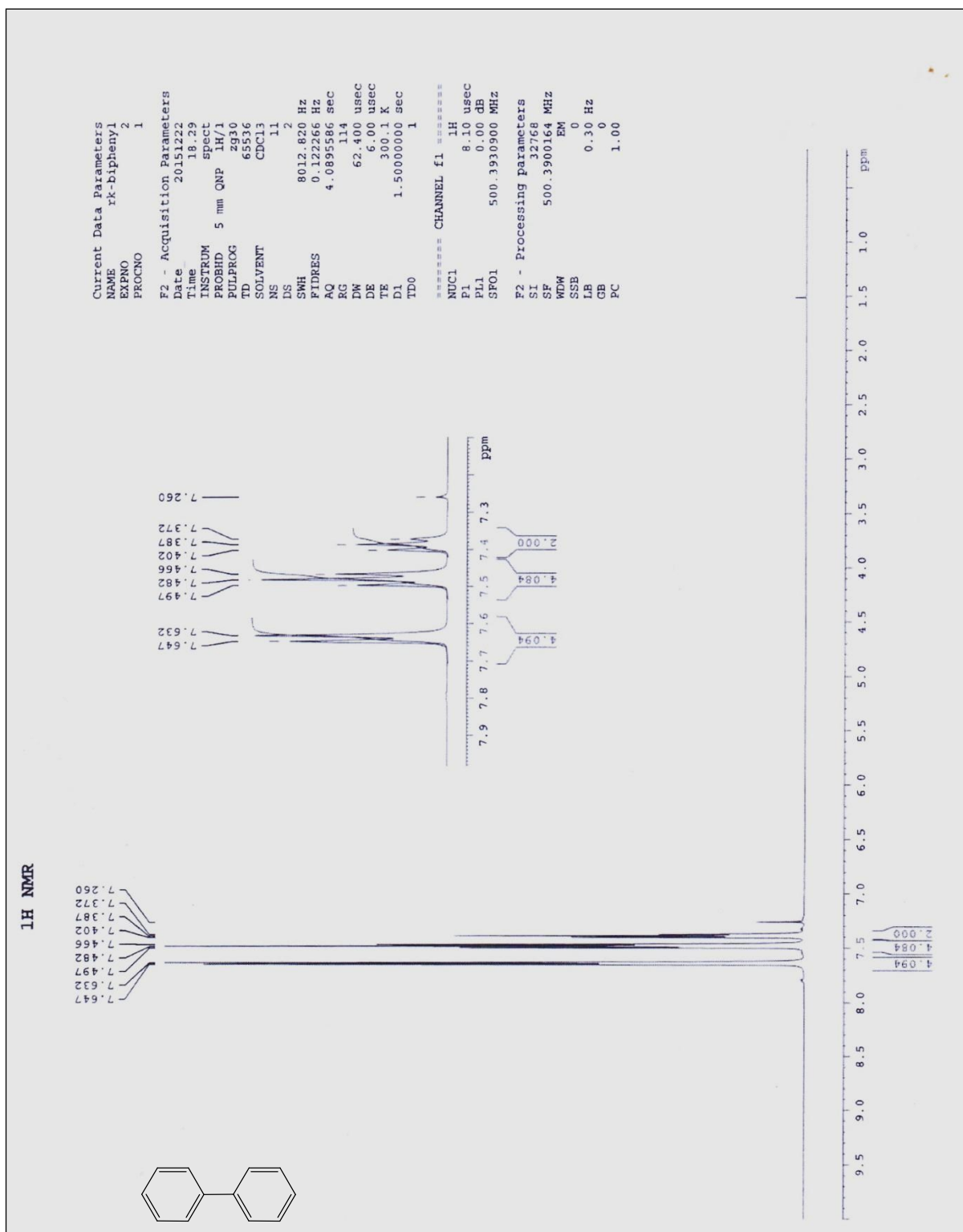


## Pd nanoparticles deposited on Isoniazid grafted multi walled carbon nanotubes: Synthesis, characterization and application for Suzuki reaction in aqueous media

Mahsa Hajjhorbani, Malak Hekmati\*

### *Spectra data for selected products:*



Current Data Parameters  
 NAME rk-biphenyl  
 EXPNO 1  
 PROCNO 1  
 F2 - Acquisition Parameters  
 Date\_ 20151222  
 Time 11:00:00  
 INSTRUM spect  
 PROBHD 5 mm QNP 1H/1  
 PULPROG zgpg30  
 TD 65536  
 SOLVENT CDCl3  
 NS 30  
 DS 4  
 SFO 30030.029 Hz  
 SRH 0.458222 Hz  
 FIDRES 1.0919410 sec  
 AQ 1.9976500 sec  
 RG 327.650 usec  
 DR 16.650 usec  
 DE 6.00 usec  
 TE 300.2 K  
 D1 2.00000000 sec  
 d11 0.03000000 sec  
 DELTA 1.89299998 sec  
 TD0 1

\*\*\*\*\* CHANNEL f1 \*\*\*\*\*  
 NUC1 13C  
 P1 13.00 usec  
 PL1 0.00 dB  
 SFO1 125.837483 MHz

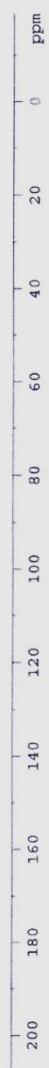
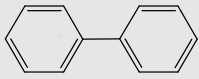
\*\*\*\*\* CHANNEL f2 \*\*\*\*\*  
 CPDPRG2 waltz16  
 NUC2 1H  
 P2 100.00 usec  
 PL2 19.00 dB  
 PL12 24.50 dB  
 PL13 26.00 dB  
 SFO2 500.320016 MHz

F2 - Processing parameters  
 SI 32768  
 SF 125.837483 MHz  
 WDW EM  
 SSB 0  
 H 0  
 GB 1.00 Hz  
 PC 1.40

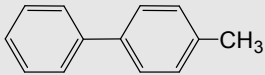
13C NMR

77.615  
 77.361  
 77.107

141.604  
 129.093  
 127.591  
 127.512



1H NMR



7.650  
7.635  
7.635  
7.567  
7.551  
7.497  
7.482  
7.467  
7.395  
7.380  
7.365  
7.316  
7.301  
7.260

7.650  
7.635  
7.567  
7.551  
7.497  
7.482  
7.467  
7.395  
7.380  
7.365  
7.316  
7.301  
7.260

2.457

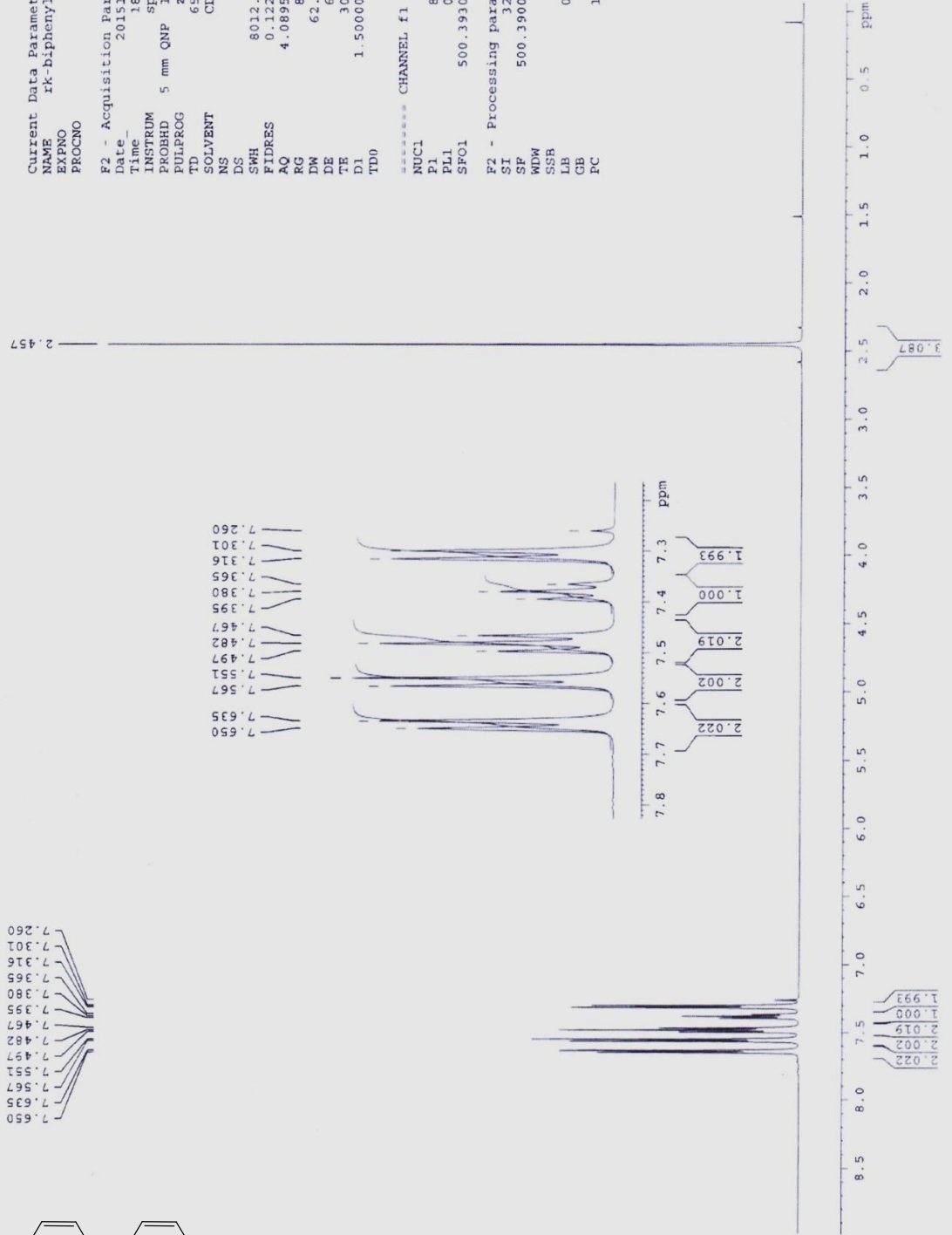
Current Data Parameters  
NAME rk-biphenyltoluene  
EXPNO 1  
PROCNO 1

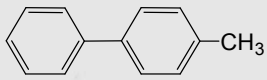
F2 - Acquisition Parameters  
Date\_ 20151222  
Time 18.11  
INSTRUM spect  
PROBHD 5 mm QNP 1H/1  
PULPROG zg30  
TD 65536  
SOLVENT CDCl3  
NS 12  
DS 2  
SWH 8012.820 Hz  
FIDRES 0.122266 Hz  
AQ 4.0895586 sec  
RG 80.6  
DW 62.400 usec  
DE 6.00 usec  
TE 300.6 K  
D1 1.50000000 sec  
TD0 1

=====  
CHANNEL f1  
=====

NUCL 1H  
PI 8.10 usec  
PL1 0.00 dB  
SFO1 500.3910900 MHz

F2 - Processing parameters  
SI 32768  
SF 500.3900160 MHz  
WDW EM  
SSB 0  
LB 0.30 Hz  
GB 0  
PC 1.00





13C NMR

141.520  
138.717  
137.339  
129.821  
129.050  
127.334  
127.312

77.618  
77.364  
77.110

21.428

200 180 160 140 120 100 80 60 40 20 0 ppm

```

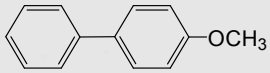
Current Data Parameters
NAME      pK-Biphenyl/Chloro
EXPNO     2
PROCNO    1

F2 - Acquisition Parameters
Date_     20151222
Time      18.19
INSTRUM   spect
PROBHD    5 mm QNP 1H/1
PULPROG   zgpg30
TD         65536
SOLVENT   CDCl3
NS         4
DS         4
SHE       30010.029 Hz
FIDRES    0.458222 Hz
AQ         1.0119410 sec
RG         327.5
DM         16.650 usec
DE         6.00 usec
TE         300.3 K
TR         2.0000000 sec
T1         1.7100000 sec
DELTA     1.8399998 sec
TD0        1

===== CHANNEL f1 =====
NUC1       13C
P1         11.50 usec
PL1        4.00 dB
SFO1       125.8157483 MHz

===== CHANNEL f2 =====
CPDPRG2    waltz16
NUC2       1H
P2         100.00 usec
PL2        0.00 dB
PL3        0.00 dB
PL12       24.50 dB
PL13       26.00 dB
SFO2       500.3920016 MHz

F2 - Processing parameters
SI         32768
SF         125.8231324 MHz
WDW        EM
SSB        0
LB         1.00 Hz
GB         0
PC         1.40
  
```

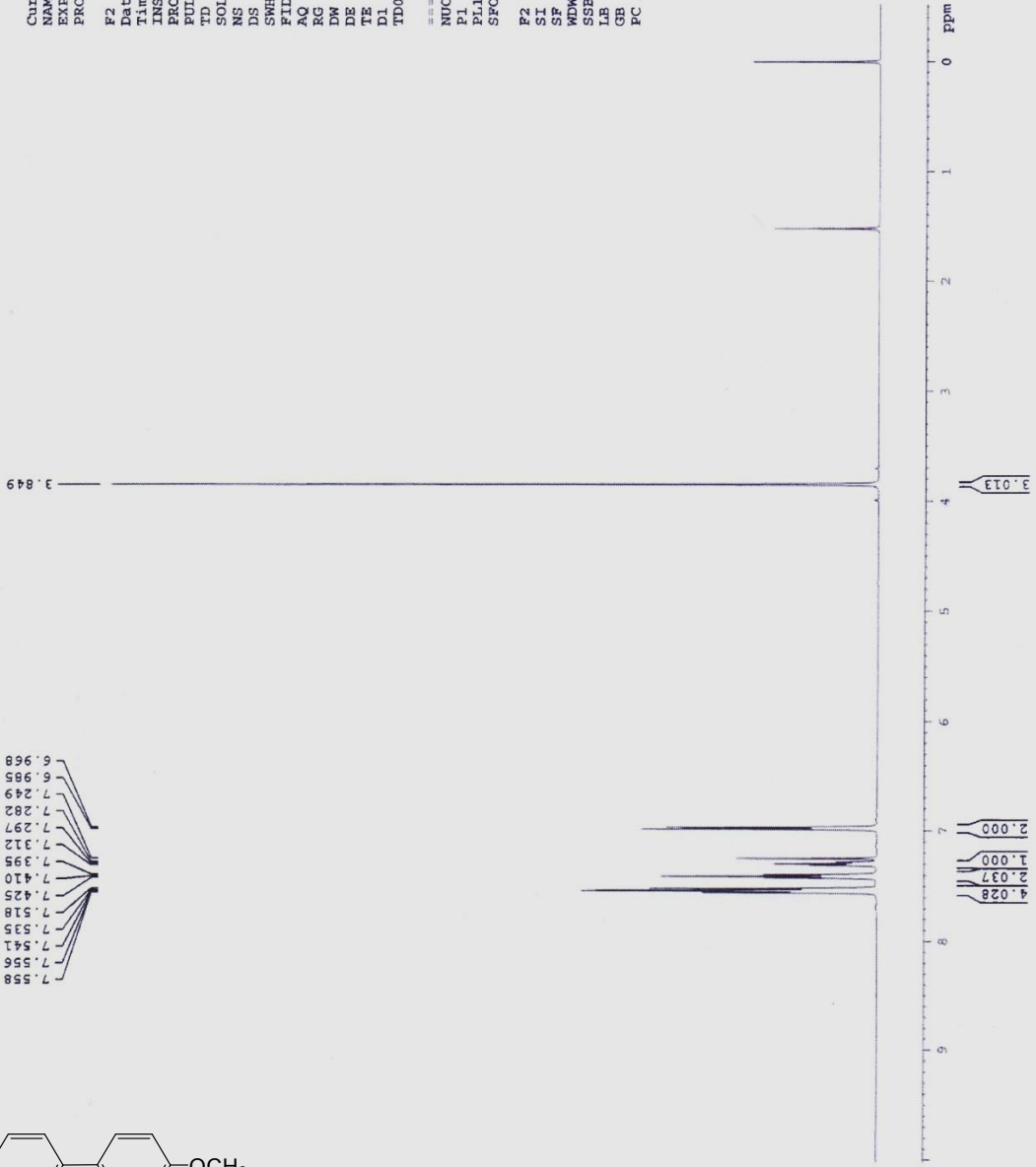


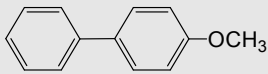
1H NMR

7.558  
7.556  
7.541  
7.535  
7.518  
7.425  
7.410  
7.395  
7.312  
7.297  
7.282  
7.249  
6.995  
6.968

3.013

Current Data Parameters  
 NAME ik-bymeo  
 EXPNO 1  
 PROCNO 1  
 F2 - Acquisition Parameters  
 Date 20151202  
 Time 16.58  
 INSTRUM spect  
 PROBHD 5 mm QNP 1H/1  
 PULPROG zg30  
 TD 65536  
 SOLVENT CDCl3  
 NS 9  
 DS 2  
 SWH 8012.820 Hz  
 FIDRES 0.122266 Hz  
 AQ 4.089586 sec  
 RG 362  
 DW 62.400 usec  
 DE 6.00 usec  
 TE 300.3 K  
 D1 1.5000000 sec  
 TD0 1  
 =====  
 CHANNEL f1  
 NUC1 1H  
 P1 8.10 usec  
 PL1 0.00 dB  
 SFO1 500.3930900 MHz  
 F2 - Processing parameters  
 SI 32768  
 SF 500.3900212 MHz  
 WDW EM  
 SSB 0  
 LB 0.30 Hz  
 GB 0  
 PC 1.00

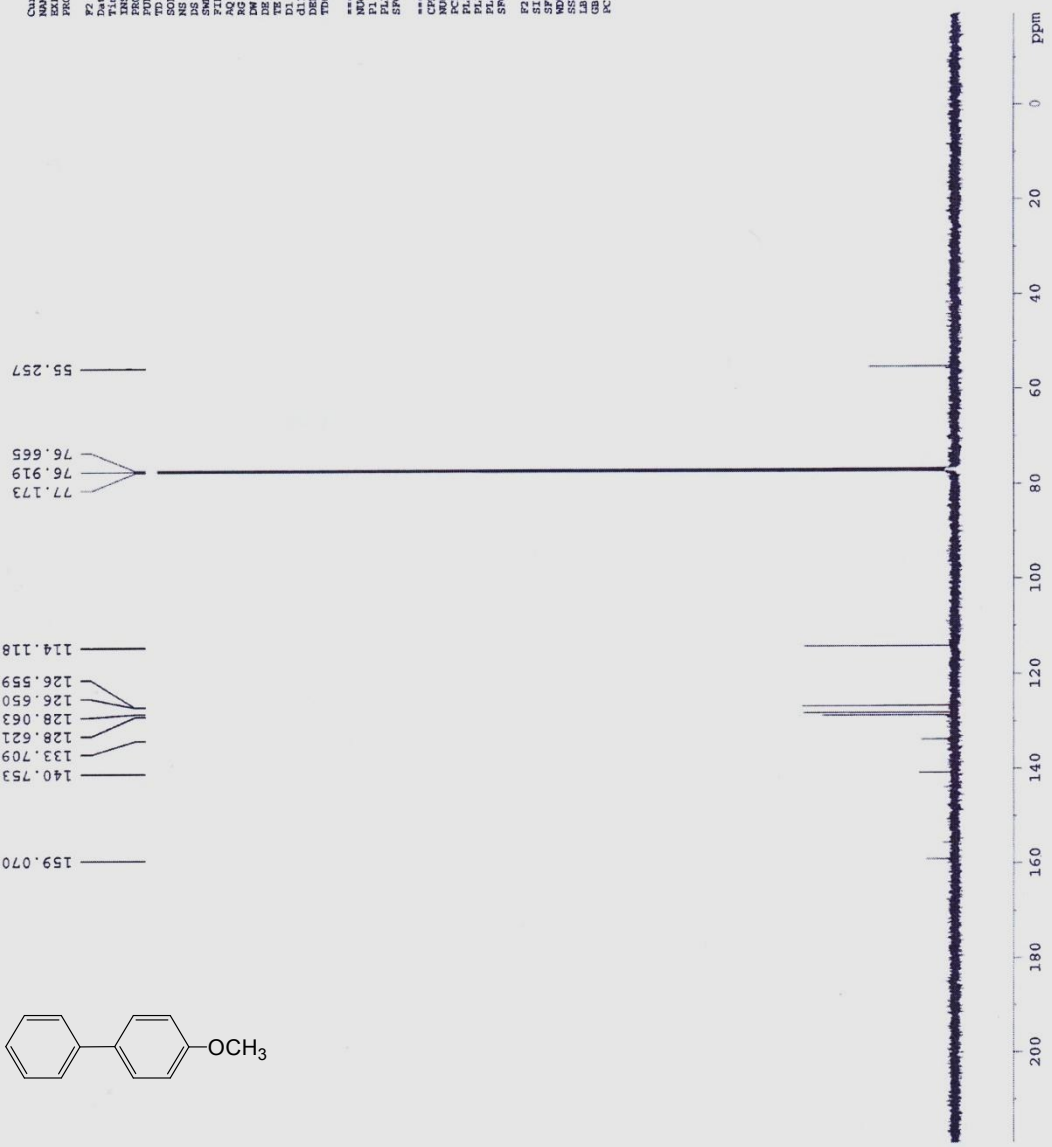


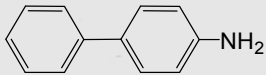


**<sup>13</sup>C NMR**

55.257  
 76.655  
 76.919  
 77.173  
 114.118  
 126.559  
 126.550  
 128.063  
 128.621  
 133.709  
 140.753  
 159.070

Current Data Parameters  
 EXPNO 2  
 PROCNO 1  
 F2 - Acquisition Parameters  
 Date\_ 20151202  
 Time 17.02  
 INSTRUM spect  
 PULPROG zgpg30  
 TD 65536  
 SFO1 125.8357483 MHz  
 NS 127  
 DS 4  
 SWH 30036.029 Hz  
 FIDRES 1.6912410 sec  
 AQ 1.6912410 sec  
 RG 7298.2  
 DW 16.660 usec  
 DE 1.00 usec  
 TE 300.3 K  
 D1 2.0000000 sec  
 d11 0.0300000 sec  
 DELTA 1.8999999 sec  
 TPRO 1  
 ===== CHANNEL f1 =====  
 NUC1 <sup>13</sup>C  
 P1 11.50 usec  
 PL1 4.00 dB  
 SFO1 125.8357483 MHz  
 ===== CHANNEL f2 =====  
 CPDPRG22 waltz16  
 NUC2 <sup>13</sup>C  
 P2 100.00 usec  
 PL2 0.00 dB  
 PL12 24.50 dB  
 PL13 24.50 dB  
 SFO2 500.33260316 MHz  
 F2 - Processing parameters  
 SI 32768  
 SF 125.8231796 MHz  
 NDM 0  
 ESB 0  
 GB 0  
 PC 1.40





7.538  
7.536  
7.521  
7.518  
7.418  
7.414  
7.401  
7.385  
7.369  
7.274  
7.259  
7.244  
7.238  
7.234  
7.232  
6.732  
6.737  
6.740  
6.750  
6.754  
6.754

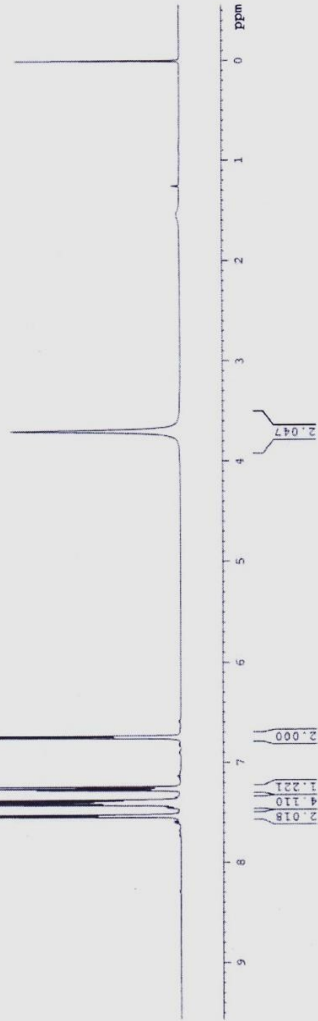
3.701

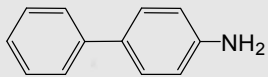
Current Data Parameters  
 NAME rk-1-byhb2  
 EXPNO 1  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20151203  
 Time 17.32  
 INSTRUM spect  
 PULPROG zgpg30  
 TD 65536  
 SOLVENT CDCl3  
 NS 10  
 DS 2  
 SWH 8012.820 Hz  
 FIDRES 0.122266 Hz  
 Aq 4.089586 sec  
 RG 228.1  
 DM 62.400 usec  
 DE 6.00 usec  
 TE 300.2 K  
 D1 1.50000000 sec  
 TDO 1

===== CHANNEL f1 =====  
 NUC1 1H  
 P1 8.10 usec  
 PL1 0.00 dB  
 SFO1 500.390900 MHz

F2 - Processing Parameters  
 SI 32768  
 SF 500.3900271 MHz  
 EM 0  
 SSB 0  
 LB 0.30 Hz  
 GB 0  
 PC 1.00





13C NMR

77.198  
76.944  
76.691

145.757  
141.090  
131.511  
128.570  
127.927  
126.320  
126.166  
115.302

200 180 160 140 120 100 80 60 40 20 0 ppm

```

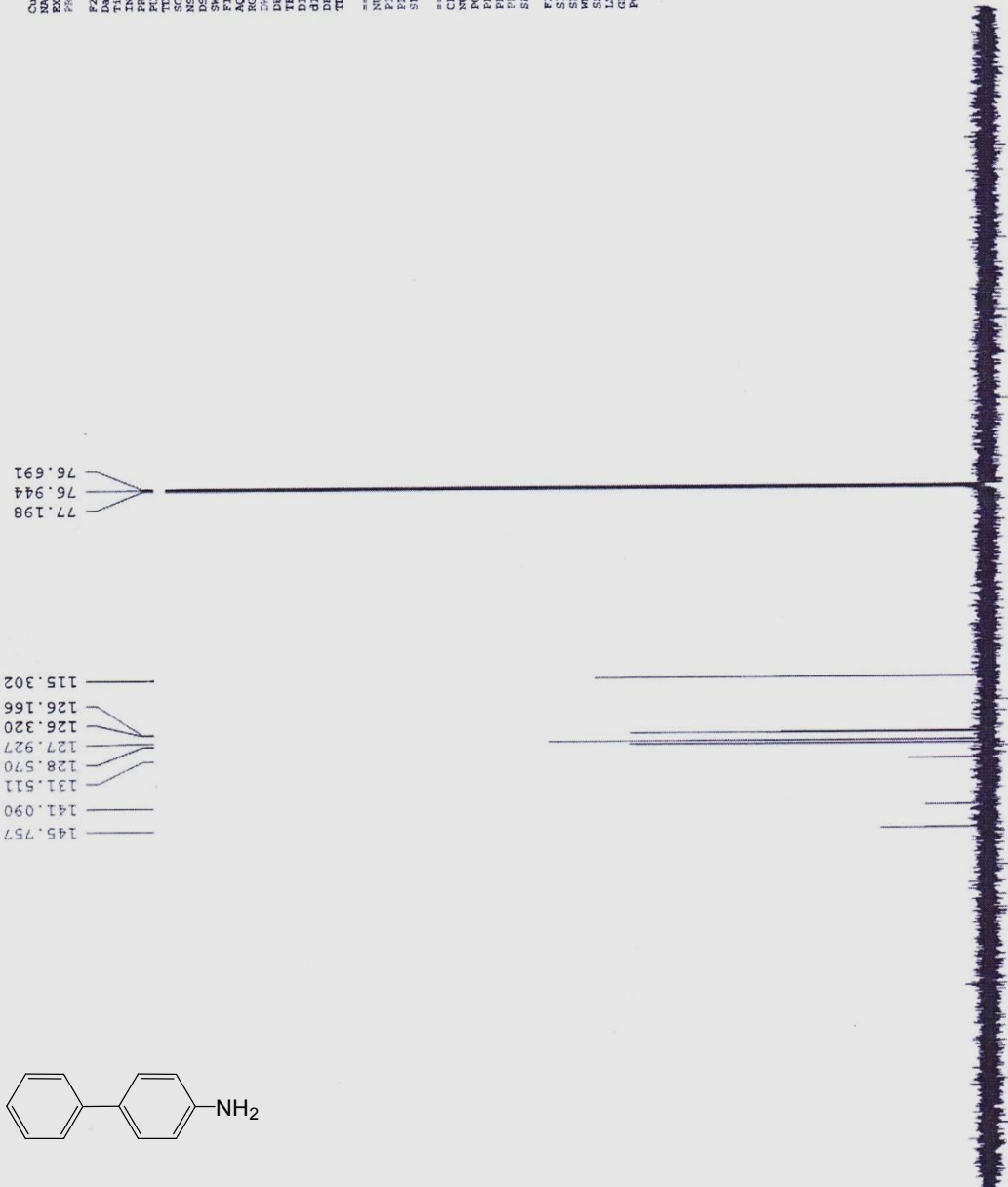
Current Data Parameters
NAME      xk-1-bynh2
EXPNO     2
PROCNO    1

F2 - Acquisition Parameters
Date_     20151203
Time      17.36
INSTRUM   spect
PROBHD    5 mm QNP
PULPROG   zgpg30
TD         65536
SOLVENT   CDCl3
NS         41
DS         2
SWH        30030.025 Hz
FIDRES     0.458222 Hz
AQ         1.0912410 sec
RG         72984.2
AQ         1.06527 usec
DE         6.00 usec
TE         300.4 K
D1         2.00000000 sec
d11        0.03000000 sec
DELTA     1.89999999 sec
TD0        1

===== CHANNEL f1 =====
NUC1       13C
P1         11.00 usec
PL1        0.00 dB
PL12       4.00 dB
SFO1       125.8157463 MHz

===== CHANNEL f2 =====
CPDPRG2    waltz16
NUC2       1H
PCPD2      100.00 usec
PL2        0.00 dB
PL12       24.50 dB
SFO2       500.1320016 MHz

F2 - Processing parameters
SI         32768
SF         125.8231796 MHz
WDW        EM
SSB        0
LB         1.00 Hz
GB         0
PC         1.40
  
```





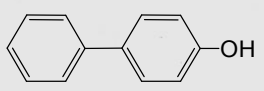
Current Data Parameters  
 NAME rk-biphenyl-OH  
 EXPNO 1  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20151223  
 Time 18.23  
 INSTRUM spect  
 PROBHD 5 mm QNP 1H/1  
 PULPROG zg30  
 TD 65536  
 SOLVENT CDCl3  
 NS 10  
 DS 2  
 SWH 8012.820 Hz  
 FIDRES 0.122266 Hz  
 AQ 4.0895586 Sec  
 RG 228.1  
 DW 62.400 usec  
 DE 6.00 usec  
 TE 300.2 K  
 D1 1.5000000 Sec  
 TDO 1

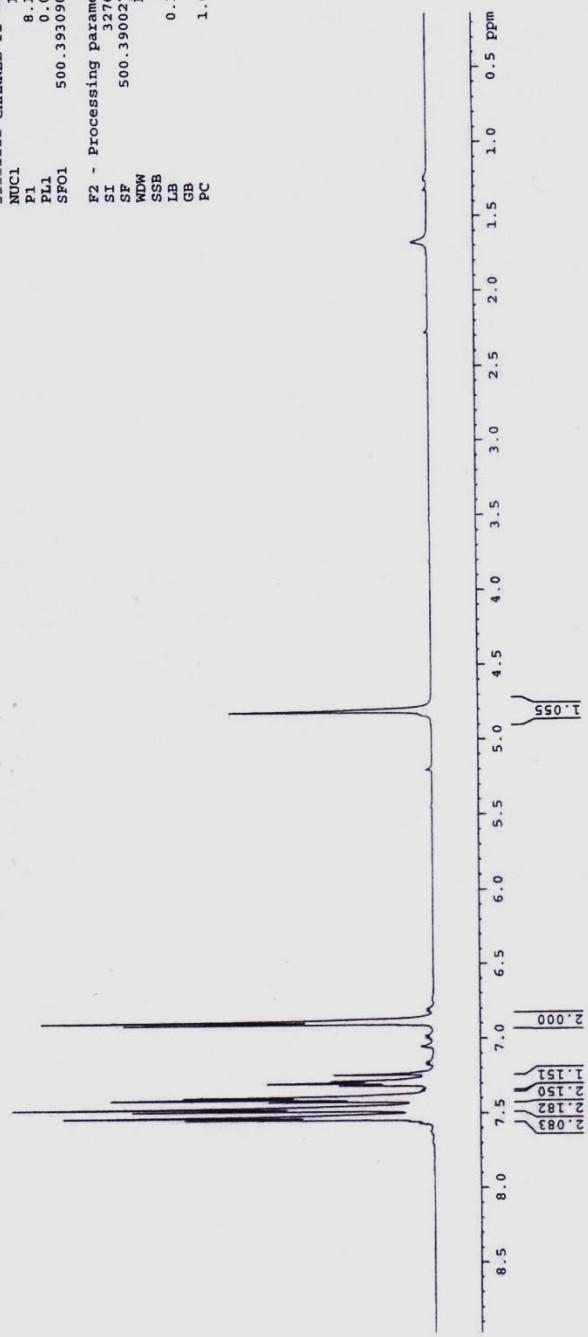
===== CHANNEL f1 =====  
 NUC1 1H  
 P1 8.10 usec  
 PL1 0.00 dB  
 SFO1 500.3930900 MHz

F2 - Processing parameters  
 SI 32768  
 SF 500.3900274 MHz  
 EM  
 WDW 0  
 SSB 0  
 LB 0.30 Hz  
 GB 0  
 PC 1.00

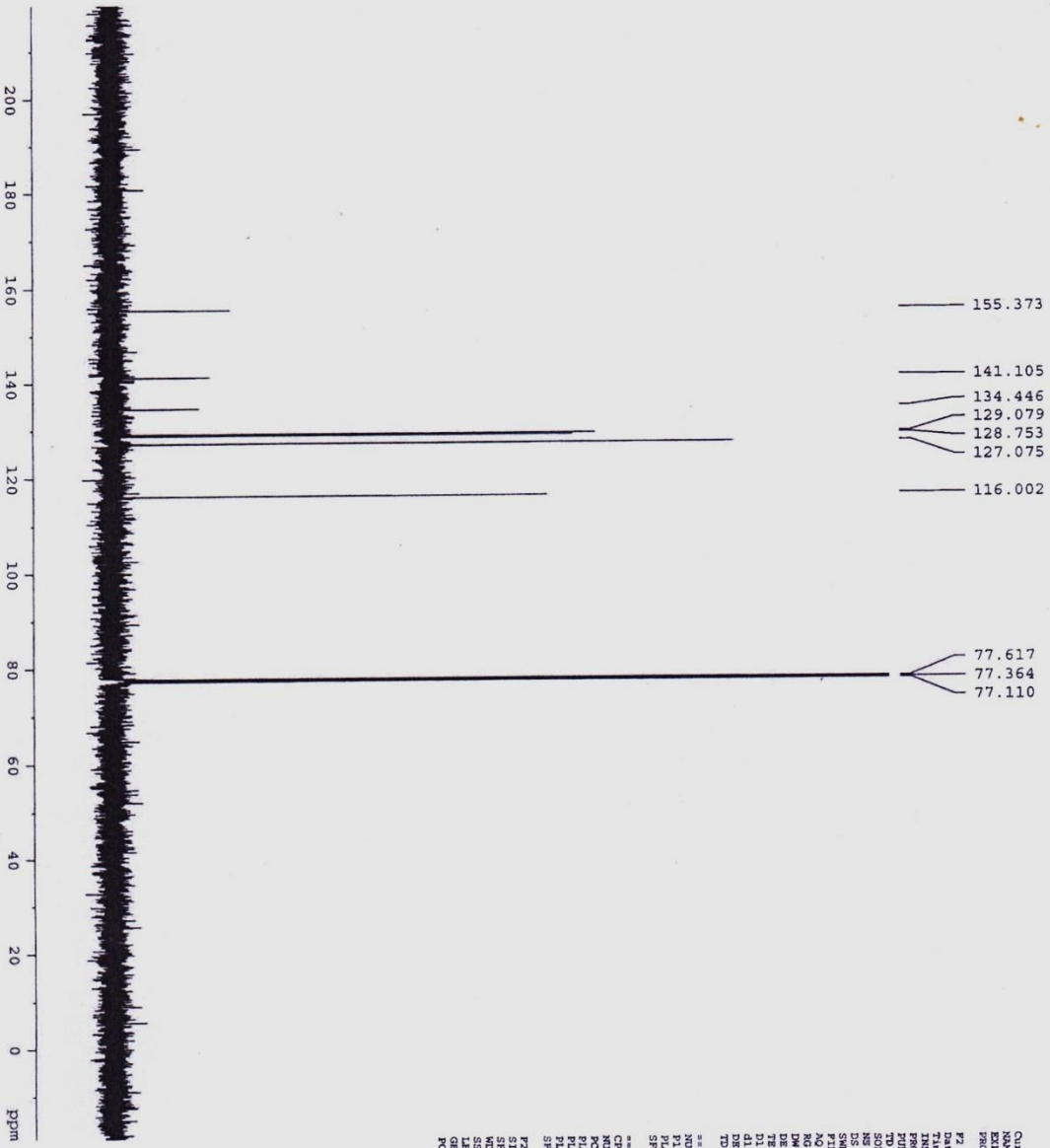
7.542  
7.539  
7.536  
7.523  
7.488  
7.482  
7.478  
7.469  
7.465  
7.420  
7.417  
7.410  
7.405  
7.390  
7.390  
7.390  
7.311  
7.309  
7.297  
7.282  
7.240  
6.904  
6.900  
6.891  
6.887



4.812



13C NMR



```

Current Data Parameters
NAME      4'-biphenyl-OH
EXPNO     2
PROCNO    1
SOLVENT   CDCl3
F2 - Acquisition Parameters
Time      2018.27
INSTRUM   spect
PROBHD    5 mm QNP 1H/1
PULPROG   zgpg30
TD         65536
SOLVENT   CDCl3
NS         62
DS         4
SWH        30030.029 Hz
FIDRES     0.458222 Hz
AQ         1.091249 sec
RG         16.650 usec
DE         6.00 usec
TE         300.2 K
DELTA     0.000000 sec
d11        1.8999998 sec
TD0        1
===== CHANNEL f1 =====
NUC1       13C
P1         11.50 usec
SFO1       125.8357480 MHz
===== CHANNEL f2 =====
NUC2       13C
P2         100.00 usec
SFO2       500.13920016 MHz
F2 - Processing parameters
SI         32768
SF         125.821251 MHz
SM         32
AS         1.00 Hz
GB         0
PC         1.40
  
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