

Supporting Information

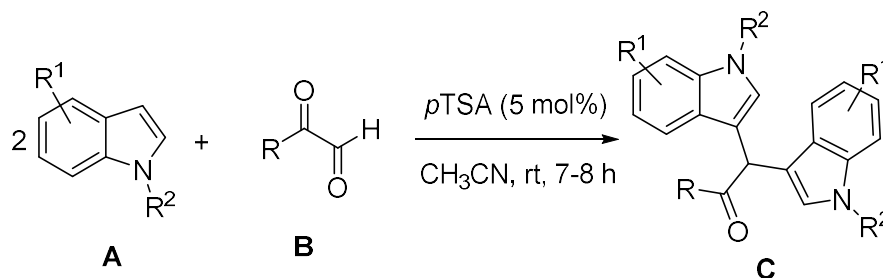
Cu(OTf)₂/HFIP Catalyzed Regioselective Cycloisomerization of Indole-C3-functionalized Alkynols to Carbazoles

Srinivasarao Yaragorla,* Tabassum Khan and Sayonika Chakroborthy

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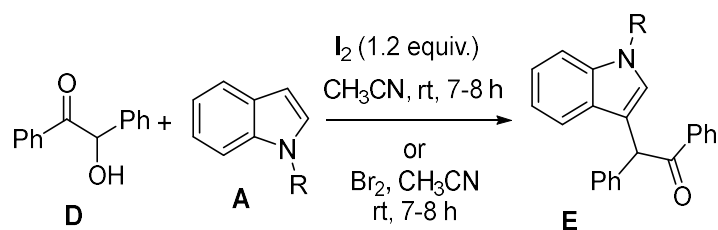
I. Experimental section

II.A. General experimental procedure for the synthesis of 2,2-bis(1-alkyl/aryl-1H-indol-3-yl)-1-phenylethanone:¹ A mixture of phenylglyoxal (1 equiv.), *N*-alkyl/aryl Indole (2 equiv.), *p*TSA (5 mol%), and CH₃CN was stirred at room temperature for 7-8 hours. After completion of the reaction (monitored by TLC), the resulting mixture was quenched with water and extracted into ethyl acetate (thrice). Combined organic layers were washed with NaHCO₃ solution and dried over anhydrous Na₂SO₄ and the solvent was evaporated to obtain the crude product. The crude product was purified by column chromatography to obtain pure product **C** in good yield.



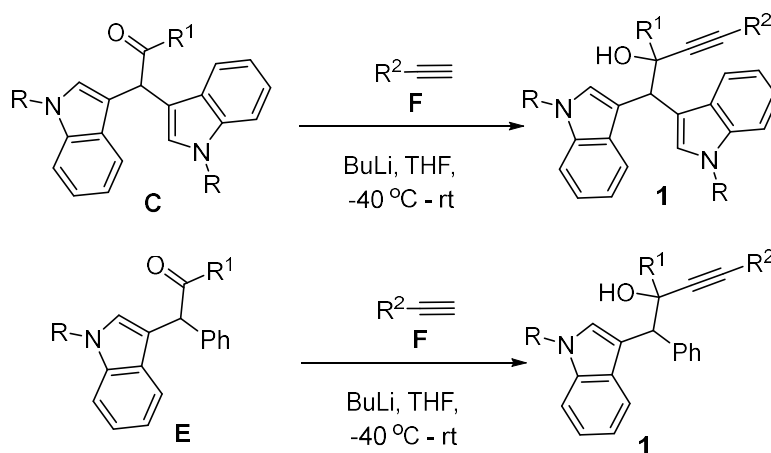
Scheme S1. Synthesis of 2,2-bis(1-alkyl/aryl-1H-indol-3-yl)-1-phenylethanone

II. B. General experimental procedure for the synthesis of ketone E:¹ A mixture of 2-hydroxy-1,2-diphenylethanone (1 equiv.) and *N*-alkyl/aryl Indole (1.2 equiv.), I₂ (1.2 equiv.) and acetonitrile were charged into an oven-dried round bottom flask and stirred at reflux temperature. The progress of the reaction was monitored by TLC. Then the reaction mass was quenched with Na₂S₂O₃ solution and extracted with ethyl acetate 2 times. The combined organic layer was concentrated, and crude was purified using column chromatography (60-120 mesh size, 15% EtOAc in pet ether).



Scheme S2. Synthesis of heteroaryl substituted diphenylethanone





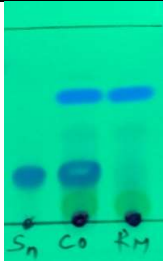
II.C. General experimental procedure for the propargyl alcohol 1:² To a solution of terminal alkyne (6 mmol) at 0 °C in THF (10-30 mL), was added 3 equiv., 6 mmol of *n*-BuLi (2 M in hexanes). The solution was stirred at 0 °C for 20 min, then the appropriate α -(3-indolyl) ketone was added (2 mmol, 1.0 equiv.) at -40°C. The resulting mixture was stirred at room temperature until the starting ketone was consumed as determined by TLC. The reaction was quenched with a saturated aqueous NH₄Cl solution and extracted with AcOEt (3 × 20 mL). The combined organic layers were dried over anhydrous Na₂SO₄, filtered and concentrated at reduced pressure. The residue was purified by flash chromatography on silica gel using mixtures of hexane and AcOEt as eluents to obtain the alkynols **1**.



Scheme S3. Synthesis of propargyl alcohols

General experimental procedure for the Synthesis of carbazole 2: Alkynol **1** (100 mg, 1 equiv.), HFIP (0.2 mL) and 10 mol% Cu(OTf)₂ were weighed into a small round bottom flask equipped with a tiny magnetic bead and stirred slowly at room temperature. The reaction turned reddish immediately after the addition of HFIP. A slow stirring is required to avoid the spilling of the reaction mixture onto the walls of the reaction flask. The reaction progress was monitored by TLC. After completion of the reaction, the crude compound was absorbed into silica gel and purified by column chromatography on silica gel using a mixture of hexane and AcOEt as eluents to obtain the carbazole **2**.

The detailed images of the reaction mixture are given below for more clarity.

				
Before addition of HFIP	Beginning of the reaction	Middle of the reaction	After completion of the reaction	TLC of the reaction

II. References

1. Suárez, A.; Martínez, F.; Suárez-Pantiga, S.; Sanz, R. *p*TSA-Catalyzed Reaction of Indoles with 2-Oxoaldehydes: Synthesis of α , α -Bis(indol-3-yl) Ketones. *ChemistrySelect* **2017**, *2*, 787-790.
2. Suárez, A.; Suárez-Pantiga, S.; Nieto-Faza, O.; Sanz, R. Gold-catalyzed synthesis of 1-(indol-3-yl) carbazoles: Selective 1, 2-alkyl vs 1, 2-vinyl migration. *Org. Lett.* **2017**, *19*, 5074-5077.

III. Single Crystal XRD data

The vapor diffusion crystallization method was used for crystal growth, where the compound was dissolved in chloroform by heating to make a saturated solution in a small vial which was placed in a closed bottle with another solvent as *n*-hexane. The crystal data was recorded on Bruker Apex-II CCD.

III.A. X-ray data of Compound 2j:

Identification code	ysr013
Empirical formula	C ₃₁ H ₂₆ N ₂
Formula weight	426.54
Temperature	296 K
Wavelength	0.71073 Å
Crystal system	'Monoclinic'
Space group	P1 21/n 1
Unit cell dimensions	a = 13.23 (18) Å α = 90. b = 9.3280 (11) Å β = 102.019 (5). c = 19.219 (3) Å γ = 90 (5).
Volume	2320.3 (5)

Z	4
Density	1.221 g/cm ³
Absorption coefficient	0.071 mm ⁻¹
F (000)	904
Crystal size	0.21 x 0.17 x 0.12 mm ³
Theta (max)	25.35
Index ranges	-15<=h<=15, -11<=k<=11, -23<=l<=23
Reflections collected	54774
R (reflection)	0.049 (3215)
wR2 (reflections)	0.2386(4254)
restraints / parameters	285/288
Goodness-of-fit on F ²	1.034
Tmin, Tmax	0.655, 0.746
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Npar	288
CCDC No.	2249416

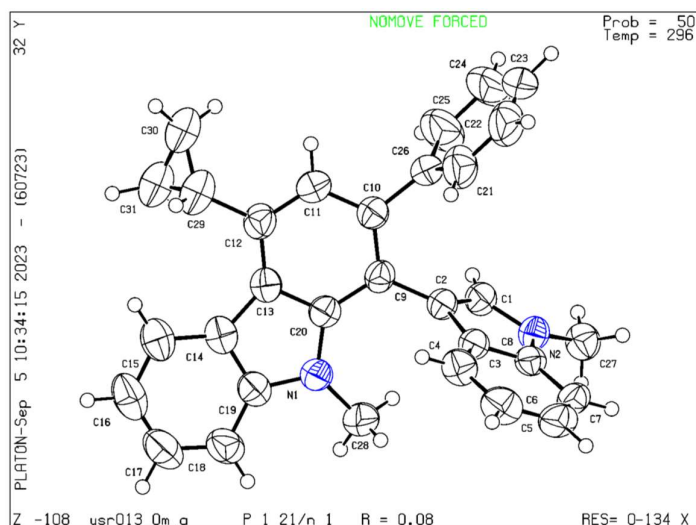


Figure S1. ORTEP representation of compound **2j** and thermal ellipsoids are drawn with 50% probability.

III.B. X-ray data of Compound **2k**:

Identification code	ysr032
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Formula weight	476.59
Temperature	298 K
Wavelength	0.71073 Å
Crystal system	'Monoclinic'
Space group	P 1 21/n 1

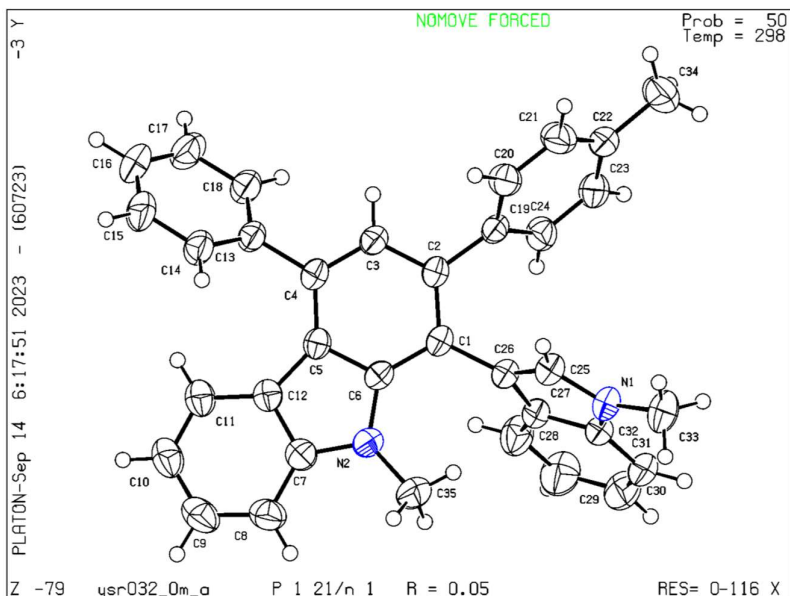


Figure S2. ORTEP representation of compound **2k** and thermal ellipsoids are drawn with 50% probability.

Unit cell dimensions	$a = 10.7077 (8) \text{ \AA}$ $\alpha = 90$.
	$b = 9.2729 (7) \text{ \AA}$ $\beta = 98.298 (3)$.
	$c = 25.954 (2) \text{ \AA}$ $\gamma = 90$.
Volume	2550.0 (3)
Z	4
Density	1.241 g/cm ³
Absorption coefficient	0.072 mm ⁻¹
F (000)	1008.0
Crystal size	0.21 x 0.17 x 0.11 mm ³
Theta (max)	27.539
Index ranges	-13 ≤ h ≤ 13, -12 ≤ k ≤ 12, -33 ≤ l ≤ 33
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R (reflection)	0.0514 (4500)
wR2 (reflections)	0.1462 (5871)
restraints / parameters	0/337
Goodness-of-fit on F ²	1.064
Tmin, Tmax	0.502, 0.746
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Npar	337
CCDC No.	2294921

II.C. X-ray data of Compound **2y**:

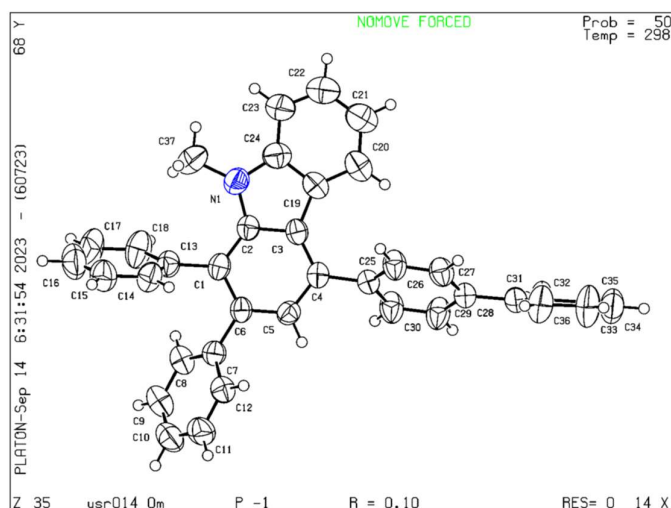
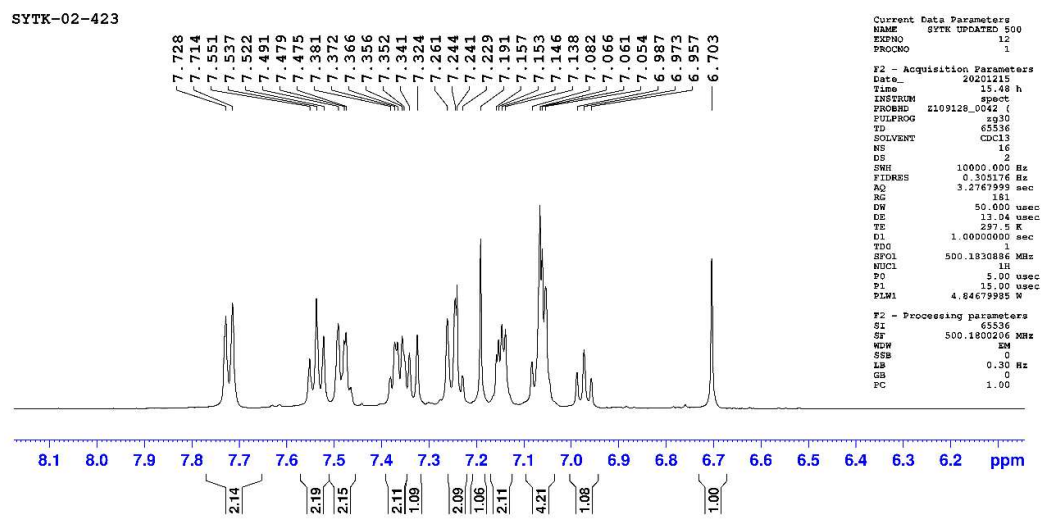
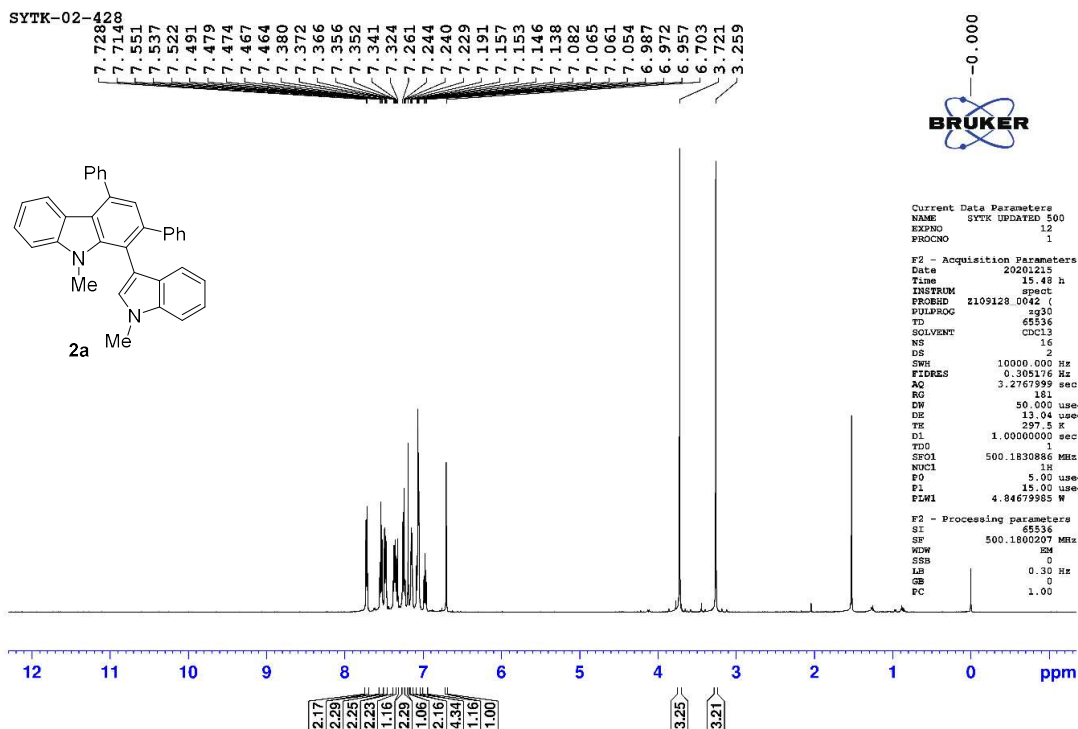


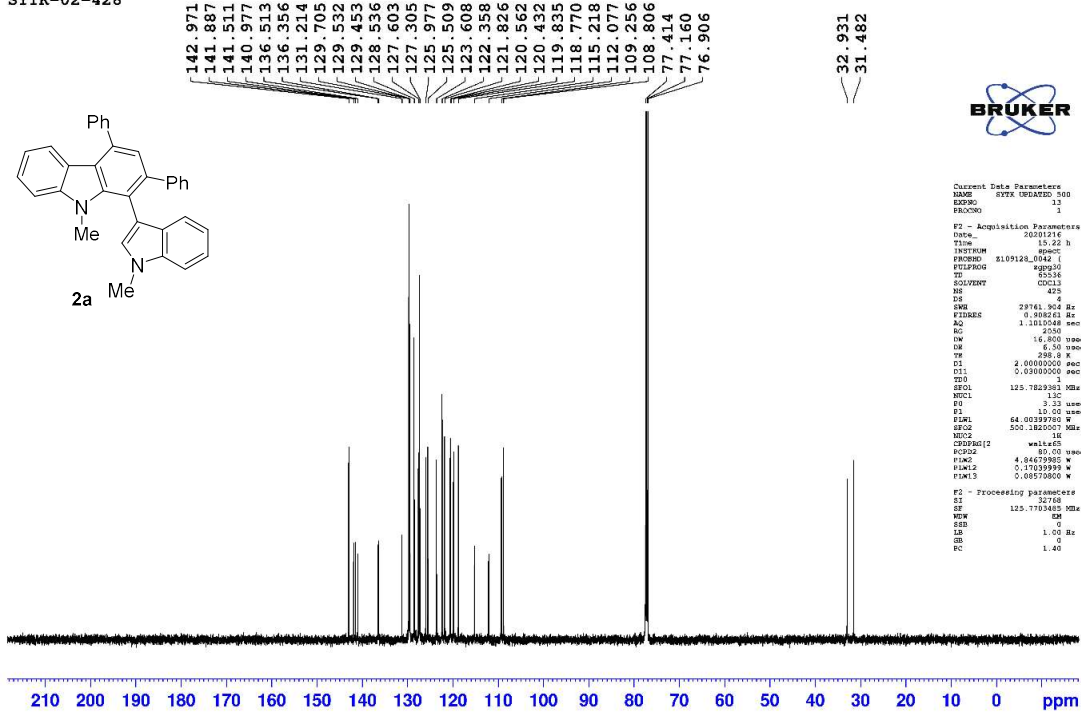
Figure S3. ORTEP representation of compound **2y** and thermal ellipsoids are drawn with 50% probability.

Identification code	ysr014
Empirical formula	C ₃₇ H ₂₇ N
Formula weight	485.59
Temperature	298 K
Wavelength	0.71073 Å
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Space group	P -1
Unit cell dimensions	a = 9.6614 (12) Å α = 66.465 (4).
	b = 12.3016 (5) Å β = 77.764 (5).
	c = 12.4047 (5) Å γ = 82.339 (5).
Volume	1319.0 (3)
Z	2
Density	1.223 g/cm ³
Absorption coefficient	0.070 mm ⁻¹
F (000)	512.0
Crystal size	0.2 x 0.15 x 0.1 mm ³
Theta (max)	25.349
Index ranges	-11 ≤ h ≤ 11, -14 ≤ k ≤ 14, -14 ≤ l ≤ 14
Reflections collected	20603
R (reflection)	0.1040 (2010)
wR2 (reflections)	0.2919 (4319)
restraints / parameters	0/344
Goodness-of-fit on F ²	0.970
Tmin, Tmax	0.609, 0.746
Data completeness	0.892
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Npar	344
CCDC No.	2294918

IV. Copies ¹H and ¹³C NMR



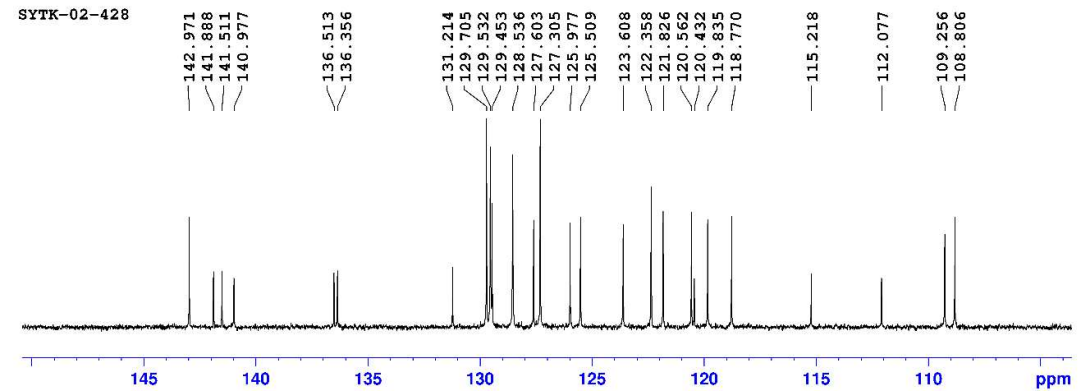
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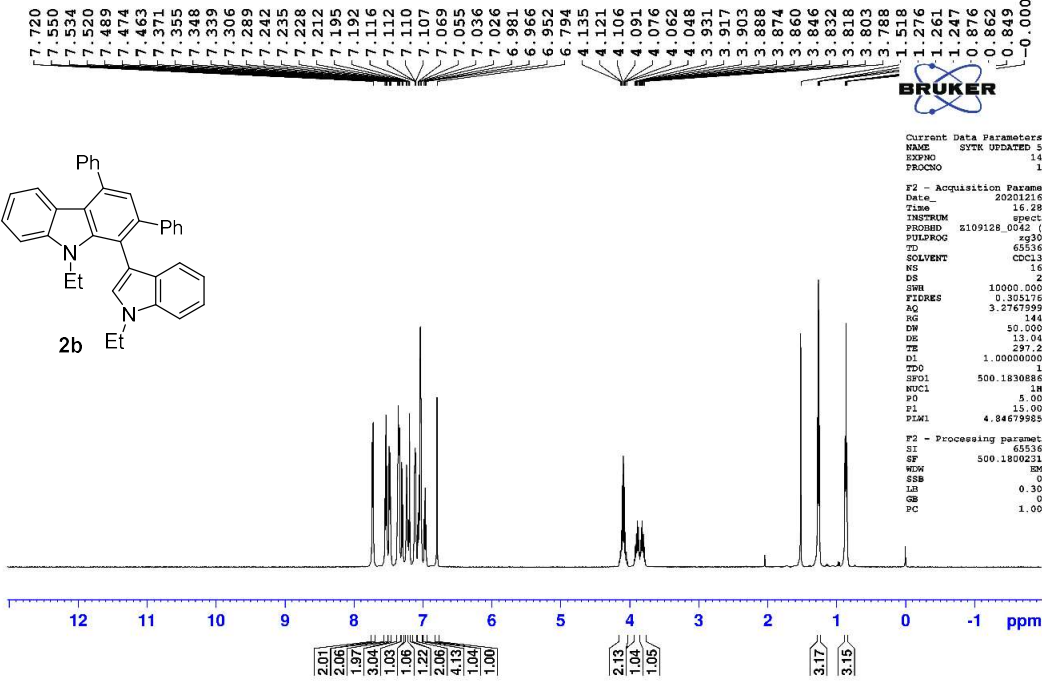
BRUKER

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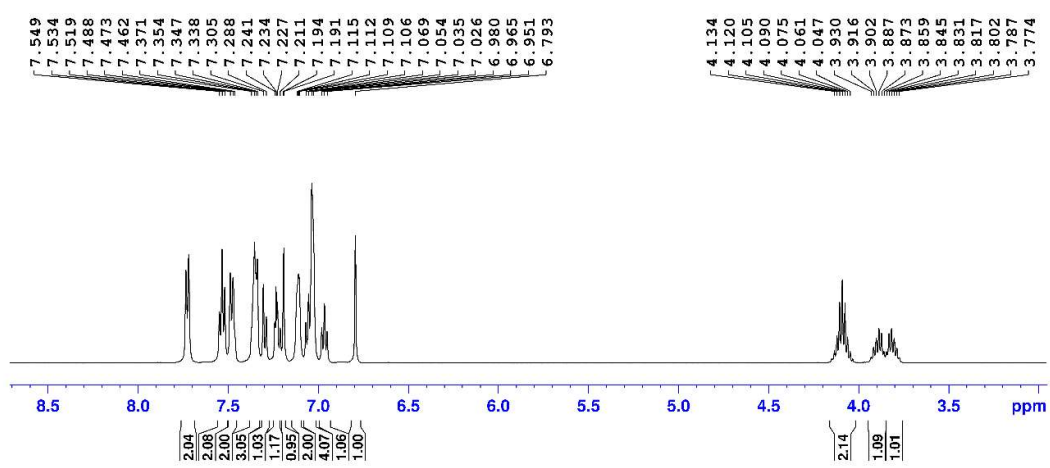
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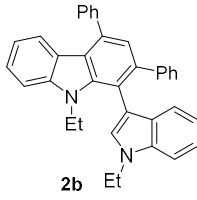
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SYTK-02-430



SYTK-02-430



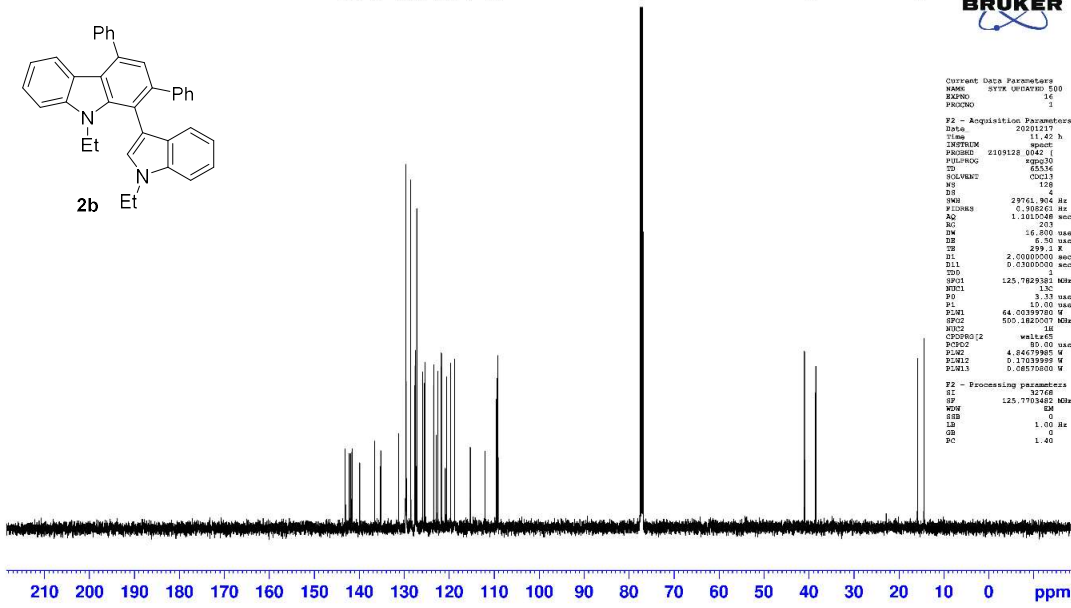
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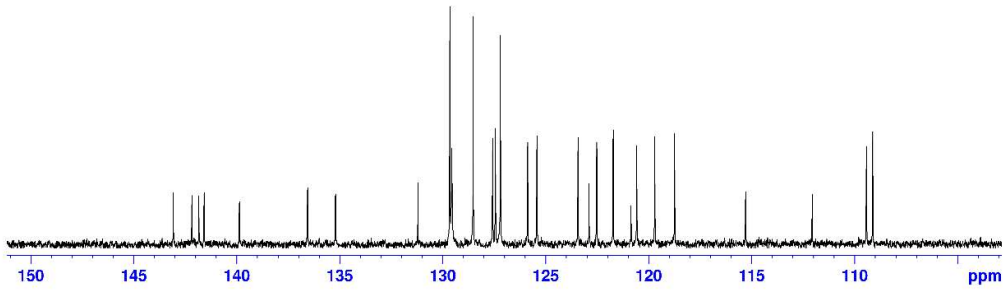


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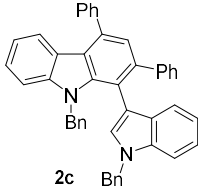
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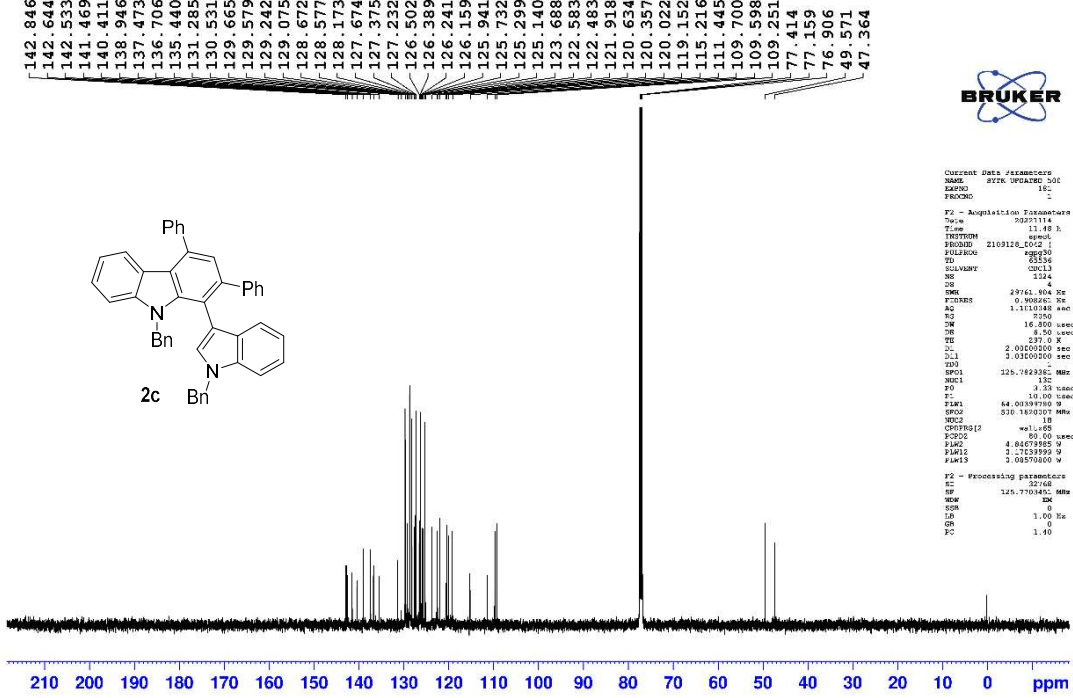
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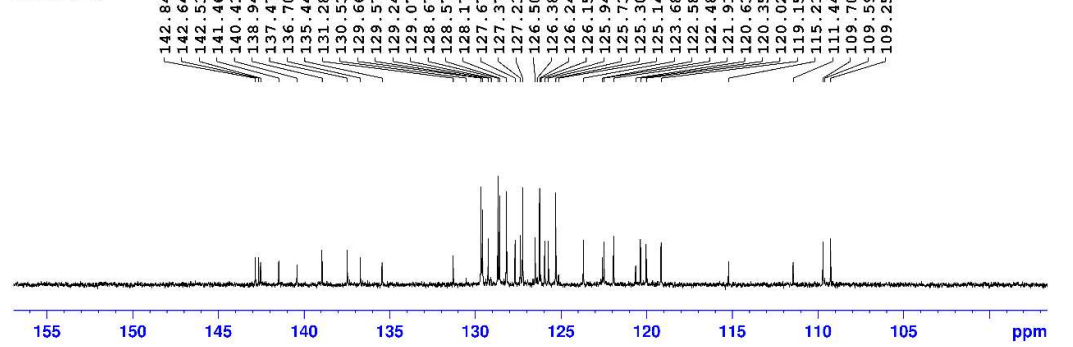
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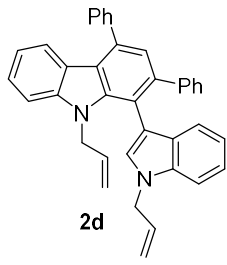
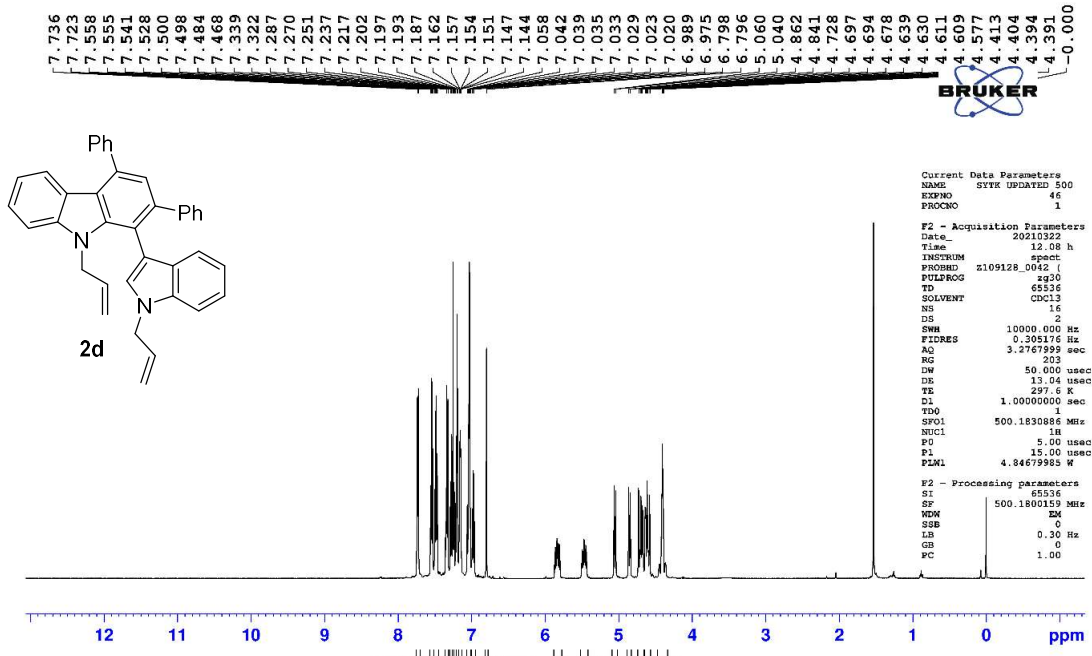
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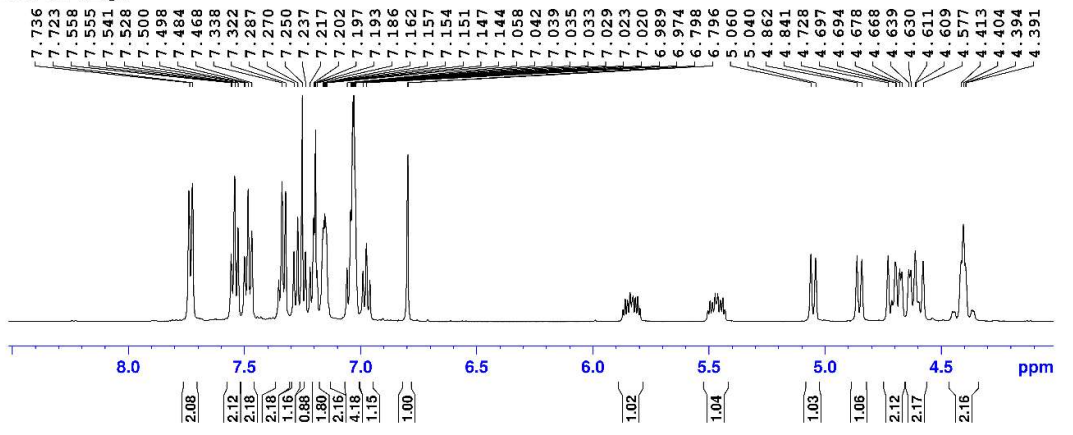
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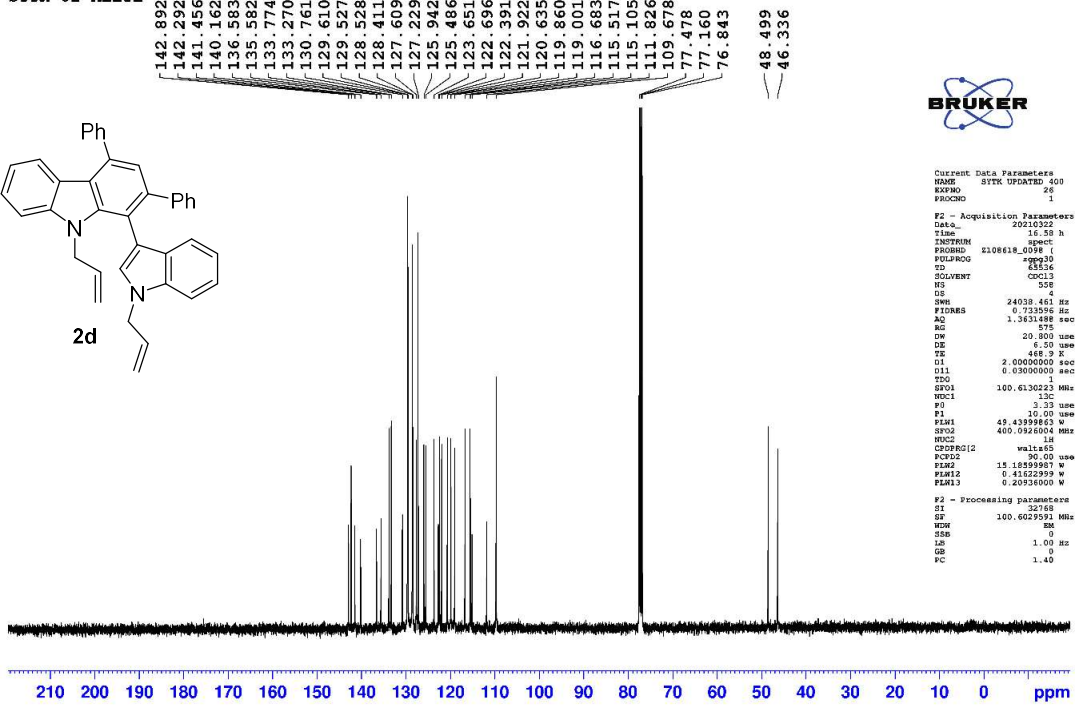
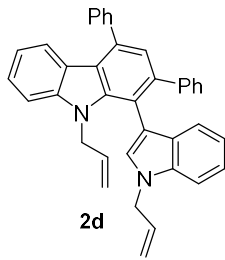
SYTK-02-Allyl



SYTK-02-Allyl



SYTK-02-ALLYL



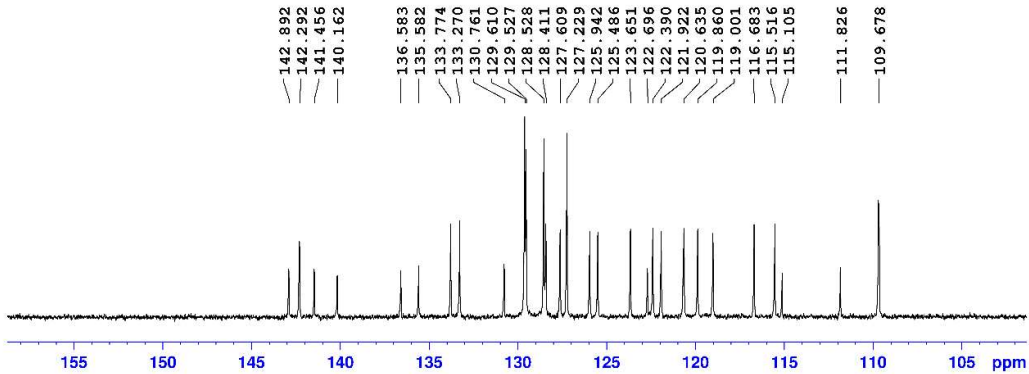
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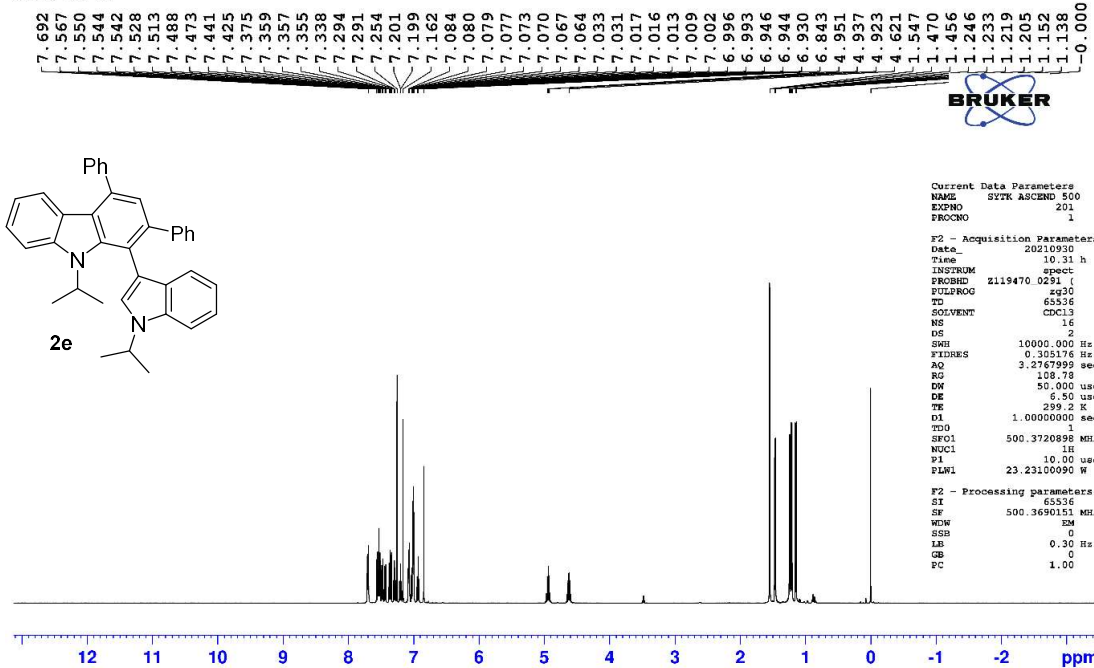
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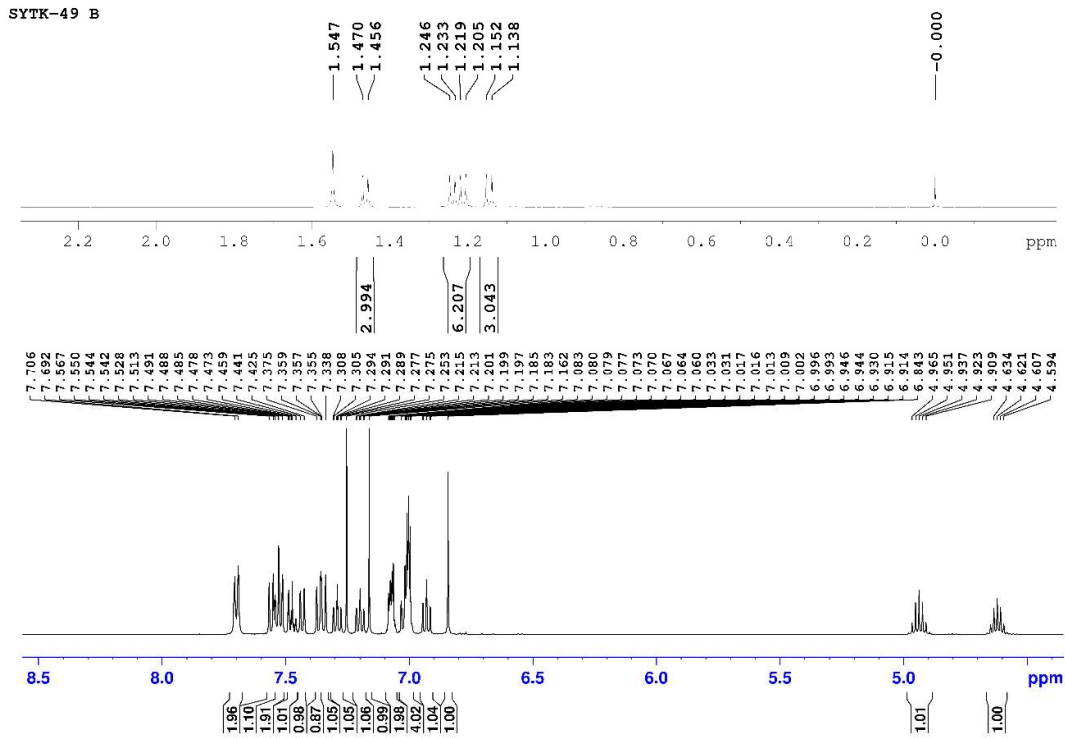
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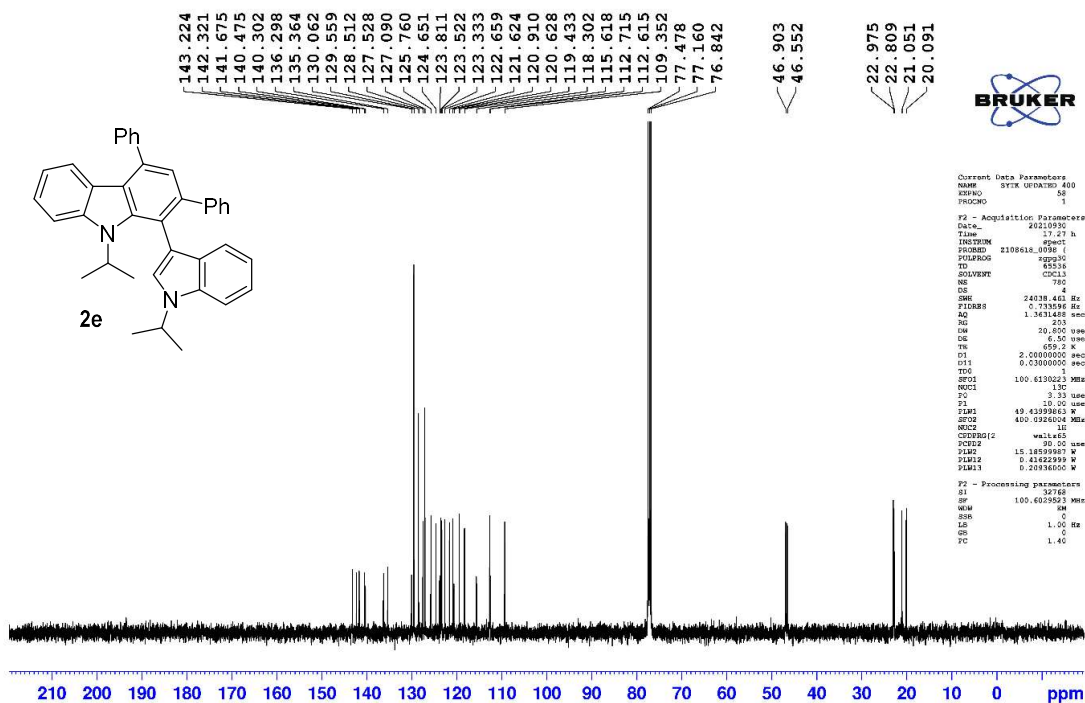
SYTK-49 B



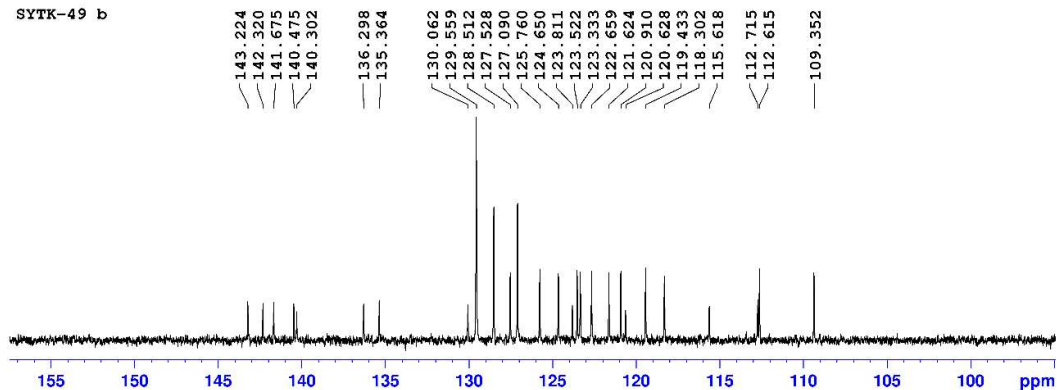
SYTK-49 B



SYTK-49 b

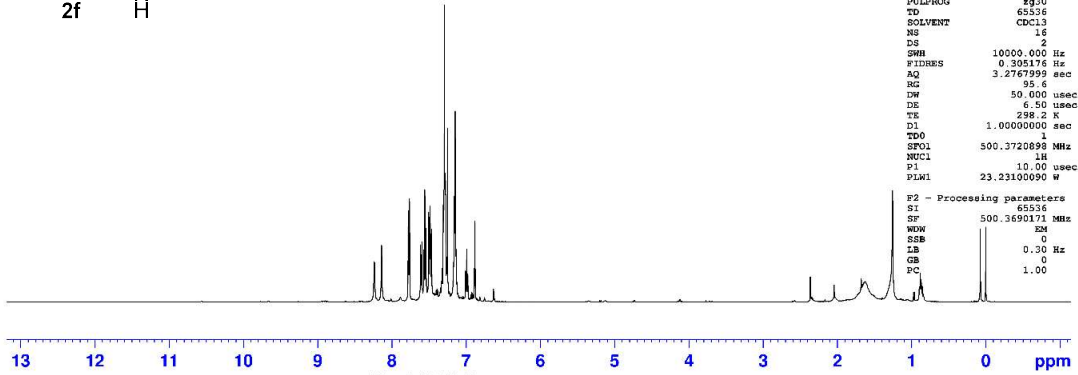
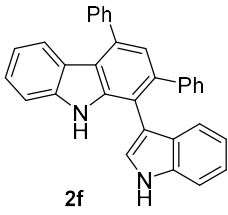
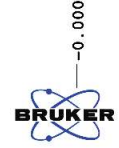


SYTK-49 b



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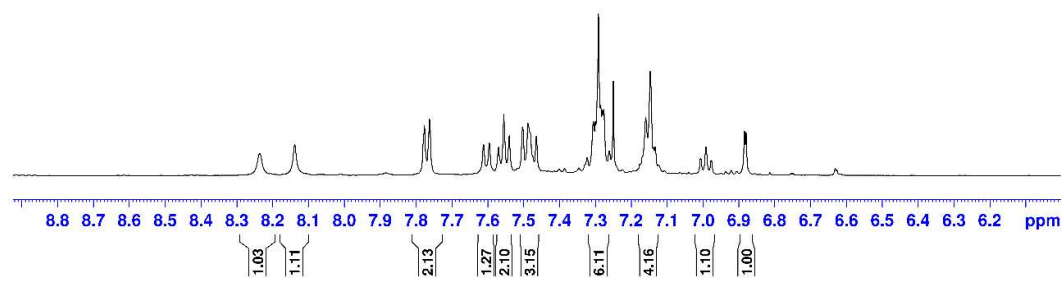
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DE 6.50 usec
TE 298.2 K
D1 1.00000000 sec
YD0
SFO1 500.3720898 MHz
NUC1 1H
P1 10.00 usec
PLM1 23.23100090 W

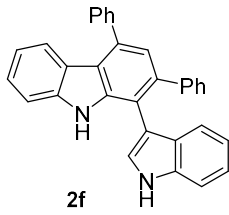
F2 - Processing parameters
SI 65536
SF 500.3690171 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

NH CARB

8.236
8.138
7.779
7.776
7.762
7.612
7.596
7.569
7.555
7.540
7.503
7.488
7.474
7.464
7.328
7.323
7.305
7.300
7.291
7.285
7.281
7.276
7.261
7.249
7.176
7.168
7.159
7.147
7.137
7.133
7.124
7.007
7.005
6.991
6.977
6.975
6.884
6.879



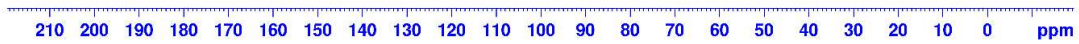
SYTK- NH-CARB



142.258
141.288
140.220
140.022
139.389
136.501
136.201
130.014
129.491
128.568
127.790
127.661
127.154
126.320
125.645
124.818
123.849
123.253
122.555
120.437
120.256
119.678
119.109
114.925
112.244
111.651
110.645
77.160
76.843

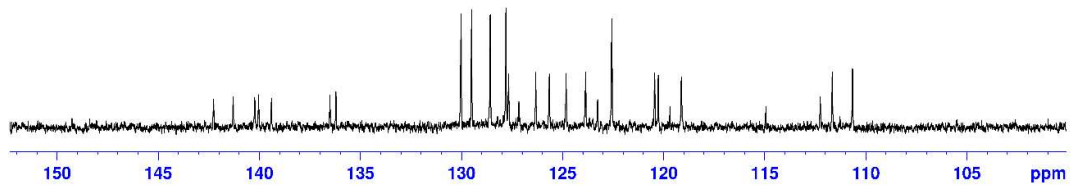


Current Data Parameters
NAME SYTK_UPDATE_000
EXPNO 60
PROCNO 1
F2 - Acquisition Parameters
Date_ 20211005
Time 14.11 h
INSTRUM spect
PULPROG zgpg30
PRGNAME zgpg30
TD 65536
SOLVENT CDCl3
NS 1300
DS 4
SWH 24050.464 Hz
FIDRES 0.733296 Hz
AQ 1.2631069 sec
RG 675
RW 20.810 usec
CW 6.00 usec
TE 300.2 K
D1 2.0000000 sec
D11 0.0300000 sec
YTD
SFO1 100.6130213 MHz
NUC1 13C
P1 3.75 usec
P2 10.00 usec
F1A1 49.8395863 MHz
SFO2 400.0924004 MHz
NUC2 1H
CDEPRG2 waltz165
CDD2 90.00 usec
FIR2 15.1859987 MHz
FIR12 0.8102299 MHz
FIR13 0.2091600 MHz
F2 - Processing parameters
SI 32768
SF 100.6029111 MHz
WDW EM
SSB 0
LR 1.00 Hz
GB 0
PC 1.40

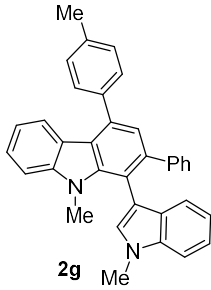


SYTK- NH-CARB

142.258
141.287
140.220
140.022
139.389
136.501
136.201
130.014
129.491
128.568
127.790
127.661
127.154
126.320
125.645
124.818
123.849
122.555
120.437
120.256
119.678
119.109
114.925
112.244
111.651
110.645



SYTK-Me C



7.727
7.724
7.710
7.554
7.552
7.538
7.523
7.499
7.496
7.493
7.482
7.477
7.467
7.377
7.361
7.349
7.346
7.344
7.271
7.269
7.258
7.241
7.179
7.092
7.090
7.076
7.062
7.060
7.053
7.037
6.985
6.983
6.969
6.954
6.953
6.885
6.869
6.734
3.755
2.238
2.230
1.560



Current Data Parameters
 NAME SYTK UPDATED 500
 EXPNO 180
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20221114
 Time 10.51 h
 INSTRUM spect
 PROBHD E109128_0042 ()
 PULPROG zg30
 TO 65336
 SOLVENT CDCl3
 NS 16
 DS 2
 SWH 10000.000 Hz
 FIDRES 0.305176 Hz
 AQ 3.276799 s
 RG 456
 DM 50.000 usec
 DE 13.04 usec
 TE 296.2 K
 D1 1.00000000 sec
 TDO 1
 SFO1 500.1830886 MHz
 NUC1 1H
 PD 5.00 usec
 P1 15.00 usec
 PLW1 4.8467985 w

F2 - Processing parameters
 SI 65336
 SF 500.1800131 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 FC 1.00

13 12 11 10 9 8 7 6 5 4 3 2 1 0 ppm

2.08
2.13
3.17
1.16
1.07
1.05
1.19
2.04
1.13
2.11
1.00

3.17
3.22
3.24

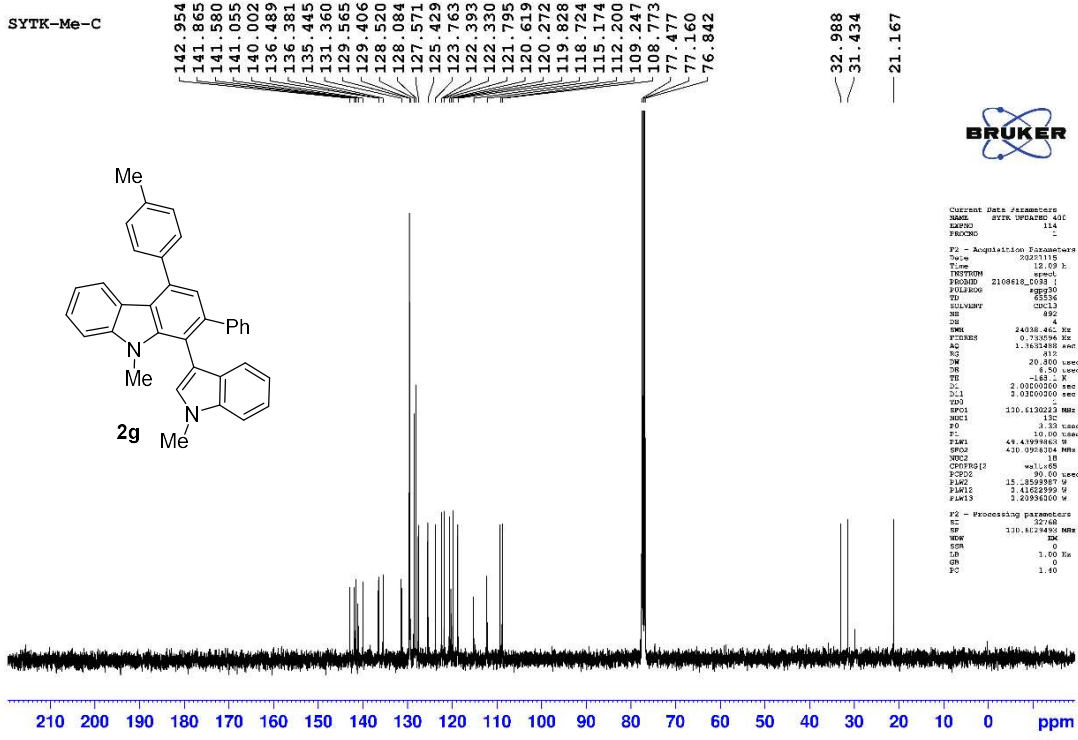
SYTK-Me C

7.727
7.724
7.710
7.555
7.552
7.538
7.523
7.499
7.496
7.494
7.482
7.477
7.467
7.377
7.361
7.349
7.346
7.344
7.271
7.269
7.258
7.241
7.179
7.092
7.090
7.076
7.062
7.060
7.053
7.037
6.985
6.983
6.969
6.955
6.953
6.885
6.869
6.734

8.5 8.0 7.5 7.0 6.5 6.0 ppm

1.97
2.04
2.05
2.94
0.80
1.03
0.93
1.10
1.80
1.06
2.02
1.00

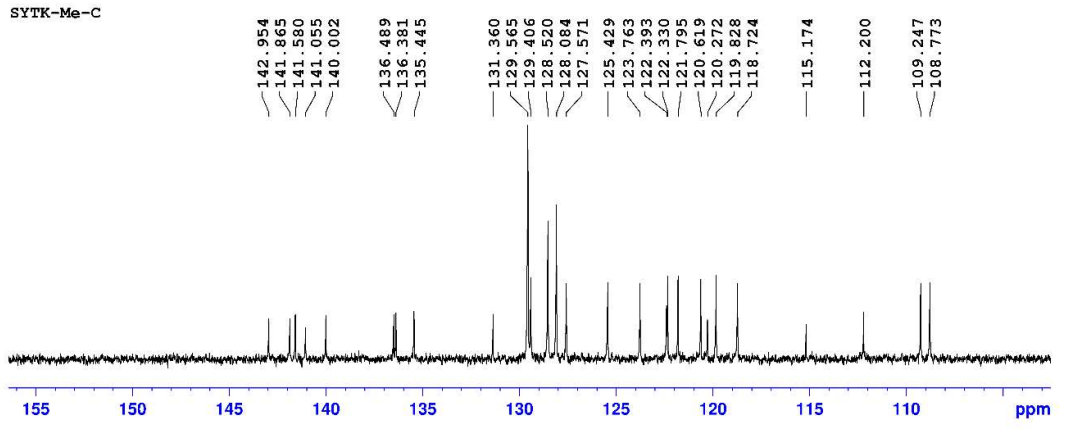
SYTK-Me-C



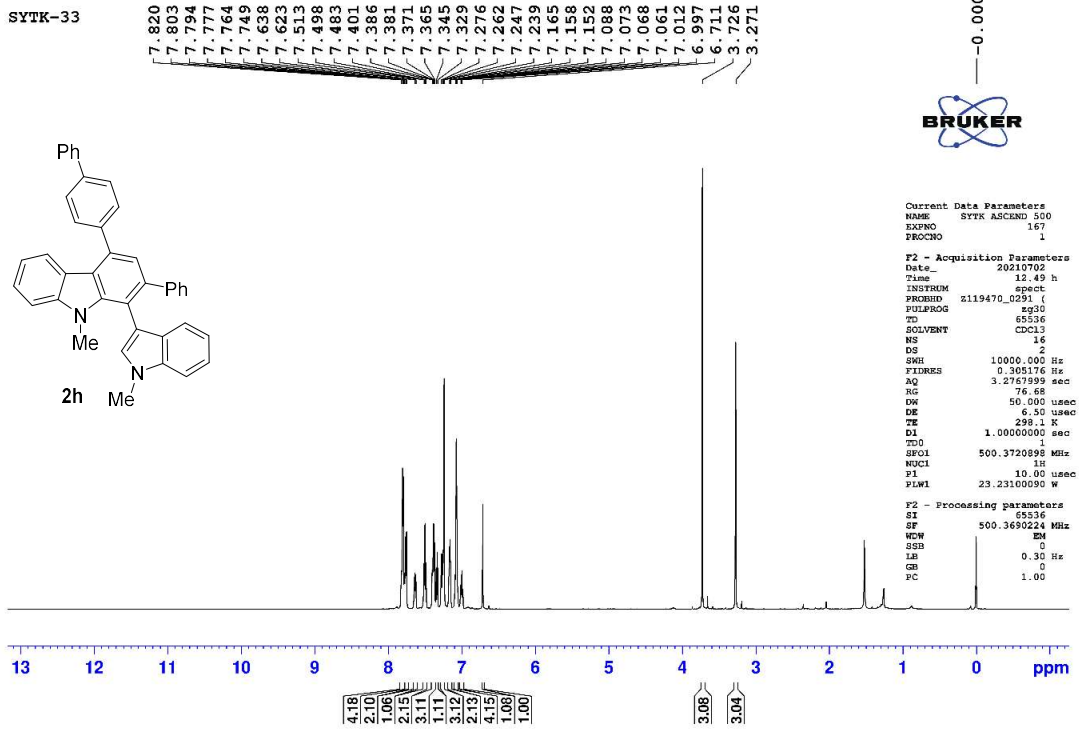
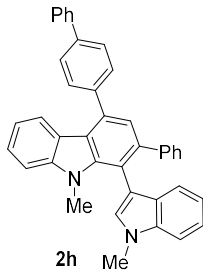
```

CURRENT DATA PARAMETERS
NAME      SYTK-UPGRAB-0401
EXPNO    1
PROCNO   1
F2 - Acquisition Parameters
Date_    20231115
Time     12:09:31
INSTRUM  spect
PROBHD   Z108418-QNP5
PULPROG  zgpg30
TD        65536
SOLVENT  CDCl3
NS       4092
DS        4
SWH       24000 Hz
FIDRES    0.733094 Hz
AQ         1.9635800 sec
RG         812
OR        20.800 usec
DE        6.50 usec
TE        300.2 K
DQ        2.0000000 sec
DELTA     3.0000000 sec
SFO1      100.6130213 MHz
SFO2      132.2445132 MHz
PC        3.23 usec
P1        10.00 usec
P2        48.4199961 usec
SFO3      400.0994004 MHz
NUC1      13C
CPDPRG2  waltz16b
PCPD2     90.00 usec
PL1       15.3599987 usec
PL2       3.4100000 usec
PL3       3.0000000 usec
F4P13     1.0000000 usec
F2 - Processing parameters
SI        32768
SF        100.6132480 MHz
WDW       EM
SSB       0
GB        0
PC        1.00 usec
  
```

SYTK-Me-C



SYTK-33

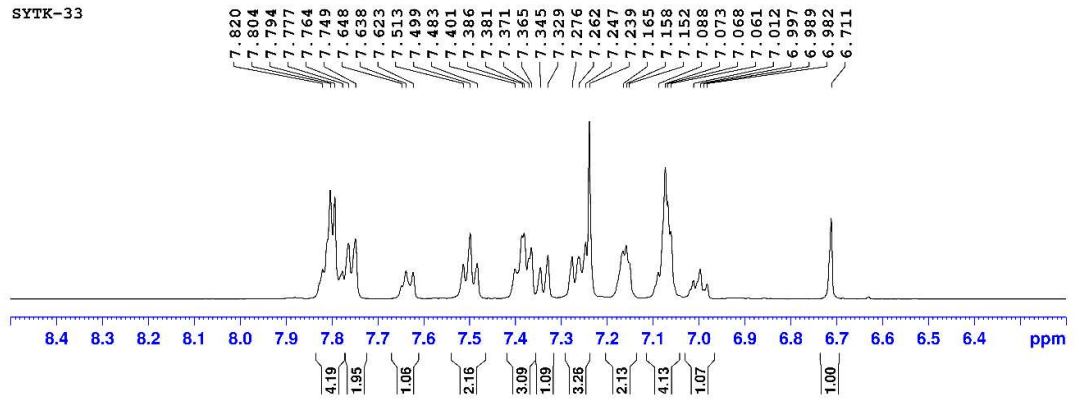


Current Data Parameters
 NAME SYTK ASCND 500
 EXPNO 167
 PROCNO 1

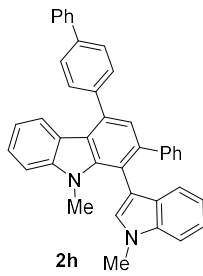
F2 - Acquisition Parameters
 Date_ 20210702
 Time 12.49 h
 INSTRUM spect
 PROCID z119470_0291 (1
 PULPROG zgpg
 TD 65536
 SOLVENT CDCl3
 NS 16
 DS 2
 SWH 10000.000 Hz
 FIDRES 0.305176 Hz
 AQ 3.2767999 sec
 RG 76.68
 DW 50.000 usec
 DE 6.50 usec
 TE 299.1 K
 D1 1.00000000 sec
 TD0 1
 SFO1 500.3720898 MHz
 NUC1 1H
 P1 10.00 usec
 PLW1 23.23100030 W

F2 - Processing parameters
 SI 65536
 SF 500.3690224 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00

SYTK-33



SYTK-33

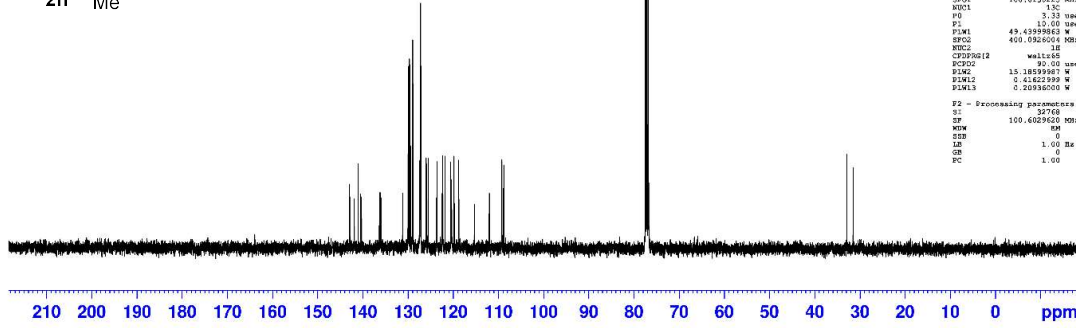


142.985
141.945
141.051
140.503
140.345
136.351
136.074
131.201
129.984
129.702
129.451
128.990
127.477
127.318
127.270
127.210
126.001
125.568
123.661
122.431
122.334
121.830
120.553
120.386
119.847
118.809
115.327
112.043
109.268
108.856
77.160
76.842

32.938
31.503

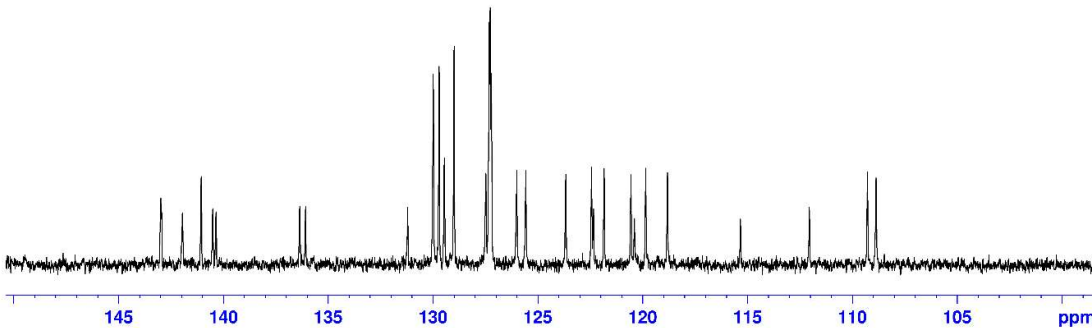


Current Data Parameters
NAME: SYTK-33
EXPNO: 37
PROCNO: 3
F2 - Acquisition Parameters
Date_: 20120905
Time: 11.50 h
INSTRUM: spect
PROBHD: z106z18 0508 1
PULPROG: zgpg30
TD: 65536
SOLVENT: CDCl3
NS: 512
DS: 4
SWH: 24036.462 Hz
F2DRBS: 0.73338 Hz
AQ: 1.3631660 sec
RG: 812
RW: 29.900 usec
TE: 6.50 usec
DE: 709.4 K
D1: 2.0000000 sec
D11: 0.0300000 sec
TD0: 100.613022 MHz
NUC1: 13C
PC: 3.33 usec
PT: 10.00 usec
P1M1: 49.6399862 W
SFO2: 400.0526004 MHz
NUC2: 1H
CPDPRG2: waltz16
SFO2: 80.00 usec
P1M2: 15.2859987 W
P1M3: 0.2162399 W
P1M4: 0.2093600 W
F2 - Processing parameters
SI: 32768
SF: 100.6282620 MHz
WDW: EM
SSP: 0
LB: 1.00 Hz
GB: 0
PC: 1.00

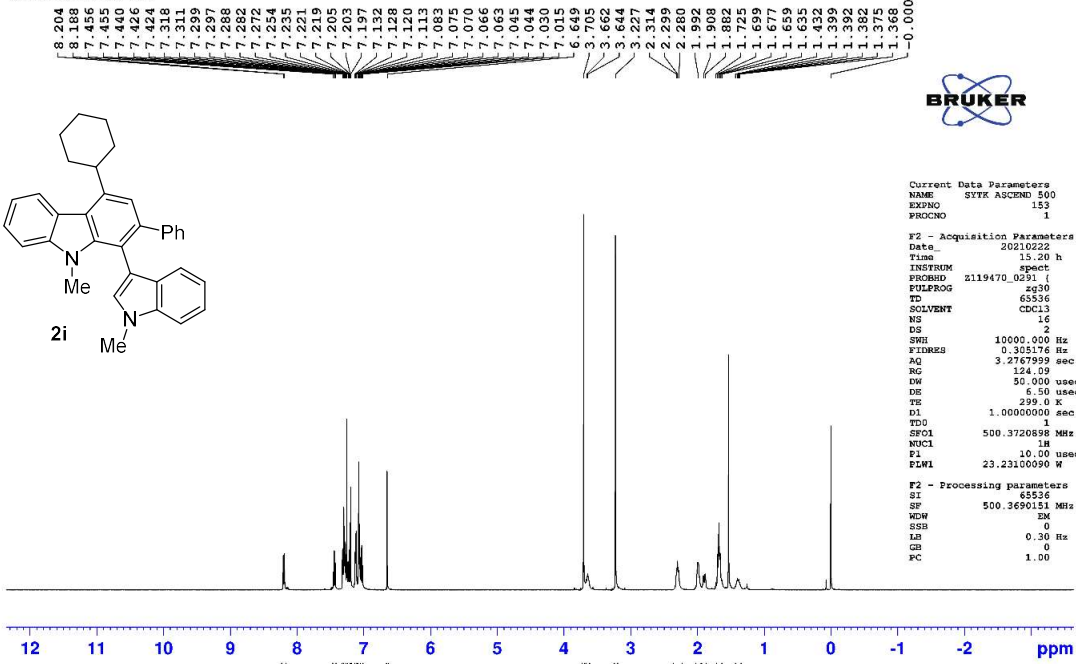


SYTK-33

142.985
141.945
141.051
140.503
140.345
136.351
136.074
131.201
129.984
129.702
129.451
128.990
127.477
127.318
127.270
127.210
126.001
125.568
123.662
122.431
122.334
121.830
120.553
120.386
119.848
118.809
115.327
112.043
109.268
108.856



SYTK-02-476-P2

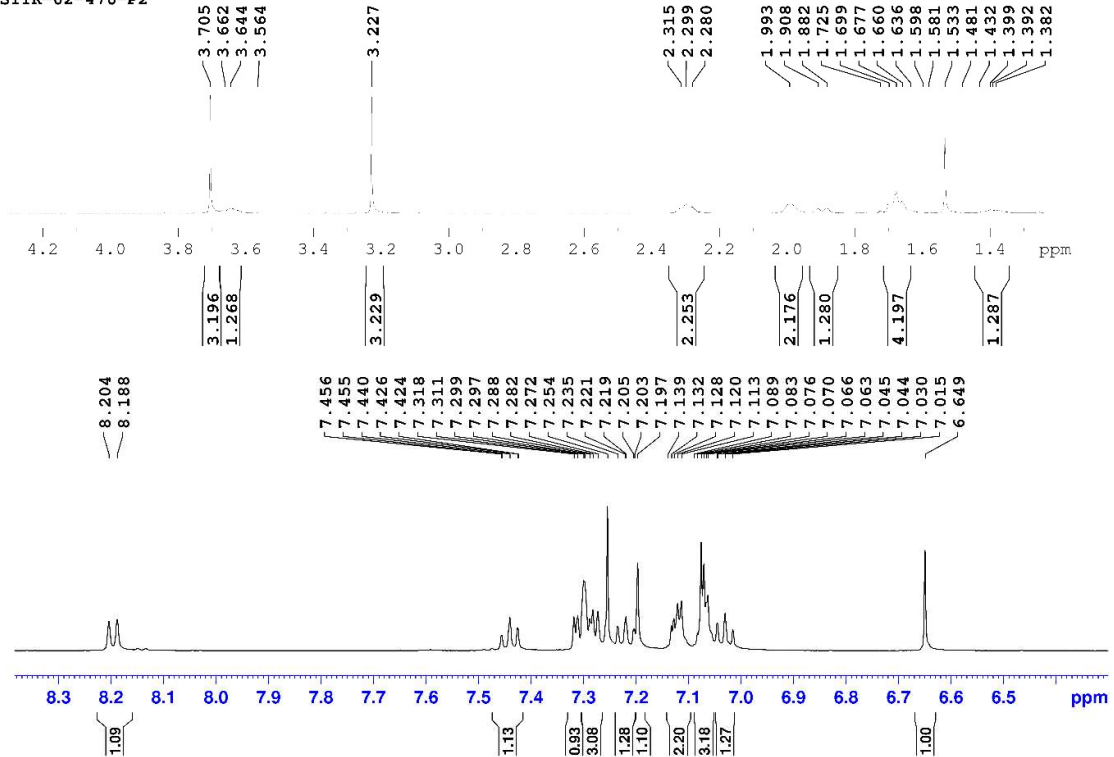


Current Data Parameters
 NAME SYTK ASCEND 500
 EXPNO 153
 PROCNO 1

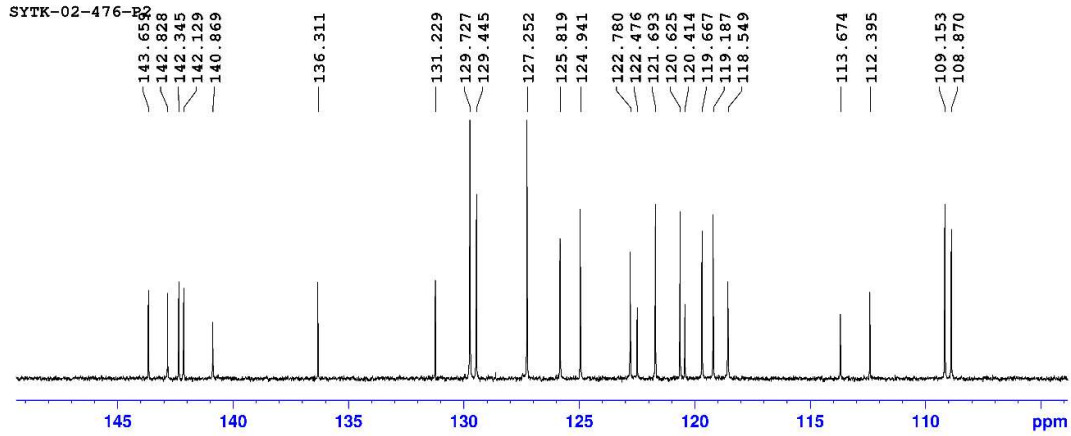
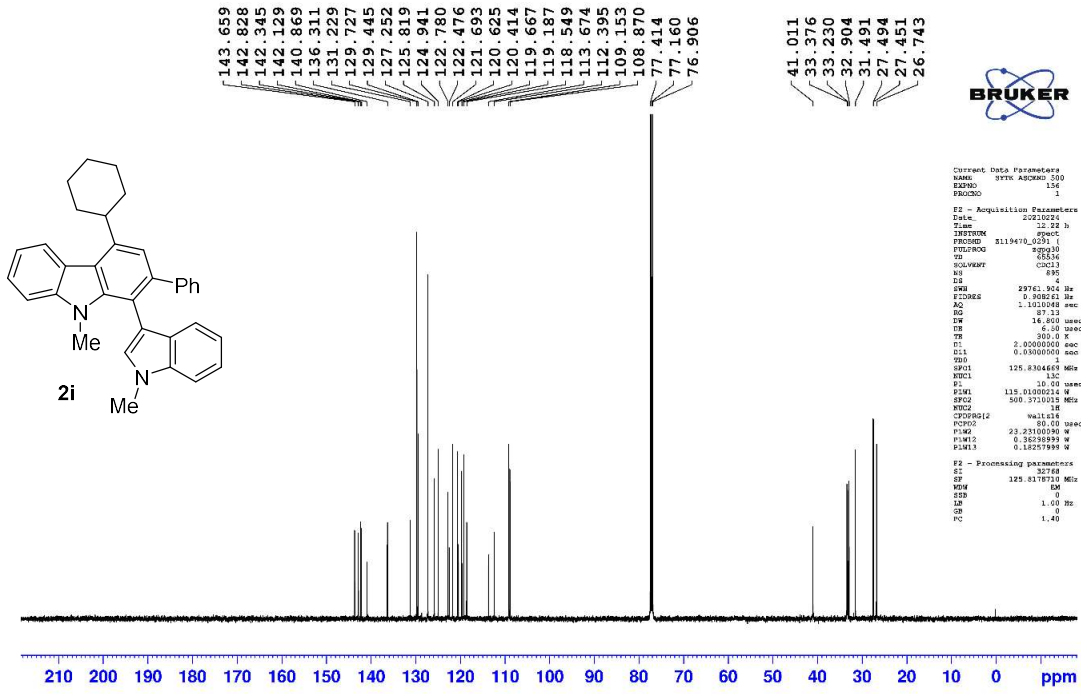
F2 - Acquisition Parameters
 Date_ 20210222
 Time 15.20 h
 INSTRUM spect
 FREQSHD 2119470.0291 i
 FULPROG zg30
 TD 65536
 SOLVENT CDCl3
 NS 16
 DS 2
 SFE 10000.000 Hz
 FIDRES 0.305176 Hz
 AQ 3.2767959 sec
 RQ 124.09
 DW 50.000 usec
 DE 6.30 usec
 TE 299.0 K
 D1 1.00000000 sec
 TDD 1
 SFO1 500.3720898 MHz
 NUC1 1H
 P1 10.00 usec
 PLW1 23.23100090 W

F2 - Processing parameters
 SI 65536
 SF 500.3690151 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00

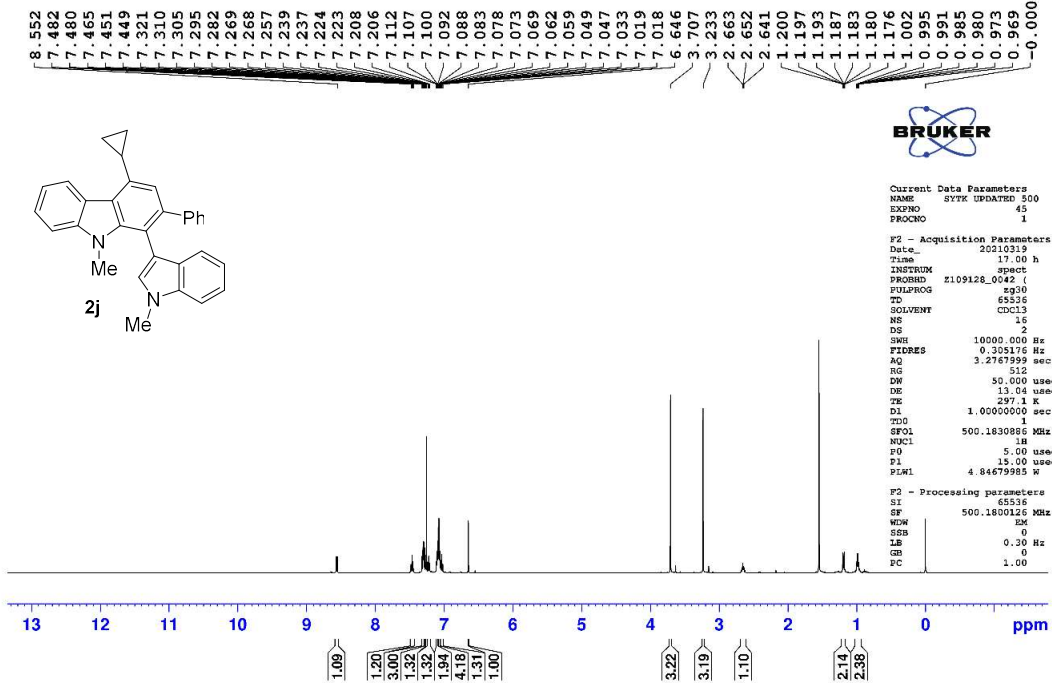
SYTK-02-476-P2



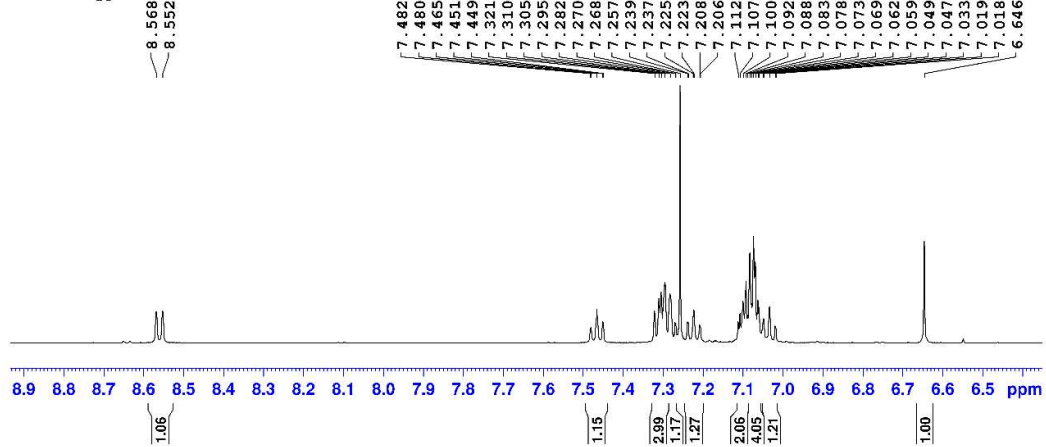
SYTK-02-476-P2



SYTK-02-Cyp-1



SYTK-02-Cyp-1

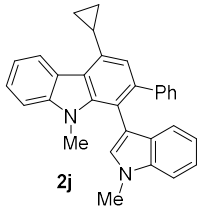


SYTK-02-CYP-1



```

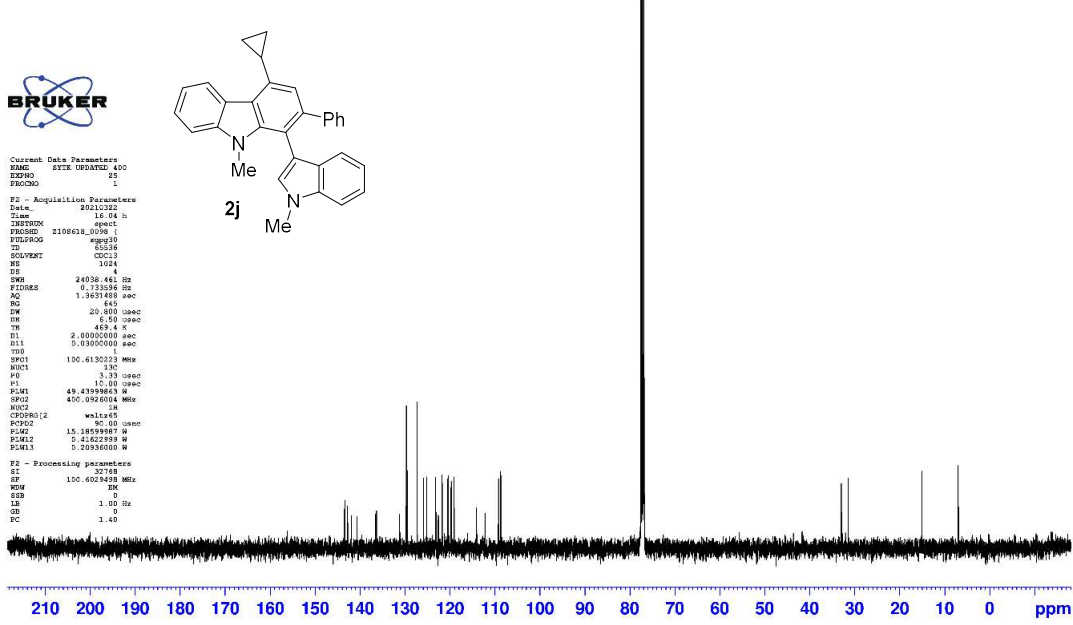
Current Data Parameters
NAME: SYTK_02CYP-1_400
EXPNO: 2
PROCNO: 1
F2 - Acquisition Parameters
Date_: 20210302
Time: 16.04.5
INSTRUM: spect
PROBHD: 1HBOEX-50098 (
PULPROG: zgpg30
TD: 65536
SOLVENT: CDCl3
NS: 1024
DS: 4
SWH: 24038.461 MHz
FIDRES: 0.33356 Hz
AQ: 1.3651488 sec
RG: 445
DM: 20.800 usec
DE: 8.50 usec
TE: 499.4 K
D1: 2.0000000 sec
d11: 0.0300000 sec
SFO1: 100.6130233 MHz
NUC1: 13C
P1: 130
PC: 3.33 usec
PL1: 0.00 usec
PL12: 49.4399863 dB
SFO2: 400.2610054 MHz
NUC2: 1H
PCPD2: 15.00 usec
PL2: 15.00 usec
PL12: 0.4162399 dB
PL13: 0.2050000 dB
F2 - Processing parameters
SI: 32768
SF: 100.6074098 MHz
WDW: EM
SSB: 0
LB: 1.00 Hz
GB: 0
PC: 1.40
  
```



143.381
142.736
141.883
140.631
136.610
136.301
131.214
129.684
129.415
127.270
125.868
125.141
123.164
123.038
122.570
121.711
120.541
120.339
119.706
119.053
114.127
112.196
109.178
108.684
77.477
77.160
76.842

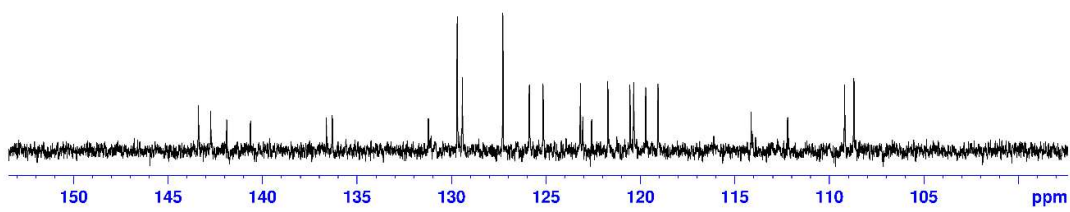
32.931
31.399

15.053
6.996
6.940

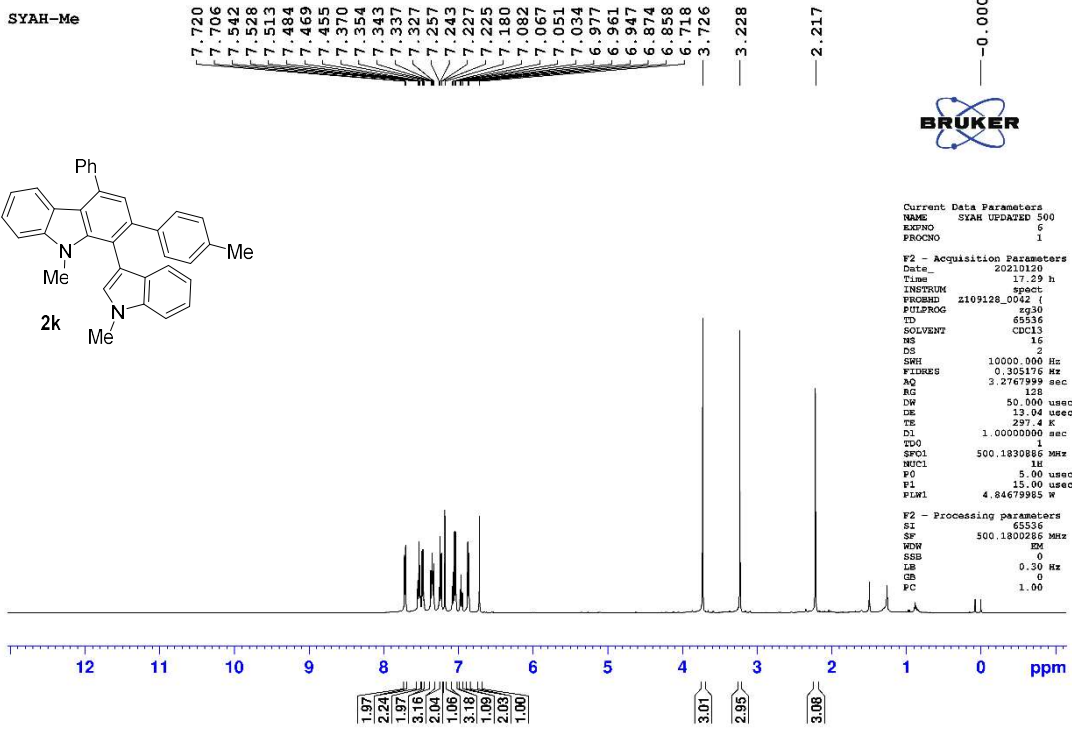
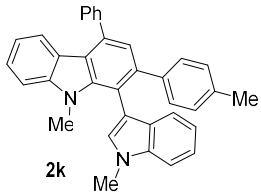


SYTK-02-CYP-1

143.381
142.736
141.883
140.631
136.610
136.301
131.214
129.684
129.415
127.270
125.868
125.141
123.164
123.038
122.570
121.711
120.541
120.339
119.706
119.053
114.127
112.196
109.178
108.684

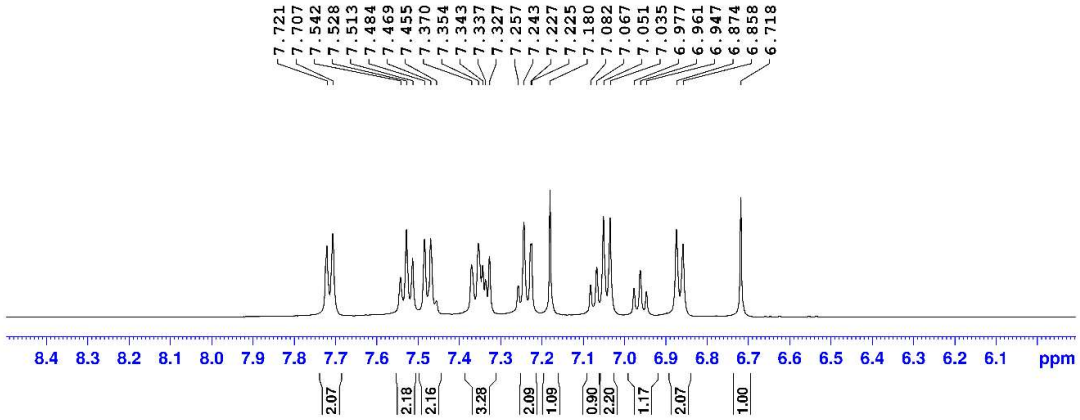


SYAH-Me

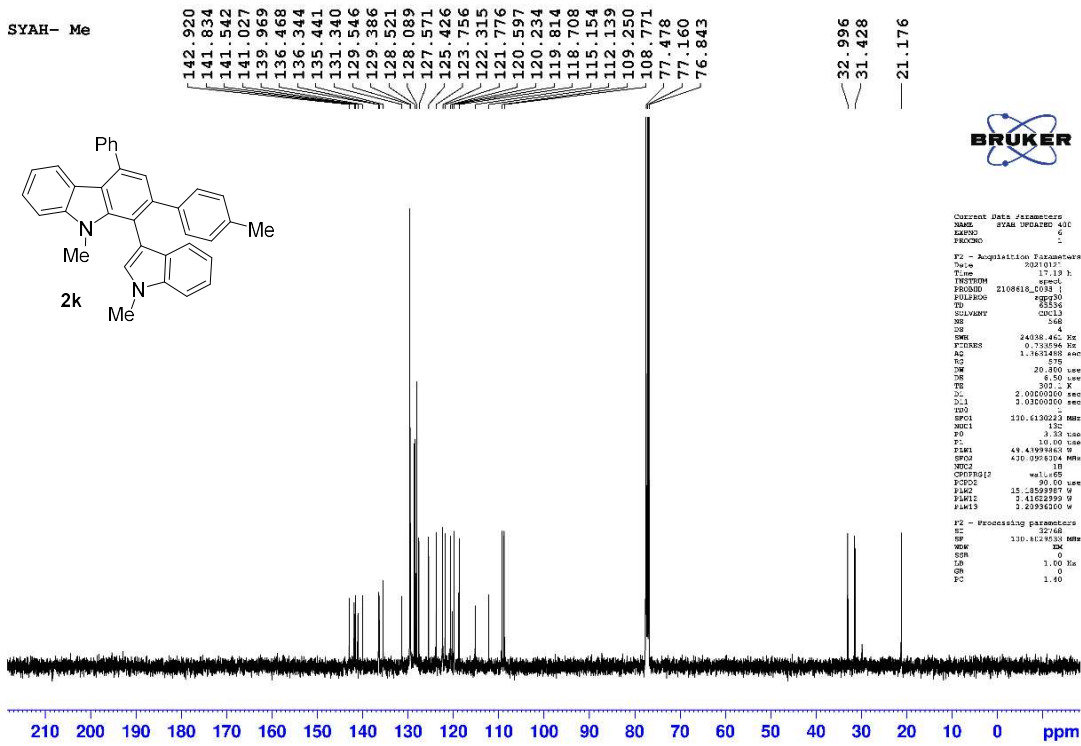
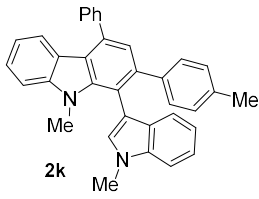


Current Data Parameters
 NAME: SYAH_UPDATED_500
 EXPNO: 6
 PROCNO: 1
 F2 - Acquisition Parameters
 Date_: 20210120
 Time: 17.29 h
 INSTRUM: spect
 FREQID: z109128_0042 f
 PULPROG: zg30
 TD: 65536
 SOLVENT: CDCl3
 NS: 16
 DS: 2
 SSB: 0
 RBW: 10000.000 Hz
 FIDRES: 0.305176 Hz
 AQ: 3.2767999 sec
 RG: 128
 DW: 50.000 usec
 DE: 13.04 usec
 TE: 297.4 K
 D1: 1.00000000 sec
 TDO: 1
 SFO1: 500.1330886 MHz
 NUC1: 1H
 P0: 5.00 usec
 F1: 15.00 usec
 PLW1: 4.84679985 W
 F2 - Processing parameters
 SI: 65536
 SF: 500.1330886 MHz
 MDW: 0
 SSB: 0
 LB: 0.30 Hz
 GB: 0
 PC: 1.00

SYAH-Me



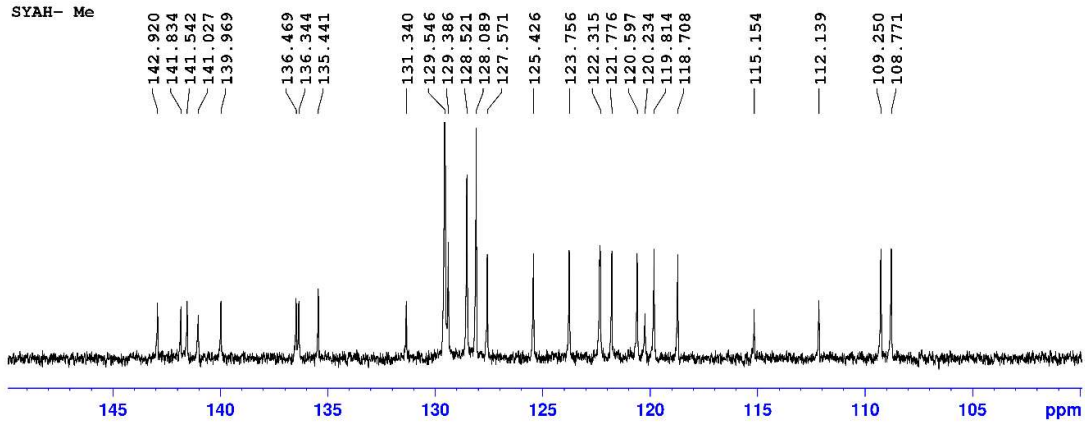
SYAH- Me



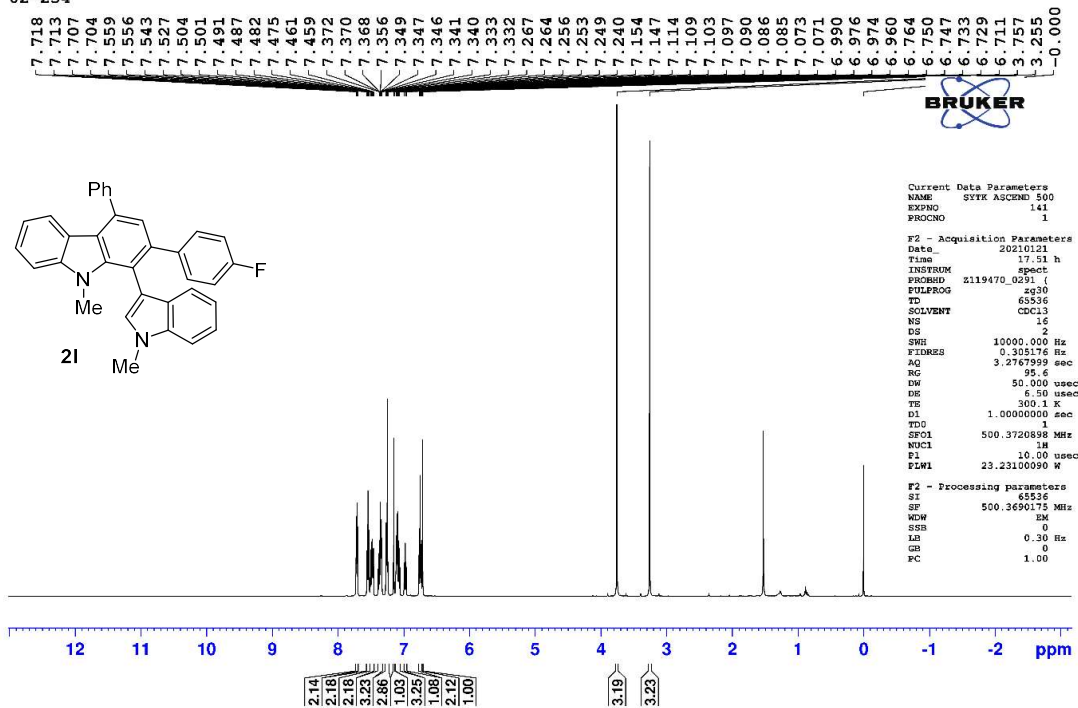
```

=====
NAME      SYAH-UPGRADE-431C
EXPNO     6
PROCNO    1
F2 - Acquisition Parameters
Date_     20210117
Time      17:19:11
INSTRUM   spect
PROBHD    1H0610_05B-1
PULPROG   zgpg30
NUC1       13C
SOLVENT    CDCl3
NS         500
DS         4
SWH        24320.462 Hz
FIDRES     0.35056 Hz
AQ         1.1620495 sec
RG         678
WDW        EM
SSB        0
GB         0
PC         20.000 usec
DE         8.50 usec
TE         300.2 K
DQ         2.0000000 sec
DELTA      3.0000000 sec
VFO1       101.626125 MHz
NUC2       13C
MPC1       152
PC         3.00 usec
P1         10.00 usec
P1A1       48.4199860 W
P1A2       420.0968304 MHz
MPC2       18
CDEPRG2    waltz165
PCPG2      90.00 usec
PLM2       15.2859987 W
PLM1       2.4402899 W
PLM13      2.2395200 W
F2 - Processing parameters
SI         32768
SF         101.626125 MHz
WDW        EM
SSB        0
GB         0
PC         3.00 usec
PC         1.00
  
```

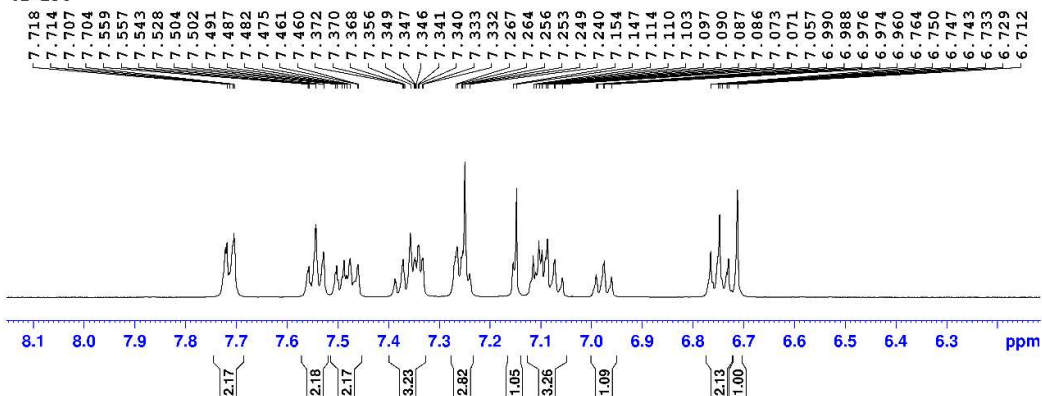
SYAH- Me



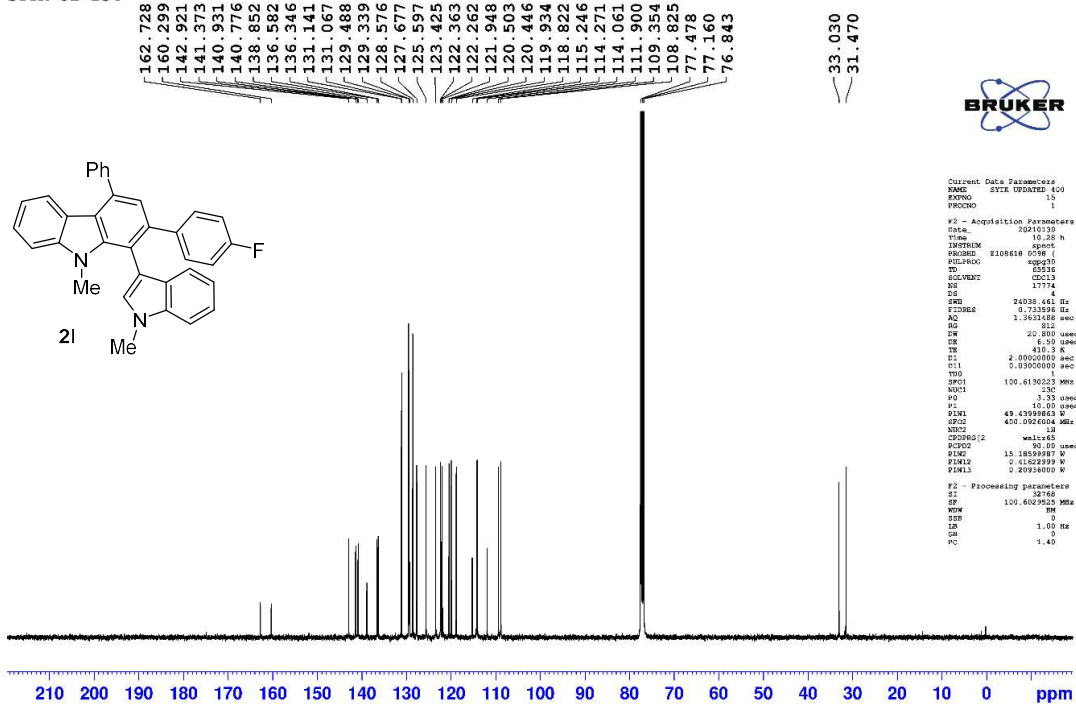
02-254



02-254



SYTK-02-254

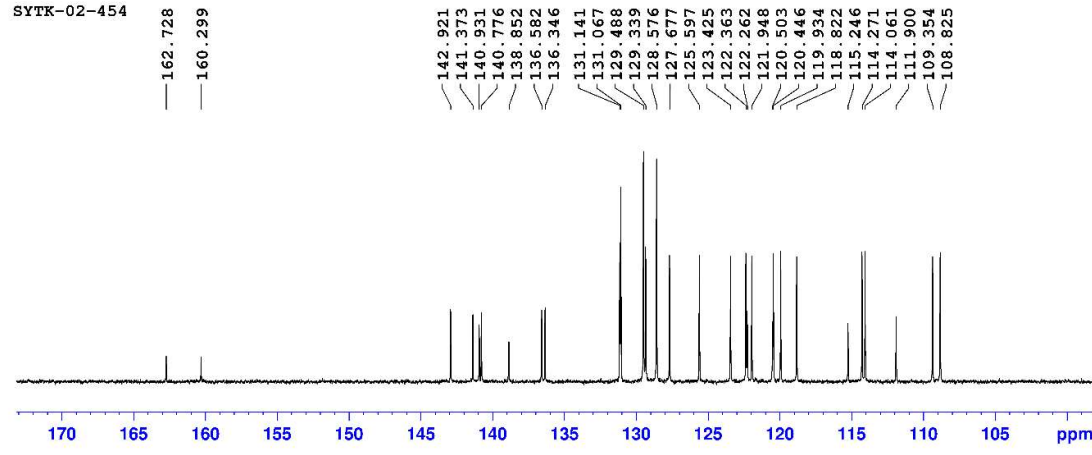


BRUKER

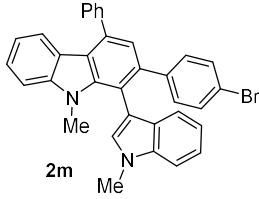
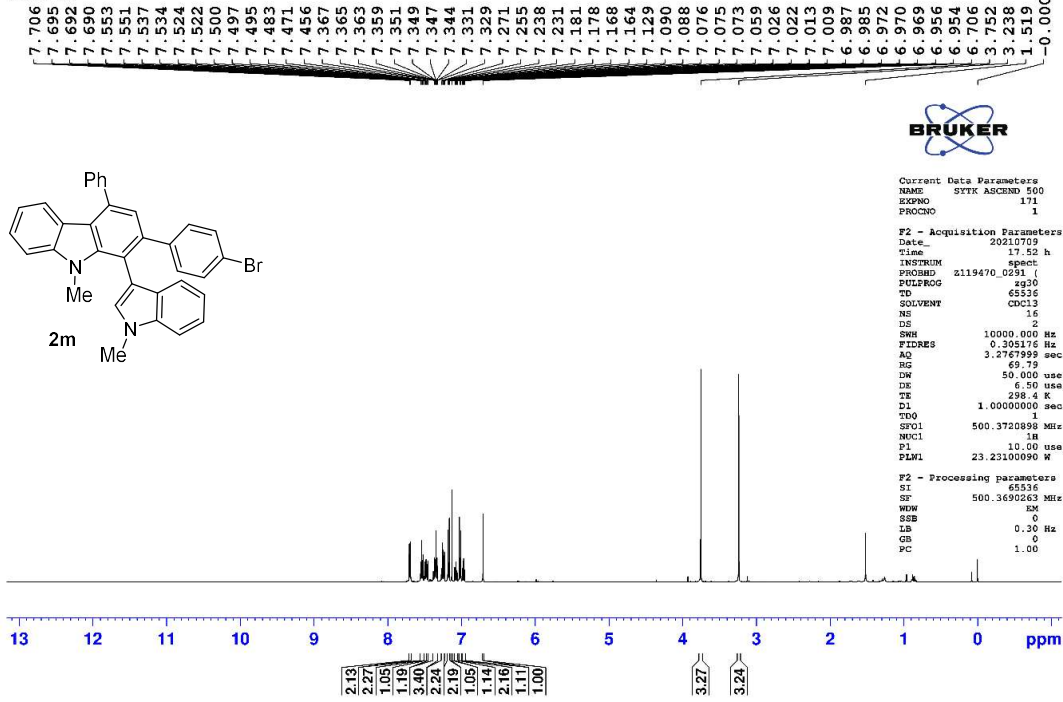
```

Current Data Parameters
NAME      SYTK_UPDATE_100
EXPNO    15
PROCNO   1
F2 - Acquisition Parameters
Date_     20210130
Time      10.25 h
INSTRUM  spect
PROBHD   E1081H1 05H 1
PULPROG  zgpg30
TD        65536
SOLVENT  CDCl3
NS        1774
DS        4
SWH       24000.461 Hz
FIDRES    0.733596 Hz
AQ         1.3631680 sec
RG         312
SWH        20.800 umso
DS         6.50 umso
TE         482.3 K
D1         2.00000000 sec
D11        0.03000000 sec
VWD        1
SFO1       100.6130213 MHz
NUC1        13C
PQ         1.33 umso
PI         10.00 umso
P1A1       49.43999863 M
SFO2       400.0924004 MHz
NUC2        1H
CPOBPG2   waltz165
DPCPG2     90.00 umso
P1A2       15.18599987 M
P1M1       0.11422299 M
P1M3       0.20914000 M
F2 - Processing parameters
SI         32768
SF         100.6130213 MHz
WDW        EM
SSB        0
GB         0
PC         1.40
    
```

SYTK-02-454



SYTK-37

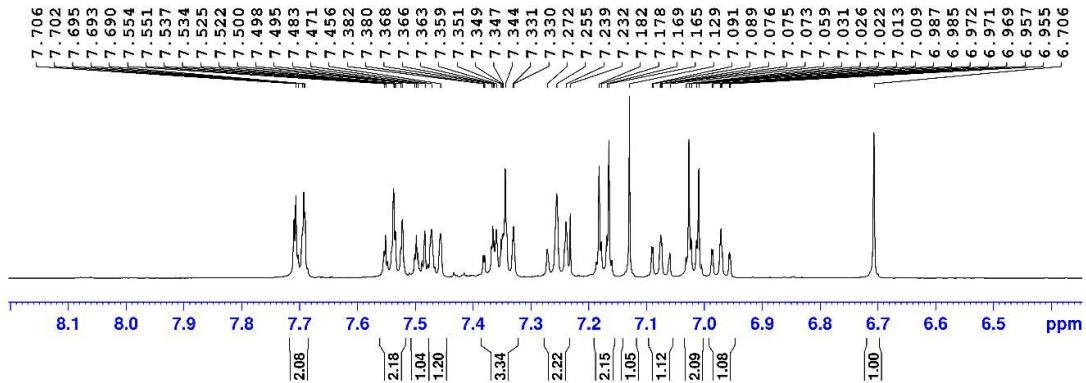


Current Data Parameters
 NAME SYTK ASCHND 500
 EXPNO 171
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20210709
 Time 17.52 h
 INSTRUM spect
 PROBHD 2119470_0291 ()
 PULPROG zg30
 TD 65536
 SOLVENT CDCl3
 NS 16
 DS 2
 SWH 10000.000 Hz
 FIDRES 0.305176 Hz
 AQ 3.2767999 sec
 RG 69.79
 DW 50.000 usec
 DE 6.50 usec
 TE 298.4 K
 D1 1.0000000 sec
 TDO 1
 SFO1 500.3720896 MHz
 NUC1 1H
 P1 10.00 usec
 PLWL 23.23100090 W

F2 - Processing parameters
 SI 65536
 SF 500.3690263 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00

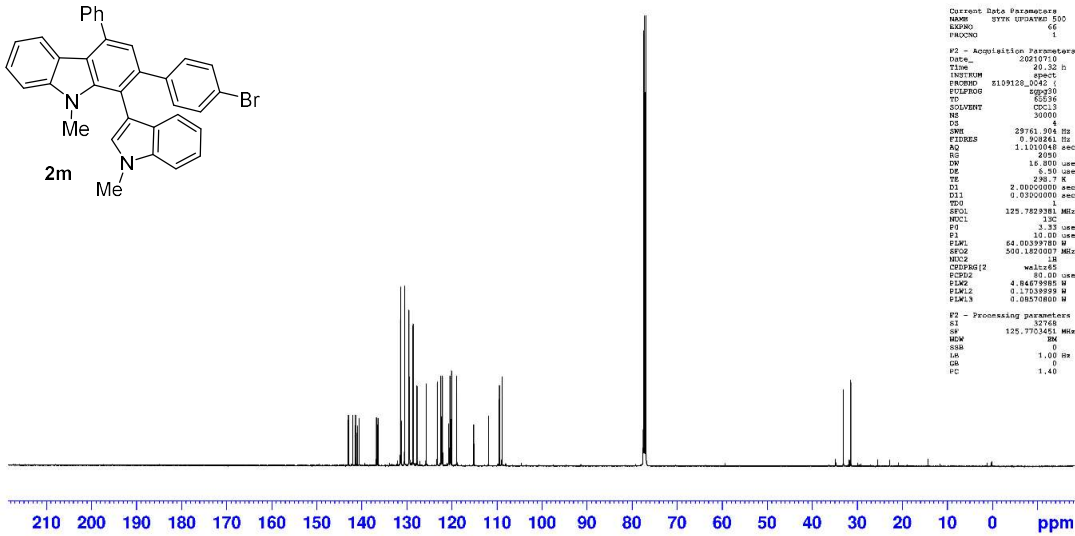
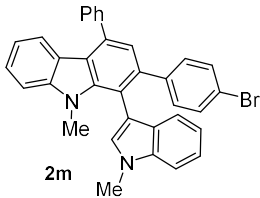
SYTK-37



SYTK-37

142.962
 141.979
 141.351
 140.962
 140.536
 136.728
 136.388
 131.366
 131.186
 130.458
 129.484
 129.352
 128.593
 127.713
 125.675
 123.212
 122.410
 122.258
 122.046
 120.697
 120.409
 120.231
 120.040
 118.885
 115.107
 111.809
 109.428
 108.839
 77.414
 77.160
 76.906

33.051
 31.414

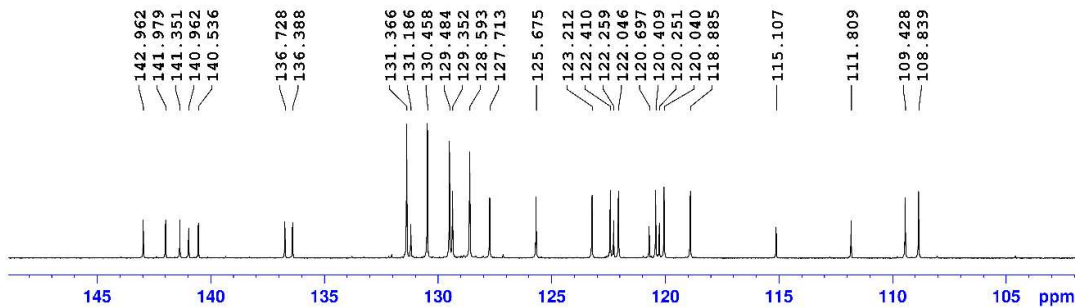


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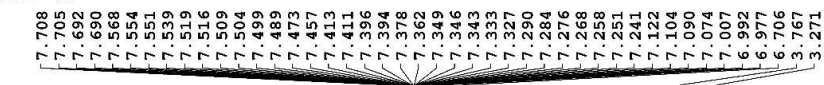
Current Data Parameters
NAME      SYTK-37-04-05-200
EXPNO    1
PROCNO   1
F2 - Acquisition Parameters
Date_    20210710
Time     20.32.0
INSTRUM  spect
PROBHD   5mmQNP1H1
PULPROG  zgpg30
TD        65536
SOLVENT  CDCl3
NS        30000
DS        4
SWE       29761.804 Hz
FIDRES   0.302861 Hz
AQ        1.1510048 sec
RG         2020
AQ        16.800 usec
DE         8.50 usec
TE        298.1 K
D1        2.0000000 sec
d11       0.0300000 sec
TPO       1
SFO       125.7629381 MHz
NUC1      13C
P1        3.33 usec
F1        10.00 usec
PLW1     64.0000000 W
SFO2      500.1325000 MHz
NUC2      1H
CPDPRG2  waltz165
SFO3      80.00 usec
PLW2     4.84878885 W
PLW3     0.17038939 W
PLW4     0.08570800 W
F2 - Processing parameters
SI        32768
SF        125.7703451 MHz
WDW       EM
SSB       0
GB        1.00 usec
CB        0
PC        1.40
  
```

SYTK-37

142.962
 141.979
 141.351
 140.962
 140.536
 136.728
 136.388
 131.366
 131.186
 130.458
 129.484
 129.352
 128.593
 127.713
 125.675
 123.212
 122.410
 122.259
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 120.409
 120.251
 120.040
 118.885
 115.107
 111.809
 109.428
 108.839



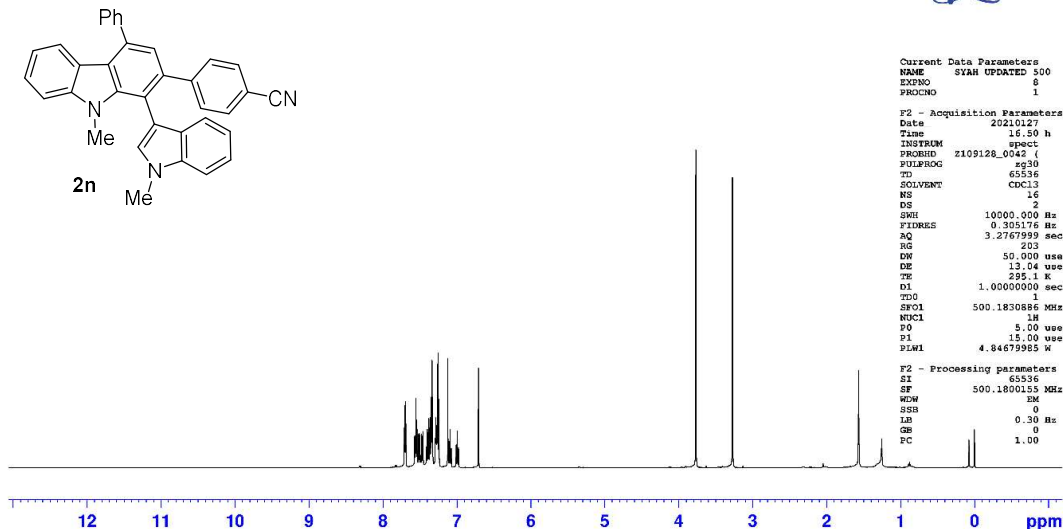
SYAH- CN



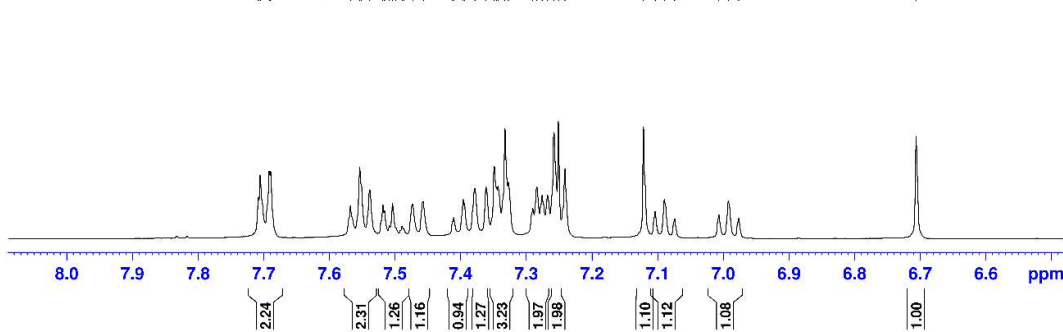
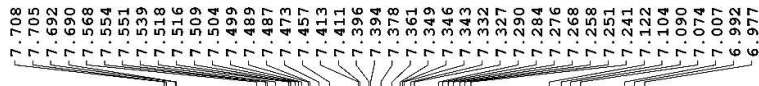
Current Data Parameters
 NAME SYAH UPDATED 500
 EXPNO 8
 PROCNO 1

F2 - Acquisition Parameters
 Date 20210127
 Time 16:50 h
 INSTRUM spect
 PROBRD z109128_0042 ()
 PULPROG zg30
 TD 65536
 SOLVENT CDCl3
 NS 16
 DS 2
 SWH 10000.000 Hz
 FIDRES 0.335176 Hz
 AQ 3.2767999 sec
 RG 203
 DW 50.000 usec
 DE 13.04 usec
 TE 295.1 K
 D1 1.00000000 sec
 ZDO 1
 SFO1 500.1830886 MHz
 NUC1 1H
 P0 5.00 usec
 F1 15.00 usec
 PLW1 4.84679985 W

F2 - Processing parameters
 SI 65536
 SF 500.1800155 MHz
 MDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00



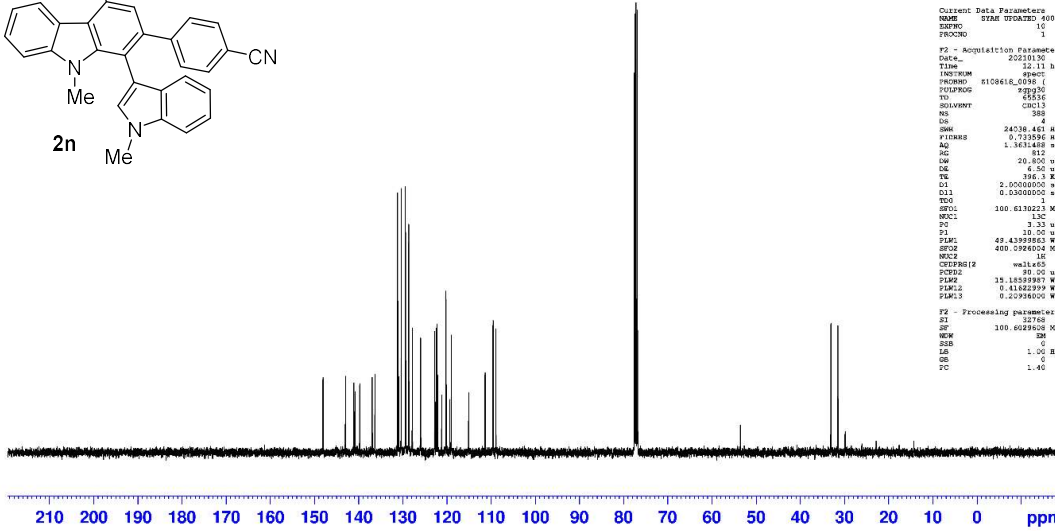
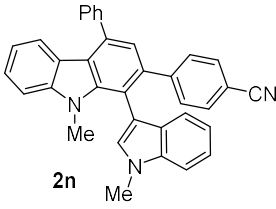
SYAH- CN



SYAH-CN

148.048
142.958
141.027
140.773
139.727
136.896
136.289
131.142
130.865
130.332
129.366
128.621
127.819
125.934
122.753
122.457
122.211
122.029
121.170
120.200
120.171
119.330
119.005
115.064
111.347
109.521
108.890
77.478
77.160
76.842

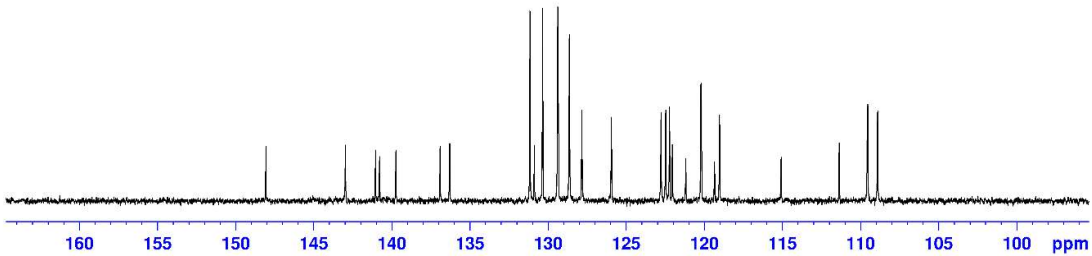
33.040
31.452



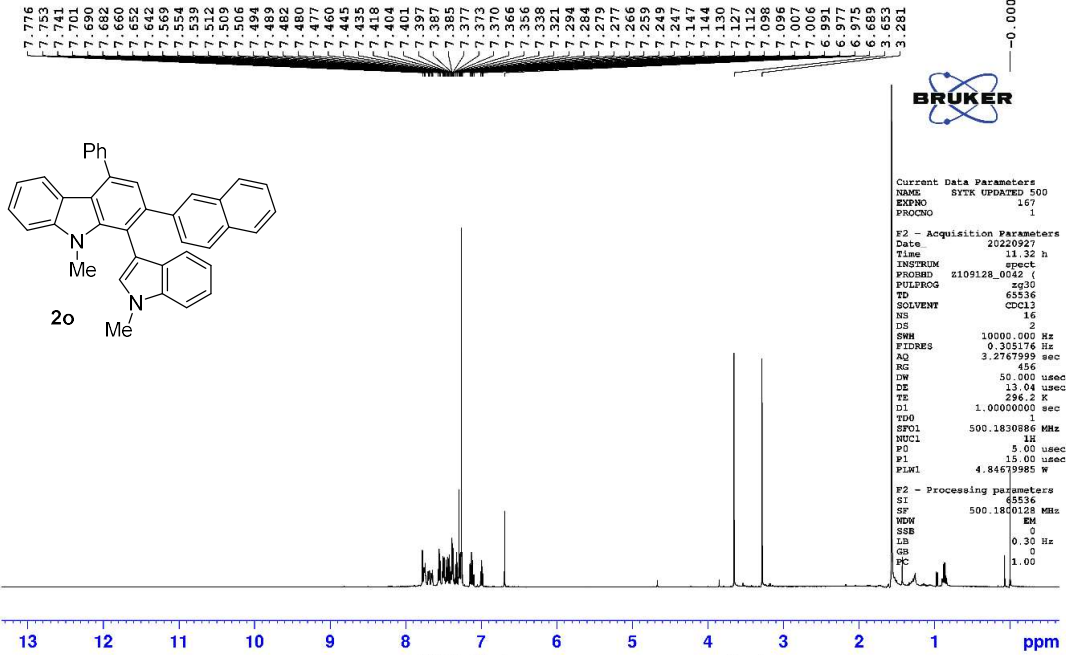
Current Data Parameters
NAME SYAH-CN-200
EXPNO 10
PROCNO 1
F2 - Acquisition Parameters
Date_ 20251130
Time 22.11 h
INSTRUM spect
PROBHD SI0616-009 1
PULPROG zgpg30
TD 43516
SOLVENT CDCl3
NS 308
DS 4
SW 24036.463 Hz
FIDRES 0.733596 Hz
AQ 1.3631468 sec
RG 812
SQ 20.900 usec
DE 6.50 usec
TE 300.2 K
D1 2.0000000 sec
d11 0.2000000 sec
TSD 0
SFO1 100.6130213 MHz
MAG1 13C
PC 1.13 usec
P1 10.00 usec
PL1 0.0000000 W
PL2 49.4339503 W
SFO2 400.0940004 MHz
MAG2 1H
CPCPDE12 waltz16
SFO3 90.00 usec
PL3 15.1839987 W
PL4 0.4182299 W
PL5 0.2095800 W
F2 - Processing parameters
SI 32768
SF 100.623500 MHz
WDW DM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

SYAH-CN

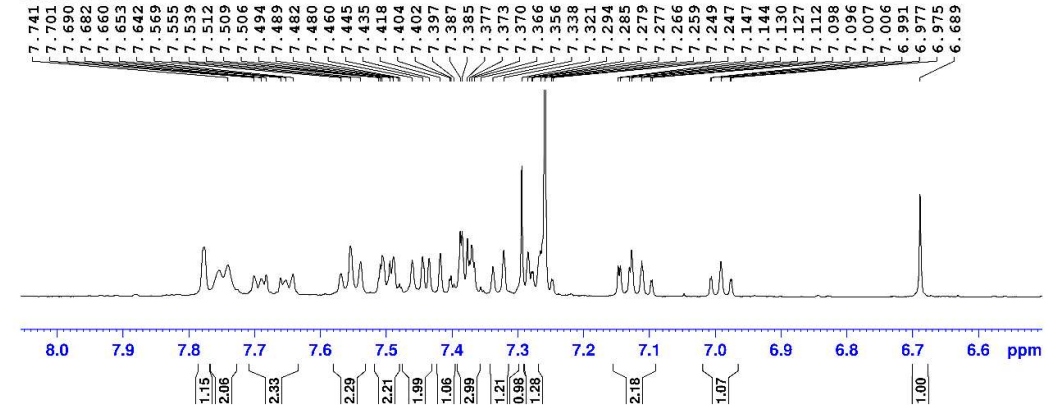
148.048
142.958
141.027
140.773
139.727
136.896
136.289
131.142
130.866
130.332
129.366
128.621
127.819
125.934
122.753
122.457
122.211
122.029
121.170
120.200
120.172
119.330
119.005
115.064
111.347
109.521
108.890



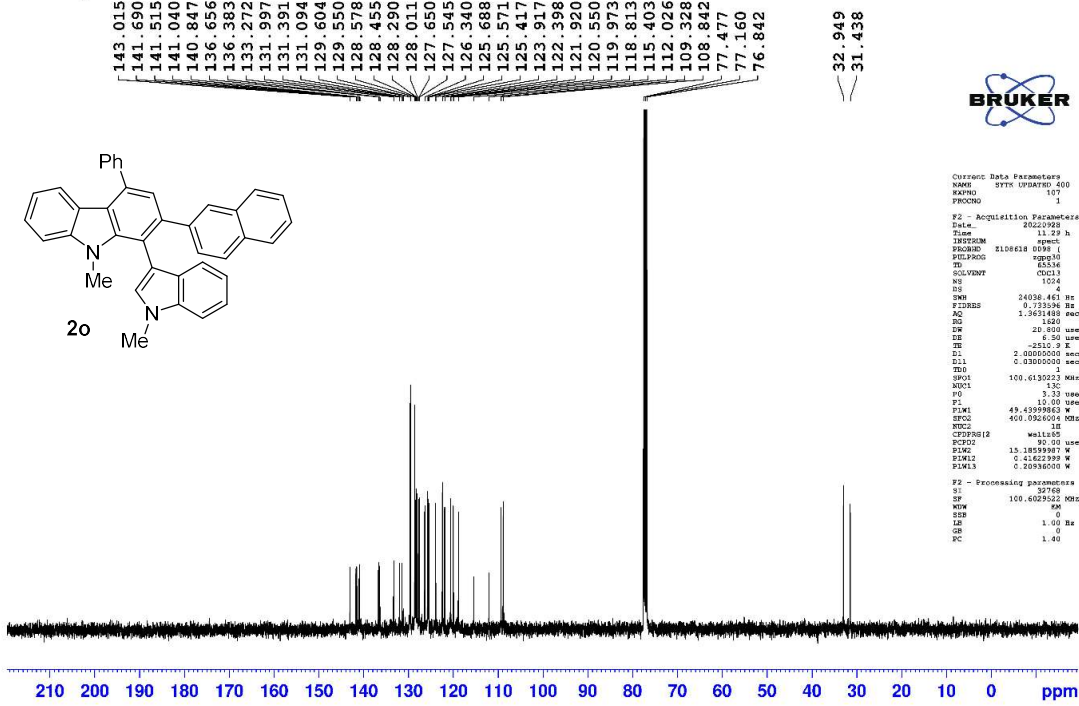
SYTK-Na Ph-P



SYTK-Na Ph-P



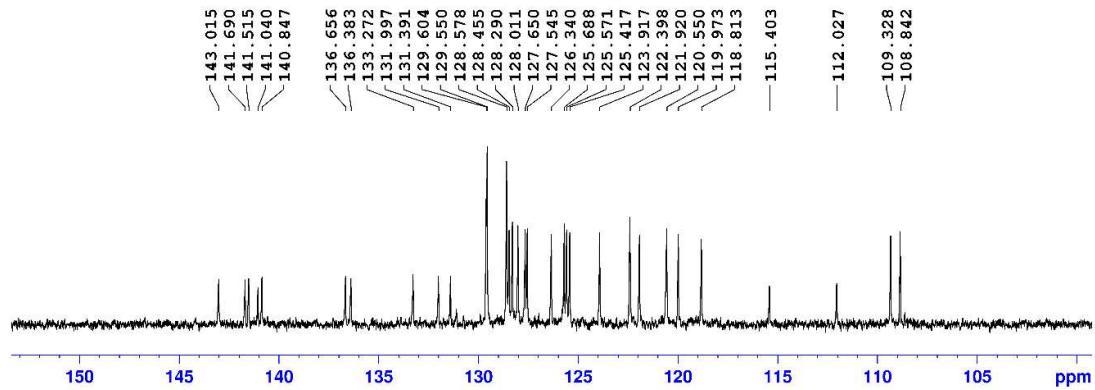
SYTK-Naph-P



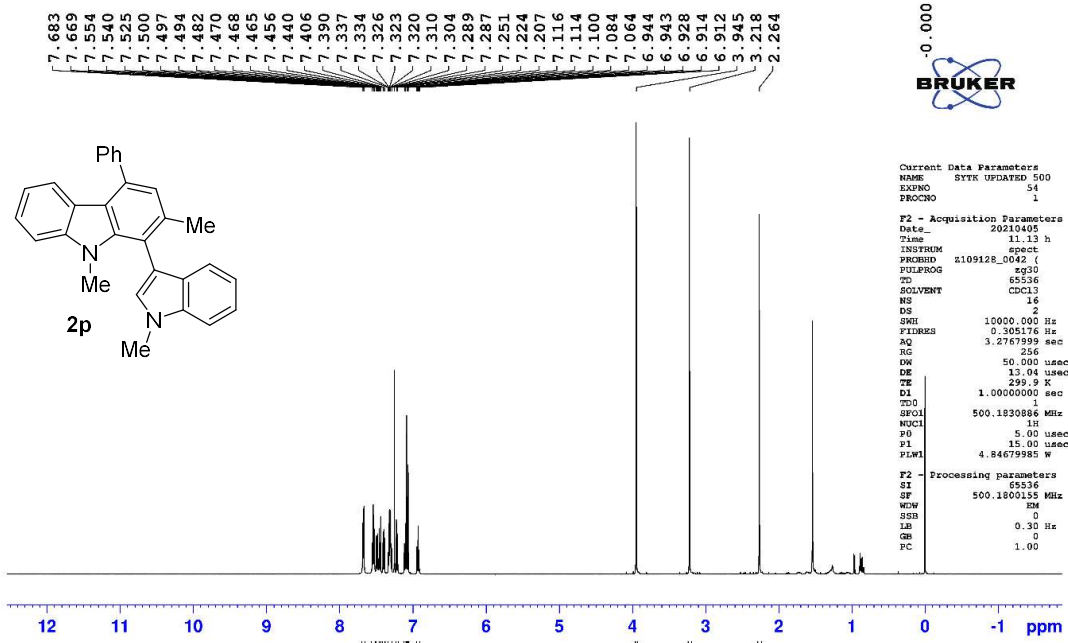
```

Current Data Parameters
NAME: SYTK
EXPNO: 400
PROCNO: 107
F2 - Acquisition Parameters
Date_: 20220926
Time: 11.27 h
INSTRUM: spect
PROCNO: 110843
PULPROG: zgpg30
TD: 65536
SOLVENT: CDCl3
NS: 1024
DS: 4
SWH: 24008.461 Hz
FIDRES: 0.73208 Hz
AQ: 1.3631480 sec
RG: 3840
EQ: 20.800 usec
DE: 6.50 usec
TE: 300.2 K
D1: 2.00000000 sec
d11: 0.03000000 sec
TD0:
SFO1: 100.6130221 MHz
NUC1: 13C
P1: 3.33 usec
PT: 15.00 usec
PL1: 48.43999863 dB
PL2: 400.00000000 dB
PL3: 10
CFOPR12: well180
PCPD2: 90.00 usec
EPR2: 15.18599881 MHz
EPR12: 0.41622999 MHz
EPR13: 0.20836000 MHz
F2 - Processing parameters
SI: 32768
SF: 100.6260021 MHz
WDW: EM
SSB: 0
LB: 1.00 Hz
GB: 0
PC: 1.40
    
```

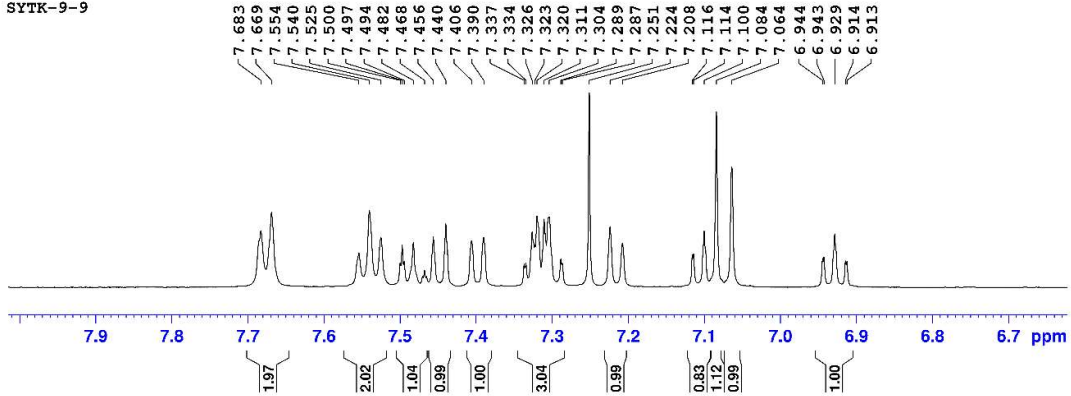
SYTK-Naph-P



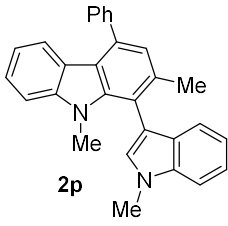
SYTK-9-9



SYTK-9-9



SYTK-9-9

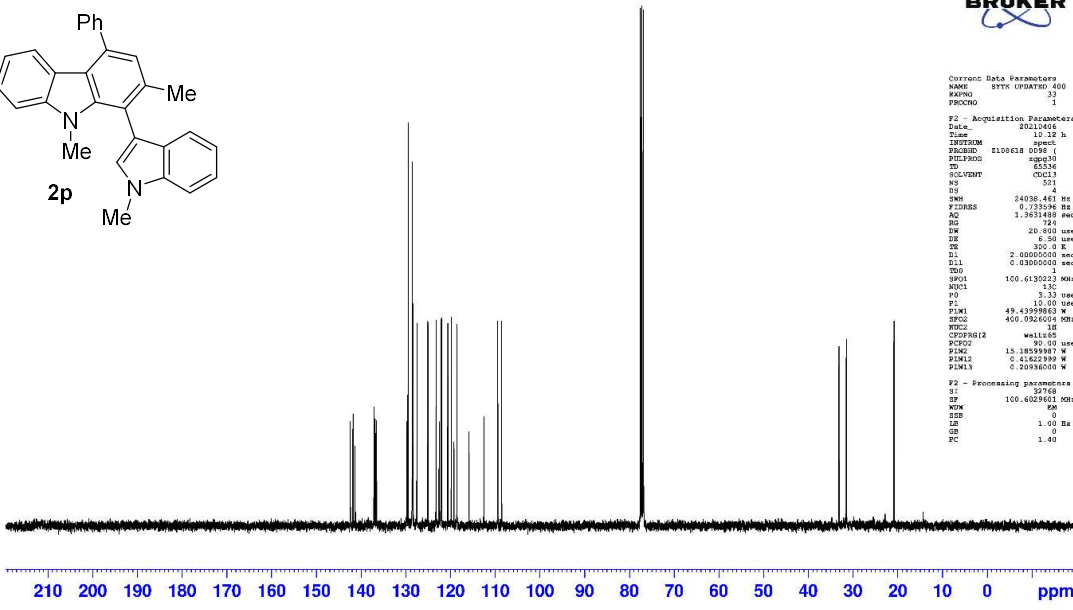


142.378
141.763
141.291
137.075
136.807
136.498
129.743
129.446
128.499
128.424
127.471
125.024
123.188
122.500
122.107
122.000
120.573
119.791
119.200
118.522
115.831
112.514
109.400
108.538
77.478
77.160
76.842

33.108
31.462
20.806

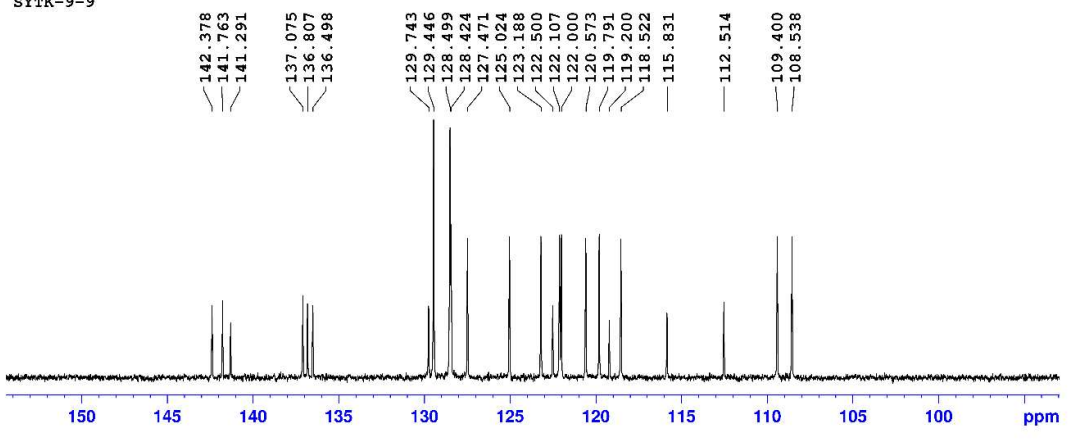


Current Data Parameters
NAME SYTK UPDATED 200
SAPNO 13
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120408
Time 10.12 h
INSTRUM spect
PROBHD E10623 0098 I
PULPROG zgpg30
TD 6536
SOLVENT CDCl3
NS 531
DS 4
SWH 24036.461 Hz
F2RES 0.15336 Hz
AQ 1.3651489 sec
RG 724
DW 20.800 usec
DE 6.50 usec
XE 300.0 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
SFO1 100.6130231 MHz
NUC1 13C
P0 3.33 usec
P1 15.00 usec
PL1 49.43998863 W
PL2 400.00000000 MHz
RDC2 18
CPCORP12 waltz160
PCPD2 90.00 usec
P1A2 15.18599887 W
P1M12 0.41622399 W
P1M15 0.20936000 W
F2 - Processing parameters
SI 32768
SF 100.6025013 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

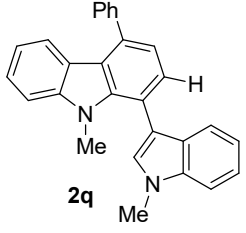
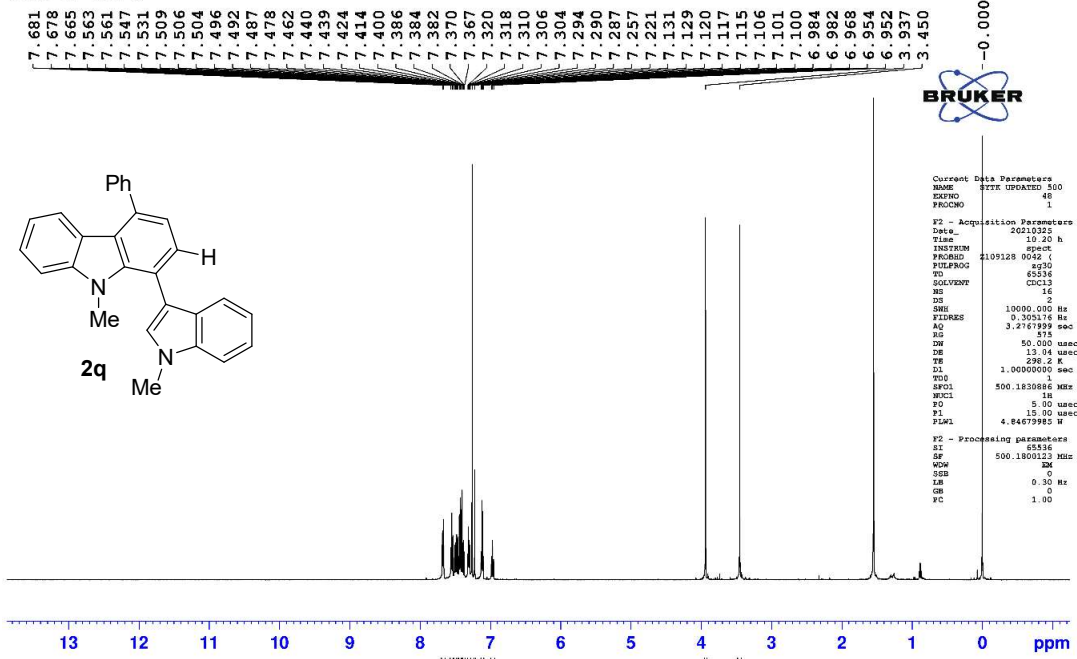


SYTK-9-9

142.378
141.763
141.291
137.075
136.807
136.498
129.743
129.446
128.499
128.424
127.471
125.024
123.188
122.500
122.107
120.573
119.791
119.200
118.522
115.831
112.514
109.400
108.538



SYTK-02-488 A

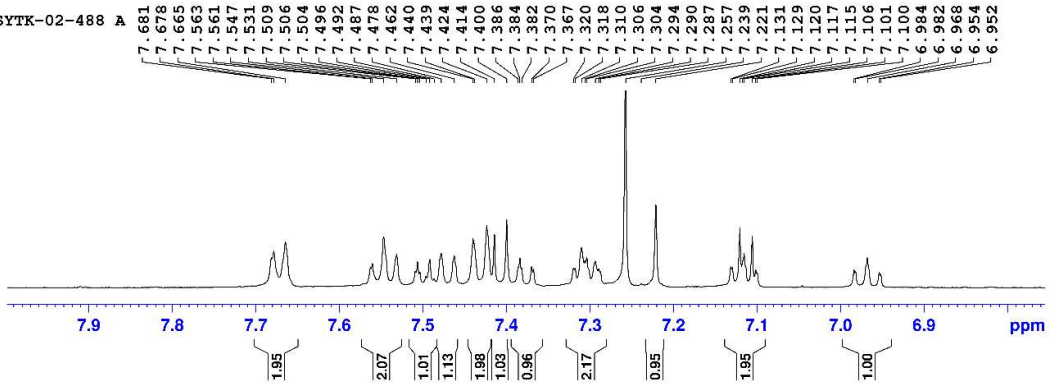


Current Data Parameters
NAME SYTK_UPDATED_500
EXPNO 48
PROCNO 1

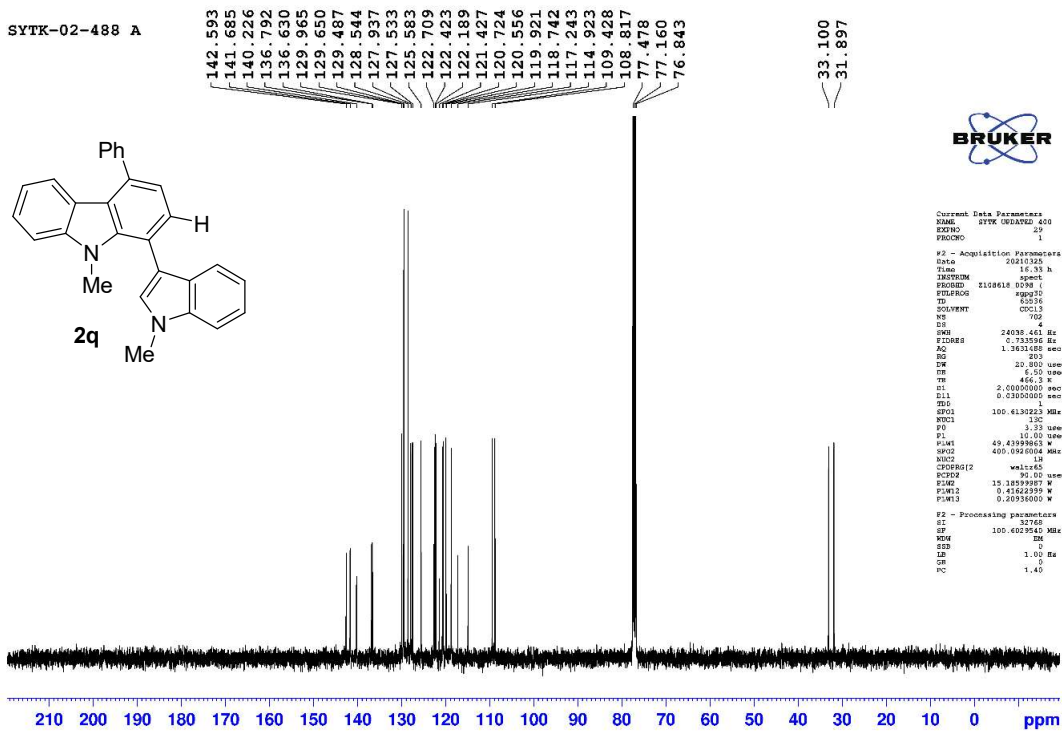
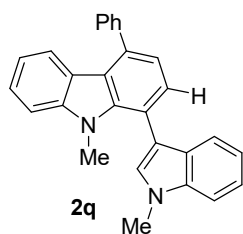
F2 - Acquisition Parameters
Date_ 20110325
Time 10.20 h
INSTRUM spect
PROBHD Z109128 0042 (4
PULPROG zgpg
TD 65536
SOLVENT CDCl3
NS 16
DS 10000.000 Hz
SHE 0.300174 Hz
AQ 3.2161929 sec
RG 815
DE 50.000 usec
DB 13.04 usec
TL 236.2 K
D1 1.00000000 sec
FID 500.1830886 MHz
SFO 500.131122
MTC 18
PC 5.00 usec
PI 15.00 usec
PL2 4.84673982 Hz

F2 - Processing parameters
SI 65536
SF 500.1801122 MHz
WDW 0
SFB 0.30 Hz
GB 0
PC 1.00

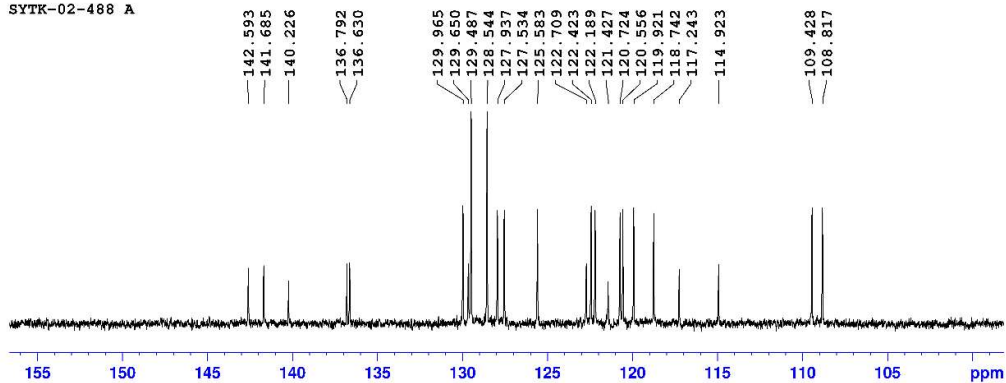
SYTK-02-488 A



SYTK-02-488 A

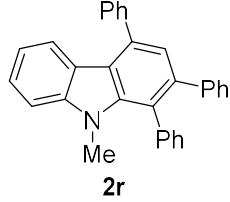
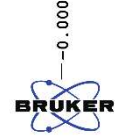


SYTK-02-488 A



SYSC-P-24

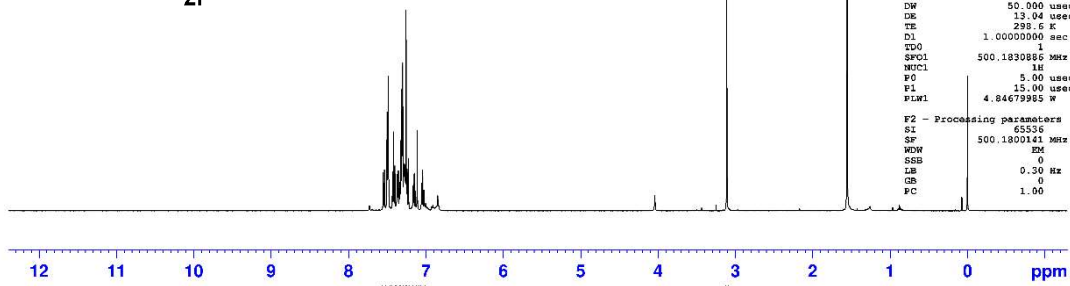
7.550
7.534
7.500
7.498
7.484
7.430
7.415
7.400
7.369
7.355
7.340
7.338
7.326
7.323
7.321
7.313
7.309
7.299
7.289
7.286
7.283
7.280
7.277
7.274
7.271
7.266
7.259
7.254
7.248
7.241
7.224
7.222
7.163
7.149
7.133
7.111
7.055
7.041
7.025
6.846
3.109



Current Data Parameters
 NAME SYSC_UPDATED_500
 EXPNO 28
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20211113
 Time 10.44 h
 INSTRUM spect
 PROCNO 2109128_0042 (1
 PULPROG zg30
 TD 65536
 SOLVENT CDCl3
 NS 16
 DS 2
 SWH 10000.000 Hz
 FIDRES 0.305176 Hz
 AQ 3.2767999 sec
 RG 406
 DW 50.000 usec
 DE 13.04 usec
 TE 293.6 K
 D1 1.00000000 sec
 TDO 1
 SFO1 500.1303086 MHz
 NUC1 1H
 P1 5.00 usec
 F1 15.00 usec
 PL1 4.84679985 W

F2 - Processing parameters
 SZ 65536
 SF 500.1303086 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00

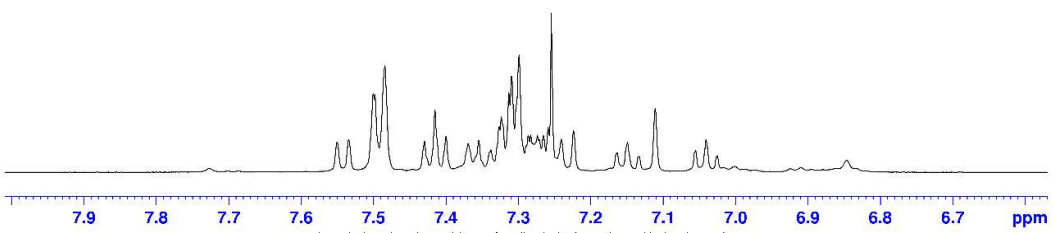


1.12
4.94
2.16
1.63
5.24
2.28
1.32
1.26
1.06
1.30

3.00

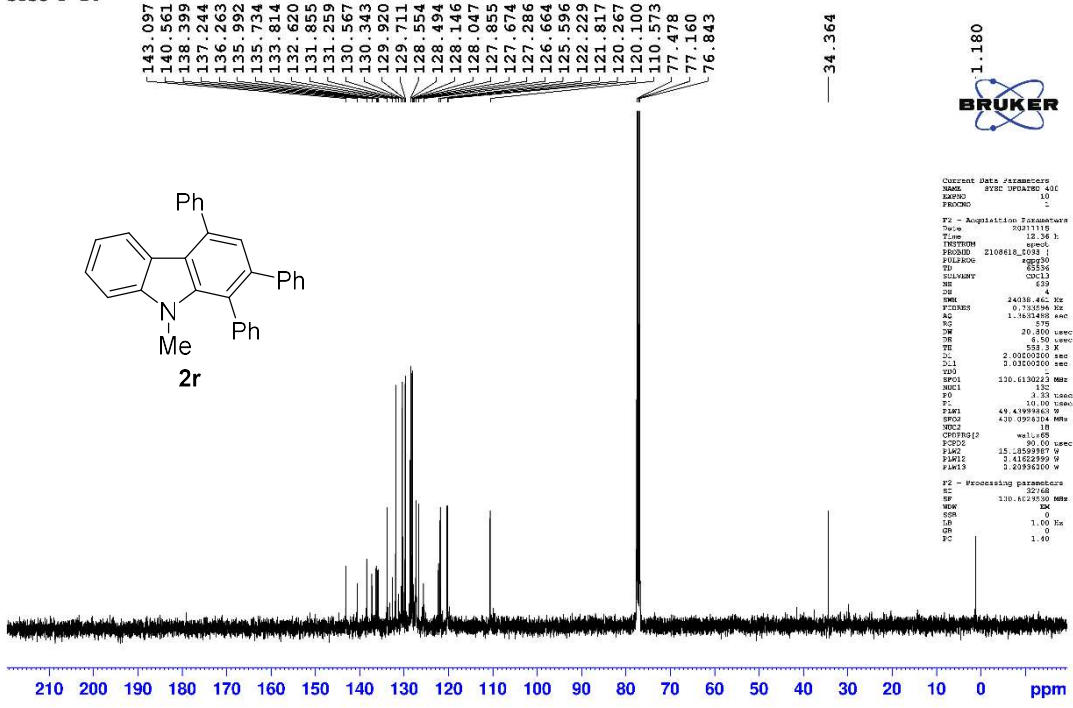
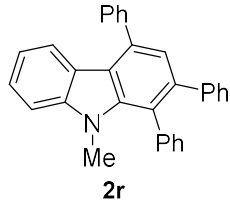
SYSC-P-24

7.550
7.534
7.500
7.498
7.484
7.430
7.415
7.400
7.369
7.355
7.340
7.338
7.326
7.324
7.321
7.313
7.309
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7.289
7.286
7.283
7.280
7.277
7.274
7.271
7.266
7.259
7.255
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7.241
7.224
7.164
7.149
7.133
7.111
7.055
7.041
7.025
6.847

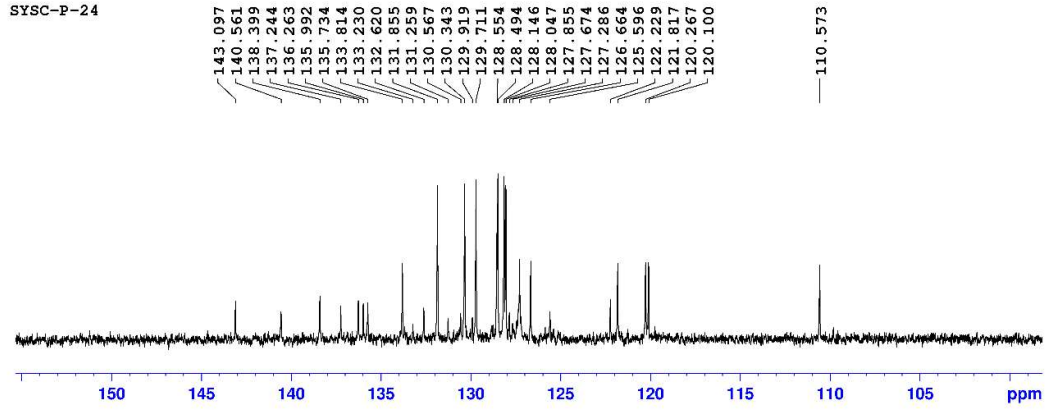


1.00
1.00
4.33
2.25
1.99
5.31
2.19
1.16
1.31
1.03
1.31

SYSC-P-24

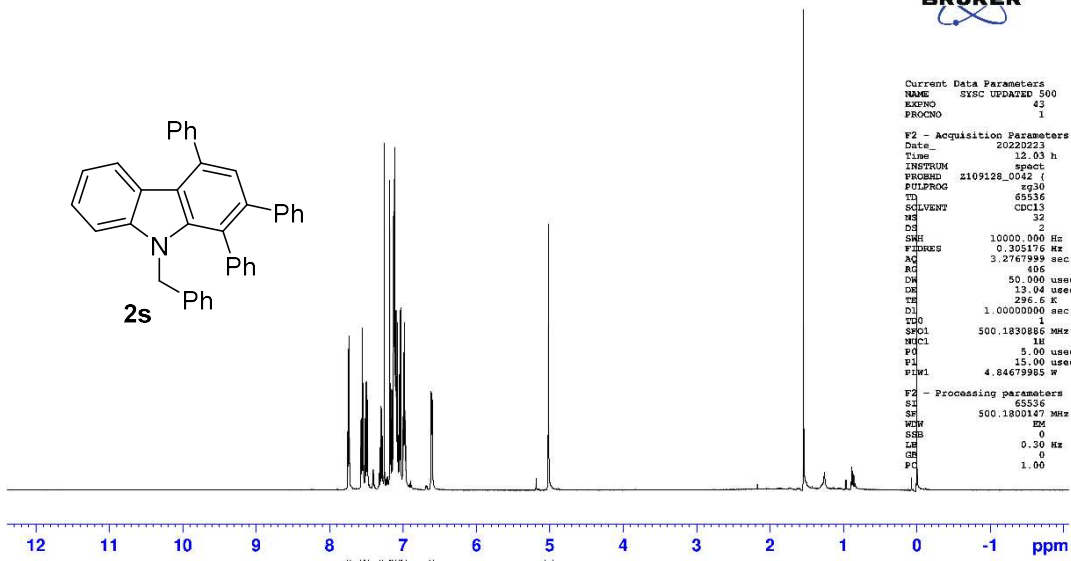
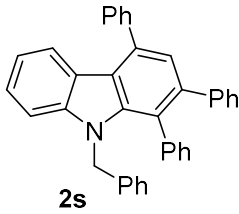


SYSC-P-24



SYSC-P-28-B

7.745
7.732
7.730
7.569
7.555
7.552
7.540
7.514
7.499
7.480
7.311
7.309
7.295
7.281
7.278
7.253
7.178
7.168
7.151
7.126
7.114
7.111
7.099
7.092
7.081
7.076
7.072
7.063
7.045
7.031
7.028
7.003
7.002
6.993
6.989
6.987
6.978
6.963
6.613
6.602
6.598
5.016



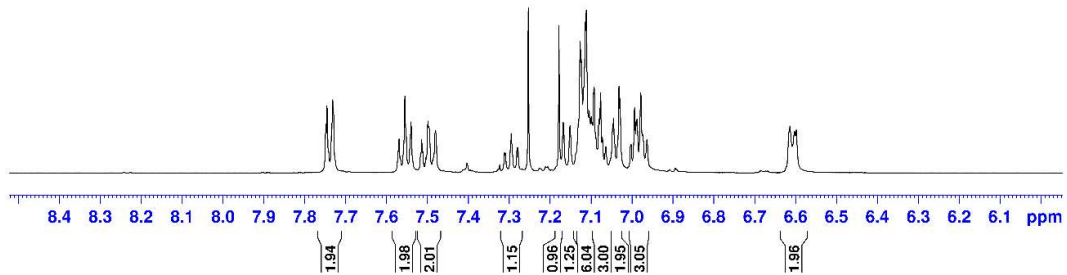
Current Data Parameters
NAME SYSC UPDATED 500
KEXPNO 43
PROCNO 1

F2 - Acquisition Parameters
Date_ 20220223
Time 12.03 h
INSTRUM spect
PROBHD z109128_0042 f
PULPROG zgpg30
TD 65536
FIDRES 0.32
SOLVENT CDCl3
NS 32
DS 2
SWH 10000.000 Hz
FIDRES 0.305176 Hz
AQ 3.2767999 sec
RG 406
DM 50.000 usec
DE 13.04 usec
TE 296.6 K
D1 1.00000000 sec
TDO 1
SFO1 500.130886 MHz
NUC1 1H
PD 5.00 usec
PL 15.00 usec
PWL 4.84679985 W

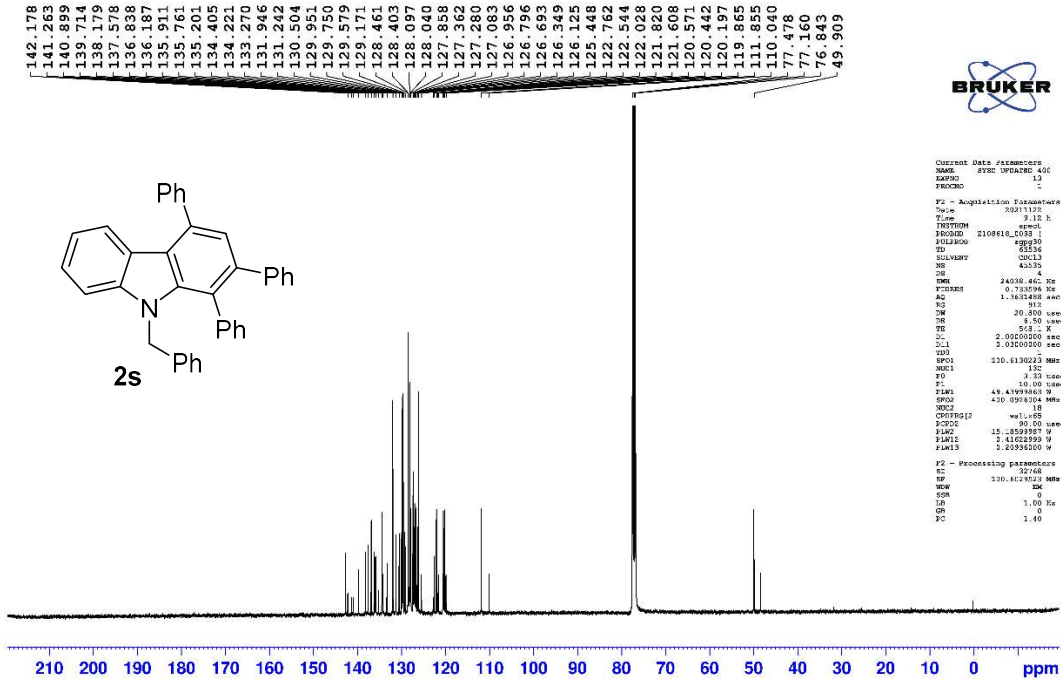
F2 - Processing parameters
SI 65536
SF 500.1300147 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

SYSC-P-28-B

7.748
7.745
7.742
7.732
7.571
7.566
7.555
7.552
7.540
7.516
7.514
7.511
7.504
7.499
7.484
7.480
7.311
7.309
7.295
7.281
7.278
7.253
7.178
7.168
7.151
7.137
7.131
7.126
7.124
7.118
7.114
7.111
7.104
7.099
7.097
7.092
7.088
7.081
7.076
7.072
7.064
7.045
7.031
7.029
7.003
7.002
6.993
6.989
6.987
6.978
6.973
6.963
6.613
6.602
6.598



SYSC-P-28-overnight

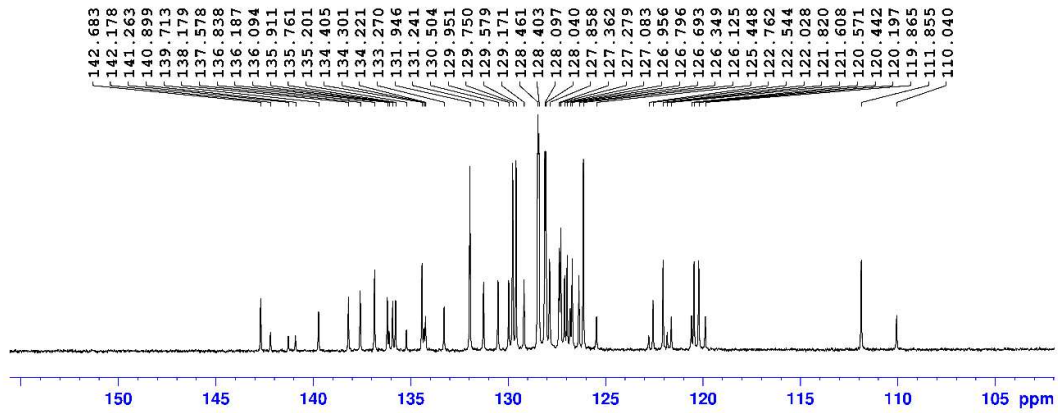


Current Data Parameters
NAME: SYSC-P-28-overnight
EXPNO: 13
PROCNO: 1

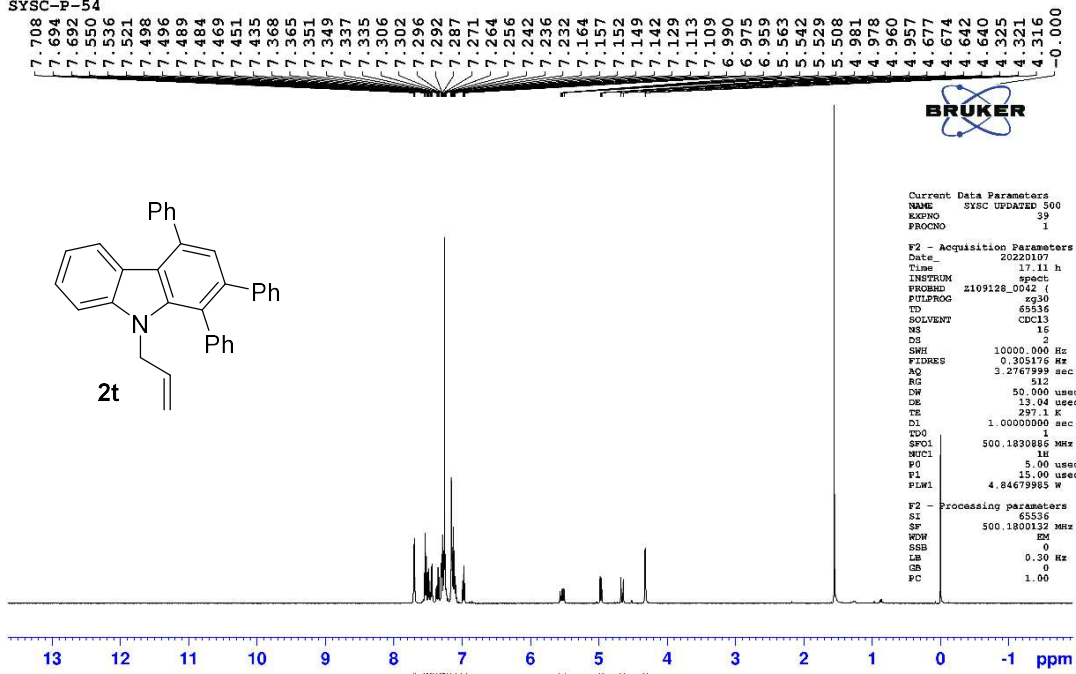
F2 - Acquisition Parameters
Date_ 20211122
Time: 8:12:2
INSTRUM: spect
PROBHD: 210918_5031 1
PULPROG: zgpg30
TD: 65536
SOLVENT: CDCl3
NS: 4032
DS: 4
SWH: 24038.462 Hz
FIDRES: 0.731894 Hz
AQ: 1.1612481 sec
RG: 911
SW: 20.850 usec
DR: 6.50 usec
DE: 5.0 Hz
TE: 2.00000000 sec
D1: 2.00000000 sec
D11: 2.00000000 sec
D12: 2.00000000 sec
D13: 2.00000000 sec
SFO: 100.6130223 MHz
NUC1: 13C
P1: 1.53 usec
PL1: 0.00 usec
PL2: 49.4199846 Hz
PL3: 430.0998304 Hz
PL4: 0.00 usec
PL5: 15.2809989 Hz
PL6: 1.6160399 Hz
PL7: 5.2099800 Hz

F2 - Processing parameters
SI: 32768
SF: 100.6130223 MHz
WDW: EM
SSB: 0
GB: 0
PC: 1.40

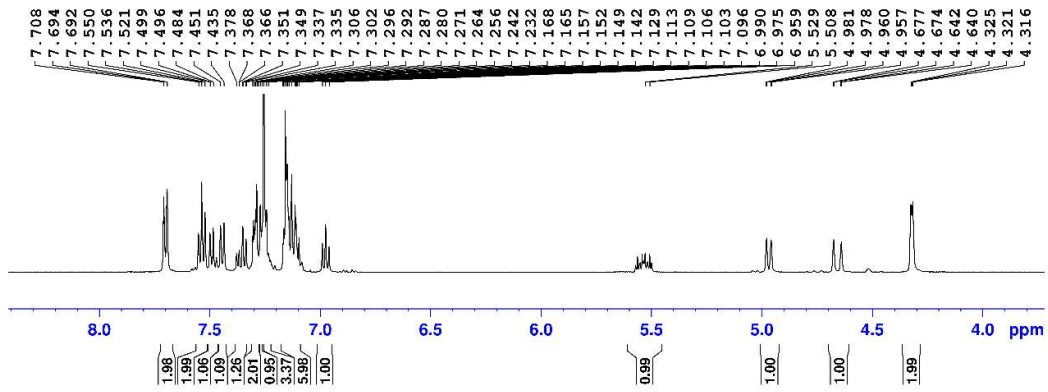
SYSC-P-28



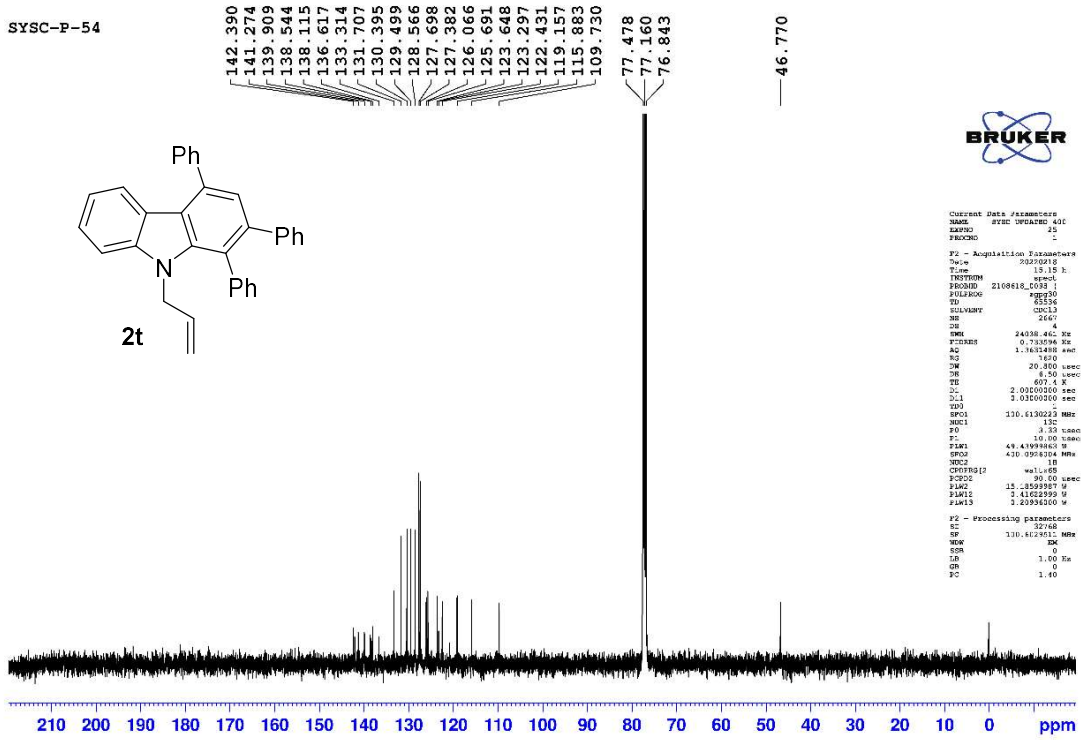
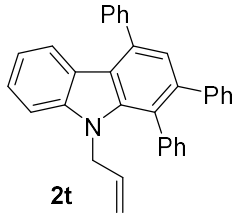
SYSC-P-54



SYSC-P-54



SYSC-P-54

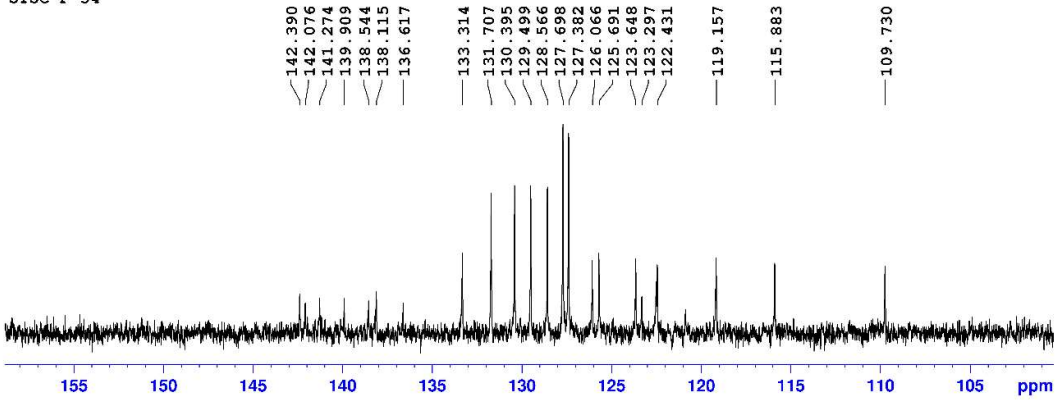


```

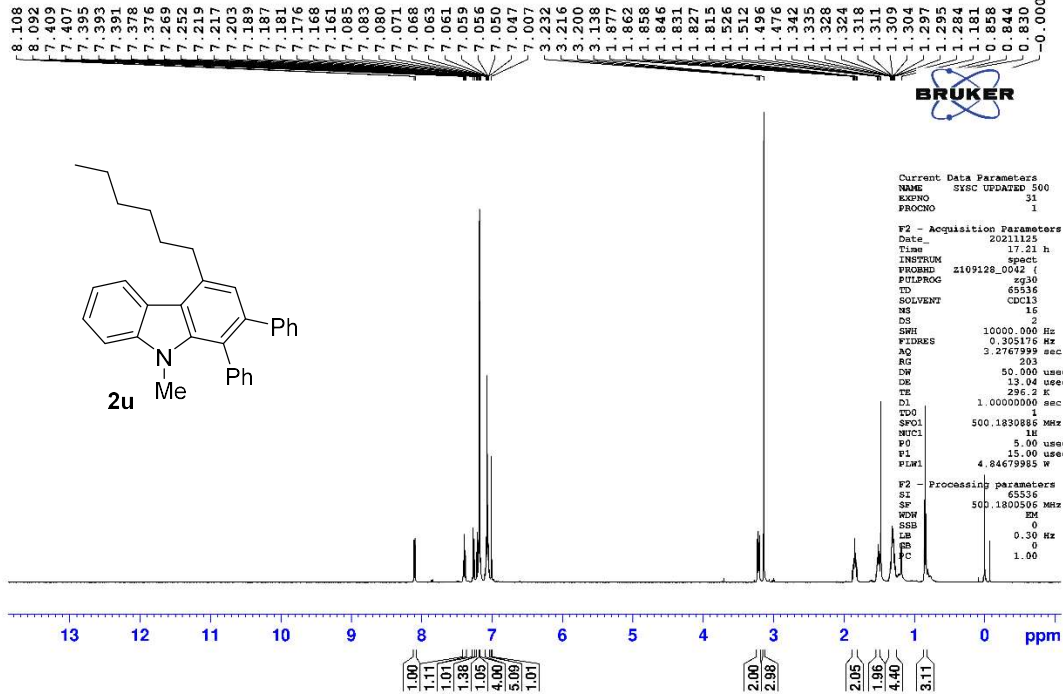
Current Data Parameters
NAME      SYSC-DWATED 401
EXPNO    2
PROCNO   1
F2 - Acquisition Parameters
Time     0320218
Date_    15.10.18
INSTRUM  spect
PROBHD   zgpg30
PULPROG  zgpg30
TD       65536
SOLVENT  CDCl3
NS       2647
DS       4
SWH       24038.441 Hz
FIDRES   0.731594 Hz
AQ       1.3631481 sec
RG       1470
SR       29.800 usec
CH       8.50 usec
TE       300.2 K
C11      2.0000000 sec
C12      3.0000000 sec
TD0
SFO1     100.626125 MHz
NUC1      13C
P1        3.00 usec
PC1       10.00 dB
FWD1     48.4099840 dB
EP1      430.0958304 MHz
NUC2      1H
C12PRG2  waltz16
PCPD2    15.00 usec
P12      3.1602990 usec
FWD12   3.1602990 dB
P1212   3.0994000 dB
F2 - Processing parameters
SI        32768
SF        100.626125 MHz
WDW       EM
SSB       0
GB        0
PC        1.00 dB
PC2       1.40

```

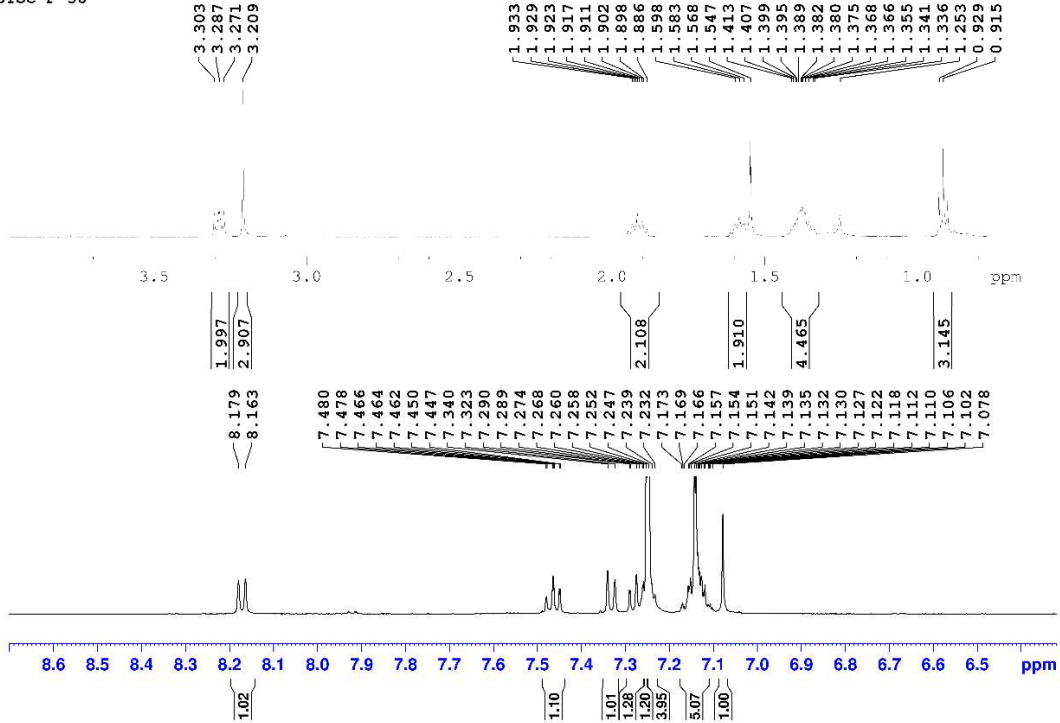
SYSC-P-54



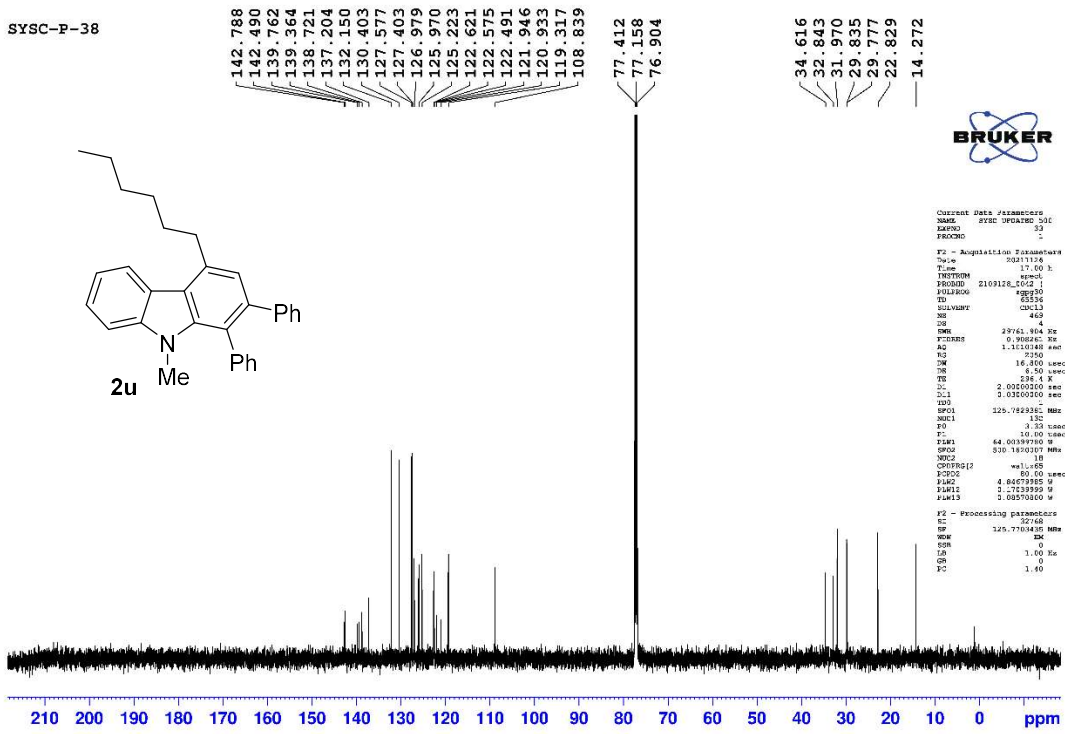
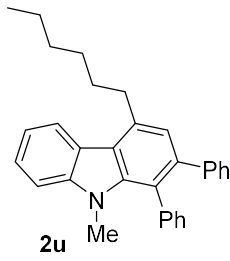
SYSC-P-38



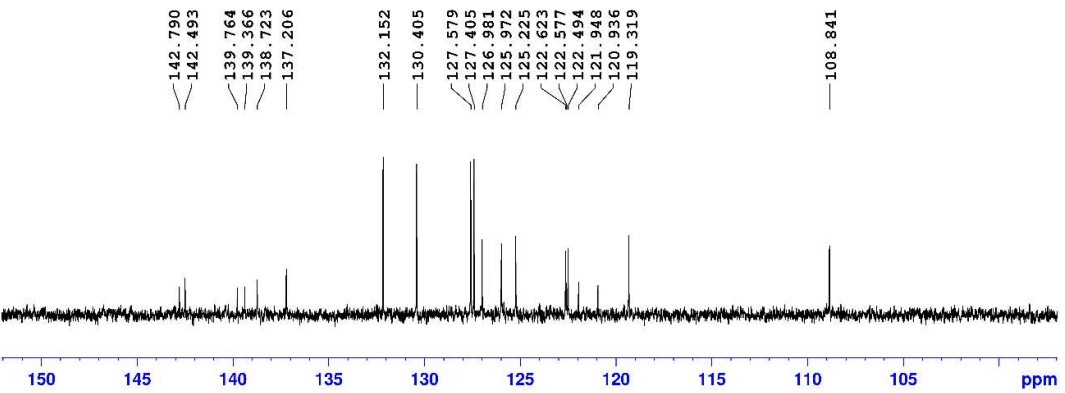
SYSC-P-38



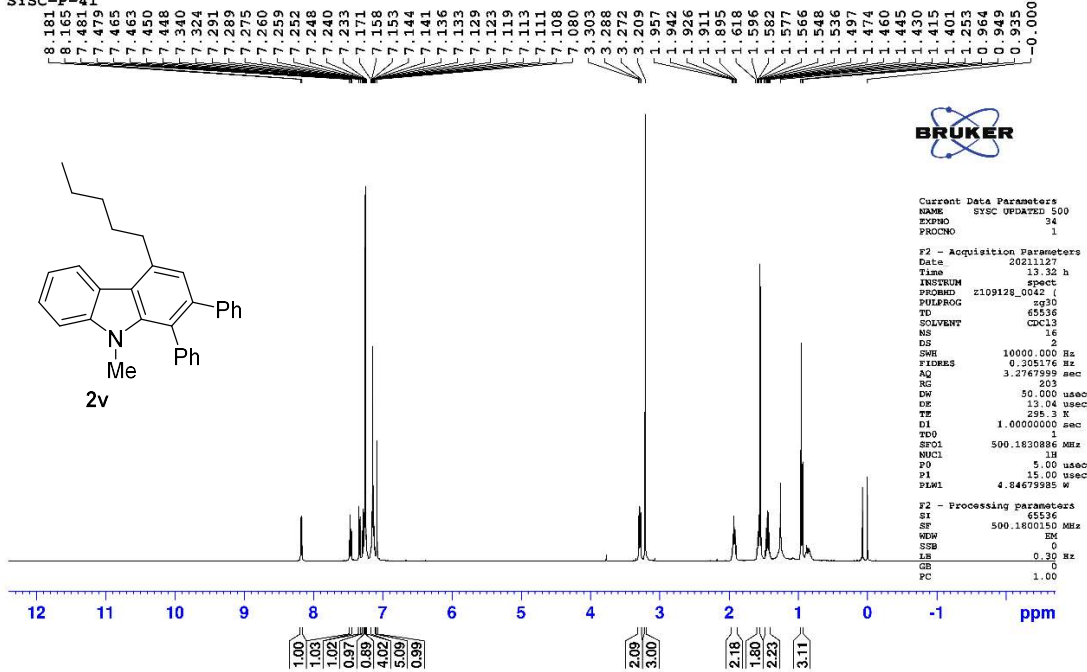
SYSC-P-38



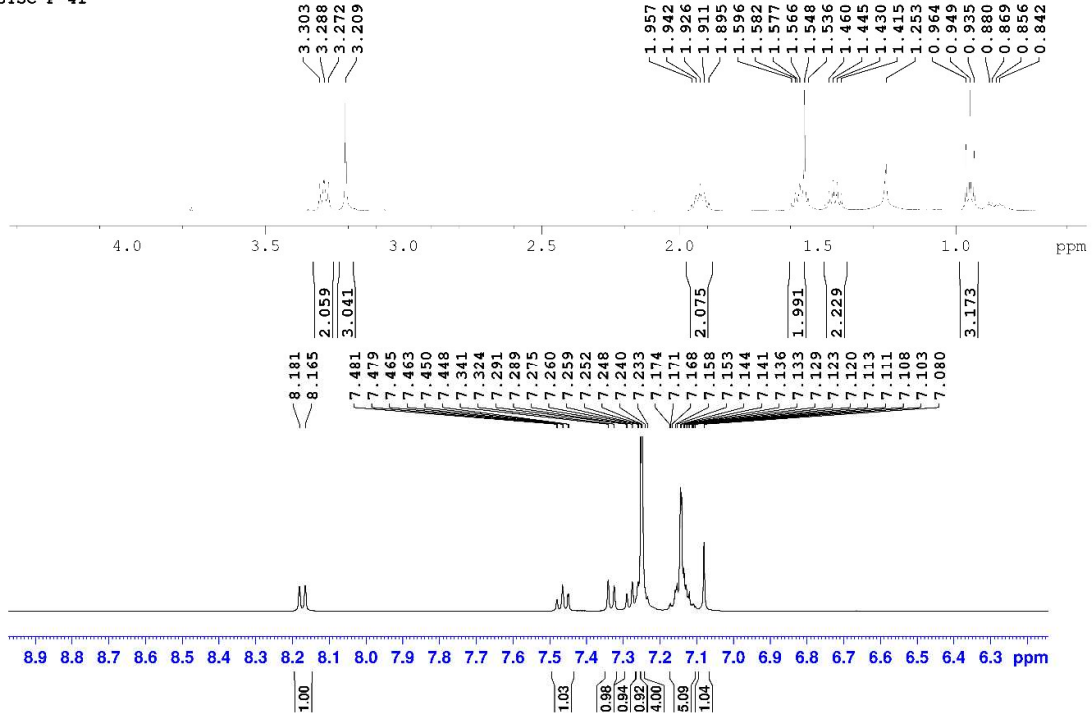
SYSC-P-38



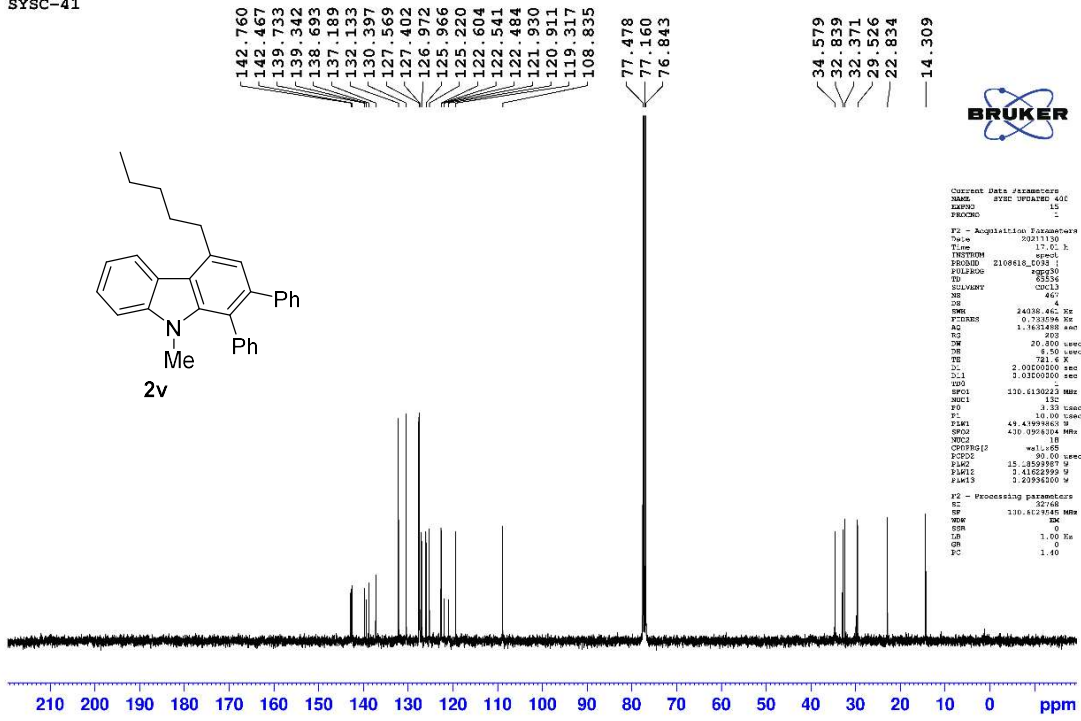
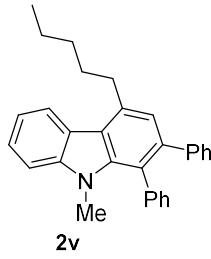
SYSC-P-41



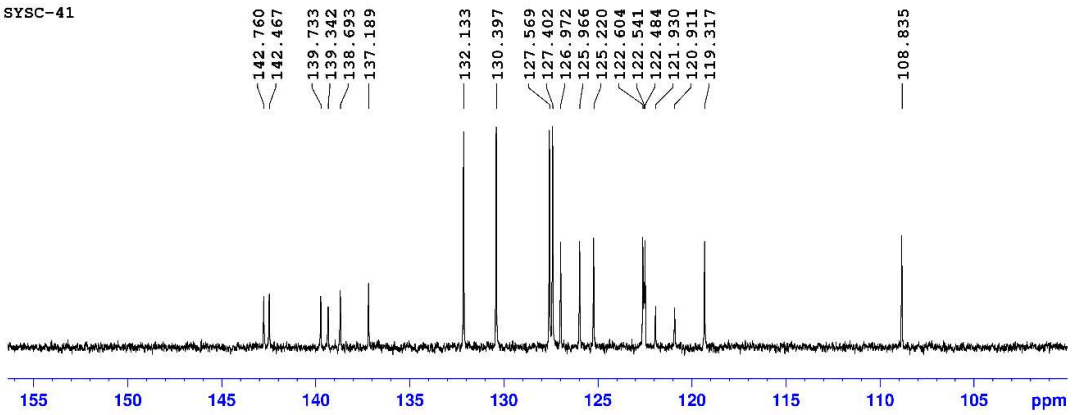
SYSC-P-41



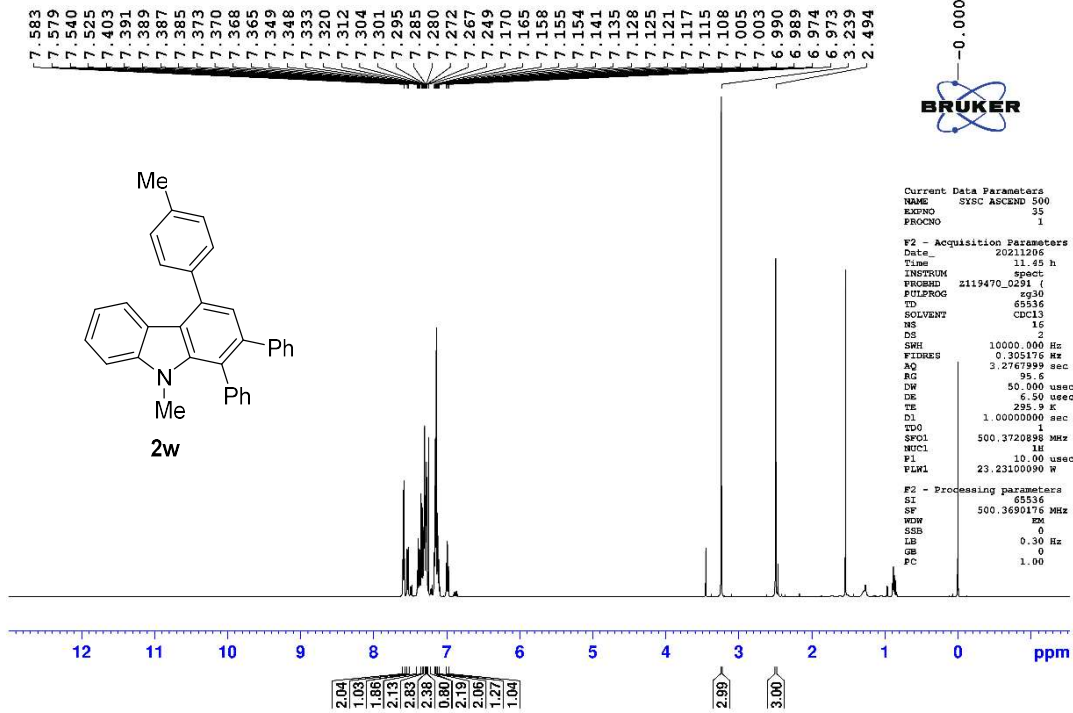
SYSC-41



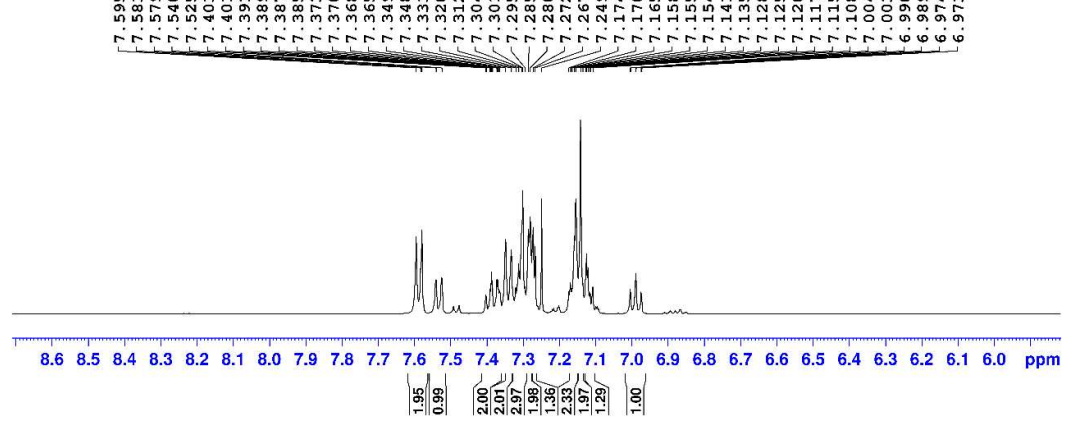
SYSC-41



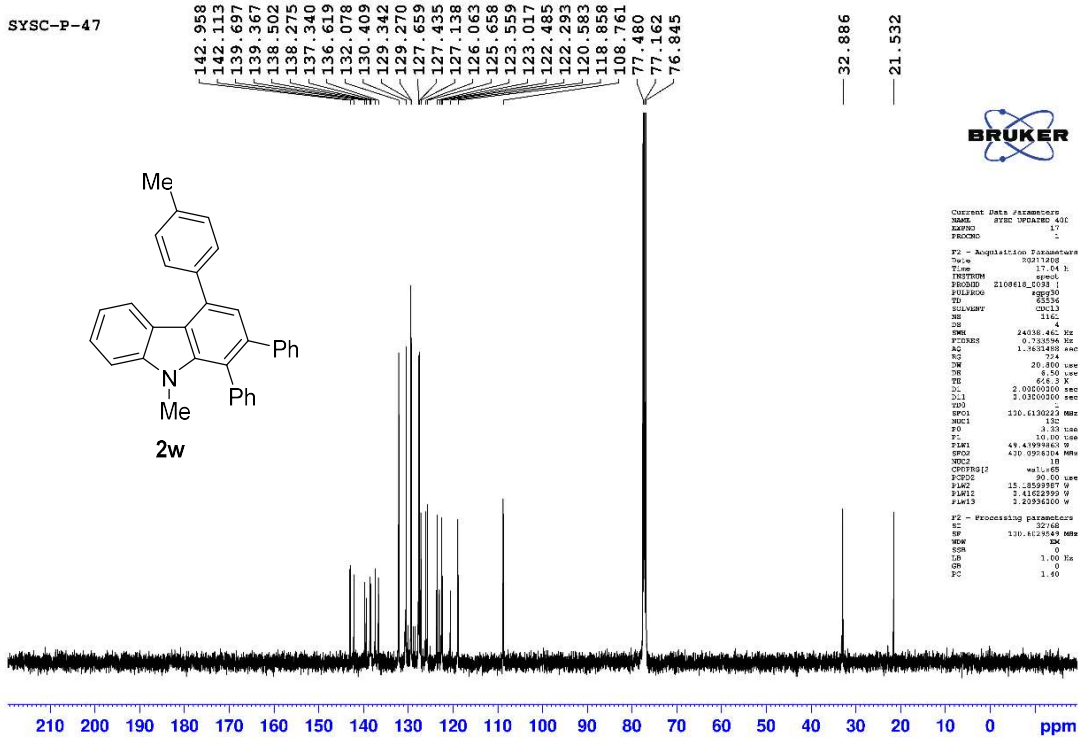
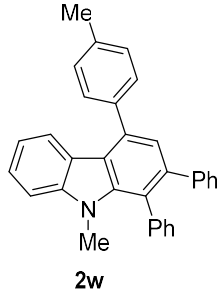
SYSC-P-47



SYSC-P-47



SYSC-P-47

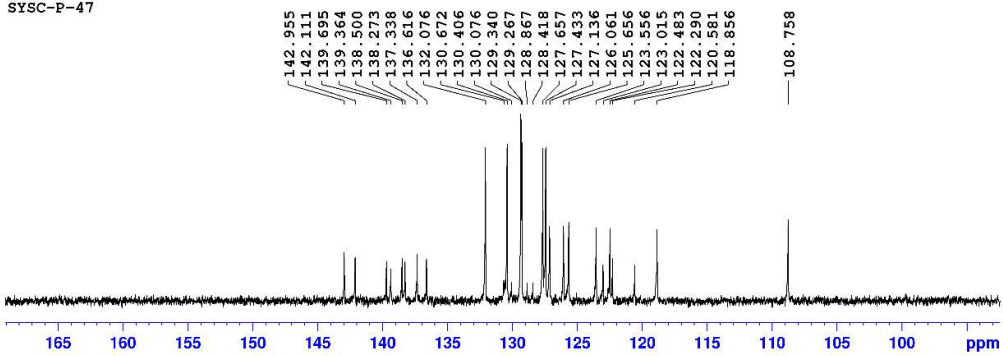


BRUKER

```

Current Data Parameters
NAME      SYSC-UPSCALE-47C
EXPNO    17
PROCNO   1
F2 - Acquisition Parameters
Date_    20111208
Time     17:04.1
INSTRUM  spect
PROBHD   510061L050 1
PULPROG  zgpg30
NUC1      13C
SOLVENT  CDCl3
NS        3162
DS        4
SWH       24336.462 Hz
FIDRES    0.73358 Hz
AQ        1.1623058 sec
RG        724
WDW        20.500 usec
DE        6.50 usec
TE        300.2 K
DCL       2.0000010 sec
DLE       0.0300010 sec
VDW       110.6130215 MHz
MDEL      152
SI         3.123 usec
PI         10.000 usec
RG1       48.41898662 W
SFO2      410.0963104 MHz
WDW2      18
SFO22     null:65
SFO23     90.00 usec
PLA2      15.18599987 W
PLA12     0.41022999 W
PLW13     0.22936100 W
F2 - Processing parameters
SI         32768
SF         110.613049 MHz
WDW        EM
SSB        0
GB         0.00 usec
PC         1.60
  
```

SYSC-P-47

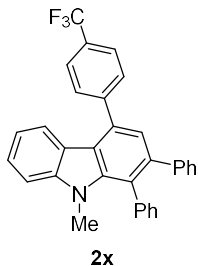


SYSC-P-65

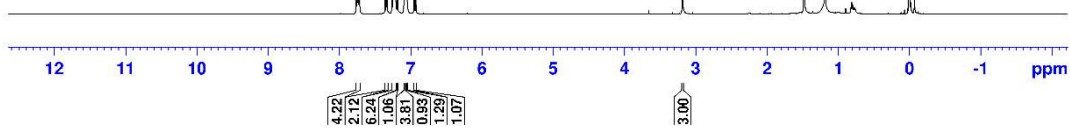
7.765
7.748
7.733
7.717
7.661
7.545
7.530
7.261
7.244
7.230
7.224
7.218
7.210
7.184
7.091
7.089
7.086
7.080
7.070
7.063
7.052
6.957
6.955
6.941
6.927
6.925

3.184

-0.000

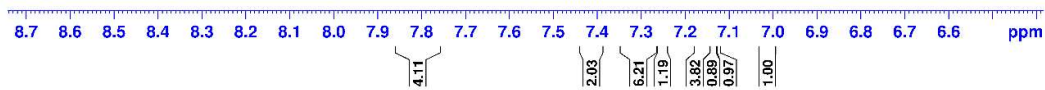


Current Data Parameters
NAME SYSC_UPDATED_500
EXPNO 38
PROCNO 1
F2 - Acquisition Parameters
Date_ 20220107
Time 11:50 h
INSTRUM spect
PROBHD zg30
PULPROG zg30
TD 65536
SOLVENT CDCl3
MS 15
DS 2
SWH 10000.000 Hz
FIDRES 0.305176 Hz
AQ 3.2187989 sec
RG 405
DQ 50.000 usec
TE 12.04 usec
TE 297.7 K
C1 1
C2 1.00000000 sec
C3 1
SFO1 500.1830886 MHz
NUC1 1H
H0 5.00 usec
H1 15.00 usec
H1a1 4.84679985 w
F2 - Processing parameters
SI 65536
SF 500.1800492 MHz
WDW EM
SSB 0
GB 0.30 Hz
CB 0
MC 1.00

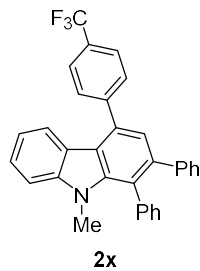


SYSC-P-65

7.837
7.820
7.805
7.788
7.434
7.432
7.417
7.401
7.332
7.322
7.316
7.308
7.302
7.295
7.289
7.281
7.256
7.162
7.161
7.157
7.152
7.142
7.138
7.135
7.129
7.124
7.028
7.027
7.012
6.998
6.996



SYSC-P-65



145.047
143.023
141.795
139.869
139.407
138.198
134.913
131.978
130.346
129.905
127.751
127.535
127.332
126.266
126.028
125.583
123.942
123.379
122.108
121.793
120.250
119.156
109.051
77.160
76.843

32.896



```

Current Data Parameters
NAME: SYSC-UPDATE-65
EXPNO: 2
PROCNO: 1
F2 - Acquisition Parameters
Date_ 20220106
Time 15:02:26
INSTRUM spect
PROBHD 210861L_C03B 1
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 2324
DS 4
SFR 24930.460 Hz
FIDRES 0.1261884 Hz
AQ 1.1615481 sec
RG 402
SM 20.000 usec
DE 8.50 usec
TE 300.2 K
ZC 2.0160250 sec
ZL 1.0320050 sec
FID 130.6130213 MHz
NUC1 13C
NUC2 13C
PC 10.00 usec
F1A1 49.47988603 MHz
SFO2 430.0908104 MHz
NPROB 18
CPDPRG12 waltz16
PROC 00:00:46.66
F1A2 15.3509987 MHz
F1A12 1.41622959 MHz
F1A13 1.20336100 MHz
F2 - Processing parameters
SI 32768
SF 130.6130213 MHz
WDW EM
SSB 0
GB 1.00 Hz
CN 0
PC 1.40

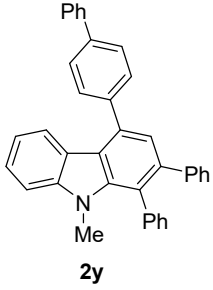
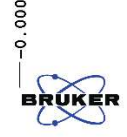
```

SYSC-P-65



P-44

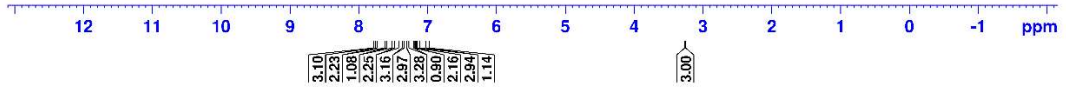
7.743
7.616
7.601
7.517
7.502
7.486
7.419
7.417
7.406
7.403
7.391
7.389
7.387
7.379
7.376
7.336
7.333
7.331
7.328
7.321
7.317
7.293
7.291
7.285
7.279
7.252
7.200
7.178
7.175
7.172
7.168
7.165
7.152
7.148
7.141
7.136
7.132
7.129
7.126
7.119
7.117
7.1017
7.016
7.003
7.001
6.987
6.985
3.258



Current Data Parameters
 NAME SYSC ASCEND 500
 EXPNO 36
 PROCNO 1

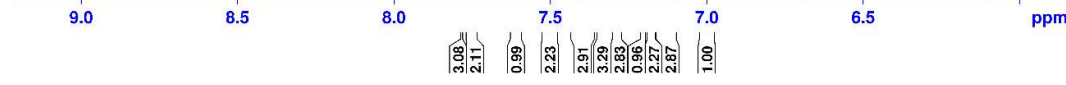
F2 - Acquisition Parameters
 Date_ 20211207
 Time 12.42 h
 INSTRUM spect
 PROBRD zll9470_0291 ()
 FULPROG zgpg
 TD 65536
 ID SOLVENT CDC13
 NS 16
 DS 2
 SWH 10000.000 Hz
 FIDRES 0.305176 Hz
 AQ 3.2767999 sec
 RG 108.78
 DW 50.000 usec
 DE 6.50 usec
 TE 297.0 K
 D1 1.00000000 sec
 TD0
 SFO1 500.372098 MHz
 NUC1 1H
 P1 10.00 usec
 FWH 23.23100038 W

F2 - Processing parameters
 SI 65536
 SF 500.3690159 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00

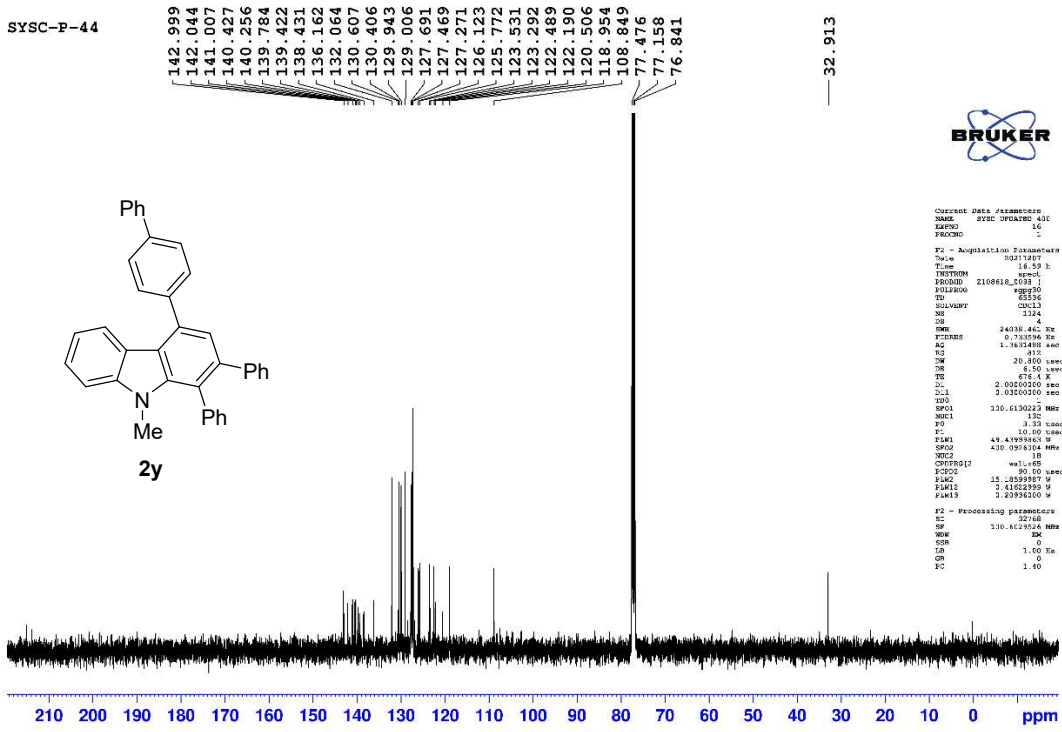


P-44

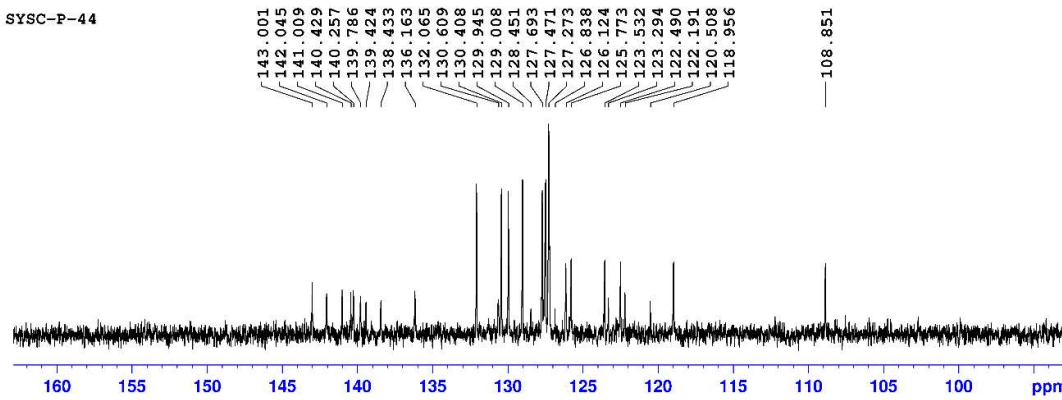
7.561
7.559
7.755
7.745
7.743
7.616
7.601
7.517
7.502
7.489
7.486
7.408
7.406
7.403
7.401
7.391
7.389
7.387
7.379
7.376
7.336
7.333
7.331
7.328
7.321
7.317
7.310
7.306
7.299
7.297
7.293
7.291
7.288
7.285
7.279
7.252
7.200
7.192
7.188
7.183
7.178
7.175
7.172
7.168
7.165
7.152
7.148
7.141
7.136
7.132
7.129
7.119
7.117
7.016
7.003
7.001
6.987

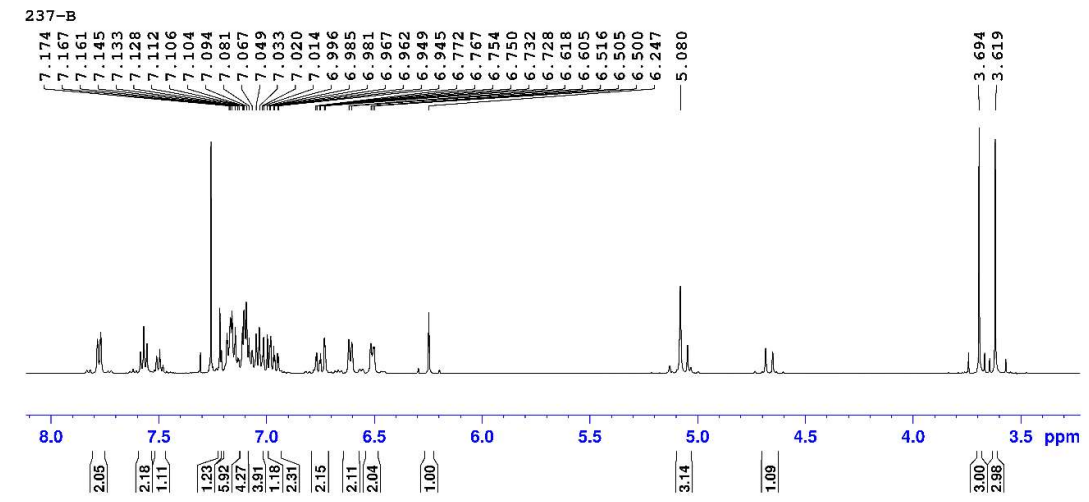
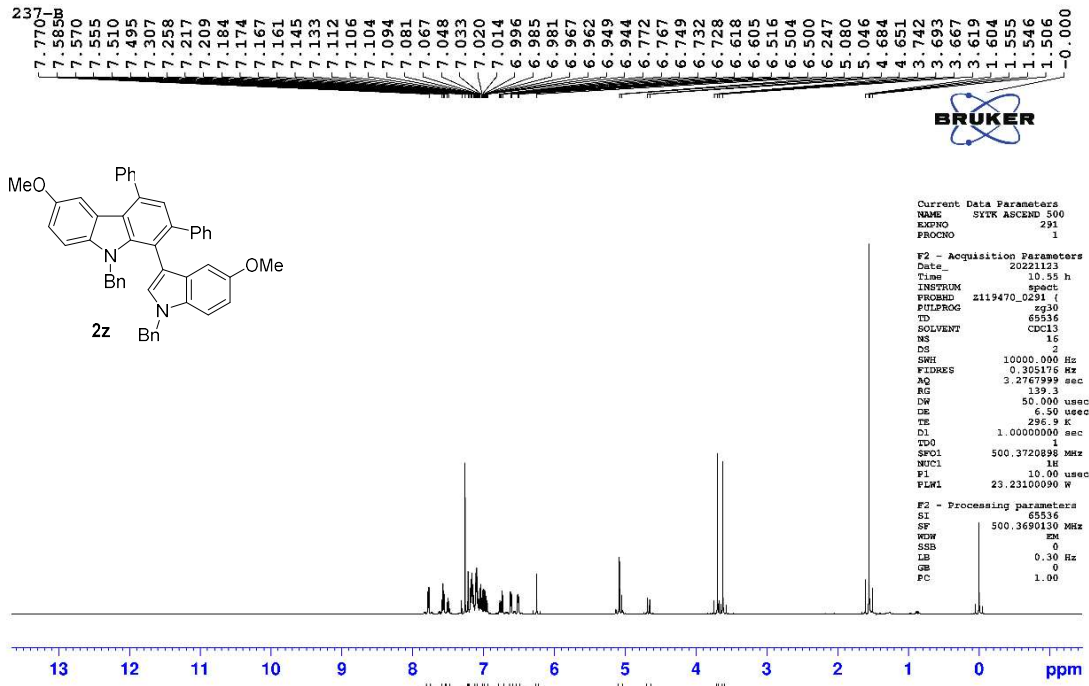


SYSC-P-44

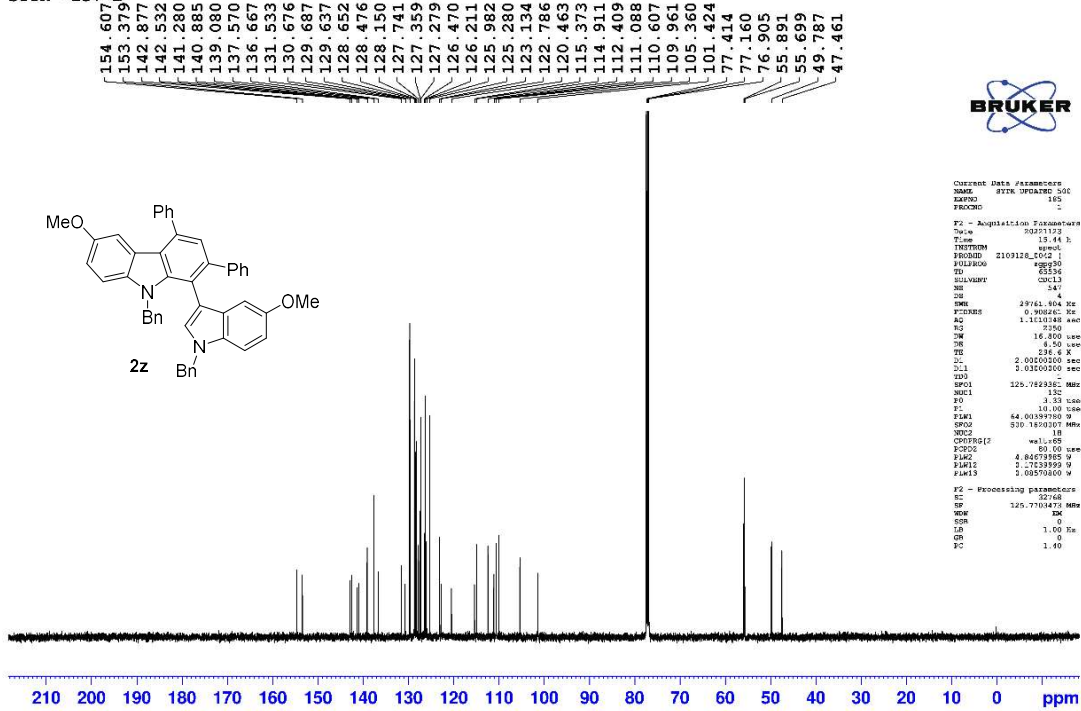


SYSC-P-44

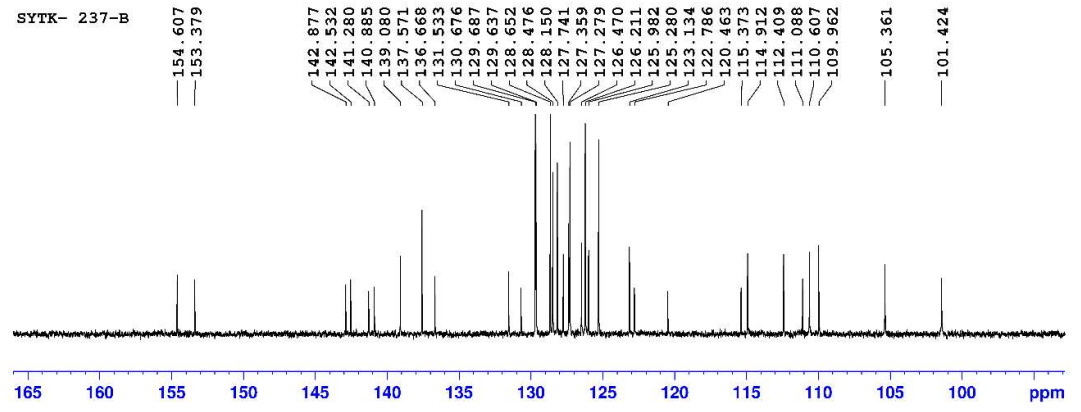




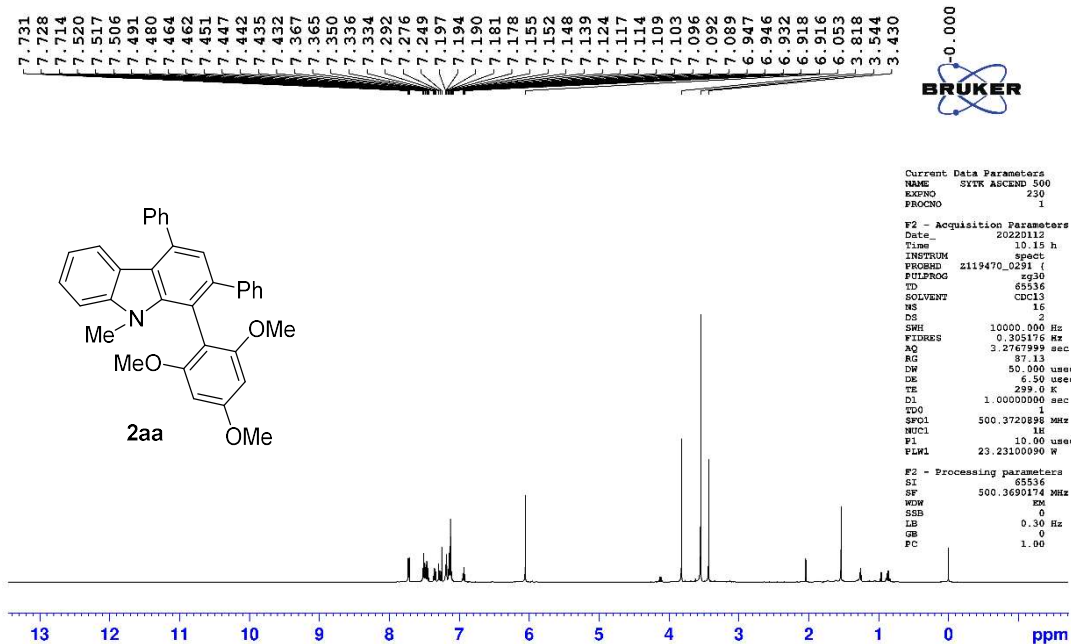
SYTK- 237-B



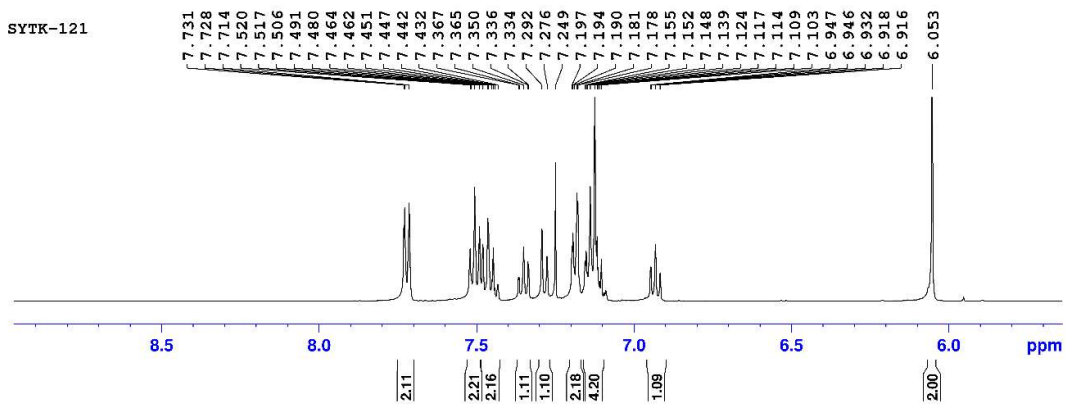
SYTK- 237-B



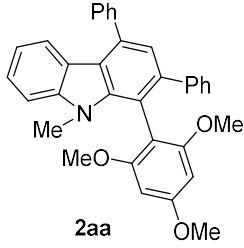
SYTK-121



SYTK-121



SYTK-121



161.579
159.499
143.075
142.498
141.750
141.147
140.145
136.231
129.672
129.256
128.373
127.377
127.014
125.953
125.125
123.215
122.503
122.279
120.217
118.314
114.661
108.708
108.365
90.145
77.414
77.160
76.906
55.630
55.399

30.694



```

Current Data Parameters
NAME      SYTK_UPDATED_501
SAMPNO   1
PROCNO   1

F2 - Acquisition Parameters
Date_    2020119
Time     14.31.1
INSTRUM  spect
PROBHD   2109128_002
PULPROG  zgpg30
TD        65536
SOLVENT  CDCl3
NS        4
DS        4
SWH       29161.604 Hz
FIDRES    0.400000 Hz
AQ        1.1110248 sec
RG        2500
SFO       16.400 sec
DE        4.50 sec
TE        300.0 K
SI        2.0000000 sec
SFO2      3.0000000 sec
AQ2        1
SFO3      125.7629981 MHz
AQ3        1
SFO4      3.33 sec
SFO5      10.00 sec
SFO6      44.0000000 MHz
SFO7      370.0000000 MHz
SFO8      18
SFO9      18
SFO10     wall:0.00
SFO11     80.00 sec
SFO12     4.8400000 MHz
SFO13     1.7638889 MHz
SFO14     1.0000000 MHz

F2 - Processing parameters
SI        32768
SF        125.7700471 MHz
WDW       EM
SSB       0
GB        0
CB        1.00 Hz
DB        0
PC        1.40

```

210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 ppm

SYTK-121

161.579
159.499
143.075
142.498
141.750
141.147
140.145
136.231
129.672
129.256
128.374
127.377
127.014
125.953
125.125
123.215
122.503
122.279
120.217
118.314
114.661
108.708
108.365
90.145

165 160 155 150 145 140 135 130 125 120 115 110 105 100 95 90 ppm