SUPPORTING INFORMATION

for

Room Temperature Syntheses of Entirely Diverse Substituted β-Fluorofurans

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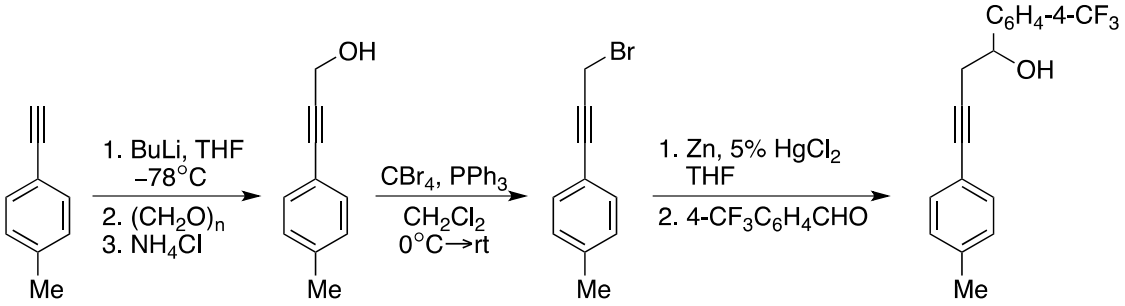
4-(4-Methylphenyl)-1-[4-(trifluoromethyl)phenyl]but-3-yn-1-ol (5f).



A 250-mL three-necked flask was charged with 4-ethynyltoluene (12.0 g, 0.100 mol) and anhydrous THF (100 mL). The solution was cooled to −78°C and BuLi (2.5 M, 44 mL, 0.11 mol) was added during 1 h. Paraformaldehyde (3.6 g, 0.12 mol) was added portionwise under nitrogen. The reaction was stirred at ambient temperature for 12 h and acidified with HCl (1 N, 120 mL) at 0°C. Most of the organic solvent was removed under vacuum. The residue was extracted with Et_2O (2 × 200 mL). Brine (100 mL) was added to the aqueous layer which was then extracted with Et_2O (100 mL). The combined organic layer was washed with brine (2 × 50 mL), dried over $MgSO_4$, filtered, and concentrated under vacuum. The crude **3-(4-methylphenyl)prop-2-yn-1-ol** (white solid) was kept for a few hours under vacuum and used for next step without further purification. NMR (δ, ppm): ^{1}H ($CDCl_3$) 7.37 (d, J = 8.4 Hz, 2H), 7.18 (d, J = 8.4 Hz, 2H), 4.73 (d, J = 6.0 Hz, 2H), 2.36 (s, 3H), 1.94 (t, J = 6.0 Hz 1H); ^{13}C ($CDCl_3$) 138.8, 131.7, 129.2, 119.6, 86.7.[S1]

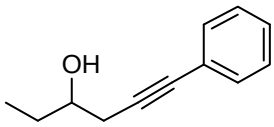
The propargyl alcohol (estimated as 0.10 mol) in anhydrous CH_2Cl_2 (200 mL) was loaded into a 500-mL three-necked flask equipped with septum and nitrogen inlet adapter. Carbon tetrabro-mide (40 g, 0.12 mol) was added under nitrogen. The homogeneous solution was cooled to 0°C and PPh_3 (32 g, 0.12 mol) was added in small portions under nitrogen (highly exothermic). The reaction mixture was stirred at ambient temperature for 16 h. EtOH (5 mL) was added to quench the reac-tion, followed by ice-water (50 mL). The organic layer was separated, dried over $MgSO_4$, filtered, and concentrated. The residue was distilled under vacuum to give the **1-(3-bromoprop-1-yn-1-yl)-4-methylbenzene** as a yellow or colorless oil (8.5 g, 0.041 mol). NMR (δ, ppm): ^{1}H ($CDCl_3$) 7.65 (d, J = 8.2 Hz, 2H), 7.58 (d, J = 8.2 Hz, 2H), 7.36 (d, J = 8.0 Hz, 2H), 7.14 (d, J = 8.0 Hz, 2H), 4.18 (s, 2H), 2.36 (s, 3H).[S2]

Zinc dust (0.384 g, 6.00 mmol), $HgCl_2$ (0.082 g, 0.30 mmol) in anhydrous THF (2.0 mL) was stirred vigorously under nitrogen at ambient temperature for 1 h. The aldehyde (0.900 g, 5.00 mmol) and propargyl bromide (1.16 g, 5.50 mmol) in anhydrous THF (23 mL) were to the mixture

S1) Köllhofer, A.; Plenio, H. *Adv. Synth. Catal.* **2005**, *347*, 1295−1300.
S2) (a) Bird, T. G. C.; Bruneau, P.; Crawley, G. C.; Edwards, M. P.; Foster, S. J.; Girodeau, J. M.; Kingston, J. F.; McMillan, R. M. *J. Med. Chem.* **1991**, *34*, 2176−2186. (b) Kleinbeck, F.; Toste, F. D. *J. Am. Chem. Soc.* **2009**, *131*, 9178−9179.

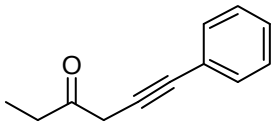
via syringe. The reaction was stirred at ambient temperature for 72 h (monitored by TLC). Saturated NH_4Cl solution (30 mL) and Et_2O (100 mL) were added and the mixture was filtered through celite pad. The organic layer was separated, dried over $MgSO_4$, filtered and concentrated. The residue was purified via silica gel column chromatography (hexanes/ethyl acetate 10:1). The 4-(4-methylphenyl)-1-[4-(trifluoromethyl)phenyl]but-3-yn-1-ol (**5f**) was separated as the major product (0.660 g, 2.17 mmol, 43%) along the isomeric product, buta-2,3-dien-1-ol (0.530 g, 1.74 mol) which arose from the dual reactivity of propargyl-metal reagent. Data for **5f**: White solid, mp 138-140 °C. Calcd for $C_{18}H_{15}F_3O$: C, 71.04; H, 4.97. Found: C, 70.64; H, 4.87. IR (ν, cm^{-1}, KBr) 3376, 2927, 1327, 1119. UV-vis (ε, $M^{-1}cm^{-1}$; ether; 3.9×10^{-5} M) 243 (22000), 254 (20000). MS (EI, m/z): 304 (4%, M^+), 130 (100%). NMR (δ, ppm): ^1H ($CDCl_3$) 7.65 (d, *J* = 8.2 Hz, 2H), 7.58 (d, *J* = 8.2 Hz, 2H), 7.28 (d, *J* = 8.0 Hz, 2H), 7.12 (d, *J* = 8.0 Hz, 2H), 5.02 (t, *J* = 5.6 Hz, 1H), 2.90 (dd, *J* = 5.2, 16.8 Hz, 1H), 2.84 (dd, *J* = 7.3, 16.8 Hz, 1H), 2.53 (bd, *J* = 2.7 Hz, 1H), 2.35 (s, 3H); ^{13}C ($CDCl_3$) 146.8, 138.6 , 131.8, 130.3 (q, *J* = 32.3 Hz), 129.3, 126.4, 125.6 (q, *J* = 3.8 Hz), 124.4 (q, *J* = 272.0 Hz), 120.1, 84.4 , 72.2, 30.9, 21.7.

6-Phenylhex-5-yn-3-ol (5g).



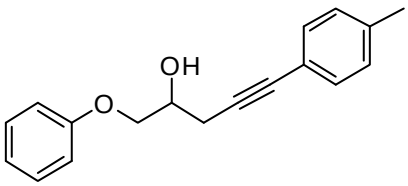
White solid, mp 37-38 °C. IR (ν, cm^{-1}, KBr) 2929, 1700, 1653, 1119. MS (EI, m/z): 174 (10%, M^+), 116 (100%). NMR (δ, ppm, $CDCl_3$): ^1H 7.46-7.39 (m, 2H), 7.32-7.28 (m, 3H), 3.84-3.74 (m, 1H), 2.68 (dd, *J* = 16.8, 4.8 Hz, 1H), 2.57 (dd, *J* = 16.8, 6.7 Hz, 1H), 1.95 (d, *J* = 5.0 Hz, 1H), 1.74-1.59 (m, 2H), 1.02 (t, *J* = 7.4 Hz, 3H); ^{13}C 131.9, 128.5, 128.1, 123.6, 86.4, 83.2, 29.5, 28.2, 10.2.

6-Phenylhex-5-yn-3-one (3g).



Unstable yellow oil. IR (ν, cm^{-1}, film) 2979, 2940, 2190, 1719, 1491, 758. MS (EI, m/z): 172 (20%, M^+), 57 (100%). NMR (δ, ppm, $CDCl_3$): ^1H 7.45-7.41 (m, 2H), 7.34-7.29 (m, 3H), 3.48 (s, 2H) 2.73 (q, *J* = 7.3 Hz, 2H), 1.13 (t, *J* = 7.3 Hz, 3H); ^{13}C 205.4, 131.8, 128.5, 128.4, 123.2, 84.8, 82.4, 35.0, 34.7, 7.9.

5-(4-Methylphenyl)-1-phenoxypent-4-yn-2-ol (5h).



White solid, mp 63-64 °C. Calcd for $C_{18}H_{18}O_2$: C, 81.17; H, 6.81. Found: C, 81.13; H, 6.89. IR (ν, cm^{-1}, KBr) 3460, 2916, 2332, 1599, 1500, 1251. UV-vis (ε, $M^{-1}cm^{-1}$; ether; 3.3×10^{-5} M) 242 (24000), 253 (23000). MS (EI, *m*/*z*): 266 (30%, M^+), 155 (100%). NMR (δ, ppm): ^1H ($CDCl_3$) 7.35-7.25 (m, 4H), 7.11 (d, *J* = 7.8 Hz, 2H), 7.02-6.93 (m, 3H), 4.30-4.22 (m, 1H), 4.18 (dd, *J* = 9.4, 4.1 Hz, 1H), 4.08 (dd, *J* = 9.4, 6.4 Hz, 1H), 2.81 (d, *J* = 6.2 Hz, 2H), 2.50 (d, *J* = 5.0 Hz, 1H), 2.35 (s, 3H); ^{13}C ($CDCl_3$) 158.7, 138.3, 131.7, 129.8, 129.2, 121.4, 120.3, 114.8, 84.4, 83.5, 70.8, 69.0, 24.8, 21.6.

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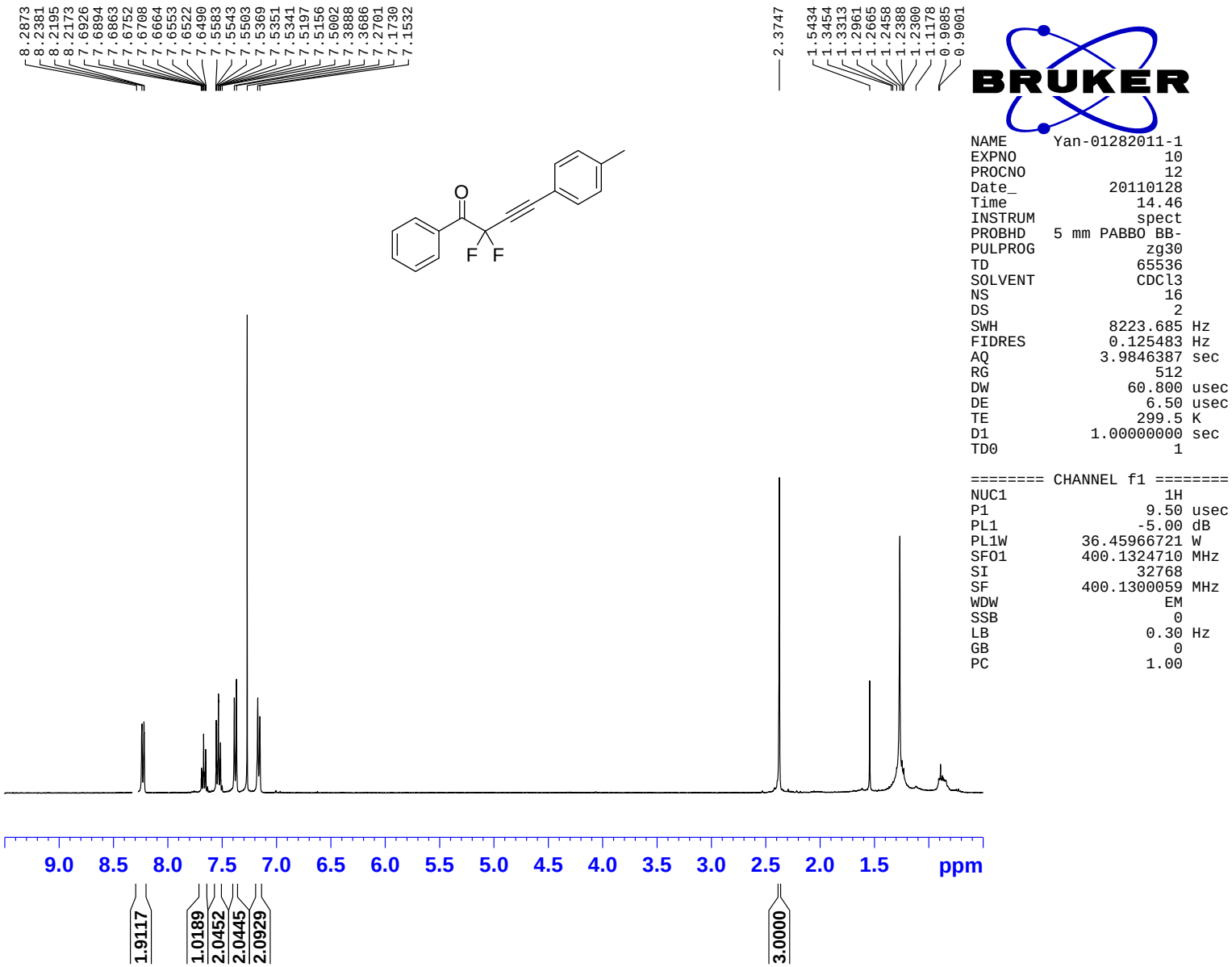
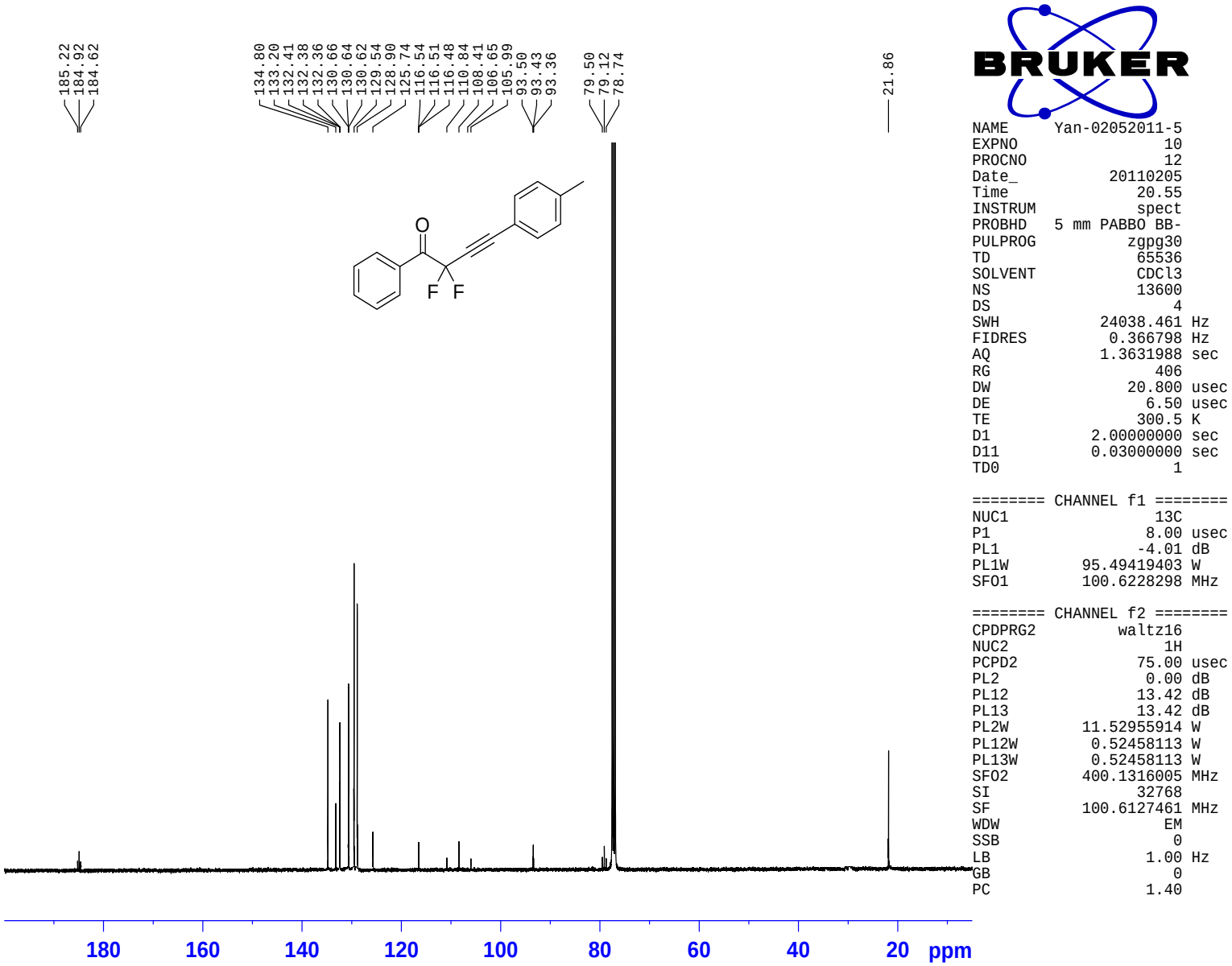
^{1}H NMR spectrum for **4a** ($CDCl_3$)



Organic & Biomolecular Chemistry **2012**, *10*, http://dx.doi.org/10.1039/c1ob06693e

^{13}C NMR spectrum for **4a** ($CDCl_3$)

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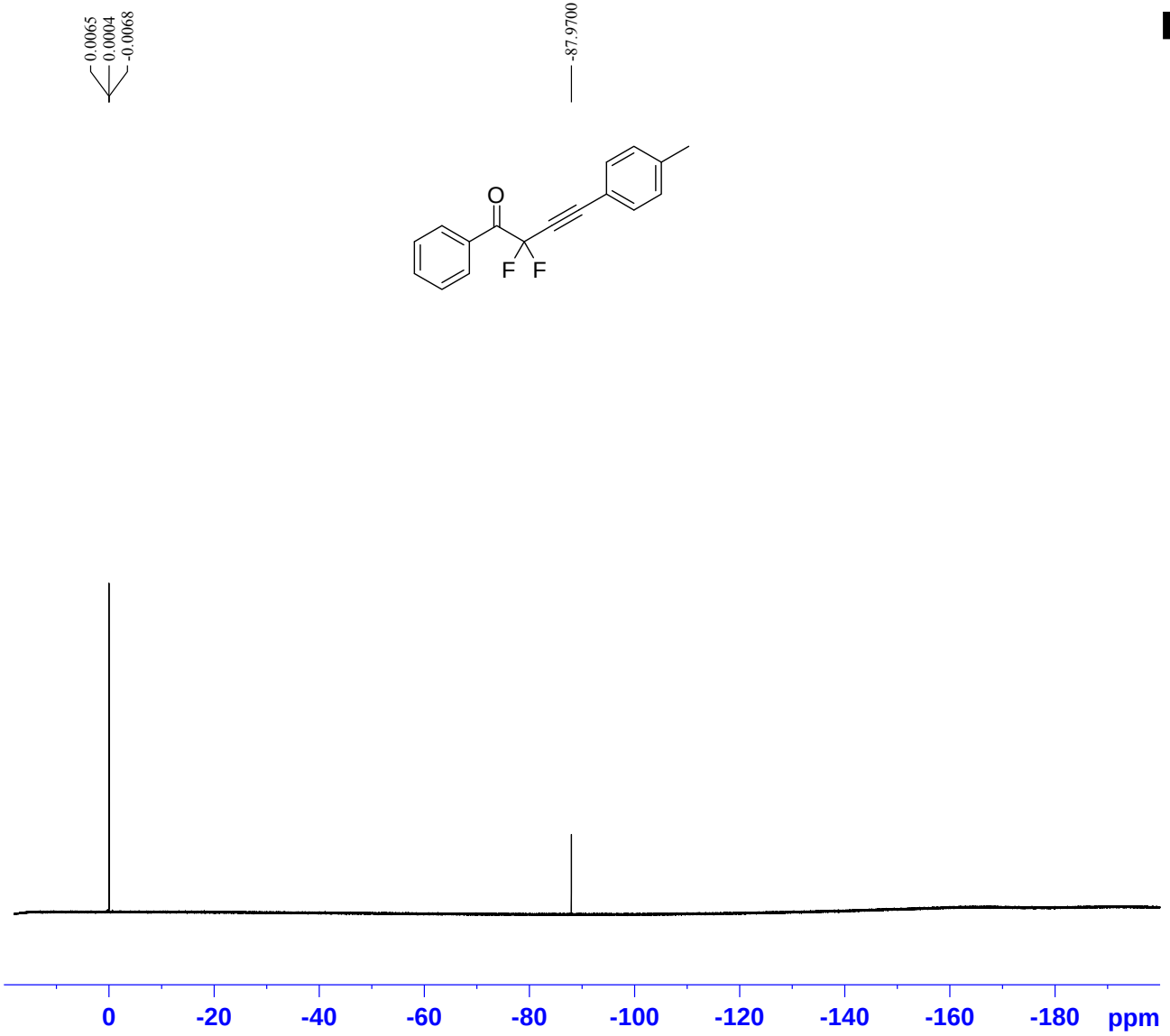
Organic & Biomolecular Chemistry **2012**, *10*, http://dx.doi.org/10.1039/c1ob06693e

^{19}F NMR spectrum for **4a** ($CDCl_3$)

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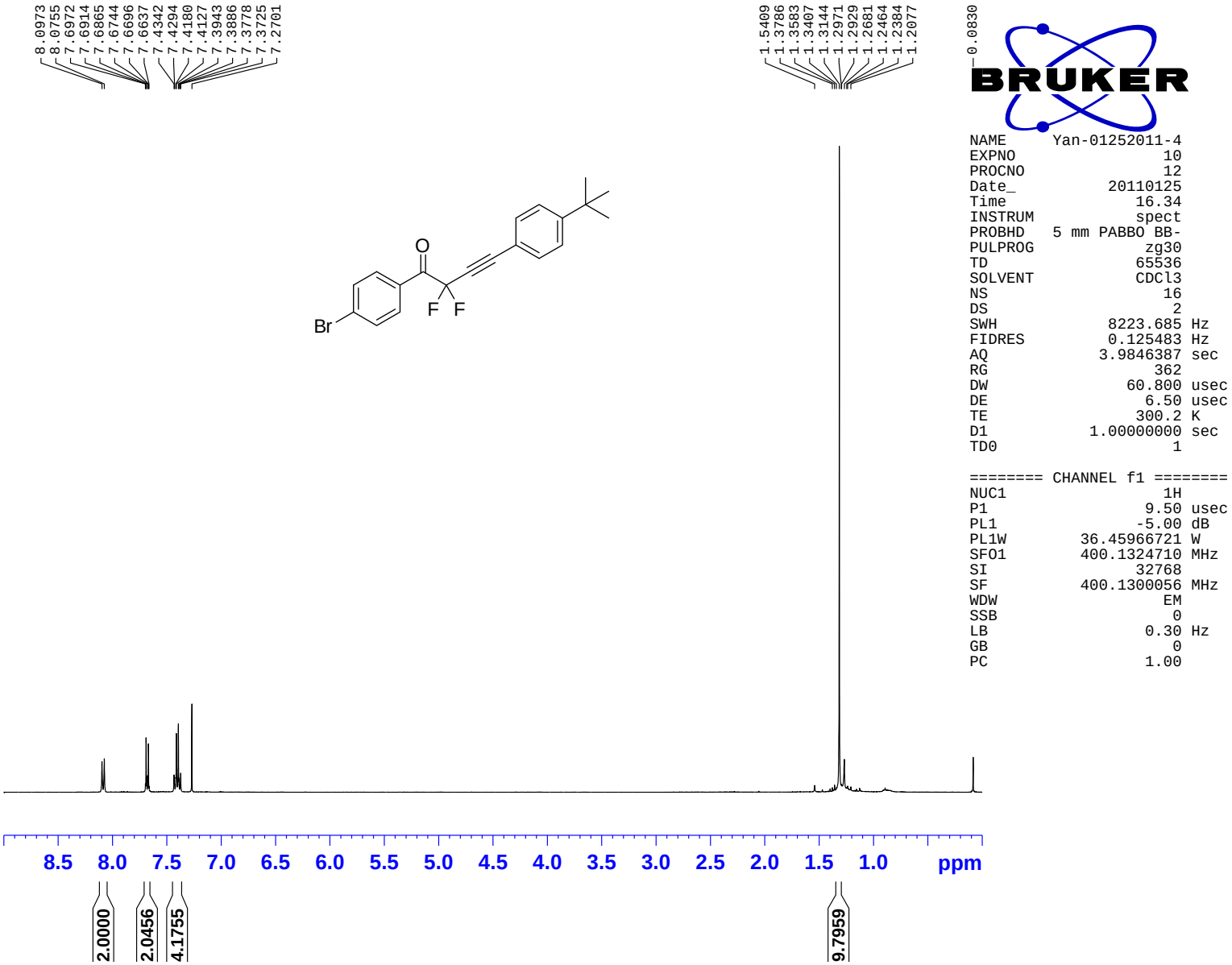
Organic & Biomolecular Chemistry **2012**, *10*, http://dx.doi.org/10.1039/c1ob06693e

^{1}H NMR spectrum for **4e** ($CDCl_3$)



Organic & Biomolecular Chemistry **2012**, *10*, http://dx.doi.org/10.1039/c1ob06693e

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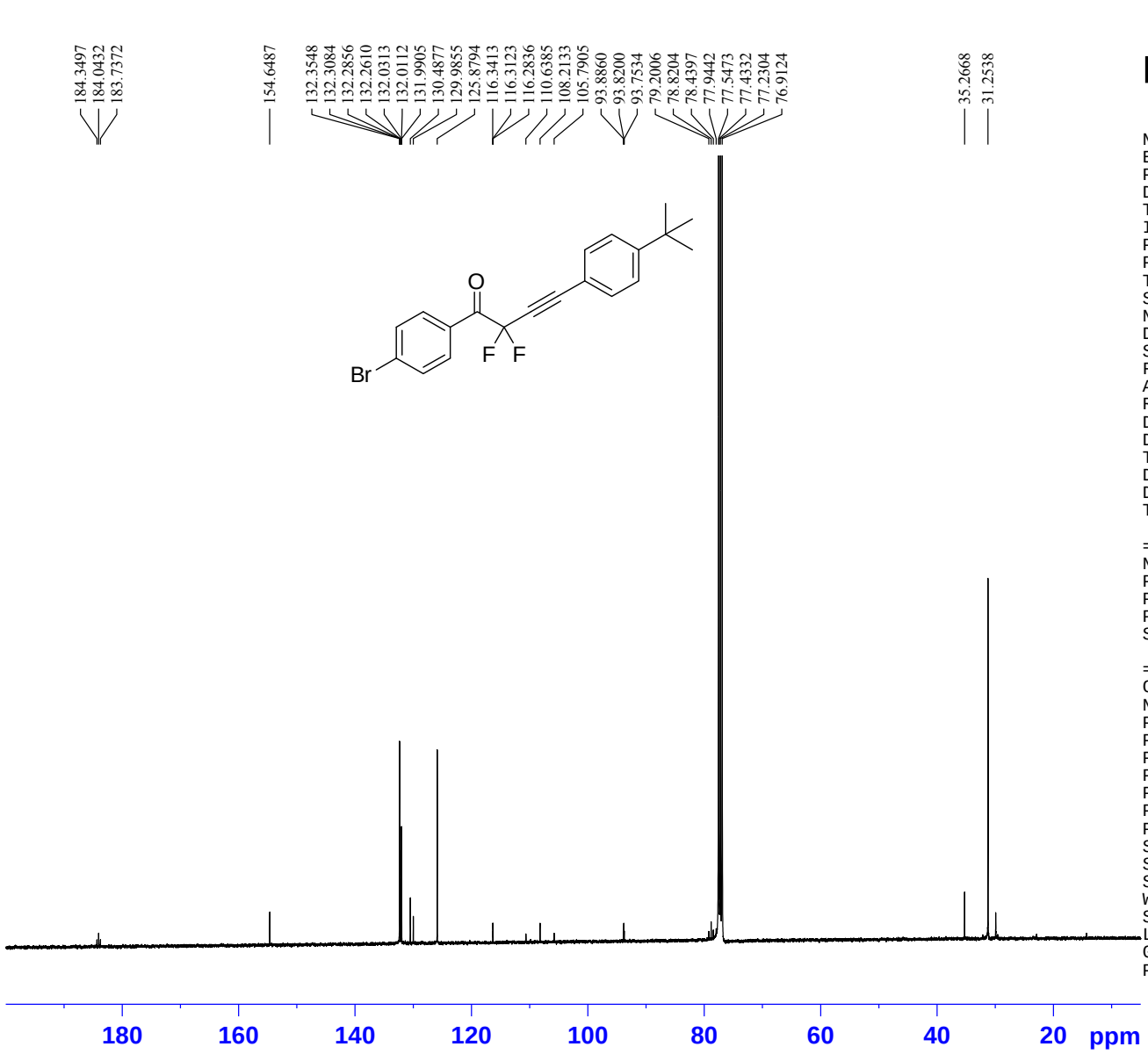

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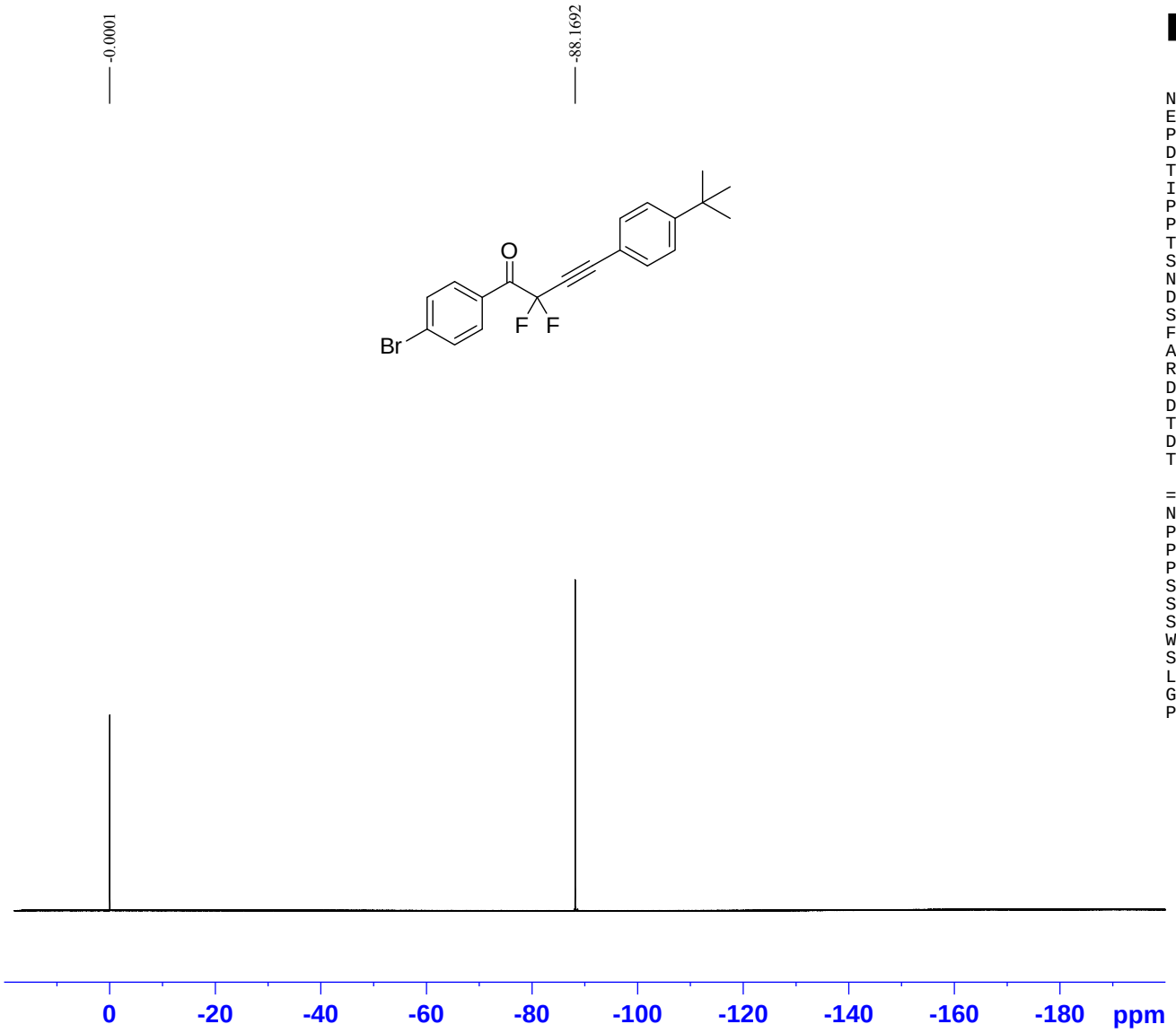
Organic & Biomolecular Chemistry **2012**, *10*, http://dx.doi.org/10.1039/c1ob06693e

^{19}F NMR spectrum for **4e** ($CDCl_3$)

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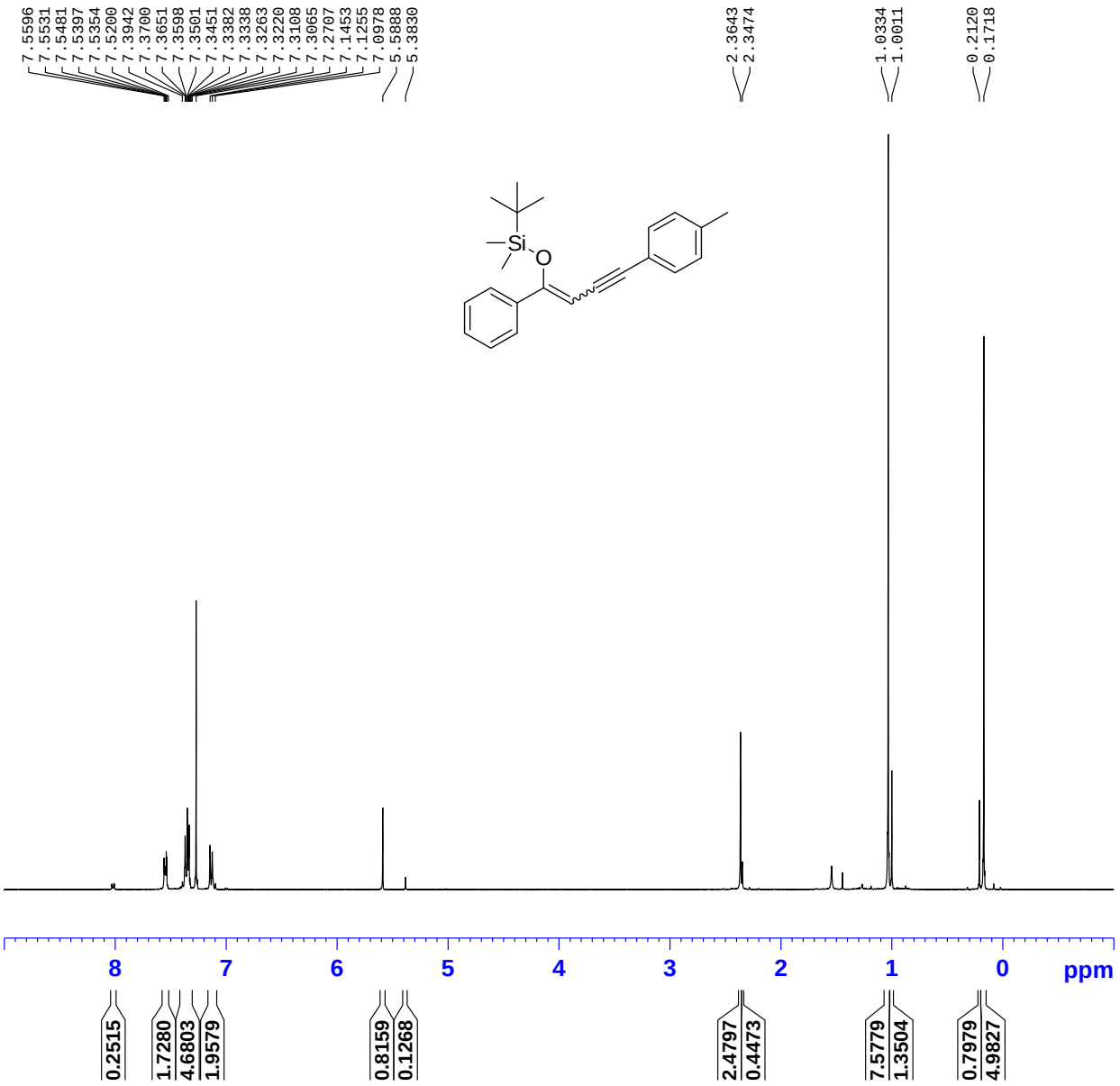
Organic & Biomolecular Chemistry **2012**, *10*, http://dx.doi.org/10.1039/c1ob06693e

^{1}H NMR spectrum for **6a** ($CDCl_3$)

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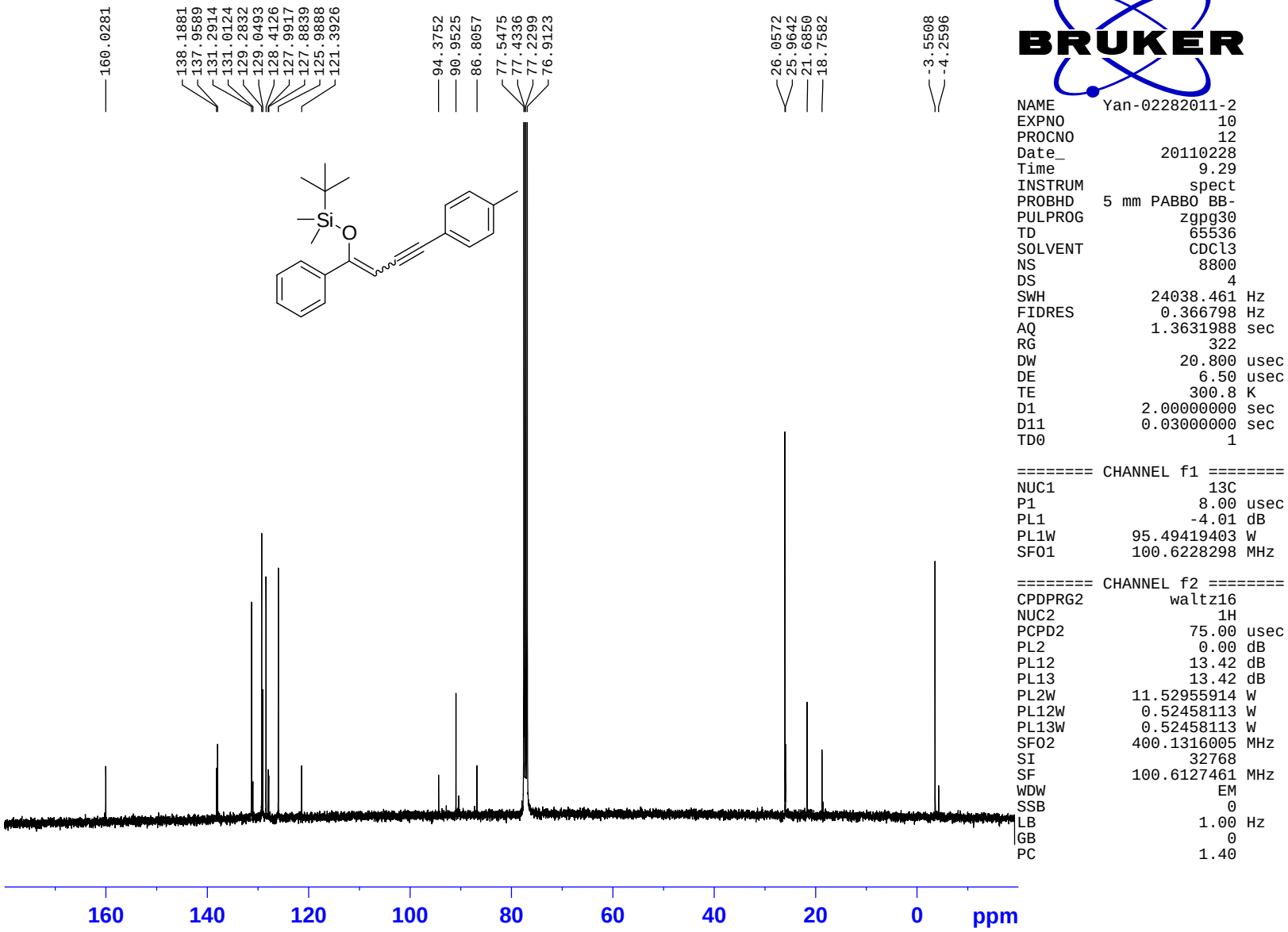
Organic & Biomolecular Chemistry **2012**, *10*, http://dx.doi.org/10.1039/c1ob06693e

^{13}C NMR spectrum for **6a** ($CDCl_3$)

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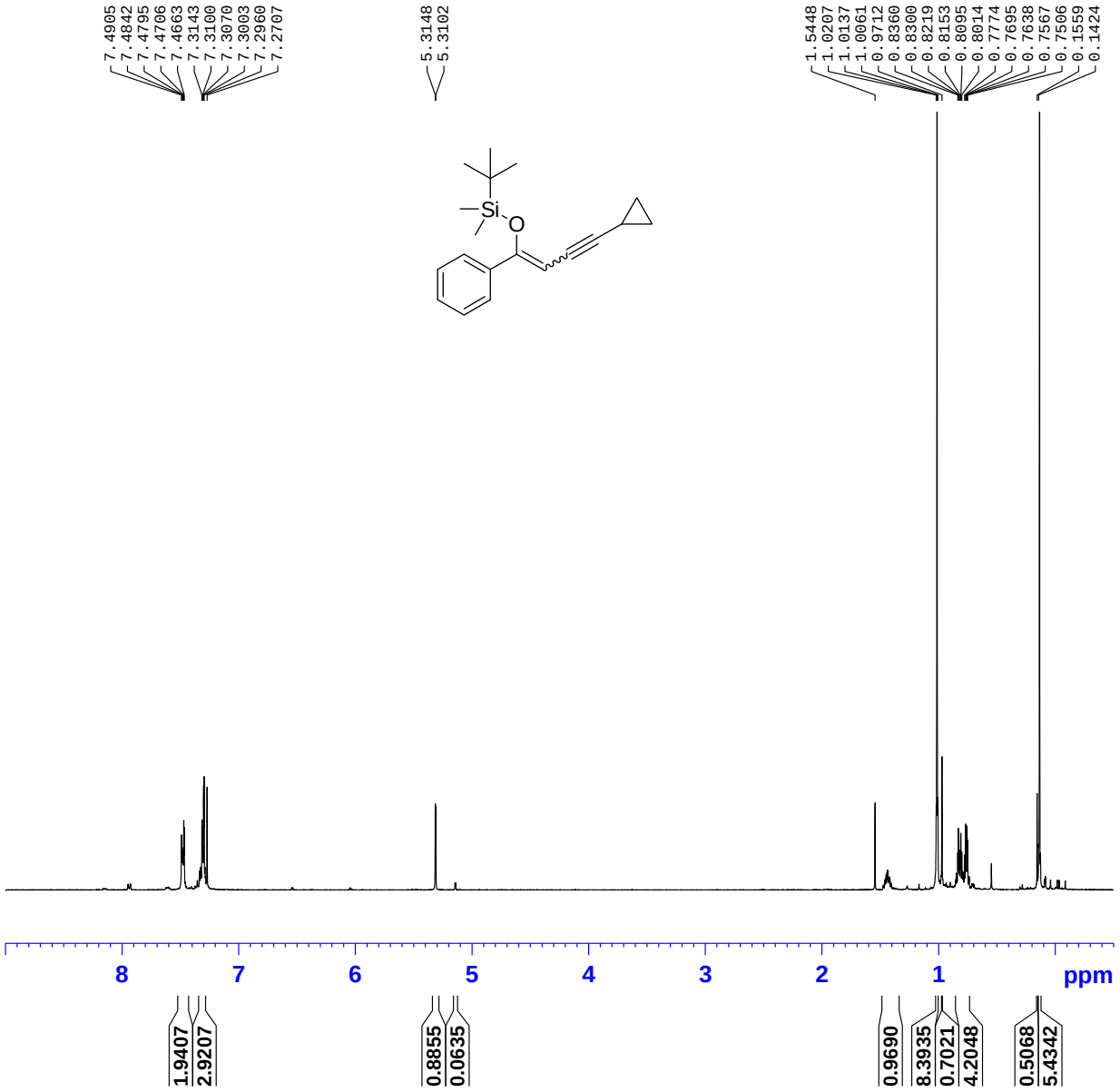
Organic & Biomolecular Chemistry **2012**, *10*, http://dx.doi.org/10.1039/c1ob06693e

^{1}H NMR spectrum for **6b** ($CDCl_3$)

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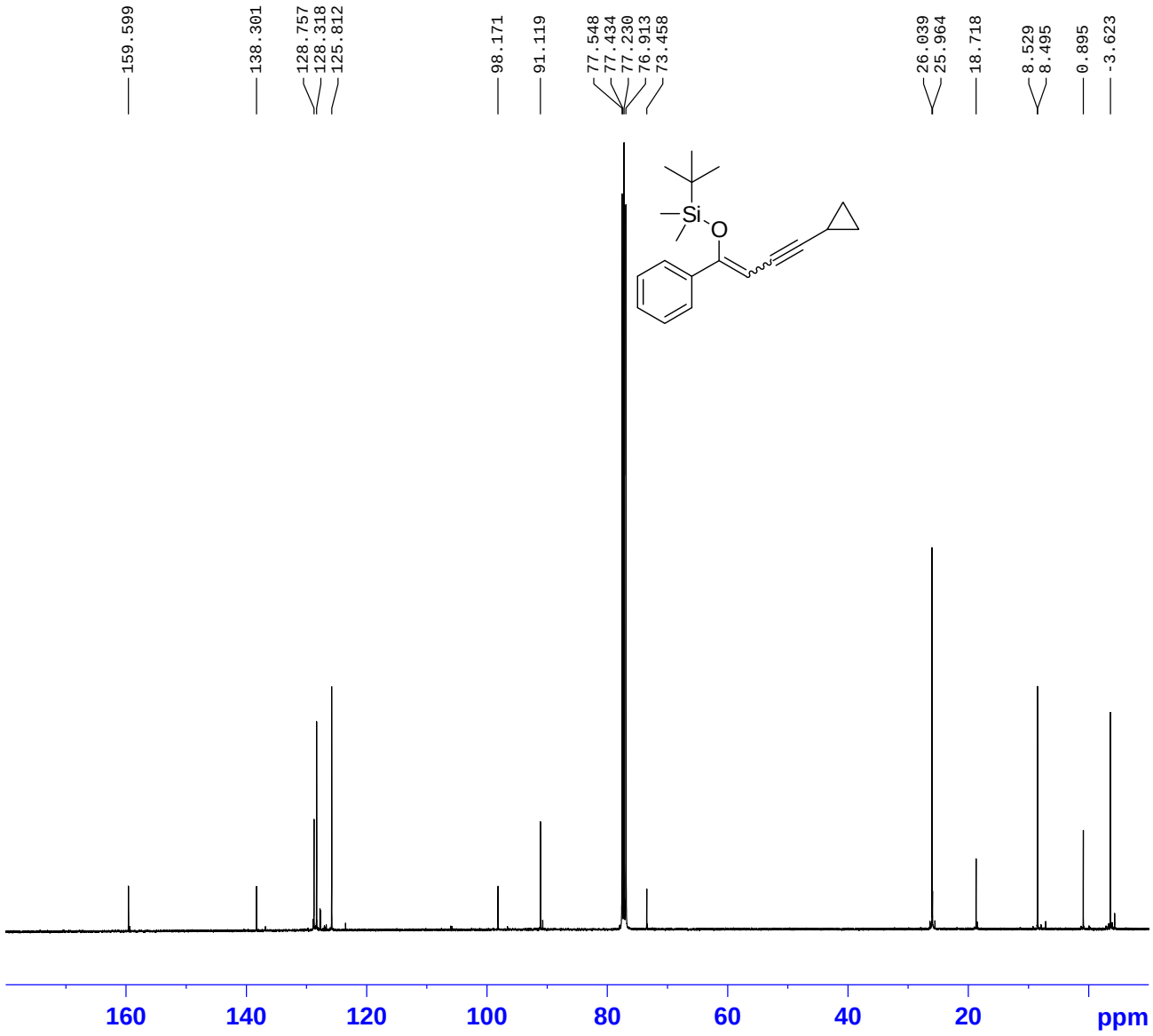
^{13}C NMR spectrum for **6b** ($CDCl_3$)

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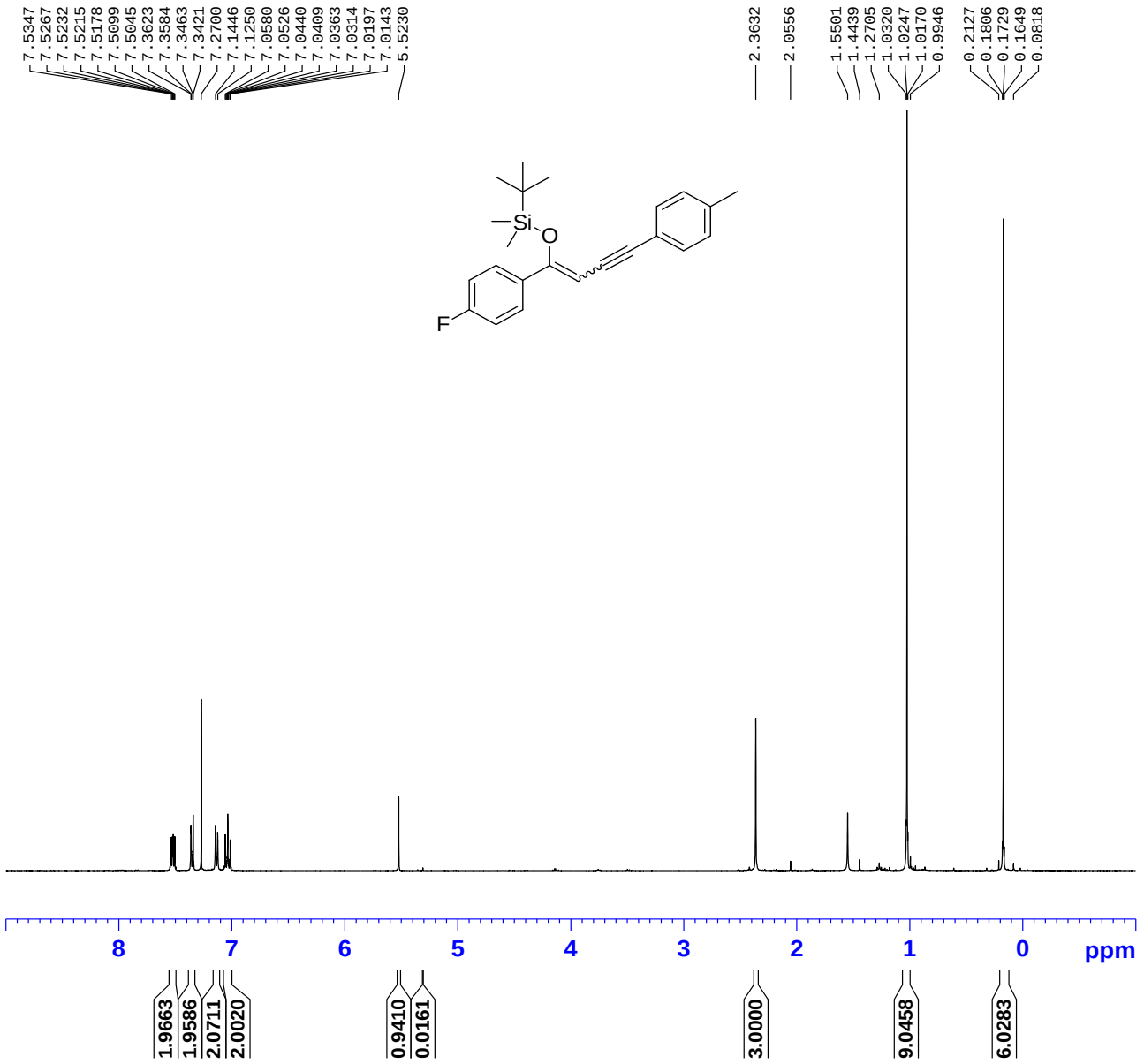
Organic & Biomolecular Chemistry **2012**, *10*, http://dx.doi.org/10.1039/c1ob06693e

^{1}H NMR spectrum for **6c** ($CDCl_3$)

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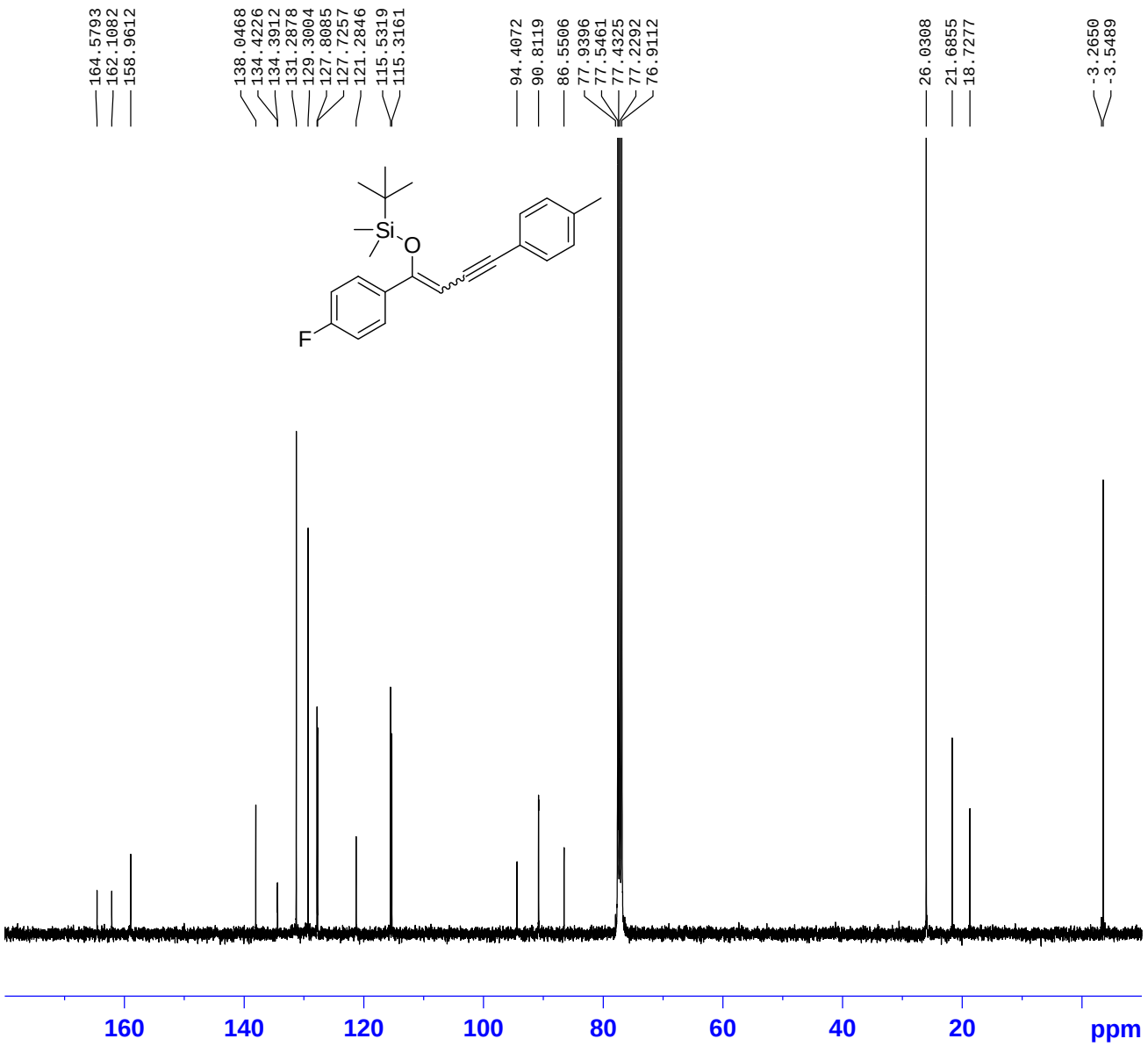
SFO1        400.1324710 MHz
SI                 32768
SF          400.1300059 MHz
WDW                   EM
SSB                    0
LB                 0.30 Hz
GB                     0
PC                 1.00
```

Organic & Biomolecular Chemistry **2012**, *10*, http://dx.doi.org/10.1039/c1ob06693e

^{13}C NMR spectrum for **6c** ($CDCl_3$)



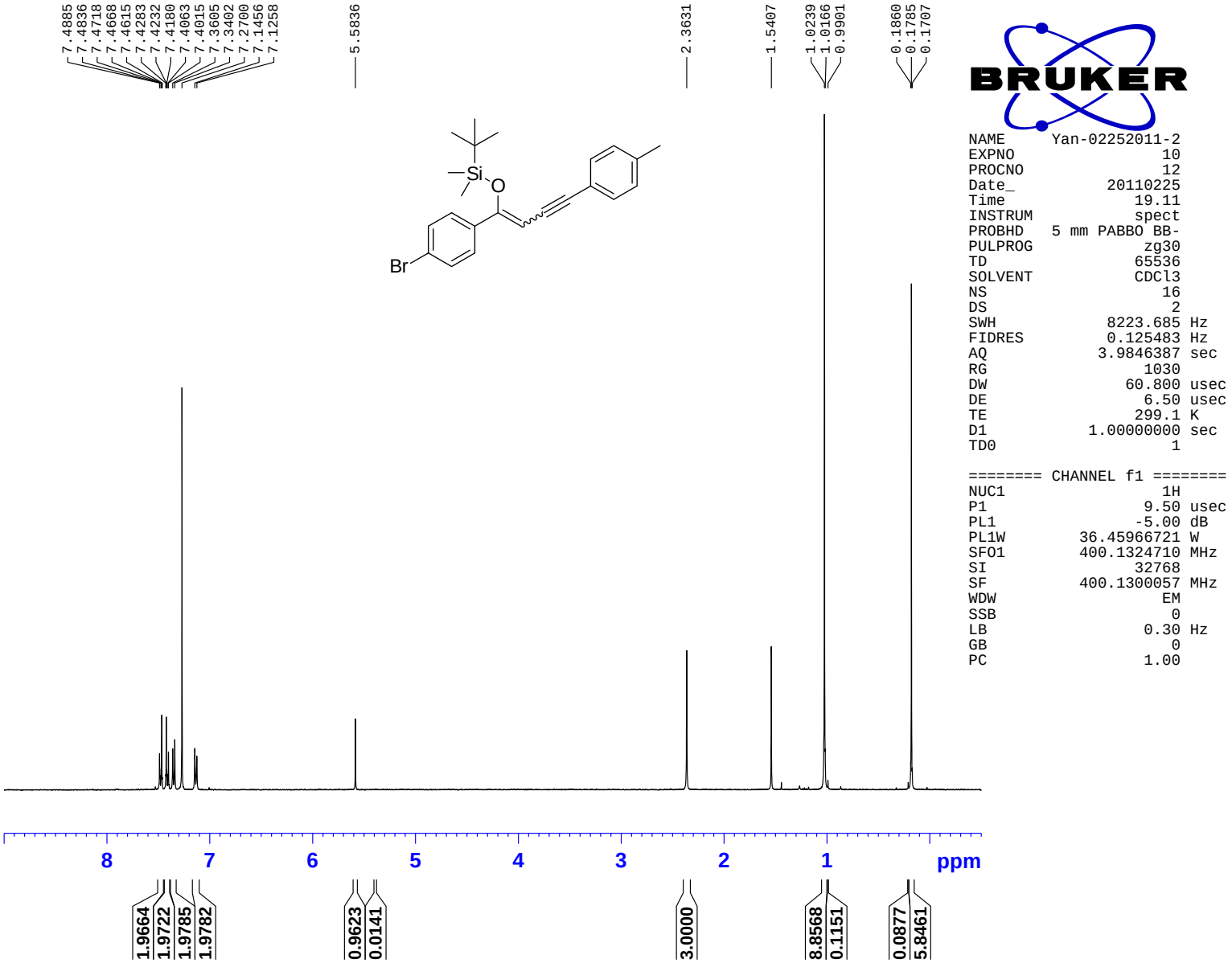

```
NAME        Yan-02282011-5
EXPNO                   10
PROCNO                  12
Date_             20110301
Time                  8.24
INSTRUM              spect
PROBHD    5 mm PABBO BB-
PULPROG             zgpg30
TD                   65536
SOLVENT              CDCl3
NS                    9800
DS                       4
SWH              24038.461 Hz
FIDRES            0.366798 Hz
AQ               1.3631988 sec
RG                     287
DW                  20.800 usec
DE                   6.50 usec
TE                  300.7 K
D1               2.00000000 sec
D11              0.03000000 sec
TD0                      1

======== CHANNEL f1 ========
NUC1                   13C
P1                    8.00 usec
PL1                  -4.01 dB
PL1W           95.49419403 W
SFO1          100.6228298 MHz

======== CHANNEL f2 ========
CPDPRG2            waltz16
NUC2                   1H
PCPD2                75.00 usec
PL2                   0.00 dB
PL12                 13.42 dB
PL13                 13.42 dB
PL2W           11.52955914 W
PL12W           0.52458113 W
PL13W           0.52458113 W
SFO2          400.1316005 MHz
SI                   32768
SF            100.6127460 MHz
WDW                    EM
SSB                     0
LB                   1.00 Hz
GB                      0
PC                   1.40
```

Organic & Biomolecular Chemistry **2012**, *10*, http://dx.doi.org/10.1039/c1ob06693e

^{1}H NMR spectrum for **6d** ($CDCl_3$)

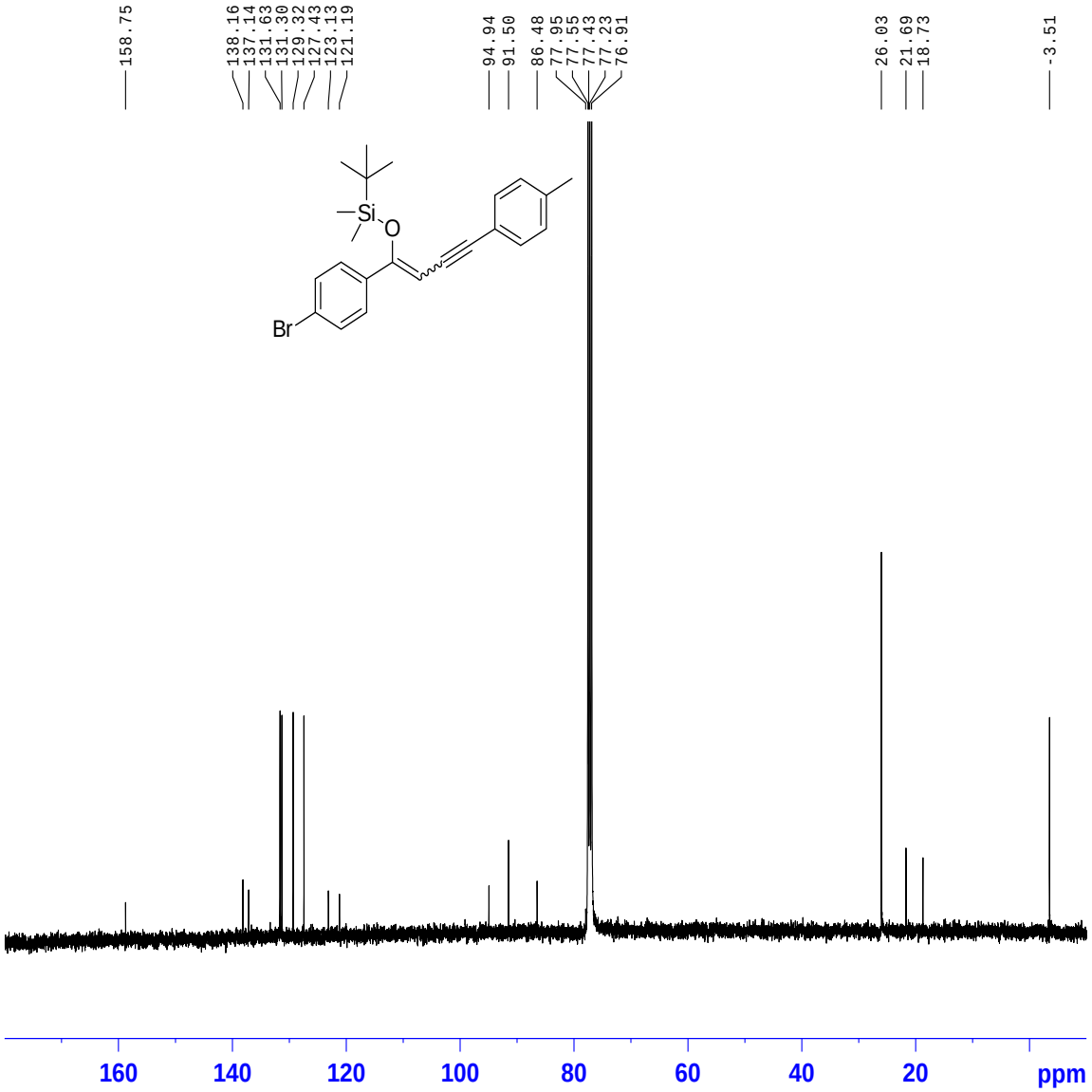



```
NAME          Yan-02252011-2
EXPNO                     10
PROCNO                    12
Date_               20110225
Time                   19.11
INSTRUM                spect
PROBHD   5 mm PABBO BB-
PULPROG                zg30
TD                    65536
SOLVENT               CDCl3
NS                       16
DS                        2
SWH                8223.685 Hz
FIDRES             0.125483 Hz
AQ                 3.9846387 sec
RG                      1030
DW                    60.800 usec
DE                     6.50 usec
TE                    299.1 K
D1                 1.00000000 sec
TD0                       1

======== CHANNEL f1 ========
NUC1                      1H
P1                     9.50 usec
PL1                   -5.00 dB
PL1W             36.45966721 W
SFO1             400.1324710 MHz
SI                     32768
SF               400.1300057 MHz
WDW                       EM
SSB                       0
LB                     0.30 Hz
GB                        0
PC                     1.00
```

Organic & Biomolecular Chemistry **2012**, *10*, http://dx.doi.org/10.1039/c1ob06693e

^{13}C NMR spectrum for **6d** ($CDCl_3$)




```
NAME      Yan-02252011-3
EXPNO                 10
PROCNO                12
Date_           20110226
Time                7.27
INSTRUM            spect
PROBHD   5 mm PABBO BB-
PULPROG           zgpg30
TD                 65536
SOLVENT            CDCl3
NS                 12800
DS                     4
SWH           24038.461 Hz
FIDRES         0.366798 Hz
AQ             1.3631988 sec
RG                   322
DW                20.800 usec
DE                 6.50 usec
TE                300.2 K
D1            2.00000000 sec
D11           0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
NUC1                 13C
P1                  8.00 usec
PL1                -4.01 dB
PL1W         95.49419403 W
SFO1        100.6228298 MHz

======== CHANNEL f2 ========
CPDPRG2           waltz16
NUC2                  1H
PCPD2              75.00 usec
PL2                 0.00 dB
PL12               13.42 dB
PL13               13.42 dB
PL2W         11.52955914 W
PL12W         0.52458113 W
PL13W         0.52458113 W
SFO2        400.1316005 MHz
SI                 32768
SF          100.6127459 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40
```

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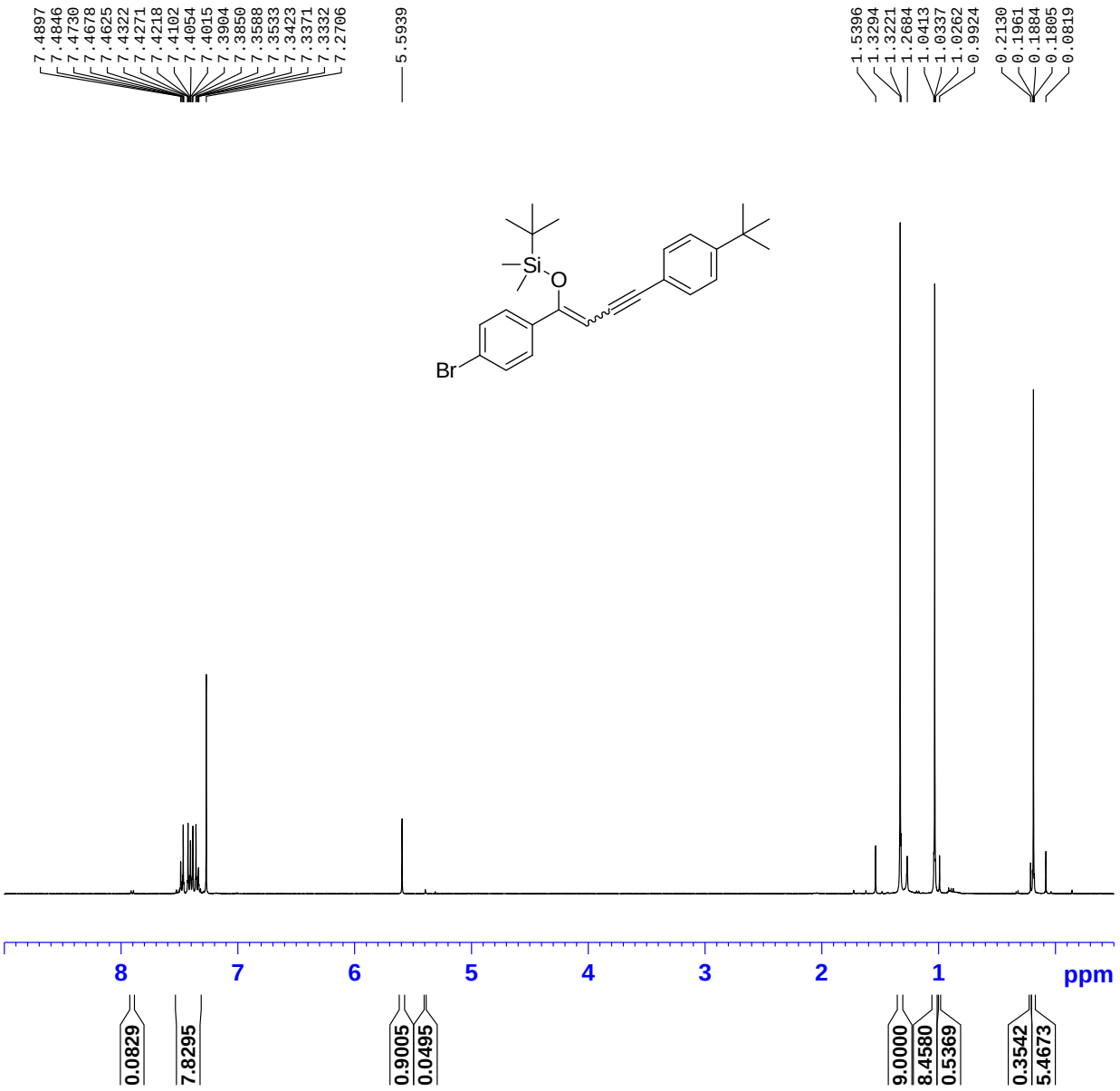
^{1}H NMR spectrum for **6e** ($CDCl_3$)

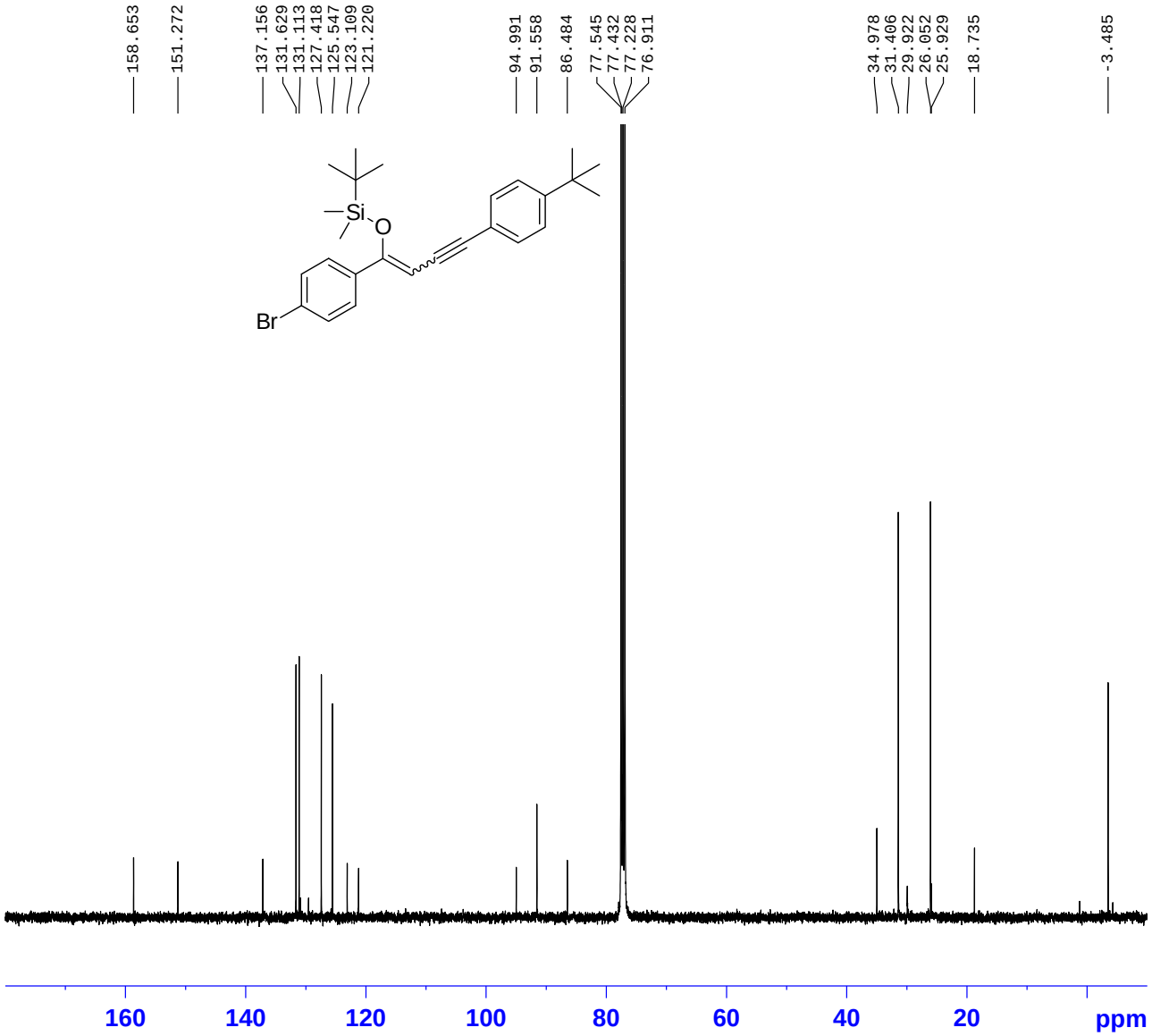



```
NAME      Yan-02262011-4
EXPNO                 10
PROCNO                12
Date_           20110226
Time               23.14
INSTRUM            spect
PROBHD   5 mm PABBO BB-
PULPROG             zg30
TD                 65536
SOLVENT            CDCl3
NS                     8
DS                     2
SWH             8223.685 Hz
FIDRES          0.125483 Hz
AQ             3.9846387 sec
RG                   645
DW                60.800 usec
DE                 6.50 usec
TE                299.3 K
D1           1.00000000 sec
TD0                    1

======== CHANNEL f1 ========
NUC1                  1H
P1                  9.50 usec
PL1                -5.00 dB
PL1W        36.45966721 W
SFO1        400.1324710 MHz
SI                 32768
SF          400.1300057 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00
```

Organic & Biomolecular Chemistry **2012**, *10*, http://dx.doi.org/10.1039/c1ob06693e

^{13}C NMR spectrum for **6e** ($CDCl_3$)




```
NAME        Yan-02262011-5
EXPNO                   10
PROCNO                  12
Date_             20110227
Time                 11.30
INSTRUM              spect
PROBHD   5 mm PABBO BB-
PULPROG             zgpg30
TD                   65536
SOLVENT              CDCl3
NS                   12800
DS                       4
SWH              24038.461 Hz
FIDRES            0.366798 Hz
AQ                1.3631988 sec
RG                     322
DW                  20.800 usec
DE                   6.50 usec
TE                  301.0 K
D1               2.00000000 sec
D11              0.03000000 sec
TD0                      1

======== CHANNEL f1 ========
NUC1                   13C
P1                    8.00 usec
PL1                  -4.01 dB
PL1W           95.49419403 W
SFO1          100.6228298 MHz

======== CHANNEL f2 ========
CPDPRG2            waltz16
NUC2                   1H
PCPD2                75.00 usec
PL2                   0.00 dB
PL12                 13.42 dB
PL13                 13.42 dB
PL2W           11.52955914 W
PL12W           0.52458113 W
PL13W           0.52458113 W
SFO2          400.1316005 MHz
SI                   32768
SF            100.6127461 MHz
WDW                    EM
SSB                     0
LB                   1.00 Hz
GB                      0
PC                   1.40
```

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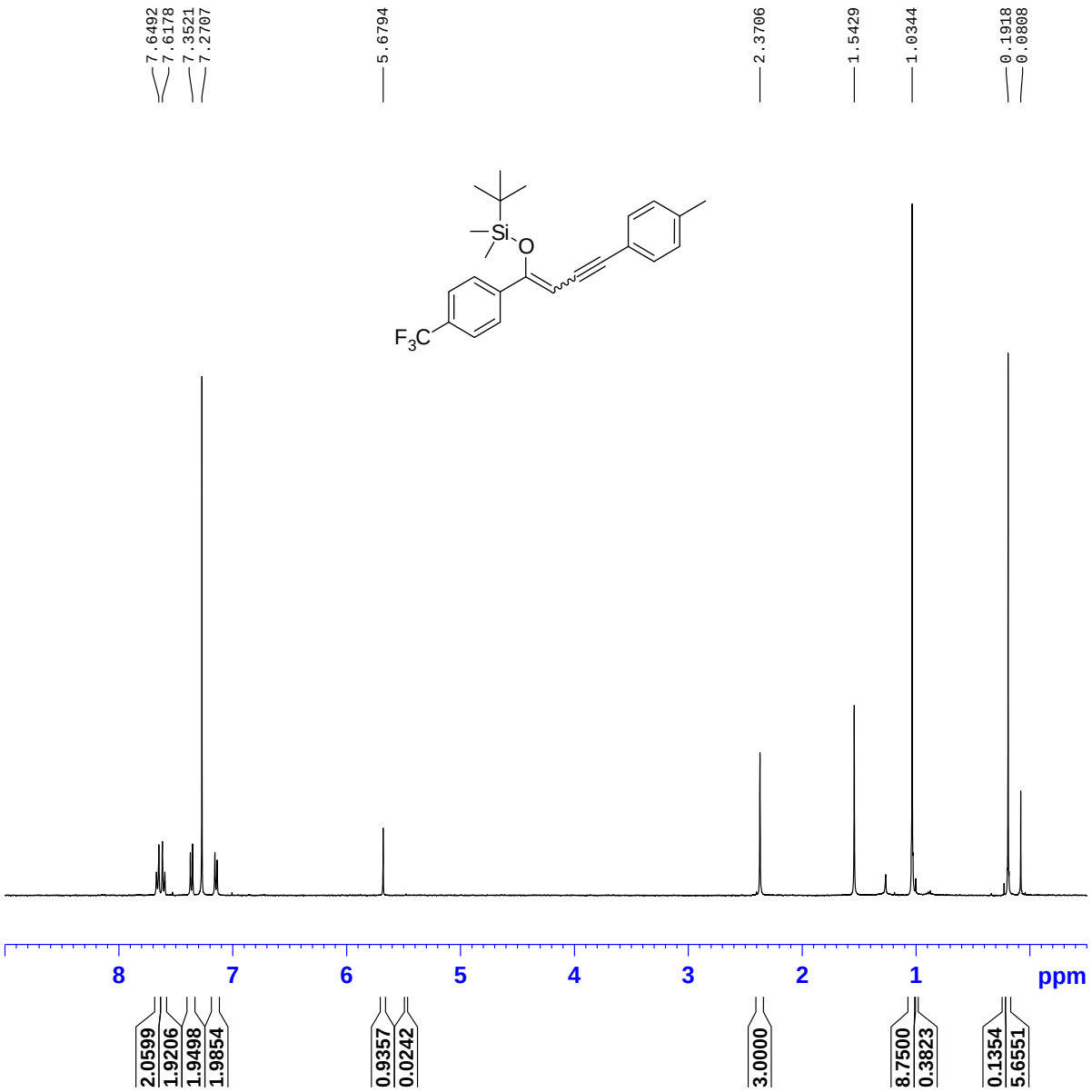
^{1}H NMR spectrum for **6f** ($CDCl_3$)




```
NAME      Yan-03022011-2
EXPNO               10
PROCNO              12
Date_         20110302
Time             14.23
INSTRUM          spect
PROBHD   5 mm PABBO BB-
PULPROG          zg30
TD              65536
SOLVENT          CDCl3
NS                  16
DS                   2
SWH           8223.685 Hz
FIDRES        0.125483 Hz
AQ           3.9846387 sec
RG                 645
DW              60.800 usec
DE               6.50 usec
TE              299.2 K
D1          1.00000000 sec
TD0                  1

======== CHANNEL f1 ========
NUC1                1H
P1               9.50 usec
PL1             -5.00 dB
PL1W       36.45966721 W
SFO1       400.1324710 MHz
SI               32768
SF         400.1300057 MHz
WDW                 EM
SSB                  0
LB              0.30 Hz
GB                   0
PC              1.00
```

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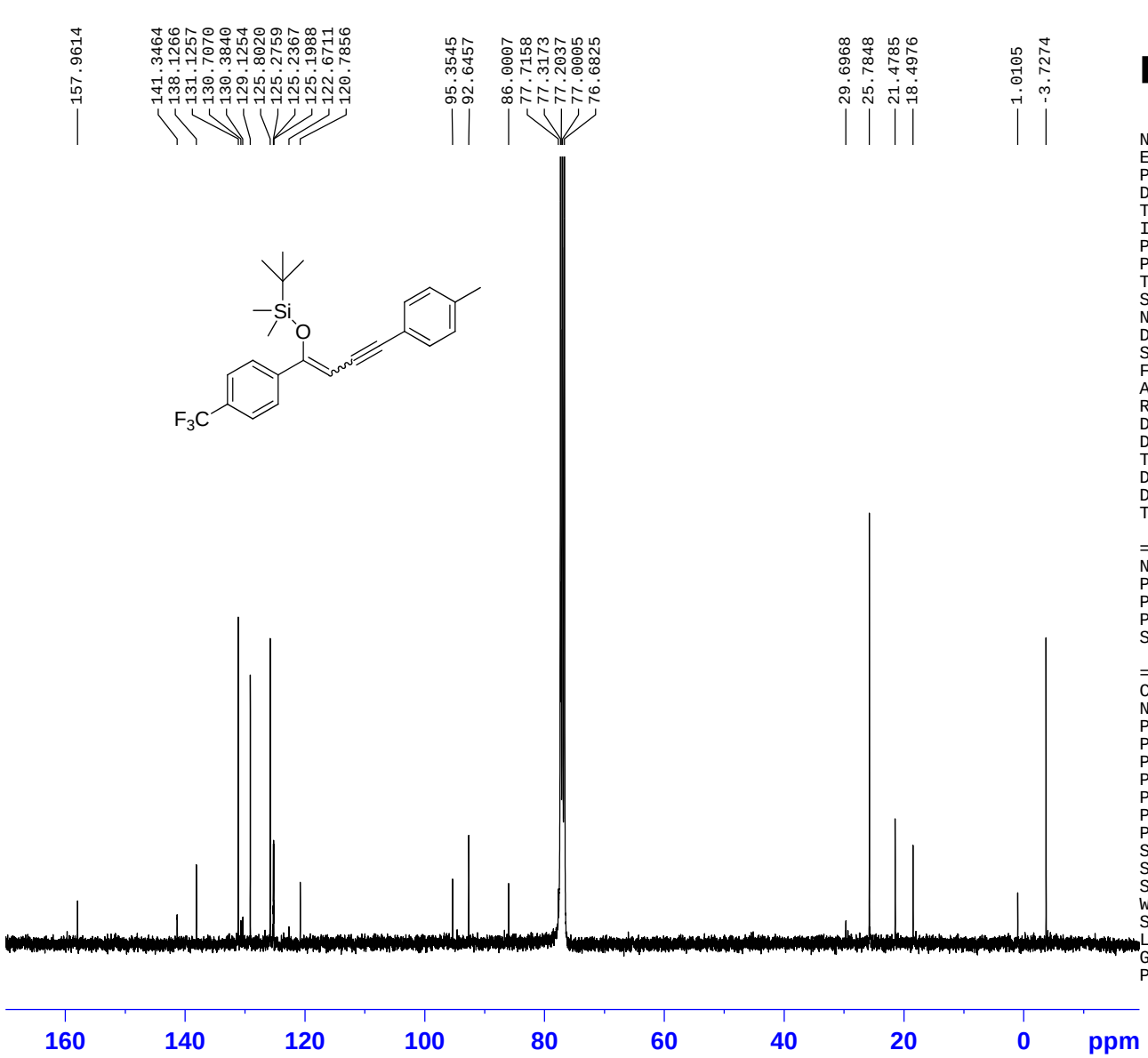
^{13}C NMR spectrum for **6f** ($CDCl_3$)




```
NAME        Yan-03022011-3
EXPNO                   10
PROCNO                  12
Date_             20110303
Time                  9.32
INSTRUM              spect
PROBHD    5 mm PABBO BB-
PULPROG             zgpg30
TD                   65536
SOLVENT              CDCl3
NS                   36600
DS                       4
SWH             24038.461 Hz
FIDRES           0.366798 Hz
AQ               1.3631988 sec
RG                     228
DW                  20.800 usec
DE                   6.50 usec
TE                  300.9 K
D1              2.00000000 sec
D11             0.03000000 sec
TD0                      1

======== CHANNEL f1 ========
NUC1                   13C
P1                    8.00 usec
PL1                  -4.01 dB
PL1W          95.49419403 W
SFO1         100.6228298 MHz

======== CHANNEL f2 ========
CPDPRG2           waltz16
NUC2                   1H
PCPD2                75.00 usec
PL2                   0.00 dB
PL12                 13.42 dB
PL13                 13.42 dB
PL2W          11.52955914 W
PL12W          0.52458113 W
PL13W          0.52458113 W
SFO2         400.1316005 MHz
SI                   32768
SF           100.6127690 MHz
WDW                     EM
SSB                      0
LB                    1.00 Hz
GB                       0
PC                    1.40
```

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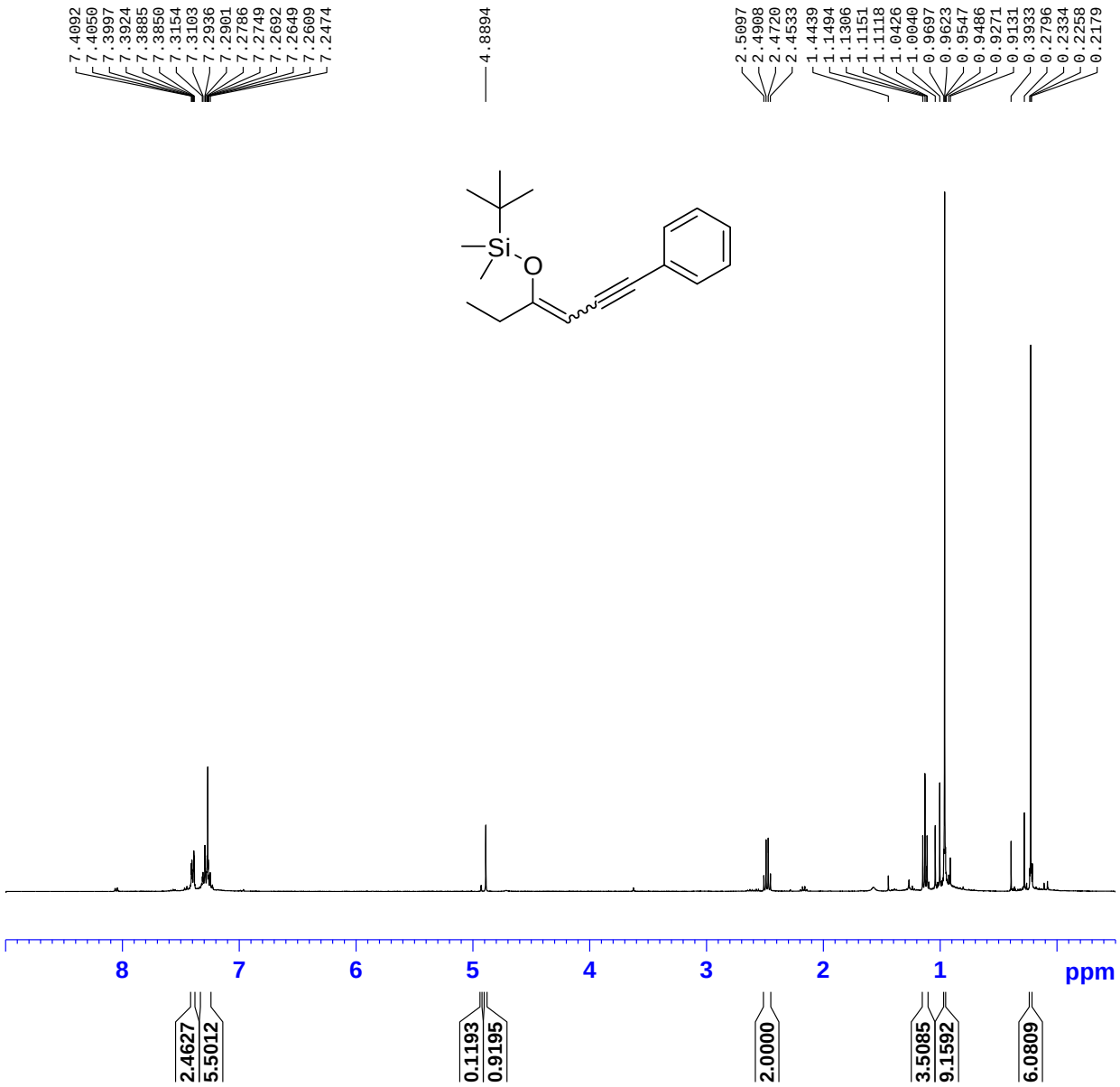
^{1}H NMR spectrum for **6g** ($CDCl_3$)




```
NAME      Yan-04262011-3
EXPNO                 10
PROCNO                 1
Date_           20110426
Time               20.58
INSTRUM            spect
PROBHD   5 mm PABBO BB-
PULPROG             zg30
TD                 65536
SOLVENT            CDCl3
NS                    16
DS                     2
SWH             8223.685 Hz
FIDRES          0.125483 Hz
AQ              3.9846387 sec
RG                   287
DW                60.800 usec
DE                 6.50 usec
TE                299.4 K
D1           1.00000000 sec
TD0                    1

======== CHANNEL f1 ========
NUC1                  1H
P1                  9.50 usec
PL1                -5.00 dB
PL1W         36.45966721 W
SFO1        400.1324710 MHz
SI                 32768
SF          400.1300061 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00
```

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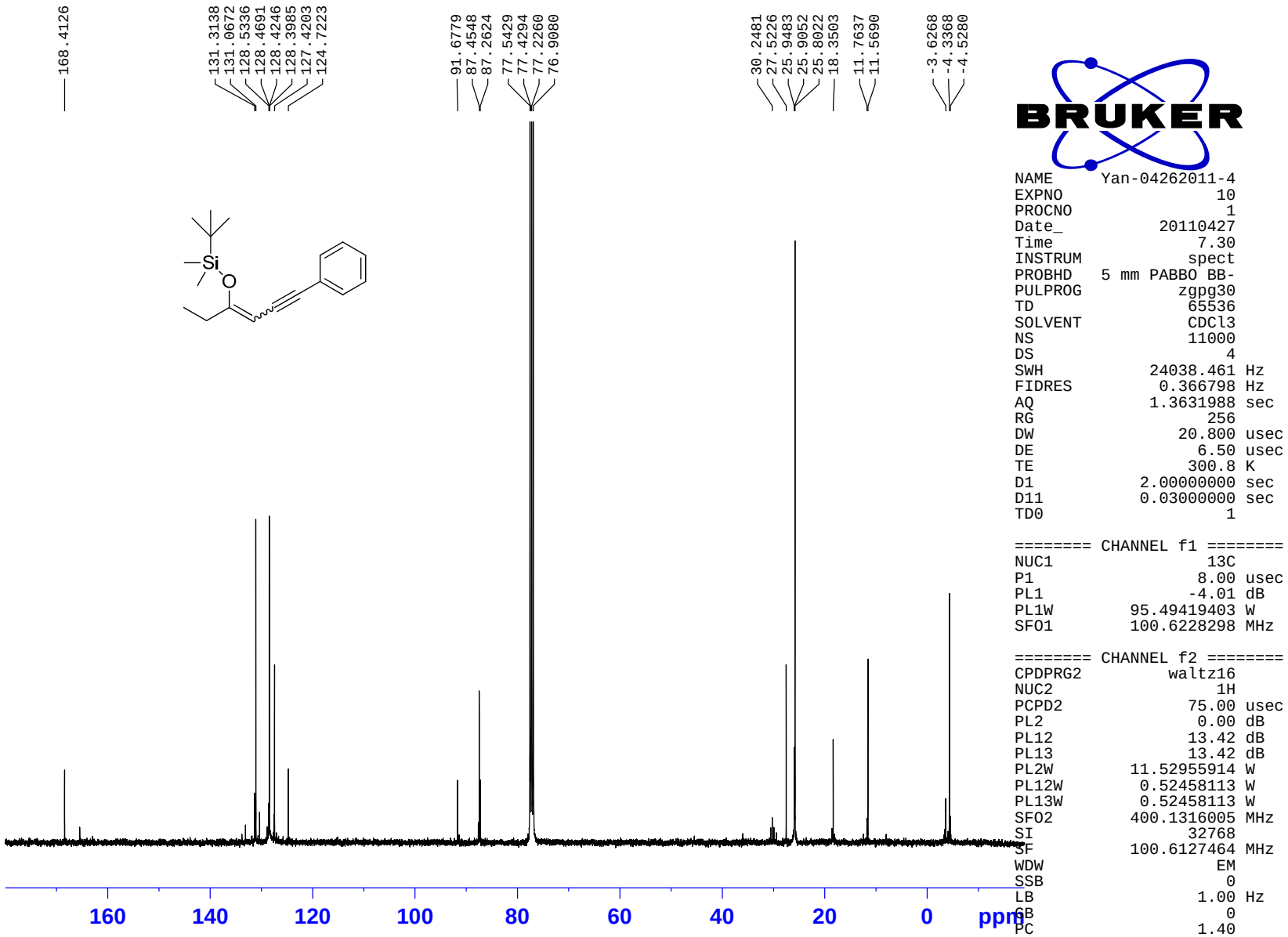
^{13}C NMR spectrum for **6g** ($CDCl_3$)




```
NAME          Yan-04262011-4
EXPNO                     10
PROCNO                     1
Date_               20110427
Time                    7.30
INSTRUM                spect
PROBHD    5 mm PABBO BB-
PULPROG                zgpg30
TD                      65536
SOLVENT                 CDCl3
NS                      11000
DS                          4
SWH                24038.461 Hz
FIDRES              0.366798 Hz
AQ                  1.3631988 sec
RG                        256
DW                     20.800 usec
DE                      6.50 usec
TE                     300.8 K
D1                 2.00000000 sec
D11                0.03000000 sec
TD0                        1

======== CHANNEL f1 ========
NUC1                      13C
P1                      8.00 usec
PL1                    -4.01 dB
PL1W              95.49419403 W
SFO1             100.6228298 MHz

======== CHANNEL f2 ========
CPDPRG2               waltz16
NUC2                      1H
PCPD2                  75.00 usec
PL2                     0.00 dB
PL12                   13.42 dB
PL13                   13.42 dB
PL2W              11.52955914 W
PL12W              0.52458113 W
PL13W              0.52458113 W
SFO2             400.1316005 MHz
SI                     32768
SF               100.6127464 MHz
WDW                       EM
SSB                        0
LB                      1.00 Hz
GB                         0
PC                      1.40
```

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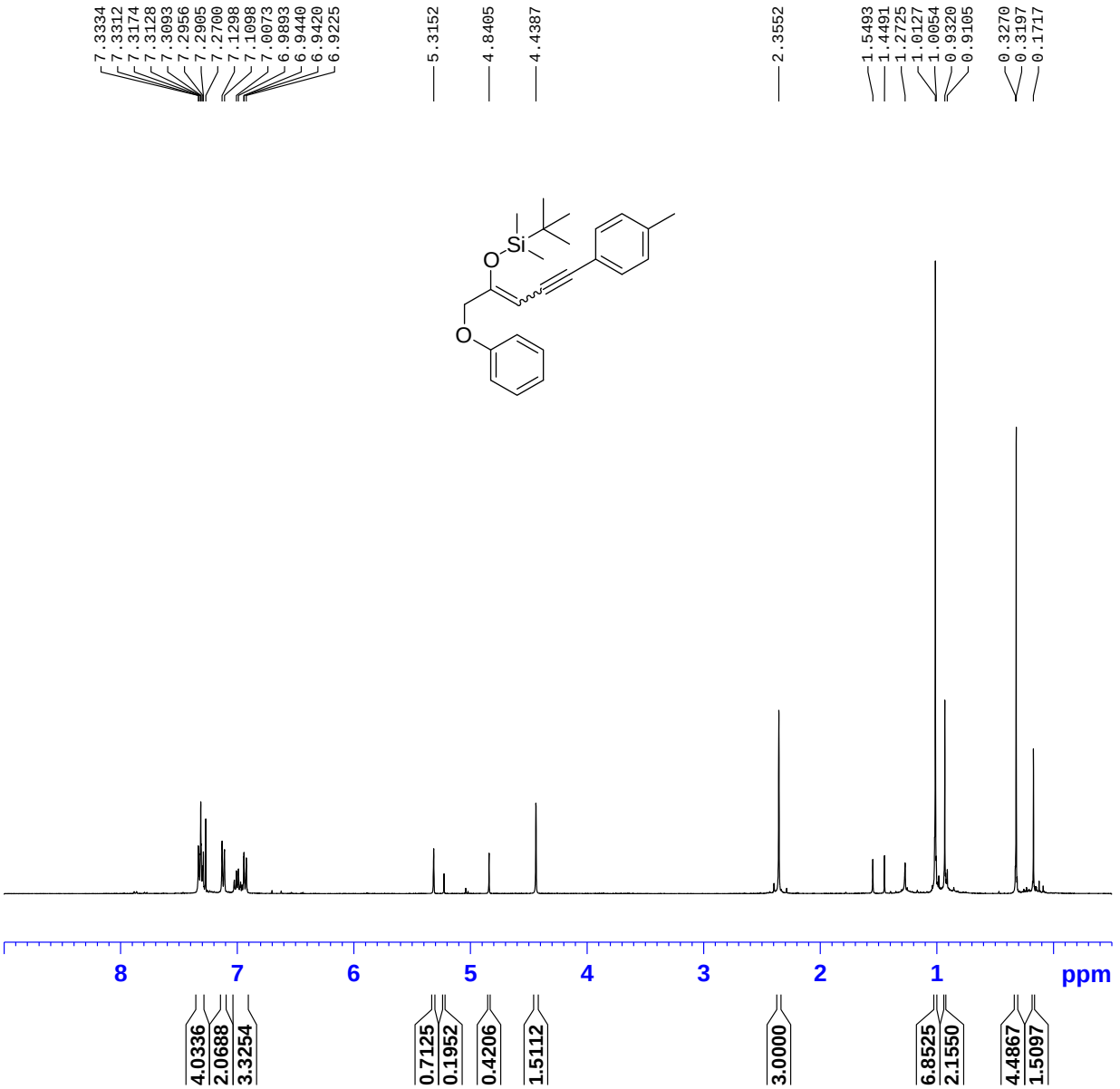
^{1}H NMR spectrum for **6h** ($CDCl_3$)




```
NAME      Yan-04082011-1
EXPNO                 10
PROCNO                 1
Date_           20110408
Time                1.50
INSTRUM            spect
PROBHD   5 mm PABBO BB-
PULPROG             zg30
TD                 65536
SOLVENT            CDCl3
NS                     8
DS                     2
SWH             8223.685 Hz
FIDRES          0.125483 Hz
AQ             3.9846387 sec
RG                   181
DW                60.800 usec
DE                 6.50 usec
TE                298.2 K
D1           1.00000000 sec
TD0                    1

======== CHANNEL f1 ========
NUC1                  1H
P1                  9.50 usec
PL1                -5.00 dB
PL1W        36.45966721 W
SFO1        400.1324710 MHz
SI                 32768
SF          400.1300060 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00
```

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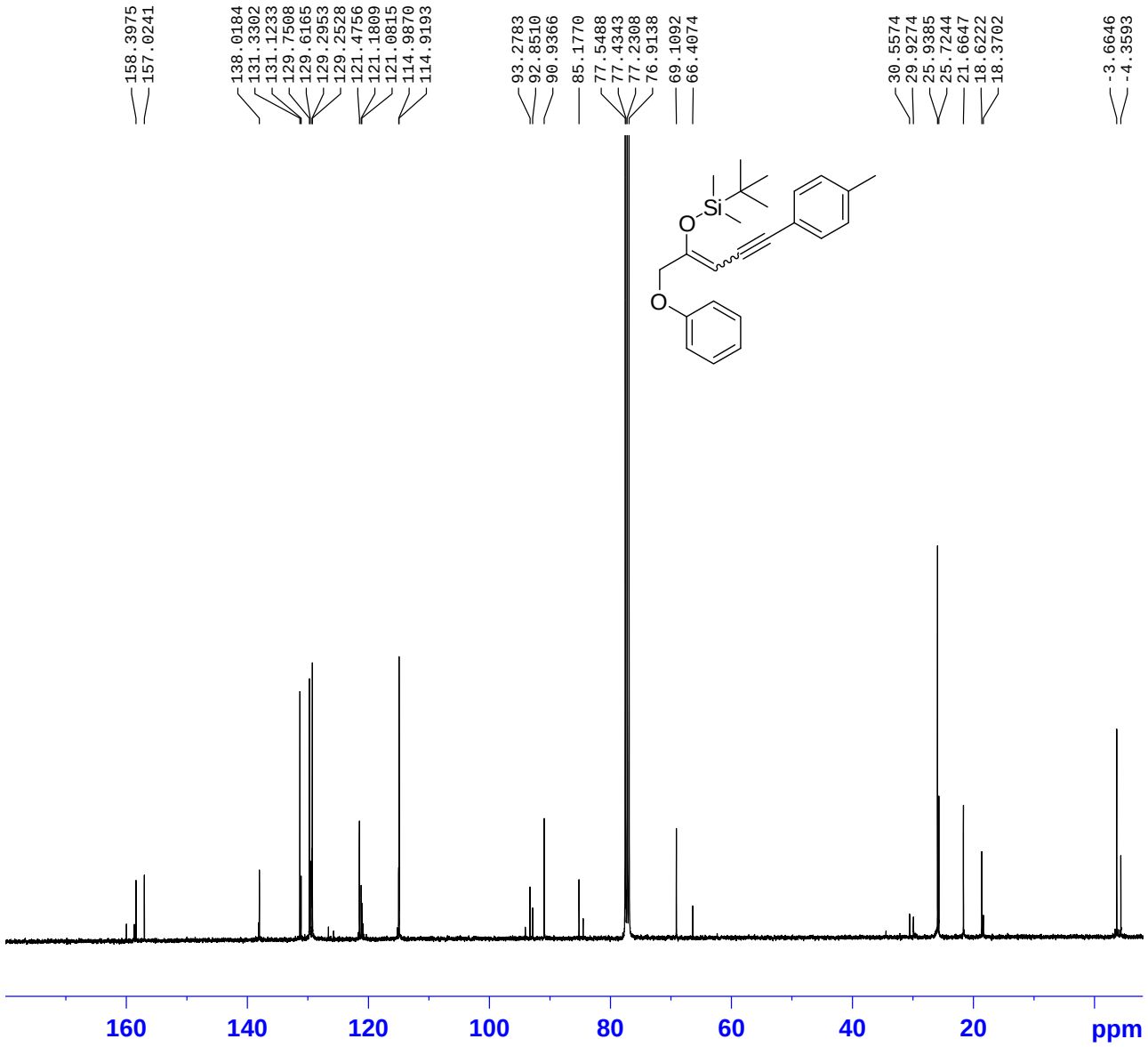
^{13}C NMR spectrum for **6h** ($CDCl_3$)



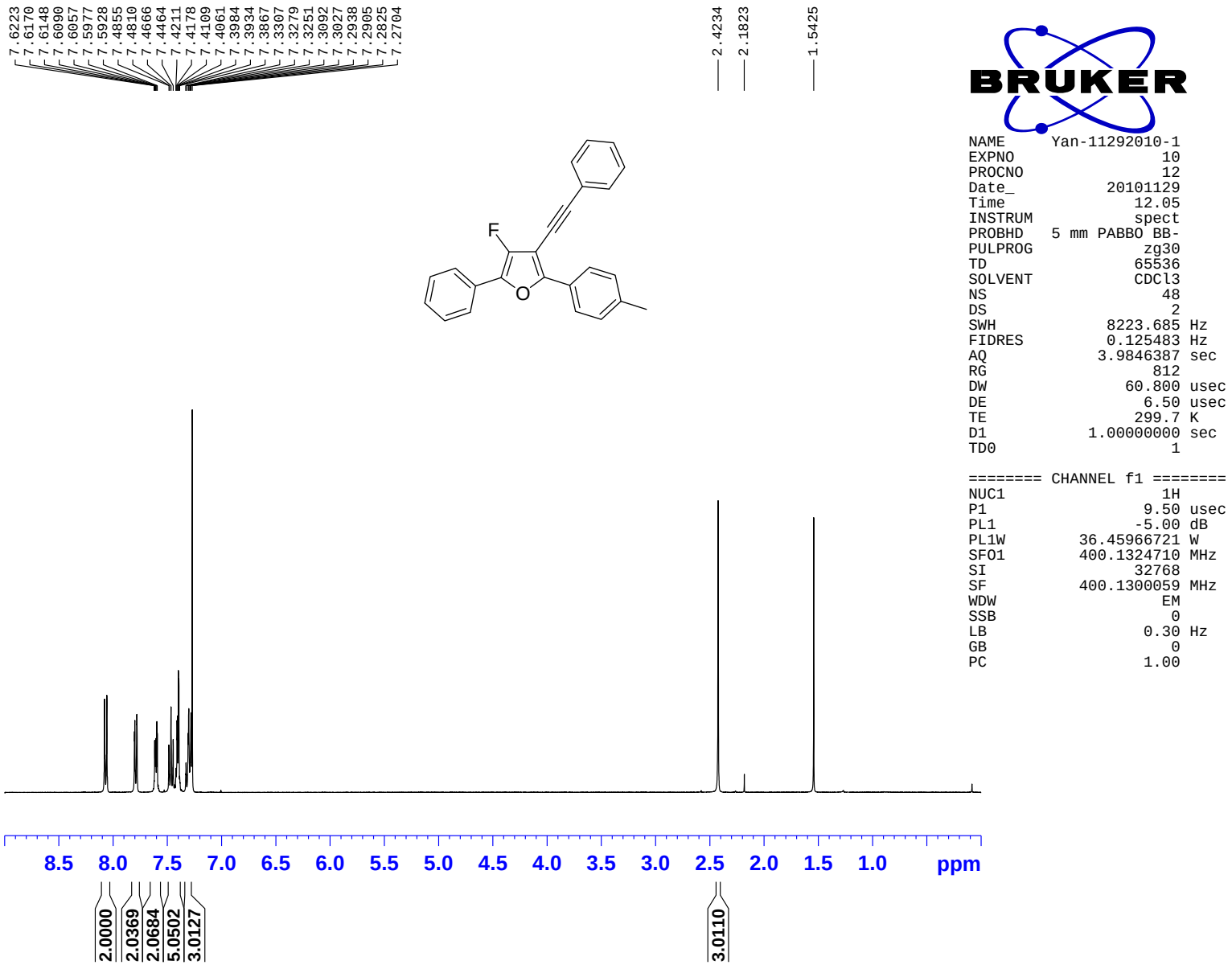

```
NAME        Yan-04082011-2
EXPNO                   10
PROCNO                   1
Date_             20110408
Time                 9.35
INSTRUM             spect
PROBHD    5 mm PABBO BB-
PULPROG             zgpg30
TD                   65536
SOLVENT              CDCl3
NS                    8000
DS                       4
SWH            24038.461 Hz
FIDRES          0.366798 Hz
AQ             1.3631988 sec
RG                     256
DW                20.800 usec
DE                 6.50 usec
TE                 300.5 K
D1            2.00000000 sec
D11           0.03000000 sec
TD0                      1

======== CHANNEL f1 ========
NUC1                   13C
P1                  8.00 usec
PL1                -4.01 dB
PL1W         95.49419403 W
SFO1        100.6228298 MHz

======== CHANNEL f2 ========
CPDPRG2           waltz16
NUC2                   1H
PCPD2               75.00 usec
PL2                  0.00 dB
PL12                13.42 dB
PL13                13.42 dB
PL2W         11.52955914 W
PL12W         0.52458113 W
PL13W         0.52458113 W
SFO2        400.1316005 MHz
SI                  32768
SF          100.6127468 MHz
WDW                    EM
SSB                     0
LB                   1.00 Hz
GB                      0
PC                   1.40
```

Organic & Biomolecular Chemistry **2012**, *10*, http://dx.doi.org/10.1039/c1ob06693e

^{1}H NMR spectrum for **10** ($CDCl_3$)




```
NAME        Yan-11292010-1
EXPNO               10
PROCNO              12
Date_         20101129
Time             12.05
INSTRUM          spect
PROBHD   5 mm PABBO BB-
PULPROG          zg30
TD              65536
SOLVENT         CDCl3
NS                 48
DS                  2
SWH          8223.685 Hz
FIDRES       0.125483 Hz
AQ           3.9846387 sec
RG                812
DW             60.800 usec
DE              6.50 usec
TE             299.7 K
D1          1.00000000 sec
TD0                 1

======== CHANNEL f1 ========
NUC1               1H
P1               9.50 usec
PL1             -5.00 dB
PL1W       36.45966721 W
SFO1       400.1324710 MHz
SI              32768
SF         400.1300059 MHz
WDW                EM
SSB                 0
LB              0.30 Hz
GB                  0
PC              1.00
```

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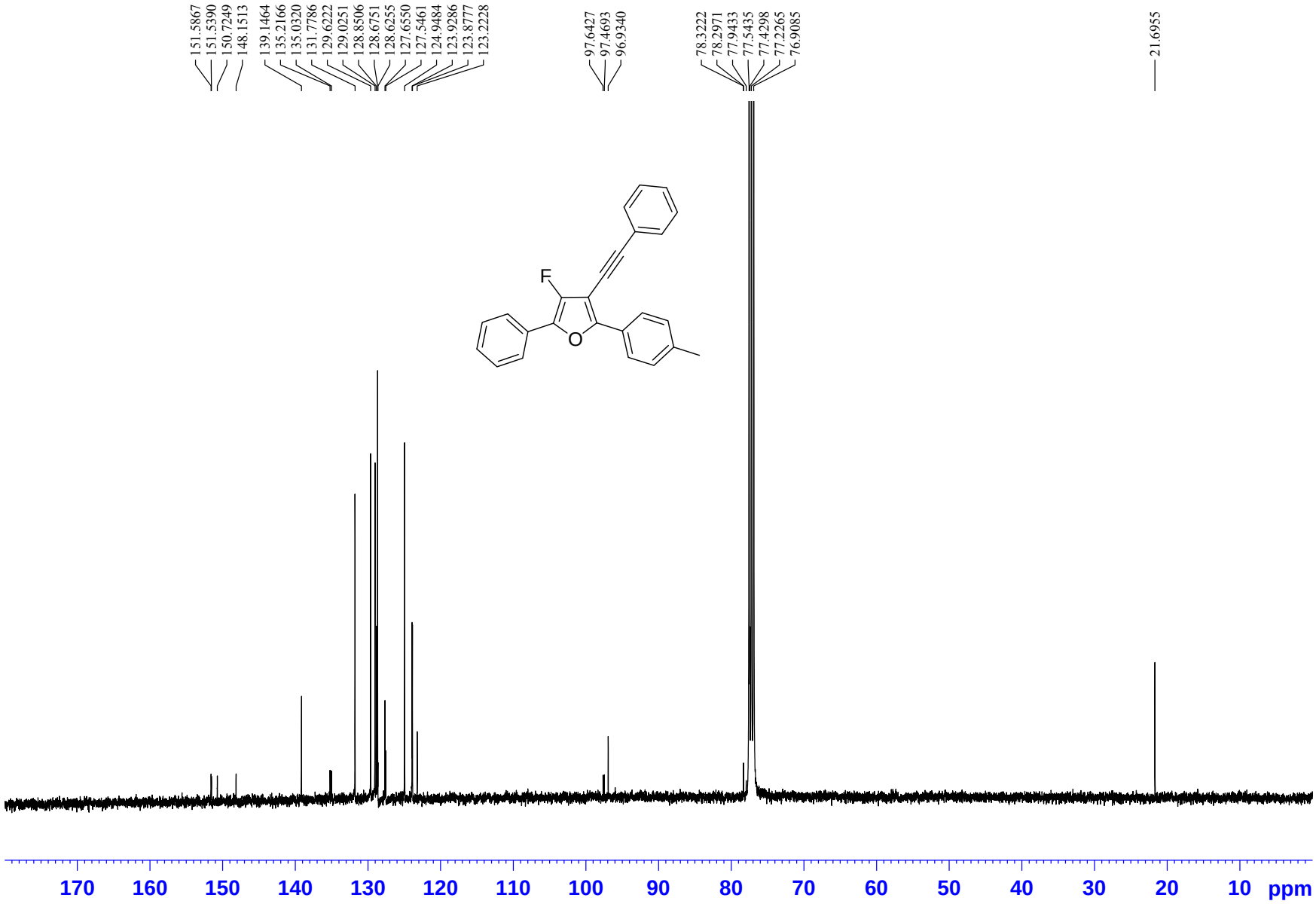
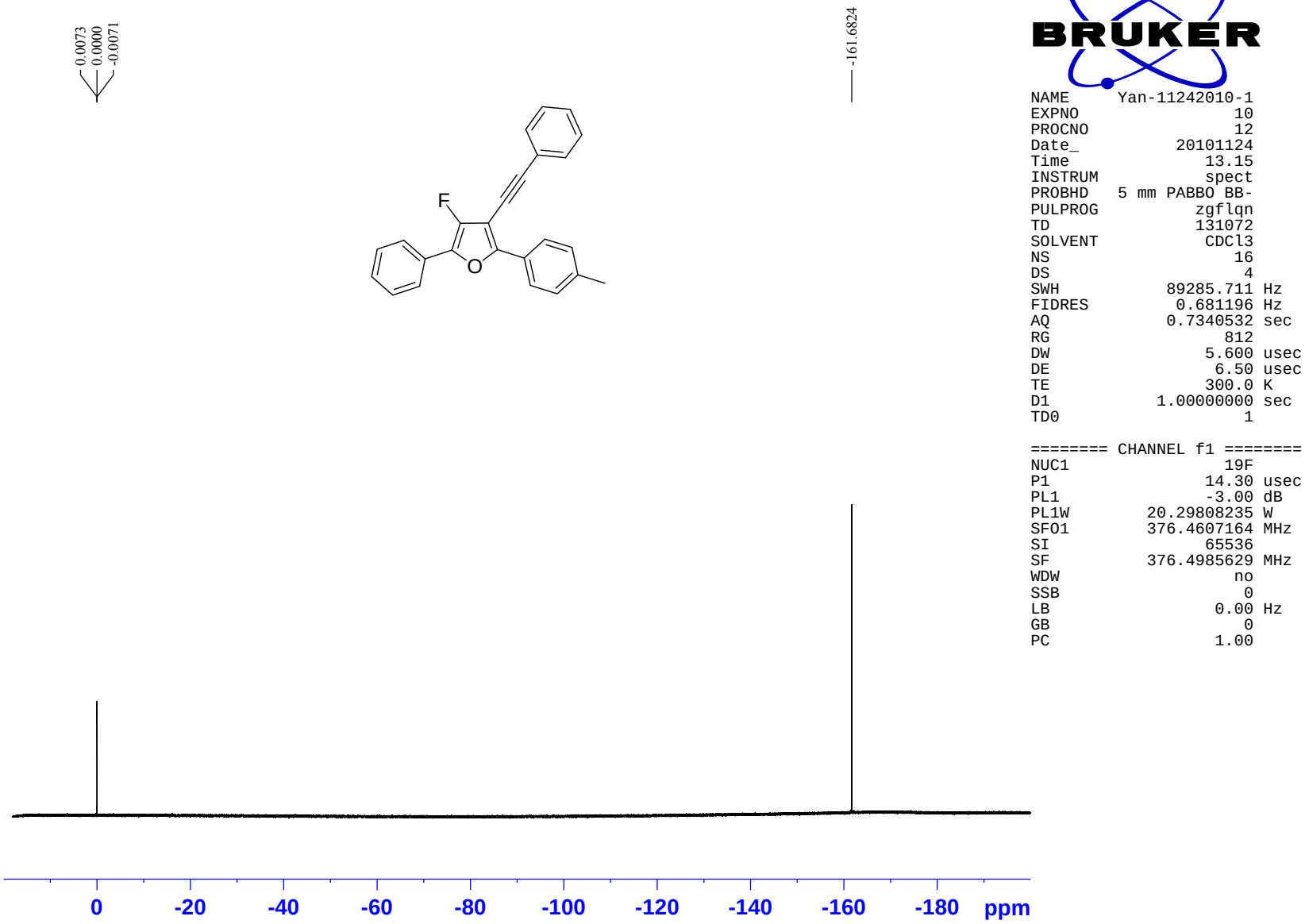
^{13}C NMR spectrum for **10** ($CDCl_3$)



Organic & Biomolecular Chemistry **2012**, *10*, http://dx.doi.org/10.1039/c1ob06693e

^{19}F NMR spectrum for **10** ($CDCl_3$)

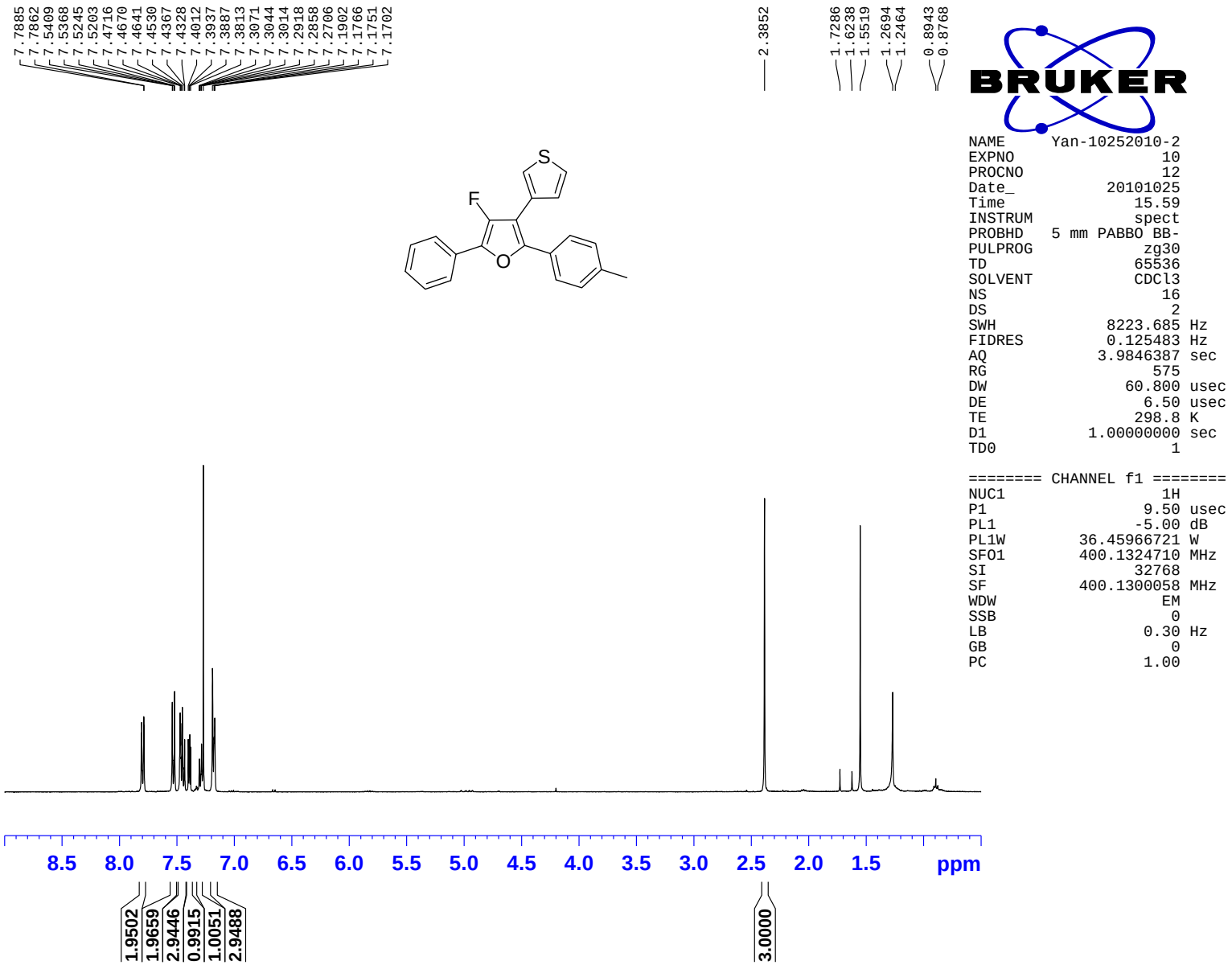



```
NAME      Yan-11242010-1
EXPNO                 10
PROCNO                12
Date_           20101124
Time               13.15
INSTRUM            spect
PROBHD   5 mm PABBO BB-
PULPROG          zgflqn
TD                131072
SOLVENT             CDCl3
NS                    16
DS                     4
SWH            89285.711 Hz
FIDRES          0.681196 Hz
AQ             0.7340532 sec
RG                   812
DW                 5.600 usec
DE                 6.50 usec
TE                 300.0 K
D1           1.00000000 sec
TD0                    1

======== CHANNEL f1 ========
NUC1                 19F
P1                 14.30 usec
PL1                -3.00 dB
PL1W         20.29808235 W
SFO1         376.4607164 MHz
SI                 65536
SF           376.4985629 MHz
WDW                  no
SSB                   0
LB                 0.00 Hz
GB                    0
PC                 1.00
```

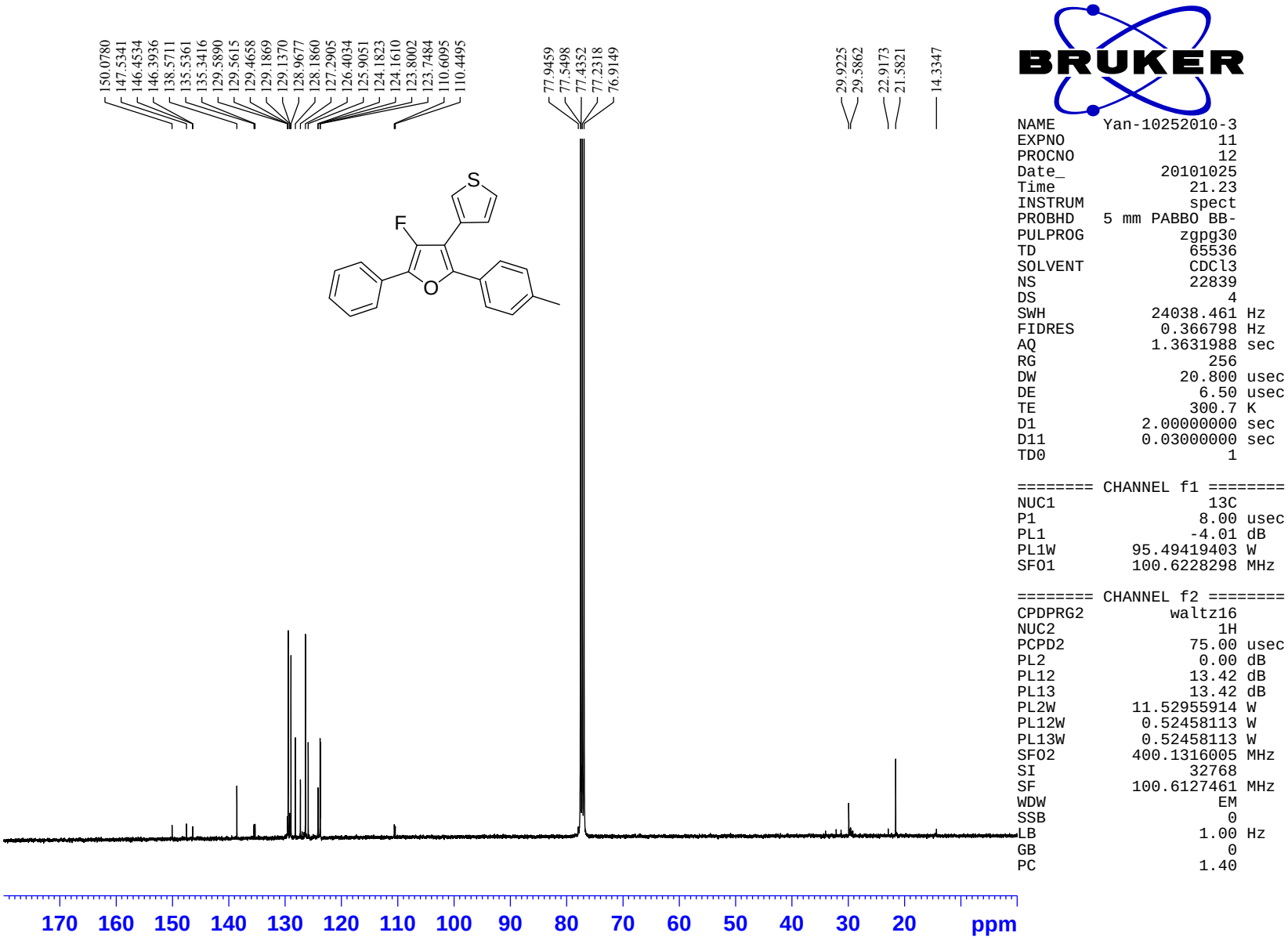
Organic & Biomolecular Chemistry **2012**, *10*, http://dx.doi.org/10.1039/c1ob06693e

^{1}H NMR spectrum for **11** ($CDCl_3$)



Organic & Biomolecular Chemistry **2012**, *10*, http://dx.doi.org/10.1039/c1ob06693e

^{13}C NMR spectrum for **11** ($CDCl_3$)



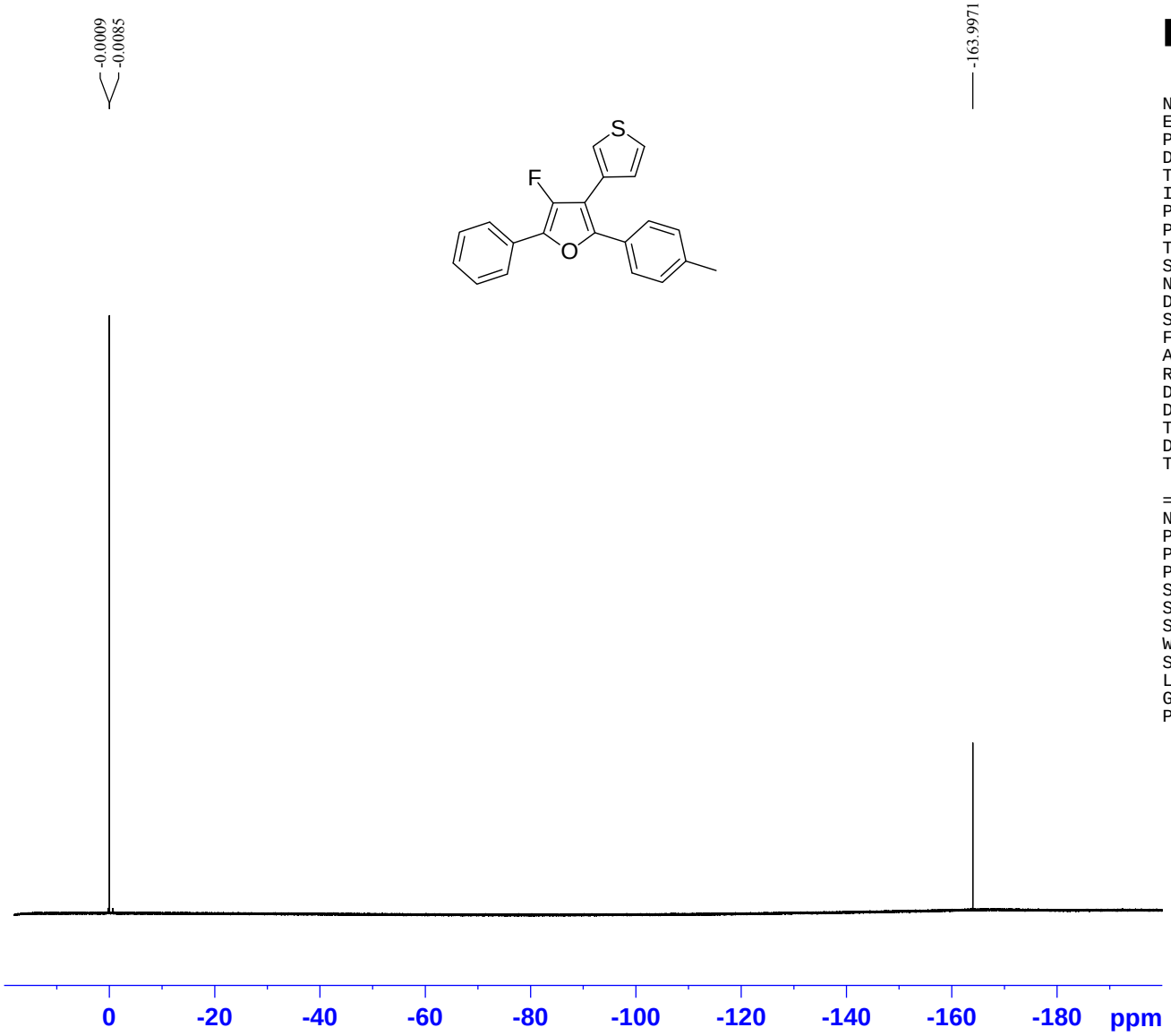

```
NAME        Yan-10252010-3
EXPNO                   11
PROCNO                  12
Date_             20101025
Time                 21.23
INSTRUM              spect
PROBHD   5 mm PABBO BB-
PULPROG            zgpg30
TD                  65536
SOLVENT             CDCl3
NS                  22839
DS                      4
SWH             24038.461 Hz
FIDRES           0.366798 Hz
AQ               1.3631988 sec
RG                    256
DW                  20.800 usec
DE                   6.50 usec
TE                  300.7 K
D1              2.00000000 sec
D11             0.03000000 sec
TD0                     1

======== CHANNEL f1 ========
NUC1                  13C
P1                   8.00 usec
PL1                 -4.01 dB
PL1W          95.49419403 W
SFO1          100.6228298 MHz

======== CHANNEL f2 ========
CPDPRG2           waltz16
NUC2                  1H
PCPD2                75.00 usec
PL2                   0.00 dB
PL12                 13.42 dB
PL13                 13.42 dB
PL2W          11.52955914 W
PL12W          0.52458113 W
PL13W          0.52458113 W
SFO2          400.1316005 MHz
SI                 32768
SF            100.6127461 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40
```

Organic & Biomolecular Chemistry **2012**, *10*, http://dx.doi.org/10.1039/c1ob06693e

^{19}F NMR spectrum for **11** ($CDCl_3$)




```
NAME      Yan-10232010-2
EXPNO                 10
PROCNO                12
Date_           20101023
Time               18.51
INSTRUM            spect
PROBHD   5 mm PABBO BB-
PULPROG          zgflqn
TD                131072
SOLVENT             CDCl3
NS                    16
DS                     4
SWH            89285.711 Hz
FIDRES          0.681196 Hz
AQ             0.7340532 sec
RG                   812
DW                 5.600 usec
DE                 6.50 usec
TE                 299.5 K
D1           1.00000000 sec
TD0                    1

======== CHANNEL f1 ========
NUC1                 19F
P1                 14.30 usec
PL1                -3.00 dB
PL1W        20.29808235 W
SFO1        376.4607164 MHz
SI                 65536
SF          376.4985625 MHz
WDW                  EM
SSB                   0
LB                 0.30 Hz
GB                    0
PC                 1.00
```

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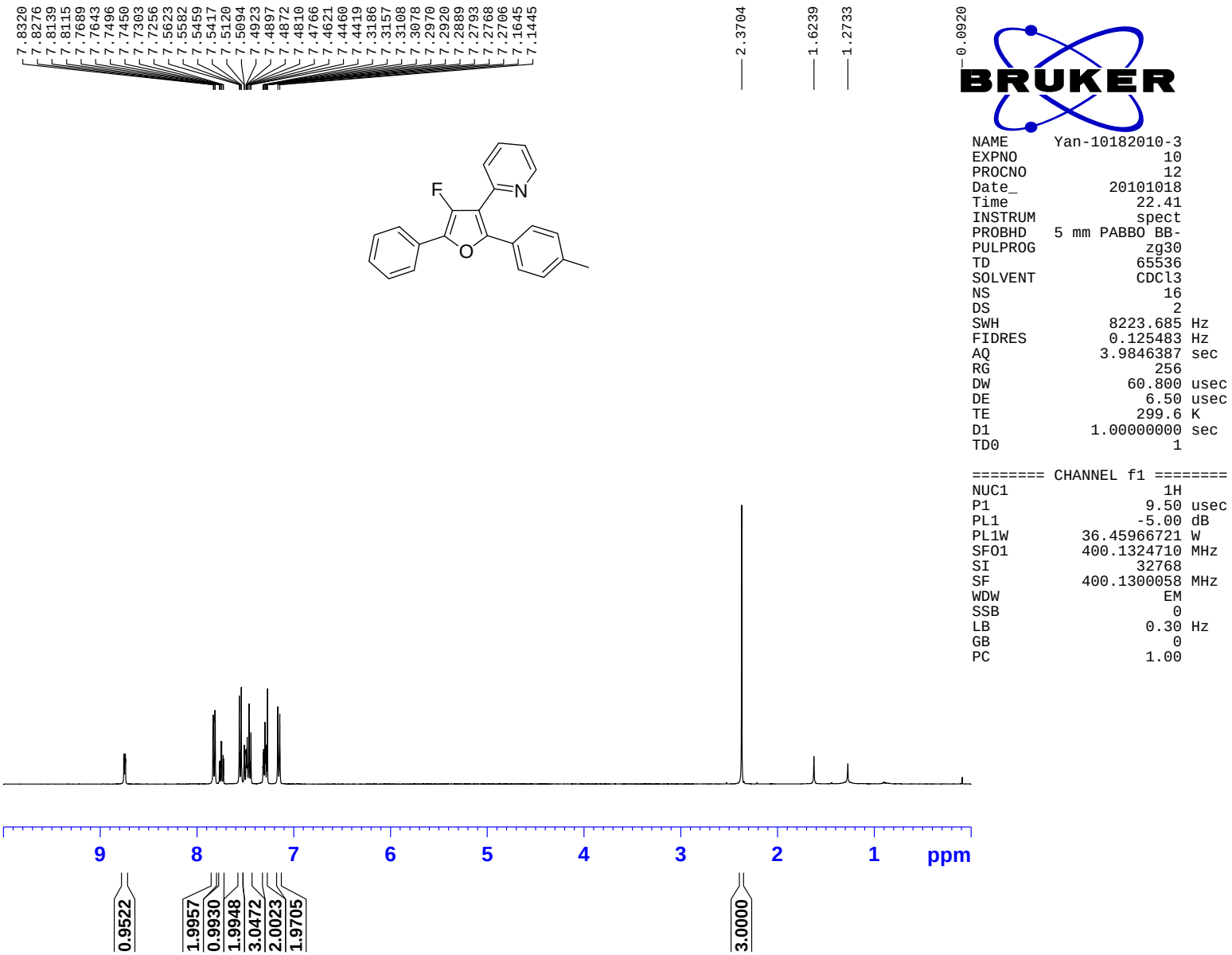
^{1}H NMR spectrum for **12** ($CDCl_3$)



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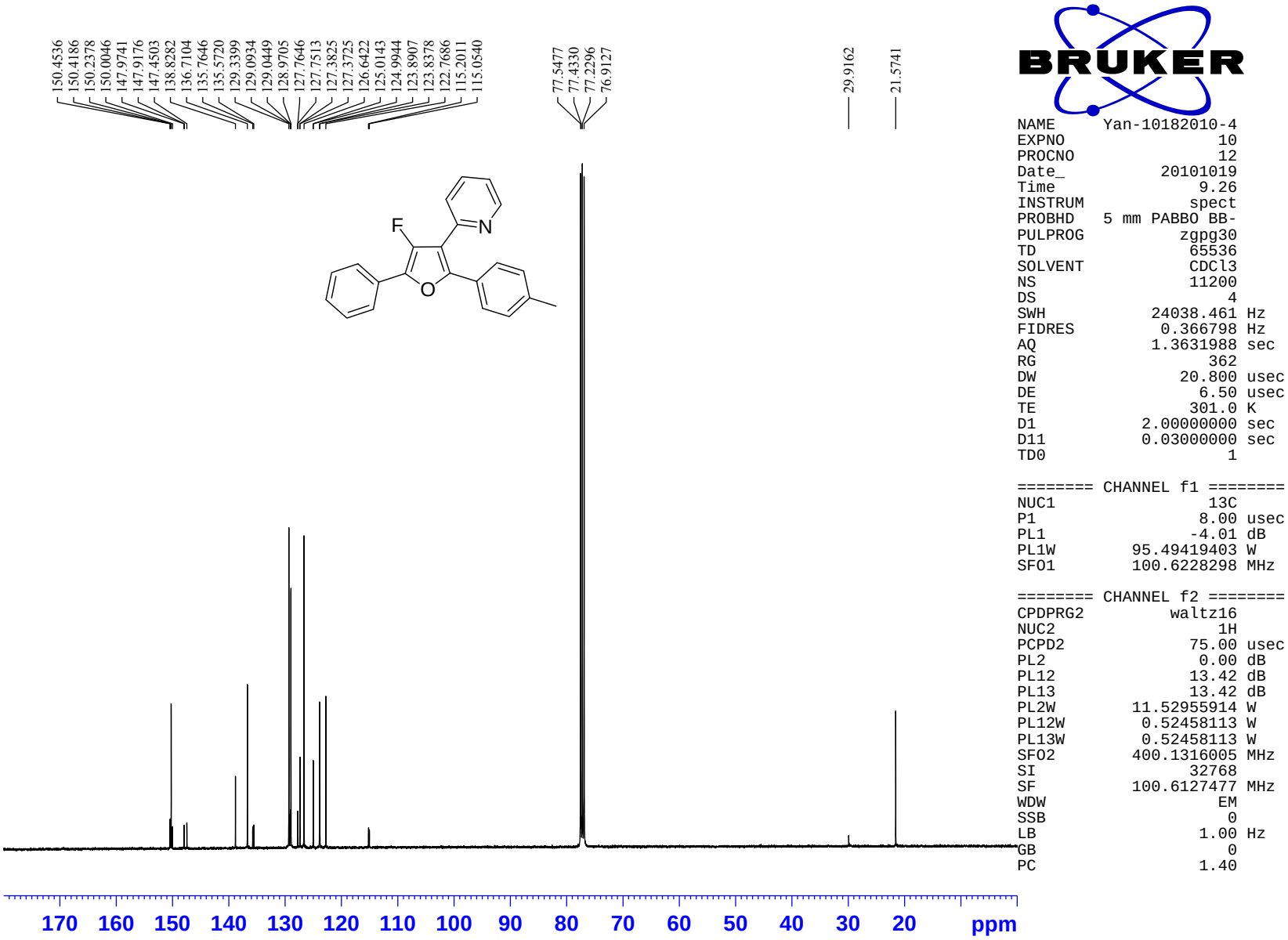
^{13}C NMR spectrum for **12** ($CDCl_3$)




```
NAME          Yan-10182010-4
EXPNO                     10
PROCNO                    12
Date_               20101019
Time                    9.26
INSTRUM                spect
PROBHD   5 mm PABBO BB-
PULPROG              zgpg30
TD                    65536
SOLVENT               CDCl3
NS                    11200
DS                        4
SWH               24038.461 Hz
FIDRES             0.366798 Hz
AQ                1.3631988 sec
RG                      362
DW                   20.800 usec
DE                    6.50 usec
TE                   301.0 K
D1                2.00000000 sec
D11               0.03000000 sec
TD0                       1

======== CHANNEL f1 ========
NUC1                    13C
P1                    8.00 usec
PL1                  -4.01 dB
PL1W            95.49419403 W
SFO1           100.6228298 MHz

======== CHANNEL f2 ========
CPDPRG2              waltz16
NUC2                    1H
PCPD2                75.00 usec
PL2                   0.00 dB
PL12                 13.42 dB
PL13                 13.42 dB
PL2W            11.52955914 W
PL12W            0.52458113 W
PL13W            0.52458113 W
SFO2           400.1316005 MHz
SI                    32768
SF             100.6127477 MHz
WDW                     EM
SSB                      0
LB                    1.00 Hz
GB                       0
PC                    1.40
```

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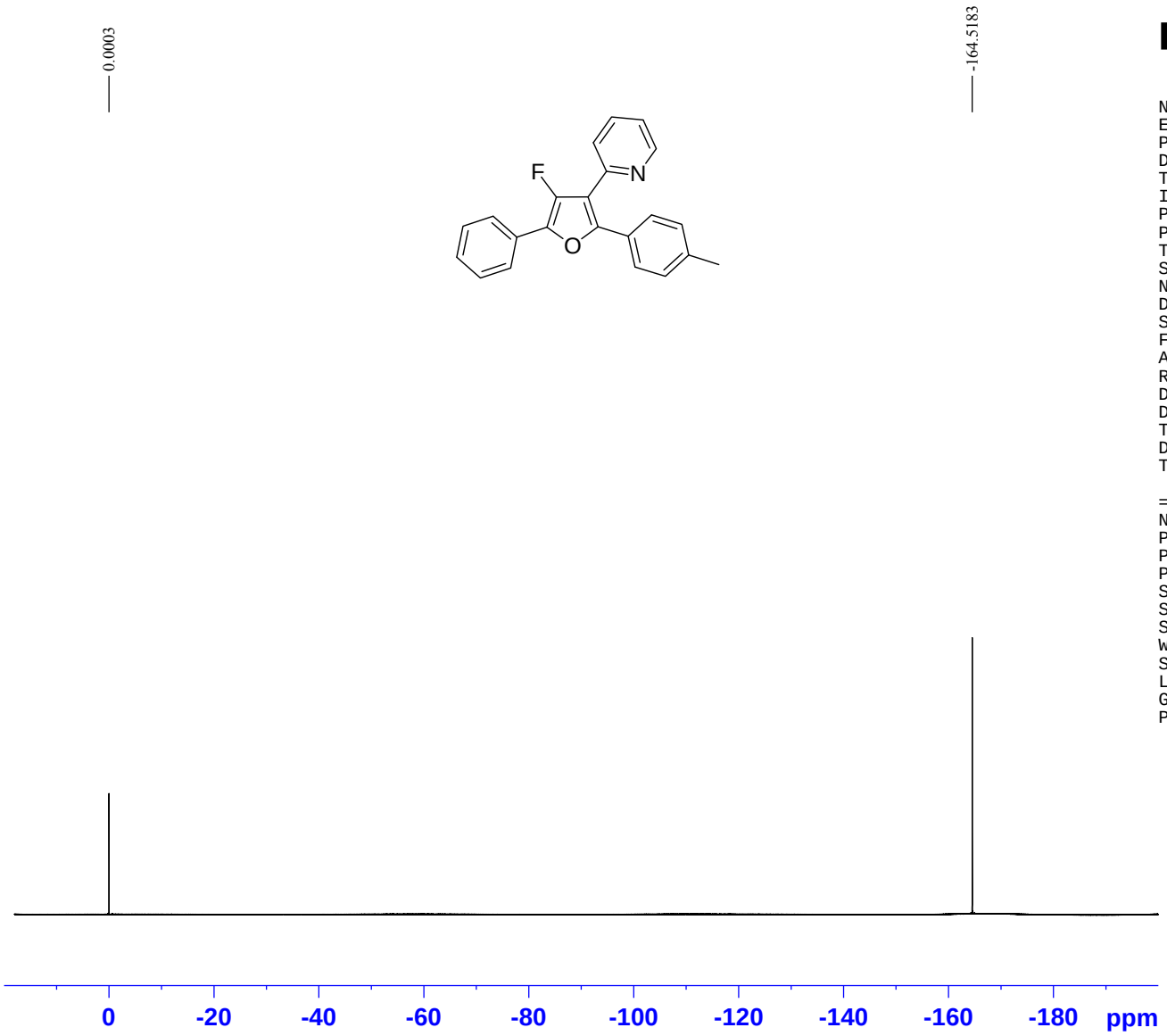
^{13}F NMR spectrum for **12** ($CDCl_3$)




```
NAME      Yan-10232010-4
EXPNO                 10
PROCNO                12
Date_           20101023
Time               19.17
INSTRUM            spect
PROBHD   5 mm PABBO BB-
PULPROG          zgflqn
TD                131072
SOLVENT             CDCl3
NS                    16
DS                     4
SWH            89285.711 Hz
FIDRES          0.681196 Hz
AQ             0.7340532 sec
RG                   812
DW                 5.600 usec
DE                 6.50 usec
TE                 299.5 K
D1           1.00000000 sec
TD0                    1

======== CHANNEL f1 ========
NUC1                 19F
P1                 14.30 usec
PL1                -3.00 dB
PL1W         20.29808235 W
SFO1         376.4607164 MHz
SI                 65536
SF           376.4985657 MHz
WDW                  EM
SSB                   0
LB                 0.30 Hz
GB                    0
PC                 1.00
```

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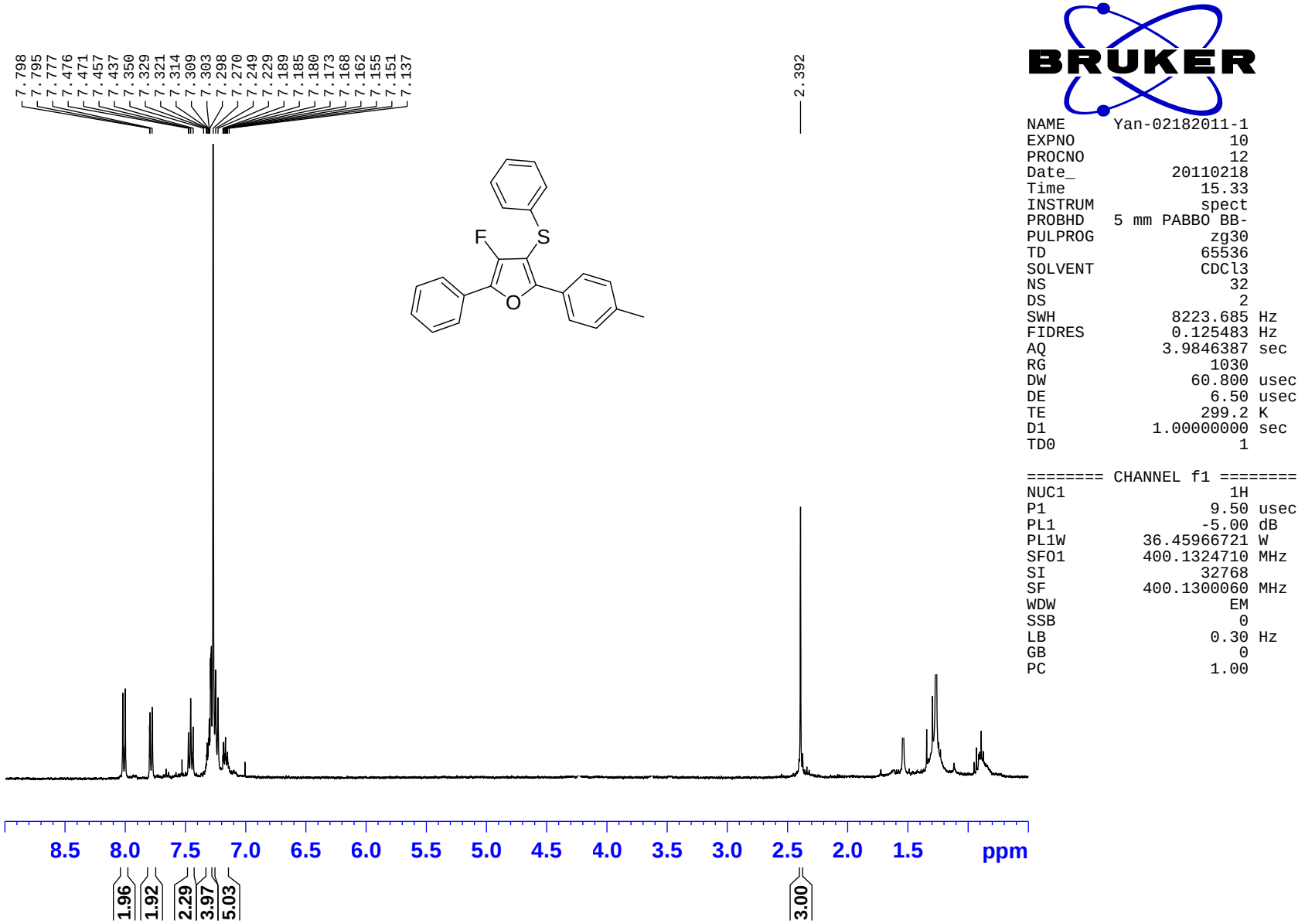
^{1}H NMR spectrum for **13** ($CDCl_3$)




```
NAME        Yan-02182011-1
EXPNO                   10
PROCNO                  12
Date_             20110218
Time                 15.33
INSTRUM              spect
PROBHD   5 mm PABBO BB-
PULPROG                zg30
TD                    65536
SOLVENT               CDCl3
NS                       32
DS                        2
SWH                8223.685 Hz
FIDRES             0.125483 Hz
AQ                 3.9846387 sec
RG                      1030
DW                    60.800 usec
DE                     6.50 usec
TE                    299.2 K
D1               1.00000000 sec
TD0                       1

======== CHANNEL f1 ========
NUC1                      1H
P1                     9.50 usec
PL1                   -5.00 dB
PL1W            36.45966721 W
SFO1            400.1324710 MHz
SI                      32768
SF              400.1300060 MHz
WDW                       EM
SSB                        0
LB                     0.30 Hz
GB                         0
PC                     1.00
```

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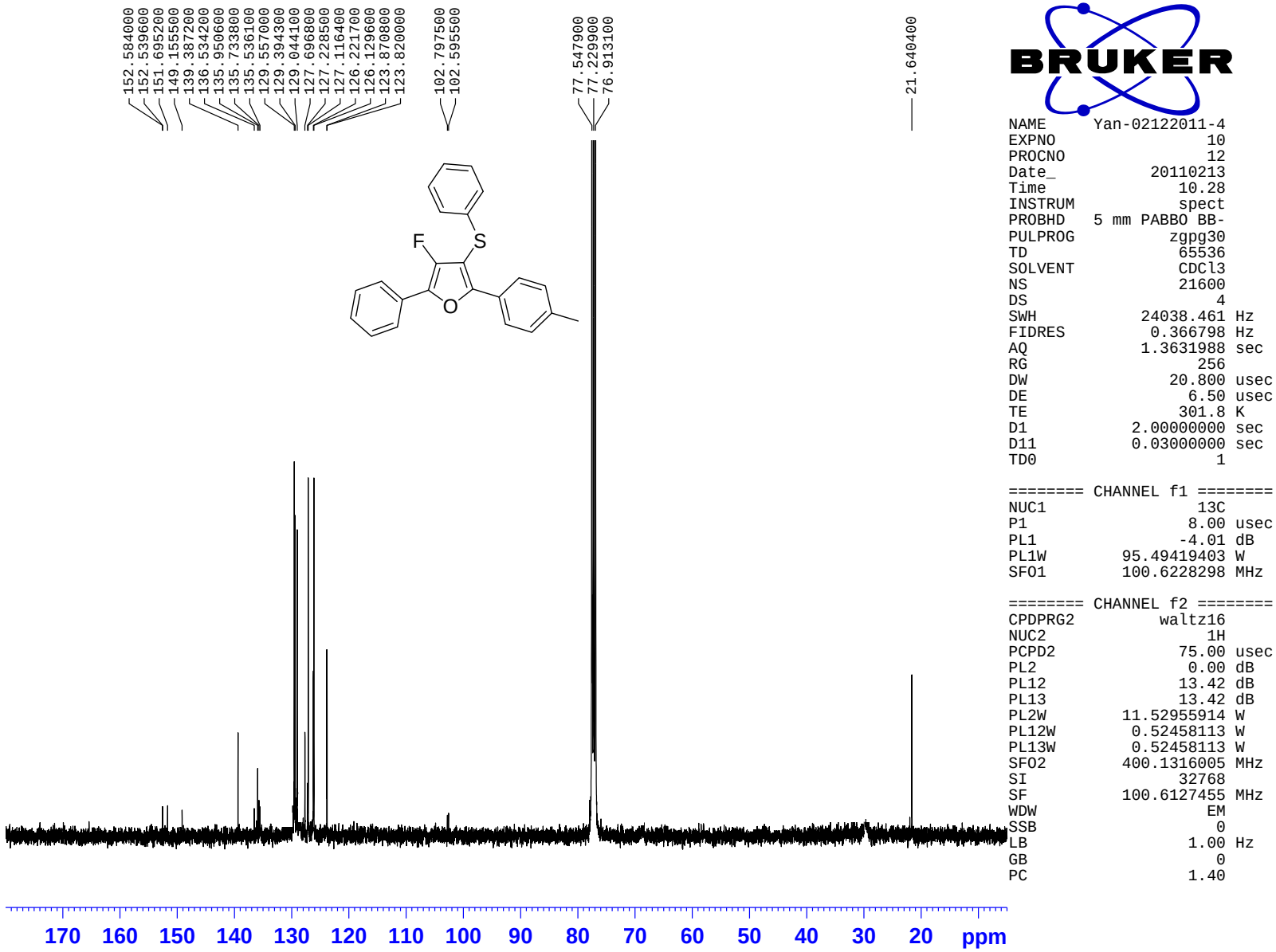
^{13}C NMR spectrum for **13** ($CDCl_3$)



BRUKER

NAME	Yan-02122011-4	
EXPNO	10	
PROCNO	12	
Date_	20110213	
Time	10.28	
INSTRUM	spect	
PROBHD	5 mm PABBO BB-	
PULPROG	zgpg30	
TD	65536	
SOLVENT	CDCl3	
NS	21600	
DS	4	
SWH	24038.461	Hz
FIDRES	0.366798	Hz
AQ	1.3631988	sec
RG	256	
DW	20.800	usec
DE	6.50	usec
TE	301.8	K
D1	2.00000000	sec
D11	0.03000000	sec
TD0	1	
======== CHANNEL f1 ========		
NUC1	13C	
P1	8.00	usec
PL1	-4.01	dB
PL1W	95.49419403	W
SFO1	100.6228298	MHz
======== CHANNEL f2 ========		
CPDPRG2	waltz16	
NUC2	1H	
PCPD2	75.00	usec
PL2	0.00	dB
PL12	13.42	dB
PL13	13.42	dB
PL2W	11.52955914	W
PL12W	0.52458113	W
PL13W	0.52458113	W
SFO2	400.1316005	MHz
SI	32768	
SF	100.6127455	MHz
WDW	EM	
SSB	0	
LB	1.00	Hz
GB	0	
PC	1.40	

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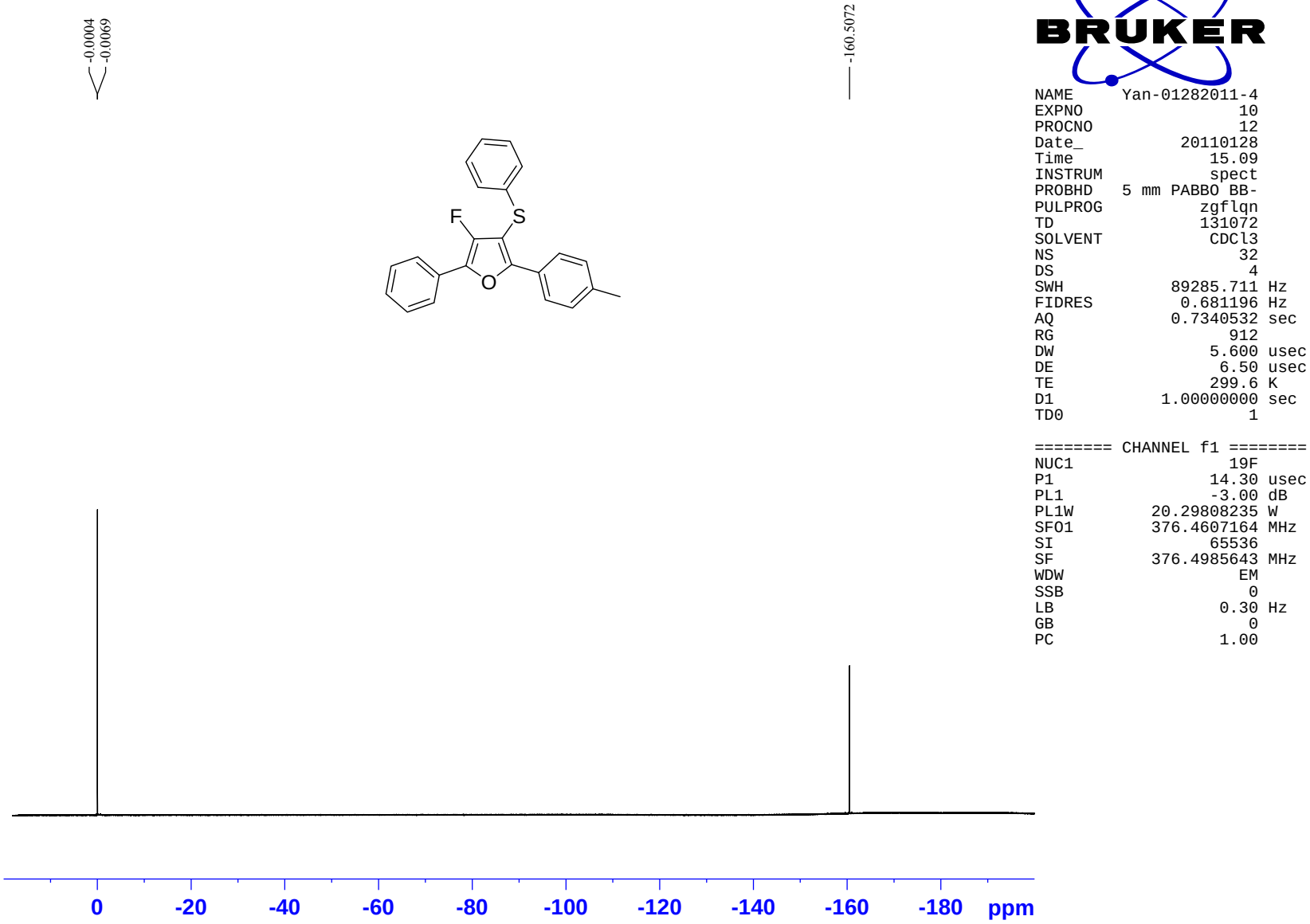
^{19}F NMR spectrum for **13** ($CDCl_3$)




```
NAME      Yan-01282011-4
EXPNO                 10
PROCNO                12
Date_           20110128
Time               15.09
INSTRUM            spect
PROBHD   5 mm PABBO BB-
PULPROG          zgflqn
TD                131072
SOLVENT             CDCl3
NS                    32
DS                     4
SWH            89285.711 Hz
FIDRES          0.681196 Hz
AQ             0.7340532 sec
RG                   912
DW                 5.600 usec
DE                 6.50 usec
TE                299.6 K
D1           1.00000000 sec
TD0                    1

======== CHANNEL f1 ========
NUC1                 19F
P1                 14.30 usec
PL1                -3.00 dB
PL1W        20.29808235 W
SFO1        376.4607164 MHz
SI                 65536
SF          376.4985643 MHz
WDW                  EM
SSB                   0
LB                 0.30 Hz
GB                    0
PC                 1.00
```

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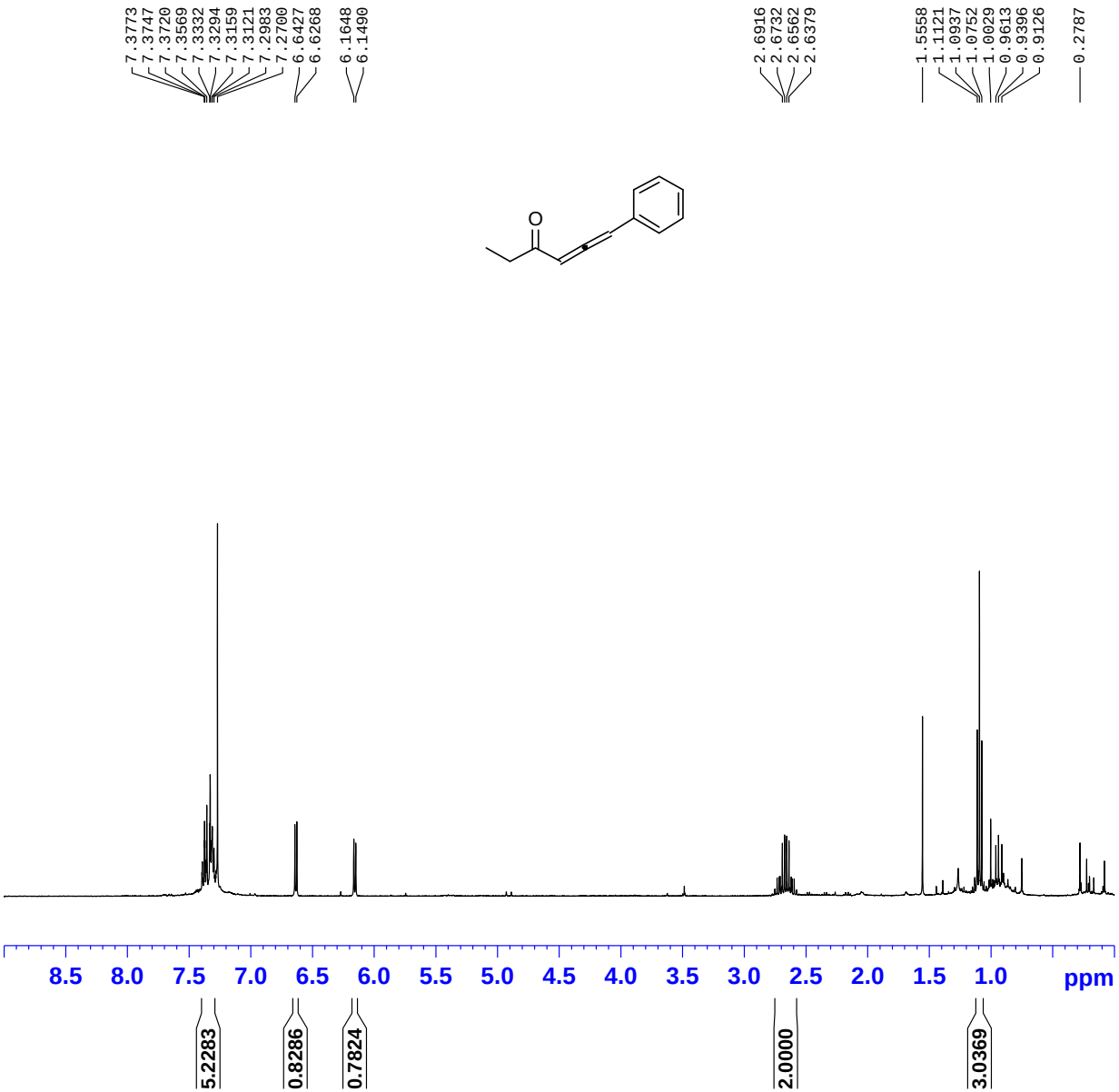
^{1}H NMR spectrum for **Allenylketone** ($CDCl_3$)

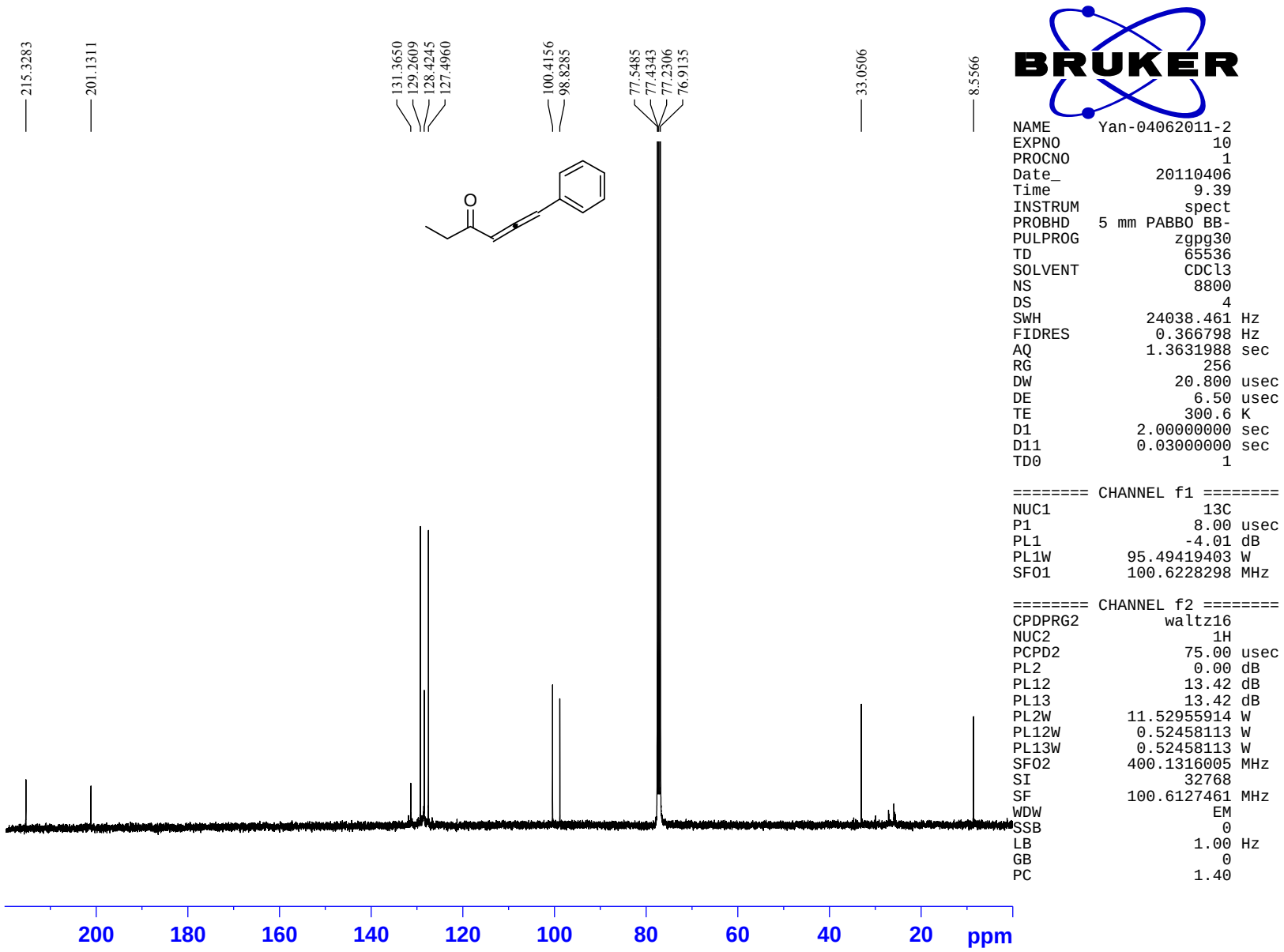



```
NAME      Yan-04062011-1
EXPNO                 10
PROCNO                 1
Date_           20110406
Time                1.04
INSTRUM            spect
PROBHD   5 mm PABBO BB-
PULPROG             zg30
TD                 65536
SOLVENT            CDCl3
NS                    16
DS                     2
SWH             8223.685 Hz
FIDRES          0.125483 Hz
AQ              3.9846387 sec
RG                   362
DW                60.800 usec
DE                 6.50 usec
TE                298.5 K
D1           1.00000000 sec
TD0                    1

======== CHANNEL f1 ========
NUC1                  1H
P1                  9.50 usec
PL1                -5.00 dB
PL1W        36.45966721 W
SFO1        400.1324710 MHz
SI                 32768
SF          400.1300059 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00
```

Organic & Biomolecular Chemistry **2012**, *10*, http://dx.doi.org/10.1039/c1ob06693e

^{13}C NMR spectrum for **Allenylketone** ($CDCl_3$)




```
NAME        Yan-04062011-2
EXPNO                   10
PROCNO                   1
Date_             20110406
Time                 9.39
INSTRUM             spect
PROBHD   5 mm PABBO BB-
PULPROG             zgpg30
TD                   65536
SOLVENT              CDCl3
NS                    8800
DS                       4
SWH             24038.461 Hz
FIDRES           0.366798 Hz
AQ               1.3631988 sec
RG                     256
DW                  20.800 usec
DE                   6.50 usec
TE                  300.6 K
D1              2.00000000 sec
D11             0.03000000 sec
TD0                      1

======== CHANNEL f1 ========
NUC1                   13C
P1                    8.00 usec
PL1                  -4.01 dB
PL1W          95.49419403 W
SFO1          100.6228298 MHz

======== CHANNEL f2 ========
CPDPRG2            waltz16
NUC2                   1H
PCPD2                75.00 usec
PL2                   0.00 dB
PL12                 13.42 dB
PL13                 13.42 dB
PL2W          11.52955914 W
PL12W          0.52458113 W
PL13W          0.52458113 W
SFO2          400.1316005 MHz
SI                   32768
SF            100.6127461 MHz
WDW                    EM
SSB                     0
LB                   1.00 Hz
GB                      0
PC                   1.40
```