

Supporting Information

New Dammarane-Type Triterpenoid Saponins from *Panax notoginseng* Leaves and Their Nitric Oxide Inhibitory Activities

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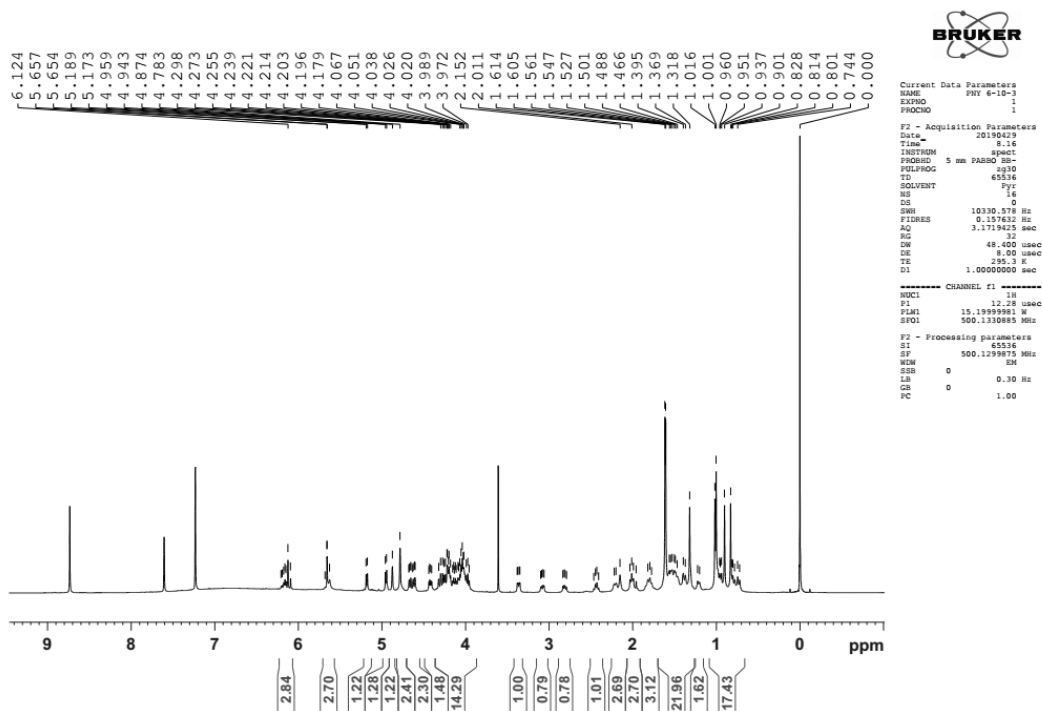


Figure S1 ¹H NMR (500 MHz, C₅D₅N) spectrum of 1

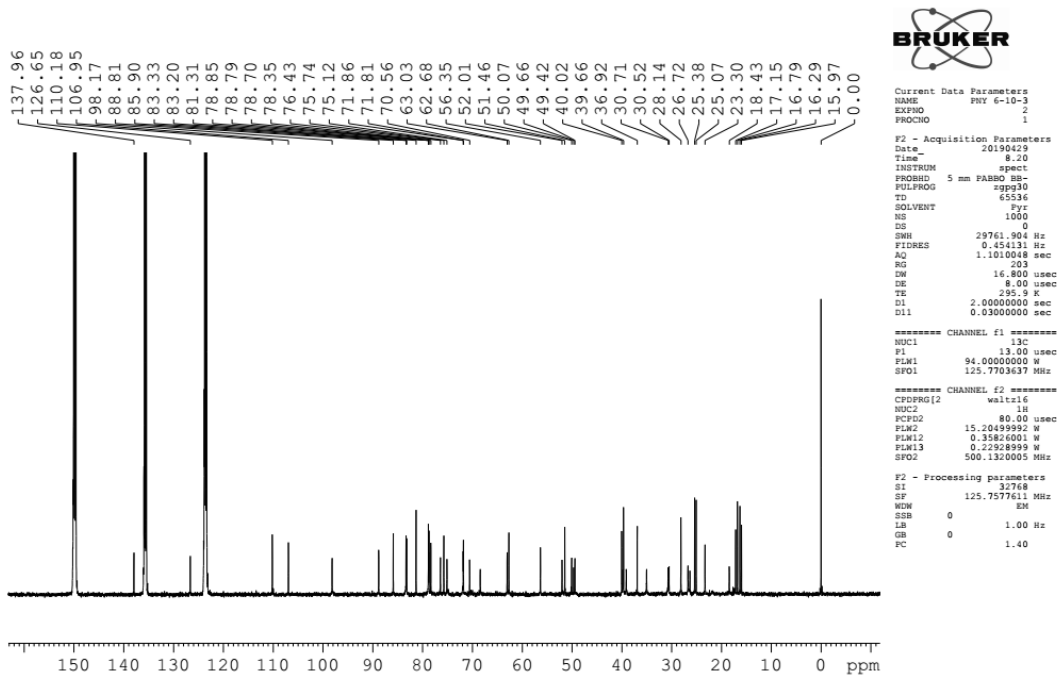


Figure S2 ¹³C NMR (125 MHz, C₅D₅N) spectrum of 1

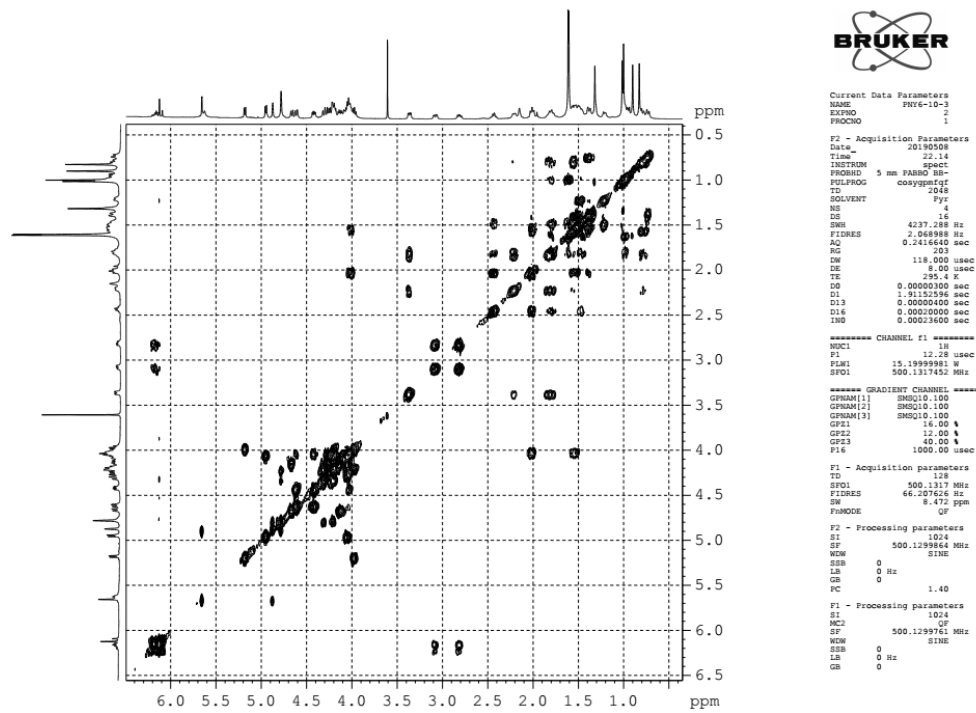


Figure S3 ^1H ^1H COSY ($\text{C}_5\text{D}_5\text{N}$) spectrum of 1

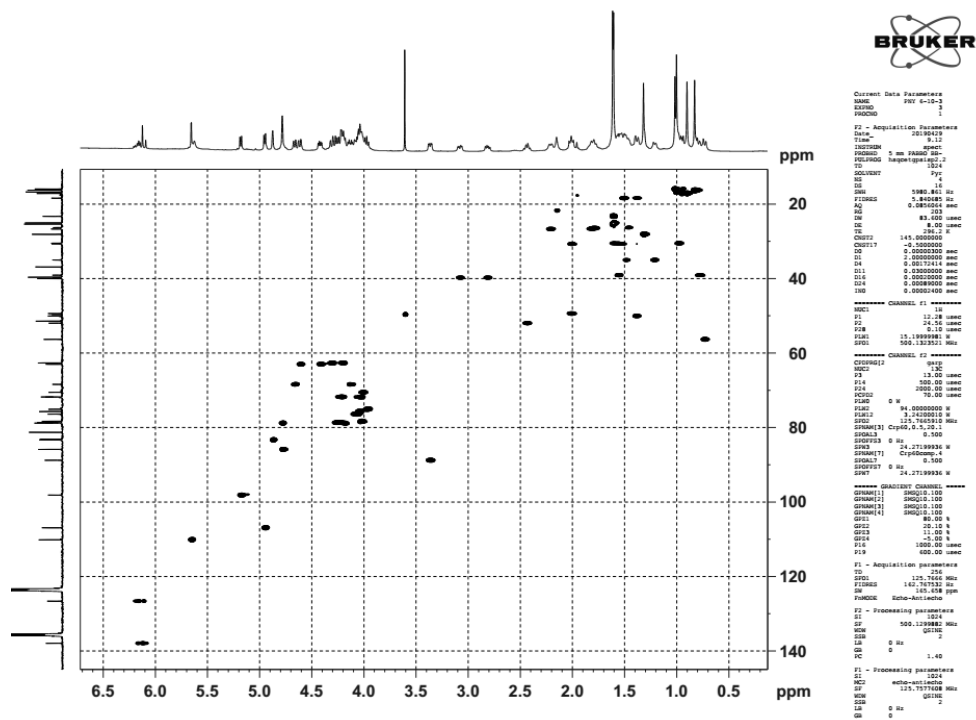


Figure S4 HSQC ($\text{C}_5\text{D}_5\text{N}$) spectrum of 1

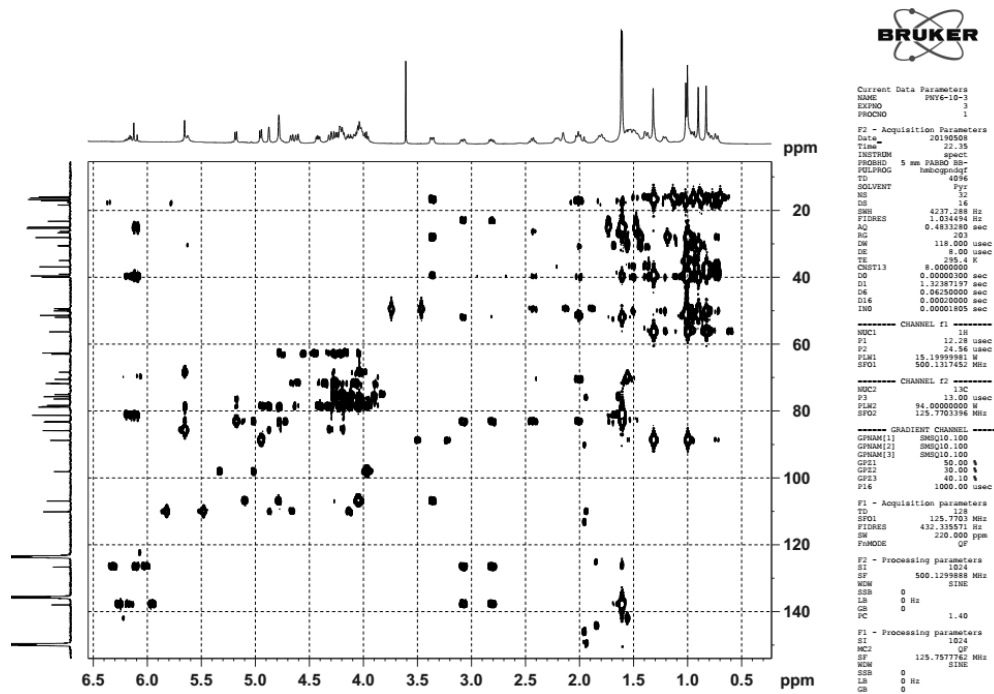


Figure S5 HMBC (C₅D₅N) spectrum of 1

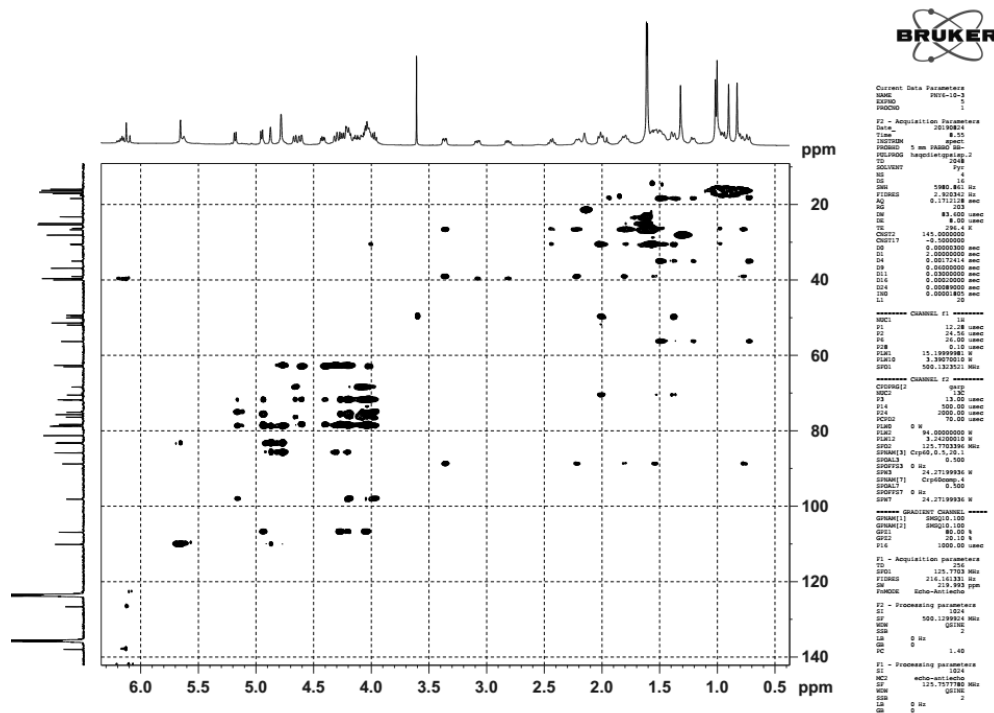


Figure S6 HSQC-TOCSY (C₅D₅N) spectrum of 1

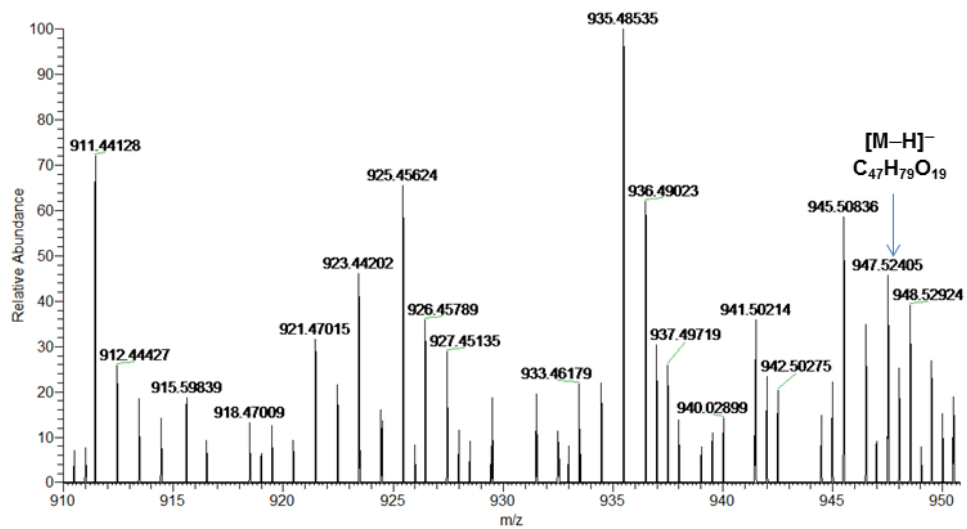


Figure S7 ESI-Q-Orbitrap-MS spectrum of 1

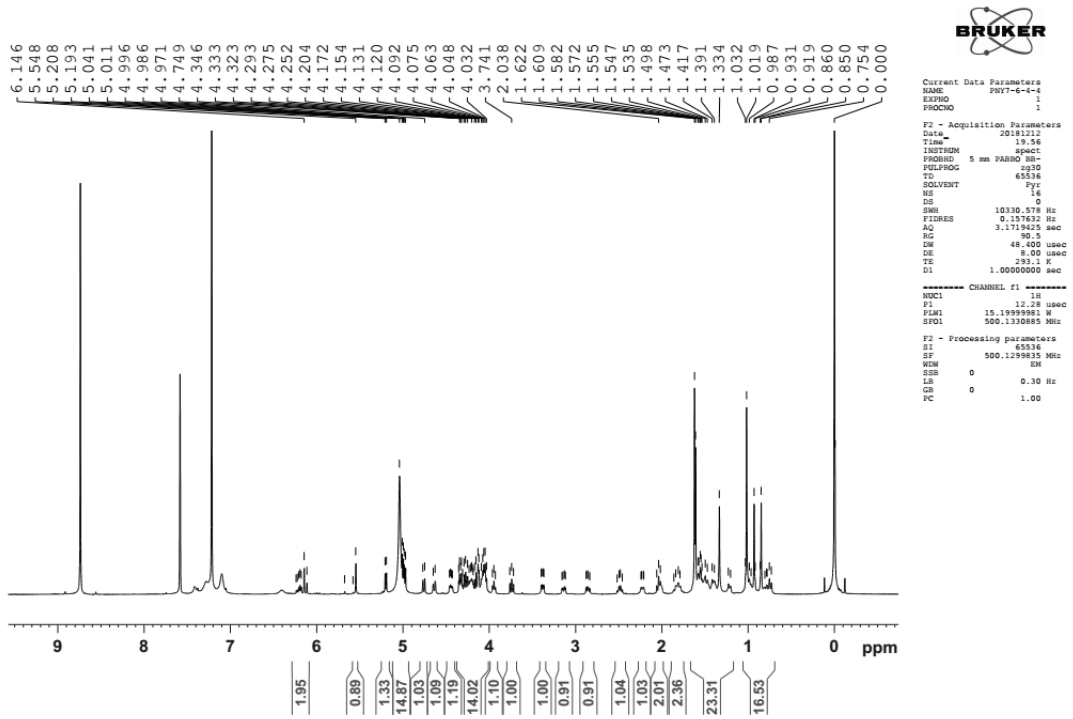


Figure S8 ¹H NMR (500 MHz, C₅D₅N) spectrum of 2

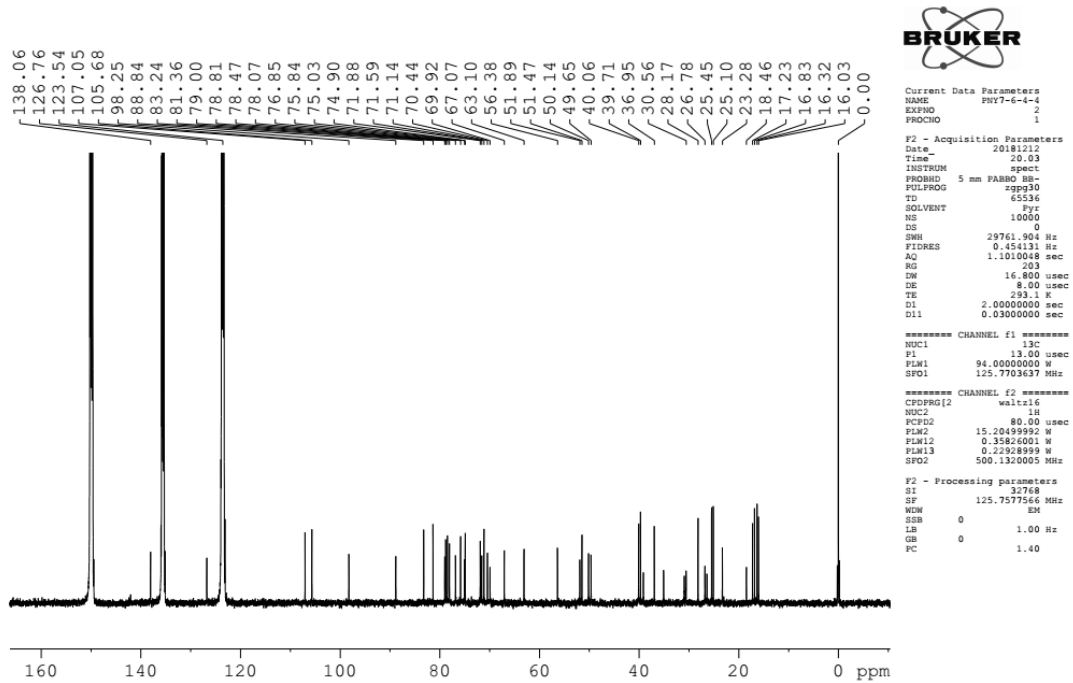


Figure S9 ^{13}C NMR (125 MHz, $\text{C}_5\text{D}_5\text{N}$) spectrum of 2

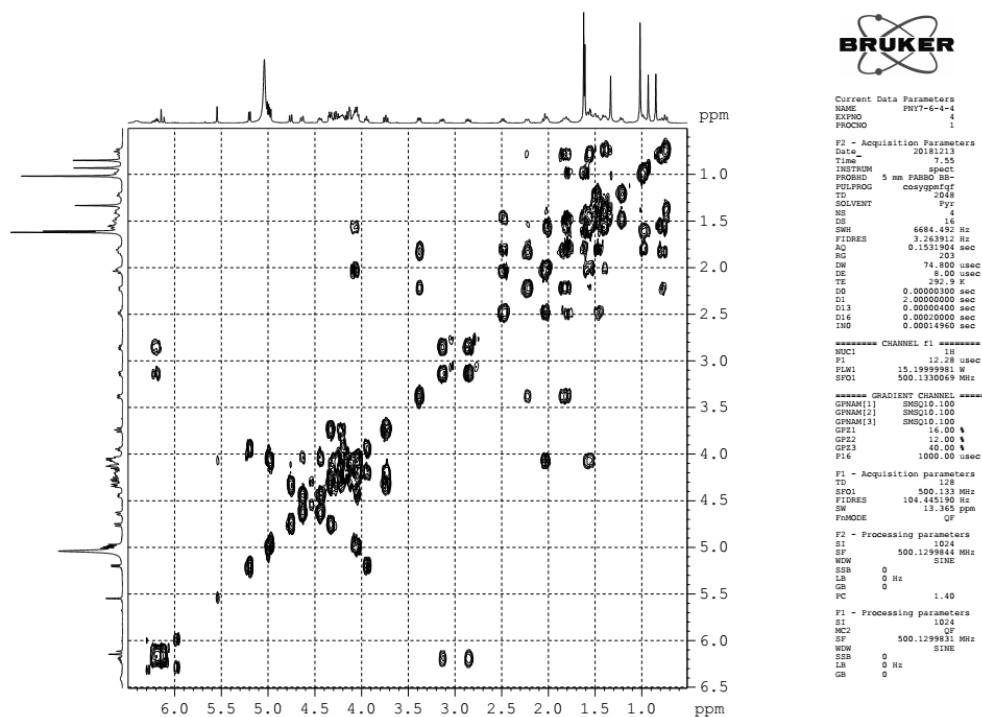


Figure S10 ^1H ^1H COSY ($\text{C}_5\text{D}_5\text{N}$) spectrum of 2

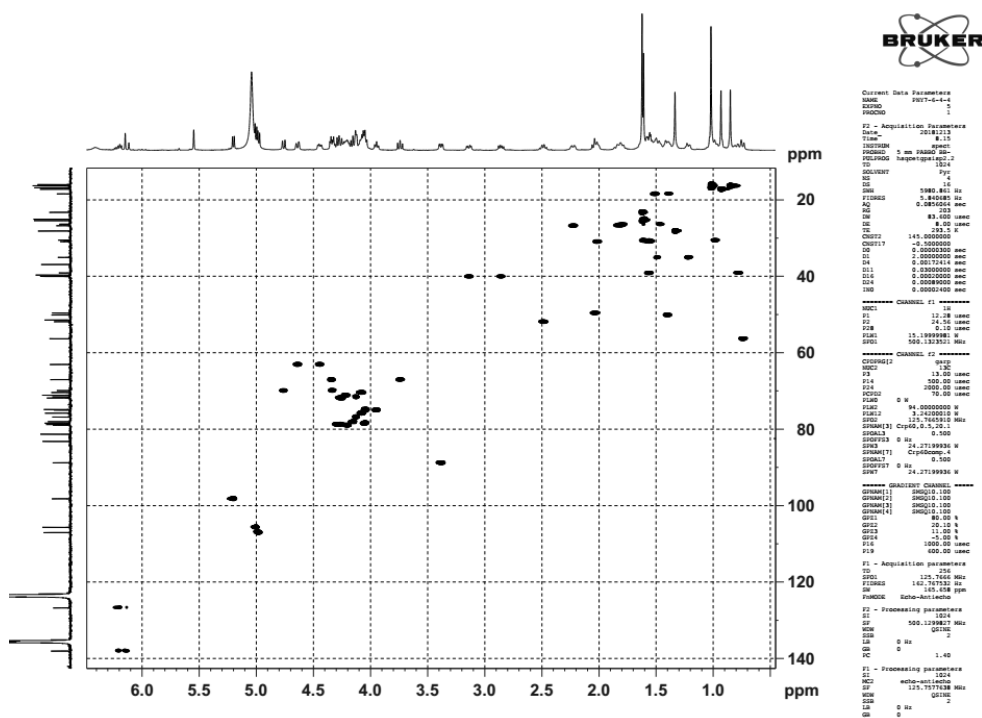


Figure S11 HSQC ($\text{C}_5\text{D}_5\text{N}$) spectrum of 2

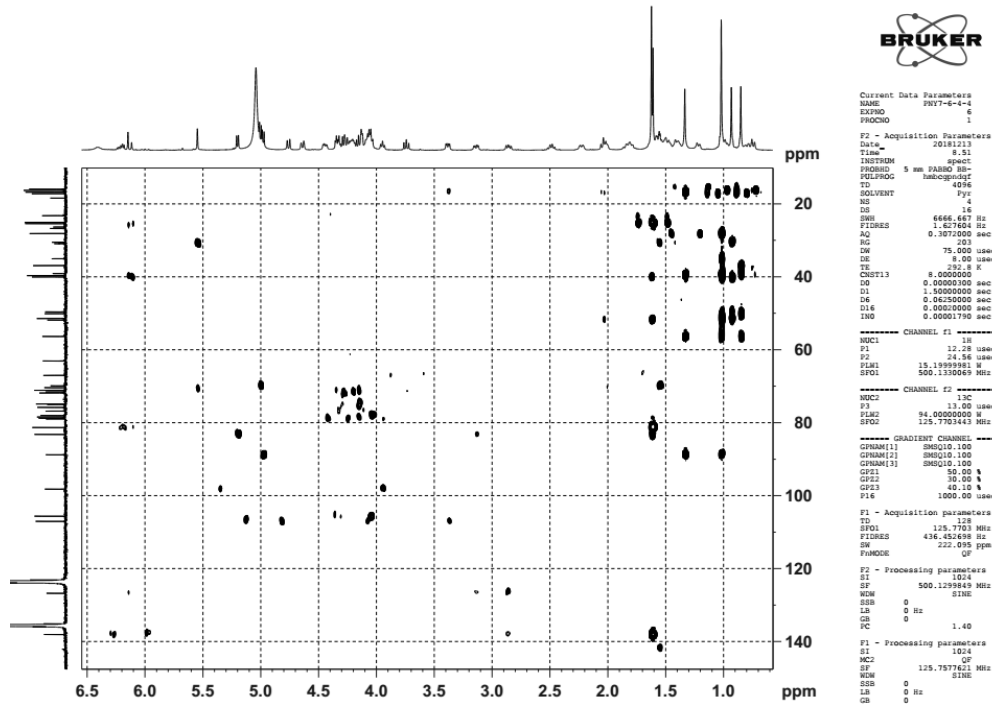


Figure S12 HMBC (C₅D₅N) spectrum of 2

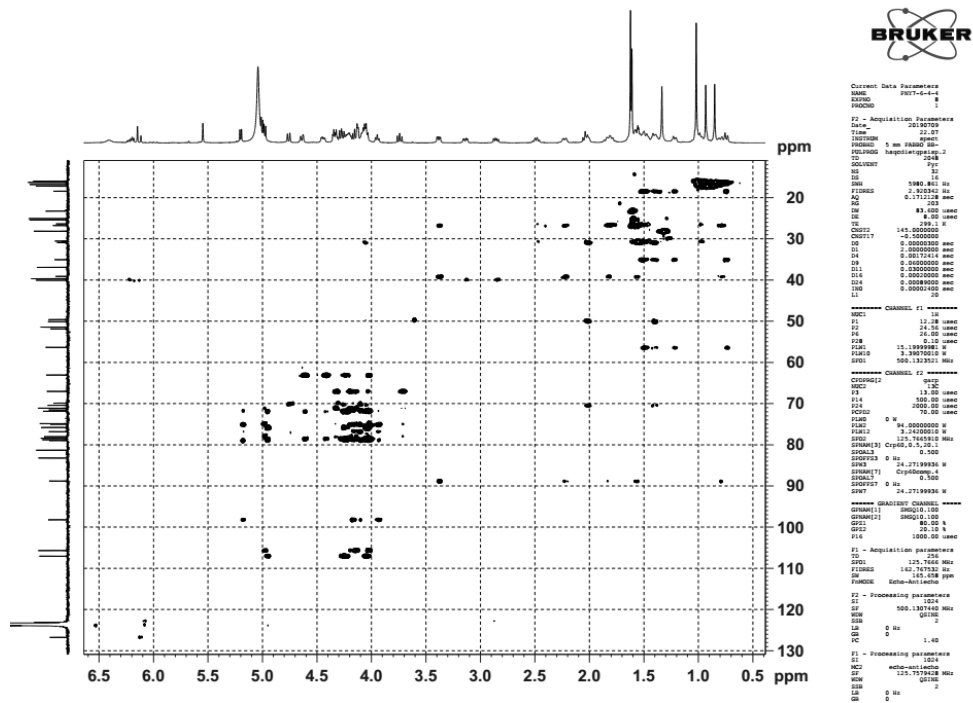


Figure S13 HSQC-TOCSY (C₅D₅N) spectrum of 2

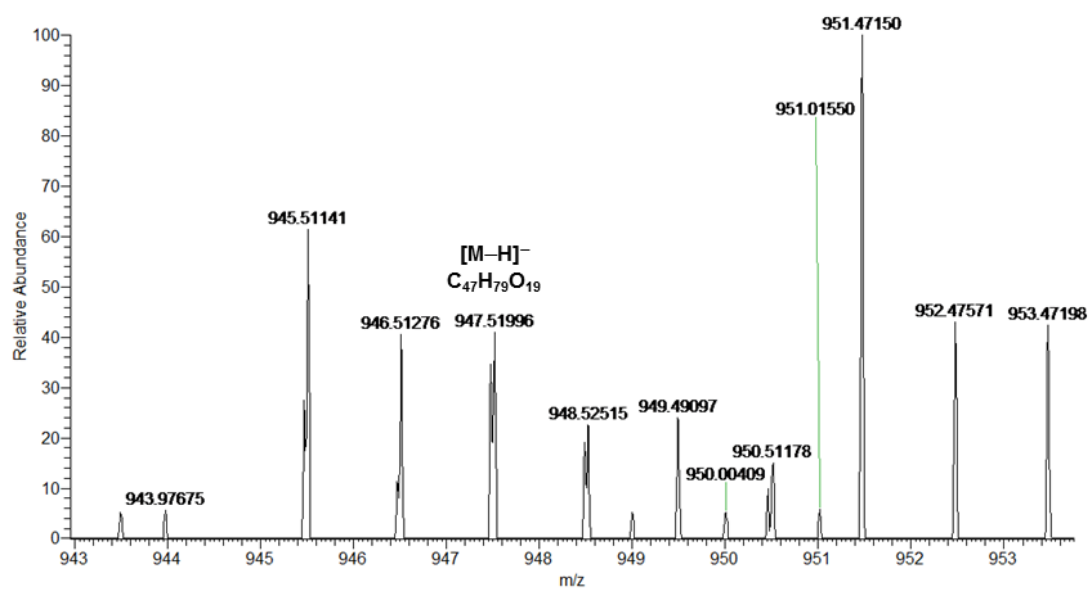


Figure S14 ESI-Q-Orbitrap-MS spectrum of 2

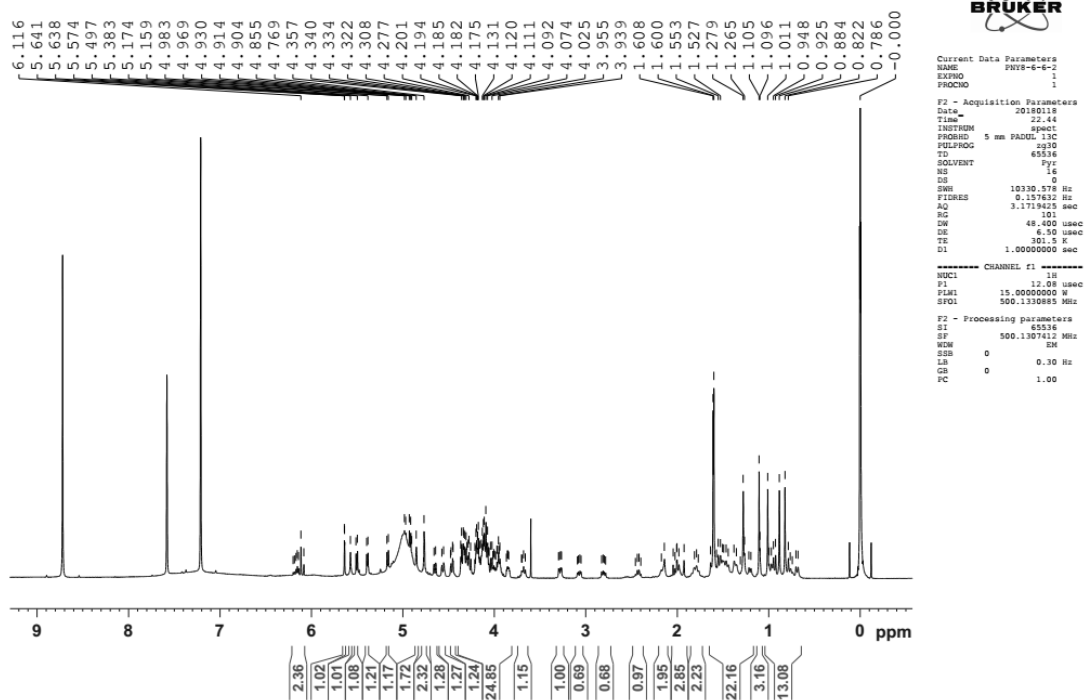


Figure S15 ^1H NMR (500 MHz, $\text{C}_5\text{D}_5\text{N}$) spectrum of 3

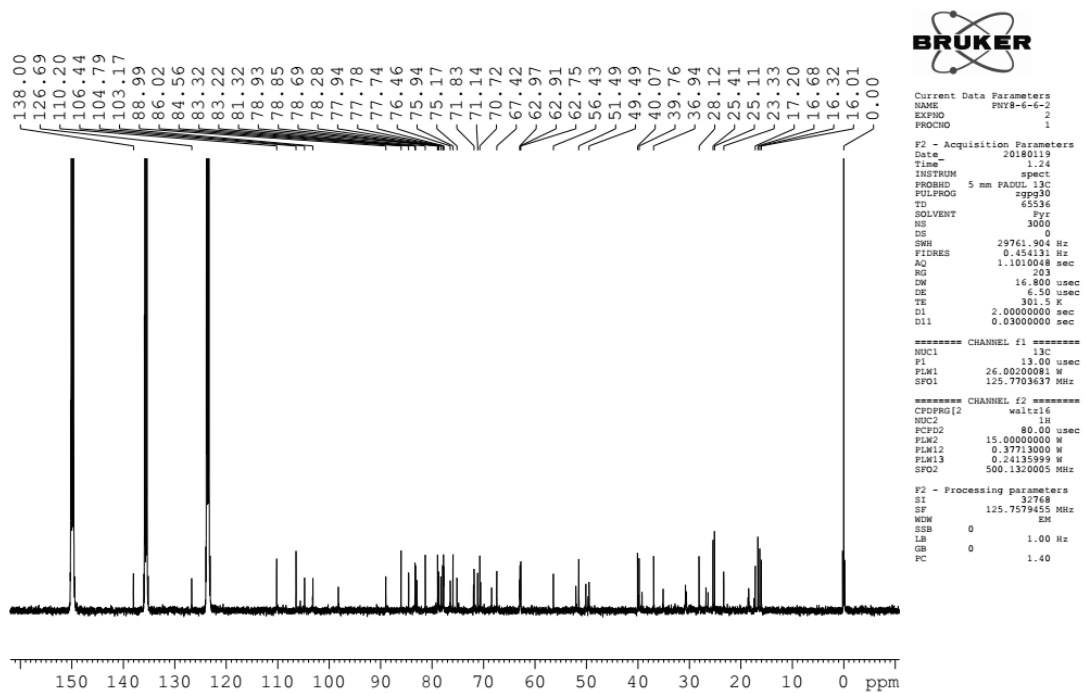


Figure S16 ^{13}C NMR (125 MHz, $\text{C}_5\text{D}_5\text{N}$) spectrum of 3

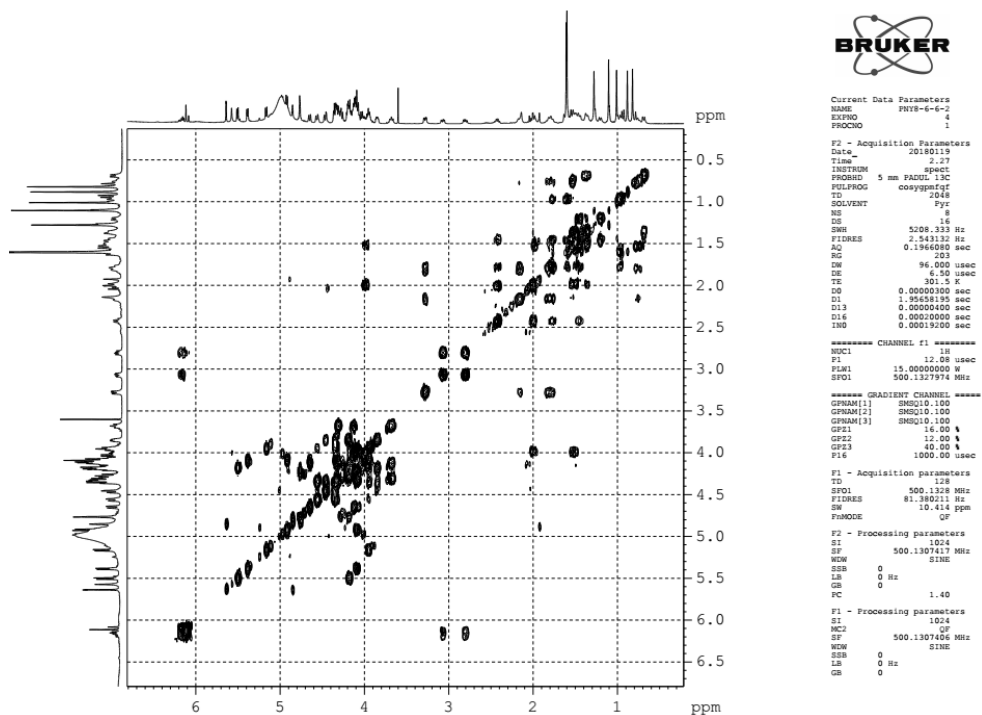


Figure S17 ^1H ^1H COSY ($\text{C}_5\text{D}_5\text{N}$) spectrum of 3

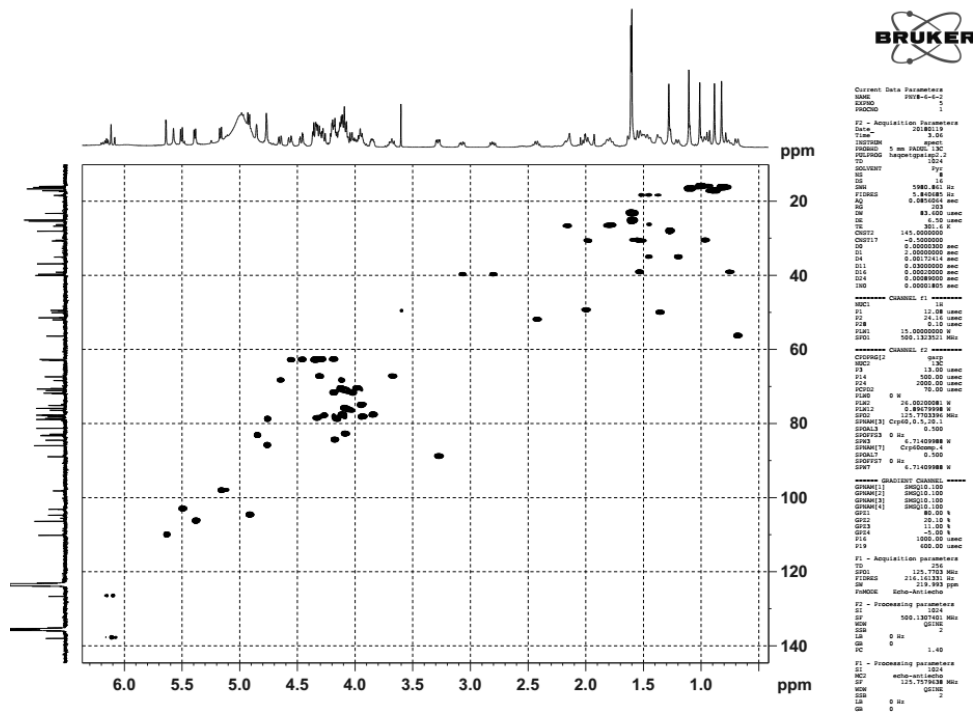


Figure S18 HSQC ($\text{C}_5\text{D}_5\text{N}$) spectrum of 3

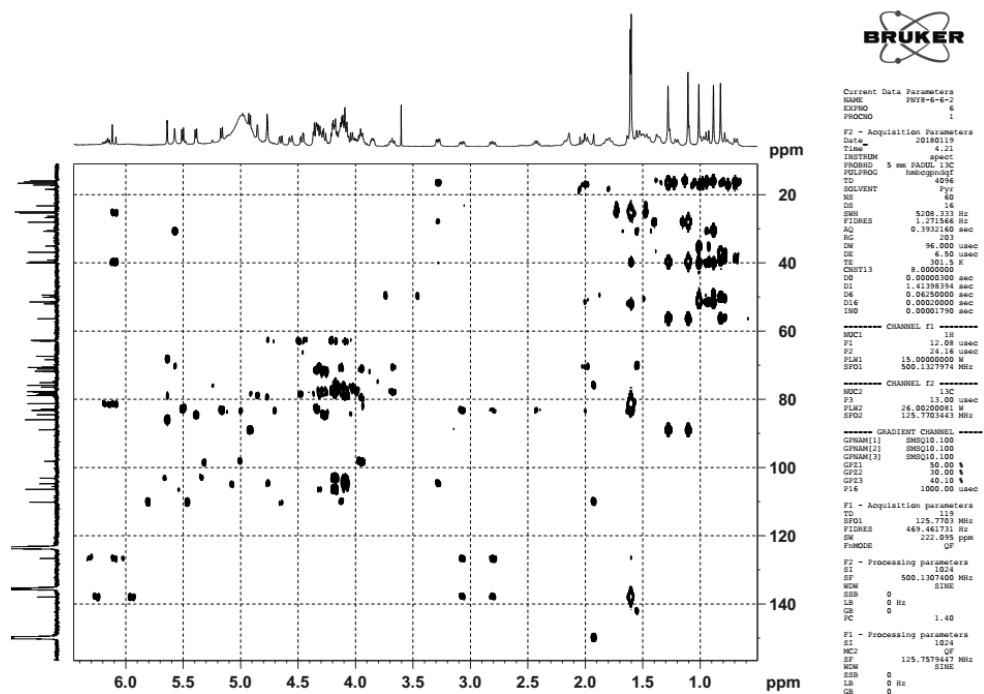


Figure S19 HMBC (C₅D₅N) spectrum of 3

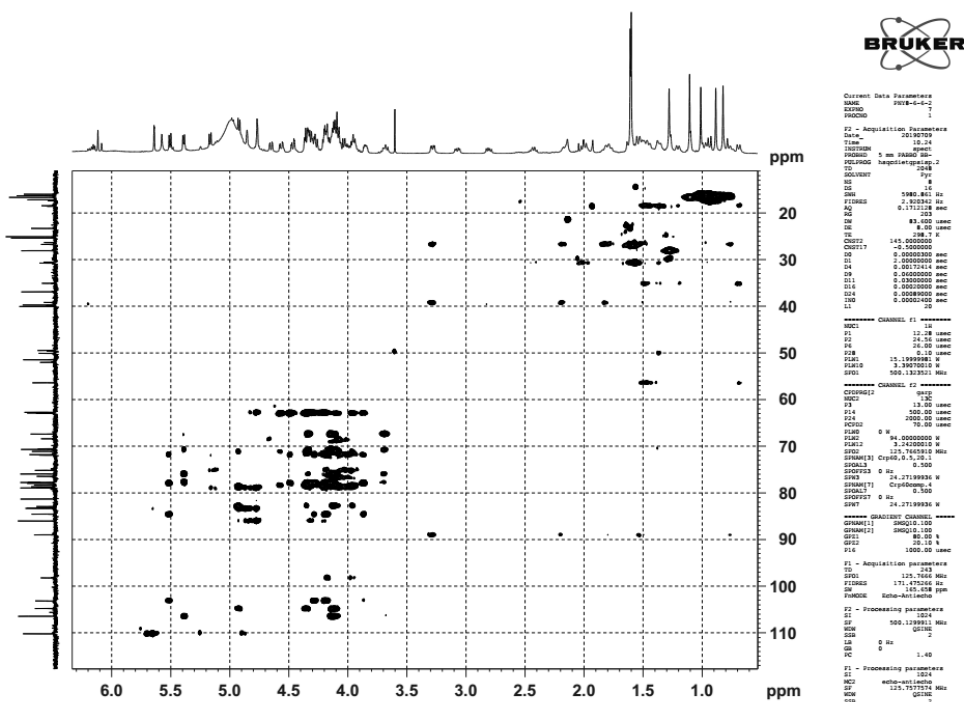


Figure S20 HSQC-TOCSY (C₅D₅N) spectrum of 3

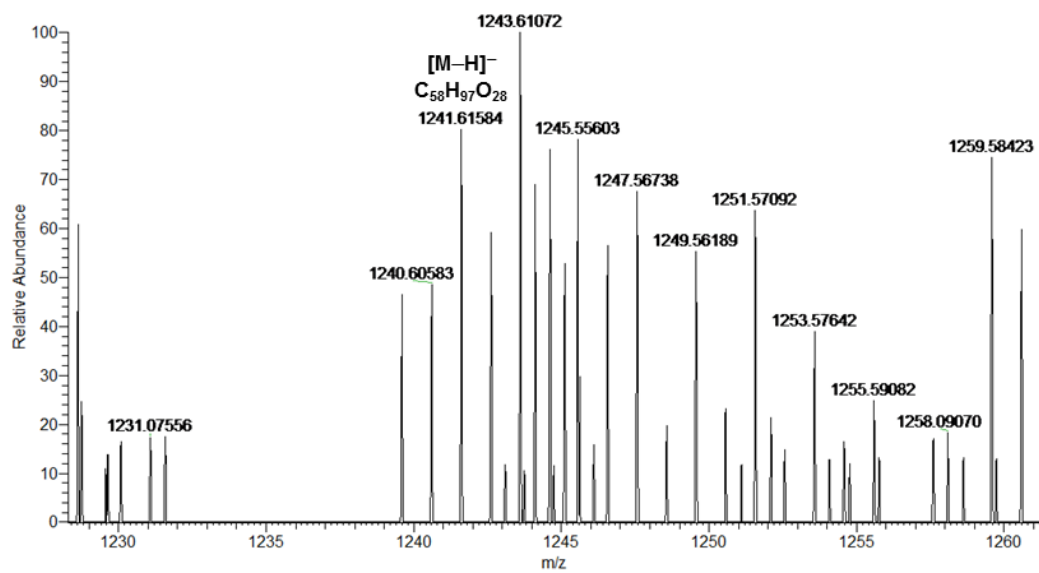


Figure S21 ESI-Q-Orbitrap-MS spectrum of 3

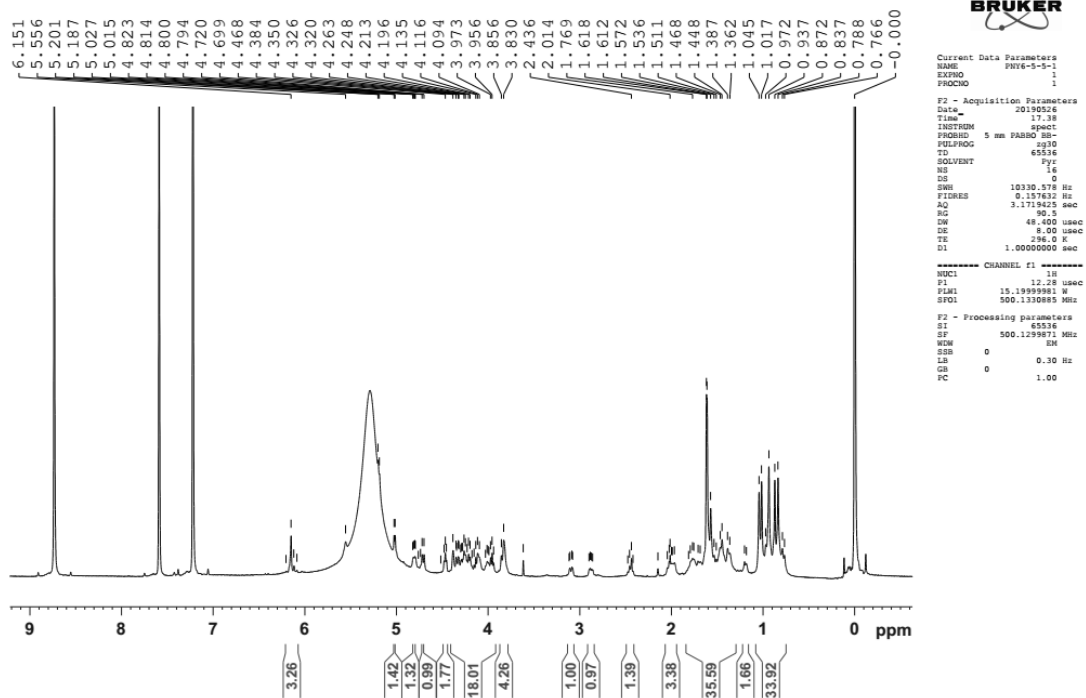


Figure S22 ^1H NMR (500 MHz, $\text{C}_5\text{D}_5\text{N}$) spectrum of 4

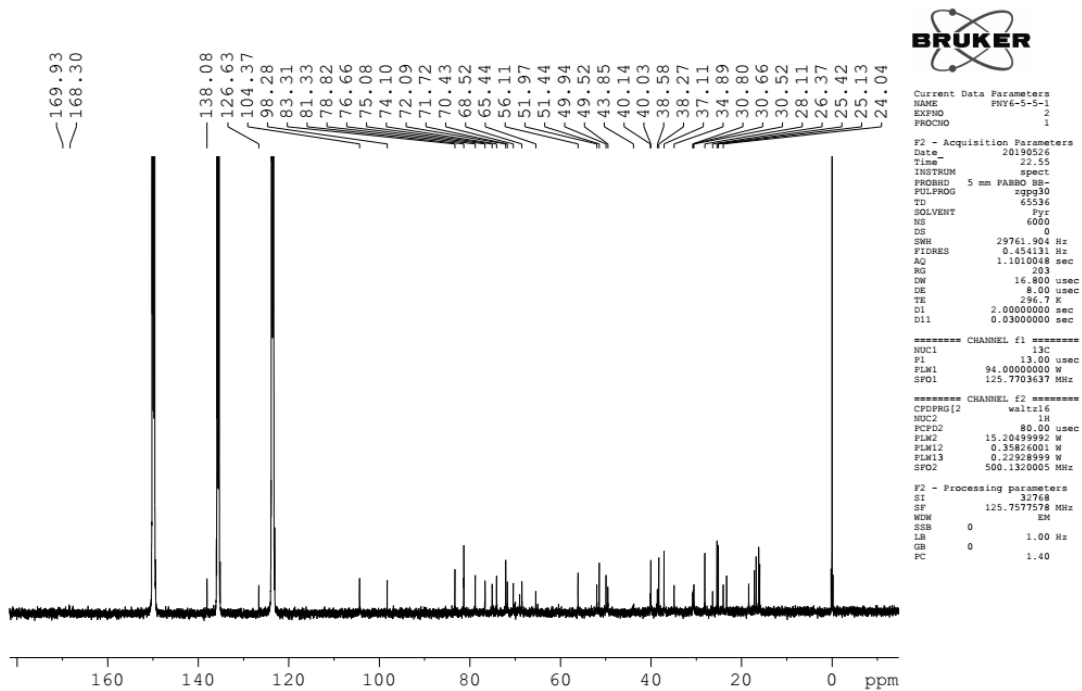
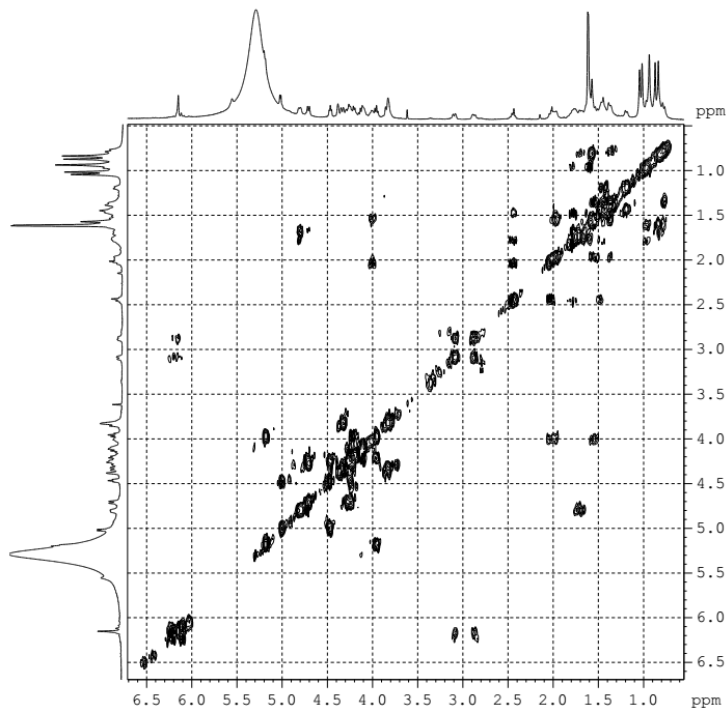


Figure S23 ^{13}C NMR (125 MHz, $\text{C}_5\text{D}_5\text{N}$) spectrum of 4



```

Current Data Parameters
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EXPRO    5
PROCNO    1

F2 - Acquisition Parameters
Date_    20190829
Time     10.19
INSTRUM  spect
PROBHD   5 mm PABBO BH-
PULPROG  cosyypngfj
TD       7048
SOLVENT  Pyr
NS       4
DS       16
SWH      5747.136 Hz
FIDRES   2.806214 Hz
AQ       0.1781760 sec
RG       203
WDW      87.000 usec
SSB      0
GB       0
TE       296.4 K
DQ       0.0000000 sec
D1       1.87501397 sec
D13      0.00000400 sec
D16      0.00020000 sec
RG       0.00017400 sec

===== CHANNEL f1 =====
NUC1      1H
P1        12.28 usec
PC1       15.1999981 Hz
SFO1      500.1320223 MHz

===== GRADIENT CHANNEL =====
GPM1[1]  SHGQ10.100
GPM1[2]  SHGQ10.100
GPM1[3]  SHGQ10.100
GPF1     16.00 %
GPF2     12.00 %
GPF3     40.00 %
PI6      1000.00 usec

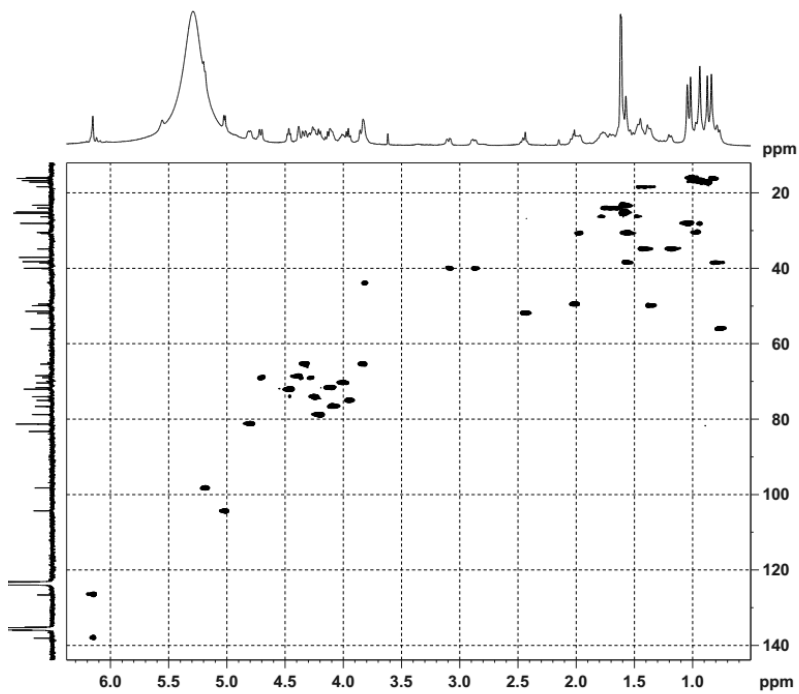
F1 - Acquisition Parameters
TD        128
SFO1      500.132 MHz
FIDRES    87.798851 Hz
SW        11.491 ppm
FUNDCO    CF

F2 - Processing parameters
SI        1024
SF        500.1299984 MHz
WDW       SINE
SSB       0 Hz
LB        0
GB        0
PC        1.40

F1 - Processing parameters
SI        1024
MC2       CF
SF        500.1299984 MHz
WDW       SINE
SSB       0 Hz
LB        0
GB        0

```

Figure S24 ^1H ^1H COSY ($\text{C}_5\text{D}_5\text{N}$) spectrum of 4



```

Current Data Parameters
NAME      PNT6-5-5-1
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PROCNO    1

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INSTRUM  spect
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PULPROG  hsqcetgpa1
TD       1024
SOLVENT  Pyr
NS       4
DS       16
SWH      5319.149 Hz
FIDRES   5.194461 Hz
AQ       0.0962560 sec
RG       203
WDW      94.000 usec
SSB      0
GB       0
TE       296.4 K
DQ       0.0000000 sec
D1       1.44023505 sec
D13      0.00172414 sec
D16      0.01000000 sec
D19      0.00000400 sec
D24      0.00010000 sec
RG       0.00014000 sec

===== CHANNEL f1 =====
NUC1      1H
P1        12.28 usec
PC1       15.1999981 Hz
SFO1      500.1320225 MHz

===== CHANNEL f2 =====
CPDPRG2  9azp
MC2       13C
P2        13.00 usec
P4        26.00 usec
PCPD2    70.00 usec
PAP2     94.0000000 Hz
PAP12    3.2420000 Hz
SFO2     125.7671642 MHz

===== GRADIENT CHANNEL =====
GPM1[1]  SHGQ10.100
GPM1[2]  SHGQ10.100
GPM1[3]  SHGQ10.100
GPF1     80.00 %
GPF2     20.00 %
PI6      1000.00 usec

F1 - Acquisition Parameters
TD        256
SFO1      125.7672 MHz
FIDRES    162.749847 Hz
SW        145.439 ppm
FUNDCO    Echo-AntiEcho

F2 - Processing parameters
SI        1024
SF        500.1299989 MHz
WDW       QFTINE
SSB       0 Hz
LB        2
GB        0
PC        1.40

F1 - Processing parameters
SI        1024
MC2       echo-antiecho
SF        125.7671642 MHz
WDW       SINE
SSB       0 Hz
LB        2
GB        0

```

Figure S25 HSQC ($\text{C}_5\text{D}_5\text{N}$) spectrum of 4

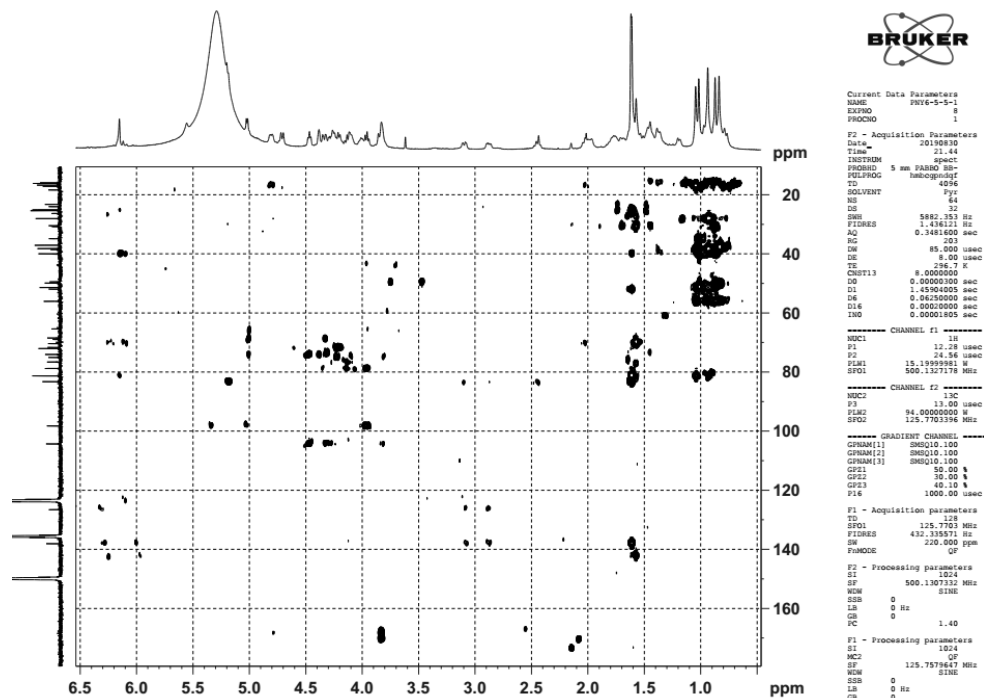


Figure S26 HMBC (C₅D₅N) spectrum of 4

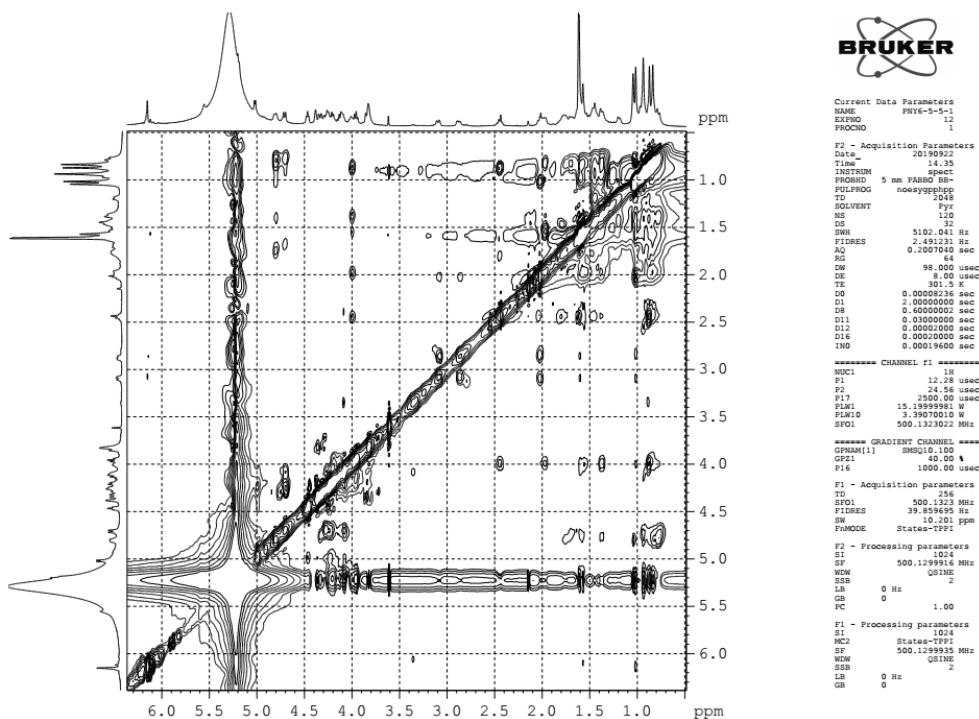


Figure S27 NOSEY (C₅D₅N) spectrum of 4

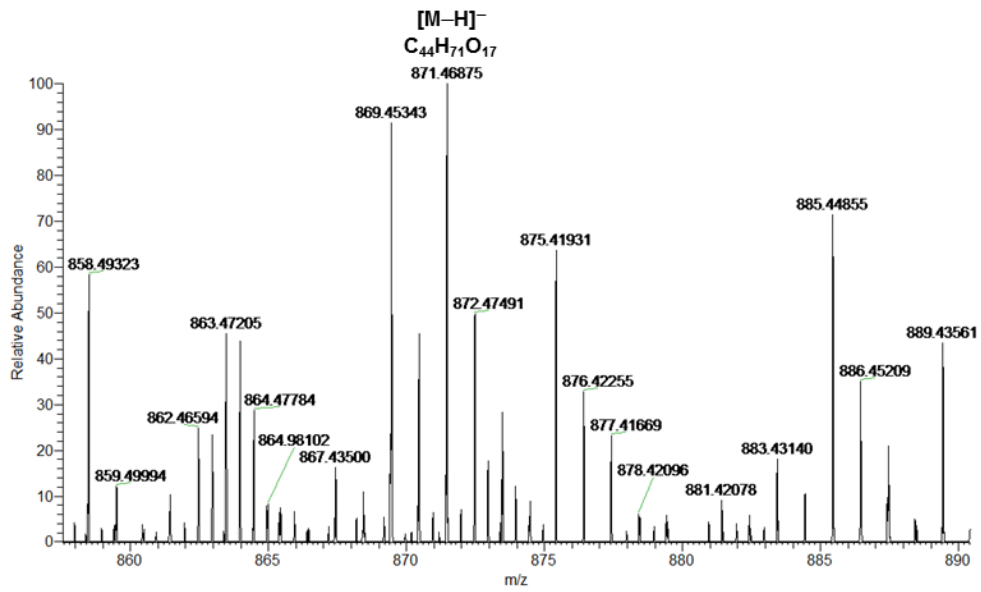


Figure S28 ESI-Q-Orbitrap-MS spectrum of 4

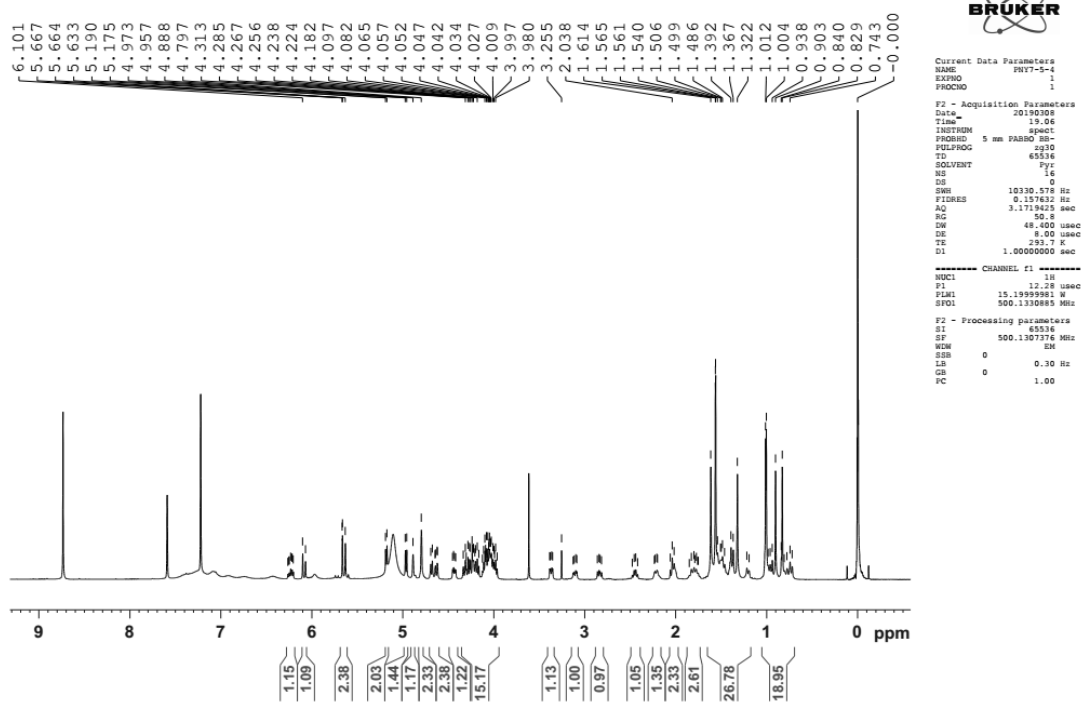


Figure S29 ^1H NMR (500 MHz, $\text{C}_5\text{D}_5\text{N}$) spectrum of 5

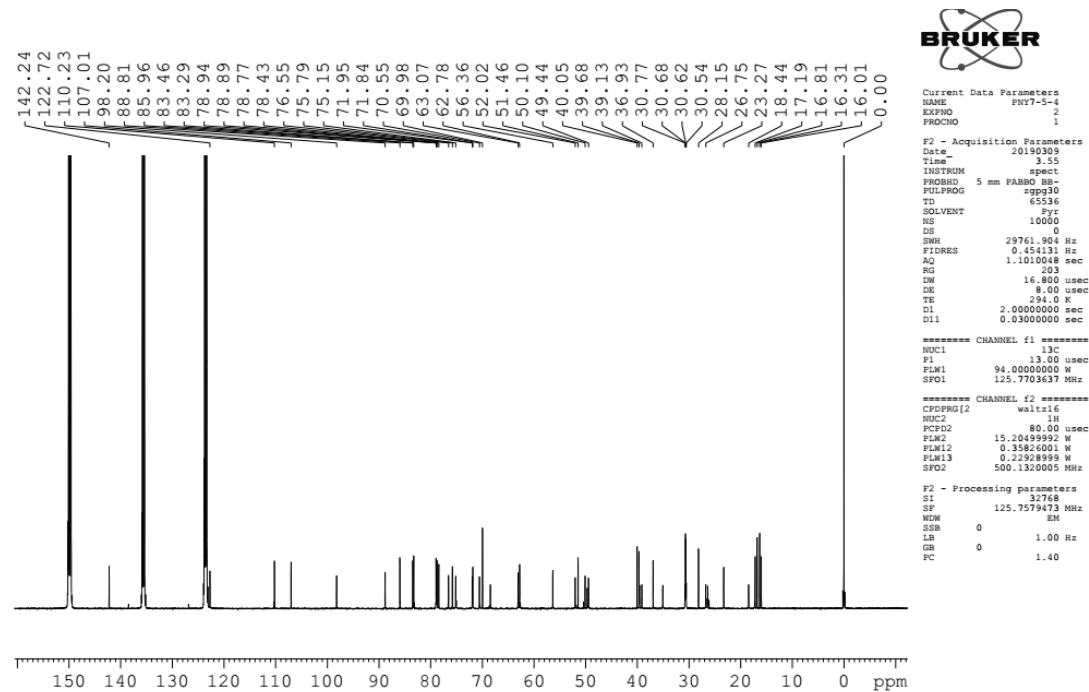


Figure S30 ^{13}C NMR (125 MHz, $\text{C}_5\text{D}_5\text{N}$) spectrum of 5

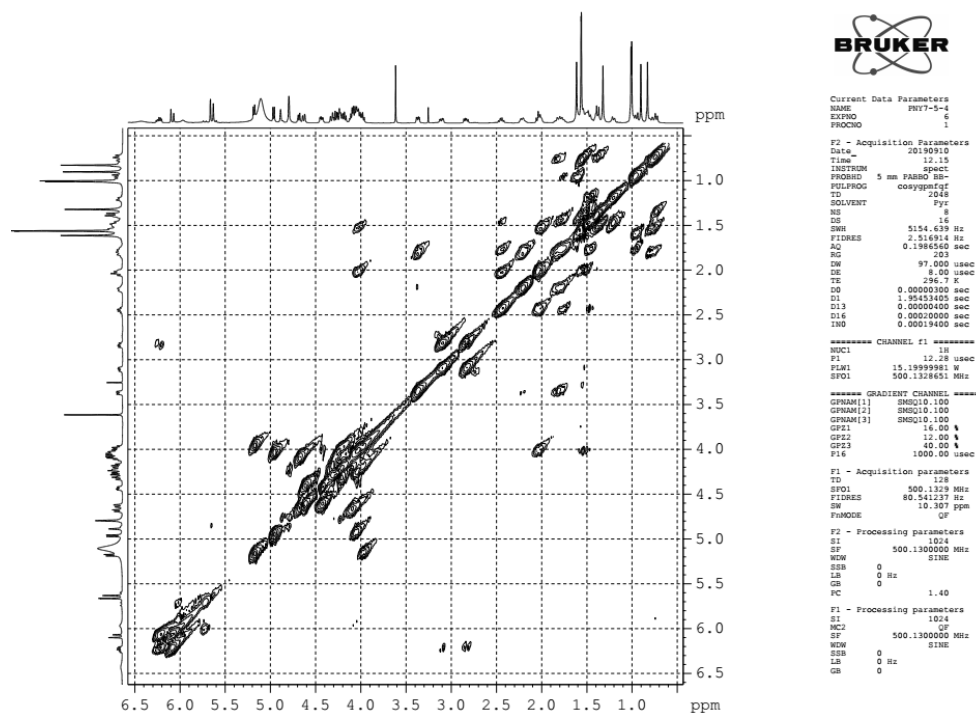


Figure S31 ^1H ^1H COSY ($\text{C}_5\text{D}_5\text{N}$) spectrum of 5

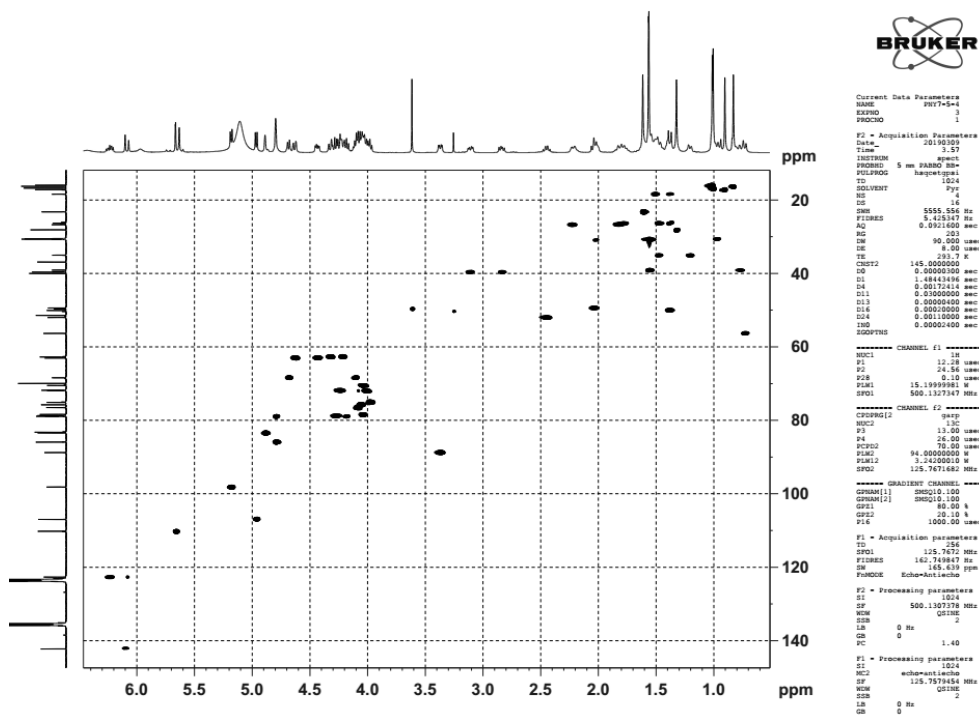


Figure S32 HSQC ($\text{C}_5\text{D}_5\text{N}$) spectrum of 5

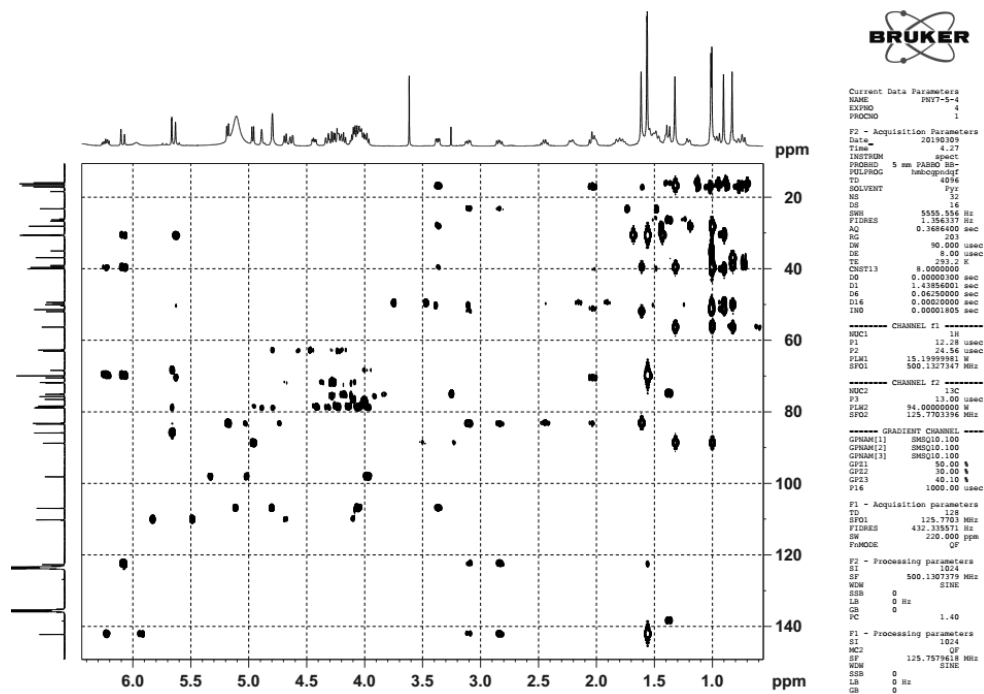


Figure S33 HMBC (C₅D₅N) spectrum of 5

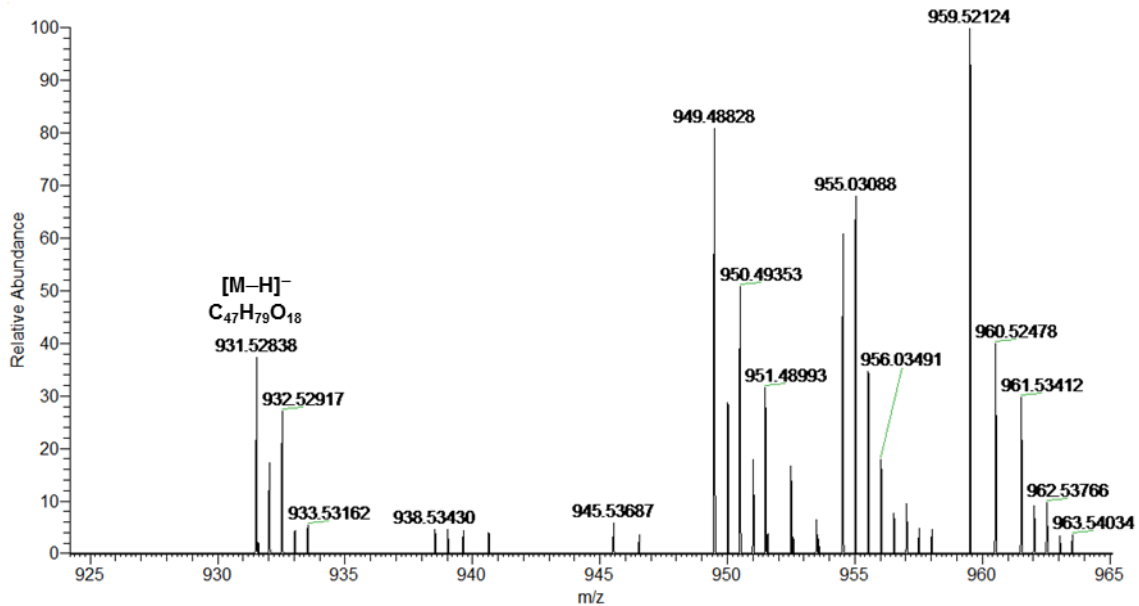


Figure S34 ESI-Q-Orbitrap-MS spectrum of 5

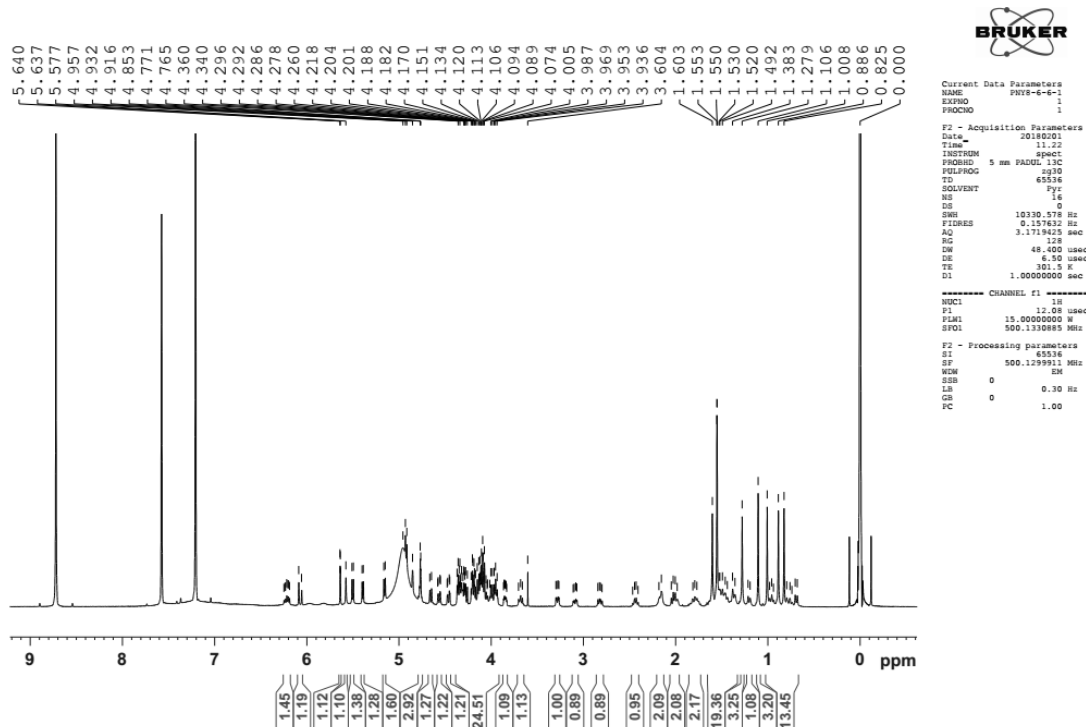


Figure S35 ^1H NMR (500 MHz, $\text{C}_5\text{D}_5\text{N}$) spectrum of 6

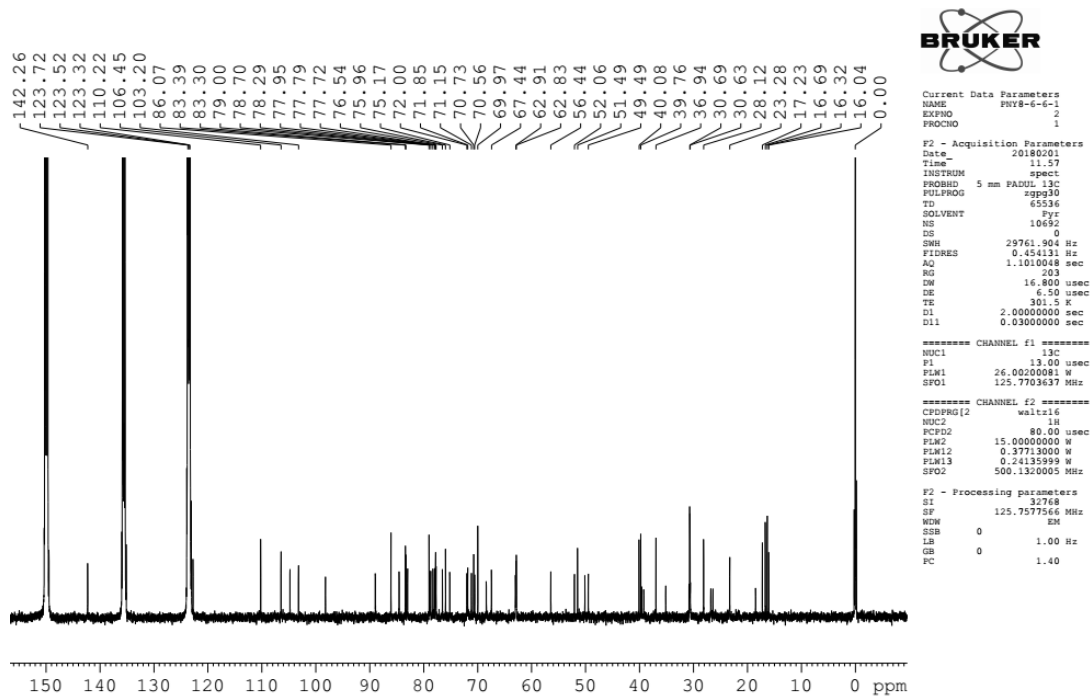


Figure S36 ^{13}C NMR (125 MHz, $\text{C}_5\text{D}_5\text{N}$) spectrum of 6

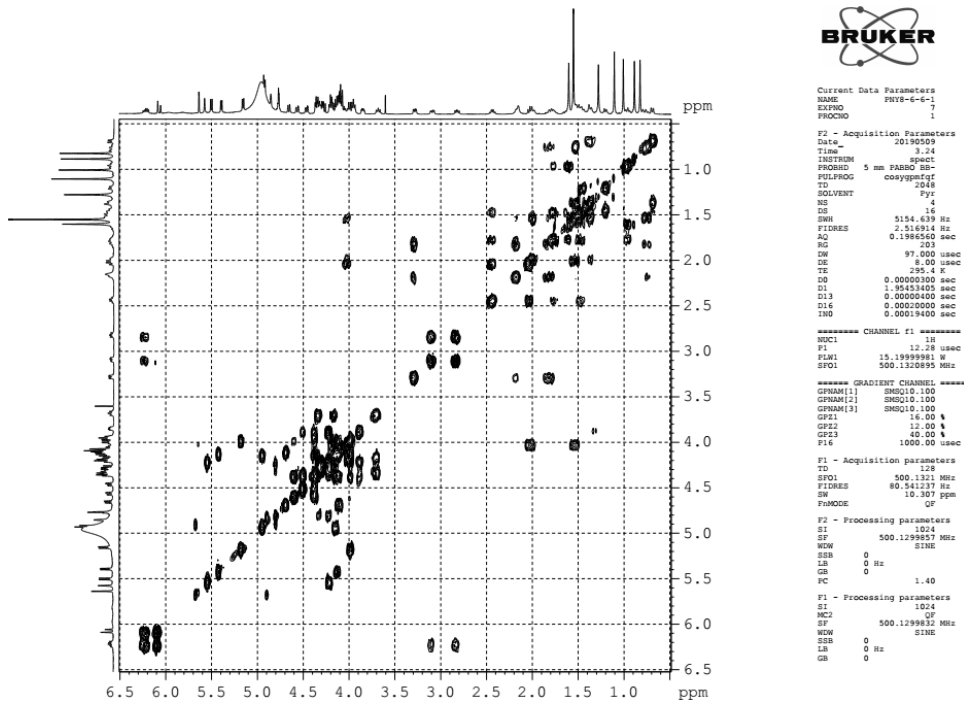


Figure S37 ^1H - ^1H COSY ($\text{C}_5\text{D}_5\text{N}$) spectrum of 6

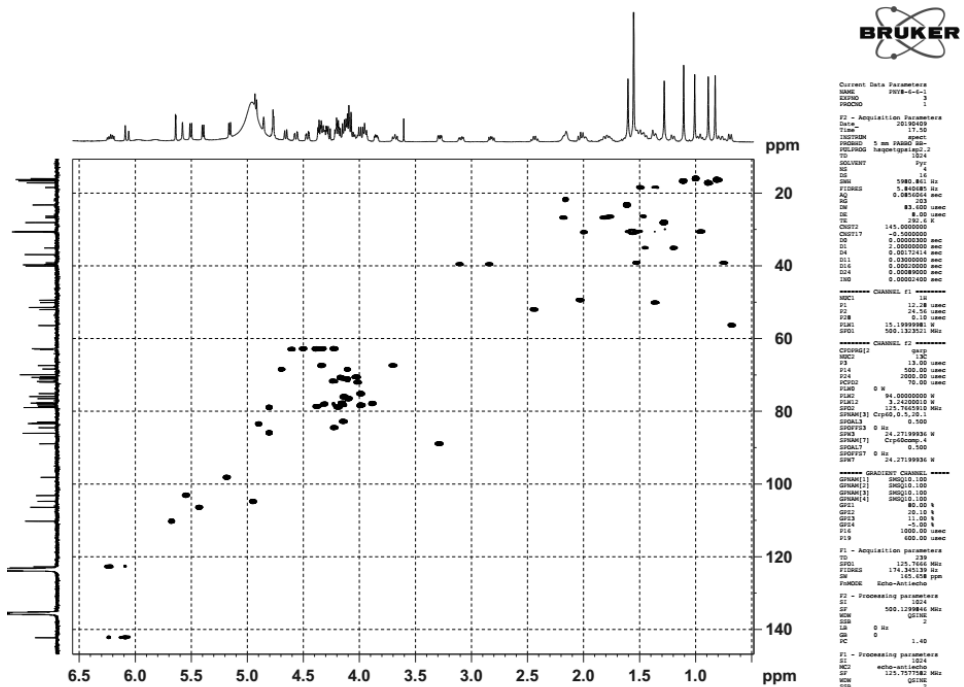


Figure S38 HSQC ($\text{C}_5\text{D}_5\text{N}$) spectrum of 6

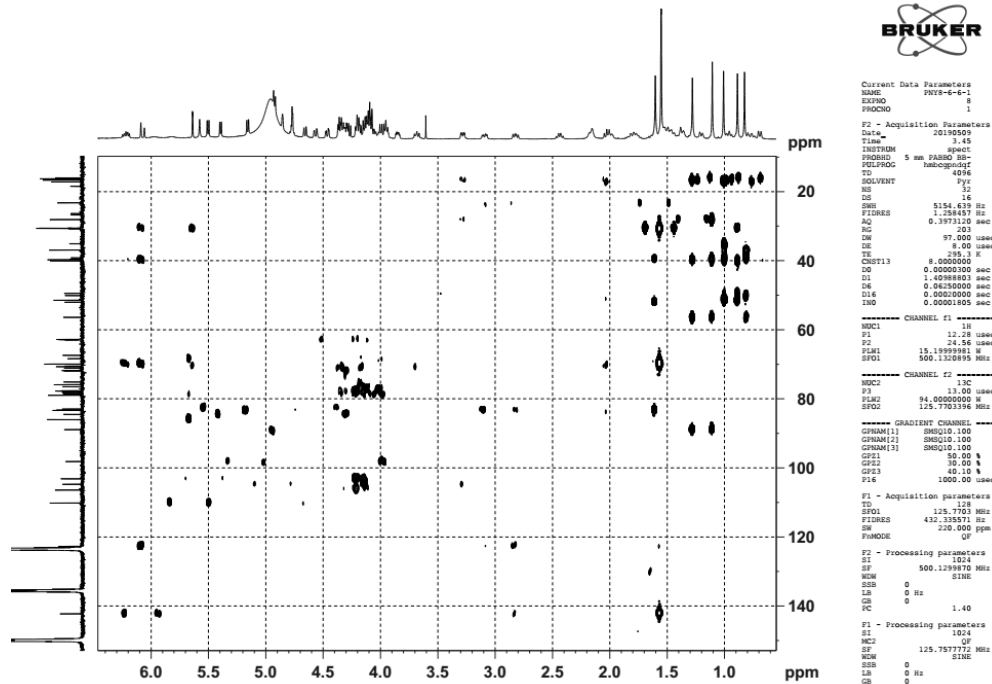


Figure S39 HMBC (C₅D₅N) spectrum of 6

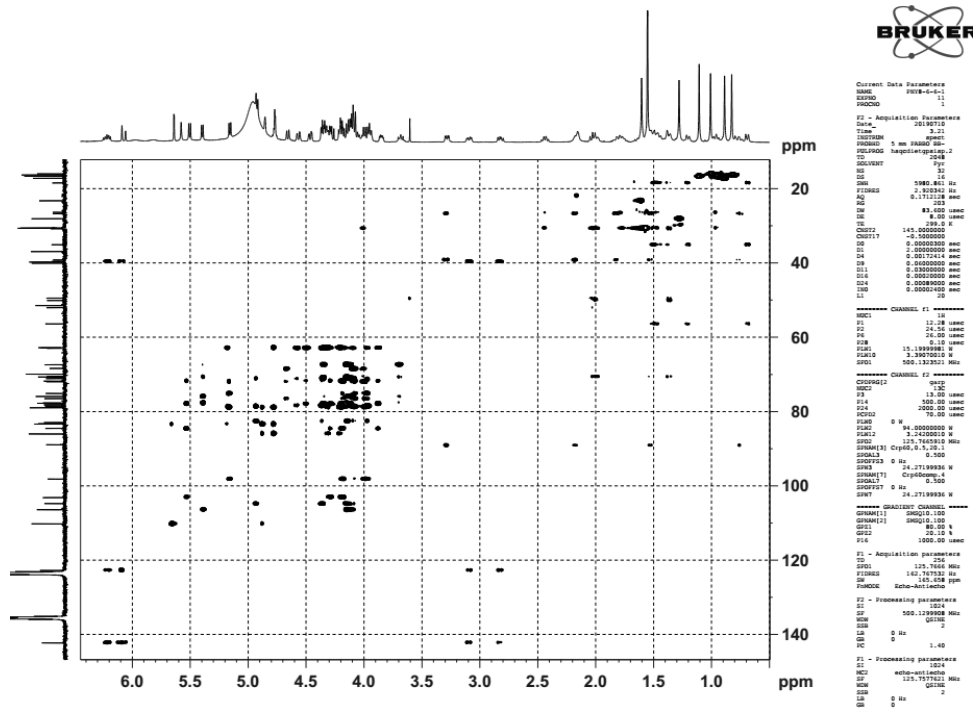


Figure S40 HSQC-TOCSY (C₅D₅N) spectrum of 6

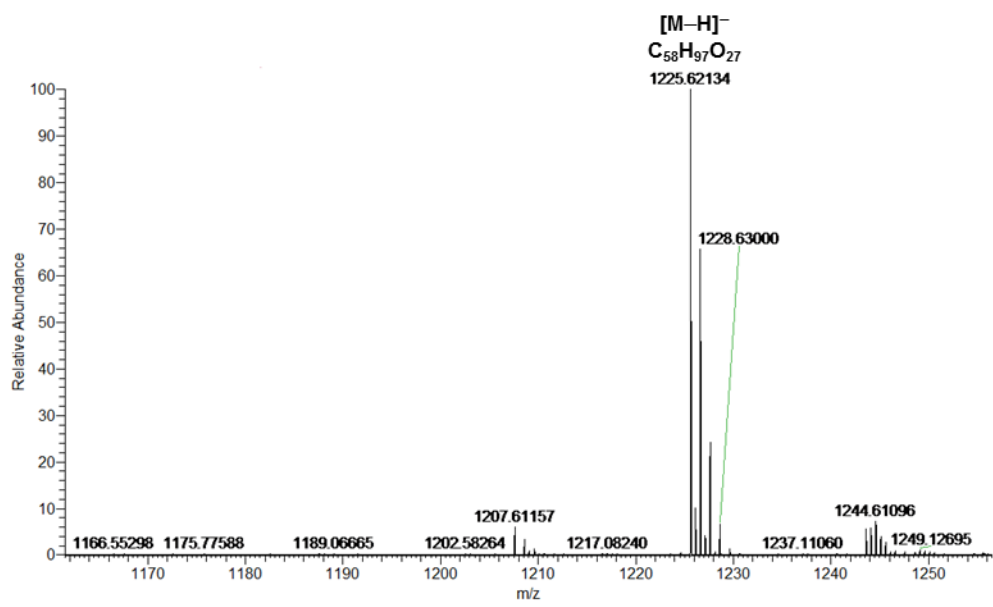


Figure S41 ESI-Q-Orbitrap-MS spectrum of 6

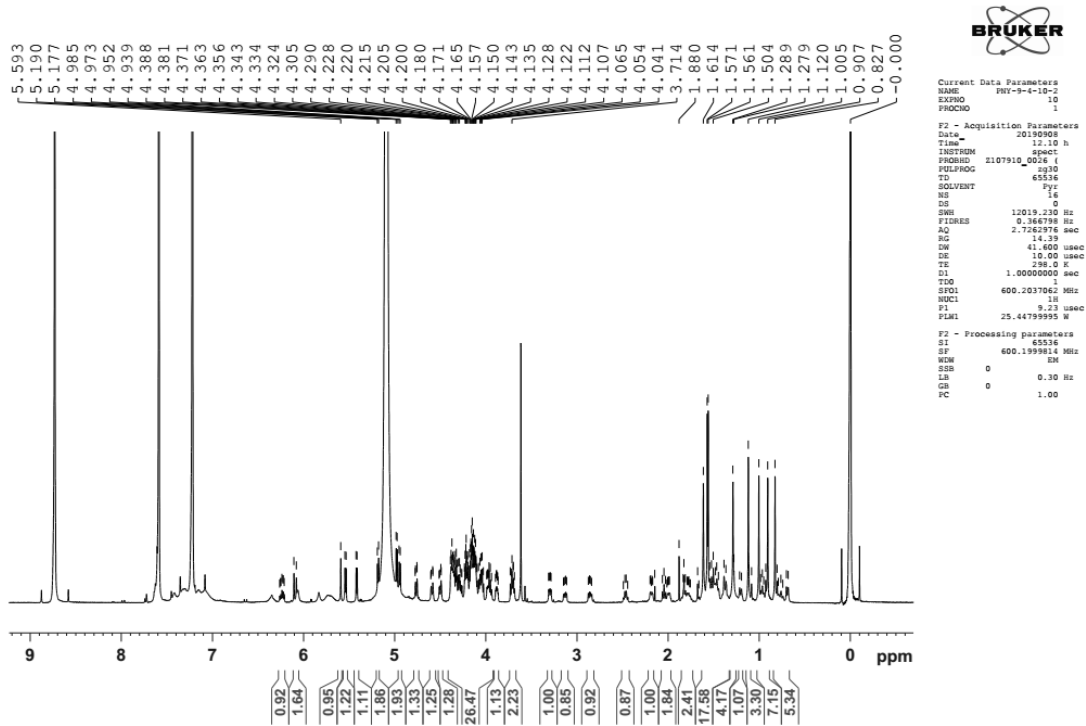


Figure S42 ¹H NMR (600 MHz, C₅D₅N) spectrum of 7

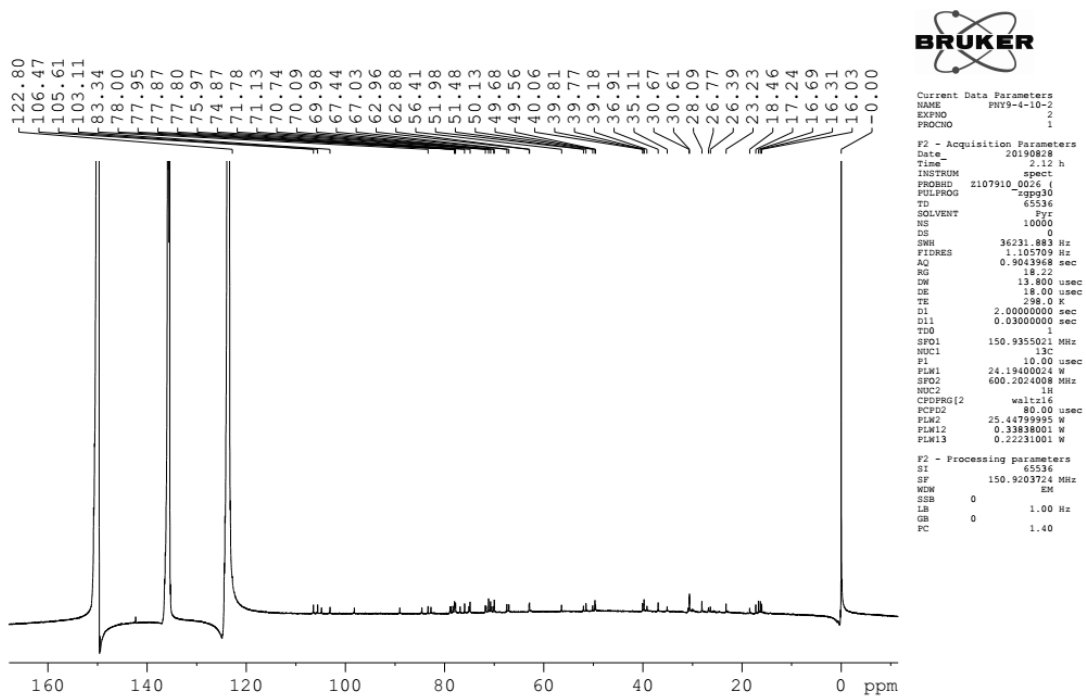
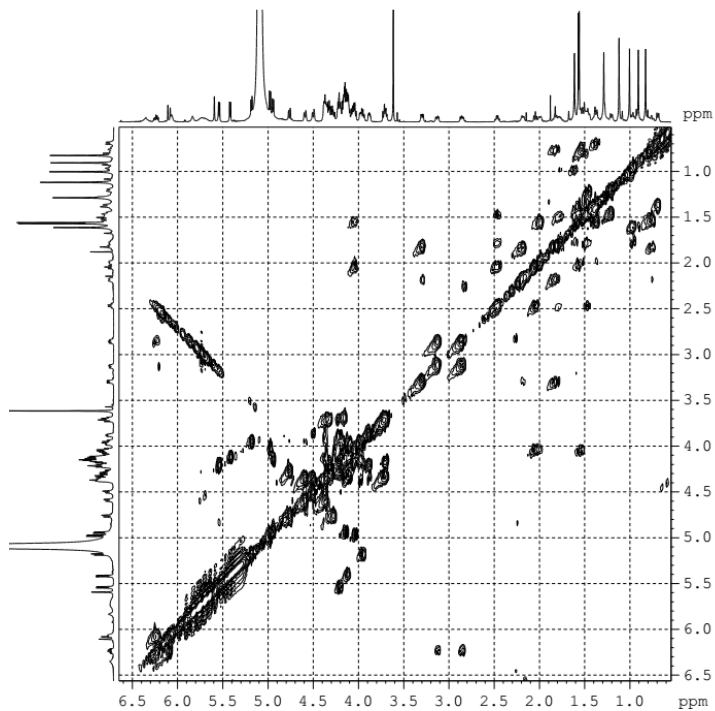


Figure S43 ¹³C NMR (150 MHz, C₅D₅N) spectrum of 7



```

Current Data Parameters
NAME          PRY9-4-10-2
EXPNO        11
PROCNO       1

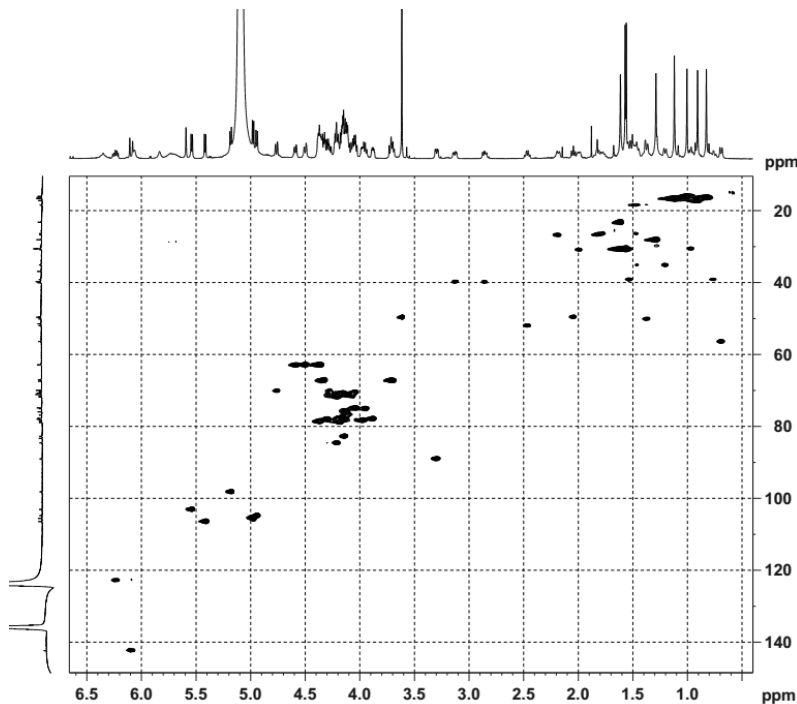
F2 - Acquisition Parameters
Date_        20190901
Time         11:26 h
INSTRUM      spect
PROBHD       z107910 003.6
PULPROG      cosyppmgf
TD           2048
SOLVENT      Py
NS           8
DS           16
SWH          7142.857 Hz
FIDRES      6.975466 Hz
AQ           0.1433600 sec
RG           188.54
DM           70.000 usec
DE           10.00 usec
TE           298.0 K
D0           0.0000000 sec
D1           1.9871203 sec
D13         0.0000400 sec
D16         0.0001000 sec
IND         0.00014000 sec
TNAV        1
SFO1         600.2026011 MHz
NUC1         13C
P1           9.23 usec
P161         25.4479995 W
GPHAS1[1]   SMSG10.100
GPE1        16.00 %
GPHAS1[2]   SMSG10.100
GPE2        12.00 %
GPHAS1[3]   SMSG10.100
GPE3        40.00 %
P16         1000.00 usec

F1 - Acquisition parameters
TD           28
SFO1         600.2026 MHz
FIDRES      111.407140 Hz
SW          11.901 ppm
FWDK        OF

F2 - Processing parameters
SI           1024
SF           600.1999628 MHz
WDW          SINE
SSB          0
LB           0 Hz
GB           0
PC           1.40

F1 - Processing parameters
SI           1024
SF           600.1999628 MHz
WDW          SINE
SSB          0
LB           0 Hz
GB           0
  
```

Figure S44 ^1H ^1H COSY ($\text{C}_5\text{D}_5\text{N}$) spectrum of 7



```

Current Data Parameters
NAME          PRY9-4-10-2
EXPNO        1
PROCNO       1

F2 - Acquisition Parameters
Date_        20190901
Time         2:40 h
INSTRUM      spect
PROBHD       z107910 003.6
PULPROG      hsqc
TD           2048
SOLVENT      Py
NS           8
DS           16
SWH          7812.500 Hz
FIDRES      7.529395 Hz
AQ           0.1318720 sec
RG           188.54
DM           64.000 usec
DE           10.00 usec
TE           298.0 K
D0           0.0000000 sec
D1           1.9871203 sec
D13         0.0000400 sec
D16         0.0001000 sec
IND         0.00014000 sec
TNAV        1
SFO1         600.2026011 MHz
NUC1         13C
P1           9.23 usec
P161         25.4479995 W
GPHAS1[1]   SMSG10.100
GPE1        16.00 %
GPHAS1[2]   SMSG10.100
GPE2        12.00 %
GPHAS1[3]   SMSG10.100
GPE3        40.00 %
P16         1000.00 usec

F1 - Acquisition parameters
TD           28
SFO1         600.2026 MHz
FIDRES      111.407140 Hz
SW          11.901 ppm
FWDK        OF

F2 - Processing parameters
SI           1024
SF           600.1999628 MHz
WDW          SINE
SSB          0
LB           0 Hz
GB           0
PC           1.40

F1 - Processing parameters
SI           1024
SF           600.1999628 MHz
WDW          SINE
SSB          0
LB           0 Hz
GB           0
  
```

Figure S45 HSQC ($\text{C}_5\text{D}_5\text{N}$) spectrum of 7

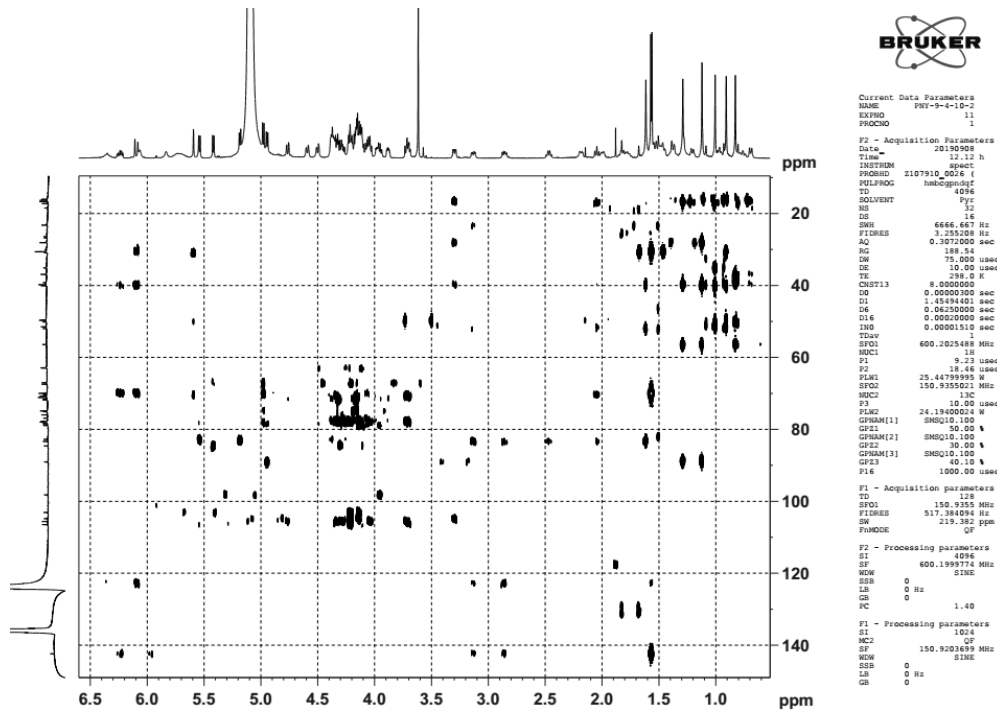


Figure S46 HMBC (C₅D₅N) spectrum of 7

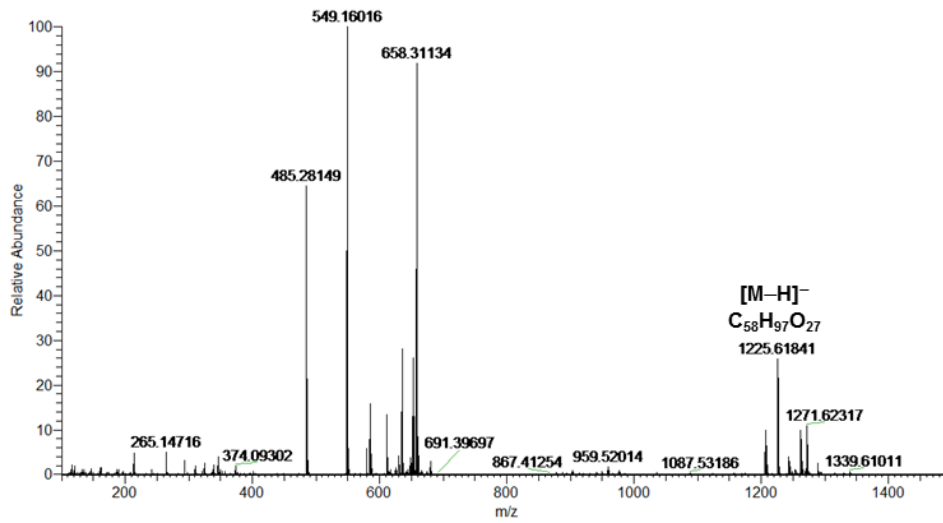


Figure S47 ESI-Q-Orbitrap-MS spectrum of 7

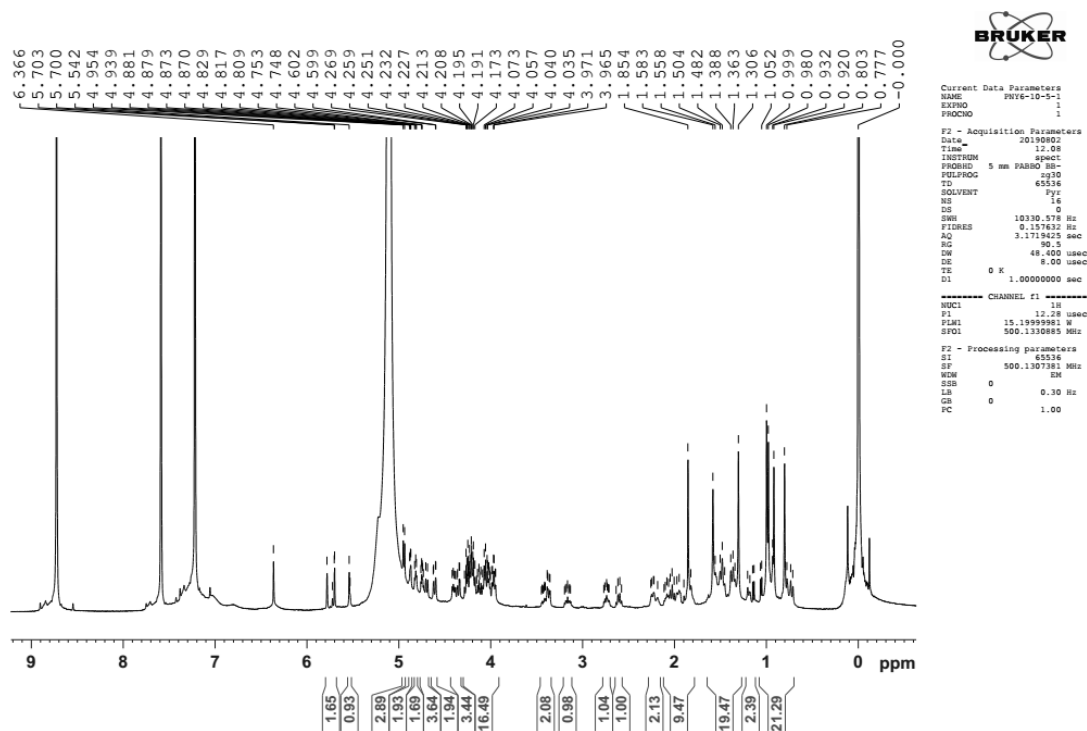


Figure S48 ¹H NMR (500 MHz, C₅D₅N) spectrum of 8

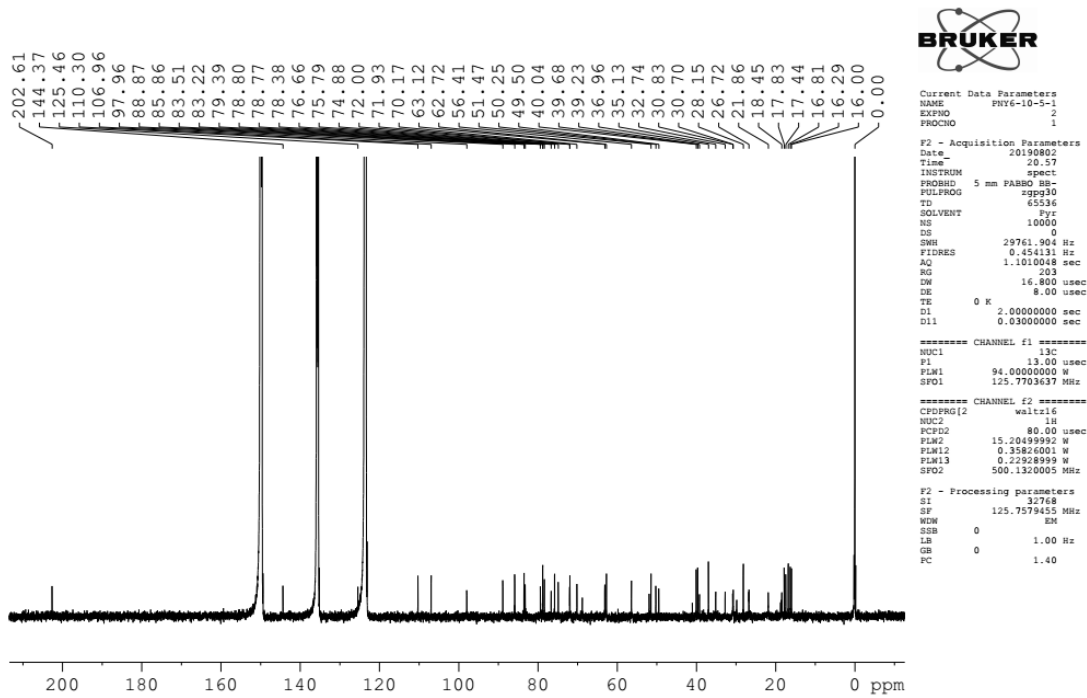


Figure S49 ¹³C NMR (125 MHz, C₅D₅N) spectrum of 8

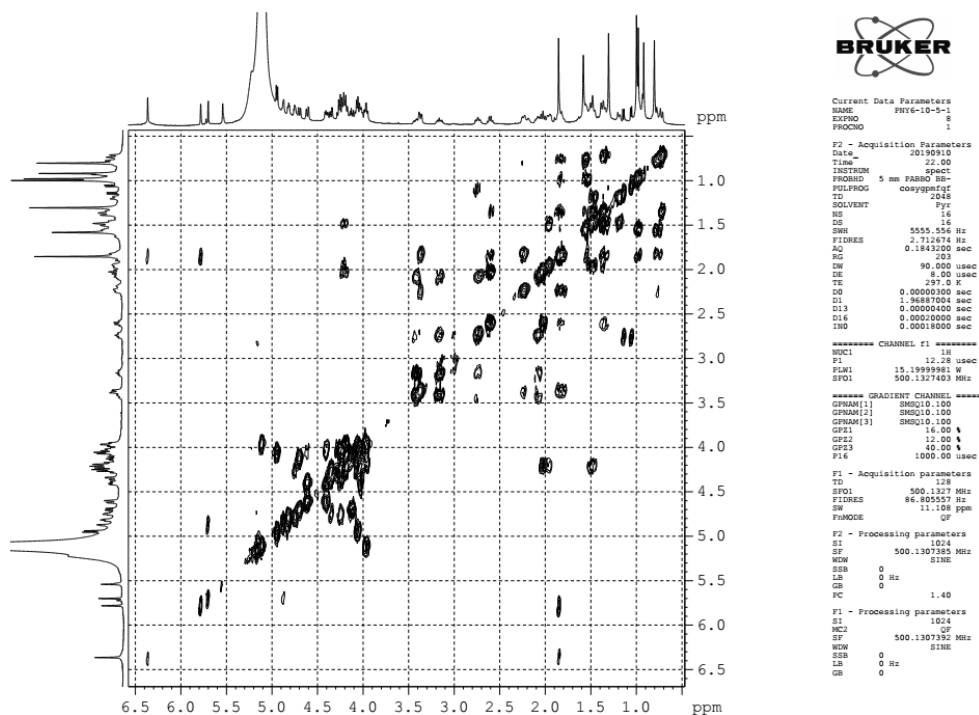


Figure S50 ^1H ^1H COSY ($\text{C}_5\text{D}_5\text{N}$) spectrum of 8

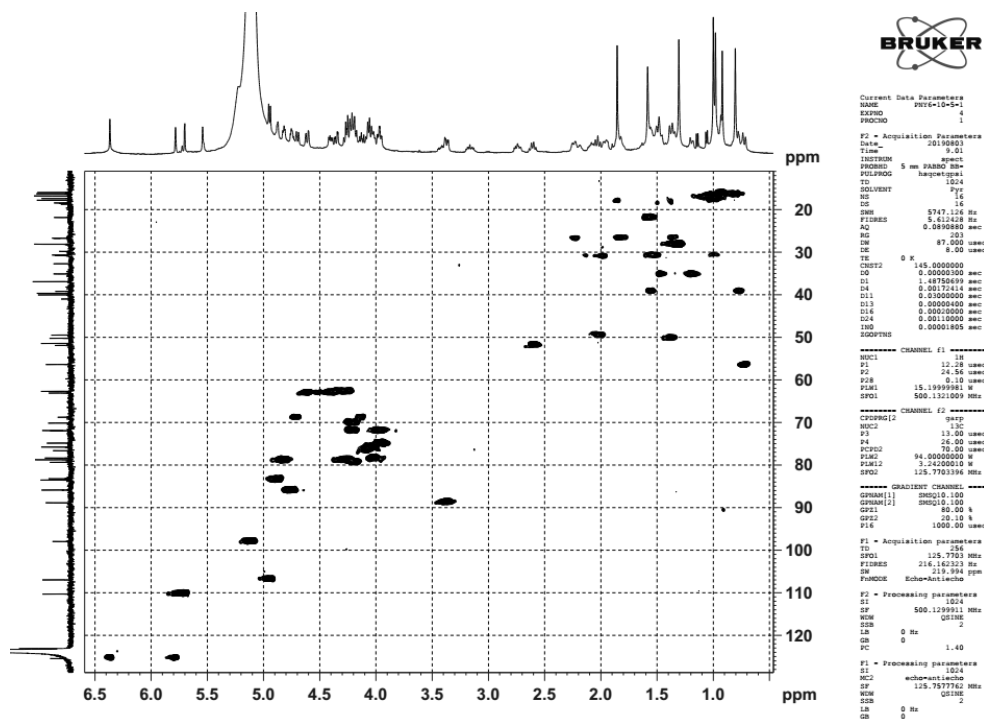


Figure S51 HSQC ($\text{C}_5\text{D}_5\text{N}$) spectrum of 8

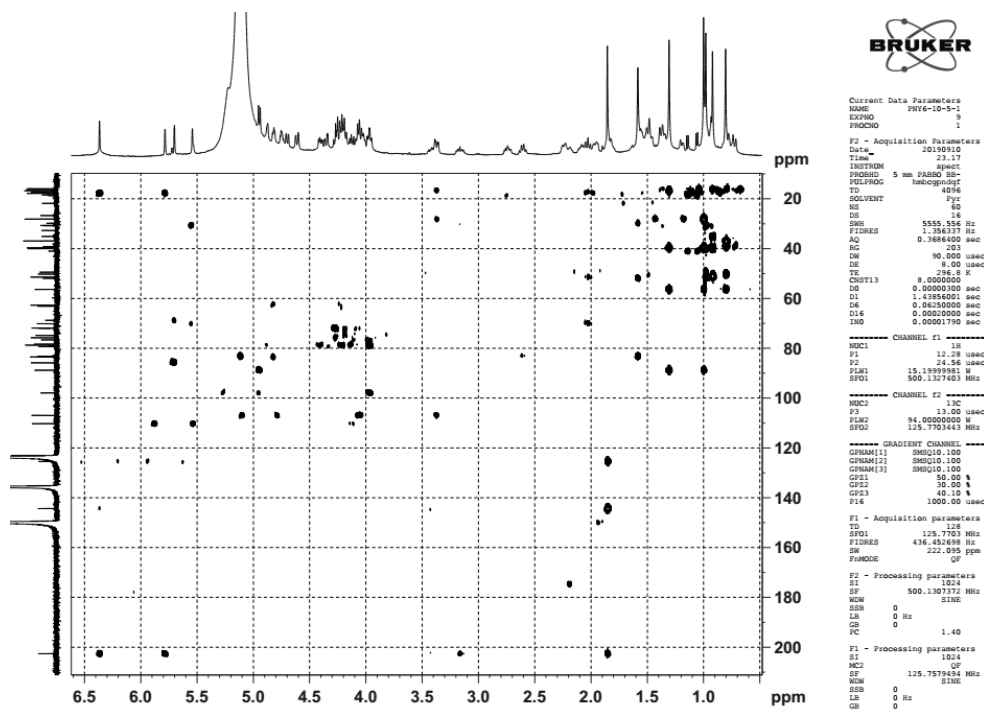


Figure S52 HMBC (C₅D₅N) spectrum of 8

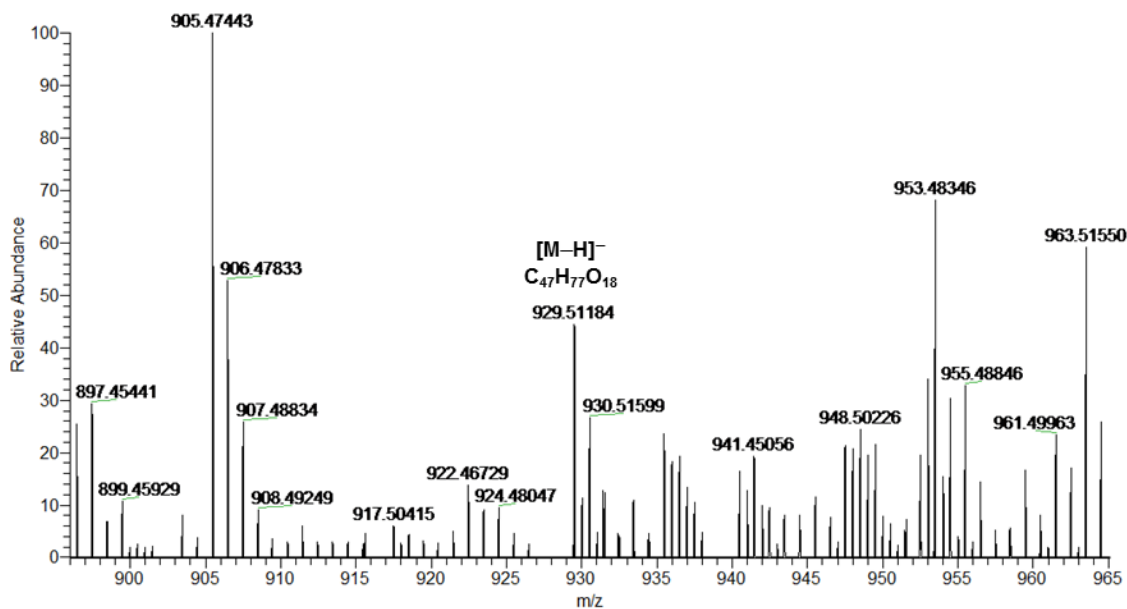


Figure S53 ESI-Q-Orbitrap-MS spectrum of 8

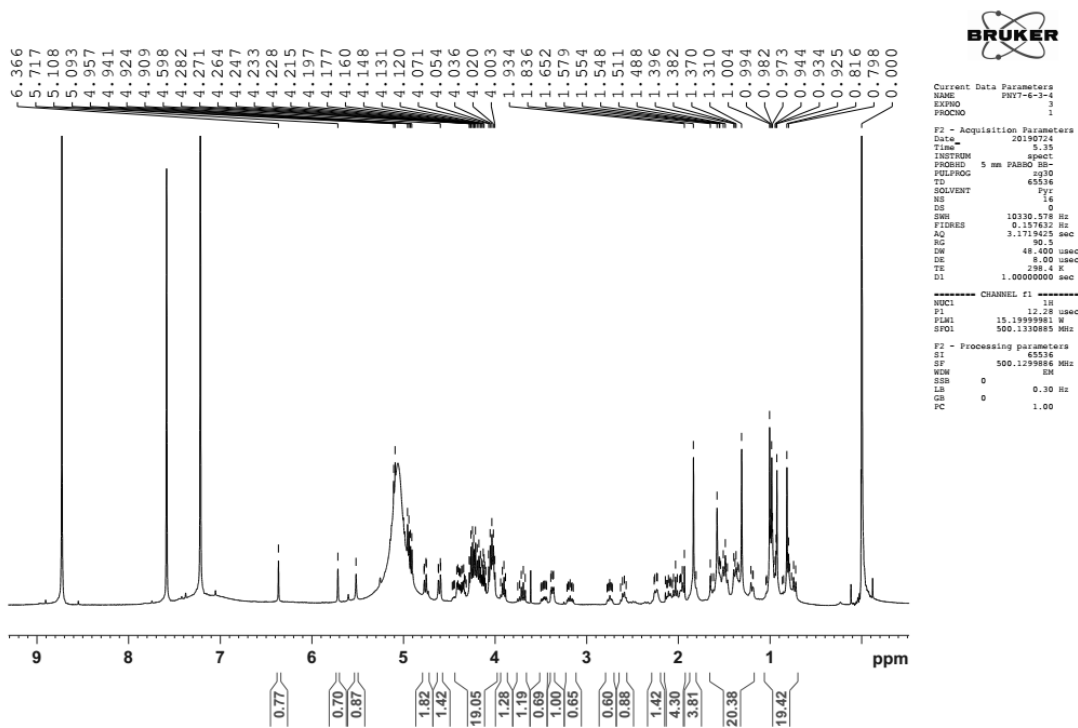


Figure S54 ¹H NMR (500 MHz, C₅D₅N) spectrum of 9

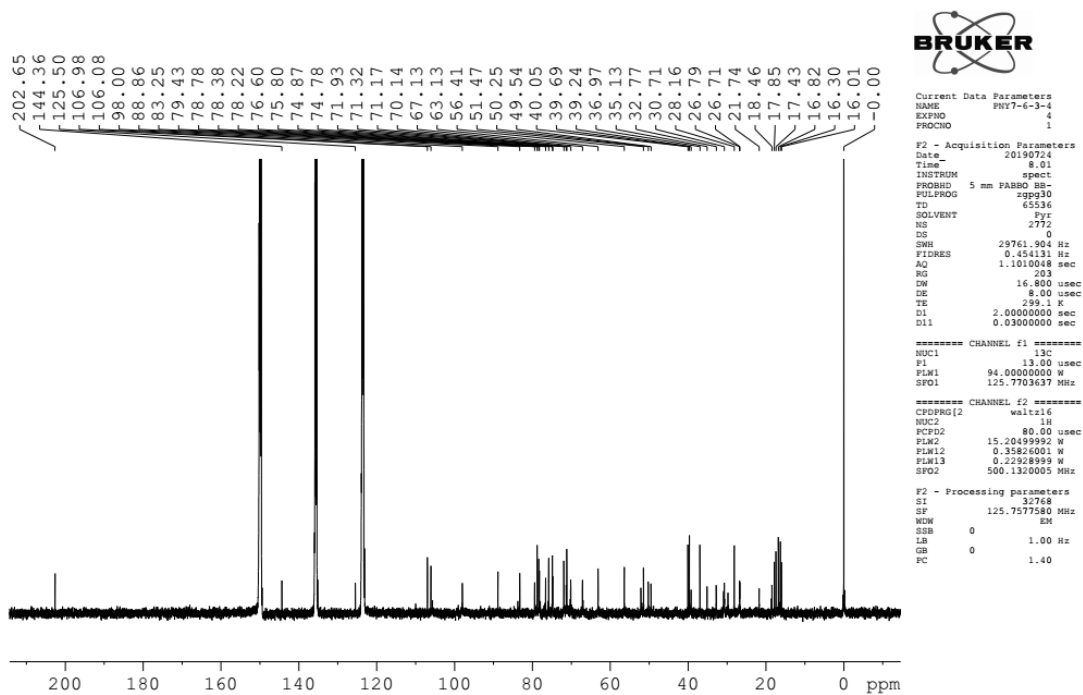
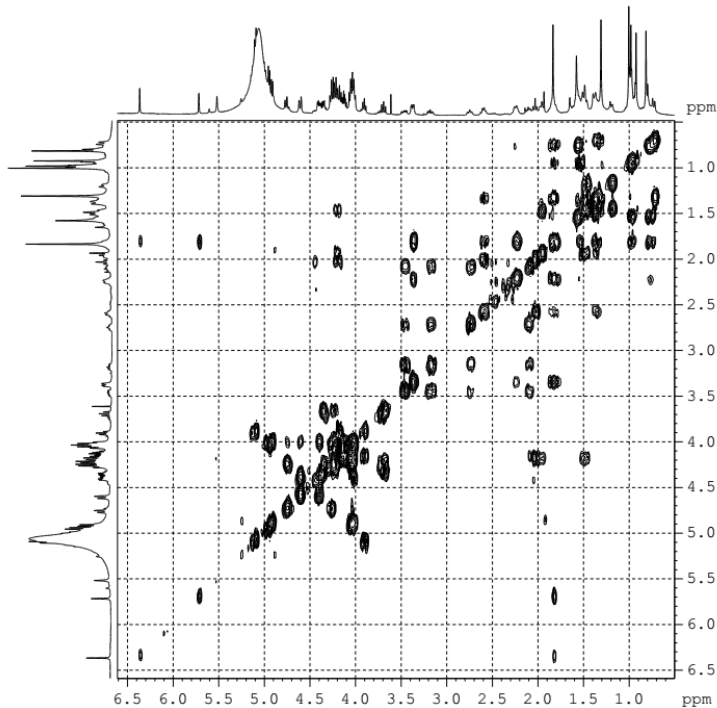


Figure S55 ¹³C NMR (125 MHz, C₅D₅N) spectrum of 9



```

Current Data Parameters
NAME          PH77-6-3-4
EXPNO        8
PROCNO       1

F2 - Acquisition Parameters
Date_        20190819
Time         13.51
INSTRUM      spect
PROBHD       5 mm F4BBO BB-
PULPROG      cosypppafgr
TD           65536
SOLVENT      Fyr
NS           16
DS           4
SWH           6684.432 Hz
FIDRES       3.243912 Hz
AQ           0.1531904 sec
RG           203
DM           74.800 usec
DE           8.00 usec
TE           295.7 K
D0           0.0000000 sec
D1           2.0000000 sec
D11          0.0000000 sec
D16          0.0002000 sec
IND          0.00014960 sec

===== CHANNEL f1 =====
NUC1         1H
P1           12.228 usec
PULSE1      15.1999981 W
SFO1        500.1330069 MHz

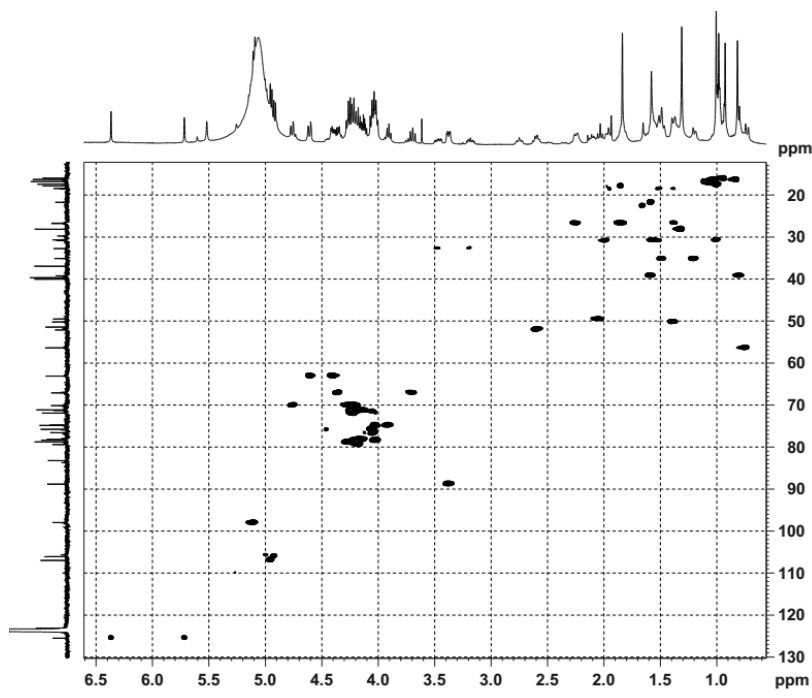
===== GRADIENT CHANNEL =====
GPRAM[1]    SMCQ10.100
GPRAM[2]    SMCQ10.100
GPRAM[3]    SMCQ10.100
GPE1        16.00 V
GPE2        12.00 V
GPE3        4.00 V
P16         1000.00 usec

F1 - Acquisition parameters
TD           128
SFO1        500.133 MHz
FIDRES      104.448320 Hz
SW          13.365 ppm
PULPROG     cp
PC          1.40

F2 - Processing parameters
SI           1024
SF           500.1307419 MHz
WDW          SINC
SSB          0 Hz
LB           0 Hz
GB           0
PC           1.40

F1 - Processing parameters
SI           1024
SF           500.1307416 MHz
WDW          SINC
SSB          0 Hz
LB           0 Hz
GB           0
  
```

Figure S56 ^1H ^1H COSY ($\text{C}_5\text{D}_5\text{N}$) spectrum of 9



```

Current Data Parameters
NAME          PH77-6-3-4
EXPNO        5
PROCNO       1

F2 - Acquisition Parameters
Date_        20190724
Time         8.04
INSTRUM      spect
PROBHD       5 mm F4BBO BB-
PULPROG      hsqcqp1
TD           65536
SOLVENT      Fyr
NS           16
DS           4
SWH           5883.352 Hz
FIDRES       5.744465 Hz
AQ           0.0978000 sec
RG           203
DM           85.000 usec
DE           8.00 usec
TE           298.2 K
D0           0.0000000 sec
D1           1.4895500 sec
D11          0.0017111 sec
D16          0.0000000 sec
D18          0.0000000 sec
D19          0.0000000 sec
D24          0.0011000 sec
IND          0.0002400 sec

===== CHANNEL f1 =====
NUC1         1H
P1           12.28 usec
P2           24.56 usec
P2B         0.10 usec
PULSE1      15.1999981 W
SFO1        500.1319239 MHz

===== CHANNEL f2 =====
GRAB[1]     13C
NUC2        13C
P3           13.00 usec
P4           16.00 usec
P5           16.00 usec
P6           16.00 usec
P7         94.0000000 W
P8         3.24200010 W
P9         125.767168 MHz

===== GRADIENT CHANNEL =====
GPRAM[1]    SMCQ10.100
GPRAM[2]    SMCQ10.100
GPE1        16.00 V
GPE2        12.00 V
GPE3        4.00 V
P16         1000.00 usec

F1 - Acquisition parameters
TD           256
SFO1        125.7672 MHz
FIDRES      162.739840 Hz
SW          145.639 ppm
PULPROG     Echu-Muon-echo
PC          1.40

F2 - Processing parameters
SI           1024
SF           500.1299824 MHz
WDW          SINC
SSB          0 Hz
LB           2
GB           0
PC           1.40

F1 - Processing parameters
SI           1024
SF           125.7577649 MHz
WDW          SINC
SSB          0 Hz
LB           2
GB           0
  
```

Figure S57 HSQC ($\text{C}_5\text{D}_5\text{N}$) spectrum of 9

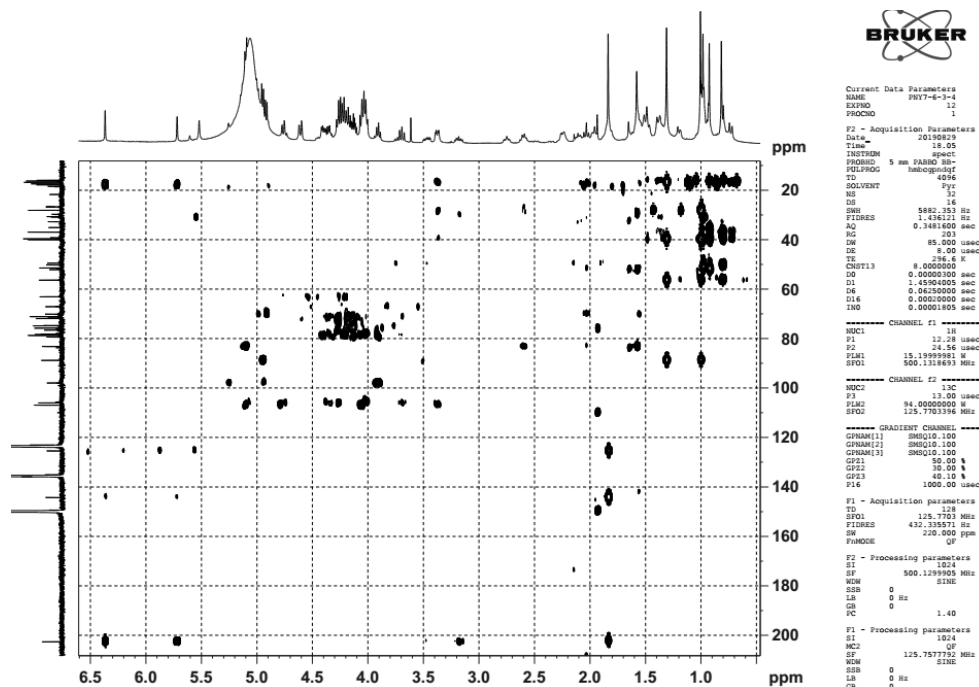


Figure S58 HMBC (C₅D₅N) spectrum of 9

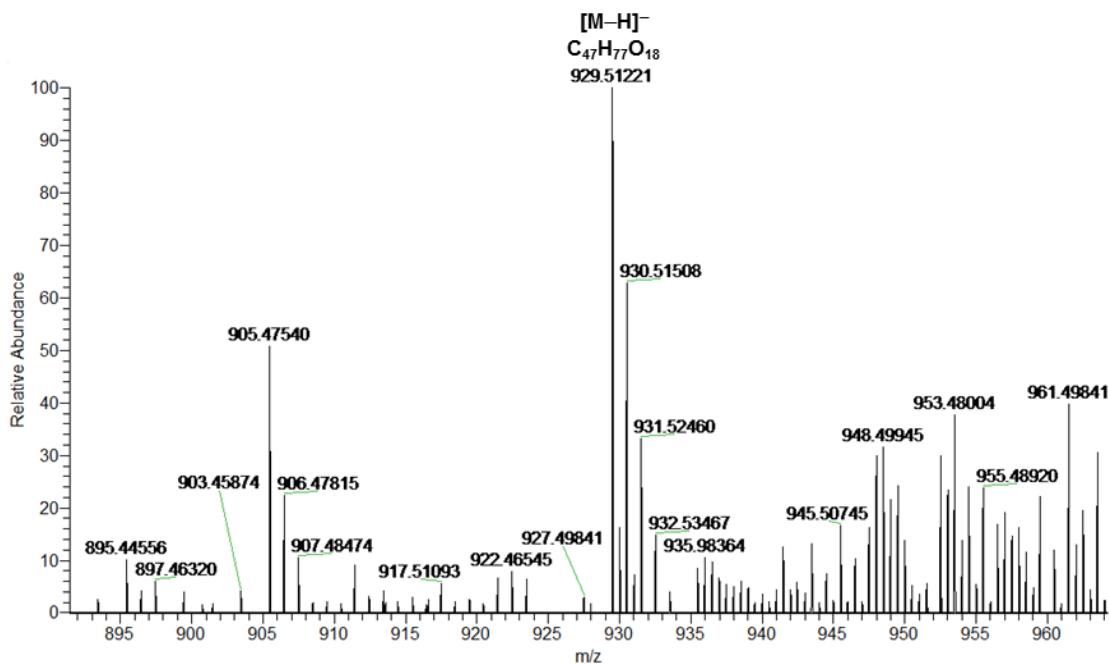


Figure S59 ESI-Q-Orbitrap-MS spectrum of 9

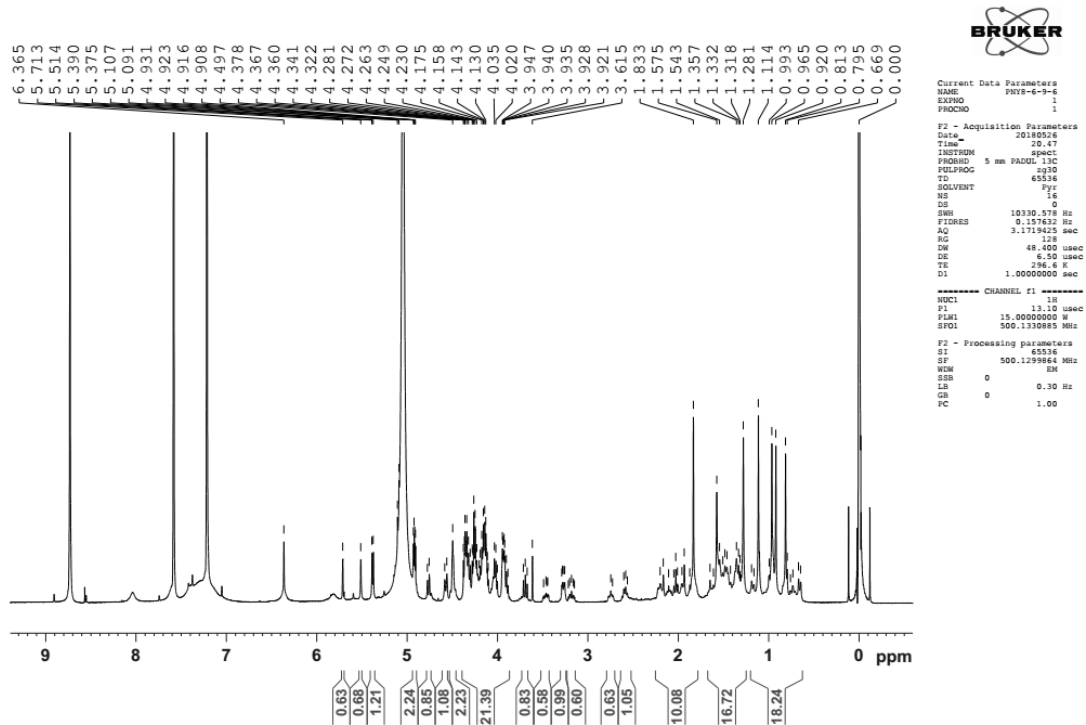


Figure S60 ¹H NMR (500 MHz, C₅D₅N) spectrum of PNY8-6-9-6 (10)

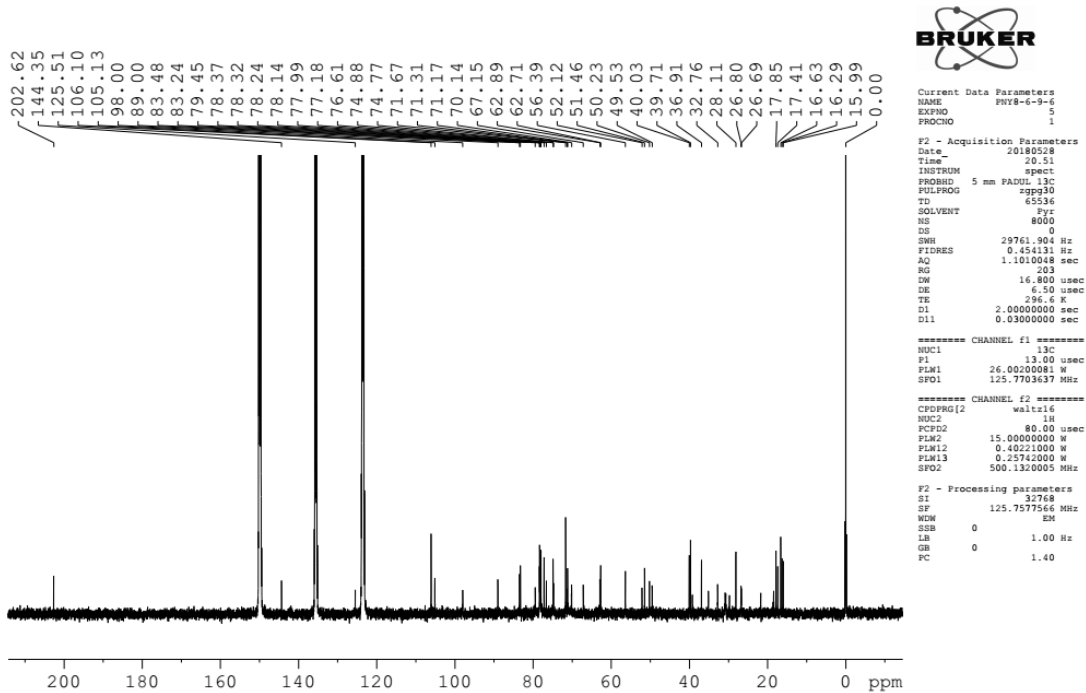


Figure S61 ¹³C NMR (125 MHz, C₅D₅N) spectrum of 10

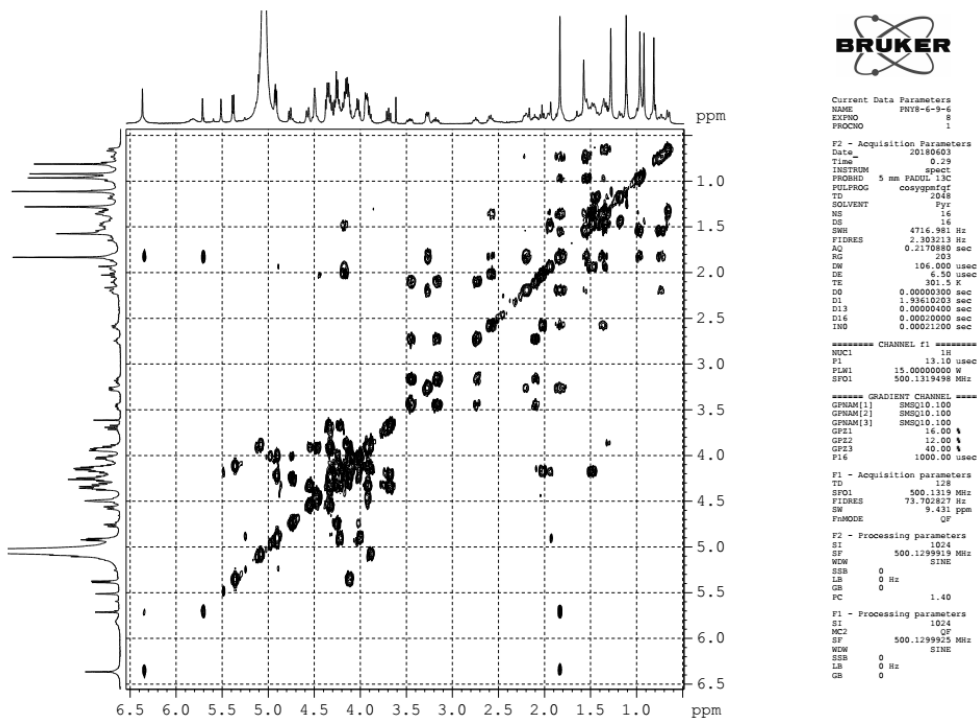


Figure S62 ¹H ¹H COSY (C₅D₅N) spectrum of 10

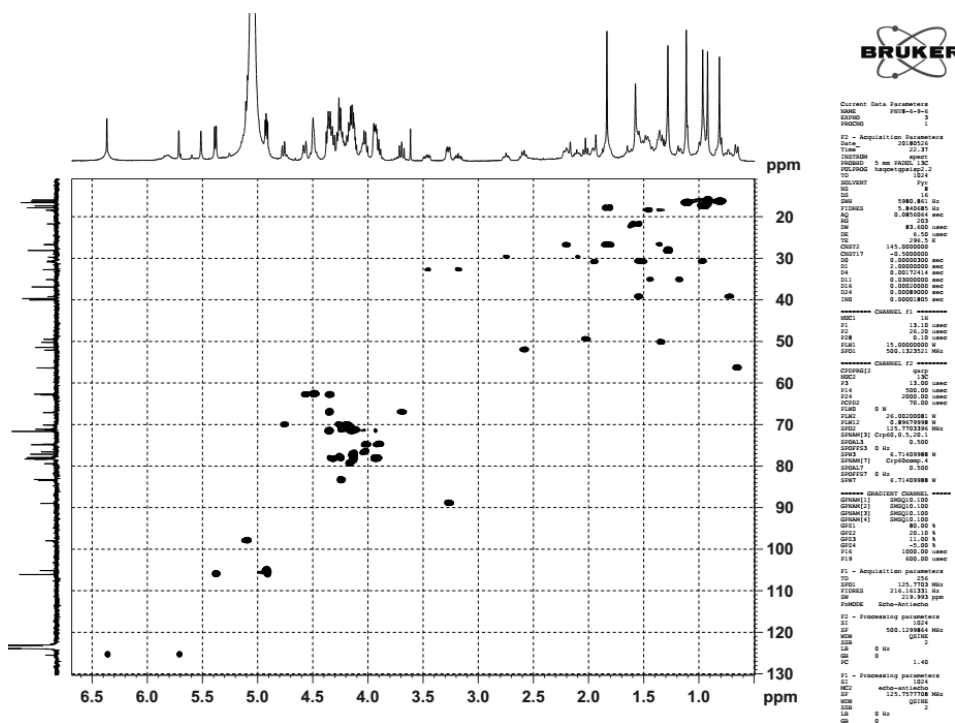


Figure S63 HSQC (C₅D₅N) spectrum of 10

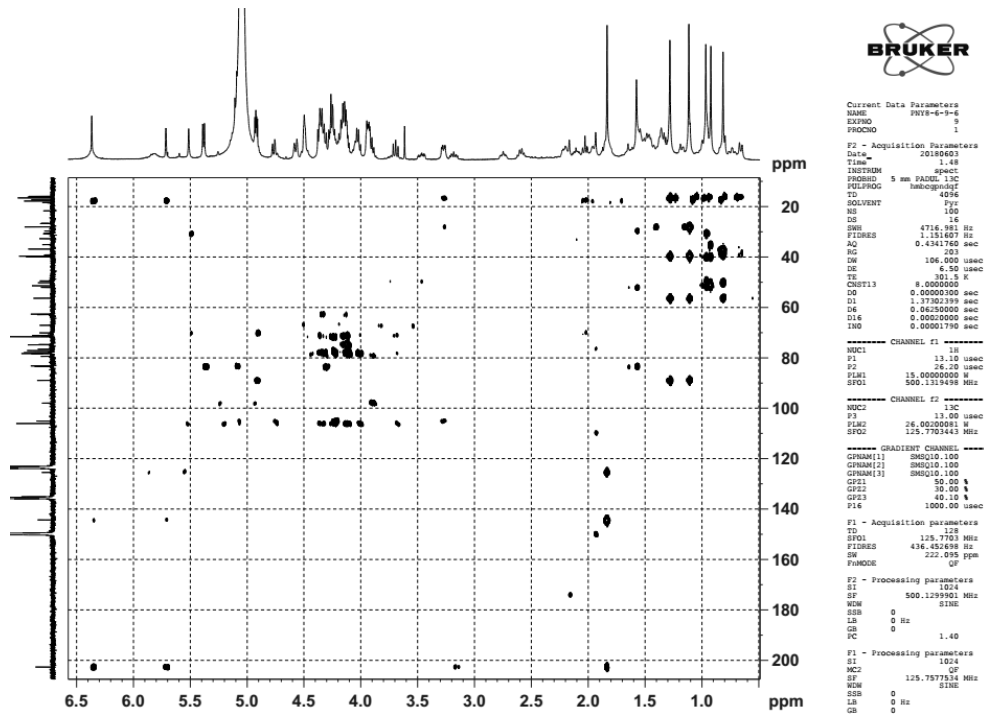


Figure S64 HMBIC (C₅D₅N) spectrum of 10

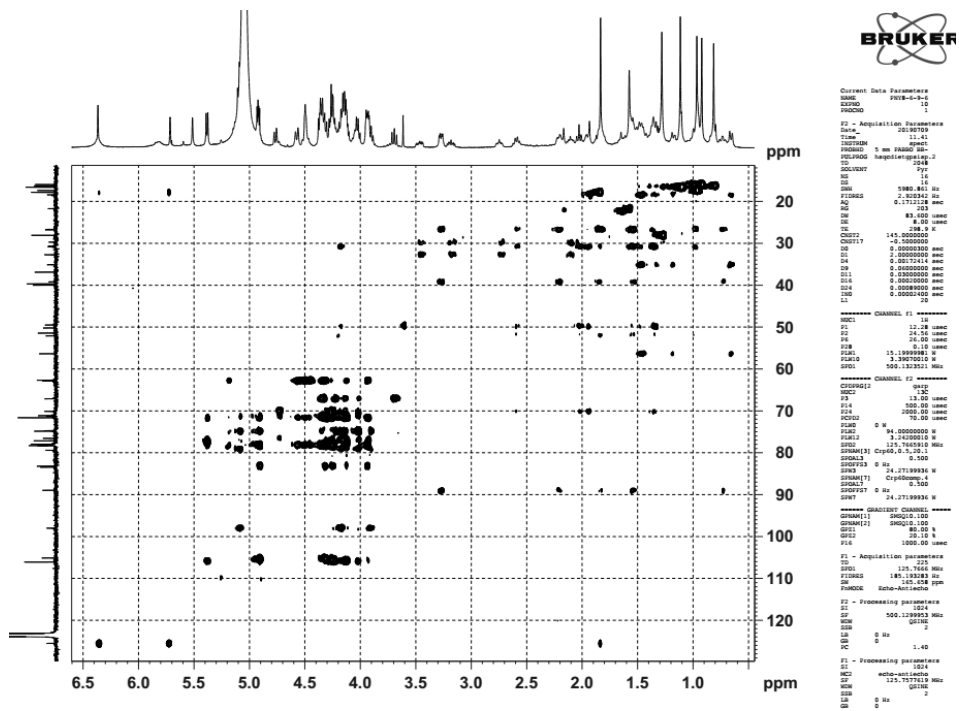


Figure S65 HSQC-TOCSY (C₅D₅N) spectrum of 10

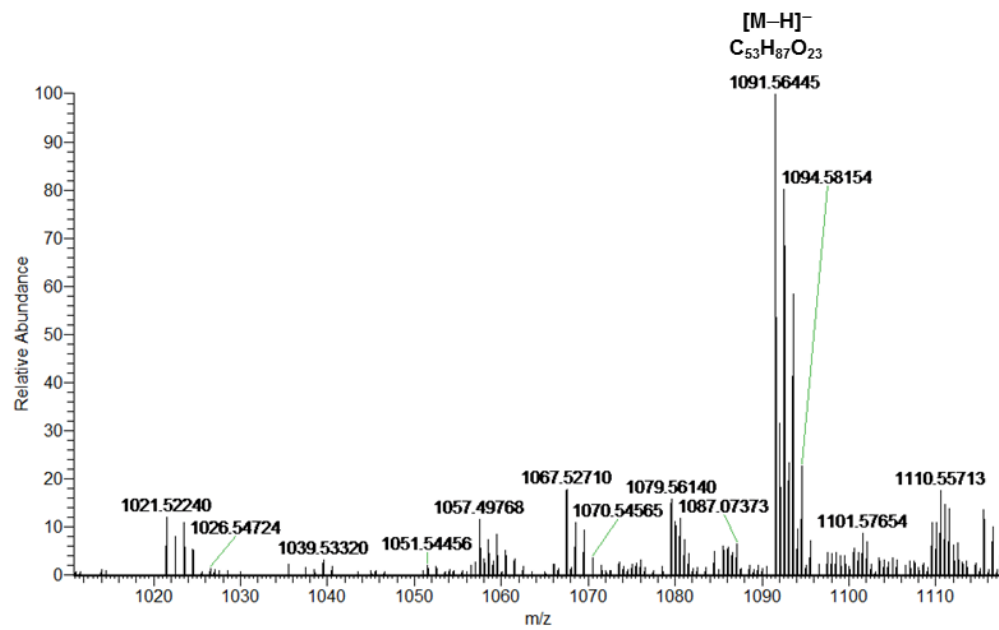


Figure S66 ESI-Q-Orbitrap-MS spectrum of 10

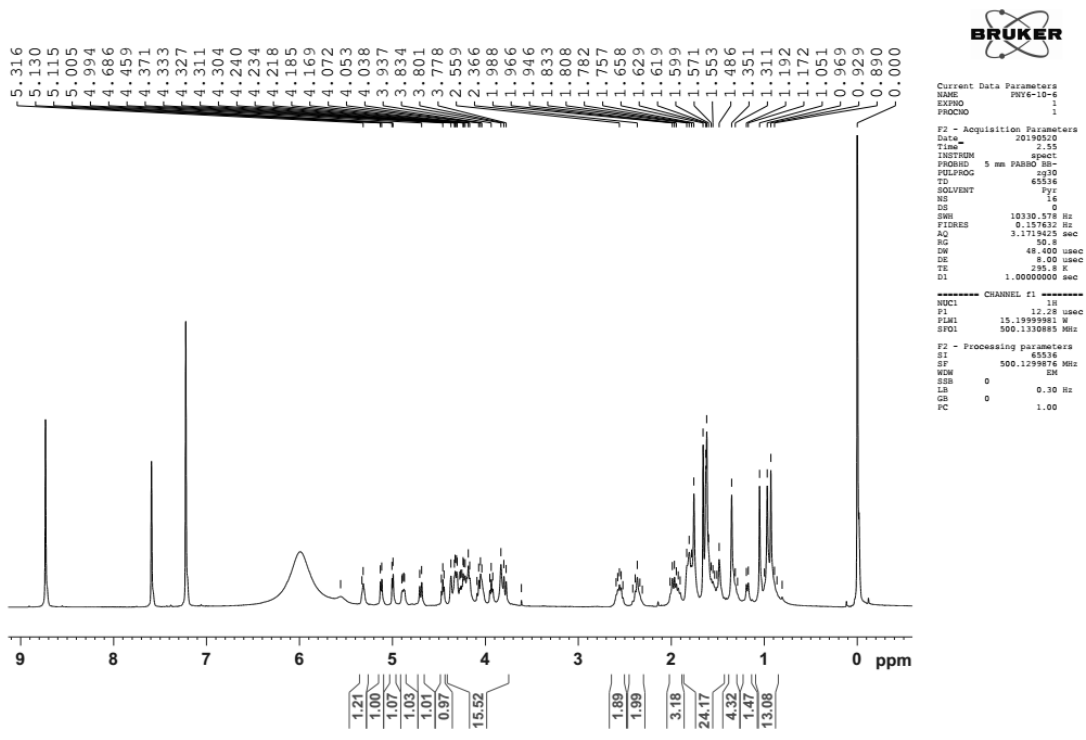


Figure S67 ¹H NMR (500 MHz, C₅D₅N) spectrum of 11

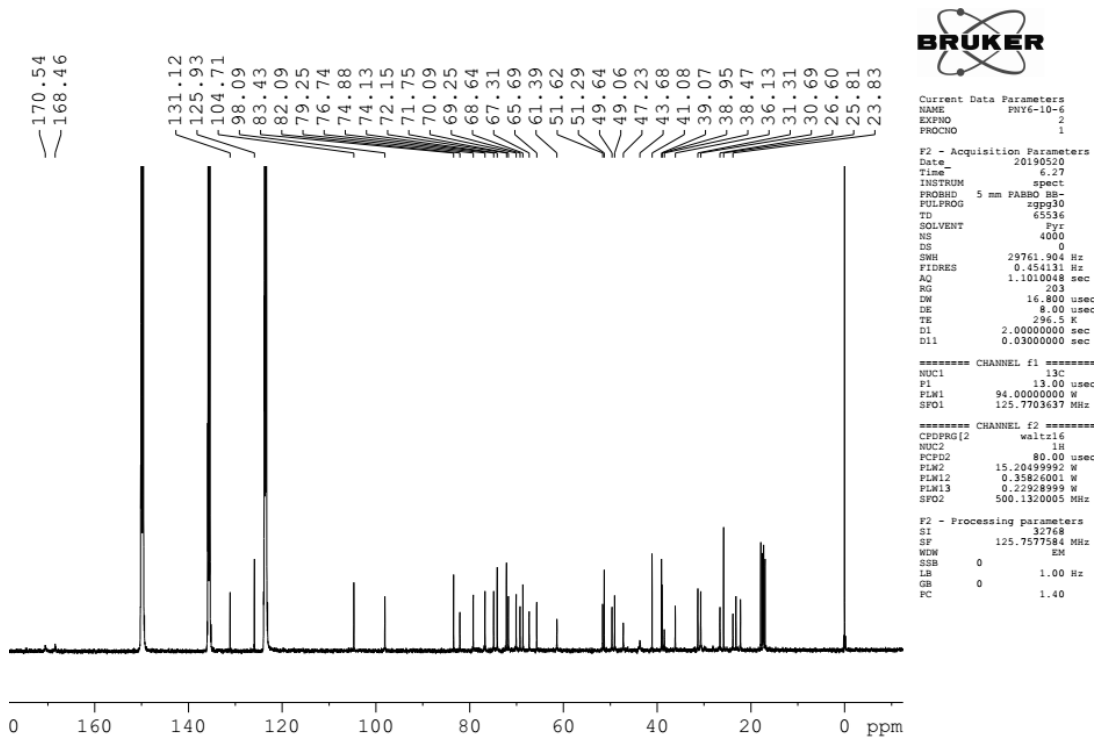


Figure S68 ^{13}C NMR (125 MHz, $\text{C}_5\text{D}_5\text{N}$) spectrum of 11

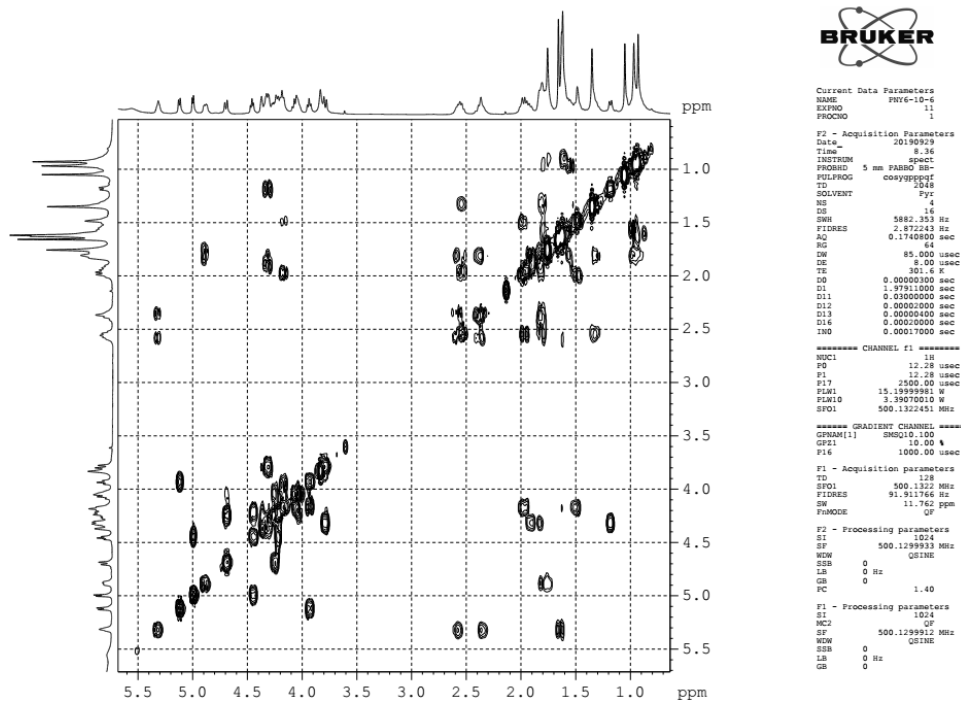


Figure S69 ^1H ^1H COSY ($\text{C}_5\text{D}_5\text{N}$) spectrum of 11

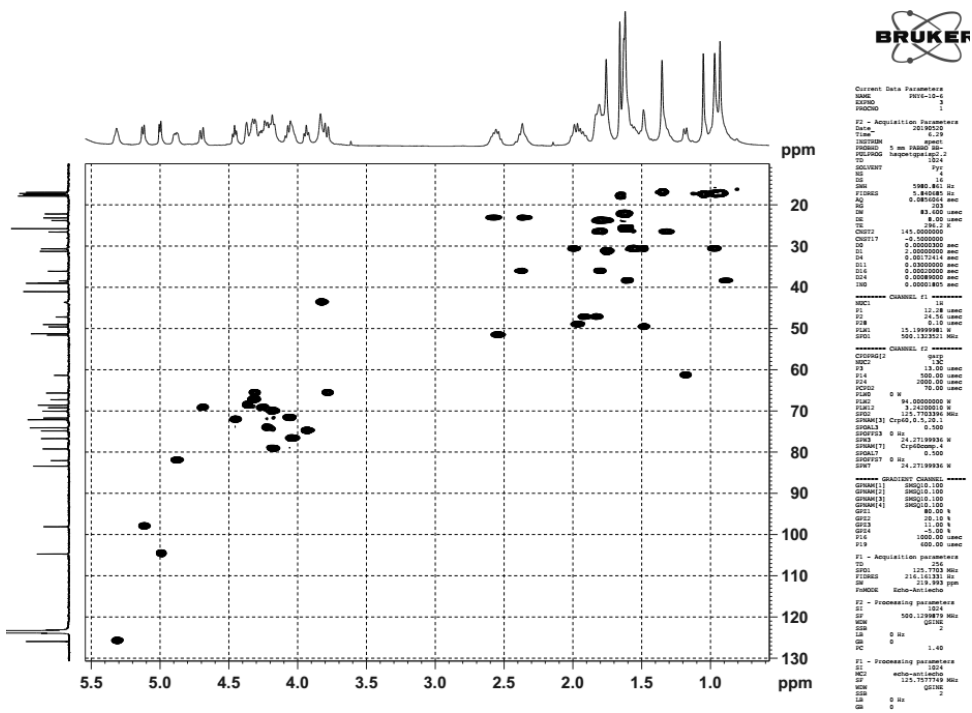


Figure S70 HSQC ($\text{C}_5\text{D}_5\text{N}$) spectrum of 11

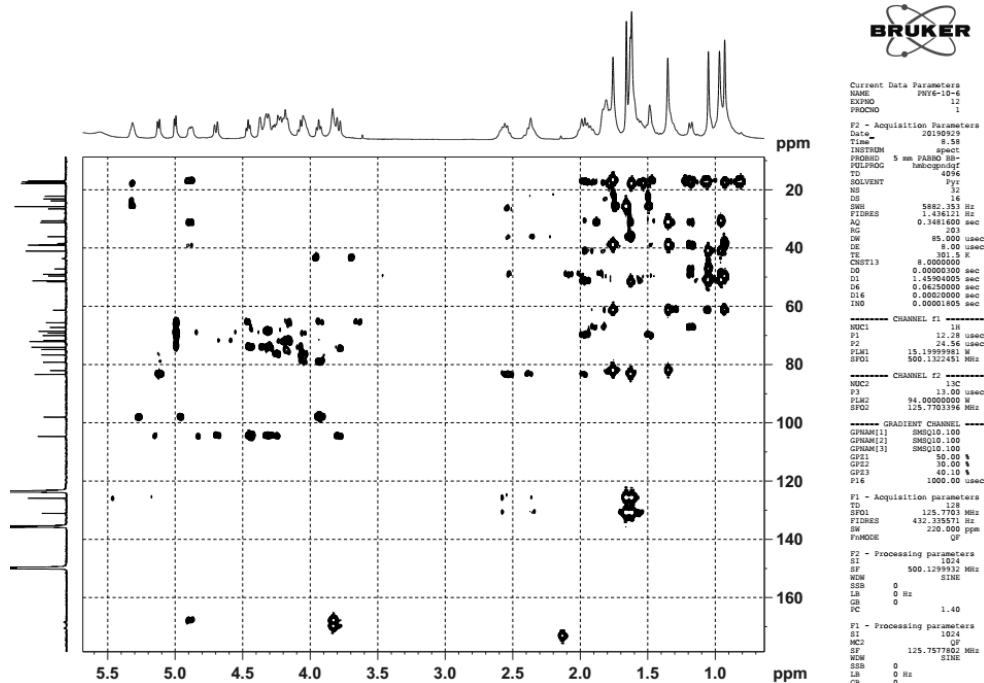


Figure S71 HMQC (C_5D_5N) spectrum of 11

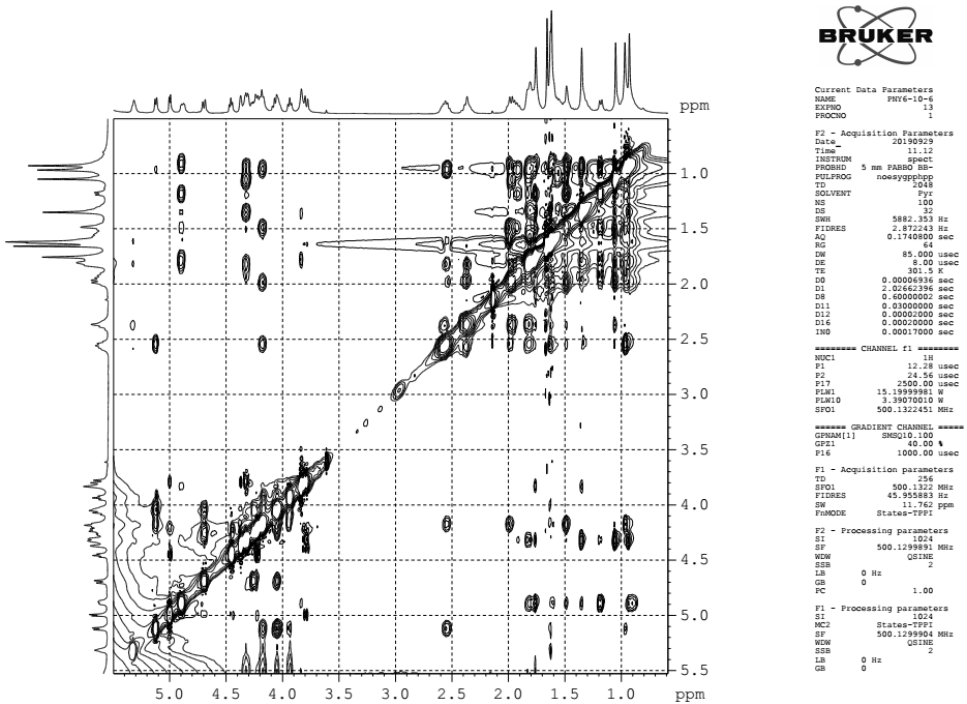


Figure S72 NOESY (C_5D_5N) spectrum of 11

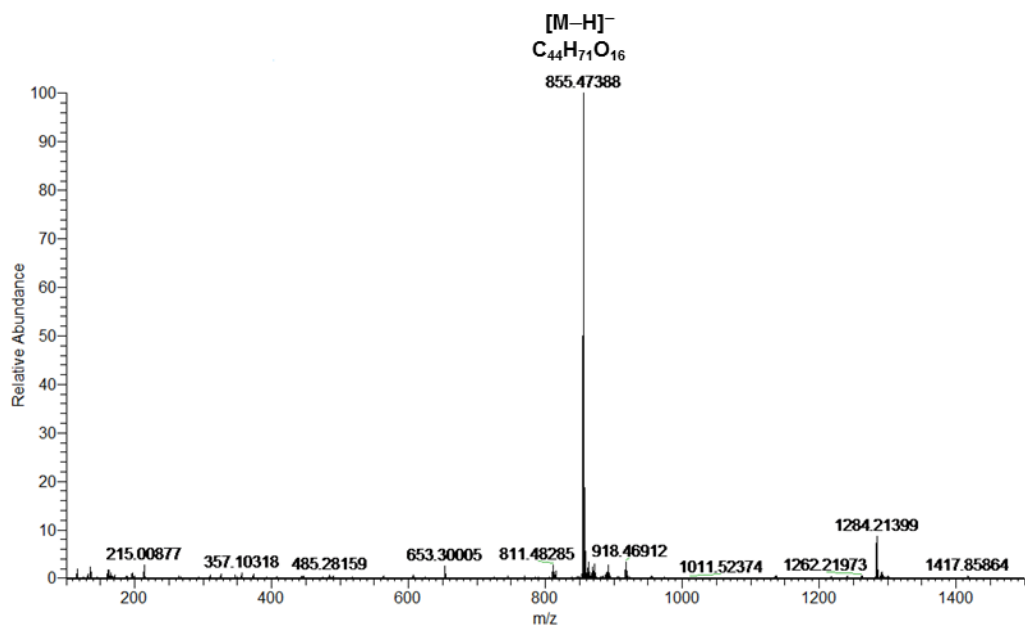


Figure S73 ESI-Q-Orbitrap-MS spectrum of 11

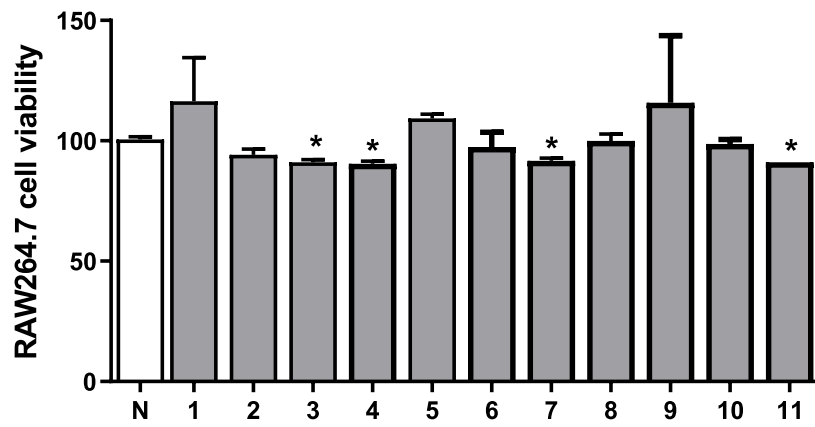


Figure S74 MTT assay of compounds 1-11 at the concentration of 50 μM