

Electronic *Supplementary* Information for

Synthesis of highly rigid phosphine-oxazoline ligands for palladium-catalyzed asymmetric allylic alkylation

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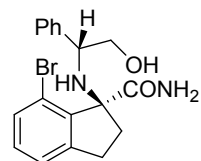
Contents

1. NMR spectrum of compounds.....	S2-S54
2. HPLC trace of compounds.....	S55-S69

Copies of NMR spectra

(1*S*,1'*R*)-7-bromo-1-(2-hydroxy-1-phenyl-ethylamino)-indan-1-carboxylic acid amide (**6**)

QZX-4-113A 1H 2018 7 11



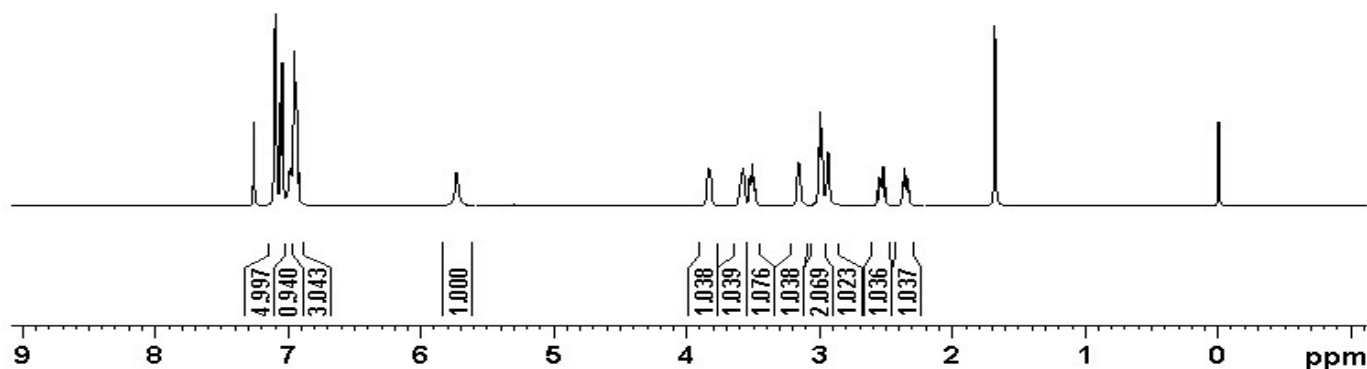
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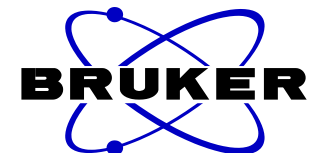
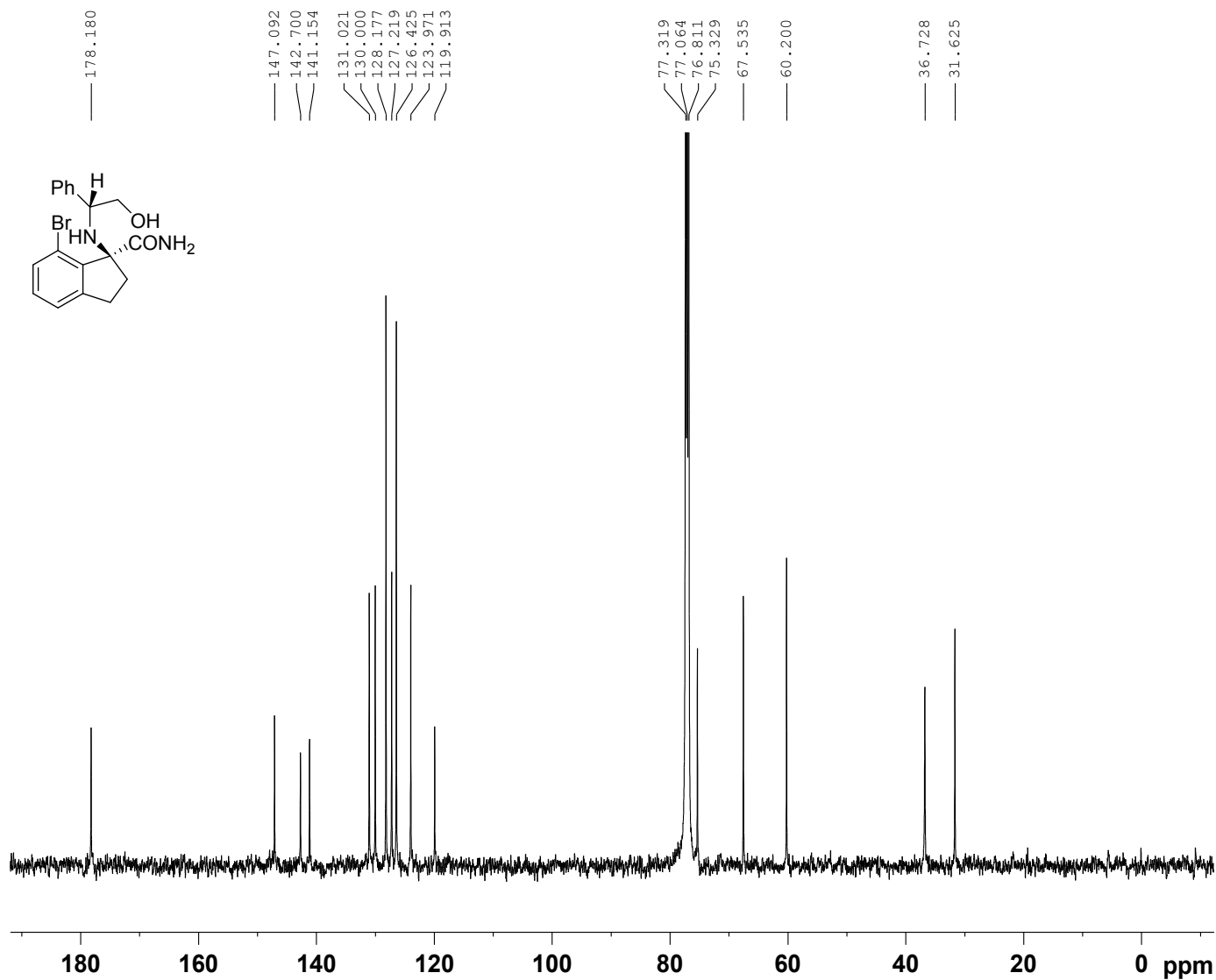
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2.549
2.539
2.521
2.503
2.377
2.366
2.352
2.337
2.326
1.680



NAME QZX-4-113A
EXPNO 1
PROCNO 1
Date_ 20180711
Time_ 9.35
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 16384
SOLVENT CDC13
NS 8
DS 0
SWH 10000.000 Hz
FIDRES 0.610352 Hz
AQ 0.8193000 sec
RG 406
DW 50.000 usec
DE 6.00 usec
TE 297.2 K
D1 2.00000000 sec
TDO 1

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PL1 2.00 dB
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SI 16384
SF 500.0300109 MHz
WDW EM
SSB 0
LB 0.60 Hz
GB 0
PC 2.00





```

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PROCNO         1
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Time           20.20
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PROBHD         5 mm PABBO BB-
PULPROG        zgpg30
TD             65536
SOLVENT        CDCl3
NS             888
DS             1
SWH            32679.738 Hz
FIDRES         0.498653 Hz
AQ            1.0027661 sec
RG            6500
DW            15.300 usec
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TD0           20
  
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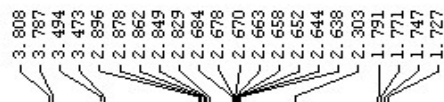
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NUC1          13C
P1            12.20 usec
PL1           3.00 dB
SFO1          125.7464750 MHz
  
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CPDPRG2       waltz16
NUC2          1H
PCPD2         80.00 usec
PL2           2.00 dB
PL12          17.70 dB
PL13          17.70 dB
SFO2          500.0355000 MHz
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SF            125.7326392 MHz
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PC            1.00
  
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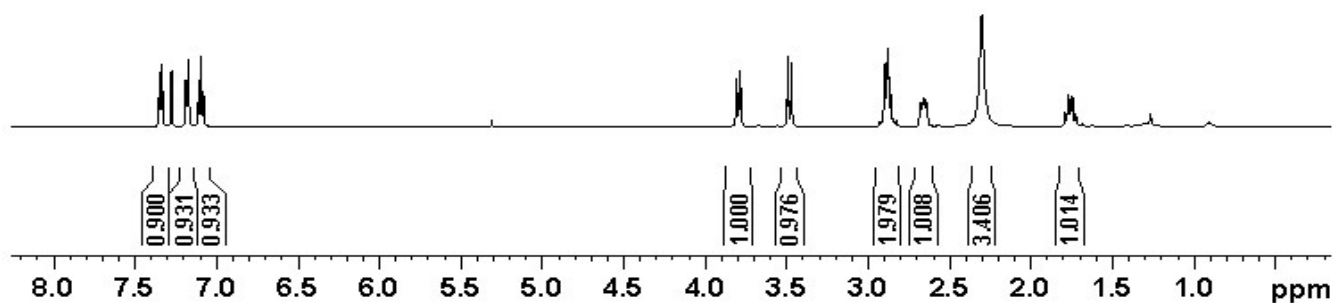
(S)-(1-Amino-7-bromo-indan-1-yl)-methanol (**8**)

QZX-131P 1H 2016 11 30



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PROCNO 1
Date_ 20161130
Time_ 15.22
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 16384
SOLVENT CDC13
NS 8
DS 1
SWH 10000.000 Hz
FIDRES 0.610352 Hz
AQ 0.8193000 sec
RG 362
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DE 6.00 usec
TE 295.9 K
D1 1.00000000 sec
TD0 1

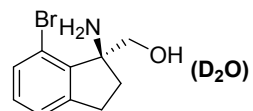
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PL1 2.00 dB
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SI 16384
SF 500.0300020 MHz
WDW EM
SSE 0
LB 0.30 Hz
GB 0
PC 2.00



qzx-1-136 1H 2016 12 06

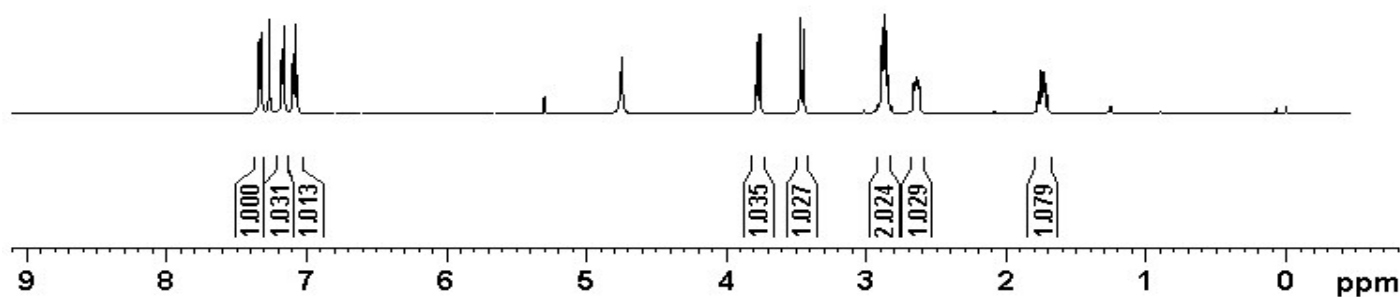
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7.081
7.066

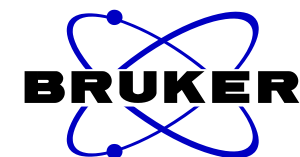
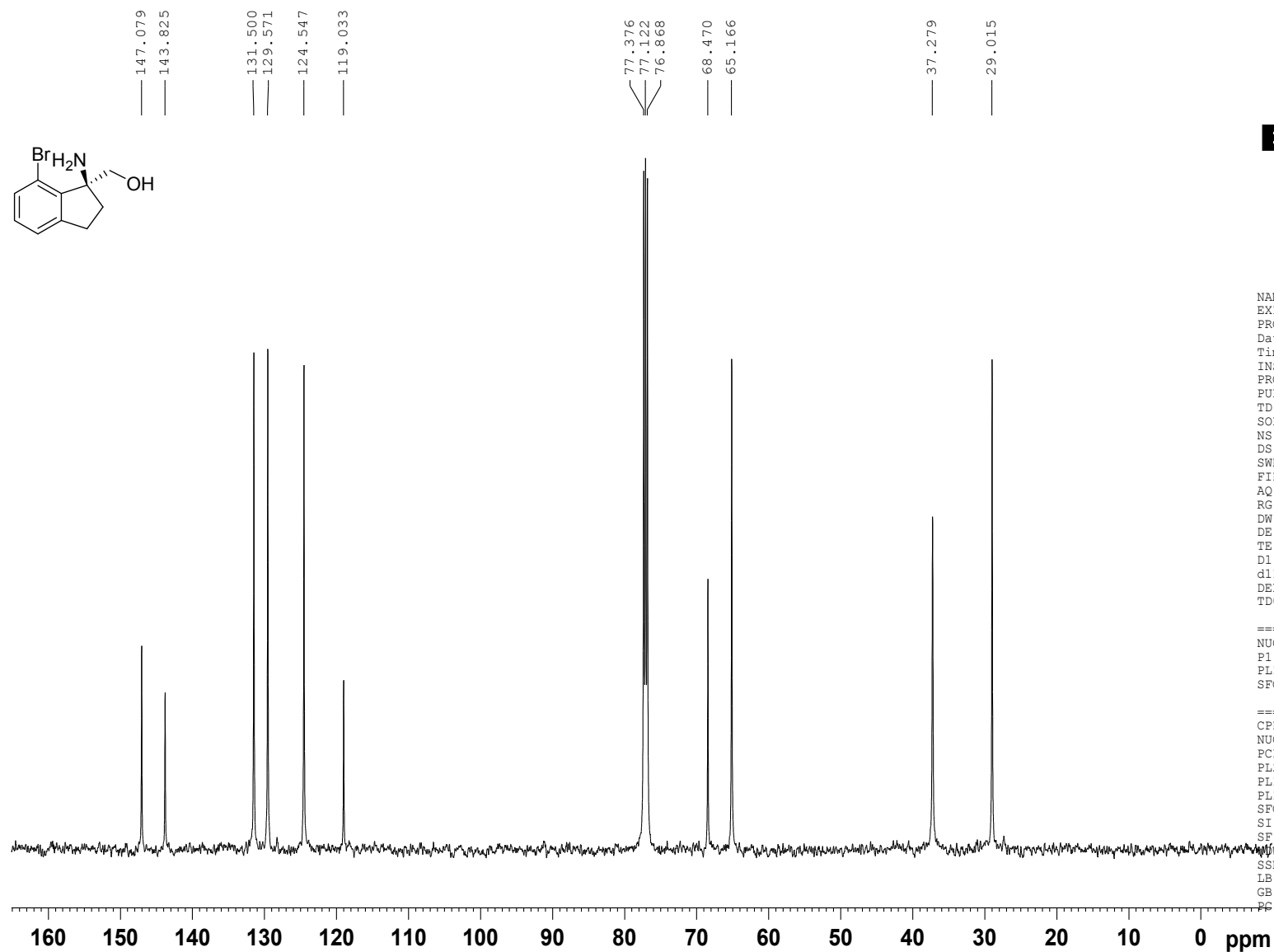
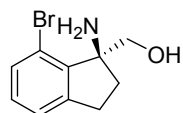
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3.760
3.470
3.448
2.914
2.883
2.867
2.850
2.817
2.662
2.656
2.648
2.641
2.636
2.630
2.622
2.616
1.770
1.750
1.726
1.706



NAME qzx-1-136
EXPNO 1
PROCNO 1
Date_ 20161204
Time_ 17.04
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 32768
SOLVENT D2O
NS 8
DS 1
SWH 10000.000 Hz
FIDRES 0.305176 Hz
AQ 1.6385000 sec
RG 724
DW 50.000 usec
DE 6.00 usec
TE 673.2 K
D1 1.00000000 sec
TD0 1

===== CHANNEL f1 =====
NUC1 1H
P1 13.00 usec
PL1 2.00 dB
SF01 500.0335010 MHz
SI 16384
SF 500.0287381 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 2.00





```

NAME          QZX-8
EXPNO         2
PROCNO        1
Date_         20180926
Time_         17.33
INSTRUM       spect
PROBHD        5 mm PADUL 13C
PULPROG       zgpg30
TD            65536
SOLVENT       CDC13
NS            150
DS            1
SWH           32679.738 Hz
FIDRES        0.498653 Hz
AQ            1.0027661 sec
RG            8200
DW            15.300 usec
DE            6.00 usec
TE            298.2 K
D1            2.0000000 sec
d11           0.0300000 sec
DELTA         1.899999998 sec
TD0           10

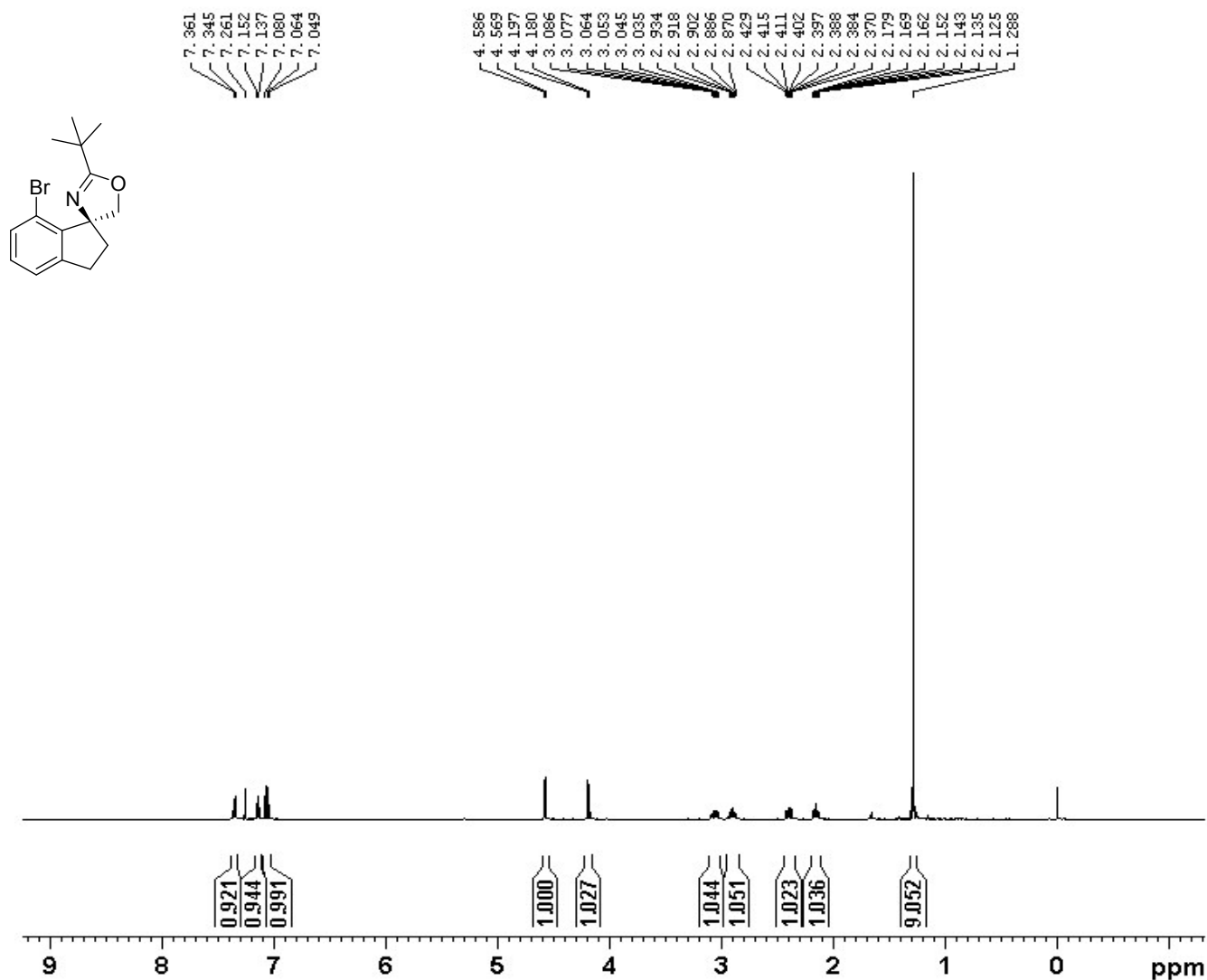
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NUC1          13C
P1            12.20 usec
PL1           3.00 dB
SFO1          125.7464750 MHz

===== CHANNEL f2 =====
CPDPRG2       waltz16
NUC2          1H
PCPD2         80.00 usec
PL2           2.00 dB
PL12          17.70 dB
PL13          17.70 dB
SFO2          500.0355000 MHz
SI            32768
SF            125.7326392 MHz
WDW           EM
SSB           0
LB            10.00 Hz
GB            0
PC            1.00

```

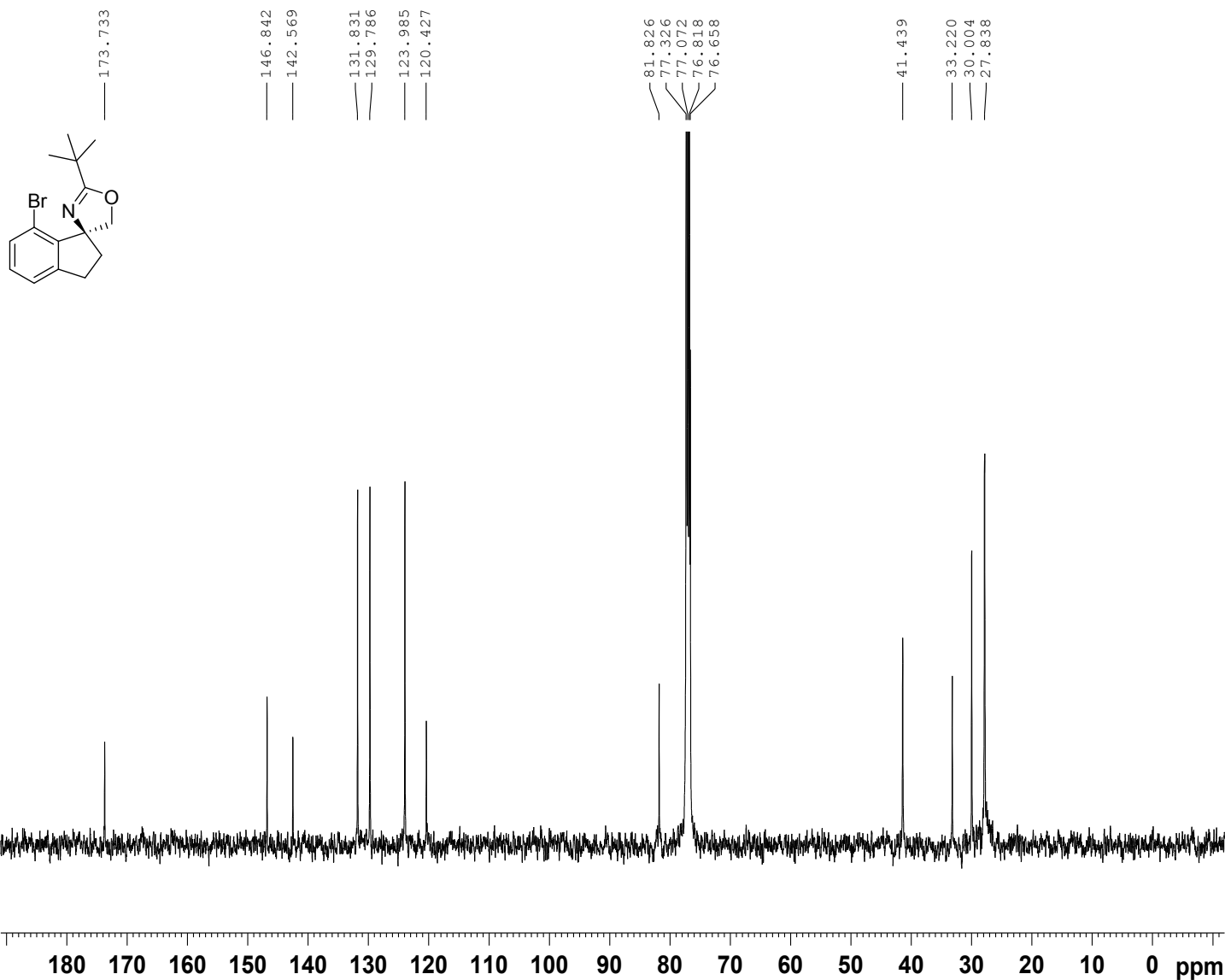
(S)-7-bromo-2'-(tert-butyl)-2,3-dihydro-5'H-spiro[indene-1,4'-oxazole] (9a)

GYF-11-16 1H 2017 11 16



NAME GYF-11-16
 EXPNO 1
 PROCNO 1
 Date_ 20171116
 Time_ 15.14
 INSTRUM spect
 PROBHD 5 mm PABBO BB-
 PULPROG zg30
 TD 16384
 SOLVENT CDCl3
 NS 8
 DS 1
 SWH 10000.000 Hz
 FIDRES 0.610352 Hz
 AQ 0.8193000 sec
 RG 322
 DW 50.000 usec
 DE 6.00 usec
 TE 673.2 K
 D1 1.00000000 sec
 TDO 1

===== CHANNEL f1 =====
 NUC1 1H
 P1 13.00 usec
 PL1 2.00 dB
 SF01 500.0335010 MHz
 SI 16384
 SF 500.0300102 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 2.00



```

NAME          GYF-11-17
EXPNO         2
PROCNO        1
Date_         20171119
Time          11.29
INSTRUM       spect
PROBHD        5 mm PABBO BB-
PULPROG       zgpg30
TD            65536
SOLVENT       CDC13
NS            533
DS            2
SWH           32679.738 Hz
FIDRES        0.498653 Hz
AQ            1.0027661 sec
RG            4100
DW            15.300 usec
DE            6.00 usec
TE            673.2 K
D1            2.00000000 sec
d11           0.03000000 sec
DELTA         1.89999998 sec
TD0           10
  
```

```

===== CHANNEL f1 =====
NUC1          13C
P1            12.20 usec
PL1           3.00 dB
SFO1          125.7464750 MHz
  
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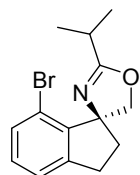
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===== CHANNEL f2 =====
CPDPRG2       waltz16
NUC2          1H
PCPD2         80.00 usec
PL2           2.00 dB
PL12          17.70 dB
PL13          17.70 dB
SFO2          500.0355000 MHz
SI            32768
SF            125.7326386 MHz
WDW           EM
SSB           0
LB            6.00 Hz
GB            0
PC            2.00
  
```

(S)-7-bromo-2'-isopropyl-2,3-dihydro-5'H-spiro[indene-1,4'-oxazole] (**9b**)

GYF-11-9

1H 2017 1109



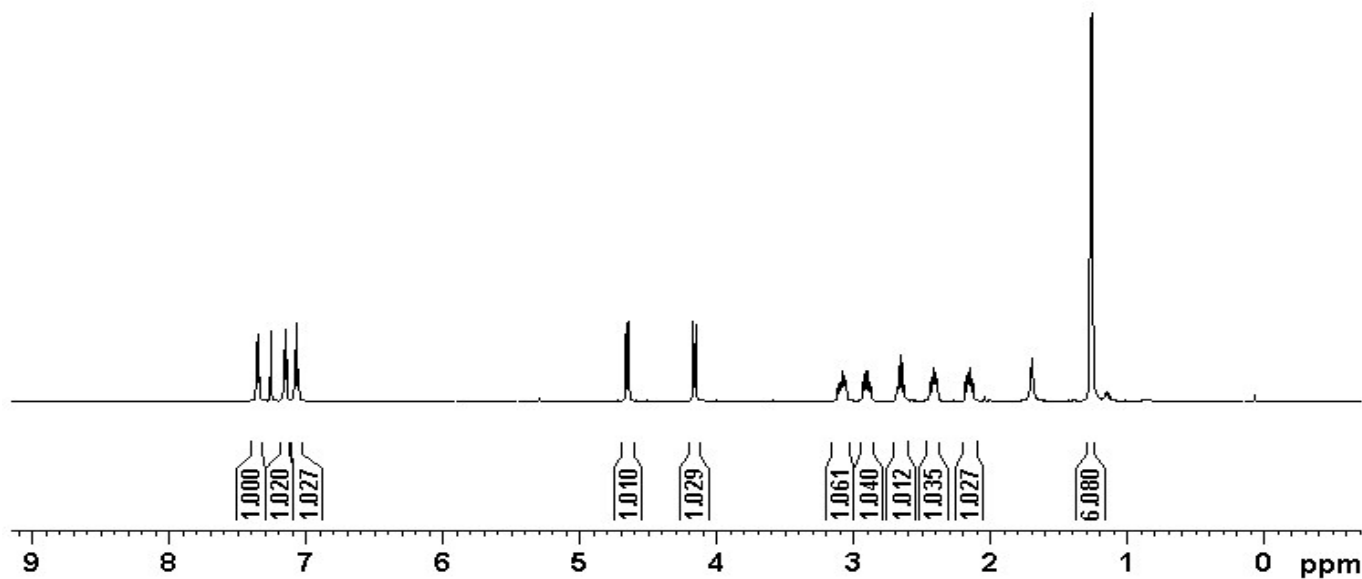
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7.055

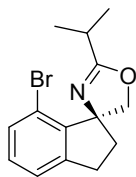
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4.171
4.154
3.117
3.099
3.085
3.072
3.055
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2.919
2.904
2.887
2.873
2.686
2.672
2.658
2.644
2.630
2.444
2.432
2.426
2.417
2.405
2.400
2.388
2.181
2.169
2.164
2.153
2.143
2.138
2.126
1.270
1.257



NAME GYF-11-9
EXPNO 1
PROCNO 1
Date_ 20171109
Time_ 16.59
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 16384
SOLVENT CDC13
NS 8
DS 1
SWH 10000.000 Hz
FIDRES 0.610352 Hz
AQ 0.8193000 sec
RG 812
DW 50.000 usec
DE 6.00 usec
TE 673.2 K
D1 1.00000000 sec
TD0 1

===== CHANNEL f1 =====
NUC1 1H
P1 13.00 usec
PL1 2.00 dB
SF01 500.0335010 MHz
SI 16384
SF 500.0300101 MHz
WDW EM
SSE 0
LB 0.30 Hz
GB 0
PC 2.00

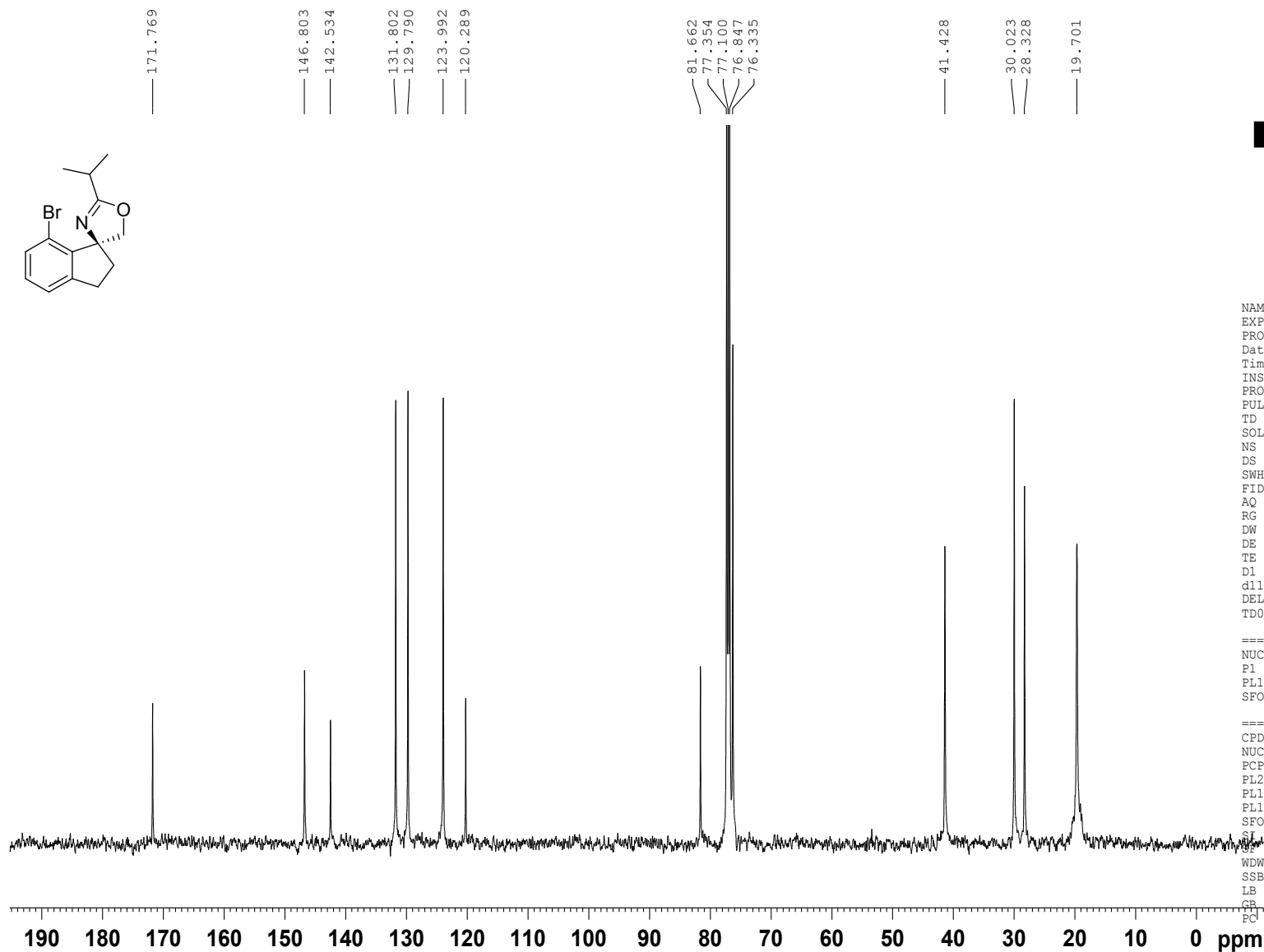




NAME QZX-9B
EXPNO 2
PROCNO 1
Date_ 20180926
Time_ 17.41
INSTRUM spect
PROBHD 5 mm PADUL 13C
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 150
DS 1
SWH 32679.738 Hz
FIDRES 0.498653 Hz
AQ 1.0027661 sec
RG 8200
DW 15.300 usec
DE 6.00 usec
TE 297.8 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
TD0 10

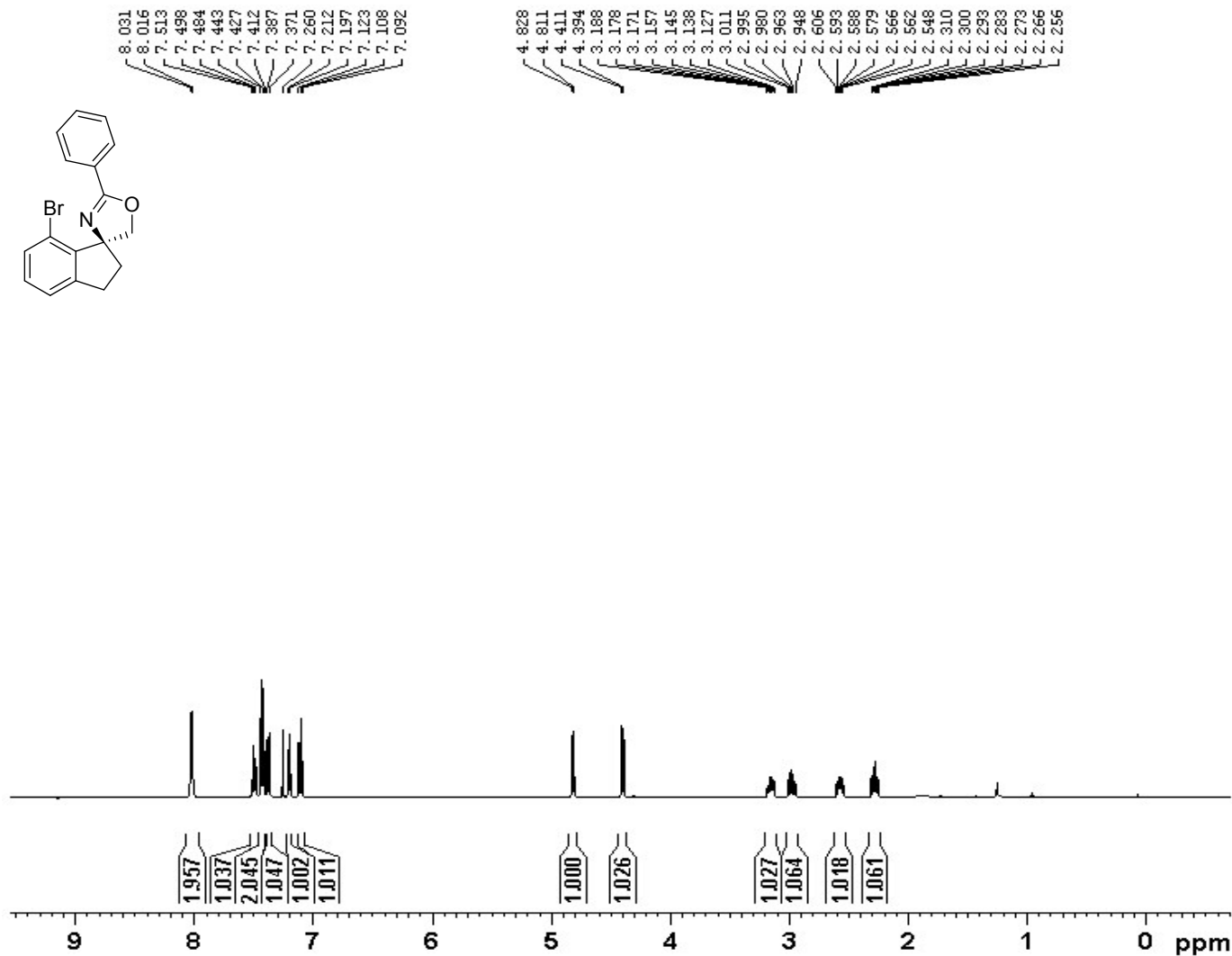
===== CHANNEL f1 =====
NUC1 13C
P1 12.20 usec
PL1 3.00 dB
SFO1 125.7464750 MHz

===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 2.00 dB
PL12 17.70 dB
PL13 17.70 dB
SFO2 500.0355000 MHz
SI 32768
SF 125.7326392 MHz
WDW EM
SSB 0
LB 10.00 Hz
GB 0
PC 1.00



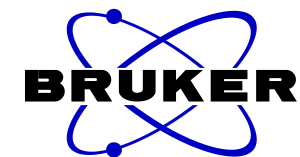
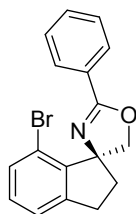
(S)-7-bromo-2'-phenyl-2,3-dihydro-5'H-spiro[indene-1,4'-oxazole] (**9c**)

GYF-18-14-2 1H 1D 2018 03 14



NAME GYF-18-14-2
 EXPNO 1
 PROCNO 1
 Date_ 20180314
 Time_ 16.07
 INSTRUM spect
 PROBHD 5 mm PABBO BB-
 PULPROG zg30
 TD 16384
 SOLVENT CDC13
 NS 8
 DS 1
 SWH 10000.000 Hz
 FIDRES 0.610352 Hz
 AQ 0.8193000 sec
 RG 256
 DW 50.000 usec
 DE 8.00 usec
 TE 293.2 K
 D1 2.00000000 sec
 TDO 1

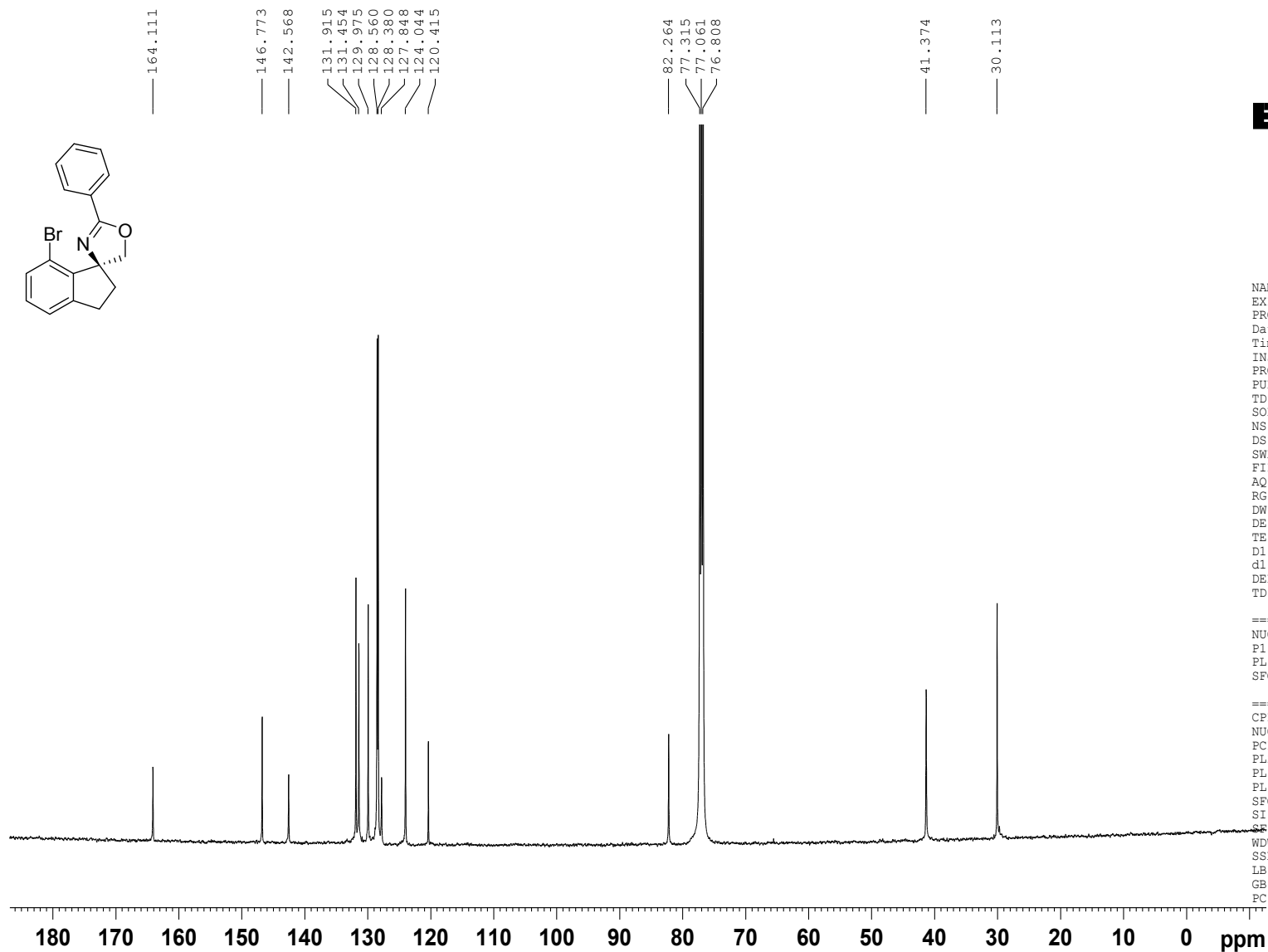
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 NUC1 1H
 P1 13.00 usec
 PL1 2.00 dB
 SF01 500.0335000 MHz
 SI 16384
 SF 500.0300106 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00



NAME GYF-3-19-4
 EXPNO 2
 PROCNO 1
 Date_ 20180319
 Time 21.50
 INSTRUM spect
 PROBHD 5 mm PABBO BB-
 PULPROG zgpg30
 TD 65536
 SOLVENT CDCl3
 NS 14790
 DS 1
 SWH 32679.738 Hz
 FIDRES 0.498653 Hz
 AQ 1.0027661 sec
 RG 5160
 DW 15.300 usec
 DE 6.00 usec
 TE 296.4 K
 D1 2.00000000 sec
 d11 0.03000000 sec
 DELTA 1.89999998 sec
 TD0 20

===== CHANNEL f1 =====
 NUC1 13C
 P1 12.20 usec
 PL1 3.00 dB
 SFO1 125.7464750 MHz

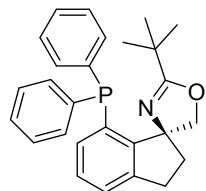
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 CPDPRG2 waltz16
 NUC2 1H
 PCPD2 80.00 usec
 PL2 2.00 dB
 PL12 17.70 dB
 PL13 17.70 dB
 SFO2 500.0355000 MHz
 SI 32768
 SF 125.7326392 MHz
 WDW EM
 SSB 0
 LB 6.00 Hz
 GB 0
 PC 1.00



(S)-2'-(tert-butyl)-7-(diphenylphosphino)-2,3-dihydro-5'H-spiro[indene-1,4'-oxazole] (**L1**)

GYF-3-19-2

1H 2018 03 19



7.303
7.293
7.274
7.261
7.248
7.208
7.193
7.180
7.165
7.158
7.142
7.128
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6.865
6.852

4.681

4.324

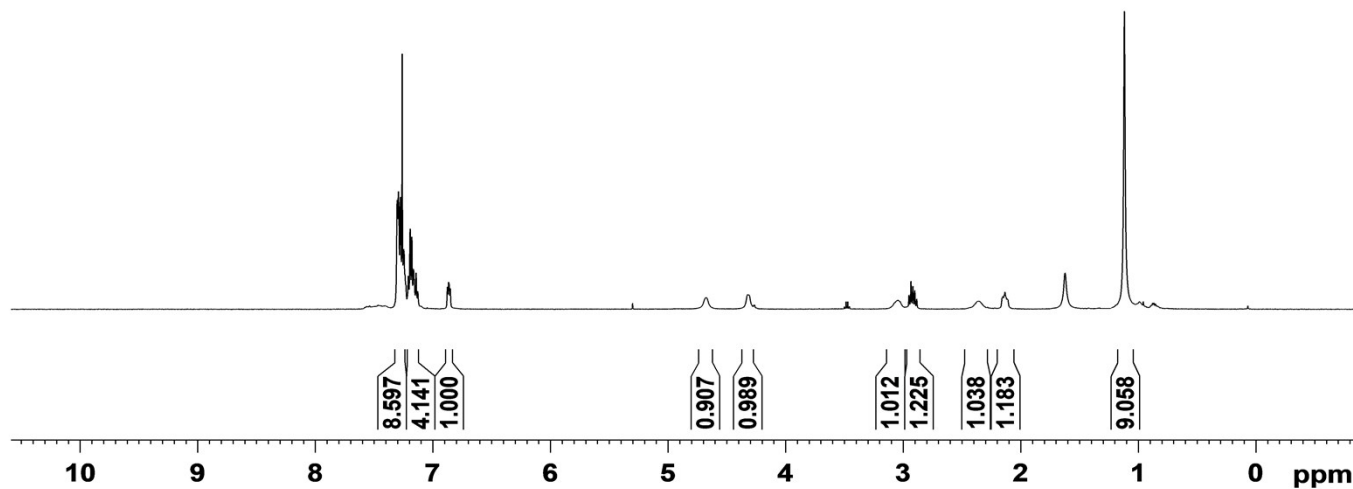
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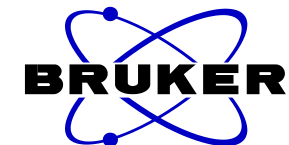
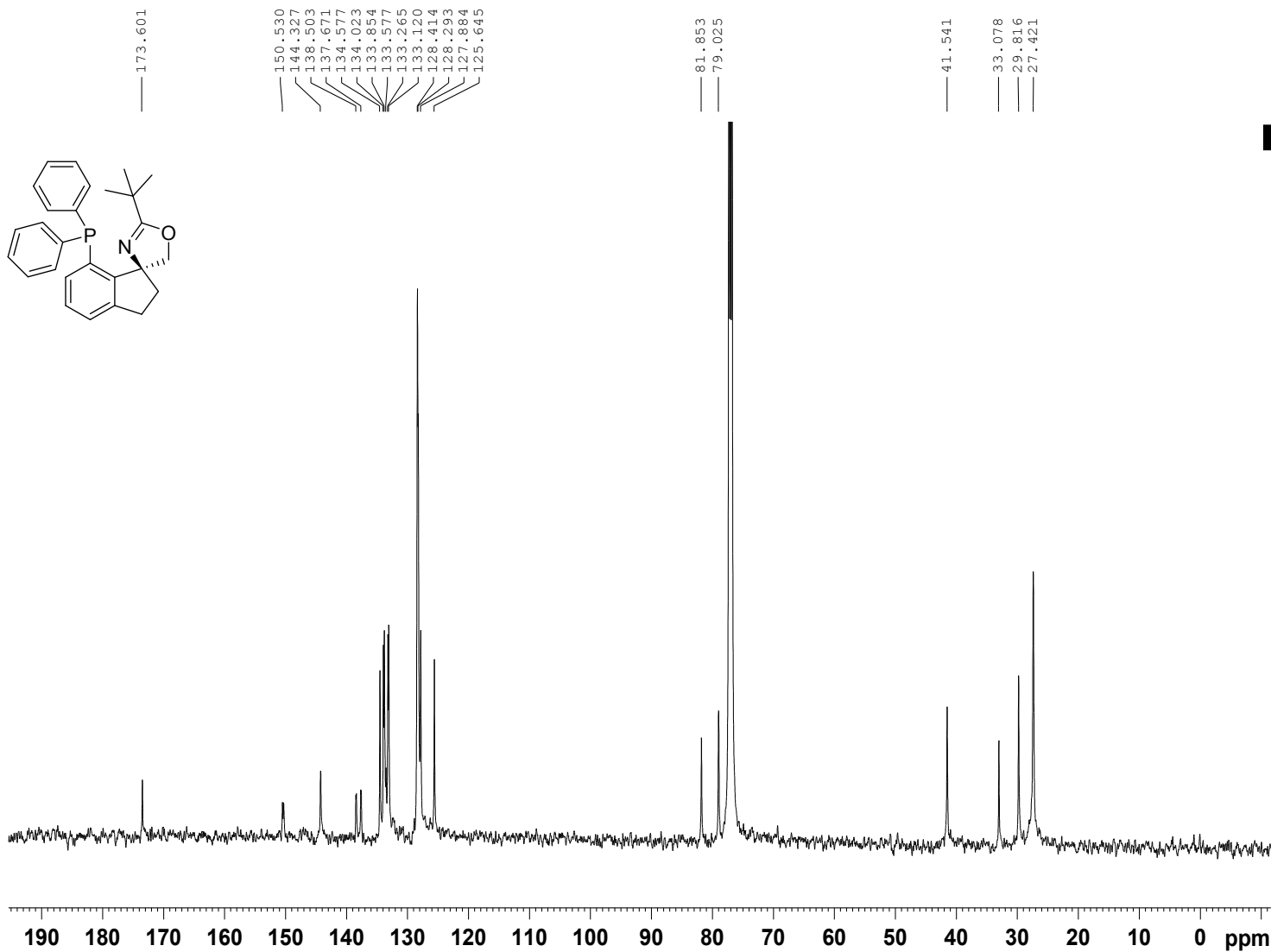
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NAME GYF-3-19-2
EXPNO 1
PROCNO 1
Date_ 20180319
Time_ 15.22
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PULPROG zg30
TD 16384
SOLVENT CDCl3
NS 8
DS 1
SWH 10000.000 Hz
FIDRES 0.610352 Hz
AQ 0.8193000 sec
RG 575
DW 50.000 usec
DE 6.00 usec
TE 293.5 K
D1 2.00000000 sec
TD0 1

===== CHANNEL f1 =====
NUC1 1H
P1 13.00 usec
PL1 2.00 dB
SFO1 500.0335010 MHz
SI 16384
SF 500.0300101 MHz
WDW EM
SSB 0
LB 0.60 Hz
GB 0
PC 2.00





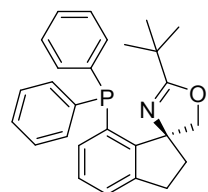
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 EXPNO 2
 PROCNO 1
 Date_ 20171130
 Time_ 11.07
 INSTRUM spect
 PROBHD 5 mm PABBO BB-
 PULPROG zgpg30
 TD 65536
 SOLVENT CDCl3
 NS 1100
 DS 2
 SWH 32679.738 Hz
 FIDRES 0.498653 Hz
 AQ 1.0027661 sec
 RG 6500
 DW 15.300 usec
 DE 6.00 usec
 TE 673.2 K
 D1 2.00000000 sec
 d11 0.03000000 sec
 DELTA 1.89999998 sec
 TD0 10

===== CHANNEL f1 =====
 NUC1 13C
 P1 12.20 usec
 PL1 3.00 dB
 SFO1 125.7464750 MHz

===== CHANNEL f2 =====
 CPDPRG2 waltz16
 NUC2 1H
 PCPD2 80.00 usec
 PL2 2.00 dB
 PL12 17.70 dB
 PL13 17.70 dB
 SFO2 500.0355000 MHz
 SI 32768
 SF 125.7326386 MHz
 WDW EM
 SSB 0
 LB 12.00 Hz
 GB 0
 PC 2.00

GYF-18-3-14-1

31P 1D 2018 03 14



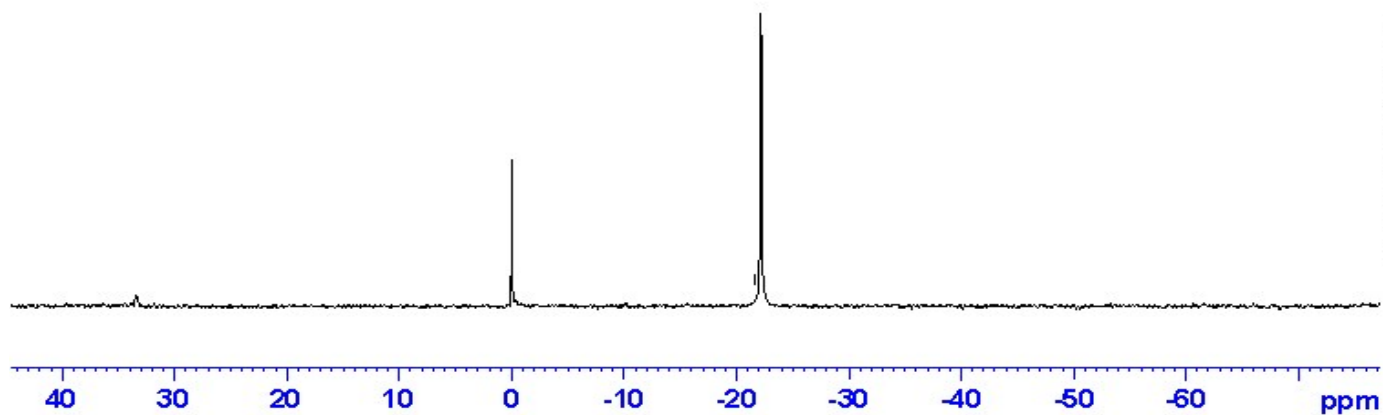
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NAME GYF-18-3-14-1
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PROCNO 1
Date_ 20180314
Time_ 18.21
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PULPROG zgdc
TD 32768
SOLVENT CDC13
NS 200
DS 2
SWH 100000.000 Hz
FIDRES 3.051758 Hz
AQ 0.1638950 sec
RG 23100
DW 5.000 usec
DE 6.00 usec
TE 294.3 K
D1 2.00000000 sec
d11 0.03000000 sec
TD0 1

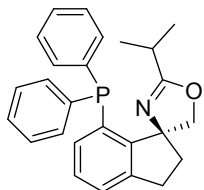
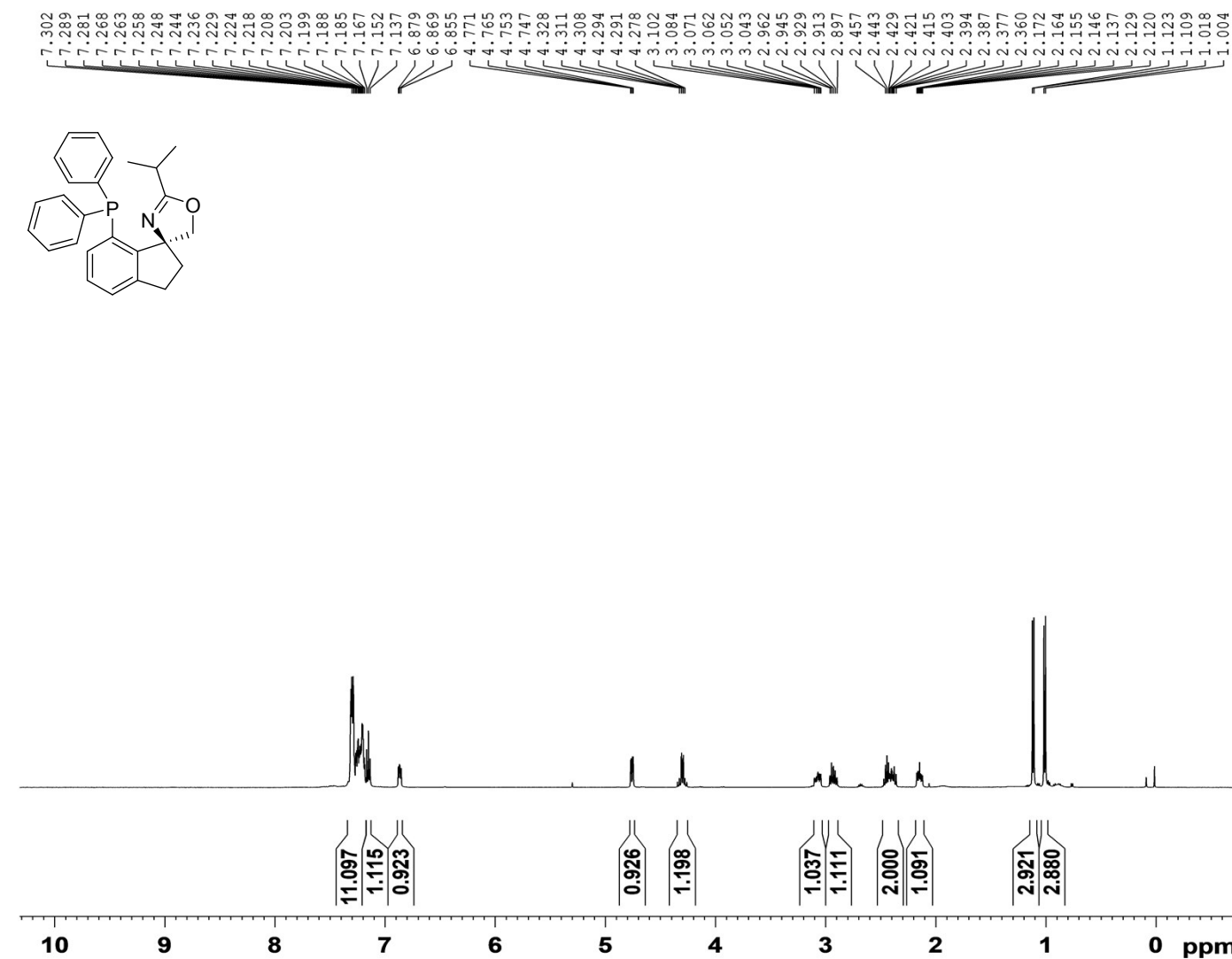
===== CHANNEL f1 =====
NUC1 31P
P1 13.40 usec
PL1 3.00 dB
SF01 202.4158540 MHz

===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 2.00 dB
PL12 17.70 dB
SF02 500.0335010 MHz
SI 32768
SF 202.4158397 MHz
WDW EM
SSB 0
LB 12.00 Hz
GB 0
PC 5.00



GYF-4-4

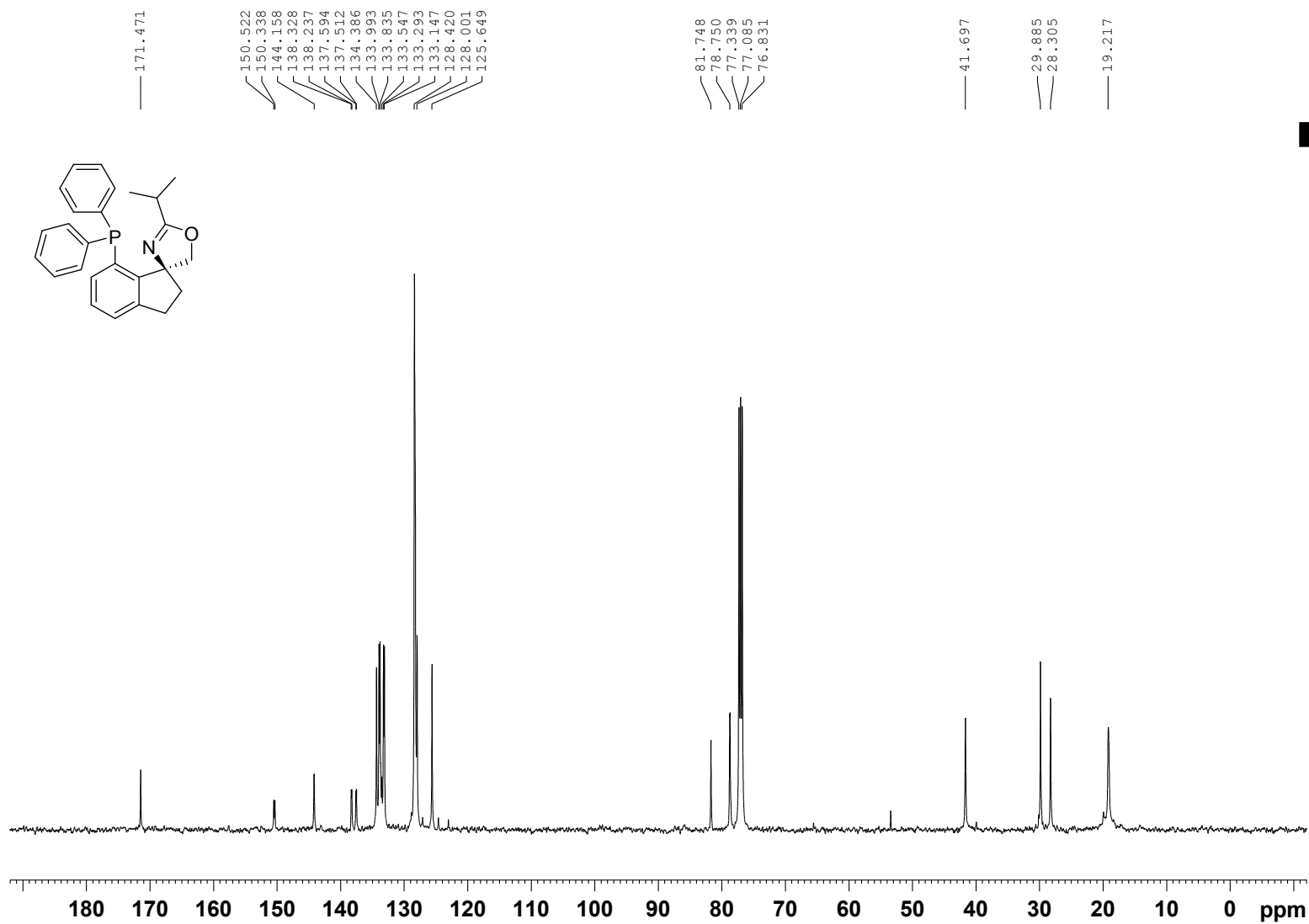
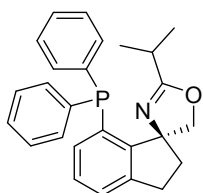
1H 1D 2018 03 08



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EXPNO	1
PROCNO	1
Date_	20180308
Time_	14.33
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	16384
SOLVENT	CDC13
NS	8
DS	1
SWH	10000.000 Hz
FIDRES	0.610352 Hz
AQ	0.8193000 sec
RG	161
DW	50.000 usec
DE	8.00 usec
TE	290.2 K
D1	2.00000000 sec
TD0	1

```
===== CHANNEL f1 =====
```

NUC1		1H
P1	13.00	usec
PL1	2.00	dB
SFO1	500.0335000	MHz
SI	16384	
SF	500.0300064	MHz
WDW	EM	
SSB	0	
LB	0.30	Hz
GB	0	
PC	1.00	



```

NAME           QZX-L2
EXPNO           2
PROCNO          1
Date_           20180926
Time            16.18
INSTRUM         spect
PROBHD          5 mm PADUL 13C
PULPROG         zgpg30
TD              65536
SOLVENT         CDC13
NS              610
DS              1
SWH             32679.738 Hz
FIDRES          0.498653 Hz
AQ             1.0027661 sec
RG             5790
DW             15.300 usec
DE             6.00 usec
TE             297.9 K
D1             2.00000000 sec
d11            0.03000000 sec
DELTA          1.89999998 sec
TD0            10
  
```

```

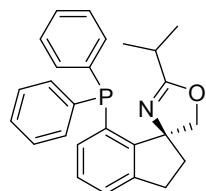
===== CHANNEL f1 =====
NUC1            13C
P1             12.20 usec
PL1            3.00 dB
SFO1           125.7464750 MHz
  
```

```

===== CHANNEL f2 =====
CPDPRG2        waltz16
NUC2            1H
PCPD2          80.00 usec
PL2            2.00 dB
PL12           17.70 dB
PL13           17.70 dB
SFO2           500.0355000 MHz
SI             32768
SF             125.7326392 MHz
WDW            EM
SSB            0
LB             10.00 Hz
GB             0
PC             1.00
  
```

GYF-3-19-1

31P 1D 2018 03 19



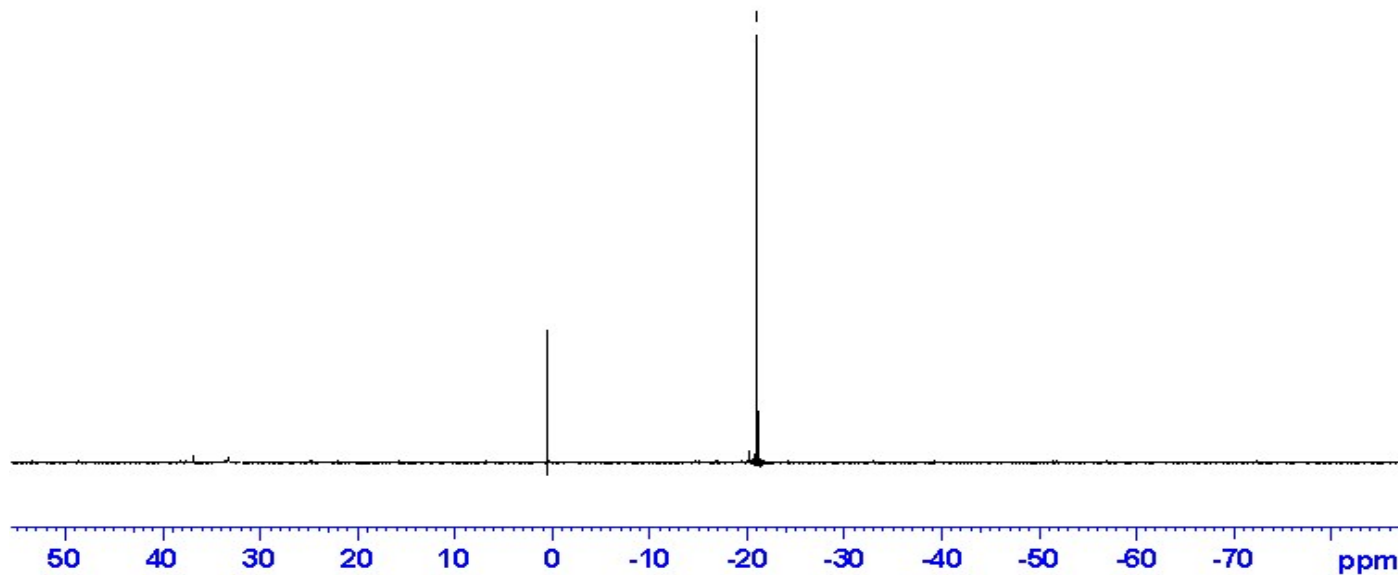
— -21.047



NAME GYF-3-19-1
EXPNO 8
PROCNO 1
Date_ 20180319
Time 19.28
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgdc
TD 32768
SOLVENT CDC13
NS 400
DS 2
SWH 100000.000 Hz
FIDRES 3.051758 Hz
AQ 0.1638950 sec
RG 23100
DW 5.000 usec
DE 6.00 usec
TE 294.7 K
D1 2.00000000 sec
d11 0.03000000 sec
TD0 2

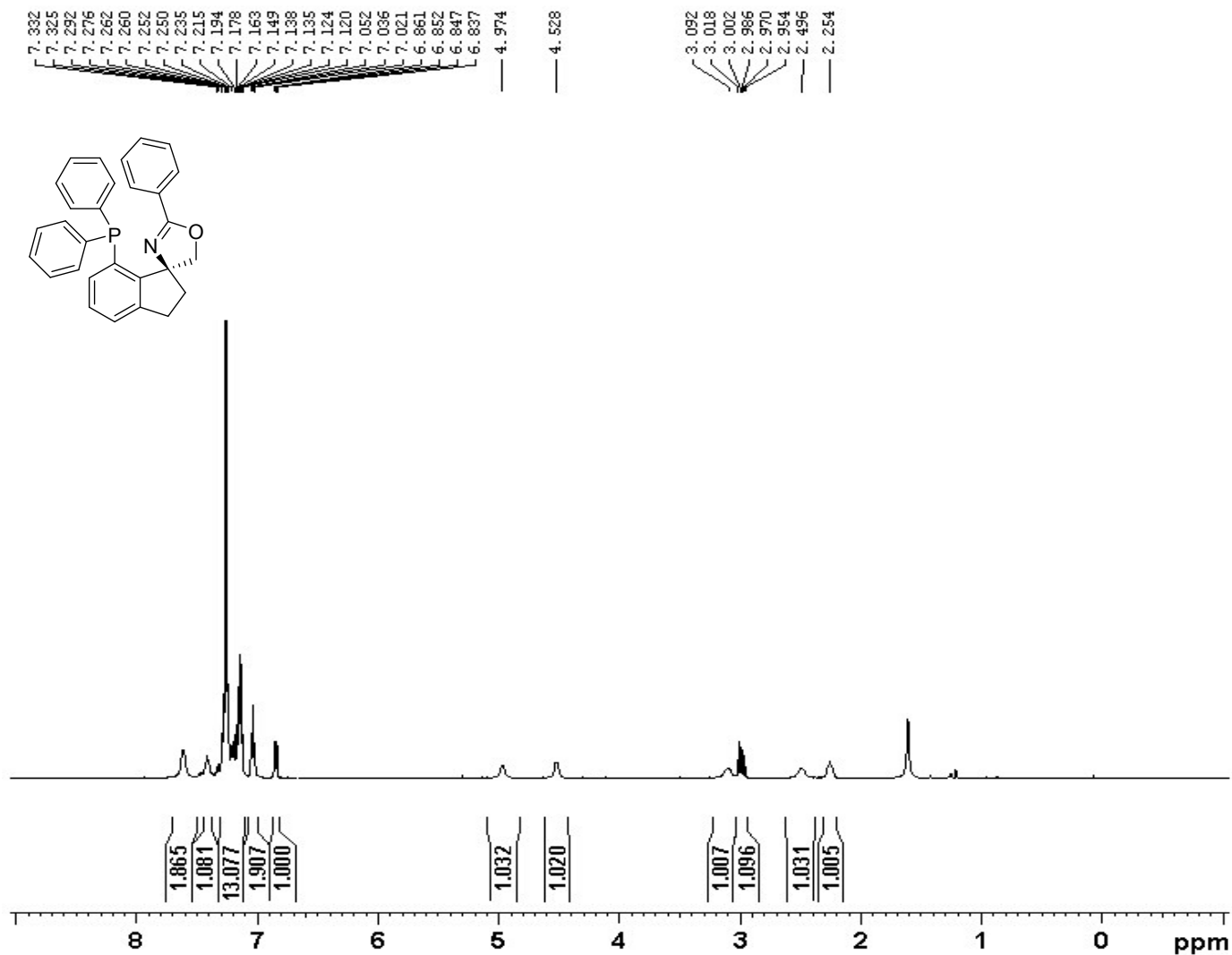
===== CHANNEL f1 =====
NUC1 31P
P1 13.40 usec
PL1 3.00 dB
SF01 202.4158540 MHz

===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 2.00 dB
PL12 17.70 dB
SF02 500.0335010 MHz
SI 32768
SF 202.4157493 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 5.00



(S)-7-(diphenylphosphino)-2'-phenyl-2,3-dihydro-5'H-spiro[indene-1,4'-oxazole] (**L3**)

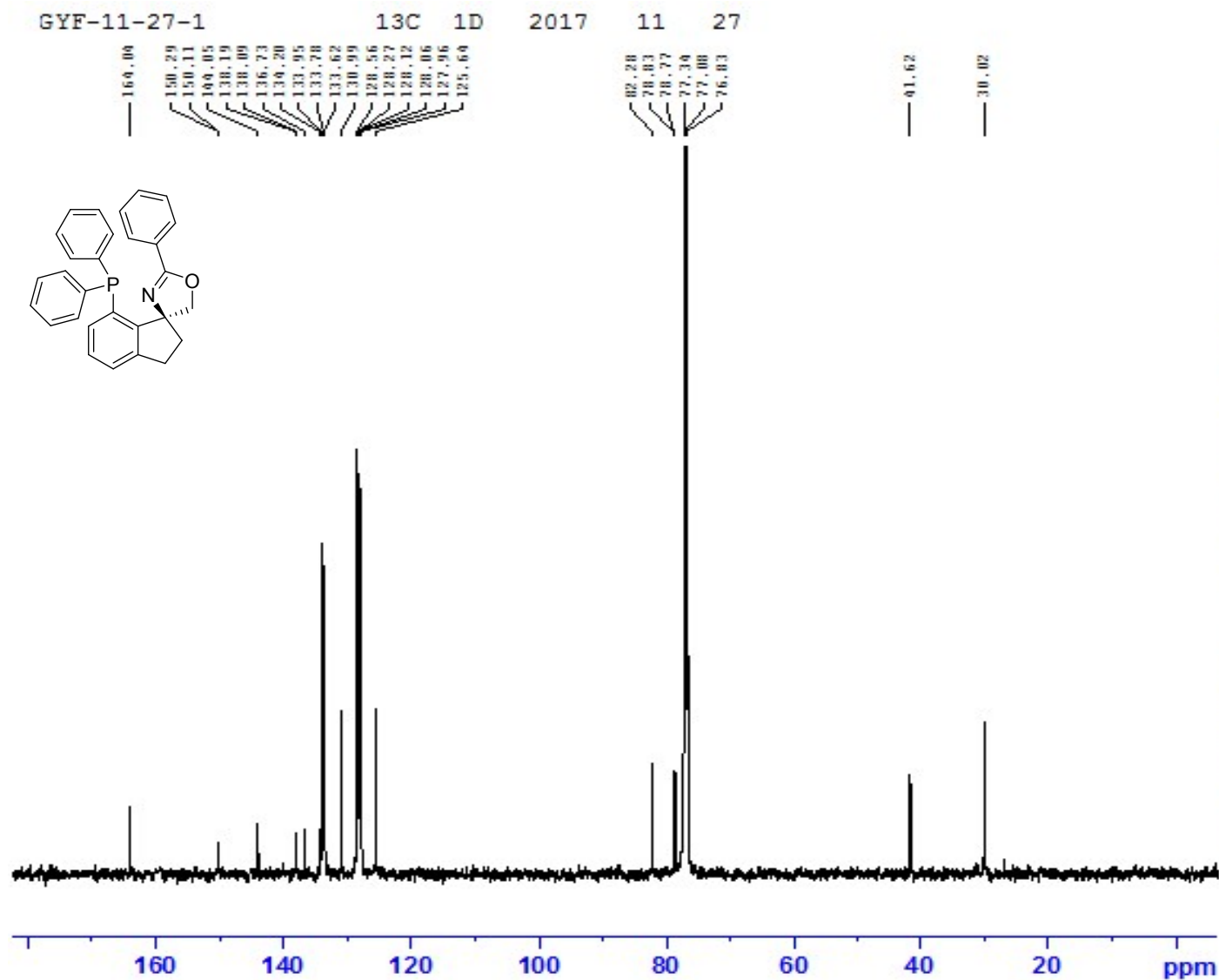
GYF-3-19-3 1H 2018 03 19



```

NAME          GYF-3-19-3
EXPNO         1
PROCNO        1
Date_         20180319
Time_         15.26
INSTRUM       spect
PROBHD        5 mm PABBO BB-
PULPROG       zg30
TD            16384
SOLVENT       CDCl3
NS            8
DS            1
SWH           10000.000 Hz
FIDRES        0.610352 Hz
AQ            0.8193000 sec
RG            575
DW            50.000 usec
DE            6.00 usec
TE            293.5 K
D1            2.00000000 sec
TD0           1

===== CHANNEL f1 =====
NUC1          1H
P1            13.00 usec
PL1           2.00 dB
SF01          500.0335010 MHz
SI            16384
SF            500.0300106 MHz
WDW           no
SSB           0
LB            0.00 Hz
GB            0
PC            2.00
    
```



```

NAME      GYF-11-27-2
EXPNO     2
PROCNO    1
Date_     20171127
Time      16.08
INSTRUM    spect
PROBHD     5 mm PABBO BB-
PULPROG    zgpg30
TD         65536
SOLVENT    CDCl3
NS         723
DS         2
SWH        32679.738 Hz
FIDRES     0.498653 Hz
AQ         1.0027661 sec
RG         5790
DW         15.300 usec
DE         6.00 usec
TE         673.2 K
D1         2.00000000 sec
d11        0.03000000 sec
DELTA      1.89999998 sec
TD0        10
  
```

```

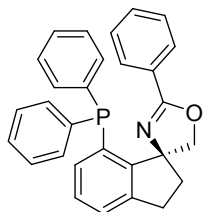
===== CHANNEL f1 =====
NUC1      13C
P1        12.20 usec
PL1       3.00 dB
SFO1      125.7464750 MHz
  
```

```

===== CHANNEL f2 =====
CPDPRG2   waltz16
NUC2      1H
PCPD2     80.00 usec
PL2       2.00 dB
PL12      17.70 dB
PL13      17.70 dB
SFO2      500.0355000 MHz
SI        32768
SF        125.7326386 MHz
WDW       EM
SSB       0
LB        6.00 Hz
GB        0
PC        2.00
  
```

GYF-3-26-1

31P 1D 2018 03 28



-20.327



NAME GYF-3-26-1
EXPNO 8
PROCNO 1
Date_ 20180328
Time_ 11.35
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgdc
TD 32768
SOLVENT CDC13
NS 100
DS 2
SWH 100000.000 Hz
FIDRES 3.051758 Hz
AQ 0.1638950 sec
RG 23100
DW 5.000 usec
DE 6.00 usec
TE 296.2 K
D1 2.00000000 sec
d11 0.03000000 sec
TDO 1

===== CHANNEL f1 =====
NUC1 31P
P1 13.40 usec
PL1 3.00 dB
SF01 202.4158540 MHz

===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 2.00 dB
PL12 17.70 dB
SF02 500.0335010 MHz
SI 32768
SF 202.4158455 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 5.00

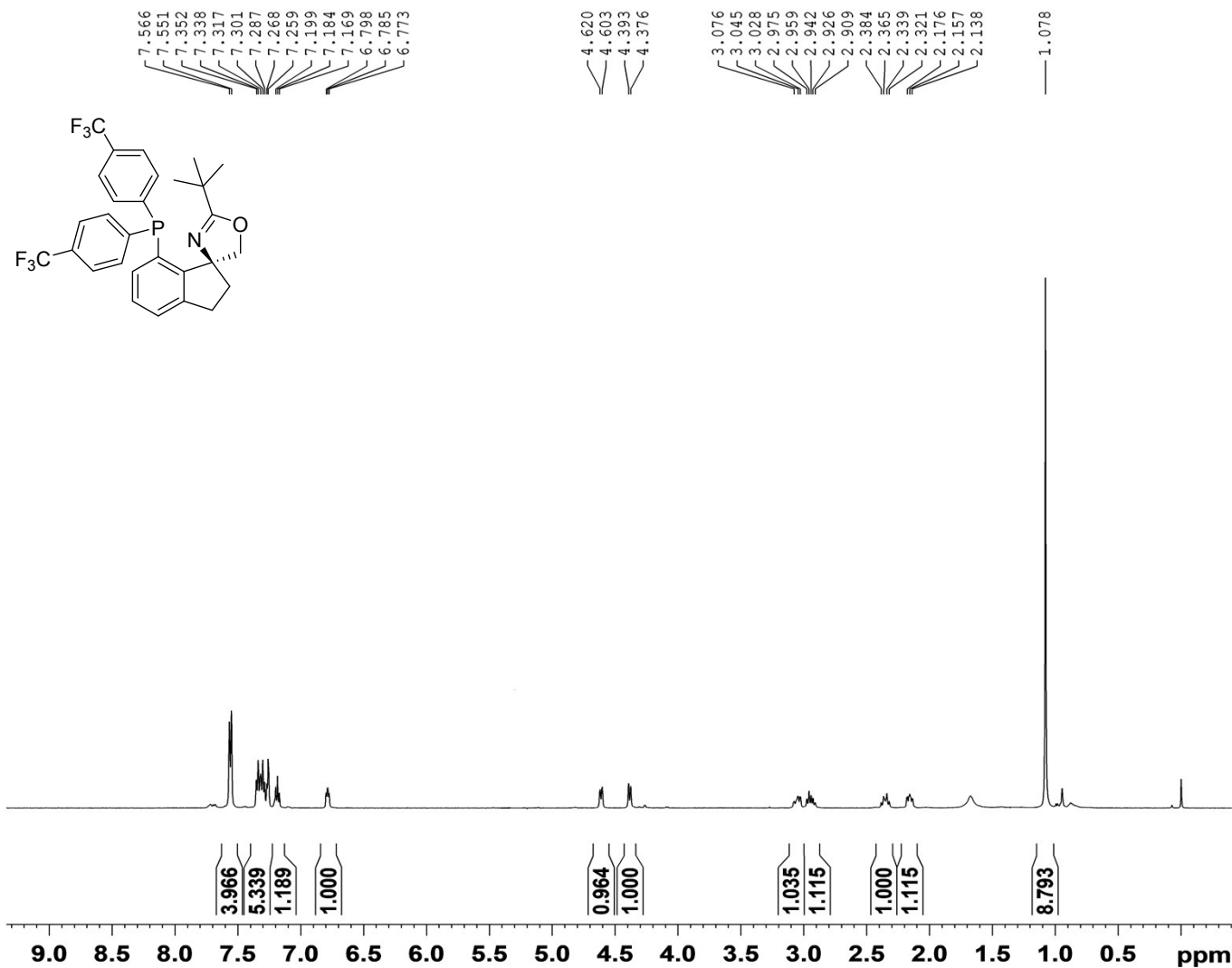
200 150 100 50 0 -50 -100 -150 -200 ppm

(S)-7-(bis(4-(trifluoromethyl)phenyl)phosphino)-2'-(tert-butyl)-2,3-dihydro-5'H-spiro[indene-1,4'-oxazole] (**L4**)

QZX-4-70-1

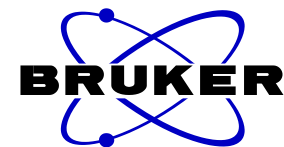
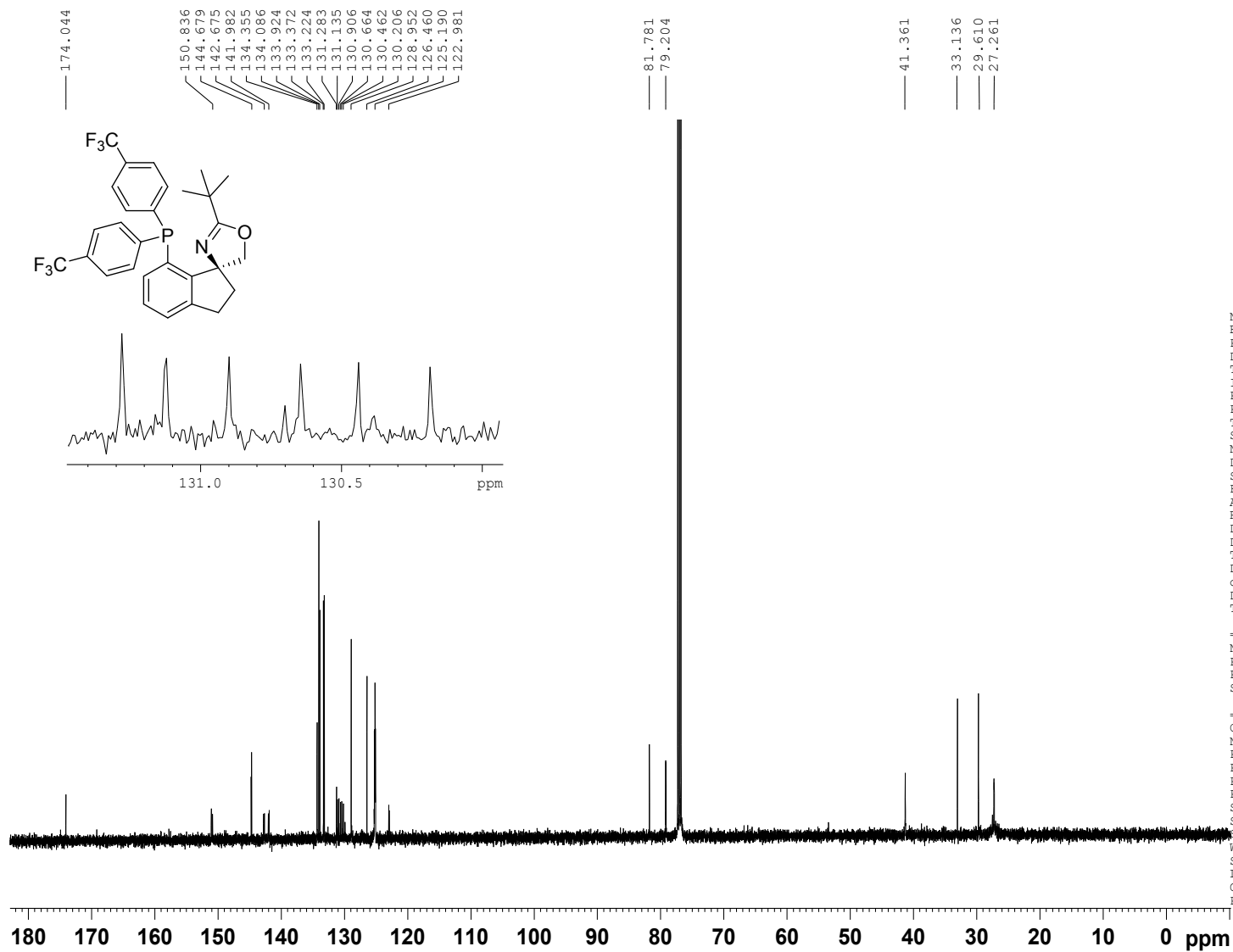
1H

2018 07 05



NAME QZX-4-70-1
EXPNO 1
PROCNO 1
Date_ 20180705
Time 15.37
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 16384
SOLVENT CDC13
NS 8
DS 0
SWH 10000.000 Hz
FIDRES 0.610352 Hz
AQ 0.8193000 sec
RG 362
DW 50.000 usec
DE 6.00 usec
TE 297.2 K
D1 2.00000000 sec
TD0 1

===== CHANNEL f1 =====
NUC1 1H
P1 13.00 usec
PL1 2.00 dB
SF01 500.0335010 MHz
SI 16384
SF 500.0300107 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 2.00



```

NAME      QZX-4-70-1
EXPNO     2
PROCNO    1
Date_     20180706
Time      13.14
INSTRUM   spect
PROBHD    5 mm PABBO BB-
PULPROG   zgpg30
TD        65536
SOLVENT   CDCl3
NS         2512
DS         1
SWH        32679.738 Hz
FIDRES     0.498653 Hz
AQ         1.0027661 sec
RG         7290
DW         15.300 usec
DE         6.00 usec
TE         298.1 K
D1         2.00000000 sec
d11        0.03000000 sec
DELTA     1.89999998 sec
TD0        20

```

```

===== CHANNEL f1 =====
NUC1       13C
P1         12.20 usec
PL1        3.00 dB
SFO1       125.7464750 MHz

```

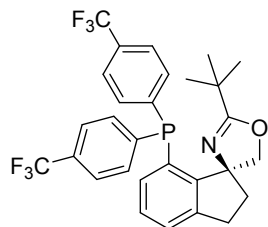
```

===== CHANNEL f2 =====
CPDPRG2    waltz16
NUC2        1H
PCPD2       80.00 usec
PL2         2.00 dB
PL12        17.70 dB
PL13        17.70 dB
SFO2       500.0355000 MHz
SI          32768
SF          125.7326392 MHz
WDW         no
SSB         0
LB          0.00 Hz
GB          0
PC          1.00

```

QZX-4-70-1

31P 1D 2018 07 10



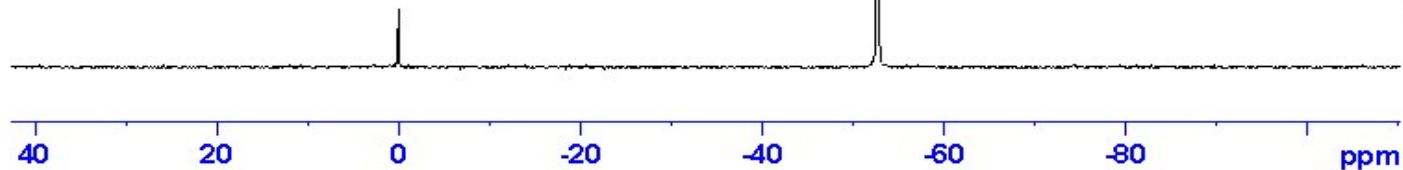
— -52.611



NAME QZX-4-70-1
EXPNO 8
PROCNO 1
Date_ 20180710
Time 11.37
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgdc
TD 32768
SOLVENT CDC13
NS 200
DS 2
SWH 100000.000 Hz
FIDRES 3.051758 Hz
AQ 0.1638950 sec
RG 23100
DW 5.000 usec
DE 6.00 usec
TE 297.9 K
D1 2.00000000 sec
d11 0.03000000 sec
TD0 2

===== CHANNEL f1 =====
NUC1 31P
P1 13.40 usec
PL1 3.00 dB
SF01 202.4158540 MHz

===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 2.00 dB
PL12 17.70 dB
SF02 500.0335010 MHz
SI 32768
SF 202.4222161 MHz
WDW EM
SSB 0
LB 12.00 Hz
GB 0
PC 5.00

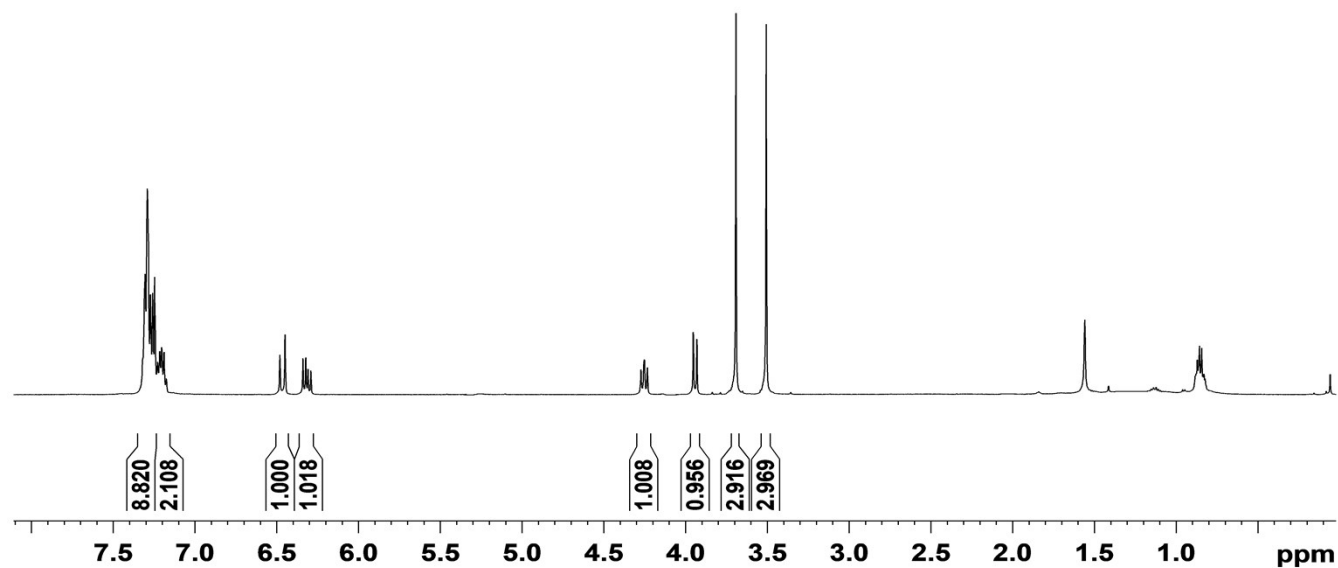
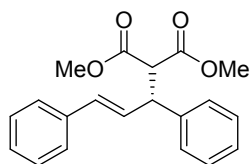


(*R,E*)-dimethyl 2-(1,3-diphenylallyl)malonate (**12a**)

QZX-4-56 1H 1D 2018 05 08

7.319
7.305
7.291
7.273
7.258
7.247
7.229
7.215
7.203
7.189
7.175
6.482
6.451
6.341
6.324
6.310
6.293

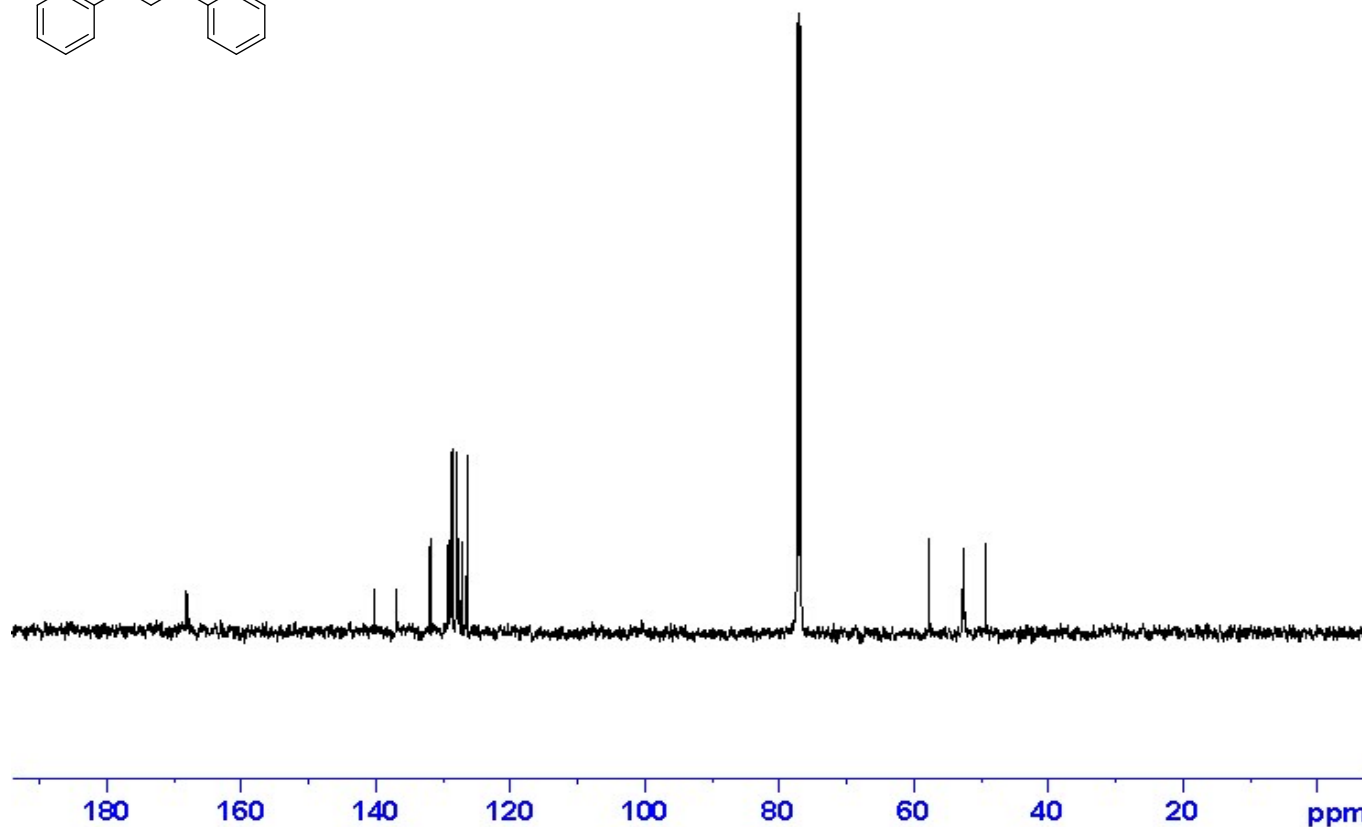
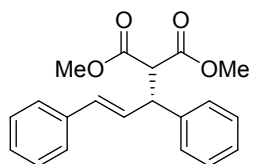
4.274
4.253
4.235
3.954
3.932
3.693
3.508



NAME QZX-4-56
EXPNO 1
PROCNO 1
Date_ 20180509
Time_ 16.22
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 16384
SOLVENT CDCl3
NS 8
DS 0
SWH 10000.000 Hz
FIDRES 0.610352 Hz
AQ 0.8193000 sec
RG 406
DW 50.000 usec
DE 8.00 usec
TE 295.1 K
D1 2.00000000 sec
TD0 1

===== CHANNEL f1 =====
NUC1 1H
P1 13.00 usec
PL1 2.00 dB
SFO1 500.0335000 MHz
SI 16384
SF 500.0300167 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

QZX-4-56 13C 1D 2018 0525



NAME QZX-4-56
EXPNO 2
PROCNO 1
Date_ 20180525
Time_ 16.30
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDC13
NS 202
DS 2
SWH 32679.738 Hz
FIDRES 0.498653 Hz
AQ 1.0027661 sec
RG 3250
DW 15.300 usec
DE 6.00 usec
TE 297.7 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
TD0 10

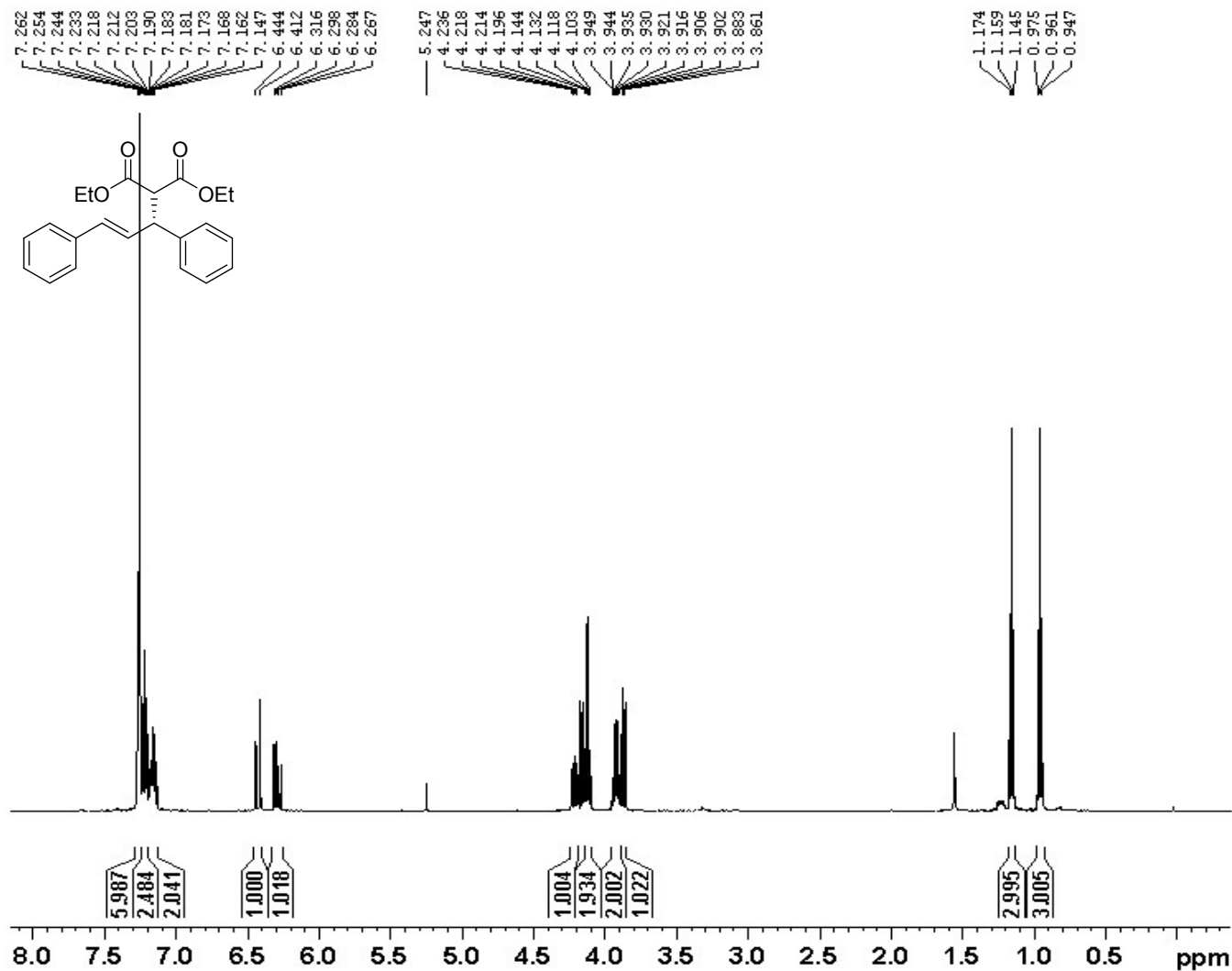
===== CHANNEL f1 =====
NUC1 13C
P1 12.20 usec
PL1 3.00 dB
SF01 125.7464750 MHz

===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 2.00 dB
PL12 17.70 dB
PL13 17.70 dB
SF02 500.0355000 MHz
SI 32768
SF 125.7326299 MHz
WDW EM
SSB 0
LB 6.00 Hz
GB 0
PC 2.00

(*R,E*)-diethyl 2-(1,3-diphenylallyl)malonate (**12b**)

QZX-4-58B2

1H 1D 2018 04 10

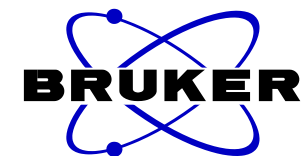
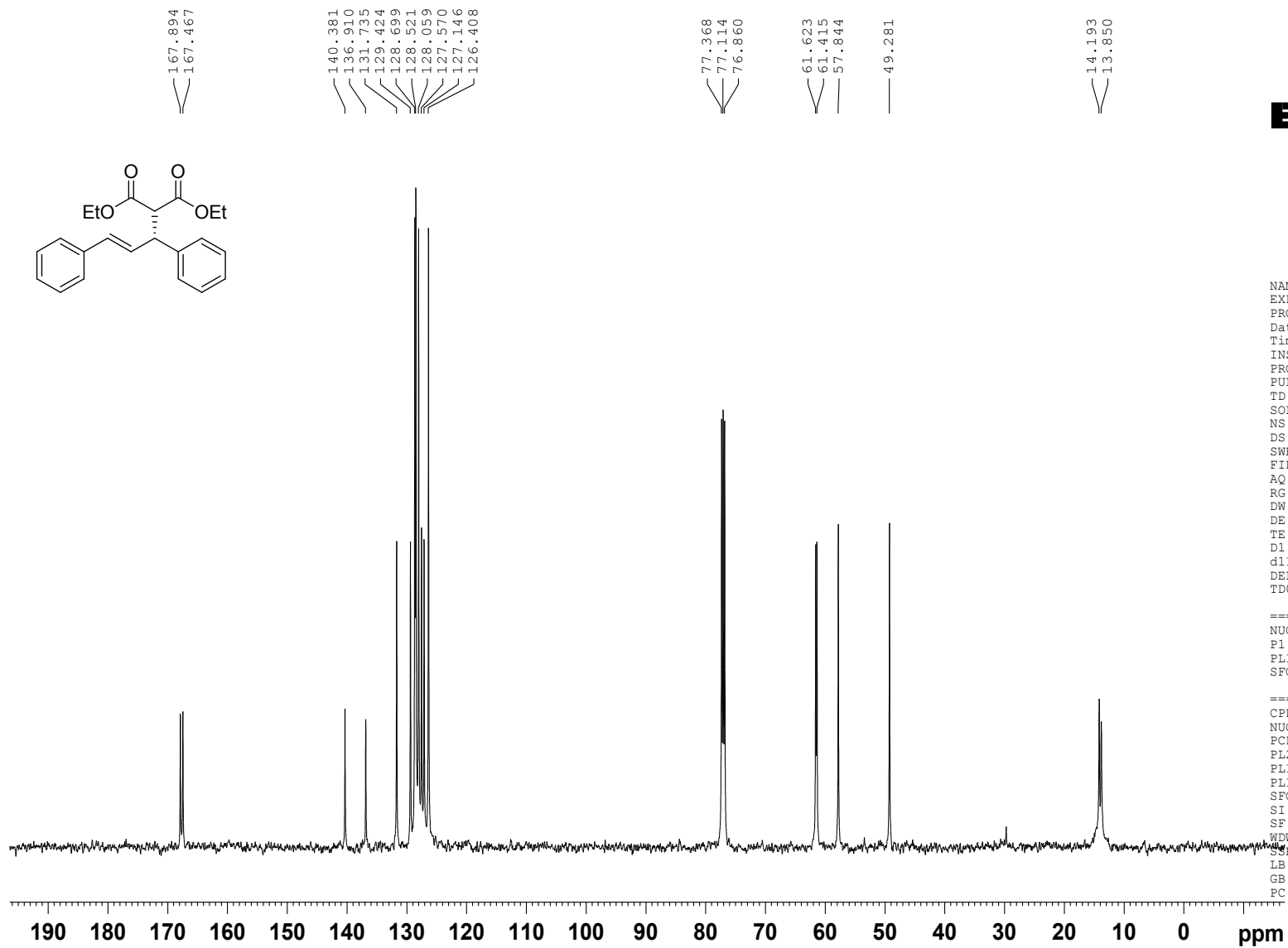
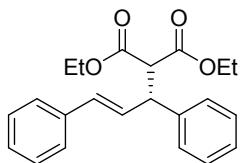


```

NAME          QZX-4-58B2
EXPNO         1
PROCNO        1
Date_         20180410
Time_         16.49
INSTRUM       spect
PROBHD        5 mm PABBO BB-
PULPROG       zg30
TD            16384
SOLVENT       CDC13
NS            8
DS            0
SWH           10000.000 Hz
FIDRES        0.610352 Hz
AQ            0.8193000 sec
RG            203
DW            50.000 usec
DE            8.00 usec
TE            295.2 K
D1            2.00000000 sec
TDO           1
  
```

```

===== CHANNEL f1 =====
NUC1          1H
P1            13.00 usec
PL1           2.00 dB
SF01          500.0335000 MHz
SI            16384
SF            500.0300345 MHz
WDW           EM
SSB           0
LB            0.30 Hz
GB            0
PC            1.00
  
```



```

NAME          QZX-12B
EXPNO         2
PROCNO        1
Date_         20180926
Time          17.13
INSTRUM       spect
PROBHD        5 mm PADUL 13C
PULPROG       zgpg30
TD            65536
SOLVENT       CDC13
NS            200
DS            1
SWH           32679.738 Hz
FIDRES        0.498653 Hz
AQ            1.0027661 sec
RG            8200
DW            15.300 usec
DE            6.00 usec
TE            297.7 K
D1            2.00000000 sec
d11           0.03000000 sec
DELTA         1.89999998 sec
TD0           10

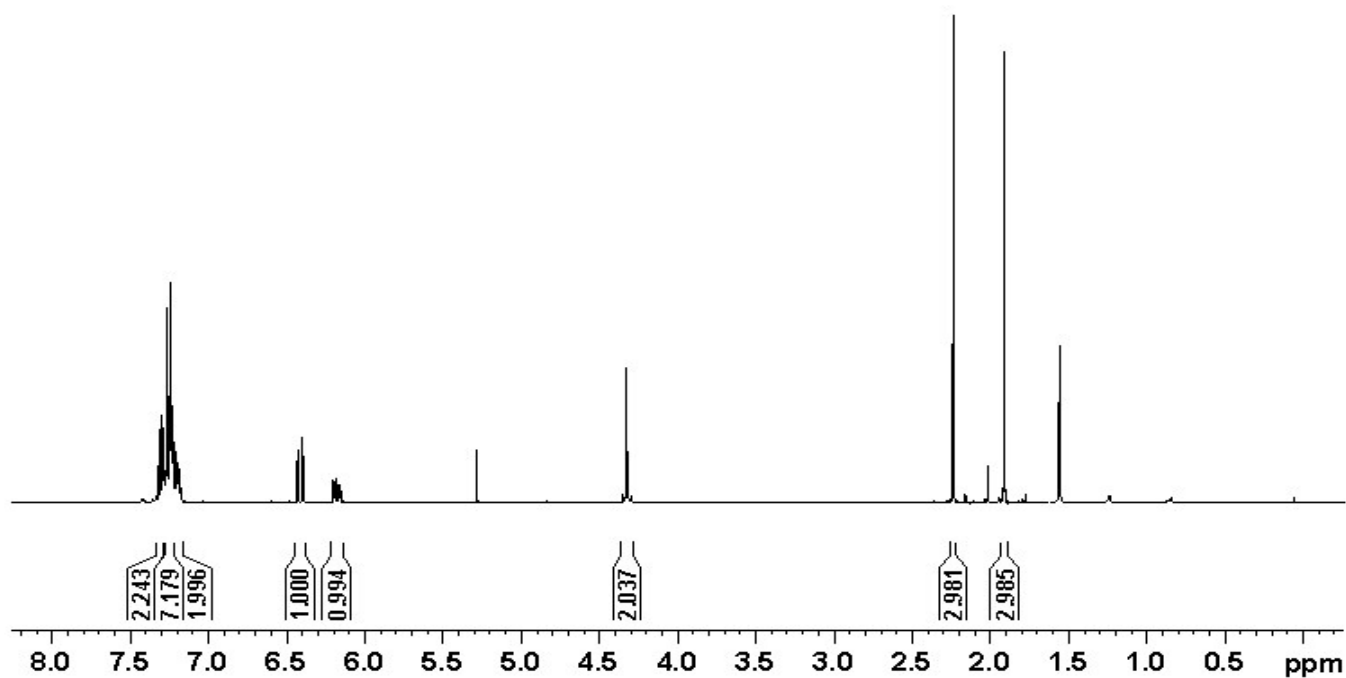
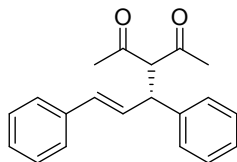
===== CHANNEL f1 =====
NUC1           13C
P1            12.20 usec
PL1            3.00 dB
SFO1          125.7464750 MHz

===== CHANNEL f2 =====
CPDPRG2       waltz16
NUC2           1H
PCPD2          80.00 usec
PL2            2.00 dB
PL12           17.70 dB
PL13           17.70 dB
SFO2          500.0355000 MHz
SI            32768
SF            125.7326392 MHz
WDW            EM
SSB            0
LB            10.00 Hz
GB            0
PC            1.00

```

(*R,E*)-3-(1,3-diphenylallyl)pentane-2,4-dione (**12c**)

QZX-4-58B1 1H 1D 2018 04 10



```

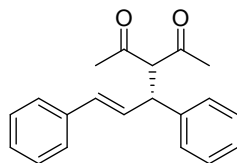
NAME          QZX-4-58B1
EXPNO         1
PROCNO        1
Date_         20180410
Time_         16.44
INSTRUM       spect
PROBHD        5 mm PABBO BB-
PULPROG       zg30
TD            16384
SOLVENT       CDCl3
NS            8
DS            0
SWH           10000.000 Hz
FIDRES        0.610352 Hz
AQ            0.8193000 sec
RG            406
DW            50.000 usec
DE            8.00 usec
TE            295.2 K
D1            2.00000000 sec
TD0           1
    
```

```

===== CHANNEL f1 =====
NUC1          1H
P1            13.00 usec
PL1           2.00 dB
SF01          500.0335000 MHz
SI            16384
SF            500.0300177 MHz
WDW           EM
SSB           0
LB            0.30 Hz
GB            0
PC            1.00
    
```

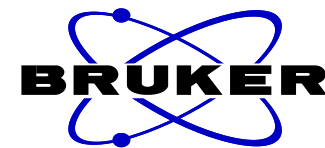
QZX-4-58B1

13C 2018 05 29

202.93
202.77140.15
136.60
131.73
129.30
129.07
128.58
127.97
127.77
127.33
126.41

74.57

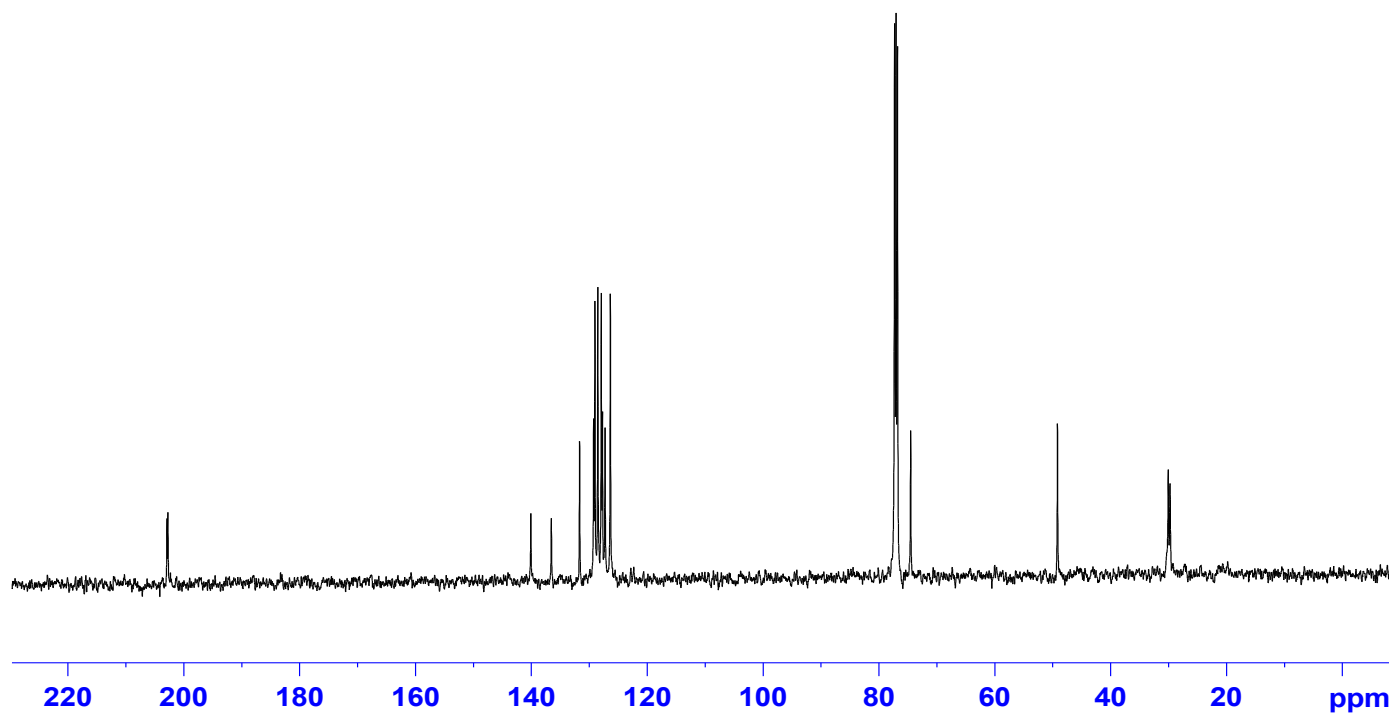
49.22

30.09
29.78

NAME QZX-4-58B1
EXPNO 2
PROCNO 1
Date_ 20180529
Time_ 10.41
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDC13
NS 202
DS 1
SWH 32679.738 Hz
FIDRES 0.498653 Hz
AQ 1.0027661 sec
RG 2890
DW 15.300 usec
DE 6.00 usec
TE 297.9 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
TD0 20

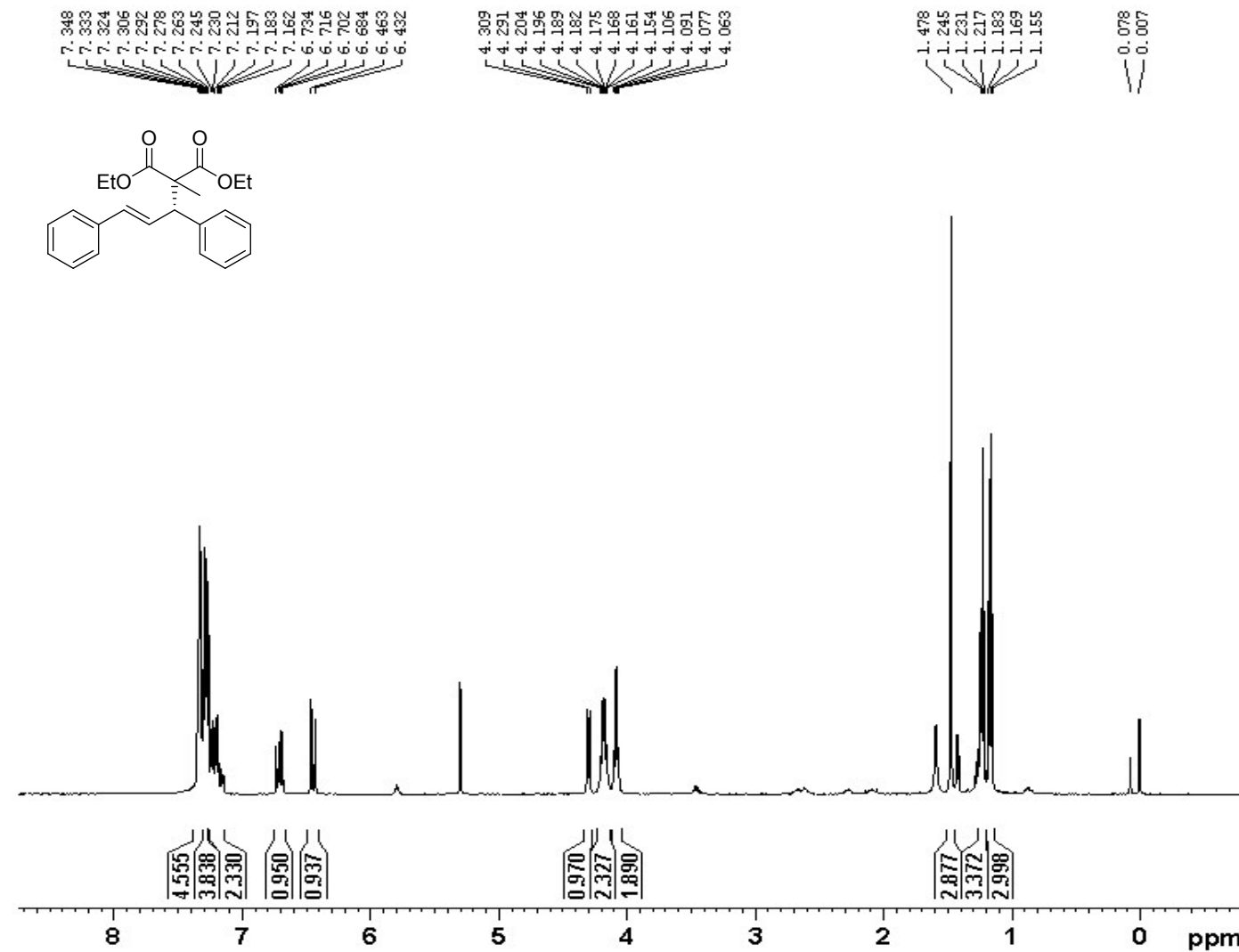
===== CHANNEL f1 =====
NUC1 13C
P1 12.20 usec
PL1 3.00 dB
SFO1 125.7464750 MHz

===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 2.00 dB
PL12 17.70 dB
PL13 17.70 dB
SFO2 500.0355000 MHz
SI 32768
SF 125.7326392 MHz
WDW EM
SSB 0
LB 10.00 Hz
GB 0
PC 1.00



(*S,E*)-diethyl 2-(1,3-diphenylallyl)-2-methylmalonate (**12d**)

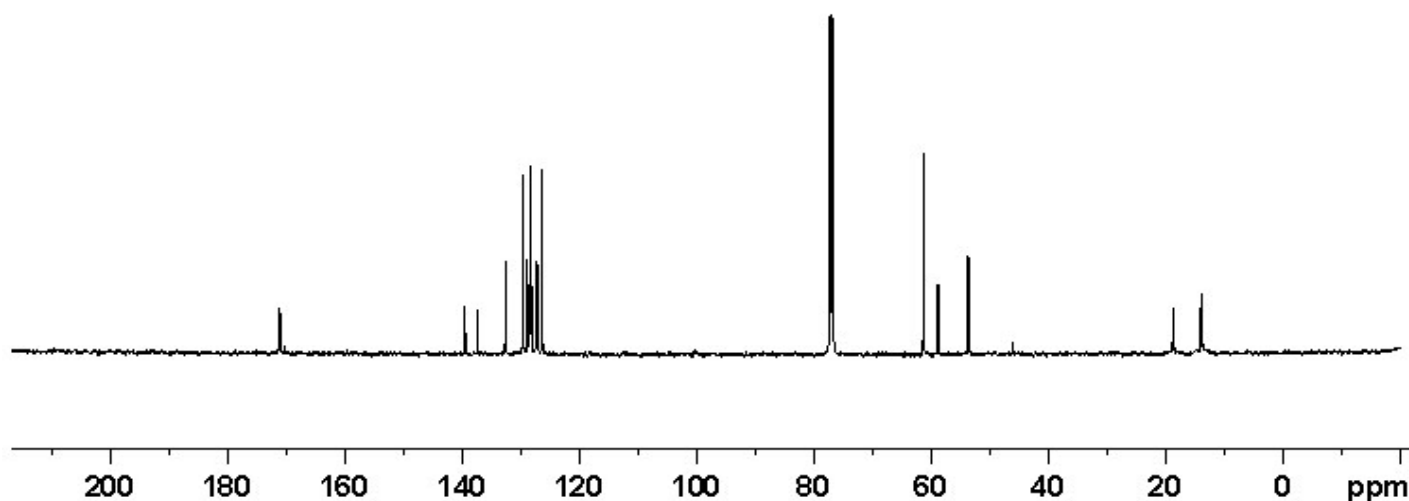
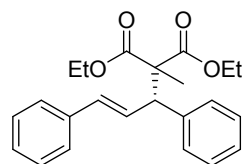
QZX-4-156 1H 2018 0607



NAME QZX-4-156
 EXPNO 1
 PROCNO 1
 Date_ 20180607
 Time_ 17.20
 INSTRUM spect
 PROBHD 5 mm PABBO BB-
 PULPROG zg30
 TD 16384
 SOLVENT CDCl3
 NS 8
 DS 1
 SWH 10000.000 Hz
 FIDRES 0.610352 Hz
 AQ 0.8193000 sec
 RG 322
 DW 50.000 usec
 DE 6.00 usec
 TE 296.6 K
 D1 2.00000000 sec
 TDO 1

===== CHANNEL f1 =====
 NUC1 1H
 P1 13.00 usec
 PL1 2.00 dB
 SF01 500.0335010 MHz
 SI 16384
 SF 500.0300089 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00

QZX-4-169

¹³C 1D171.159
170.899201806
139.427
137.288
132.549
129.578
128.813
128.398
128.165
127.276
127.066
126.29777.255
77.001
76.74761.301
58.848
53.67818.770
13.970

```

NAME          QZX-4-169
EXPNO          2
PROCNO         1
Date_          20180613
Time           14.29
INSTRUM        spect
PROBHD         5 mm PABBO BB-
PULPROG        zgpg30
TD             65536
SOLVENT        CDCl3
NS             824
DS             2
SWH            32679.728 Hz
FIDRES         0.498652 Hz
AQ            1.0027661 sec
RG             3250
DQ            15.300 usec
DE             6.00 usec
TE            297.4 K
D1            4.0000000 sec
d11            0.0300000 sec
DELTA         2.9000010 sec
TD0            10

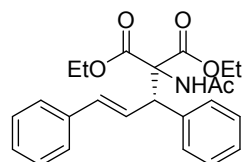
===== CHANNEL f1 =====
NUC1           13C
P1            12.20 usec
PL1           2.00 dB
SFO1          125.7464750 MHz

===== CHANNEL f2 =====
CPDPRG2        waltz16
NUC2           1H
PCPD2          80.00 usec
PL2           2.00 dB
PLL2          17.70 dB
PLL3          17.70 dB
SFO2          500.0355000 MHz
SI            32768
SF           125.7326504 MHz
WDW            EM
SSB            0
LB            6.00 Hz
GB            0
PC            2.00

```

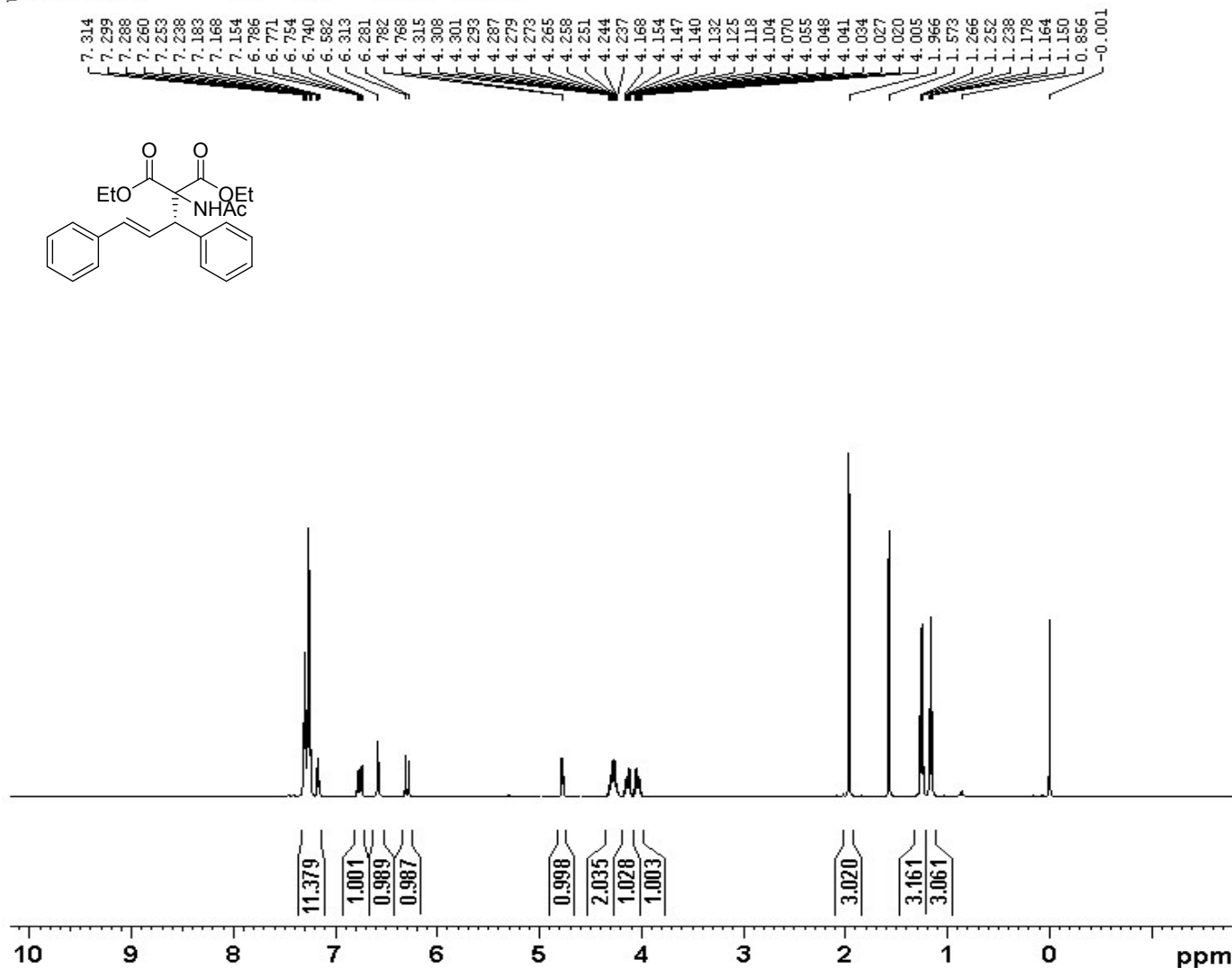
(*S,E*)-diethyl 2-acetoamido-2-(1,3-diphenyl-2-propenyl)malonate (**12e**)

QZX-4-139 1H 1D 2018 05 30



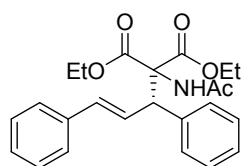
NAME QZX-4-139
EXPNO 1
PROCNO 1
Date_ 20180530
Time_ 13.47
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 16384
SOLVENT CDCl3
NS 8
DS 0
SWH 10000.000 Hz
FIDRES 0.610352 Hz
AQ 0.8193000 sec
RG 724
DW 50.000 usec
DE 8.00 usec
TE 296.7 K
D1 2.00000000 sec
TD0 1

===== CHANNEL f1 =====
NUC1 1H
P1 13.00 usec
PL1 2.00 dB
SF01 500.0335000 MHz
SI 16384
SF 500.0300107 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



QZX-4-139

13C 2018 05 31



169.02
167.50
167.14

138.36
137.58
132.36
129.54
128.78
128.44
128.38
127.58
127.20
126.41

68.97
62.66
62.47
53.05

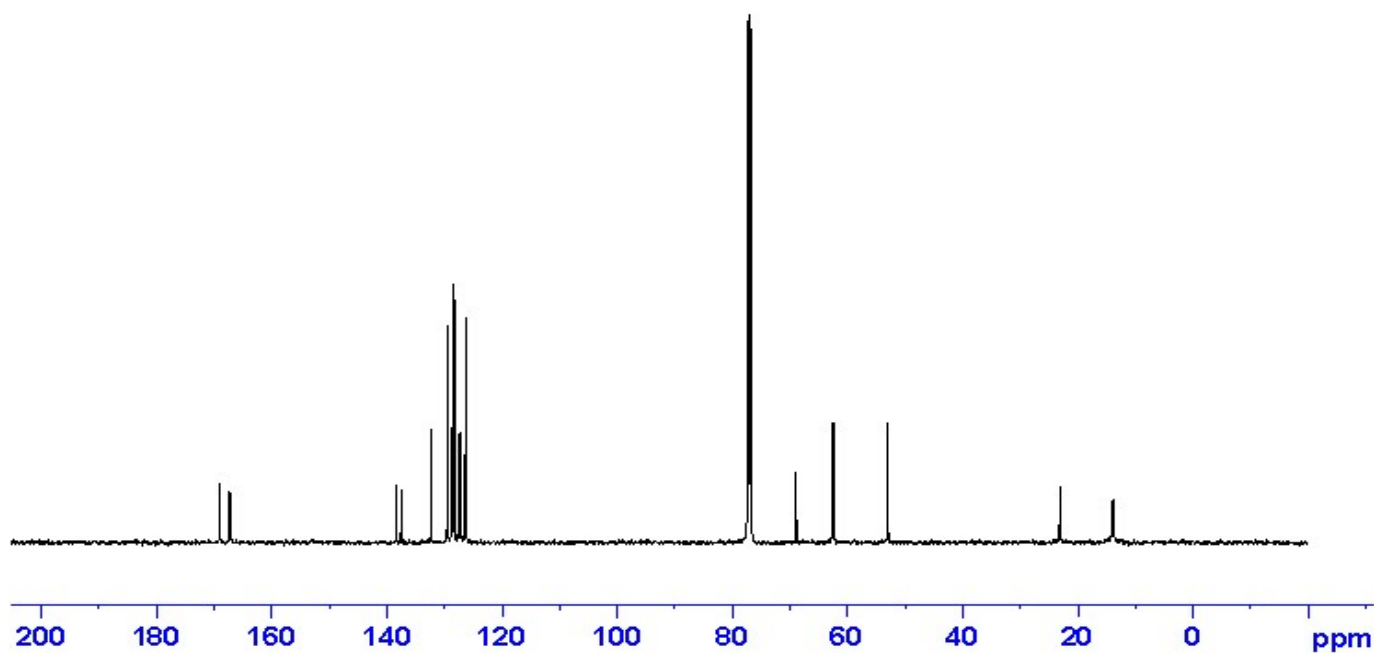
23.18
14.09
13.87



NAME QZX-4-139
EXPNO 2
PROCNO 1
Date_ 20180531
Time_ 19.44
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 1007
DS 1
SWH 32679.738 Hz
FIDRES 0.498653 Hz
AQ 1.0027661 sec
RG 2050
DW 15.300 usec
DE 6.00 usec
TE 297.6 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
TDO 20

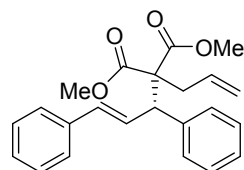
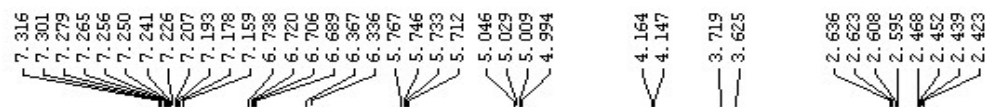
===== CHANNEL f1 =====
NUC1 13C
P1 12.20 usec
PL1 3.00 dB
SF01 125.7464750 MHz

===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 2.00 dB
PL12 17.70 dB
PL13 17.70 dB
SF02 500.0355000 MHz
SI 32768
SF 125.7326392 MHz
WDW EM
SSB 0
LB 6.00 Hz
GB 0
PC 1.00



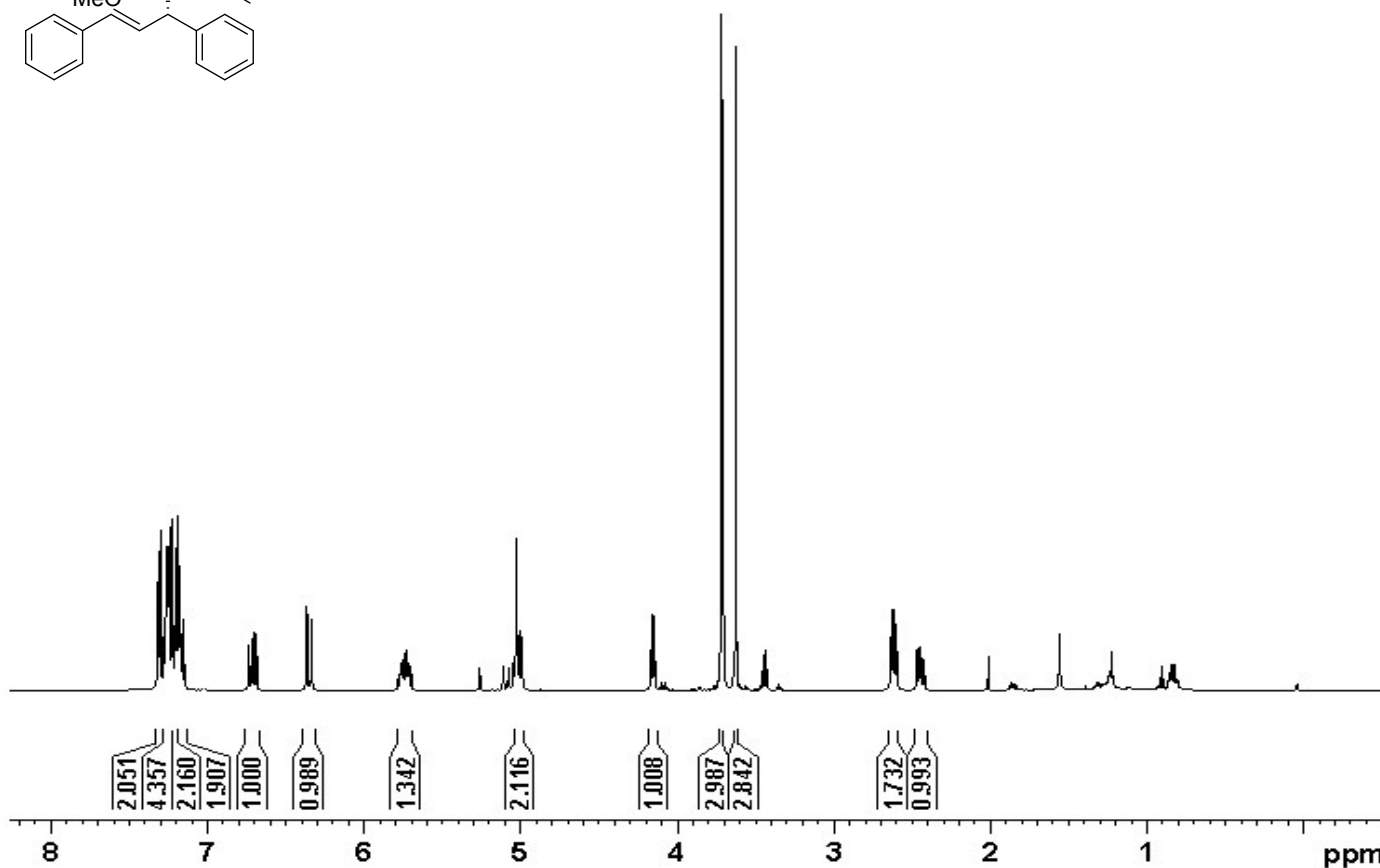
(*S,E*)-diethyl 2-allyl-2-(1,3-diphenylallyl)malonate (**12f**)

QZX-4-94 1H 1D 2018 05 08

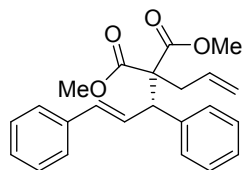


NAME QZX-4-94
EXPNO 1
PROCNO 1
Date_ 20180509
Time_ 16.20
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 16384
SOLVENT CDCl3
NS 8
DS 0
SWH 10000.000 Hz
FIDRES 0.610352 Hz
AQ 0.8193000 sec
RG 203
DW 50.000 usec
DE 8.00 usec
TE 295.1 K
D1 2.00000000 sec
TD0 1

===== CHANNEL f1 =====
NUC1 1H
P1 13.00 usec
PL1 2.00 dB
SF01 500.0335000 MHz
SI 16384
SF 500.0300271 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



QZX-4-94 13C 1D 2018 0515



170.55
170.45
169.25

139.11
137.34
133.86
133.22
132.19
129.32
129.15
128.36
127.25
126.33
118.59
117.63

77.27
77.02
76.76

63.22

53.71
52.47
52.08
51.34

39.41

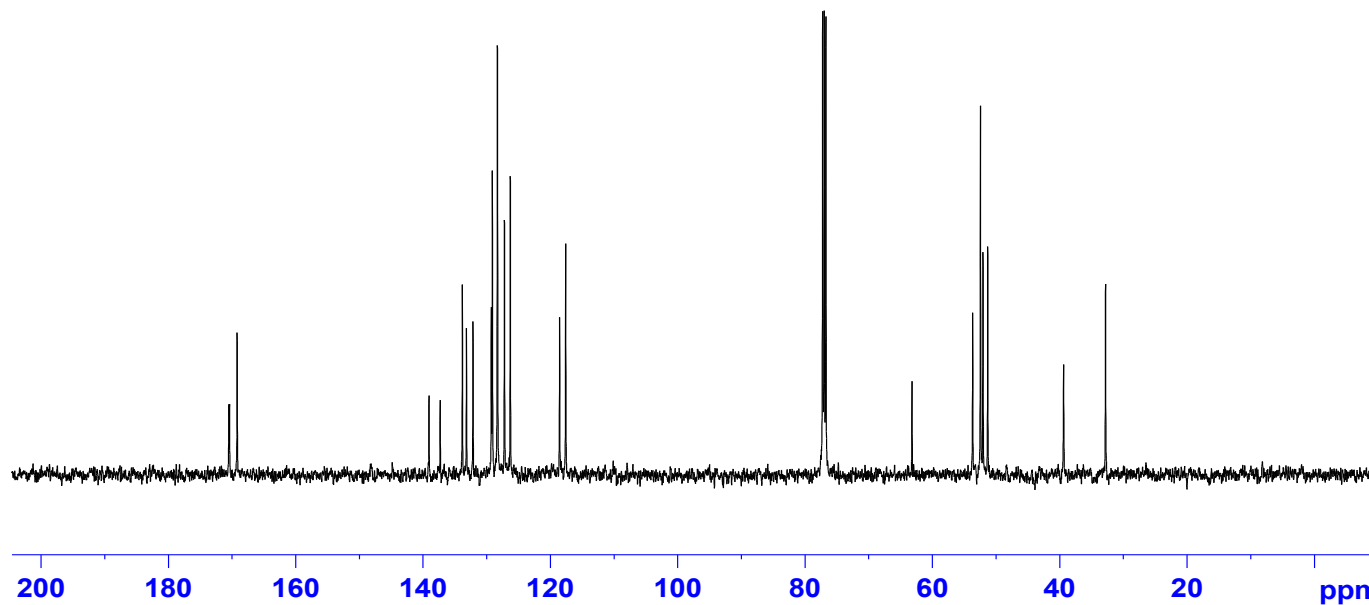
32.83



NAME QZX-4-94
EXPNO 2
PROCNO 1
Date_ 20180515
Time_ 20.05
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDC13
NS 100
DS 2
SWH 32679.738 Hz
FIDRES 0.498653 Hz
AQ 1.0027661 sec
RG 3250
DW 15.300 usec
DE 6.00 usec
TE 296.4 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
TD0 10

===== CHANNEL f1 =====
NUC1 13C
P1 12.20 usec
PL1 3.00 dB
SFO1 125.7464750 MHz

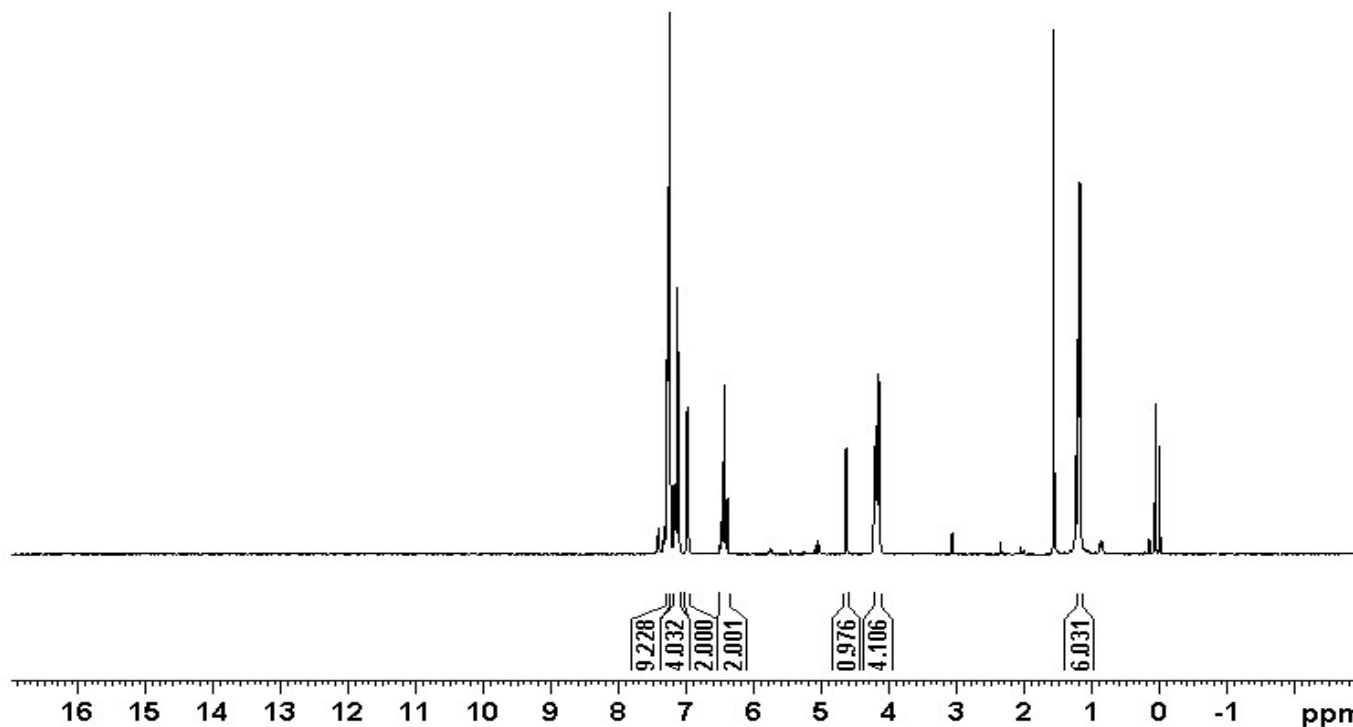
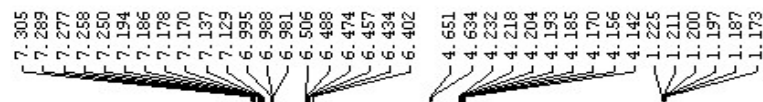
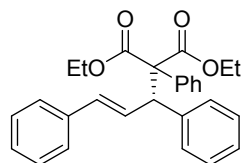
===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 2.00 dB
PL12 17.70 dB
PL13 17.70 dB
SFO2 500.0355000 MHz
SI 32768
SF 125.7326504 MHz
WDW EM
SSB 0
LB 6.00 Hz
GB 0
PC 2.00



(*S,E*)-diethyl 2-(1,3-diphenylallyl)-2-phenylmalonate (**12g**)

QZX-4-183

1H 2018 06 28

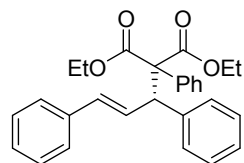


```

NAME          QZX-4-183
EXPNO          1
PROCNO         1
Date_          20180628
Time_          15.03
INSTRUM        spect
PROBHD         5 mm PABBO BB-
PULPROG        zg30
TD             16384
SOLVENT        CDCl3
NS              8
DS              1
SWH            10000.000 Hz
FIDRES         0.610352 Hz
AQ             0.8193000 sec
RG             322
DW             50.000 usec
DE             6.00 usec
TE             295.7 K
D1             1.00000000 sec
TD0            1

===== CHANNEL f1 =====
NUC1           1H
P1             13.00 usec
PL1            2.00 dB
SF01           500.0335010 MHz
SI             16384
SF             500.0300096 MHz
WDW            EM
SSB            0
LB             0.30 Hz
GB             0
PC             2.00
    
```

QZX-4-183 13C 1D 2018 06 29



169.71
169.57

139.40
137.35
135.43
132.53
130.14
129.51
129.00
128.37
127.54
127.44
127.24
126.82
126.27

77.25
77.00
76.75
68.01
61.54
61.46
55.19
53.40

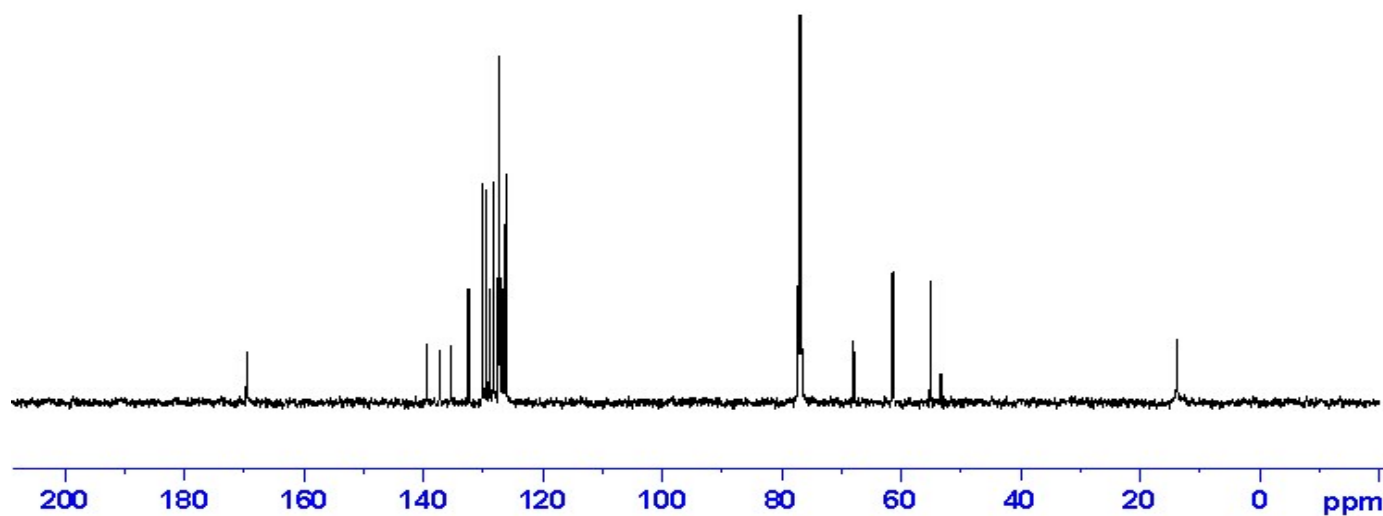
13.87



NAME QZX-4-183
EXPNO 2
PROCNO 1
Date_ 20180629
Time_ 17.35
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 205
DS 2
SWH 32679.738 Hz
FIDRES 0.498653 Hz
AQ 1.0027661 sec
RG 3250
DW 15.300 usec
DE 6.00 usec
TE 297.2 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
TD0 10

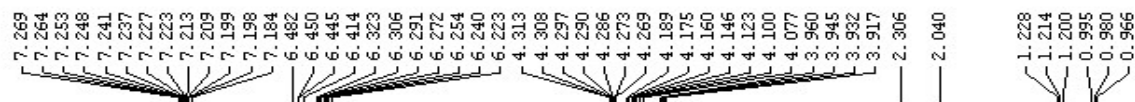
===== CHANNEL f1 =====
NUC1 13C
P1 12.20 usec
PL1 3.00 dB
SF01 125.7464750 MHz

===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 2.00 dB
PL12 17.70 dB
PL13 17.70 dB
SF02 500.0355000 MHz
SI 32768
SF 125.7326504 MHz
WDW EM
SSB 0
LB 6.00 Hz
GB 0
PC 2.00



(E)-ethyl 2-acetyl-3,5-diphenylpent-4-enoate (**12h**)

QZX-4-100 1H 1D 2018 05 14

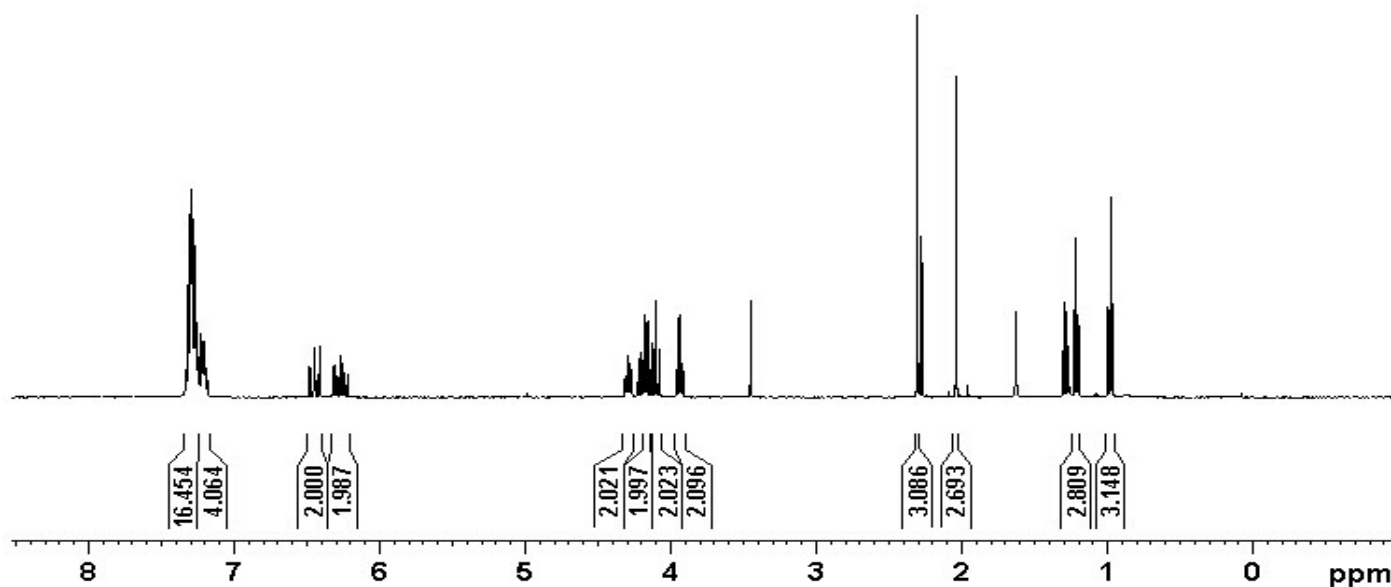


```

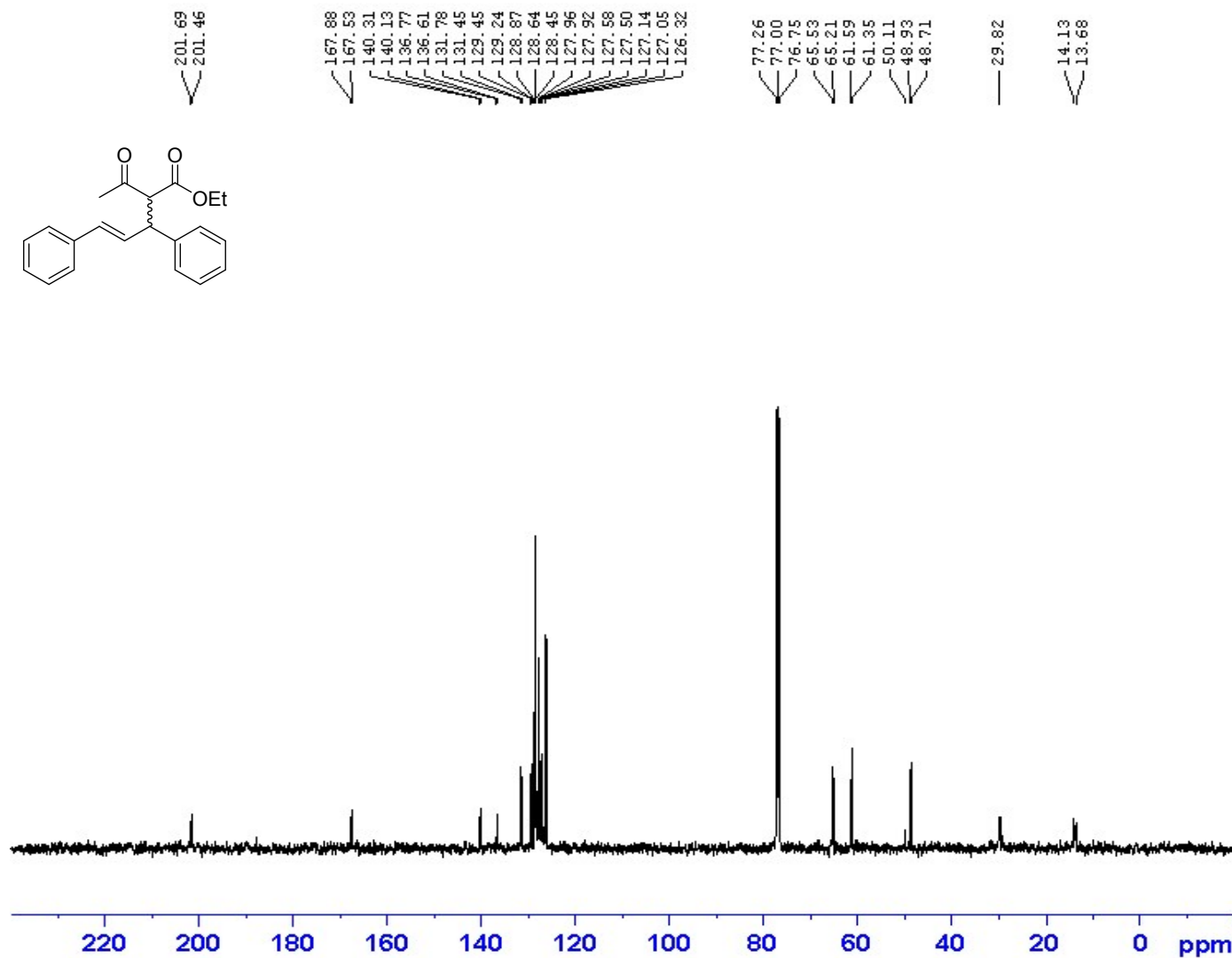
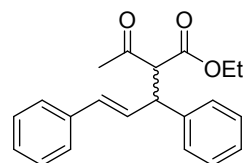
NAME          QZX-4-100
EXPNO         1
PROCNO        1
Date_         20180514
Time_         15.35
INSTRUM       spect
PROBHD        5 mm PABBO BB-
PULPROG       zg30
TD            16384
SOLVENT       CDCl3
NS            8
DS            0
SWH           10000.000 Hz
FIDRES        0.610352 Hz
AQ            0.8193000 sec
RG            203
DW            50.000 usec
DE            8.00 usec
TE            295.3 K
D1            2.00000000 sec
TD0           1
  
```

```

===== CHANNEL f1 =====
NUC1          1H
P1            13.00 usec
PL1           2.00 dB
SF01          500.0335000 MHz
SI            16384
SF            500.0300090 MHz
WDW           EM
SSB           0
LB            0.30 Hz
GB            0
PC            1.00
  
```



QZX-4-100 13C 1D 2018 0515



NAME QZX-4-100
EXPNO 2
PROCNO 1
Date_ 20180515
Time_ 20.59
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 200
DS 2
SWH 32679.738 Hz
FIDRES 0.498653 Hz
AQ 1.0027661 sec
RG 5160
DW 15.300 usec
DE 6.00 usec
TE 296.4 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
TDO 10

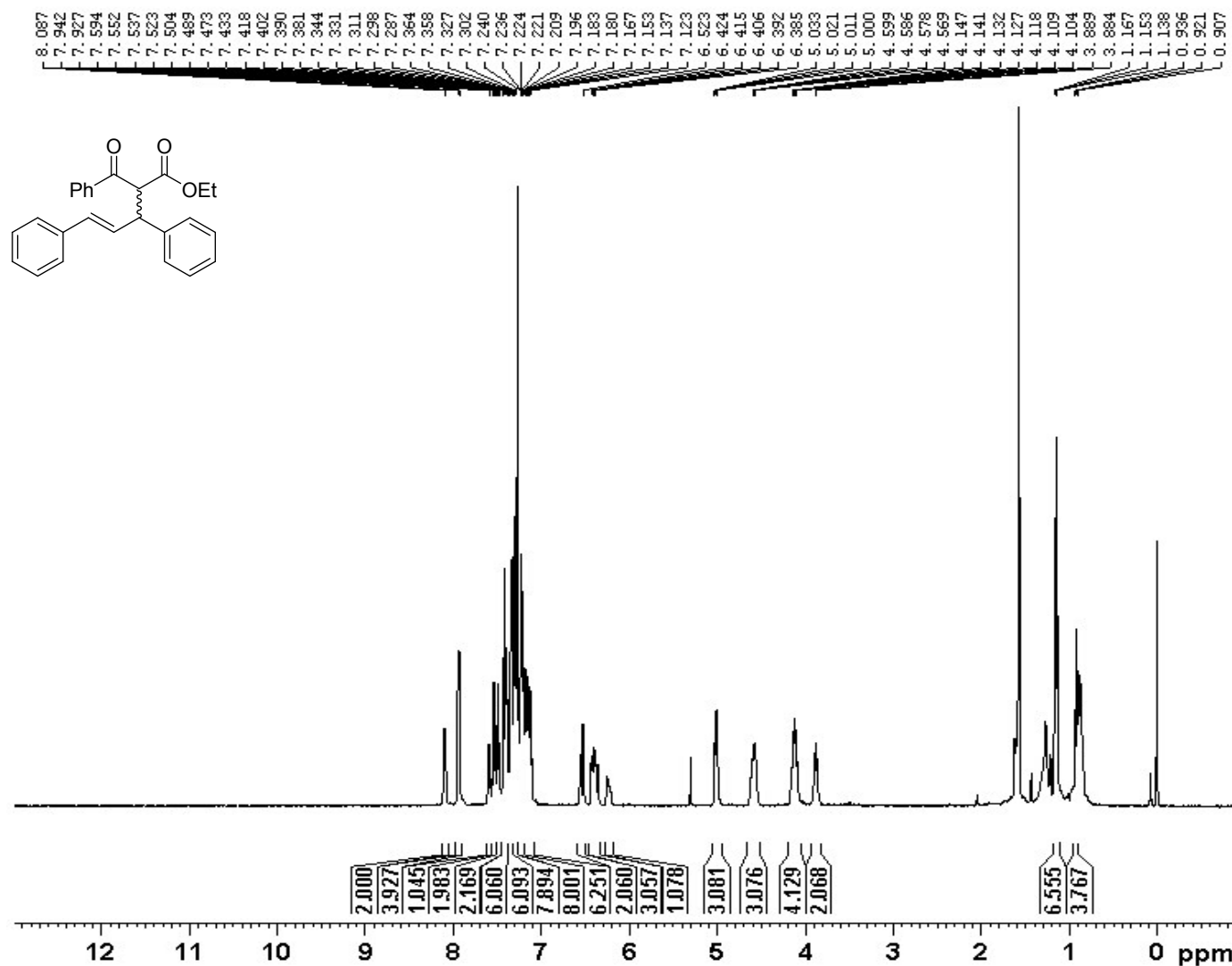
===== CHANNEL f1 =====
NUC1 13C
P1 12.20 usec
PL1 3.00 dB
SF01 125.7464750 MHz

===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 2.00 dB
PL12 17.70 dB
PL13 17.70 dB
SF02 500.0355000 MHz
SI 32768
SF 125.7326504 MHz
WDW EM
SSB 0
LB 6.00 Hz
GB 0
PC 2.00

(E)-ethyl 2-benzoyl-3,5-diphenylpent-4-enoate (**12i**)

QZX-4-164

1H 2018 06 14

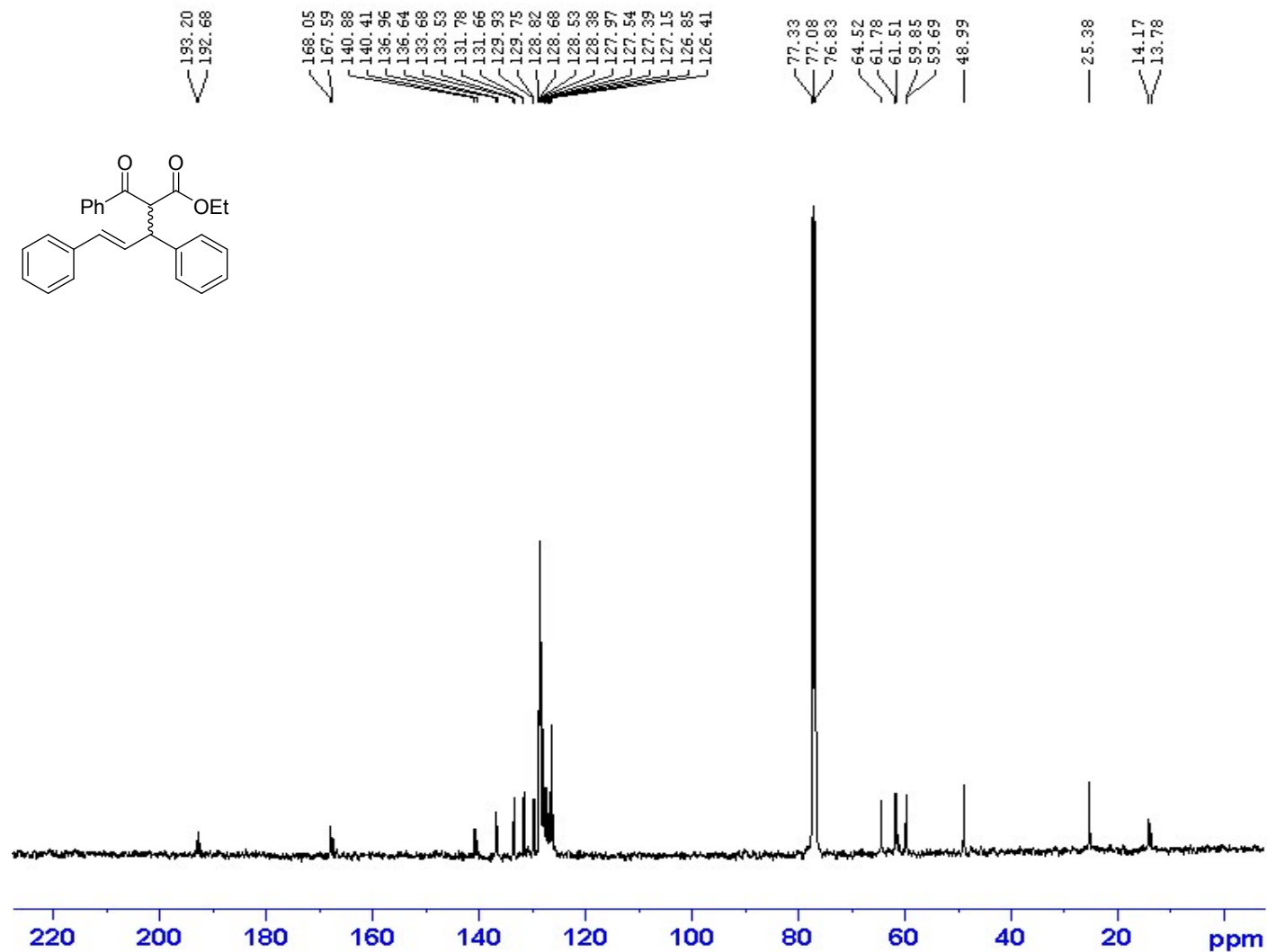
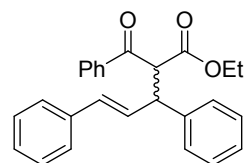


NAME QZX-4-164
EXPNO 1
PROCNO 1
Date_ 20180614
Time_ 15.26
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 16384
SOLVENT CDC13
NS 8
DS 0
SWH 10000.000 Hz
FIDRES 0.610352 Hz
AQ 0.8193000 sec
RG 724
DW 50.000 usec
DE 6.00 usec
TE 296.0 K
D1 1.00000000 sec
TD0 1

===== CHANNEL f1 =====
NUC1 1H
P1 13.00 usec
PL1 2.00 dB
SF01 500.0335010 MHz
SI 16384
SF 500.0300070 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 2.00

QZX-4-164

13C 2018 06 19



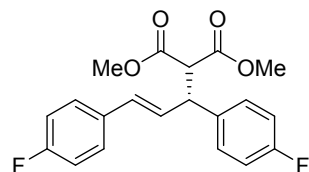
NAME QZX-4-164
 EXPNO 2
 PROCNO 1
 Date_ 20180619
 Time_ 10.39
 INSTRUM spect
 PROBHD 5 mm PABBO BB-
 PULPROG zgpg30
 TD 65536
 SOLVENT CDCl3
 NS 567
 DS 1
 SWH 32679.738 Hz
 FIDRES 0.498653 Hz
 AQ 1.0027661 sec
 RG 2050
 DW 15.300 usec
 DE 6.00 usec
 TE 297.0 K
 D1 2.00000000 sec
 d11 0.03000000 sec
 DELTA 1.89999998 sec
 TD0 20

===== CHANNEL f1 =====
 NUC1 13C
 P1 12.20 usec
 PL1 3.00 dB
 SF01 125.7464750 MHz

===== CHANNEL f2 =====
 CPDPRG2 waltz16
 NUC2 1H
 PCPD2 80.00 usec
 PL2 2.00 dB
 PL12 17.70 dB
 PL13 17.70 dB
 SF02 500.0355000 MHz
 SI 32768
 SF 125.7326392 MHz
 WDW EM
 SSB 0
 LB 10.00 Hz
 GB 0
 PC 1.00

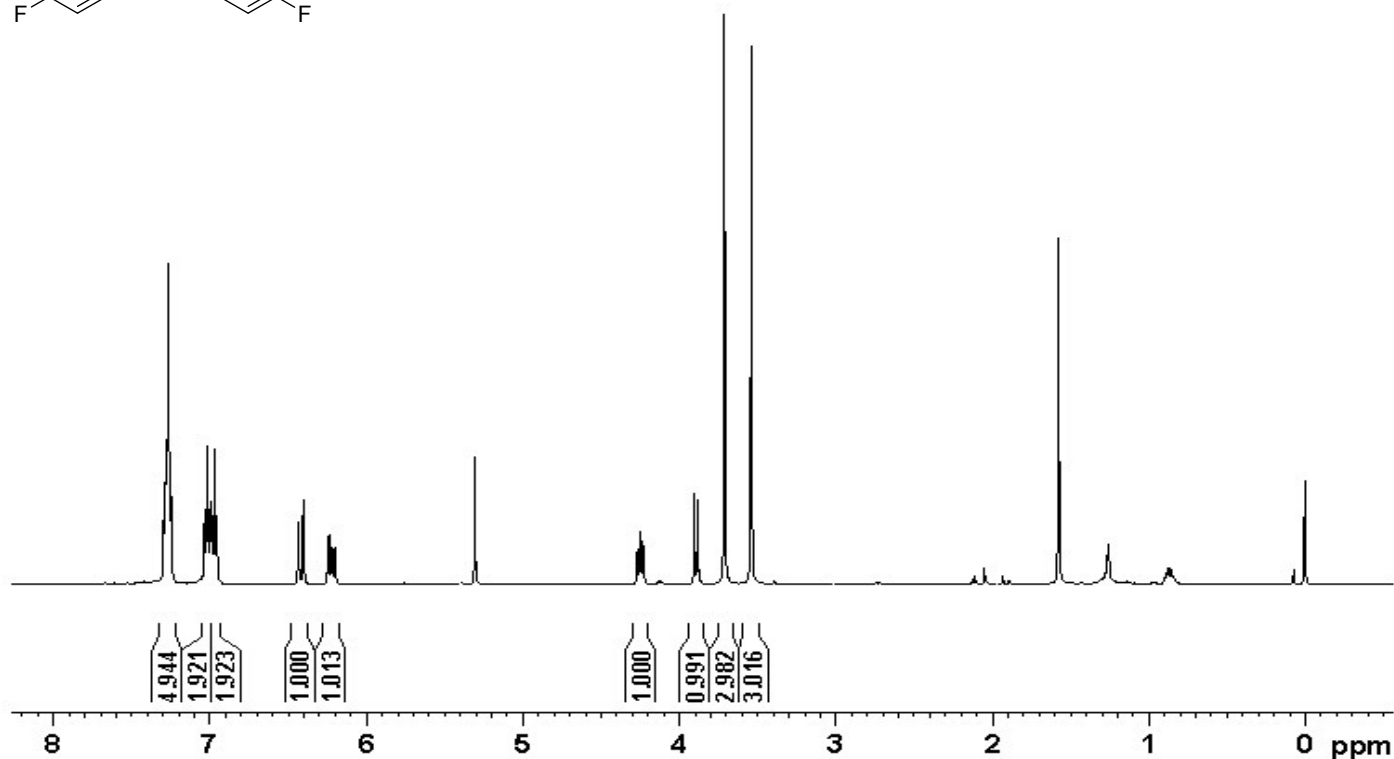
(*R,E*)-dimethyl 2-(1,3-bis(4-fluorophenyl)allyl)malonate (**12j**)

QZX-4-111 1H 2018 05 21



NAME QZX-4-111
EXPNO 1
PROCNO 1
Date_ 20180521
Time_ 11.15
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 16384
SOLVENT CDCl3
NS 8
DS 1
SWH 10000.000 Hz
FIDRES 0.610352 Hz
AQ 0.8193000 sec
RG 724
DW 50.000 usec
DE 6.00 usec
TE 294.8 K
D1 1.00000000 sec
TD0 1

===== CHANNEL f1 =====
NUC1 1H
P1 13.00 usec
PL1 2.00 dB
SF01 500.0335010 MHz
SI 16384
SF 500.0300070 MHz
WDW EM
SSB 0
LB 0.60 Hz
GB 0
PC 2.00



QZX-4-111

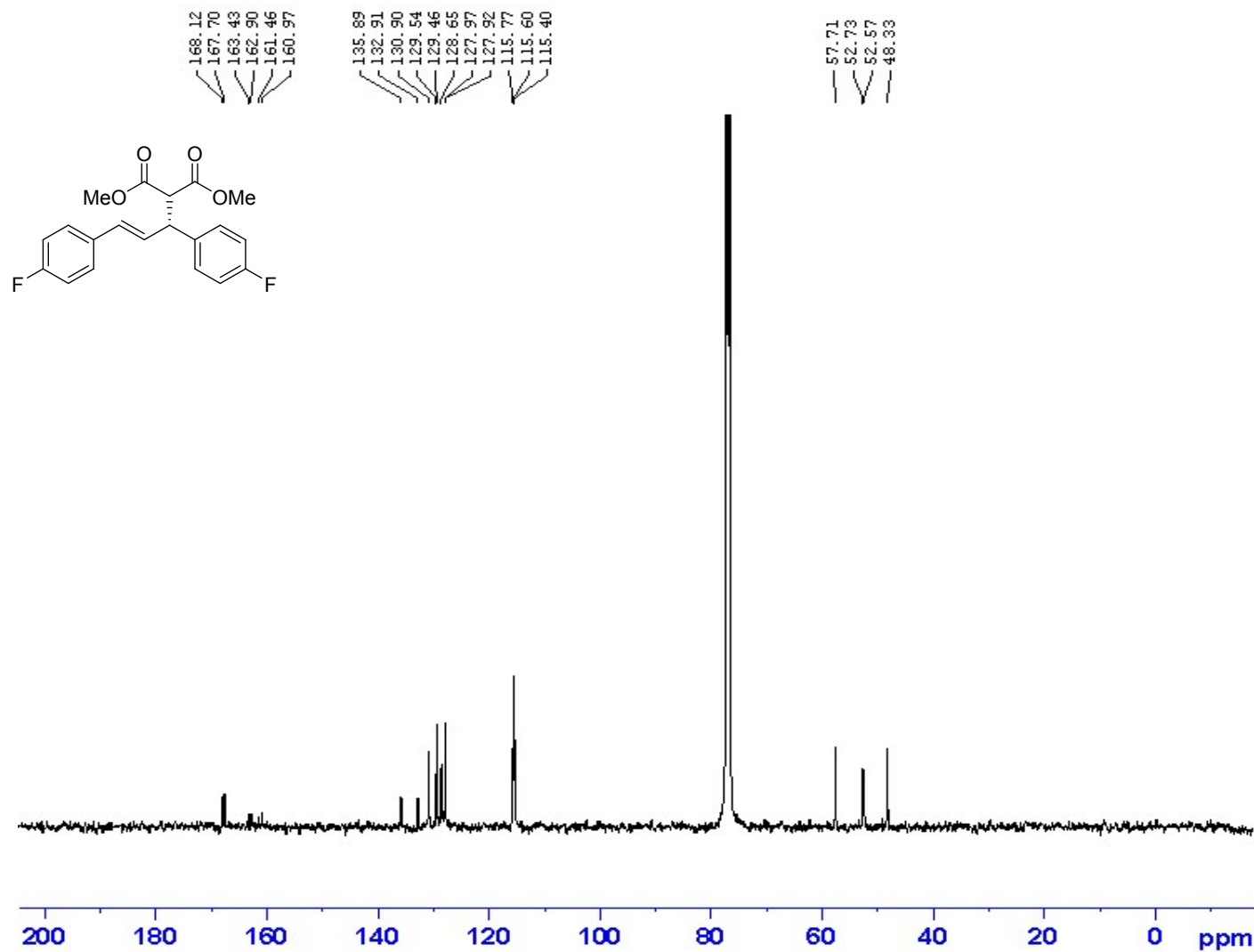
13C 2018 05 22



NAME QZX-4-111
 EXPNO 2
 PROCNO 1
 Date_ 20180522
 Time_ 17.00
 INSTRUM spect
 PROBHD 5 mm PABBO BB-
 PULPROG zgpg30
 TD 65536
 SOLVENT CDCl3
 NS 2328
 DS 1
 SWH 32679.738 Hz
 FIDRES 0.498653 Hz
 AQ 1.0027661 sec
 RG 4600
 DW 15.300 usec
 DE 6.00 usec
 TE 297.3 K
 D1 2.00000000 sec
 d11 0.03000000 sec
 DELTA 1.89999998 sec
 TDO 10

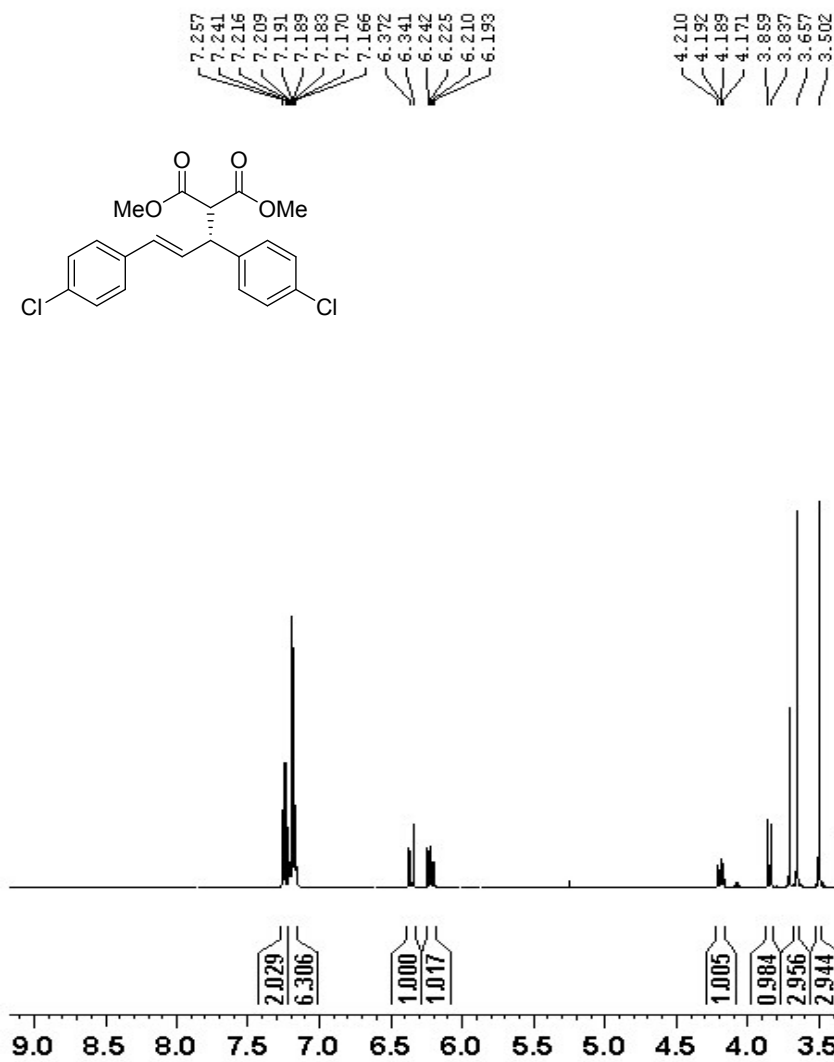
===== CHANNEL f1 =====
 NUC1 13C
 P1 12.20 usec
 PL1 3.00 dB
 SFO1 125.7464750 MHz

===== CHANNEL f2 =====
 CPDPRG2 waltz16
 NUC2 1H
 PCPD2 80.00 usec
 PL2 2.00 dB
 PL12 17.70 dB
 PL13 17.70 dB
 SFO2 500.0355000 MHz
 SI 32768
 SF 125.7326392 MHz
 WDW EM
 SSB 0
 LB 10.00 Hz
 GB 0
 PC 1.00



(*R,E*)-dimethyl 2-(1,3-bis(4-chlorophenyl)allyl)malonate (**12k**)

QZX-4-128 1H 1D 2018 05 22

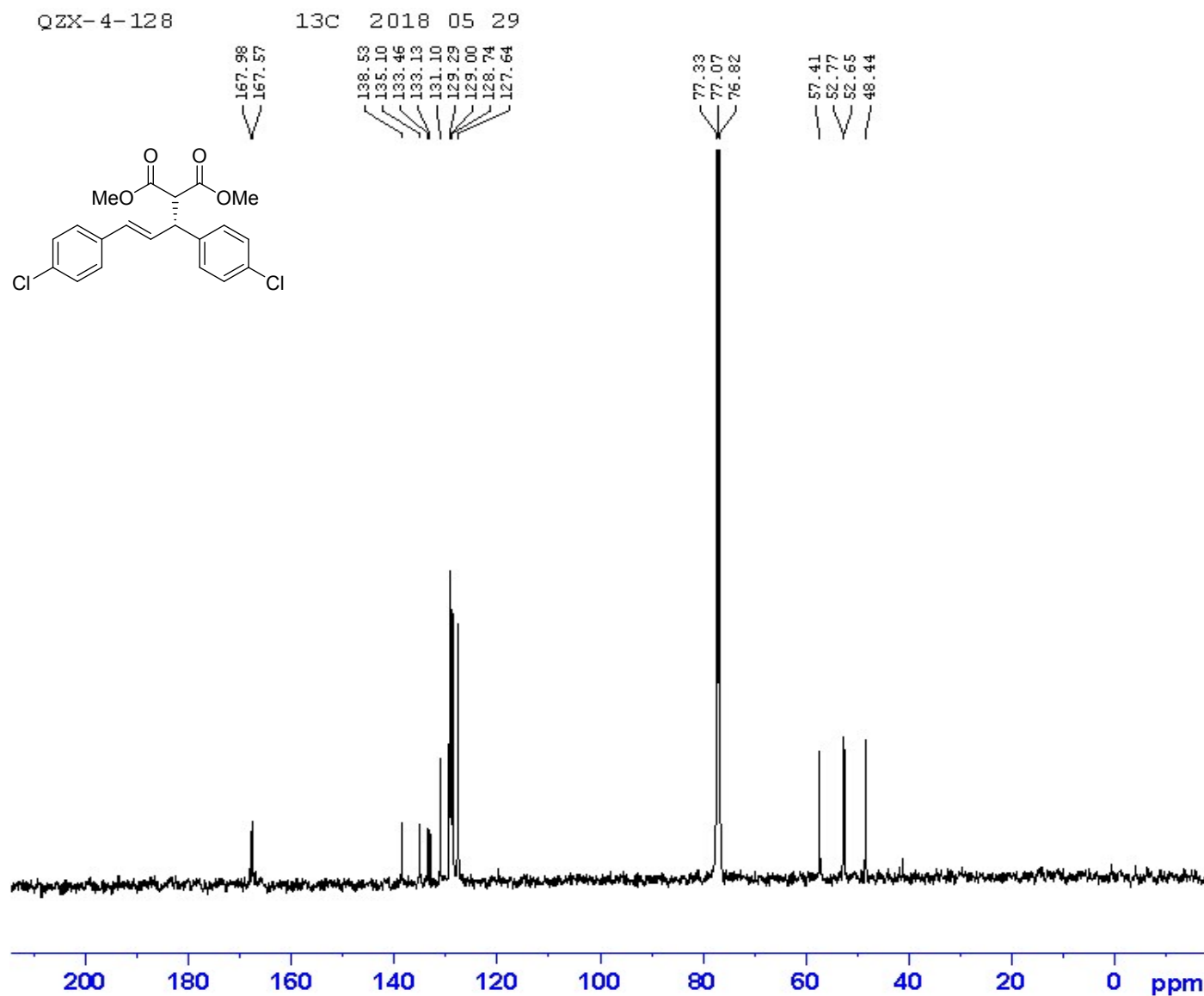


```

NAME           QZX-4-128
EXPNO          12
PROCNO         1
Date_          20180522
Time_          15.52
INSTRUM        spect
PROBHD         5 mm PABBO BB-
PULPROG        zg30
TD             16384
SOLVENT        CDCl3
NS             8
DS             0
SWH            10000.000 Hz
FIDRES         0.610352 Hz
AQ             0.8193000 sec
RG             287
DW             50.000 usec
DE             8.00 usec
TE             296.2 K
D1             2.00000000 sec
TD0            1
    
```

```

===== CHANNEL f1 =====
NUC1           1H
P1             13.00 usec
PL1            2.00 dB
SF01           500.0335000 MHz
SI             16384
SF             500.0300324 MHz
WDW            EM
SSB            0
LB             0.30 Hz
GB             0
PC             1.00
    
```



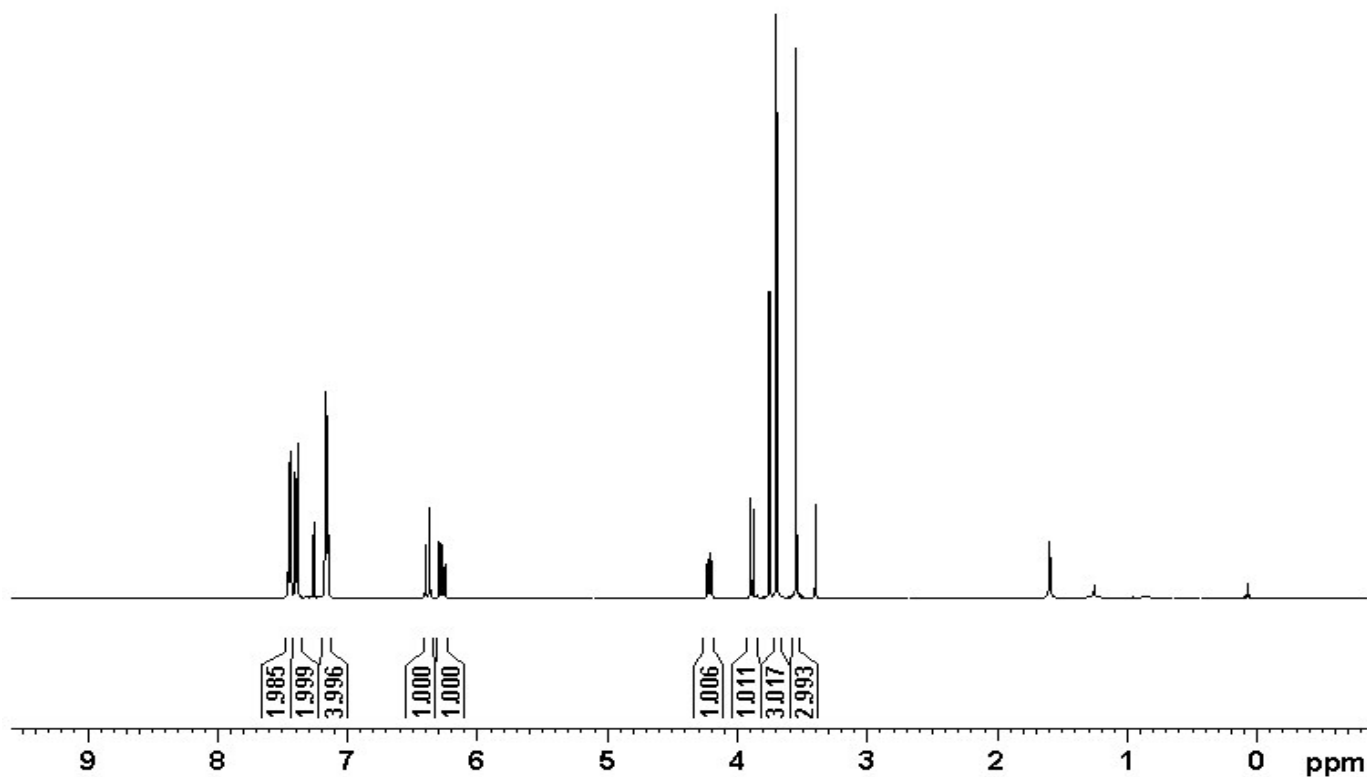
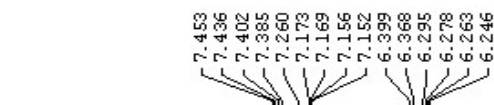
NAME QZX-4-128
EXPNO 2
PROCNO 1
Date_ 20180529
Time_ 10.17
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDC13
NS 279
DS 1
SWH 32679.738 Hz
FIDRES 0.498653 Hz
AQ 1.0027661 sec
RG 2890
DW 15.300 usec
DE 6.00 usec
TE 297.7 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
TD0 20

===== CHANNEL f1 =====
NUC1 13C
P1 12.20 usec
PL1 3.00 dB
SF01 125.7464750 MHz

===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 2.00 dB
PL12 17.70 dB
PL13 17.70 dB
SF02 500.0355000 MHz
SI 32768
SF 125.7326392 MHz
WDW EM
SSB 0
LB 10.00 Hz
GB 0
PC 1.00

(*R,E*)-dimethyl 2-(1,3-bis(4-bromophenyl)allyl)malonate (**12l**)

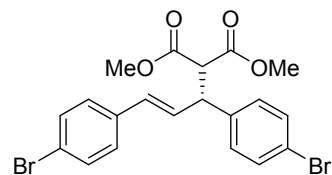
QZX-4-90 1H 1D 2018 05 14



NAME QZX-4-90
EXPNO 1
PROCNO 1
Date_ 20180514
Time_ 15.25
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 16384
SOLVENT CDCl3
NS 8
DS 0
SWH 10000.000 Hz
FIDRES 0.610352 Hz
AQ 0.8193000 sec
RG 406
DW 50.000 usec
DE 8.00 usec
TE 295.3 K
D1 2.00000000 sec
TD0 1

===== CHANNEL f1 =====
NUC1 1H
P1 13.00 usec
PL1 2.00 dB
SF01 500.0335000 MHz
SI 16384
SF 500.0300107 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

QZX-4-90 13C 1D 2018 0515



167.87
167.46

138.93
135.44
131.87
131.61
131.11
129.57
129.19
127.88
121.53
121.16

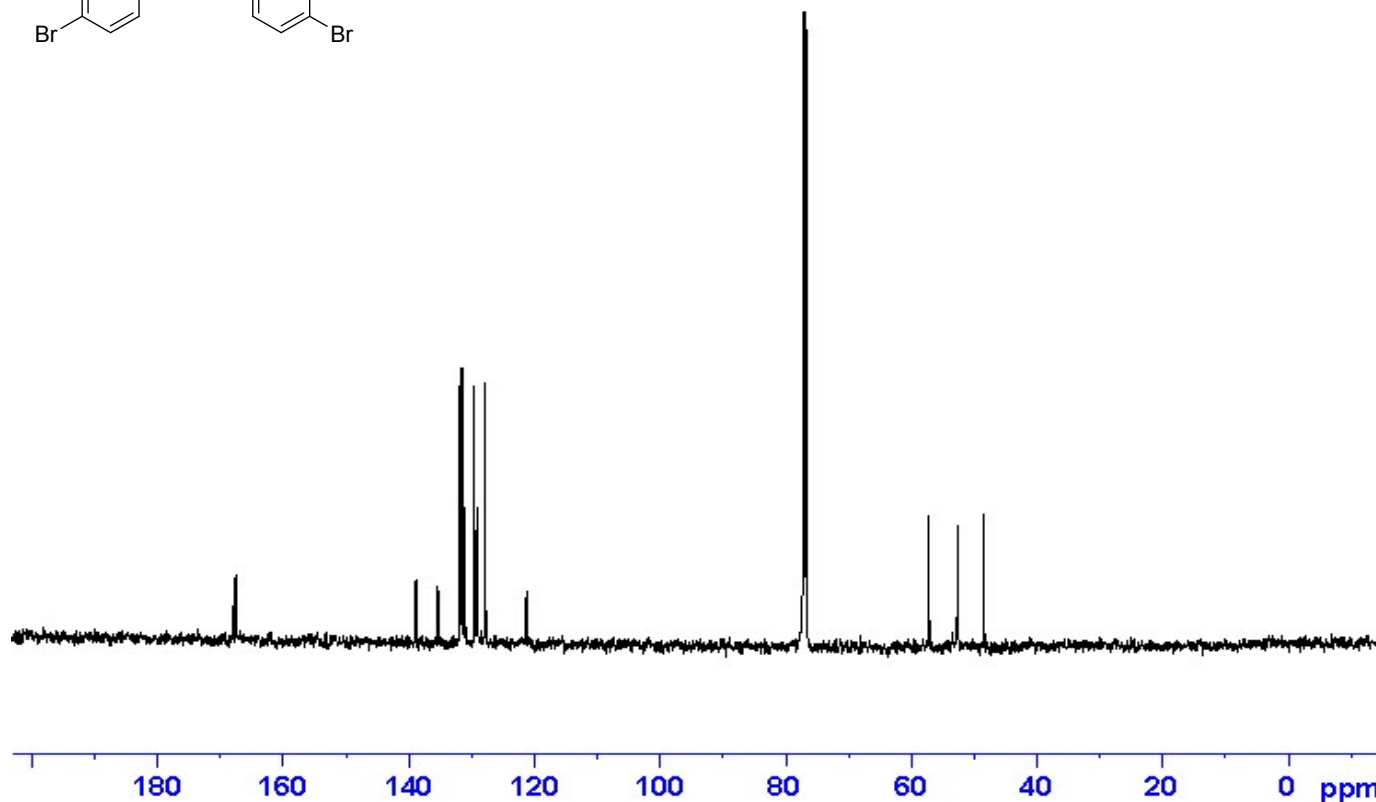
77.25
76.99
76.74

57.21
52.71
52.60
48.43

NAME QZX-4-90
EXPNO 2
PROCNO 1
Date_ 20180515
Time_ 20.12
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDC13
NS 173
DS 2
SWH 32679.738 Hz
FIDRES 0.498653 Hz
AQ 1.0027661 sec
RG 3250
DW 15.300 usec
DE 6.00 usec
TE 296.3 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
TDO 10

===== CHANNEL f1 =====
NUC1 13C
P1 12.20 usec
PL1 3.00 dB
SF01 125.7464750 MHz

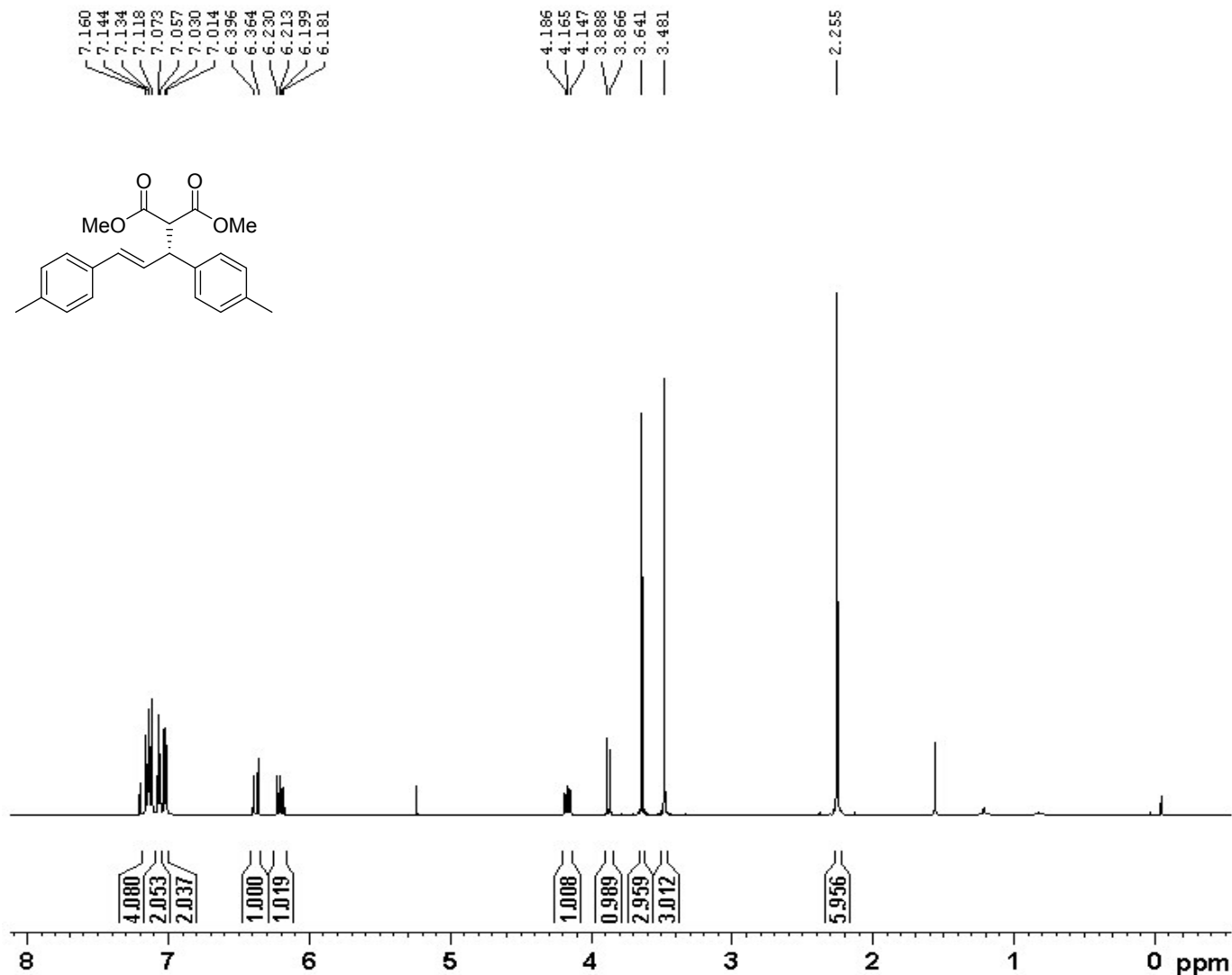
===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 2.00 dB
PL12 17.70 dB
PL13 17.70 dB
SF02 500.0355000 MHz
SI 32768
SF 125.7326504 MHz
WDW EM
SSB 0
LB 6.00 Hz
GB 0
PC 2.00



(*R,E*)-dimethyl 2-(1,3-di-*p*-tolylallyl)malonate (**12m**)

QZX-4-129

1H 2018 05 22



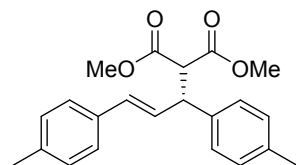
```

NAME          QZX-4-129
EXPNO          1
PROCNO         1
Date_          20180522
Time           15.45
INSTRUM        spect
PROBHD         5 mm PABBO BB-
PULPROG        zg30
TD             16384
SOLVENT        CDCl3
NS              8
DS              0
SWH            10000.000 Hz
FIDRES         0.610352 Hz
AQ             0.8193000 sec
RG             144
DW             50.000 usec
DE             6.00 usec
TE             296.2 K
D1             2.00000000 sec
TD0            1
  
```

```

===== CHANNEL f1 =====
NUC1           1H
P1             13.00 usec
PL1            2.00 dB
SF01           500.0335010 MHz
SI             16384
SF             500.0300388 MHz
WDW            EM
SSB            0
LB             0.30 Hz
GB             0
PC             1.00
  
```

QZX-4-129 13C 1D 2018 0525



168.27
167.84

137.24
136.65
134.08
131.43
129.36
129.11
128.23
127.65
126.25

77.25
77.00
76.75

57.74
52.54
52.40
48.82

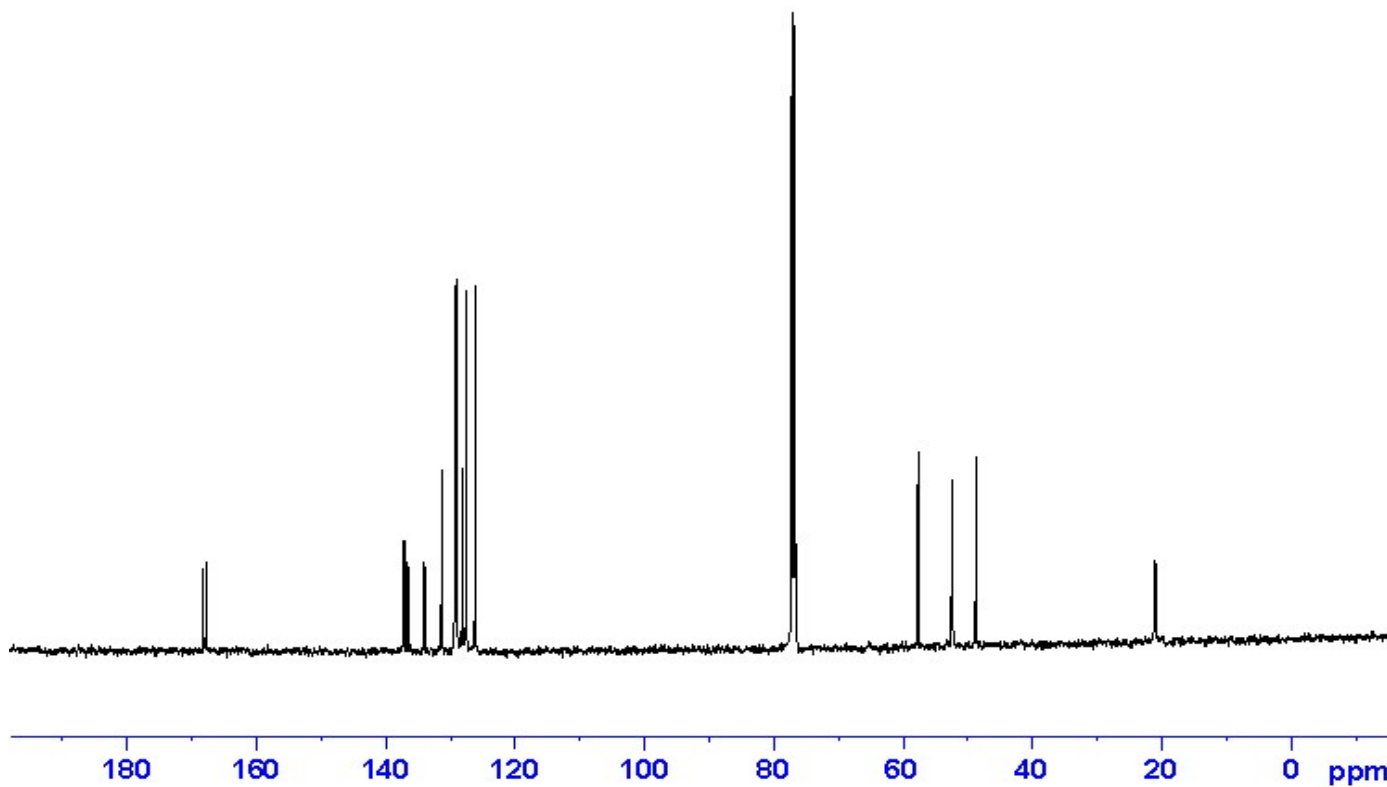
21.11
21.02



NAME QZX-4-129
EXPNO 2
PROCNO 1
Date_ 20180525
Time_ 17.24
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDC13
NS 433
DS 2
SWH 32679.738 Hz
FIDRES 0.498653 Hz
AQ 1.0027661 sec
RG 5160
DW 15.300 usec
DE 6.00 usec
TE 297.2 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
TD0 10

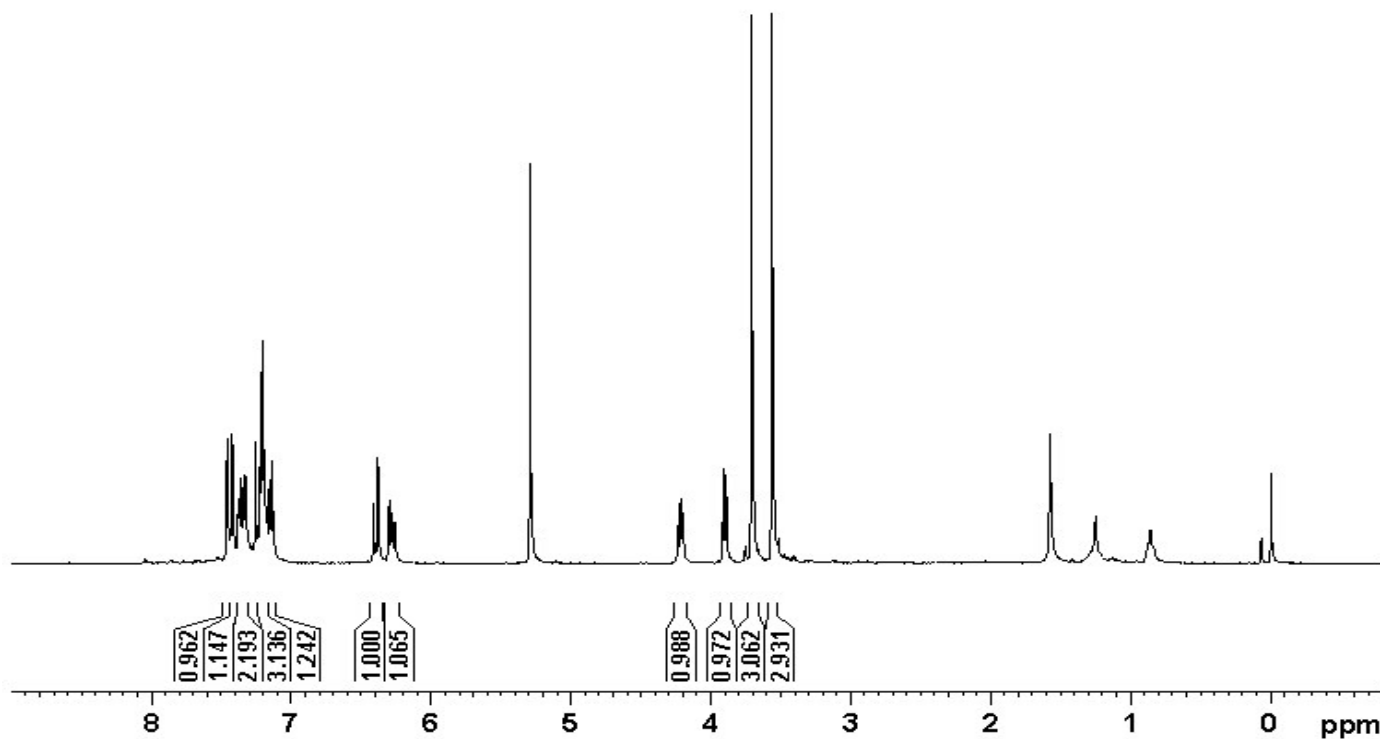
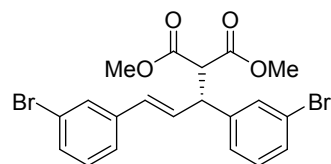
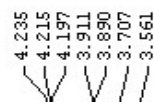
===== CHANNEL f1 =====
NUC1 13C
P1 12.20 usec
PL1 3.00 dB
SF01 125.7464750 MHz

===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 2.00 dB
PL12 17.70 dB
PL13 17.70 dB
SF02 500.0355000 MHz
SI 32768
SF 125.7326504 MHz
WDW EM
SSB 0
LB 6.00 Hz
GB 0
PC 2.00



(*R,E*)-dimethyl 2-(1,3-bis(3-bromophenyl)allyl)malonate (**12n**)

QZX-4-132 1H 1D 2018 05 29

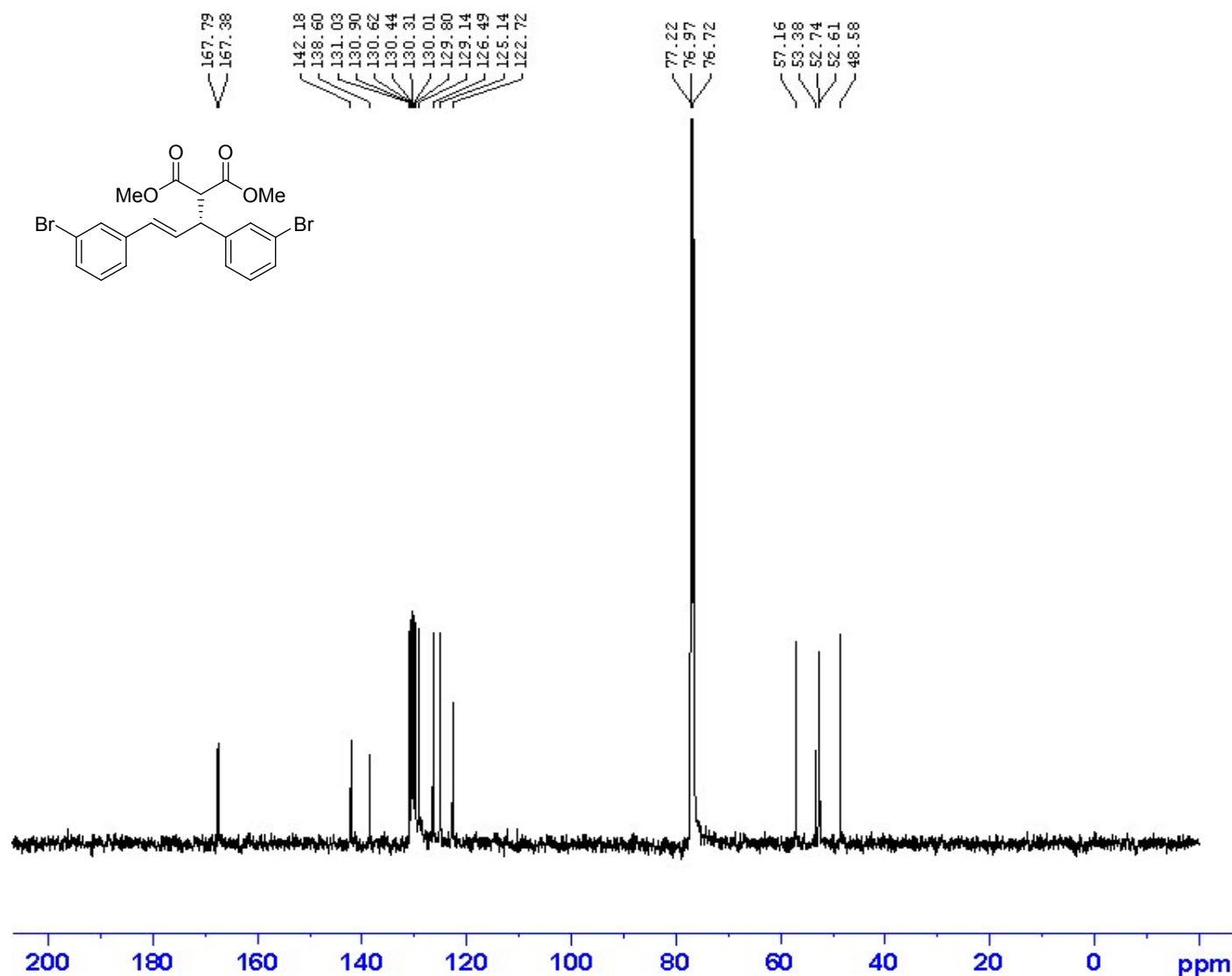
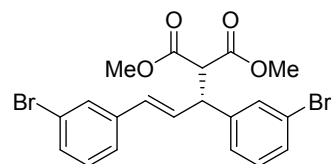


NAME QZX-4-132
EXPNO 1
PROCNO 1
Date_ 20180529
Time_ 17.11
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 16384
SOLVENT CDCl3
NS 8
DS 0
SWH 10000.000 Hz
FIDRES 0.610352 Hz
AQ 0.8193000 sec
RG 456
DW 50.000 usec
DE 8.00 usec
TE 297.1 K
D1 2.00000000 sec
TD0 1

===== CHANNEL f1 =====
NUC1 1H
P1 13.00 usec
PL1 2.00 dB
SF01 500.0335000 MHz
SI 16384
SF 500.0300132 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

QZX-4-132

13C 1D 2018 05 30



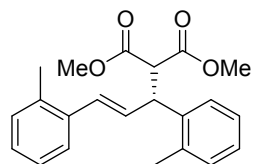
NAME QZX-4-132
 EXPNO 2
 PROCNO 1
 Date_ 20180530
 Time_ 12.23
 INSTRUM spect
 PROBHD 5 mm PABBO BB-
 PULPROG zgpg30
 TD 65536
 SOLVENT CDC13
 NS 1447
 DS 0
 SWH 32679.738 Hz
 FIDRES 0.498653 Hz
 AQ 1.0027661 sec
 RG 5160
 DW 15.300 usec
 DE 6.00 usec
 TE 297.6 K
 D1 2.00000000 sec
 d11 0.03000000 sec
 DELTA 1.89999998 sec
 TDO 10

===== CHANNEL f1 =====
 NUC1 13C
 P1 12.20 usec
 PL1 3.00 dB
 SF01 125.7464750 MHz

===== CHANNEL f2 =====
 CPDPRG2 waltz16
 NUC2 1H
 PCPD2 80.00 usec
 PL2 2.00 dB
 PL12 17.70 dB
 PL13 17.70 dB
 SF02 500.0355000 MHz
 SI 32768
 SF 125.7326504 MHz
 WDW EM
 SSB 0
 LB 6.00 Hz
 GB 0
 PC 2.00

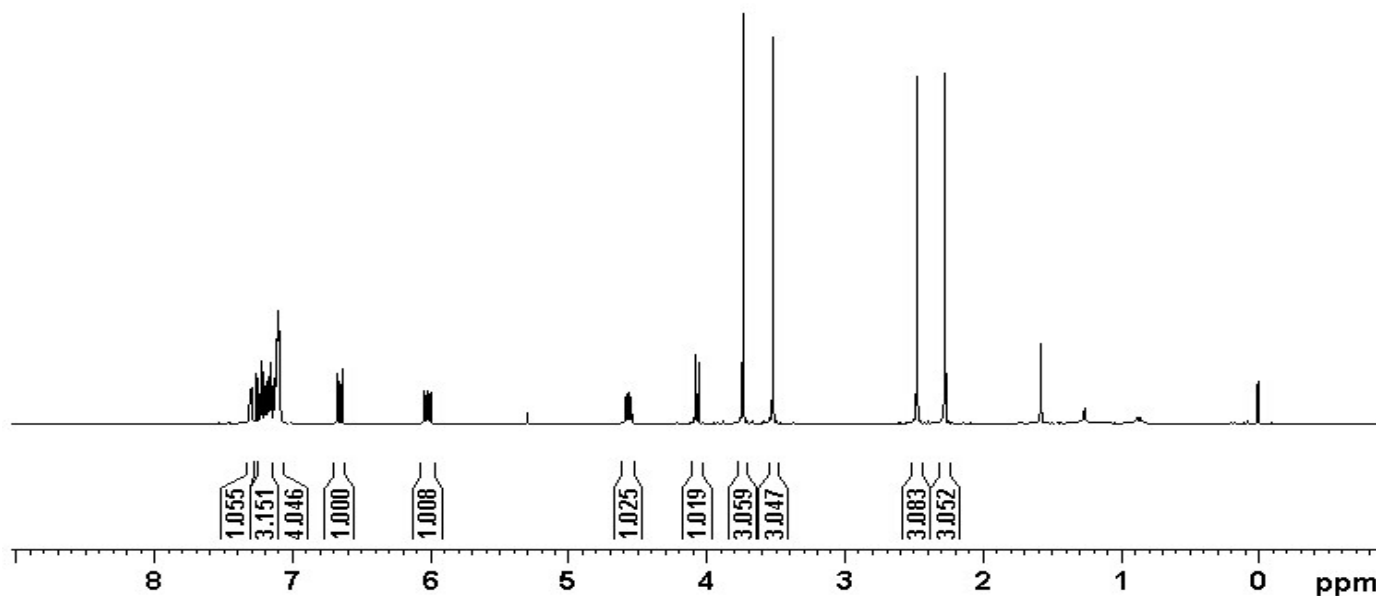
(*R,E*)-dimethyl 2-(1,3-di-*o*-tolylallyl)malonate (**12o**)

QZX-4-190 1H 2018 07 02



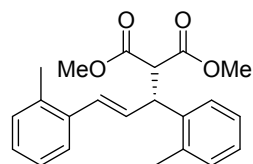
NAME QZX-4-190
EXPNO 1
PROCNO 1
Date_ 20180702
Time_ 15.47
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 16384
SOLVENT CDC13
NS 8
DS 1
SWH 10000.000 Hz
FIDRES 0.610352 Hz
AQ 0.8193000 sec
RG 322
DW 50.000 usec
DE 6.00 usec
TE 298.1 K
D1 2.00000000 sec
TD0 1

===== CHANNEL f1 =====
NUC1 1H
P1 13.00 usec
PL1 2.00 dB
SF01 500.0335010 MHz
SI 16384
SF 500.0300095 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 2.00



QZX-4-190

13C 1D 2018 07 04

168.42
167.79138.23
136.44
136.08
135.25
130.81
130.42
130.05
129.72
127.43
126.76
126.29
125.96
125.7677.24
76.99
76.7357.10
53.38
52.59
52.42
44.76

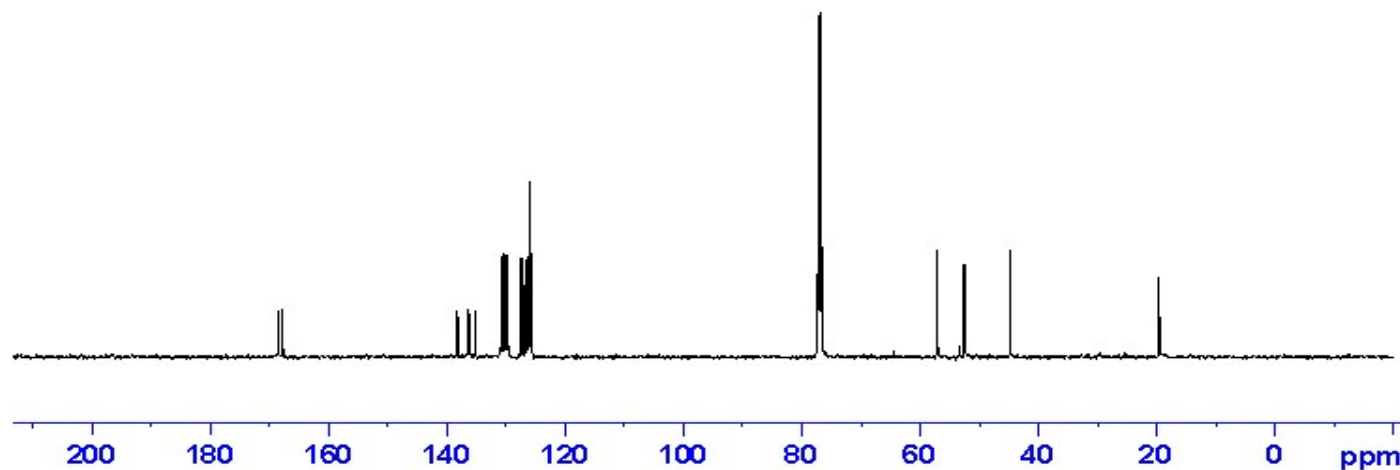
19.65



NAME QZX-4-190
EXPNO 2
PROCNO 1
Date_ 20180704
Time_ 12.28
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDC13
NS 1074
DS 2
SWH 32679.738 Hz
FIDRES 0.498653 Hz
AQ 1.0027661 sec
RG 5790
DW 15.300 usec
DE 6.00 usec
TE 298.4 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
TD0 10

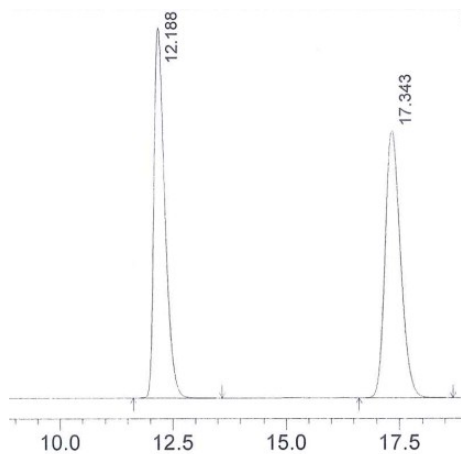
===== CHANNEL f1 =====
NUC1 13C
P1 12.20 usec
PL1 3.00 dB
SF01 125.7464750 MHz

===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 2.00 dB
PL12 17.70 dB
PL13 17.70 dB
SF02 500.0355000 MHz
SI 32768
SF 125.7326504 MHz
UDW EM
SSB 0
LB 6.00 Hz
GB 0
PC 2.00

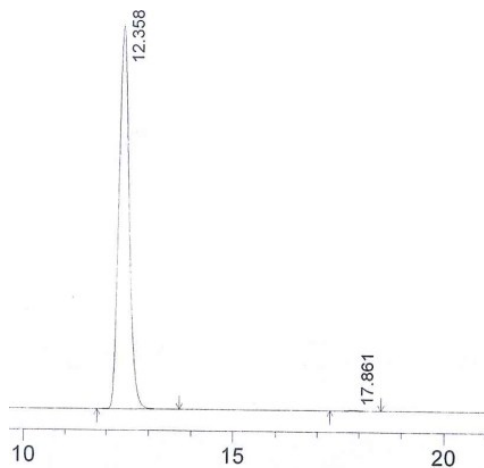


Copies of HPLC trace

(*R,E*)-dimethyl 2-(1,3-diphenylallyl)malonate (**12a**)

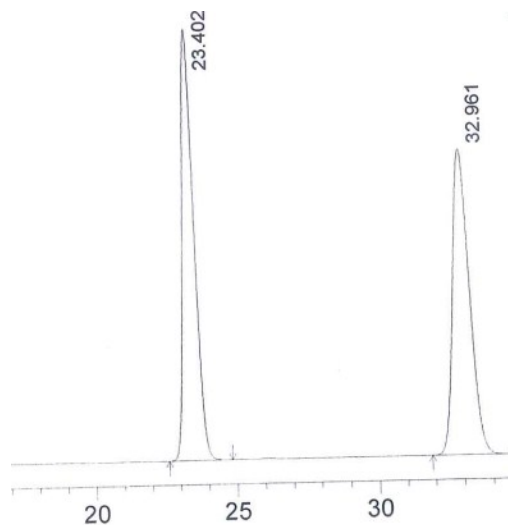


Peak	Ret. Time	Area	Area %	Height	Height %
1	12.188	5275883	49.900	312569	58.065
2	17.343	5297033	50.100	225738	41.935

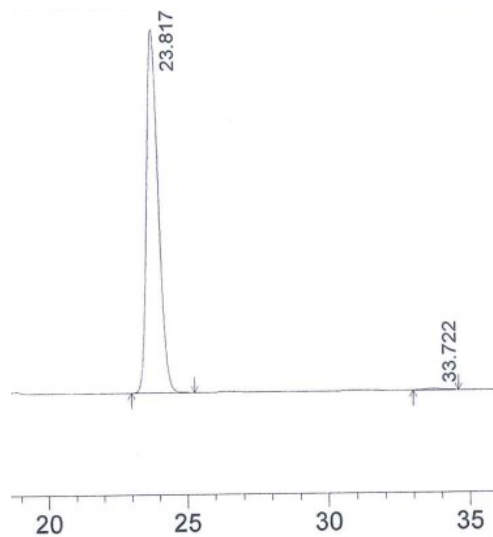


Peak	Ret. Time	Area	Area %	Height	Height %
1	12.358	12561688	99.715	737566	99.801
2	17.861	35848	0.285	1471	0.199

(*R,E*)-diethyl 2-(1,3-diphenylallyl)malonate (**12b**)

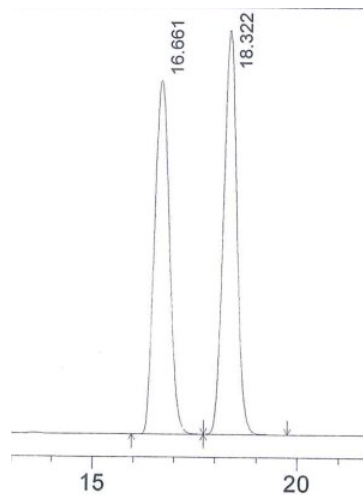


Peak	Ret. Time	Area	Area %	Height	Height %
1	23.402	5291150	49.945	183861	58.514
2	32.961	5302711	50.055	130354	41.486

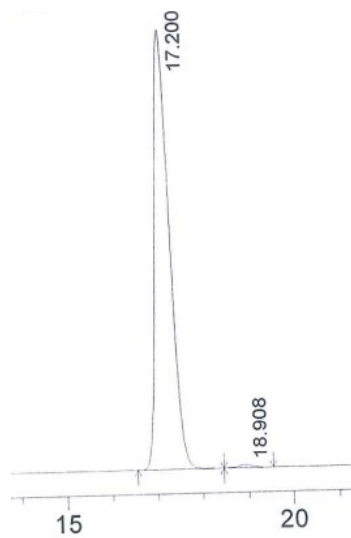


Peak	Ret. Time	Area	Area %	Height	Height %
1	23.817	4422694	99.496	150057	99.632
2	33.722	22382	0.504	554	0.368

(*R,E*)-3-(1,3-diphenylallyl)pentane-2,4-dione (**12c**)

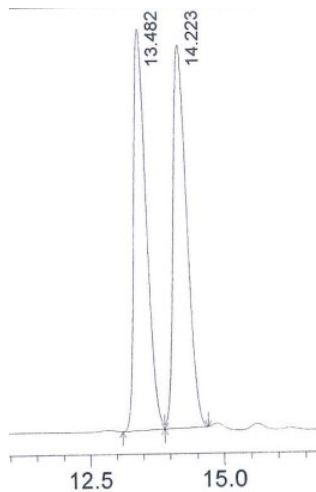


Peak	Ret. Time	Area	Area %	Height	Height %
1	16.661	6099897	50.083	239470	46.681
2	18.322	6079600	49.917	273520	53.319

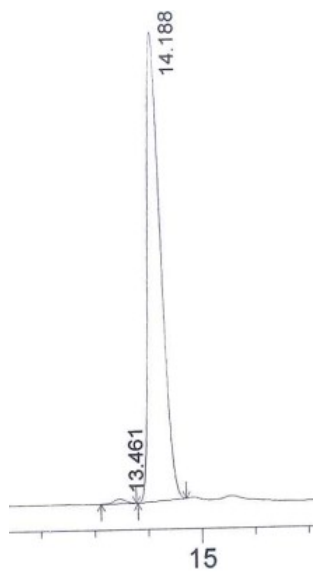


Peak	Ret. Time	Area	Area %	Height	Height %
1	17.200	10357642	99.313	455479	99.312
2	18.908	71615	0.687	3155	0.688

(*S,E*)-diethyl 2-(1,3-diphenylallyl)-2-methylmalonate (12d**)**

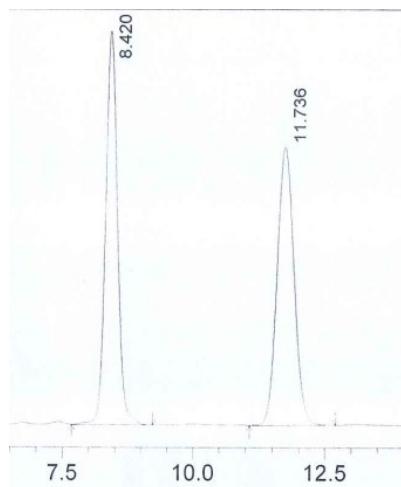


Peak	Ret. Time	Area	Area %	Height	Height %
1	13.482	18131339	50.106	1098414	51.194
2	14.223	18054458	49.894	1047192	48.806

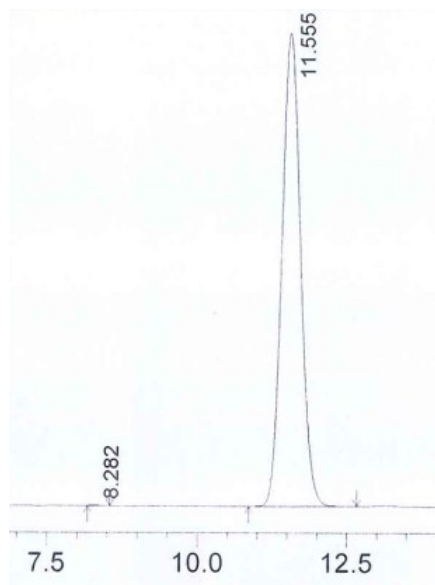


Peak	Ret. Time	Area	Area %	Height	Height %
1	13.461	143211	0.883	9140	0.971
2	14.188	16083075	99.117	932200	99.029

(*S,E*)-diethyl 2-acetoamido-2-(1,3-diphenyl-2-propenyl)malonate (**12e**)

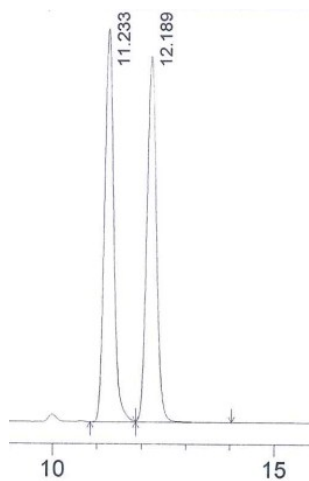


Peak	Ret. Time	Area	Area %	Height	Height %
1	8.420	1874263	50.535	118210	58.640
2	11.736	1834552	49.465	83375	41.360

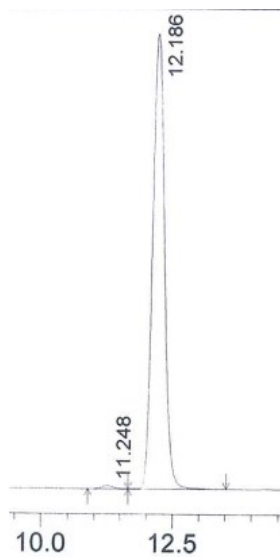


Peak	Ret. Time	Area	Area %	Height	Height %
1	8.282	1273	0.024	100	0.040
2	11.555	5354869	99.976	247890	99.960

(*S,E*)-diethyl 2-allyl-2-(1,3-diphenylallyl)malonate (**12f**)

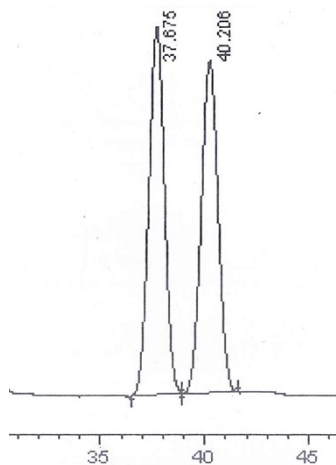


Peak	Ret. Time	Area	Area %	Height	Height %
1	11.233	23574842	50.295	1653307	51.796
2	12.189	23297929	49.705	1538688	48.204

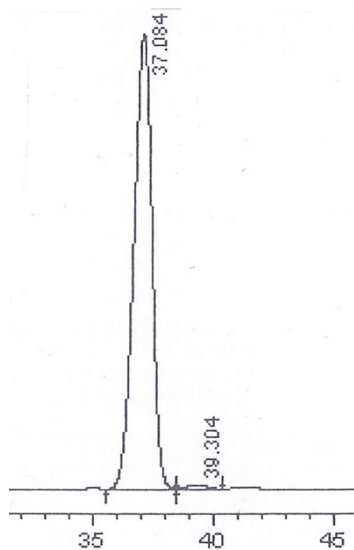


Peak	Ret. Time	Area	Area %	Height	Height %
1	11.248	239819	0.643	16660	0.709
2	12.186	37057477	99.357	2332932	99.291

(*S,E*)-diethyl 2-(1,3-diphenylallyl)-2-phenylmalonate (**12g**)

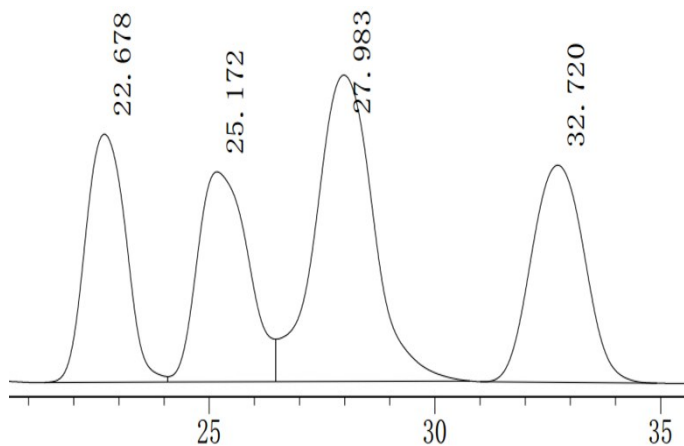


Peak	Ret. Time	Area	Area %	Height	Height %
1	37.675	251928	50.734	4854	52.551
2	40.206	244636	49.266	4382	47.449

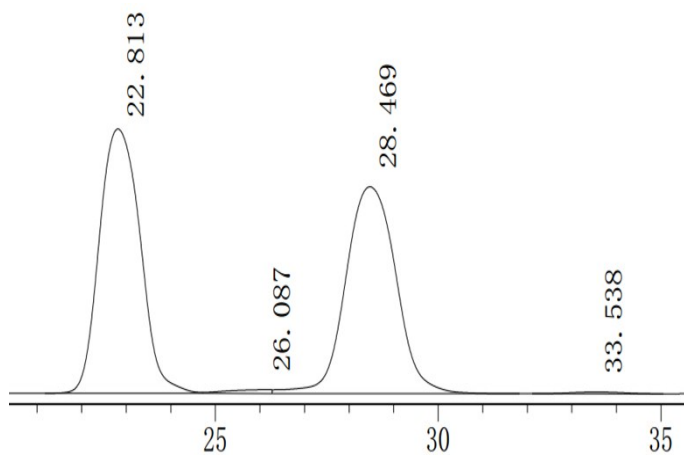


Peak	Ret. Time	Area	Area %	Height	Height %
1	37.084	4798929	98.974	91495	99.031
2	39.304	49739	1.026	895	0.969

(E)-ethyl 2-acetyl-3,5-diphenylpent-4-enoate (12h)

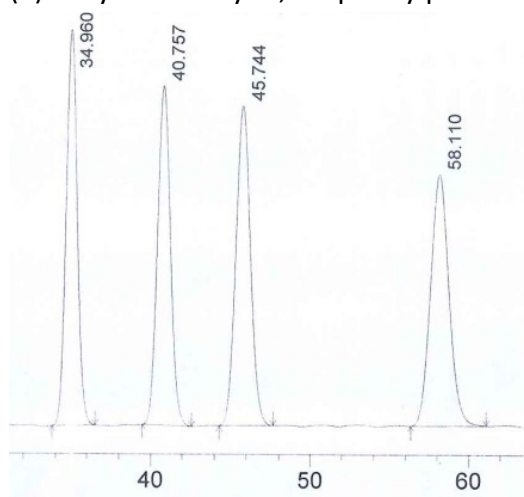


Peak	Ret. Time	Area	Area %	Height	Height %
1	22.678	15594260	19.986	251113	25.271
2	25.172	16638043	21.323	212582	21.394
3	27.983	27845682	35.687	310116	31.209
4	32.720	17949446	23.004	219858	22.126

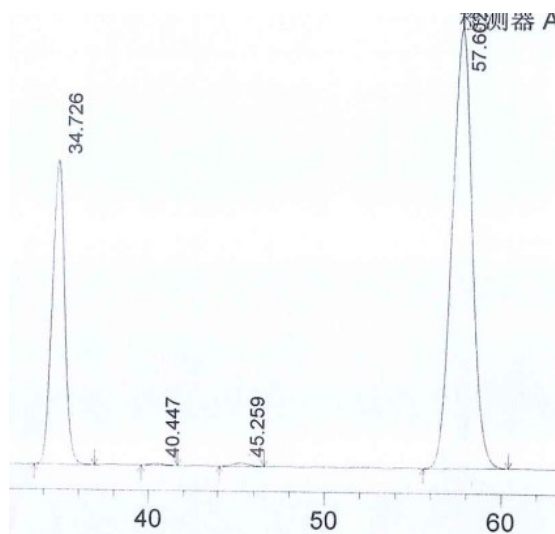


Peak	Ret. Time	Area	Area %	Height	Height %
1	22.813	16803172	50.297	263779	55.474
2	26.087	255129	0.764	3672	0.772
3	28.469	16212400	48.529	206359	43.398
4	33.538	136937	0.410	1692	0.256

(*E*)-ethyl 2-benzoyl-3,5-diphenylpent-4-enoate (**12i**)

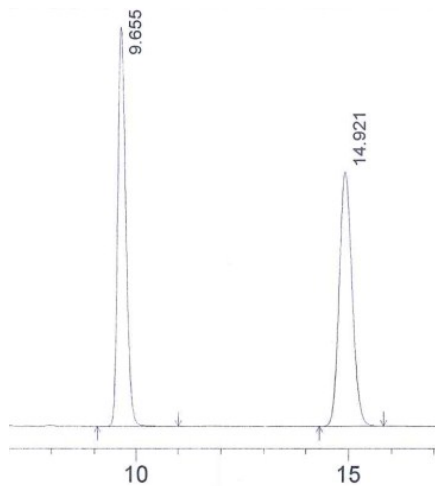


Peak	Ret. Time	Area	Area %	Height	Height %
1	34.960	1075450	24.459	21828	30.297
2	40.757	1074667	24.441	18715	25.976
3	45.744	1118199	25.431	17636	24.479
4	58.110	1128665	25.669	13867	19.247

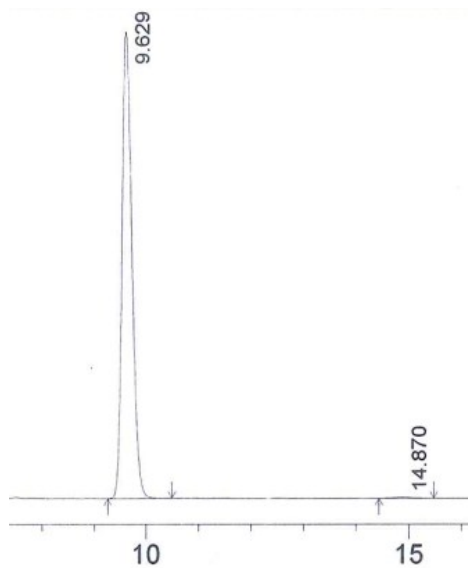


Peak	Ret. Time	Area	Area %	Height	Height %
1	34.726	4740886	29.661	95118	40.660
2	40.447	29948	0.187	545	0.233
3	45.259	62668	0.392	1006	0.430
4	57.602	11150135	69.760	137268	58.677

(*R,E*)-dimethyl 2-(1,3-bis(4-fluorophenyl)allyl)malonate (**12j**)

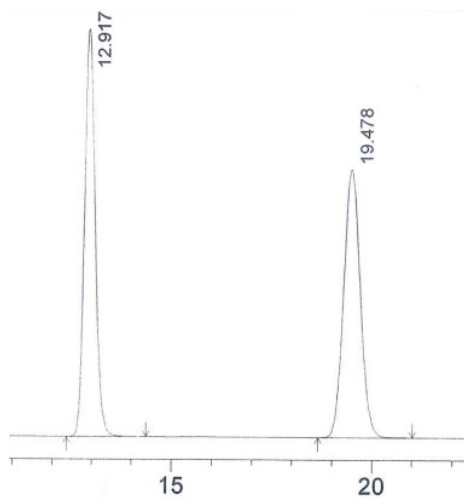


Peak	Ret. Time	Area	Area %	Height	Height %
1	9.655	11108646	50.040	821543	61.111
2	14.921	11090911	49.960	522808	38.889

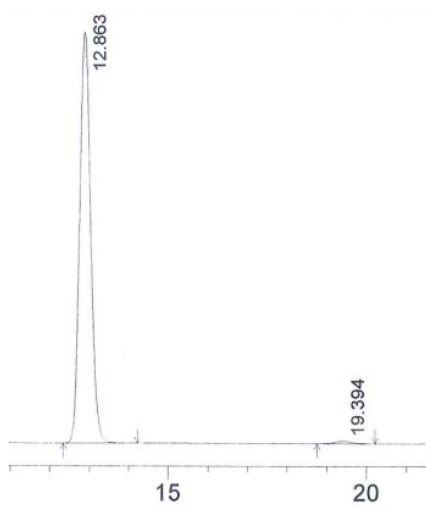


Peak	Ret. Time	Area	Area %	Height	Height %
1	9.629	5421842	99.648	405300	99.775
2	14.870	19176	0.352	914	0.225

(*R,E*)-dimethyl 2-(1,3-bis(4-chlorophenyl)allyl)malonate (**12k**)

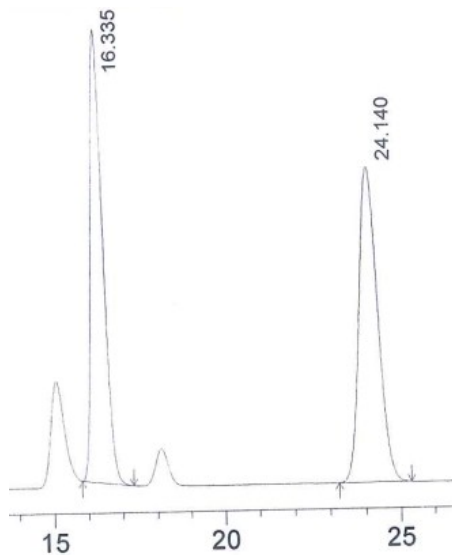


Peak	Ret. Time	Area	Area %	Height	Height %
1	12.917	9032283	50.090	474500	60.332
2	19.478	8999837	49.910	311982	39.668

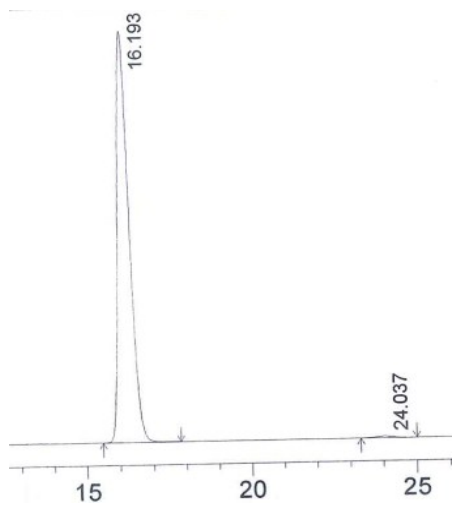


Peak	Ret. Time	Area	Area %	Height	Height %
1	12.863	7852091	99.108	417284	99.410
2	19.394	70702	0.892	2475	0.590

(*R,E*)-dimethyl 2-(1,3-bis(4-bromophenyl)allyl)malonate (**12I**)

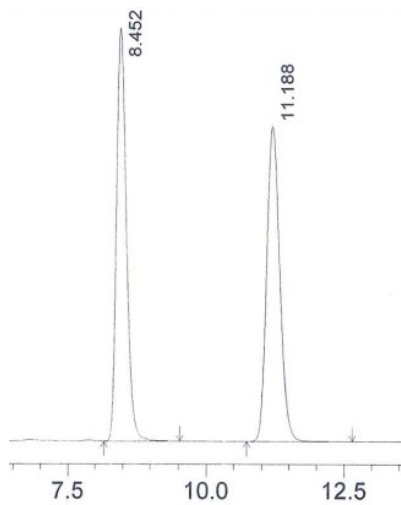


Peak	Ret. Time	Area	Area %	Height	Height %
1	16.335	450188	49.533	17948	58.996
2	24.140	458672	50.467	12474	41.004

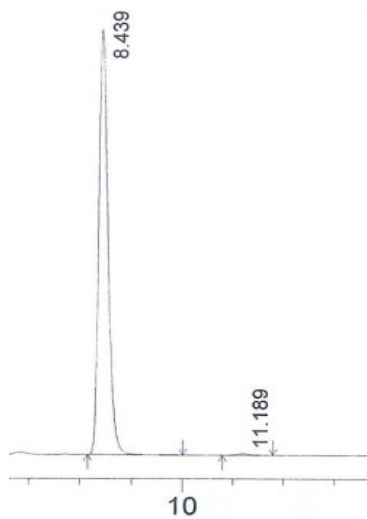


Peak	Ret. Time	Area	Area %	Height	Height %
1	16.193	9580817	99.383	390745	99.583
2	24.037	59462	0.617	1637	0.417

(*R,E*)-dimethyl 2-(1,3-di-*p*-tolylallyl)malonate (**12m**)

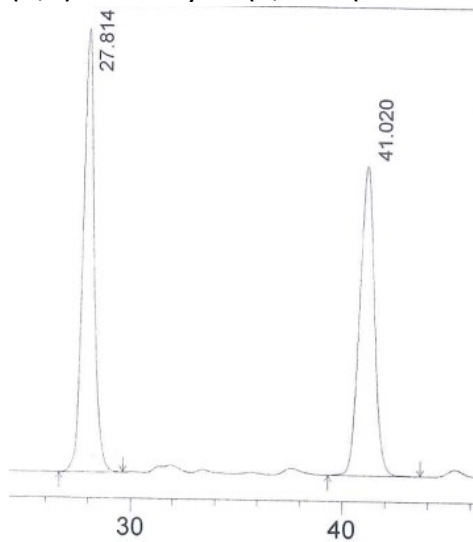


Peak	Ret. Time	Area	Area %	Height	Height %
1	8.452	18799425	49.938	1494039	56.773
2	11.188	18846401	50.062	1137560	43.227

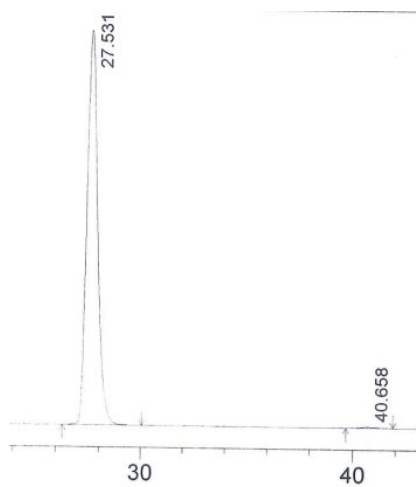


Peak	Ret. Time	Area	Area %	Height	Height %
1	8.439	6898775	99.519	554590	99.645
2	11.189	33366	0.481	1973	0.355

(*R,E*)-dimethyl 2-(1,3-bis(3-bromophenyl)allyl)malonate (**12n**)

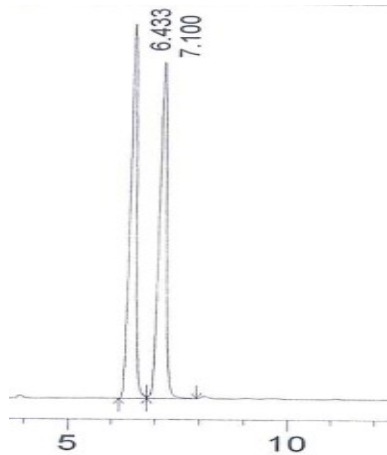


Peak	Ret. Time	Area	Area %	Height	Height %
1	27.814	8906162	51.844	246445	58.877
2	41.020	8272754	48.156	172128	41.123

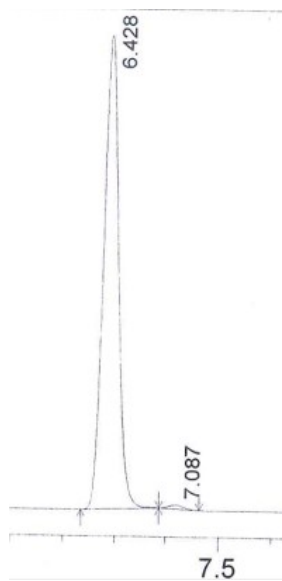


Peak	Ret. Time	Area	Area %	Height	Height %
1	27.531	15040237	99.508	436017	99.640
2	40.658	74373	0.492	1576	0.360

(*R,E*)-dimethyl 2-(1,3-di-*o*-tolylallyl)malonate (**12o**)



Peak	Ret. Time	Area	Area %	Height	Height %
1	6.433	3333597	49.677	332409	52.666
2	7.100	3376915	50.323	298751	47.334



Peak	Ret. Time	Area	Area %	Height	Height %
1	6.428	7382921	99.190	733768	99.165
2	7.087	60267	0.810	6178	0.835