

Diastereoselective Intramolecular Aldol Ring Closures of Threonine
Derivatives Leading to Densely Functionalised Pyroglutamates
Related to Oxazolomycin

Elizabeth A. Heaviside, Mark G. Moloney* and Amber L. Thompson

Department of Chemistry, Chemistry Research Laboratory, The
University of Oxford, 12 Mansfield Road, Oxford. OX1 3TA.

4a

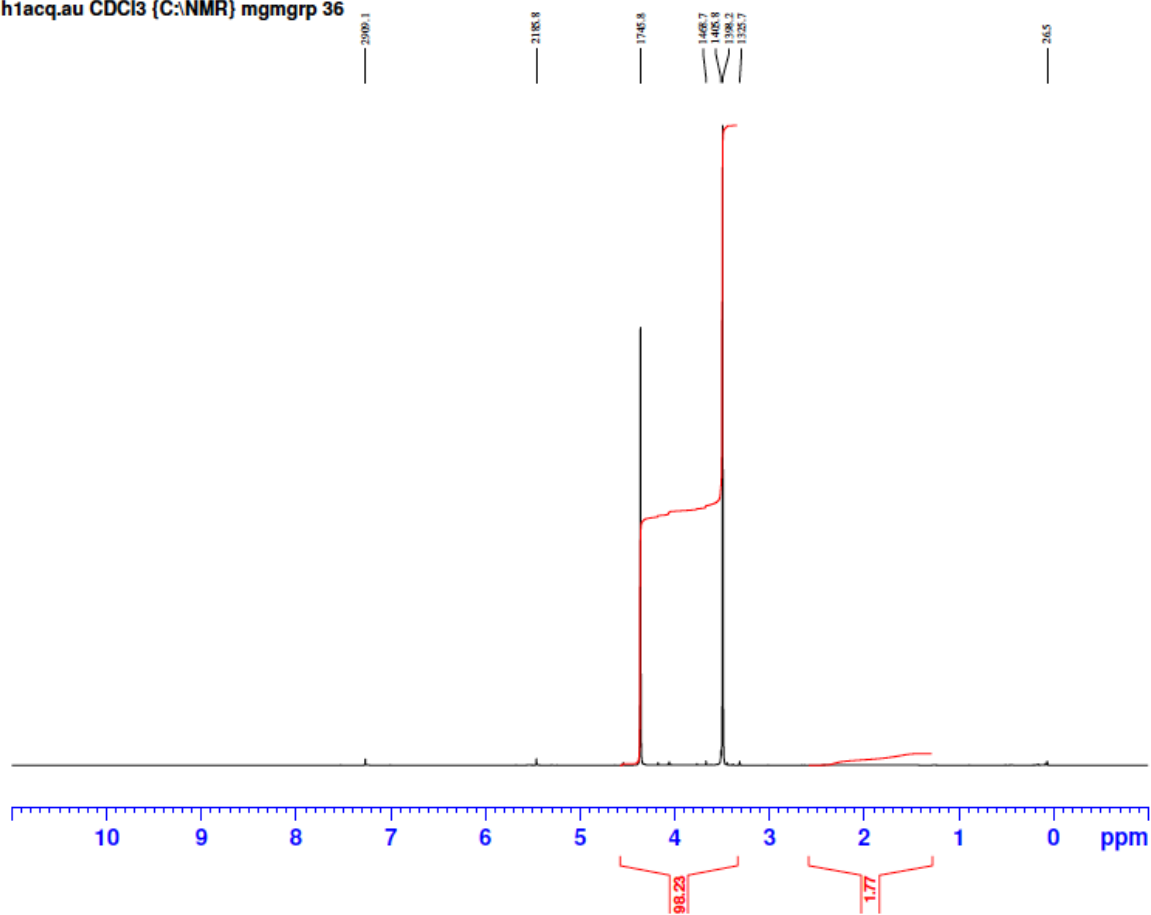
Instrument DQX400
Chemist BH
Group MGM
BH3144

h1acq.au CDCl3 {C:NMR} mgmgrp 36

NMRO@CHEM.OX

NAME Jul23-2010-36
EXPNO 1
PROCNO 1
Date_ 20100723
Time_ 15.35
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zg60
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 8278.146 Hz
FIDRES 0.126314 Hz
AQ 3.9584243 sec
RG 90.5
DW 60.400 usec
DE 7.50 usec
TE 300.0 K
D1 1.0000000 sec

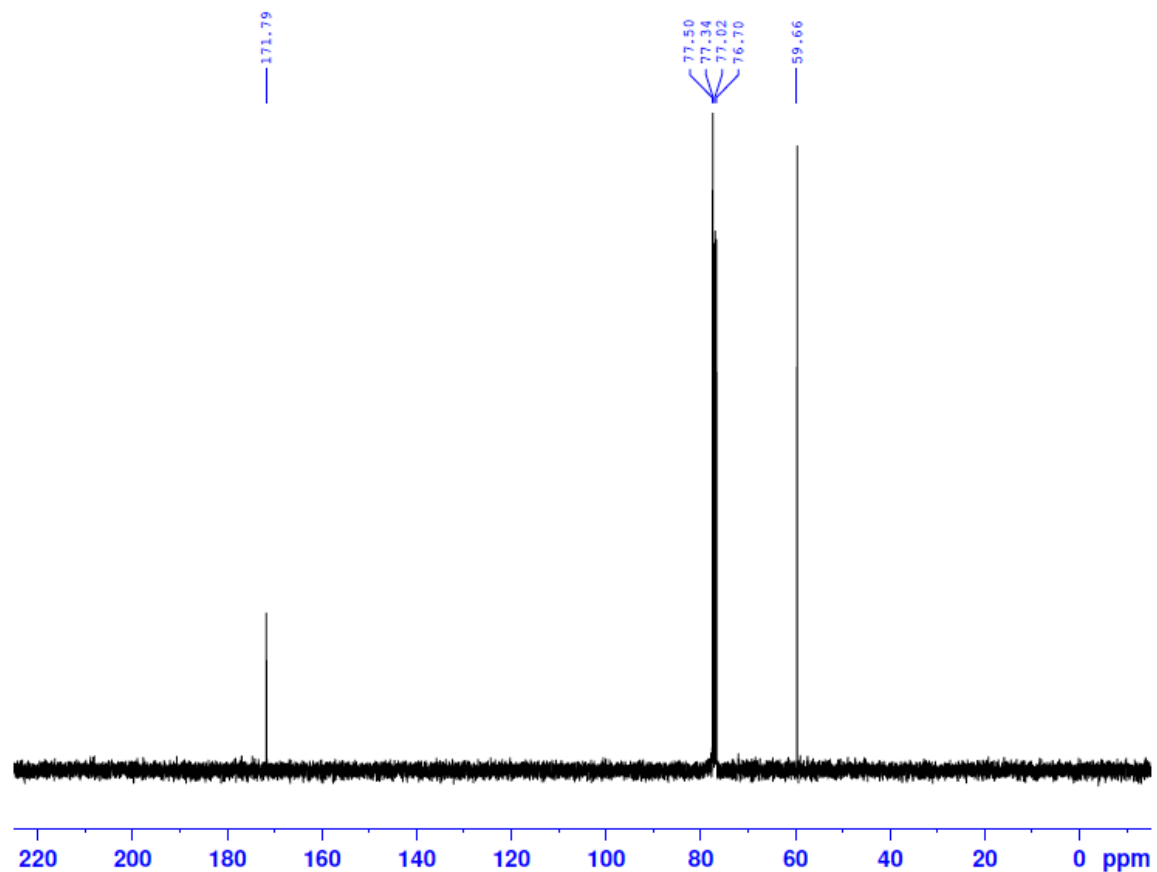
----- CHANNEL f1 -----
NUC1 1H
P1 9.00 usec
PL1 0.00 dB
SFO1 400.2024714 MHz
SI 32768
SF 400.2000028 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



4a

Instrument DQX400
Chemist BH
Group MGM
BH3144
c13acq.au CDCl3 (C:NMR) mgmgrp 36

NMR@CHEM.OX

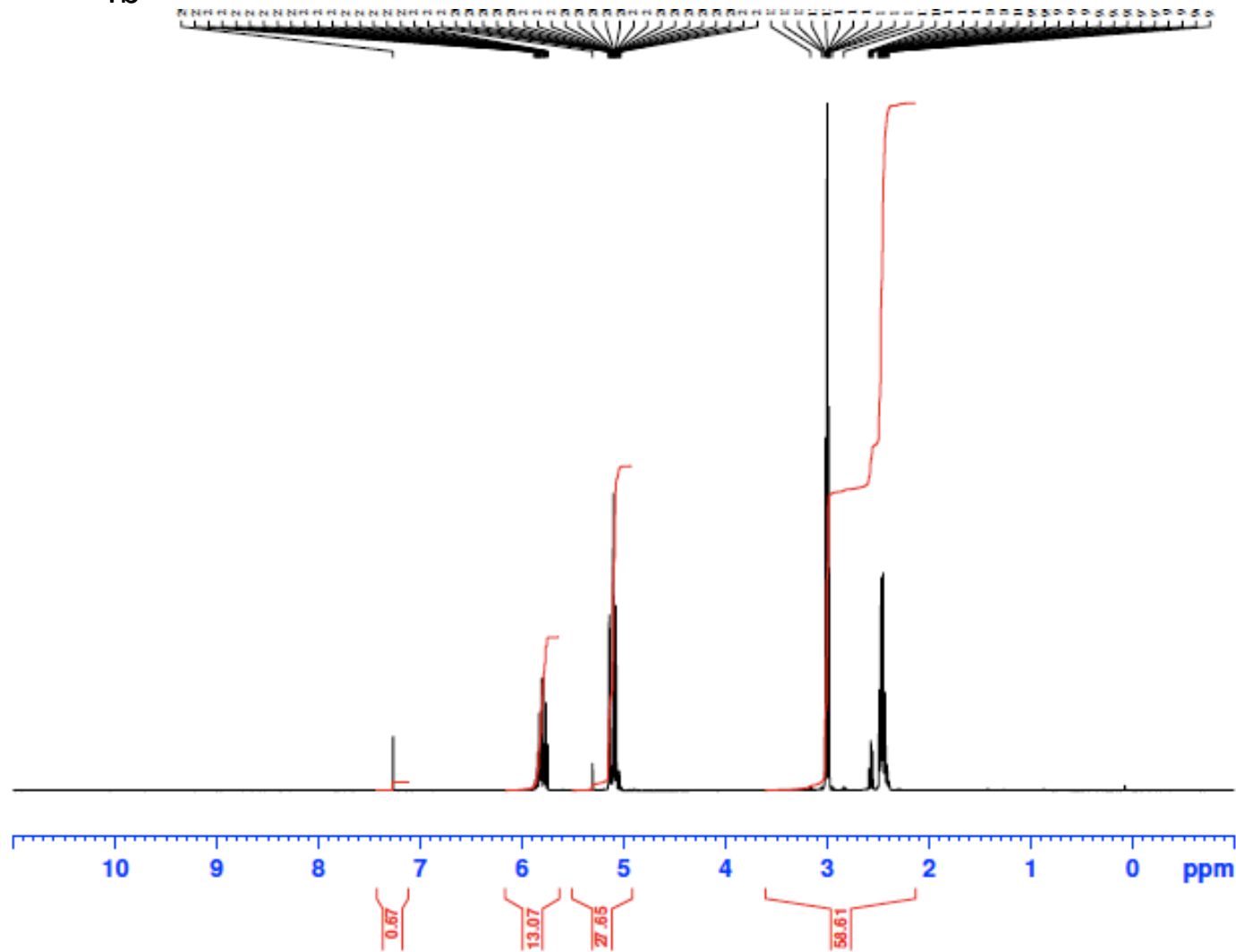


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NAME      Jul23-2010-36
EXPNO     2
PROCNO    1
Date_     20100723
Time      15.43
INSTRUM   av400
PROBHD    5 mm QNP 1H/13
PULPROG   zgpg30
TD        32768
SOLVENT   CDCl3
NS        256
DS        4
SWH       26178.010 Hz
FIDRES    0.798889 Hz
AQ        0.6259188 sec
RG        32768
DW        19.100 usec
DE        7.50 usec
TE        300.0 K
D1        1.00000000 sec
D11       0.03000000 sec
TDO       1
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----- CHANNEL f1 -----
NUC1      13C
P1        9.50 usec
PL1       0.00 dB
SFO1     100.6403931 MHz
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----- CHANNEL f2 -----
CPDPRG2   waltz16
NUC2      1H
PCPD2     80.00 usec
PL2       0.00 dB
PL12     19.00 dB
PL13     25.00 dB
SFO2     400.2016008 MHz
SI        32768
SF       100.6303718 MHz
WDW       EM
SSB       0
LB        1.00 Hz
GB        0
PC        1.40
```

4b



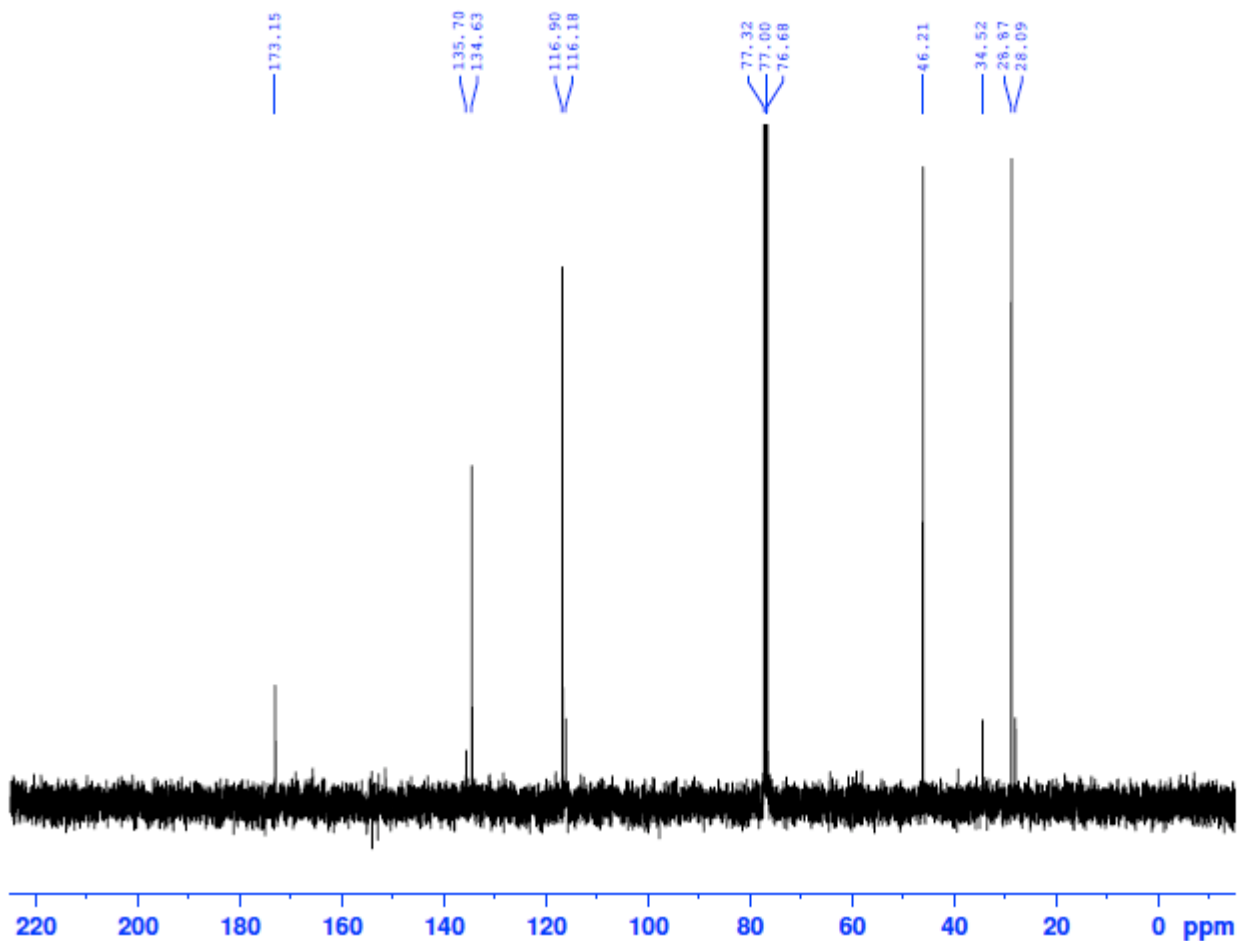
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NAME      Dec09-2010-19
EXPNO     1
PROCNO    1
Date_     20101210
Time      14.22
INSTRUM   av400
PROBHD    5 mm QNP 1H/13
PULPROG   zg60
TD         65536
SOLVENT   CDC13
NS         16
DS         2
SWH        8278.146 Hz
FIDRES     0.126314 Hz
AQ         3.9584243 sec
RG         128
DW         60.400 usec
DE         7.50 usec
TE         300.0 K
D1         1.00000000 sec
  
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===== CHANNEL f1 =====
NUC1      1H
P1         9.00 usec
PL1        0.00 dB
SFO1      400.2024714 MHz
SI         32768
SF         400.2000028 MHz
WDW        EM
SSB         0
LB         0.30 Hz
GB         0
PC         1.00
  
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4b

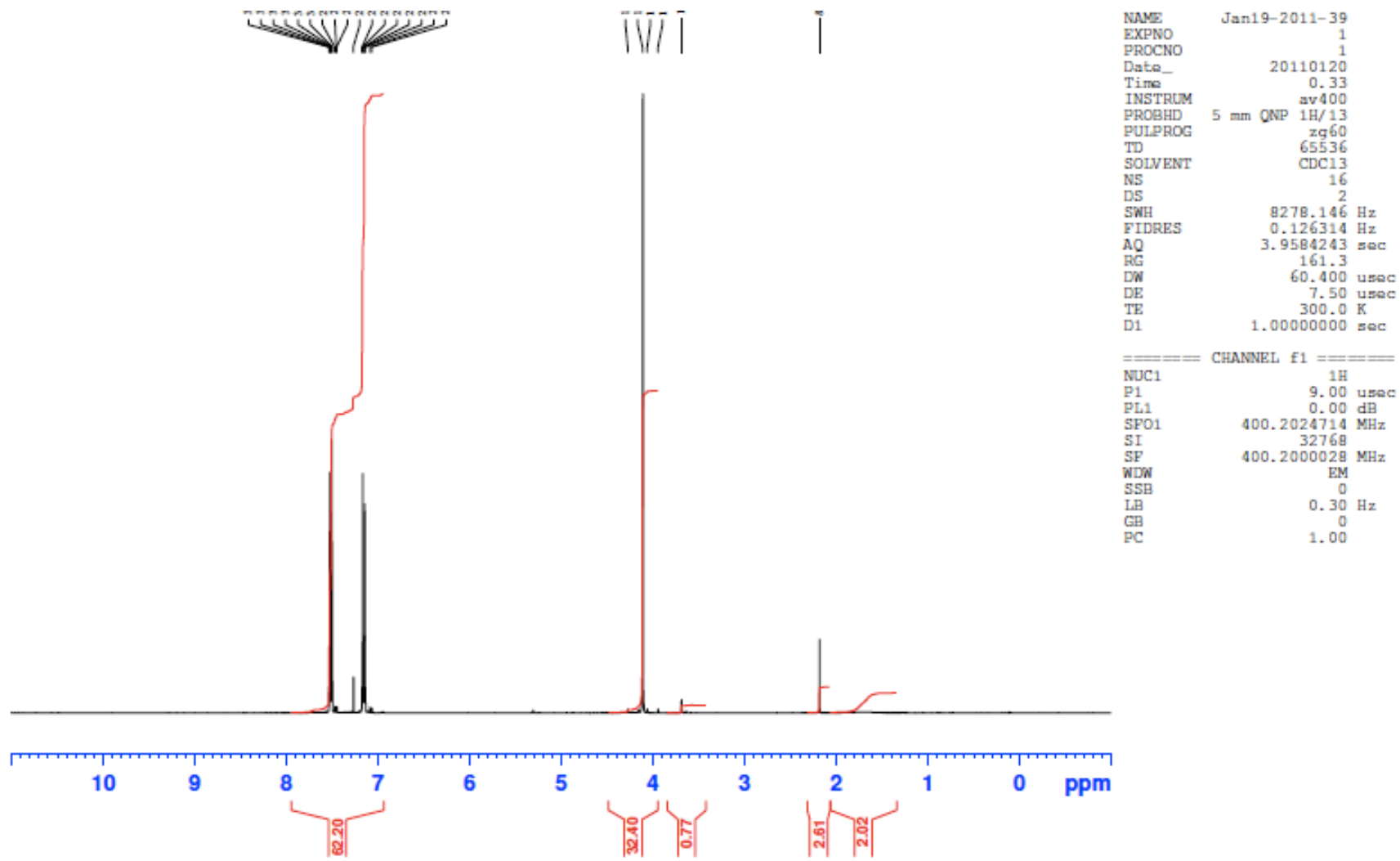


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NAME          Dec09-2010-19
EXPNO         2
PROCNO       1
Date_        20101210
Time         14.30
INSTRUM      av400
PROBHD       5 mm QNP 1H/13
PULPROG      zgpg30
TD           32768
SOLVENT      CDCl3
NS           256
DS           4
SWH          26178.010 Hz
FIDRES       0.798889 Hz
AQ           0.6259188 sec
RG           32768
DW           19.100 usec
DE           7.50 usec
TE           300.0 K
D1           1.00000000 sec
D11          0.03000000 sec
TD0          1

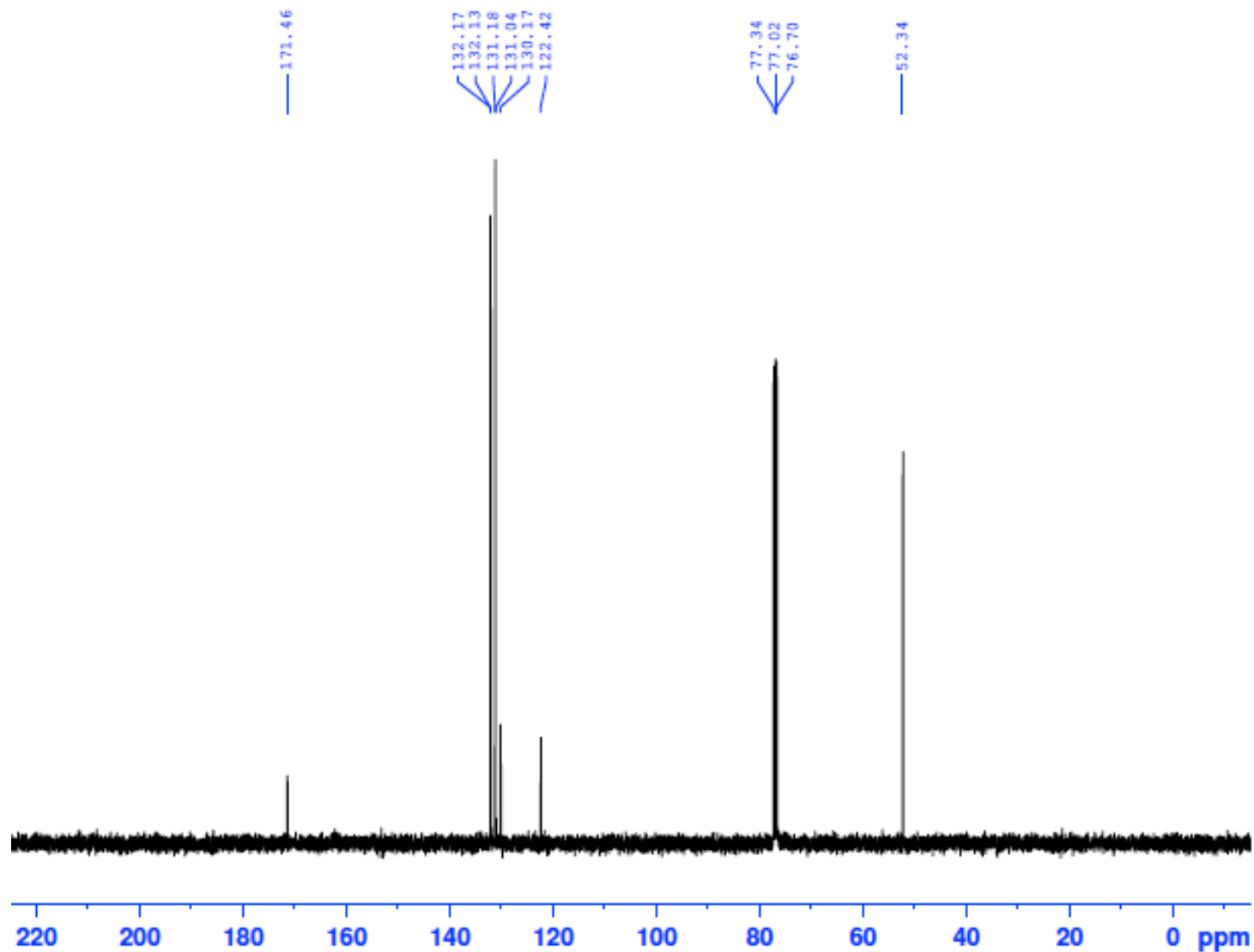
===== CHANNEL f1 =====
NUC1          13C
P1            9.50 usec
PL1           0.00 dB
SFO1          100.6403931 MHz

===== CHANNEL f2 =====
CPDPRG2      waltz16
NUC2          1H
PCPD2         80.00 usec
PL2           0.00 dB
PL12          19.00 dB
PL13          25.00 dB
SFO2          400.2016008 MHz
SI            32768
SF            100.6303718 MHz
WDW           EM
SSB           0
LB            1.00 Hz
GB            0
PC            1.40
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4c



4c



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NAME Jan19-2011-39
EXPNO 2
PROCNO 1
Date_ 20110120
Time 0.41
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 32768
SOLVENT CDC13
NS 256
DS 4
SWH 26178.010 Hz
FIDRES 0.798889 Hz
AQ 0.6259188 sec
RG 32768
DW 19.100 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec
D11 0.03000000 sec
TDO 1
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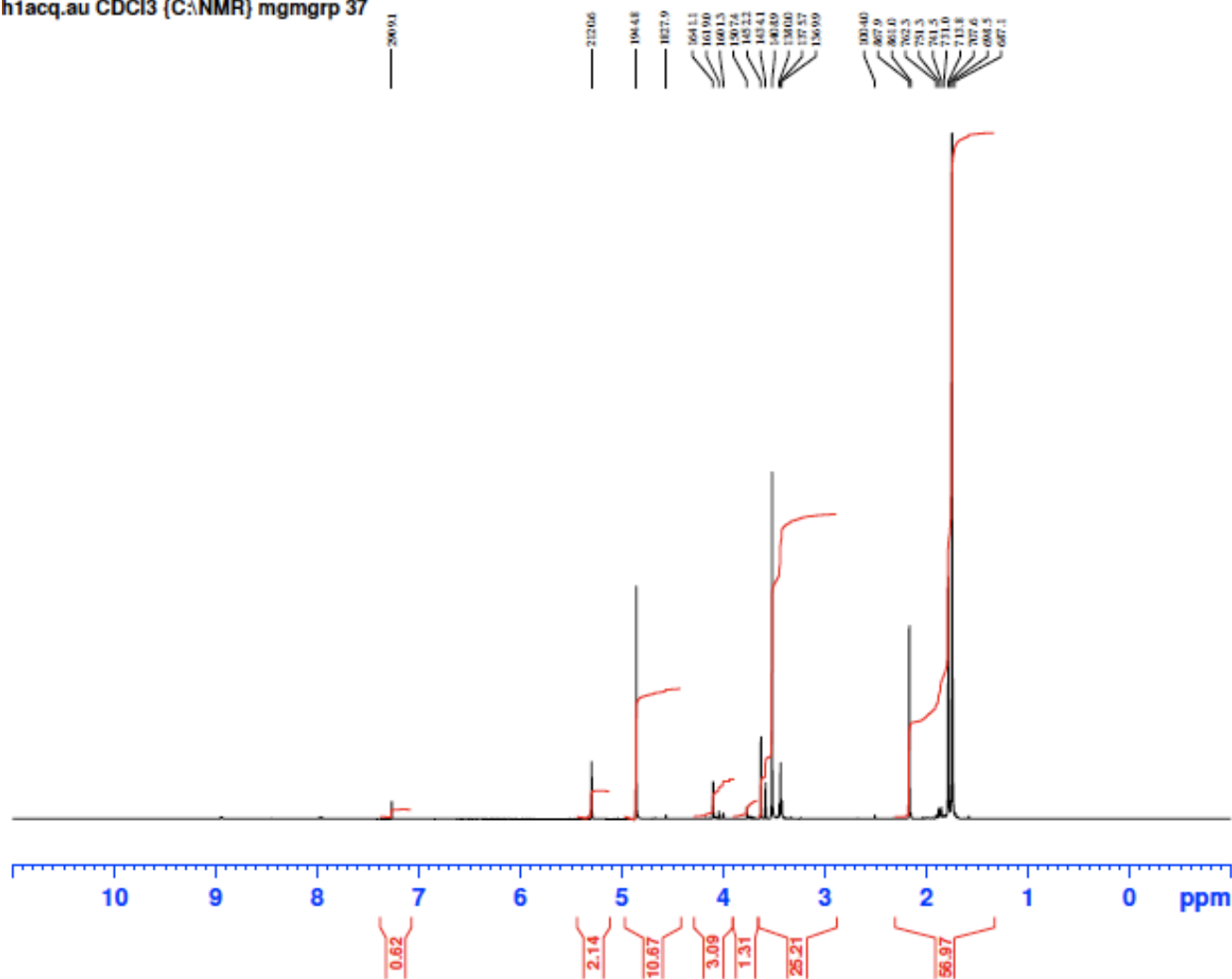
```
==== CHANNEL f1 =====
NUC1 13C
P1 9.50 usec
PL1 0.00 dB
SFO1 100.6403931 MHz
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```
==== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 0.00 dB
PL12 19.00 dB
PL13 25.00 dB
SFO2 400.2016008 MHz
SI 32768
SF 100.6303718 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
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5a

Instrument DQX400
Chemist BH
Group MGM
BH3150
h1acq.au CDC13 (CANMR) mgmgrp 37

NMR@CHEM.OX



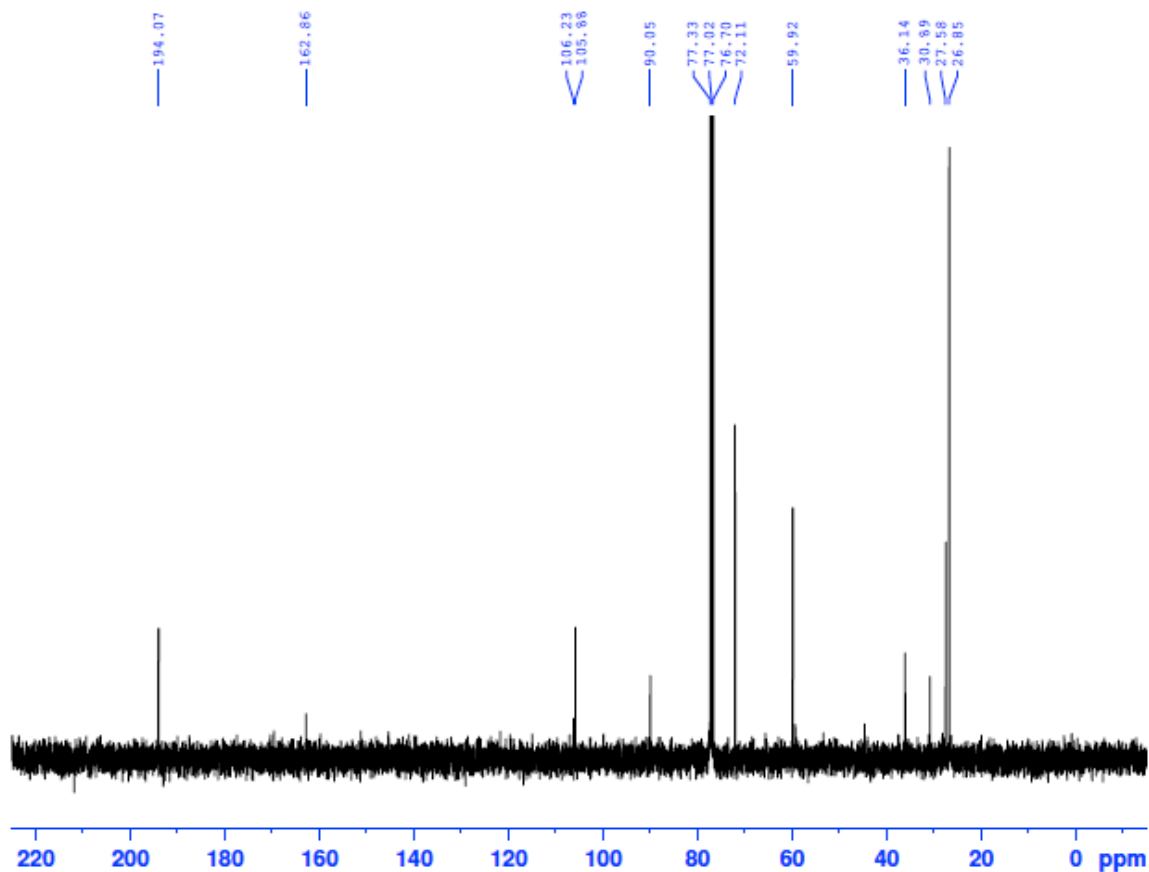
NAME Jul123-2010-36
EXPNO 6
PROCNO 1
Date_ 20100723
Time 16.00
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zg60
TD 65536
SOLVENT CDC13
NS 16
DS 2
SWH 8278.146 Hz
FIDRES 0.126314 Hz
AQ 3.9584243 sec
RG 128
DW 60.400 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec

==== CHANNEL f1 =====
NUC1 1H
P1 9.00 usec
PL1 0.00 dB
SFO1 400.2024714 MHz
SI 32768
SF 400.2000028 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

5a

Instrument DQX400
Chemist BH
Group MGM
BH3150
c13acq.au CDC13 (C:NMR) mgmgrp 37

NMR@CHEM.OX



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NAME      Jul23-2010-36
EXPNO     7
PROCNO    1
Data_     20100723
Time      16.08
INSTRUM   av400
PROBHD    5 mm QNP 1H/13
PULPROG   zgpg30
TD        32768
SOLVENT   CDC13
NS        256
DS        4
SWH       26178.010 Hz
FIDRES    0.798889 Hz
AQ        0.6259188 sec
RG        32768
DW        19.100 usec
DE        7.50 usec
TE        300.0 K
D1        1.00000000 sec
D11       0.03000000 sec
TD0       1

===== CHANNEL f1 =====
NUC1      13C
P1        9.50 usec
PL1       0.00 dB
SFO1     100.6403931 MHz

===== CHANNEL f2 =====
CPDPRG2   waltz16
NUC2      1H
PCPD2     80.00 usec
PL2       0.00 dB
PL12     19.00 dB
PL13     25.00 dB
SFO2     400.2016008 MHz
SI        32768
SF       100.6303718 MHz
WDW       EM
SSB       0
LB        1.00 Hz
GB        0
PC        1.40
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5b

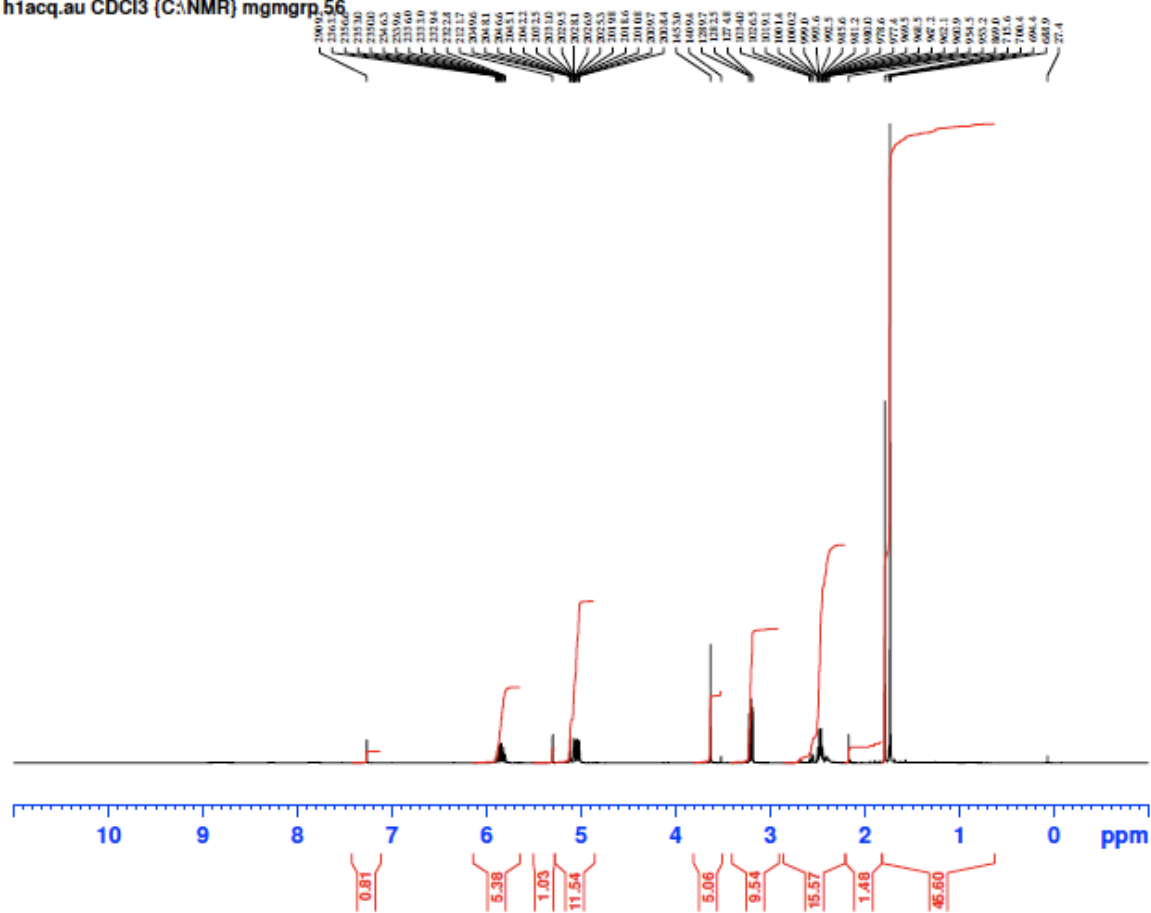
Instrument DQX400
Chemist BH
Group MGM
BH498

h1acq.au CDCI3 (C:\NMR) mgmgrp.56

NMROCHEM.OX

NAME Dec10-2010-56
EXPNO 1
PROCNO 1
Date_ 20101211
Time 4.30
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zg60
TD 65536
SOLVENT CDCI3
NS 16
DS 2
SWH 8278.146 Hz
FIDRES 0.126314 Hz
AQ 3.9584243 sec
RG 90.5
DW 60.400 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec

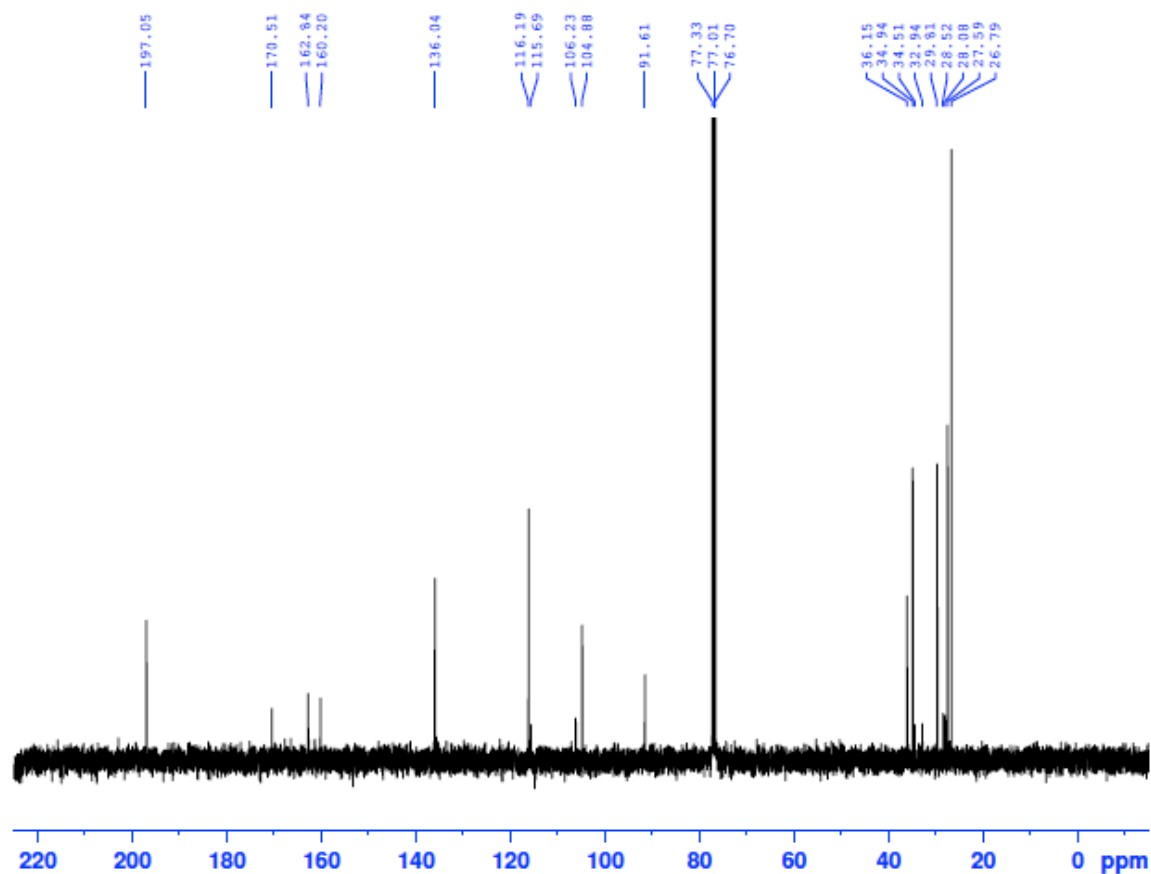
==== CHANNEL f1 =====
NUC1 1H
P1 9.00 usec
PL1 0.00 dB
SFO1 400.2024714 MHz
SI 32768
SF 400.2000028 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



5b

Instrument DQX400
 Chemist BH
 Group MGM
 BH498
 c13acq.au CDC13 (C:NMR) mgmgrp 56

NMR@CHEM.OX



```

NAME      Dec10-2010-56
EXPNO     2
PROCNO    1
Data_     20101211
Time      4.38
INSTRUM   av400
PROBHD    5 mm QNP 1H/13
PULPROG   zgpg30
TD         32768
SOLVENT   CDC13
NS         256
DS         4
SWH        26178.010 Hz
FIDRES    0.798889 Hz
AQ         0.6259188 sec
RG         32768
DW         19.100 usec
DE         7.50 usec
TE         300.0 K
D1         1.00000000 sec
D11        0.03000000 sec
TD0        1
  
```

```

===== CHANNEL f1 =====
NUC1      13C
P1        9.50 usec
PL1       0.00 dB
SFO1     100.6403931 MHz
  
```

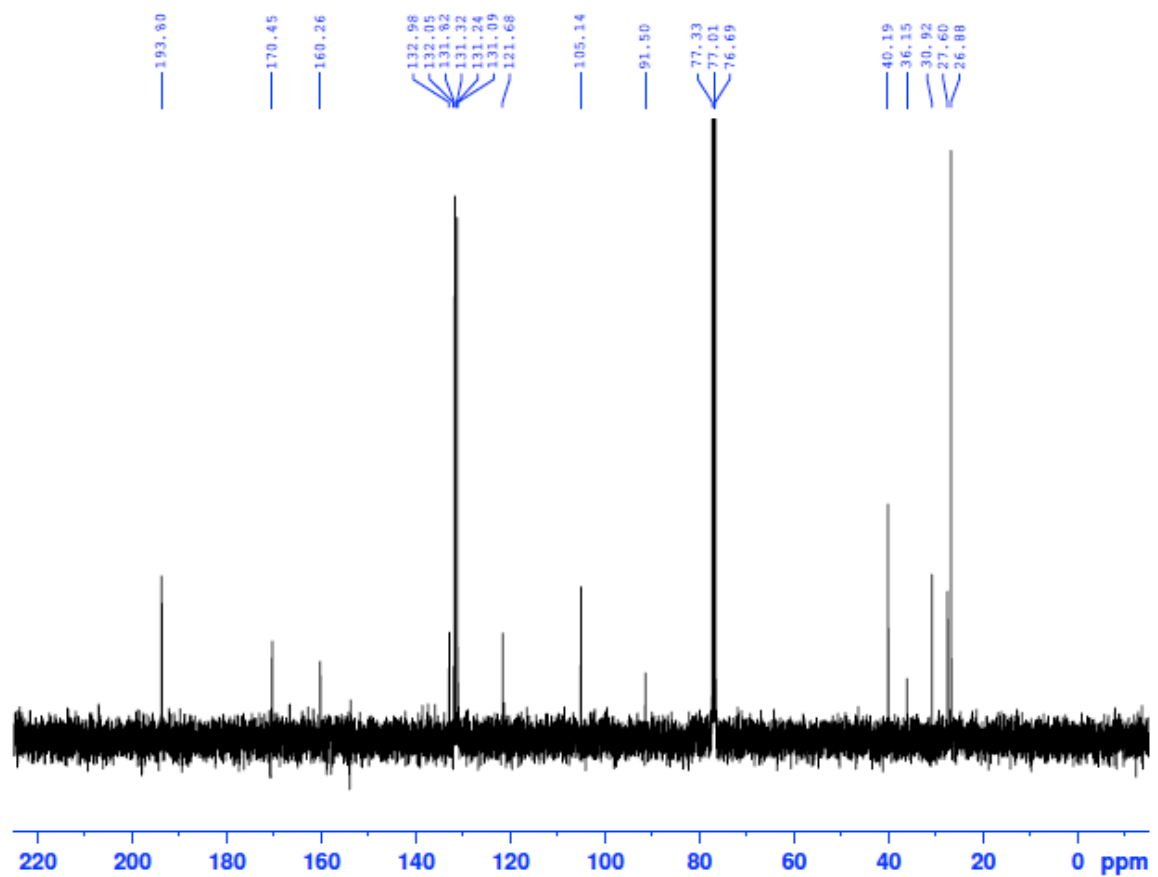
```

===== CHANNEL f2 =====
CPDPRG2   waltz16
NUC2       1H
PCPD2     80.00 usec
PL2        0.00 dB
PL12      19.00 dB
PL13      25.00 dB
SFO2     400.2016008 MHz
SI         32768
SF        100.6303718 MHz
WDW        EM
SSB         0
LB         1.00 Hz
GB          0
PC          1.40
  
```


5c

Instrument DQX400
Chemist BH
Group MGM
BH4126
c13acq.au CDC13 (C:NMR) mgmgrp 52

NMR@CHEM.OX



```
NAME      Jan25-2011-52
EXPNO     2
PROCNO    1
Data_     20110126
Time      1.44
INSTRUM   av400
PROBHD    5 mm QNP 1H/13
PULPROG   zgpg30
TD        32768
SOLVENT   CDC13
NS        256
DS        4
SWH       26178.010 Hz
FIDRES    0.798889 Hz
AQ        0.6259188 sec
RG        32768
DW        19.100 usec
DE        7.50 usec
TE        300.0 K
D1        1.00000000 sec
D11       0.03000000 sec
TDO       1

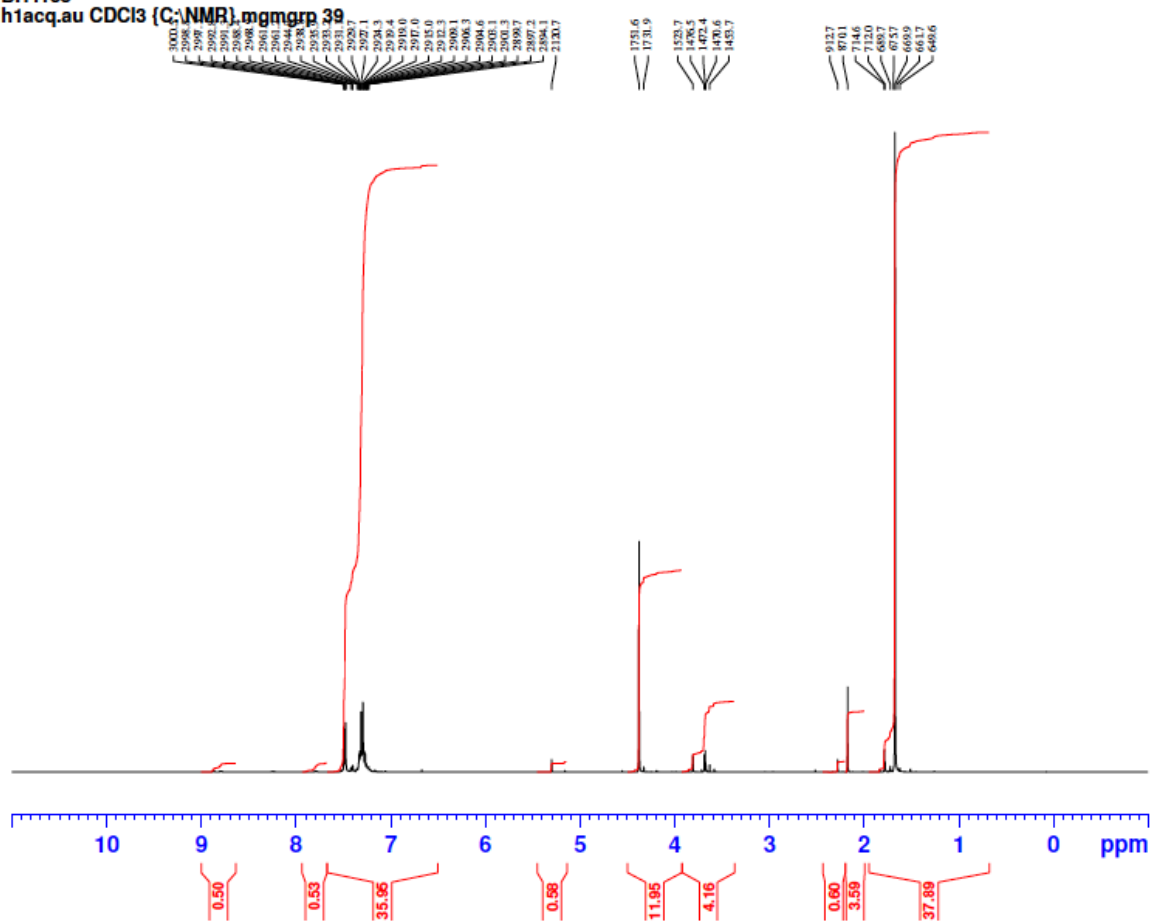
===== CHANNEL f1 =====
NUC1      13C
P1        9.50 usec
PL1       0.00 dB
SFO1     100.6403931 MHz

===== CHANNEL f2 =====
CPDPRG2   waltz16
NUC2      1H
PCPD2     80.00 usec
PL2       0.00 dB
PL12     19.00 dB
PL13     25.00 dB
SFO2     400.2016008 MHz
SI        32768
SF       100.6303718 MHz
WDW       EM
SSB       0
LB        1.00 Hz
GB        0
PC        1.40
```

5d

Instrument DQX400
Chemist BH
Group MGM
BH4138
h1acq.au CDC13 (C: NMR) mgmgrp 39

NMRCHEM.OX



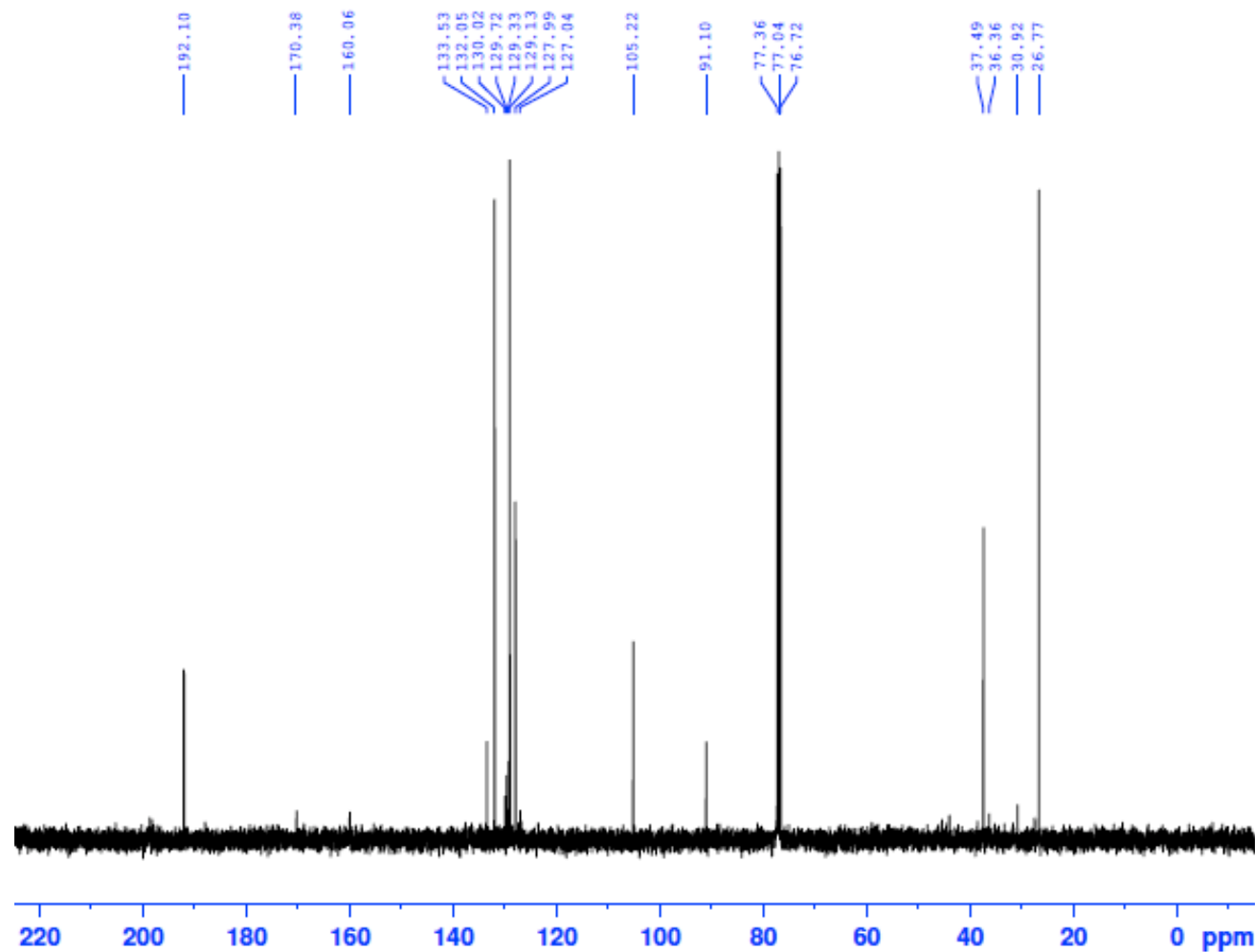
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NAME Feb01-2011-39
EXPNO 4
PROCNO 1
Date_ 20110201
Time 19.52
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zg60
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 8278.146 Hz
FIDRES 0.126314 Hz
AQ 3.9584243 sec
RG 90.5
DW 60.400 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec
----- CHANNEL f1 -----
NUC1 1H
P1 9.00 usec
PL1 0.00 dB
SFO1 400.2024714 MHz
SI 32768
SF 400.2000028 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

5d

Instrument DQX400
Chemist BH
Group MGM
BH4138
c13acq.au CDCI3 (C:\NMR) mgmgrp 39

NMR@CHEM.OX



NAME Feb01-2011-39
EXPNO 5
PROCNO 1
Date_ 20110201
Time 20.00
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 32768
SOLVENT CDCI3
NS 256
DS 4
SWH 26178.010 Hz
FIDRES 0.798889 Hz
AQ 0.6259188 sec
RG 32768
DW 19.100 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec
D11 0.03000000 sec
TDO 1

==== CHANNEL f1 =====
NUC1 13C
P1 9.50 usec
PL1 0.00 dB
SFO1 100.6403931 MHz

==== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 0.00 dB
PL12 19.00 dB
PL13 25.00 dB
SFO2 400.2016008 MHz
SI 32768
SF 100.6303718 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

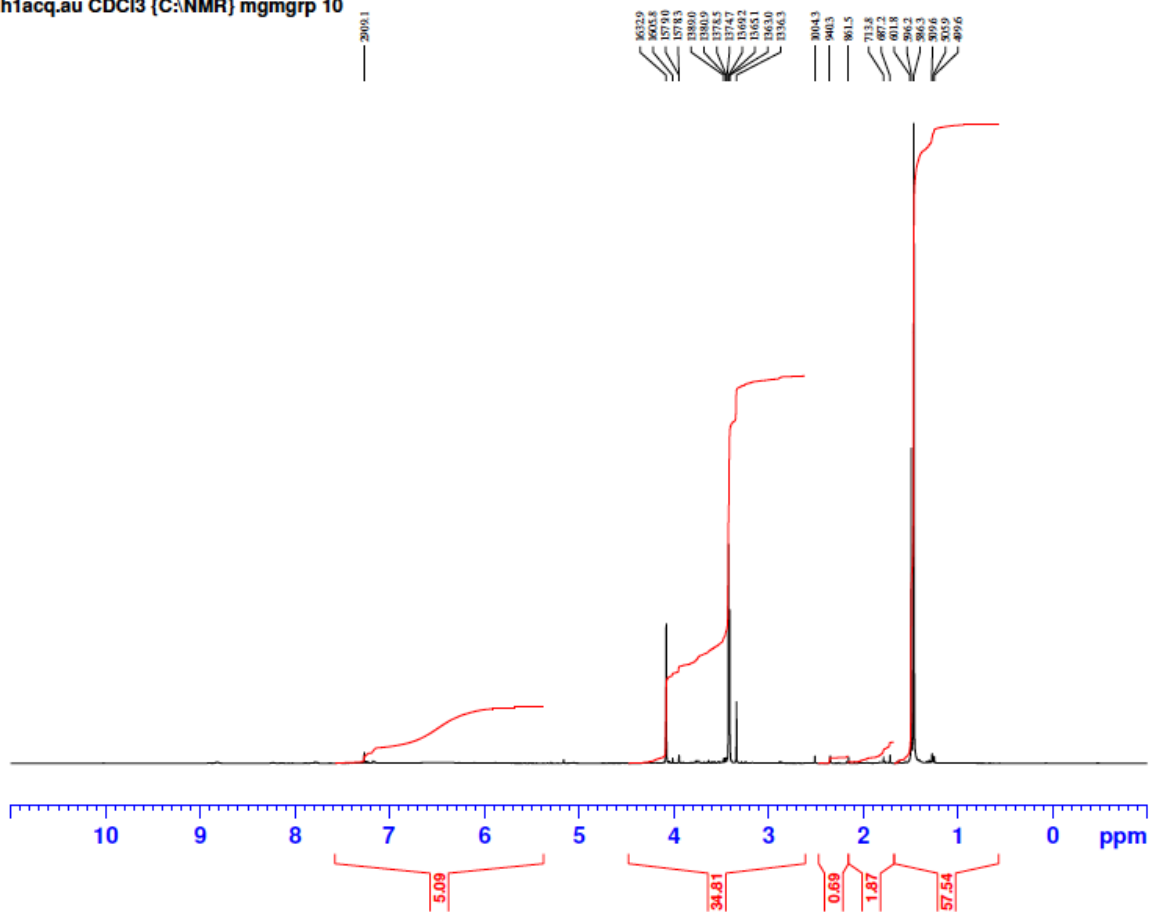
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Instrument DQX400
Chemist BH
Group MGM
BH3152
h1acq.au CDCI3 {C:NMR} mgmgrp 10

NMROCHEM.OX

NAME Jul23-2010-10
EXPNO 1
PROCNO 1
Date_ 20100725
Time 18.06
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zg60
TD 65536
SOLVENT CDCI3
NS 16
DS 2
SWH 8278.146 Hz
FIDRES 0.126314 Hz
AQ 3.9584243 sec
RG 90.5
DW 60.400 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec

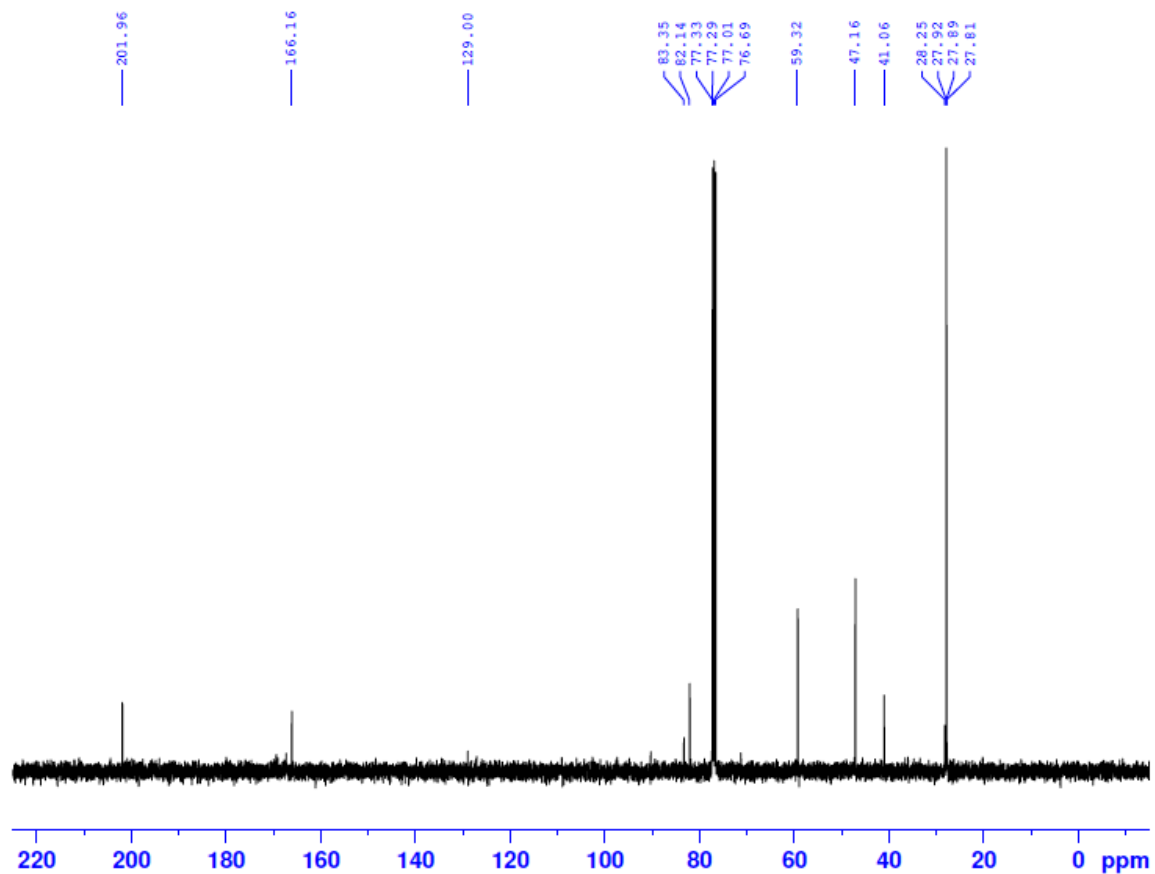
----- CHANNEL f1 -----
NUC1 1H
P1 9.00 usec
PL1 0.00 dB
SFO1 400.2024714 MHz
SI 32768
SF 400.2000028 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



6a

Instrument DQX400
Chemist BH
Group MGM
BH3152
c13acq.au CDC13 (C:NMR) mgmgrp 10

NMR@CHEM.OX



NAME Jul23-2010-10
EXPNO 2
PROCNO 1
Date_ 20100725
Time 18.13
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 32768
SOLVENT CDC13
NS 256
DS 4
SWH 26178.010 Hz
FIDRES 0.798889 Hz
AQ 0.6259188 sec
RG 32768
DW 19.100 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec
D11 0.03000000 sec
TDO 1

----- CHANNEL f1 -----
NUC1 13C
P1 9.50 usec
PL1 0.00 dB
SFO1 100.6403931 MHz

----- CHANNEL f2 -----
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 0.00 dB
PL12 19.00 dB
PL13 25.00 dB
SFO2 400.2016008 MHz
SI 32768
SF 100.6303718 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

6b

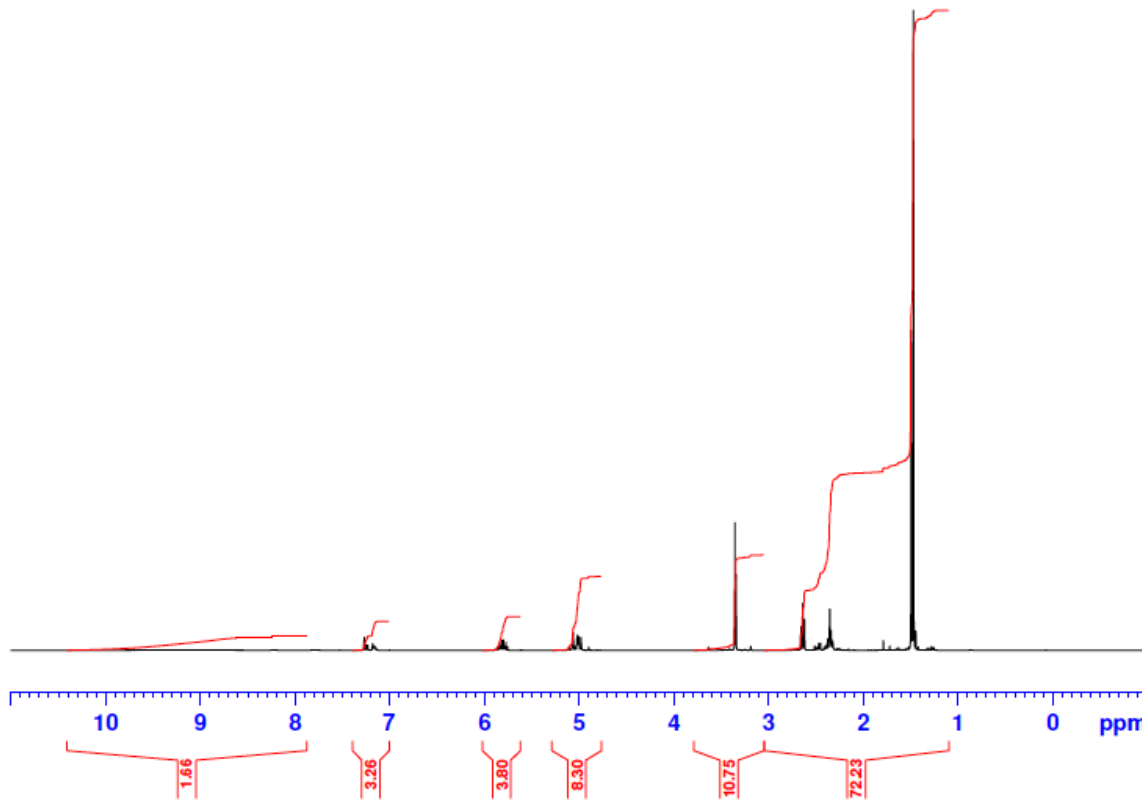
Instrument DQX400
Chemist BH
Group MGM
BH4100
h1acq.au CDC13 {C:NMR} mgmgrp 5

NMROCHEM.OX

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NAME Dec13-2010-5
EXPNO 1
PROCNO 1
Date_ 20101213
Time 10.02
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zg60
TD 65536
SOLVENT CDC13
NS 16
DS 2
SWH 8278.146 Hz
FIDRES 0.126314 Hz
AQ 3.9584243 sec
RG 90.5
DW 60.400 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec

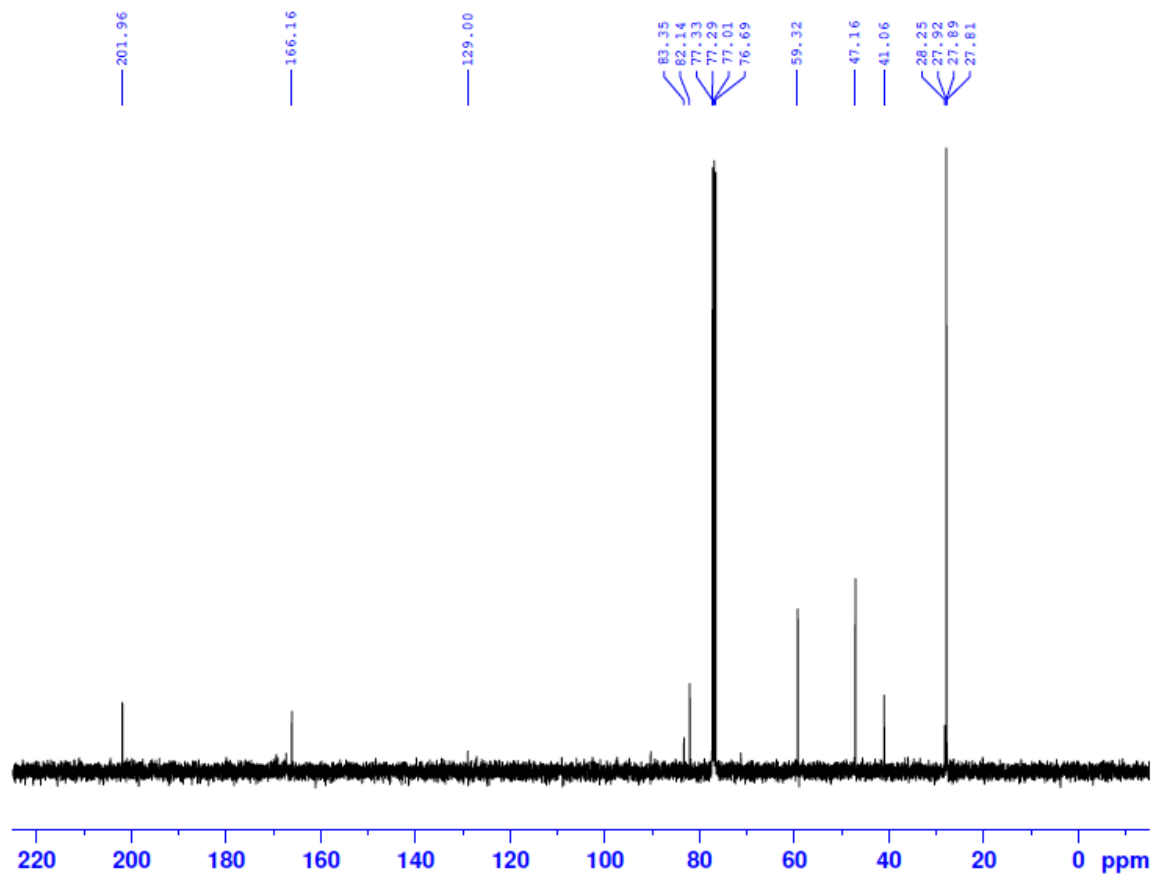
----- CHANNEL f1 -----
NUC1 1H
P1 9.00 usec
PL1 0.00 dB
SFO1 400.2024714 MHz
SI 32768
SF 400.2000028 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



6b

Instrument DQX400
Chemist BH
Group MGM
BH3152
c13acq.au CDC13 (C:NMR) mgmgrp 10

NMR@CHEM.OX



```
NAME      Jul23-2010-10
EXPNO     2
PROCNO    1
Date_     20100725
Time      18.13
INSTRUM   av400
PROBHD    5 mm QNP 1H/13
PULPROG   zgpg30
TD         32768
SOLVENT   CDC13
NS         256
DS         4
SWH       26178.010 Hz
FIDRES    0.798889 Hz
AQ         0.6259188 sec
RG         32768
DW         19.100 usec
DE         7.50 usec
TE         300.0 K
D1         1.00000000 sec
D11        0.03000000 sec
TD0        1
```

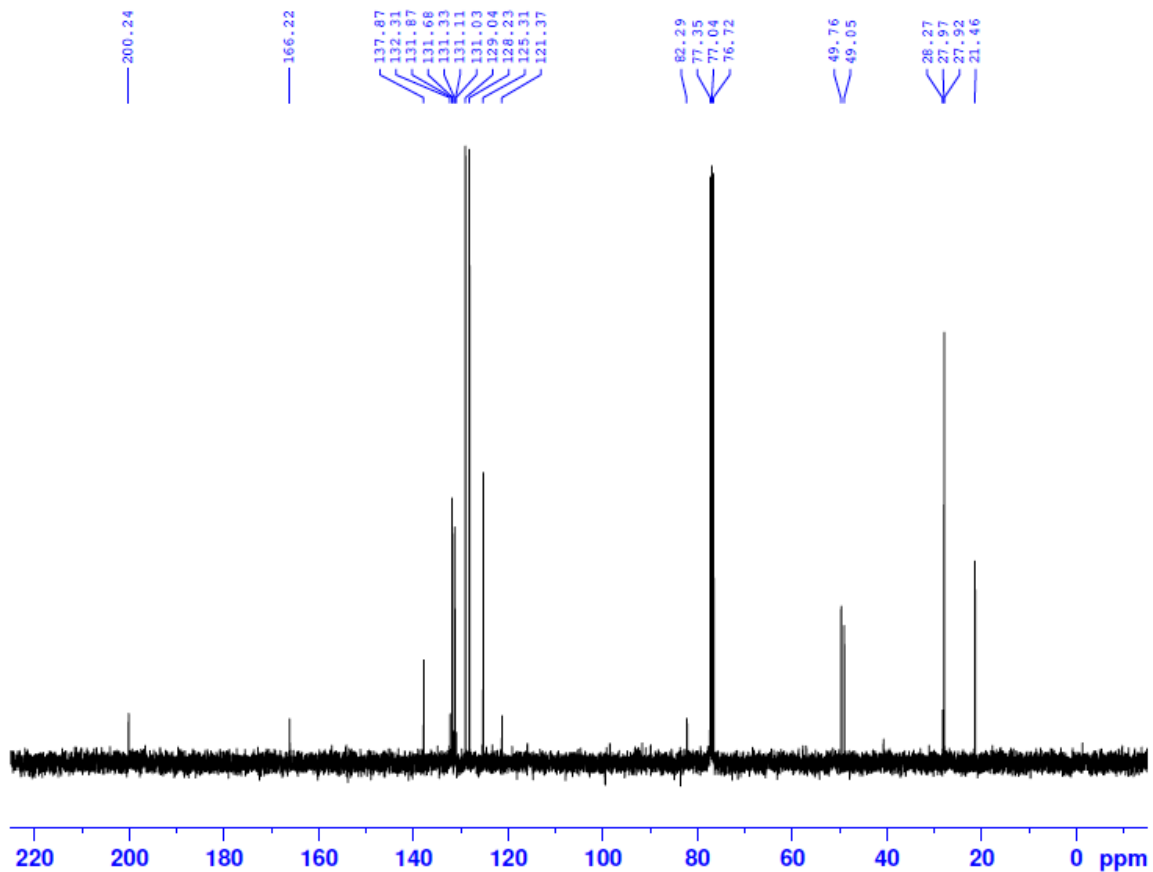
```
----- CHANNEL f1 -----
NUC1      13C
P1        9.50 usec
PL1       0.00 dB
SFO1     100.6403931 MHz
```

```
----- CHANNEL f2 -----
CPDPRG2   waltz16
NUC2      1H
PCPD2     80.00 usec
PL2       0.00 dB
PL12     19.00 dB
PL13     25.00 dB
SFO2     400.2016008 MHz
SI        32768
SF       100.6303718 MHz
WDW       EM
SSB       0
LB        1.00 Hz
GB        0
PC        1.40
```


6c

Instrument DQX400
Chemist BH
Group MGM
BH4130
c13acq.au CDC13 (C:NMR) mgmgrp 47

NMR@CHEM.OX



```
NAME      Jan24-2011-47
EXPNO     2
PROCNO    1
Date_     20110124
Time      22.59
INSTRUM   av400
PROBHD    5 mm QNP 1H/13
PULPROG   zgpg30
TD        32768
SOLVENT   CDC13
NS        256
DS        4
SWH       26178.010 Hz
FIDRES    0.798889 Hz
AQ        0.6259188 sec
RG        32768
DW        19.100 usec
DE        7.50 usec
TE        300.0 K
D1        1.00000000 sec
D11       0.03000000 sec
TD0       1

----- CHANNEL f1 -----
NUC1      13C
P1        9.50 usec
PL1       0.00 dB
SFO1     100.6403931 MHz

----- CHANNEL f2 -----
CPDPRG2   waltz16
NUC2      1H
PCPD2     80.00 usec
PL2       0.00 dB
PL12     19.00 dB
PL13     25.00 dB
SFO2     400.2016008 MHz
SI        32768
SF       100.6303718 MHz
WDW       EM
SSB       0
LB        1.00 Hz
GB        0
PC        1.40
```

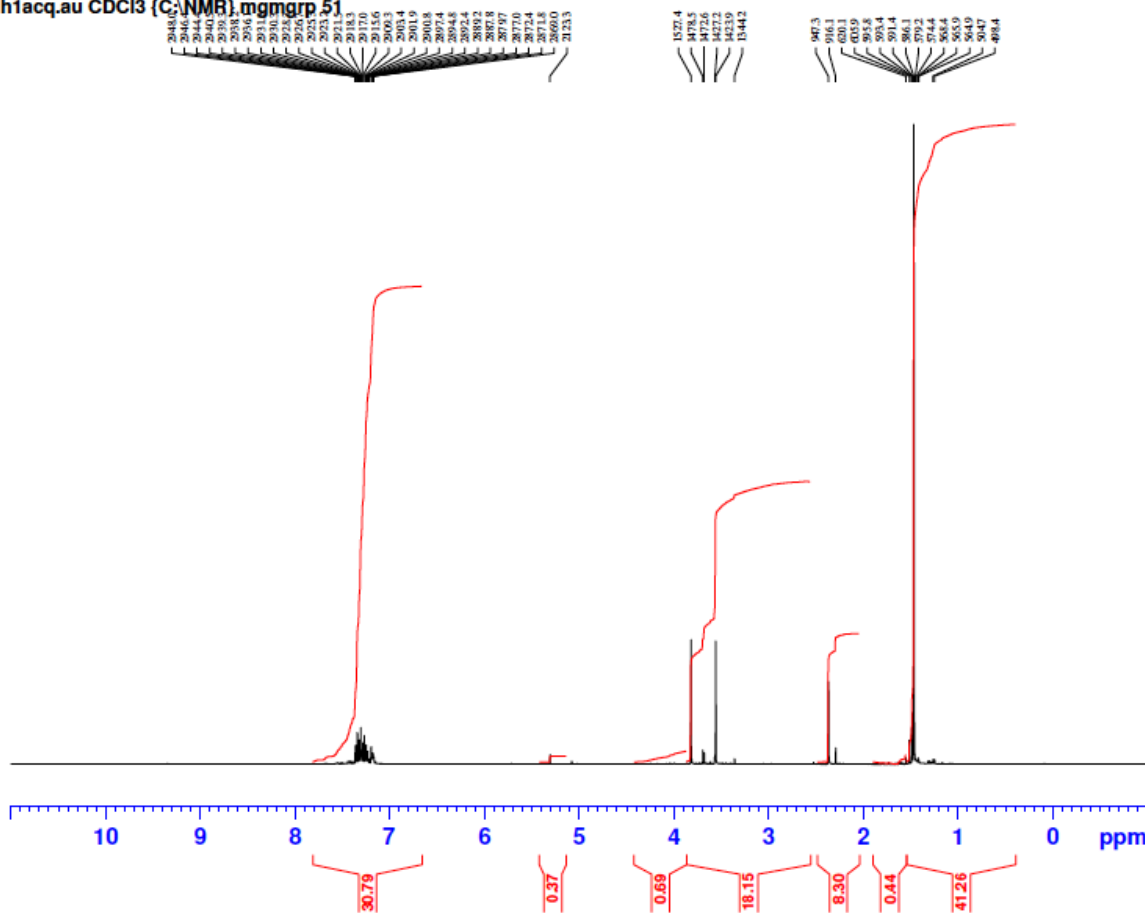
6d

Instrument DQX400
Chemist BH
Group MGM
BH4150
h1acq.au CDC13 (C-NMR) mgmgrp 51

NMROCHEM.OX

NAME Feb02-2011-50
EXPNO 6
PROCNO 1
Date_ 20110202
Time 23.16
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zg60
TD 65536
SOLVENT CDC13
NS 16
DS 2
SWH 8278.146 Hz
FIDRES 0.126314 Hz
AQ 3.9584243 sec
RG 128
DW 60.400 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec

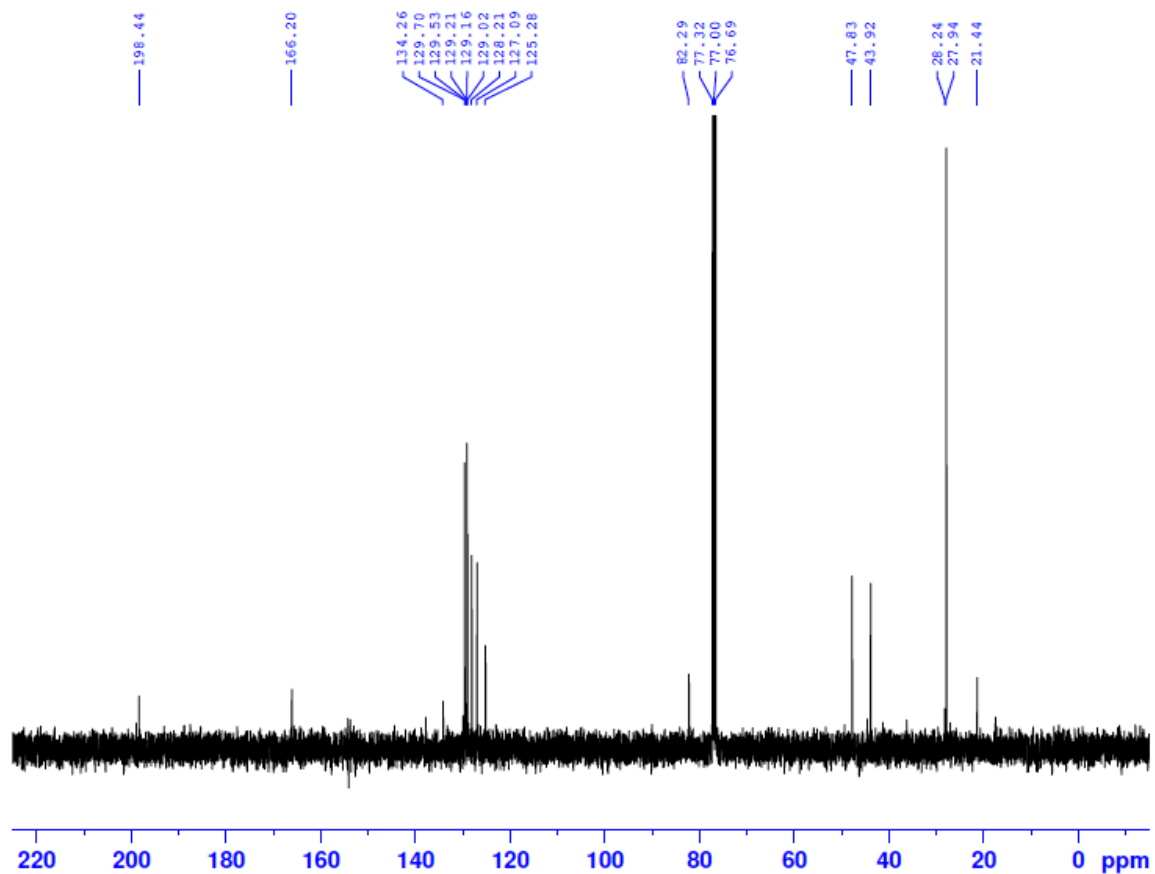
----- CHANNEL f1 -----
NUC1 1H
P1 9.00 usec
PL1 0.00 dB
SFO1 400.2024714 MHz
SI 32768
SF 400.2000028 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



6d

Instrument DQX400
Chemist BH
Group MGM
BH4150
c13acq.au CDC13 (C:NMR) mgmgrp 51

NMR@CHEM.OX



NAME	Feb02-2011-50
EXPNO	7
PROCNO	1
Date_	20110202
Time	23.24
INSTRUM	av400
PROBHD	5 mm QNP 1H/13
PULPROG	zgpg30
TD	32768
SOLVENT	CDC13
NS	256
DS	4
SWH	26178.010 Hz
FIDRES	0.798889 Hz
AQ	0.6259188 sec
RG	32768
DW	19.100 usec
DE	7.50 usec
TE	300.0 K
D1	1.00000000 sec
D11	0.03000000 sec
TD0	1

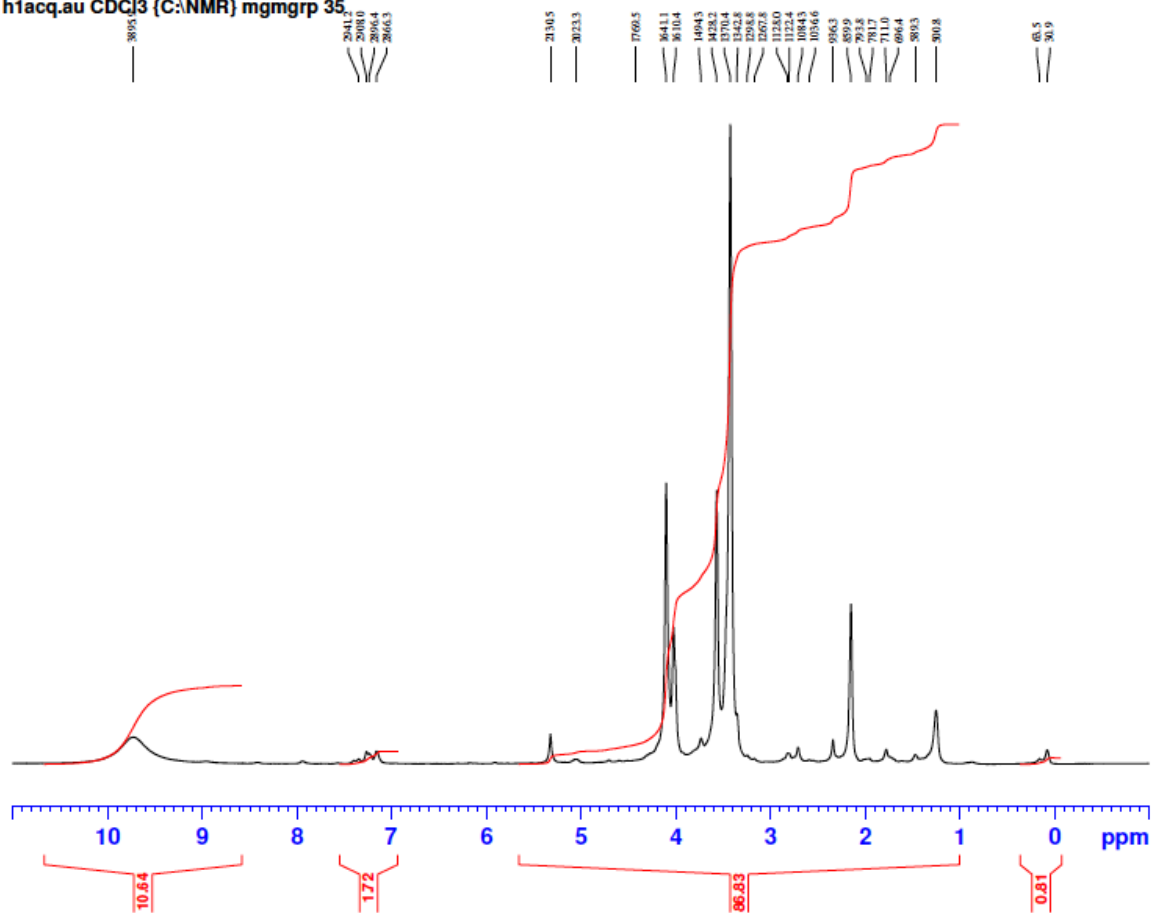
----- CHANNEL f1 -----

NUC1	13C
P1	9.50 usec
PL1	0.00 dB
SFO1	100.6403931 MHz

----- CHANNEL f2 -----

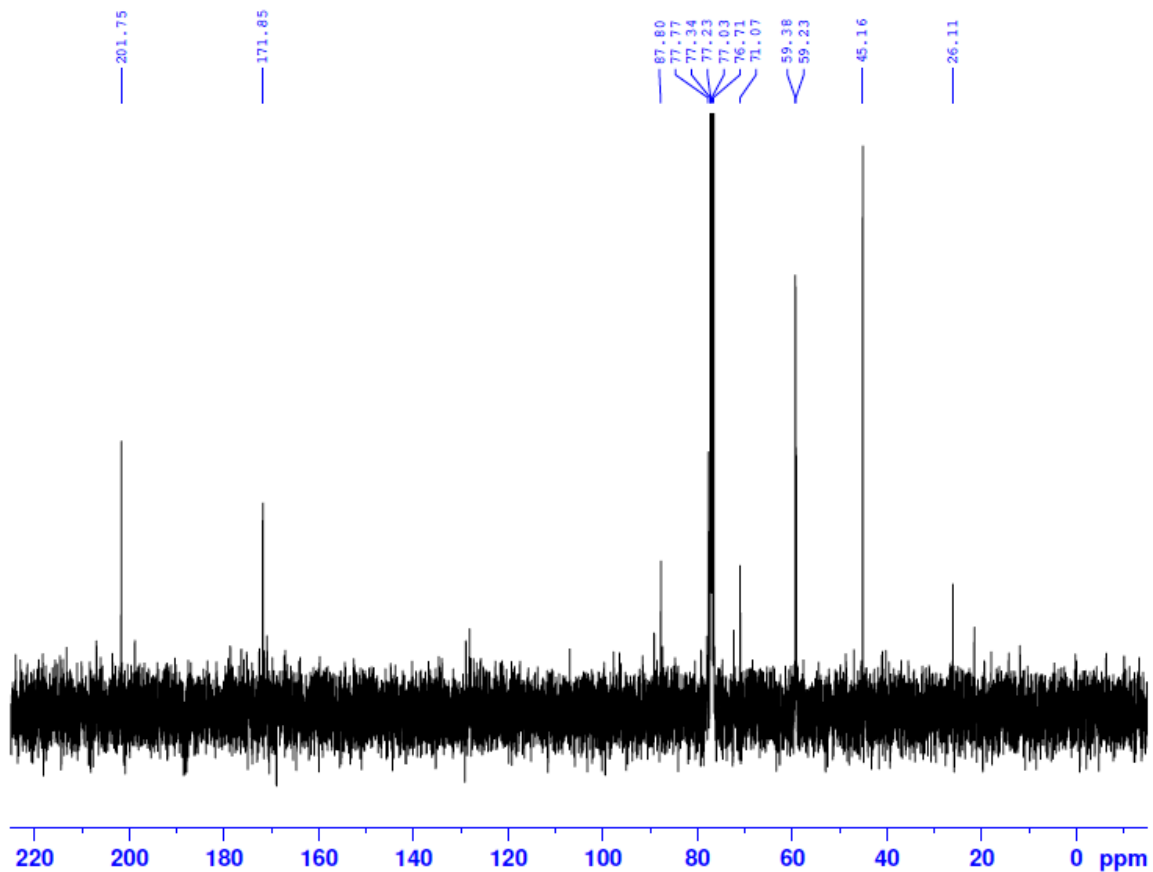
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	0.00 dB
PL12	19.00 dB
PL13	25.00 dB
SFO2	400.2016008 MHz
SI	32768
SF	100.6303718 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

Instrument DQX400
 Chemist BH
 Group MGM
 BH3156
 h1acq.au CDC13 {C:NMR} mgmgrp 35



Instrument DQX400
 Chemist BH
 Group MGM
 BH3156
 c13acq.au CDC13 (C:NMR) mgmgrp 35

NMR@CHEM.OX



NAME Jul27-2010-35
 EXPNO 2
 PROCNO 1
 Date_ 20100728
 Time 21.24
 INSTRUM av400
 PROBHD 5 mm QNP 1H/13
 PULPROG zgpg30
 TD 32768
 SOLVENT CDC13
 NS 256
 DS 4
 SWH 26178.010 Hz
 FIDRES 0.798889 Hz
 AQ 0.6259188 sec
 RG 32768
 DW 19.100 usec
 DE 7.50 usec
 TE 300.0 K
 D1 1.00000000 sec
 D11 0.03000000 sec
 TD0 1

----- CHANNEL f1 -----
 NUC1 13C
 P1 9.50 usec
 PL1 0.00 dB
 SFO1 100.6403931 MHz

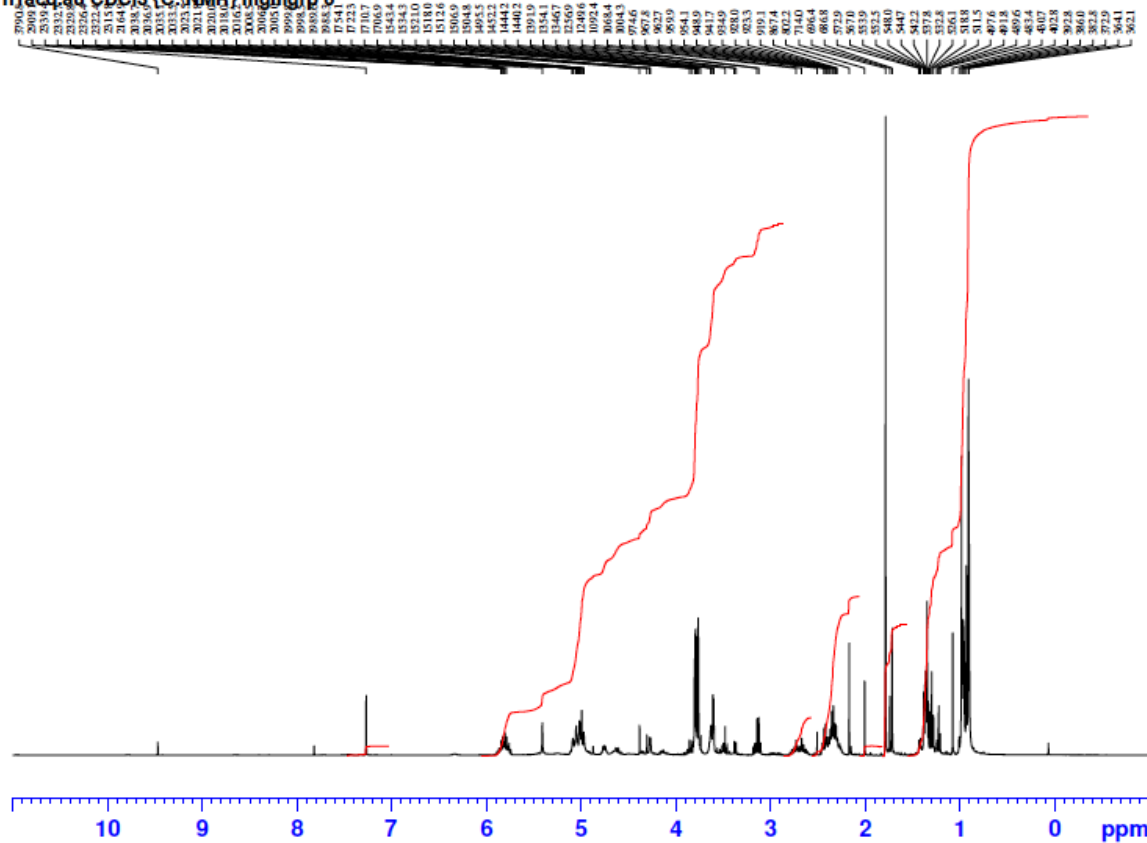
----- CHANNEL f2 -----
 CPDPRG2 waltz16
 NUC2 1H
 PCPD2 80.00 usec
 PL2 0.00 dB
 PL12 19.00 dB
 PL13 25.00 dB
 SFO2 400.2016008 MHz
 SI 32768
 SF 100.6303718 MHz
 WDW EM
 SSB 0
 LB 1.00 Hz
 GB 0
 PC 1.40

9a

Instrument DQX400
Chemist BH
Group MGM
BH4102

hjacq.au CDC13 (C-NMR) mgmgrp 6

NMROCHEM.OX



NAME Dec13-2010-5
EXPNO 6
PROCNO 1
Date_ 20101213
Time 10.30
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zg60
TD 65536
SOLVENT CDC13
NS 16
DS 2
SWH 8278.146 Hz
FIDRES 0.126314 Hz
AQ 3.9584243 sec
RG 90.5
DW 60.400 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec

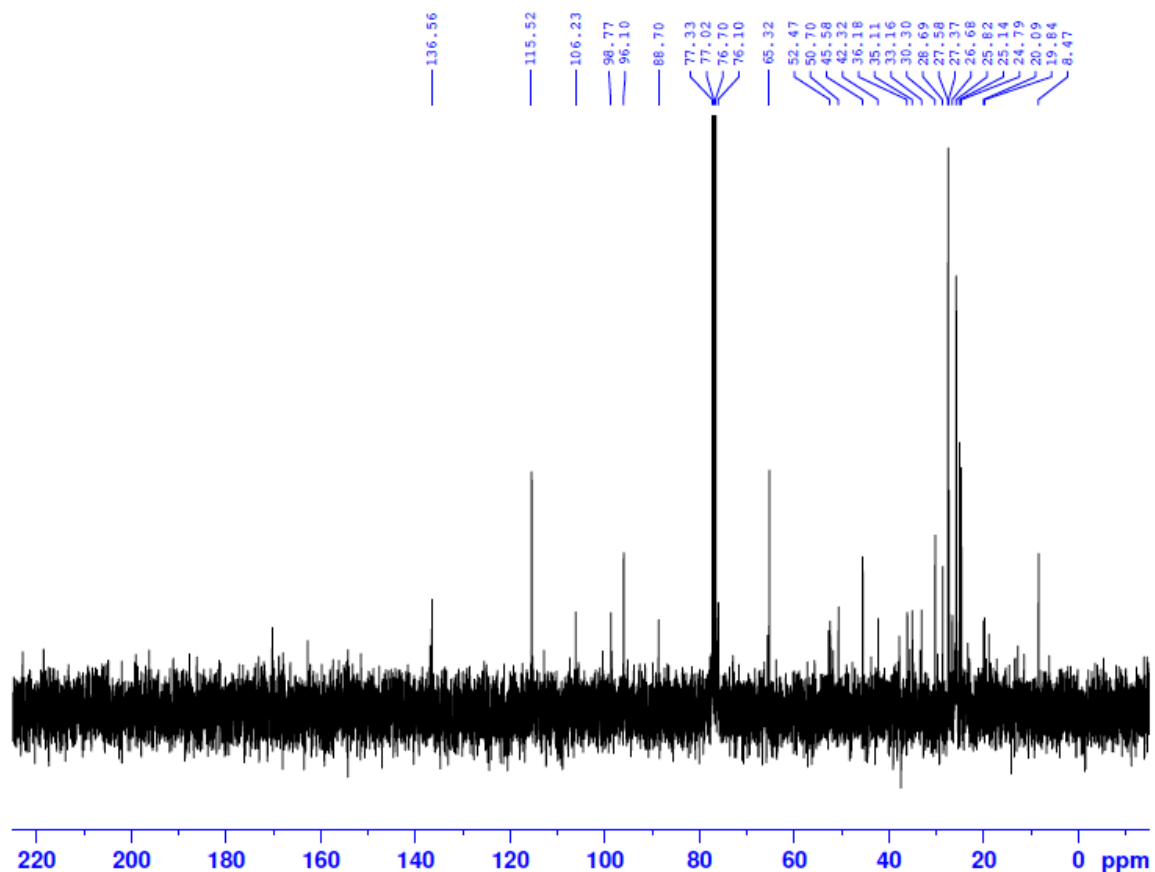
----- CHANNEL f1 -----
NUC1 13C
P1 9.00 usec
PL1 0.00 dB
SF01 400.2024714 MHz
SI 32768
SF 400.2000028 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

0.63
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9a

Instrument DQX400
Chemist BH
Group MGM
BH4102
c13acq.au CDC13 (C:NMR) mgmgrp 6

NMR@CHEM.OX



NAME Dec13-2010-5
EXPNO 7
PROCNO 1
Date_ 20101213
Time 10.38
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 32768
SOLVENT CDC13
NS 256
DS 4
SWH 26178.010 Hz
FIDRES 0.798889 Hz
AQ 0.6259188 sec
RG 32768
DW 19.100 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec
D11 0.03000000 sec
TD0 1

----- CHANNEL f1 -----
NUC1 13C
P1 9.50 usec
PL1 0.00 dB
SFO1 100.6403931 MHz

----- CHANNEL f2 -----
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 0.00 dB
PL12 19.00 dB
PL13 25.00 dB
SFO2 400.2016008 MHz
SI 32768
SF 100.6303718 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

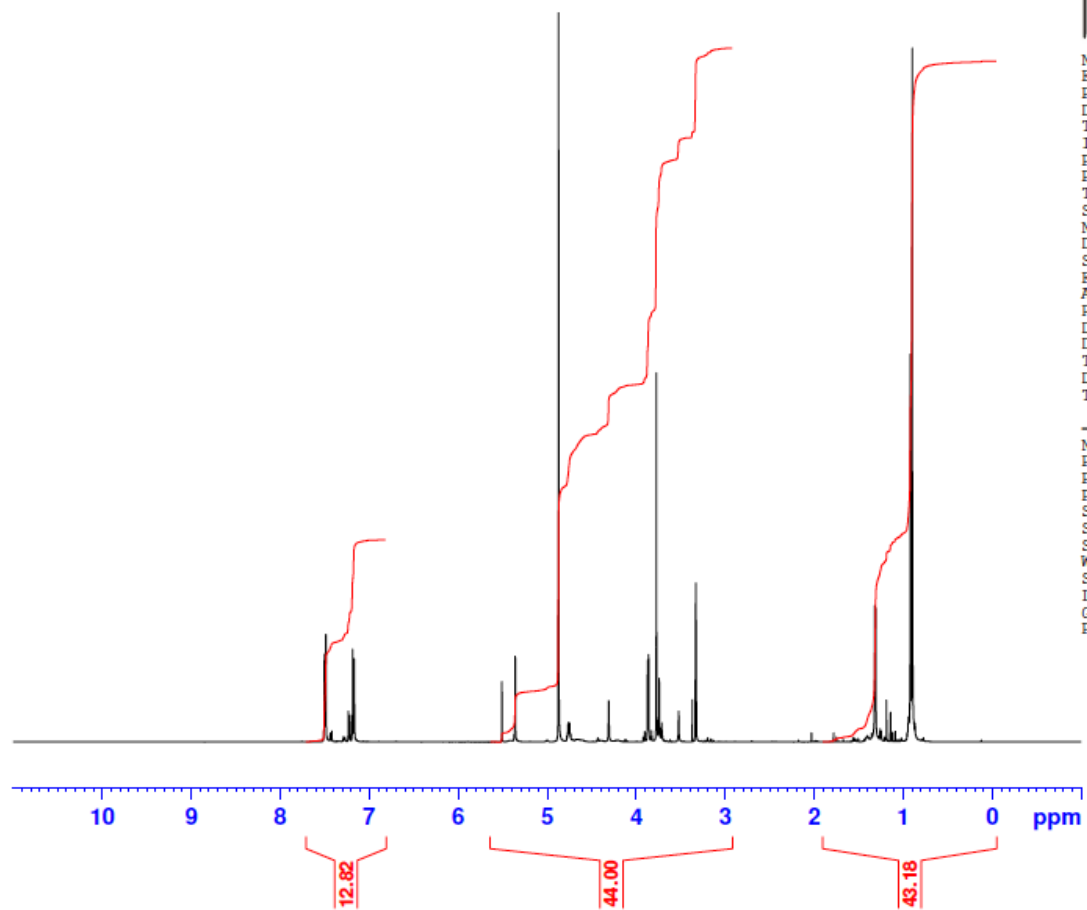
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Instrument AVC500
Group MGM
2432 Beth Heaviside 7/2/11

NMROCHEM.OX

NAME bh24320702
EXPNO 1
PROCNO 1
Date_ 20110207
Time_ 23.23
INSTRUM avc500
PROBHD 5 mm CPDUL 13C
PULPROG zg30
TD 65536
SOLVENT MeOD
NS 16
DS 2
SWH 10330.578 Hz
FIDRES 0.157632 Hz
AQ 3.1719923 sec
RG 4
DW 48.400 usec
DE 6.00 usec
TE 298.0 K
D1 1.00000000 sec
TD0 1

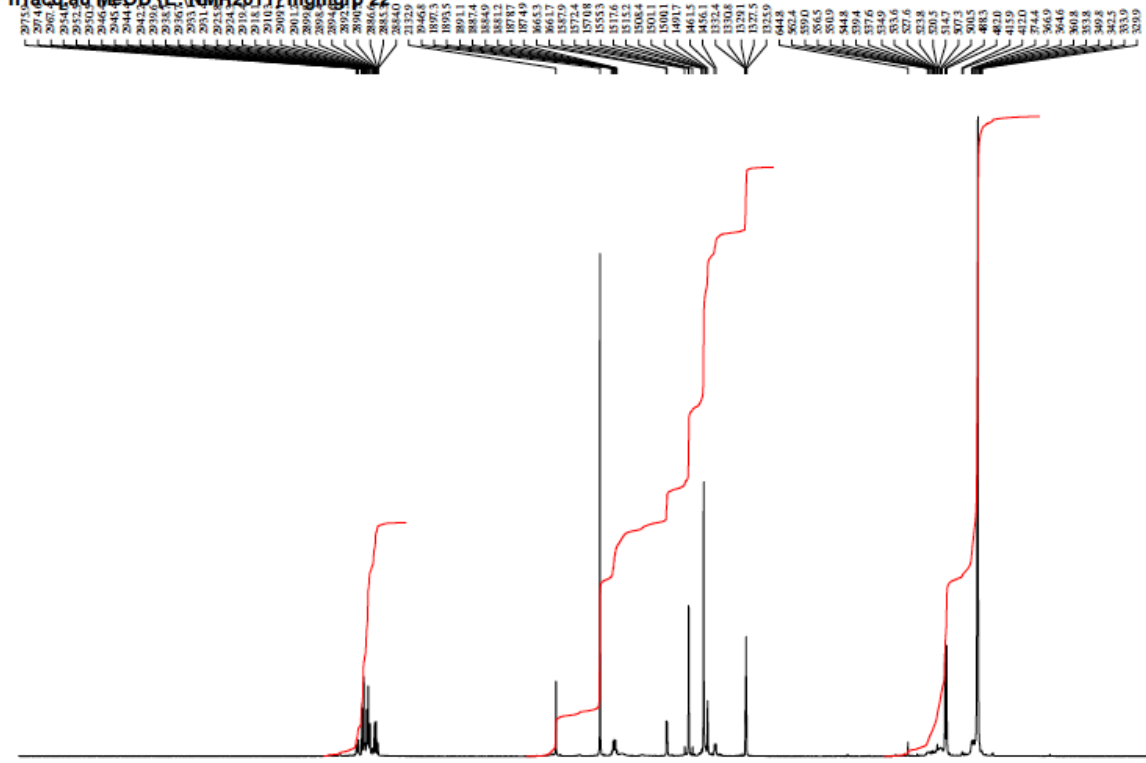
----- CHANNEL f1 -----
NUC1 1H
P1 9.60 usec
PL1 -6.00 dB
PL1W 15.19999981 W
SFO1 500.3030896 MHz
SI 32768
SF 500.3000000 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



9c

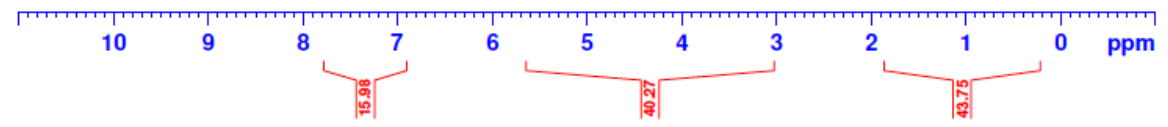
Instrument DQX400
Chemist BH
Group MGM
BH4148 F2 MeOD
hjacq.au MeOD (F:\NMR2011\mgmgrp 22

NMROCHEM.OX



```
NAME Feb09-2011-22
EXPNO 1
PROCNO 1
Date_ 20110210
Time 4.59
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zg60
TD 65536
SOLVENT MeOD
NS 16
DS 2
SWH 8278.146 Hz
FIDRES 0.126314 Hz
AQ 3.9584243 sec
RG 90.5
DW 60.400 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec

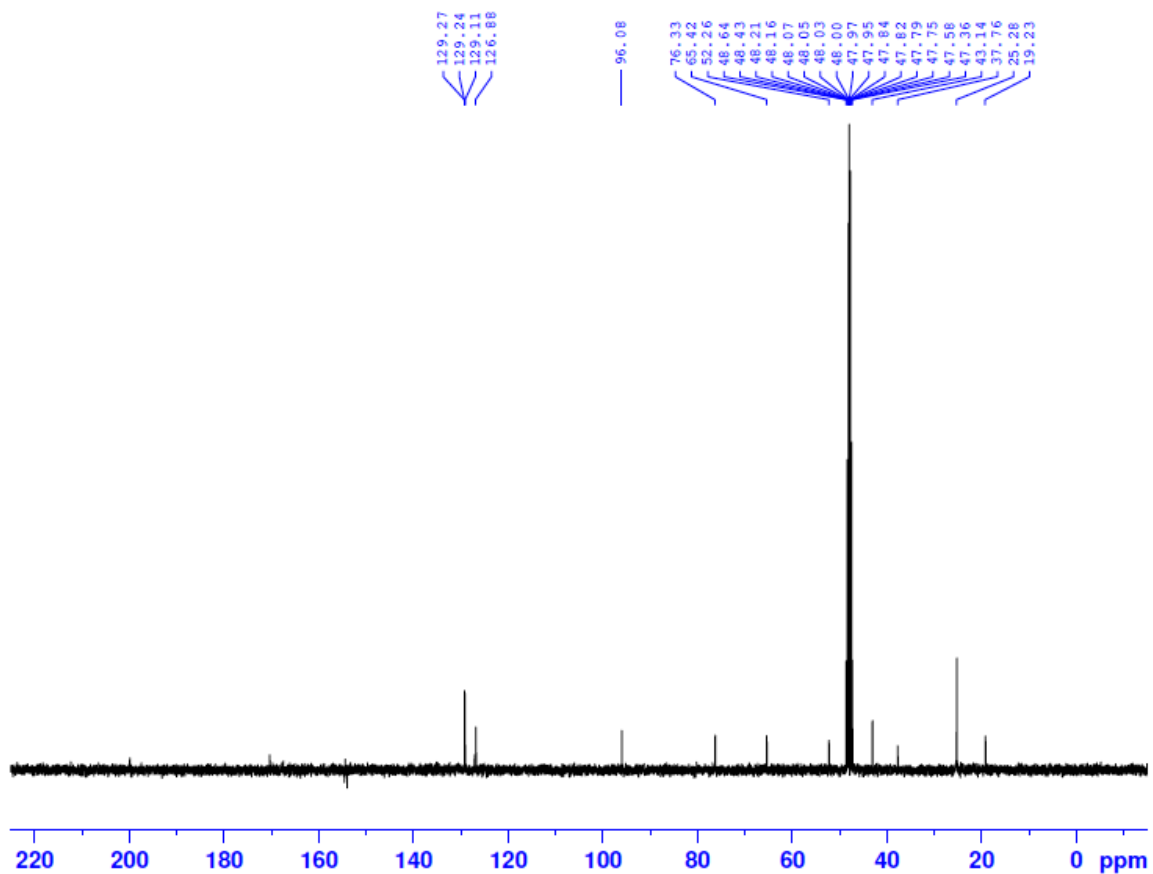
----- CHANNEL f1 -----
NUC1 1H
P1 9.00 usec
PL1 0.00 dB
SF01 400.2024714 MHz
SI 32768
SF 400.2000000 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
```



9c

Instrument DQX400
Chemist BH
Group MGM
BH4148 F2 MeOD
c13acq.au MeOD (E:ANMR2011) mgmgrp 22

NMR@CHEM.OX



```
NAME Feb09-2011-22
EXPNO 2
PROCNO 1
Date_ 20110210
Time 5.07
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 32768
SOLVENT MeOD
NS 256
DS 4
SWH 26178.010 Hz
FIDRES 0.798889 Hz
AQ 0.6259188 sec
RG 32768
DW 19.100 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec
D11 0.03000000 sec
TD0 1

----- CHANNEL f1 -----
NUC1 13C
P1 9.50 usec
PL1 0.00 dB
SFO1 100.6403931 MHz

----- CHANNEL f2 -----
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 0.00 dB
PL12 19.00 dB
PL13 25.00 dB
SFO2 400.2016008 MHz
SI 32768
SF 100.6303300 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
```

Instrument DQX400
 Chemist BH
 Group MGM
 BH3184 F2
 h1acq.au CDC13 {C:NMR} mgmgrp 42

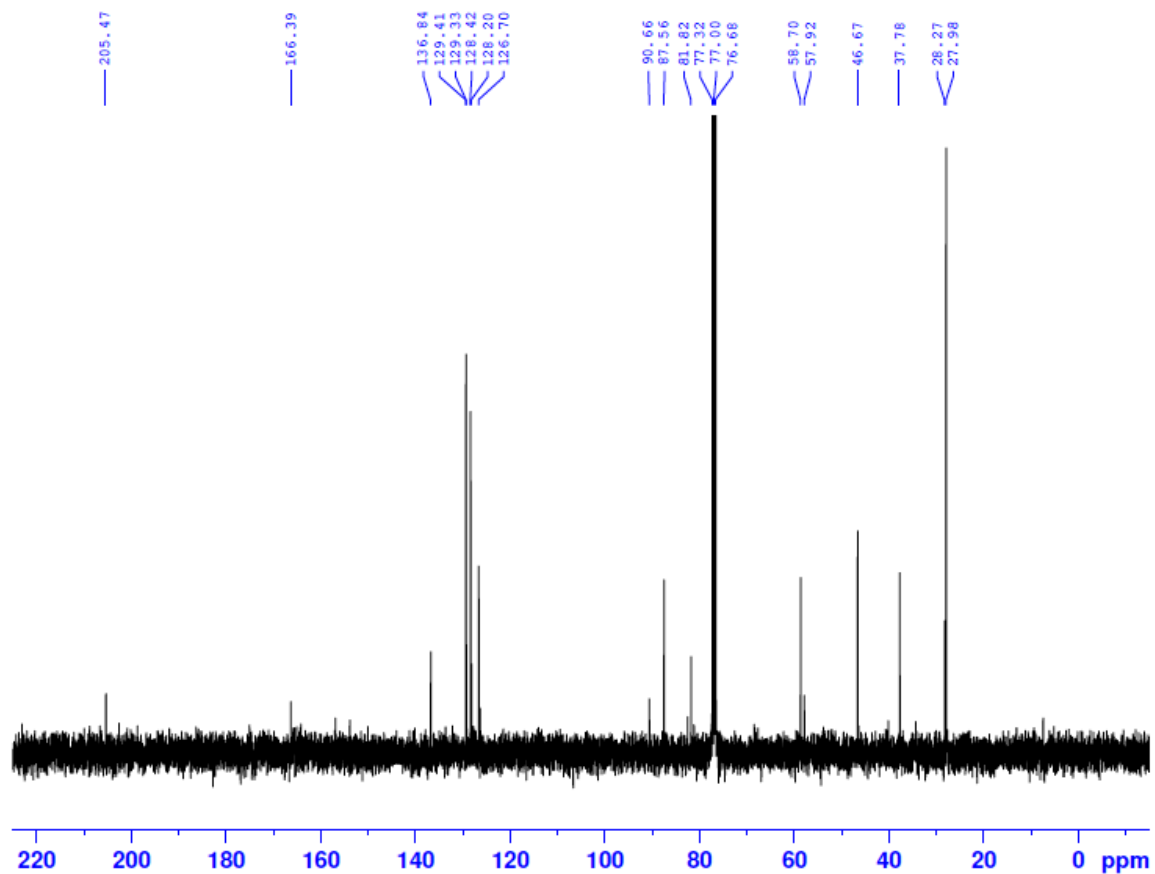
NMROCHEM.OX

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Instrument DQX400
 Chemist BH
 Group MGM
 BH3184 F2
 c13acq.au CDC13 (C:NMR) mgmgrp 42

NMR@CHEM.OX



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NAME      Aug10-2010-42
EXPNO     2
PROCNO    1
Date_     20100811
Time      0.25
INSTRUM   av400
PROBHD    5 mm QNP 1H/13
PULPROG   zgpg30
TD        32768
SOLVENT   CDC13
NS        256
DS        4
SWH       26178.010 Hz
FIDRES    0.798889 Hz
AQ        0.6259188 sec
RG        32768
DW        19.100 usec
DE        7.50 usec
TE        300.0 K
D1        1.00000000 sec
D11       0.03000000 sec
TD0       1
  
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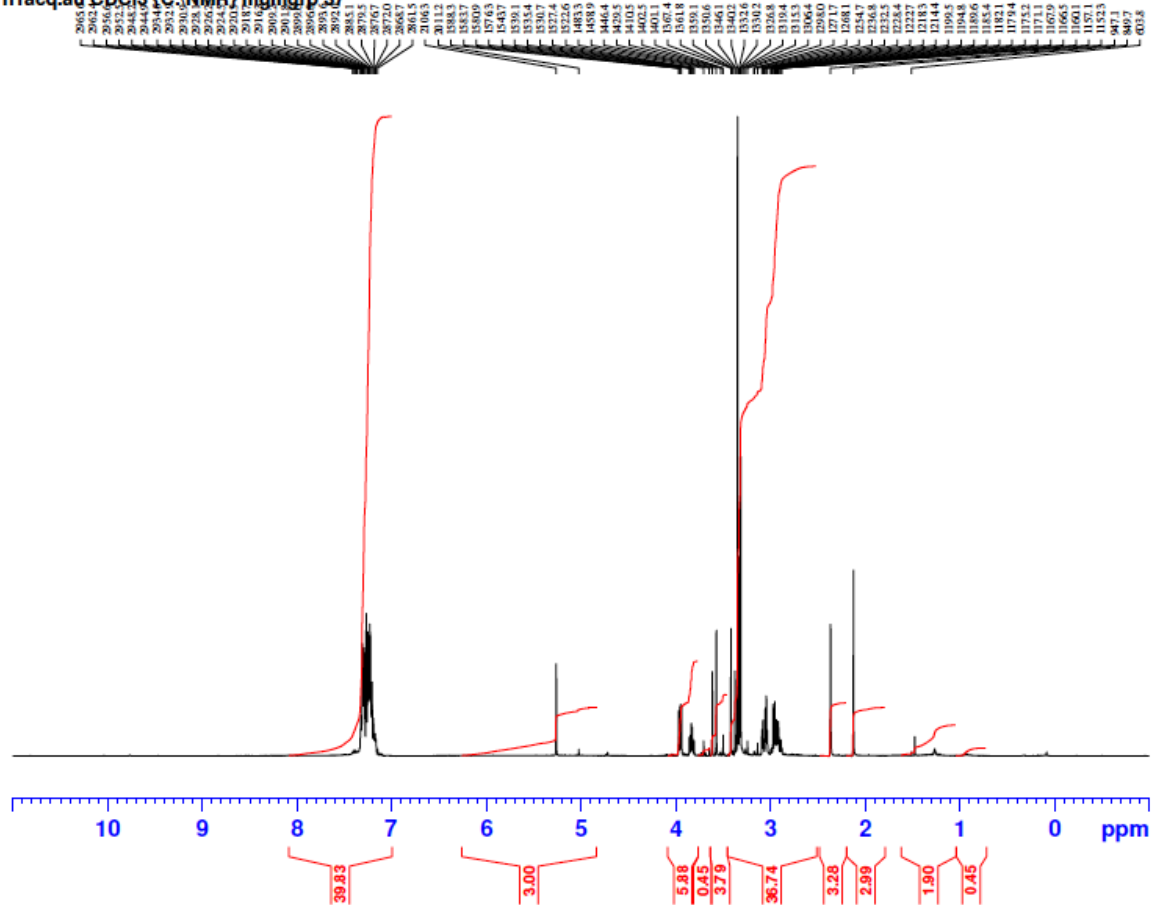
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----- CHANNEL f1 -----
NUC1      13C
P1        9.50 usec
PL1       0.00 dB
SFO1     100.6403931 MHz

----- CHANNEL f2 -----
CPDPRG2   waltz16
NUC2      1H
PCPD2     80.00 usec
PL2       0.00 dB
PL12     19.00 dB
PL13     25.00 dB
SFO2     400.2016008 MHz
SI        32768
SF       100.6303718 MHz
WDW       EM
SSB       0
LB        1.00 Hz
GB        0
PC        1.40
  
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Instrument DQX400
 Chemist BH
 Group MGM
 BH420
 h1acq.au CDC13 (C-NMR) mgmarp 37

NMROCHEM.OX



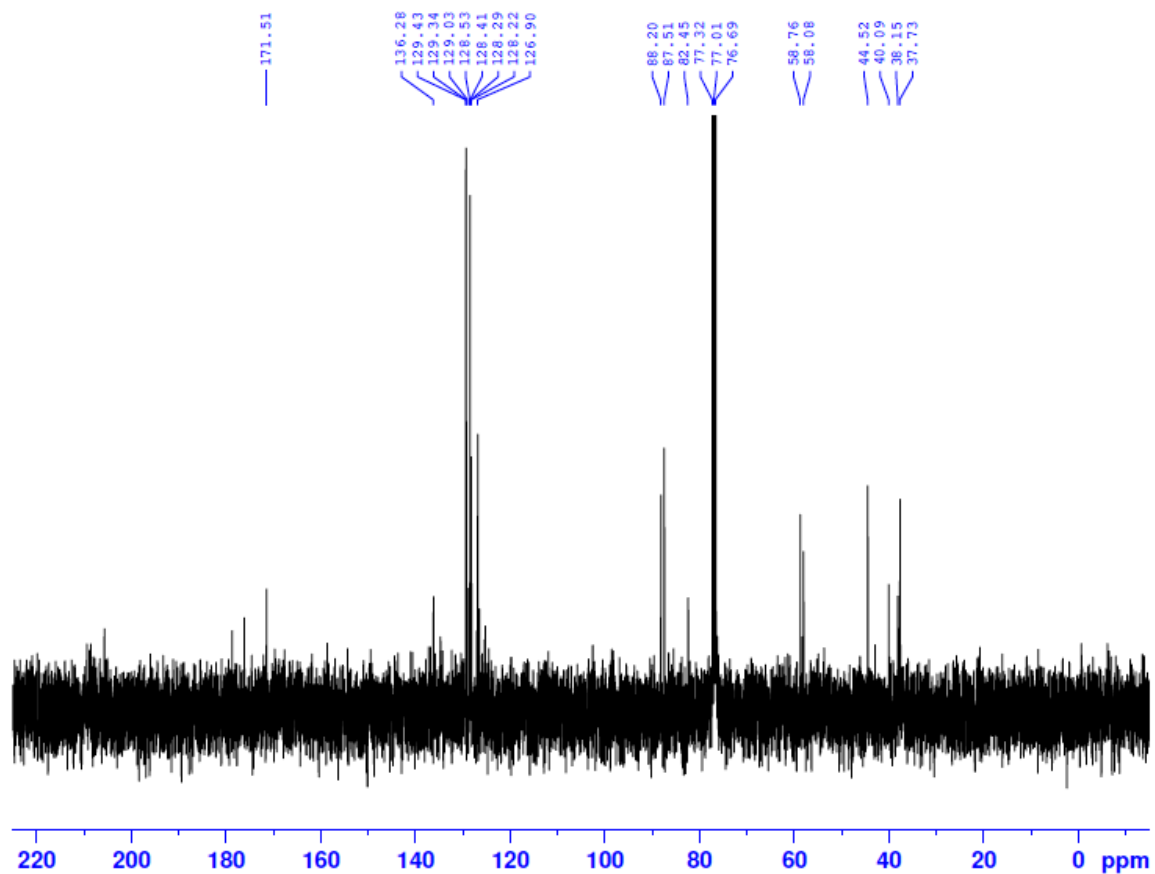
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NAME      Sep14-2010-37
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PROCNO    1
Date_     20100914
Time      15.35
INSTRUM   av400
PROBHD    5 mm QNP 1H/13
PULPROG   zg60
TD         65536
SOLVENT   CDC13
NS         16
DS         2
SWH        8278.146 Hz
FIDRES     0.126314 Hz
AQ         3.9584243 sec
RG         228.1
DW         60.400 usec
DE         7.50 usec
TE         300.0 K
D1         1.00000000 sec

----- CHANNEL f1 -----
NUC1       13C
P1         9.00 usec
PL1        0.00 dB
SFO1       400.2024714 MHz
SI         32768
SF         400.2000028 MHz
WDW        EM
SSB        0
LB         0.30 Hz
GB         0
PC         1.00
  
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Instrument DQX400
 Chemist BH
 Group MGM
 BH420
 c13acq.au CDC13 (C:NMR) mgmgrp 37

NMR@CHEM.OX



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NAME      Sep14-2010-37
EXPNO     2
PROCNO    1
Date_     20100914
Time      15.43
INSTRUM   av400
PROBHD    5 mm QNP 1H/13
PULPROG   zgpg30
TD         32768
SOLVENT   CDC13
NS         256
DS         4
SWH        26178.010 Hz
FIDRES     0.798889 Hz
AQ         0.6259188 sec
RG         32768
DW         19.100 usec
DE         7.50 usec
TE         300.0 K
D1         1.00000000 sec
D11        0.03000000 sec
TD0        1

----- CHANNEL f1 -----
NUC1       13C
P1         9.50 usec
PL1        0.00 dB
SFO1       100.6403931 MHz

----- CHANNEL f2 -----
CPDPRG2   waltz16
NUC2       1H
PCPD2     80.00 usec
PL2        0.00 dB
PL12      19.00 dB
PL13      25.00 dB
SFO2       400.2016008 MHz
SI         32768
SF         100.6303718 MHz
WDW        EM
SSB        0
LB         1.00 Hz
GB         0
PC         1.40
  
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13a

Instrument DQX400
Chemist BH
Group MGM
BH3154
h1acq.au CDCI3 {C:NMR} mgmgrp 2

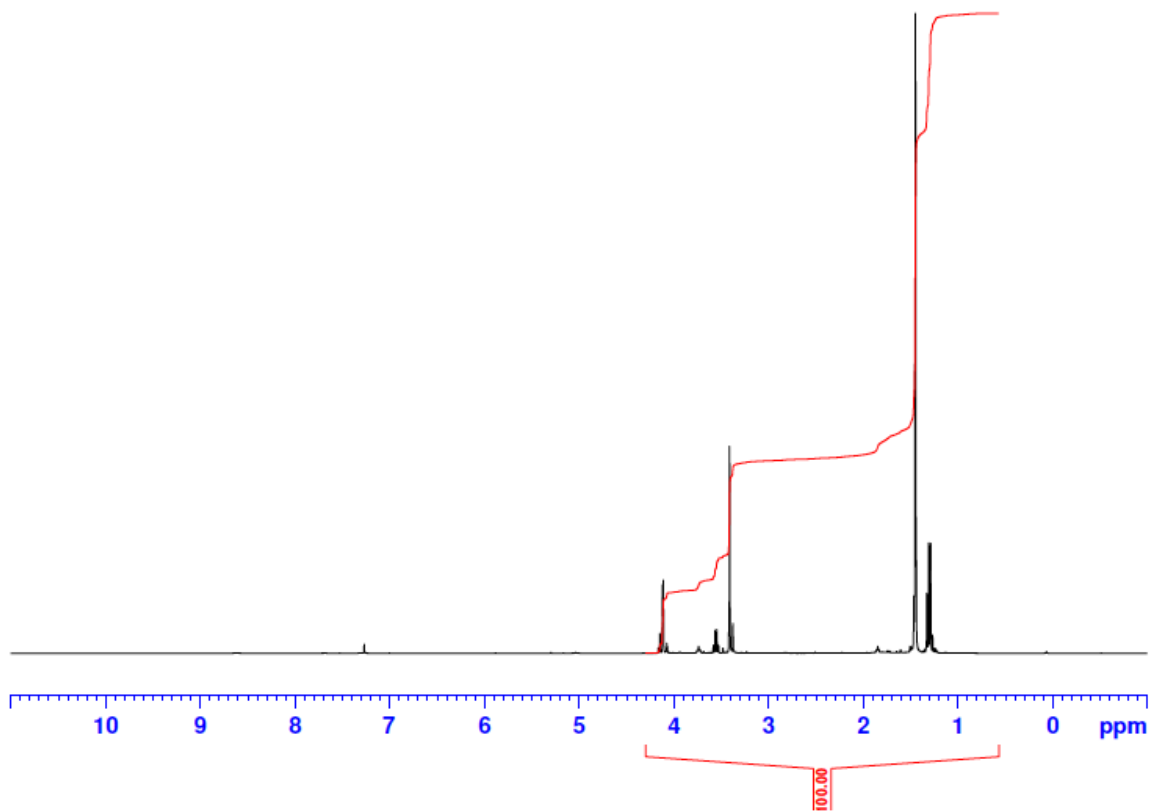
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690.0
596.1
585.9
509.8
509.8
509.8
414.4
509.9
509.9
512.7
512.7
307.1
488.8
484.1

NMROCHEM.OX

NAME Ju127-2010-2
EXPNO 1
PROCNO 1
Date_ 20100727
Time 9.54
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zg60
TD 65536
SOLVENT CDCI3
NS 16
DS 2
SWH 8278.146 Hz
FIDRES 0.126314 Hz
AQ 3.9584243 sec
RG 90.5
DW 60.400 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec

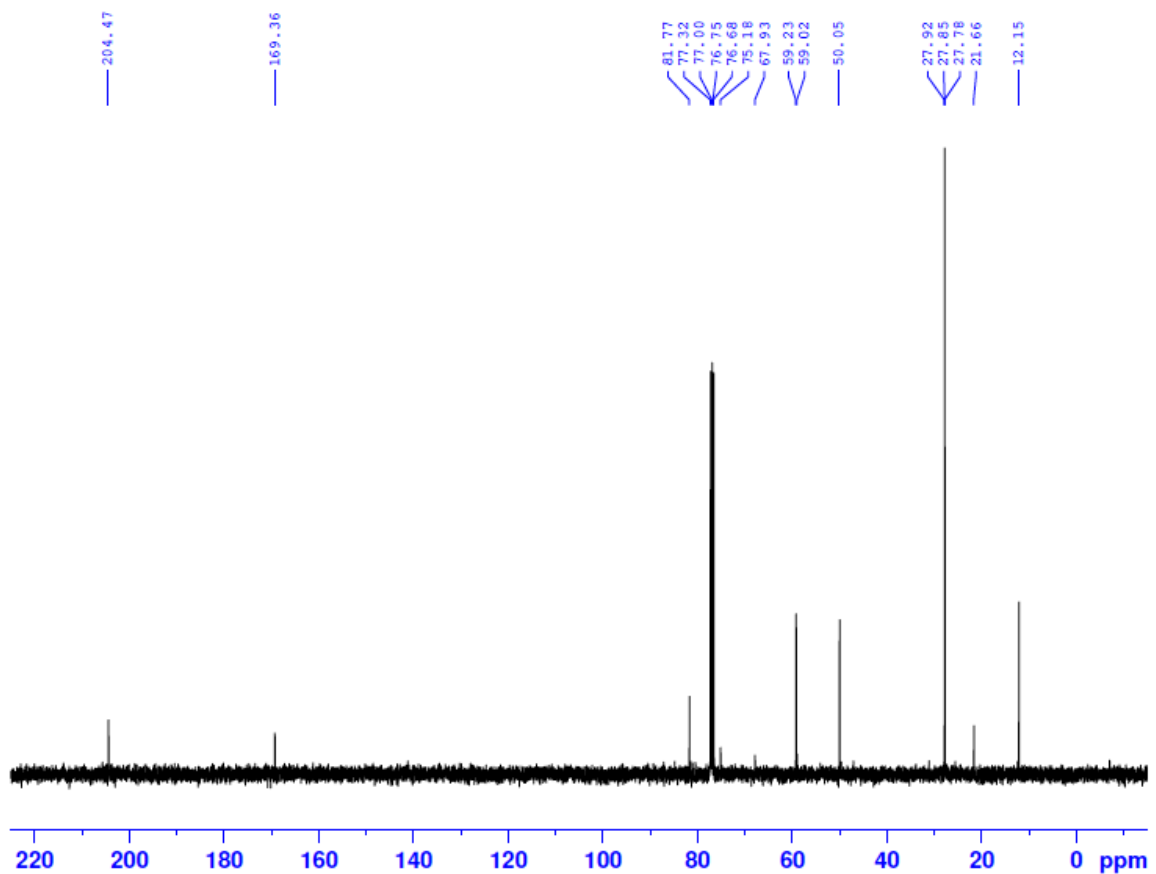
----- CHANNEL f1 -----
NUC1 1H
P1 9.00 usec
PL1 0.00 dB
SFO1 400.2024714 MHz
SI 32768
SF 400.2000028 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



13a

Instrument DQX400
Chemist BH
Group MGM
BH3154
c13acq.au CDC13 (C:NMR) mgmgrp 2

NMR@CHEM.OX



```
NAME Jul27-2010-2
EXPNO 2
PROCNO 1
Date_ 20100727
Time 10.02
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 32768
SOLVENT CDC13
NS 256
DS 4
SWH 26178.010 Hz
FIDRES 0.798889 Hz
AQ 0.6259188 sec
RG 32768
DW 19.100 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec
D11 0.03000000 sec
TD0 1

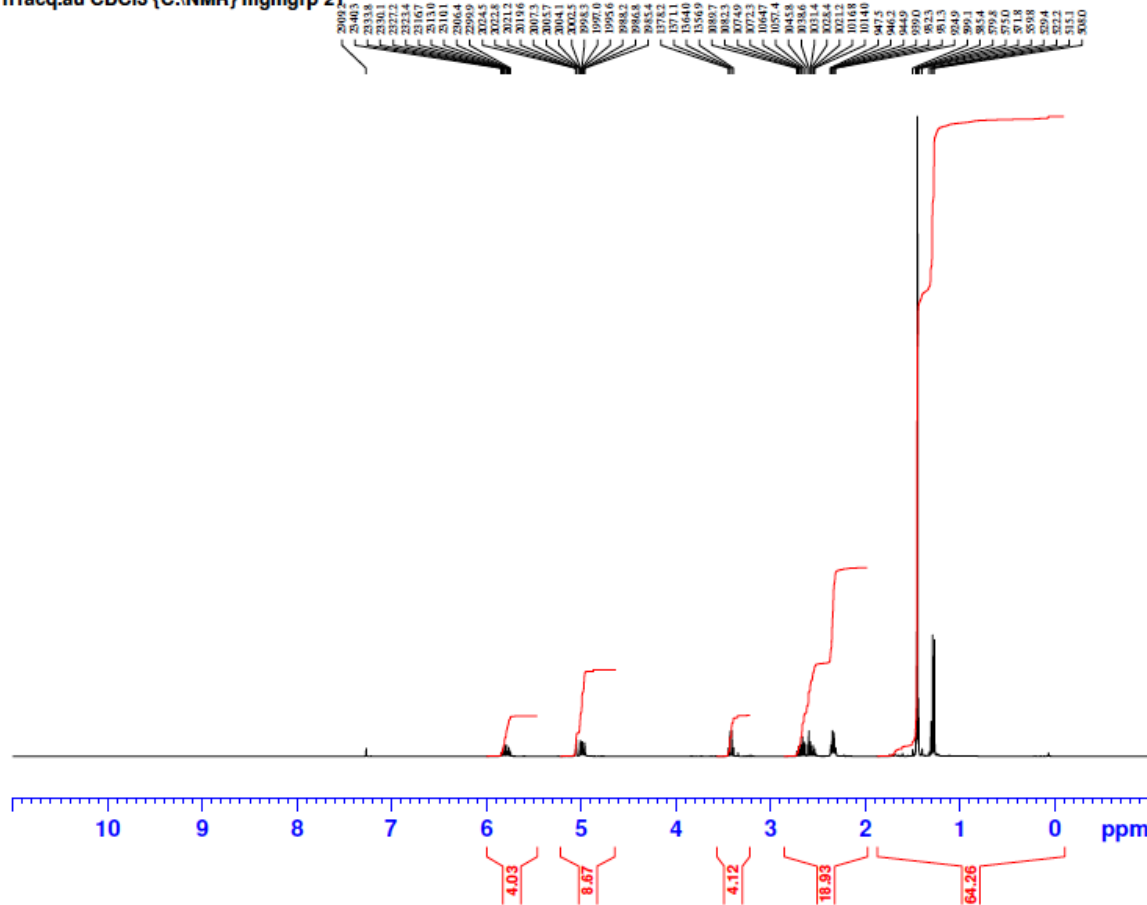
----- CHANNEL f1 -----
NUC1 13C
P1 9.50 usec
PL1 0.00 dB
SFO1 100.6403931 MHz

----- CHANNEL f2 -----
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 0.00 dB
PL12 19.00 dB
PL13 25.00 dB
SFO2 400.2016008 MHz
SI 32768
SF 100.6303718 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
```

13b

Instrument DQX400
Chemist BH
Group MGM
BH4106
h1acq.au CDCI3 {C:NMR} mgmgrp 21

NMROCHEM.OX



```

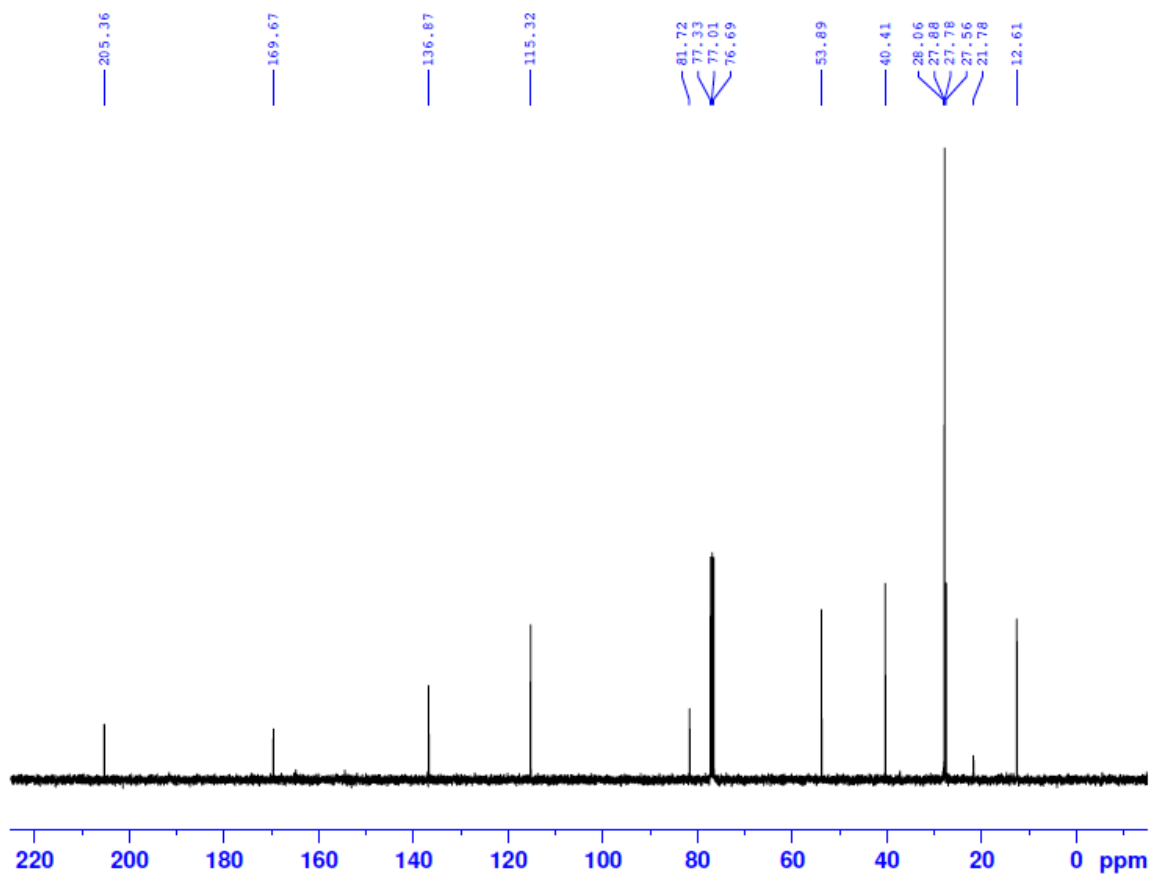
NAME      Dec17-2010-21
EXPNO     1
PROCNO    1
Date_     20101217
Time      17.05
INSTRUM   av400
PROBHD    5 mm QNP 1H/13
PULPROG   zg60
TD         65536
SOLVENT   CDCI3
NS         16
DS         2
SWH       8278.146 Hz
FIDRES    0.126314 Hz
AQ        3.9584243 sec
RG         40.3
DW        60.400 usec
DE        7.50 usec
TE        300.0 K
D1        1.00000000 sec

----- CHANNEL f1 -----
NUC1      1H
P1        9.00 usec
PL1       0.00 dB
SFO1     400.2024714 MHz
SI        32768
SF        400.2000028 MHz
WDW       EM
SSB       0
LB        0.30 Hz
GB        0
PC        1.00
    
```

13b

Instrument DQX400
Chemist BH
Group MGM
BH4106
c13acq.au CDC13 (C:NMR) mgmgrp 21

NMR@CHEM.OX



```
NAME      Dec17-2010-21
EXPNO     2
PROCNO    1
Date_     20101217
Time      17.13
INSTRUM   av400
PROBHD    5 mm QNP 1H/13
PULPROG   zgpg30
TD         32768
SOLVENT   CDC13
NS         256
DS         4
SWH        26178.010 Hz
FIDRES     0.798889 Hz
AQ         0.6259188 sec
RG         32768
DW         19.100 usec
DE         7.50 usec
TE         300.0 K
D1         1.00000000 sec
D11        0.03000000 sec
TD0        1

----- CHANNEL f1 -----
NUC1       13C
P1         9.50 usec
PL1        0.00 dB
SFO1       100.6403931 MHz

----- CHANNEL f2 -----
CPDPRG2   waltz16
NUC2       1H
PCPD2     80.00 usec
PL2        0.00 dB
PL12       19.00 dB
PL13       25.00 dB
SFO2       400.2016008 MHz
SI         32768
SF         100.6303718 MHz
WDW        EM
SSB        0
LB         1.00 Hz
GB         0
PC         1.40
```

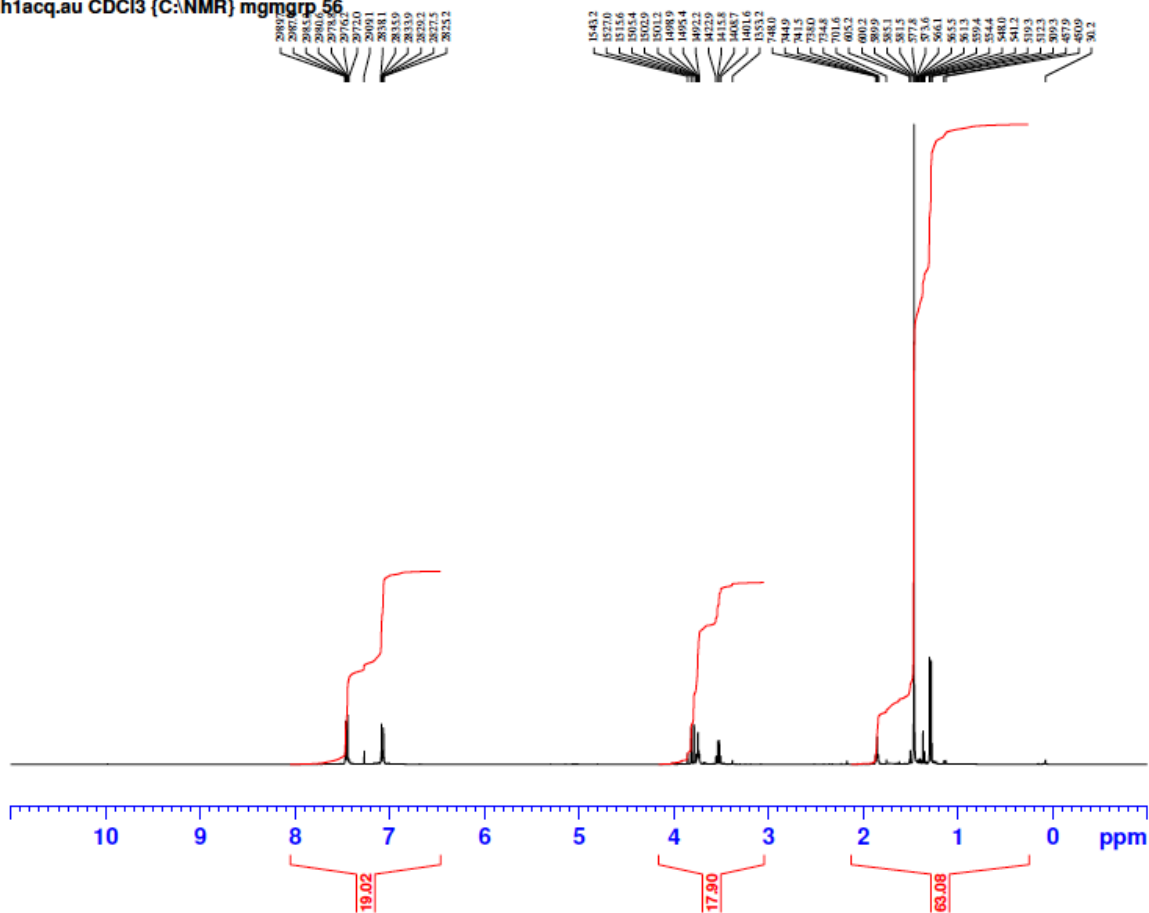
13c

Instrument DQX400
Chemist BH
Group MGM
BH4134
h1acq.au CDC13 {C:NMR} mgmgrp 56

NMROCHEM.OX

NAME Jan31-2011-56
EXPNO 1
PROCNO 1
Date_ 20110201
Time 2.20
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zg60
TD 65536
SOLVENT CDC13
NS 16
DS 2
SWH 8278.146 Hz
FIDRES 0.126314 Hz
AQ 3.9584243 sec
RG 90.5
DW 60.400 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec

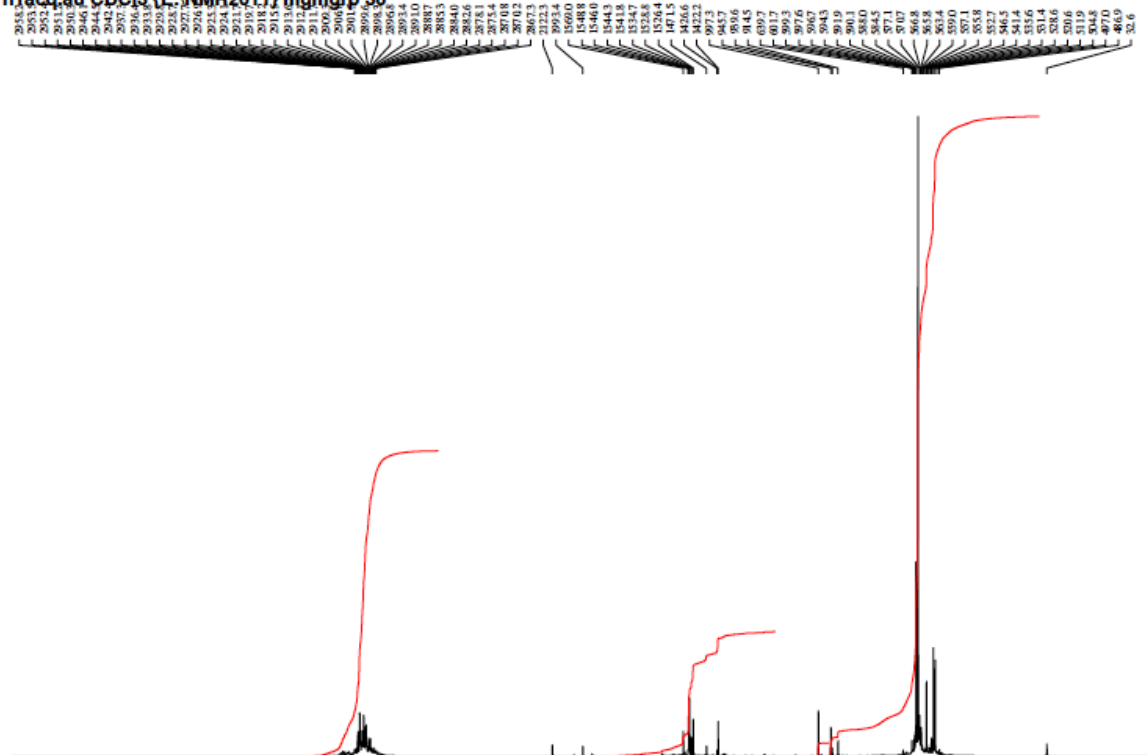
----- CHANNEL f1 -----
NUC1 1H
P1 9.00 usec
PL1 0.00 dB
SFO1 400.2024714 MHz
SI 32768
SF 400.2000028 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



13d

Instrument DQX400
Chemist BH
Group MGM
BH4158
h1acq.au CDC13 (F:NMR2011) mgmgrp 36

NMROCHEM.OX



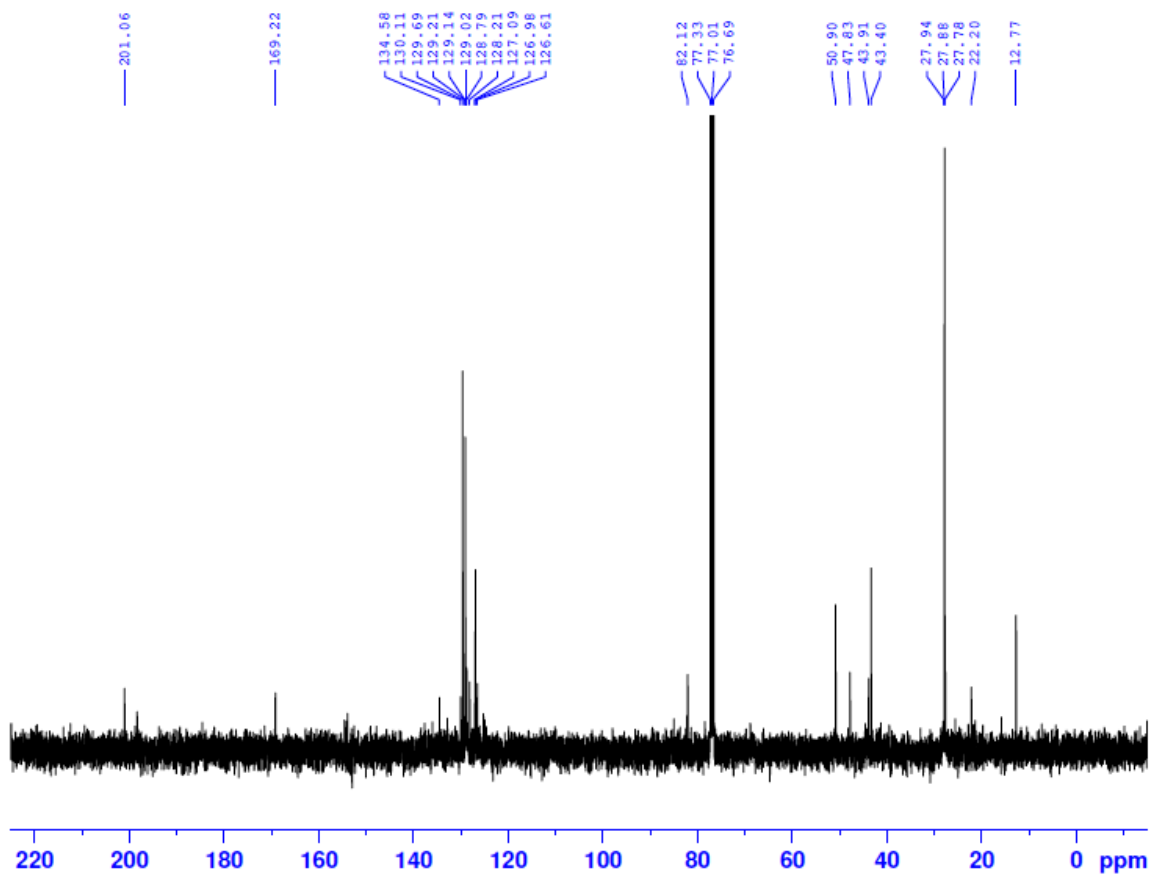
NAME Feb09-2011-36
EXPNO 1
PROCNO 1
Date_ 20110210
Time 10.23
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zg60
TD 65536
SOLVENT CDC13
NS 16
DS 2
SWH 8278.146 Hz
FIDRES 0.126314 Hz
AQ 3.9584243 sec
RG 90.5
DW 60.400 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec
----- CHANNEL f1 -----
NUC1 1H
P1 9.00 usec
PL1 0.00 dB
SF01 400.2024714 MHz
SI 32768
SF 400.2000028 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

10 9 8 7 6 5 4 3 2 1 0 ppm
28.18 11.51 1.22 59.08

13d

Instrument DQX400
Chemist BH
Group MGM
BH4158
c13acq.au CDC13 (E:\NMR2011) mgmgrp 36

NMR@CHEM.OX



```
NAME Feb09-2011-36
EXPNO 2
PROCNO 1
Date_ 20110210
Time 10.31
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 32768
SOLVENT CDC13
NS 256
DS 4
SWH 26178.010 Hz
FIDRES 0.798889 Hz
AQ 0.6259188 sec
RG 32768
DW 19.100 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec
D11 0.03000000 sec
TD0 1

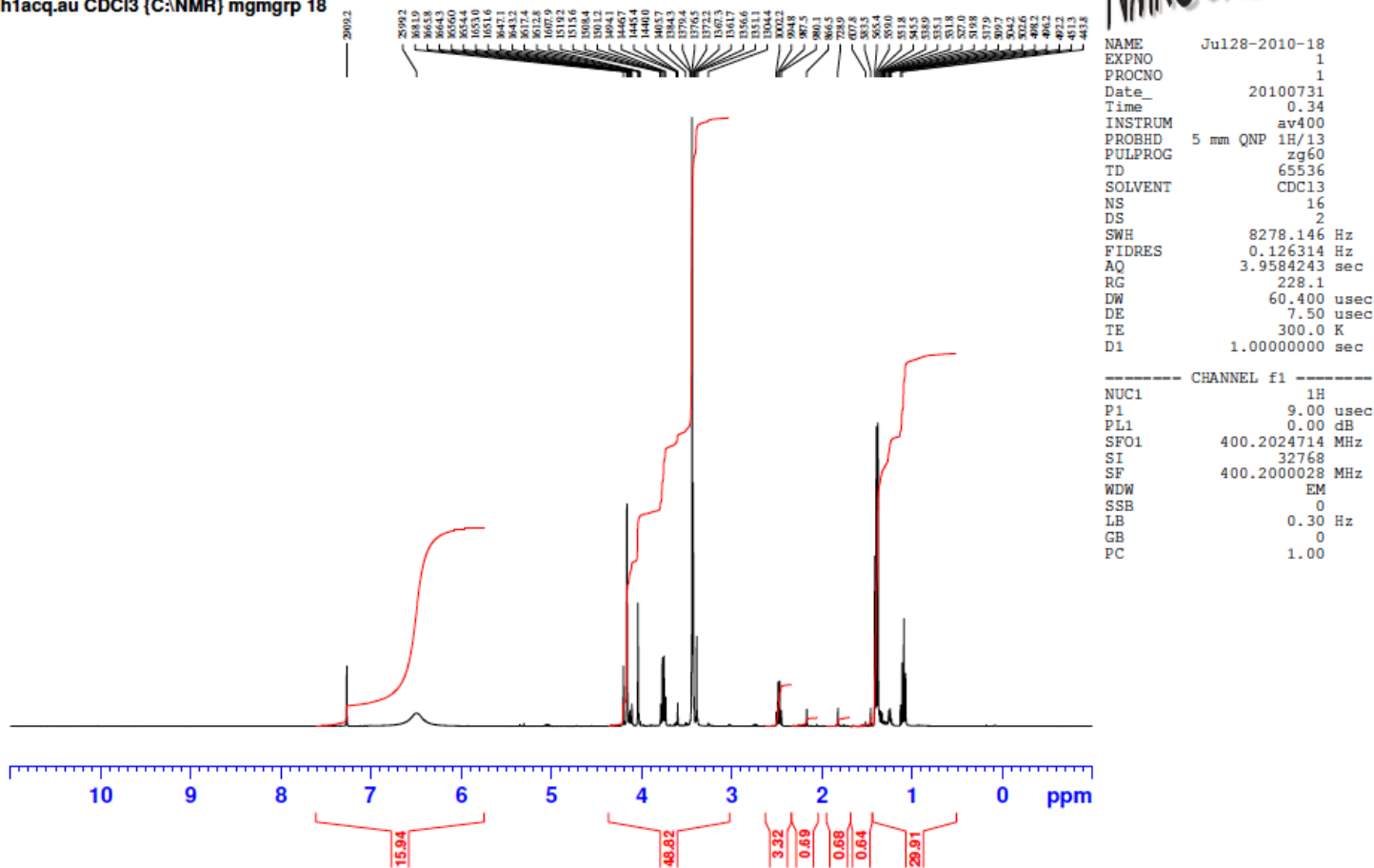
----- CHANNEL f1 -----
NUC1 13C
P1 9.50 usec
PL1 0.00 dB
SFO1 100.6403931 MHz

----- CHANNEL f2 -----
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 0.00 dB
PL12 19.00 dB
PL13 25.00 dB
SFO2 400.2016008 MHz
SI 32768
SF 100.6303718 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
```

14a

Instrument DQX400
 Chemist BH
 Group MGM
 BH3160
 h1acq.au CDC13 {C:NMR} mgmgrp 18

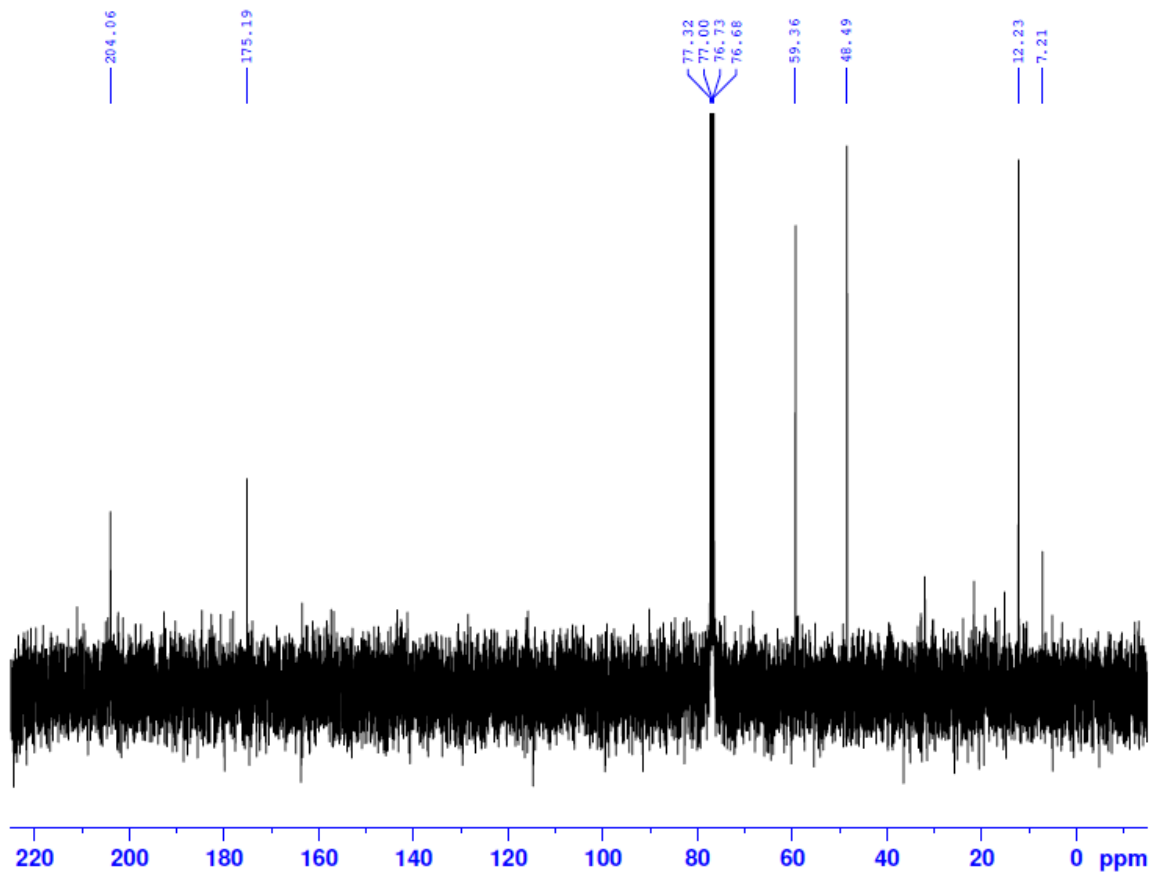
NMROCHEM.OX



14a

Instrument DQX400
Chemist BH
Group MGM
BH3160
c13acq.au CDC13 (C:NMR) mgmgrp 18

NMR@CHEM.OX



NAME Jul28-2010-18
EXPNO 2
PROCNO 1
Date_ 20100731
Time 0.41
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 32768
SOLVENT CDC13
NS 256
DS 4
SWH 26178.010 Hz
FIDRES 0.798889 Hz
AQ 0.6259188 sec
RG 32768
DW 19.100 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec
D11 0.03000000 sec
TD0 1

----- CHANNEL f1 -----
NUC1 13C
P1 9.50 usec
PL1 0.00 dB
SFO1 100.6403931 MHz

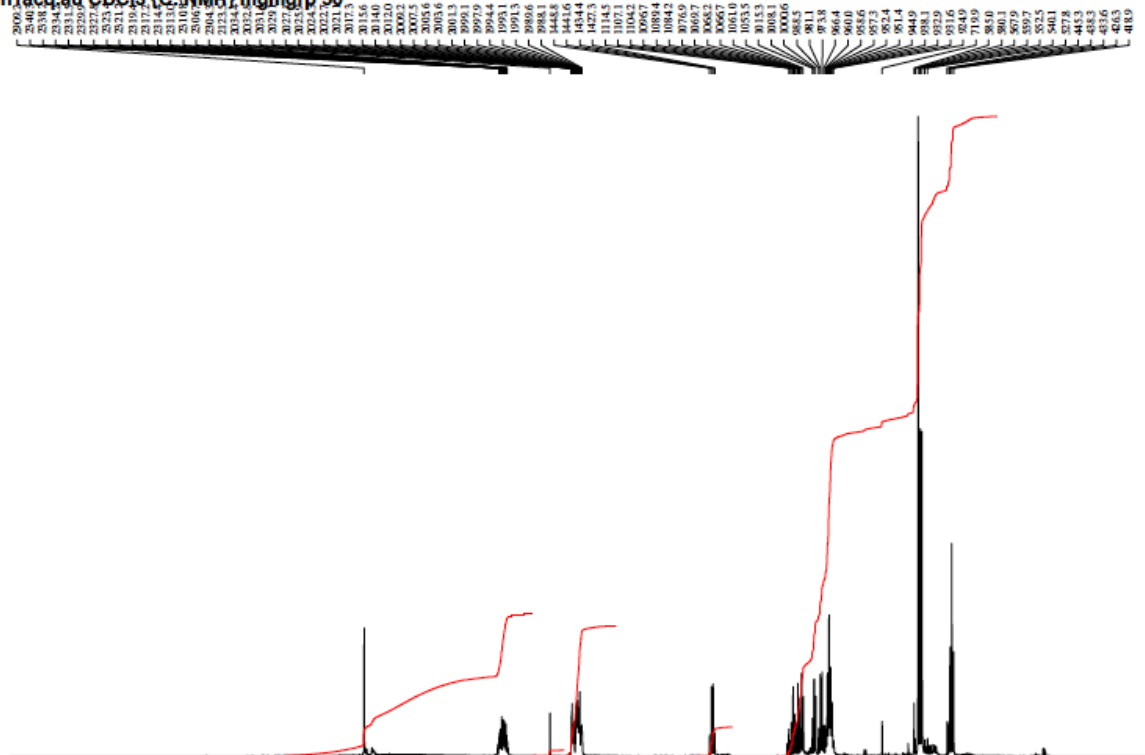
----- CHANNEL f2 -----
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 0.00 dB
PL12 19.00 dB
PL13 25.00 dB
SFO2 400.2016008 MHz
SI 32768
SF 100.6303718 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

14b

Instrument DQX400
 Chemist BH
 Group MGM
 BH4144

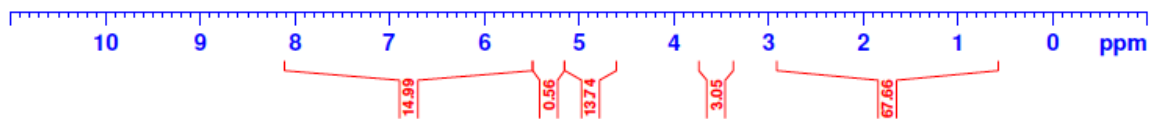
h1acq.au CDC13 (C-NMR) mgmgrp 50

NMRCHEM.OX



NAME Feb02-2011-50
 EXPNO 1
 PROCNO 1
 Date_ 20110202
 Time 22.47
 INSTRUM av400
 PROBHD 5 mm QNP 1H/13
 PULPROG zg60
 TD 65536
 SOLVENT CDC13
 NS 16
 DS 2
 SWH 8278.146 Hz
 FIDRES 0.126314 Hz
 AQ 3.9584243 sec
 RG 228.1
 DW 60.400 usec
 DE 7.50 usec
 TE 300.0 K
 D1 1.00000000 sec

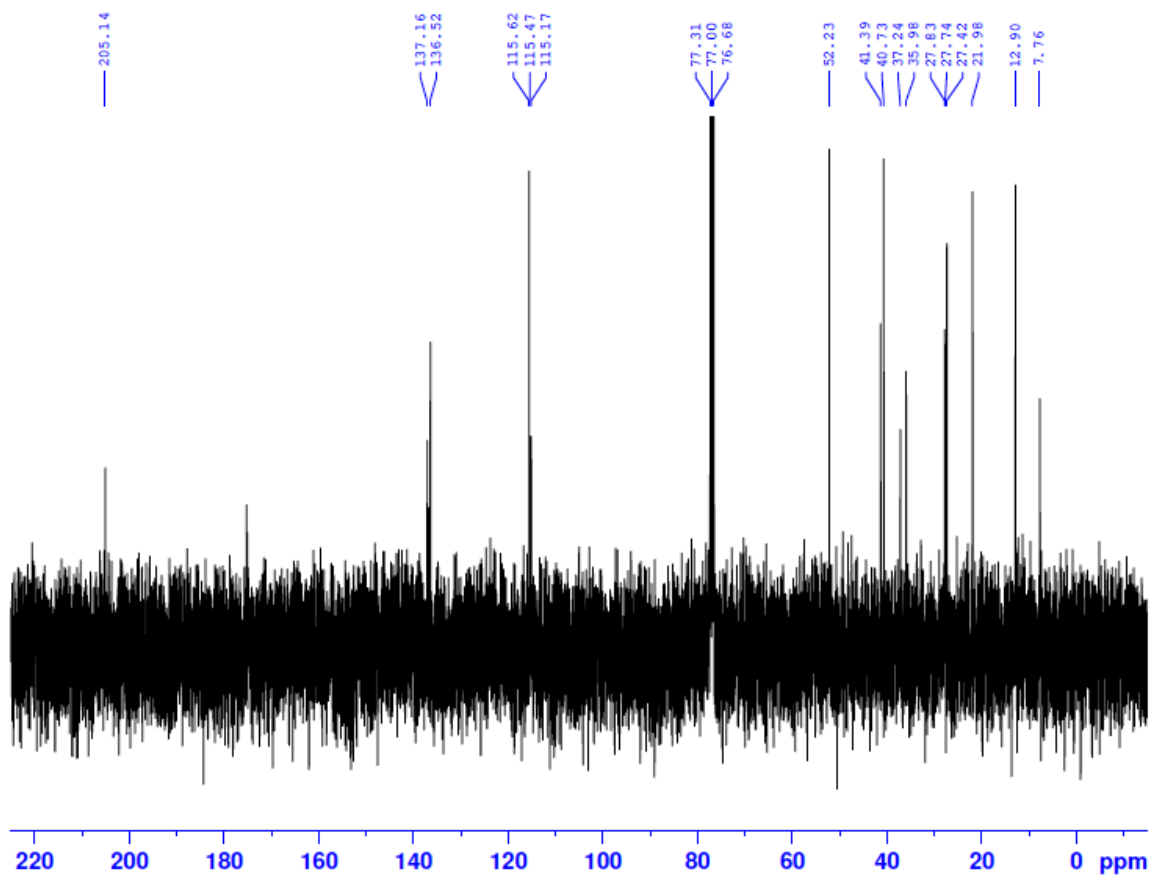
----- CHANNEL f1 -----
 NUC1 1H
 P1 9.00 usec
 PL1 0.00 dB
 SFO1 400.2024714 MHz
 SI 32768
 SF 400.2000028 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00



14b

Instrument DQX400
Chemist BH
Group MGM
BH4144
c13acq.au CDC13 (C:NMR) mgmgrp 50

NMR@CHEM.OX



```
NAME      Feb02-2011-50
EXPNO     2
PROCNO    1
Date_     20110202
Time      22.55
INSTRUM   av400
PROBHD    5 mm QNP 1H/13
PULPROG   zgpg30
TD        32768
SOLVENT   CDC13
NS        256
DS        4
SWH       26178.010 Hz
FIDRES    0.798889 Hz
AQ        0.6259188 sec
RG        32768
DW        19.100 usec
DE        7.50 usec
TE        300.0 K
D1        1.00000000 sec
D11       0.03000000 sec
TD0       1

----- CHANNEL f1 -----
NUC1      13C
P1        9.50 usec
PL1       0.00 dB
SFO1     100.6403931 MHz

----- CHANNEL f2 -----
CPDPRG2   waltz16
NUC2      1H
PCPD2     80.00 usec
PL2       0.00 dB
PL12     19.00 dB
PL13     25.00 dB
SFO2     400.2016008 MHz
SI        32768
SF       100.6303718 MHz
WDW       EM
SSB       0
LB        1.00 Hz
GB        0
PC        1.40
```

14c

Instrument DQX400
Chemist BH
Group MGM
BH4156

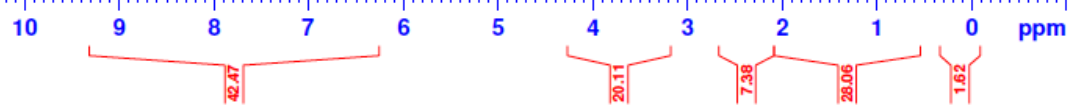
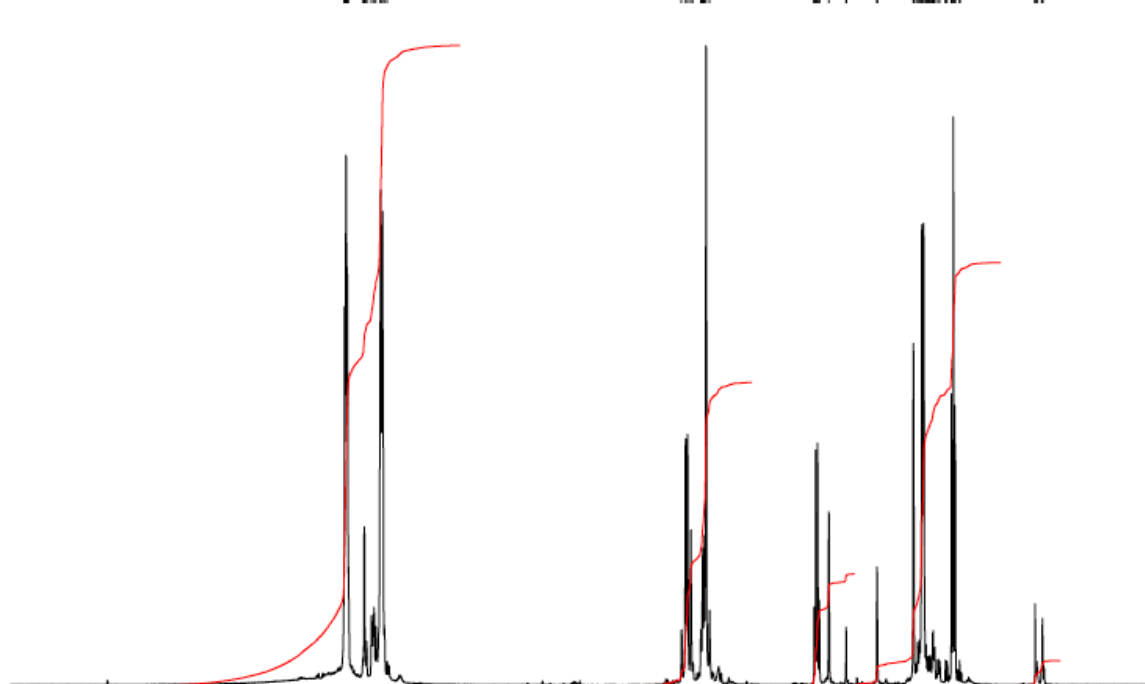
hjacq.au CDC13 (F: NMR2011) mgmgrp 19

NMROCHEM.OX

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NAME Feb09-2011-19
EXPNO 1
PROCNO 1
Date_ 20110210
Time 3.34
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zg60
TD 65536
SOLVENT CDC13
NS 16
DS 2
SWH 8278.146 Hz
FIDRES 0.126314 Hz
AQ 3.9584243 sec
RG 128
DW 60.400 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec

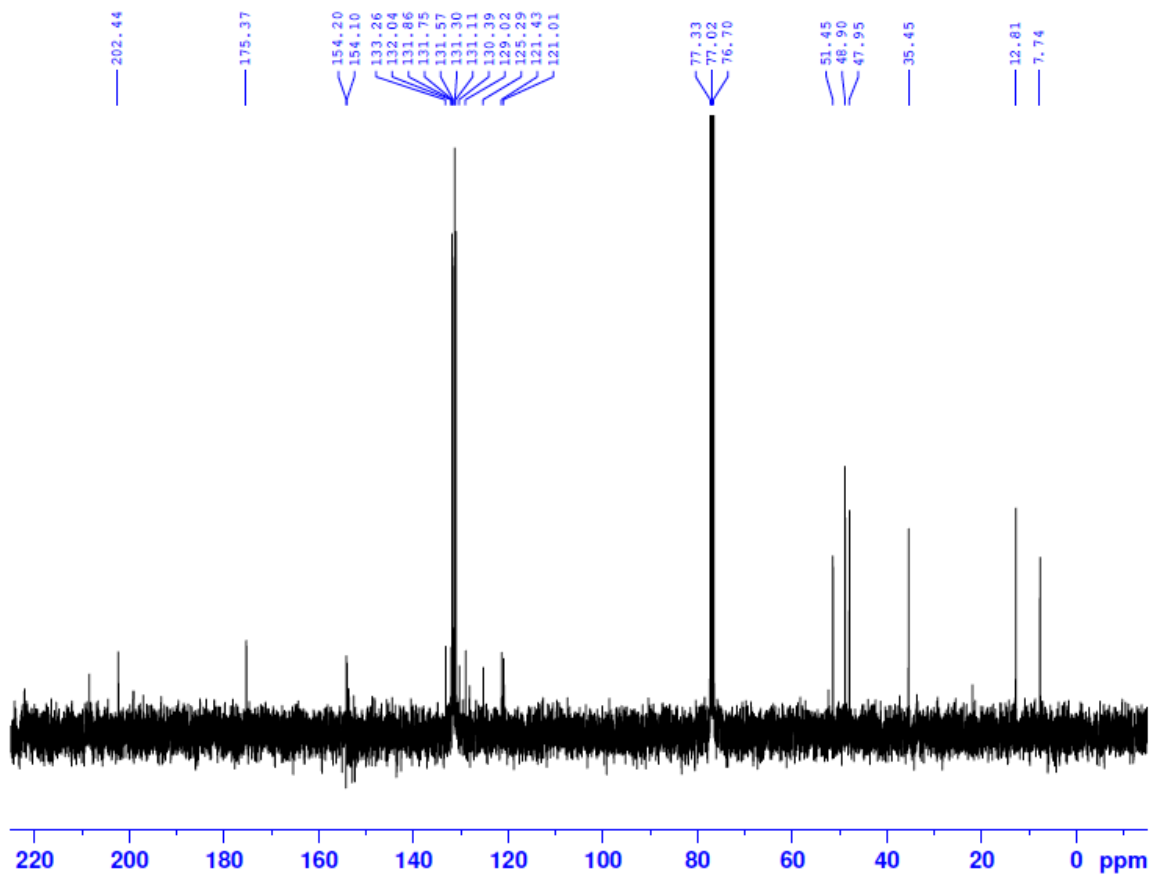
----- CHANNEL f1 -----
NUC1 1H
P1 9.00 usec
PL1 0.00 dB
SFO1 400.2024714 MHz
SI 32768
SF 400.2000028 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



14c

Instrument DQX400
Chemist BH
Group MGM
BH4156
c13acq.au CDC13 (E:\NMR2011) mgmgrp 19

NMR@CHEM.OX



NAME Feb09-2011-19
EXPNO 2
PROCNO 1
Date_ 20110210
Time 3.42
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 32768
SOLVENT CDC13
NS 256
DS 4
SWH 26178.010 Hz
FIDRES 0.798889 Hz
AQ 0.6259188 sec
RG 32768
DW 19.100 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec
D11 0.03000000 sec
TD0 1

----- CHANNEL f1 -----
NUC1 13C
P1 9.50 usec
PL1 0.00 dB
SFO1 100.6403931 MHz

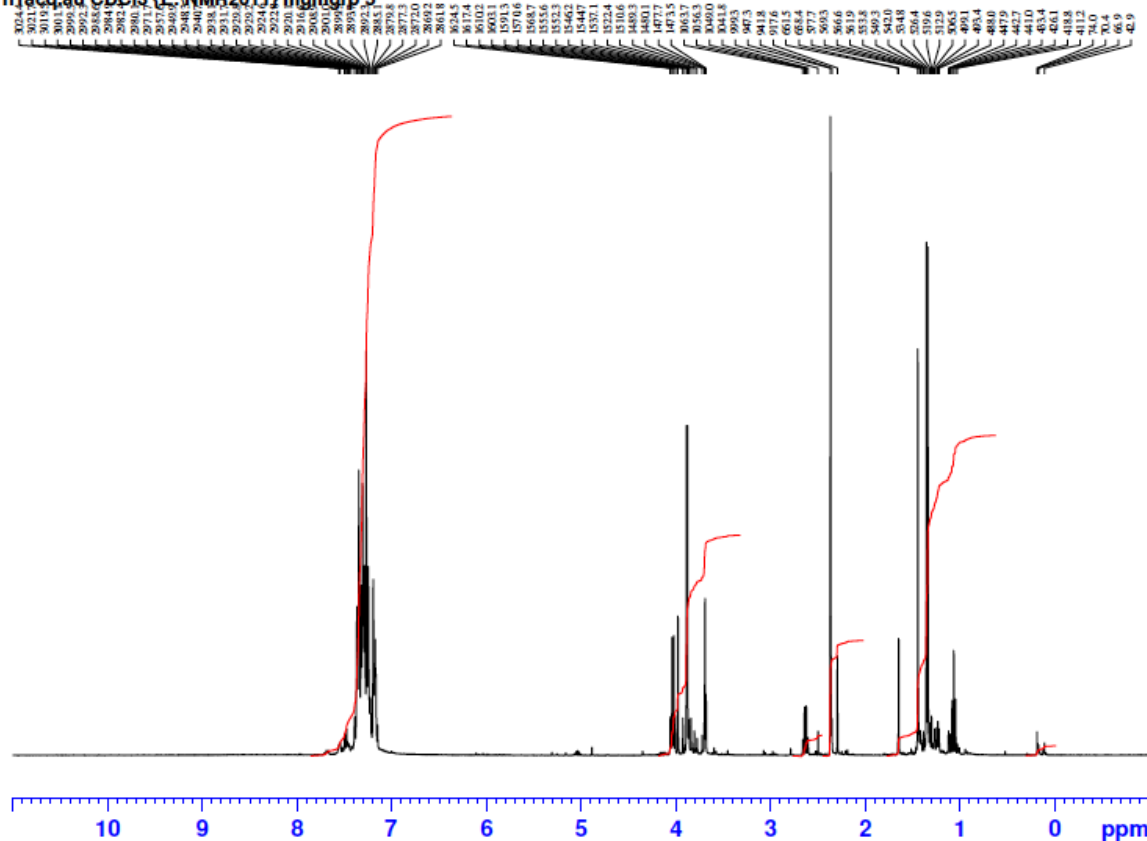
----- CHANNEL f2 -----
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 0.00 dB
PL12 19.00 dB
PL13 25.00 dB
SFO2 400.2016008 MHz
SI 32768
SF 100.6303718 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

14d

Instrument DQX400
Chemist BH
Group MGM
BH4180

hjacq.au CDC13 (F1-NMR2011) mgmgrp 5

NMRCHEM.OX



NAME Mar08-2011-5
EXPNO 1
PROCNO 1
Date_ 20110308
Time 10.16
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zg60
TD 65536
SOLVENT CDC13
NS 16
DS 2
SWH 8278.146 Hz
FIDRES 0.126314 Hz
AQ 3.9584243 sec
RG 228.1
DW 60.400 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec

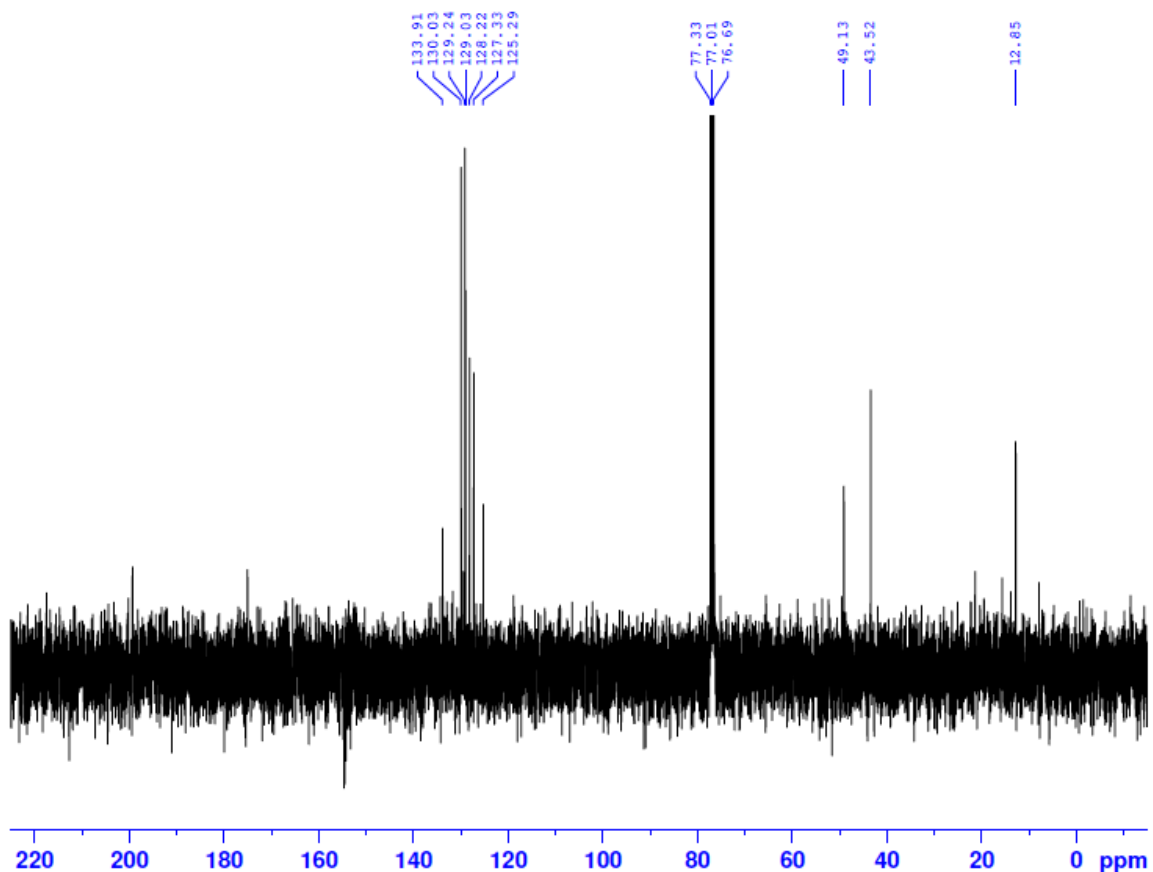
----- CHANNEL f1 -----
NUC1 1H
P1 9.00 usec
PL1 0.00 dB
SFO1 400.2024714 MHz
SI 32768
SF 400.2000028 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

48.22
16.64
1.54
8.70
24.16
0.73

14d

Instrument DQX400
Chemist BH
Group MGM
BH4180
c13acq.au CDC13 (E:\NMR2011) mgmgrp 5

NMR@CHEM.OX

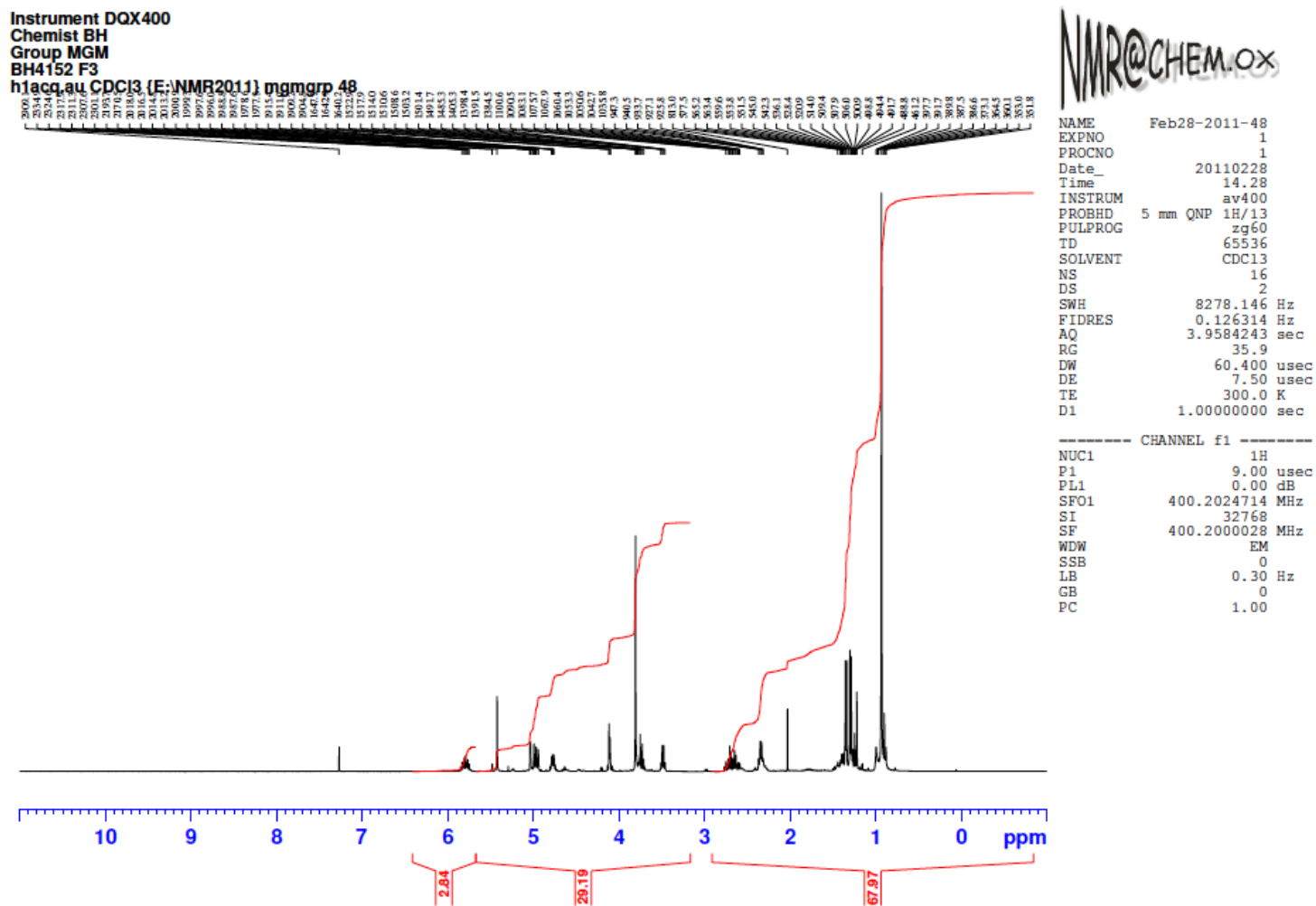


```
NAME      Mar08-2011-5
EXPNO     2
PROCNO    1
Date_     20110308
Time      10.24
INSTRUM   av400
PROBHD    5 mm QNP 1H/13
PULPROG   zgpg30
TD         32768
SOLVENT   CDC13
NS         256
DS         4
SWH       26178.010 Hz
FIDRES    0.798889 Hz
AQ         0.6259188 sec
RG         32768
DW         19.100 usec
DE         7.50 usec
TE         300.0 K
D1         1.00000000 sec
D11        0.03000000 sec
TD0        1

----- CHANNEL f1 -----
NUC1       13C
P1         9.50 usec
PL1        0.00 dB
SFO1       100.6403931 MHz

----- CHANNEL f2 -----
CPDPRG2   waltz16
NUC2       1H
PCPD2     80.00 usec
PL2        0.00 dB
PL12       19.00 dB
PL13       25.00 dB
SFO2       400.2016008 MHz
SI         32768
SF         100.6303718 MHz
WDW        EM
SSB        0
LB         1.00 Hz
GB         0
PC         1.40
```

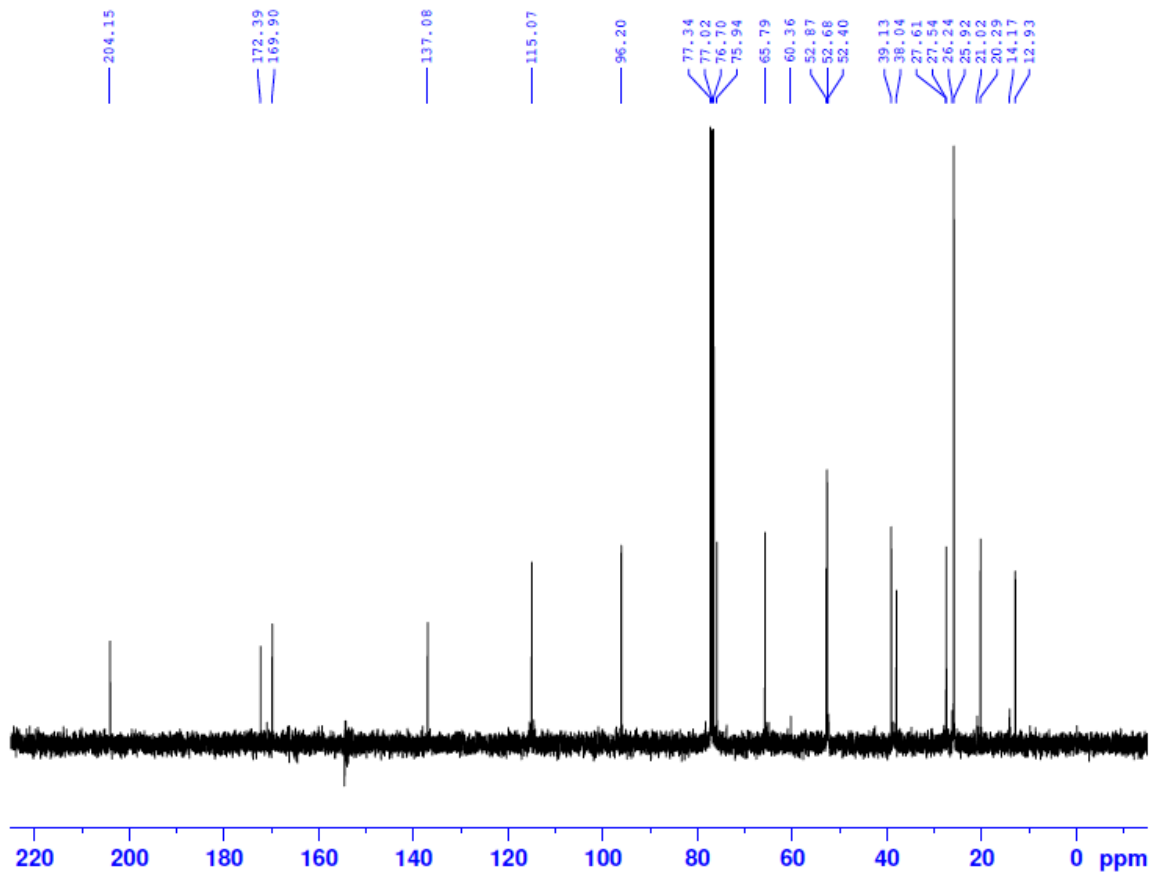
15b'



15b'

Instrument DQX400
 Chemist BH
 Group MGM
 BH4152 F3
 c13acq.au CDC13 (E:\NMR2011) mgmgrp 48

NMR@CHEM.OX



```

NAME      Feb28-2011-48
EXPNO     2
PROCNO    1
Date_     20110228
Time      14.36
INSTRUM   av400
PROBHD    5 mm QNP 1H/13
PULPROG   zgpg30
TD         32768
SOLVENT   CDC13
NS         256
DS         4
SWH        26178.010 Hz
FIDRES     0.798889 Hz
AQ         0.6259188 sec
RG         32768
DW         19.100 usec
DE         7.50 usec
TE         300.0 K
D1         1.00000000 sec
D11        0.03000000 sec
TD0        1
  
```

```

----- CHANNEL f1 -----
NUC1      13C
P1        9.50 usec
PL1       0.00 dB
SFO1     100.6403931 MHz
  
```

```

----- CHANNEL f2 -----
CPDPRG2   waltz16
NUC2      1H
PCPD2     80.00 usec
PL2       0.00 dB
PL12     19.00 dB
PL13     25.00 dB
SFO2     400.2016008 MHz
SI        32768
SF       100.6303718 MHz
WDW       EM
SSB       0
LB        1.00 Hz
GB        0
PC        1.40
  
```

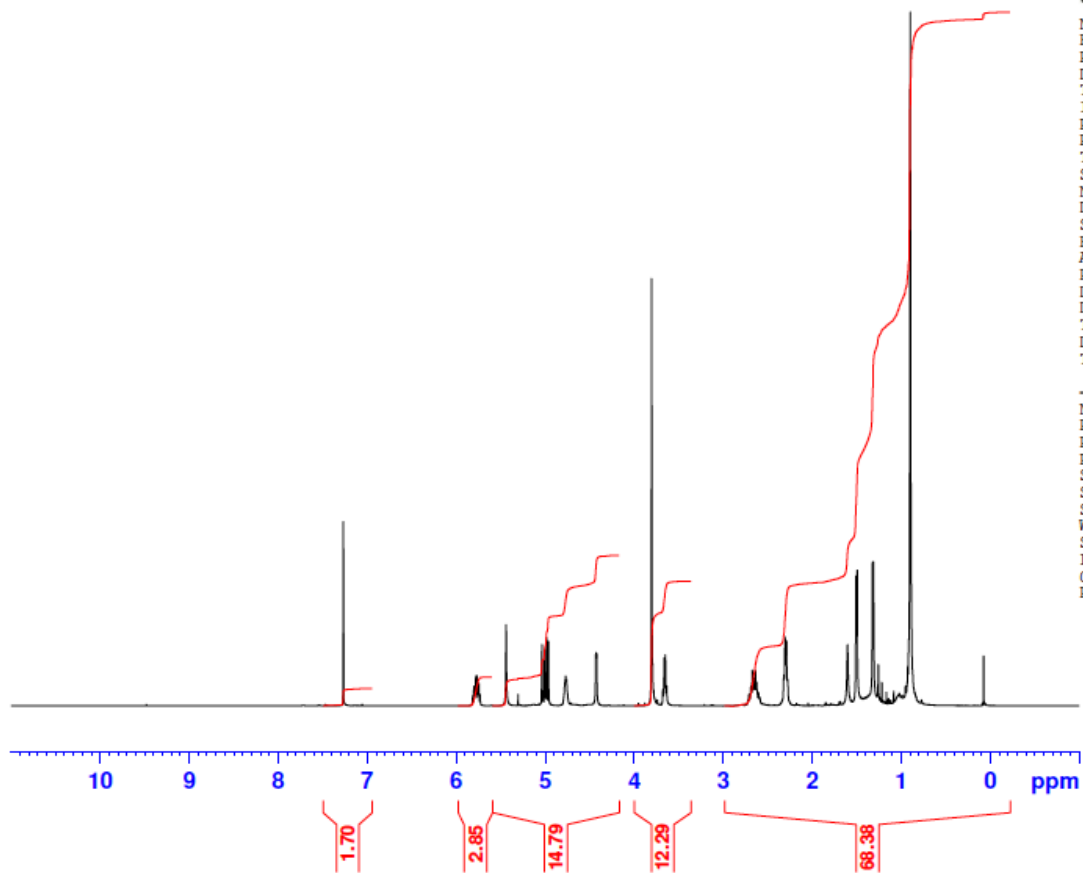
15b

Instrument AVC500
Group MGM
3432 Beth Heavside 31/3/11

NMRO@CHEM.OX

NAME bh34323103
EXPNO 1
PROCNO 1
Date_ 20110403
Time_ 21.27
INSTRUM avc500
PROBHD 5 mm CPDUL 13C
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 10330.578 Hz
FIDRES 0.157632 Hz
AQ 3.1719923 sec
RG 4
DW 48.400 usec
DE 6.00 usec
TE 298.0 K
D1 1.00000000 sec
TD0 1

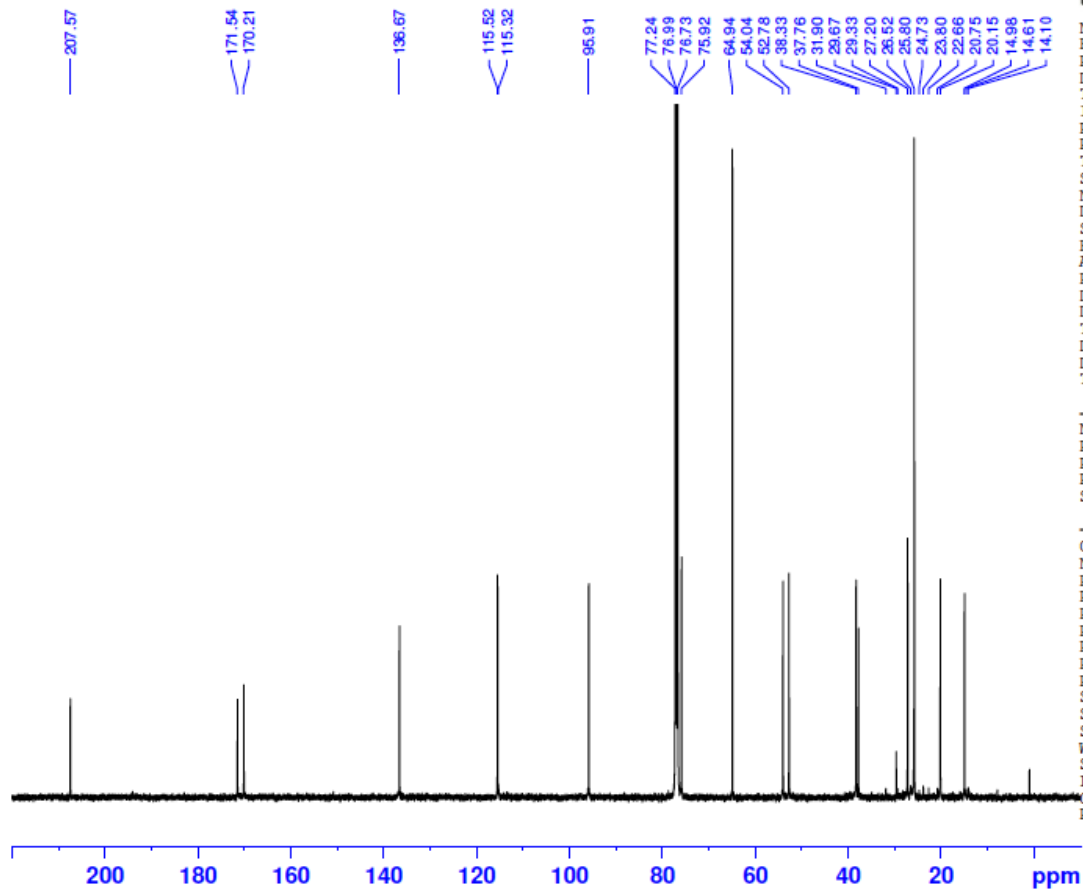
----- CHANNEL f1 -----
NUC1 1H
P1 9.60 usec
PL1 -6.00 dB
PL1W 15.19999981 W
SFO1 500.3030896 MHz
SI 32768
SF 500.3000240 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



15b

Instrument AVC500
Group MGM
3432 Beth Heaviside 31/3/11

NMR@CHEM.OX



```
NAME          bh34323103
EXPNO         3
PROCNO        1
Date_         20110403
Time_         23.21
INSTRUM       avc500
PROBHD        5 mm CPDUL 13C
PULPROG       zgpg30
TD            65536
SOLVENT       CDC13
NS            1024
DS            2
SWH           31250.000 Hz
FIDRES        0.476837 Hz
AQ            1.0486259 sec
RG            1820
DW            16.000 usec
DE            20.00 usec
TE            298.0 K
D1            2.00000000 sec
D11           0.03000000 sec
TD0           1

----- CHANNEL f1 -----
NUC1          13C
P1            9.50 usec
PL1           -4.40 dB
PL1W          28.15752029 W
SFO1          125.8131151 MHz

----- CHANNEL f2 -----
CPDPRG2       waltz16
NUC2          1H
PCPD2         80.00 usec
PL2           -6.00 dB
PL12          12.42 dB
PL13          18.42 dB
PL2W          15.19999981 W
PL12W         0.21869738 W
PL13W         0.05493430 W
SFO2          500.3020012 MHz
SI            32768
SF            125.8005438 MHz
WDW           EM
SSB           0
LB            1.00 Hz
GB            0
PC            1.40
```

15c'

Instrument DQX400
Chemist BH
Group MGM
BH4160 F3
h1acq.au CDC13 {E:\NMR2011\mgmgrp 54

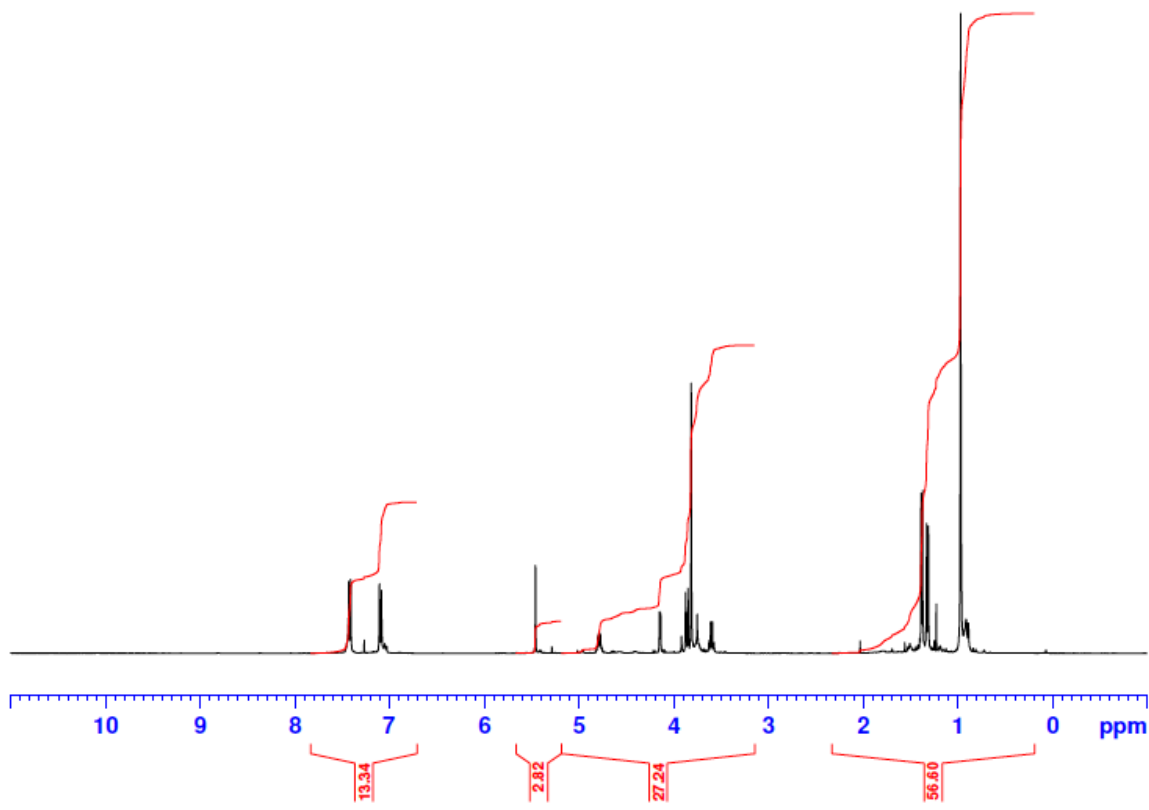
NMROCHEM.OX

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140.4
140.2
140.0

NAME	Feb17-2011-54
EXPNO	1
PROCNO	1
Date_	20110218
Time	7.59
INSTRUM	av400
PROBHD	5 mm QNP 1H/13
PULPROG	zg60
TD	65536
SOLVENT	CDC13
NS	16
DS	2
SWH	8278.146 Hz
FIDRES	0.126314 Hz
AQ	3.9584243 sec
RG	35.9
DW	60.400 usec
DE	7.50 usec
TE	300.0 K
D1	1.00000000 sec

----- CHANNEL f1 -----

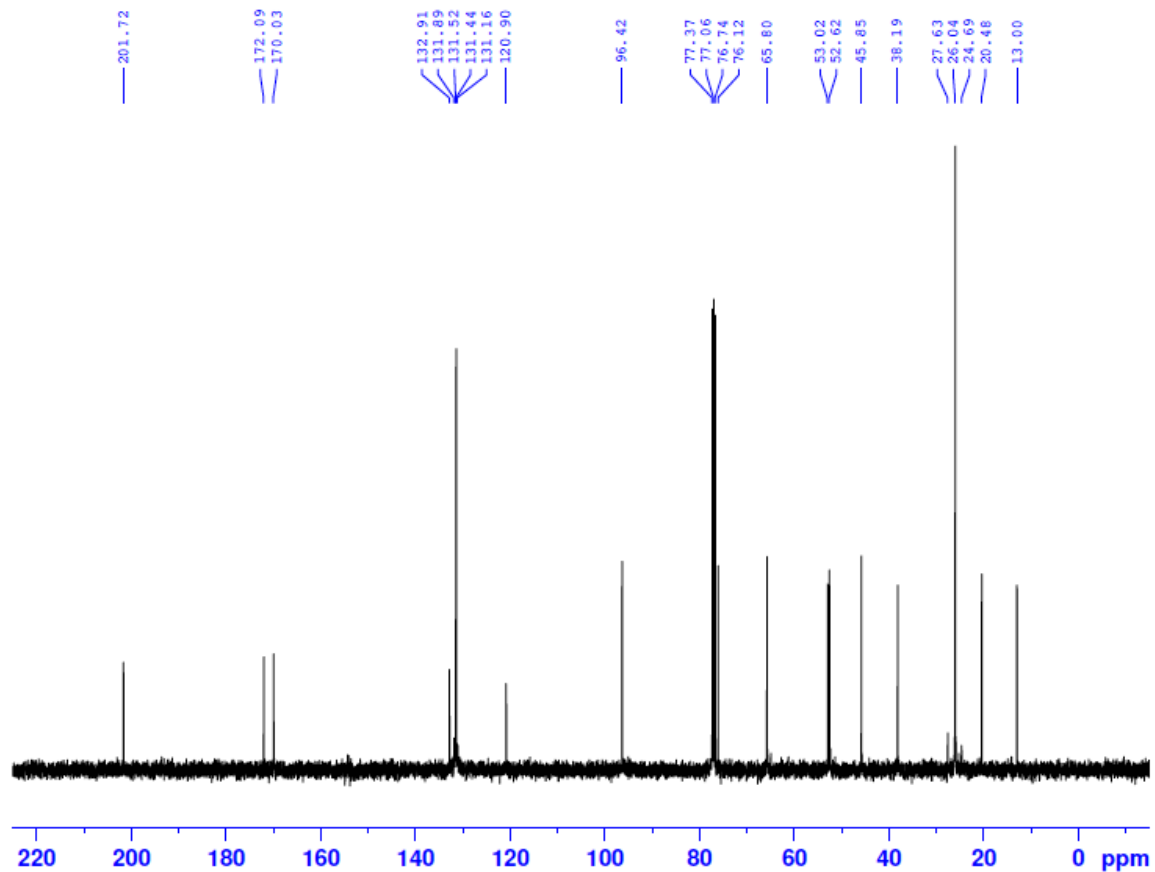
NUC1	1H
P1	9.00 usec
PL1	0.00 dB
SFO1	400.2024714 MHz
SI	32768
SF	400.2000028 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00



15c'

Instrument DQX400
Chemist BH
Group MGM
BH4160 F3
c13acq.au CDC13 (E:\NMR2011) mgmgrp 54

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```
NAME      Feb17-2011-54
EXPNO     2
PROCNO    1
Date_     20110218
Time      8.07
INSTRUM   av400
PROBHD    5 mm QNP 1H/13
PULPROG   zgpg30
TD         32768
SOLVENT   CDC13
NS         256
DS         4
SWH        26178.010 Hz
FIDRES     0.798889 Hz
AQ         0.6259188 sec
RG         32768
DW         19.100 usec
DE         7.50 usec
TE         300.0 K
D1         1.00000000 sec
D11        0.03000000 sec
TD0        1

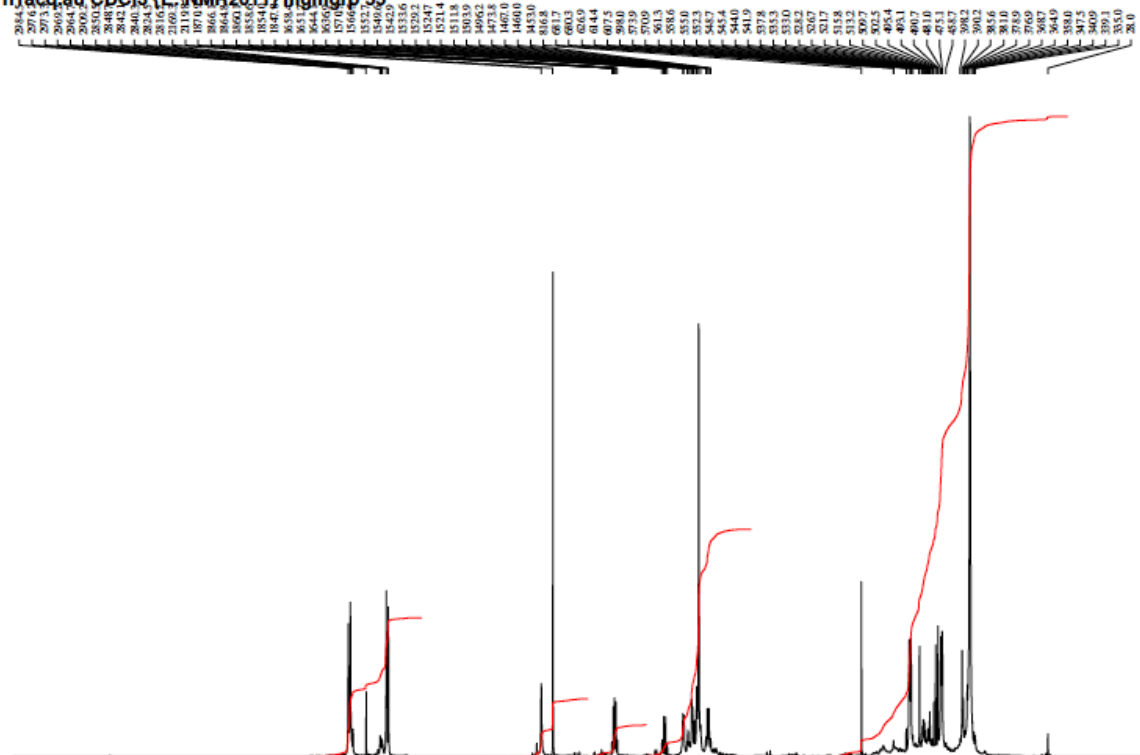
----- CHANNEL f1 -----
NUC1       13C
P1         9.50 usec
PL1        0.00 dB
SFO1       100.6403931 MHz

----- CHANNEL f2 -----
CPDPRG2   waltz16
NUC2       1H
PCPD2     80.00 usec
PL2        0.00 dB
PL12       19.00 dB
PL13       25.00 dB
SFO2       400.2016008 MHz
SI         32768
SF         100.6303718 MHz
WDW        EM
SSB        0
LB         1.00 Hz
GB         0
PC         1.40
```


15c

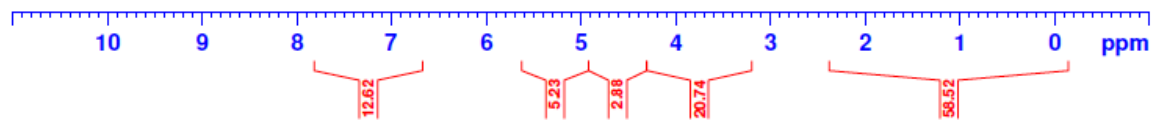
Instrument DQX400
Chemist BH
Group MGM
BH4160 F2
hjacq.au CDC13 (F1-NMR2011) mgmgrp 55

NMROCHEM.OX



NAME Feb17-2011-54
EXPNO 6
PROCNO 1
Date_ 20110218
Time 8.27
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zg60
TD 65536
SOLVENT CDC13
NS 16
DS 2
SWH 8278.146 Hz
FIDRES 0.126314 Hz
AQ 3.9584243 sec
RG 90.5
DW 60.400 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec

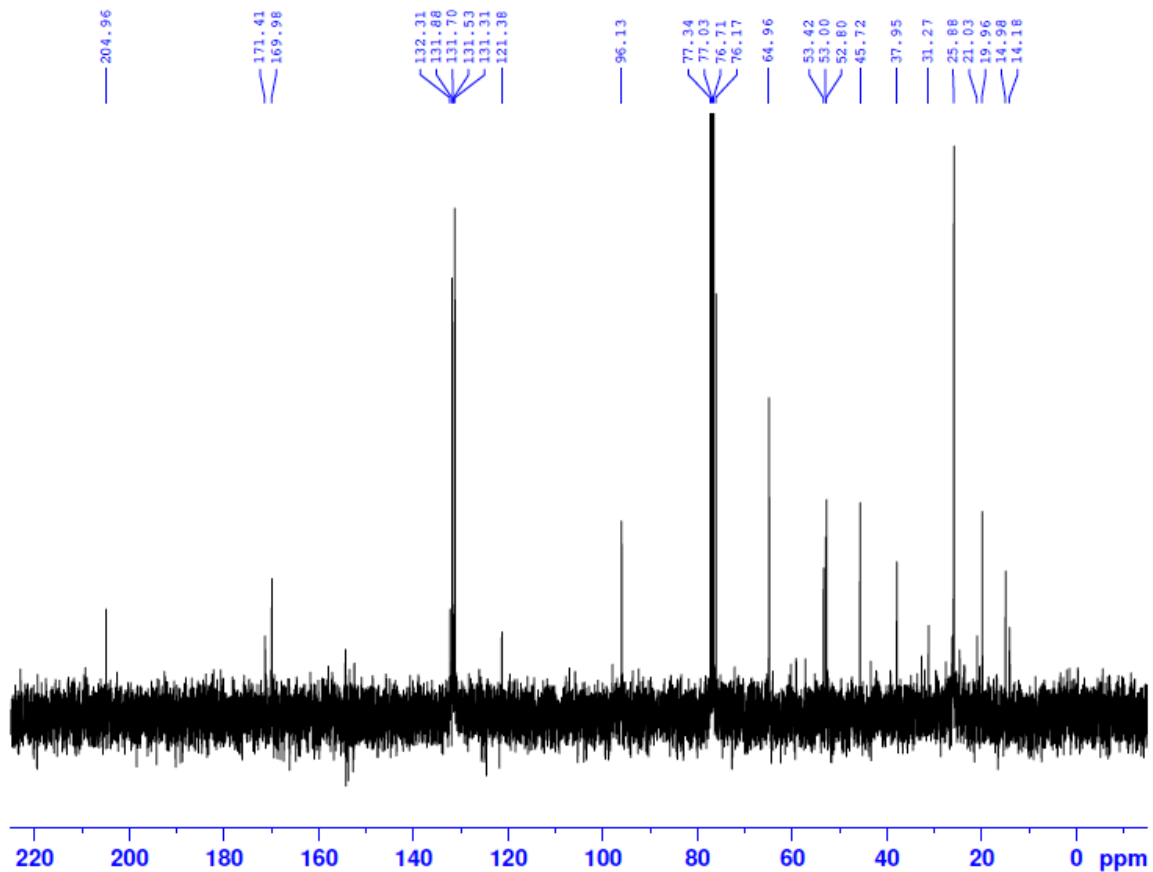
----- CHANNEL f1 -----
NUC1 1H
P1 9.00 usec
PL1 0.00 dB
SFO1 400.2024714 MHz
SI 32768
SF 400.2000028 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



15c

Instrument DQX400
Chemist BH
Group MGM
BH4160 F2
c13acq.au CDC13 (E:\NMR2011) mgmgrp 55

NMR@CHEM.OX



NAME Feb17-2011-54
EXPNO 7
PROCNO 1
Date_ 20110218
Time 8.35
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 32768
SOLVENT CDC13
NS 256
DS 4
SWH 26178.010 Hz
FIDRES 0.798889 Hz
AQ 0.6259188 sec
RG 32768
DW 19.100 usec
DE 7.50 usec
TE 300.0 K
D1 1.0000000 sec
D11 0.0300000 sec
TD0 1

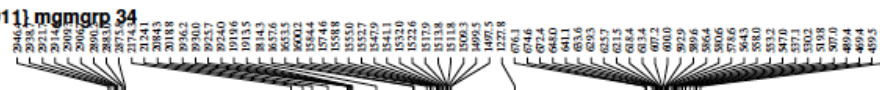
----- CHANNEL f1 -----
NUC1 13C
P1 9.50 usec
PL1 0.00 dB
SFO1 100.6403931 MHz

----- CHANNEL f2 -----
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 0.00 dB
PL12 19.00 dB
PL13 25.00 dB
SFO2 400.2016008 MHz
SI 32768
SF 100.6303718 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

15d'

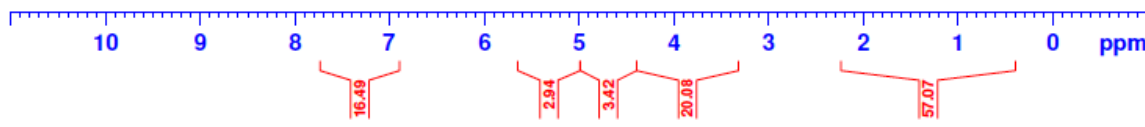
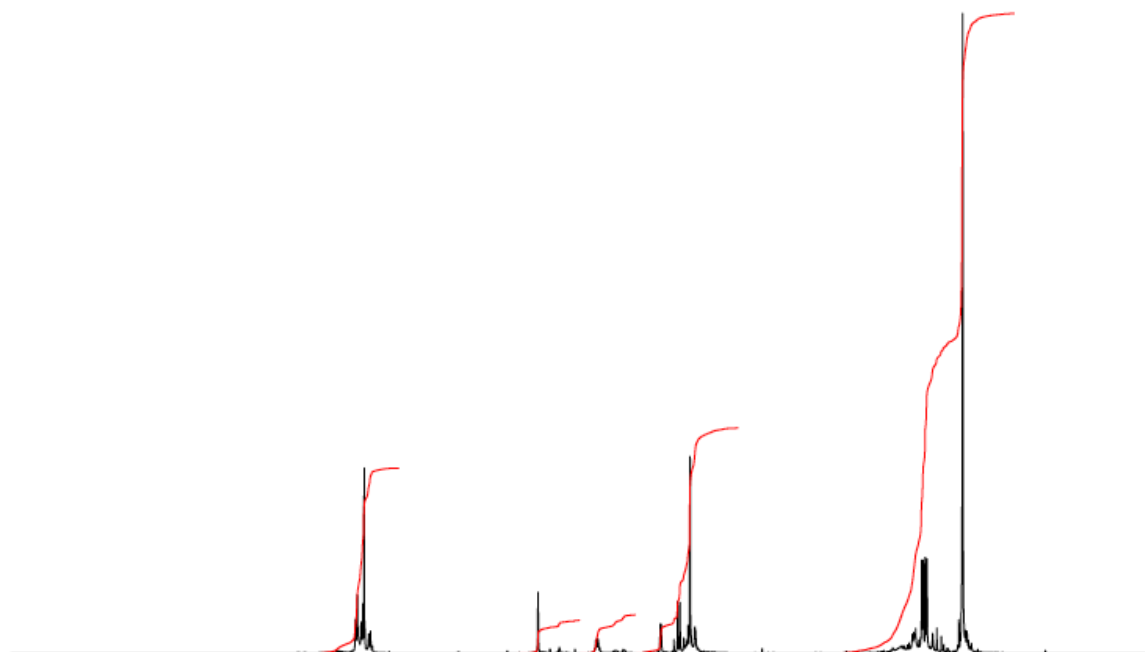
Instrument DQX400
Chemist BH
Group MGM
BH4182 F6
h1acq.au CDC13 {E:\NMR2011\mgmgrp 34

NMROCHEM.OX



NAME Mar10-2011-33
EXPNO 6
PROCNO 1
Date_ 20110311
Time 17.23
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zg60
TD 65536
SOLVENT CDC13
NS 16
DS 2
SWH 8278.146 Hz
FIDRES 0.126314 Hz
AQ 3.9584243 sec
RG 256
DW 60.400 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec

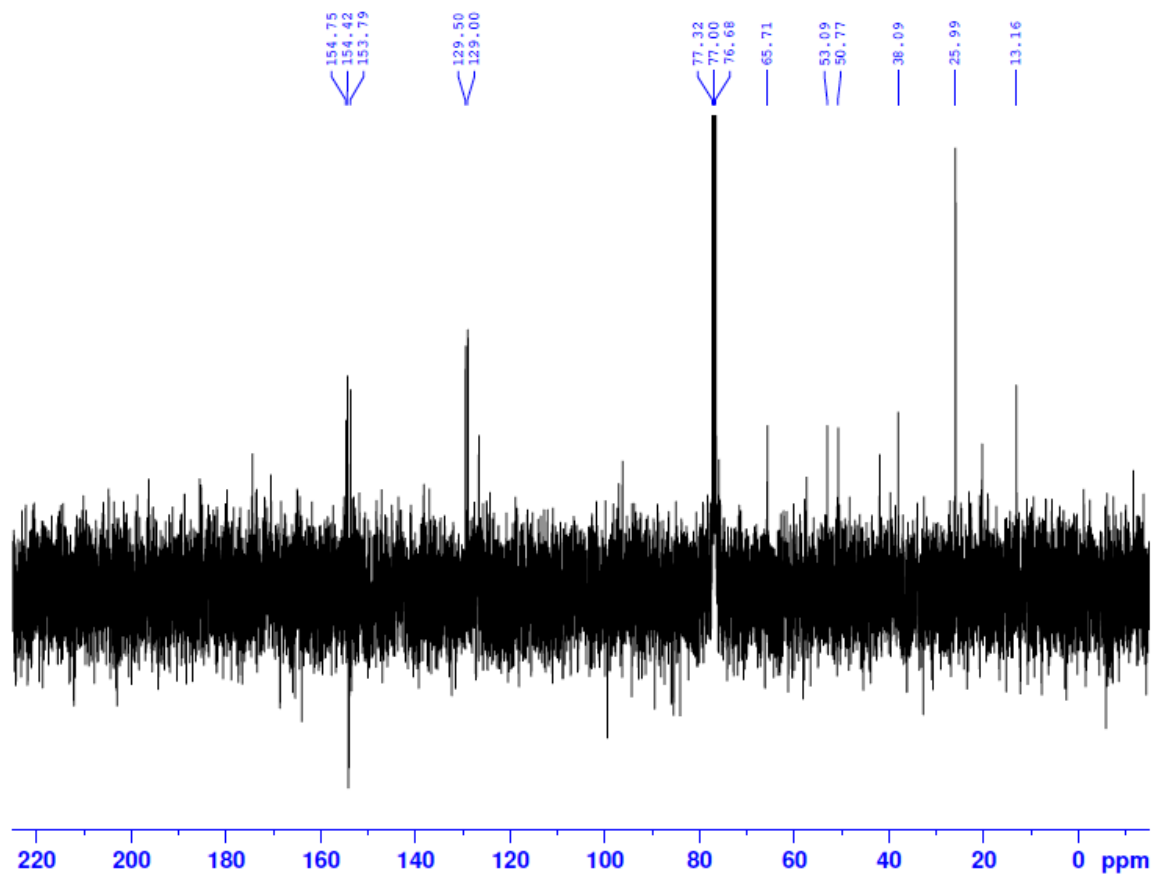
----- CHANNEL f1 -----
NUC1 1H
P1 9.00 usec
PL1 0.00 dB
SFO1 400.2024714 MHz
SI 32768
SF 400.2000028 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



15d'

Instrument DQX400
Chemist BH
Group MGM
BH4182 F6
c13acq.au CDC13 (E:\NMR2011) mgmgrp 34

NMR@CHEM.OX



```
NAME Mar10-2011-33
EXPNO 7
PROCNO 1
Date_ 20110311
Time 17.31
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 32768
SOLVENT CDC13
NS 256
DS 4
SWH 26178.010 Hz
FIDRES 0.798889 Hz
AQ 0.6259188 sec
RG 32768
DW 19.100 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec
D11 0.03000000 sec
TD0 1

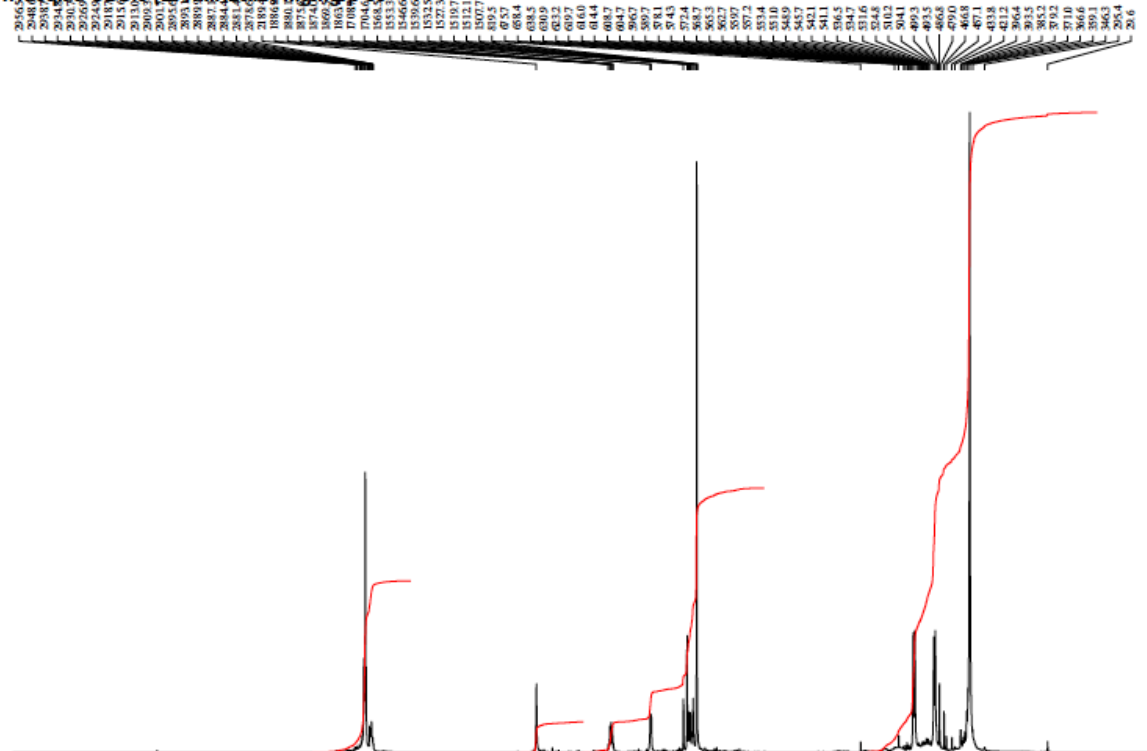
----- CHANNEL f1 -----
NUC1 13C
P1 9.50 usec
PL1 0.00 dB
SFO1 100.6403931 MHz

----- CHANNEL f2 -----
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 0.00 dB
PL12 19.00 dB
PL13 25.00 dB
SFO2 400.2016008 MHz
SI 32768
SF 100.6303718 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
```

15d

Instrument DQX400
Chemist BH
Group MGM
BH4182 F5
hjacq.au CDC13 (E: NMR2011) mgmgrp 33

NMRCHEM.OX



NAME	Mar10-2011-33
EXPNO	1
PROCNO	1
Date_	20110311
Time	16.54
INSTRUM	av400
PROBHD	5 mm QNP 1H/13
PULPROG	zg60
TD	65536
SOLVENT	CDC13
NS	16
DS	2
SWH	8278.146 Hz
FIDRES	0.126314 Hz
AQ	3.9584243 sec
RG	90.5
DW	60.400 usec
DE	7.50 usec
TE	300.0 K
D1	1.00000000 sec
----- CHANNEL f1 -----	
NUC1	1H
P1	9.00 usec
PL1	0.00 dB
SFO1	400.2024714 MHz
SI	32768
SF	400.2000028 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

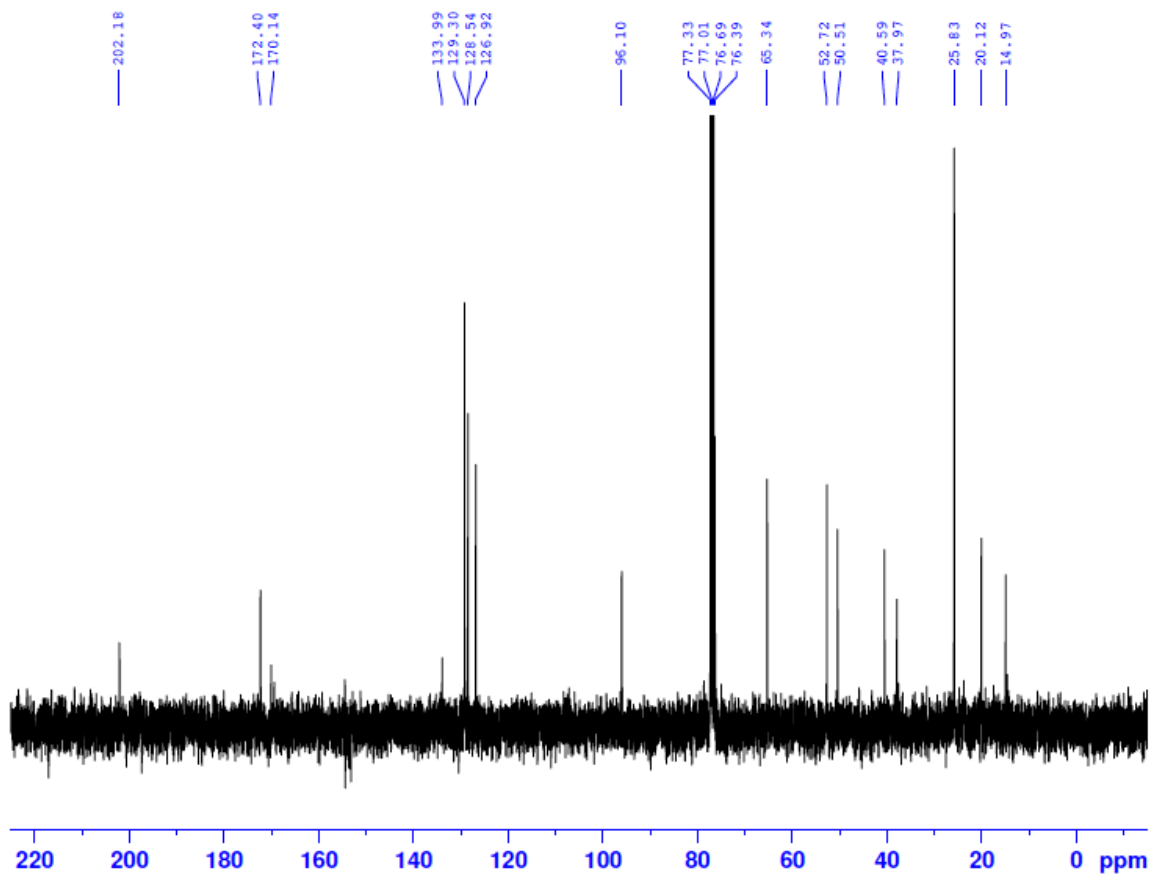
10 9 8 7 6 5 4 3 2 1 0 ppm

15.50 2.73 20.88 57.89

15d

Instrument DQX400
Chemist BH
Group MGM
BH4182 F5
c13acq.au CDC13 (E:\NMR2011) mgmgrp 33

NMR@CHEM.OX

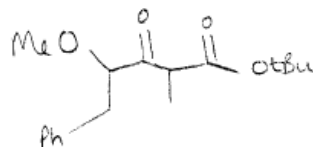


```
NAME Mar10-2011-33
EXPNO 2
PROCNO 1
Date_ 20110311
Time 17.02
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 32768
SOLVENT CDC13
NS 256
DS 4
SWH 26178.010 Hz
FIDRES 0.798889 Hz
AQ 0.6259188 sec
RG 32768
DW 19.100 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec
D11 0.03000000 sec
TD0 1

----- CHANNEL f1 -----
NUC1 13C
P1 9.50 usec
PL1 0.00 dB
SFO1 100.6403931 MHz

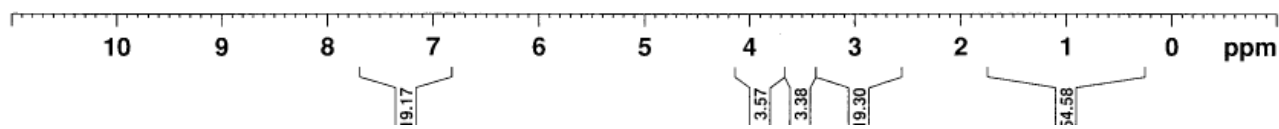
----- CHANNEL f2 -----
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 0.00 dB
PL12 19.00 dB
PL13 25.00 dB
SFO2 400.2016008 MHz
SI 32768
SF 100.6303718 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
```

Instrument DQX400
 Chemist BH
 Group MGM
 BH3200 F1+2
 h1acq au CDC13 (C-NMB) mgmgrp 52

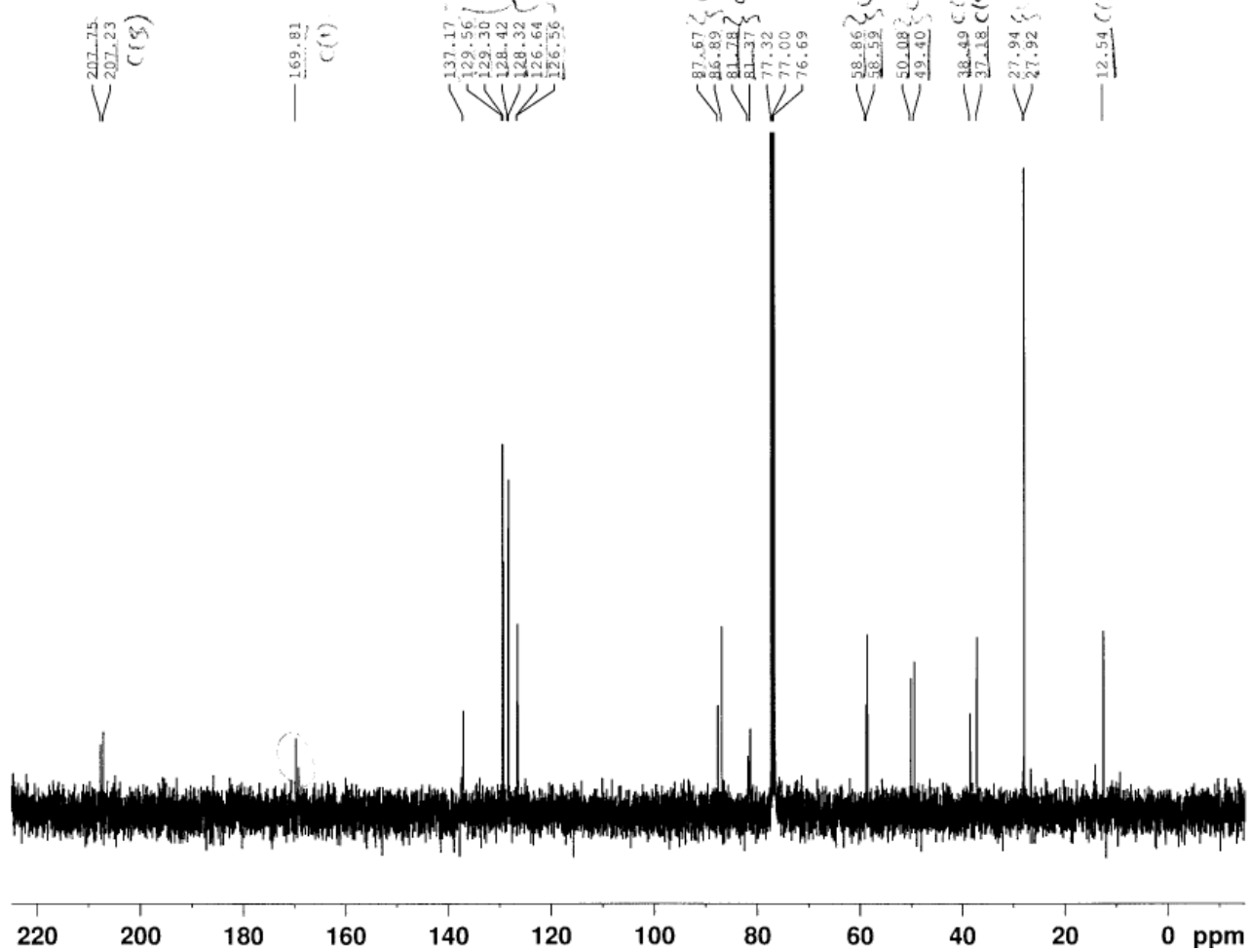


NAME Sep07-2010-52
 EXPNO 1
 PROCNO 1
 Date_ 20100907
 Time 10.40
 INSTRUM av400
 PROBHD 5 mm QNP 1H/13
 PULPROG zg60
 TD 65536
 SOLVENT CDC13
 NS 16
 DS 2
 SWH 8278.146 H
 FIDRES 0.126314 H
 AQ 3.9584243 s
 RG 128
 DW 60.400 u
 DE 7.50 u
 TE 300.0 K
 D1 1.00000000 s

----- CHANNEL f1 -----
 NUC1 1H
 P1 9.00 u
 PL1 0.00 dB
 SFO1 400.2024714 MHz
 SI 32768
 SF 400.2000028 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00



Instrument DQX400
 Chemist BH
 Group MGM
 BH3200 F1+2
 c13acq.au CDC13 {C:NMR} mgmgrp 52



```

NAME      Sep07-2010-52
EXPNO     2
PROCNO    1
Date_     20100907
Time      10.48
INSTRUM   av400
PROBHD    5 mm QNP 1H/13
PULPROG   zgpg30
TD         32768
SOLVENT   CDC13
NS         256
DS         4
SWH        26178.010 F
FIDRES     0.798889 F
AQ         0.6259188 s
RG         32768
DW         19.100 u
DE         7.50 u
TE         300.0 K
D1         1.0000000 s
D11        0.0300000 s
TD0        1
  
```

```

===== CHANNEL f1 =====
NUC1      13C
P1        9.50 u
PL1       0.00 c
SFO1     100.6403931 M
  
```

```

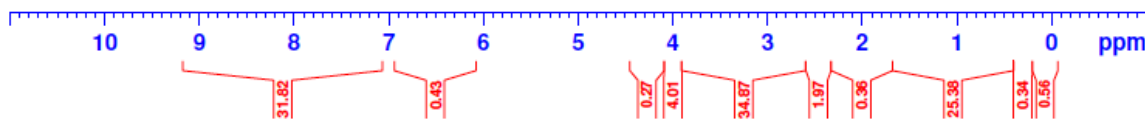
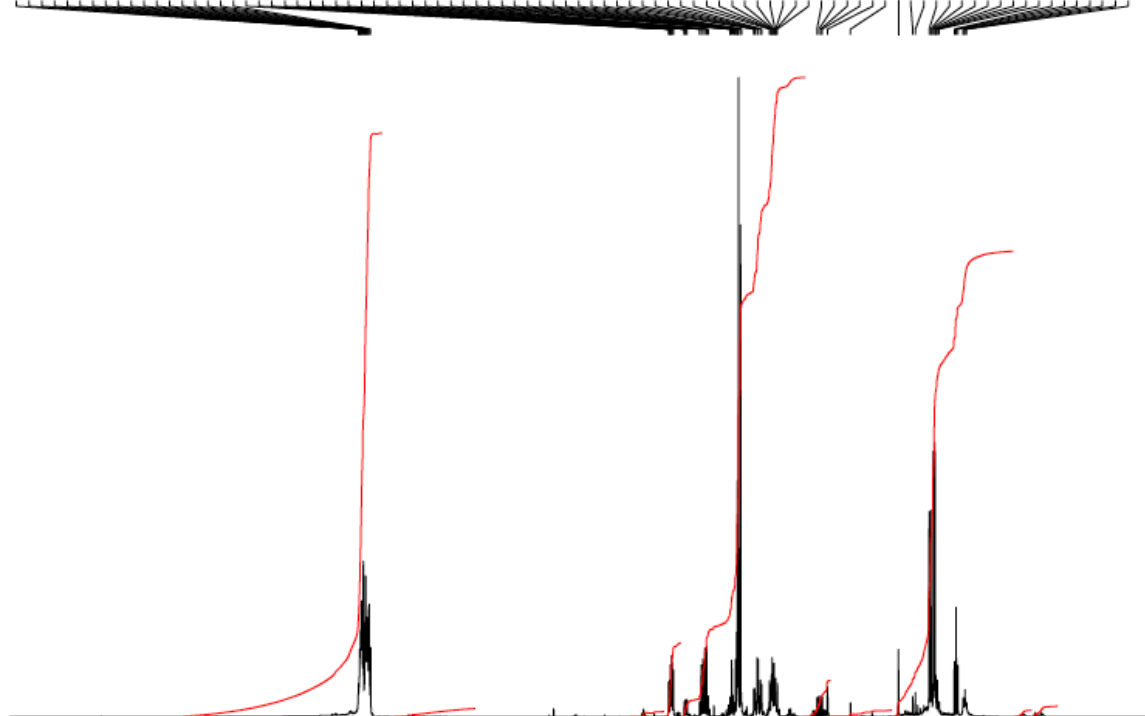
===== CHANNEL f2 =====
CPDPRG2   waltz16
NUC2      1H
PCPD2     80.00 u
PL2       0.00 c
PL12      19.00 c
PL13      25.00 c
SFO2     400.2016008 M
SI        32768
SF        100.6303718 M
WDW       EM
SSB       0
LB        1.00 F
GB        0
PC        1.40
  
```


Instrument DQX400
 Chemist BH
 Group MGM
 BH3206

h1acq au CDCl3 (C:NMB) mgmgrp 44

NMRCHEM.OX

3540 3530 3520 3510 3500 3490 3480 3470 3460 3450 3440 3430 3420 3410 3400 3390 3380 3370 3360 3350 3340 3330 3320 3310 3300 3290 3280 3270 3260 3250 3240 3230 3220 3210 3200 3190 3180 3170 3160 3150 3140 3130 3120 3110 3100 3090 3080 3070 3060 3050 3040 3030 3020 3010 3000 2990 2980 2970 2960 2950 2940 2930 2920 2910 2900 2890 2880 2870 2860 2850 2840 2830 2820 2810 2800 2790 2780 2770 2760 2750 2740 2730 2720 2710 2700 2690 2680 2670 2660 2650 2640 2630 2620 2610 2600 2590 2580 2570 2560 2550 2540 2530 2520 2510 2500 2490 2480 2470 2460 2450 2440 2430 2420 2410 2400 2390 2380 2370 2360 2350 2340 2330 2320 2310 2300 2290 2280 2270 2260 2250 2240 2230 2220 2210 2200 2190 2180 2170 2160 2150 2140 2130 2120 2110 2100 2090 2080 2070 2060 2050 2040 2030 2020 2010 2000 1990 1980 1970 1960 1950 1940 1930 1920 1910 1900 1890 1880 1870 1860 1850 1840 1830 1820 1810 1800 1790 1780 1770 1760 1750 1740 1730 1720 1710 1700 1690 1680 1670 1660 1650 1640 1630 1620 1610 1600 1590 1580 1570 1560 1550 1540 1530 1520 1510 1500 1490 1480 1470 1460 1450 1440 1430 1420 1410 1400 1390 1380 1370 1360 1350 1340 1330 1320 1310 1300 1290 1280 1270 1260 1250 1240 1230 1220 1210 1200 1190 1180 1170 1160 1150 1140 1130 1120 1110 1100 1090 1080 1070 1060 1050 1040 1030 1020 1010 1000 990 980 970 960 950 940 930 920 910 900 890 880 870 860 850 840 830 820 810 800 790 780 770 760 750 740 730 720 710 700 690 680 670 660 650 640 630 620 610 600 590 580 570 560 550 540 530 520 510 500 490 480 470 460 450 440 430 420 410 400 390 380 370 360 350 340 330 320 310 300 290 280 270 260 250 240 230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0



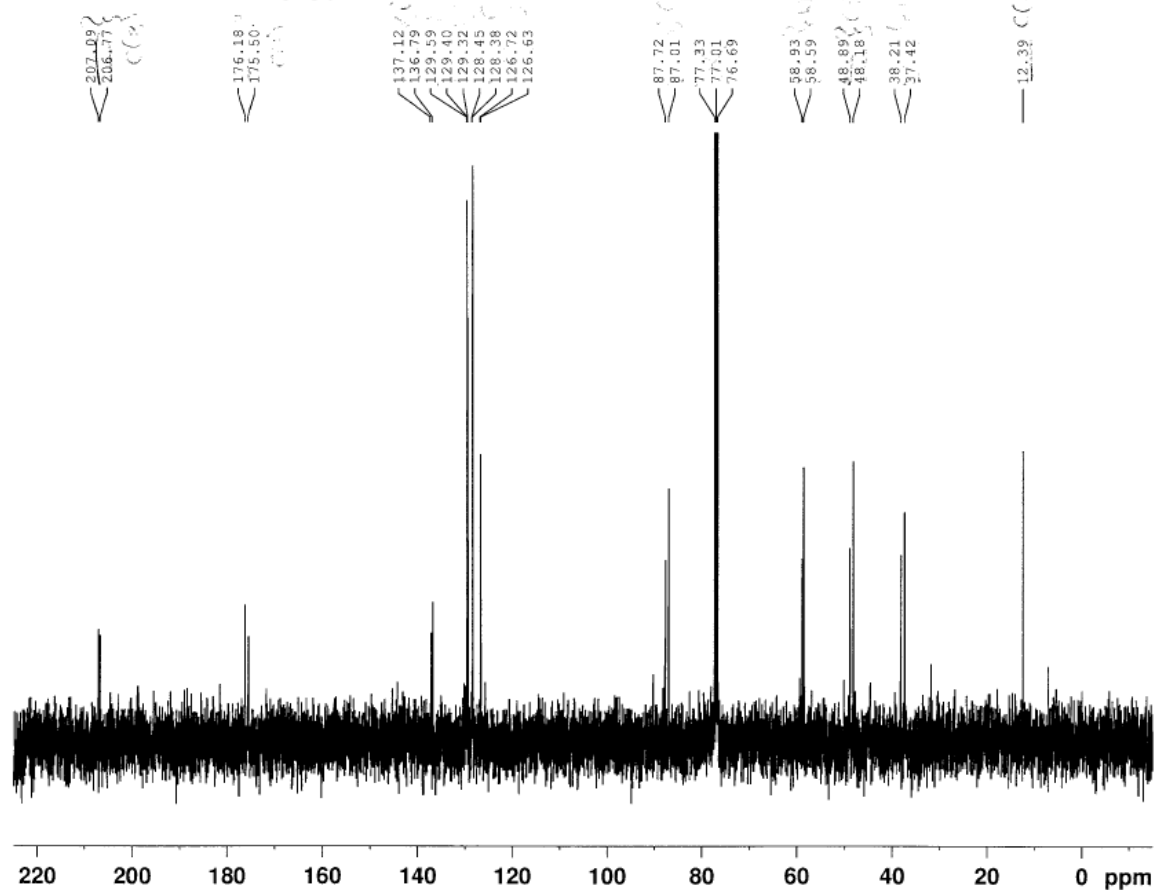
```

NAME          Sep13-2010-44
EXPNO         1
PROCNO        1
Date_         20100913
Time          17.02
INSTRUM       av400
PROBHD        5 mm QNP 1H/13
PULPROG       zg60
TD            65536
SOLVENT       CDCl3
NS            16
DS            2
SWH           8278.146 Hz
FIDRES        0.126314 Hz
AQ            3.9584243 sec
RG            128
DW            60.400 usec
DE            7.50 usec
TE            300.0 K
D1            1.00000000 sec

----- CHANNEL f1 -----
NUC1          1H
P1            9.00 usec
PL1           0.00 dB
SFO1          400.2024714 MHz
SI            32768
SF            400.2000028 MHz
WDW           EM
SSB           0
LB            0.30 Hz
GB            0
PC            1.00
  
```

Instrument DQX400
 Chemist BH
 Group MGM
 BH3206
 c13acq.au CDC13 {C:\NMR} mgmgrp 44

NMR@CHEM.OX



```

NAME      Sep13-2010-44
EXPNO     3
PROCNO    1
Date_     20100913
Time      17.14
INSTRUM   av400
PROBHD    5 mm QNP 1H/13
PULPROG   zgpg30
TD         32768
SOLVENT   CDC13
NS         256
DS         4
SWH        26178.010 |
FIDRES     0.798889 |
AQ         0.6259188 |
RG         32768
DW         19.100 |
DE         7.50 |
TE         300.0 |
D1         1.00000000 |
D11        0.03000000 |
TD0        1
  
```

```

===== CHANNEL f1 =====
NUC1       13C
P1         9.50 |
PL1        0.00 |
SFO1       100.6403931 |
  
```

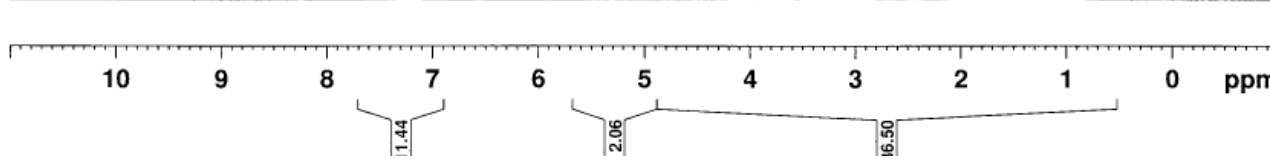
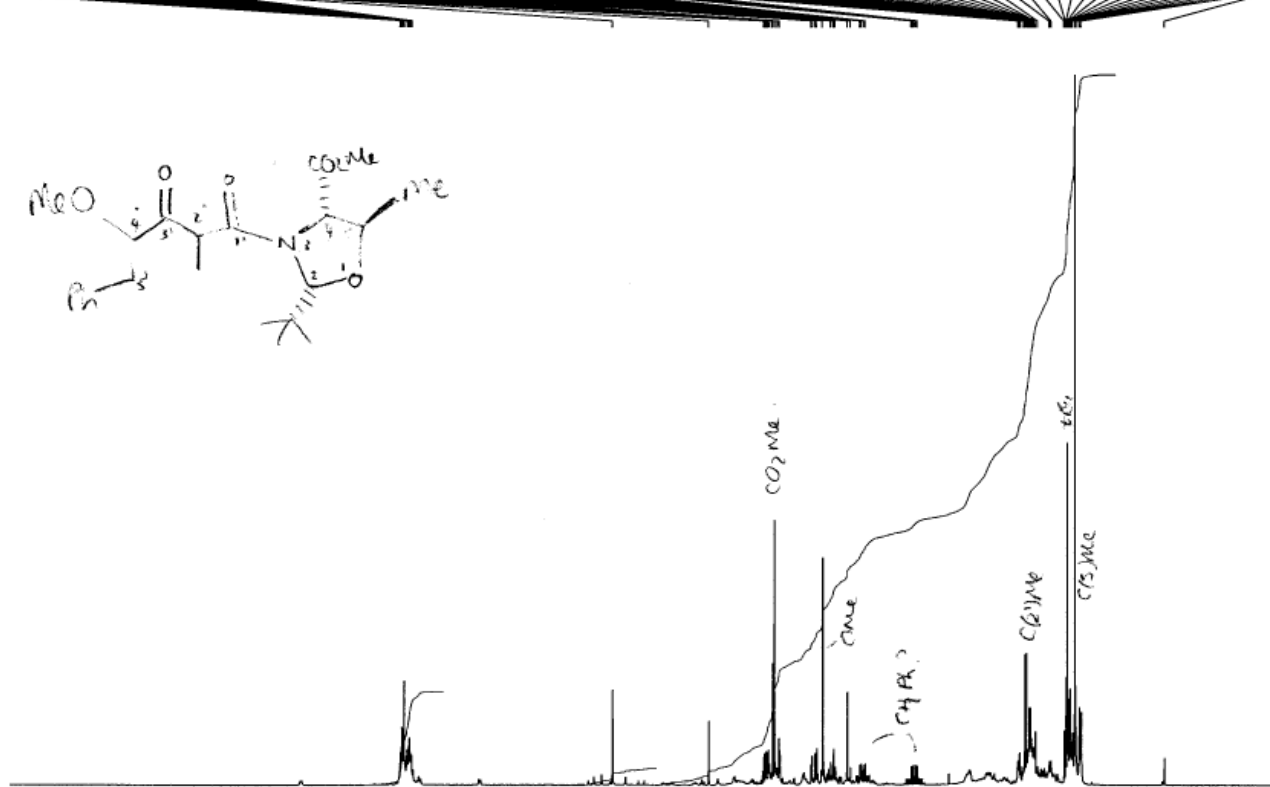
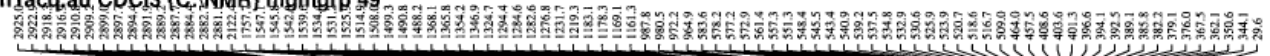
```

===== CHANNEL f2 =====
CPDPRG2    waltz16
NUC2       1H
PCPD2      80.00 |
PL2        0.00 |
PL12       19.00 |
PL13       25.00 |
SFO2       400.2016008 |
SI         32768
SF         100.6303718 |
WDW        EM
SSB        0
LB         1.00 |
GB         0
PC         1.40
  
```

Instrument DQX400
 Chemist BH
 Group MGM
 BH422

h1acq au CDC13 (C-NMR) mgmgrp 49

NMR@CHEM.OX

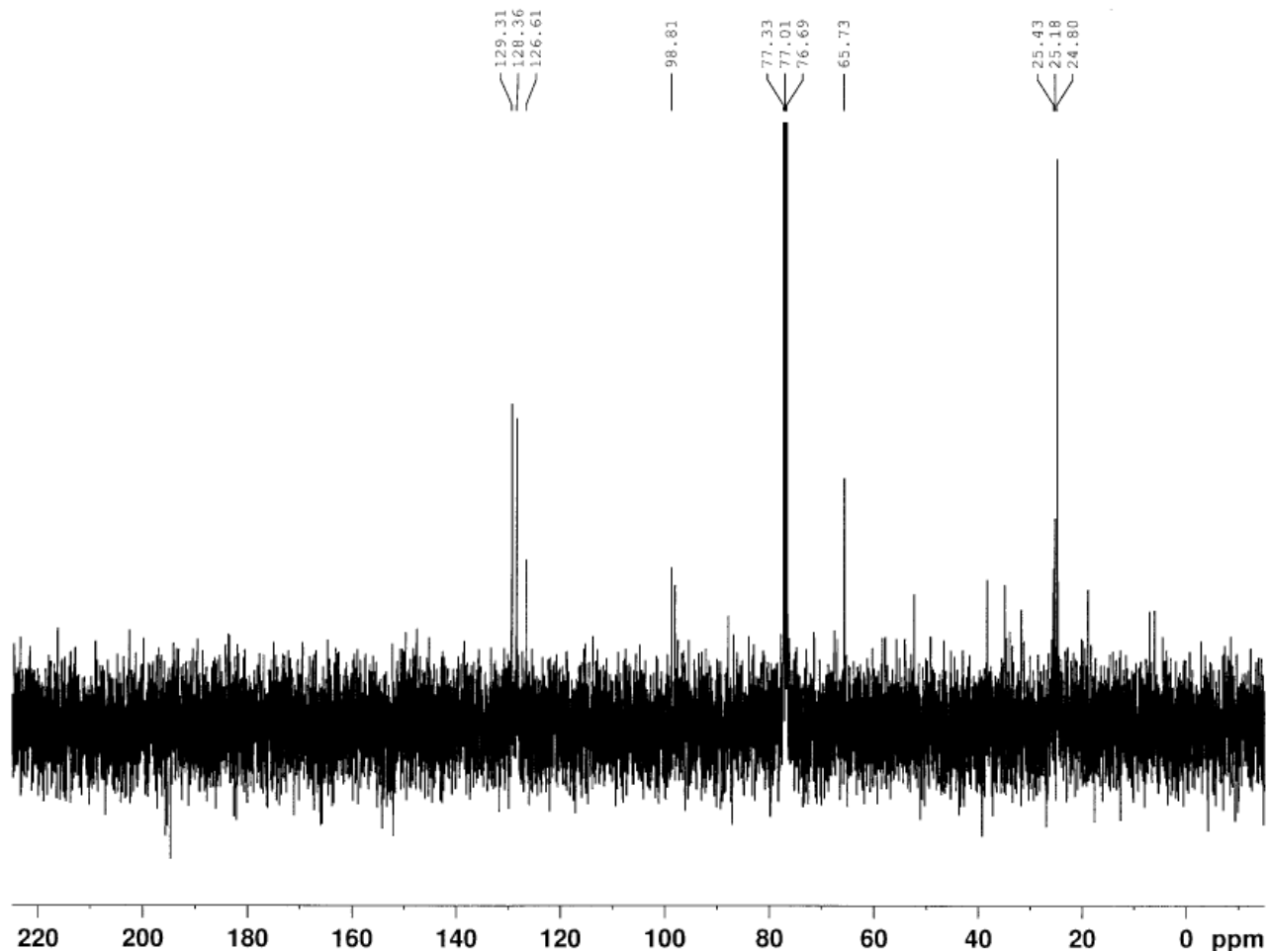


NAME Sep14-2010-49
 EXPNO 1
 PROCNO 1
 Date_ 20100914
 Time 20.39
 INSTRUM av400
 PROBHD 5 mm QNP 1H/13
 PULPROG zg60
 TD 65536
 SOLVENT CDC13
 NS 16
 DS 2
 SWH 8278.146 H
 FIDRES 0.126314 H
 AQ 3.9584243 s
 RG 128
 DW 60.400 u
 DE 7.50 u
 TE 300.0 K
 D1 1.00000000 s

----- CHANNEL f1 -----
 NUC1 13C
 P1 9.00 u
 PL1 0.00 d
 SF01 400.2024714 M
 SI 32768
 SF 400.2000028 M
 WDW EM
 SSB 0
 LB 0.30 H
 GB 0
 PC 1.00

Instrument DQX400
 Chemist BH
 Group MGM
 BH422
 c13acq.au CDCl3 {C:\NMR} mgmgrp 49

NMR@CHEM.OX



```

NAME      Sep14-2010-49
EXPNO     2
PROCNO    1
Date_     20100914
Time      20.47
INSTRUM   av400
PROBHD    5 mm QNP 1H/13
PULPROG   zgpg30
TD         32768
SOLVENT   CDCl3
NS         256
DS         4
SWH       26178.010 Hz
FIDRES    0.798889 Hz
AQ         0.6259188 s
RG         32768
DW         19.100 us
DE         7.50 us
TE         300.0 K
D1         1.00000000 s
D11        0.03000000 s
TD0        1
  
```

```

===== CHANNEL f1 =====
NUC1      13C
P1        9.50 us
PL1       0.00 dB
SFO1     100.6403931 MHz
  
```

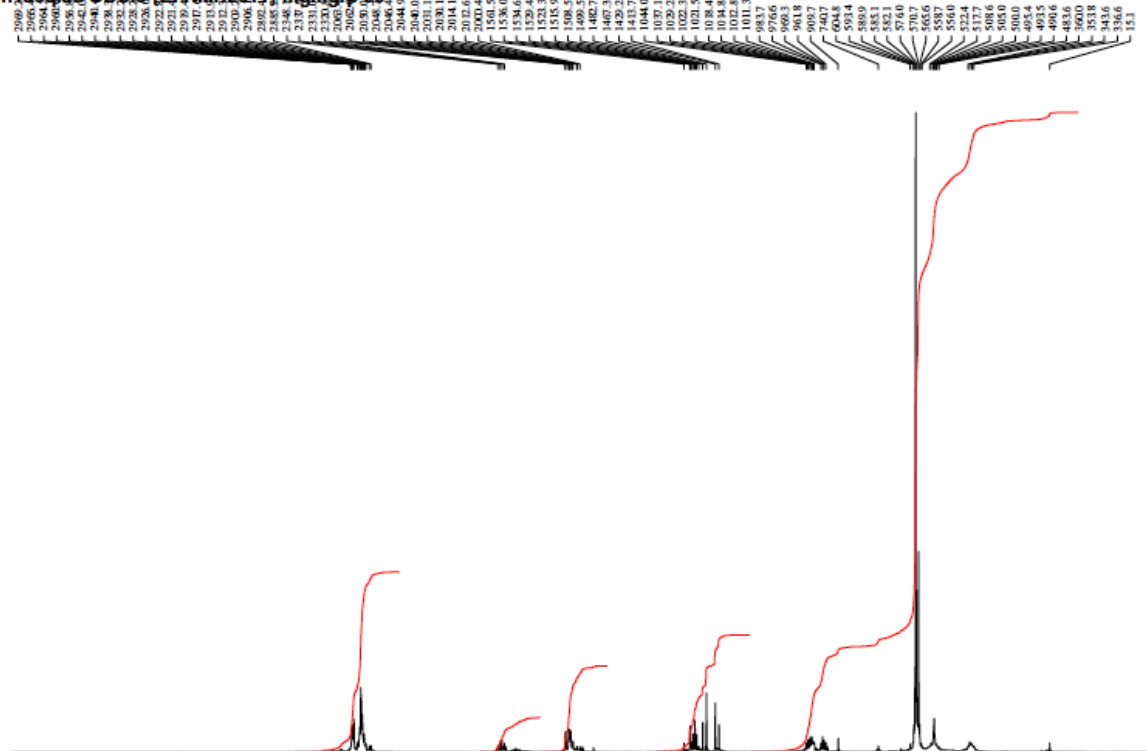
```

===== CHANNEL f2 =====
CPDPRG2   waltz16
NUC2      1H
PCPD2     80.00 us
PL2       0.00 dB
PL12      19.00 dB
PL13      25.00 dB
SFO2     400.2016008 MHz
SI        32768
SF        100.6303718 MHz
WDW       EM
SSB       0
LB        1.00 Hz
GB        0
PC        1.40
  
```

19a

Instrument DQX400
Chemist BH
Group MGM
BH5100

h1acq au CDCl3 (F1: NMR2011) mgmgrp 59



NMRCHEM.OX

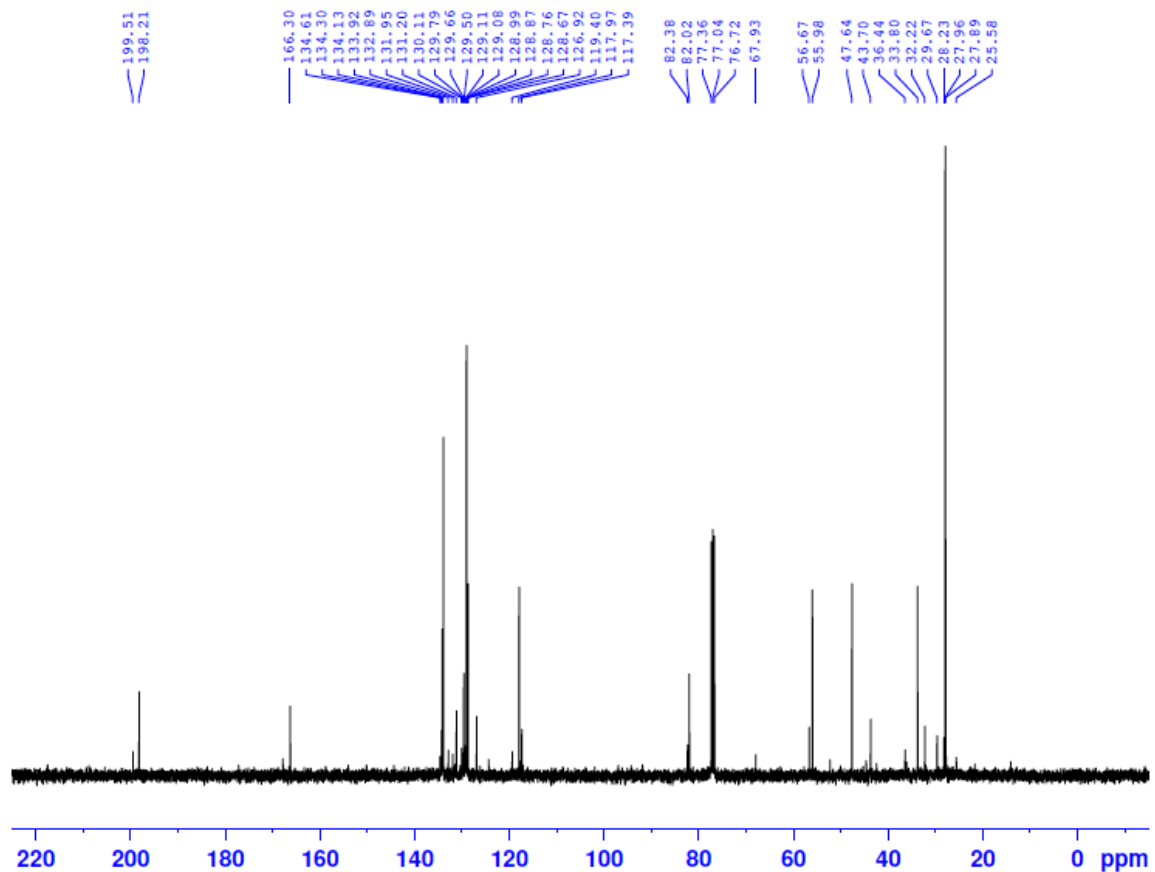
NAME Aug05-2011-59
EXPNO 1
PROCNO 1
Date_ 20110805
Time 14.02
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zg60
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 8278.146 Hz
FIDRES 0.126314 Hz
AQ 3.9584243 sec
RG 35.9
DW 60.400 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec

----- CHANNEL f1 -----
NUC1 1H
P1 9.00 usec
PL1 0.00 dB
SFO1 400.2024714 MHz
SI 32768
SF 400.2000028 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

19a

Instrument DQX400
Chemist BH
Group MGM
BH5100
c13acq.au CDC13 (E:\NMR2011) mgmgrp 59

NMR@CHEM.OX



```
NAME Aug05-2011-59
EXPNO 2
PROCNO 1
Date_ 20110805
Time 14.10
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 32768
SOLVENT CDC13
NS 256
DS 4
SWH 26178.010 Hz
FIDRES 0.798889 Hz
AQ 0.6259188 sec
RG 32768
DW 19.100 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec
D11 0.03000000 sec
TD0 1

----- CHANNEL f1 -----
NUC1 13C
P1 9.50 usec
PL1 0.00 dB
SFO1 100.6403931 MHz

----- CHANNEL f2 -----
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 0.00 dB
PL12 19.00 dB
PL13 25.00 dB
SFO2 400.2016008 MHz
SI 32768
SF 100.6303718 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
```

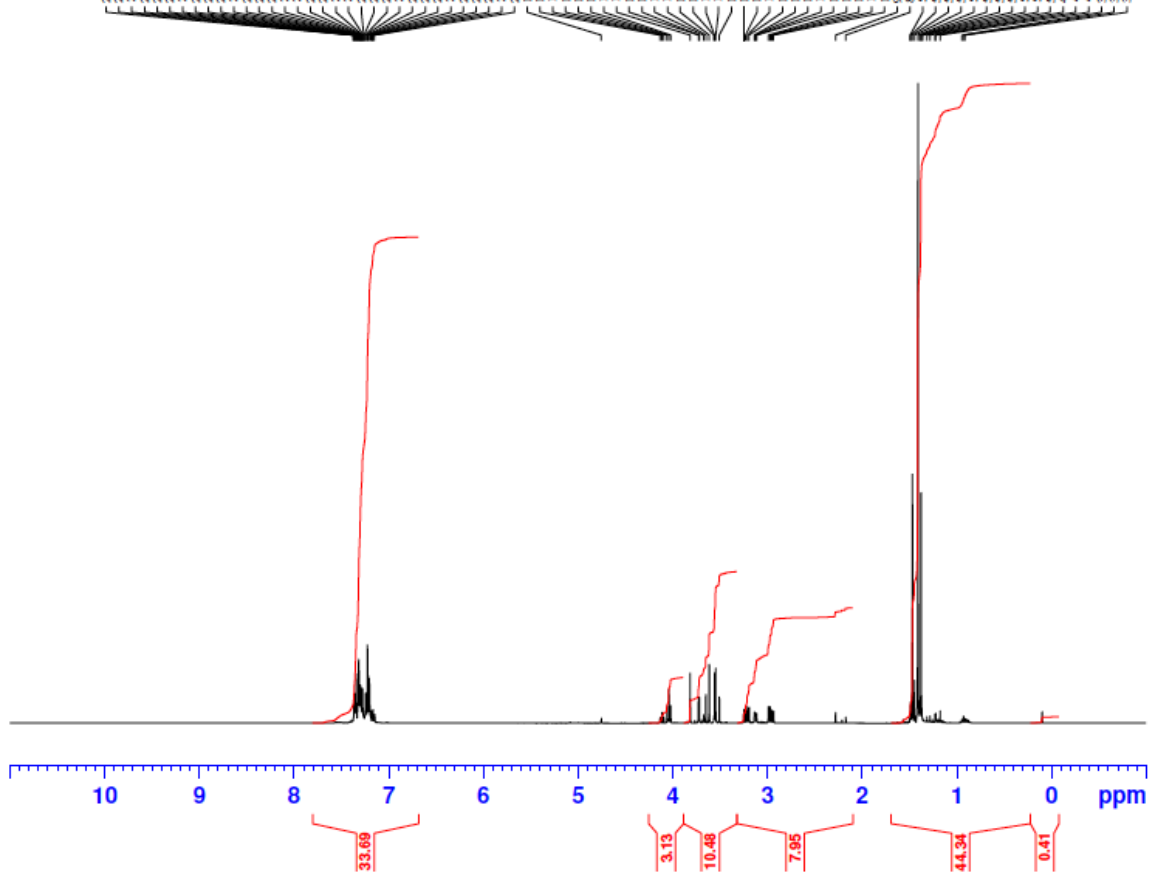
Instrument DQX400
Chemist BH
Group MGM
BH590 F3
h1acq.au CDC13 (E: NMR2011) mgmgrp 37

NMROCHEM.OX

2953.0 2949.8 2948.4 2946.4 2944.9 2941.5 2938.8 2938.5 2935.1 2927.2 2927.0 2925.2 2922.7 2918.0 2915.0 2913.8 2910.7 2907.0 2903.3 2900.8 2898.9 2896.9 2893.9 2890.1 2888.7 2887.0 2885.9 2883.7 2865.5 2865.4 2863.8 2861.8 2859.3 1653.7 1646.1 1638.6 1636.6 1634.5 1632.4 1609.6 1609.6 1608.0 1605.5 1470.5 1461.3 1446.1 1435.8 1425.8 1416.3 1403.9 1395.8 1392.8 1382.4 1377.9 1286.0 1264.5 1244.9 1240.3 1185.9 1185.7 1181.6 1177.4 1175.7 869.7 597.9 594.9 594.8 573.8 564.2 557.7 551.6 548.2 543.4 526.6 526.6 501.5 490.9 480.5 377.8 371.1 364.4

NAME Aug02-2011-37
EXPNO 1
PROCNO 1
Date_ 20110803
Time 3.16
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zg60
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 8278.146 Hz
FIDRES 0.126314 Hz
AQ 3.9584243 sec
RG 35.9
DW 60.400 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec

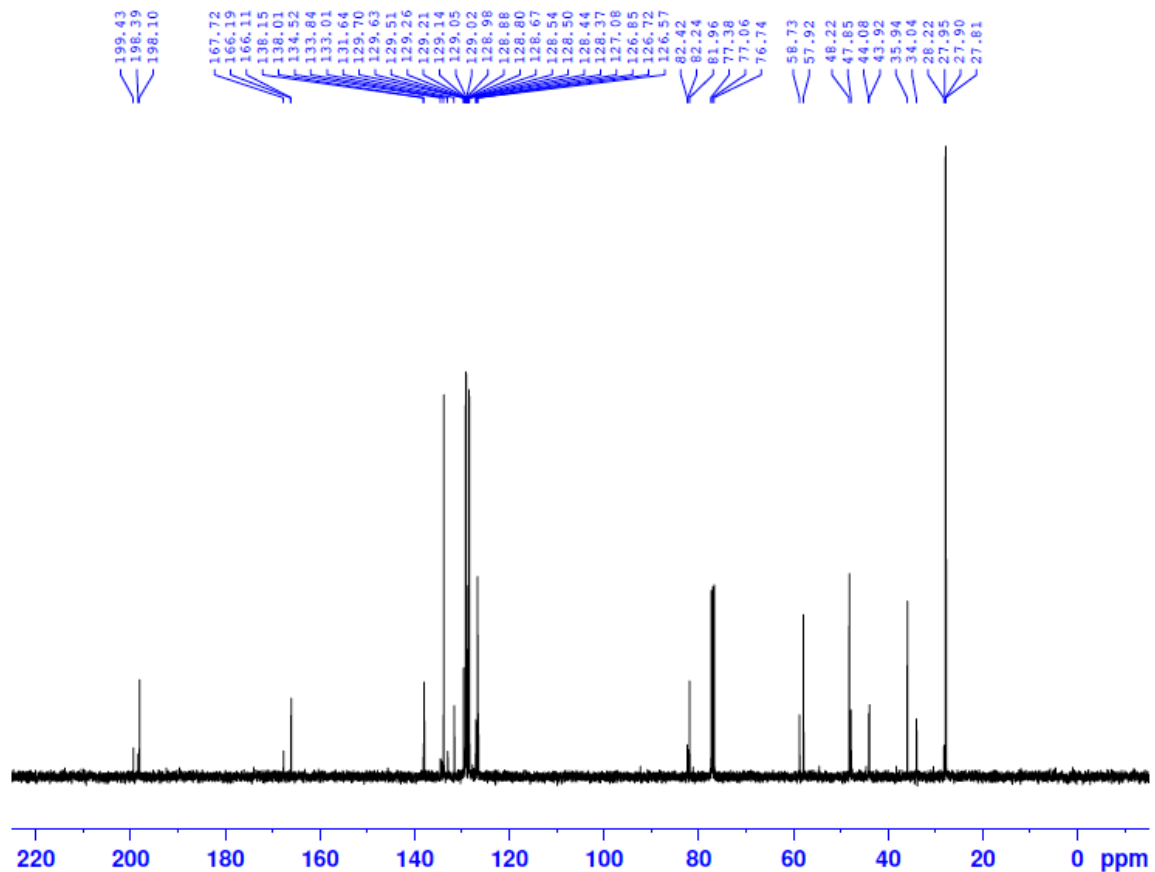
----- CHANNEL f1 -----
NUC1 1H
P1 9.00 usec
PL1 0.00 dB
SFO1 400.2024714 MHz
SI 32768
SF 400.2000028 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



19b

Instrument DQX400
 Chemist BH
 Group MGM
 BH590 F3
 c13acq.au CDCl3 [E:\NMR2011] mgmgrp 37

NMR@CHEM.OX



```

NAME      Aug02-2011-37
EXPNO     2
PROCNO    1
Date_     20110803
Time      3.24
INSTRUM   av400
PROBHD    5 mm QNP 1H/13
PULPROG   zgpg30
TD        32768
SOLVENT   CDCl3
NS        256
DS        4
SWH       26178.010 Hz
FIDRES    0.798889 Hz
AQ        0.6259188 sec
RG        32768
DW        19.100 usec
DE        7.50 usec
TE        300.0 K
D1        1.00000000 sec
D11       0.03000000 sec
TD0       1

----- CHANNEL f1 -----
NUC1      13C
P1        9.50 usec
PL1       0.00 dB
SFO1     100.6403931 MHz

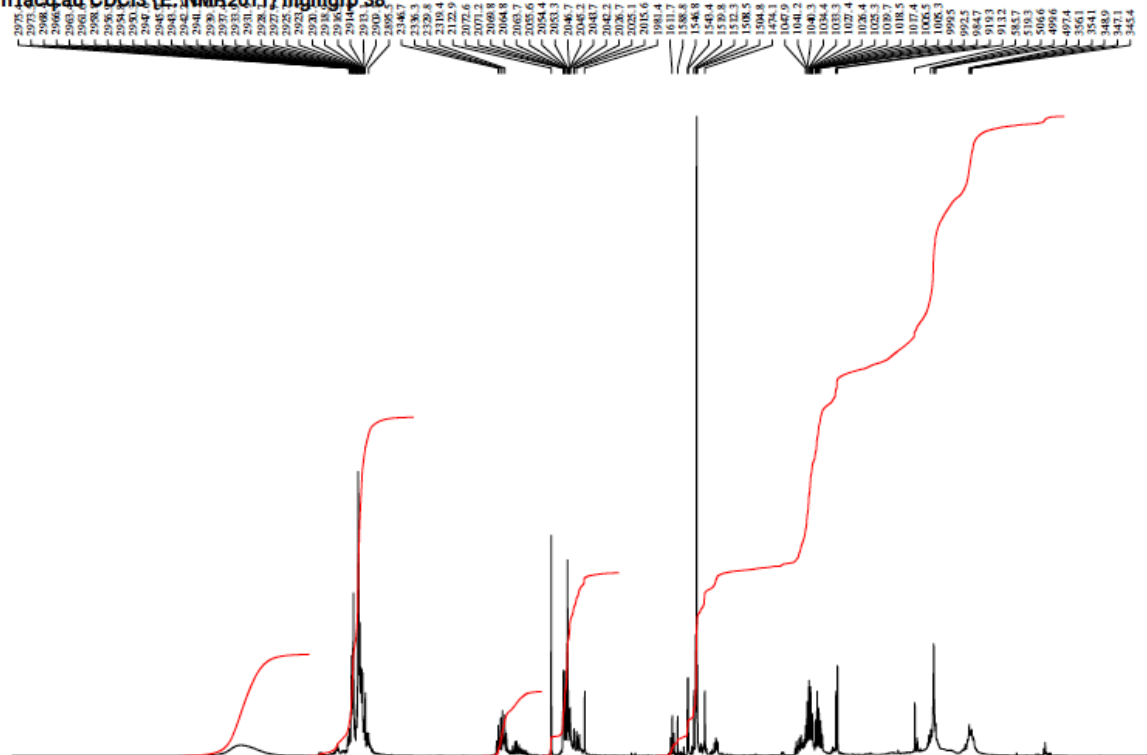
----- CHANNEL f2 -----
CPDPRG2   waltz16
NUC2      1H
PCPD2     80.00 usec
PL2       0.00 dB
PL12      19.00 dB
PL13      25.00 dB
SFO2     400.2016008 MHz
SI        32768
SF       100.6303718 MHz
WDW       EM
SSB       0
LB        1.00 Hz
GB        0
PC        1.40
  
```


20a

Instrument DQX400
Chemist BH
Group MGM
BH5108

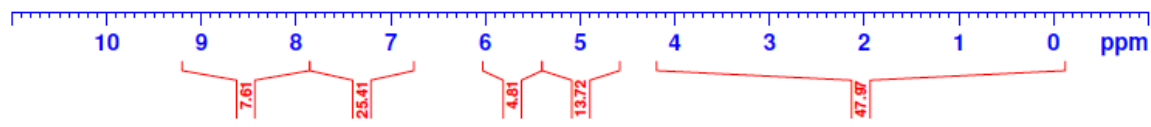
h1acc au CDCl3 (F: NMR2011) mgmgrp 38

NMR@CHEM.OX



NAME Aug08-2011-38
EXPNO 1
PROCNO 1
Date_ 20110808
Time 23.24
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zg60
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 8278.146 Hz
FIDRES 0.126314 Hz
AQ 3.9584243 sec
RG 128
DW 60.400 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec

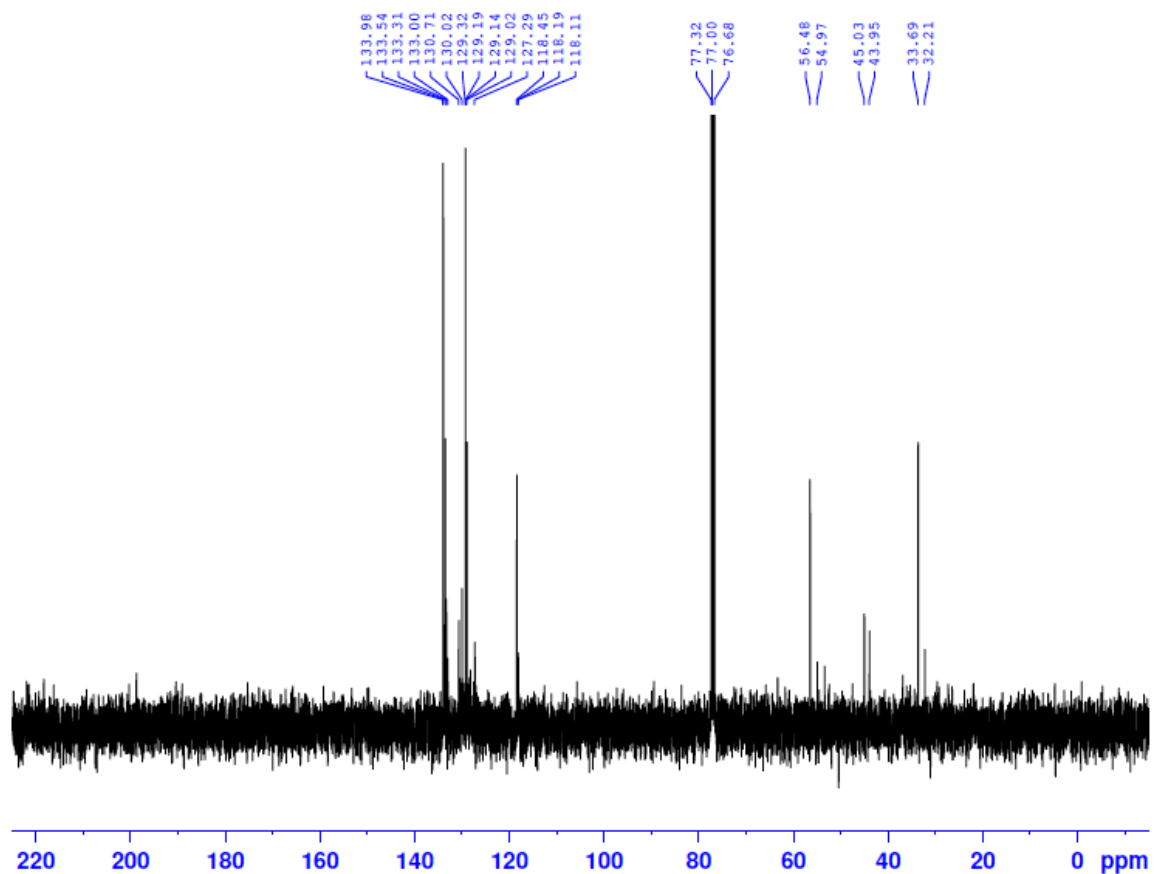
----- CHANNEL f1 -----
NUC1 1H
P1 9.00 usec
PL1 0.00 dB
SFO1 400.2024714 MHz
SI 32768
SF 400.2000028 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



20a

Instrument DQX400
Chemist BH
Group MGM
BH5108
c13acq.au CDC13 (E:\NMR2011) mgmgrp 38

NMR@CHEM.OX



```
NAME      Aug08-2011-38
EXPNO     2
PROCNO    1
Date_     20110808
Time      23.32
INSTRUM   av400
PROBHD    5 mm QNP 1H/13
PULPROG   zgpg30
TD         32768
SOLVENT   CDC13
NS         256
DS         4
SWH       26178.010 Hz
FIDRES    0.798889 Hz
AQ         0.6259188 sec
RG         32768
DW         19.100 usec
DE         7.50 usec
TE         300.0 K
D1         1.00000000 sec
D11        0.03000000 sec
TD0        1

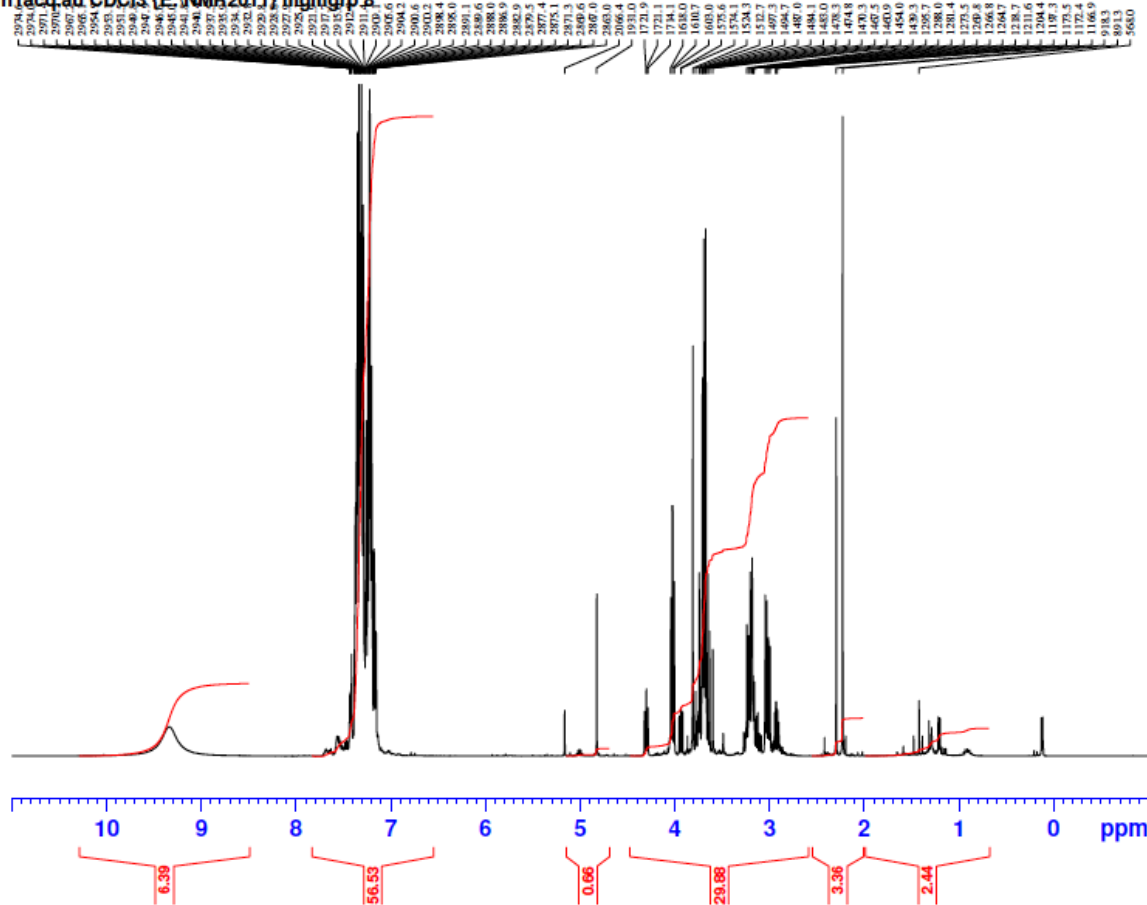
----- CHANNEL f1 -----
NUC1       13C
P1         9.50 usec
PL1        0.00 dB
SFO1       100.6403931 MHz

----- CHANNEL f2 -----
CPDPRG2   waltz16
NUC2       1H
PCPD2     80.00 usec
PL2        0.00 dB
PL12       19.00 dB
PL13       25.00 dB
SFO2       400.2016008 MHz
SI         32768
SF         100.6303718 MHz
WDW        EM
SSB        0
LB         1.00 Hz
GB         0
PC         1.40
```

20b

Instrument DQX400
Chemist BH
Group MGM
bH594

h1acq au CDC13 (E: NMR2011) mgmgr 8



NMR@CHEM.OX

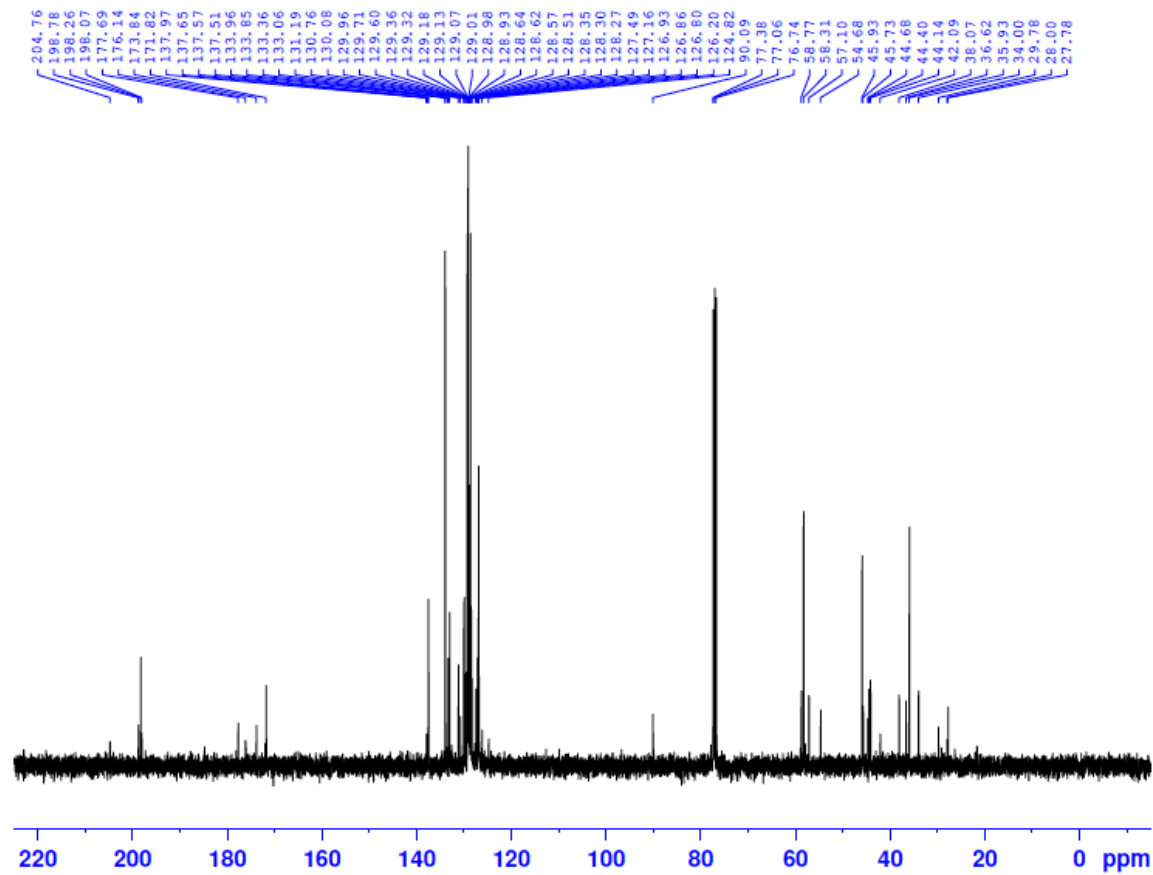
```
NAME Aug04-2011-8
EXPNO 1
PROCNO 1
Date_ 20110804
Time 16.20
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zg60
TD 65536
SOLVENT CDC13
NS 16
DS 2
SWH 8278.146 Hz
FIDRES 0.126314 Hz
AQ 3.9584243 sec
RG 40.3
DW 60.400 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec

----- CHANNEL f1 -----
NUC1 1H
P1 9.00 usec
PL1 0.00 dB
SFO1 400.2024714 MHz
SI 32768
SF 400.2000028 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
```

20b

Instrument DQX400
Chemist BH
Group MGM
bH594
c13acq.au CDC13 (E:\NMR2011) mgmgrp 8

NMR@CHEM.OX



NAME Aug04-2011-8
EXPNO 2
PROCNO 1
Date_ 20110804
Time 16.28
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 32768
SOLVENT CDC13
NS 256
DS 4
SWH 26178.010 Hz
FIDRES 0.798889 Hz
AQ 0.6259188 sec
RG 32768
DW 19.100 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec
D11 0.03000000 sec
TD0 1

----- CHANNEL f1 -----
NUC1 13C
P1 9.50 usec
PL1 0.00 dB
SFO1 100.6403931 MHz

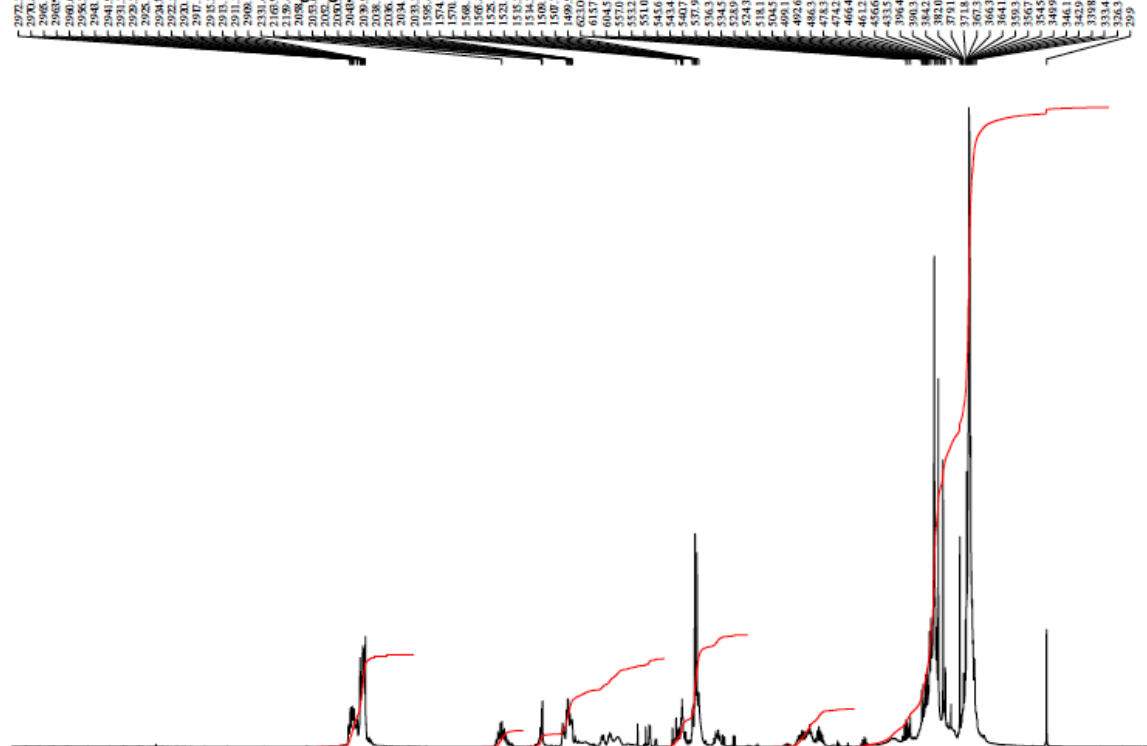
----- CHANNEL f2 -----
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 0.00 dB
PL12 19.00 dB
PL13 25.00 dB
SFO2 400.2016008 MHz
SI 32768
SF 100.6303718 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

21a

Instrument DQX400
Chemist BH
Group MGM
BH5114 F3

h1acq au CDCl3 (E: NMR2011) mgmgrp 23

NMRCHEM.OX



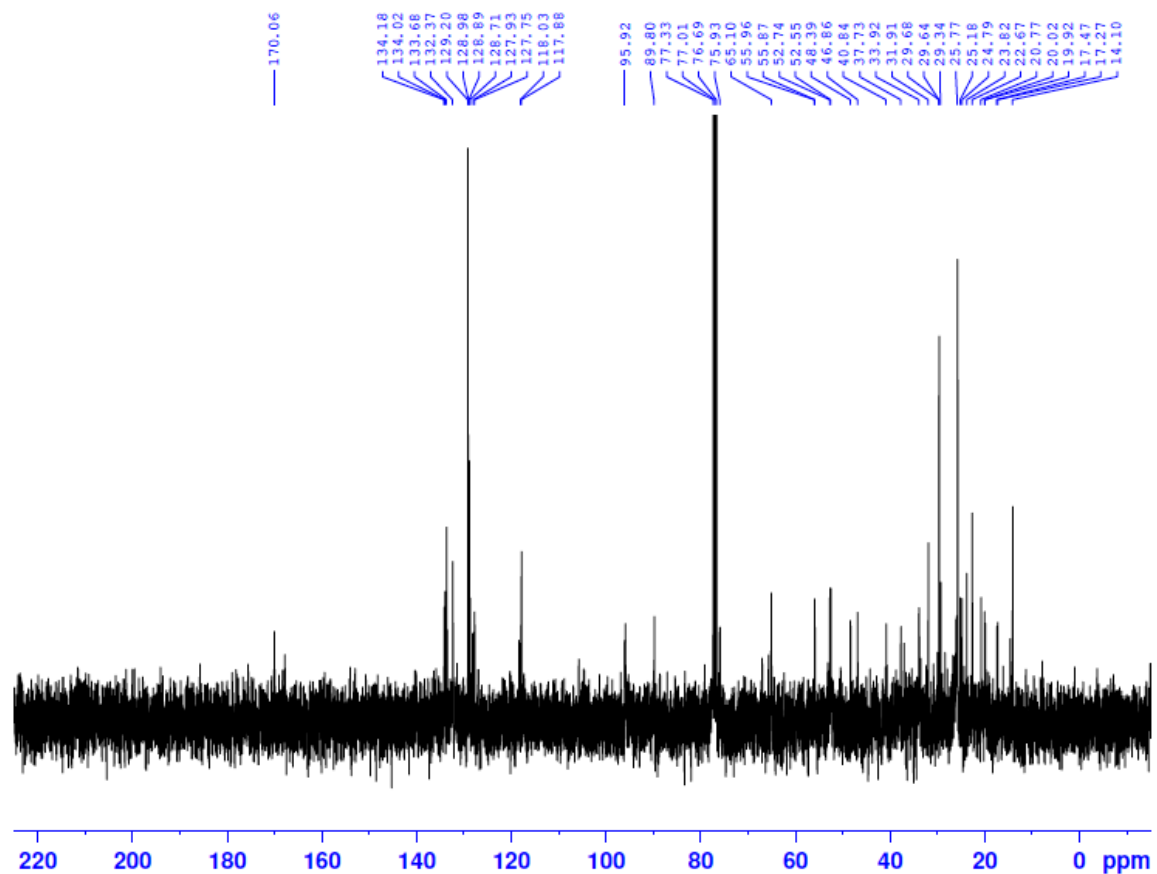
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NAME Sep16-2011-23
EXPNO 1
PROCNO 1
Date_ 20110917
Time 9.17
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zg60
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 8278.146 Hz
FIDRES 0.126314 Hz
AQ 3.9584243 sec
RG 40.3
DW 60.400 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec

----- CHANNEL f1 -----
NUC1 1H
P1 9.00 usec
PL1 0.00 dB
SFO1 400.2024714 MHz
SI 32768
SF 400.2000028 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
```

21a

Instrument DQX400
Chemist BH
Group MGM
BH5114 F3
c13acq.au CDC13 (E:\NMR2011) mgmgrp 23

NMR@CHEM.OX



```
NAME Sep16-2011-23
EXPNO 2
PROCNO 1
Date_ 20110917
Time 9.25
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 32768
SOLVENT CDC13
NS 256
DS 4
SWH 26178.010 Hz
FIDRES 0.798889 Hz
AQ 0.6259188 sec
RG 32768
DW 19.100 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec
D11 0.03000000 sec
TD0 1

----- CHANNEL f1 -----
NUC1 13C
P1 9.50 usec
PL1 0.00 dB
SFO1 100.6403931 MHz

----- CHANNEL f2 -----
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 0.00 dB
PL12 19.00 dB
PL13 25.00 dB
SFO2 400.2016008 MHz
SI 32768
SF 100.6303718 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
```

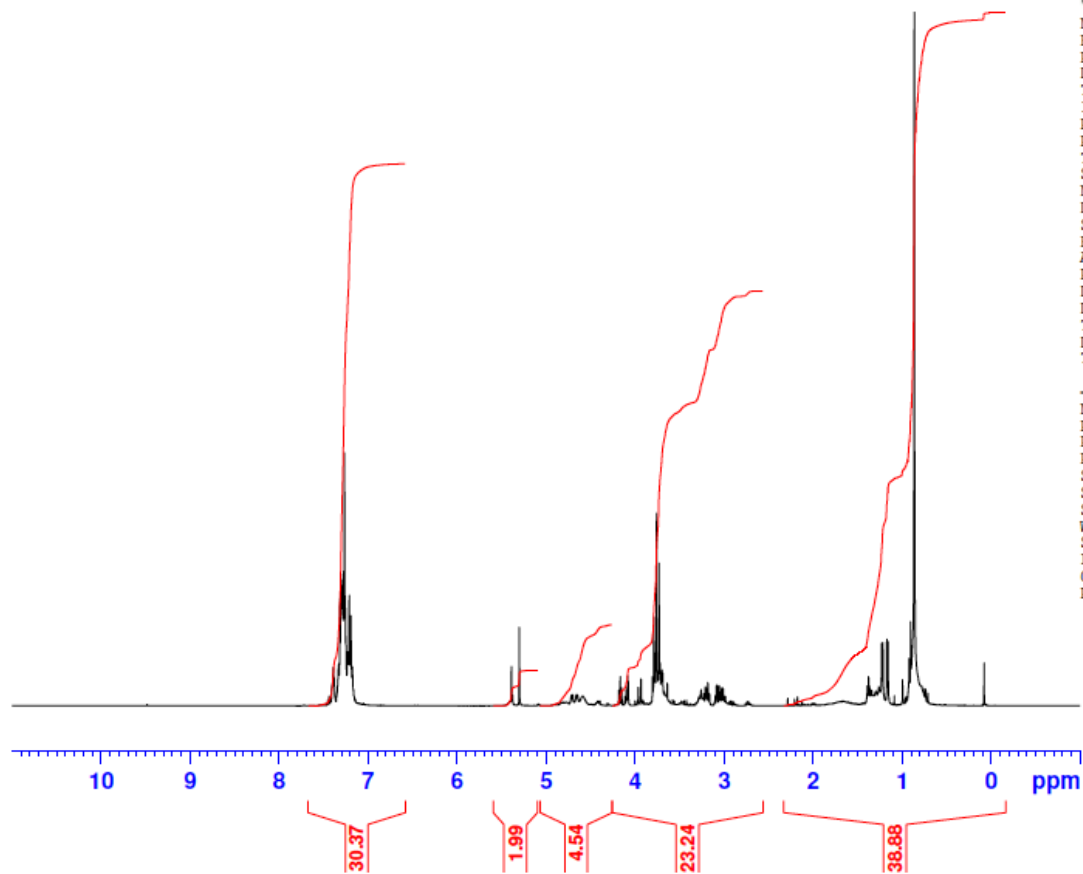
21b

Instrument AVC500
Group MGM
BETH HEAVISIDE 6011 20/9/11

NMRO@CHEM.OX

NAME bh60112009
EXPNO 1
PROCNO 1
Date_ 20110921
Time 0.58
INSTRUM avc500
PROBHD 5 mm CPDUL 13C
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 10330.578 Hz
FIDRES 0.157632 Hz
AQ 3.1719923 sec
RG 4
DW 48.400 usec
DE 6.00 usec
TE 298.0 K
D1 1.00000000 sec
TD0 1

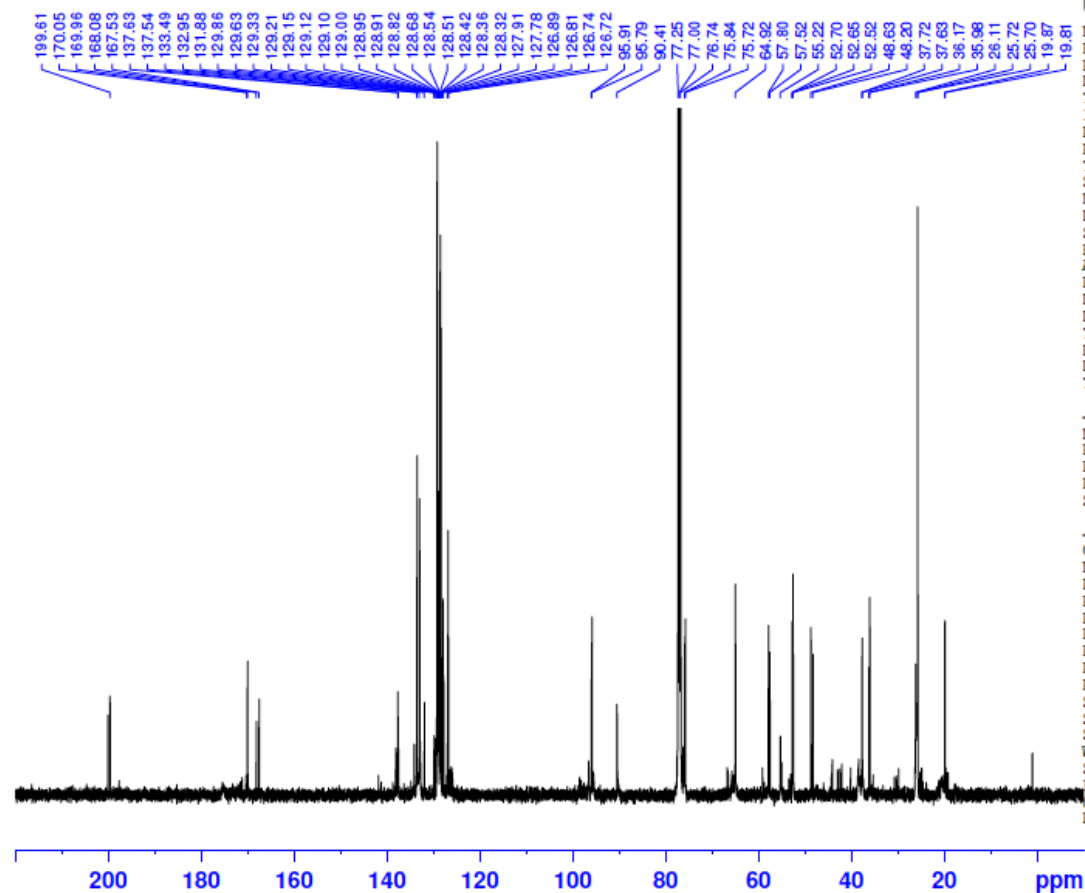
----- CHANNEL f1 -----
NUC1 1H
P1 9.60 usec
PL1 -6.00 dB
PL1W 15.19999981 W
SFO1 500.3030896 MHz
SI 32768
SF 500.3000240 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



21b

Instrument AVC500
Group MGM
BETH HEAVISIDE 6011 20/9/11

NMR@CHEM.OX



```
NAME          bh60112009
EXPNO          4
PROCNO         1
Date_          20110921
Time           2.09
INSTRUM        avc500
PROBHD         5 mm CPDUL 13C
PULPROG        zgpg30
TD             65536
SOLVENT        CDCl3
NS             1024
DS             2
SWH            31250.000 Hz
FIDRES         0.476837 Hz
AQ             1.0486259 sec
RG             1030
DW             16.000 usec
DE             20.00 usec
TE             298.0 K
D1             2.00000000 sec
D11            0.03000000 sec
TDO           1

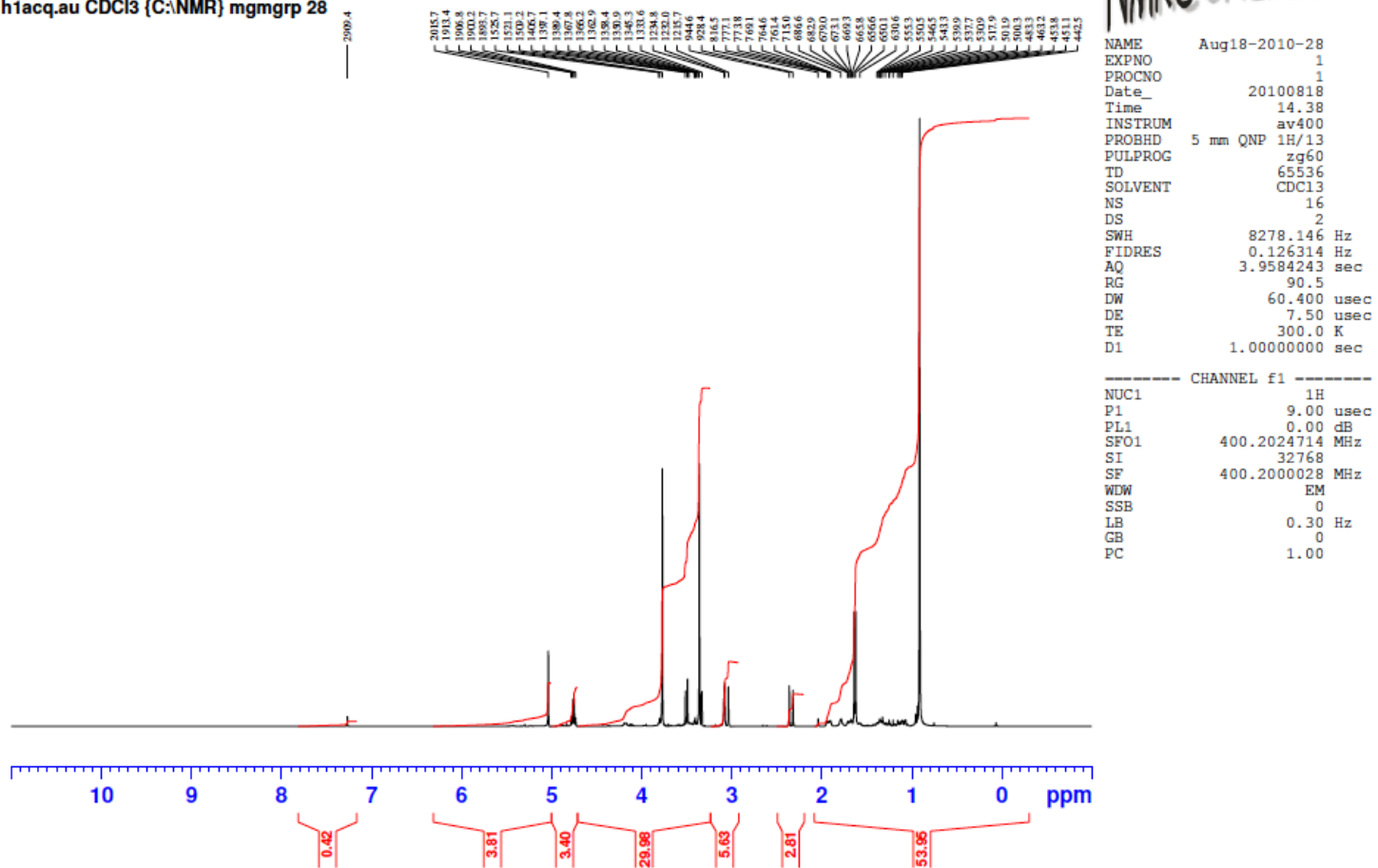
----- CHANNEL f1 -----
NUC1           13C
P1             10.00 usec
PL1            -4.40 dB
PL1W           28.15752029 W
SFO1           125.8131151 MHz

----- CHANNEL f2 -----
CPDPRG2        waltz16
NUC2           1H
PCPD2          80.00 usec
PL2            -6.00 dB
PL12           12.42 dB
PL13           18.42 dB
PL2W           15.19999981 W
PL12W          0.21869738 W
PL13W          0.05493430 W
SFO2           500.3020012 MHz
SI             32768
SF             125.8005438 MHz
WDW            EM
SSB            0
LB             1.00 Hz
GB             0
PC             1.40
```


22a

Instrument DQX400
Chemist BH
Group MGM
BH3192 F2+3
h1acq.au CDCl3 {C:NMR} mgmgrp 28

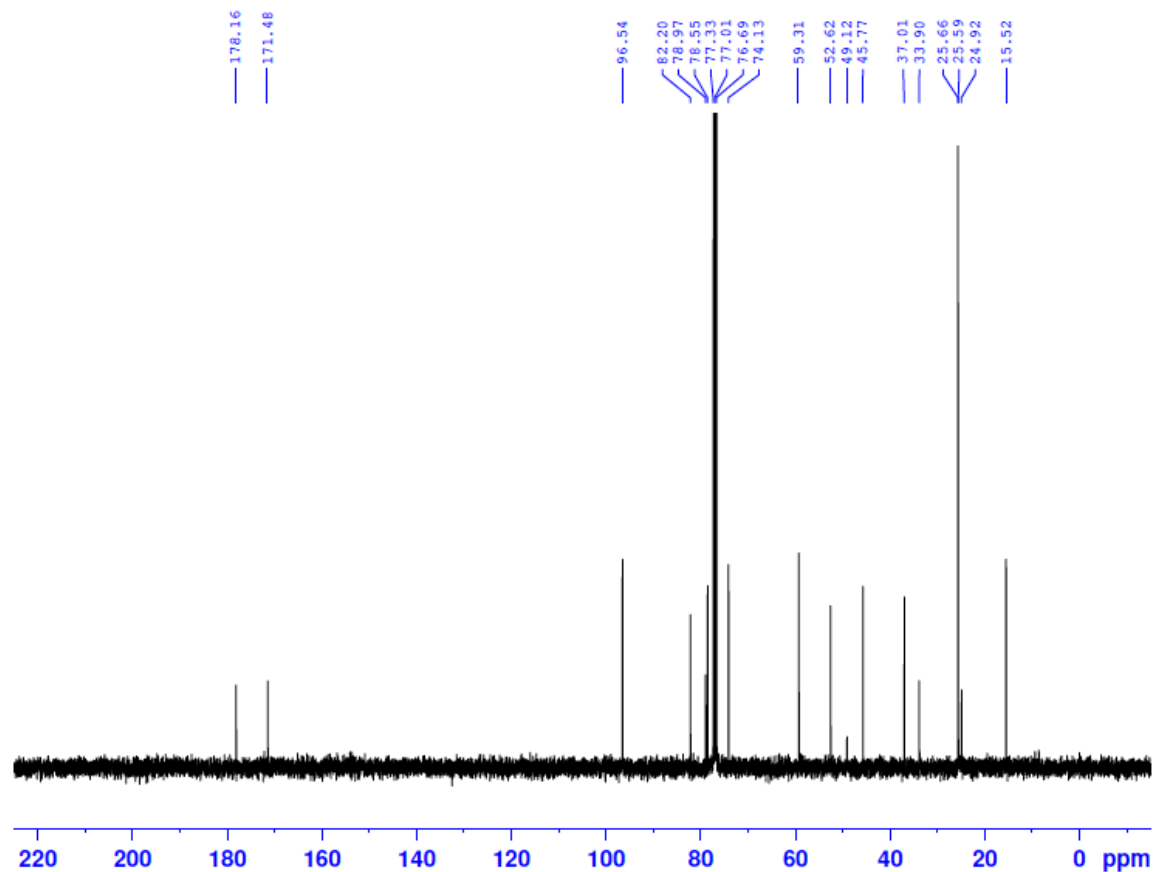
NMRCHEM.OX



22a

Instrument DQX400
Chemist BH
Group MGM
BH3192 F2+3
c13acq.au CDCl3 (C:NMR) mgmgrp 28

NMR@CHEM.OX



NAME Aug18-2010-28
EXPNO 2
PROCNO 1
Date_ 20100818
Time 14.46
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 256
DS 4
SWH 26178.010 Hz
FIDRES 0.798889 Hz
AQ 0.6259188 sec
RG 32768
DW 19.100 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec
D11 0.03000000 sec
TD0 1

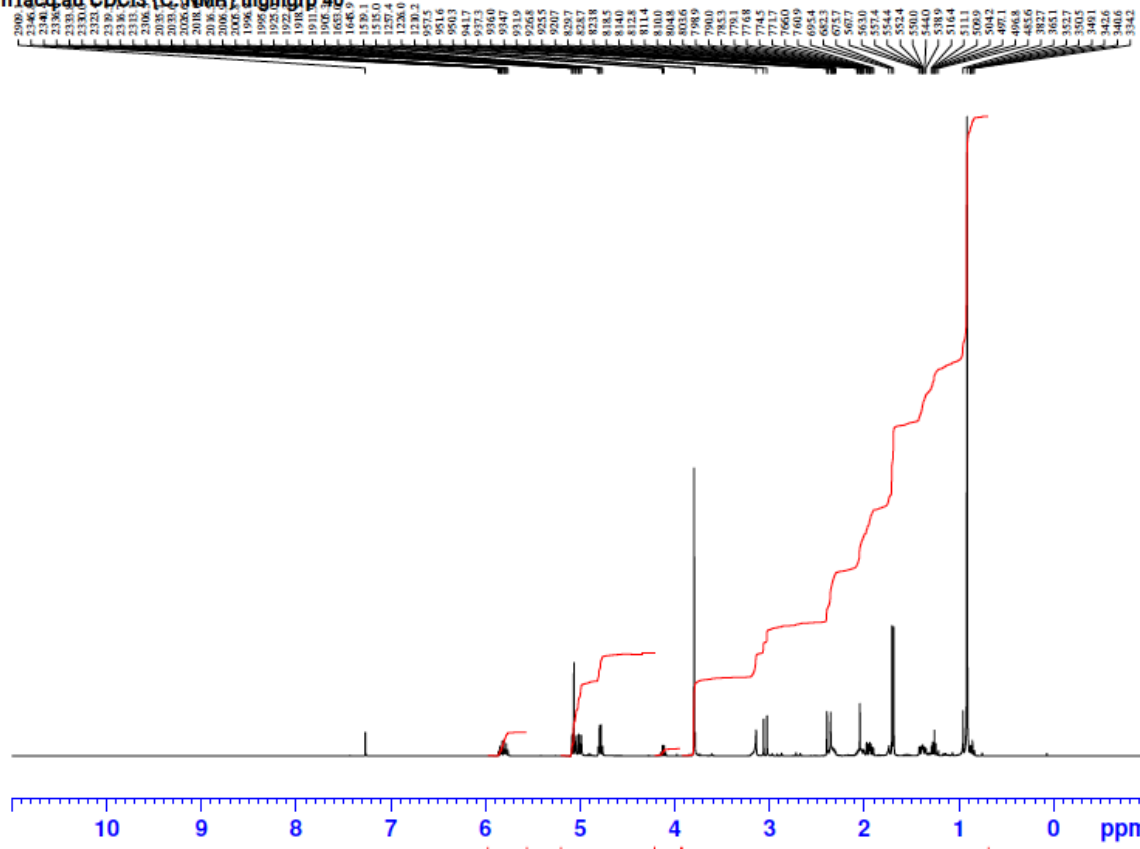
----- CHANNEL f1 -----
NUC1 13C
P1 9.50 usec
PL1 0.00 dB
SFO1 100.6403931 MHz

----- CHANNEL f2 -----
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 0.00 dB
PL12 19.00 dB
PL13 25.00 dB
SFO2 400.2016008 MHz
SI 32768
SF 100.6303718 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

22b

Instrument DQX400
Chemist BH
Group MGM
BH4108 F2
h1acc.au CDCl3 (C;NMR) mgmgrp 40

NMR@CHEM.OX



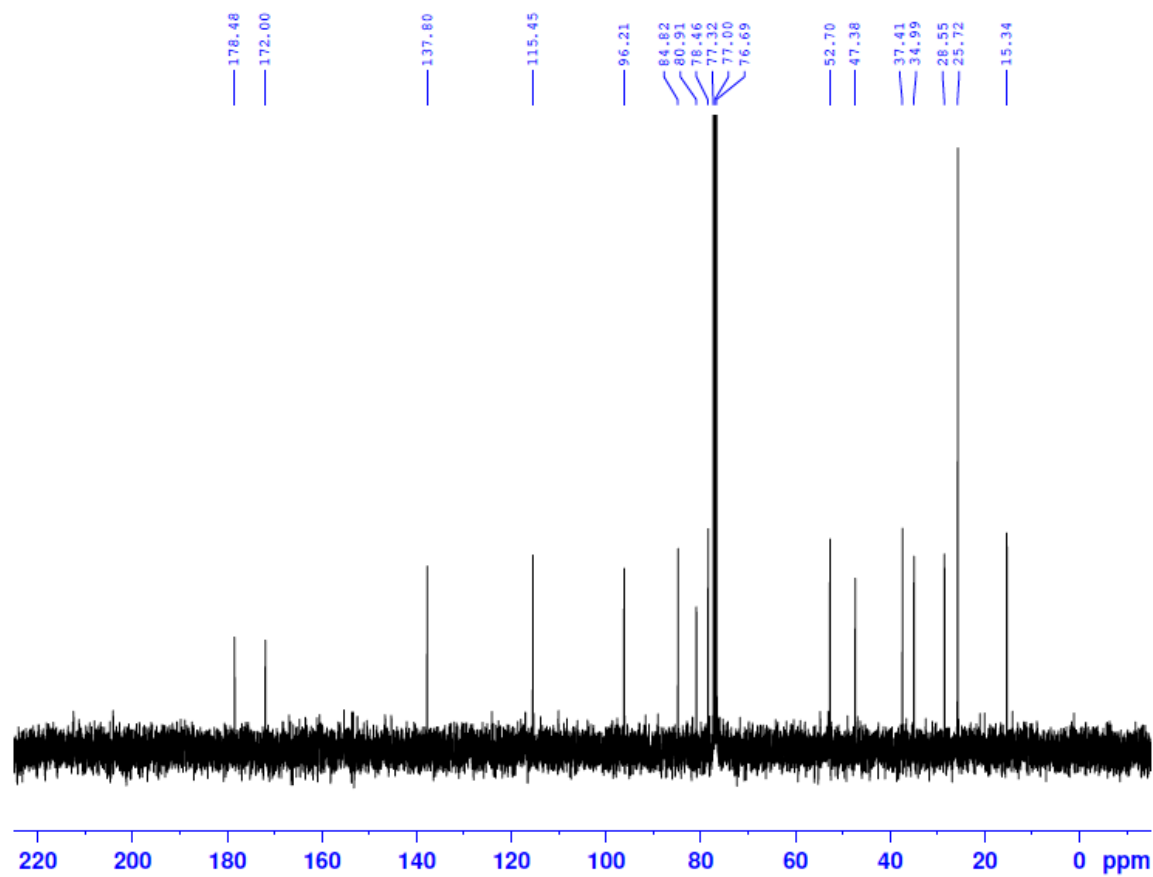
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NAME      Jan07-2011-40
EXPNO     1
PROCNO    1
Date_     20110108
Time      3.50
INSTRUM   av400
PROBHD    5 mm QNP 1H/13
PULPROG   zg60
TD        65536
SOLVENT   CDCl3
NS        16
DS        2
SWH       8278.146 Hz
FIDRES    0.126314 Hz
AQ        3.9584243 sec
RG        90.5
DW        60.400 usec
DE        7.50 usec
TE        300.0 K
D1        1.00000000 sec

----- CHANNEL f1 -----
NUC1      1H
P1        9.00 usec
PL1       0.00 dB
SFO1     400.2024714 MHz
SI        32768
SF        400.2000028 MHz
WDW       EM
SSB       0
LB        0.30 Hz
GB        0
PC        1.00
```

22b

Instrument DQX400
Chemist BH
Group MGM
BH4108 F2
c13acq.au CDCl3 (C:NMR) mgmgrp 40

NMR@CHEM.OX



NAME Jan07-2011-40
EXPNO 2
PROCNO 1
Date_ 20110108
Time 3.58
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 256
DS 4
SWH 26178.010 Hz
FIDRES 0.798889 Hz
AQ 0.6259188 sec
RG 32768
DW 19.100 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec
D11 0.03000000 sec
TD0 1

----- CHANNEL f1 -----
NUC1 13C
P1 9.50 usec
PL1 0.00 dB
SFO1 100.6403931 MHz

----- CHANNEL f2 -----
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 0.00 dB
PL12 19.00 dB
PL13 25.00 dB
SFO2 400.2016008 MHz
SI 32768
SF 100.6303718 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

22c

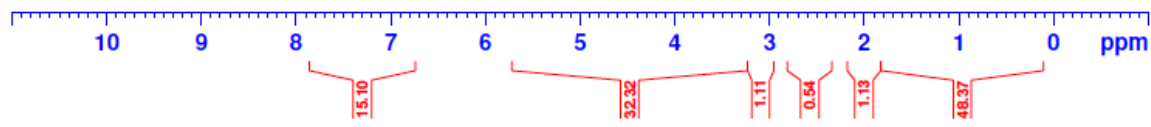
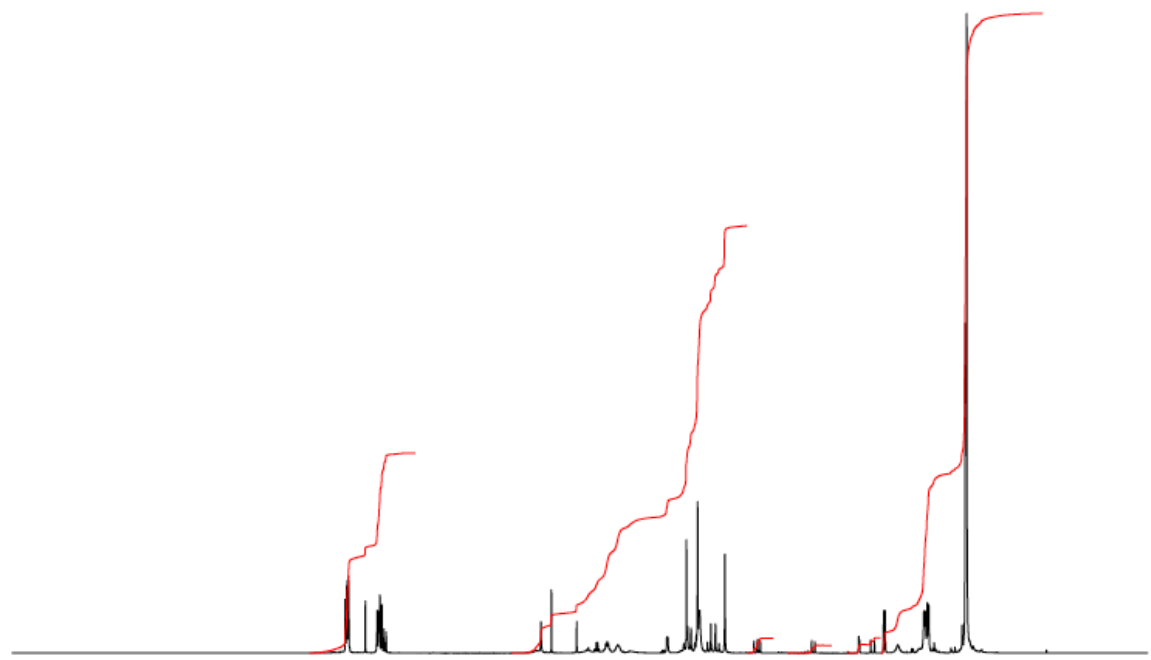
Instrument DQX400
Chemist BH
Group MGM
BH4154 F2
h1acq.au CDC13 (E:\NMR2011) mgmgrp 21

NMRCHEM.OX

2095
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2200

```
NAME Feb25-2011-21
EXPNO 1
PROCNO 1
Date_ 20110226
Time 1.34
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zg60
TD 65536
SOLVENT CDC13
NS 16
DS 2
SWH 8278.146 Hz
FIDRES 0.126314 Hz
AQ 3.9584243 sec
RG 90.5
DW 60.400 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec

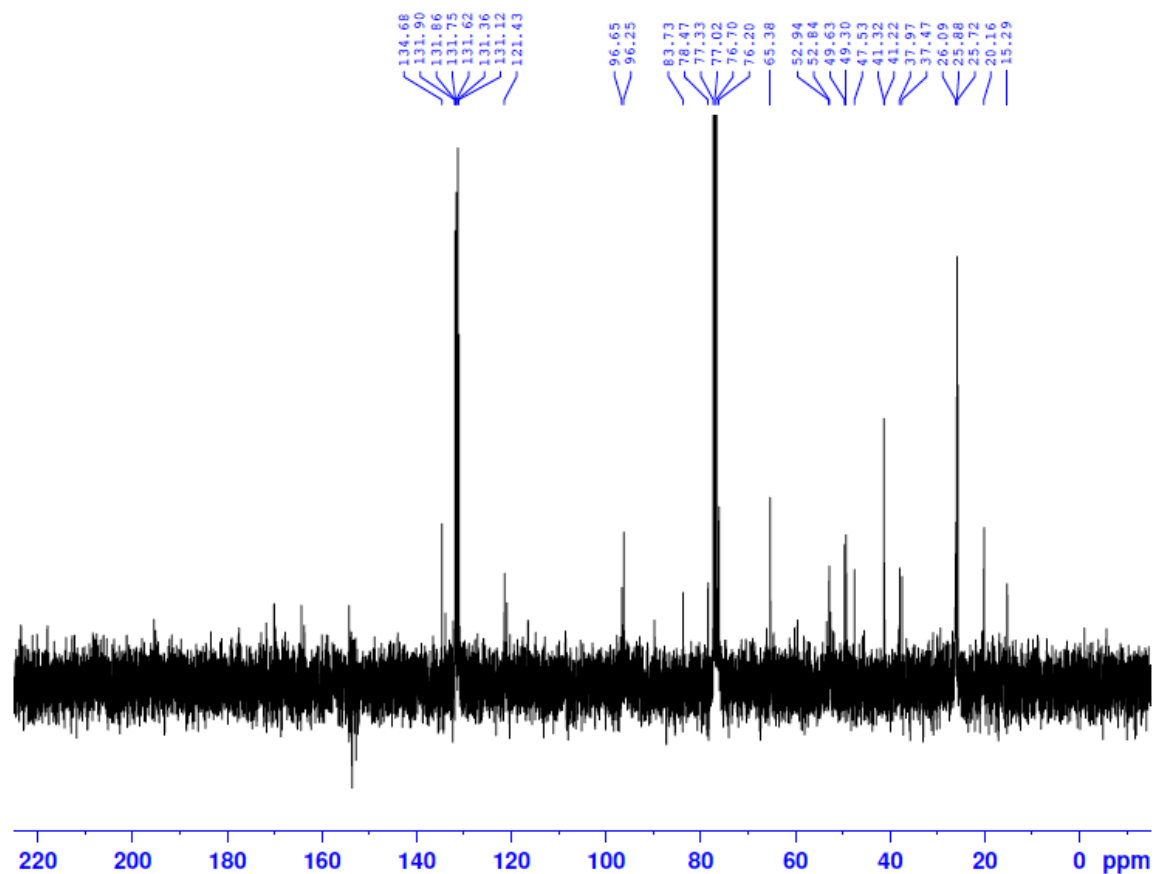
----- CHANNEL f1 -----
NUC1 1H
P1 9.00 usec
PL1 0.00 dB
SFO1 400.2024714 MHz
SI 32768
SF 400.2000028 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
```



22c

Instrument DQX400
Chemist BH
Group MGM
BH4154 F2
c13acq.au CDC13 (E:\NMR2011) mgmgrp 21

NMR@CHEM.OX



```
NAME Feb25-2011-21
EXPNO 2
PROCNO 1
Date_ 20110226
Time 1.42
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 32768
SOLVENT CDC13
NS 256
DS 4
SWH 26178.010 Hz
FIDRES 0.798889 Hz
AQ 0.6259188 sec
RG 32768
DW 19.100 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec
D11 0.03000000 sec
TD0 1

----- CHANNEL f1 -----
NUC1 13C
P1 9.50 usec
PL1 0.00 dB
SFO1 100.6403931 MHz

----- CHANNEL f2 -----
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 0.00 dB
PL12 19.00 dB
PL13 25.00 dB
SFO2 400.2016008 MHz
SI 32768
SF 100.6303718 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
```

22d

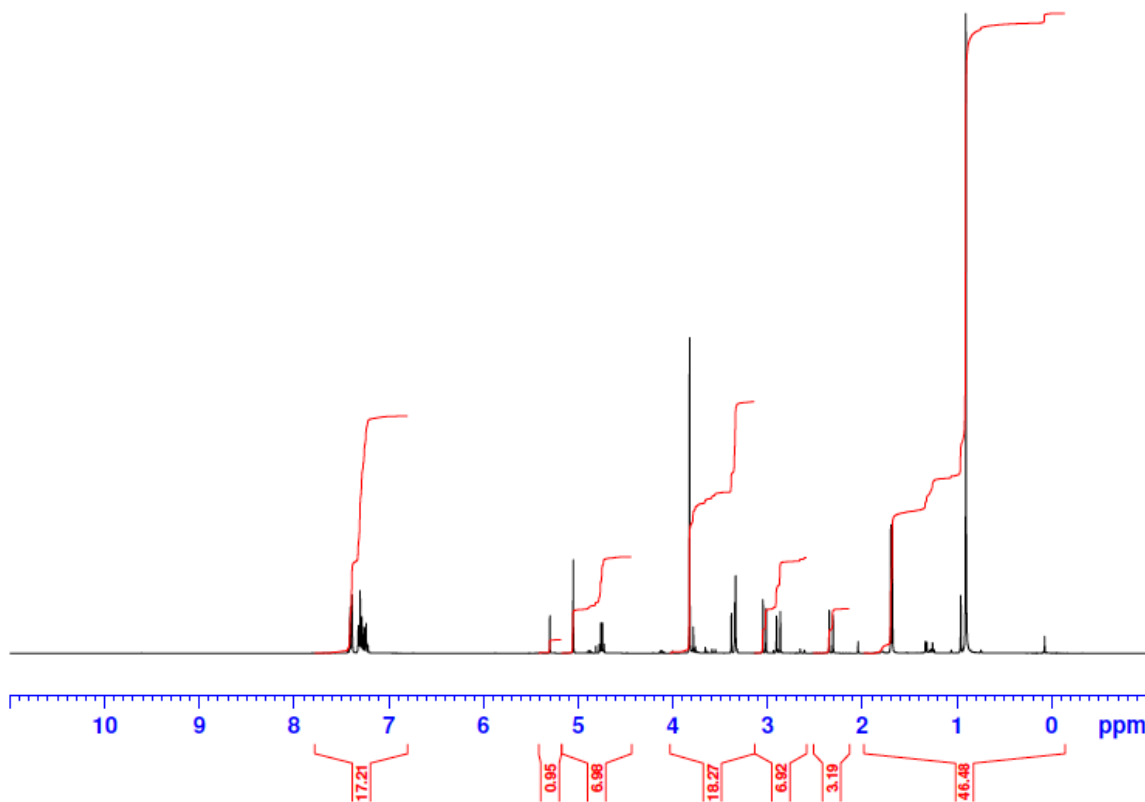
Instrument DQX400
Chemist BH
Group MGM
BH4172 F2
h1acq.au CDCl3 {E:NMB2Q11} mgmgrp_3

NMR@CHEM.OX

2972.52
2966
2965.8
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2965.8
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2914.7
2914.7
2914.7
2905.2
2905.2
2904.7
2904.7
2903.7
2903.7
2897.4
2897.4
2894.8
2894.8
2891.2
2891.2
2891.1
2131.1
2021.3
1956.1
1956.1
1949.9
1949.4
1897.8
1897.8
1891.3
1529.4
1529.4
1514.2
1514.2
1463.9
1463.9
1434.2
1434.2
1430.6
1430.6
1421.0
1421.0
1338.4
1338.4
1335.7
1335.7
1326.6
1326.6
1200.1
1200.1
1162.1
1162.1
1157.3
1157.3
1146.3
1146.3
939.0
939.0
923.2
871.5
871.5
871.5
871.5
833.5
833.5
5269
5269
510.3
510.3
503.1
503.1
384.2
384.2
372.7
361.5
29.4

```
NAME Mar08-2011-3
EXPNO 1
PROCNO 1
Date_ 20110309
Time 10.16
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zg60
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 8278.146 Hz
FIDRES 0.126314 Hz
AQ 3.9584243 sec
RG 45.3
DW 60.400 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec

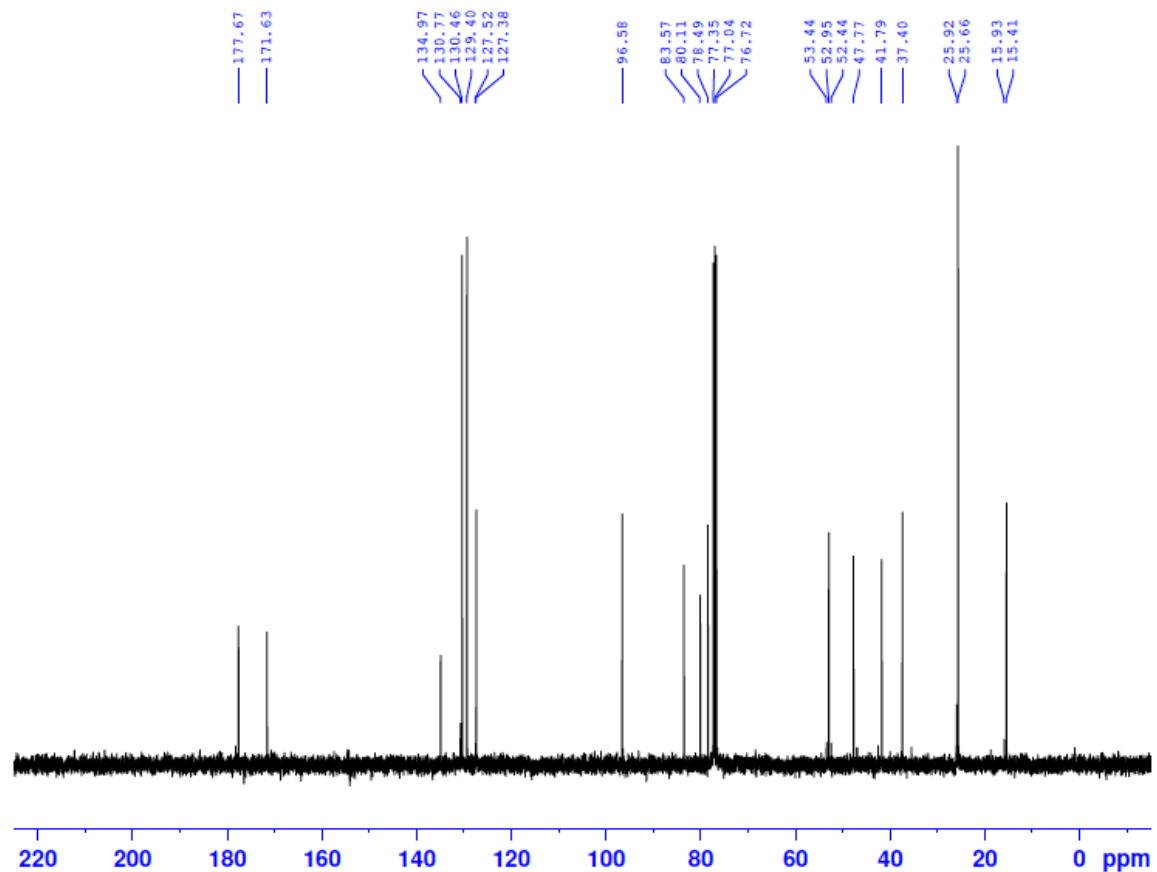
----- CHANNEL f1 -----
NUC1 1H
P1 9.00 usec
PL1 0.00 dB
SFO1 400.2024714 MHz
SI 32768
SF 400.2000028 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
```



22d

Instrument DQX400
Chemist BH
Group MGM
BH4172 F2
c13acq.au CDC13 (E:\NMR2011) mgmgrp 3

NMR@CHEM.OX



```
NAME Mar08-2011-3
EXPNO 2
PROCNO 1
Date_ 20110309
Time 10.24
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 32768
SOLVENT CDC13
NS 256
DS 4
SWH 26178.010 Hz
FIDRES 0.798889 Hz
AQ 0.6259188 sec
RG 32768
DW 19.100 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec
D11 0.03000000 sec
TD0 1

----- CHANNEL f1 -----
NUC1 13C
P1 9.50 usec
PL1 0.00 dB
SFO1 100.6403931 MHz

----- CHANNEL f2 -----
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 0.00 dB
PL12 19.00 dB
PL13 25.00 dB
SFO2 400.2016008 MHz
SI 32768
SF 100.6303718 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
```

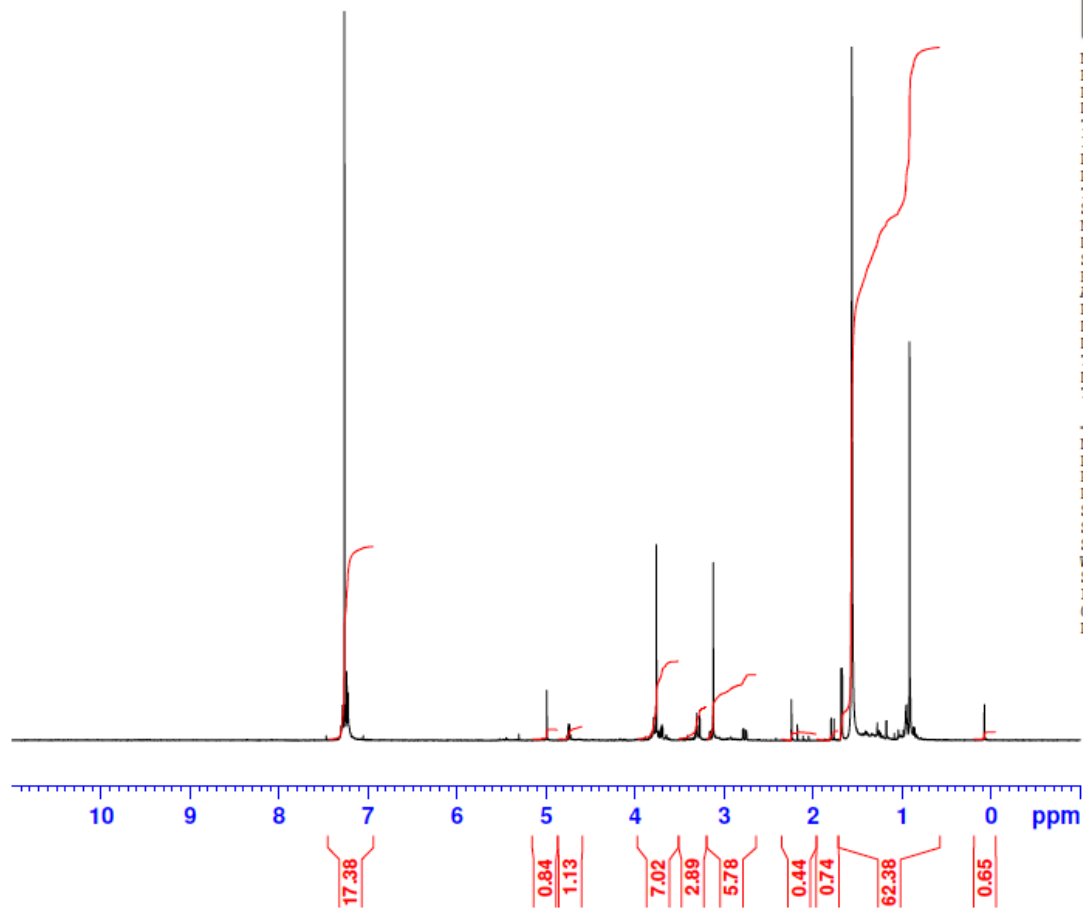

22e

Instrument AVC500
Group MGM
0944 Beth Heaviside 13/10/10

NMRO@CHEM.OX

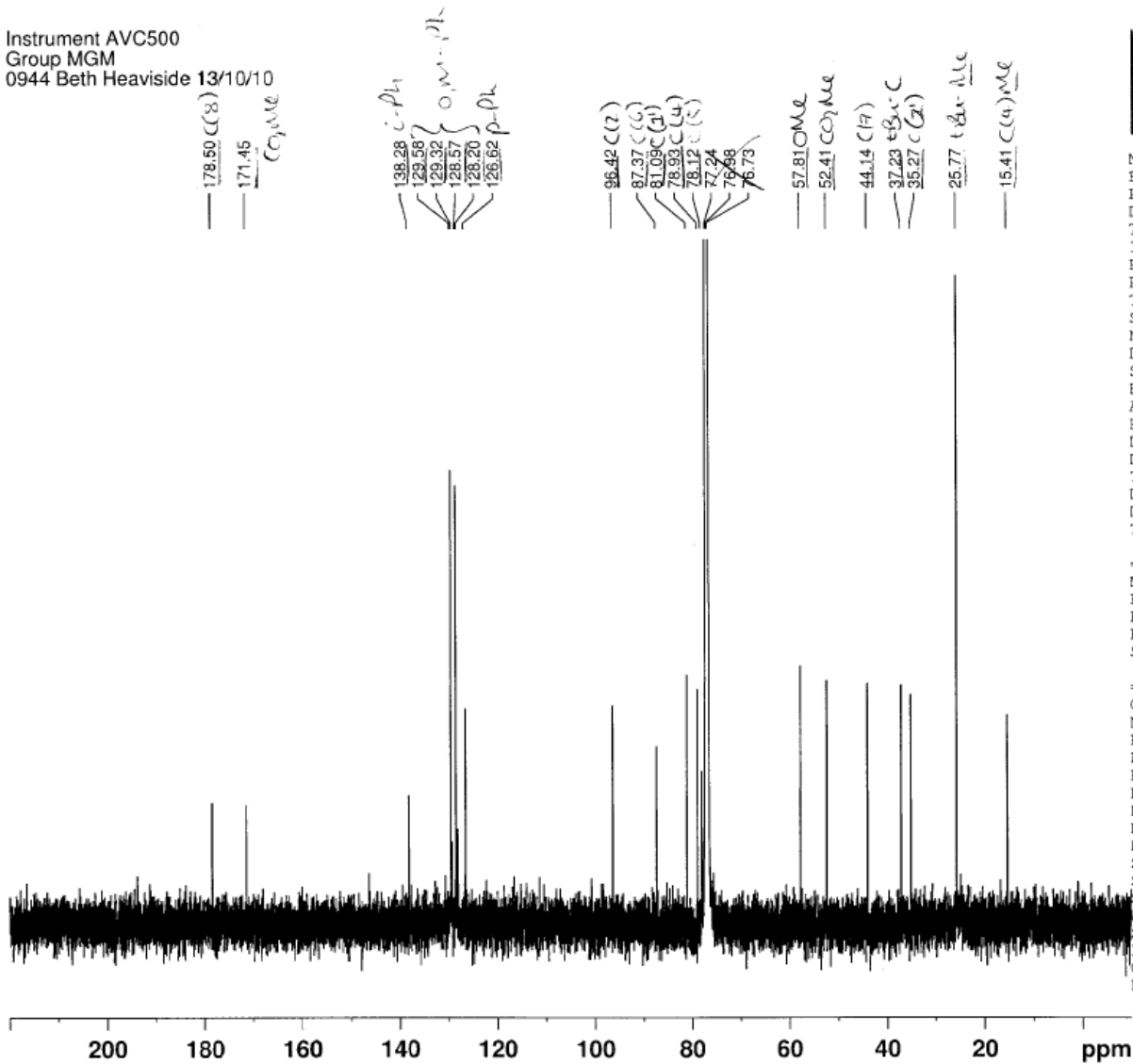
NAME bh09441310
EXPNO 1
PROCNO 1
Date_ 20101013
Time 16.20
INSTRUM avc500
PROBHD 5 mm CPDUL 13C
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 10330.578 Hz
FIDRES 0.157632 Hz
AQ 3.1719923 sec
RG 4
DW 48.400 usec
DE 6.00 usec
TE 298.0 K
D1 1.00000000 sec
TD0 1

----- CHANNEL f1 -----
NUC1 1H
P1 9.60 usec
PL1 -6.00 dB
PL1W 15.19999981 W
SFO1 500.3030896 MHz
SI 32768
SF 500.3000240 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



22e

Instrument AVC500
Group MGM
0944 Beth Heaviside 13/10/10



NMR@CHEM.OX

```

NAME          bh09441310
EXPNO         4
PROCNO        1
Date_         20101013
Time          18.52
INSTRUM       avc500
PROBHD        5 mm CPDUL 13C
PULPROG       zgpg30
TD            65536
SOLVENT       CDC13
NS            2048
DS            2
SWH           31250.000 Hz
FIDRES        0.476837 Hz
AQ            1.0486259 sec
RG            1820
DW            16.000 usec
DE            20.00 usec
TE            298.0 K
D1            2.00000000 sec
D11           0.03000000 sec
TD0           1
  
```

```

===== CHANNEL f1 =====
NUC1          13C
P1            9.50 usec
PL1           -4.40 dB
PL1W          28.15752029 W
SFO1          125.8131151 MHz
  
```

```

===== CHANNEL f2 =====
CPDPRG2       waltz16
NUC2          1H
PCPD2         80.00 usec
PL2           -6.00 dB
PL12          12.42 dB
PL13          18.42 dB
PL2W          15.19999981 W
PL12W         0.21869738 W
PL13W         0.05493430 W
SFO2          500.3020012 MHz
SI            32768
SF            125.8005438 MHz
WDW           EM
SSB           0
LB            1.00 Hz
GB            0
PC            1.40
  
```

Instrument DQX400
 Chemist BH
 Group MGM
 BH3176 F3
 h1acq.au CDCl3 {C:NMR} mgmgrp 20

NMRCHEM.OX

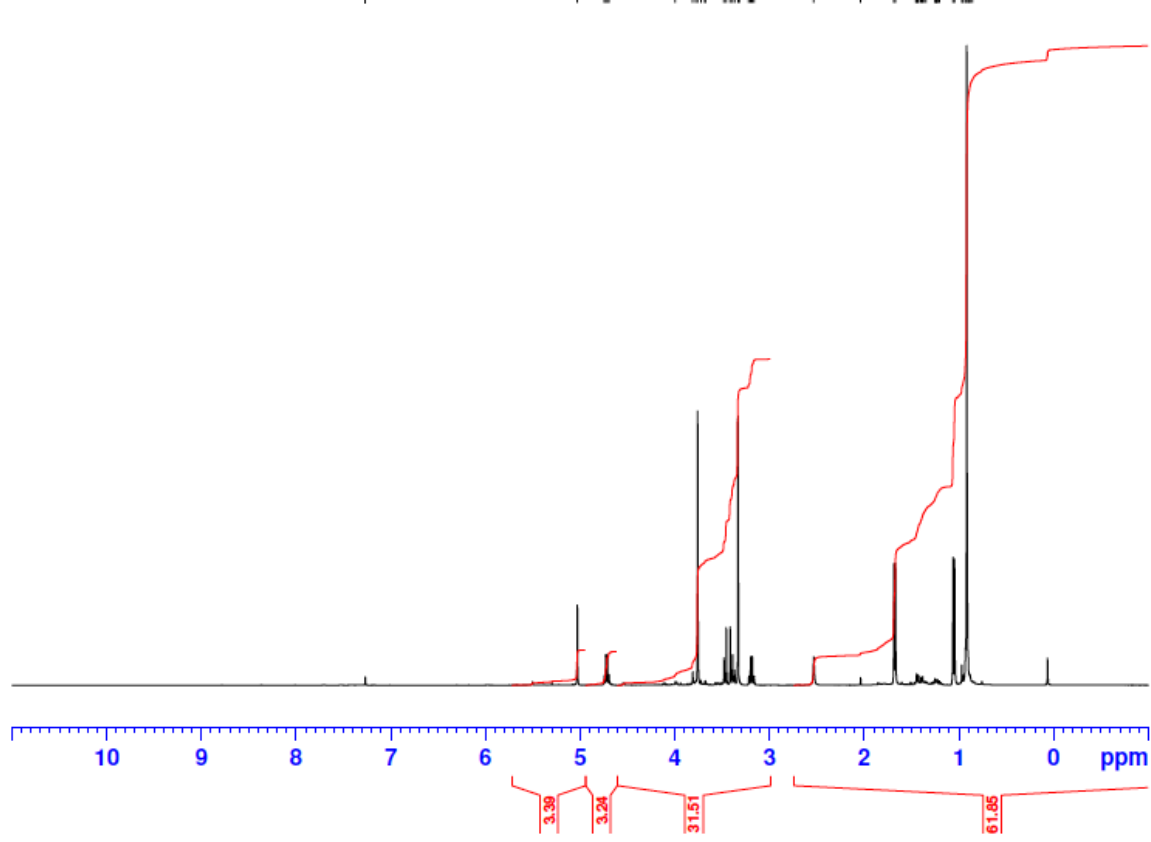
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1878.4
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1511.6
1504.0
1400.3
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1371.5
1362.8
1362.9
1366.8
1366.9
1340.0
1333.9
1327.1
1287.2
1271.0
1265.9
1013.3
815.5
668.1
668.1
581.3
579.8
572.7
559.9
559.9
553.3
548.9
507.7
497.8
494.1
491.3
489.0
425.1
418.0
388.1
371.2
366.2
363.3
354.7
341.5
341.5

```

NAME      Aug12-2010-20
EXPNO     1
PROCNO    1
Date_     20100812
Time      18.01
INSTRUM   av400
PROBHD    5 mm QNP 1H/13
PULPROG   zg60
TD         65536
SOLVENT   CDCl3
NS         16
DS         2
SWH       8278.146 Hz
FIDRES    0.126314 Hz
AQ         3.9584243 sec
RG         90.5
DW         60.400 usec
DE         7.50 usec
TE         300.0 K
D1         1.00000000 sec

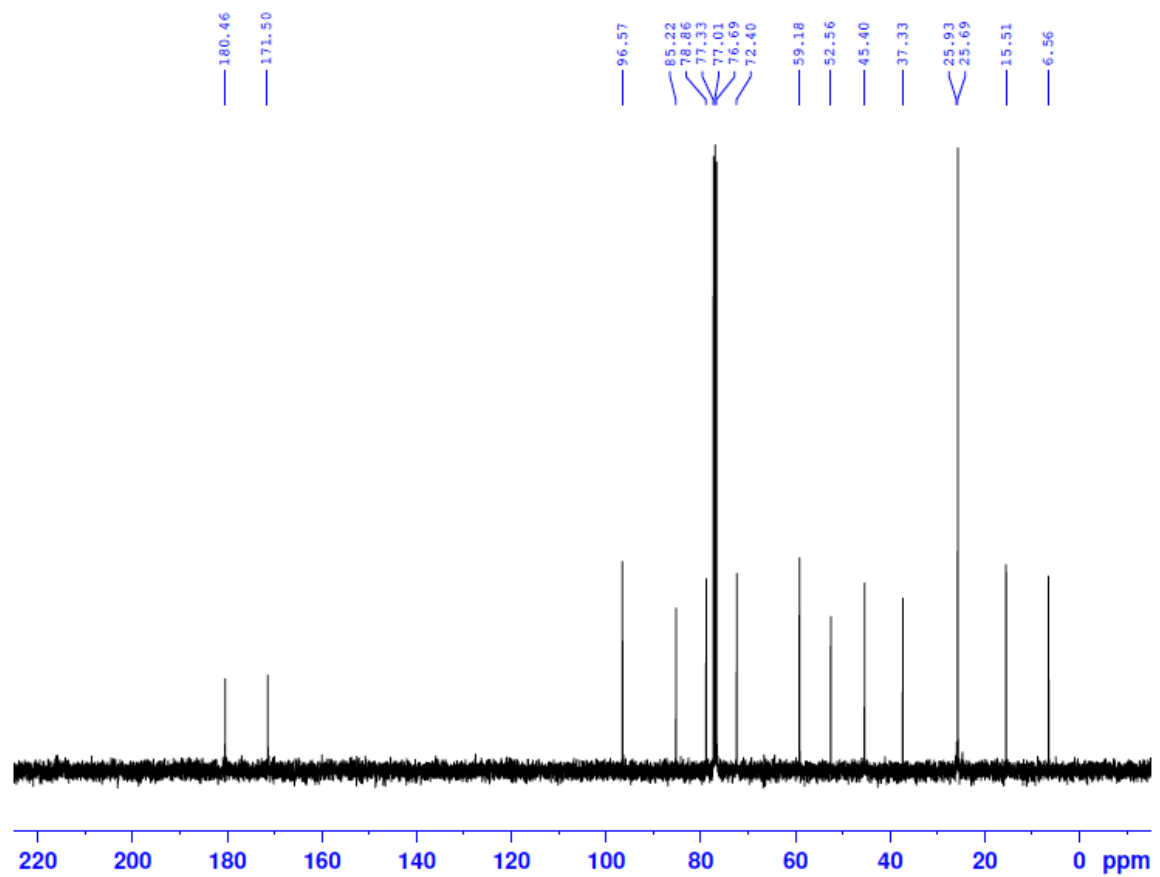
----- CHANNEL f1 -----
NUC1       1H
P1         9.00 usec
PL1        0.00 dB
SFO1       400.2024714 MHz
SI         32768
SF         400.2000028 MHz
WDW        EM
SSB        0
LB         0.30 Hz
GB         0
PC         1.00
  
```



22f

Instrument DQX400
 Chemist BH
 Group MGM
 BH3176 F3
 c13acq.au CDCl3 (C:NMR) mgmgrp 20

NMR@CHEM.OX



NAME Aug12-2010-20
 EXPNO 2
 PROCNO 1
 Date_ 20100812
 Time 18.08
 INSTRUM av400
 PROBHD 5 mm QNP 1H/13
 PULPROG zgpg30
 TD 32768
 SOLVENT CDCl3
 NS 256
 DS 4
 SWH 26178.010 Hz
 FIDRES 0.798889 Hz
 AQ 0.6259188 sec
 RG 32768
 DW 19.100 usec
 DE 7.50 usec
 TE 300.0 K
 D1 1.00000000 sec
 D11 0.03000000 sec
 TDO 1

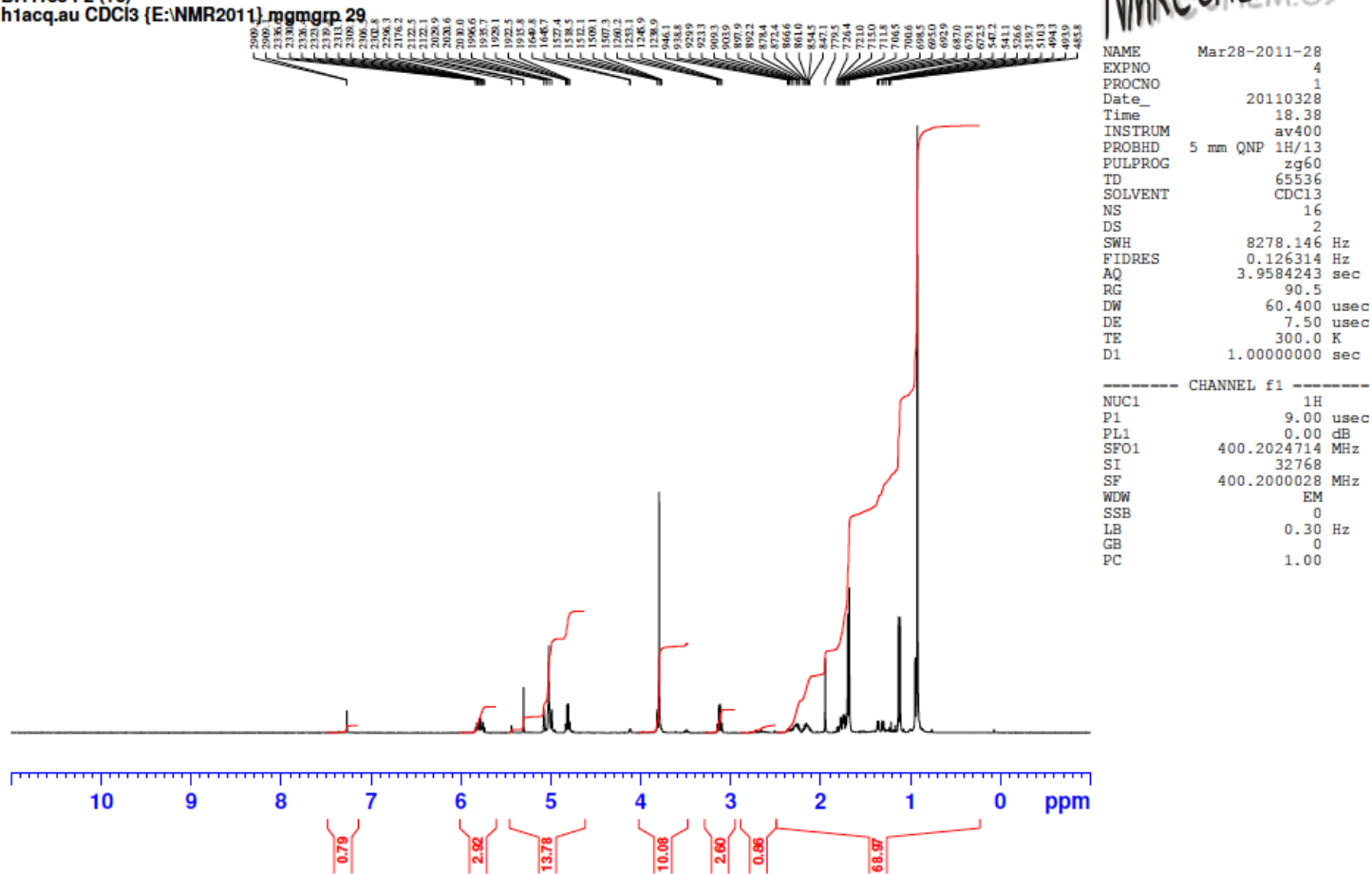
----- CHANNEL f1 -----
 NUC1 13C
 P1 9.50 usec
 PL1 0.00 dB
 SFO1 100.6403931 MHz

----- CHANNEL f2 -----
 CPDPRG2 waltz16
 NUC2 1H
 PCPD2 80.00 usec
 PL2 0.00 dB
 PL12 19.00 dB
 PL13 25.00 dB
 SFO2 400.2016008 MHz
 SI 32768
 SF 100.6303718 MHz
 WDW EM
 SSB 0
 LB 1.00 Hz
 GB 0
 PC 1.40

22g

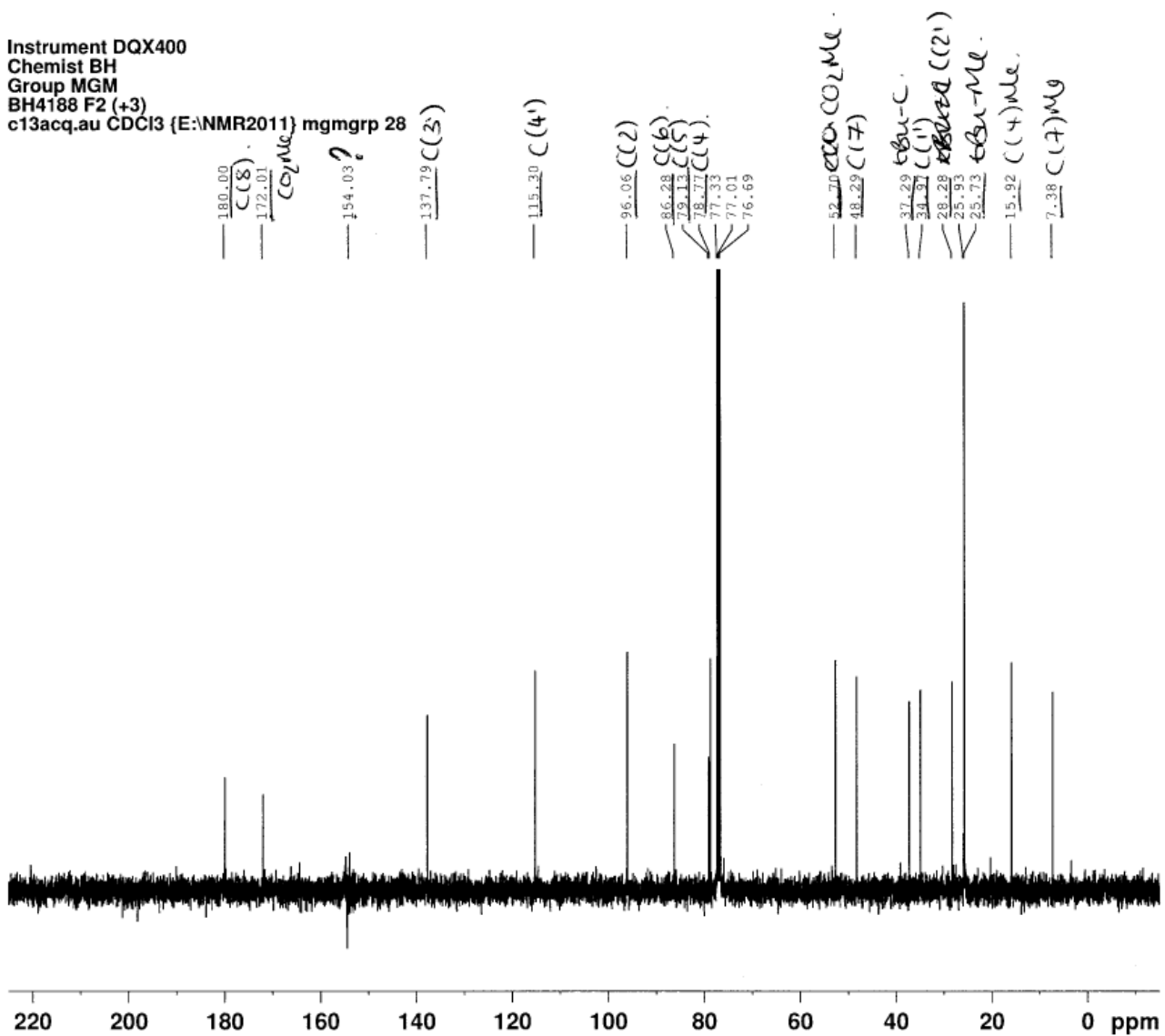
Instrument DQX400
Chemist BH
Group MGM
BH4188 F2 (+3)
h1acq.au CDCl3 {E:NMR2011} mgmgrp 29

NMR@CHEM.OX



22g

Instrument DQX400
 Chemist BH
 Group MGM
 BH4188 F2 (+3)
 c13acq.au CDC13 (E:NMR2011) mgmgrp 28



NMROCHEM.OX

NAME Mar29-2011-26
 EXPNO 3
 PROCNO 1
 Date_ 20110329
 Time 15.51
 INSTRUM av400
 PROBHD 5 mm QNP 1H/13
 PULPROG zgpg30
 TD 32768
 SOLVENT CDC13
 NS 256
 DS 4
 SWH 26178.010
 FIDRES 0.798889
 AQ 0.6259188
 RG 32768
 DW 19.100
 DE 7.50
 TE 300.0
 D1 1.0000000
 D11 0.0300000
 TDO 1

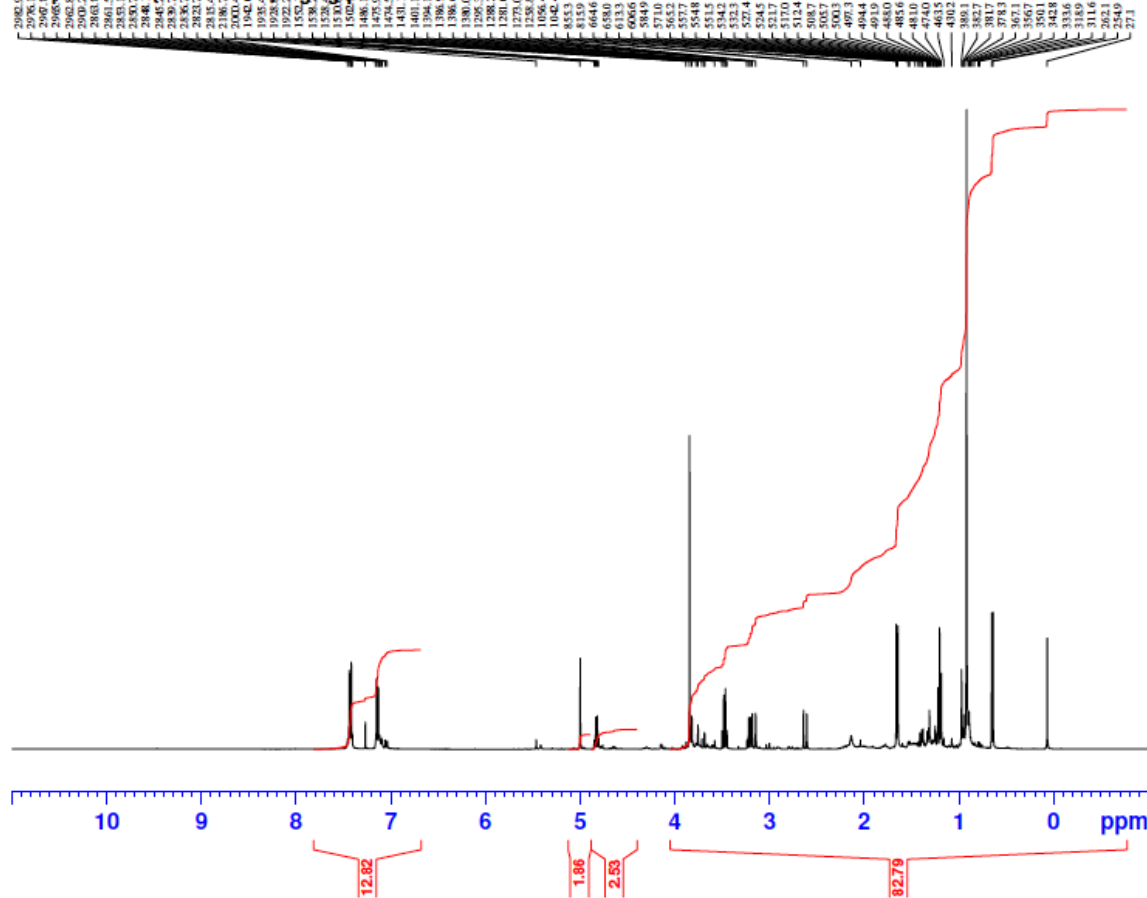
==== CHANNEL f1 ====
 NUC1 13C
 P1 9.50
 PL1 0.00
 SFO1 100.6403931

==== CHANNEL f2 ====
 CPDPRG2 waltz16
 NUC2 1H
 PCPD2 80.00
 PL2 0.00
 PL12 19.00
 PL13 25.00
 SFO2 400.2016008
 S1 32768
 SF 100.6303718
 WDW EM
 SSB 0
 LB 1.00
 GB 0
 PC 1.40

22h

Instrument DQX400
Chemist BH
Group MGM
BH4178

h1acc au CDCl3 (F:NMR2011) mgmgrp 24



NMRCHEM.OX

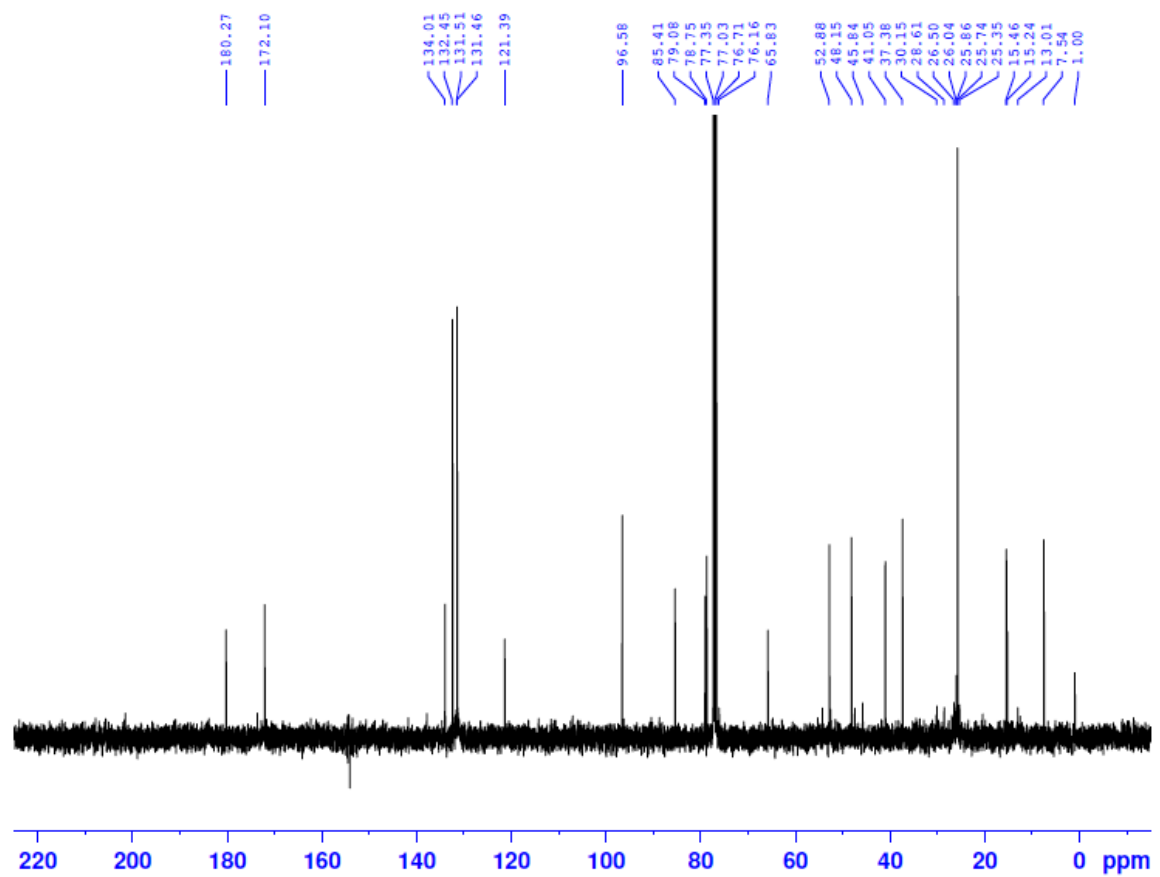
NAME Mar09-2011-24
EXPNO 1
PROCNO 1
Date_ 20110309
Time 18.51
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zg60
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 8278.146 Hz
FIDRES 0.126314 Hz
AQ 3.9584243 sec
RG 40.3
DW 60.400 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec

----- CHANNEL f1 -----
NUC1 1H
P1 9.00 usec
PL1 0.00 dB
SFO1 400.2024714 MHz
SI 32768
SF 400.2000028 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

22h

Instrument DQX400
Chemist BH
Group MGM
BH4178
c13acq.au CDC13 (E:\NMR2011) mgmgrp 24

NMR@CHEM.OX



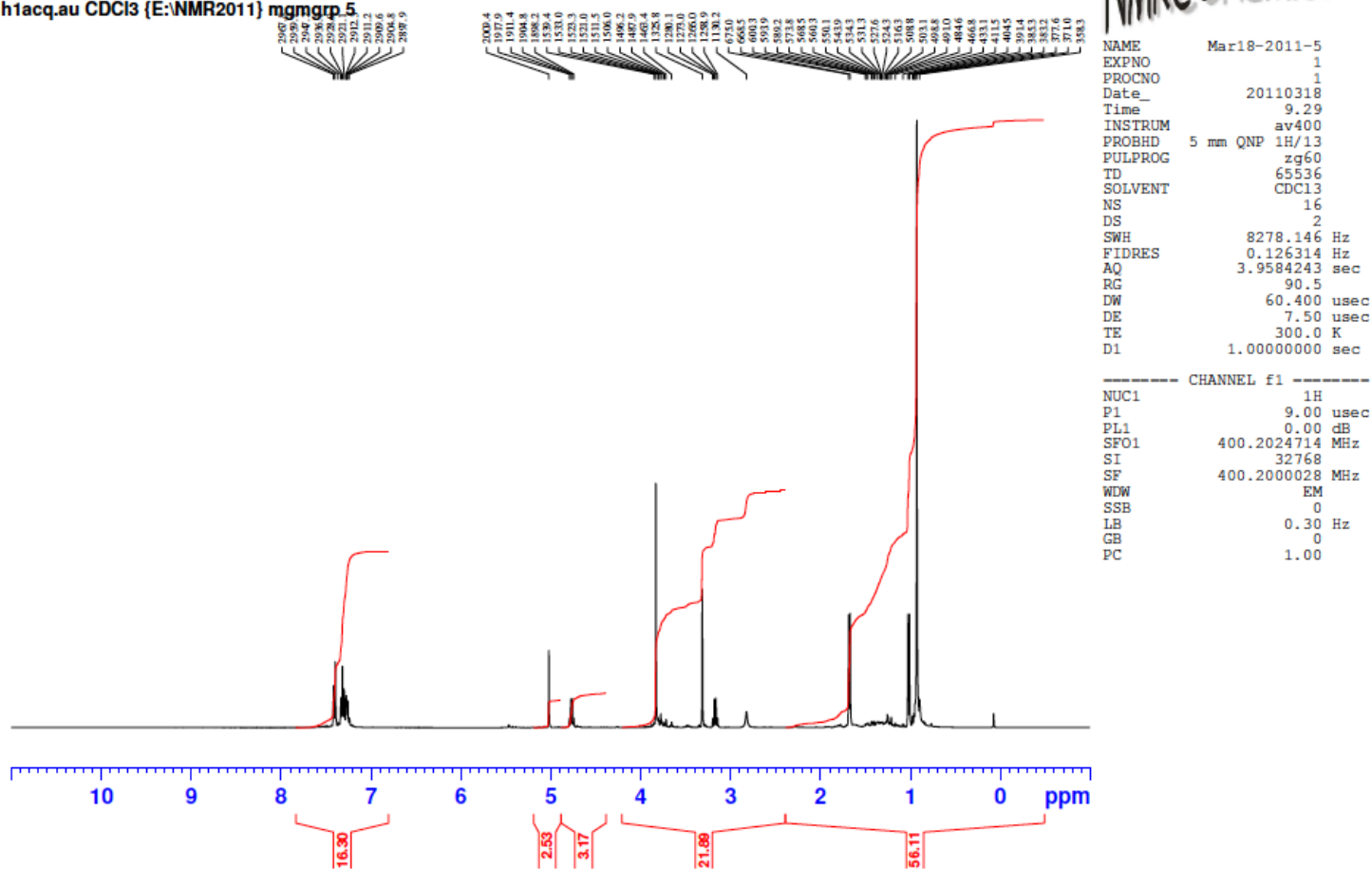
```
NAME Mar09-2011-24
EXPNO 2
PROCNO 1
Date_ 20110309
Time 18.59
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 32768
SOLVENT CDC13
NS 256
DS 4
SWH 26178.010 Hz
FIDRES 0.798889 Hz
AQ 0.6259188 sec
RG 32768
DW 19.100 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec
D11 0.03000000 sec
TD0 1

----- CHANNEL f1 -----
NUC1 13C
P1 9.50 usec
PL1 0.00 dB
SFO1 100.6403931 MHz

----- CHANNEL f2 -----
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 0.00 dB
PL12 19.00 dB
PL13 25.00 dB
SFO2 400.2016008 MHz
SI 32768
SF 100.6303718 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
```

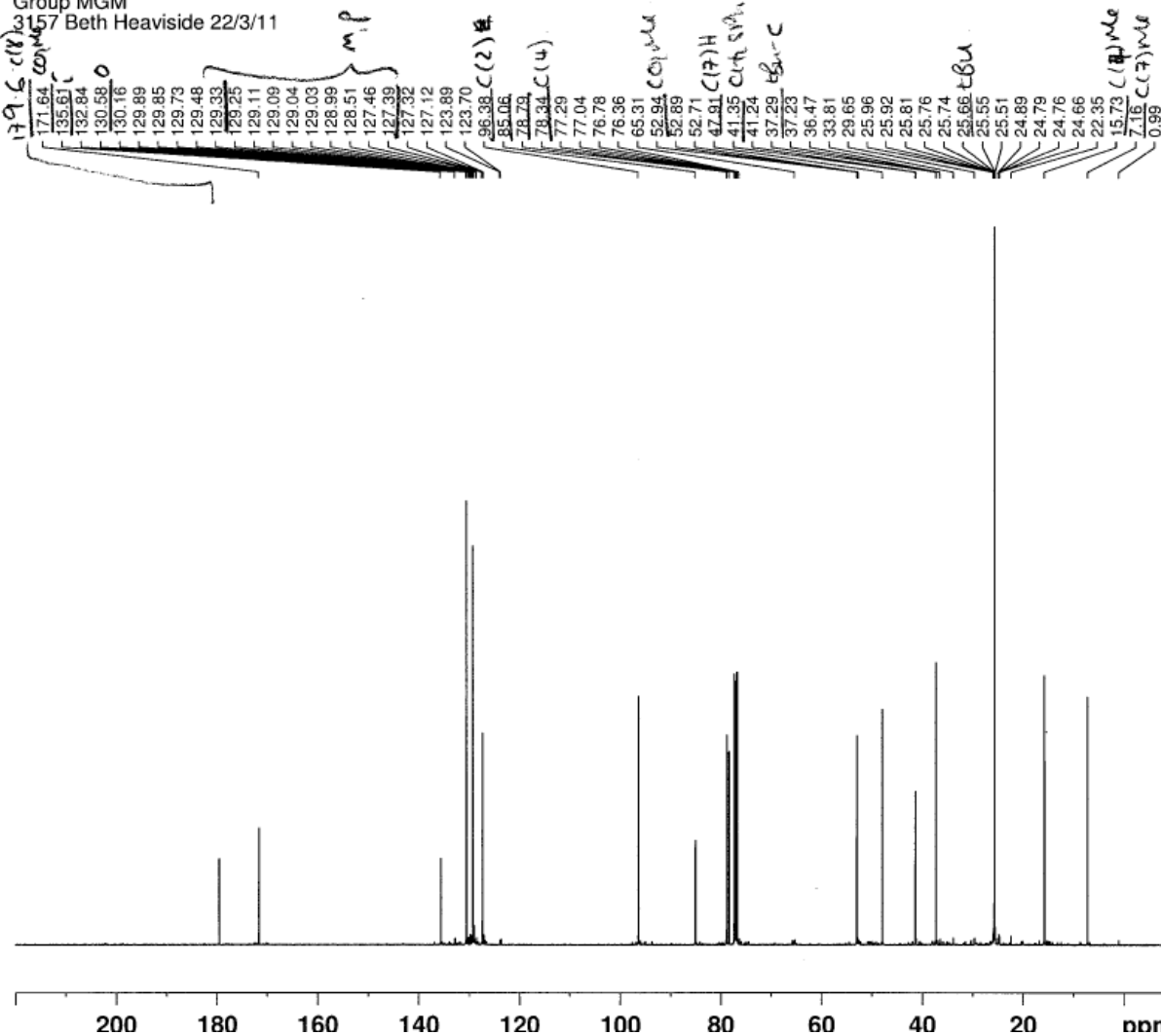

Instrument DQX400
 Chemist BH
 Group MGM
 BH4184
 h1acq.au CDCl3 {E:NMR2011} mgmgrp_5

NMRCHEM.OX



Instrument AVC500
 Group MGM
 57 Beth Heaviside 22/3/11

NMR@CHEM.OX



```

NAME          bh31572203
EXPNO         3
PROCNO        1
Date_         20110323
Time          0.41
INSTRUM       avc500
PROBHD        5 mm CPDUL 13C
PULPROG       zgpg30
TD            65536
SOLVENT       CDCl3
NS            512
DS            2
SWH           31250.000 Hz
FIDRES        0.476837 Hz
AQ            1.0486259 sec
RG            1820
DW            16.000 usec
DE            20.00 usec
TE            298.1 K
D1            2.00000000 sec
D11           0.03000000 sec
TD0           1

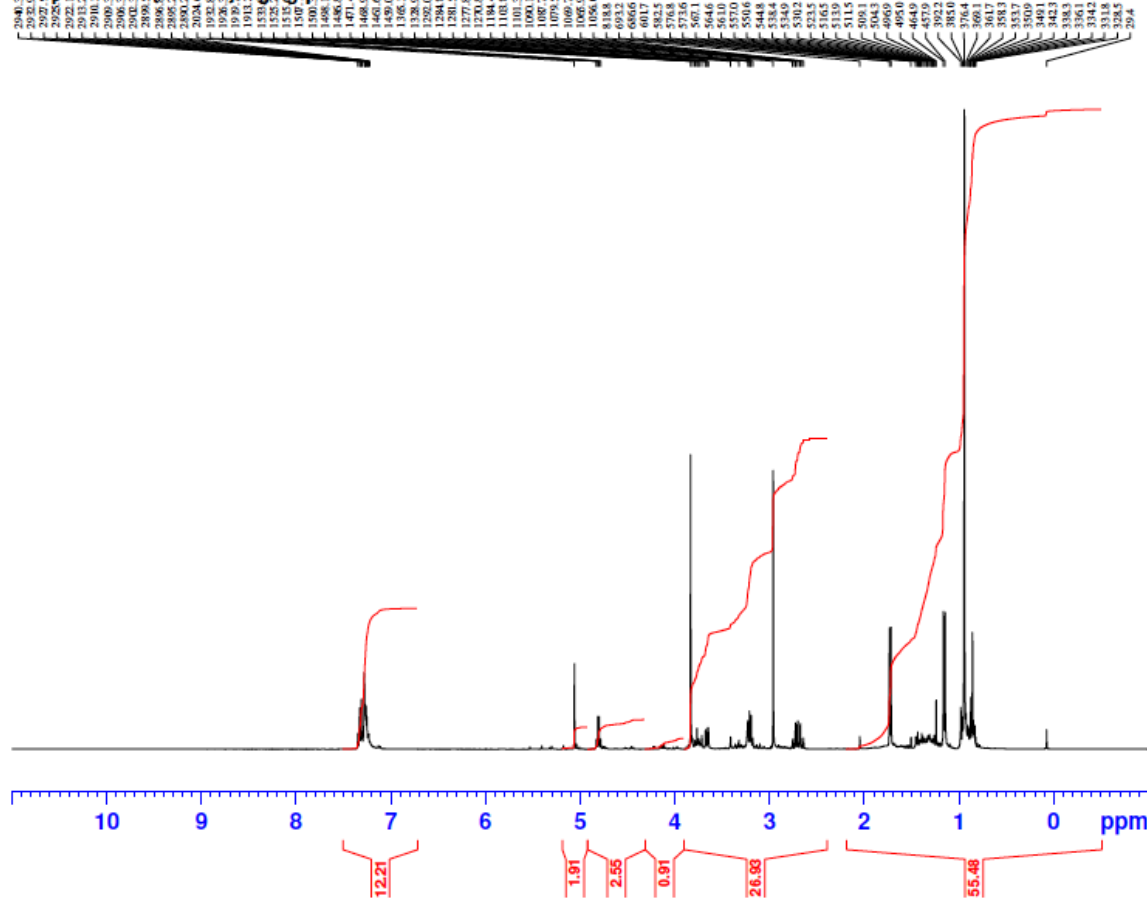
----- CHANNEL f1 -----
NUC1          13C
P1            9.50 usec
PL1           -4.40 dB
PL1W         28.15752029 W
SFO1         125.8131151 MHz

----- CHANNEL f2 -----
CPDPRG2      waltz16
NUC2          1H
PCPD2        80.00 usec
PL2           -6.00 dB
PL12         12.42 dB
PL13         18.42 dB
PL2W         15.19999981 W
PL12W        0.21869738 W
PL13W        0.05493430 W
SFO2         500.3020012 MHz
SI           32768
SF           125.8005438 MHz
WDW          EM
SSB          0
LB           1.00 Hz
GB           0
PC           1.40
    
```

22j

Instrument DQX400
Chemist BH
Group MGM
BH426 F4

h1acq.au CDCl3 (C;NMB) mgmgrp 2



NMROCHEM.OX

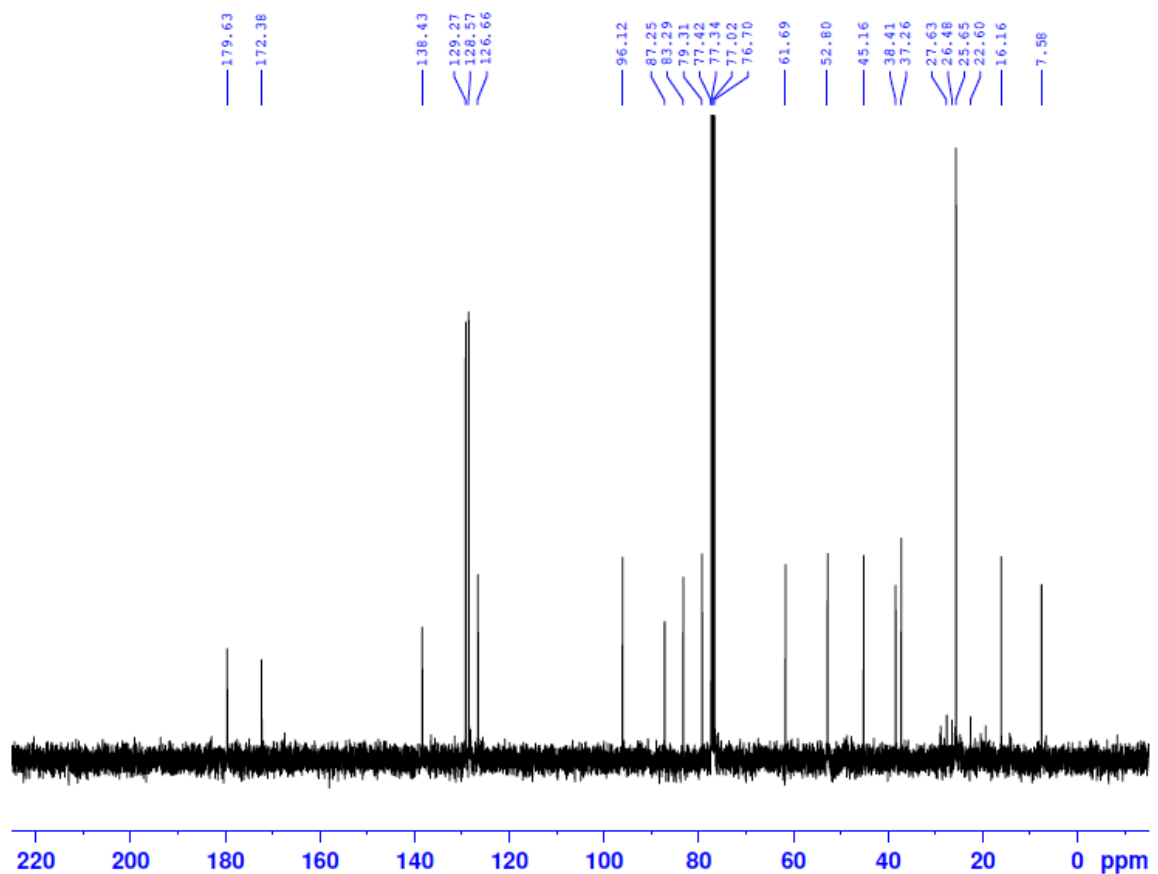
```
NAME Sep20-2010-2
EXPNO 1
PROCNO 1
Date_ 20100920
Time 9.05
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zg60
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 8278.146 Hz
FIDRES 0.126314 Hz
AQ 3.9584243 sec
RG 40.3
DW 60.400 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec

----- CHANNEL f1 -----
NUC1 1H
P1 9.00 usec
PL1 0.00 dB
SFO1 400.2024714 MHz
SI 32768
SF 400.2000028 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
```

22j

Instrument DQX400
Chemist BH
Group MGM
BH426 F4
c13acq.au CDCl3 (C13NMR) mgmgrp 2

NMR@CHEM.OX



```
NAME Sep20-2010-2
EXPNO 2
PROCNO 1
Date_ 20100920
Time 9.13
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 256
DS 4
SWH 26178.010 Hz
FIDRES 0.798889 Hz
AQ 0.6259188 sec
RG 32768
DW 19.100 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec
D11 0.03000000 sec
TDO 1

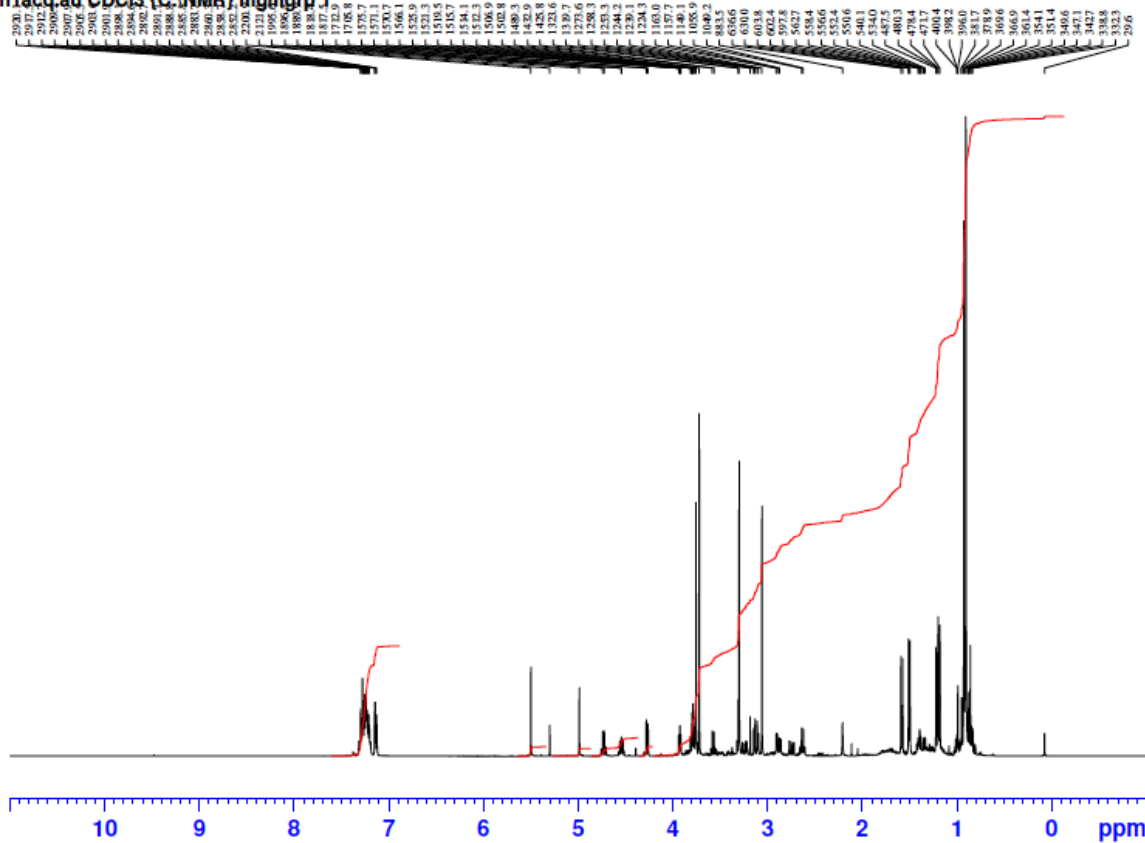
----- CHANNEL f1 -----
NUC1 13C
P1 9.50 usec
PL1 0.00 dB
SFO1 100.6403931 MHz

----- CHANNEL f2 -----
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 0.00 dB
PL12 19.00 dB
PL13 25.00 dB
SFO2 400.2016008 MHz
SI 32768
SF 100.6303718 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
```

22j'

Instrument DQX400
Chemist BH
Group MGM
BH426 F3
h1acq.au CDCl3 (C-NMR) mgmgrp 1

NMROCHEM.OX



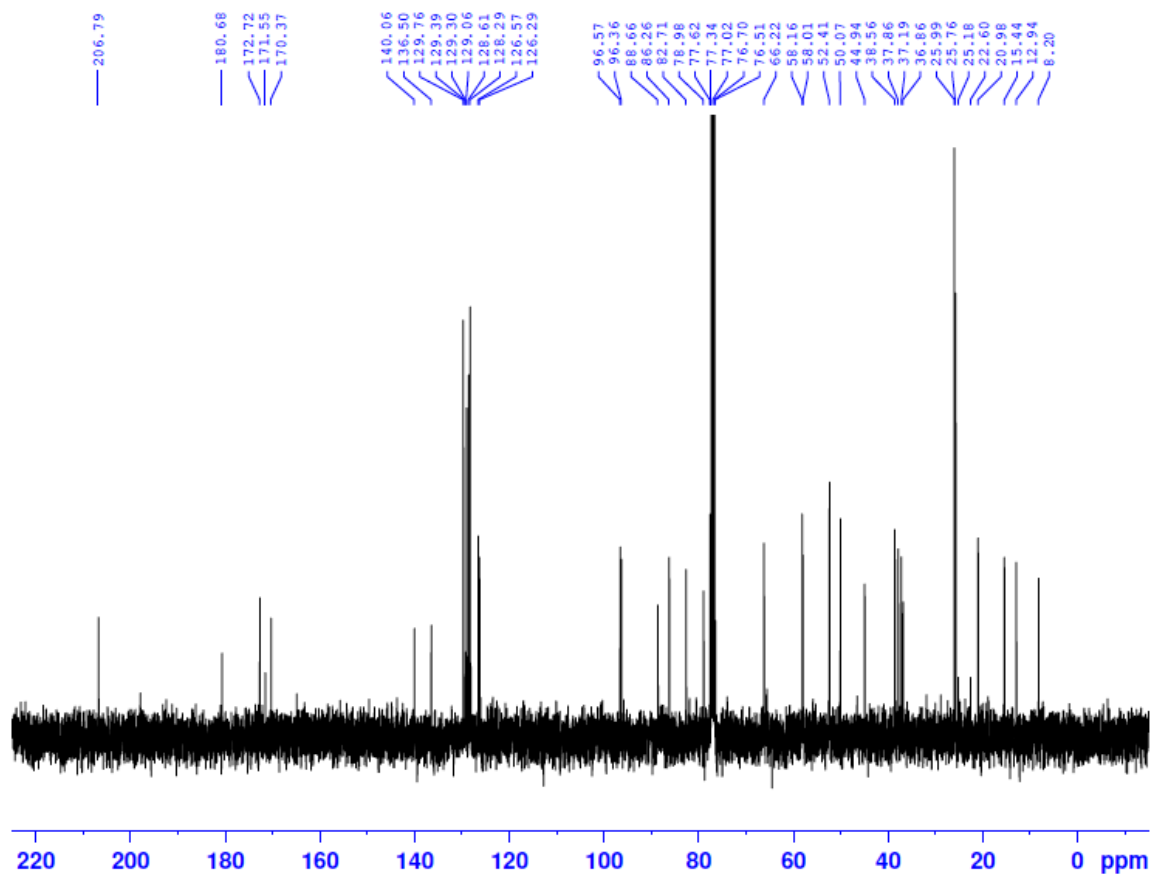
```
NAME          Sep20-2010-1
EXPNO          1
PROCNO         1
Date_          20100920
Time           8.37
INSTRUM        av400
PROBHD         5 mm QNP 1H/13
PULPROG        zg60
TD             65536
SOLVENT        CDCl3
NS             16
DS             2
SWH            8278.146 Hz
FIDRES         0.126314 Hz
AQ             3.9584243 sec
RG             90.5
DW             60.400 usec
DE             7.50 usec
TE             300.0 K
D1             1.00000000 sec

----- CHANNEL f1 -----
NUC1           1H
P1             9.00 usec
PL1            0.00 dB
SFO1           400.2024714 MHz
SI             32768
SF             400.2000028 MHz
WDW            EM
SSB            0
LB             0.30 Hz
GB             0
PC             1.00
```

22j'

Instrument DQX400
 Chemist BH
 Group MGM
 BH426 F3
 c13acq.au CDCl3 (C13NMR) mgmgrp 1

NMR@CHEM.OX



```

NAME          Sep20-2010-1
EXPNO         2
PROCNO        1
Date_         20100920
Time          8.45
INSTRUM       av400
PROBHD        5 mm QNP 1H/13
PULPROG       zgpg30
TD            32768
SOLVENT       CDCl3
NS            256
DS            4
SWH           26178.010 Hz
FIDRES        0.798889 Hz
AQ            0.6259188 sec
RG            32768
DW            19.100 usec
DE            7.50 usec
TE            300.0 K
D1            1.00000000 sec
D11           0.03000000 sec
TD0           1

----- CHANNEL f1 -----
NUC1          13C
P1            9.50 usec
PL1           0.00 dB
SFO1         100.6403931 MHz

----- CHANNEL f2 -----
CPDPRG2      waltz16
NUC2          1H
PCPD2        80.00 usec
PL2           0.00 dB
PL12         19.00 dB
PL13         25.00 dB
SFO2         400.2016008 MHz
SI           32768
SF           100.6303718 MHz
WDW          EM
SSB          0
LB           1.00 Hz
GB           0
PC           1.40
  
```

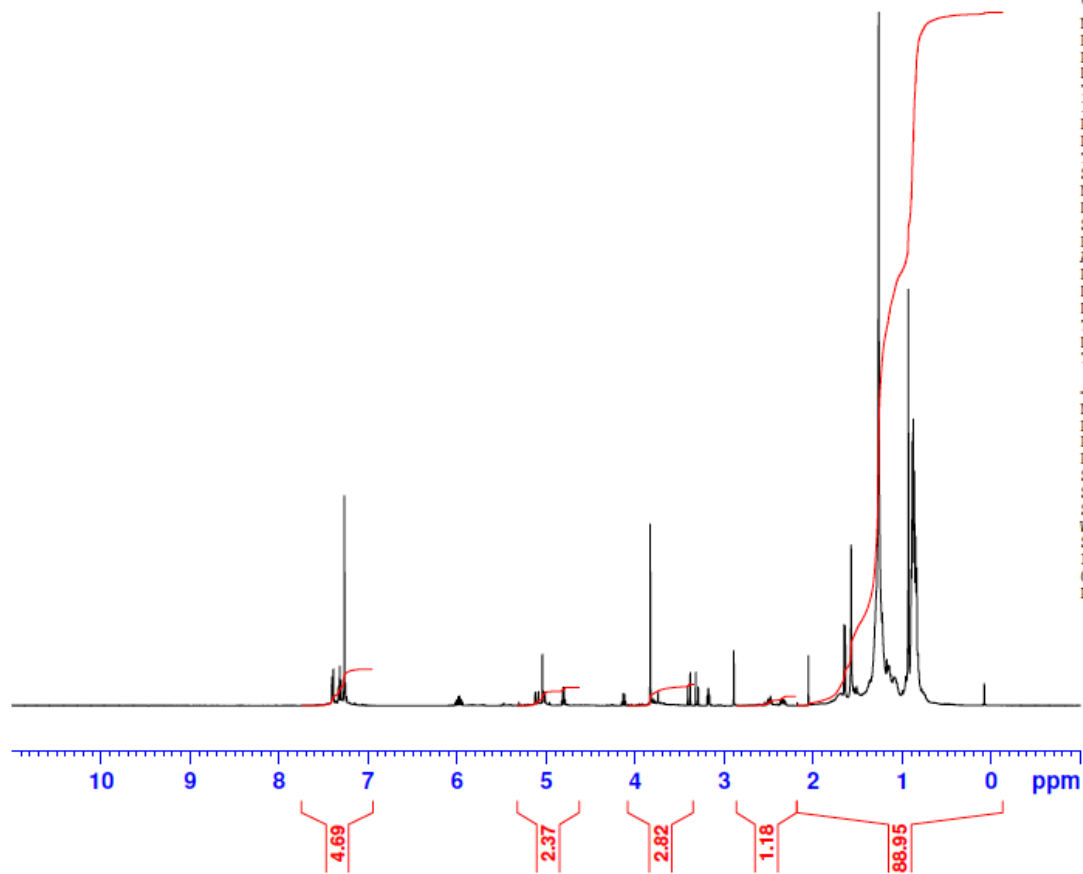
22k

Instrument AVC500
Group MGM
BETH HEAVISIDE 6146 27/9/11

NMRO@CHEM.OX

NAME bh61462709
EXPNO 1
PROCNO 1
Date_ 20110928
Time 23.42
INSTRUM avc500
PROBHD 5 mm CPDUL 13C
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 10330.578 Hz
FIDRES 0.157632 Hz
AQ 3.1719923 sec
RG 4
DW 48.400 usec
DE 6.00 usec
TE 298.0 K
D1 1.00000000 sec
TD0 1

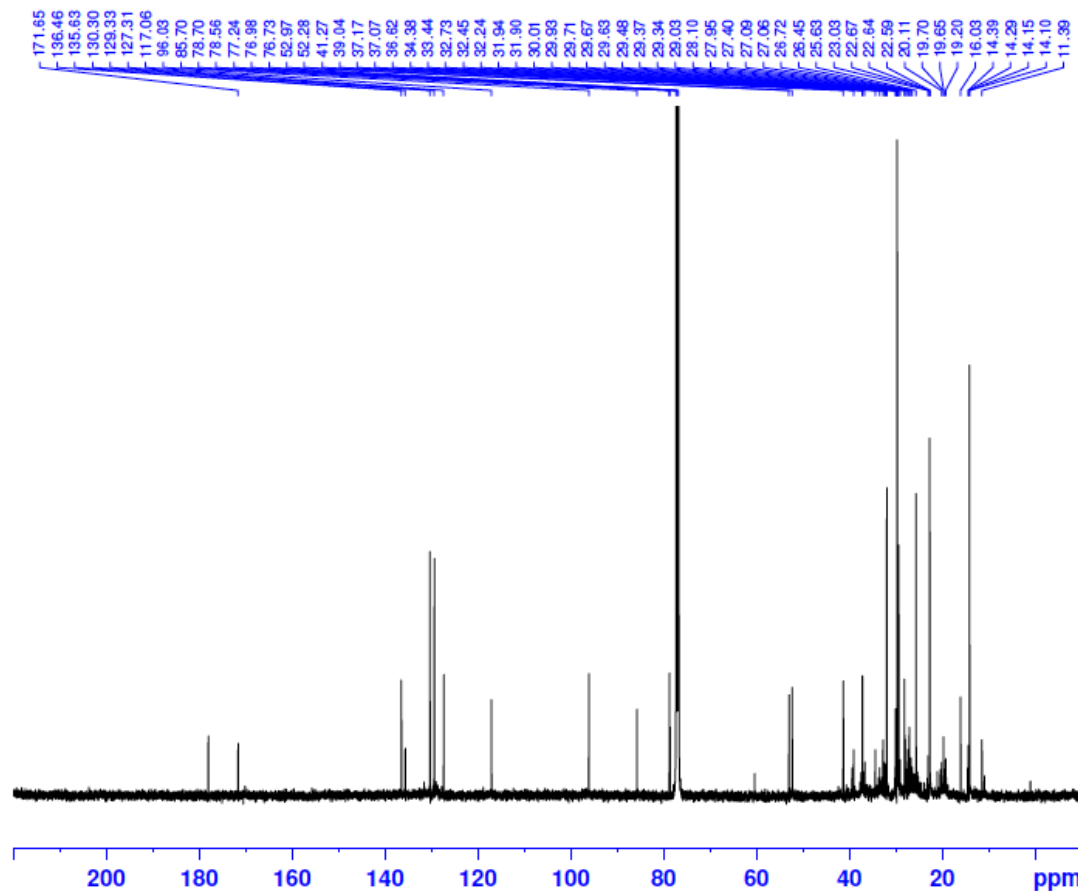
----- CHANNEL f1 -----
NUC1 1H
P1 9.60 usec
PL1 -6.00 dB
PL1W 15.19999981 W
SFO1 500.3030896 MHz
SI 32768
SF 500.3000240 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



22k

Instrument AVC500
Group MGM
BETH HEAVISIDE 6146 27/9/11

NMR@CHEM.OX



```
NAME          bh61462709
EXPNO         4
PROCNO        1
Date_         20110929
Time          0.52
INSTRUM       avc500
PROBHD        5 mm CPDUL 13C
PULPROG       zgpg30
TD            65536
SOLVENT       CDCl3
NS            1024
DS            2
SWH           31250.000 Hz
FIDRES        0.476837 Hz
AQ            1.0486259 sec
RG            1820
DW            16.000 usec
DE            20.00 usec
TE            298.0 K
D1            2.00000000 sec
D11           0.03000000 sec
TD0           1

----- CHANNEL f1 -----
NUC1          13C
P1            10.00 usec
PL1           -4.40 dB
PL1W          28.15752029 W
SFO1          125.8131151 MHz

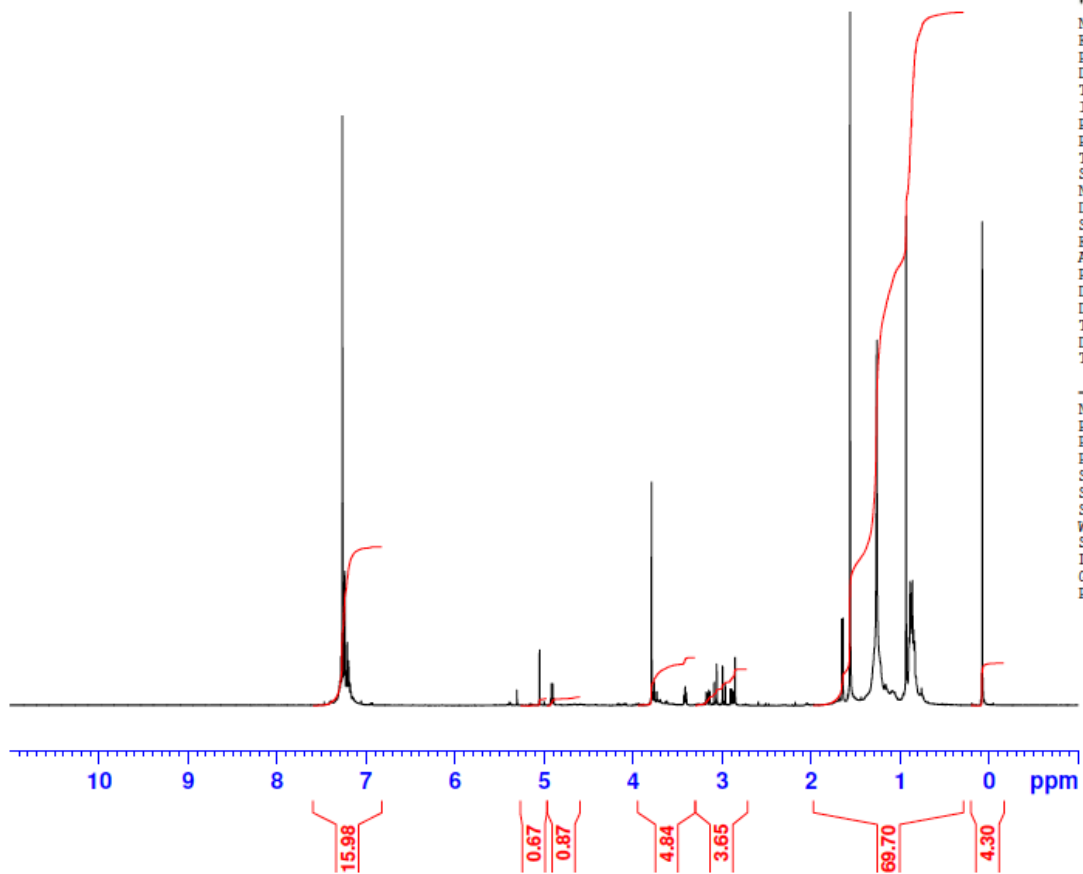
----- CHANNEL f2 -----
CPDPRG2       waltz16
NUC2          1H
PCPD2         80.00 usec
PL2           -6.00 dB
PL12          12.42 dB
PL13          18.42 dB
PL2W          15.19999981 W
PL12W         0.21869738 W
PL13W         0.05493430 W
SFO2          500.3020012 MHz
SI            32768
SF            125.8005438 MHz
WDW           EM
SSB           0
LB            1.00 Hz
GB            0
PC            1.40
```


Instrument AVC500
Group MGM
BETH HEAVISIDE 6147 27/9/11

NMROCHEM.OX

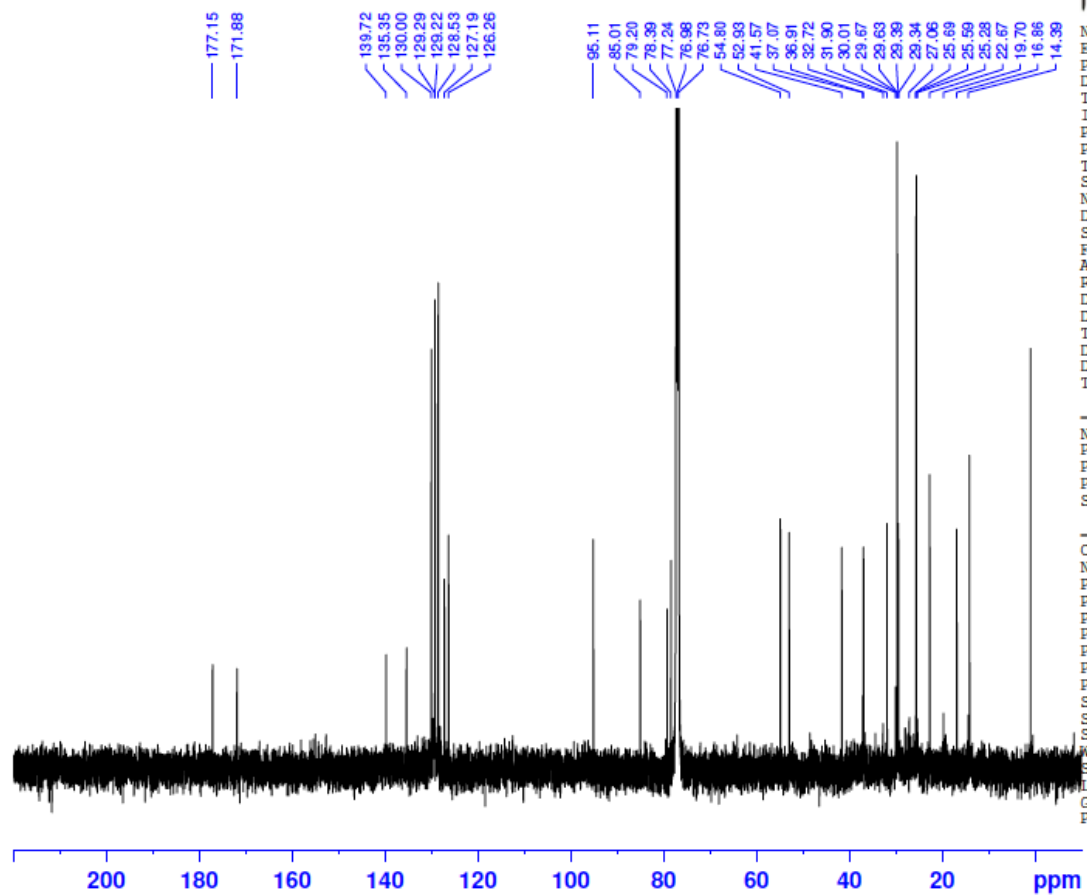
NAME bh61472709
EXPNO 1
PROCNO 1
Date_ 20110928
Time 21.26
INSTRUM avc500
PROBHD 5 mm CPDUL 13C
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 10330.578 Hz
FIDRES 0.157632 Hz
AQ 3.1719923 sec
RG 4
DW 48.400 usec
DE 6.00 usec
TE 298.0 K
D1 1.00000000 sec
TD0 1

----- CHANNEL f1 -----
NUC1 1H
P1 9.60 usec
PL1 -6.00 dB
PL1W 15.19999981 W
SFO1 500.3030896 MHz
SI 32768
SF 500.3000240 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



Instrument AVC500
Group MGM
BETH HEAVISIDE 6147 27/9/11

NMR@CHEM.OX



```

NAME          bh61472709
EXPNO         4
PROCNO        1
Date_         20110928
Time          22.36
INSTRUM       avc500
PROBHD        5 mm CPDUL 13C
PULPROG       zgpg30
TD            65536
SOLVENT       CDCl3
NS            1024
DS            2
SWH           31250.000 Hz
FIDRES        0.476837 Hz
AQ            1.0486259 sec
RG            1820
DW            16.000 usec
DE            20.00 usec
TE            298.0 K
D1            2.00000000 sec
D11           0.03000000 sec
TDO           1

----- CHANNEL f1 -----
NUC1          13C
P1            10.00 usec
PL1           -4.40 dB
PL1W          28.15752029 W
SFO1          125.8131151 MHz

----- CHANNEL f2 -----
CPDPRG2       waltz16
NUC2          1H
PCPD2         80.00 usec
PL2           -6.00 dB
PL12          12.42 dB
PL13          18.42 dB
PL2W          15.19999981 W
PL12W         0.21869738 W
PL13W         0.05493430 W
SFO2          500.3020012 MHz
SI            32768
SF            125.8005438 MHz
WDW           EM
SSB           0
LB            1.00 Hz
GB            0
PC            1.40

```