Electronic Supplementary Information

Enantioselective synthesis of benzannulated spiroketals using a chiral sulfoxide auxiliary

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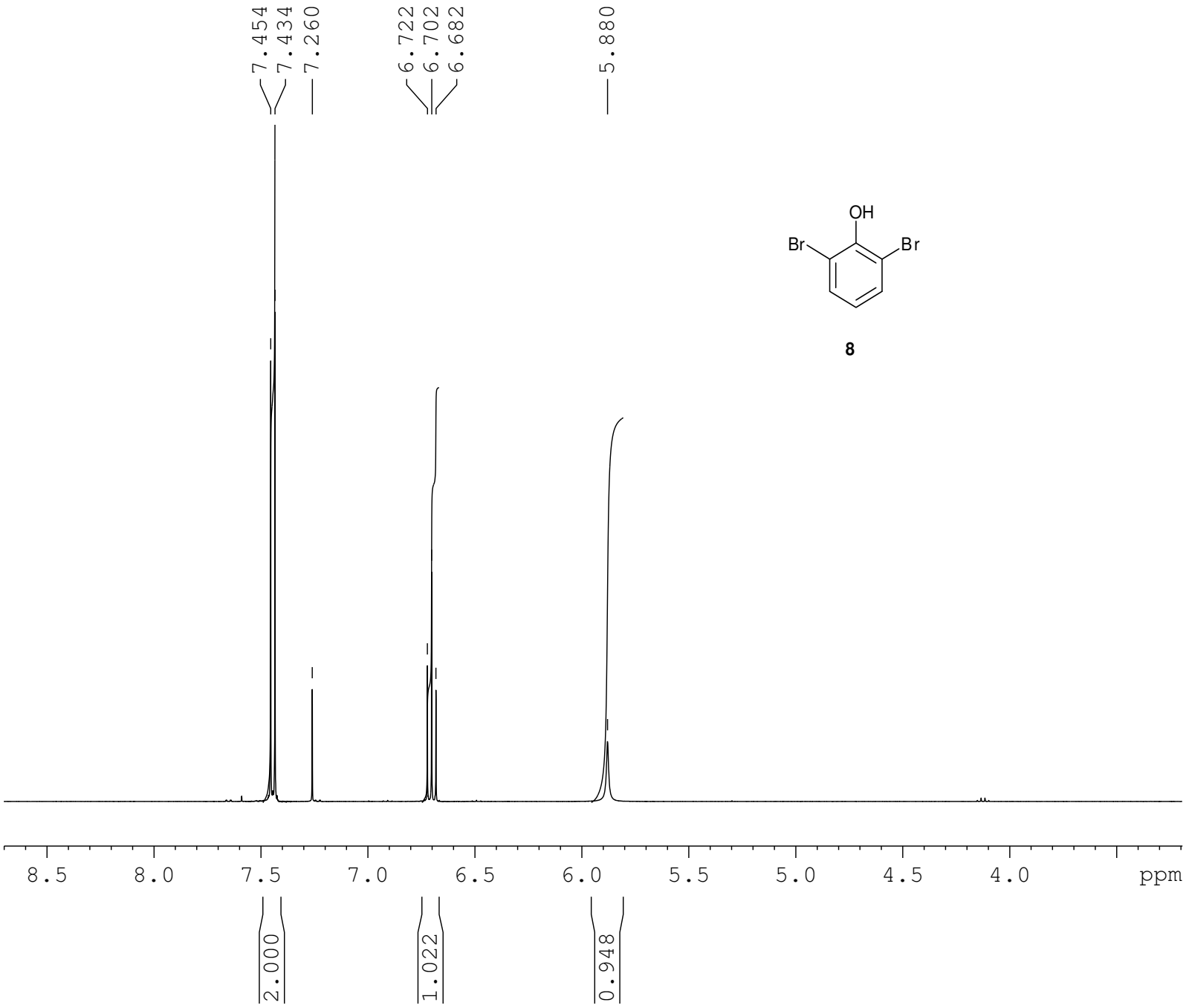


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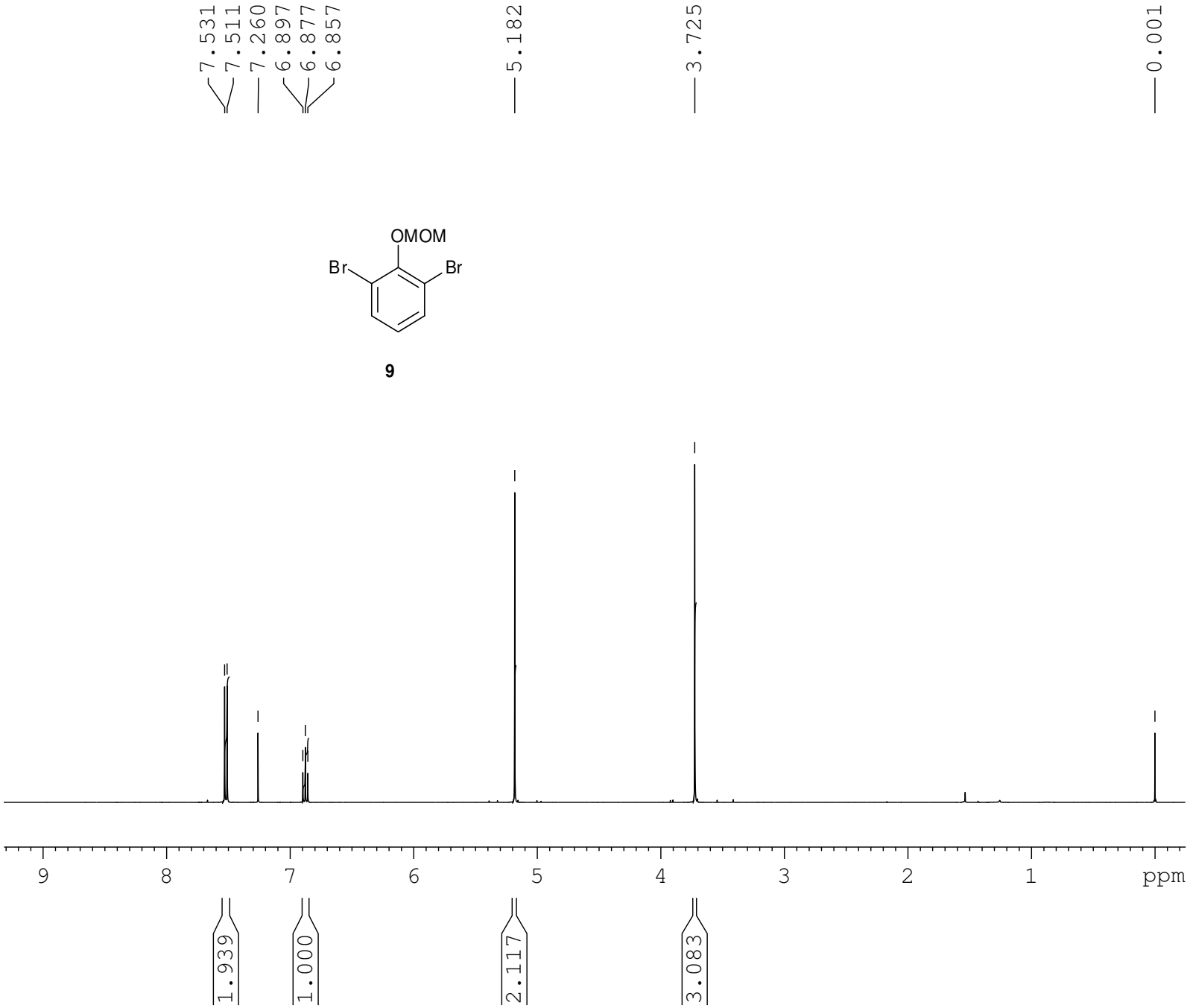
Current Data Parameters
NAME                  HA_45A
EXPNO                      1
PROCNO                     1

F2 - Acquisition Parameters
Date_              20120614
Time                   7.55
INSTRUM               spect
PROBHD    5 mm PABBO BB/
PULPROG                zg30
TD                    32768
SOLVENT               CDCl3
NS                       16
DS                        0
SWH                8169.935 Hz
FIDRES            0.249327 Hz
AQ                2.0054016 sec
RG                      256
DW                   61.200 usec
DE                    6.50 usec
TE                   300.0 K
D1              0.10000000 sec
TD0                        1

======== CHANNEL f1 ========
NUC1                      1H
P1                     7.32 usec
PL1                   -6.00 dB
PL1W          40.00000000 W
SFO1          400.1321007 MHz

F2 - Processing parameters
SI                    32768
SF            400.1300096 MHz
WDW                      EM
SSB       0
LB                     0.10 Hz
GB        0
PC                     0.80
```

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Current Data Parameters
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EXPNO                     10
PROCNO                     1

F2 - Acquisition Parameters
Date_               20120615
Time                   12.51
INSTRUM                spect
PROBHD    5 mm PABBO BB-
PULPROG                zg30
TD                    32768
SOLVENT               CDCl3
NS                       16
DS                        0
SWH                8169.935 Hz
FIDRES            0.249327 Hz
AQ                2.0054016 sec
RG                      287
DW                   61.200 usec
DE                    6.50 usec
TE                   300.1 K
D1              0.10000000 sec
TD0                       1

======== CHANNEL f1 ========
NUC1                     1H
P1                   14.90 usec
PL1                  -1.20 dB
PL1W           11.52336311 W
SFO1           399.8717194 MHz

F2 - Processing parameters
SI                    16384
SF             399.8700134 MHz
WDW                      EM
SSB       0
LB                    0.10 Hz
GB        0
PC                    0.80
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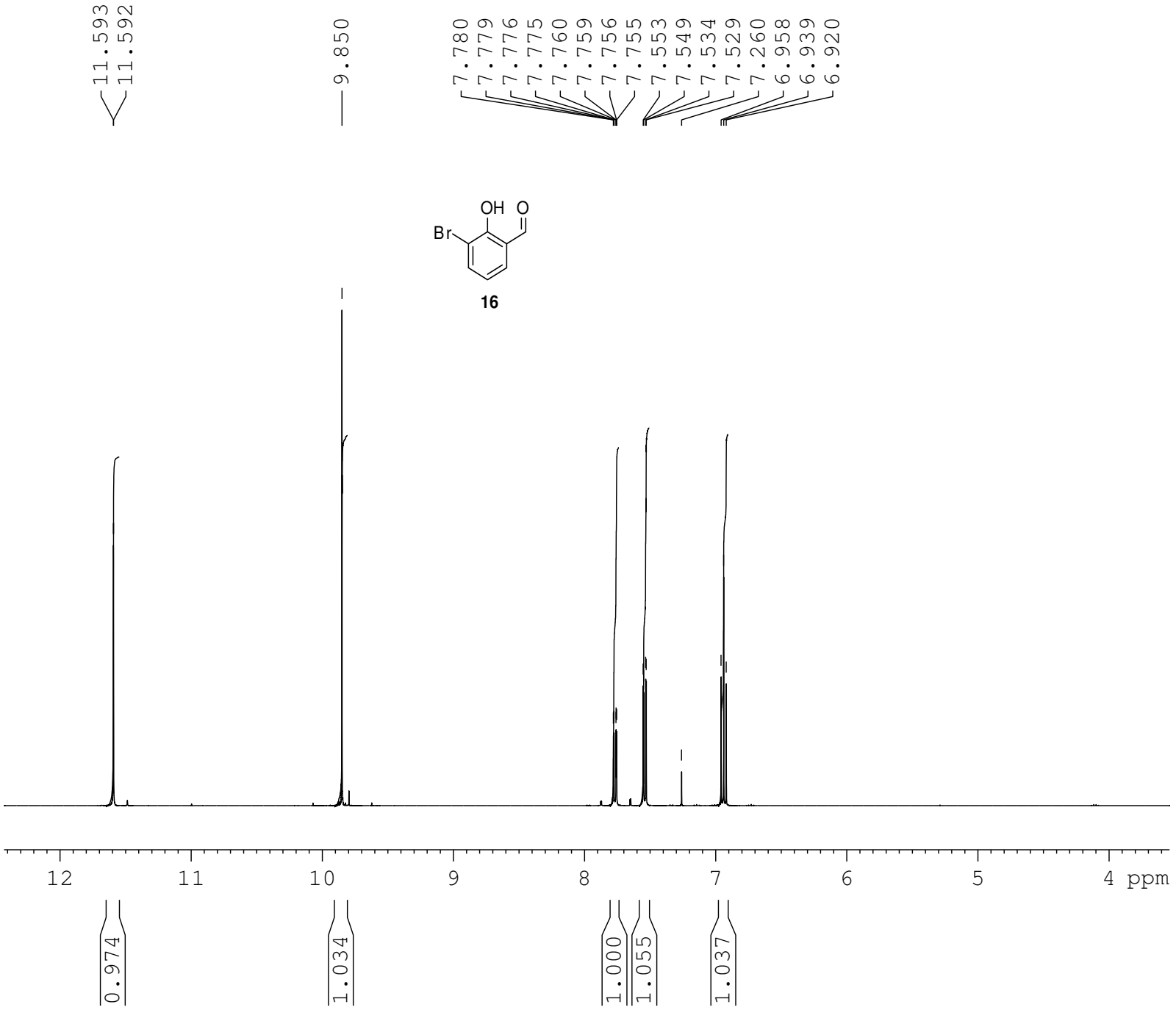


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EXPNO                      1
PROCNO                     1

F2 - Acquisition Parameters
Date_              20120524
Time                  22.26
INSTRUM               spect
PROBHD    5 mm PABBO BB/
PULPROG                zg30
TD                    32768
SOLVENT               CDCl3
NS                       16
DS                        0
SWH                8169.935 Hz
FIDRES            0.249327 Hz
AQ                2.0054016 sec
RG                      144
DW                   61.200 usec
DE                    6.50 usec
TE                   300.0 K
D1              0.10000000 sec
TD0                       1

======== CHANNEL f1 ========
NUC1                     1H
P1                    7.32 usec
PL1                  -6.00 dB
PL1W          40.00000000 W
SFO1          400.1321007 MHz

F2 - Processing parameters
SI                    32768
SF            400.1300096 MHz
WDW                      EM
SSB       0
LB                    0.10 Hz
GB        0
PC                    0.80
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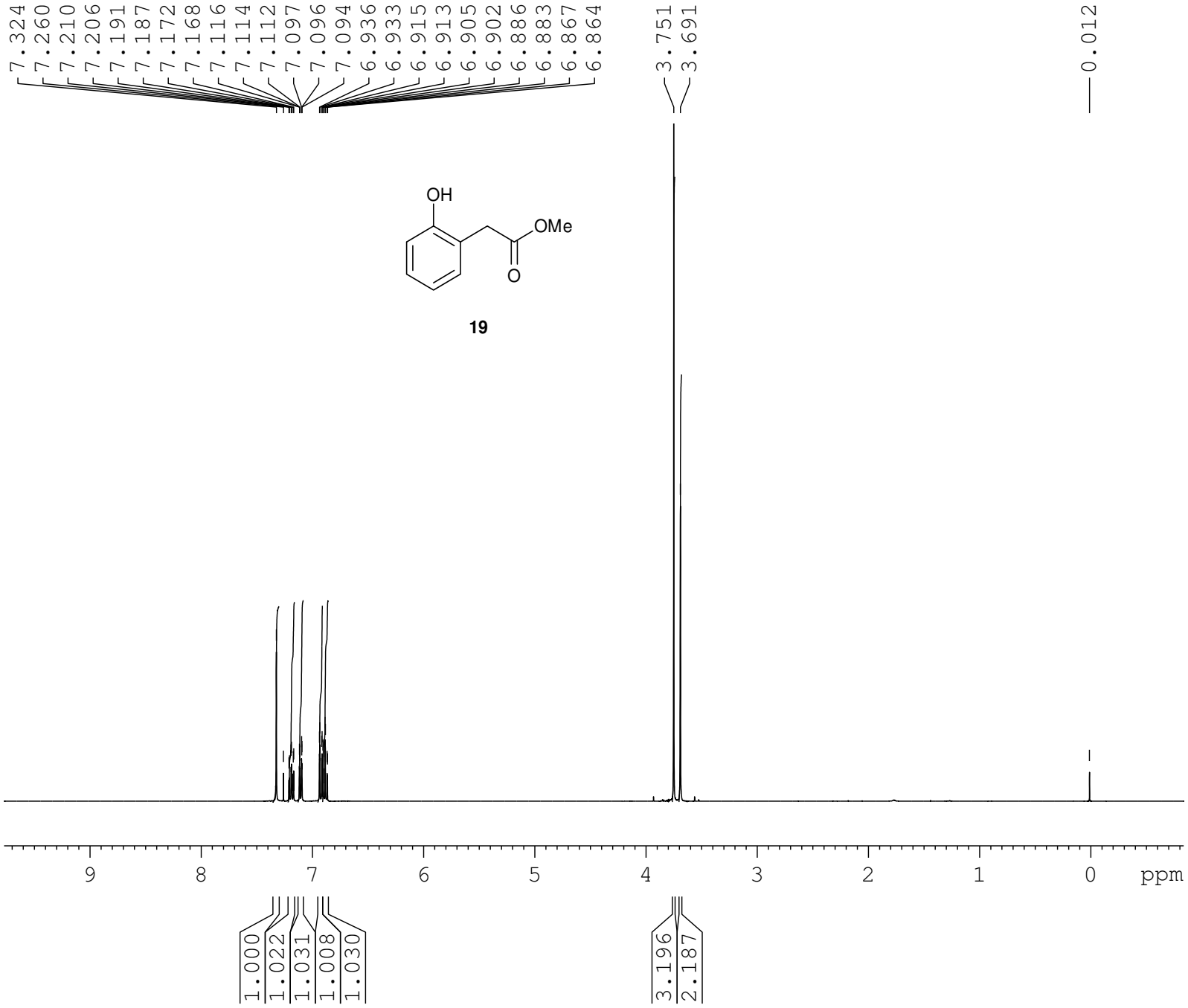


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EXPNO                       1
PROCNO                      1

F2 - Acquisition Parameters
Date_               20120419
Time                   14.43
INSTRUM                spect
PROBHD    5 mm PABBO BB/
PULPROG                 zg30
TD                     32768
SOLVENT                CDCl3
NS                        32
DS                         0
SWH                 8169.935 Hz
FIDRES              0.249327 Hz
AQ                  2.0054016 sec
RG                       114
DW                    61.200 usec
DE                     6.50 usec
TE                     300.0 K
D1                0.10000000 sec
TD0                        1

======== CHANNEL f1 ========
NUC1                      1H
P1                     7.32 usec
PL1                   -6.00 dB
PL1W            40.00000000 W
SFO1            400.1321007 MHz

F2 - Processing parameters
SI                     65536
SF              400.1300096 MHz
WDW                       EM
SSB          0
LB                     0.10 Hz
GB           0
PC                     0.80
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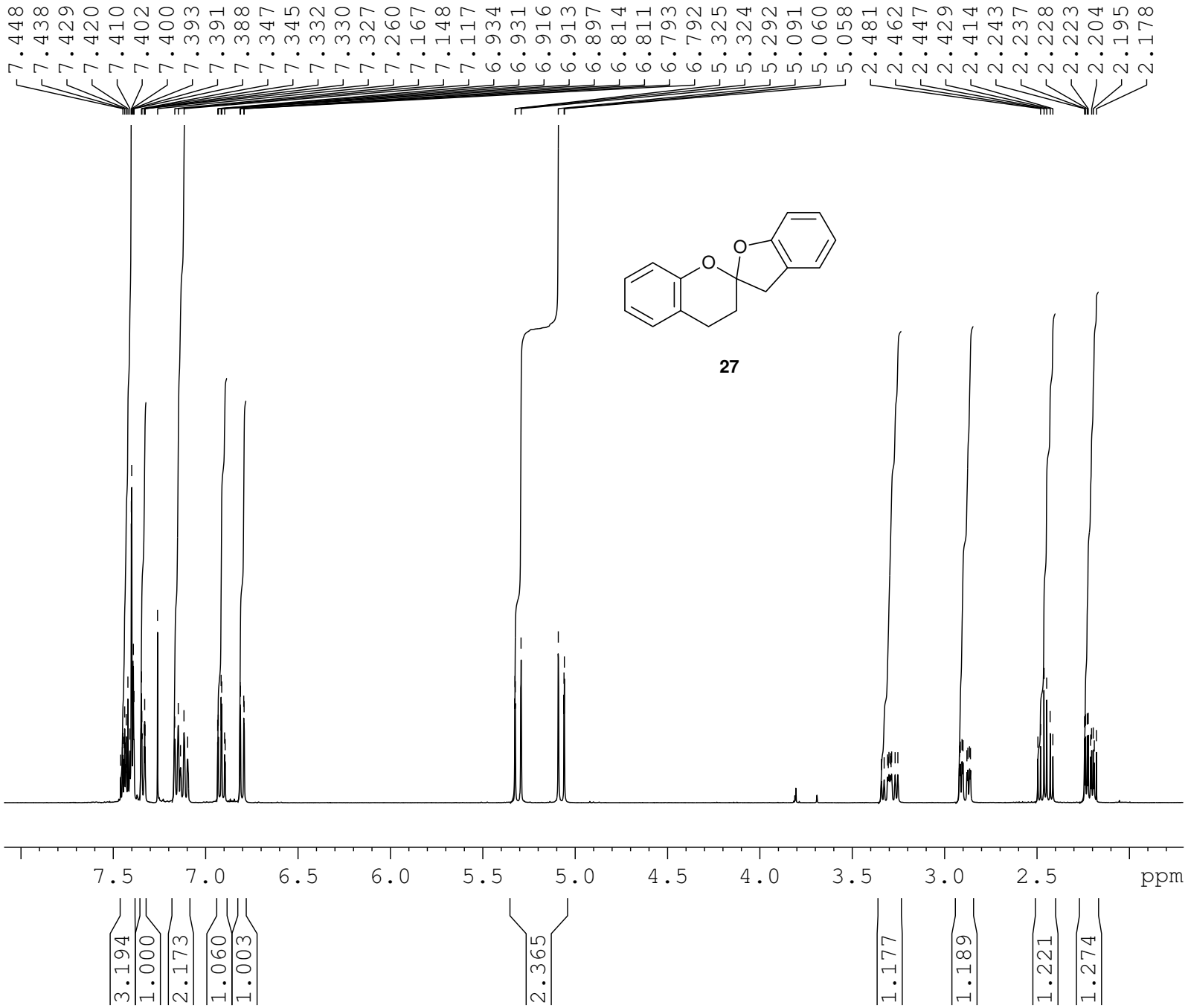


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EXPNO                 10
PROCNO                 1

F2 - Acquisition Parameters
Date_           20101213
Time               15.01
INSTRUM            spect
PROBHD   5 mm PABBO BB/
PULPROG             zg30
TD                 32768
SOLVENT            CDCl3
NS                    32
DS                     0
SWH             8169.935 Hz
FIDRES          0.249327 Hz
AQ              2.0054016 sec
RG                   203
DW                61.200 usec
DE                 6.50 usec
TE                300.0 K
D1           0.10000000 sec
TD0                    1

======== CHANNEL f1 ========
NUC1                  1H
P1                 7.32 usec
PL1               -6.00 dB
PL1W        40.00000000 W
SFO1        400.1321007 MHz

F2 - Processing parameters
SI                 16384
SF          400.1300093 MHz
WDW                   EM
SSB       0
LB                 0.10 Hz
GB        0
PC                 0.80
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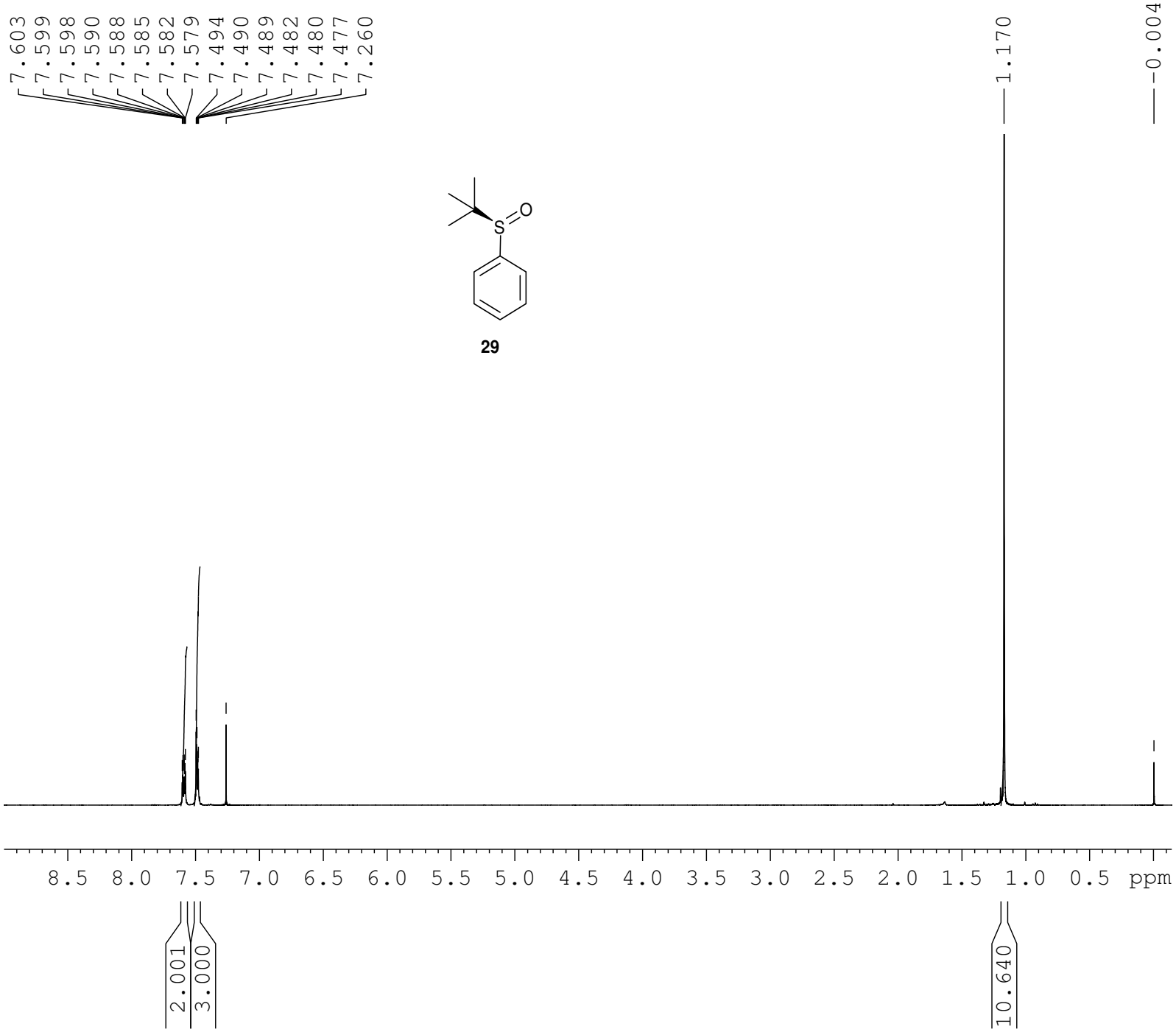


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EXPNO                      1
PROCNO                     1

F2 - Acquisition Parameters
Date_              20120806
Time                  19.57
INSTRUM               spect
PROBHD    5 mm PABBO BB/
PULPROG                zg30
TD                    32768
SOLVENT               CDCl3
NS                       16
DS                        0
SWH                8169.935 Hz
FIDRES            0.249327 Hz
AQ                2.0054016 sec
RG                      228
DW                   61.200 usec
DE                    6.50 usec
TE                   300.0 K
D1              0.10000000 sec
TD0                       1

======== CHANNEL f1 ========
NUC1                      1H
P1                     7.32 usec
PL1                   -6.00 dB
PL1W           40.00000000 W
SFO1           400.1321007 MHz

F2 - Processing parameters
SI                     65536
SF             400.1300096 MHz
WDW                       EM
SSB          0
LB                     0.10 Hz
GB           0
PC                     0.80
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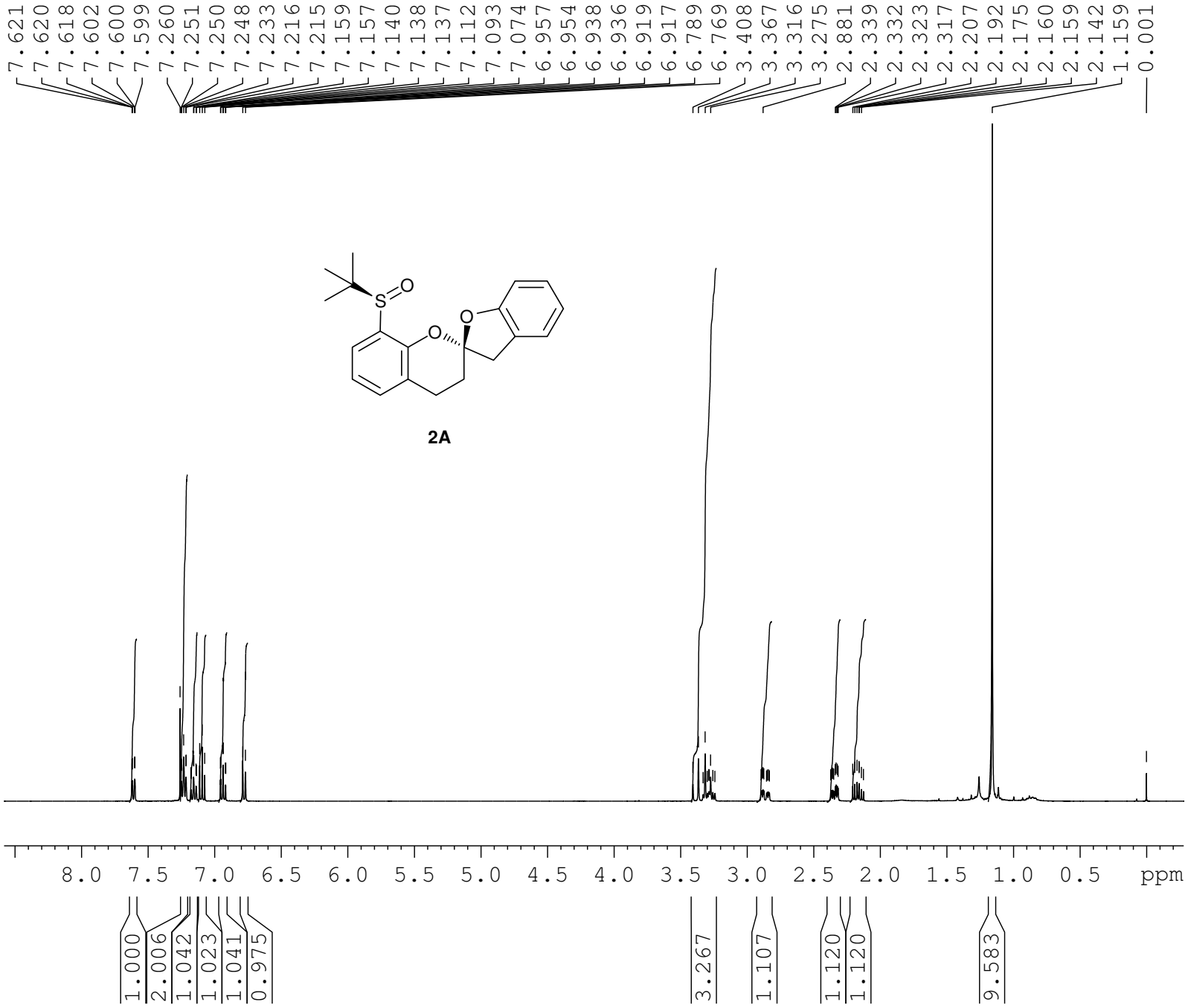


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EXPNO                  1
PROCNO                 1

F2 - Acquisition Parameters
Date_           20130514
Time                8.31
INSTRUM            spect
PROBHD   5 mm PABBO BB/
PULPROG             zg30
TD                 32768
SOLVENT            CDCl3
NS                    16
DS                     0
SWH             8169.935 Hz
FIDRES          0.249327 Hz
AQ              2.0054016 sec
RG                   101
DW                61.200 usec
DE                 6.50 usec
TE                300.0 K
D1           0.10000000 sec
TD0                    1

======== CHANNEL f1 ========
NUC1                  1H
P1                 7.32 usec
PL1               -6.00 dB
PL1W        40.00000000 W
SFO1        400.1321007 MHz

F2 - Processing parameters
SI                 65536
SF          400.1300097 MHz
WDW                   EM
SSB       0
LB                 0.10 Hz
GB        0
PC                 0.80
```

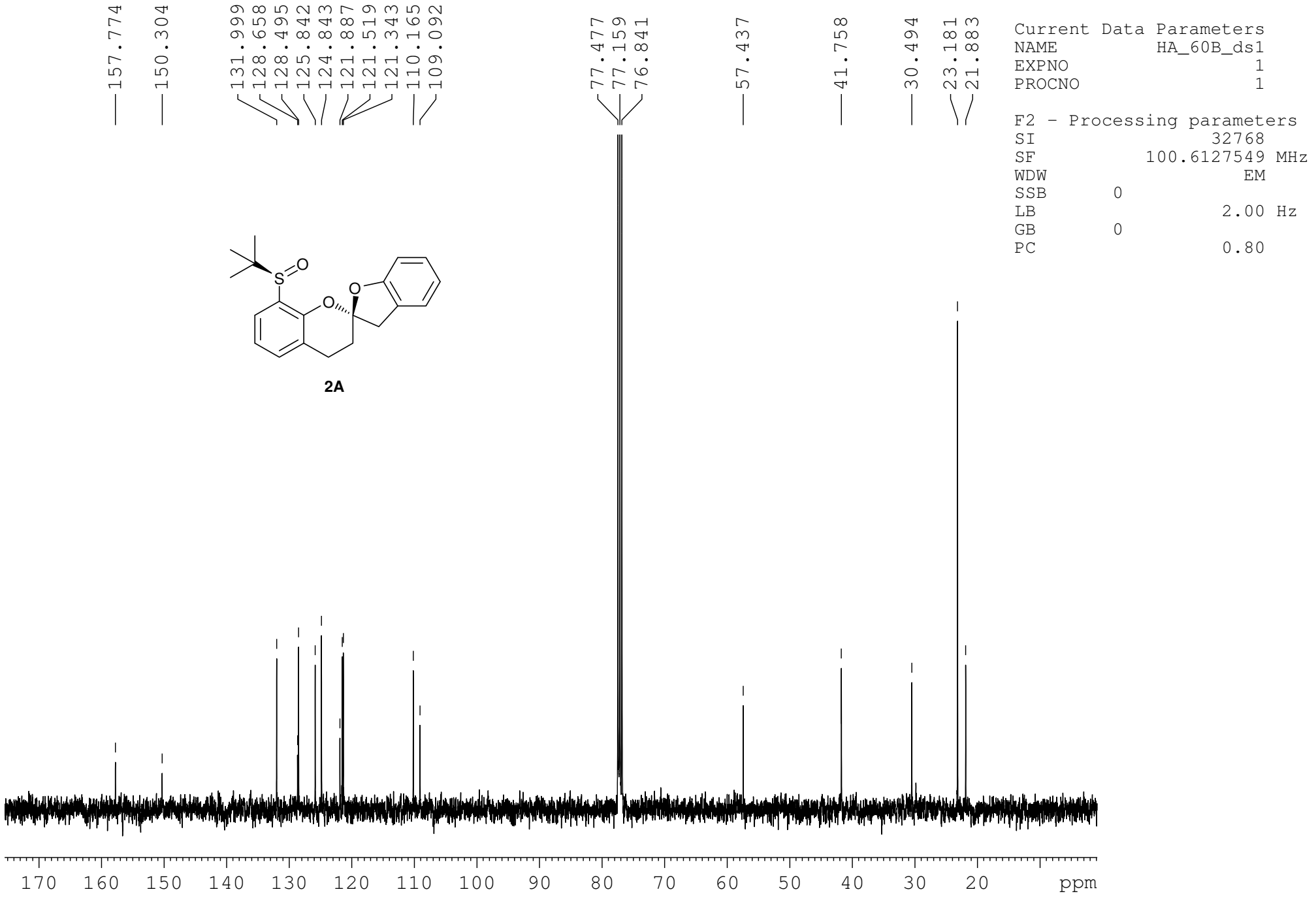

2B

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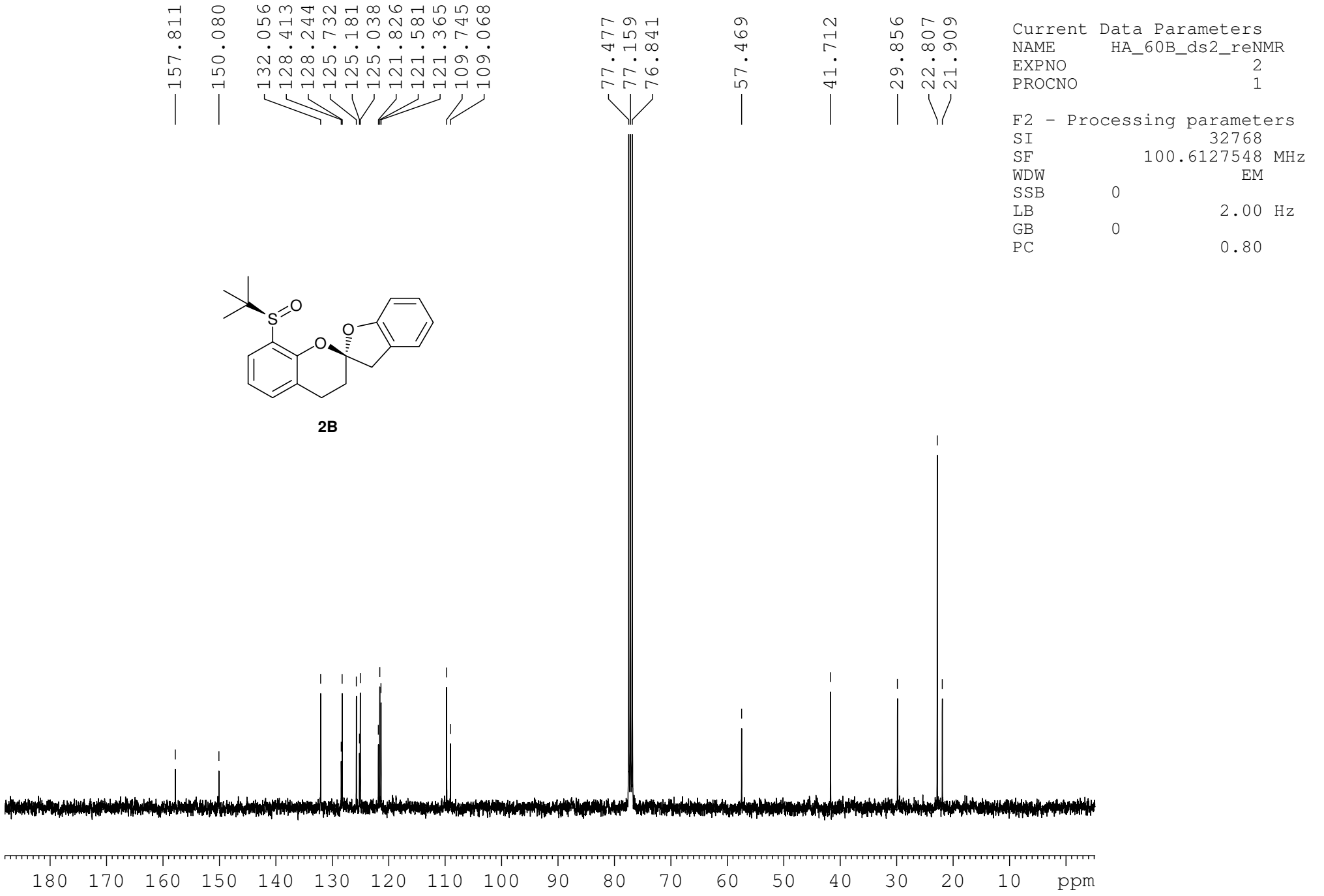
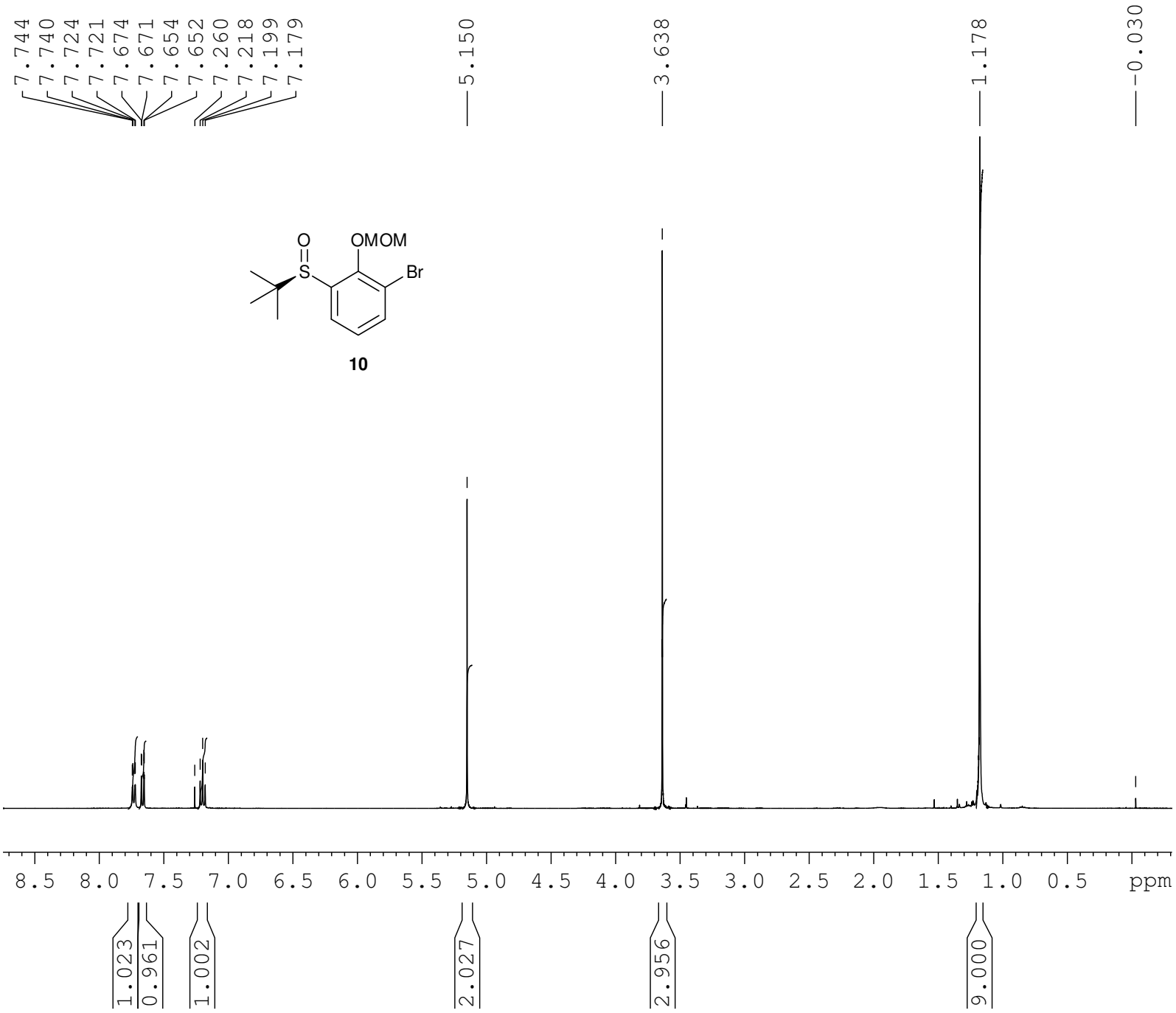
Current Data Parameters
NAME      HA_60B_ds2_reNMR
EXPNO                    1
PROCNO                   1

F2 - Acquisition Parameters
Date_             20121005
Time                 13.21
INSTRUM              spect
PROBHD    5 mm PABBO BB/
PULPROG              zg30
TD                  32768
SOLVENT             CDCl3
NS                     32
DS                      0
SWH             8169.935 Hz
FIDRES          0.249327 Hz
AQ              2.0054016 sec
RG                    228
DW                 61.200 usec
DE                  6.50 usec
TE                 300.0 K
D1            0.10000000 sec
TD0                     1

======== CHANNEL f1 ========
NUC1                   1H
P1                  7.32 usec
PL1                -6.00 dB
PL1W         40.00000000 W
SFO1         400.1321007 MHz

F2 - Processing parameters
SI                  16384
SF           400.1300093 MHz
WDW                    EM
SSB       0
LB                  0.10 Hz
GB        0
PC                  0.80
```



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Current Data Parameters
NAME                  HA_49D
EXPNO                      1
PROCNO                     1

F2 - Acquisition Parameters
Date_              20120620
Time                  14.20
INSTRUM               spect
PROBHD    5 mm PABBO BB/
PULPROG                zg30
TD                    32768
SOLVENT               CDCl3
NS                       16
DS                        0
SWH                8169.935 Hz
FIDRES            0.249327 Hz
AQ                2.0054016 sec
RG                     71.8
DW                   61.200 usec
DE                    6.50 usec
TE                   300.0 K
D1              0.10000000 sec
TD0                       1

======== CHANNEL f1 ========
NUC1                     1H
P1                    7.32 usec
PL1                  -6.00 dB
PL1W          40.00000000 W
SFO1          400.1321007 MHz

F2 - Processing parameters
SI                    32768
SF            400.1300096 MHz
WDW                      EM
SSB       0
LB                    0.10 Hz
GB        0
PC                    0.80
```

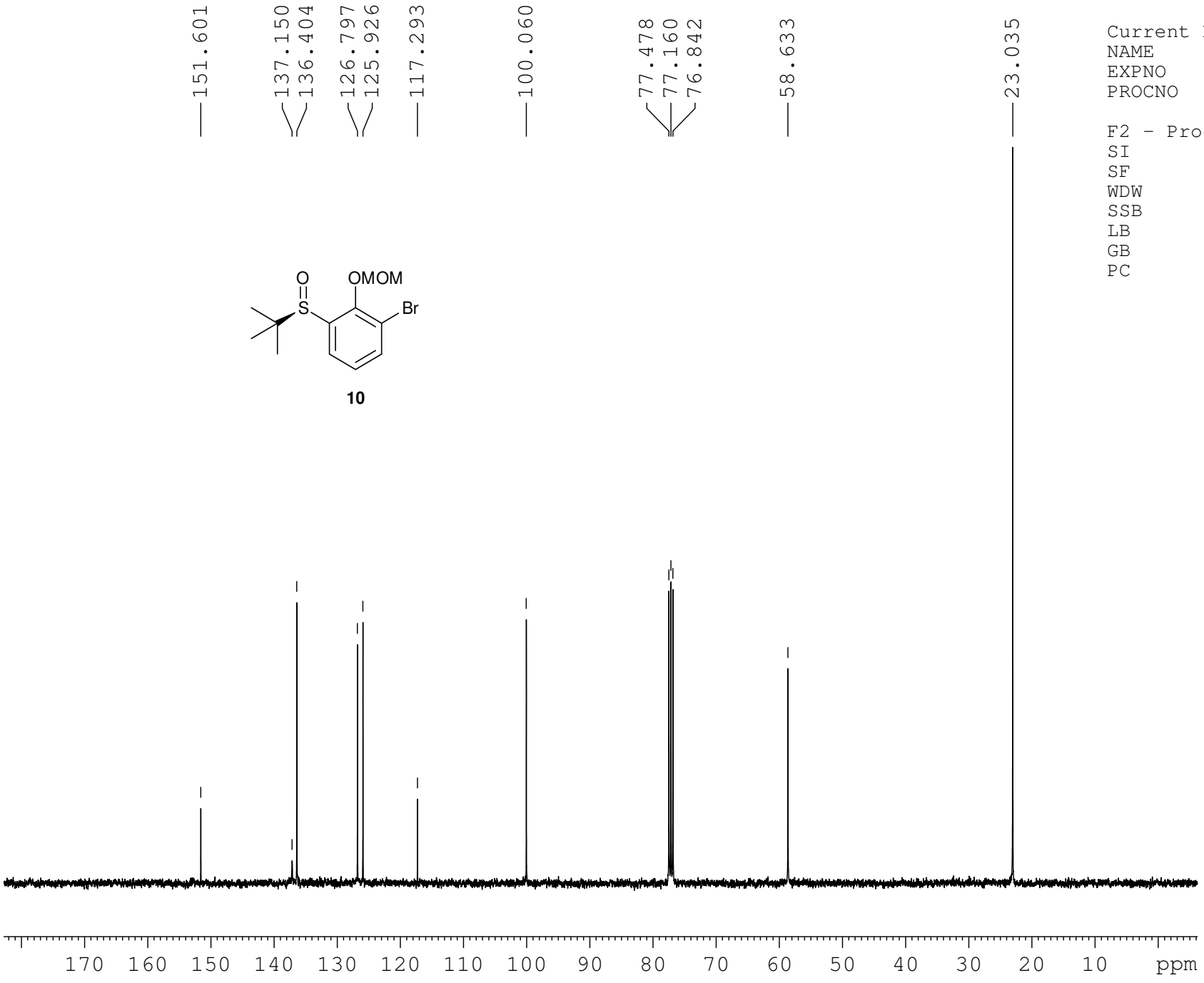

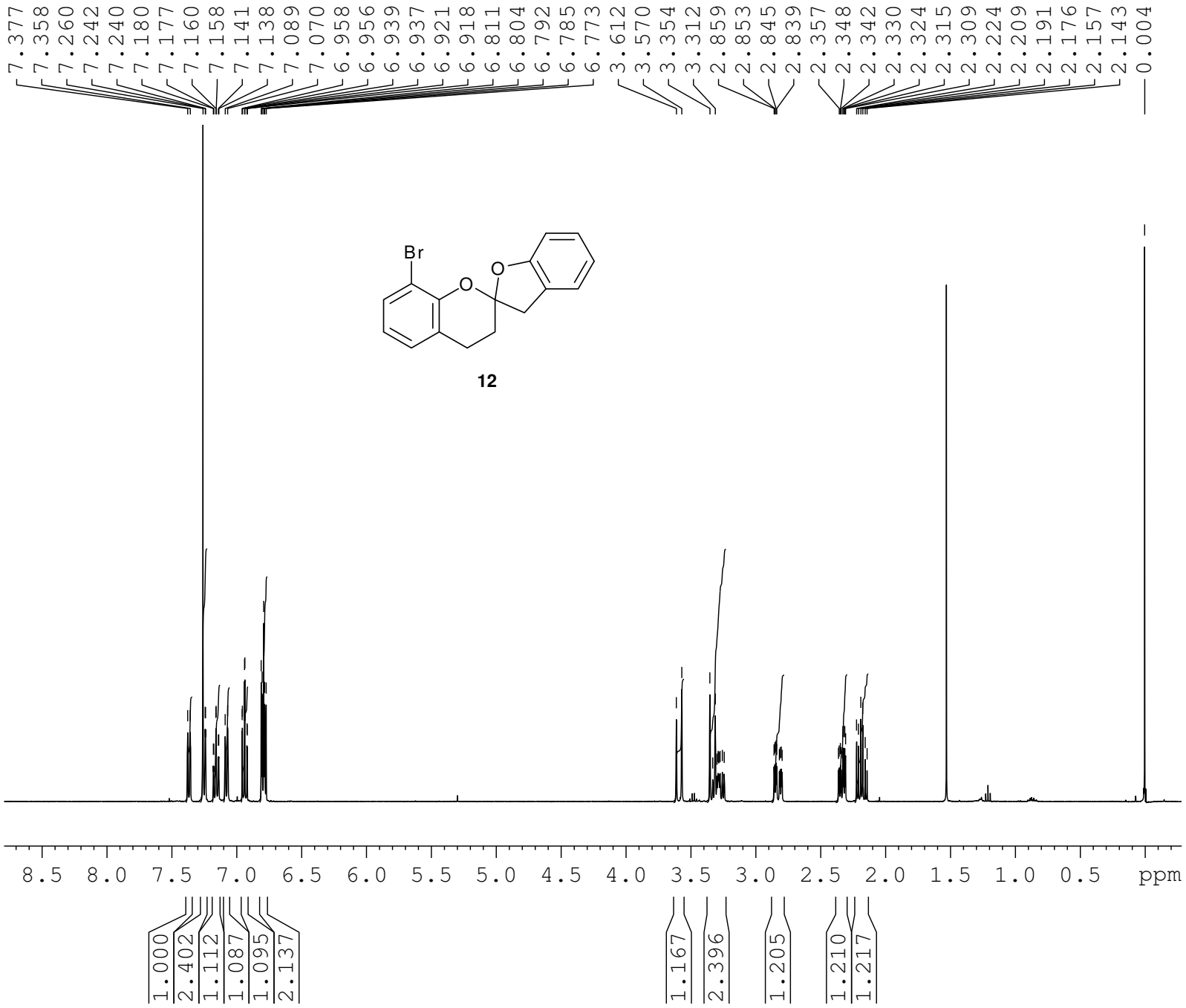


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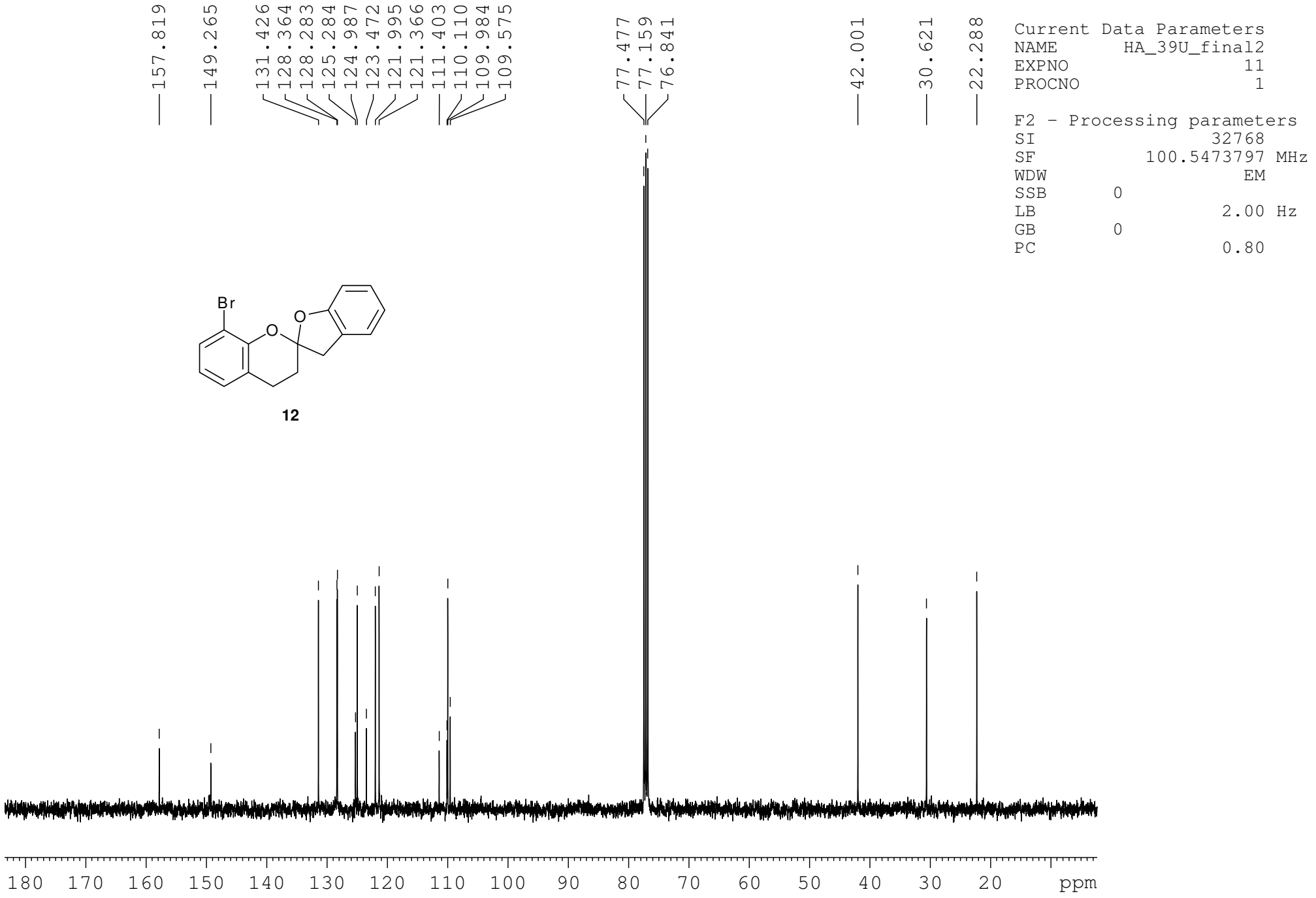
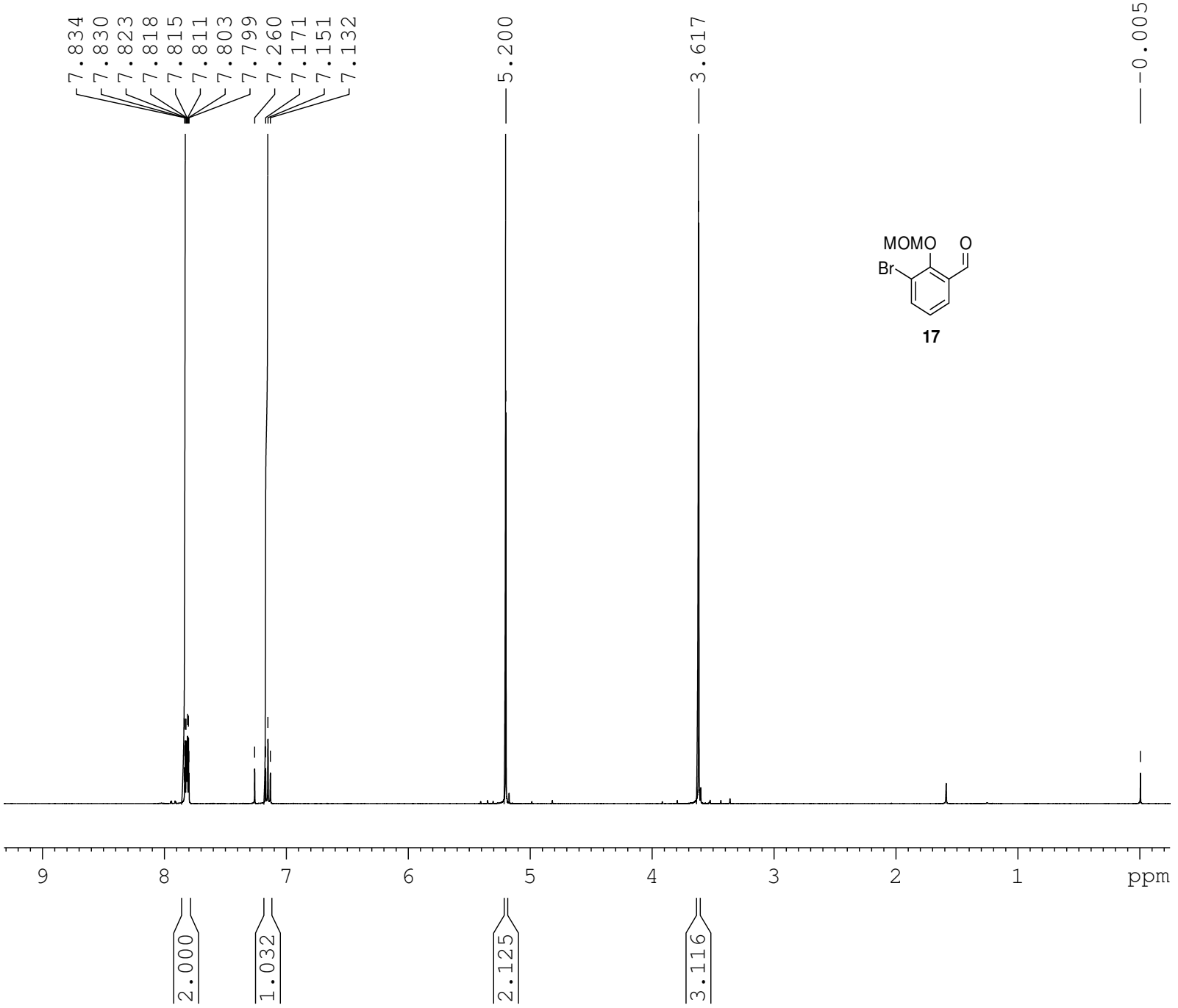
Current Data Parameters
NAME       HA_39A2_wash2
EXPNO                 10
PROCNO                 1

F2 - Acquisition Parameters
Date_           20120925
Time               13.44
INSTRUM            spect
PROBHD   5 mm PABBO BB-
PULPROG             zg30
TD                 32768
SOLVENT            CDCl3
NS                    32
DS                     0
SWH             8169.935 Hz
FIDRES          0.249327 Hz
AQ              2.0054016 sec
RG                   362
DW                61.200 usec
DE                 6.50 usec
TE                300.1 K
D1           0.10000000 sec
TD0                    1

======== CHANNEL f1 ========
NUC1                  1H
P1                14.90 usec
PL1               -1.20 dB
PL1W         11.52336311 W
SFO1        399.8717194 MHz

F2 - Processing parameters
SI                 16384
SF          399.8700134 MHz
WDW                   EM
SSB       0
LB                 0.10 Hz
GB        0
PC                 0.80
```



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Current Data Parameters
NAME                  HA_28
EXPNO                     1
PROCNO                    1

F2 - Acquisition Parameters
Date_              20120622
Time                   3.35
INSTRUM               spect
PROBHD    5 mm PABBO BB/
PULPROG                zg30
TD                    32768
SOLVENT               CDCl3
NS                       16
DS                        0
SWH                8169.935 Hz
FIDRES            0.249327 Hz
AQ                2.0054016 sec
RG                      203
DW                   61.200 usec
DE                    6.50 usec
TE                   300.0 K
D1              0.10000000 sec
TD0                       1

======== CHANNEL f1 ========
NUC1                     1H
P1                    7.32 usec
PL1                  -6.00 dB
PL1W          40.00000000 W
SFO1          400.1321007 MHz

F2 - Processing parameters
SI                    262144
SF            400.1300096 MHz
WDW                      EM
SSB       0
LB                    0.10 Hz
GB        0
PC                    0.80
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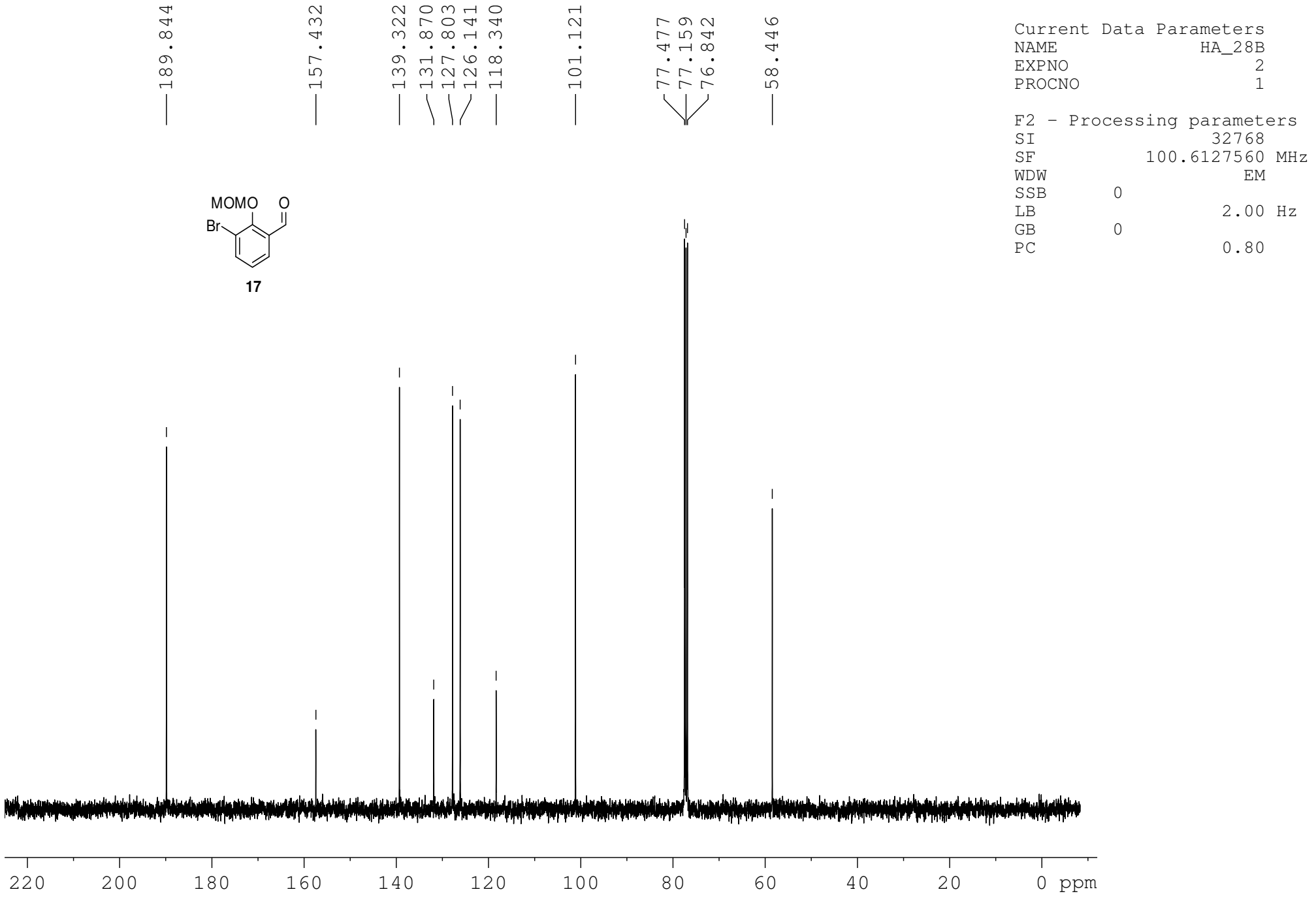

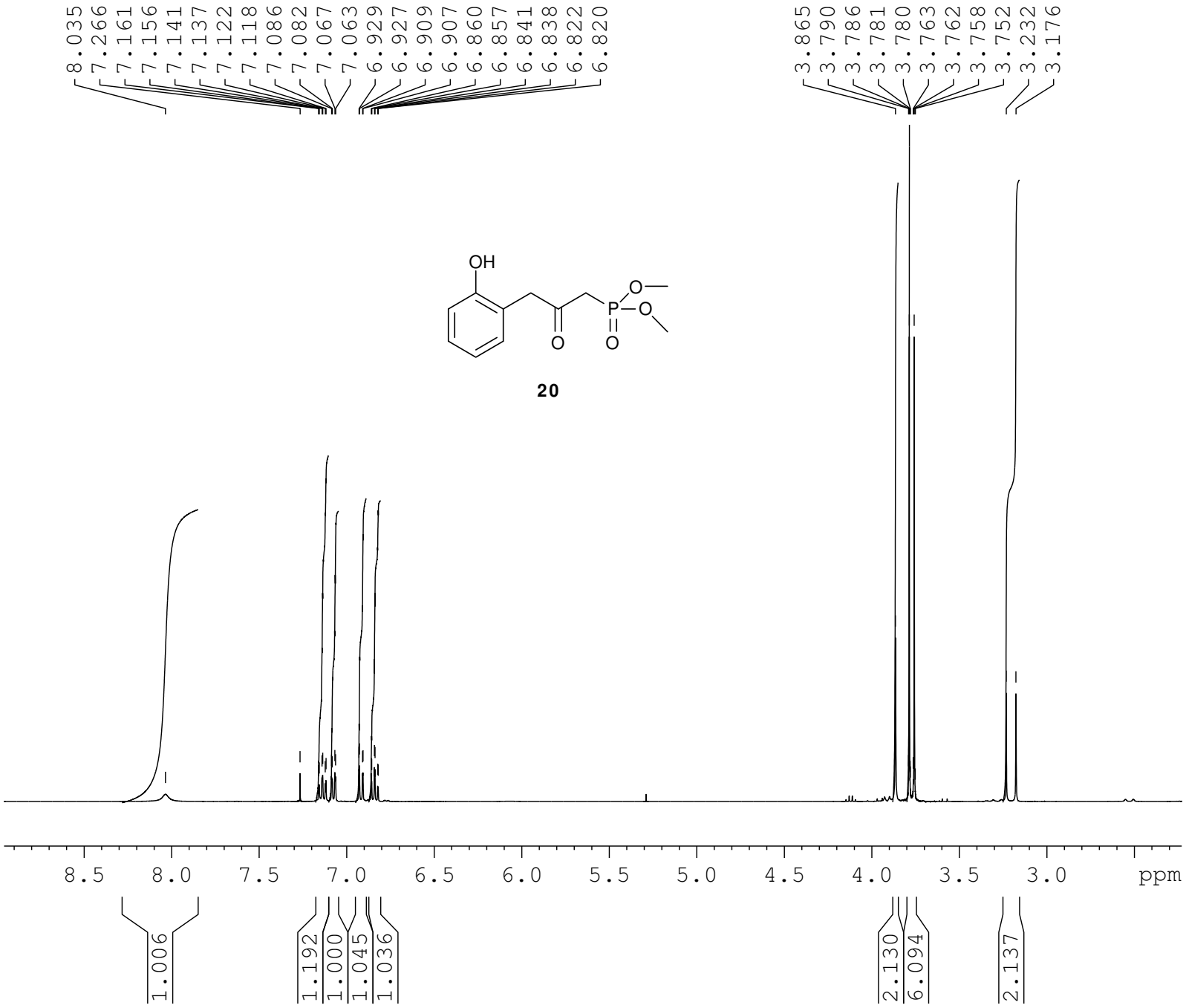

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Current Data Parameters
NAME          HA_27_13A
EXPNO                 1
PROCNO                1

F2 - Acquisition Parameters
Date_          20120111
Time              14.11
INSTRUM           spect
PROBHD   5 mm PABBO BB/
PULPROG            zg30
TD                32768
SOLVENT           CDCl3
NS                   16
DS                    0
SWH            8169.935 Hz
FIDRES        0.249327 Hz
AQ            2.0054016 sec
RG                  101
DW               61.200 usec
DE                6.50 usec
TE               300.0 K
D1           0.10000000 sec
TD0                   1

======== CHANNEL f1 ========
NUC1                  1H
P1                 7.32 usec
PL1               -6.00 dB
PL1W        40.00000000 W
SFO1        400.1321007 MHz

F2 - Processing parameters
SI                65536
SF          400.1300073 MHz
WDW                  EM
SSB       0
LB                0.10 Hz
GB        0
PC                0.80
```

200.793
200.733
155.062
131.444
129.098
120.424
116.607
77.476
77.159
76.841
53.482
53.417
46.068
40.734
39.449

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Current Data Parameters
NAME                  HA_27_13A
EXPNO                         2
PROCNO                        1

F2 - Processing parameters
SI                        65536
SF                100.6127592 MHz
WDW                          EM
SSB             0
LB                         2.00 Hz
GB              0
PC                         0.80
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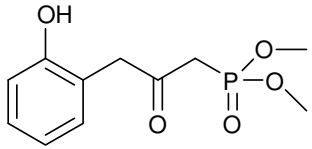

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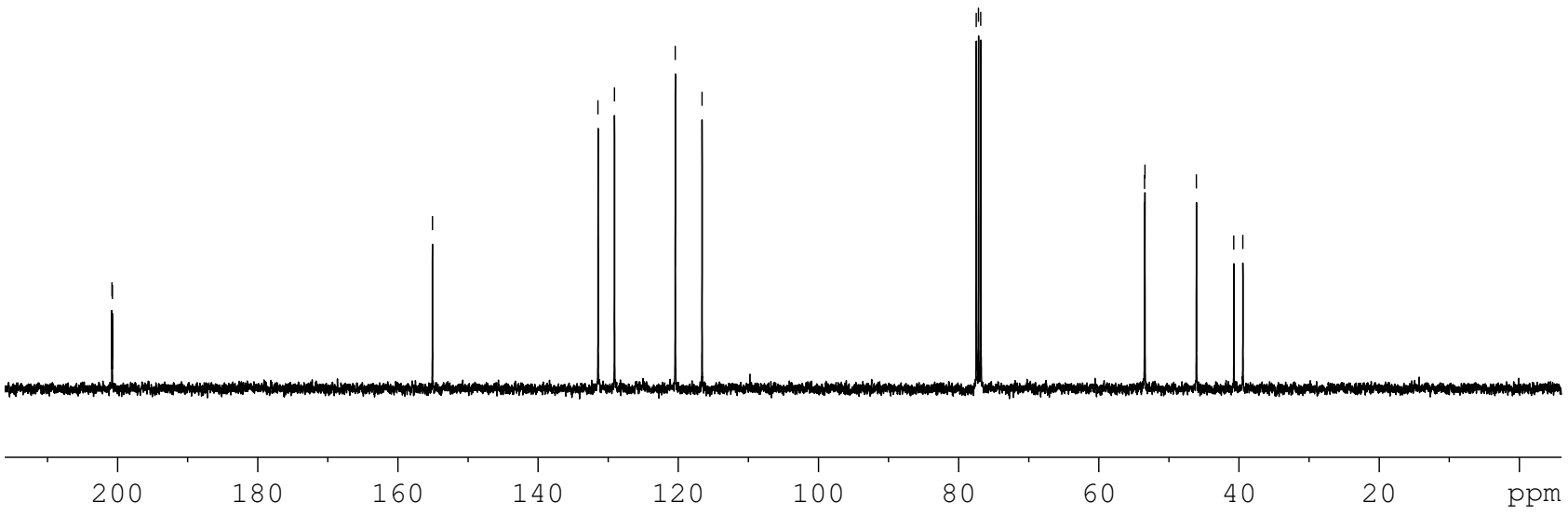

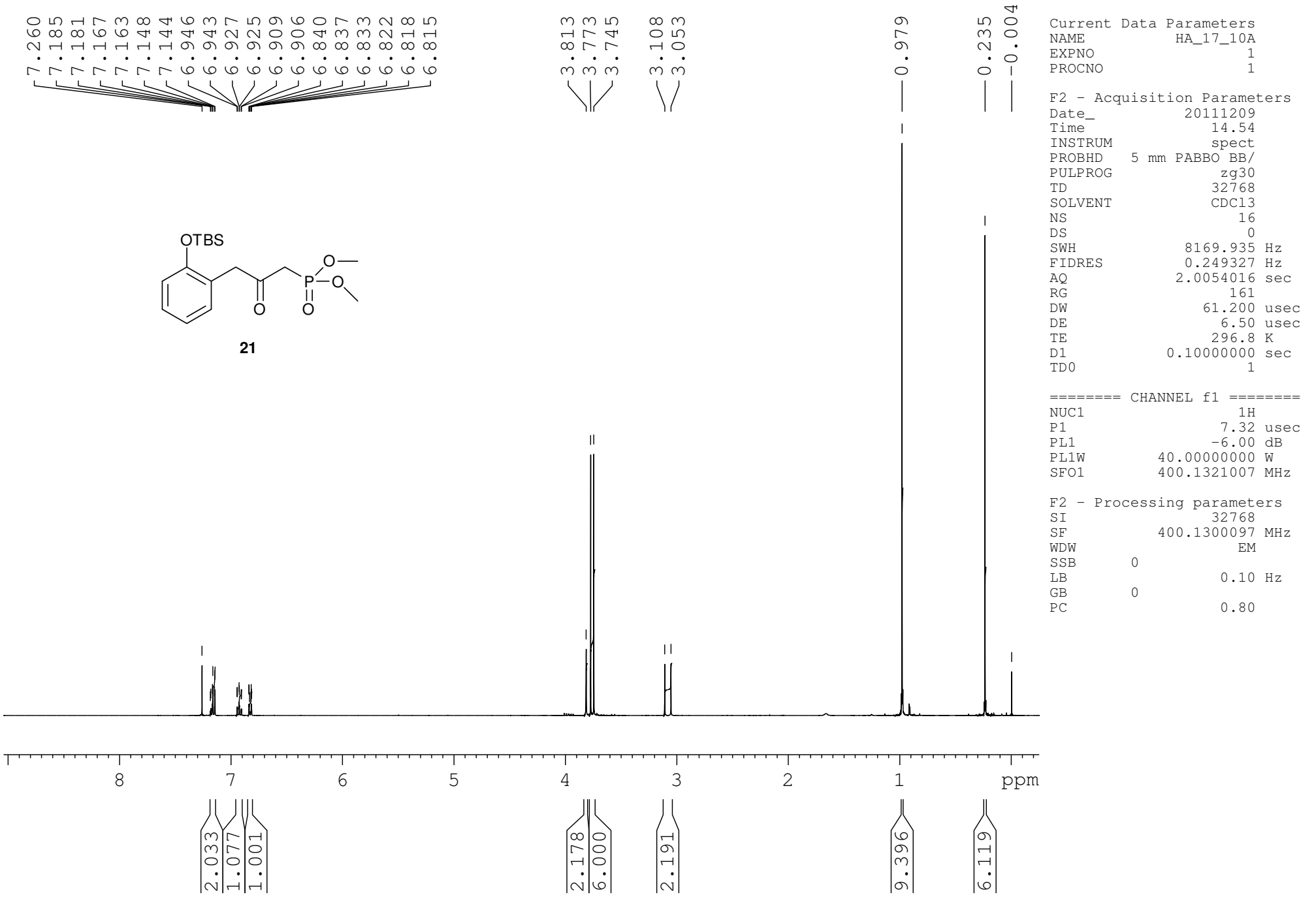


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Current Data Parameters
NAME          HA_17_10A
EXPNO                 1
PROCNO                1

F2 - Acquisition Parameters
Date_          20111209
Time              14.54
INSTRUM           spect
PROBHD   5 mm PABBO BB/
PULPROG            zg30
TD                32768
SOLVENT           CDCl3
NS                   16
DS                    0
SWH            8169.935 Hz
FIDRES        0.249327 Hz
AQ            2.0054016 sec
RG                  161
DW               61.200 usec
DE                6.50 usec
TE                296.8 K
D1           0.10000000 sec
TD0                   1

======== CHANNEL f1 ========
NUC1                  1H
P1                 7.32 usec
PL1               -6.00 dB
PL1W        40.00000000 W
SFO1        400.1321007 MHz

F2 - Processing parameters
SI                32768
SF          400.1300097 MHz
WDW                  EM
SSB       0
LB                0.10 Hz
GB        0
PC                0.80
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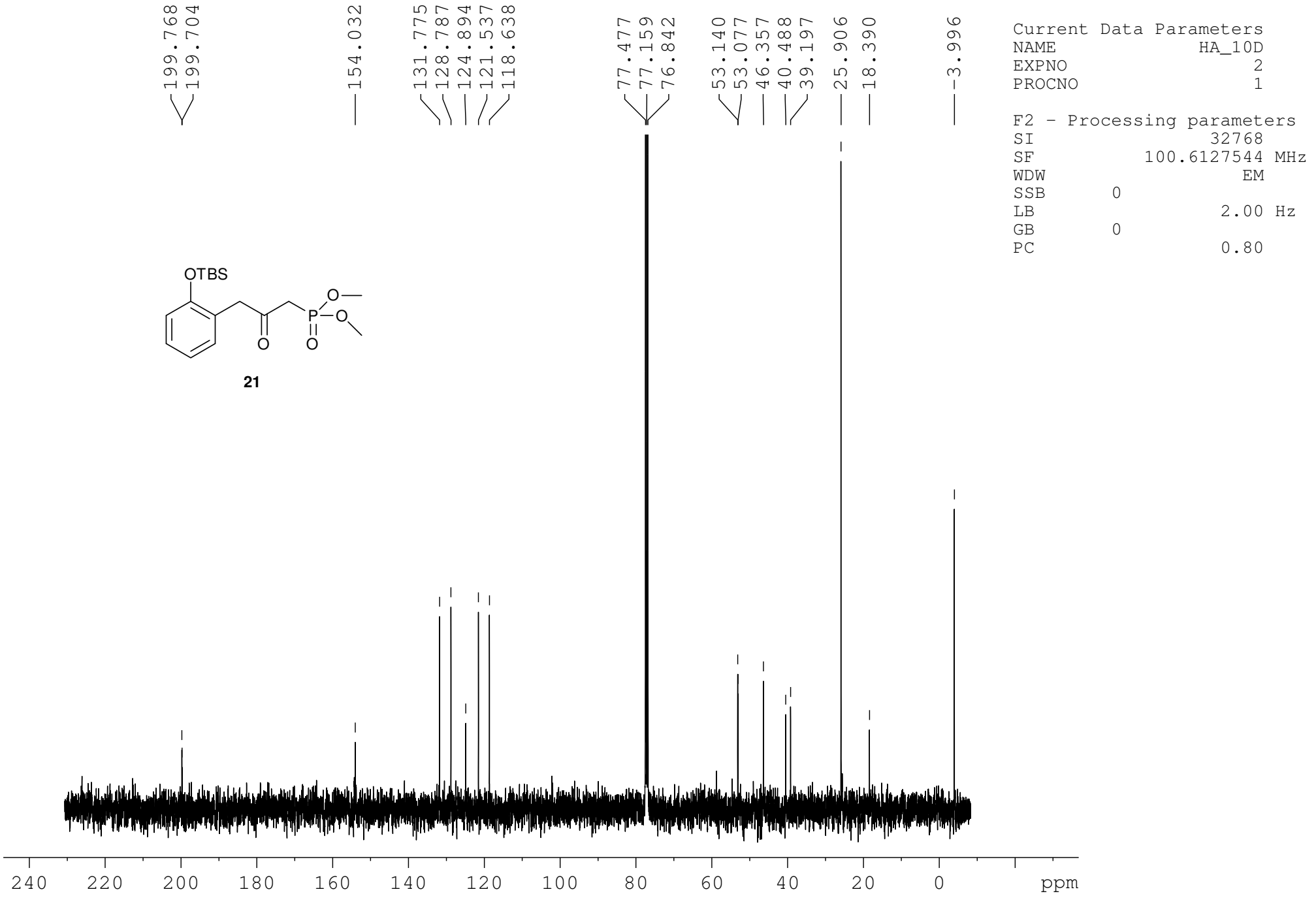

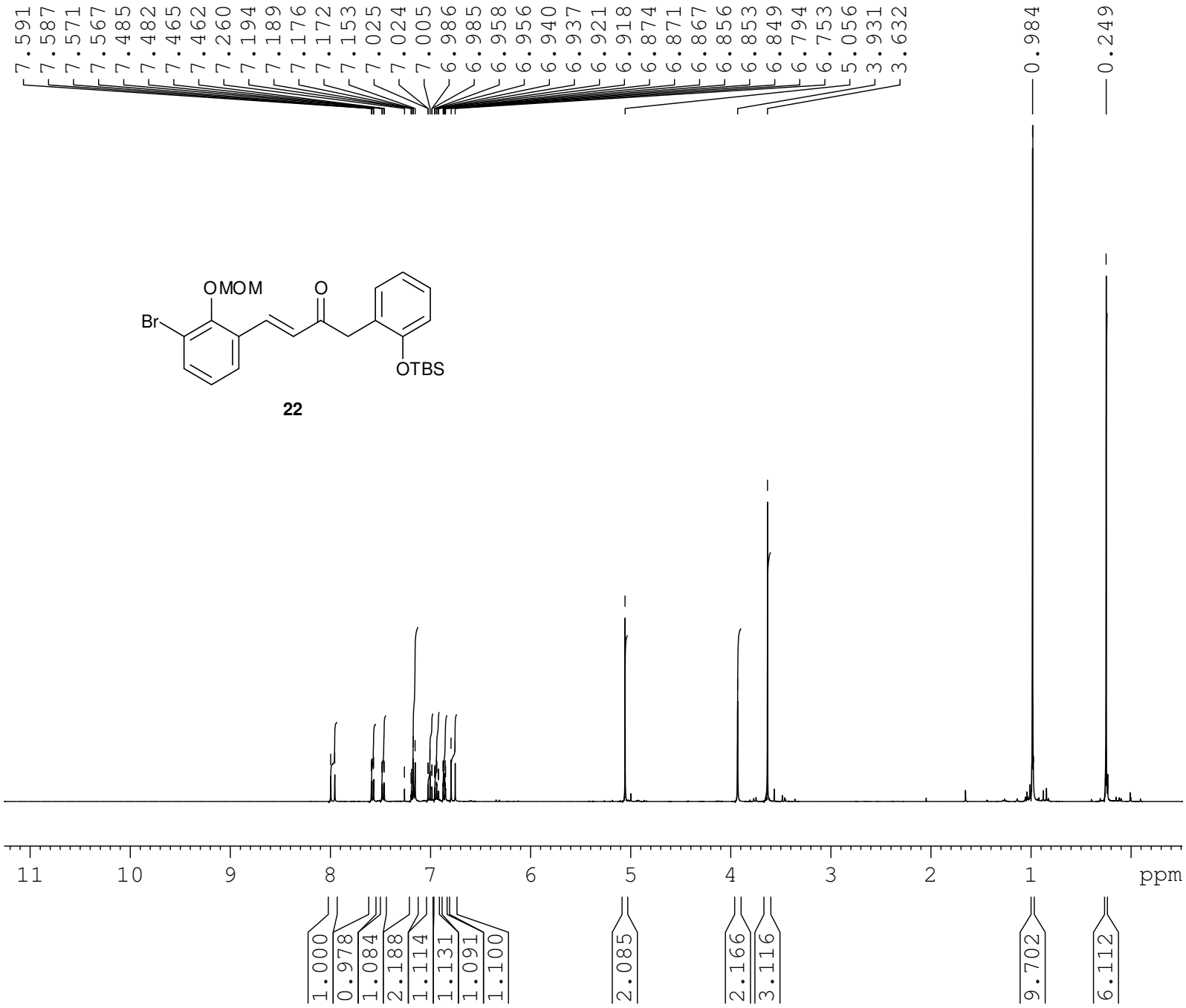


```
Current Data Parameters
NAME         HA_30C_good
EXPNO                 10
PROCNO                 1

F2 - Acquisition Parameters
Date_           20120510
Time               19.24
INSTRUM            spect
PROBHD   5 mm PABBO BB-
PULPROG             zg30
TD                 32768
SOLVENT            CDCl3
NS                    32
DS                     0
SWH             8169.935 Hz
FIDRES          0.249327 Hz
AQ              2.0054016 sec
RG                    57
DW                61.200 usec
DE                 6.50 usec
TE                300.1 K
D1           0.10000000 sec
TD0                    1

======== CHANNEL f1 ========
NUC1                  1H
P1                14.90 usec
PL1               -1.20 dB
PL1W         11.52336311 W
SFO1         399.8717194 MHz

F2 - Processing parameters
SI                 32768
SF           399.8700134 MHz
WDW                   EM
SSB       0
LB                 0.10 Hz
GB        0
PC                 0.80
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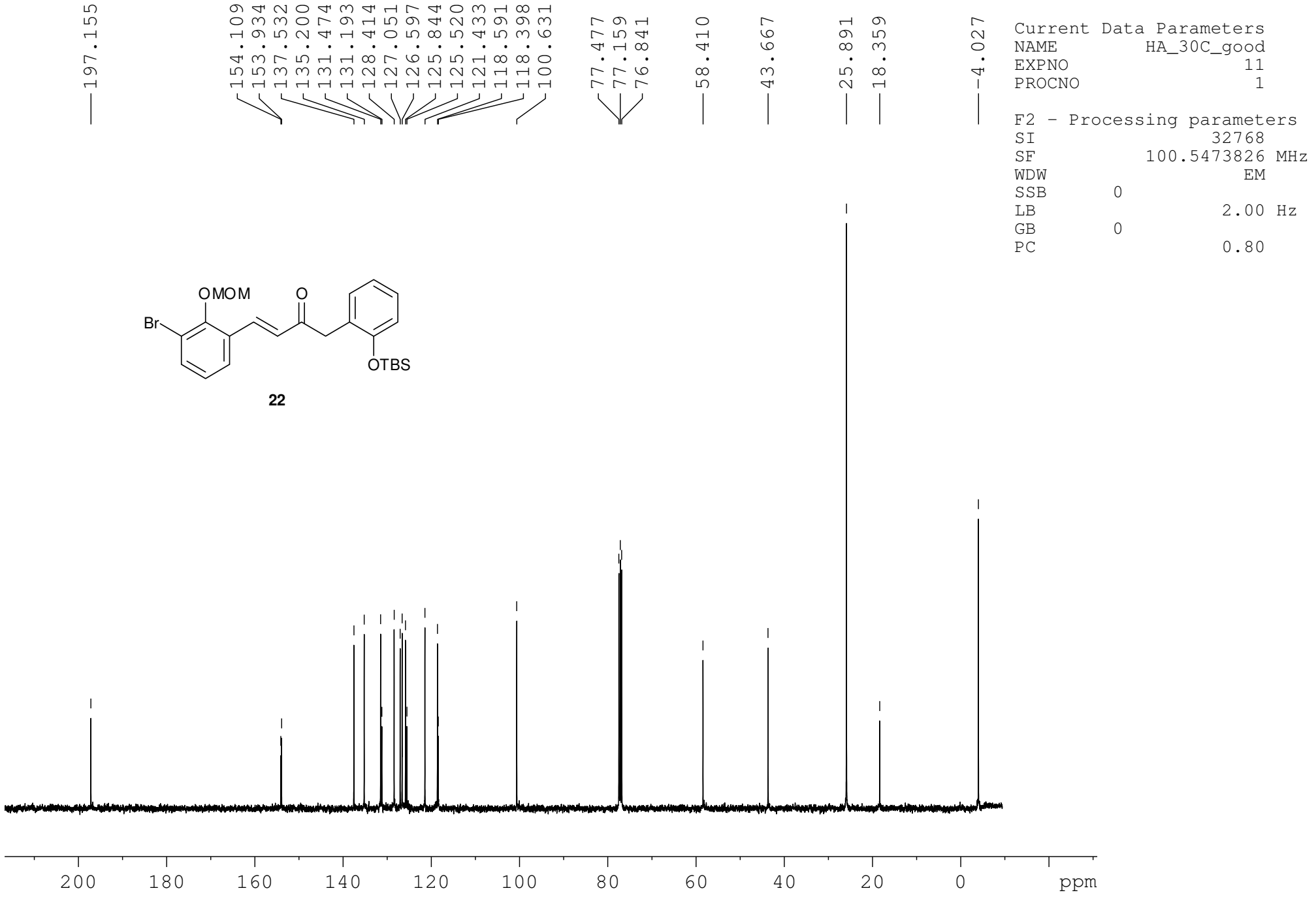


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Current Data Parameters
NAME                  HA_31K
EXPNO                      1
PROCNO                     1

F2 - Acquisition Parameters
Date_              20120703
Time                  13.03
INSTRUM               spect
PROBHD    5 mm PABBO BB/
PULPROG                zg30
TD                    32768
SOLVENT               CDCl3
NS                       16
DS                        0
SWH                8169.935 Hz
FIDRES            0.249327 Hz
AQ                2.0054016 sec
RG                     80.6
DW                   61.200 usec
DE                    6.50 usec
TE                   300.0 K
D1              0.10000000 sec
TD0                        1

======== CHANNEL f1 ========
NUC1                      1H
P1                     7.32 usec
PL1                   -6.00 dB
PL1W          40.00000000 W
SFO1          400.1321007 MHz

F2 - Processing parameters
SI                     16384
SF            400.1300093 MHz
WDW                       EM
SSB       0
LB                     0.10 Hz
GB        0
PC                     0.80
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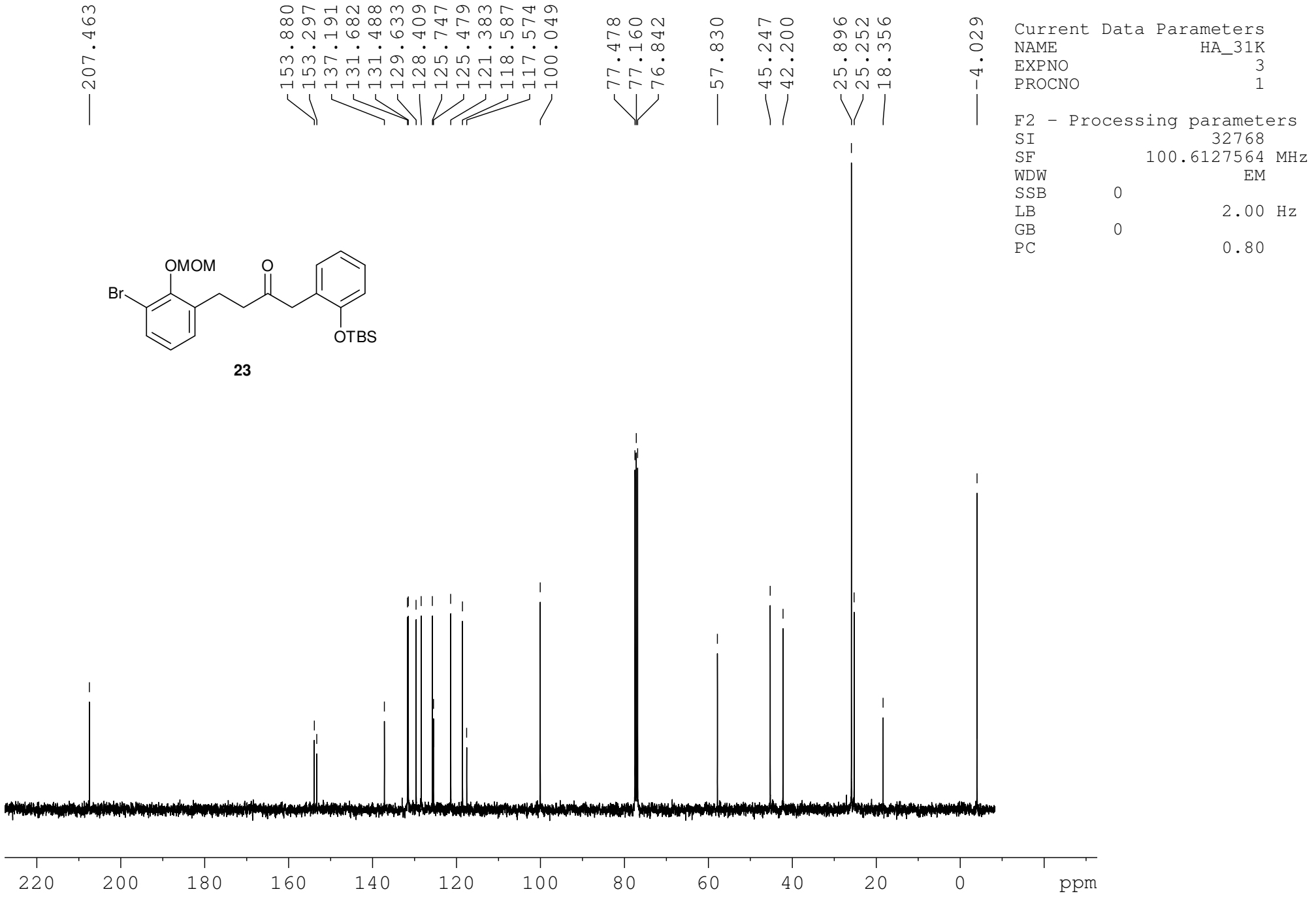

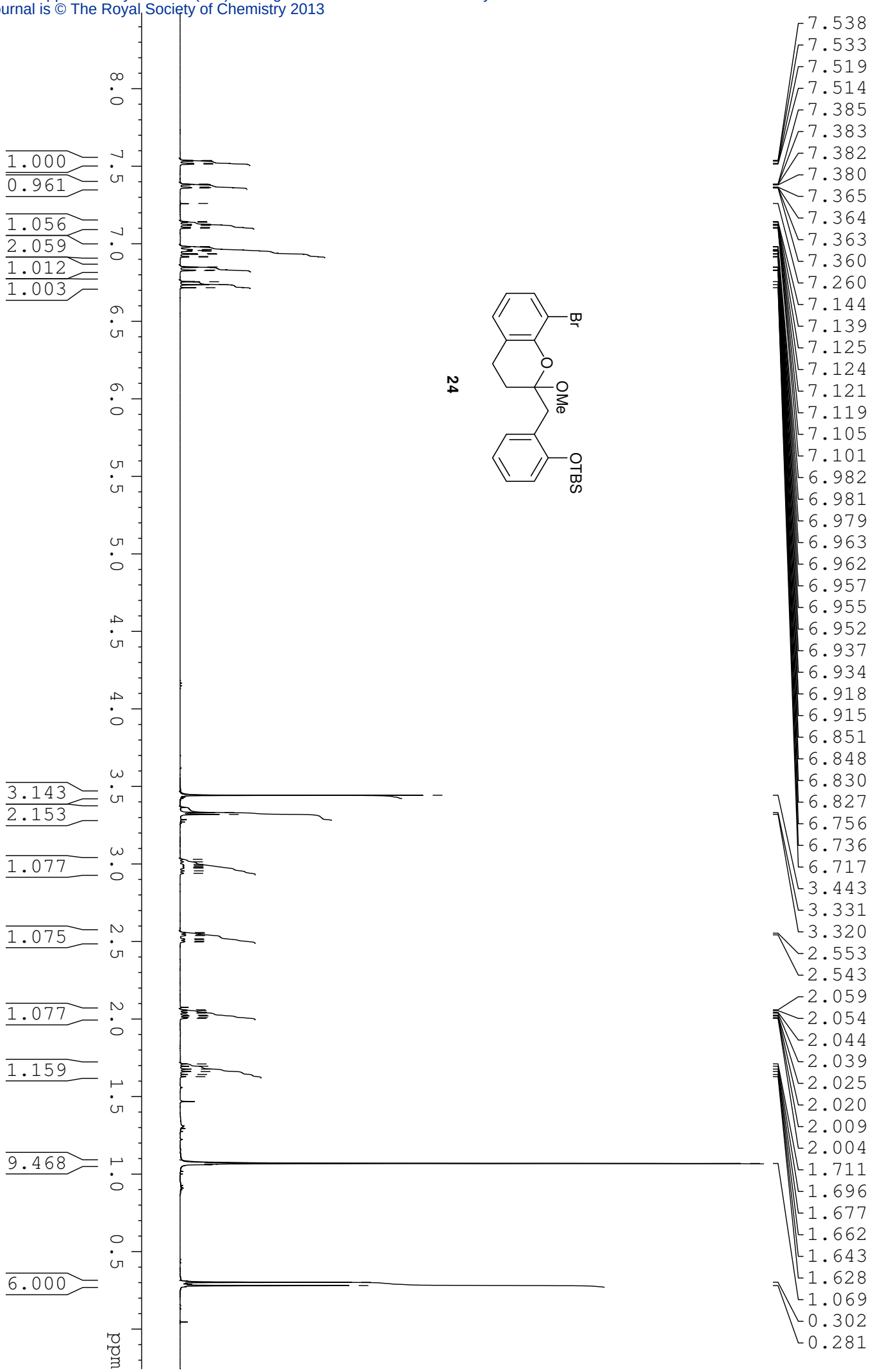

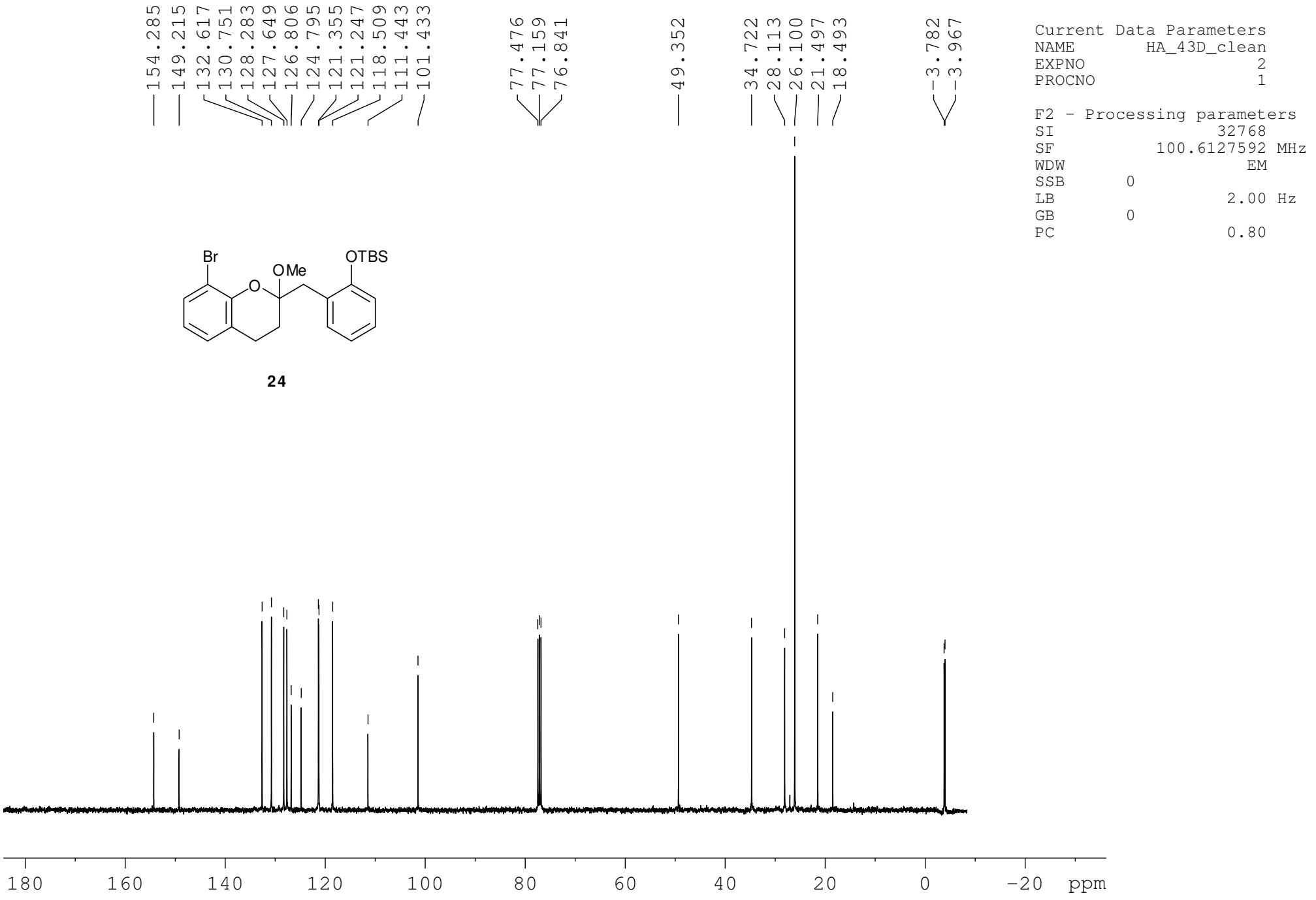

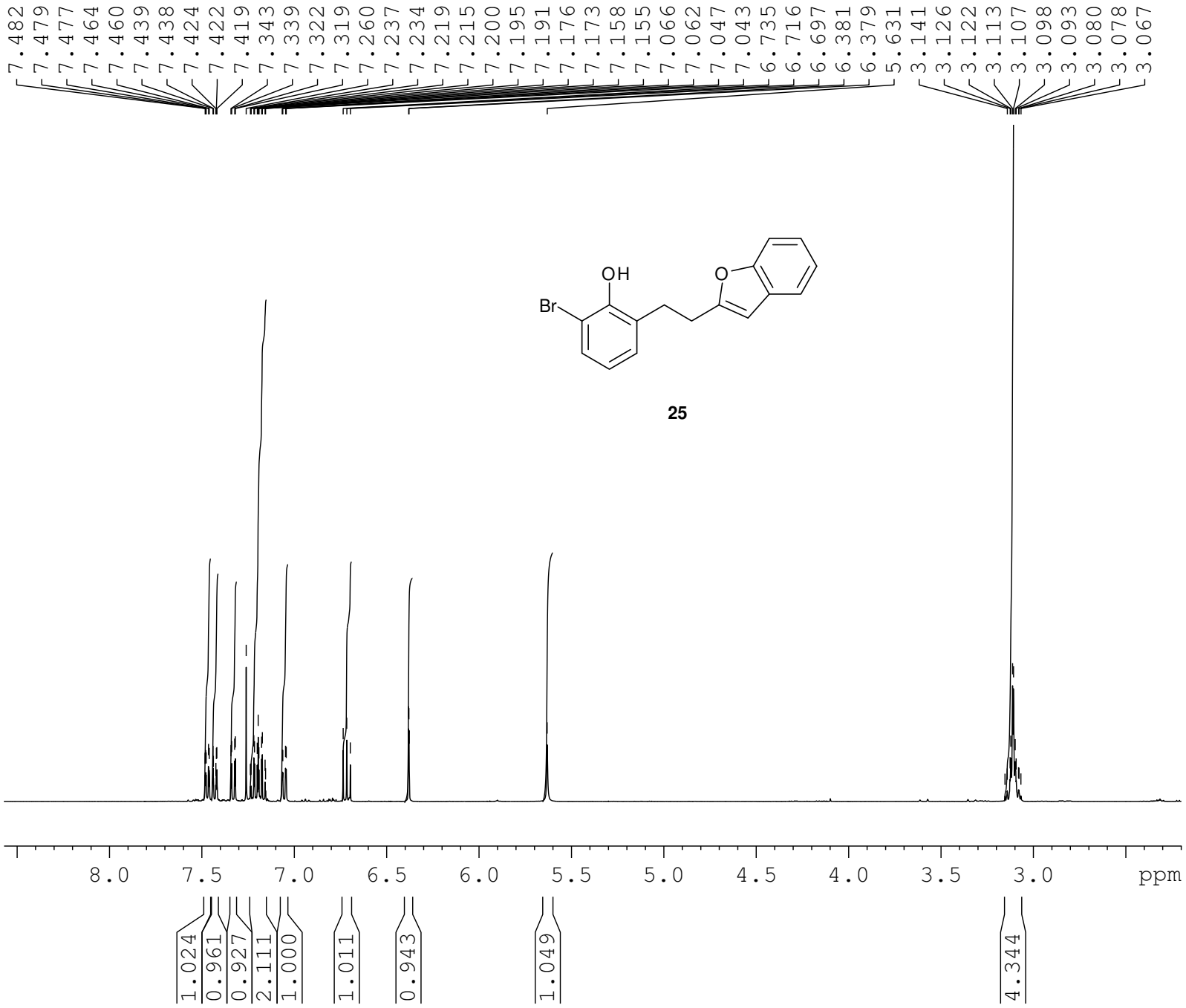


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Current Data Parameters
NAME         HA_bf_reNMR
EXPNO                  1
PROCNO                 1

F2 - Acquisition Parameters
Date_           20121005
Time               15.56
INSTRUM            spect
PROBHD   5 mm PABBO BB/
PULPROG             zg30
TD                 32768
SOLVENT            CDCl3
NS                    32
DS                     0
SWH             8169.935 Hz
FIDRES          0.249327 Hz
AQ              2.0054016 sec
RG                   287
DW                61.200 usec
DE                 6.50 usec
TE                300.0 K
D1           0.10000000 sec
TD0                    1

======== CHANNEL f1 ========
NUC1                  1H
P1                 7.32 usec
PL1               -6.00 dB
PL1W        40.00000000 W
SFO1        400.1321007 MHz

F2 - Processing parameters
SI                 16384
SF          400.1300093 MHz
WDW                   EM
SSB       0
LB                 0.10 Hz
GB        0
PC                 0.80
```
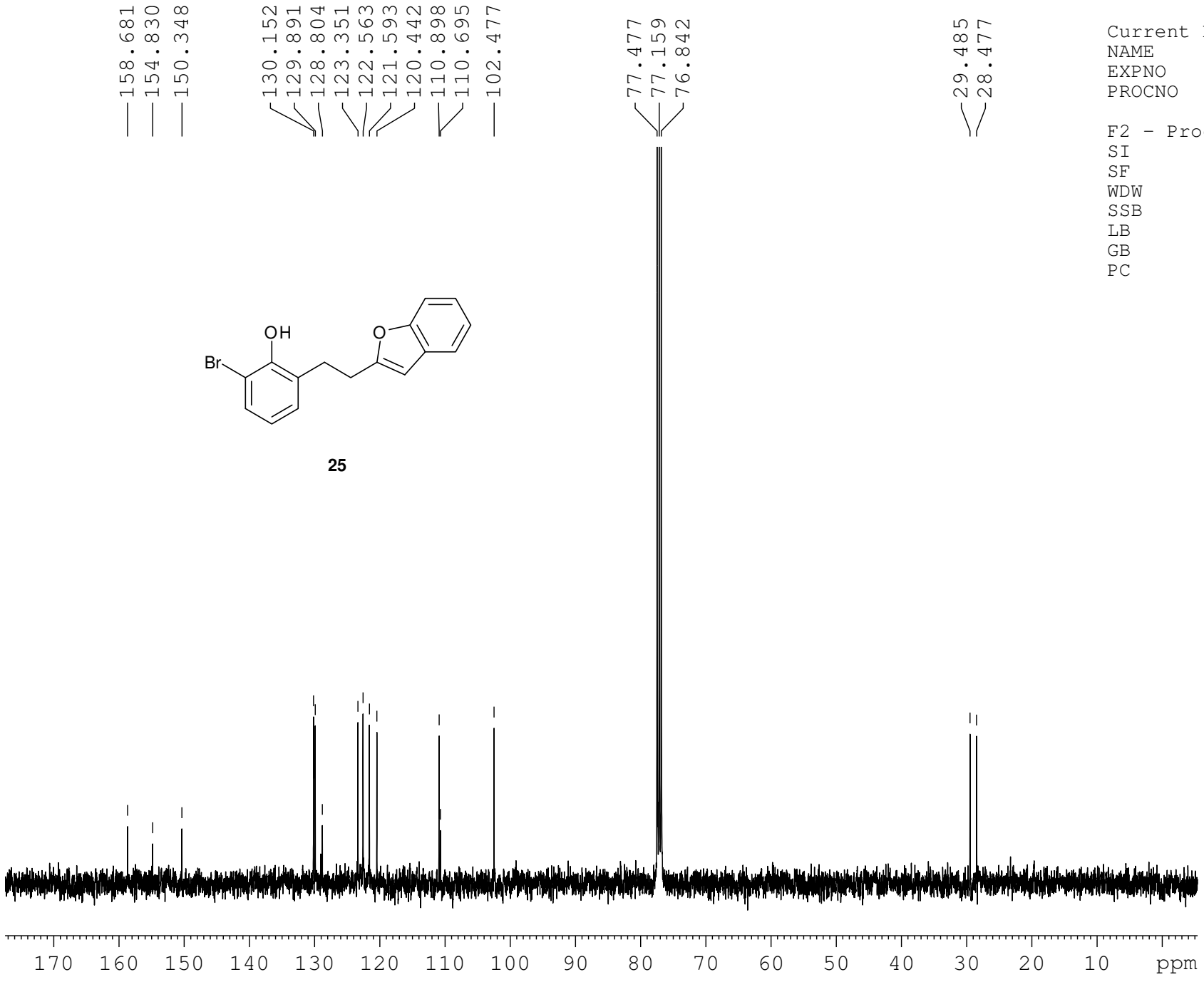
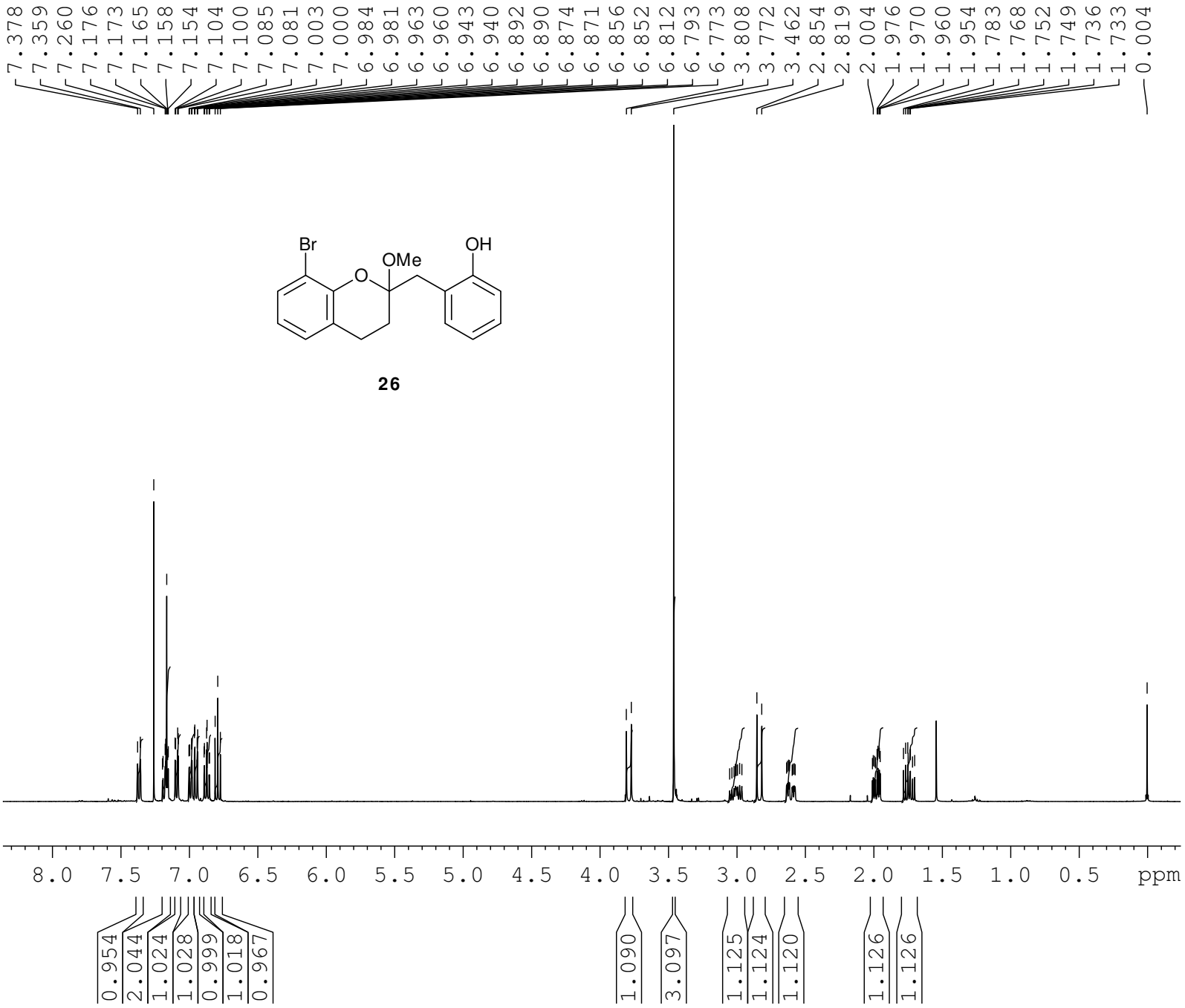
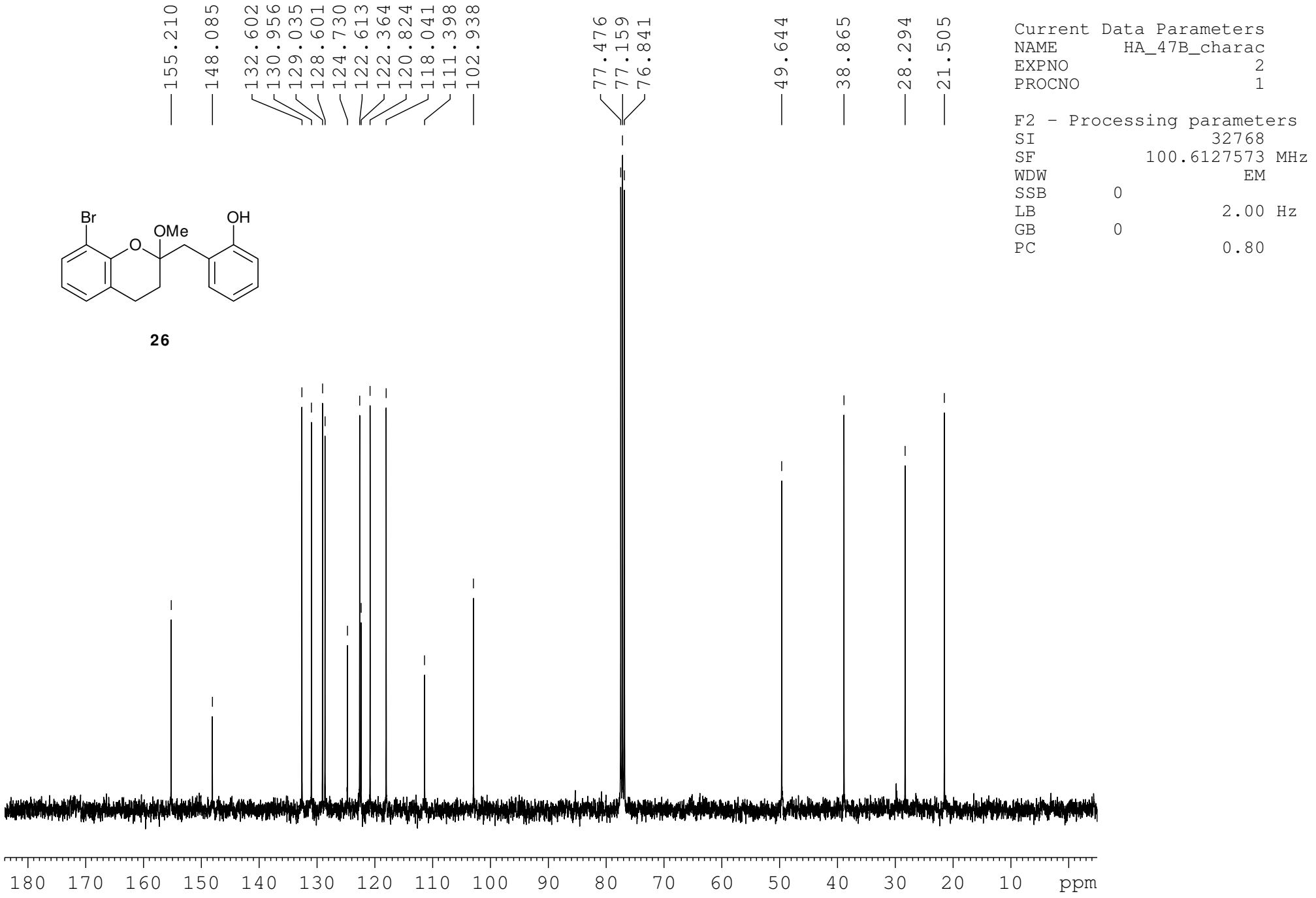



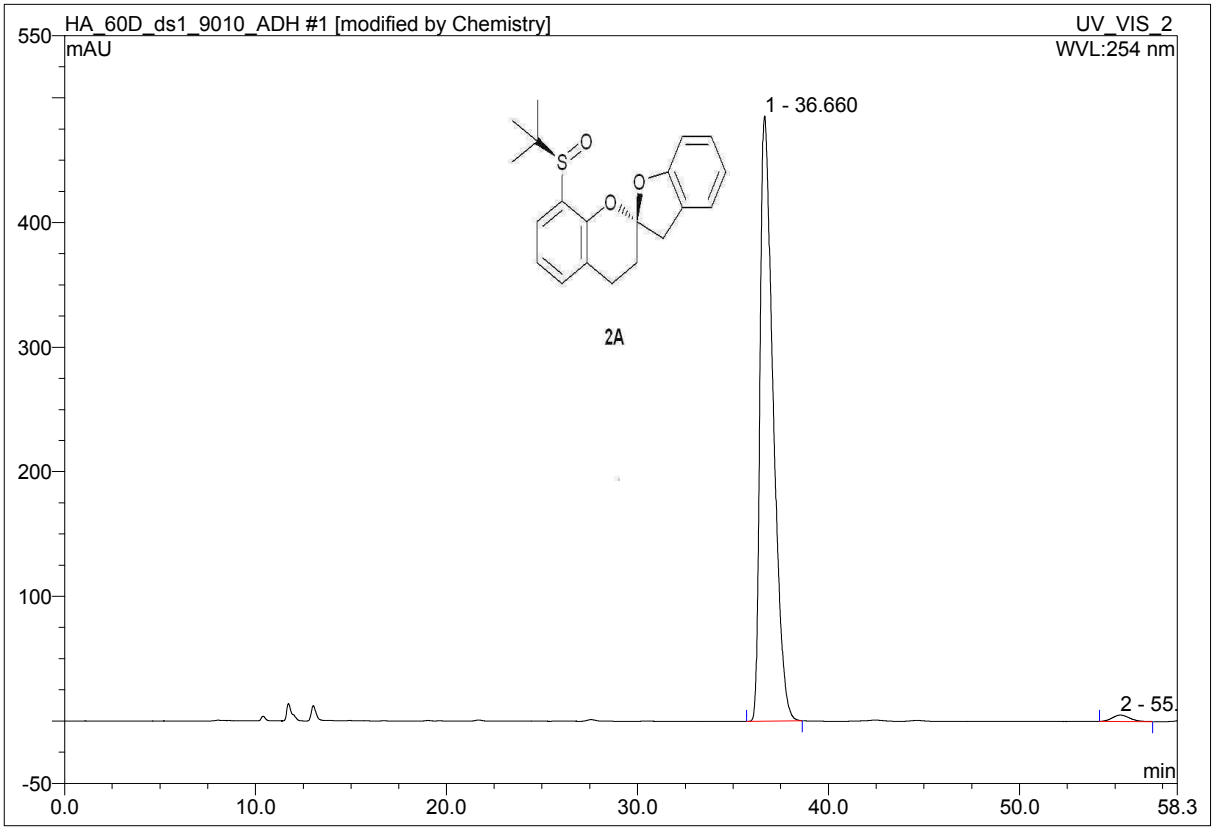



```
Current Data Parameters
NAME                  HA_47C
EXPNO                     10
PROCNO                     1

F2 - Acquisition Parameters
Date_              20120806
Time                  15.37
INSTRUM               spect
PROBHD    5 mm PABBO BB-
PULPROG                zg30
TD                    32768
SOLVENT               CDCl3
NS                       32
DS                        0
SWH                8169.935 Hz
FIDRES            0.249327 Hz
AQ                2.0054016 sec
RG                      256
DW                   61.200 usec
DE                    6.50 usec
TE                   300.1 K
D1              0.10000000 sec
TD0                       1

======== CHANNEL f1 ========
NUC1                     1H
P1                   14.90 usec
PL1                  -1.20 dB
PL1W           11.52336311 W
SFO1           399.8717194 MHz

F2 - Processing parameters
SI                    16384
SF             399.8700134 MHz
WDW                      EM
SSB       0
LB                    0.10 Hz
GB        0
PC                    0.80
```



1 HA_60D_ds1_9010_ADH

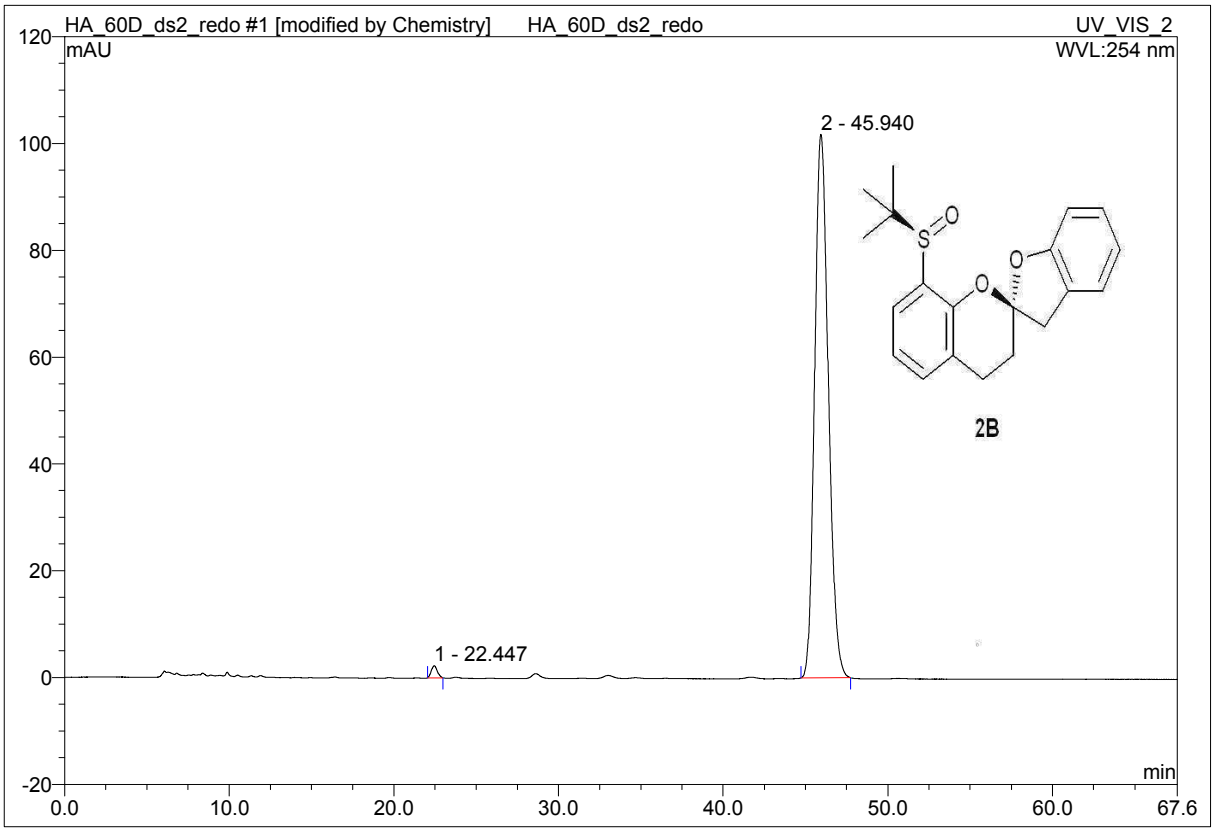
Sample Name:	**HA_60D_ds1_9010_ADH**	*Injection Volume:*	**20.0**
Vial Number:	**2**	*Channel:*	**UV_VIS_2**
Sample Type:	**unknown**	*Wavelength:*	**254**
Control Program:	**Harry1**	*Bandwidth:*	**n.a.**
Quantif. Method:	**default**	*Dilution Factor:*	**1.0000**
Recording Time:	**9/26/2012 12:04**	*Sample Weight:*	**1.0000**
Run Time (min):	**58.26**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height mAU	Area mAU*min	Rel.Area %	Amount	Type
1	36.66	n.a.	485.703	387.094	98.63	n.a.	BMB*
2	55.29	n.a.	5.131	5.372	1.37	n.a.	BMB*
Total:			490.834	392.466	100.00	0.000	

1 HA_60D_ds2_redo

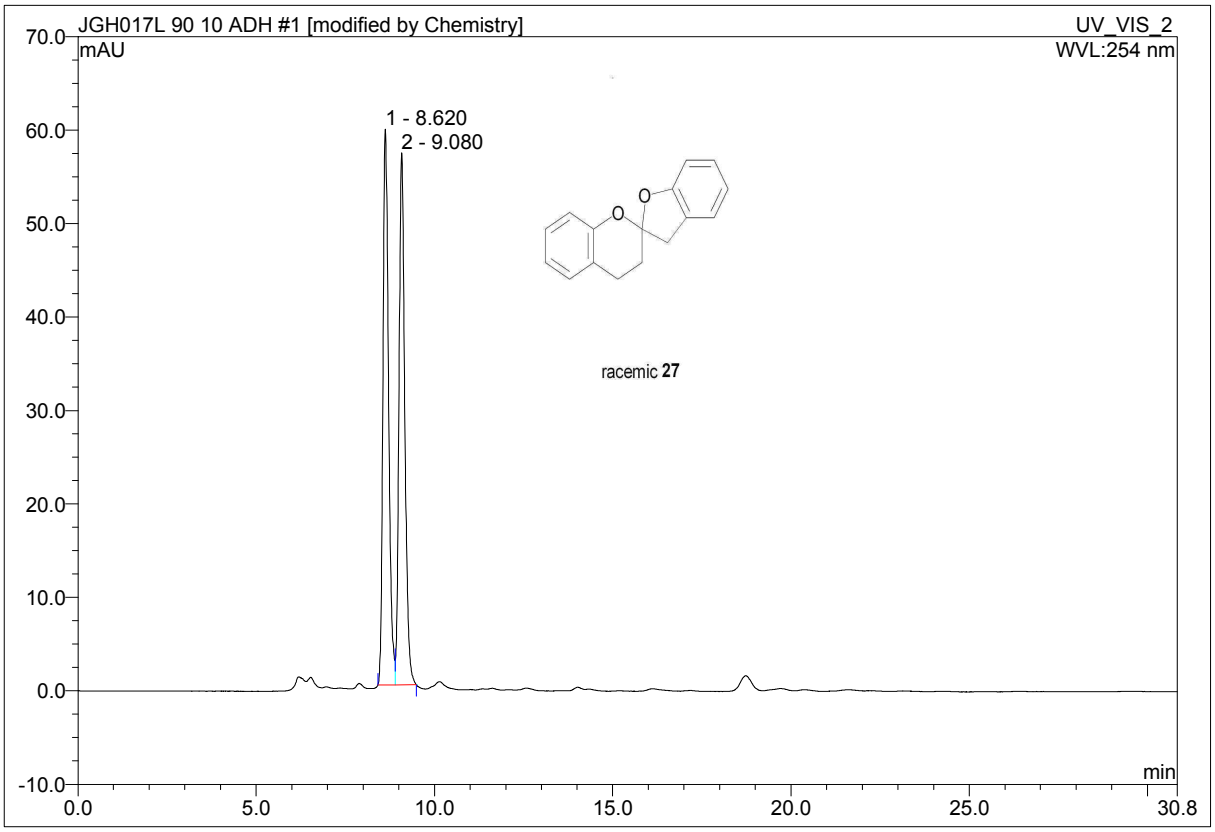
Sample Name:	**HA_60D_ds2_redo**	*Injection Volume:*	**20.0**
Vial Number:	**2**	*Channel:*	**UV_VIS_2**
Sample Type:	**unknown**	*Wavelength:*	**254**
Control Program:	**Harry1**	*Bandwidth:*	**n.a.**
Quantif. Method:	**default**	*Dilution Factor:*	**1.0000**
Recording Time:	**11/8/2012 11:20**	*Sample Weight:*	**1.0000**
Run Time (min):	**67.57**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height mAU	Area mAU*min	Rel.Area %	Amount	Type
1	22.45	n.a.	2.257	0.958	0.97	n.a.	BMB*
2	45.94	n.a.	101.748	98.038	99.03	n.a.	BMB*
Total:			104.005	98.997	100.00	0.000	

1 JGH017L 90 10 ADH

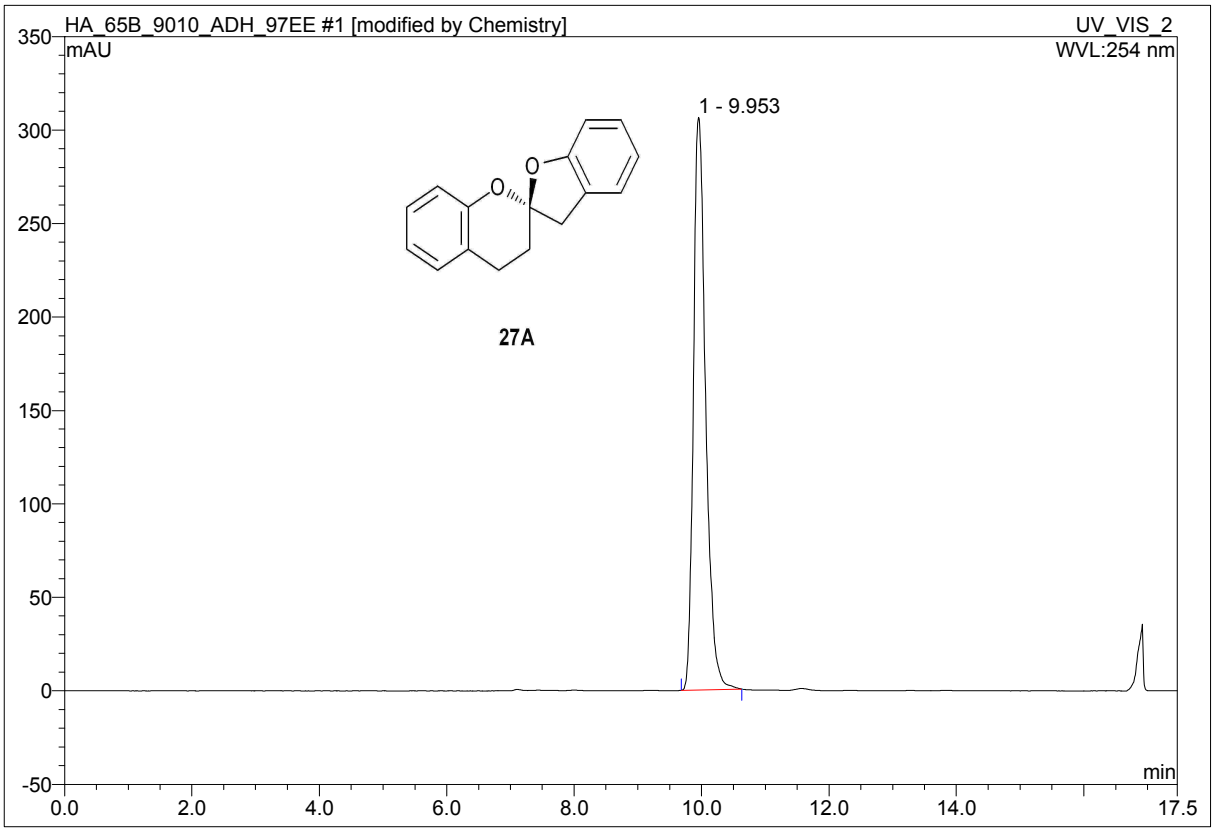
Sample Name:	**JGH017L 90 10 ADH**	*Injection Volume:*	**20.0**
Vial Number:	**2**	*Channel:*	**UV_VIS_2**
Sample Type:	**unknown**	*Wavelength:*	**254**
Control Program:	**ZEW085 65_35**	*Bandwidth:*	**n.a.**
Quantif. Method:	**default**	*Dilution Factor:*	**1.0000**
Recording Time:	**8/31/2010 9:36**	*Sample Weight:*	**1.0000**
Run Time (min):	**30.83**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height mAU	Area mAU*min	Rel.Area %	Amount	Type
1	8.62	n.a.	59.472	10.932	50.37	n.a.	BM *
2	9.08	n.a.	56.936	10.772	49.63	n.a.	MB*
Total:			116.407	21.703	100.00	0.000	

1 HA_65B_9010_ADH

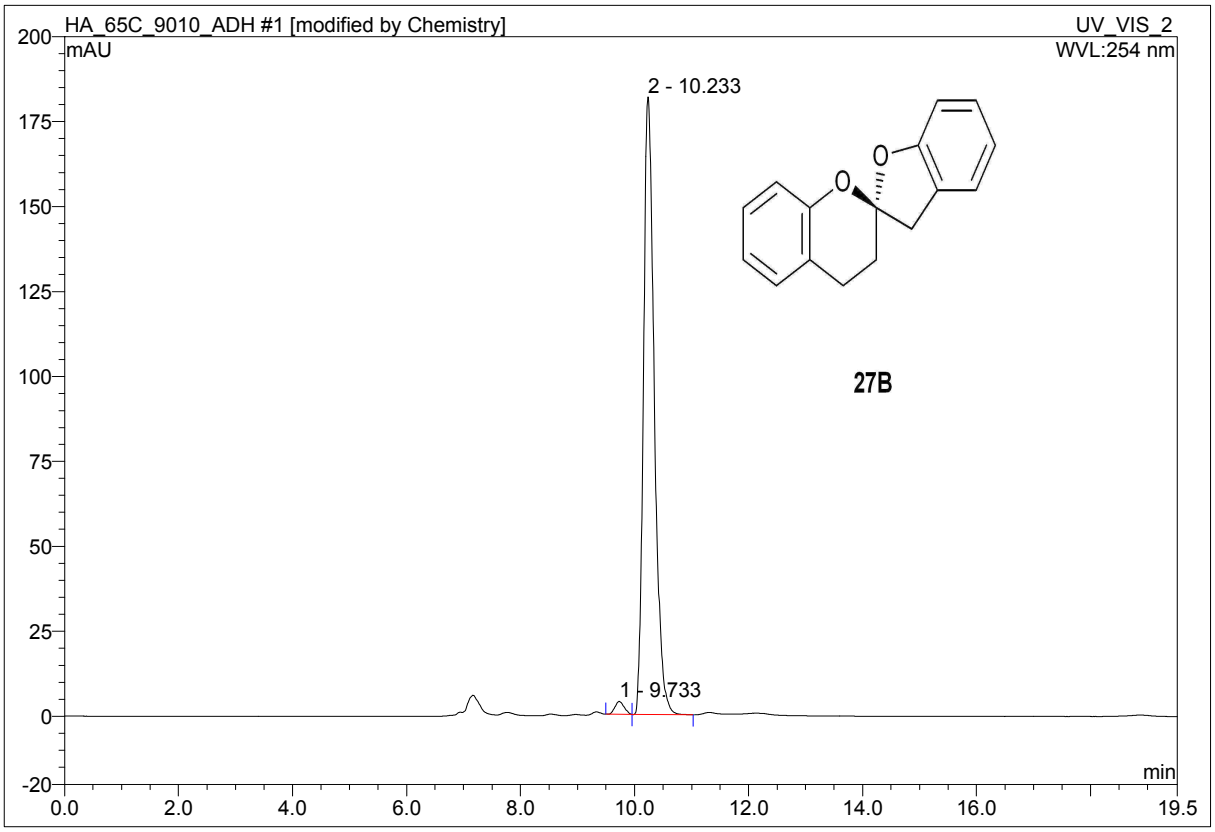
Sample Name:	**HA_65B_9010_ADH**	*Injection Volume:*	**20.0**
Vial Number:	**2**	*Channel:*	**UV_VIS_2**
Sample Type:	**unknown**	*Wavelength:*	**254**
Control Program:	**Harry1**	*Bandwidth:*	**n.a.**
Quantif. Method:	**default**	*Dilution Factor:*	**1.0000**
Recording Time:	**9/26/2012 18:55**	*Sample Weight:*	**1.0000**
Run Time (min):	**17.47**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height mAU	Area mAU*min	Rel.Area %	Amount	Type
1	9.95	n.a.	306.354	68.237	100.00	n.a.	BMB*
Total:			306.354	68.237	100.00	0.000	

1 HA_65C_9010_ADH

Sample Name:	**HA_65C_9010_ADH**	*Injection Volume:*	**20.0**
Vial Number:	**2**	*Channel:*	**UV_VIS_2**
Sample Type:	**unknown**	*Wavelength:*	**254**
Control Program:	**Harry1**	*Bandwidth:*	**n.a.**
Quantif. Method:	**default**	*Dilution Factor:*	**1.0000**
Recording Time:	**9/26/2012 22:33**	*Sample Weight:*	**1.0000**
Run Time (min):	**19.52**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height mAU	Area mAU*min	Rel.Area %	Amount	Type
1	9.73	n.a.	3.826	0.716	1.76	n.a.	BMb*
2	10.23	n.a.	181.805	40.030	98.24	n.a.	bMB*
Total:			185.632	40.747	100.00	0.000	