0 Hz
GB           0
PC                         1.40

F1 - Processing parameters
SI                          512
MC2               echo-antiecho
SF                  150.9027541 MHz
WDW                        SINE
SSB                           2
LB           0 Hz
GB           0
```

Carotol

13C HMBC spectra Dr.Orabi Caro-1 in CDCL3



BRUKER

```
Current Data Parameters
NAME                  Caro-2-2D
EXPNO                         5
PROCNO                        1

F2 - Acquisition Parameters
Date_                  20211021
Time                       7.55
INSTRUM                   spect
PROBHD    5 mm PABBO BB-
PULPROG     hmbcetgpl2nd
TD                         2048
SOLVENT                   CDCl3
NS                           32
DS                           16
SWH                  3571.428 Hz
FIDRES               1.743862 Hz
AQ                   0.2867200 sec
RG                         203
DW                   140.000 usec
DE                     6.50 usec
TE                     297.9 K
CNST6               125.0000000
CNST7               165.0000000
CNST13               10.0000000
CNST30                0.5981148
D0                   0.00000300 sec
D1                   1.34435201 sec
D6                   0.05000000 sec
D16                  0.00020000 sec
IN0                  0.00001490 sec

======== CHANNEL f1 ========
SFO1                600.1318862 MHz
NUC1                        1H
P1                       10.60 usec
P2                       21.20 usec
PLW1                27.82500076 W

======== CHANNEL f2 ========
SFO2                150.9178738 MHz
NUC2                        13C
P3                        8.80 usec
P24                    2000.00 usec
PLW2                78.13500214 W
SPNAM[7]            Crp60comp.4
SPOAL7                    0.500
SPOFFS7   0 Hz
SPW7                 9.24489975 W

====== GRADIENT CHANNEL =====
GPNAM[1]               SINE.100
GPNAM[3]               SINE.100
GPNAM[4]               SINE.100
GPNAM[5]               SINE.100
GPZ1                      80.00 %
GPZ3                      15.00 %
GPZ4                     -10.00 %
GPZ5                      -5.00 %
P16                    1000.00 usec

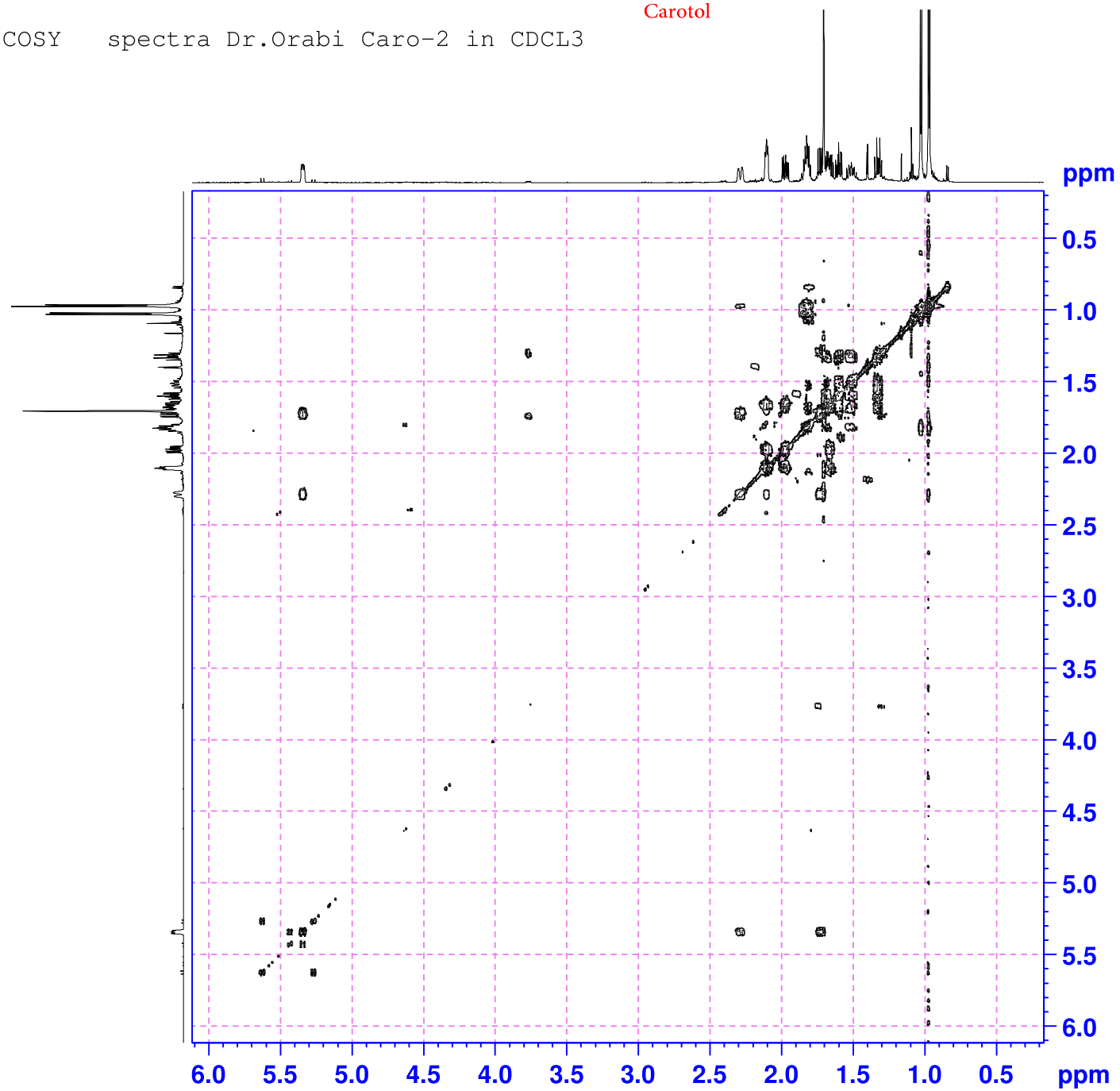
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TD                           256
SFO1                 150.9179 MHz
FIDRES               131.082214 Hz
SW                     222.353 ppm
FnMODE            Echo-Antiecho

F2 - Processing parameters
SI                         2048
SF                  600.1300000 MHz
WDW                        SINE
SSB          0
LB           0 Hz
GB           0
PC                         1.40

F1 - Processing parameters
SI                          512
MC2               echo-antiecho
SF                   150.9027541 MHz
WDW                        SINE
SSB                           2
LB           0 Hz
GB           0
```

Carotol

COSY spectra Dr.Orabi Caro-2 in CDCL3




```
Current Data Parameters
NAME            Caro-2-2D
EXPNO                   3
PROCNO                  1

F2 - Acquisition Parameters
Date_            20211021
Time                5.01
INSTRUM            spect
PROBHD   5 mm PABBO BB-
PULPROG       cosygpppqf
TD                  2048
SOLVENT             CDCl3
NS                      4
DS                      8
SWH              3571.428 Hz
FIDRES           1.743862 Hz
AQ               0.2867200 sec
RG                   90.5
DW                140.000 usec
DE                  6.50 usec
TE                 298.0 K
D0               0.00000300 sec
D1               0.59107488 sec
D11              0.03000000 sec
D12              0.00002000 sec
D13              0.00000400 sec
D16              0.00020000 sec
IN0              0.00028000 sec

======== CHANNEL f1 ========
SFO1          600.1318862 MHz
NUC1                  1H
P0                 10.60 usec
P1                 10.60 usec
P17              2500.00 usec
PLW1          27.82500076 W
PLW10          5.00229979 W

====== GRADIENT CHANNEL =====
GPNAM[1]         SINE.100
GPZ1                20.00 %
P16               1000.00 usec

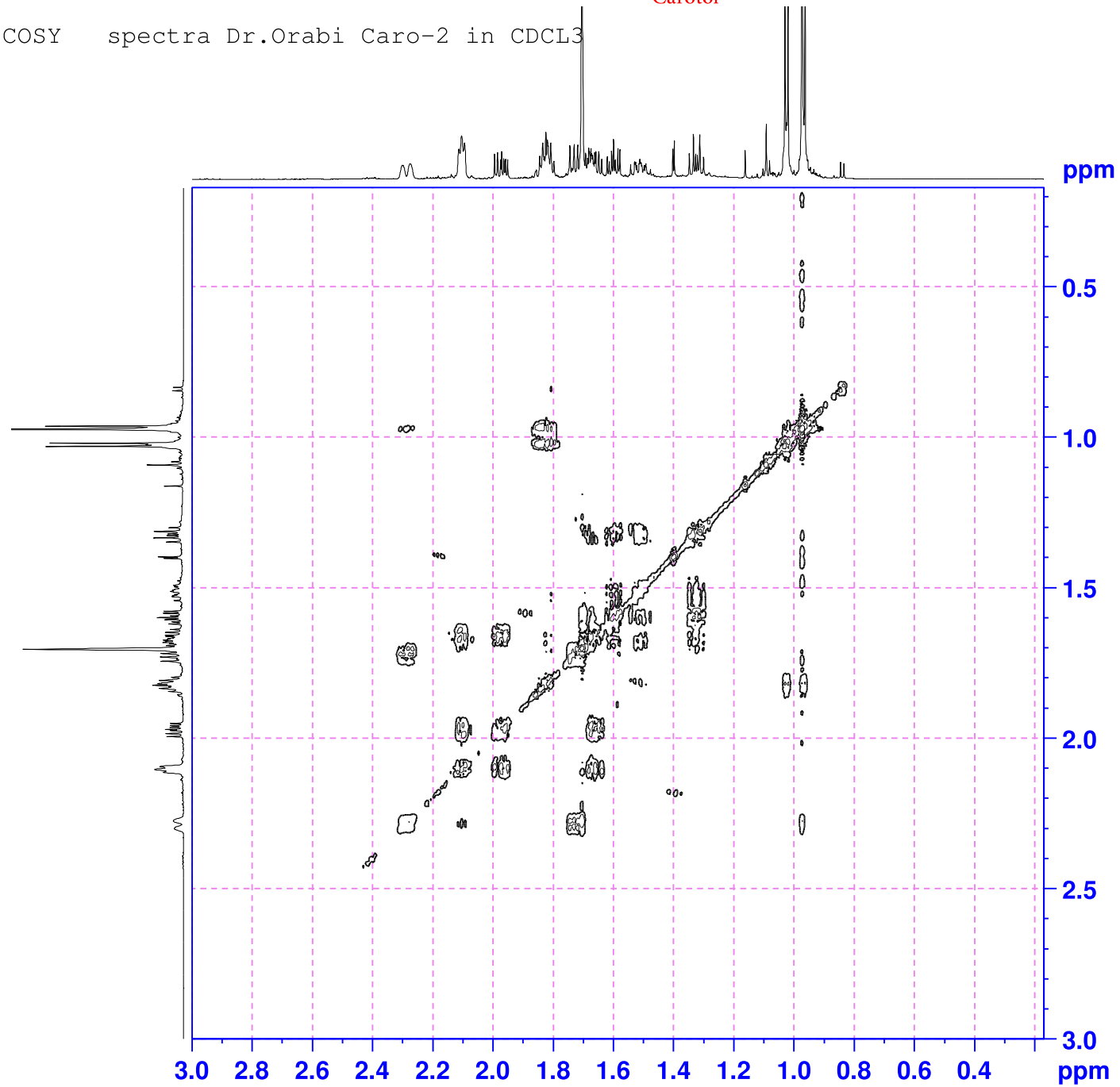
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TD                    320
SFO1             600.1319 MHz
FIDRES          11.160714 Hz
SW                 5.951 ppm
FnMODE                QF

F2 - Processing parameters
SI                   2048
SF            600.1300000 MHz
WDW                  SINE
SSB       0
LB        0 Hz
GB        0
PC                   1.40

F1 - Processing parameters
SI                   2048
MC2                    QF
SF            600.1300000 MHz
WDW                  SINE
SSB       0
LB        0 Hz
GB        0
```

Carotol

COSY spectra Dr.Orabi Caro-2 in CDCL3




```
Current Data Parameters
NAME            Caro-2-2D
EXPNO                   3
PROCNO                  1

F2 - Acquisition Parameters
Date_            20211021
Time                5.01
INSTRUM            spect
PROBHD    5 mm PABBO BB-
PULPROG       cosygpppqf
TD                  2048
SOLVENT             CDCl3
NS                     4
DS                     8
SWH              3571.428 Hz
FIDRES           1.743862 Hz
AQ               0.2867200 sec
RG                  90.5
DW                140.000 usec
DE                  6.50 usec
TE                 298.0 K
D0               0.00000300 sec
D1               0.59107488 sec
D11              0.03000000 sec
D12              0.00002000 sec
D13              0.00000400 sec
D16              0.00020000 sec
IN0              0.00028000 sec

======== CHANNEL f1 ========
SFO1          600.1318862 MHz
NUC1                  1H
P0                 10.60 usec
P1                 10.60 usec
P17              2500.00 usec
PLW1          27.82500076 W
PLW10          5.00229979 W

====== GRADIENT CHANNEL =====
GPNAM[1]         SINE.100
GPZ1                20.00 %
P16               1000.00 usec

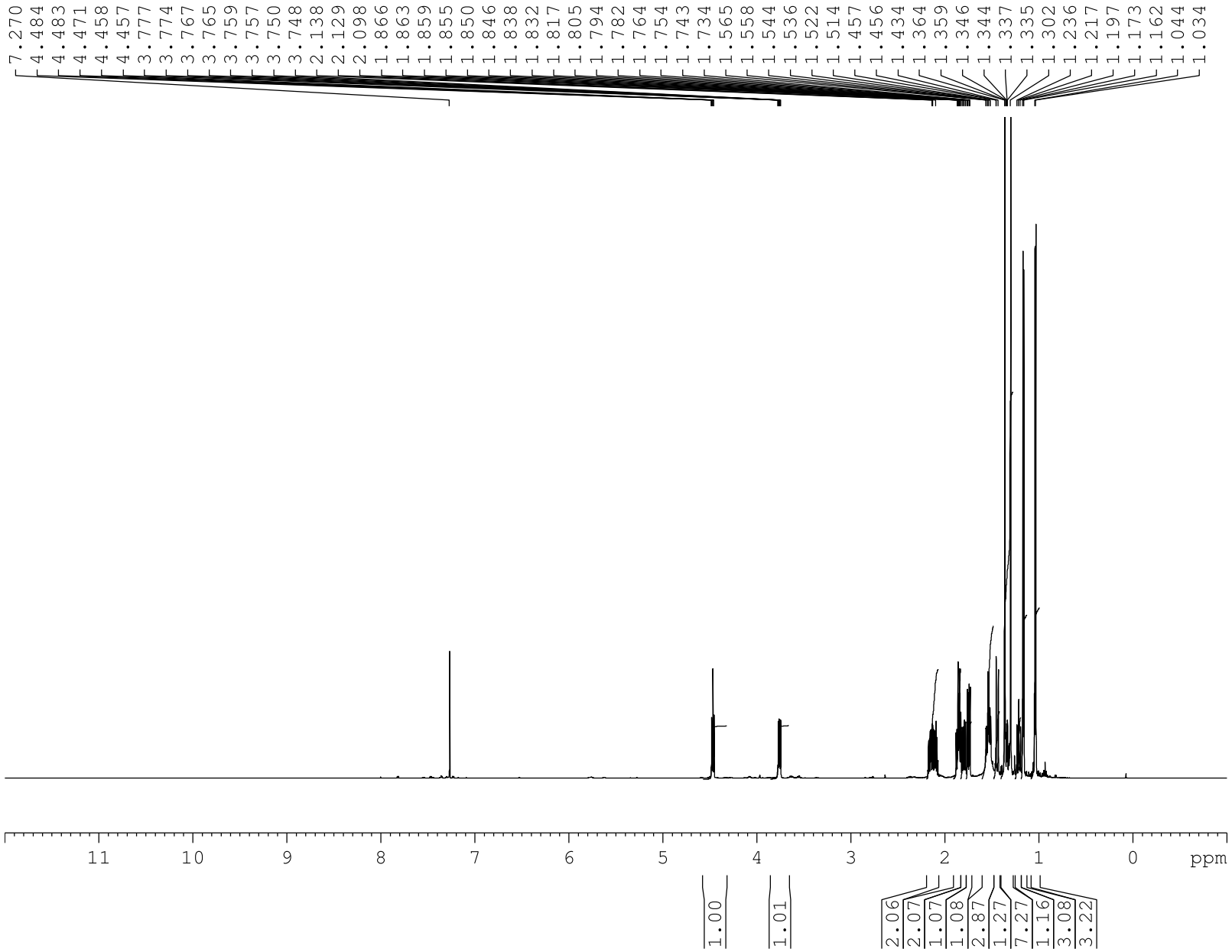
F1 - Acquisition parameters
TD                   320
SFO1             600.1319 MHz
FIDRES          11.160714 Hz
SW                 5.951 ppm
FnMODE               QF

F2 - Processing parameters
SI                  2048
SF            600.1300000 MHz
WDW                 SINE
SSB       0
LB        0 Hz
GB        0
PC                  1.40

F1 - Processing parameters
SI                  2048
MC2                  QF
SF            600.1300000 MHz
WDW                 SINE
SSB       0
LB        0 Hz
GB        0
```

1H spectra Dr.Orabi HGS -V-Caro-85-A in CDCL3

CM1




```
Current
NAME       HGS-V-Caro85A-2D
EXPNO                    1
PROCNO                   1

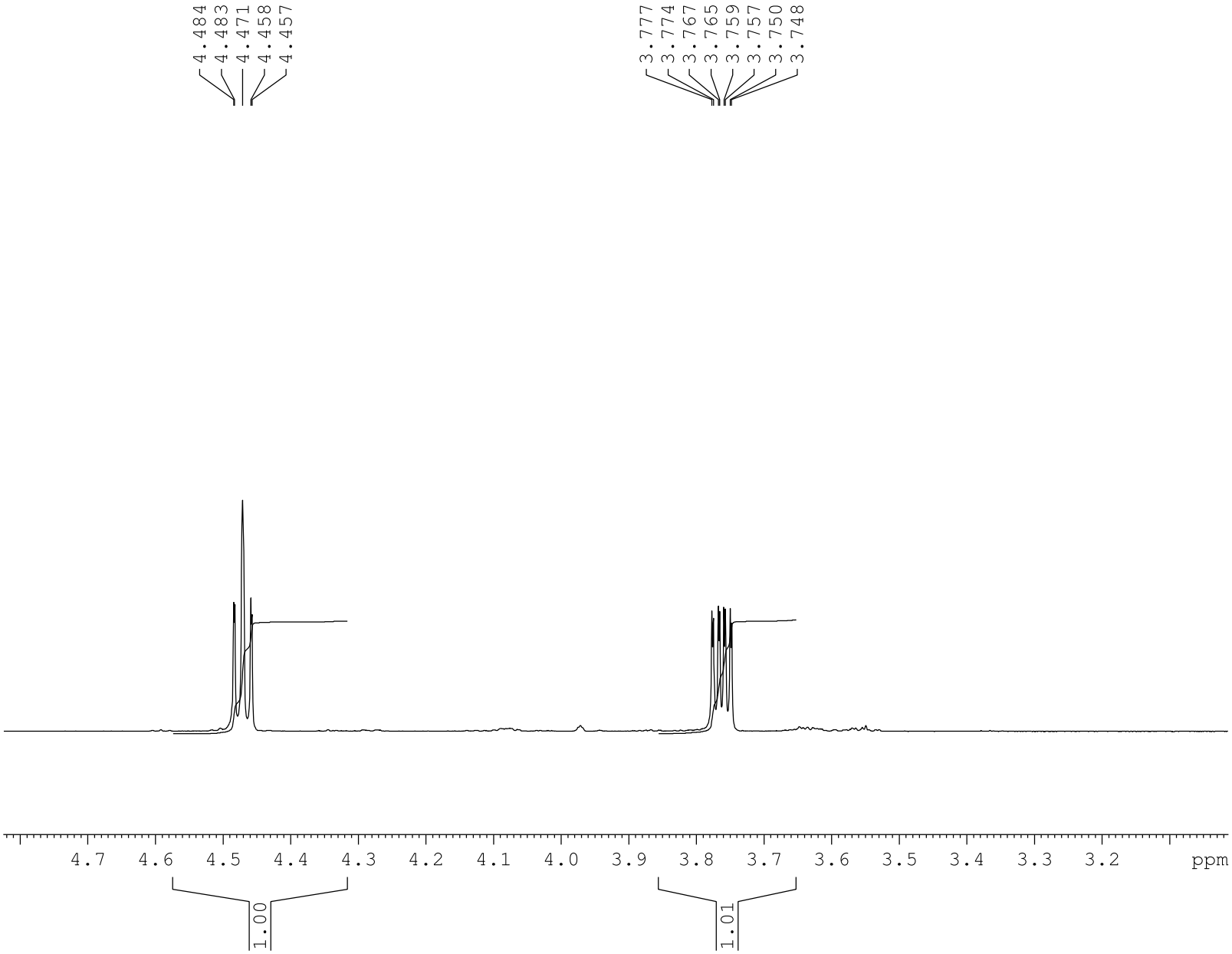
F2 - Acquisition Parameters
Date_             20220524
Time                 11.33
INSTRUM              spect
PROBHD    5 mm PABBO BB-
PULPROG               zg30
TD                   65536
SOLVENT              CDCl3
NS                      16
DS                       2
SWH             12335.526 Hz
FIDRES           0.188225 Hz
AQ               2.6563926 sec
RG                     181
DW                  40.533 usec
DE                  20.00 usec
TE                  298.0 K
D1             1.00000000 sec
TD0                      1

======== CHANNEL f1 ========
SFO1          600.1337060 MHz
NUC1                    1H
P1                  10.60 usec
PLW1          27.82500076 W

F2 - Processing parameters
SI                   32768
SF            600.1300115 MHz
WDW                     EM
SSB       0
LB                   0.30 Hz
GB        0
PC                   1.00
```

CM1

1H spectra Dr.Orabi HGS -V-Caro-85-A in CDCL3



Current
NAME HGS-V-Caro85A-2D
EXPNO 1
PROCNO 1

F2 - Acquisition Parameters

Date_	20220524
Time	11.33
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	12335.526 Hz
FIDRES	0.188225 Hz
AQ	2.6563926 sec
RG	181
DW	40.533 usec
DE	20.00 usec
TE	298.0 K
D1	1.00000000 sec
TD0	1

======== CHANNEL f1 ========

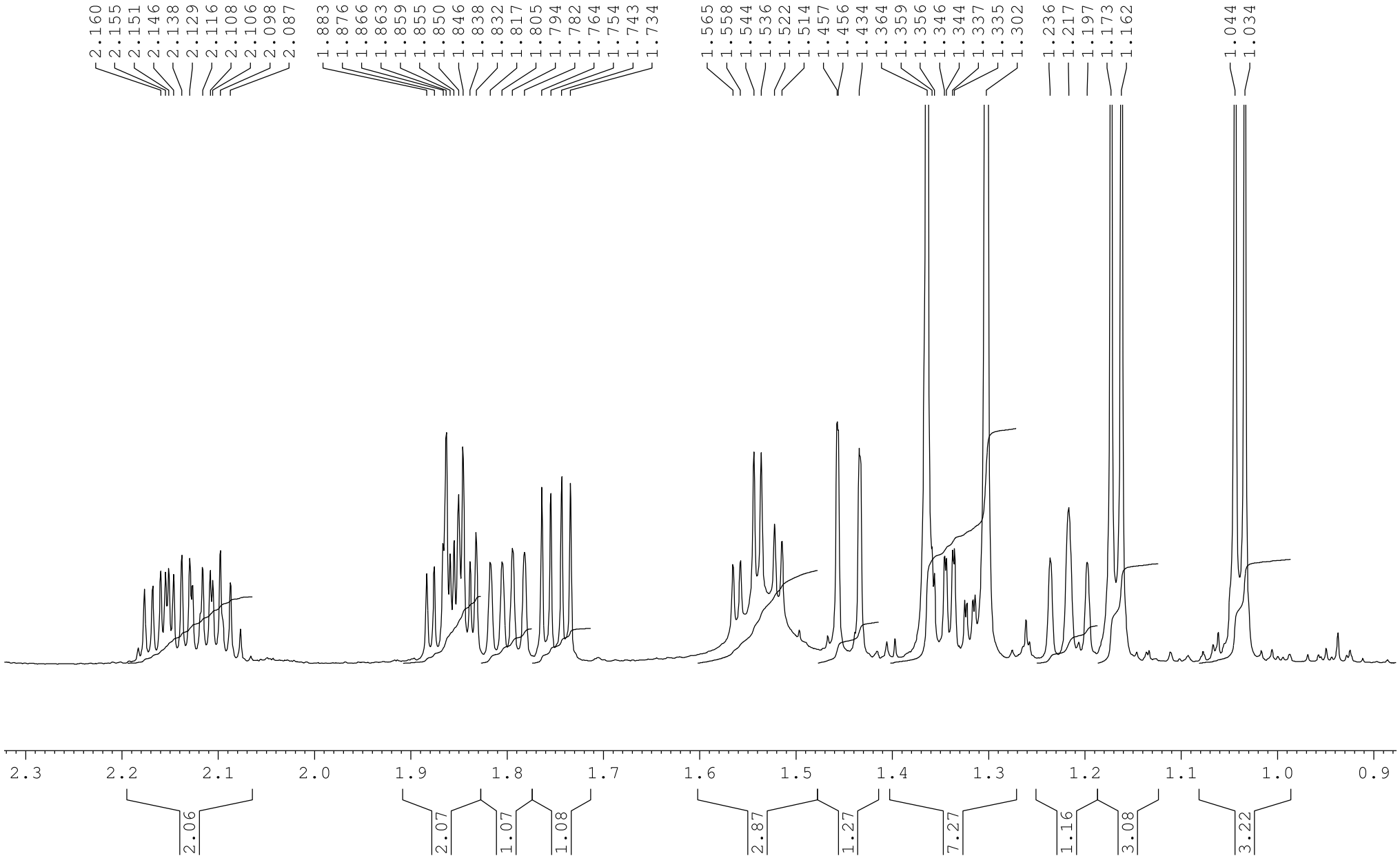
SFO1	600.1337060 MHz
NUC1	1H
P1	10.60 usec
PLW1	27.82500076 W

F2 - Processing parameters

SI	32768
SF	600.1300115 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

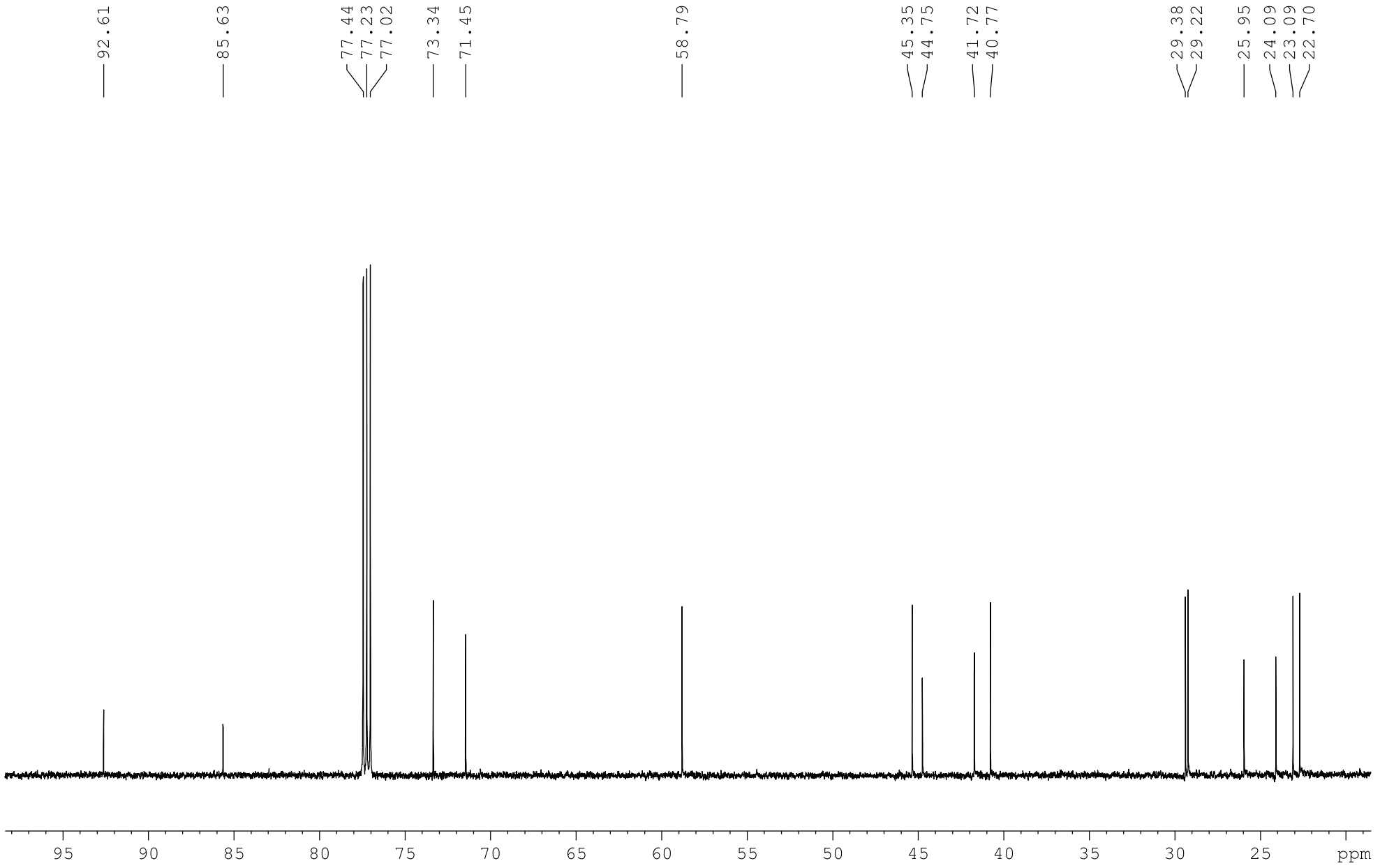
CM1

1H spectra Dr.Orabi HGS -V-Caro-85-A in CDCL3



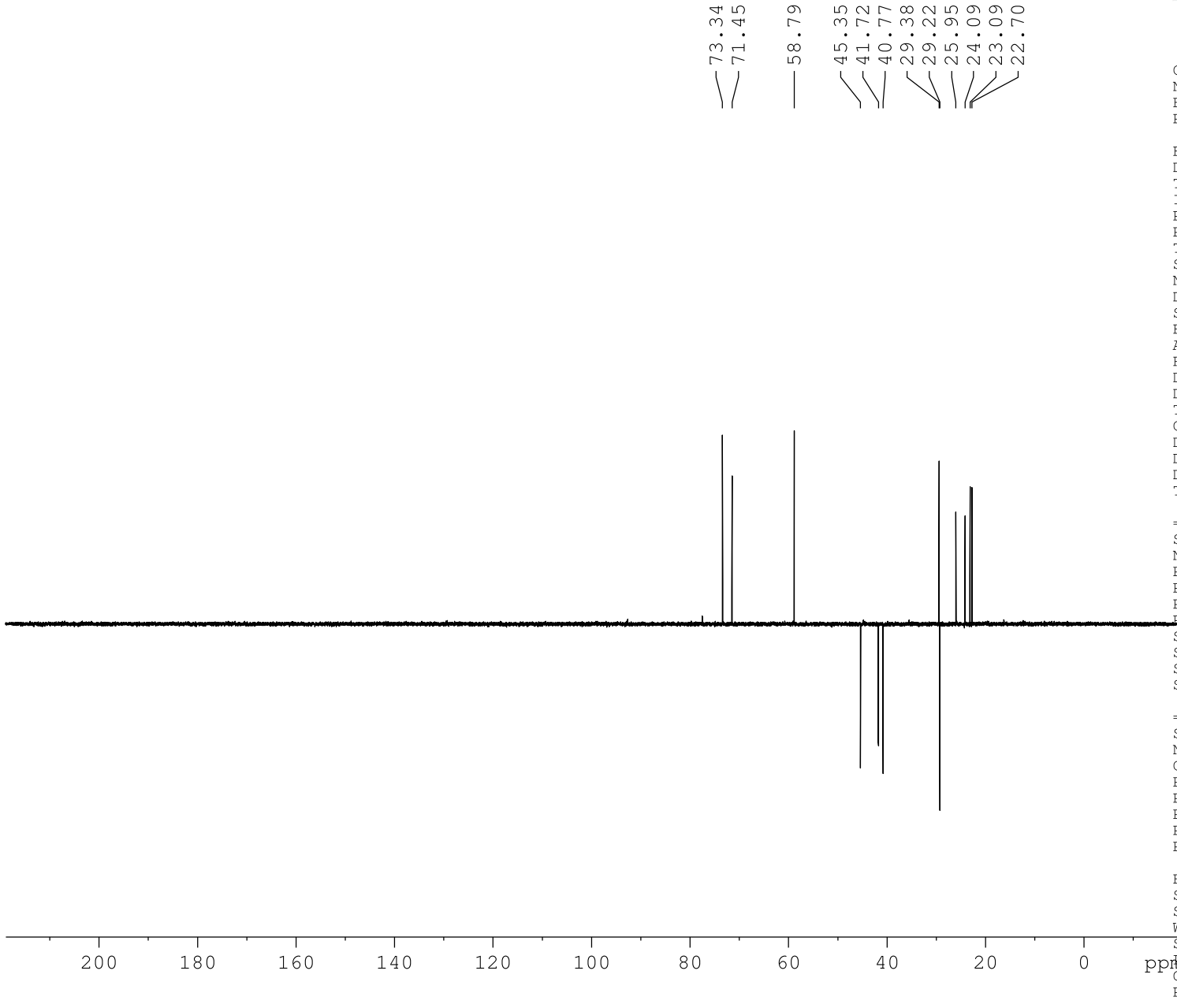
CM1

13C decoupled spectra Dr.Orabi HGS -V-Caro-85-A in CDCL3



CM1

13C DEPT 135 spectra Dr.Orabi HGS -V-Caro-85-A in CDCL3



Current Data Parameters
NAME HGS-V-Caro85A-2D
EXPNO 5
PROCNO 1

F2 - Acquisition Parameters
Date_ 20220524
Time 23.56
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG deptsp135
TD 65536
SOLVENT CDCl3
NS 500
DS 4
SWH 36057.691 Hz
FIDRES 0.550197 Hz
AQ 0.9087659 sec
RG 203
DW 13.867 usec
DE 50.00 usec
TE 298.0 K
CNST2 145.0000000
D1 2.00000000 sec
D2 0.00344828 sec
D12 0.00002000 sec
TD0 1

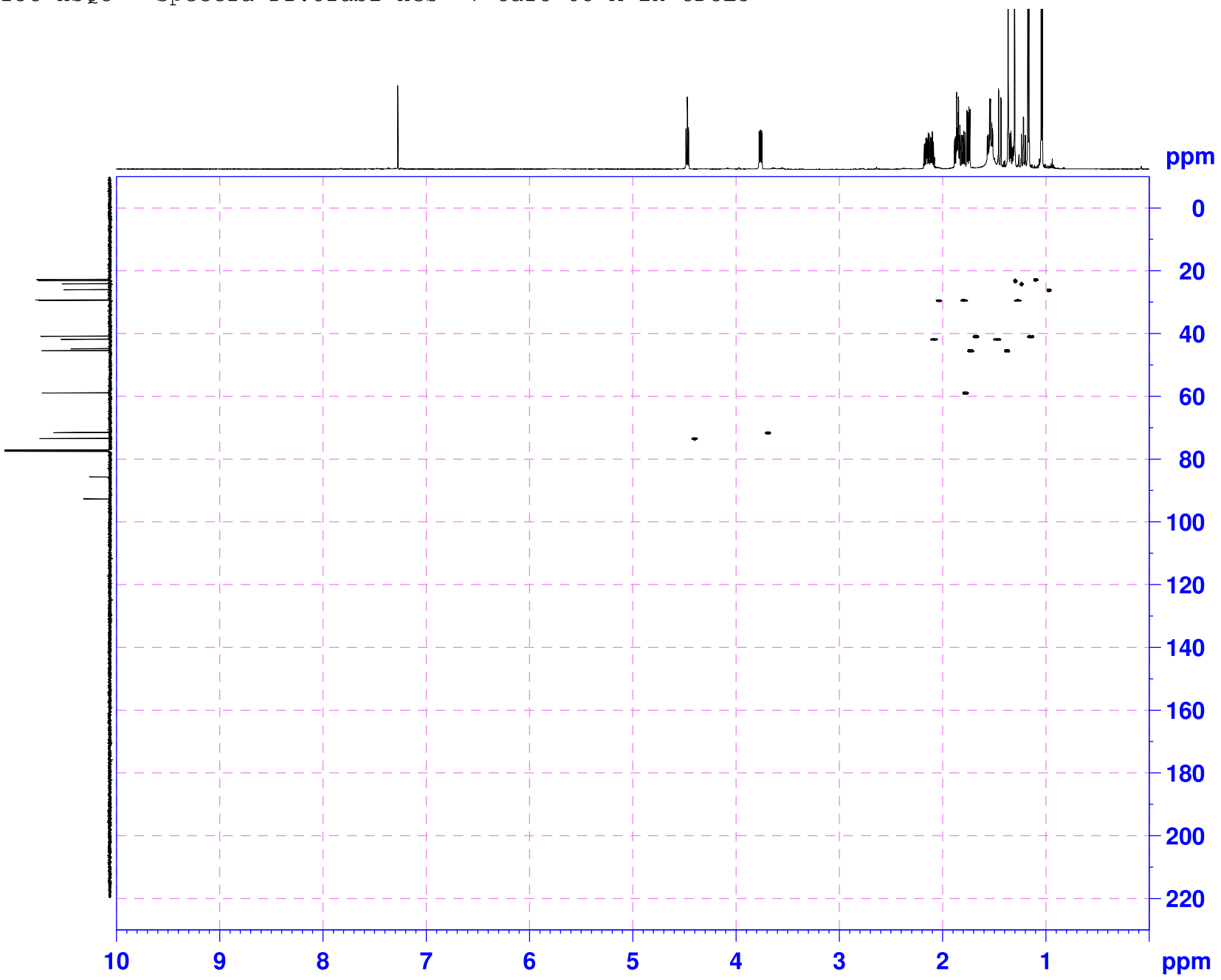
======== CHANNEL f1 ========
SFO1 150.9178979 MHz
NUC1 13C
P1 8.80 usec
P13 2000.00 usec
PLW0 0 W
PLW1 78.13500214 W
SPNAM[5] Crp60comp.4
SPOAL5 0.500
SPOFFS5 0 Hz
SPW5 9.24489975 W

======== CHANNEL f2 ========
SFO2 600.1324005 MHz
NUC2 1H
CPDPRG[2 waltz65
P3 10.60 usec
P4 21.20 usec
PCPD2 70.00 usec
PLW2 27.82500076 W
PLW12 0.63804001 W

F2 - Processing parameters
SI 32768
SF 150.9027781 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

CM1

13C HSQC spectra Dr.Orabi HGS -V-Caro-85-A in CDCL3




```
Current Data Parameters
NAME      HGS-V-Caro85A-2D
EXPNO                    7
PROCNO                   1

F2 - Acquisition Parameters
Date_             20220525
Time                  0.12
INSTRUM              spect
PROBHD    5 mm PABBO BB-
PULPROG     hsqcetgpsp.2
TD                   2048
SOLVENT             CDC13
NS                      4
DS                     16
SWH              4672.897 Hz
FIDRES           2.281688 Hz
AQ               0.2191360 sec
RG                    203
DW                107.000 usec
DE                 20.00 usec
TE                 298.1 K
CNST2         145.0000000
D0             0.00000300 sec
D1             1.88735998 sec
D4             0.00172414 sec
D11            0.03000000 sec
D16            0.00020000 sec
IN0            0.00001840 sec
ZGOPTNS

======== CHANNEL f1 ========
SFO1          600.1324588 MHz
NUC1                    1H
P1                  10.60 usec
P2                  21.20 usec
P28               1000.00 usec
PLW1          27.82500076 W

======== CHANNEL f2 ========
SFO2          150.9148803 MHz
NUC2                   13C
CPDPRG[2             garp4
P3                   8.80 usec
P14                500.00 usec
P24               2000.00 usec
PCPD2               60.00 usec
PLW0       0 W
PLW2          78.13500214 W
PLW12          1.68079996 W
SPNAM[3] Crp60,0.5,20.1
SPOAL3               0.500
SPOFFS3  0 Hz
SPW3           9.24489975 W
SPNAM[7]     Crp60comp.4
SPOAL7               0.500
SPOFFS7  0 Hz
SPW7           9.24489975 W

====== GRADIENT CHANNEL =====
GPNAM[1]         SINE.100
GPNAM[2]         SINE.100
GPZ1                80.00 %
GPZ2                20.10 %
P16               1000.00 usec

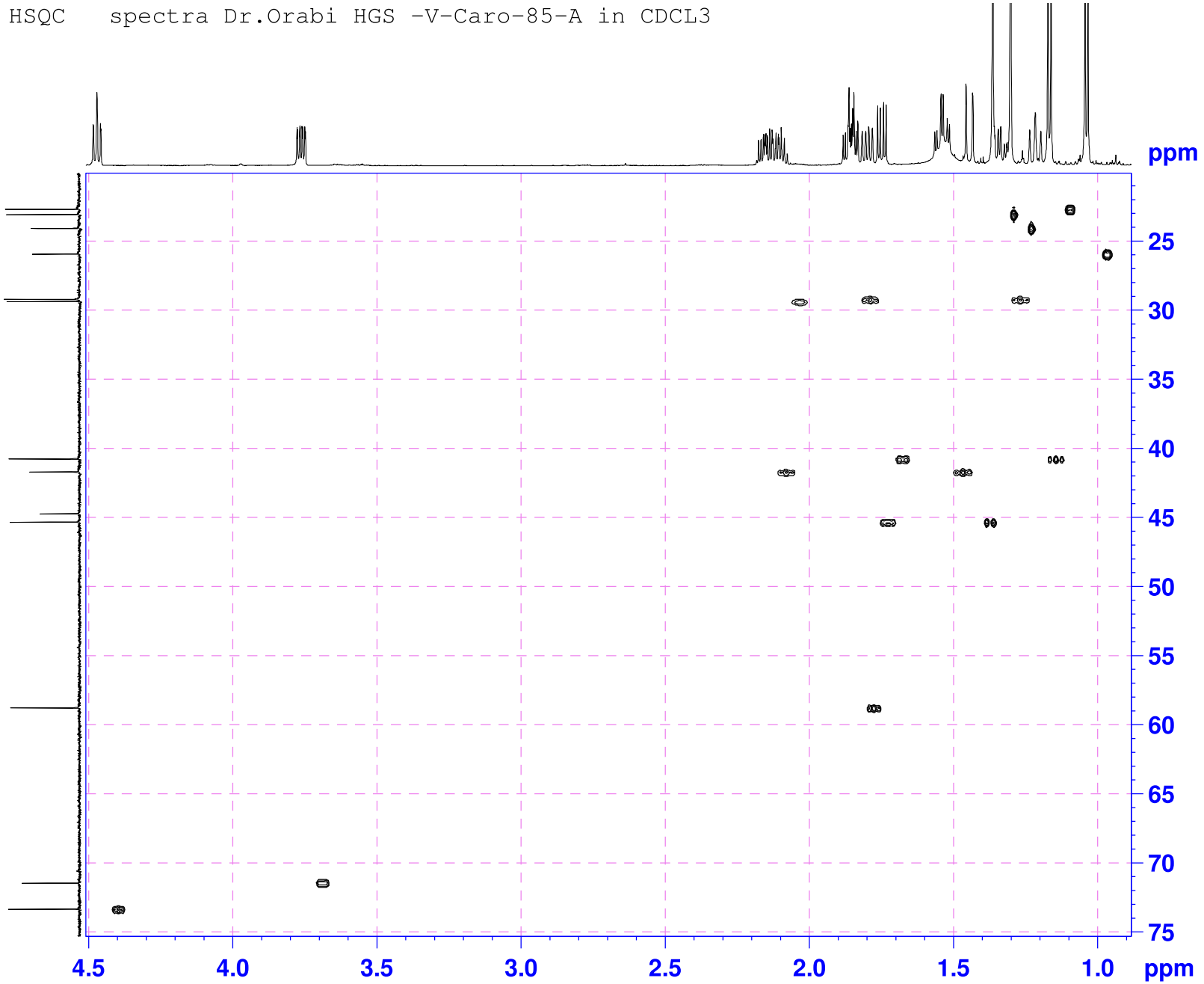
F1 - Acquisition parameters
TD                     512
SFO1            150.9149 MHz
FIDRES          53.074047 Hz
SW                180.061 ppm
FnMODE     Echo-Antiecho

F2 - Processing parameters
SI                    2048
SF            600.1300553 MHz
WDW                  QSINE
SSB                      2
LB         0 Hz
GB         0
PC                    1.40

F1 - Processing parameters
SI                    1024
MC2          echo-antiecho
SF              150.9027623 MHz
WDW                  QSINE
SSB                      2
LB         0 Hz
```

CM1

13C HSQC spectra Dr.Orabi HGS -V-Caro-85-A in CDCL3




```
Current Data Parameters
NAME      HGS-V-Caro85A-2D
EXPNO                    7
PROCNO                   1

F2 - Acquisition Parameters
Date_             20220525
Time                  0.12
INSTRUM              spect
PROBHD   5 mm PABBO BB-
PULPROG    hsqcetgpsp.2
TD                    2048
SOLVENT             CDC13
NS                       4
DS                      16
SWH              4672.897 Hz
FIDRES           2.281688 Hz
AQ               0.2191360 sec
RG                     203
DW                107.000 usec
DE                 20.00 usec
TE                 298.1 K
CNST2         145.0000000
D0             0.00000300 sec
D1             1.88735998 sec
D4             0.00172414 sec
D11            0.03000000 sec
D16            0.00020000 sec
IN0            0.00001840 sec
ZGOPTNS

======== CHANNEL f1 ========
SFO1          600.1324588 MHz
NUC1                    1H
P1                  10.60 usec
P2                  21.20 usec
P28               1000.00 usec
PLW1          27.82500076 W

======== CHANNEL f2 ========
SFO2          150.9148803 MHz
NUC2                   13C
CPDPRG[2             garp4
P3                   8.80 usec
P14                500.00 usec
P24               2000.00 usec
PCPD2               60.00 usec
PLW0       0 W
PLW2          78.13500214 W
PLW12          1.68079996 W
SPNAM[3] Crp60,0.5,20.1
SPOAL3               0.500
SPOFFS3  0 Hz
SPW3           9.24489975 W
SPNAM[7]     Crp60comp.4
SPOAL7               0.500
SPOFFS7  0 Hz
SPW7           9.24489975 W

====== GRADIENT CHANNEL =====
GPNAM[1]         SINE.100
GPNAM[2]         SINE.100
GPZ1                80.00 %
GPZ2                20.10 %
P16               1000.00 usec

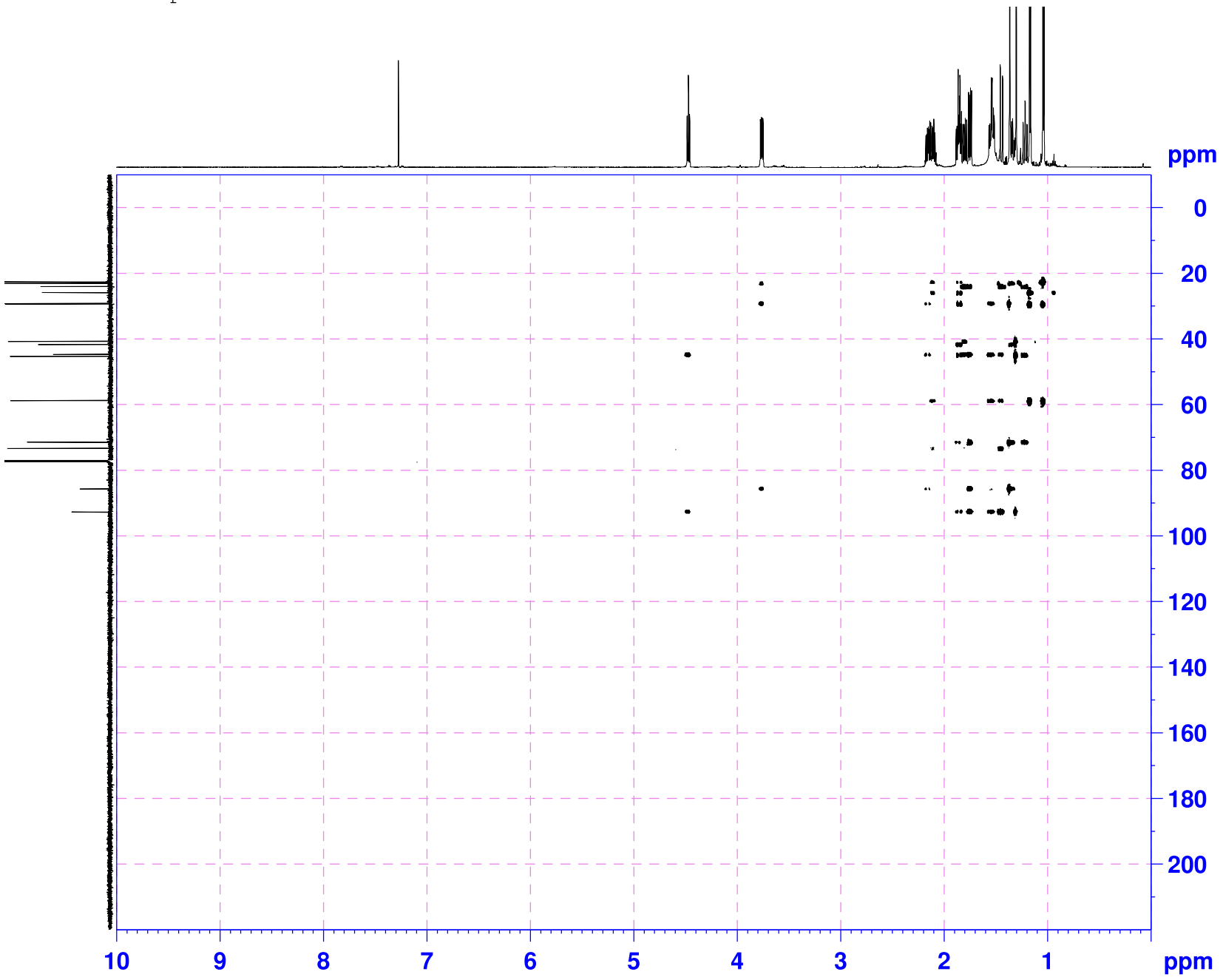
F1 - Acquisition parameters
TD                     512
SFO1            150.9149 MHz
FIDRES          53.074047 Hz
SW               180.061 ppm
FnMODE     Echo-Antiecho

F2 - Processing parameters
SI                    2048
SF            600.1300553 MHz
WDW                 QSINE
SSB                     2
LB         0 Hz
GB         0
PC                   1.40

F1 - Processing parameters
SI                    1024
MC2         echo-antiecho
SF            150.9027623 MHz
WDW                 QSINE
SSB                     2
LB         0 Hz
```

CM1

13C HMBC spectra Dr.Orabi HGS -V-Caro-85-A in CDCL3




```
Current Data Parameters
NAME      HGS-V-Caro85A-2D
EXPNO                    8
PROCNO                   1

F2 - Acquisition Parameters
Date_             20220525
Time                 1.28
INSTRUM             spect
PROBHD   5 mm PABBO BB-
PULPROG    hmbcetgpl2nd
TD                   2048
SOLVENT              CDCl3
NS                     16
DS                     16
SWH               4672.897 Hz
FIDRES            2.281688 Hz
AQ                0.2191360 sec
RG                     203
DW                107.000 usec
DE                 20.00 usec
TE                 297.9 K
CNST6          125.0000000
CNST7          165.0000000
CNST13          10.0000000
CNST30           0.5981151
D0              0.00000300 sec
D1              1.41193604 sec
D6              0.05000000 sec
D16             0.00020000 sec
IN0             0.00001490 sec

======== CHANNEL f1 ========
SFO1           600.1324588 MHz
NUC1                    1H
P1                   10.60 usec
P2                   21.20 usec
PLW1           27.82500076 W

======== CHANNEL f2 ========
SFO2           150.9178738 MHz
NUC2                   13C
P3                    8.80 usec
P24                2000.00 usec
PLW2           78.13500214 W
SPNAM[7]     Crp60comp.4
SPOAL7               0.500
SPOFFS7   0 Hz
SPW7            9.24489975 W

====== GRADIENT CHANNEL =====
GPNAM[1]         SINE.100
GPNAM[3]         SINE.100
GPNAM[4]         SINE.100
GPNAM[5]         SINE.100
GPZ1                80.00 %
GPZ3                15.00 %
GPZ4               -10.00 %
GPZ5                -5.00 %
P16               1000.00 usec

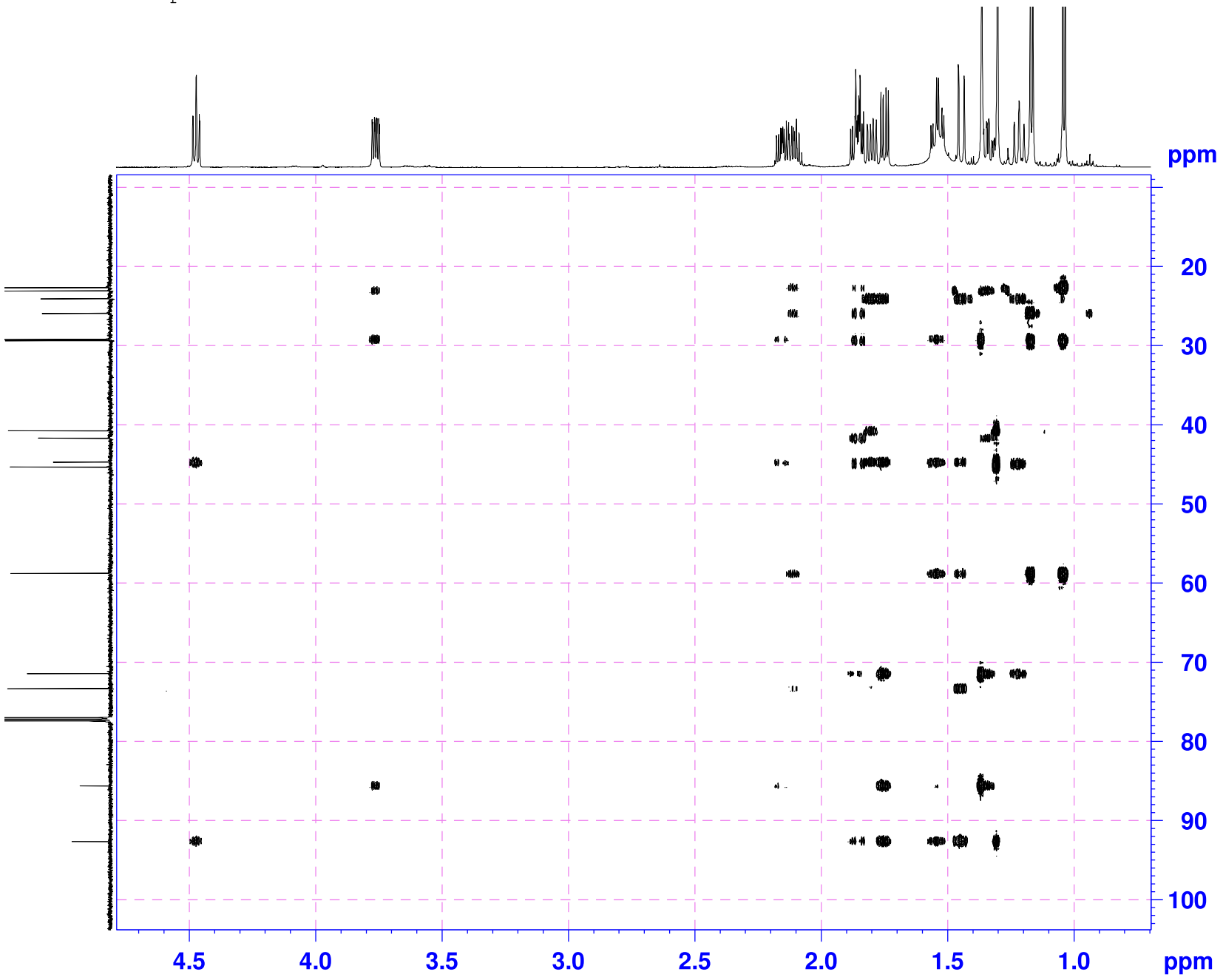
F1 - Acquisition parameters
TD                    256
SFO1            150.9179 MHz
FIDRES        131.082214 Hz
SW              222.353 ppm
FnMODE     Echo-Antiecho

F2 - Processing parameters
SI                   2048
SF            600.1300104 MHz
WDW                  SINE
SSB       0
LB        0 Hz
GB        0
PC                   1.40

F1 - Processing parameters
SI                    512
MC2         echo-antiecho
SF            150.9027493 MHz
WDW                  SINE
SSB                     2
LB        0 Hz
```

CM1

13C HMBC spectra Dr.Orabi HGS -V-Caro-85-A in CDCL3




```
Current Data Parameters
NAME      HGS-V-Caro85A-2D
EXPNO                    8
PROCNO                   1

F2 - Acquisition Parameters
Date_             20220525
Time                 1.28
INSTRUM             spect
PROBHD   5 mm PABBO BB-
PULPROG     hmbcetgpl2nd
TD                   2048
SOLVENT              CDCl3
NS                     16
DS                     16
SWH              4672.897 Hz
FIDRES           2.281688 Hz
AQ               0.2191360 sec
RG                   203
DW                107.000 usec
DE                 20.00 usec
TE                 297.9 K
CNST6         125.0000000
CNST7         165.0000000
CNST13         10.0000000
CNST30          0.5981151
D0             0.00000300 sec
D1             1.41193604 sec
D6             0.05000000 sec
D16            0.00020000 sec
IN0            0.00001490 sec

======== CHANNEL f1 ========
SFO1          600.1324588 MHz
NUC1                  1H
P1                 10.60 usec
P2                 21.20 usec
PLW1          27.82500076 W

======== CHANNEL f2 ========
SFO2          150.9178738 MHz
NUC2                 13C
P3                  8.80 usec
P24              2000.00 usec
PLW2          78.13500214 W
SPNAM[7]     Crp60comp.4
SPOAL7             0.500
SPOFFS7   0 Hz
SPW7           9.24489975 W

====== GRADIENT CHANNEL =====
GPNAM[1]         SINE.100
GPNAM[3]         SINE.100
GPNAM[4]         SINE.100
GPNAM[5]         SINE.100
GPZ1                80.00 %
GPZ3                15.00 %
GPZ4               -10.00 %
GPZ5                -5.00 %
P16               1000.00 usec

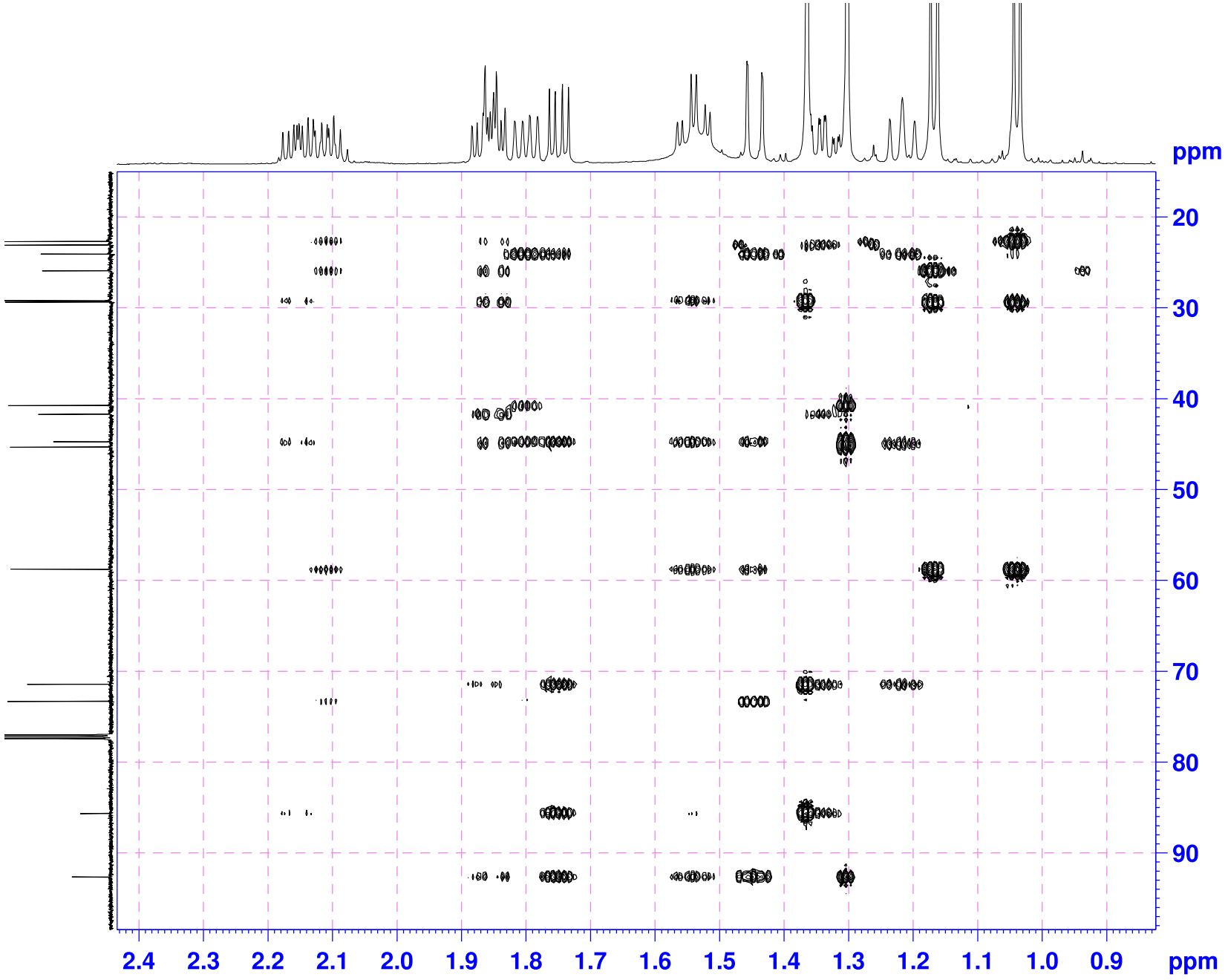
F1 - Acquisition parameters
TD                   256
SFO1            150.9179 MHz
FIDRES        131.082214 Hz
SW               222.353 ppm
FnMODE    Echo-Antiecho

F2 - Processing parameters
SI                   2048
SF            600.1300104 MHz
WDW                  SINE
SSB       0
LB        0 Hz
GB        0
PC                  1.40

F1 - Processing parameters
SI                    512
MC2         echo-antiecho
SF            150.9027493 MHz
WDW                  SINE
SSB                     2
LB        0 Hz
```

CM1

13C HMBC spectra Dr.Orabi HGS -V-Caro-85-A in CDCL3




```
Current Data Parameters
NAME      HGS-V-Caro85A-2D
EXPNO                    8
PROCNO                   1

F2 - Acquisition Parameters
Date_             20220525
Time                 1.28
INSTRUM             spect
PROBHD   5 mm PABBO BB-
PULPROG     hmbcetgpl2nd
TD                   2048
SOLVENT              CDCl3
NS                     16
DS                     16
SWH               4672.897 Hz
FIDRES            2.281688 Hz
AQ                0.2191360 sec
RG                     203
DW                107.000 usec
DE                 20.00 usec
TE                 297.9 K
CNST6          125.0000000
CNST7          165.0000000
CNST13          10.0000000
CNST30           0.5981151
D0               0.00000300 sec
D1               1.41193604 sec
D6               0.05000000 sec
D16              0.00020000 sec
IN0              0.00001490 sec

======== CHANNEL f1 ========
SFO1          600.1324588 MHz
NUC1                    1H
P1                   10.60 usec
P2                   21.20 usec
PLW1          27.82500076 W

======== CHANNEL f2 ========
SFO2          150.9178738 MHz
NUC2                   13C
P3                    8.80 usec
P24                2000.00 usec
PLW2          78.13500214 W
SPNAM[7]     Crp60comp.4
SPOAL7               0.500
SPOFFS7   0 Hz
SPW7           9.24489975 W

====== GRADIENT CHANNEL =====
GPNAM[1]         SINE.100
GPNAM[3]         SINE.100
GPNAM[4]         SINE.100
GPNAM[5]         SINE.100
GPZ1                80.00 %
GPZ3                15.00 %
GPZ4               -10.00 %
GPZ5                -5.00 %
P16               1000.00 usec

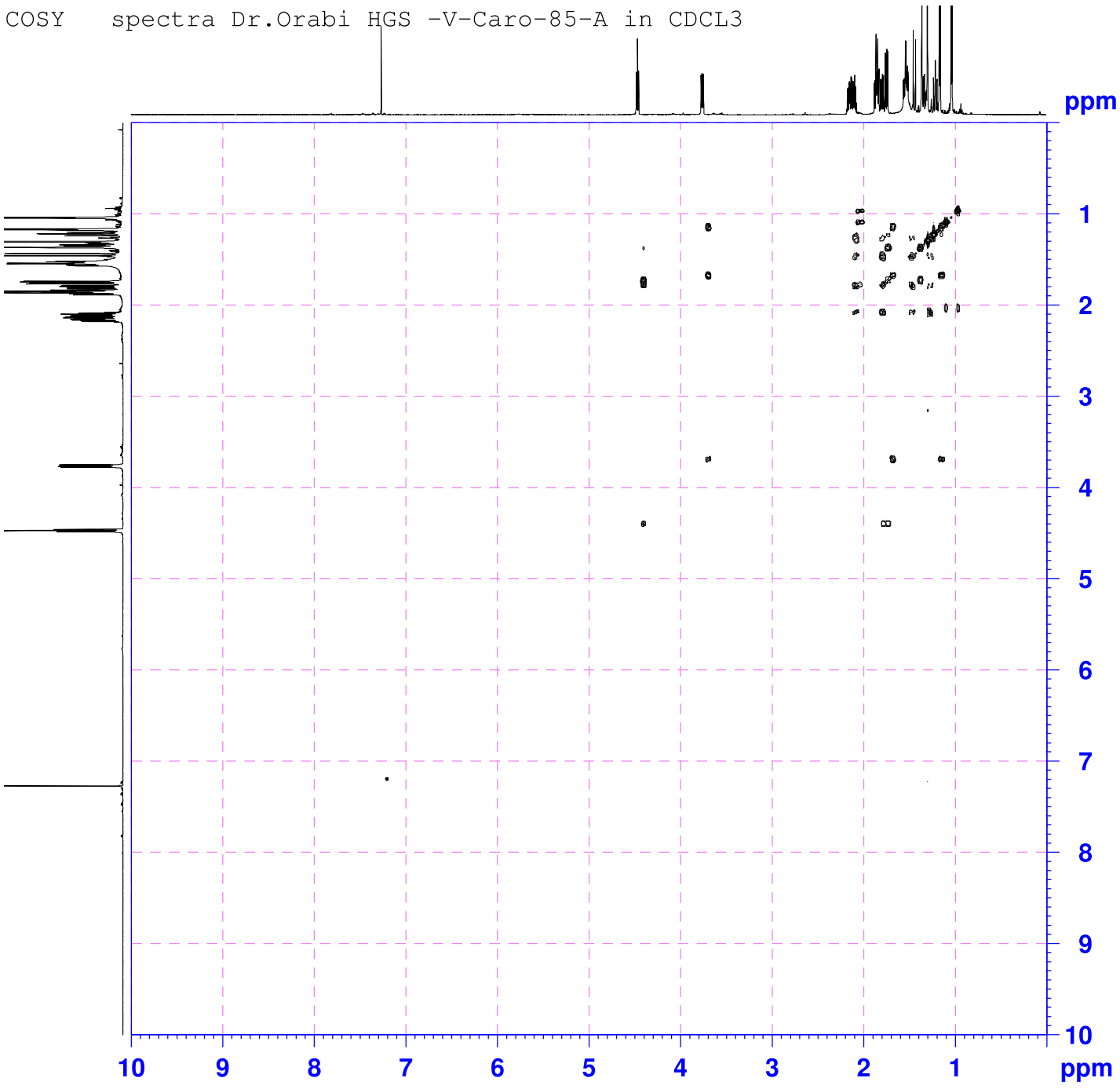
F1 - Acquisition parameters
TD                    256
SFO1            150.9179 MHz
FIDRES        131.082214 Hz
SW              222.353 ppm
FnMODE     Echo-Antiecho

F2 - Processing parameters
SI                   2048
SF            600.1300104 MHz
WDW                  SINE
SSB       0
LB        0 Hz
GB        0
PC                   1.40

F1 - Processing parameters
SI                    512
MC2         echo-antiecho
SF            150.9027493 MHz
WDW                  SINE
SSB                     2
LB        0 Hz
```

CM1

COSY spectra Dr.Orabi HGS -V-Caro-85-A in CDCL3



Current Data Parameters
NAME HGS-V-Caro85A-2D
EXPNO 6
PROCNO 1

F2 - Acquisition Parameters
Date_ 20220524
Time 23.58
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG cosygpppqf
TD 2048
SOLVENT CDCl3
NS 2
DS 8
SWH 4672.897 Hz
FIDRES 2.281688 Hz
AQ 0.2191360 sec
RG 90.5
DW 107.000 usec
DE 20.00 usec
TE 297.9 K
D0 0.00000300 sec
D1 0.65865898 sec
D11 0.03000000 sec
D12 0.00002000 sec
D13 0.00000400 sec
D16 0.00020000 sec
IN0 0.00021400 sec

======== CHANNEL f1 ========
SFO1 600.1323807 MHz
NUC1 1H
P0 10.60 usec
P1 10.60 usec
P17 2500.00 usec
PLW1 27.82500076 W
PLW10 4.62489986 W

====== GRADIENT CHANNEL =====
GPNAM[1] SINE.100
GPZ1 20.00 %
P16 1000.00 usec

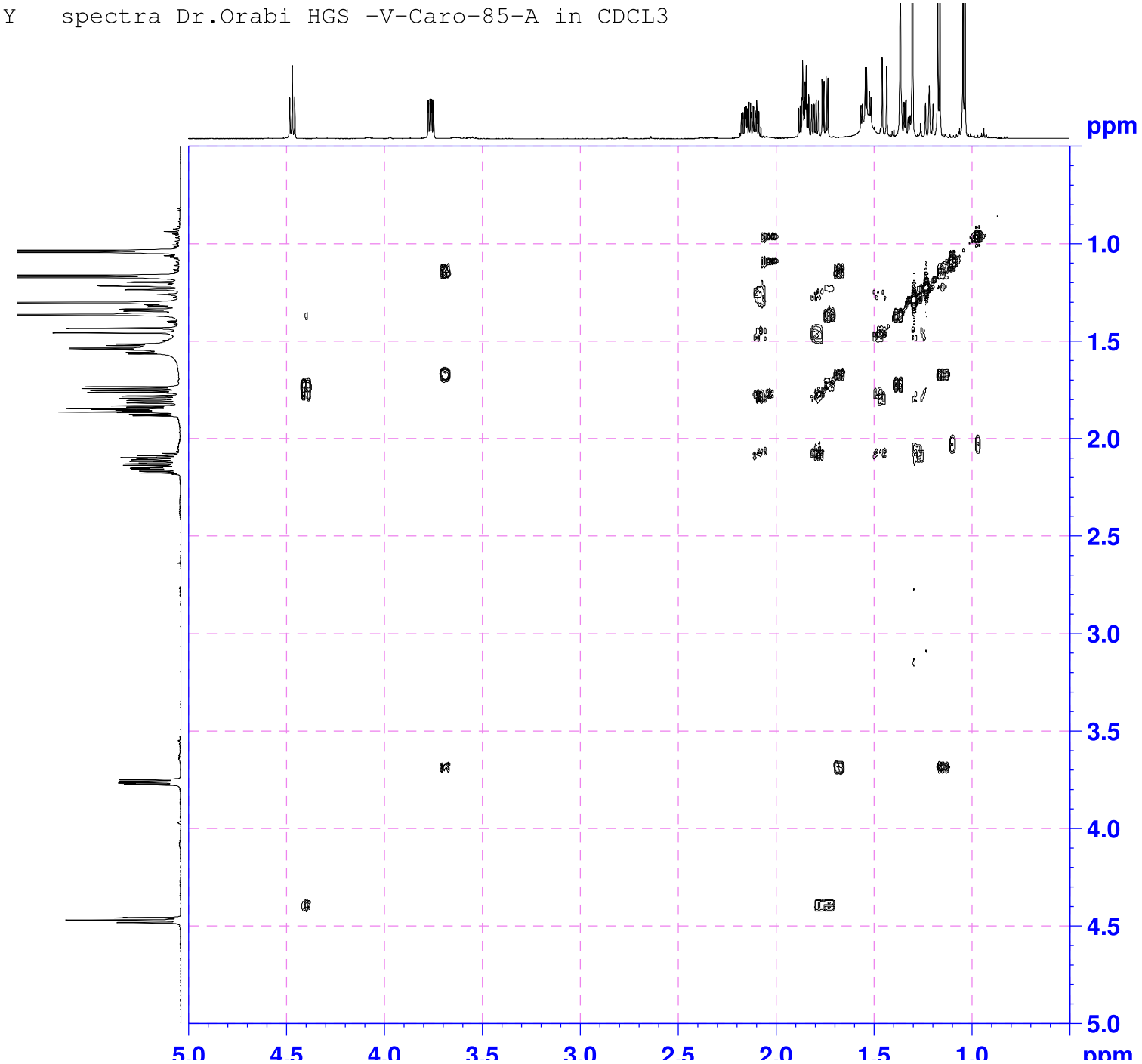
F1 - Acquisition parameters
TD 320
SFO1 600.1324 MHz
FIDRES 14.602804 Hz
SW 7.786 ppm
FnMODE QF

F2 - Processing parameters
SI 2048
SF 600.1300549 MHz
WDW SINE
SSB 0
LB 0 Hz
GB 0
PC 1.40

F1 - Processing parameters
SI 2048
MC2 QF
SF 600.1300578 MHz
WDW SINE
SSB 0
LB 0 Hz
GB 0

CM1

COSY spectra Dr.Orabi HGS -V-Caro-85-A in CDCL3



Current Data Parameters
NAME HGS-V-Caro85A-2D
EXPNO 6
PROCNO 1

F2 - Acquisition Parameters
Date_ 20220524
Time 23.58
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG cosygpppqf
TD 2048
SOLVENT CDCl3
NS 2
DS 8
SWH 4672.897 Hz
FIDRES 2.281688 Hz
AQ 0.2191360 sec
RG 90.5
DW 107.000 usec
DE 20.00 usec
TE 297.9 K
D0 0.00000300 sec
D1 0.65865898 sec
D11 0.03000000 sec
D12 0.00002000 sec
D13 0.00000400 sec
D16 0.00020000 sec
IN0 0.00021400 sec

======== CHANNEL f1 ========
SFO1 600.1323807 MHz
NUC1 1H
P0 10.60 usec
P1 10.60 usec
P17 2500.00 usec
PLW1 27.82500076 W
PLW10 4.62489986 W

====== GRADIENT CHANNEL =====
GPNAM[1] SINE.100
GPZ1 20.00 %
P16 1000.00 usec

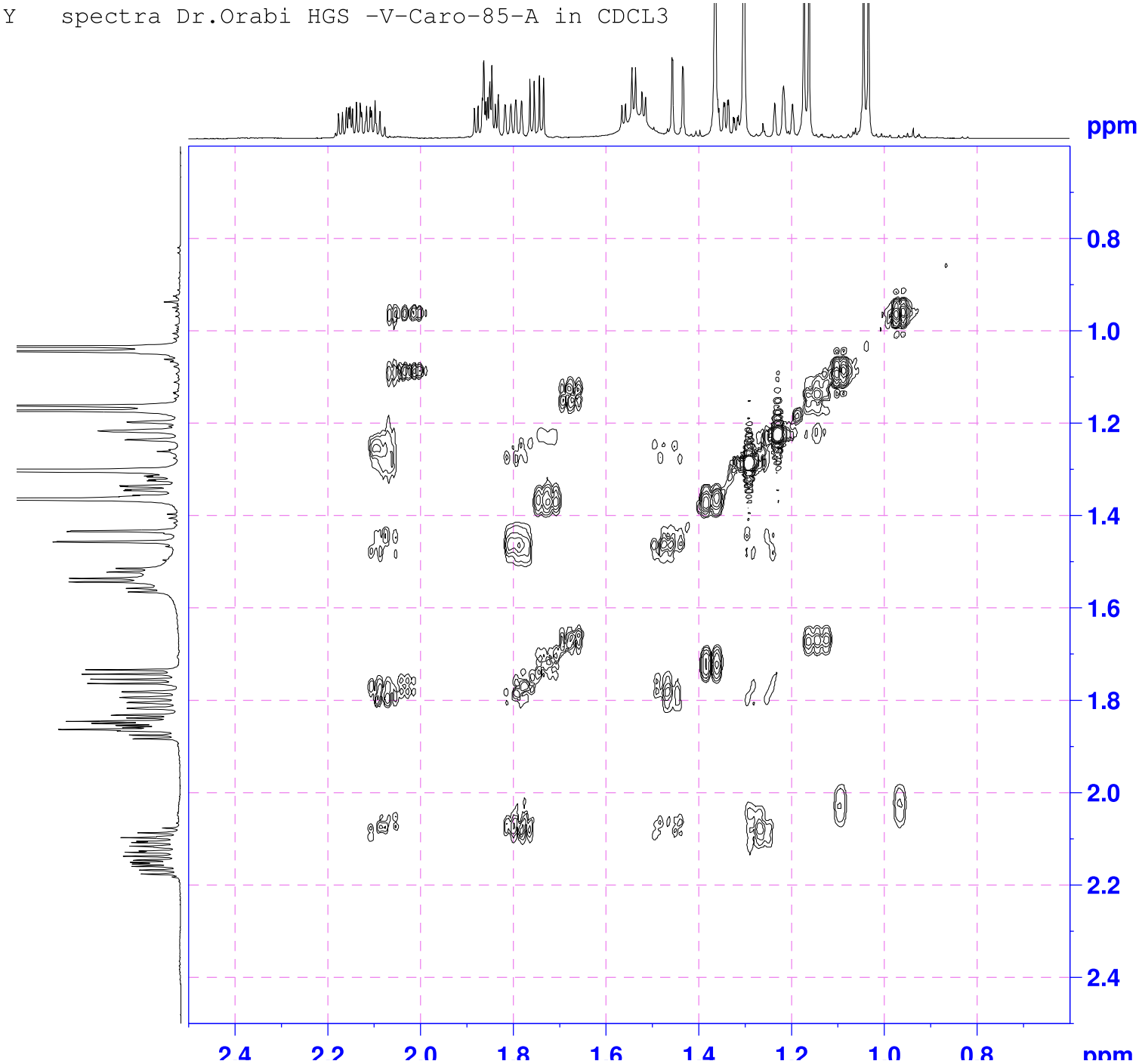
F1 - Acquisition parameters
TD 320
SFO1 600.1324 MHz
FIDRES 14.602804 Hz
SW 7.786 ppm
FnMODE QF

F2 - Processing parameters
SI 2048
SF 600.1300549 MHz
WDW SINE
SSB 0
LB 0 Hz
GB 0
PC 1.40

F1 - Processing parameters
SI 2048
MC2 QF
SF 600.1300578 MHz
WDW SINE
SSB 0
LB 0 Hz
GB 0

CM1

COSY spectra Dr.Orabi HGS -V-Caro-85-A in CDCL3



BRUKER

```
Current Data Parameters
NAME      HGS-V-Caro85A-2D
EXPNO                    6
PROCNO                   1

F2 - Acquisition Parameters
Date_           20220524
Time               23.58
INSTRUM            spect
PROBHD    5 mm PABBO BB-
PULPROG      cosygpppqf
TD                 2048
SOLVENT            CDCl3
NS                    2
DS                    8
SWH             4672.897 Hz
FIDRES          2.281688 Hz
AQ              0.2191360 sec
RG                 90.5
DW               107.000 usec
DE                20.00 usec
TE                297.9 K
D0              0.00000300 sec
D1              0.65865898 sec
D11             0.03000000 sec
D12             0.00002000 sec
D13             0.00000400 sec
D16             0.00020000 sec
IN0             0.00021400 sec

======== CHANNEL f1 ========
SFO1          600.1323807 MHz
NUC1                  1H
P0                10.60 usec
P1                10.60 usec
P17             2500.00 usec
PLW1          27.82500076 W
PLW10          4.62489986 W

====== GRADIENT CHANNEL =====
GPNAM[1]        SINE.100
GPZ1              20.00 %
P16             1000.00 usec

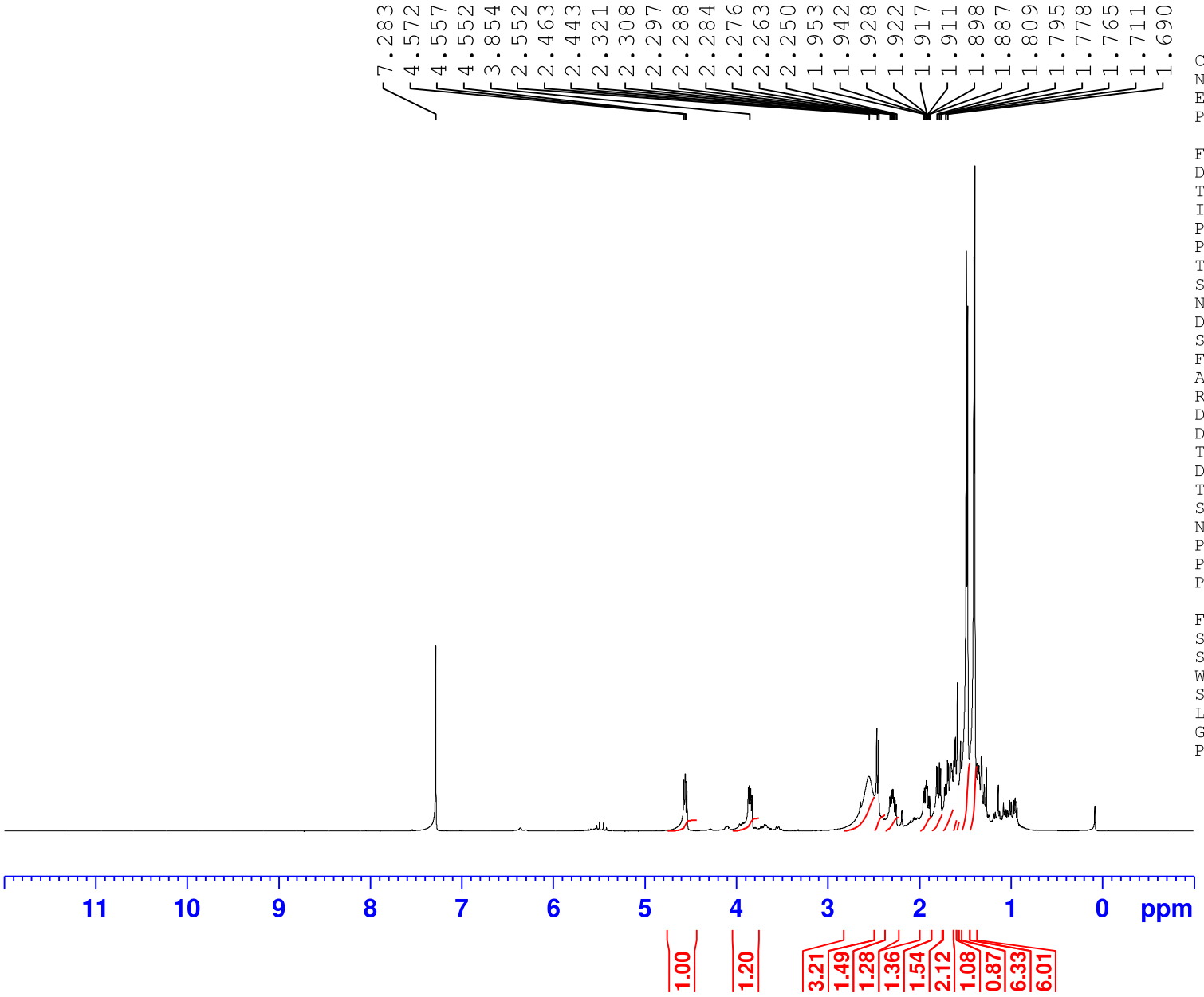
F1 - Acquisition parameters
TD                   320
SFO1            600.1324 MHz
FIDRES         14.602804 Hz
SW                 7.786 ppm
FnMODE                QF

F2 - Processing parameters
SI                   2048
SF            600.1300549 MHz
WDW                  SINE
SSB       0
LB        0 Hz
GB        0
PC                 1.40

F1 - Processing parameters
SI                   2048
MC2                    QF
SF            600.1300578 MHz
WDW                  SINE
SSB       0
LB        0 Hz
GB        0
```

CM2

1H SPECTRUM DR.ORABI HGS V caro 86 IN CDCL3



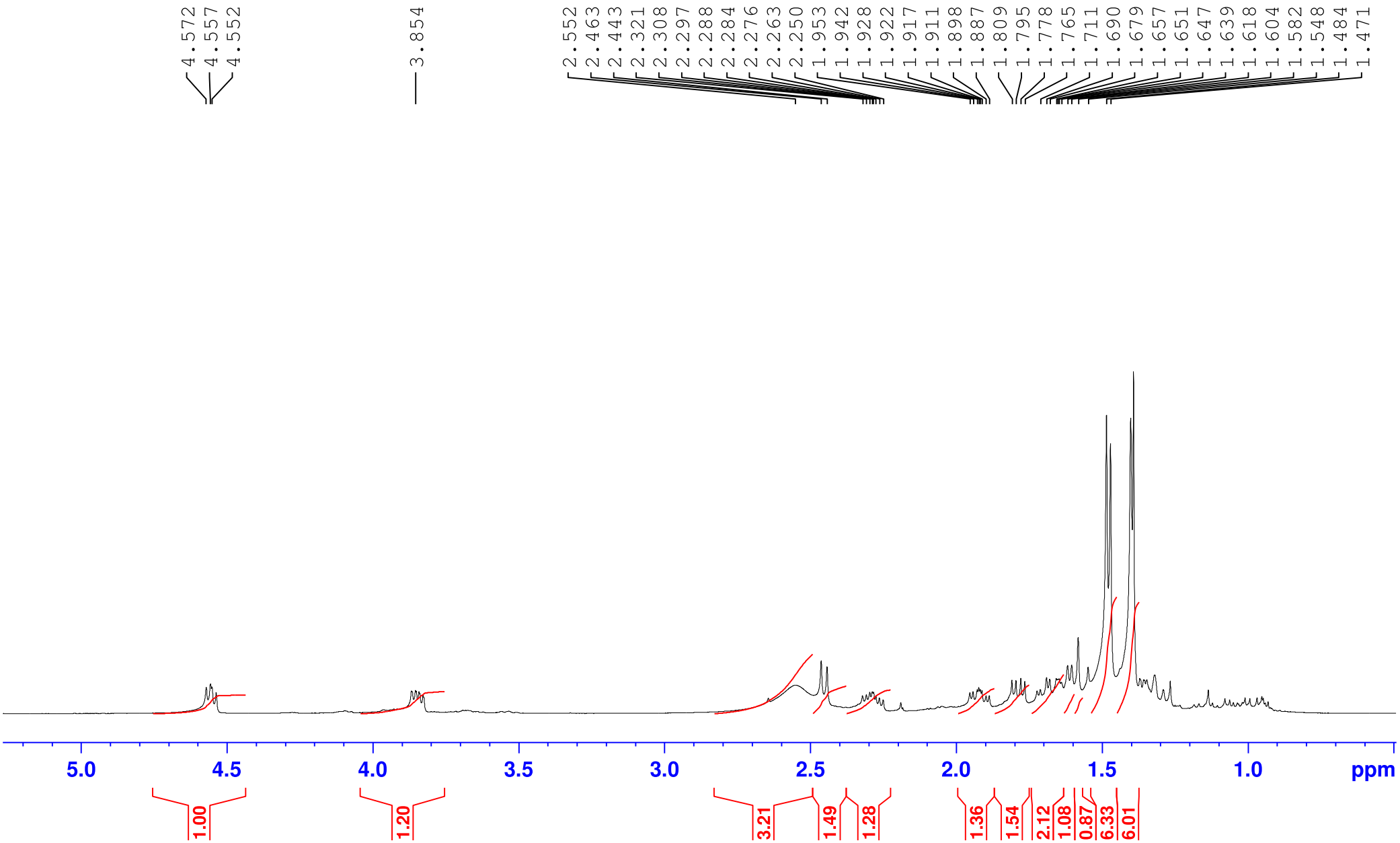
Current Data Parameters
NAME HGSVcaro86-2D
EXPNO 10
PROCNO 1

F2 - Acquisition Parameters
Date_ 20220522
Time 14.12 h
INSTRUM Avance AV Neo 400
PROBHD Z108618_0912 (
PULPROG zg30
TD 65536
SOLVENT CH3OH
NS 16
DS 2
SWH 8196.722 Hz
FIDRES 0.250144 Hz
AQ 3.9976959 sec
RG 101
DW 61.000 usec
DE 12.86 usec
TE 298.0 K
D1 1.00000000 sec
TD0 1
SFO1 400.1324708 MHz
NUC1 1H
P0 4.67 usec
P1 14.00 usec
PLW1 13.01399994 W

F2 - Processing parameters
SI 65536
SF 400.1300000 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

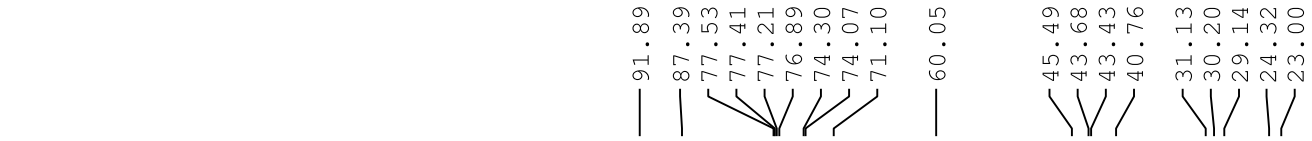
CM2

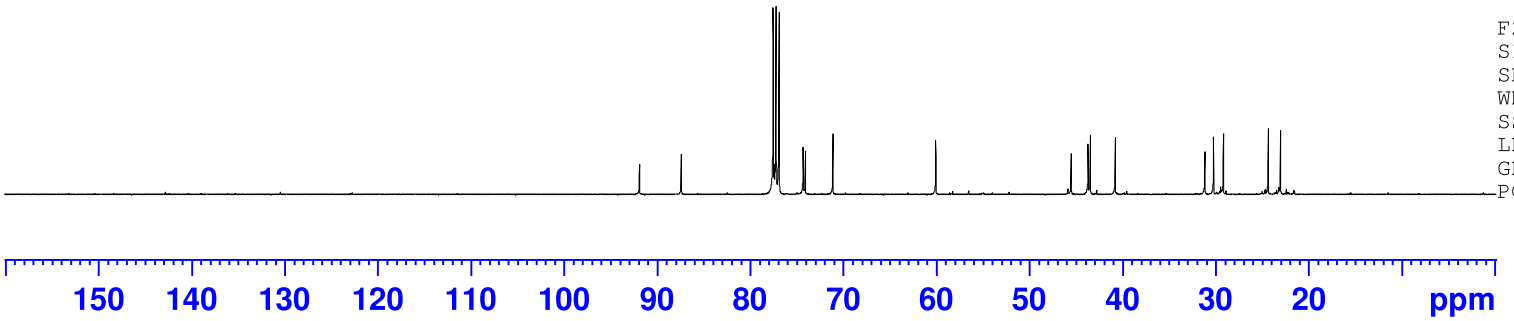
1H SPECTRUM DR.ORABI HGS V caro 86 IN CDCL3



CM2

13C DECOUPLED SPECTRUM DR.ORABI HGS V caro 86 IN CDCL3





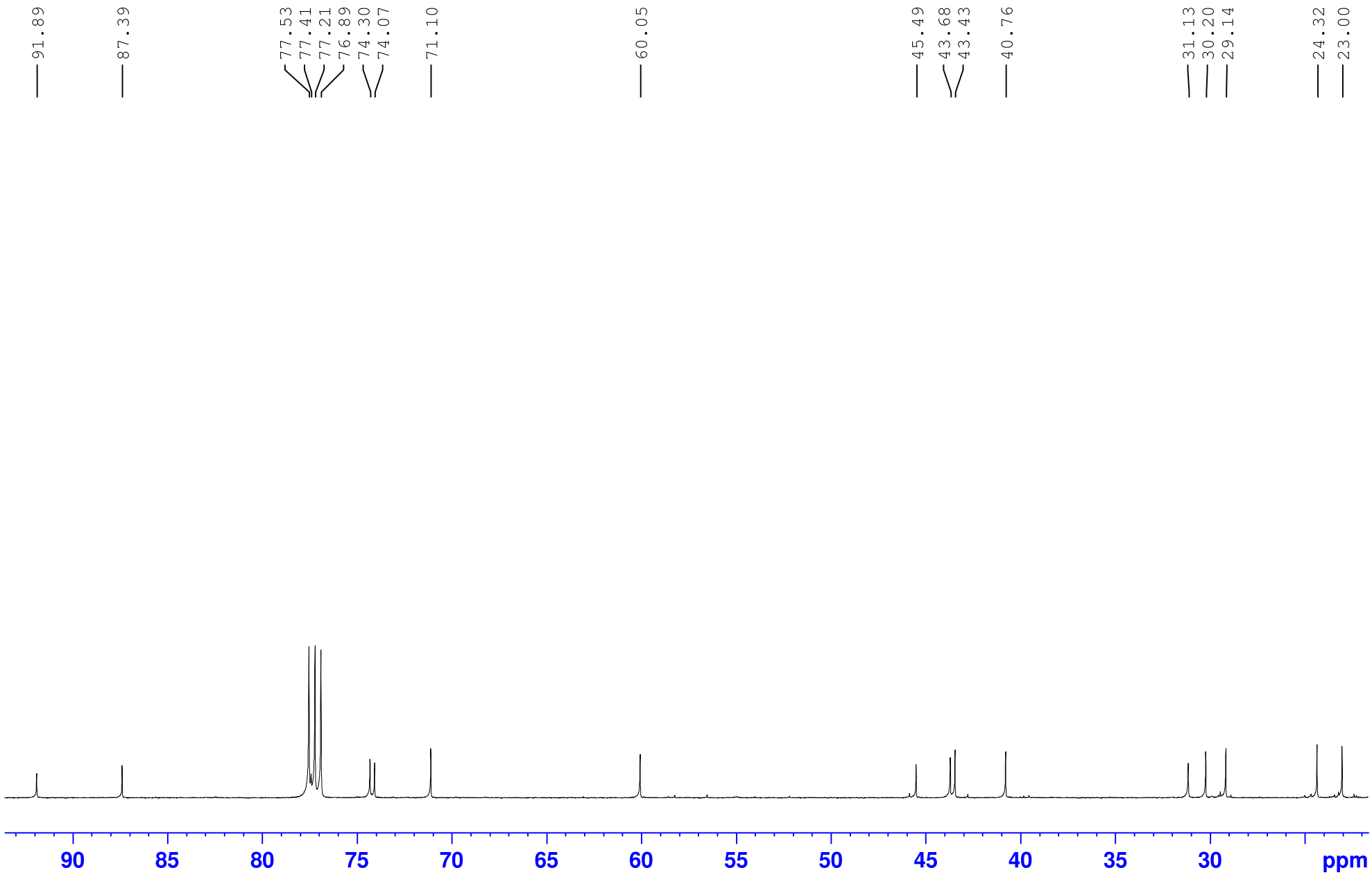
Current Data Parameters
NAME HGSVcaro86-2D
EXPNO 11
PROCNO 1

F2 - Acquisition Parameters
Date_ 20220523
Time 5.21 h
INSTRUM Avance AV Neo 400
PROBHD Z108618_0912 (
PULPROG zgpg30
TD 65536
SOLVENT CH3OH
NS 15360
DS 4
SWH 23809.523 Hz
FIDRES 0.726609 Hz
AQ 1.3762560 sec
RG 29.8117
DW 21.000 usec
DE 6.50 usec
TE 298.9 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
SFO1 100.6228298 MHz
NUC1 13C
P0 3.33 usec
P1 10.00 usec
PLW1 53.78799820 W
SFO2 400.1316005 MHz
NUC2 1H
CPDPRG[2 waltz65
PCPD2 90.00 usec
PLW2 13.01399994 W
PLW12 0.31492001 W
PLW13 0.15840000 W

F2 - Processing parameters
SI 32768
SF 100.6127514 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

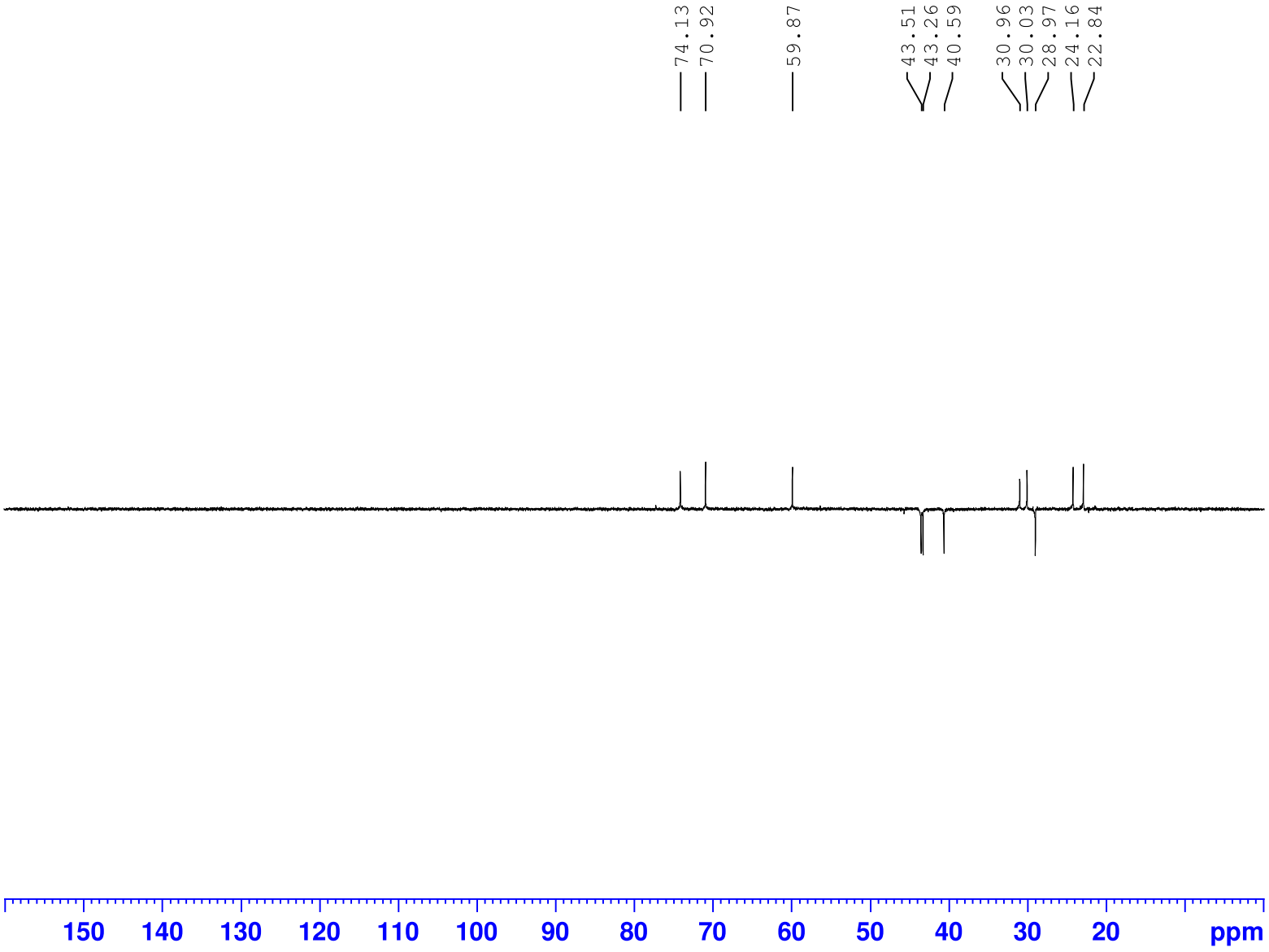
CM2

13C DECOUPLED SPECTRUM DR.ORABI HGS V caro 86 IN CDCL3



CM2

DEPT 135 SPECTRUM DR.ORABI HGS V caro 86 IN CDCL3



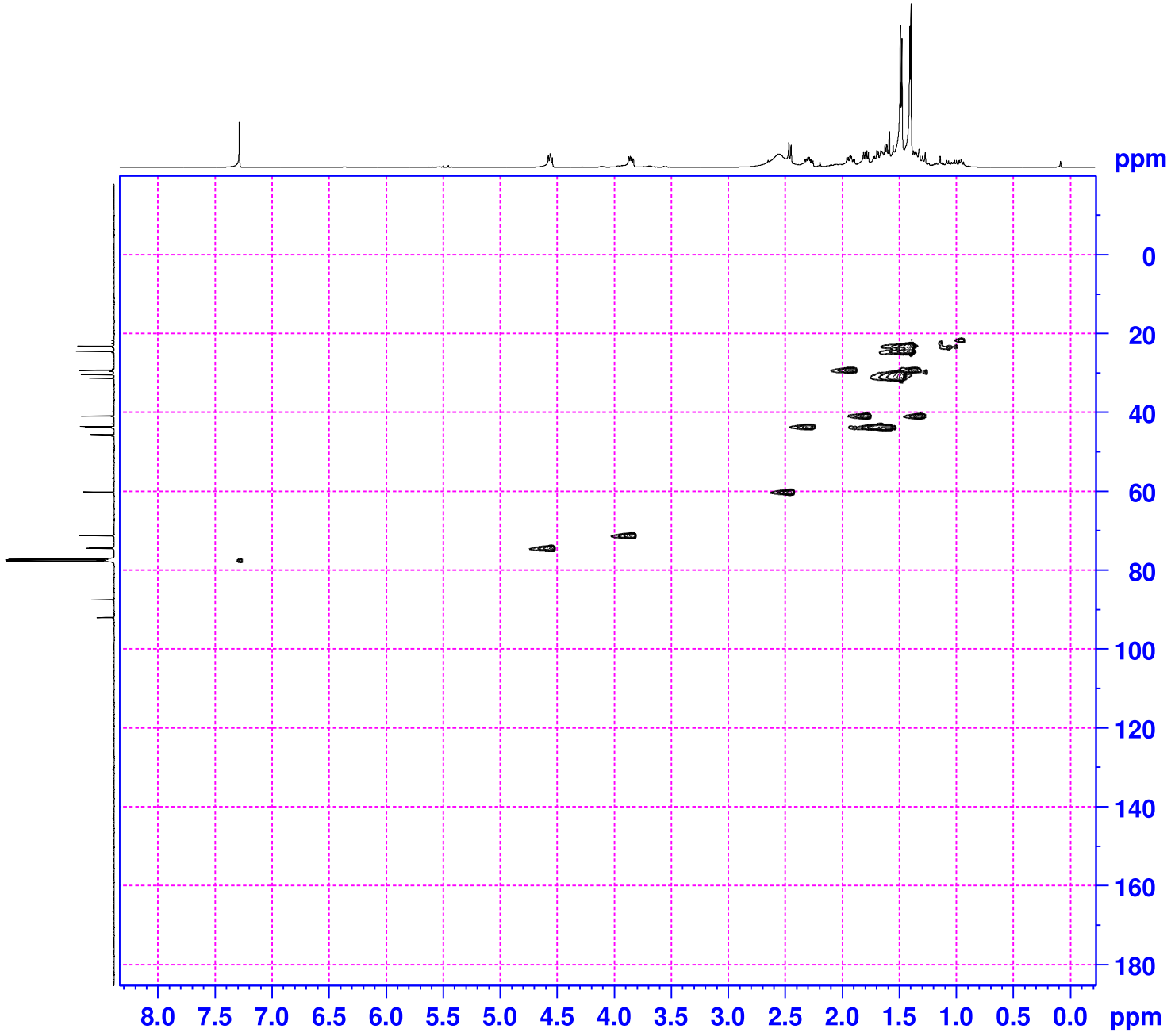

```
Current Data Parameters
NAME      HGSVcaro86-2D
EXPNO                16
PROCNO                1

F2 - Acquisition Parameters
Date_          20220523
Time               12.57 h
INSTRUM  Avance AV Neo 400
PROBHD   Z108618_0912 (
PULPROG       deptsp135
TD                65536
SOLVENT            CH3OH
NS                   256
DS                     8
SWH            16129.032 Hz
FIDRES          0.492219 Hz
AQ             2.0316160 sec
RG               46.3268
DW                31.000 usec
DE                 6.50 usec
TE                298.5 K
CNST2        145.0000000
D1             2.00000000 sec
D2             0.00344828 sec
D12            0.00002000 sec
TD0                    1
SFO1         100.6208175 MHz
NUC1                13C
P1                 10.00 usec
P13              2000.00 usec
PLW0                 0 W
PLW1         53.78799820 W
SPNAM[5]     Crp60comp.4
SPOAL5             0.500
SPOFFS5                0 Hz
SPW5          8.21819973 W
SFO2         400.1316005 MHz
NUC2                1H
CPDPRG[2         waltz65
P3                14.00 usec
P4                28.00 usec
PCPD2             90.00 usec
PLW2         13.01399994 W
PLW12         0.31492001 W

F2 - Processing parameters
SI                 32768
SF           100.6127685 MHz
WDW                   EM
SSB                    0
LB                 1.00 Hz
GB                     0
PC                 1.40
```

CM2

HSQC SPECTRUM DR.ORABI HGS V caro 86 IN CDCL3




```
Current Data Parameters
NAME      HGSVcaro86-2D
EXPNO               15
PROCNO               1

F2 - Acquisition Parameters
Date_          20220523
Time             12.38 h
INSTRUM  Avance AV Neo 400
PROBHD   2108618_0912 (
PULPROG     hsqcetgpsi2
TD              1024
SOLVENT          CH3OH
NS                 32
DS                 16
SWH          3424.657 Hz
FIDRES       6.688784 Hz
AQ           0.1495040 sec
RG                101
DW            146.000 usec
DE              6.50 usec
TE             298.1 K
CNST2       145.0000000
D0           0.00000300 sec
D1           1.50000000 sec
D4           0.00172414 sec
D11          0.03000000 sec
D16          0.00020000 sec
D24          0.00086207 sec
IN0          0.00002259 sec
TDav                1
ZGOPTNS
SFO1       400.1316262 MHz
NUC1               1H
P1               14.00 usec
P2               28.00 usec
PLW1        13.01399994 W
SFO2       100.6203145 MHz
NUC2               13C
CPDPRG[2          garp
P3               10.00 usec
P4               20.00 usec
PCPD2            80.00 usec
PLW2        53.78799820 W
PLW12        0.84043998 W
GPNAM[1]     SMSQ10.100
GPZ1             80.00 %
GPNAM[2]     SMSQ10.100
GPZ2             20.10 %
GPNAM[3]     SMSQ10.100
GPZ3             11.00 %
GPNAM[4]     SMSQ10.100
GPZ4             -5.00 %
P16            1000.00 usec
P19             600.00 usec

======== F1 INDIRECT DIMENSION ========
td1     256
sw_F1   220.000000

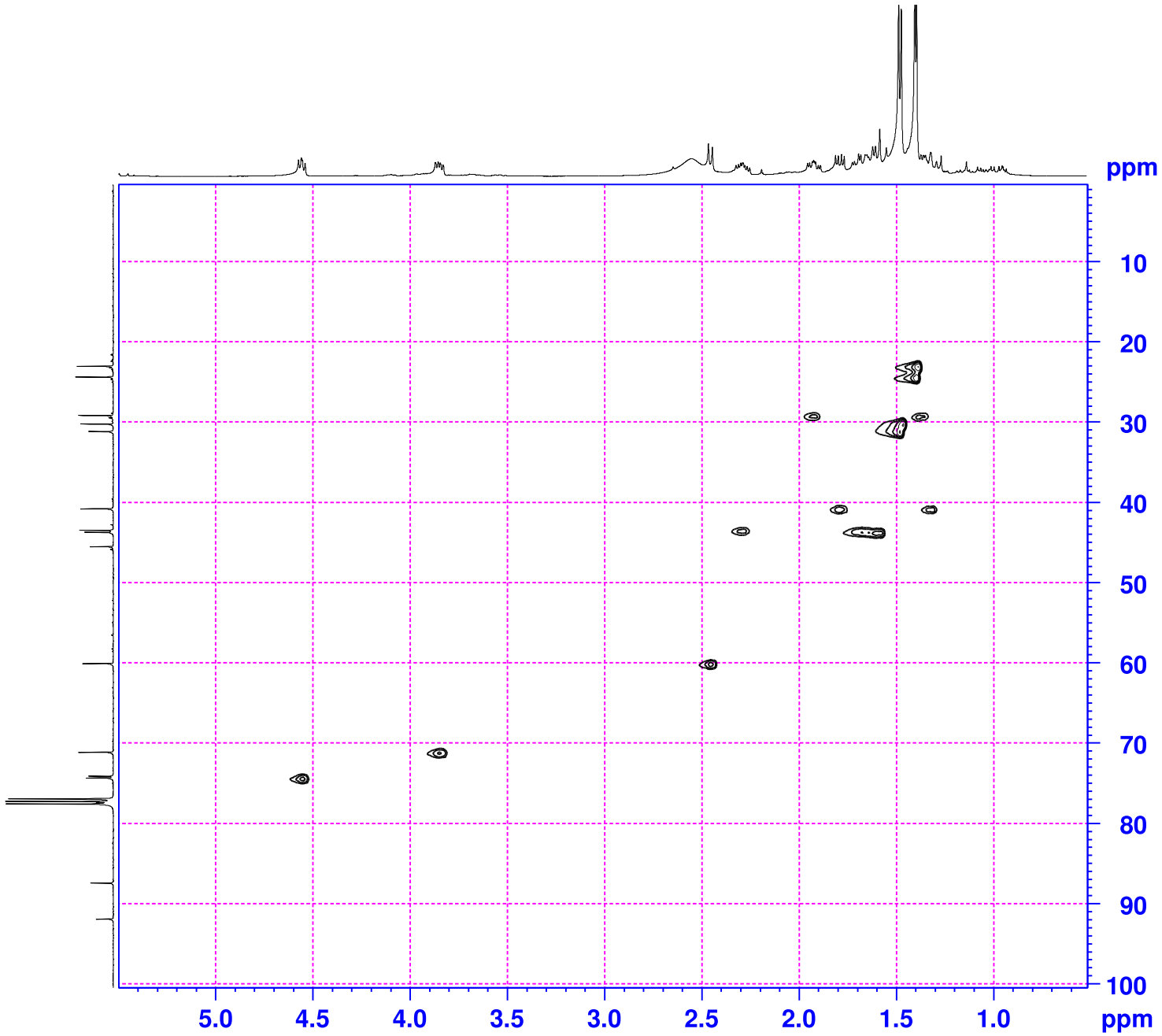
F1 - Acquisition parameters
TD              256
SFO1       100.6203 MHz
FIDRES     172.938568 Hz
SW          219.997 ppm
FnMODE   Echo-Antiecho

F2 - Processing parameters
SI                1024
SF          400.1300038 MHz
WDW               QSINE
SSB                   2
LB                  0 Hz
GB                    0
PC                 1.40

F1 - Processing parameters
SI                1024
MC2       echo-antiecho
SF          100.6127390 MHz
WDW               QSINE
SSB                   2
LB                  0 Hz
GB                    0
```

CM2

HSQC SPECTRUM DR.ORABI HGS V caro 86 IN CDCL3




```
Current Data Parameters
NAME      HGSVcaro86-2D
EXPNO                15
PROCNO                1

F2 - Acquisition Parameters
Date_          20220523
Time              12.38 h
INSTRUM  Avance AV Neo 400
PROBHD   2108618_0912 (
PULPROG     hsqcetgpsi2
TD                 1024
SOLVENT            CH3OH
NS                   32
DS                   16
SWH            3424.657 Hz
FIDRES         6.688784 Hz
AQ             0.1495040 sec
RG                  101
DW               146.000 usec
DE                 6.50 usec
TE                298.1 K
CNST2         145.0000000
D0             0.00000300 sec
D1             1.50000000 sec
D4             0.00172414 sec
D11            0.03000000 sec
D16            0.00020000 sec
D24            0.00086207 sec
IN0            0.00002259 sec
TDav                  1
ZGOPTNS
SFO1          400.1316262 MHz
NUC1                1H
P1                14.00 usec
P2                28.00 usec
PLW1          13.01399994 W
SFO2          100.6203145 MHz
NUC2                13C
CPDPRG[2             garp
P3                10.00 usec
P4                20.00 usec
PCPD2             80.00 usec
PLW2          53.78799820 W
PLW12          0.84043998 W
GPNAM[1]      SMSQ10.100
GPZ1              80.00 %
GPNAM[2]      SMSQ10.100
GPZ2              20.10 %
GPNAM[3]      SMSQ10.100
GPZ3              11.00 %
GPNAM[4]      SMSQ10.100
GPZ4              -5.00 %
P16             1000.00 usec
P19              600.00 usec

======== F1 INDIRECT DIMENSION ========
td1      256
sw_F1    220.000000

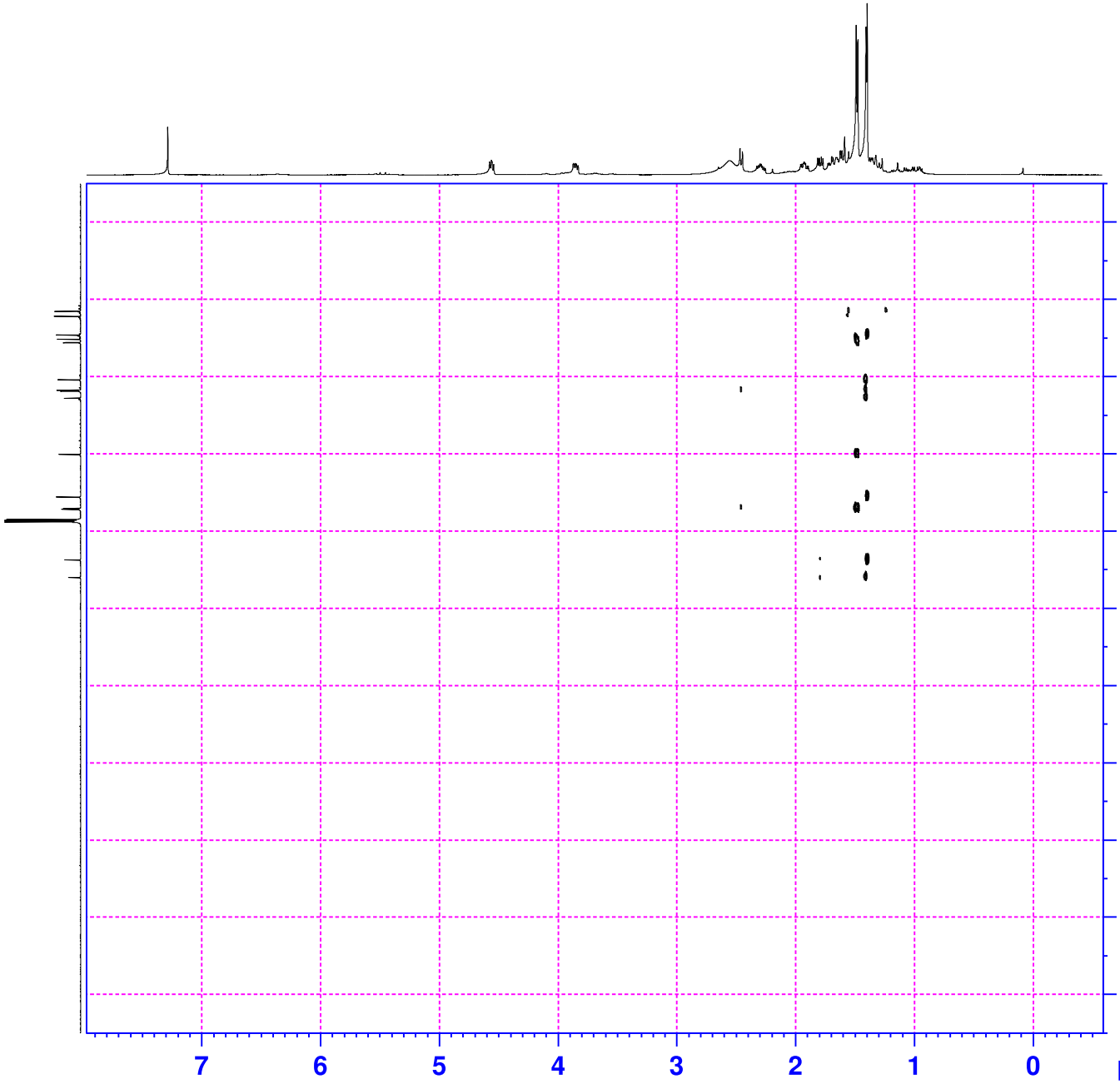
F1 - Acquisition parameters
TD                 256
SFO1           100.6203 MHz
FIDRES        172.938568 Hz
SW              219.997 ppm
FnMODE    Echo-Antiecho

F2 - Processing parameters
SI                1024
SF           400.1300038 MHz
WDW               QSINE
SSB                   2
LB                    0 Hz
GB                    0
PC                 1.40

F1 - Processing parameters
SI                1024
MC2       echo-antiecho
SF          100.6127390 MHz
WDW               QSINE
SSB                   2
LB                    0 Hz
GB                    0
```

CM2

HMBC SPECTRUM DR.ORABI HGS V caro 86 IN CDCL3




```
Current Data Parameters
NAME       HGSVcaro86-2D
EXPNO                14
PROCNO                1

F2 - Acquisition Parameters
Date_          20220523
Time               8.50 h
INSTRUM  Avance AV Neo 400
PROBHD   Z108618_0912 (
PULPROG    hmbcgplpndqf
TD                 4096
SOLVENT            CH3OH
NS                   32
DS                   16
SWH             3424.657 Hz
FIDRES          1.672196 Hz
AQ              0.5980160 sec
RG                  101
DW                146.000 usec
DE                  6.50 usec
TE                297.9 K
CNST2         145.0000000
CNST13         10.0000000
D0              0.00000300 sec
D1              1.50000000 sec
D2              0.00344828 sec
D6              0.05000000 sec
D16             0.00020000 sec
IN0             0.00002259 sec
TDav                   1
SFO1          400.1314729 MHz
NUC1                  1H
P1                 14.00 usec
P2                 28.00 usec
PLW1          13.01399994 W
SFO2          100.6228298 MHz
NUC2                 13C
P3                 10.00 usec
PLW2          53.78799820 W
GPNAM[1]       SMSQ10.100
GPZ1               50.00 %
GPNAM[2]       SMSQ10.100
GPZ2               30.00 %
GPNAM[3]       SMSQ10.100
GPZ3               40.10 %
P16              1000.00 usec

======== F1 INDIRECT DIMENSION ========
td1       128
sw_F1     220.000000

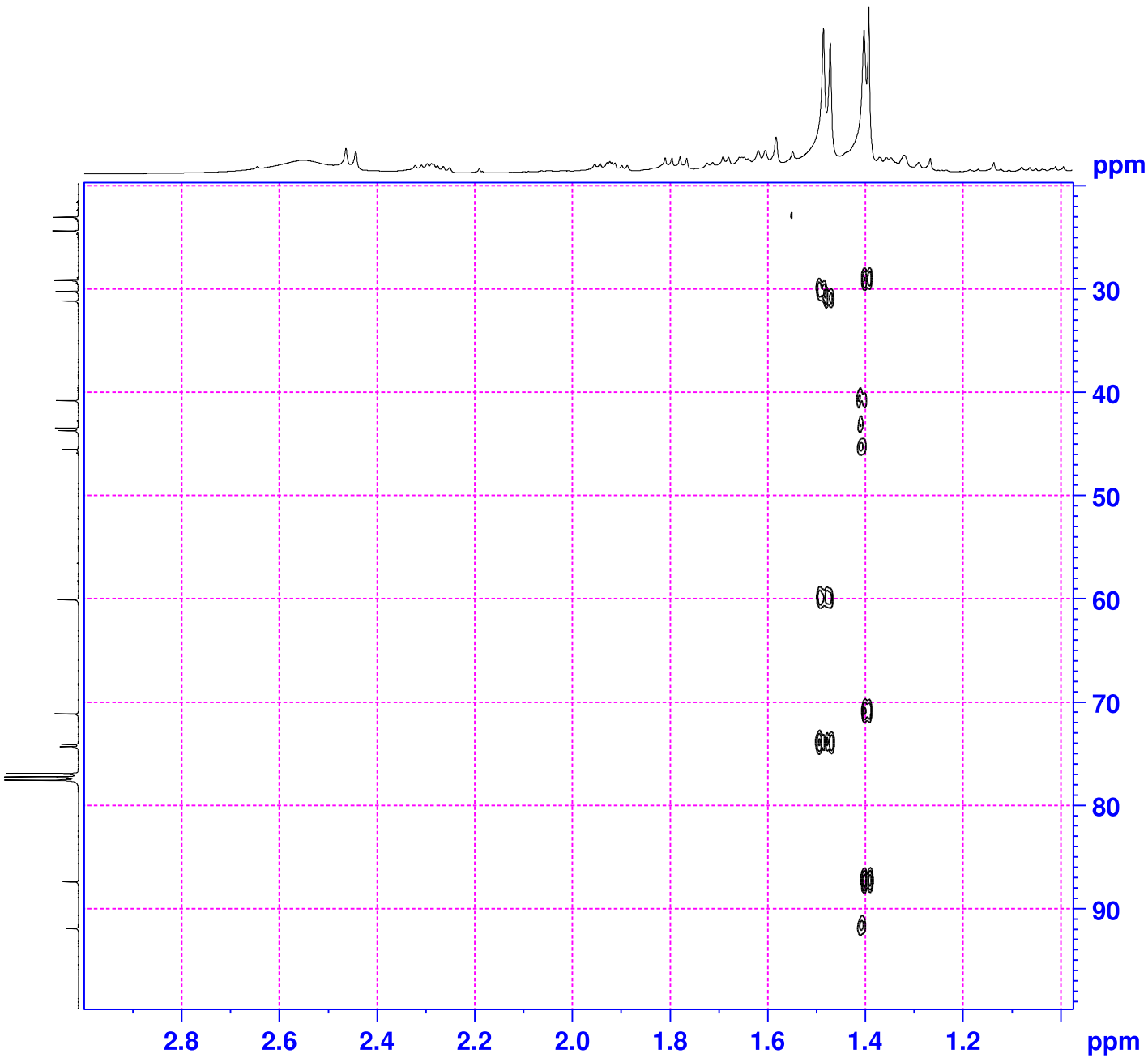
F1 - Acquisition parameters
TD                  128
SFO1            100.6228 MHz
FIDRES        345.877136 Hz
SW               219.991 ppm
FnMODE                QF

F2 - Processing parameters
SI                 4096
SF           400.1299966 MHz
WDW                QSINE
SSB                    0
LB                     0 Hz
GB                     0
PC                  1.40

F1 - Processing parameters
SI                 1024
MC2                  QF
SF           100.6127685 MHz
WDW                QSINE
SSB                    0
LB                     0 Hz
GB                     0
```

CM2

HMBC SPECTRUM DR.ORABI HGS V caro 86 IN CDCL3




```
Current Data Parameters
NAME       HGSVcaro86-2D
EXPNO                14
PROCNO                1

F2 - Acquisition Parameters
Date_          20220523
Time               8.50 h
INSTRUM  Avance AV Neo 400
PROBHD   Z108618_0912 (
PULPROG    hmbcgplpndqf
TD                 4096
SOLVENT            CH3OH
NS                   32
DS                   16
SWH             3424.657 Hz
FIDRES          1.672196 Hz
AQ              0.5980160 sec
RG                  101
DW                146.000 usec
DE                  6.50 usec
TE                297.9 K
CNST2        145.0000000
CNST13        10.0000000
D0             0.00000300 sec
D1             1.50000000 sec
D2             0.00344828 sec
D6             0.05000000 sec
D16            0.00020000 sec
IN0            0.00002259 sec
TDav                  1
SFO1         400.1314729 MHz
NUC1                 1H
P1                14.00 usec
P2                28.00 usec
PLW1         13.01399994 W
SFO2         100.6228298 MHz
NUC2                13C
P3                10.00 usec
PLW2         53.78799820 W
GPNAM[1]      SMSQ10.100
GPZ1               50.00 %
GPNAM[2]      SMSQ10.100
GPZ2               30.00 %
GPNAM[3]      SMSQ10.100
GPZ3               40.10 %
P16              1000.00 usec

======== F1 INDIRECT DIMENSION ========
td1       128
sw_F1     220.000000

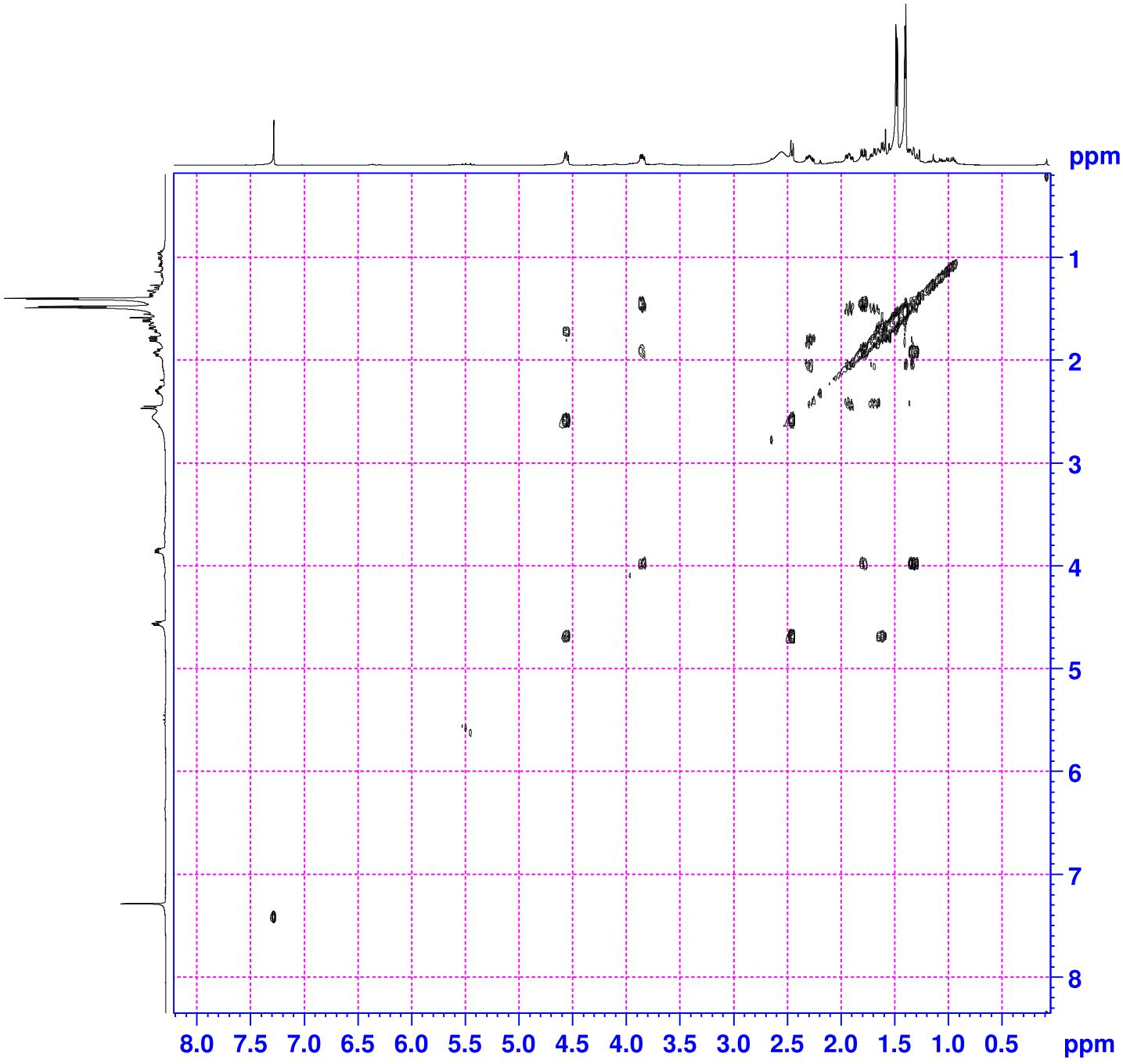
F1 - Acquisition parameters
TD                  128
SFO1            100.6228 MHz
FIDRES        345.877136 Hz
SW               219.991 ppm
FnMODE                QF

F2 - Processing parameters
SI                 4096
SF           400.1299966 MHz
WDW                QSINE
SSB                    0
LB                     0 Hz
GB                     0
PC                  1.40

F1 - Processing parameters
SI                 1024
MC2                  QF
SF           100.6127685 MHz
WDW                QSINE
SSB                    0
LB                     0 Hz
GB                     0
```

CM2

COSY SPECTRUM DR.ORABI HGS V caro 86 IN CDCL3



BRUKER

```
Current Data Parameters
NAME        HGSVcaro86-2D
EXPNO                 12
PROCNO                 1

F2 - Acquisition Parameters
Date_           20220523
Time                6.00 h
INSTRUM  Avance AV Neo 400
PROBHD   Z108618_0912 (
PULPROG       cosygpppqf
TD                  2048
SOLVENT             CH3OH
NS                     8
DS                    16
SWH             3267.974 Hz
FIDRES          3.191381 Hz
AQ              0.3133440 sec
RG                   101
DW                153.000 usec
DE                  6.50 usec
TE                298.4 K
D0              0.00000300 sec
D1              1.88735998 sec
D11             0.03000000 sec
D12             0.00002000 sec
D13             0.00000400 sec
D16             0.00020000 sec
IN0             0.00030600 sec
TDav                   1
SFO1          400.1316515 MHz
NUC1                  1H
P0                 14.00 usec
P1                 14.00 usec
P17              2500.00 usec
PLW1          13.01399994 W
PLW10          2.83430004 W
GPNAM[1]       SMSQ10.100
GPZ1               10.00 %
P16              1000.00 usec

======== F1 INDIRECT DIMENSION ========
td1       128
sw_F1     8.167247

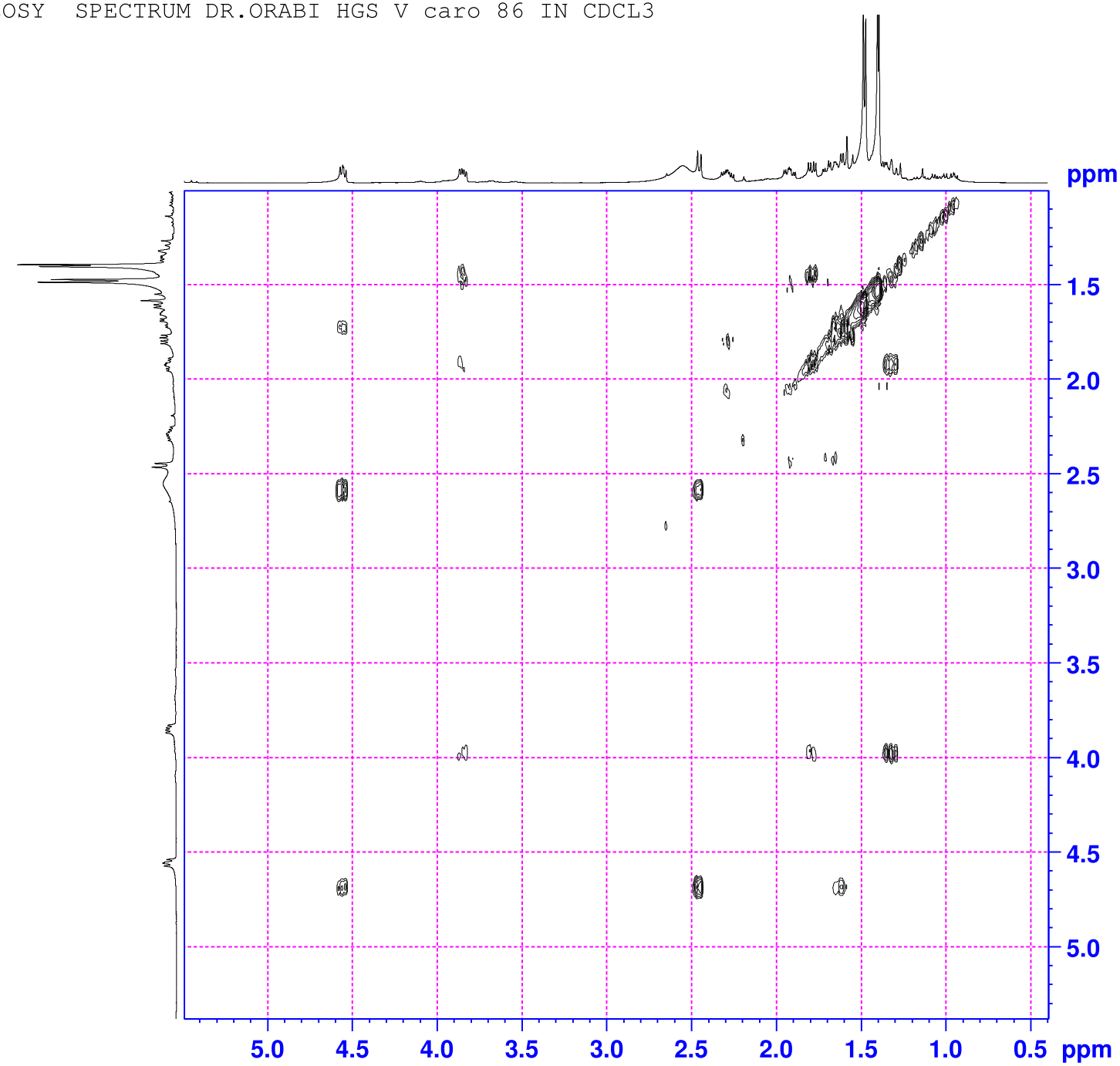
F1 - Acquisition parameters
TD                   128
SFO1           400.1317 MHz
FIDRES         51.062092 Hz
SW                 8.167 ppm
FnMODE               QF

F2 - Processing parameters
SI                  1024
SF           400.1299976 MHz
WDW                QSINE
SSB                    0
LB                     0 Hz
GB                     0
PC                  1.40

F1 - Processing parameters
SI                  1024
MC2                   QF
SF           400.1299447 MHz
WDW                QSINE
SSB                    0
LB                     0 Hz
GB                     0
```

CM2

COSY SPECTRUM DR.ORABI HGS V caro 86 IN CDCL3




```
Current Data Parameters
NAME        HGSVcaro86-2D
EXPNO                 12
PROCNO                 1

F2 - Acquisition Parameters
Date_           20220523
Time                6.00 h
INSTRUM  Avance AV Neo 400
PROBHD   Z108618_0912 (
PULPROG       cosygpppqf
TD                  2048
SOLVENT            CH3OH
NS                     8
DS                    16
SWH             3267.974 Hz
FIDRES          3.191381 Hz
AQ              0.3133440 sec
RG                   101
DW                153.000 usec
DE                  6.50 usec
TE                298.4 K
D0           0.00000300 sec
D1           1.88735998 sec
D11          0.03000000 sec
D12          0.00002000 sec
D13          0.00000400 sec
D16          0.00020000 sec
IN0          0.00030600 sec
TDav                   1
SFO1         400.1316515 MHz
NUC1                1H
P0                 14.00 usec
P1                 14.00 usec
P17              2500.00 usec
PLW1         13.01399994 W
PLW10         2.83430004 W
GPNAM[1]      SMSQ10.100
GPZ1               10.00 %
P16              1000.00 usec

======== F1 INDIRECT DIMENSION ========
td1       128
sw_F1     8.167247

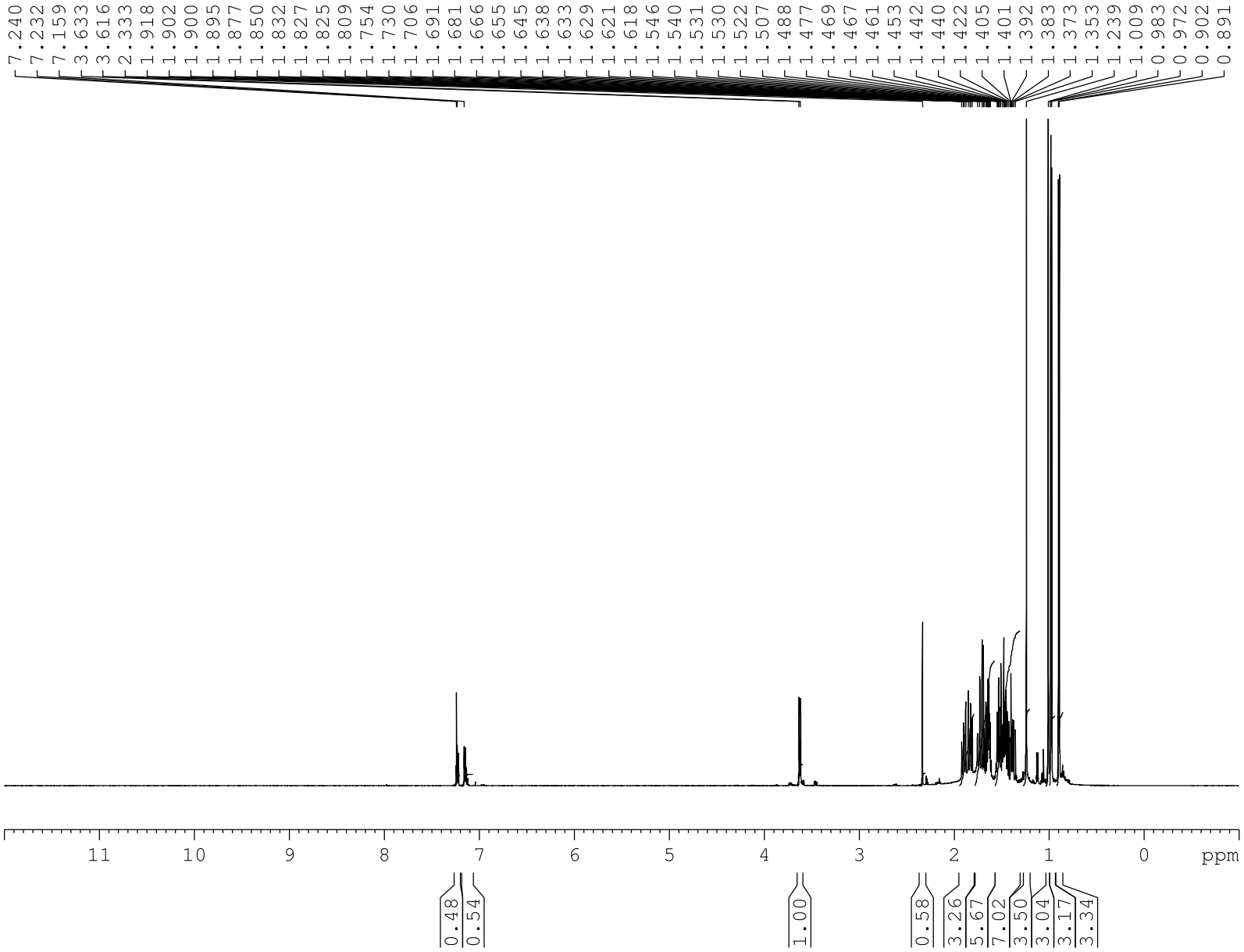
F1 - Acquisition parameters
TD                   128
SFO1          400.1317 MHz
FIDRES         51.062092 Hz
SW                 8.167 ppm
FnMODE               QF

F2 - Processing parameters
SI                  1024
SF           400.1299976 MHz
WDW                QSINE
SSB                    0
LB                     0 Hz
GB                     0
PC                  1.40

F1 - Processing parameters
SI                  1024
MC2                   QF
SF           400.1299447 MHz
WDW                QSINE
SSB                    0
LB                     0 Hz
GB                     0
```

CM3

1H spectra Dr.Orabi Caro M3 in CDCL3



Current Data Parameters

NAME	CaroM3-2D
EXPNO	2
PROCNO	1

F2 - Acquisition Parameter

Date_	20220630
Time	14.04
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	12335.526 Hz
FIDRES	0.188225 Hz
AQ	2.6563926 se
RG	203
DW	40.533 us
DE	20.00 us
TE	298.0 K
D1	1.00000000 se
TD0	1

======== CHANNEL f1 ======

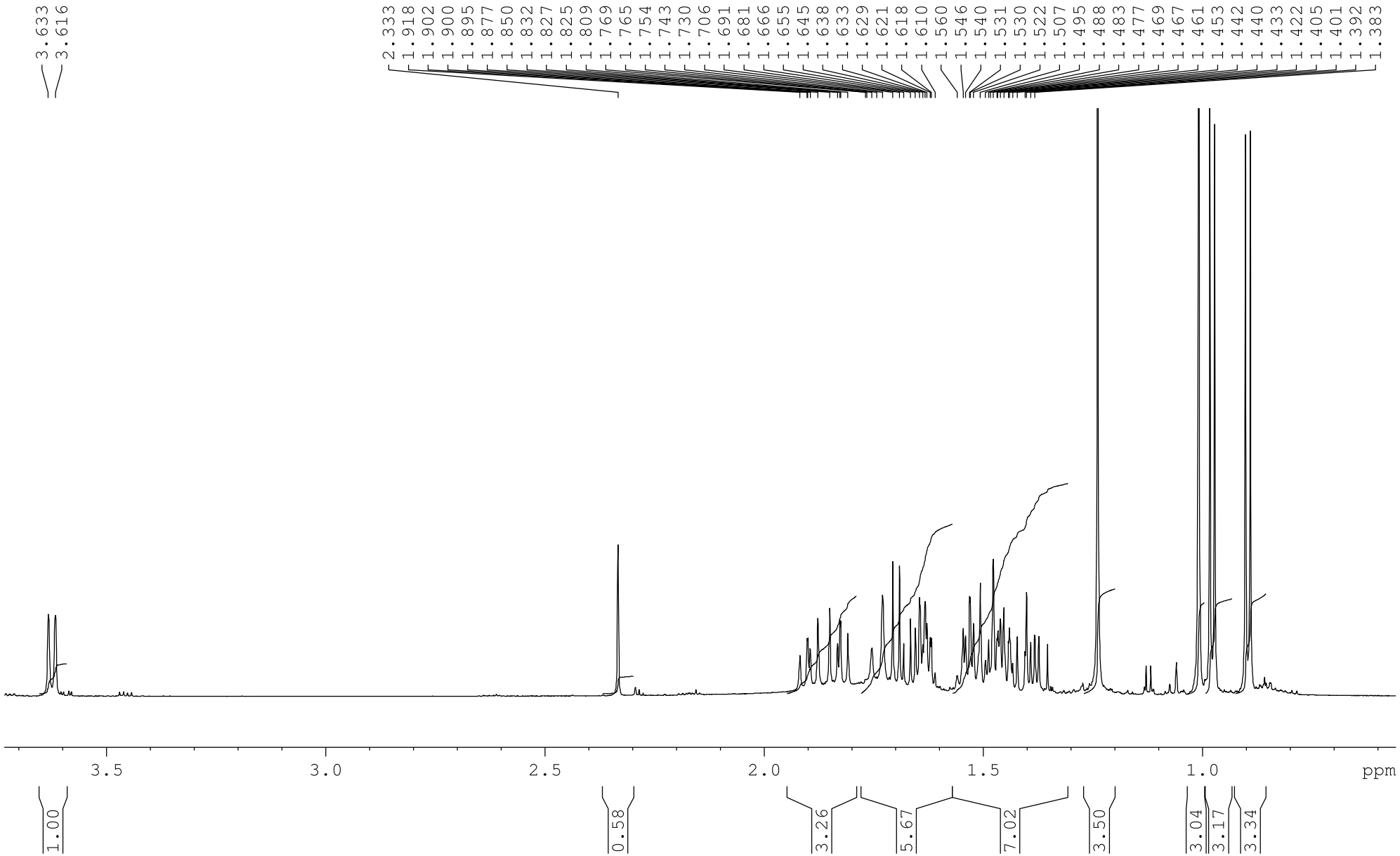
SFO1	600.1337060 MH
NUC1	1H
P1	10.60 us
PLW1	27.82500076 W

F2 - Processing parameters

SI	32768
SF	600.1300280 MH
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

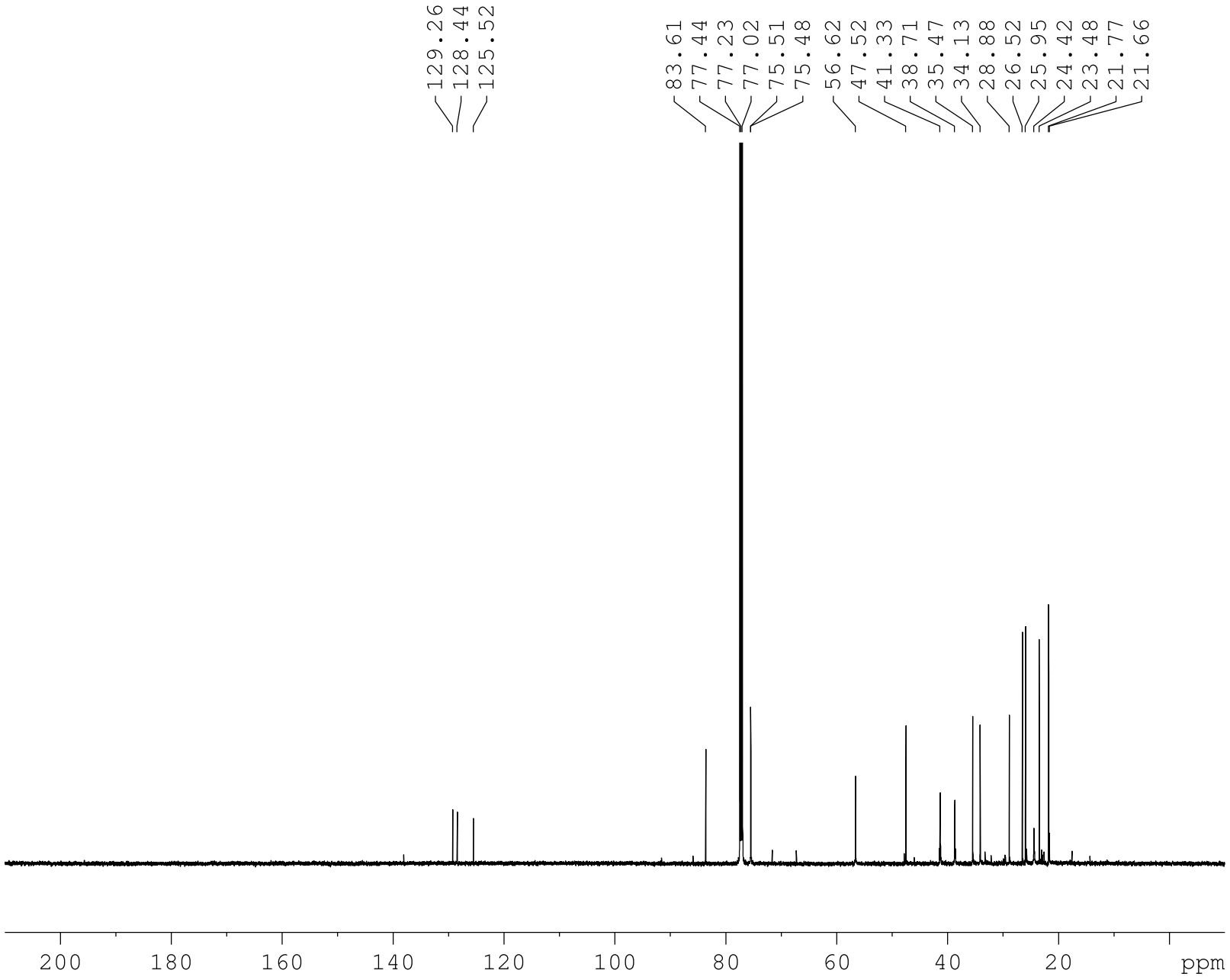
CM3

1H spectra Dr.Orabi Caro M3 in CDCL3



CM3

13C decoupled spectra Dr.Orabi Caro M3 in CDCL3




```
Current Data Parameters
NAME                  CaroM3-2D
EXPNO                         3
PROCNO                        1

F2 - Acquisition Parameters
Date_                  20220630
Time                      22.34
INSTRUM                   spect
PROBHD    5 mm PABBO BB-
PULPROG                 zgpg30
TD                       65536
SOLVENT                  CDCl3
NS                       10240
DS                           4
SWH                  36057.691 Hz
FIDRES                0.550197 Hz
AQ                    0.9087659 sec
RG                         203
DW                       13.867 usec
DE                       50.00 usec
TE                       300.7 K
D1                   2.00000000 sec
D11                  0.03000000 sec
TD0                          1

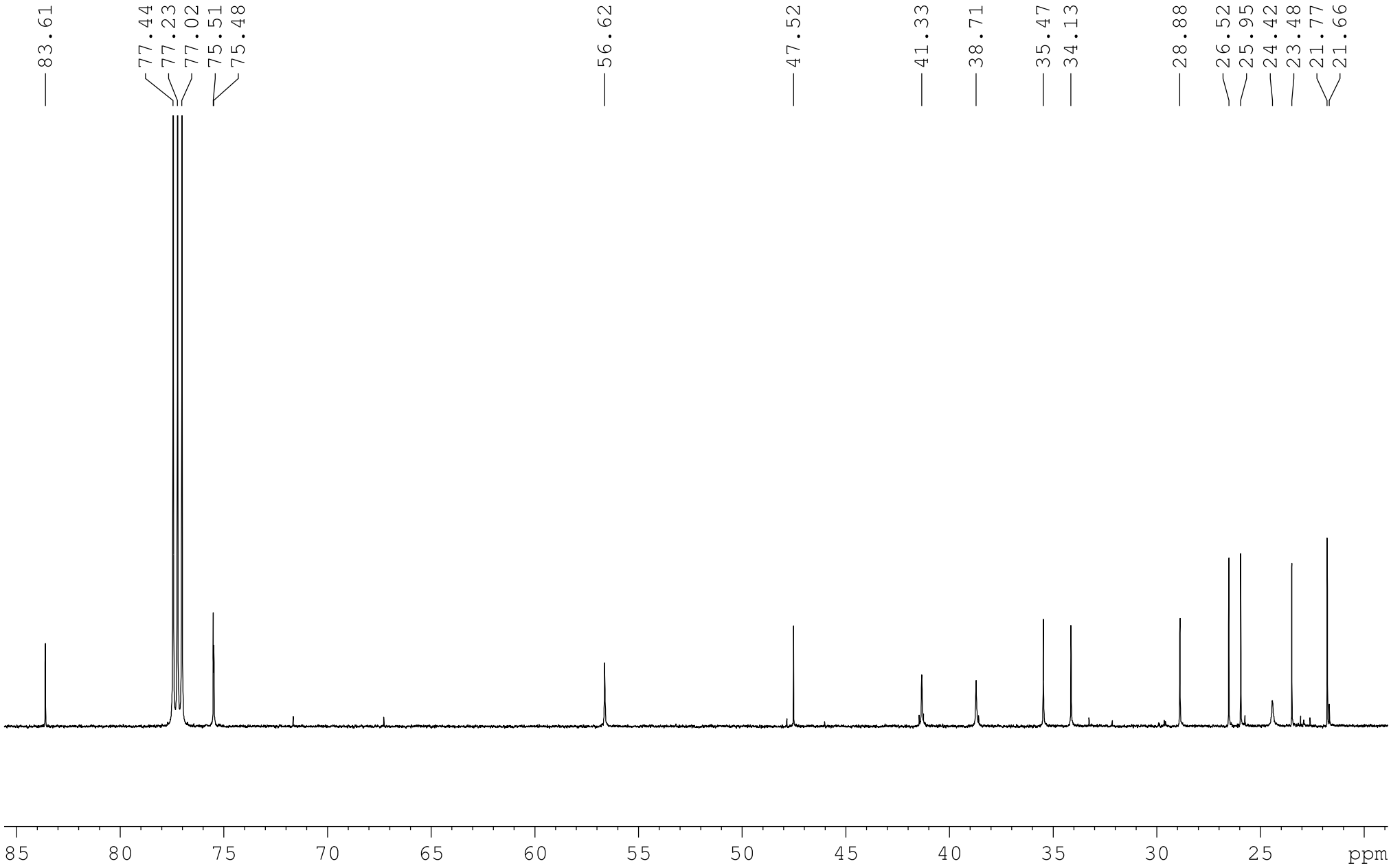
======== CHANNEL f1 ========
SFO1               150.9178979 MHz
NUC1                       13C
P1                        8.80 usec
PLW1                78.13500214 W

======== CHANNEL f2 ========
SFO2               600.1324005 MHz
NUC2                       1H
CPDPRG[2                waltz65
PCPD2                    70.00 usec
PLW2                27.82500076 W
PLW12                0.63804001 W
PLW13                0.31264001 W

F2 - Processing parameters
SI                         32768
SF                 150.9027757 MHz
WDW                           EM
SSB          0
LB                        1.00 Hz
GB           0
PC                        1.40
```

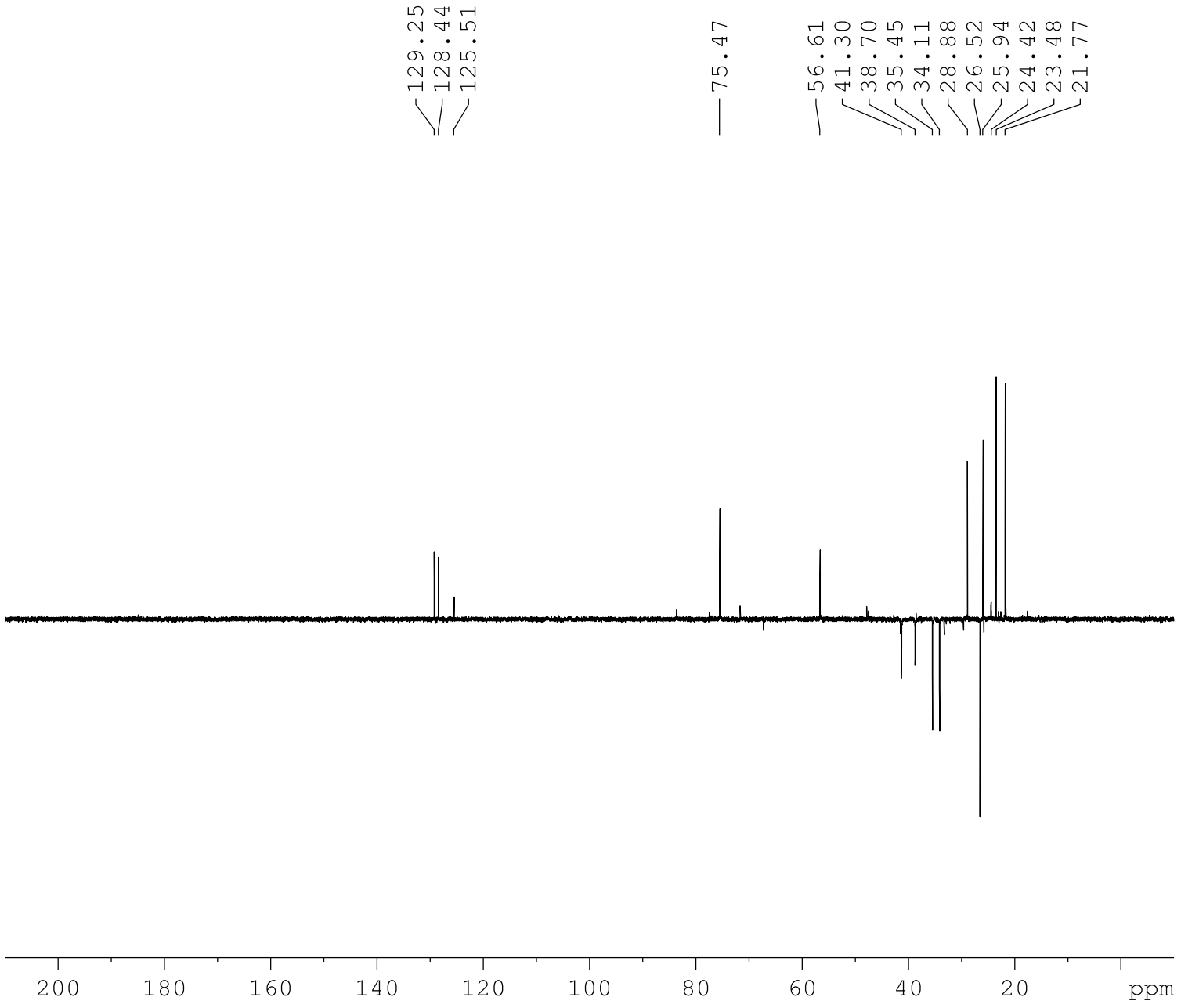
CM3

13C decoupled spectra Dr.Orabi Caro M3 in CDCL3



CM3

DEPT 135 spectra Dr.Orabi Caro M3 in CDCL3




```
Current Data Parameters
NAME            CaroM3-2D
EXPNO                   6
PROCNO                  1

F2 - Acquisition Parameters
Date_            20220701
Time                 8.48
INSTRUM             spect
PROBHD    5 mm PABBO BB-
PULPROG         deptsp135
TD                  65536
SOLVENT             CDCl3
NS                   4096
DS                      4
SWH            36057.691 Hz
FIDRES          0.550197 Hz
AQ             0.9087659 sec
RG                    203
DW                13.867 usec
DE                50.00 usec
TE                299.4 K
CNST2        145.0000000
D1            2.00000000 sec
D2            0.00344828 sec
D12           0.00002000 sec
TD0                     1

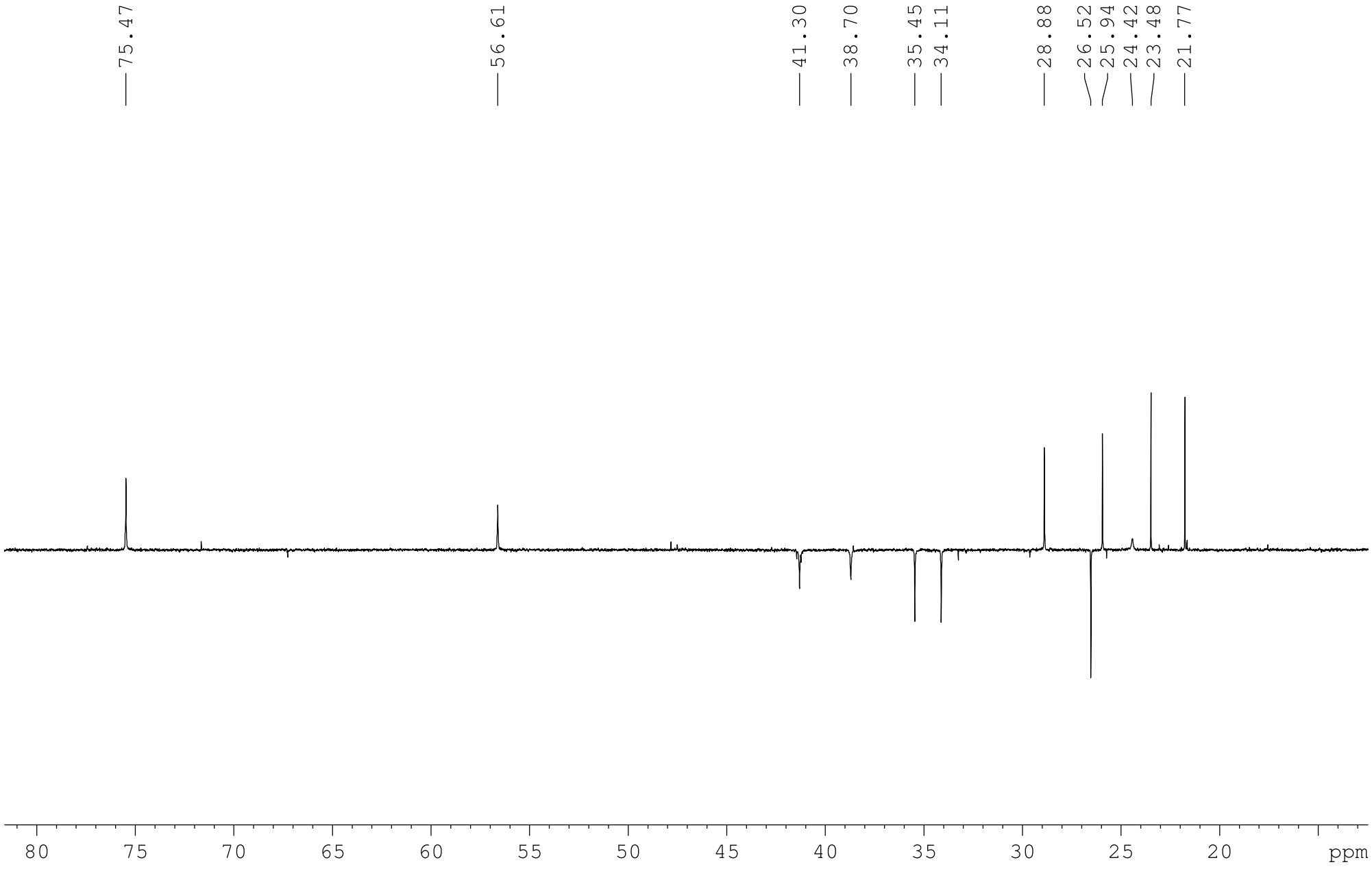
======== CHANNEL f1 ========
SFO1         150.9178979 MHz
NUC1                  13C
P1                   8.80 usec
P13               2000.00 usec
PLW0      0 W
PLW1         78.13500214 W
SPNAM[5]     Crp60comp.4
SPOAL5             0.500
SPOFFS5   0 Hz
SPW5          9.24489975 W

======== CHANNEL f2 ========
SFO2         600.1324005 MHz
NUC2                  1H
CPDPRG[2          waltz65
P3                  10.60 usec
P4                  21.20 usec
PCPD2               70.00 usec
PLW2         27.82500076 W
PLW12         0.63804001 W

F2 - Processing parameters
SI                  32768
SF           150.9027774 MHz
WDW                   EM
SSB       0
LB                  1.00 Hz
GB        0
PC                  1.40
```

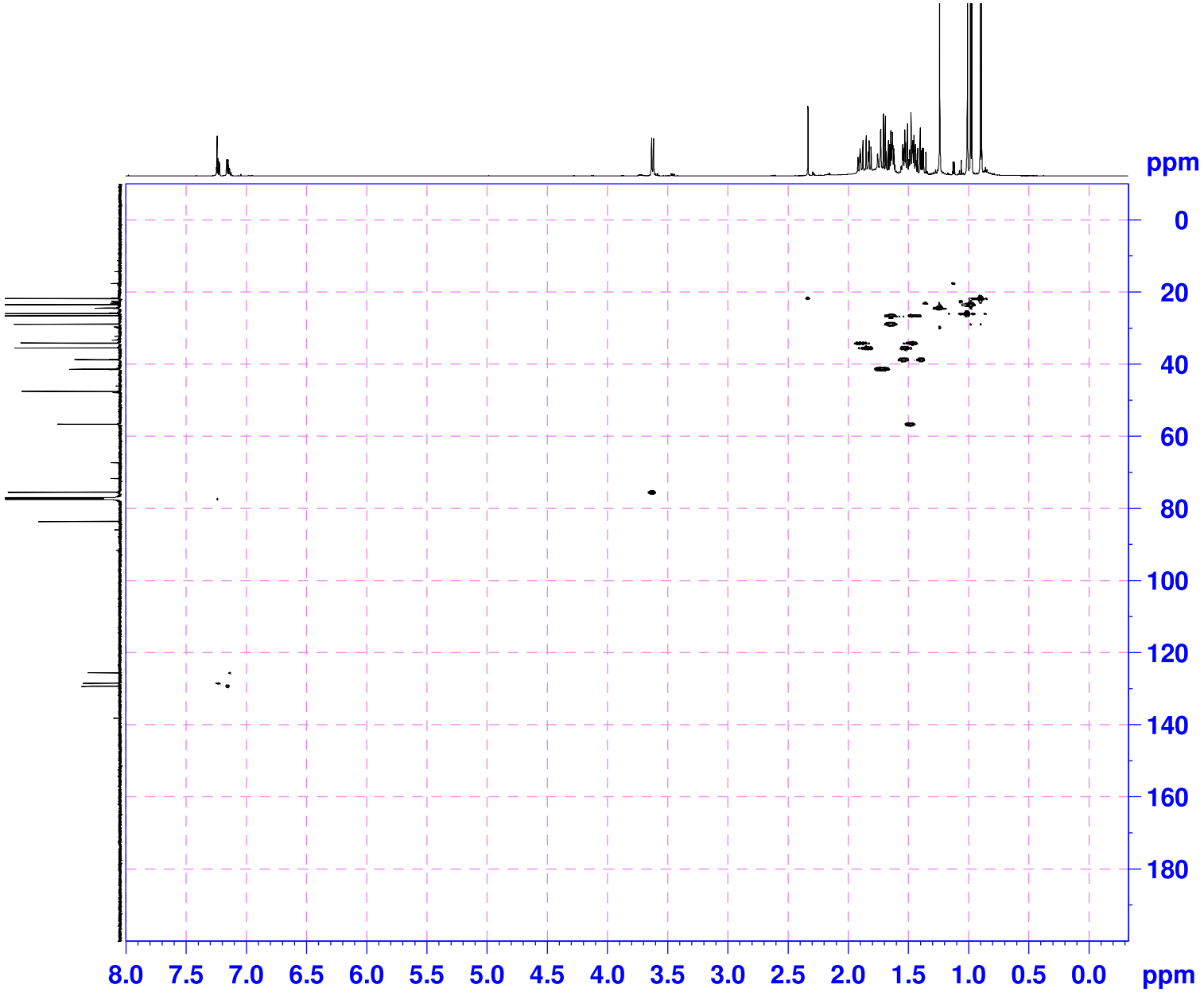
CM3

DEPT 135 spectra Dr.Orabi Caro M3 in CDCL3



CM3

13C HSQC spectra Dr.Orabi Caro M3 in CDCL3




```
Current Data Parameters
NAME                  CaroM3-2D
EXPNO                         8
PROCNO                        1

F2 - Acquisition Parameters
Date_                  20220701
Time                       9.35
INSTRUM                   spect
PROBHD    5 mm PABBO BB-
PULPROG     hsqcetgpsp.2
TD                         2048
SOLVENT                   CDCl3
NS                           16
DS                           16
SWH                  5000.000 Hz
FIDRES               2.441406 Hz
AQ                   0.2048000 sec
RG                         203
DW                   100.000 usec
DE                    20.00 usec
TE                    299.1 K
CNST2               145.0000000
D0                   0.0000300 sec
D1                   1.90169597 sec
D4                   0.00172414 sec
D11                  0.03000000 sec
D16                  0.00020000 sec
IN0                  0.00001840 sec
ZGOPTNS

======== CHANNEL f1 ========
SFO1                600.1323288 MHz
NUC1                        1H
P1                    10.60 usec
P2                    21.20 usec
P28                 1000.00 usec
PLW1               27.82500076 W

======== CHANNEL f2 ========
SFO2                150.9178993 MHz
NUC2                        13C
CPDPRG[2                garp4
P3                     8.80 usec
P14                  500.00 usec
P24                 2000.00 usec
PCPD2                 60.00 usec
PLW0          0 W
PLW2               78.13500214 W
PLW12               1.68079996 W
SPNAM[3] Crp60,0.5,20.1
SPOAL3                   0.500
SPOFFS3  0 Hz
SPW3                9.24489975 W
SPNAM[7]     Crp60comp.4
SPOAL7                   0.500
SPOFFS7  0 Hz
SPW7                9.24489975 W

====== GRADIENT CHANNEL =====
GPNAM[1]            SINE.100
GPNAM[2]            SINE.100
GPZ1                    80.00 %
GPZ2                    20.10 %
P16                  1000.00 usec

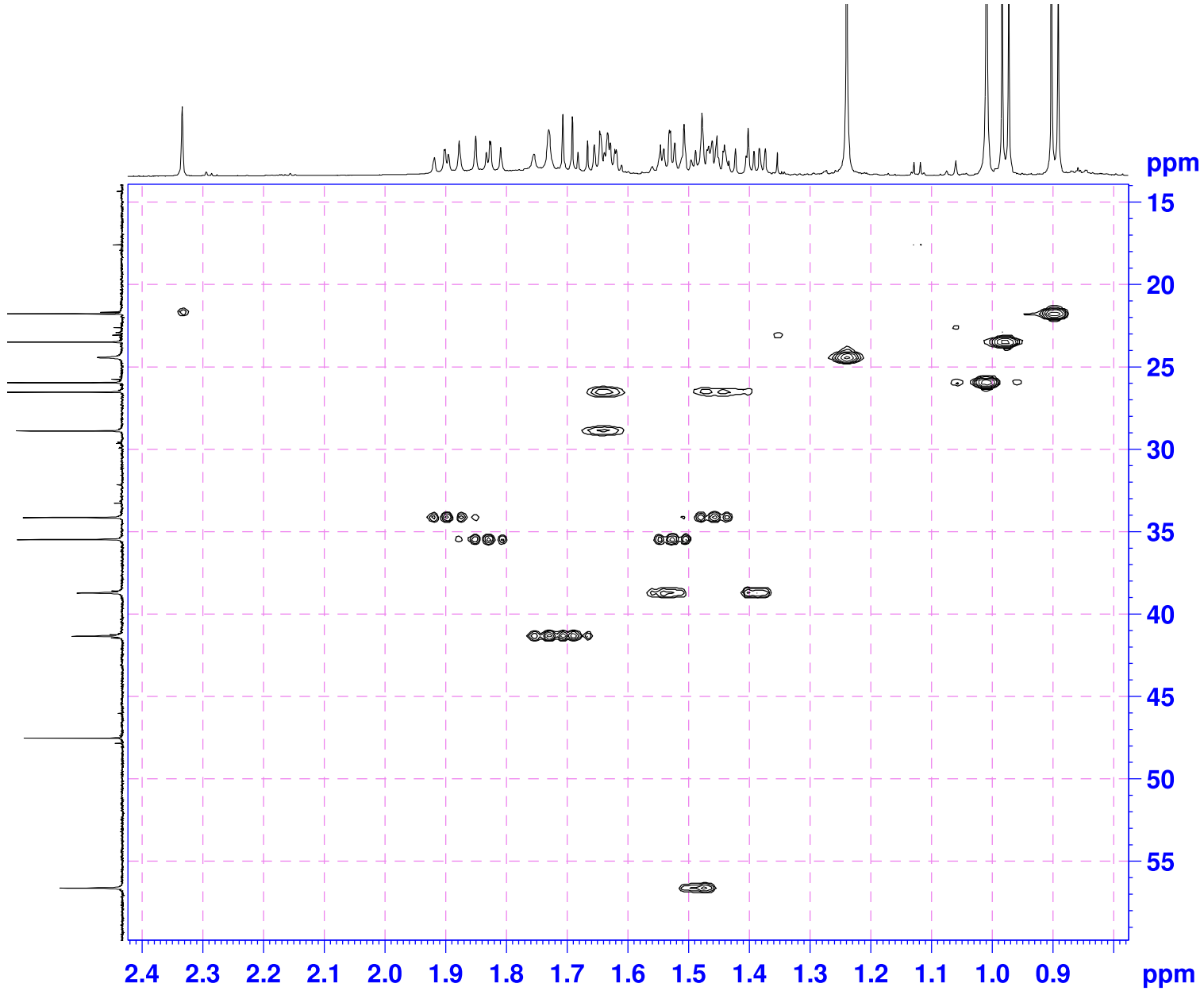
F1 - Acquisition parameters
TD                         512
SFO1                150.9179 MHz
FIDRES              53.074047 Hz
SW                   180.058 ppm
FnMODE     Echo-Antiecho

F2 - Processing parameters
SI                         2048
SF                  600.1300268 MHz
WDW                       QSINE
SSB                           2
LB                0 Hz
GB                0
PC                        1.40

F1 - Processing parameters
SI                         1024
MC2               echo-antiecho
SF                  150.9027635 MHz
WDW                       QSINE
SSB                           2
LB                0 Hz
GB                0
```

CM3

13C HSQC spectra Dr.Orabi Caro M3 in CDCL3




```
Current Data Parameters
NAME                  CaroM3-2D
EXPNO                         8
PROCNO                        1

F2 - Acquisition Parameters
Date_                  20220701
Time                       9.35
INSTRUM                   spect
PROBHD    5 mm PABBO BB-
PULPROG     hsqcetgpsp.2
TD                         2048
SOLVENT                   CDCl3
NS                           16
DS                           16
SWH                5000.000 Hz
FIDRES                2.441406 Hz
AQ                 0.2048000 sec
RG                         203
DW                   100.000 usec
DE                    20.00 usec
TE                    299.1 K
CNST2              145.0000000
D0                 0.0000300 sec
D1                 1.90169597 sec
D4                 0.00172414 sec
D11                0.03000000 sec
D16                0.00020000 sec
IN0                0.00001840 sec
ZGOPTNS

======== CHANNEL f1 ========
SFO1               600.1323288 MHz
NUC1                       1H
P1                    10.60 usec
P2                    21.20 usec
P28                 1000.00 usec
PLW1              27.82500076 W

======== CHANNEL f2 ========
SFO2               150.9178993 MHz
NUC2                      13C
CPDPRG[2                garp4
P3                     8.80 usec
P14                  500.00 usec
P24                 2000.00 usec
PCPD2                 60.00 usec
PLW0          0 W
PLW2             78.13500214 W
PLW12             1.68079996 W
SPNAM[3] Crp60,0.5,20.1
SPOAL3                 0.500
SPOFFS3  0 Hz
SPW3              9.24489975 W
SPNAM[7]     Crp60comp.4
SPOAL7                 0.500
SPOFFS7  0 Hz
SPW7              9.24489975 W

====== GRADIENT CHANNEL =====
GPNAM[1]            SINE.100
GPNAM[2]            SINE.100
GPZ1                  80.00 %
GPZ2                  20.10 %
P16                 1000.00 usec

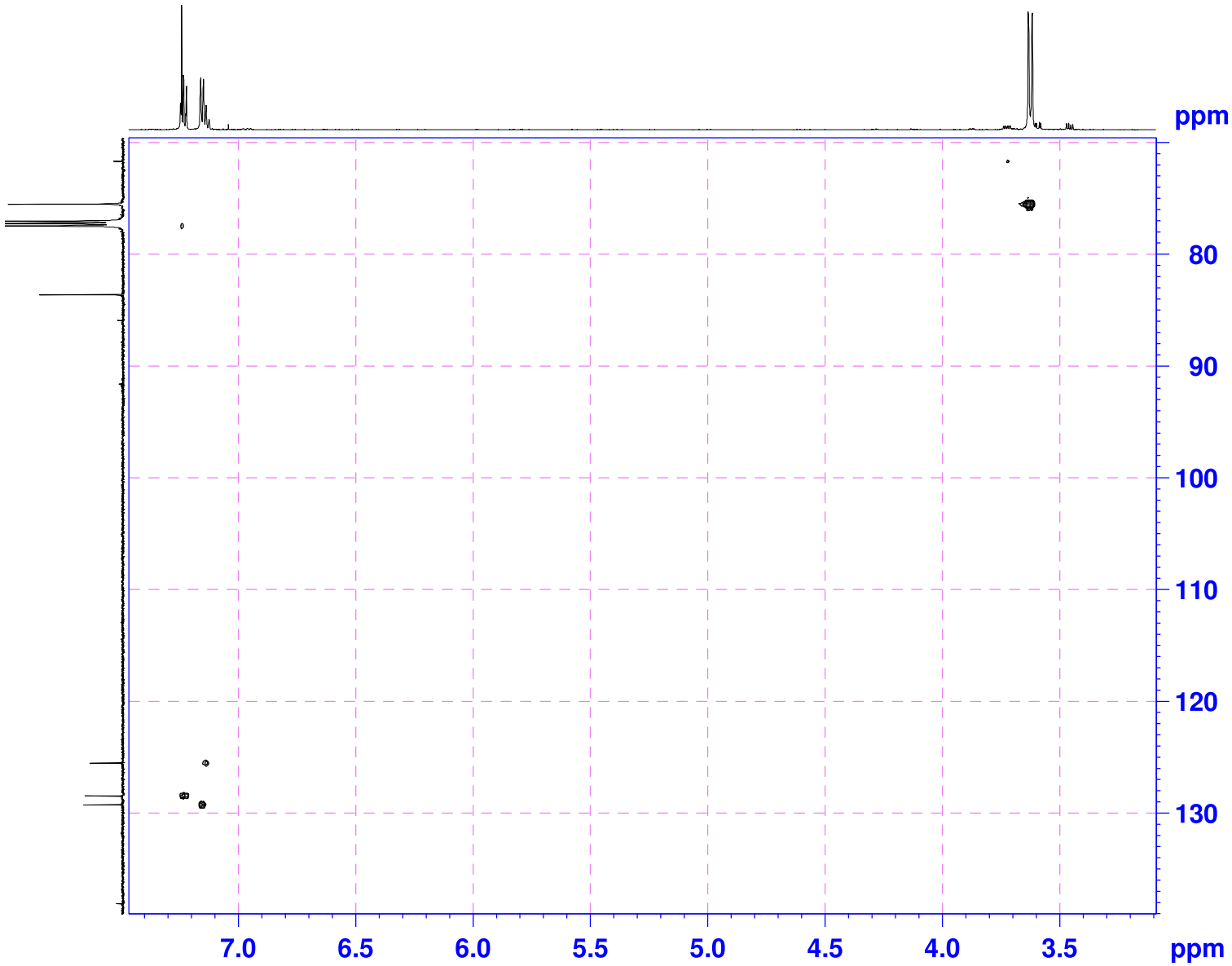
F1 - Acquisition parameters
TD                         512
SFO1                150.9179 MHz
FIDRES             53.074047 Hz
SW                   180.058 ppm
FnMODE     Echo-Antiecho

F2 - Processing parameters
SI                         2048
SF                600.1300268 MHz
WDW                       QSINE
SSB                           2
LB             0 Hz
GB             0
PC                         1.40

F1 - Processing parameters
SI                         1024
MC2             echo-antiecho
SF                150.9027635 MHz
WDW                       QSINE
SSB                           2
LB             0 Hz
GB             0
```

CM3

13C HSQC spectra Dr.Orabi Caro M3 in CDCL3




```
Current Data Parameters
NAME                  CaroM3-2D
EXPNO                         8
PROCNO                        1

F2 - Acquisition Parameters
Date_                  20220701
Time                       9.35
INSTRUM                   spect
PROBHD    5 mm PABBO BB-
PULPROG     hsqcetgpsp.2
TD                         2048
SOLVENT                   CDCl3
NS                           16
DS                           16
SWH                5000.000 Hz
FIDRES              2.441406 Hz
AQ                  0.2048000 sec
RG                         203
DW                   100.000 usec
DE                    20.00 usec
TE                    299.1 K
CNST2              145.0000000
D0                  0.0000300 sec
D1                  1.90169597 sec
D4                  0.00172414 sec
D11                 0.03000000 sec
D16                 0.00020000 sec
IN0                 0.00001840 sec
ZGOPTNS

======== CHANNEL f1 ========
SFO1               600.1323288 MHz
NUC1                       1H
P1                    10.60 usec
P2                    21.20 usec
P28                 1000.00 usec
PLW1              27.82500076 W

======== CHANNEL f2 ========
SFO2               150.9178993 MHz
NUC2                      13C
CPDPRG[2                garp4
P3                     8.80 usec
P14                  500.00 usec
P24                 2000.00 usec
PCPD2                 60.00 usec
PLW0          0 W
PLW2             78.13500214 W
PLW12             1.68079996 W
SPNAM[3] Crp60,0.5,20.1
SPOAL3                 0.500
SPOFFS3  0 Hz
SPW3               9.24489975 W
SPNAM[7]    Crp60comp.4
SPOAL7                 0.500
SPOFFS7  0 Hz
SPW7               9.24489975 W

====== GRADIENT CHANNEL =====
GPNAM[1]            SINE.100
GPNAM[2]            SINE.100
GPZ1                   80.00 %
GPZ2                   20.10 %
P16                 1000.00 usec

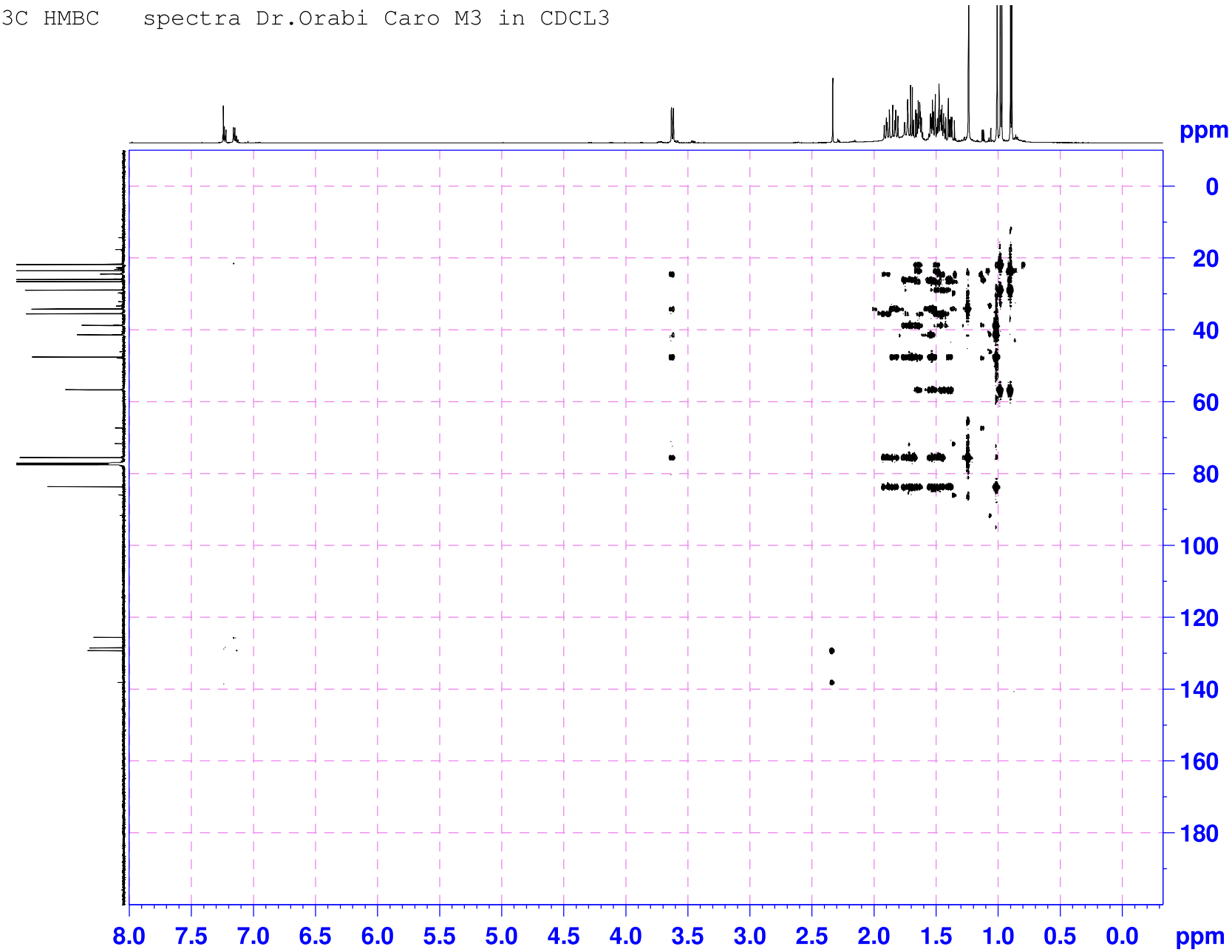
F1 - Acquisition parameters
TD                         512
SFO1                150.9179 MHz
FIDRES             53.074047 Hz
SW                   180.058 ppm
FnMODE     Echo-Antiecho

F2 - Processing parameters
SI                         2048
SF                600.1300268 MHz
WDW                      QSINE
SSB                          2
LB            0 Hz
GB            0
PC                        1.40

F1 - Processing parameters
SI                         1024
MC2               echo-antiecho
SF                150.9027635 MHz
WDW                      QSINE
SSB                          2
LB            0 Hz
GB            0
```

CM3

13C HMBC spectra Dr.Orabi Caro M3 in CDCL3



BRUKER

```
Current Data Parameters
NAME            CaroM3-2D
EXPNO                   9
PROCNO                  1

F2 - Acquisition Parameters
Date_           20220701
Time                14.29
INSTRUM             spect
PROBHD    5 mm PABBO BB-
PULPROG    hmbcetgpl2nd
TD                  2048
SOLVENT             CDCl3
NS                    32
DS                    16
SWH           5000.000 Hz
FIDRES        2.441406 Hz
AQ            0.2048000 sec
RG                  203
DW             100.000 usec
DE              20.00 usec
TE              298.8 K
CNST6       125.0000000
CNST7       165.0000000
CNST13       10.0000000
CNST30        0.5981151
D0           0.00000300 sec
D1           1.42627203 sec
D6           0.05000000 sec
D16          0.00020000 sec
IN0          0.00001490 sec

======== CHANNEL f1 ========
SFO1        600.1323288 MHz
NUC1                1H
P1                10.60 usec
P2                21.20 usec
PLW1        27.82500076 W

======== CHANNEL f2 ========
SFO2        150.9178738 MHz
NUC2                13C
P3                 8.80 usec
P24             2000.00 usec
PLW2        78.13500214 W
SPNAM[7]    Crp60comp.4
SPOAL7            0.500
SPOFFS7  0 Hz
SPW7         9.24489975 W

====== GRADIENT CHANNEL =====
GPNAM[1]        SINE.100
GPNAM[3]        SINE.100
GPNAM[4]        SINE.100
GPNAM[5]        SINE.100
GPZ1               80.00 %
GPZ3               15.00 %
GPZ4              -10.00 %
GPZ5               -5.00 %
P16             1000.00 usec

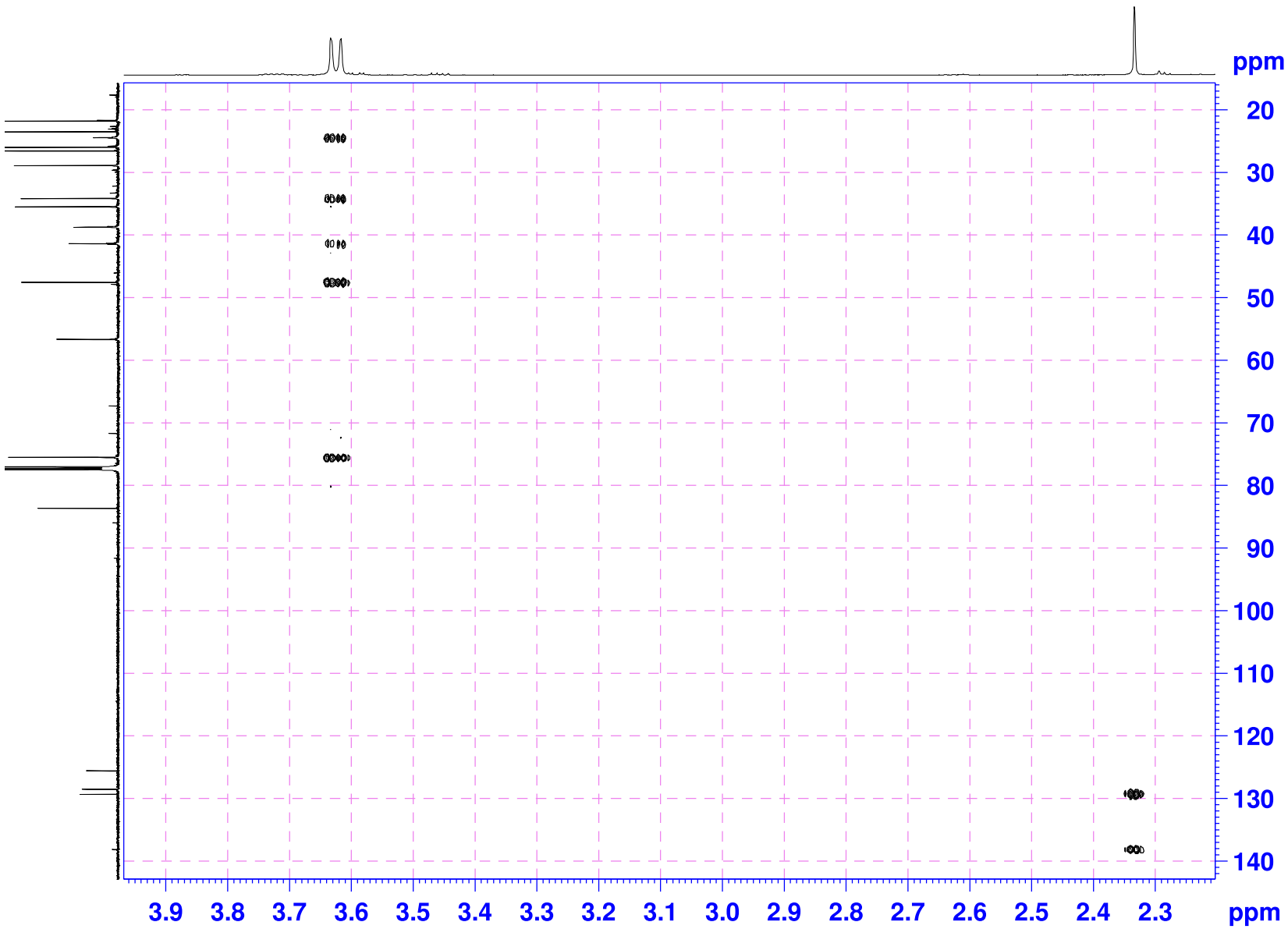
F1 - Acquisition parameters
TD                  256
SFO1          150.9179 MHz
FIDRES       131.082214 Hz
SW            222.353 ppm
FnMODE    Echo-Antiecho

F2 - Processing parameters
SI                 2048
SF          600.1300257 MHz
WDW                SINE
SSB       0
LB        0 Hz
GB        0
PC                1.40

F1 - Processing parameters
SI                  512
MC2        echo-antiecho
SF          150.9027314 MHz
WDW                SINE
SSB                   2
LB        0 Hz
GB        0
```

CM3

13C HMBC spectra Dr.Orabi Caro M3 in CDCL3




```
Current Data Parameters
NAME                  CaroM3-2D
EXPNO                         9
PROCNO                        1

F2 - Acquisition Parameters
Date_                  20220701
Time                      14.29
INSTRUM                   spect
PROBHD    5 mm PABBO BB-
PULPROG     hmbcetgpl2nd
TD                         2048
SOLVENT                  CDCl3
NS                           32
DS                           16
SWH                  5000.000 Hz
FIDRES               2.441406 Hz
AQ                   0.2048000 sec
RG                         203
DW                    100.000 usec
DE                     20.00 usec
TE                     298.8 K
CNST6               125.0000000
CNST7               165.0000000
CNST13               10.0000000
CNST30                0.5981151
D0                   0.00000300 sec
D1                   1.42627203 sec
D6                   0.05000000 sec
D16                  0.00020000 sec
IN0                  0.00001490 sec

======== CHANNEL f1 ========
SFO1                600.1323288 MHz
NUC1                        1H
P1                       10.60 usec
P2                       21.20 usec
PLW1                27.82500076 W

======== CHANNEL f2 ========
SFO2                150.9178738 MHz
NUC2                        13C
P3                        8.80 usec
P24                    2000.00 usec
PLW2                78.13500214 W
SPNAM[7]          Crp60comp.4
SPOAL7                   0.500
SPOFFS7  0 Hz
SPW7                 9.24489975 W

====== GRADIENT CHANNEL =====
GPNAM[1]              SINE.100
GPNAM[3]              SINE.100
GPNAM[4]              SINE.100
GPNAM[5]              SINE.100
GPZ1                     80.00 %
GPZ3                     15.00 %
GPZ4                    -10.00 %
GPZ5                     -5.00 %
P16                    1000.00 usec

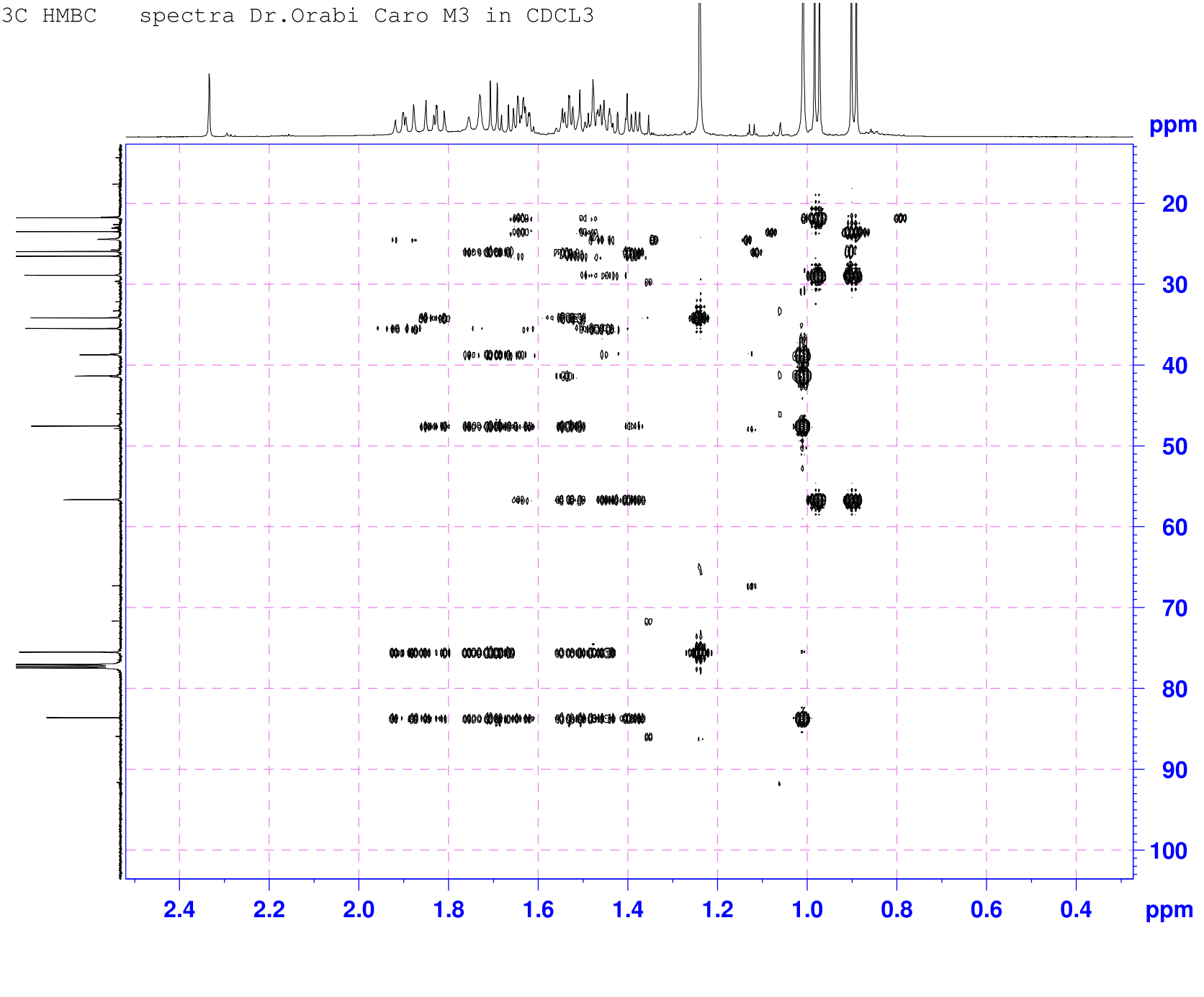
F1 - Acquisition parameters
TD                         256
SFO1                150.9179 MHz
FIDRES              131.082214 Hz
SW                    222.353 ppm
FnMODE          Echo-Antiecho

F2 - Processing parameters
SI                         2048
SF                  600.1300257 MHz
WDW                        SINE
SSB          0
LB           0 Hz
GB           0
PC                        1.40

F1 - Processing parameters
SI                          512
MC2              echo-antiecho
SF                  150.9027314 MHz
WDW                        SINE
SSB                           2
LB           0 Hz
GB           0
```

CM3

13C HMBC spectra Dr.Orabi Caro M3 in CDCL3



BRUKER

```
Current Data Parameters
NAME            CaroM3-2D
EXPNO                   9
PROCNO                  1

F2 - Acquisition Parameters
Date_            20220701
Time                14.29
INSTRUM             spect
PROBHD    5 mm PABBO BB-
PULPROG    hmbcetgpl2nd
TD                  2048
SOLVENT             CDCl3
NS                    32
DS                    16
SWH           5000.000 Hz
FIDRES        2.441406 Hz
AQ            0.2048000 sec
RG                  203
DW             100.000 usec
DE              20.00 usec
TE              298.8 K
CNST6        125.0000000
CNST7        165.0000000
CNST13        10.0000000
CNST30         0.5981151
D0            0.00000300 sec
D1            1.42627203 sec
D6            0.05000000 sec
D16           0.00020000 sec
IN0           0.00001490 sec

======== CHANNEL f1 ========
SFO1         600.1323288 MHz
NUC1                1H
P1                10.60 usec
P2                21.20 usec
PLW1         27.82500076 W

======== CHANNEL f2 ========
SFO2         150.9178738 MHz
NUC2                13C
P3                 8.80 usec
P24             2000.00 usec
PLW2         78.13500214 W
SPNAM[7]     Crp60comp.4
SPOAL7              0.500
SPOFFS7  0 Hz
SPW7          9.24489975 W

====== GRADIENT CHANNEL =====
GPNAM[1]        SINE.100
GPNAM[3]        SINE.100
GPNAM[4]        SINE.100
GPNAM[5]        SINE.100
GPZ1               80.00 %
GPZ3               15.00 %
GPZ4              -10.00 %
GPZ5               -5.00 %
P16              1000.00 usec

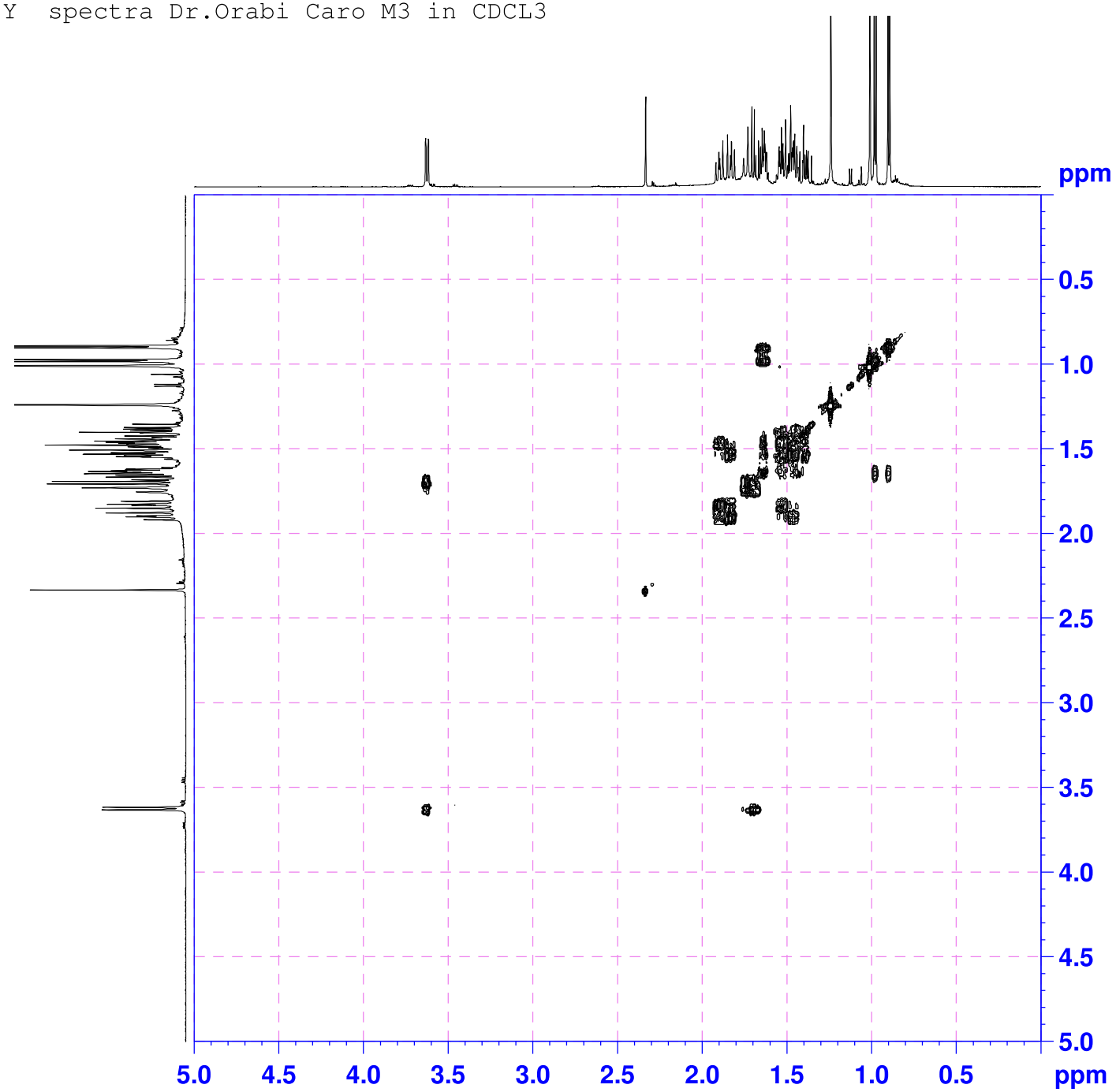
F1 - Acquisition parameters
TD                  256
SFO1           150.9179 MHz
FIDRES        131.082214 Hz
SW             222.353 ppm
FnMODE     Echo-Antiecho

F2 - Processing parameters
SI                  2048
SF           600.1300257 MHz
WDW                 SINE
SSB       0
LB        0 Hz
GB        0
PC                 1.40

F1 - Processing parameters
SI                   512
MC2         echo-antiecho
SF           150.9027314 MHz
WDW                 SINE
SSB                    2
LB        0 Hz
GB        0
```

CM3

COSY spectra Dr.Orabi Caro M3 in CDCL3




```
Current Data Parameters
NAME            CaroM3-2D
EXPNO                   7
PROCNO                  1

F2 - Acquisition Parameters
Date_            20220701
Time                8.50
INSTRUM            spect
PROBHD   5 mm PABBO BB-
PULPROG       cosygpppqf
TD                  2048
SOLVENT             CDCl3
NS                     8
DS                     8
SWH              4854.369 Hz
FIDRES           2.370297 Hz
AQ               0.2109440 sec
RG                  90.5
DW                103.000 usec
DE                 20.00 usec
TE                298.8 K
D0               0.00000300 sec
D1               0.66685098 sec
D11              0.03000000 sec
D12              0.00002000 sec
D13              0.00000400 sec
D16              0.00020000 sec
IN0              0.00020600 sec

======== CHANNEL f1 ========
SFO1          600.1322713 MHz
NUC1                  1H
P0                 10.60 usec
P1                 10.60 usec
P17              2500.00 usec
PLW1          27.82500076 W
PLW10          4.62489986 W

====== GRADIENT CHANNEL =====
GPNAM[1]         SINE.100
GPZ1                20.00 %
P16               1000.00 usec

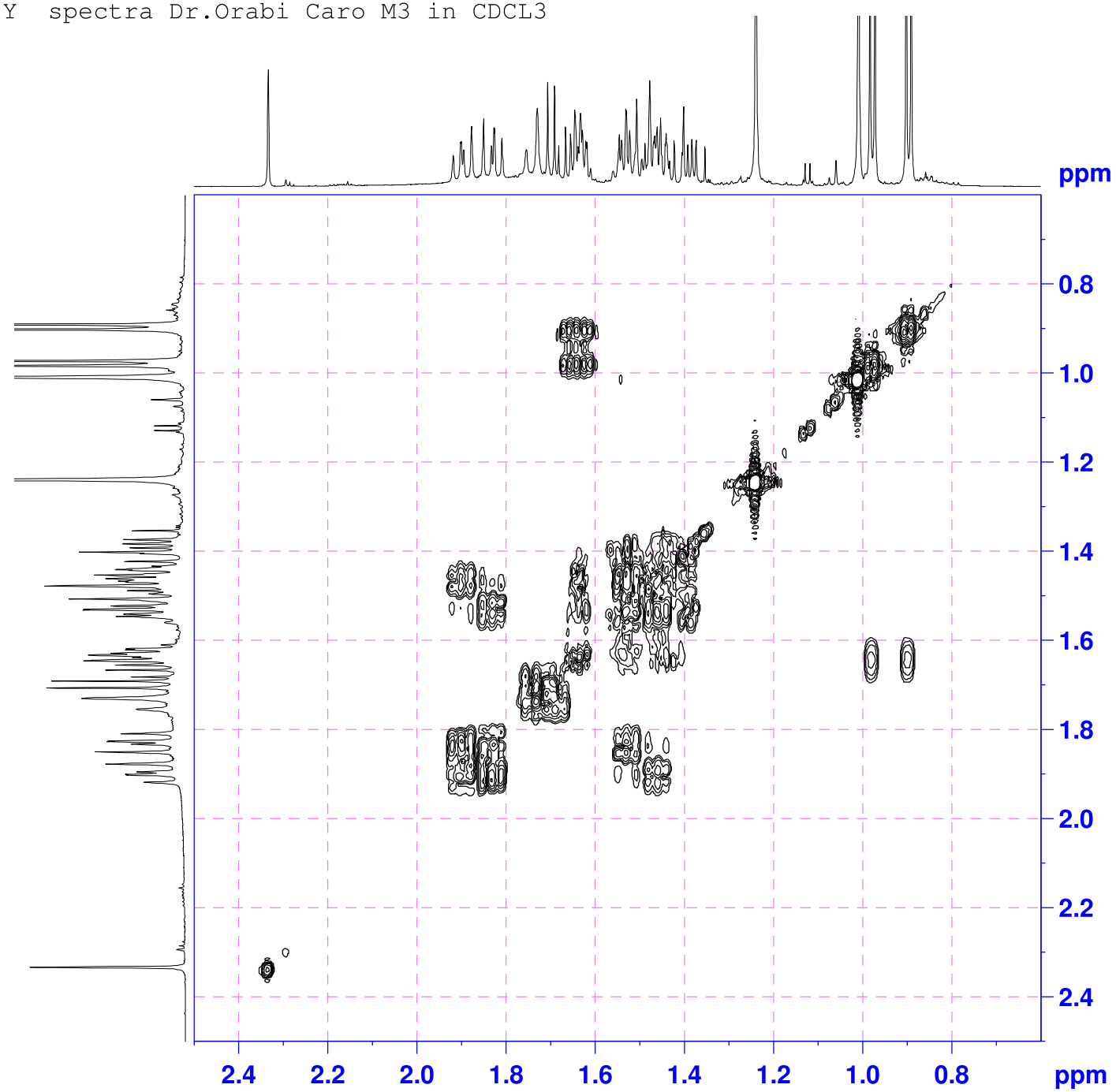
F1 - Acquisition parameters
TD                   320
SFO1             600.1323 MHz
FIDRES          15.169903 Hz
SW                  8.089 ppm
FnMODE                QF

F2 - Processing parameters
SI                   2048
SF            600.1300250 MHz
WDW                  SINE
SSB       0
LB        0 Hz
GB        0
PC                   1.40

F1 - Processing parameters
SI                   2048
MC2                    QF
SF            600.1300235 MHz
WDW                  SINE
SSB       0
LB        0 Hz
GB        0
```

CM3

COSY spectra Dr.Orabi Caro M3 in CDCL3



Current Data Parameters
NAME CaroM3-2D
EXPNO 7
PROCNO 1

F2 - Acquisition Parameters
Date_ 20220701
Time 8.50
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG cosygpppqf
TD 2048
SOLVENT CDCl3
NS 8
DS 8
SWH 4854.369 Hz
FIDRES 2.370297 Hz
AQ 0.2109440 sec
RG 90.5
DW 103.000 usec
DE 20.00 usec
TE 298.8 K
D0 0.00000300 sec
D1 0.66685098 sec
D11 0.03000000 sec
D12 0.00002000 sec
D13 0.00000400 sec
D16 0.00020000 sec
IN0 0.00020600 sec

======== CHANNEL f1 ========
SFO1 600.1322713 MHz
NUC1 1H
P0 10.60 usec
P1 10.60 usec
P17 2500.00 usec
PLW1 27.82500076 W
PLW10 4.62489986 W

====== GRADIENT CHANNEL =====
GPNAM[1] SINE.100
GPZ1 20.00 %
P16 1000.00 usec

F1 - Acquisition parameters
TD 320
SFO1 600.1323 MHz
FIDRES 15.169903 Hz
SW 8.089 ppm
FnMODE QF

F2 - Processing parameters
SI 2048
SF 600.1300250 MHz
WDW SINE
SSB 0
LB 0 Hz
GB 0
PC 1.40

F1 - Processing parameters
SI 2048
MC2 QF
SF 600.1300235 MHz
WDW SINE
SSB 0
LB 0 Hz
GB 0

Microbial Biotransformation of the Sesquiterpene Carotol: Generation of Hydroxylated Metabolites with Potential Cytotoxic and Target-Specific Binding Activities

Hanan G. Sary [1,2], Mohammed A. Khedr [1,3], Mohamed M. Radwan [4,5], Mickey Vinodh [6], and Khaled Y. Orabi [1*]

[1] Department of Pharmaceutical Chemistry, College of Pharmacy, Kuwait University, Safat 13110, Kuwait; hanan.sary@ku.edu.kw, mohammed.khedr@ku.edu.kw, ky.orabi@ku.edu.kw
[2] Department of Pharmacognosy, Faculty of Pharmacy, Ain-Shams University, Cairo, Egypt; hanangaber@pharma.asu.edu.eg
[3] Department of Pharmaceutical Chemistry, Faculty of Pharmacy, Helwan University, Ain Helwan, Cairo 11795, Egypt
[4] Department of Biomolecular Sciences, School of Pharmacy, The University of Mississippi, University, MS 38677, USA; mradwan@olemiss.edu
[5] National Center for Natural Products Research, School of Pharmacy, The University of Mississippi, University, MS 38677, USA; mradwan@olemiss.edu
[6] Research Sector Project Units, Faculty of Science, Kuwait University, Safat 13060, Kuwait; miky.findo@ku.edu.kw
* Correspondence: ky.orabi@ku.edu.kw; Tel.: +965-2463-6048

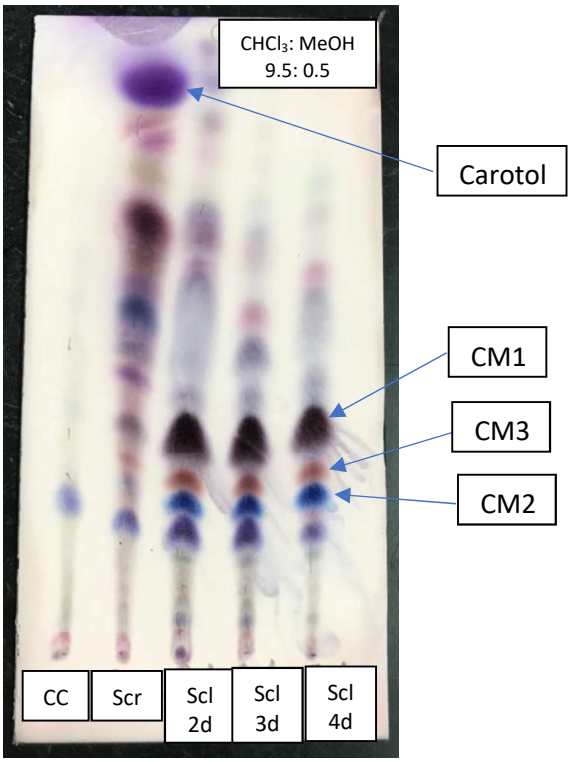


Figure S2. TLC monitoring of the metabolism on a daily basis. Visualization was performed using *p*-anisaldehyde/sulfuric acid followed by heating. Mobile phase: $CHCl_3$/MeOH (9.5:0.5).
Key: CC: culture control; Scr: screening culture; Scl: scale-up culture; d: days.

Microbial Biotransformation of the Sesquiterpene Carotol: Generation of Hydroxylated Metabolites with Potential Cytotoxic and Target-Specific Binding Activities

Hanan G. Sary [1,2], Mohammed A. Khedr [1,3], Mohamed M. Radwan [4,5], Mickey Vinodh [6], and Khaled Y. Orabi [1*]

[1] Department of Pharmaceutical Chemistry, College of Pharmacy, Kuwait University, Safat 13110, Kuwait; hanan.sary@ku.edu.kw, mohammed.khedr@ku.edu.kw, ky.orabi@ku.edu.kw
[2] Department of Pharmacognosy, Faculty of Pharmacy, Ain-Shams University, Cairo, Egypt; hanangaber@pharma.asu.edu.eg
[3] Department of Pharmaceutical Chemistry, Faculty of Pharmacy, Helwan University, Ain Helwan, Cairo 11795, Egypt
[4] Department of Biomolecular Sciences, School of Pharmacy, The University of Mississippi, University, MS 38677, USA; mradwan@olemiss.edu
[5] National Center for Natural Products Research, School of Pharmacy, The University of Mississippi, University, MS 38677, USA; mradwan@olemiss.edu
[6] Research Sector Project Units, Faculty of Science, Kuwait University, Safat 13060, Kuwait; miky.findo@ku.edu.kw
* Correspondence: ky.orabi@ku.edu.kw; Tel.: +965-2463-6048

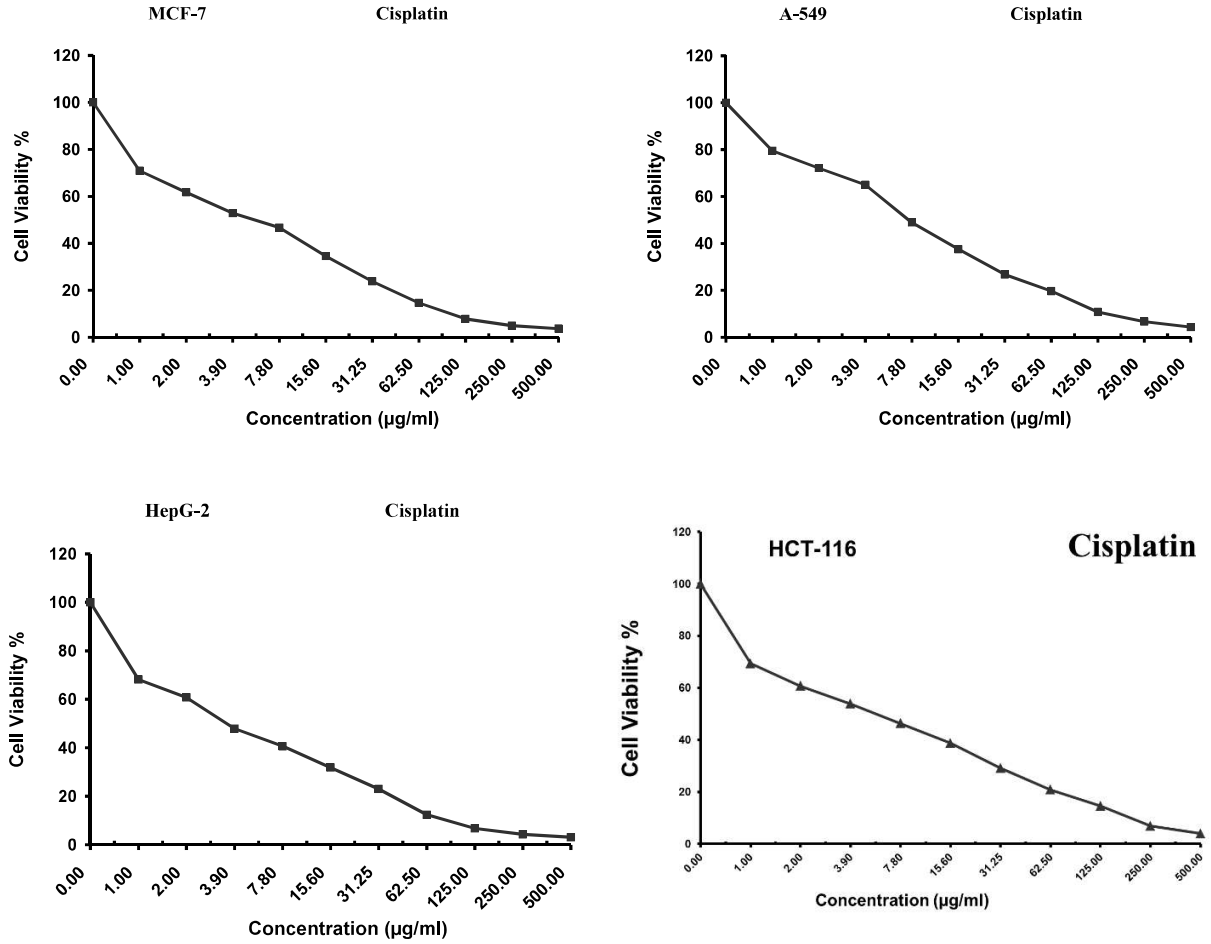


Figure S3. Dose-response curves of *cis*-platin against MCF-7 (breast carcinoma), A-549 (lung carcinoma), HepG-2 (hepatocellular carcinoma), and HCT-116 (colon carcinoma).