Electronic Supplementary Material (ESI) for Organic & Biomolecular Chemistry

Supporting Information

Enhanced Reduction of C-N Multiple Bonds using Sodium Borohydride and an Amorphous Nickel Catalyst

Shouxin Liu,[a,b]* Yihua Yang,[a] Xiaoli Zhen,[a] Junzhang Li,[a] Huimin He,[a] Juan Feng[a] and Andrew Whiting[b]*

[a]*State Key Laboratory Breeding Base-Hebei Province Key Laboratory of Molecular Chemistry for Drug, College of Chemical and Pharmaceutical Engineering, Hebei University of Science & Technology, Shijiazhuang 050018, People's Republic of China.*
[b]*Centre for Sustainable Chemical Processes, Department of Chemistry, Durham University, Science Laboratories, South Road, Durham DH1 3LE, United Kingdom*

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Experimental

General experimental

^{1}H NMR and ^{13}C NMR were recorded on a Bruker Avance II 500 spectrometer in $CDCl_3$ except otherwise stated, using tetramethylsilane as an internal reference, operated at 500.13 for ^{1}H and 125.67 MHz for ^{13}C, and J values were given in Hz. HR-EI-MS data were measured with a Micromass Autospec-Ultima ETOF spectrometer. X-ray powder diffraction (XRD) was performed on a D/MAX-2500 X-ray diffractometer using Cu-Kα radiation (k = 0.154 nm). The surface area of samples was determined by BET method on an automatic surface area and pore size analyzer (Quantachrome Instruments Quantachrome NOVA Automated Gas Sorption System). The surface morphology and the diffusion of amorphous nickel (Ni^0) were observed by scanning electronic microscopy (SEM) performed on a LEO 1530VP instrument.

Amorphous nickel (Ni^0) characterization

A typical XRD, SEM morphology and particle size distribution graphic are depicted in Figure 1，2 and 3, respectively.

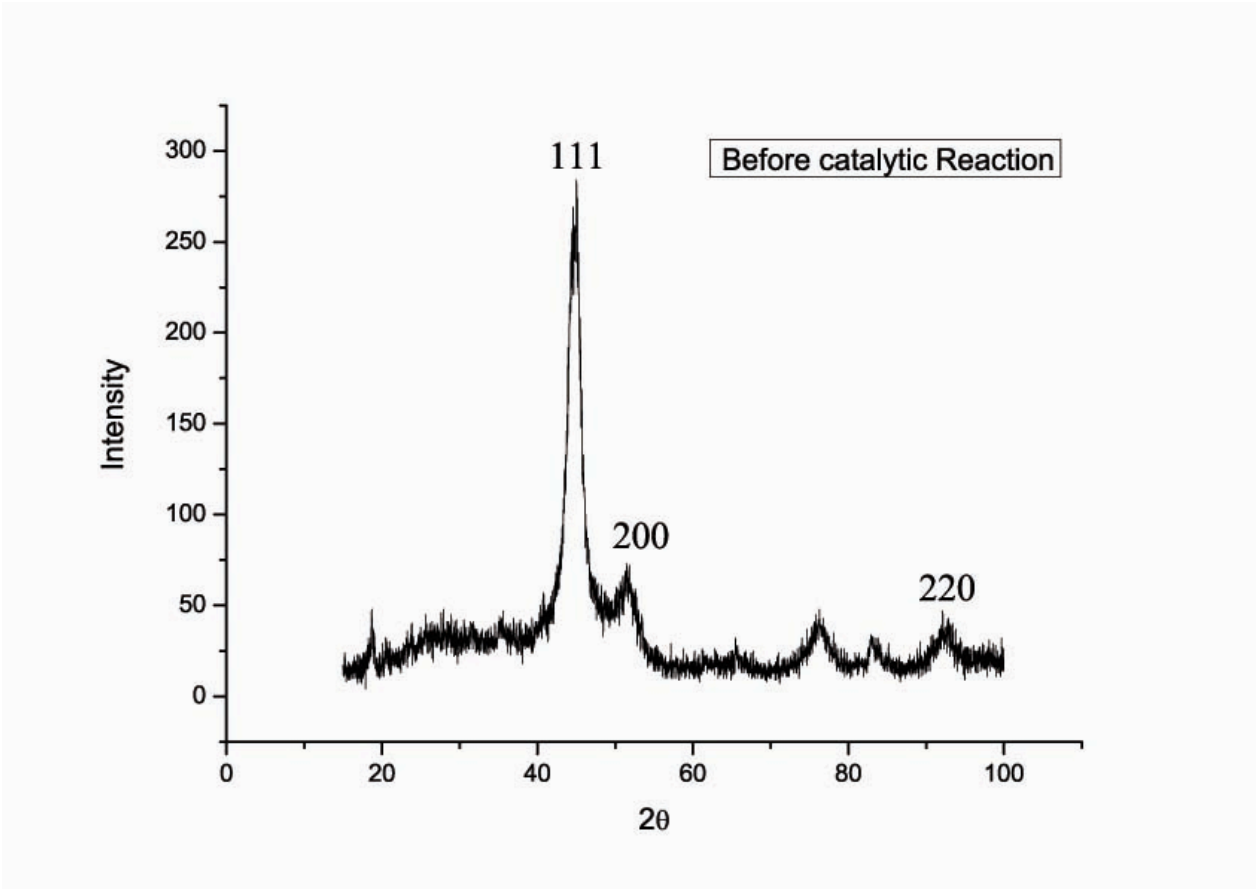

Fig. 1. X-ray diffraction spectrum of amorphous Ni using Cu-Kα (0.154 nm) radiation.

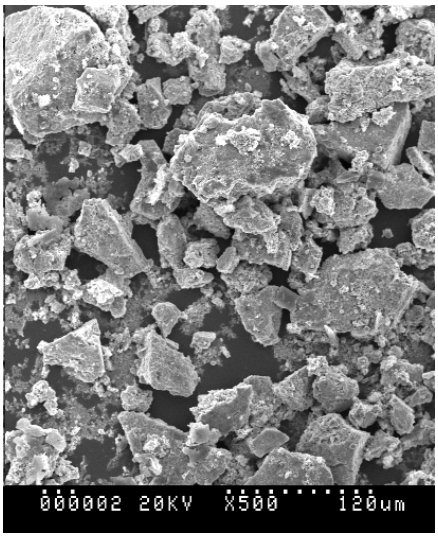

Fig. 2. SEM morphology of amorphous nickel catalyst at room temperature.

Size d.nm	Mean Intensity %	Std Dev Intensity %
0.400	0.0	
0.463	0.0	
0.536	0.0	
0.621	0.0	
0.719	0.0	
0.833	0.0	
0.965	0.0	
1.12	0.0	
1.29	0.0	
1.50	0.0	
1.74	0.0	
2.01	0.0	
2.33	0.0	
2.70	0.0	
3.12	0.0	
3.62	0.0	
4.19	0.0	
4.85	0.0	

Size d.nm	Mean Intensity %	Std Dev Intensity %
5.61	0.0	
6.50	0.0	
7.53	0.0	
8.72	0.0	
10.1	0.0	
11.7	0.0	
13.5	0.0	
15.7	0.0	
18.2	0.0	
21.0	0.0	
24.4	0.0	
28.2	0.0	
32.7	0.0	
37.8	0.0	
43.8	0.0	
50.7	0.0	
58.8	0.0	
68.1	0.0	

Size d.nm	Mean Intensity %	Std Dev Intensity %
78.8	0.0	
91.3	0.0	
106	0.0	
122	0.0	
142	0.0	
164	0.0	
190	0.0	
220	0.0	
255	0.0	
295	0.0	
342	65.4	
396	34.6	
459	0.0	
531	0.0	
615	0.0	
712	0.0	
825	0.0	
955	0.0	

Size d.nm	Mean Intensity %	Std Dev Intensity %
1110	0.0	
1280	0.0	
1480	0.0	
1720	0.0	
1990	0.0	
2300	0.0	
2670	0.0	
3090	0.0	
3580	0.0	
4150	0.0	
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1.00e4	0.0	

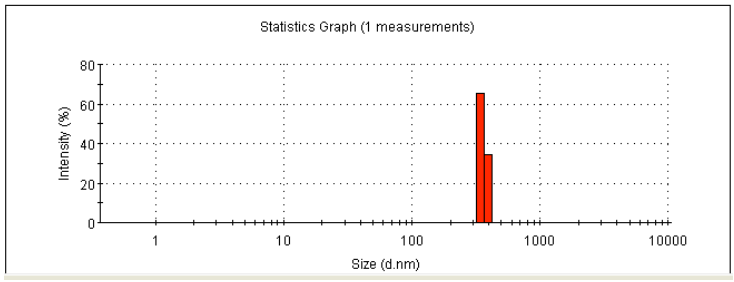
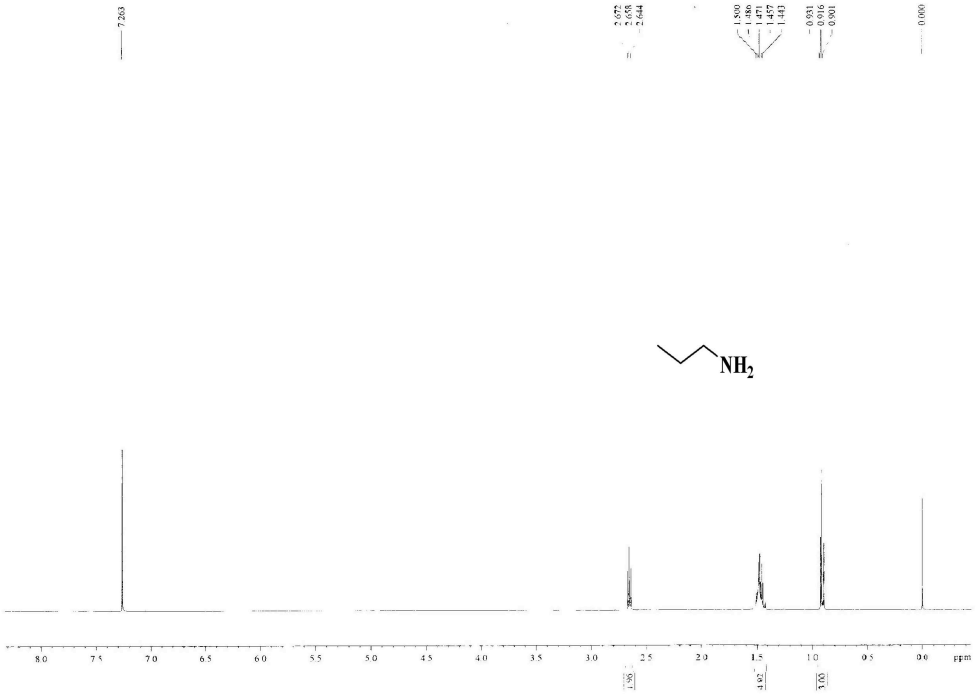


Fig 3 The particle size distribution of amorphous nickel

liushouxin-ZBA



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NS	16
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FIDRES	0.152588 Hz
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RG	512
DW	100.000 usec
DE	6.50 usec
TE	298.8 K
D1	1.00000000 sec
TD0	1
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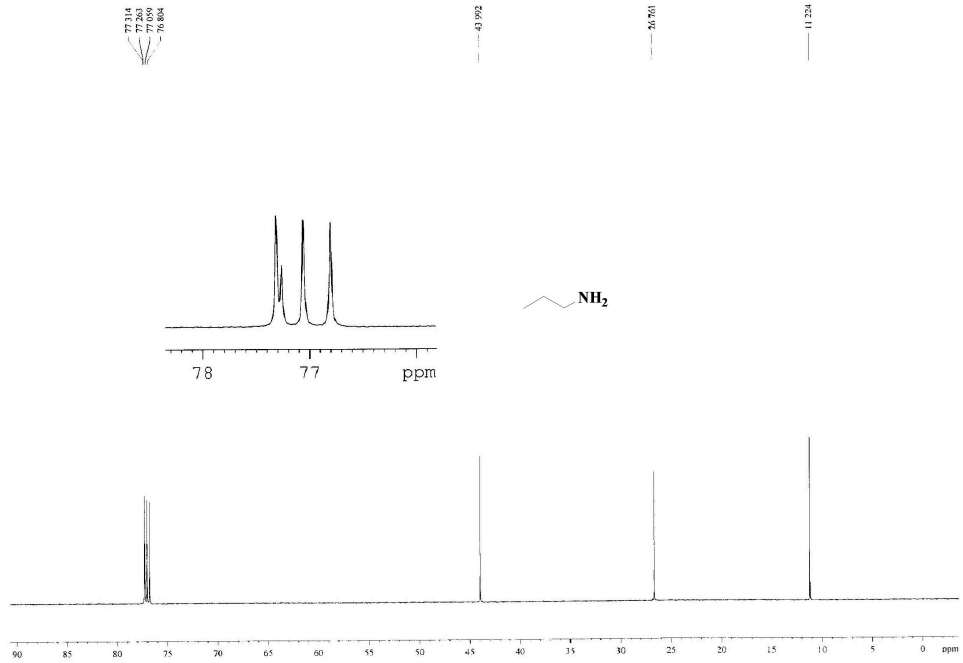
NUC1	1H
P1	9.80 usec
PL1	0.00 dB
PL1W	26.62599564 W
SFO1	500.1322506 MHz
SI	65536
SF	500.1300118 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

liushouxin-ZBA



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TE	300.2 K
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D11	0.03000000 sec
TD0	1
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NUC1	13C
P1	9.20 usec
PL1	3.00 dB
PL1W	47.46148682 W
SFO1	125.7706441 MHz
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NUC2	1H
PCPD2	80.00 usec
PL2	0.00 dB
PL12	18.06 dB
PL13	17.50 dB
PL2W	26.62599564 W
PL12W	0.41620368 W
PL13W	0.47348461 W
SFO2	500.1300005 MHz
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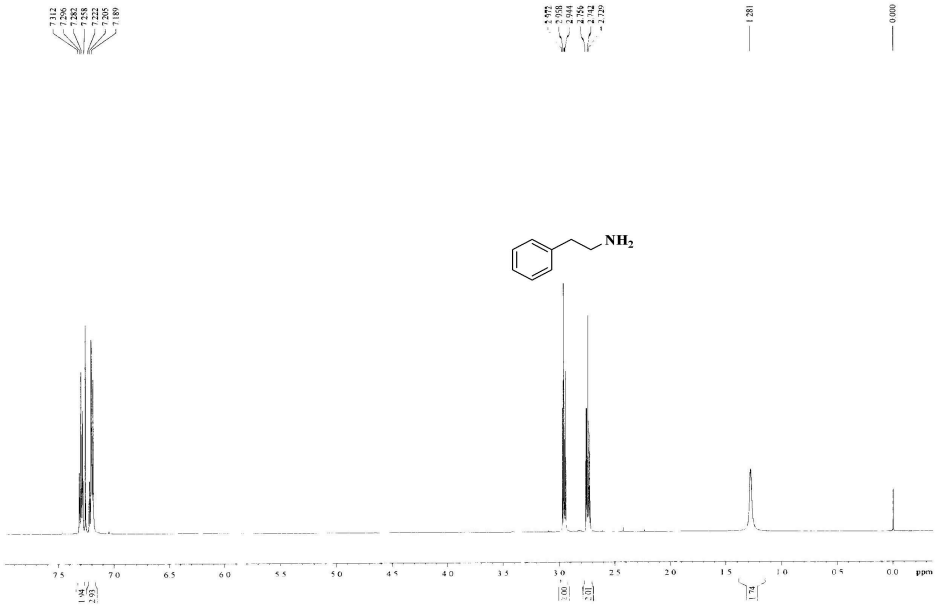
liushouxin-2-BYA

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PULPROG                  zg30
TD                      32768
SOLVENT                 CDCl3
NS                           8
DS                           0
SWH                5000.000 Hz
FIDRES                0.152588 Hz
AQ                    3.2768500 sec
RG                        90.5
DW                     100.000 usec
DE                        6.50 usec
TE                      298.0 K
D1                    1.00000000 sec
TD0                          1

======== CHANNEL f1 ========
NUC1                        1H
P1                        9.80 usec
PL1                       0.00 dB
PL1W             26.62599564 W
SFO1             500.1322506 MHz
SI                       65536
SF               500.1300148 MHz
WDW                         EM
SSB                          0
LB                        0.30 Hz
GB                           0
PC                        1.00
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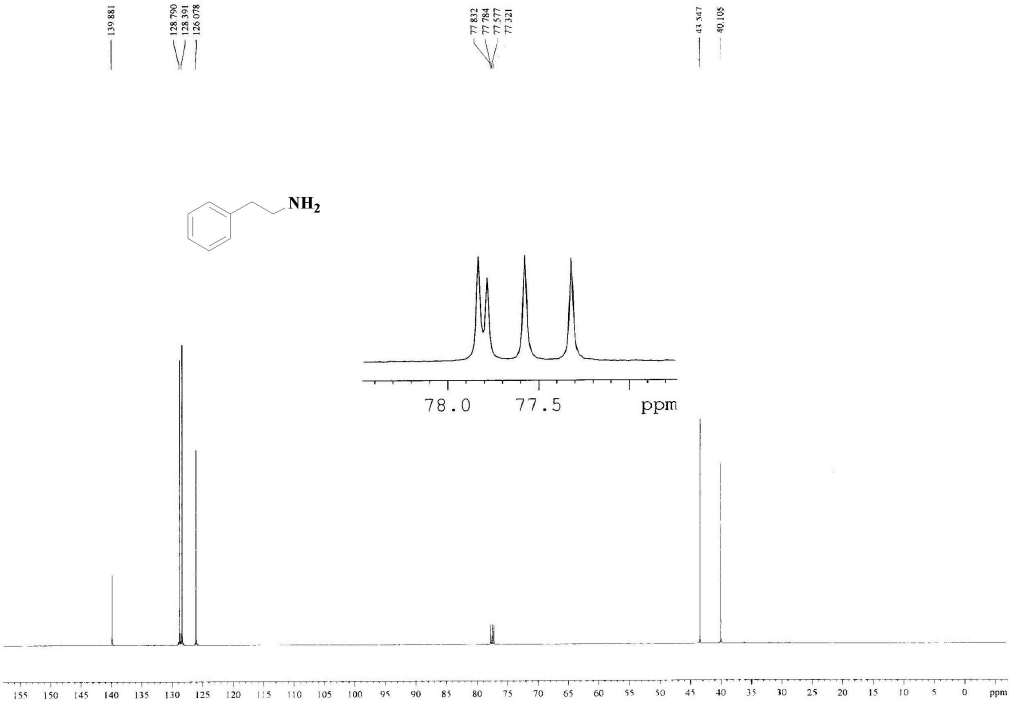


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TD                       65536
SOLVENT                 CDCl3
NS                         807
DS                           4
SWH                32894.738 Hz
FIDRES                0.501934 Hz
AQ                    0.9961972 sec
RG                         2050
DW                       15.200 usec
DE                        6.50 usec
TE                       299.9 K
D1                    2.00000000 sec
D11                   0.03000000 sec
TD0                          1

======== CHANNEL f1 ========
NUC1                       13C
P1                        9.20 usec
PL1                       3.00 dB
PL1W             47.46148682 W
SFO1             125.7728799 MHz

======== CHANNEL f2 ========
CPDPRG2                waltz16
NUC2                        1H
PCPD2                    80.00 usec
PL2                       0.00 dB
PL12                     18.06 dB
PL13                     17.50 dB
PL2W             26.62599564 W
PL12W             0.41620368 W
PL13W             0.47348461 W
SFO2             500.1320005 MHz
SI                       32768
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WDN                         EM
SSB                          0
LB                        1.00 Hz
GB                           0
PC                        1.40
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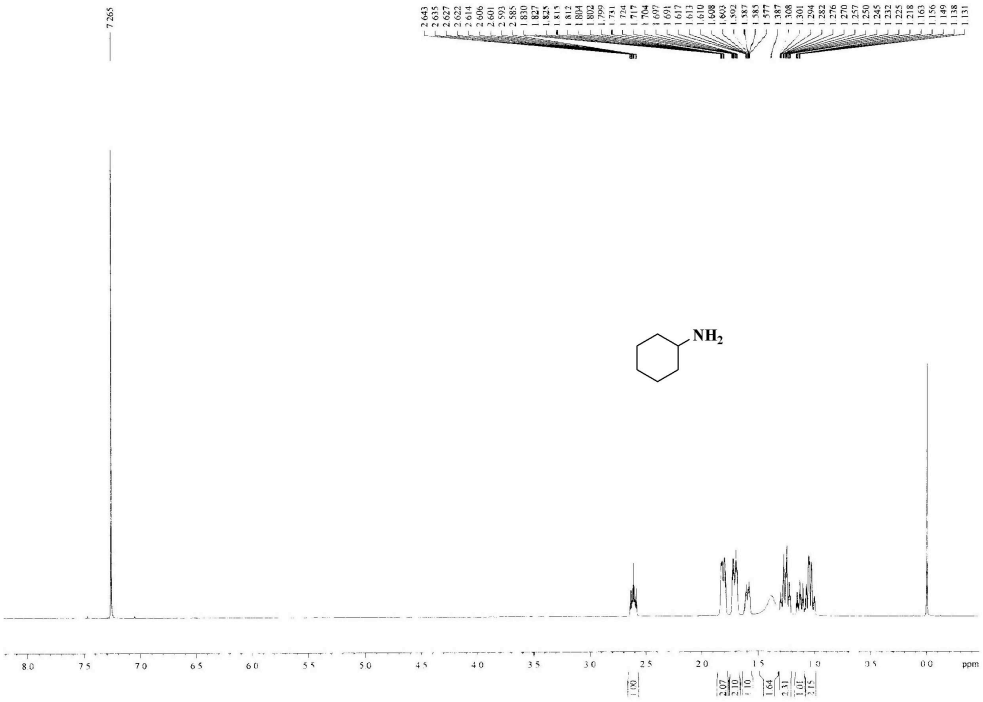
liushouxin-HJA

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PULPROG                 zg30
TD                     32768
SOLVENT                CDCl3
NS                          8
DS                          0
SWH                5000.000 Hz
FIDRES                0.152588 Hz
AQ                 3.2768500 sec
RG                        322
DW                   100.000 usec
DE                     6.50 usec
TE                    300.0 K
D1                 1.00000000 sec
TD0                         1

======== CHANNEL f1 ========
NUC1                       1H
P1                       9.80 usec
PL1                      0.00 dB
PL1W              26.62599564 W
SFO1             500.1322506 MHz
SI                       65536
SF                500.1300112 MHz
WDW                        EM
SSB                         0
LB                       0.30 Hz
GB                          0
PC                       1.00
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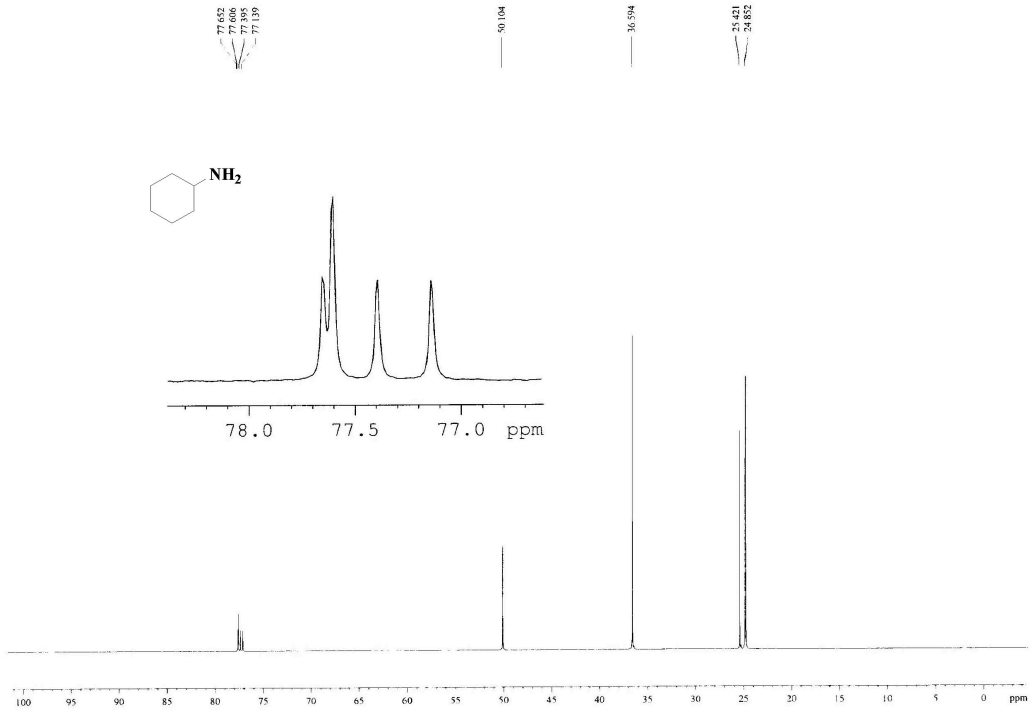


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INSTRUM                  spect
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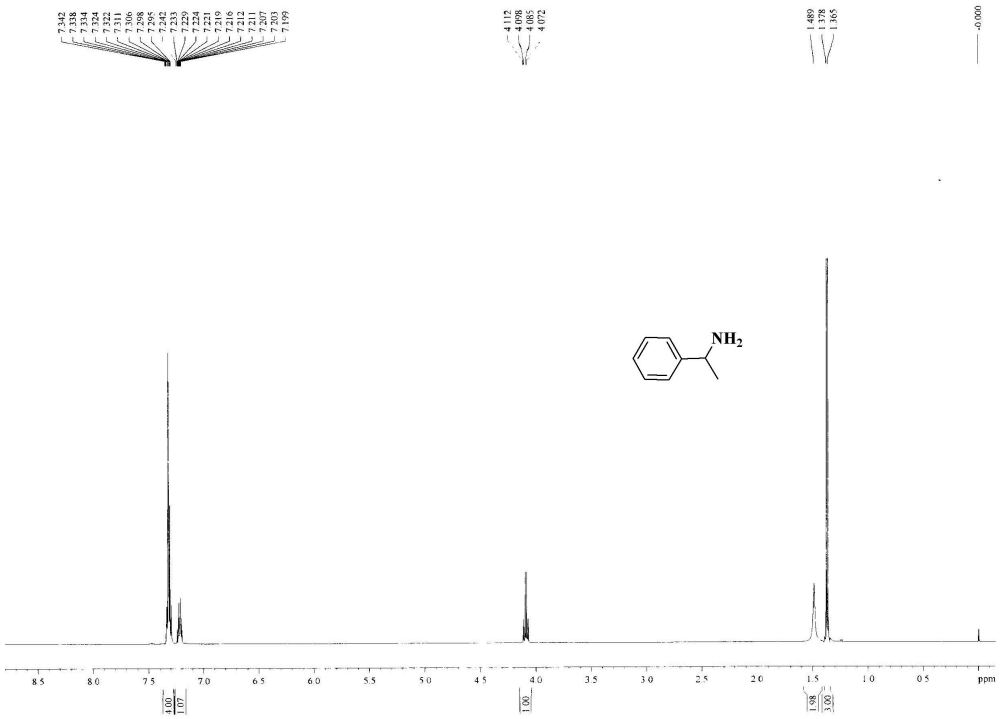
PULPROG                zgpg30
TD                     65536
SOLVENT                CDCl3
NS                        512
DS                          4
SWH               29761.904 Hz
FIDRES                0.454131 Hz
AQ                 1.1010548 sec
RG                       2050
DW                   16.800 usec
DE                     6.50 usec
TE                    299.8 K
D1                 2.00000000 sec
D11                0.03000000 sec
TD0                         1

======== CHANNEL f1 ========
NUC1                      13C
P1                       9.20 usec
PL1                      3.00 dB
PL1W              47.46148682 W
SFO1             125.7703643 MHz

======== CHANNEL f2 ========
CPDPRG2                waltz16
NUC2                       1H
PCPD2                   80.00 usec
PL2                      0.00 dB
PL12                    18.06 dB
PL13                    17.50 dB
PL2W              26.62599564 W
PL12W              0.41620368 W
PL13W              0.47348461 W
SFO2             500.1320005 MHz
SI                       32768
SF                125.7577890 MHz
WDW                        EM
SSB                         0
LB                       1.00 Hz
GB                          0
PC                       1.40
```

liushouxin-benzene-ethyl-amine

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PULPROG                 zg30
TD                     32768
SOLVENT                CDCl3
NS                          1
DS                          0
SWH                7500.000 Hz
FIDRES                0.228882 Hz
AQ                 2.1845834 sec
RG                         10
DW                    66.667 usec
DE                     6.50 usec
TE                    298.0 K
D1                 1.00000000 sec
TD0                         1

======== CHANNEL f1 ========
NUC1                       1H
P1                       9.80 usec
PL1                      0.00 dB
PL1W               26.62599564 W
SFO1               500.1322506 MHz
SI                         32768
SF                 500.1300222 MHz
WDW                        EM
SSB                         0
LB                       0.00 Hz
GB                          0
PC                       1.00
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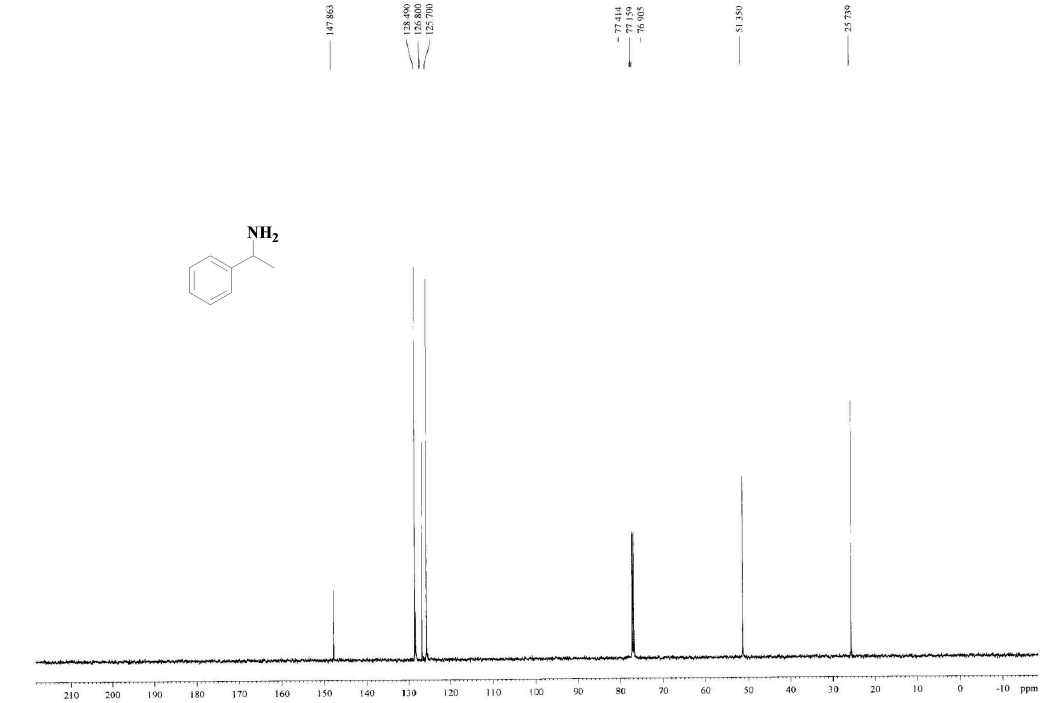


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Date_               20100406
Time                   11.07
INSTRUM                spect
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PULPROG             zgpg30
TD                     16384
SOLVENT                CDCl3
NS                         64
DS                          0
SWH               29761.904 Hz
FIDRES                1.816522 Hz
AQ                 0.2753012 sec
RG                        287
DW                    16.800 usec
DE                     6.50 usec
TE                    298.1 K
D1                 2.00000000 sec
D11                0.03000000 sec
TD0                         1

======== CHANNEL f1 ========
NUC1                      13C
P1                       9.20 usec
PL1                      3.00 dB
PL1W               47.46148682 W
SFO1               125.7703643 MHz

======== CHANNEL f2 ========
CPDPRG2                waltz16
NUC2                       1H
PCPD2                   80.00 usec
PL2                      0.00 dB
PL12                    18.06 dB
PL13                    17.50 dB
PL2W               26.62599564 W
PL12W               0.41620368 W
PL13W               0.47348461 W
SFO2               500.1320005 MHz
SI                         32768
SF                 125.7577890 MHz
WDW                        EM
SSB                         0
LB                       3.00 Hz
GB                          0
PC                       1.40
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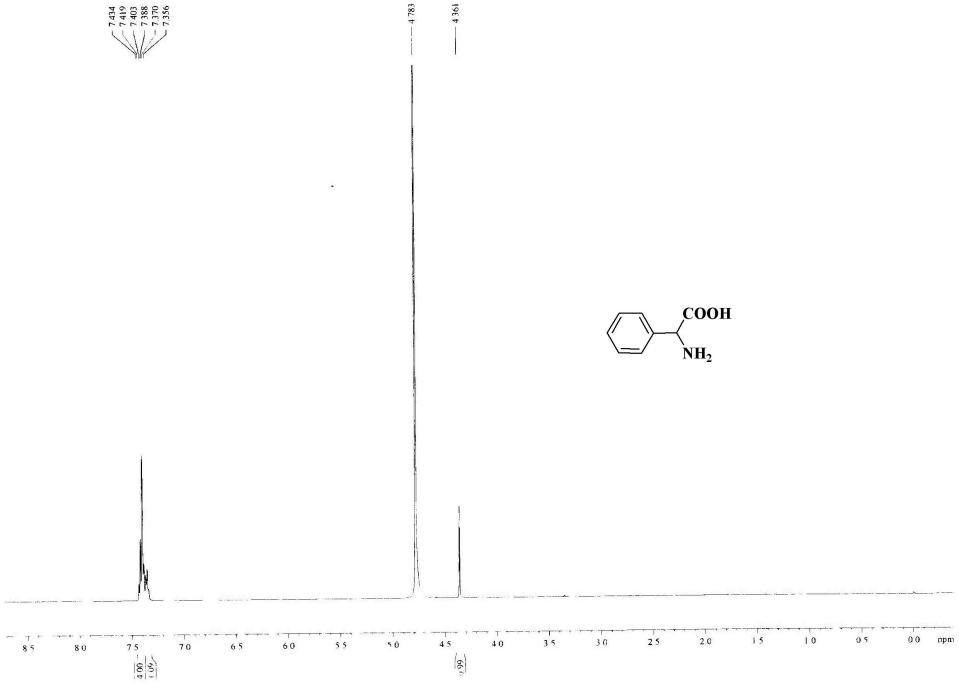
liushouxin-phenylglycine



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PROCNO	1
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PULPROG	zg30
TD	32768
SOLVENT	D2O
NS	8
DS	0
SWH	5000.000 Hz
FIDRES	0.152588 Hz
AQ	3.2768500 sec
RG	322
DW	100.000 usec
DE	6.50 usec
TE	299.1 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	9.80 usec
PL1	0.00 dB
PL1W	26.62599564 W
SFO1	500.1322506 MHz
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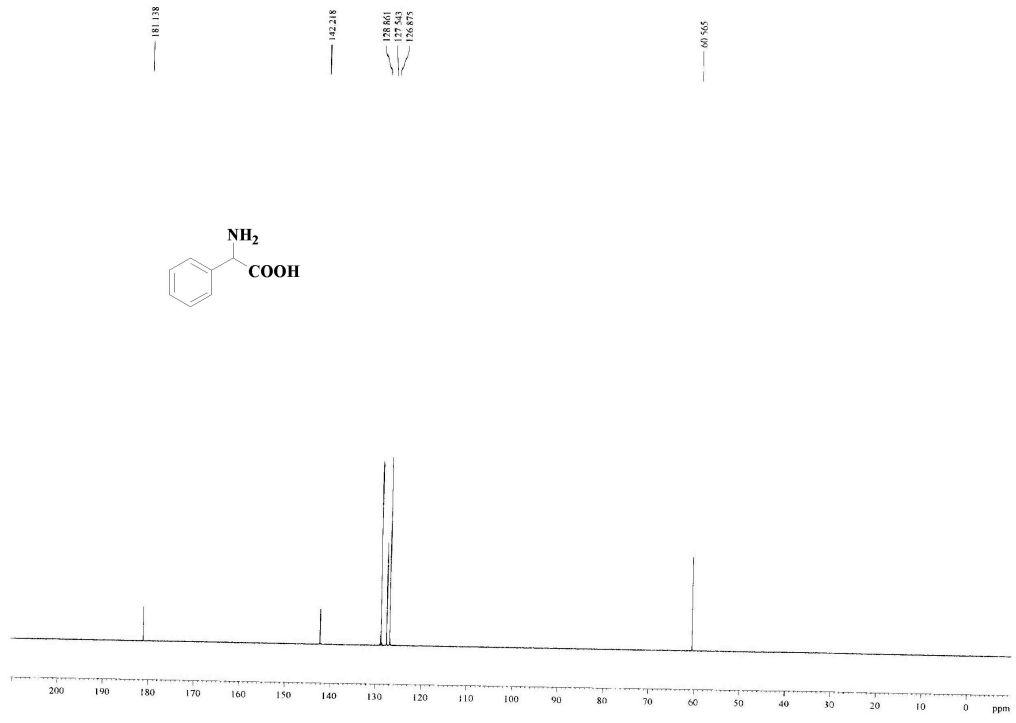
GB	0
PC	1.00



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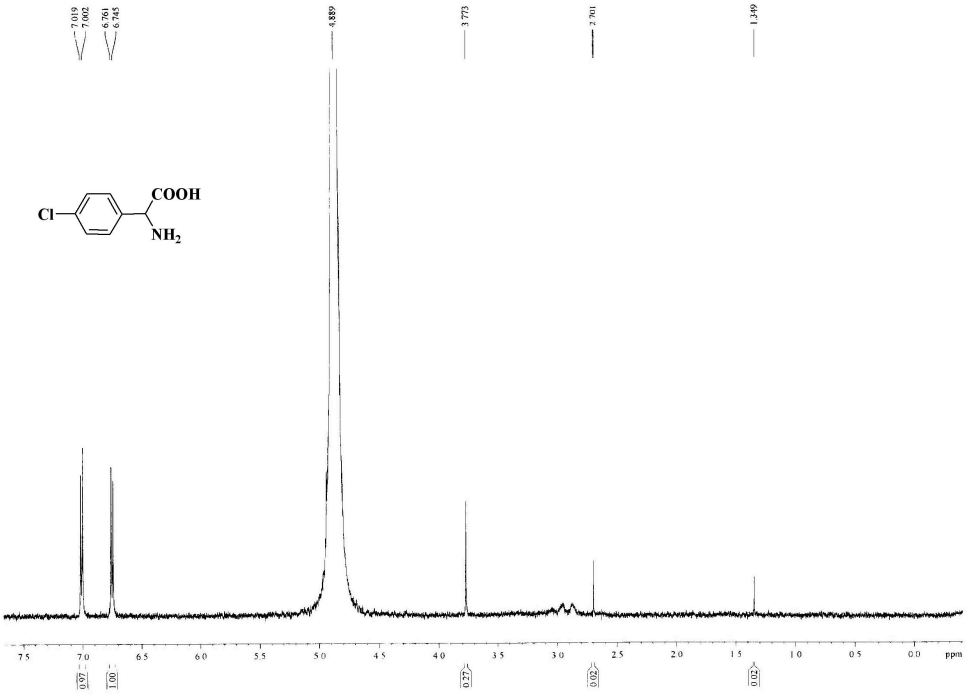
PULPROG	zgpg30
TD	32768
SOLVENT	D2O
NS	2683
DS	0
SWH	31250.000 Hz
FIDRES	0.953674 Hz
AQ	0.5243360 sec
RG	2050
DW	16.000 usec
DE	6.50 usec
TE	300.2 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.20 usec
PL1	3.00 dB
PL1W	47.46148682 W
SFO1	125.7716224 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	0.00 dB
PL12	18.06 dB
PL13	17.50 dB
PL2W	26.62599564 W
PL12W	0.41620368 W
PL13W	0.47348461 W
SFO2	500.1320005 MHz
SI	32768
SF	125.7577890 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

liushouxin-X-1

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PROCNO                       1
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PULPROG                  zg30
TD                      32768
SOLVENT                   D2O
NS                          8
DS                          0
SWH                  7500.000 Hz
FIDRES               0.228882 Hz
AQ                   2.1845834 sec
RG                        256
DW                     66.667 usec
DE                      6.50 usec
TE                     298.0 K
D1                  2.00000000 sec
TD0                         1

======== CHANNEL f1 ========
NUC1                       1H
P1                      9.60 usec
PL1                     0.00 dB
PL1W               26.62599564 W
SFO1              500.1335009 MHz
SI                      32768
SF                500.1300000 MHz
WDW                        EM
SSB                         0
LB                      0.30 Hz
GB                          0
PC                      1.00
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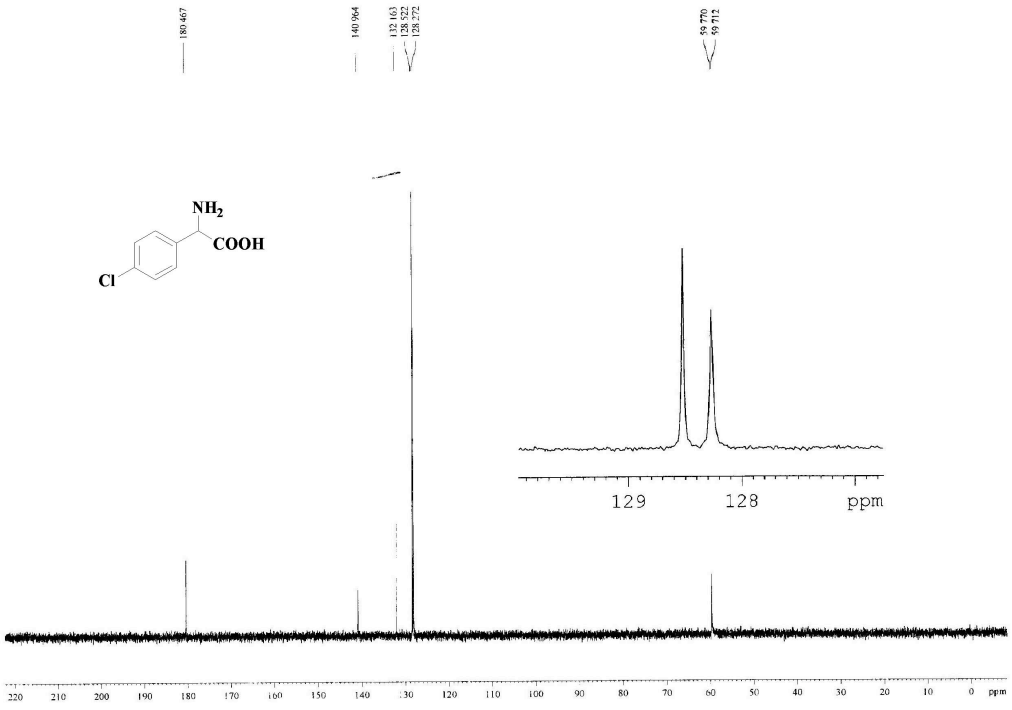


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Time                     22.06
INSTRUM                  spect
PROBHD    5 mm PABBO BB-
PULPROG                zgpg30
TD                      65536
SOLVENT                   D2O
NS                       2048
DS                          4
SWH                 31250.000 Hz
FIDRES               0.476837 Hz
AQ                   1.0486259 sec
RG                        181
DW                     16.000 usec
DE                      6.50 usec
TE                     298.0 K
D1                  2.00000000 sec
D11                 0.03000000 sec
TD0                         1

======== CHANNEL f1 ========
NUC1                      13C
P1                      9.15 usec
PL1                     3.00 dB
PL1W               47.46146682 W
SFO1              125.7716224 MHz

======== CHANNEL f2 ========
CPDPRG2                waltz16
NUC2                       1H
PCPD2                  80.00 usec
PL2                     0.00 dB
PL12                   18.42 dB
PL13                   17.50 dB
PL2W               26.62599564 W
PL12W               0.38309446 W
PL13W               0.47348461 W
SFO2              500.1320005 MHz
SI                      32768
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WDW                        EM
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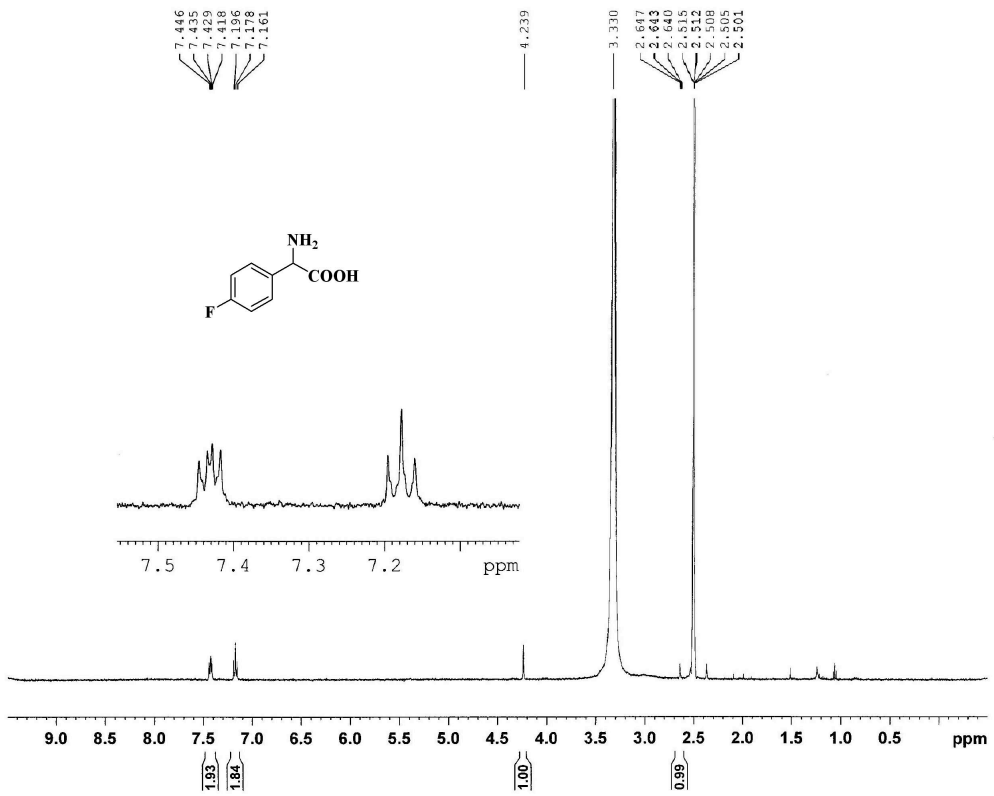
LB                      1.00 Hz
GB                          0
PC                      1.40
```

liushouxin-df-acid

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PROCNO                       1

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PULPROG                 zg30
TD                     65536
SOLVENT                  DMSO
NS                          8
DS                          2
SWH                5000.000 Hz
FIDRES                0.076294 Hz
AQ                    6.5536499 sec
RG                        322
DW                    100.000 usec
DE                      8.00 usec
TE                     300.2 K
D1                 1.00000000 sec
TD0                         1

======== CHANNEL f1 ========
NUC1                       1H
P1                      12.60 usec
PL1                      3.00 dB
SFO1              500.1322506 MHz

F2 - Processing parameters
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SF                500.1300000 MHz
WDW                           EM
SSB                            0
LB                          0.30 Hz
GB                             0
PC                          1.00
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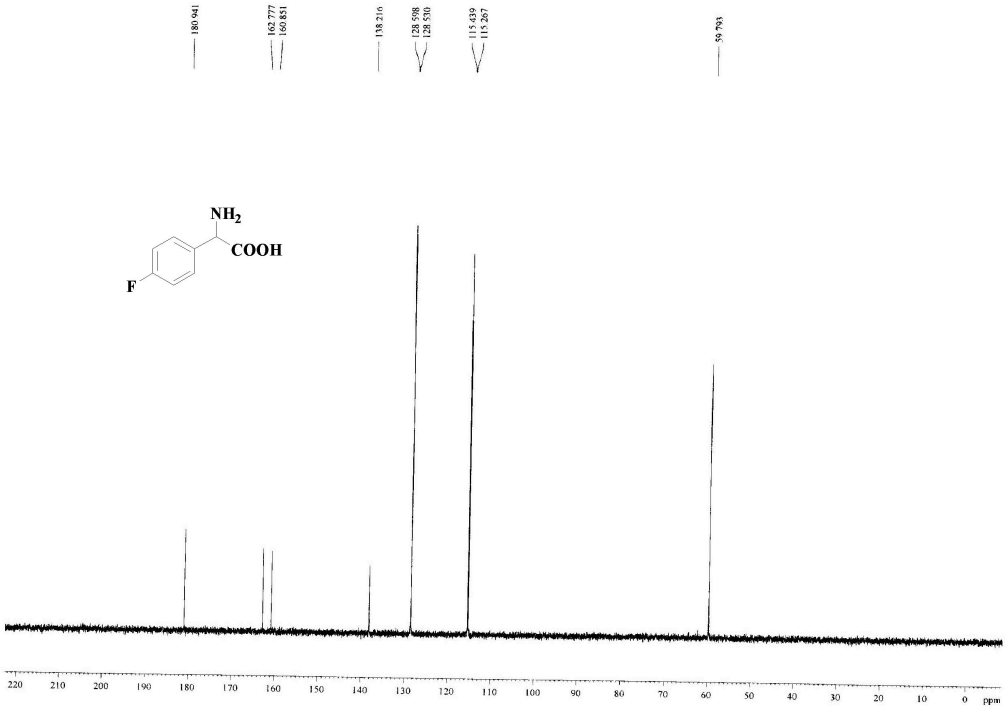


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PROCNO                       1
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INSTRUM                 spect
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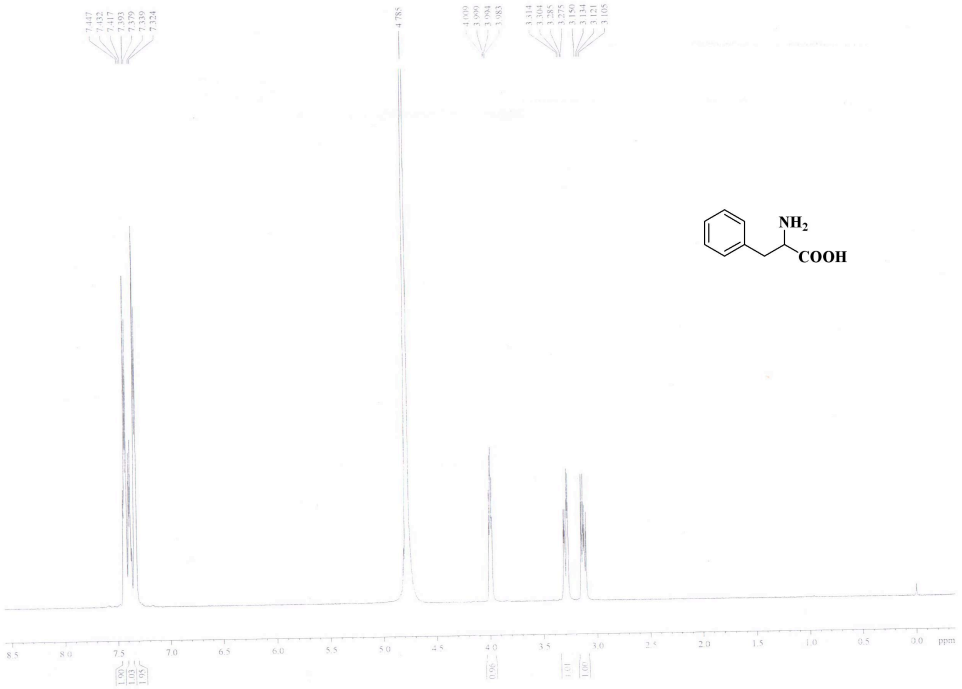
PULPROG                 zgpg30
TD                     65536
SOLVENT                  D2O
NS                        1024
DS                           4
SWH                31250.000 Hz
FIDRES                0.476837 Hz
AQ                    1.0486259 sec
RG                         181
DW                     16.000 usec
DE                      6.50 usec
TE                     298.0 K
D1                 2.00000000 sec
D11                0.03000000 sec
TD0                          1

======== CHANNEL f1 ========
NUC1                      13C
P1                       9.15 usec
PL1                      3.00 dB
PL1W              47.46149683 W
SFO1             125.7716224 MHz

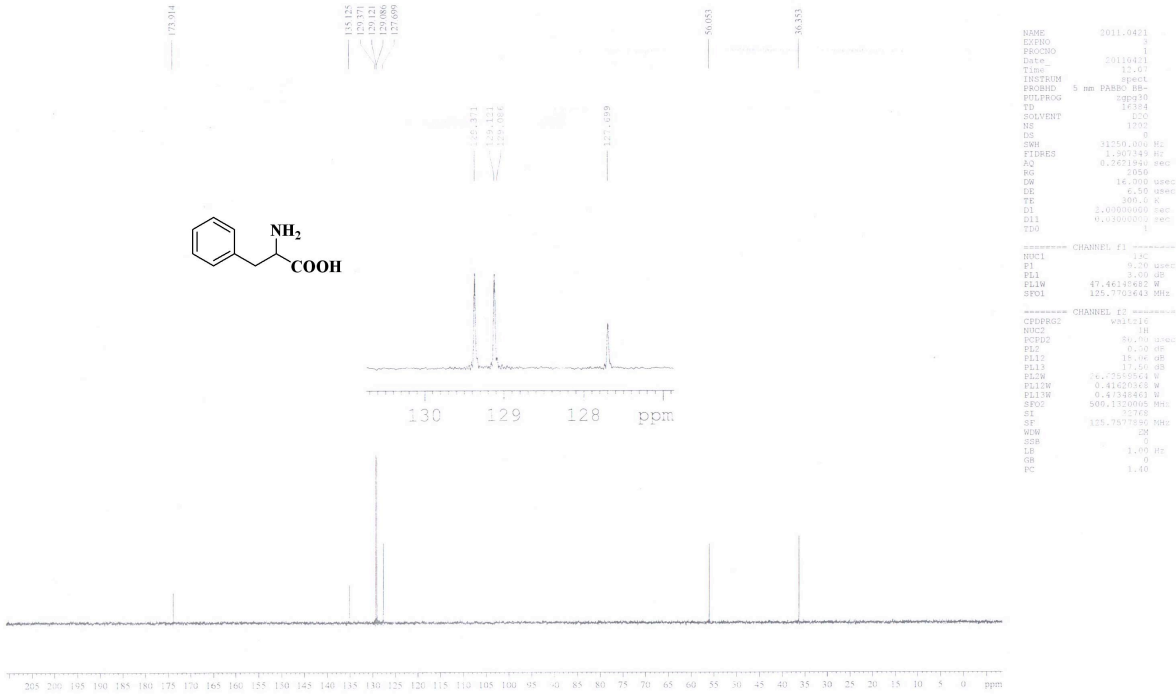
======== CHANNEL f2 ========
CPDPRG2                waltz16
NUC2                       1H
PCPD2                   80.00 usec
PL2                      0.00 dB
PL12                    18.42 dB
PL13                    17.50 dB
PL2W              26.62599564 W
PL12W              0.38309446 W
PL13W              0.47348461 W
SFO2             500.1320005 MHz
SI                         32768
SF               125.7577690 MHz
WDW                           EM
SSB                            0
LB                          1.00 Hz
GB                             0
PC                          1.40
```

liushouxin-Phe



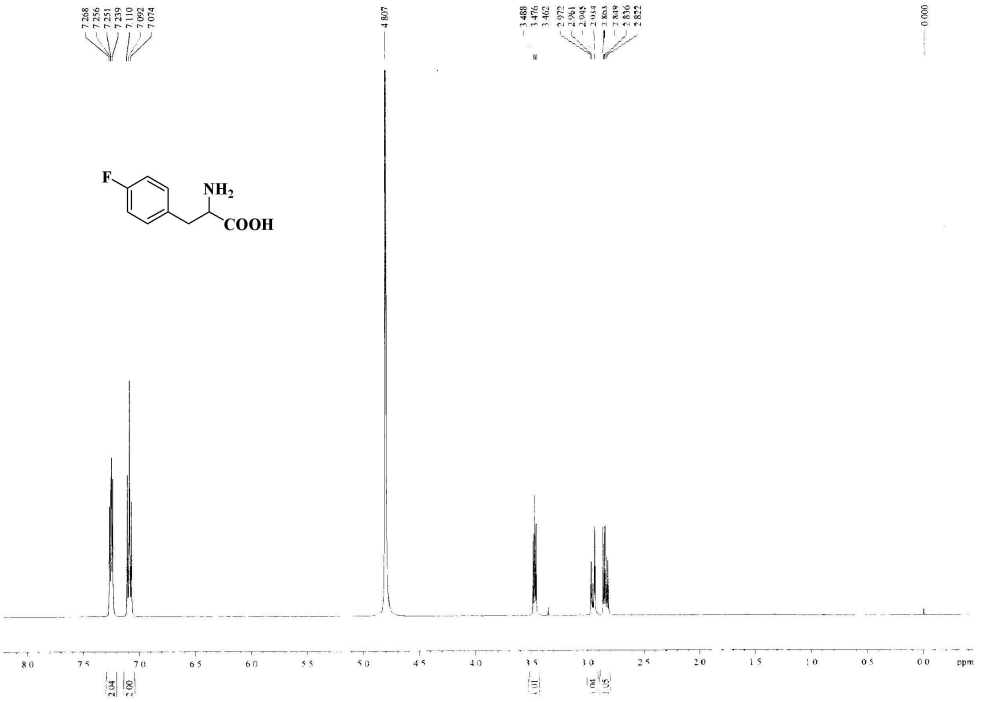
NAME	2011.0421
EXPNO	2
PROCNO	1
Date_	20110421
Time	11.46
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	32768
SOLVENT	D2O
NS	8
DS	0
SWH	5000.000 Hz
FIDRES	0.152588 Hz
AQ	3.2768500 sec
RG	90.5
DW	100.000 usec
DE	6.50 usec
TE	298.0 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	9.80 usec
PL1	0.00 dB
PL1W	26.625995564 W
SFO1	500.1322506 MHz
SI	32768
SF	500.1295597 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

liushouxin-Phe

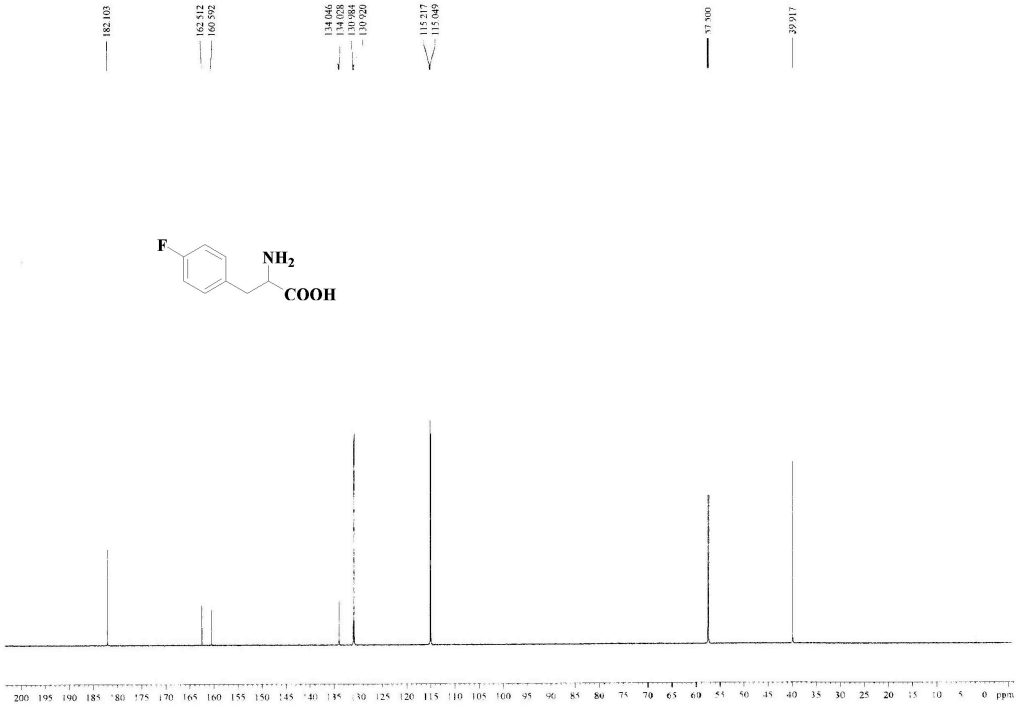


NAME	2011.0421
EXPNO	3
PROCNO	1
Date_	20110421
Time	12.67
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zgpg30
TD	16384
SOLVENT	D2O
NS	1292
DS	0
SWH	31250.000 Hz
FIDRES	1.907349 Hz
AQ	0.2621950 sec
RG	7056
DW	16.000 usec
DE	6.50 usec
TE	300.0 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.20 usec
PL1	3.00 dB
PL1W	47.46145682 W
SFO1	125.7703643 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	0.00 dB
PL12	18.06 dB
PL13	17.66 dB
PL2W	26.77550564 W
PL12W	0.41420568 W
PL13W	0.47348461 W
SFO2	500.1320005 MHz
SI	32768
SF	125.7577890 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

liushouxin-P-F-phe

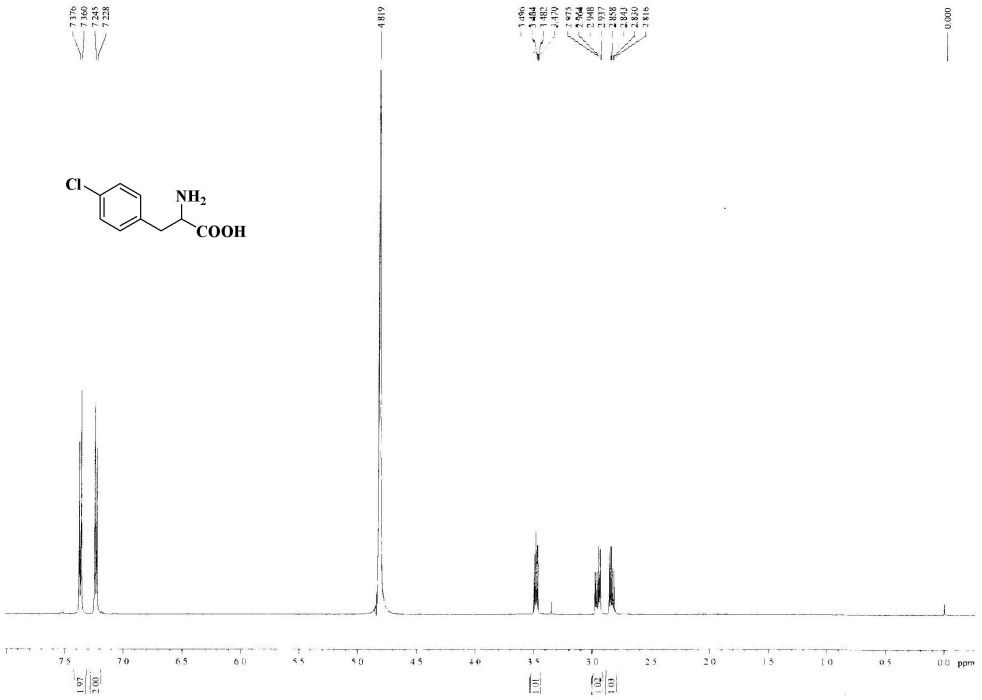


NAME	2010.0710
EXPNO	7
PROCNO	1
Date_	20100710
Time	16.25
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	32768
SOLVENT	D2O
NS	8
DS	0
SWH	5000.000 Hz
FIDRES	0.152588 Hz
AQ	3.2768500 sec
RG	287
DW	100.000 usec
DE	6.50 usec
TE	299.7 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	9.80 usec
PL1	0.00 dB
PL1W	26.62599564 W
SFO1	500.1322506 MHz
SI	65536
SF	500.1299564 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

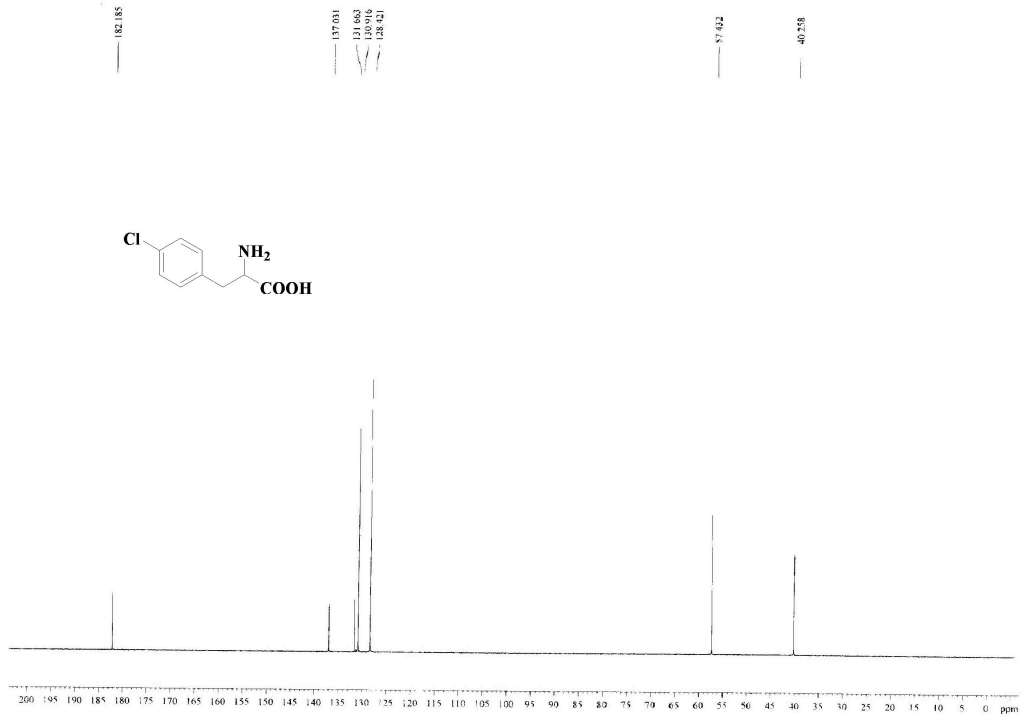


NAME	2010.0712
EXPNO	11
PROCNO	1
Date_	20100712
Time	10.05
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zgpg30
TD	65536
SOLVENT	D2O
NS	1248
DS	4
SWH	37894.738 Hz
FIDRES	0.578394 Hz
AQ	0.8961972 sec
RG	2050
DW	13.200 usec
DE	6.50 usec
TE	301.3 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.20 usec
PL1	3.00 dB
PL1W	47.46148682 W
SFO1	125.7735087 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	0.00 dB
PL12	18.06 dB
PL13	17.50 dB
PL2W	26.62599564 W
PL12W	0.41620368 W
PL13W	0.47348461 W
SFO2	500.1320005 MHz
SI	32768
SF	125.7577890 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

liushouxin-P-Cl-phe

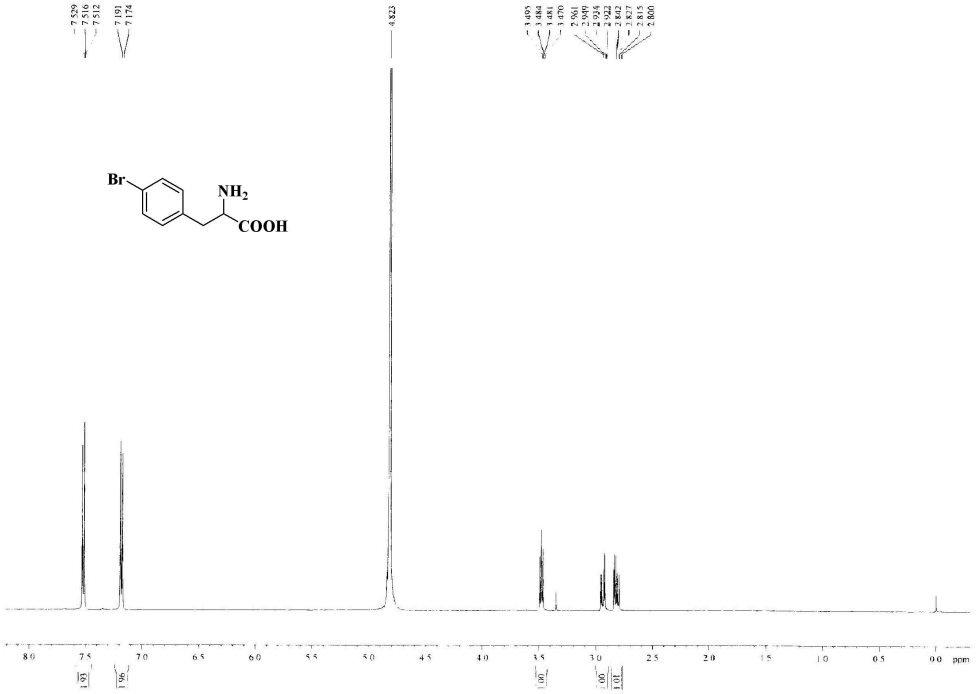


NAME	2010.0710
EXPNO	9
PROCNO	1
Date_	20100710
Time	16.42
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	32768
SOLVENT	D2O
NS	8
DS	0
SWH	5000.000 Hz
FIDRES	0.152588 Hz
AQ	3.2768500 sec
RG	322
DW	100.000 usec
DE	6.50 usec
TE	299.7 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	9.80 usec
PL1	0.00 dB
PL1W	26.62599564 W
SFO1	500.1322506 MHz
SI	65536
SF	500.1299522 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00



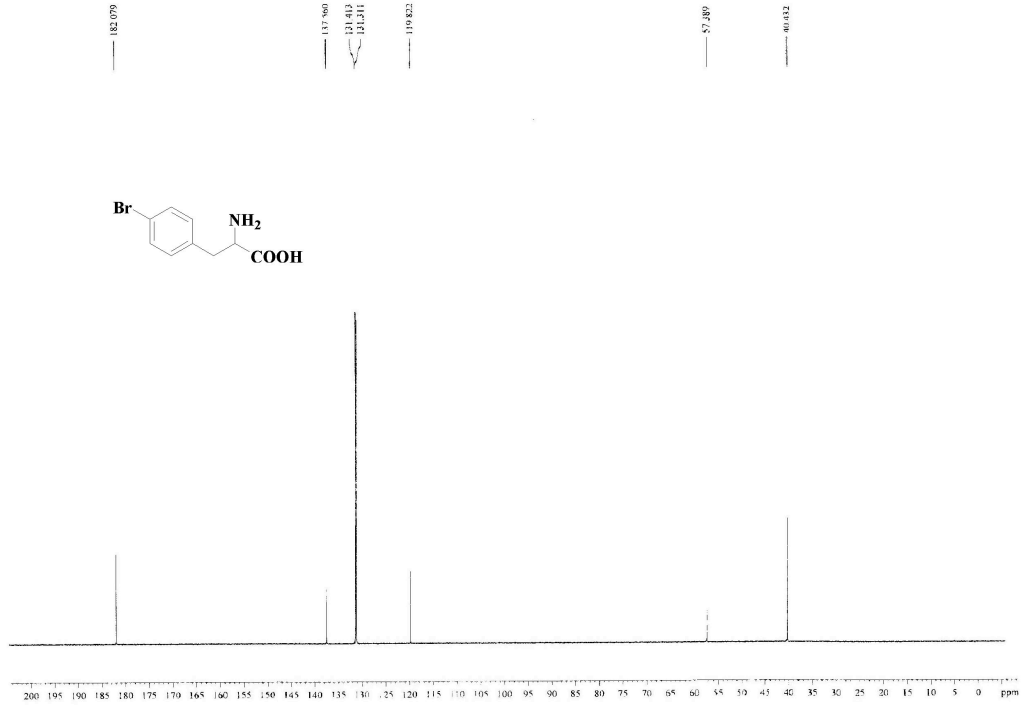
NAME	2010.0712
EXPNO	8
PROCNO	1
Date_	20100712
Time	21.31
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zgpg30
TD	65536
SOLVENT	D2O
NS	1315
DS	4
SWH	32894.738 Hz
FIDRES	0.501934 Hz
AQ	0.9961972 sec
RG	2050
DW	15.200 usec
DE	6.50 usec
TE	301.4 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.20 usec
PL1	3.00 dB
PL1W	47.46148662 W
SFO1	125.7735087 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	0.00 dB
PL12	18.06 dB
PL13	17.50 dB
PL2W	26.62599564 W
PL12W	0.41620368 W
PL13W	0.47388461 W
SFO2	500.1320005 MHz
SI	32768
SF	125.7577890 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

liushouxin-P-Br-phe




```
NAME                2010.0710
EXPNO                      10
PROCNO                      1
Date_                20100710
Time                    16.49
INSTRUM                  spect
PROBHD   5 mm PABBO BB-
PULPROG                  zg30
TD                      32768
SOLVENT                   D2O
NS                         16
DS                          0
SWH                5000.000 Hz
FIDRES                0.152588 Hz
AQ                 3.2768500 sec
RG                        362
DW                   100.000 usec
DE                     6.50 usec
TE                    299.6 K
D1                1.00000000 sec
TD0                         1

======== CHANNEL f1 ========
NUC1                       1H
P1                       9.80 usec
PL1                      0.00 dB
PL1W            26.62599564 W
SFO1            500.1322506 MHz
SI                      65536
SF              500.1299506 MHz
WDW                        EM
SSB                         0
LB                       0.30 Hz
GB                          0
PC                       1.00
```

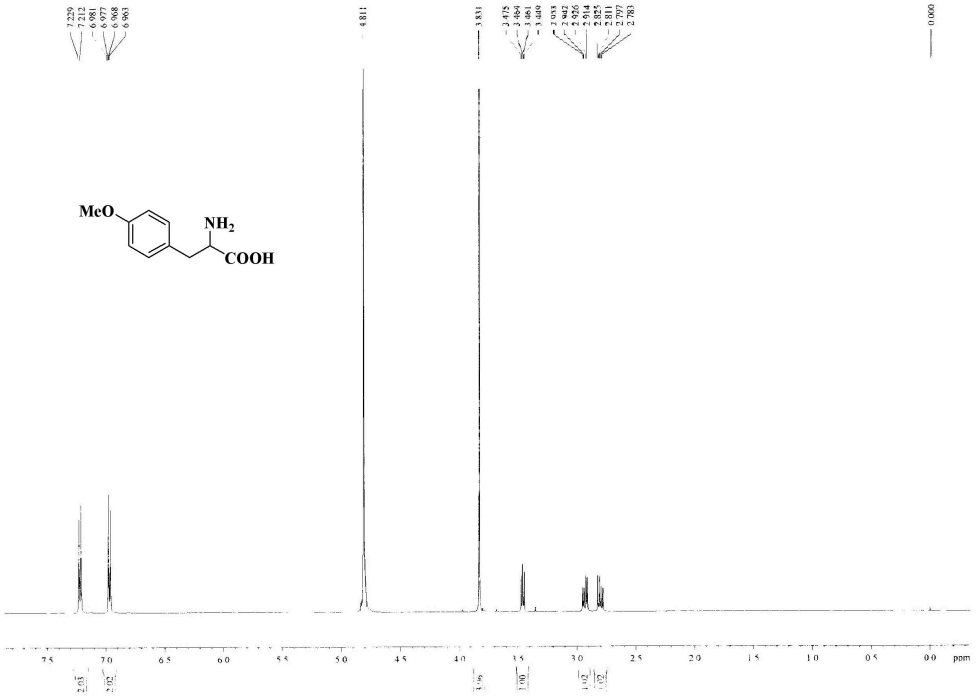



```
NAME                2010.0712
EXPNO                       9
PROCNO                      1
Date_                20100713
Time                    8.28
INSTRUM                  spect
PROBHD   5 mm PABBO BB-
PULPROG                zgpg30
TD                      65536
SOLVENT                   D2O
NS                        700
DS                          4
SWH                32894.738 Hz
FIDRES                0.501934 Hz
AQ                 0.9961972 sec
RG                       2050
DW                     15.200 usec
DE                     6.50 usec
TE                    300.9 K
D1                2.00000000 sec
D11               0.03000000 sec
TD0                         1

======== CHANNEL f1 ========
NUC1                      13C
P1                       9.20 usec
PL1                      3.00 dB
PL1W            47.46148682 W
SFO1            125.7735087 MHz

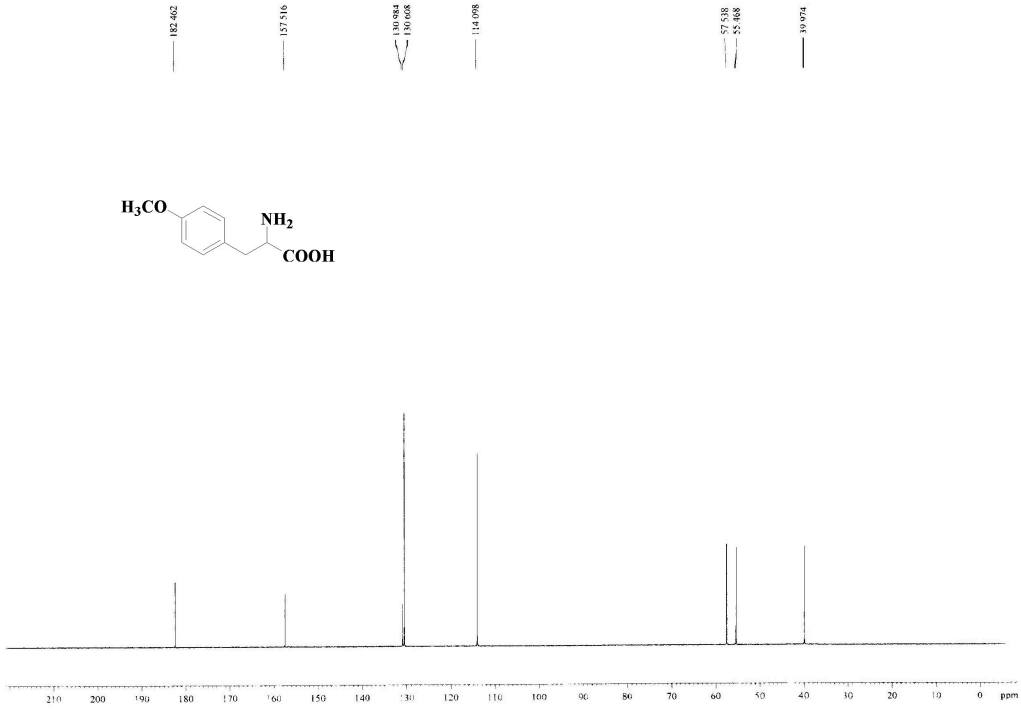
======== CHANNEL f2 ========
CPDPRG2                waltz16
NUC2                       1H
PCPD2                   80.00 usec
PL2                      0.00 dB
PL12                    18.06 dB
PL13                    17.50 dB
PL1W            26.62599564 W
PL12W            0.41670368 W
PL13W            0.47348161 W
SFO2            500.1320005 MHz
SI                      32768
SF              125.7577890 MHz
WDW                        EM
SSB                         0
LB                       1.00 Hz
GB                          0
PC                       1.40
```

liushouxin-P-MeO-phe




```
NAME                2010.0710
EXPNO                      11
PROCNO                      1
Date_                20100710
Time                    16.55
INSTRUM                 spect
PROBHD   5 mm PABBO BB-
PULPROG                 zg30
TD                     32768
SOLVENT                  D2O
NS                         8
DS                         0
SWH                5000.000 Hz
FIDRES                0.152588 Hz
AQ                 3.2768500 sec
RG                       256
DW                   100.000 usec
DE                      6.50 usec
TE                     299.5 K
D1                 1.00000000 sec
TD0                        1

======== CHANNEL f1 ========
NUC1                      1H
P1                      9.80 usec
PL1                     0.00 dB
PL1W               26.62599564 W
SFO1              500.1322506 MHz
SI                       65536
SF                500.1299549 MHz
WDW                         EM
SSB                          0
LB                        0.30 Hz
GB                           0
PC                        1.00
```

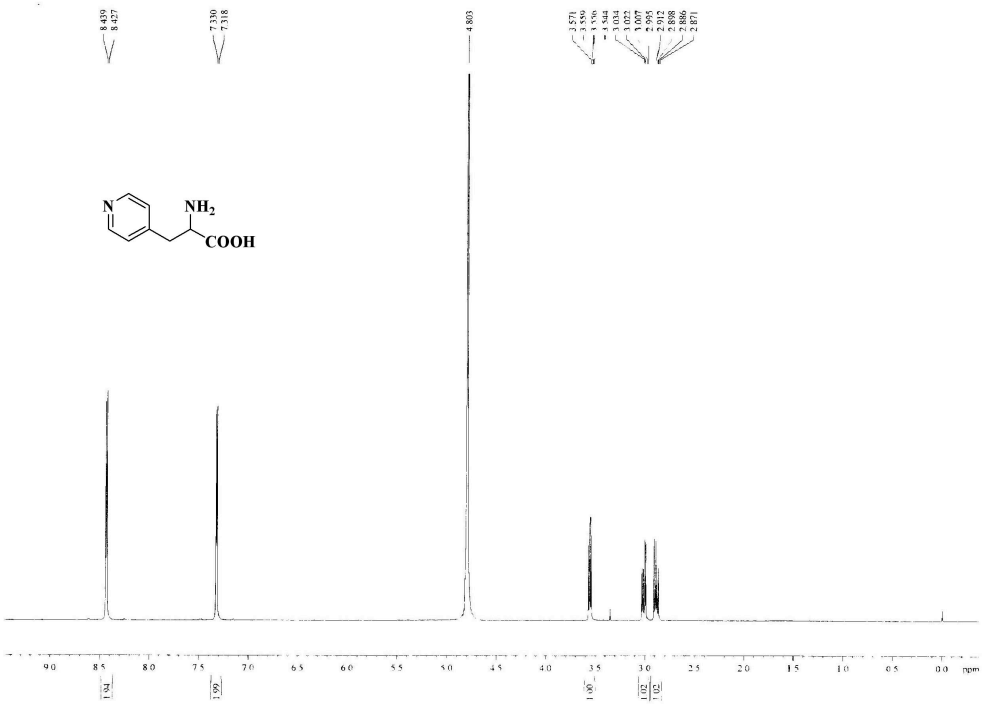



```
NAME                2010.0712
EXPNO                       7
PROCNO                      1
Date_                20100712
Time                    20.39
INSTRUM                 spect
PROBHD   5 mm PABBO BB-
PULPROG              zgpg30
TD                     65536
SOLVENT                  D2O
NS                         931
DS                         4
SWH               32894.738 Hz
FIDRES                0.501934 Hz
AQ                 0.9961972 sec
RG                      2050
DW                    15.200 usec
DE                      6.50 usec
TE                     301.4 K
D1                 2.00000000 sec
D11                0.03000000 sec
TD0                        1

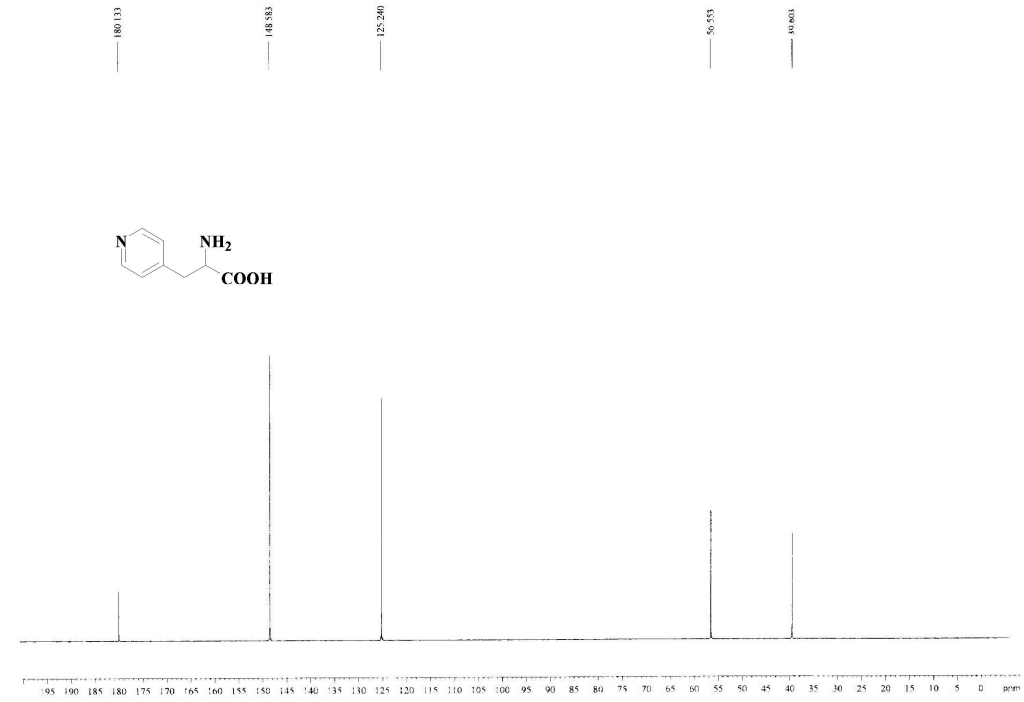
======== CHANNEL f1 ========
NUC1                      13C
P1                      9.20 usec
PL1                     3.00 dB
PL1W               45.46148682 W
SFO1              125.7735087 MHz

======== CHANNEL f2 ========
CPDPRG2                waltz16
NUC2                       1H
PCPD2                  80.00 usec
PL2                     0.00 dB
PL12                   18.06 dB
PL13                   17.50 dB
PL2W               26.62599564 W
PL12W               0.41420365 W
PL13W               0.47348461 W
SFO2              500.1320005 MHz
SI                       32768
SF                125.7577860 MHz
WDW                         EM
SSB                          0
LB                        1.00 Hz
GB                           0
PC                        1.40
```

liushouxin-P-pyr

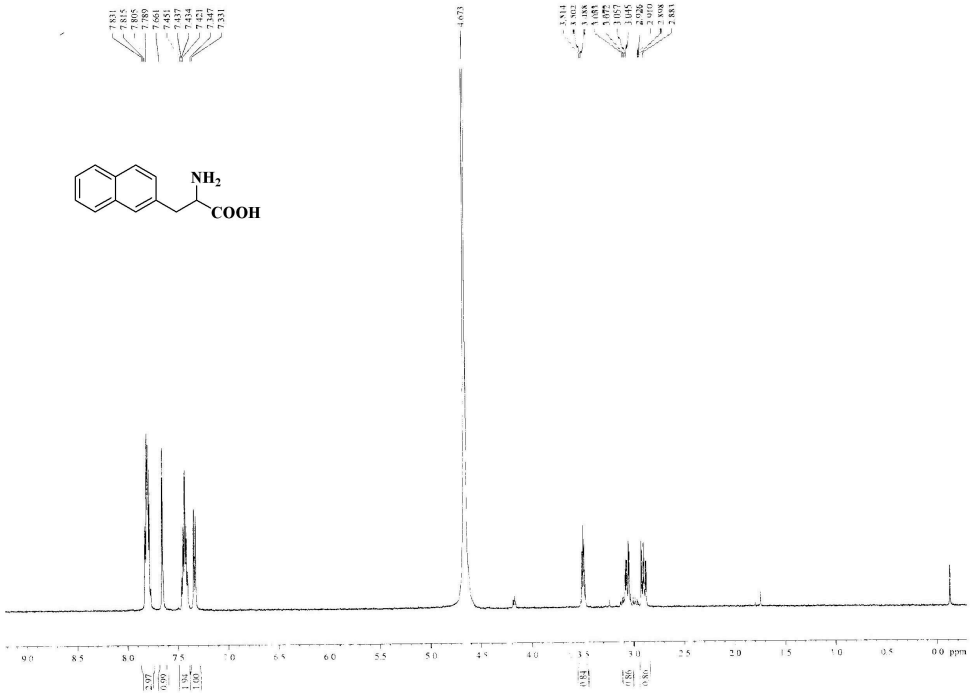


NAME	2010.0710
EXPNO	8
PROCNO	1
Date_	20100710
Time	16.33
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	32768
SOLVENT	D2O
NS	8
DS	0
SWH	5000.000 Hz
FIDRES	0.152588 Hz
AQ	3.2768500 sec
RG	322
DW	100.000 usec
DE	6.50 usec
TE	299.6 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	9.80 usec
PL1	0.00 dB
PL1W	26.62599564 W
SFO1	500.1322506 MHz
SI	65536
SF	500.1299571 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00



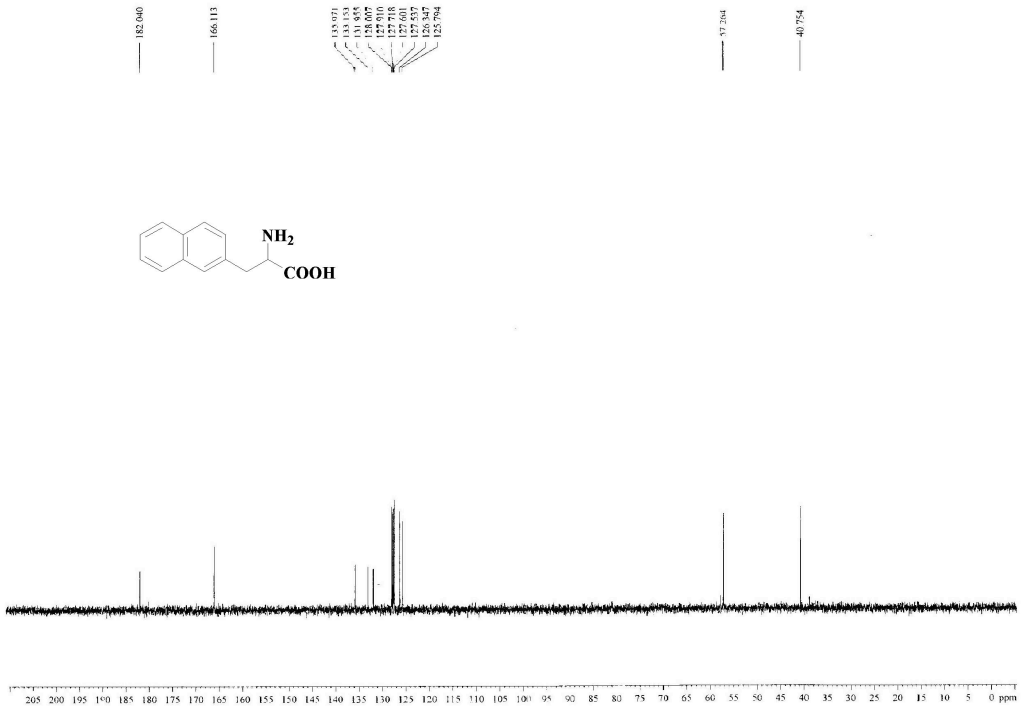
NAME	2010.0712
EXPNO	10
PROCNO	1
Date_	20100713
Time	9.10
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zgpg30
TD	65536
SOLVENT	D2O
NS	701
DS	4
SWH	32894.738 Hz
FIDRES	0.501934 Hz
AQ	0.9961972 sec
RG	2050
DW	15.200 usec
DE	6.50 usec
TE	301.1 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.20 usec
PL1	3.00 dB
PL1W	47.46148682 W
SFO1	125.7735087 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	0.00 dB
PL12	18.06 dB
PL13	17.50 dB
PL2W	26.62599564 W
PL12W	0.41620368 W
PL13W	0.47348461 W
SFO2	500.1320005 MHz
SI	32768
SF	125.7577890 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

liushouxin--N-B 苯丙氨酸




```
NAME                 2011.0329
EXPNO                        8
PROCNO                       1
Date_                20110329
Time                     14.59
INSTRUM                  spect
PROBHD     5 mm PABBO BB-
PULPROG                  zg30
TD                      32768
SOLVENT                   D2O
NS                           8
DS                           0
SWH                5000.000 Hz
FIDRES                0.152588 Hz
AQ                 3.27685000 sec
RG                        90.5
DW                  100.000 usec
DE                    6.50 usec
TE                     298.0 K
D1                 1.00000000 sec
TD0                          1

======== CHANNEL f1 ========
NUC1                        1H
P1                        9.80 usec
PL1                       0.00 dB
PL1W             26.62599564 W
SFO1             500.1322506 MHz
SI                       32768
SF               500.1300161 MHz
WDW                         EM
SSB                          0
LB                        0.30 Hz
GB                           0
PC                        1.00
```

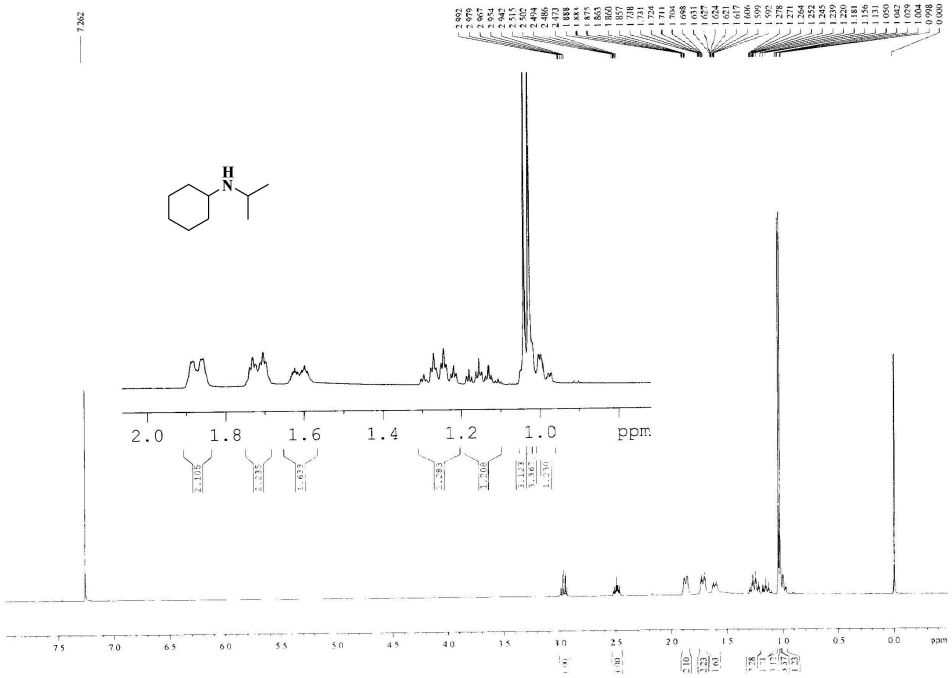



```
NAME                 2011.0330
EXPNO                        8
PROCNO                       1
Date_                20110330
Time                     18.25
INSTRUM                  spect
PROBHD     5 mm PABBO BB-
PULPROG                zgpg30
TD                      16384
SOLVENT                   D2O
NS                        4781
DS                           0
SWH                29761.904 Hz
FIDRES                1.816522 Hz
AQ                 0.27530112 sec
RG                        2050
DW                   16.800 usec
DE                    6.50 usec
TE                     298.0 K
D1                 2.00000000 sec
D11                0.03000000 sec
TD0                          1

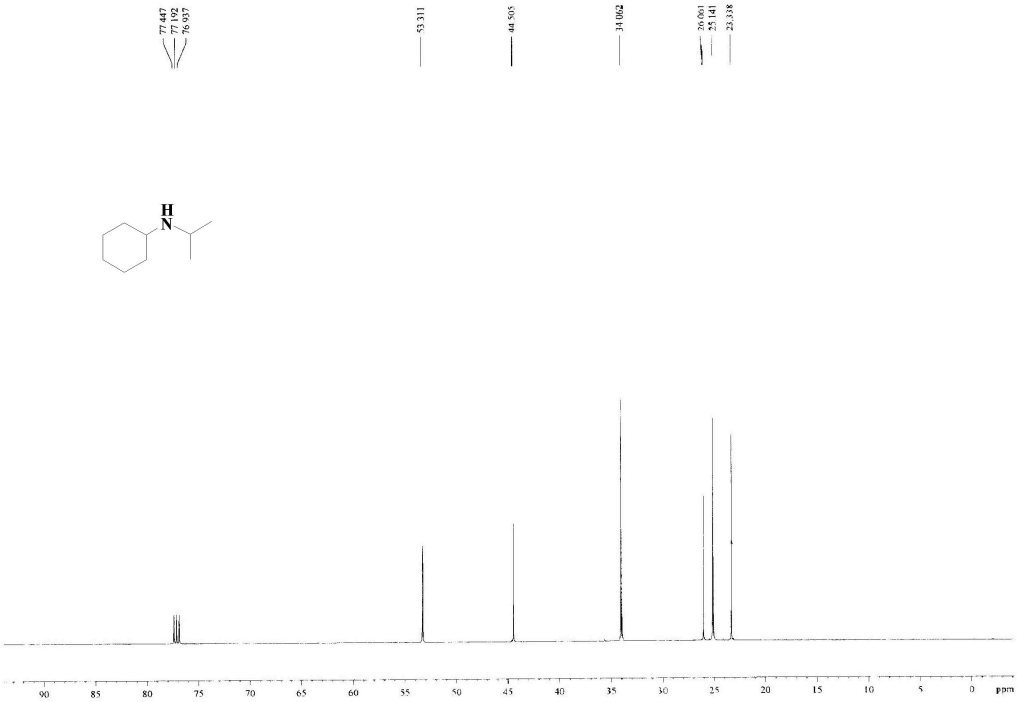
======== CHANNEL f1 ========
NUC1                       13C
P1                        9.20 usec
PL1                       3.00 dB
PL1W             47.46148682 W
SFO1             125.7703643 MHz

======== CHANNEL f2 ========
CPDPRG2                 waltz
NUC2                        1H
PCPD2                    80.00 usec
PL2                       0.00 dB
PL12                     18.06 dB
PL13                     17.50 dB
PL2W             26.62599564 W
PL12W             0.41620368 W
PL13W             0.47348461 W
SFO2             500.1320005 MHz
SI                       32768
SF               125.7577890 MHz
WDW                         EM
SSB                          0
LB                        1.00 Hz
GB                           0
PC                        1.40
```

liushouxin-HJN

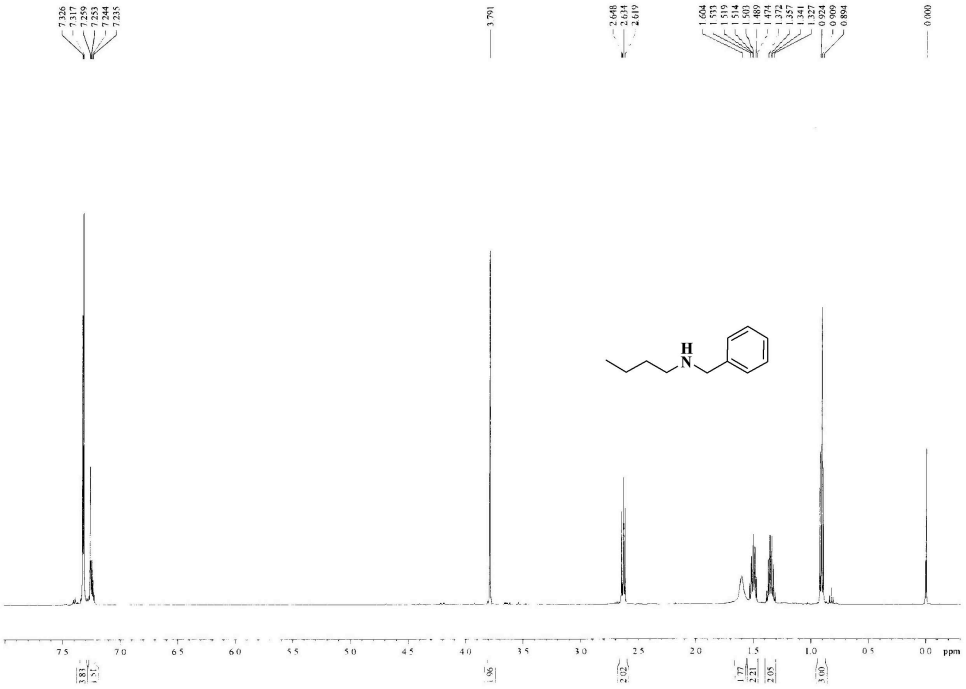


NAME	2010.0624
EXPNO	5
PROCNO	1
Date_	20100624
Time	11.46
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	32768
SOLVENT	CDCl3
NS	16
DS	0
SWH	5000.000 Hz
FIDRES	0.152588 Hz
AQ	3.2768500 sec
RG	406
DW	100.000 usec
DE	6.50 usec
TE	299.2 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	9.80 usec
PL1	0.00 dB
PL1W	26.62599564 W
SFO1	500.1322506 MHz
SI	65536
SF	500.1300126 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

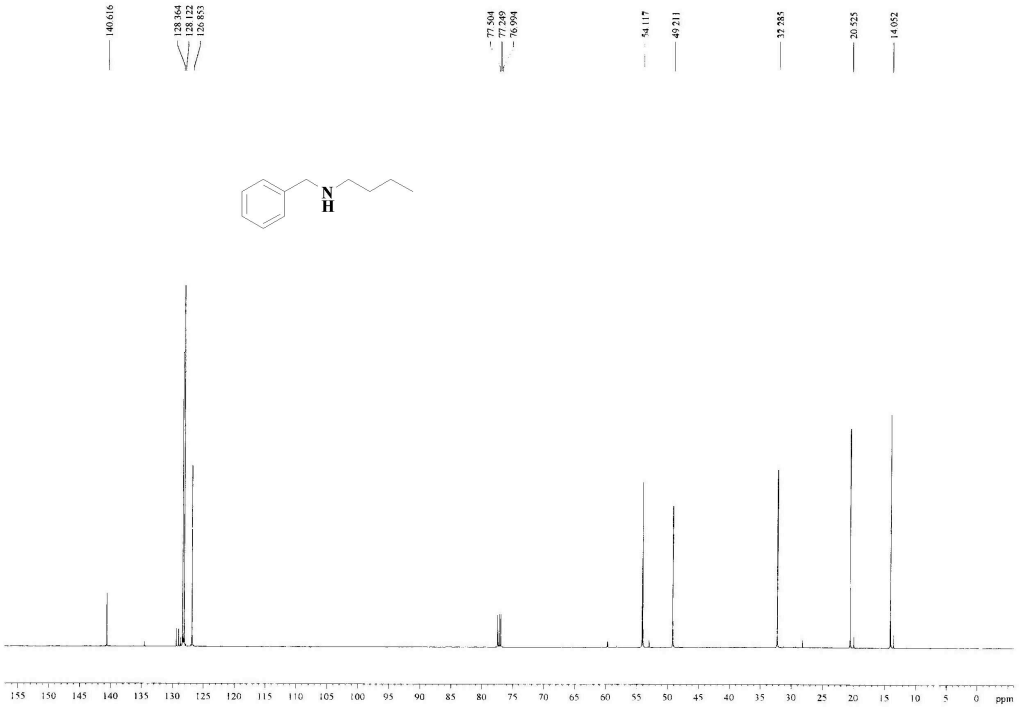


NAME	2010.0612
EXPNO	11
PROCNO	1
Date_	20100612
Time	12.51
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	512
DS	4
SWH	32894.738 Hz
FIDRES	0.501934 Hz
AQ	0.9961972 sec
RG	2050
DW	15.200 usec
DE	6.50 usec
TE	299.9 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.20 usec
PL1	3.00 dB
PL1W	47.46148682 W
SFO1	125.7728799 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	0.00 dB
PL12	18.06 dB
PL13	17.50 dB
PL2W	26.62599564 W
PL12W	0.41620368 W
PL13W	0.47348461 W
SFO2	500.1320005 MHz
SI	32768
SF	125.7577890 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

liushouxin-N-DJBJA

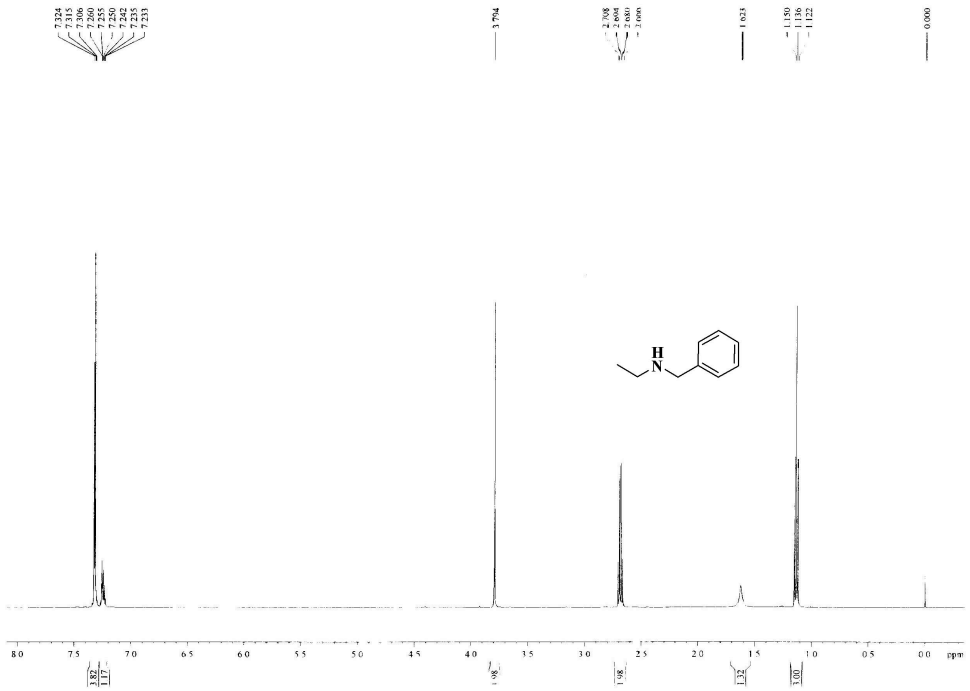


NAME	2010.0624
EXPNO	1
PROCNO	1
Date_	20100624
Time	10.03
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	32768
SOLVENT	CDCl3
NS	8
DS	0
SWH	5000.000 Hz
FIDRES	0.152588 Hz
AQ	3.2768500 sec
RG	287
DW	100.000 usec
DE	6.50 usec
TE	298.0 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	9.80 usec
PL1	0.00 dB
PL1W	26.62599564 W
SFO1	500.1322506 MHz
SI	65536
SF	500.1300142 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00



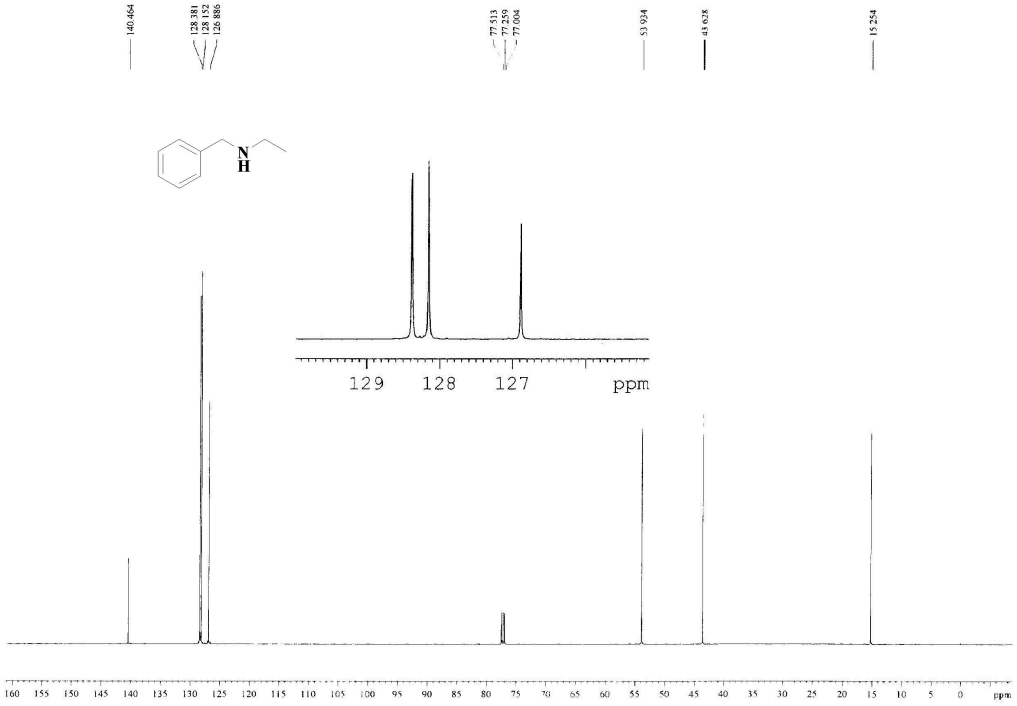
NAME	2010.0611
EXPNO	2
PROCNO	1
Date_	20100611
Time	8.22
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	496
DS	4
SWH	32894.738 Hz
FIDRES	0.501934 Hz
AQ	0.9961972 sec
RG	2050
DW	15.200 usec
DE	6.50 usec
TE	299.5 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.20 usec
PL1	3.00 dB
PL1W	47.46148682 W
SFO1	125.7728799 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	0.00 dB
PL12	18.06 dB
PL13	17.50 dB
PL2W	26.62599564 W
PL12W	0.41620368 W
PL13W	0.47348461 W
SFO2	500.1320005 MHz
SI	32768
SF	125.7577890 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

liushouxin-N-YJBA




```
NAME                 2010.0621
EXPNO                        9
PROCNO                       1
Date_                 20100621
Time                     12.07
INSTRUM                  spect
PROBHD     5 mm PABBO BB-
PULPROG                  zg30
TD                      32768
SOLVENT                 CDCl3
NS                           8
DS                           0
SWH                5000.000 Hz
FIDRES                0.152588 Hz
AQ                    3.2768500 sec
RG                         161
DW                     100.000 usec
DE                       6.50 usec
TE                      298.9 K
D1                 1.00000000 sec
TD0                          1

======== CHANNEL f1 ========
NUC1                        1H
P1                        9.80 usec
PL1                       0.00 dB
PL1W             26.62599564 W
SFO1             500.1322506 MHz
SI                       65536
SF               500.1300158 MHz
WDW                         EM
SSB                          0
LB                        0.30 Hz
GB                           0
PC                        1.00
```

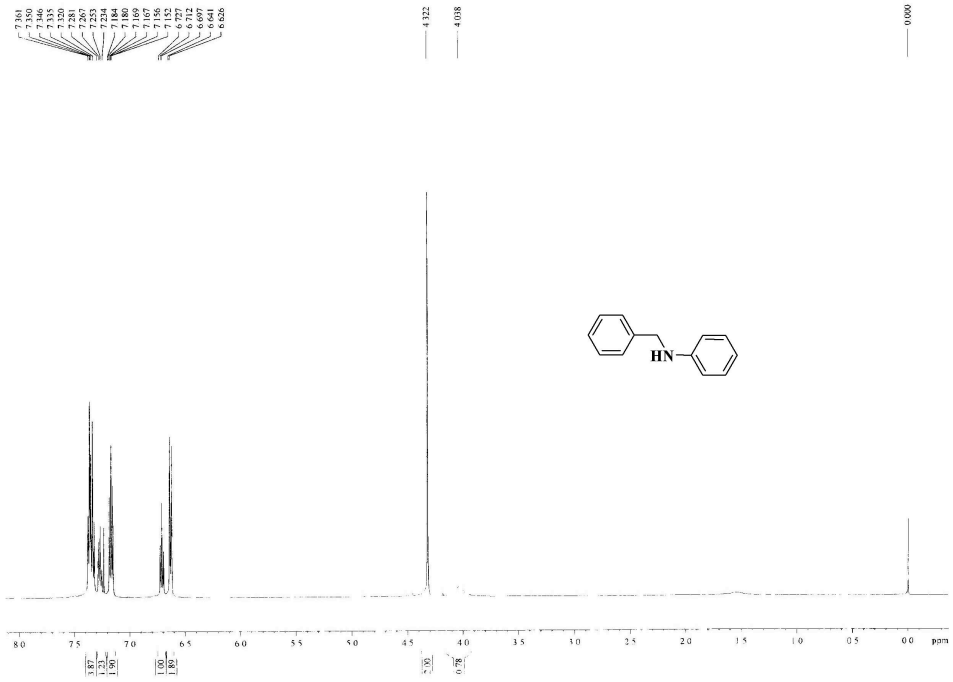



```
NAME                 2010.0611
EXPNO                        5
PROCNO                       1
Date_                 20100611
Time                     9.05
INSTRUM                  spect
PROBHD     5 mm PABBO BB-
PULPROG                 zgpg30
TD                      65536
SOLVENT                 CDCl3
NS                         481
DS                           4
SWH                32894.738 Hz
FIDRES                0.501934 Hz
AQ                    0.9961972 sec
RG                        2050
DW                      15.200 usec
DE                       6.50 usec
TE                      299.6 K
D1                 2.00000000 sec
D11                0.03000000 sec
TD0                          1

======== CHANNEL f1 ========
NUC1                       13C
P1                        9.20 usec
PL1                       3.00 dB
PL1W             87.46148682 W
SFO1             125.7728799 MHz

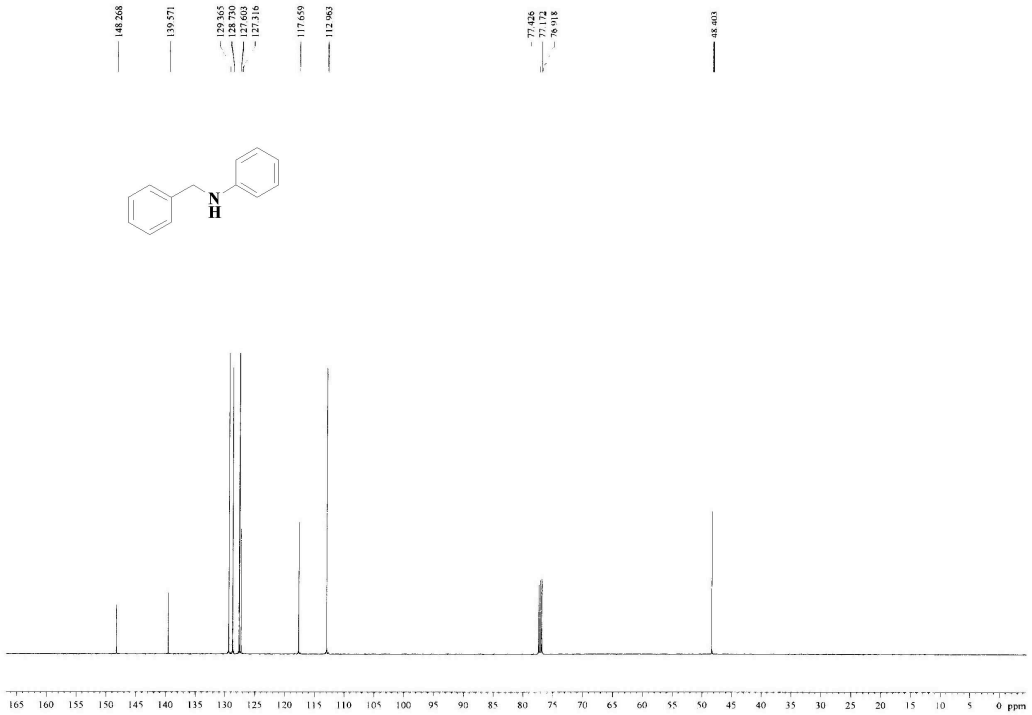
======== CHANNEL f2 ========
CPDPRG2                waltz16
NUC2                        1H
PCPD2                    80.00 usec
PL2                       0.00 dB
PL12                     18.06 dB
PL13                     17.50 dB
PL2W             26.62599564 W
PL12W             0.41620368 W
PL13W             0.47348461 W
SFO2             500.1320005 MHz
SI                       32768
SF               125.7577890 MHz
WDW                         EM
SSB                          0
LB                        1.00 Hz
GB                           0
PC                        1.40
```

liushouxin-BBA




```
NAME                2010.0621
EXPNO                       3
PROCNO                      1
Date_              20100621
Time                   10.07
INSTRUM                spect
PROBHD     5 mm PABBO BB-
PULPROG                zg30
TD                    32768
SOLVENT               CDCl3
NS                          8
DS                          0
SWH                5000.000 Hz
FIDRES                0.152588 Hz
AQ                    3.2768500 sec
RG                        203
DW                    100.000 usec
DE                      6.50 usec
TE                    298.0 K
D1                    1.00000000 sec
TD0                         1

======== CHANNEL f1 ========
NUC1                       1H
P1                      9.80 usec
PL1                     0.00 dB
PL1W           26.62599564 W
SFO1           500.1322506 MHz
SI                      65536
SF             500.1300266 MHz
WDW                        EM
SSB                         0
LB                      0.30 Hz
GB                          0
PC                      1.00
```

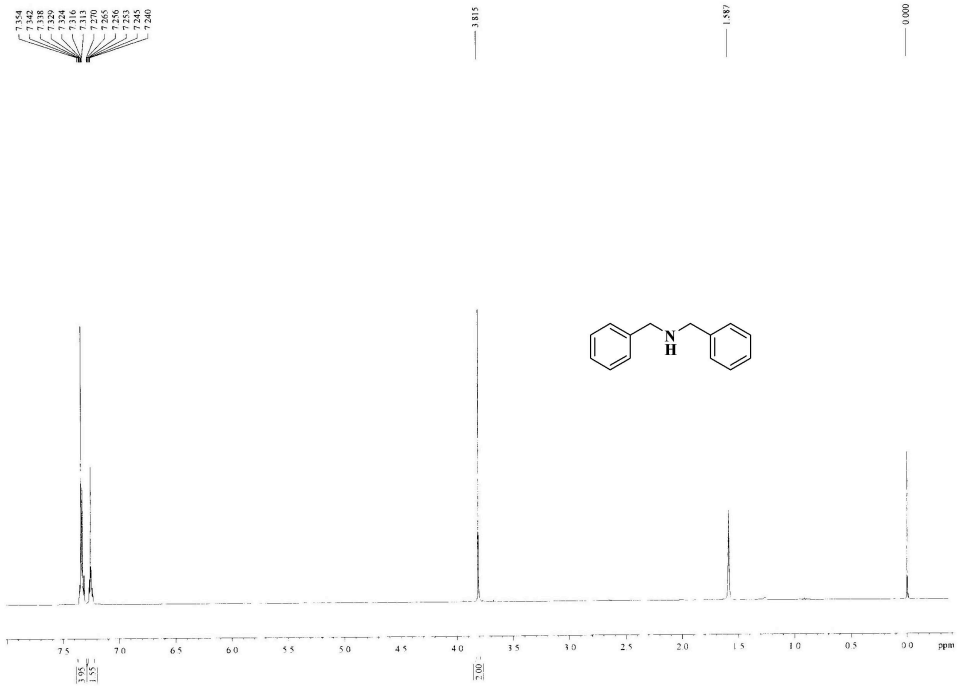



```
NAME                2010.0612
EXPNO                      18
PROCNO                      1
Date_              20100612
Time                   17.28
INSTRUM                spect
PROBHD     5 mm PABBO BB-
PULPROG             zgpg30
TD                    65536
SOLVENT               CDCl3
NS                        512
DS                          4
SWH                29761.904 Hz
FIDRES                0.454131 Hz
AQ                    1.1010548 sec
RG                       2050
DW                    16.800 usec
DE                      6.50 usec
TE                    300.4 K
D1                    2.00000000 sec
D11                   0.03000000 sec
TD0                         1

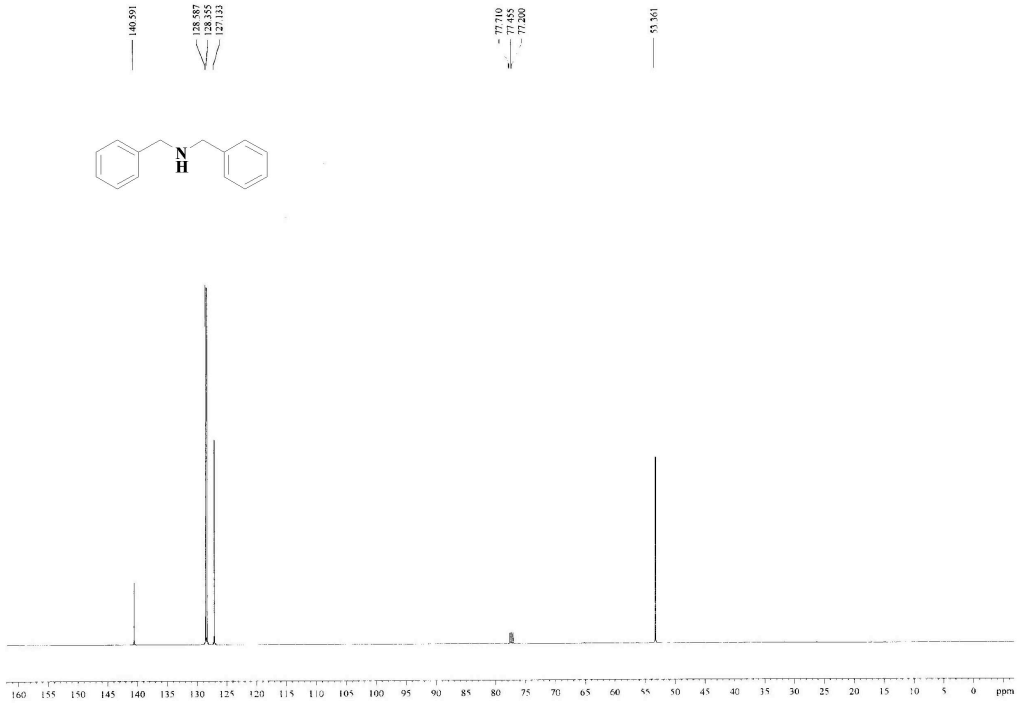
======== CHANNEL f1 ========
NUC1                      13C
P1                      9.20 usec
PL1                     3.00 dB
PL1W           47.46148682 W
SFO1           125.7703643 MHz

======== CHANNEL f2 ========
CPDPRG2                waltz16
NUC2                       1H
PCPD2                  80.00 usec
PL2                     0.00 dB
PL12                   18.06 dB
PL13                   17.50 dB
PL2W           26.62599564 W
PL12W          0.41620368 W
PL13W          0.47348461 W
SFO2           500.1320005 MHz
SI                      32768
SF             125.7577890 MHz
WDW                        EM
SSB                         0
LB                      1.00 Hz
GB                          0
PC                      1.40
```

liushouxin-EBA

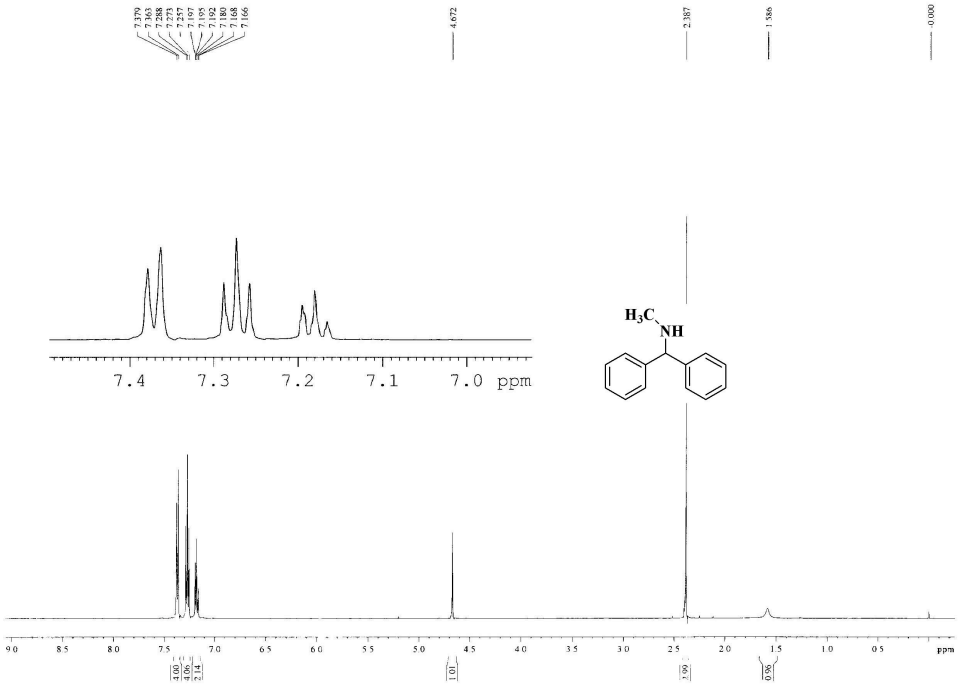


NAME	2010.0624
EXPNO	4
PROCNO	1
Date_	20100624
Time	11.31
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	32768
SOLVENT	CDCl3
NS	16
DS	0
SWH	5000.000 Hz
FIDRES	0.152588 Hz
AQ	3.2768500 sec
RG	406
DW	100.000 usec
DE	6.50 usec
TE	298.9 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	9.80 usec
PL1	0.00 dB
PL1W	26.62599564 W
SFO1	500.1322506 MHz
SI	65536
SF	500.1300154 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

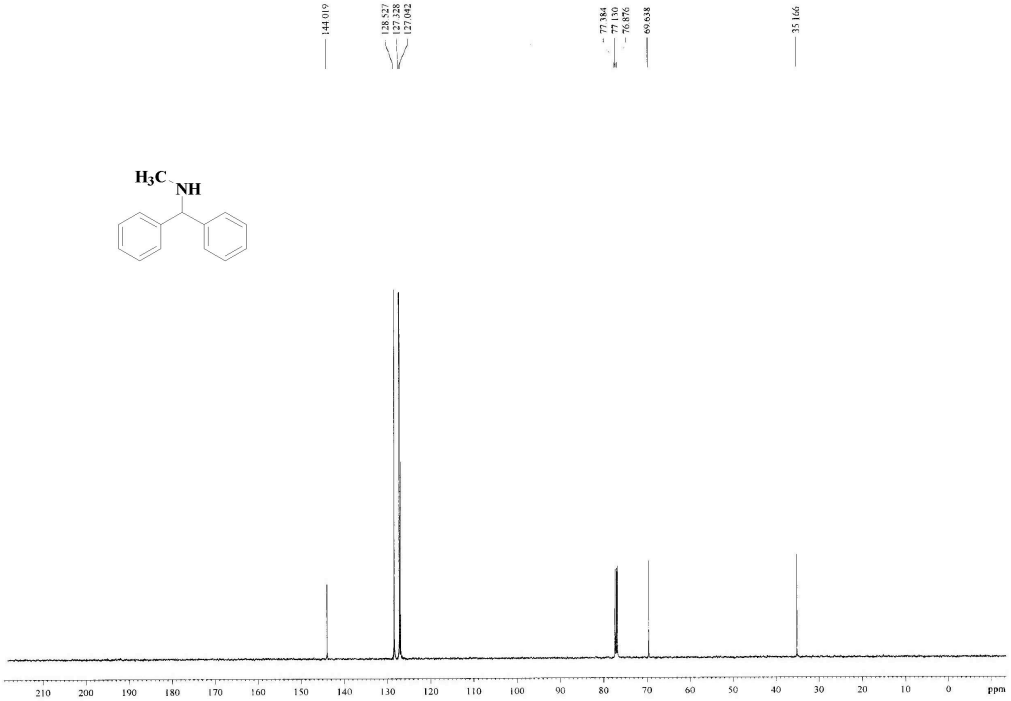


NAME	2010.0612
EXPNO	7
PROCNO	1
Date_	20100612
Time	10.47
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	787
DS	4
SWH	32894.738 Hz
FIDRES	0.501934 Hz
AQ	0.9961972 sec
RG	2050
DW	15.200 usec
DE	6.50 usec
TE	299.7 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	9.20 usec
PL1	3.00 dB
PL1W	47.46148682 W
SFO1	125.7728799 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	0.00 dB
PL12	18.06 dB
PL13	17.50 dB
PL2W	26.62599564 W
PL12W	0.41620368 W
PL13W	0.47348461 W
SFO2	500.1320005 MHz
SI	32768
SF	125.7577890 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

liushouxin-14683-47-7

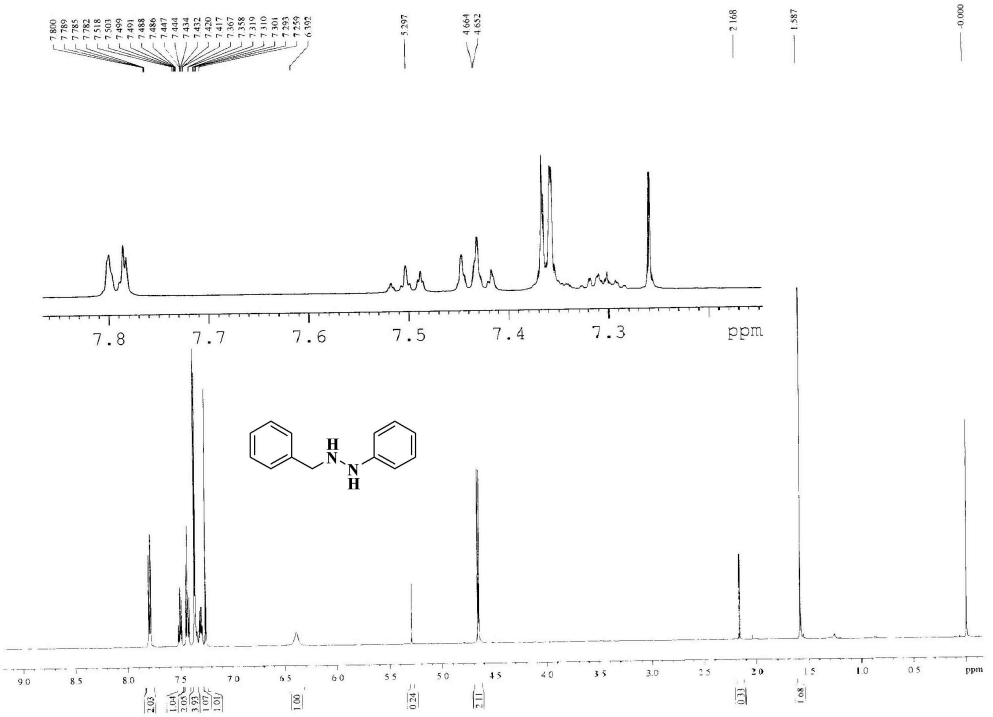


NAME	2010.0406
EXPNO	8
PROCNO	1
Date_	20100406
Time_	11.16
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	32768
SOLVENT	CDCl3
NS	1
DS	0
SWH	7500.000 Hz
FIDRES	0.228882 Hz
AQ	2.1845834 sec
RG	1
DW	66.667 usec
DE	6.50 usec
TE	298.0 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	9.80 usec
PL1	0.00 dB
PL1W	26.62599564 W
SFO1	500.1322506 MHz
SI	32768
SF	500.1300474 MHz
WDW	EM
SSB	0
LB	0.00 Hz
GB	0
PC	1.00



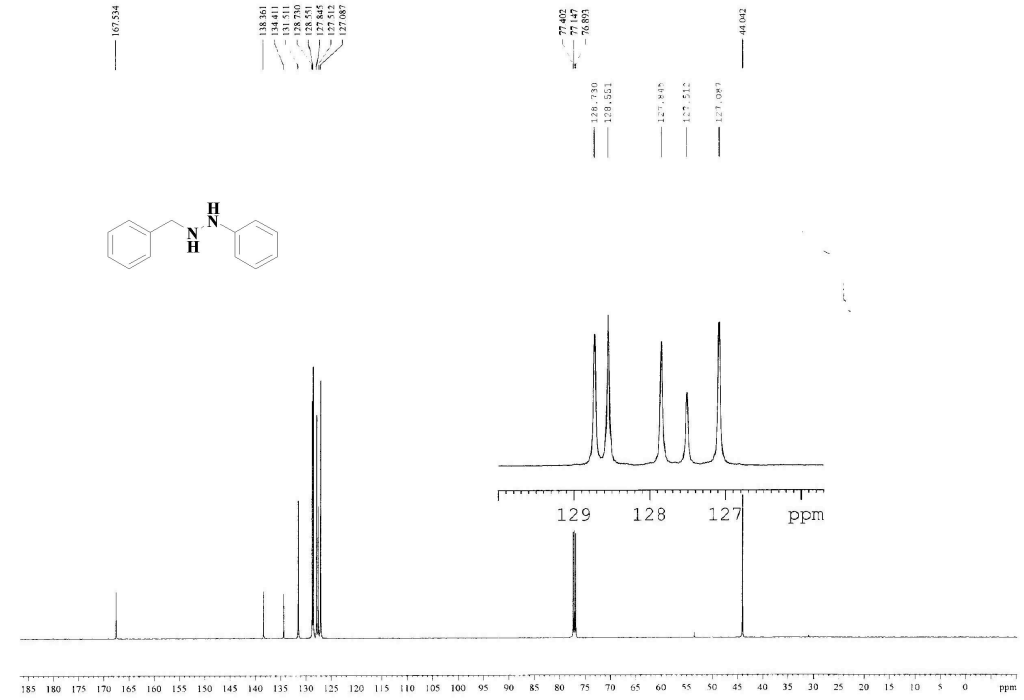
NAME	2010.0406
EXPNO	9
PROCNO	1
Date_	20100406
Time_	11.25
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zgpg30
TD	16384
SOLVENT	CDCl3
NS	64
DS	0
SWH	29761.904 Hz
FIDRES	1.816522 Hz
AQ	0.2753012 sec
RG	2050
DW	16.800 usec
DE	6.50 usec
TE	298.1 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P2	9.20 usec
PL1	3.00 dB
PL1W	47.46148682 W
SFO1	125.7703643 MHz
======== CHANNEL f2 ========	
CPDBRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	0.00 dB
PL12	18.06 dB
PL13	17.50 dB
PL2W	26.62599564 W
PL12W	0.41620368 W
PL13W	0.47344461 W
SFO2	500.1320005 MHz
SI	32768
SF	125.7577890 MHz
WDW	EM
SSB	0
LB	3.00 Hz
GB	0
PC	1.40

liushouxin-m




```
NAME                2010.0331
EXPNO                       6
PROCNO                      1
Date_              20100331
Time_                   9.14
INSTRUM                spect
PROBHD  5 mm PABBO BB-
PULPROG                 zg30
TD                     32768
SOLVENT                CDCl3
NS                          8
DS                          0
SWH             10000.000 Hz
FIDRES              0.305176 Hz
AQ                  1.6384500 sec
RG                        362
DW                   50.000 usec
DE                    6.50 usec
TE                   298.0 K
D1                  1.00000000 sec
TD0                         1

======== CHANNEL f1 ========
NUC1                      1H
P1                     9.80 usec
PL1                    0.00 dB
PL1W            26.62599564 W
SFO1           500.1322506 MHz
SI                     65536
SF             500.1300137 MHz
WDW                       EM
SSB                        0
LB                    0.30 Hz
GB                         0
PC                      1.00
```

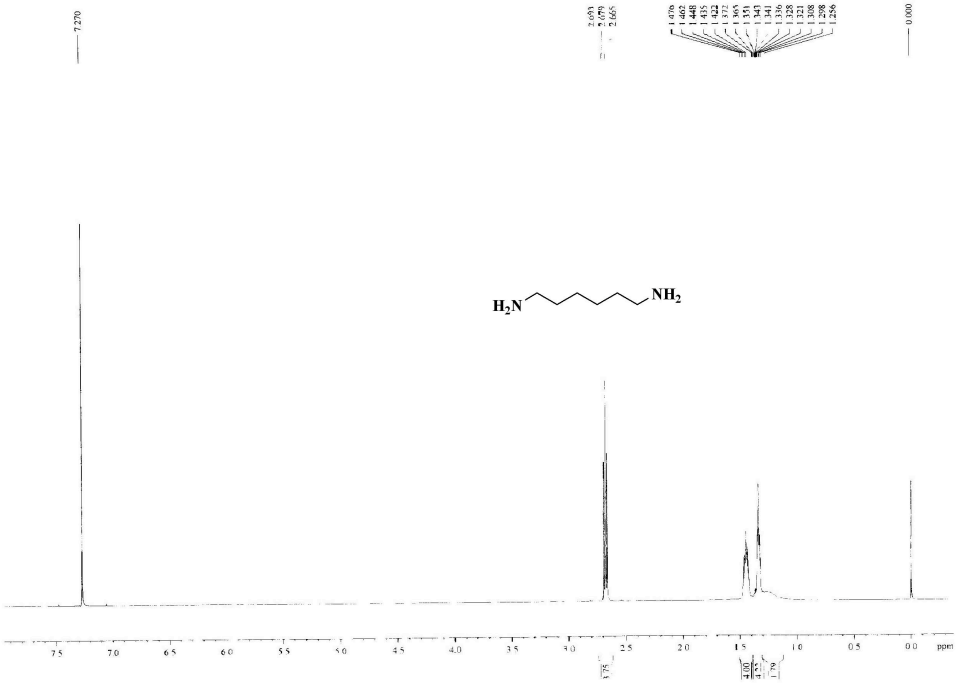



```
NAME                2010.0402
EXPNO                      13
PROCNO                      1
Date_              20100403
Time_                   8.44
INSTRUM                spect
PROBHD  5 mm PABBO BB-
PULPROG                zgpg30
TD                     16384
SOLVENT                CDCl3
NS                       2275
DS                          4
SWH             29761.904 Hz
FIDRES              1.816522 Hz
AQ                  0.2753012 sec
RG                       90.5
DW                   16.800 usec
DE                    6.50 usec
TE                   298.0 K
D1                  1.50000000 sec
D11                 0.03000000 sec
TD0                         1

======== CHANNEL f1 ========
NUC1                      13C
P1                     9.20 usec
PL1                    3.00 dB
PL1W            47.46148682 W
SFO1           125.7703643 MHz

======== CHANNEL f2 ========
CPDPRG2                waltz16
NUC2                       1H
PCPD2                 80.00 usec
PL2                    0.00 dB
PL12                  18.06 dB
PL13                  17.50 dB
PL2W            26.62599564 W
PL12W           0.41620368 W
PL13W           0.47348461 W
SFO2           500.1320005 MHz
SI                     32768
SF             125.7577890 MHz
WDW                       EM
SSB                        0
LB                    3.00 Hz
GB                         0
PC                      1.40
```

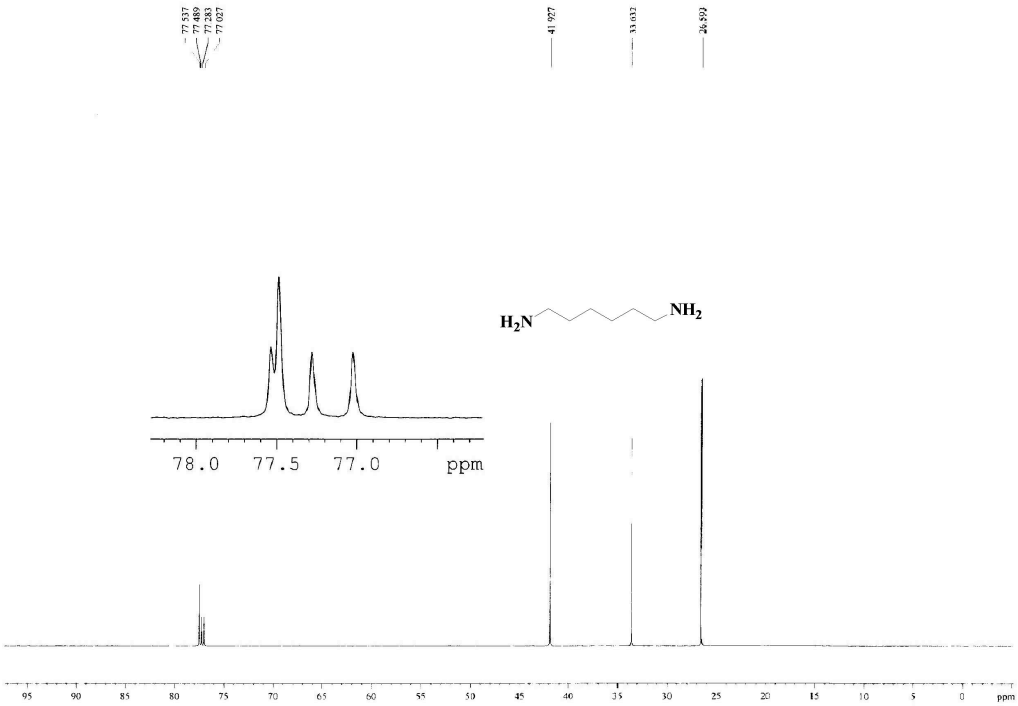
liushouxin-1,6-JEA




```
NAME                 2010.0624
EXPNO                        3
PROCNO                       1
Date_                 20100624
Time                     11.22
INSTRUM                  spect
PROBHD   5 mm PABBO BB-
PULPROG                   zg30
TD                       32768
SOLVENT                  CDCl3
NS                           8
DS                           0
SWH                5000.000 Hz
FIDRES                0.152588 Hz
AQ                    3.2768500 sec
RG                         322
DW                   100.000 usec
DE                     6.50 usec
TE                     299.0 K
D1                 1.00000000 sec
TD0                          1

======== CHANNEL f1 ========
NUC1                       1H
P1                       9.80 usec
PL1                      0.00 dB
PL1W              26.62599564 W
SFO1              500.1322506 MHz
SI                       65536
SF                500.1300086 MHz
WDW                         EM
SSB                          0
LB                       0.30 Hz
GB                           0
PC                       1.00
```

liushouxin-1,6-JEA

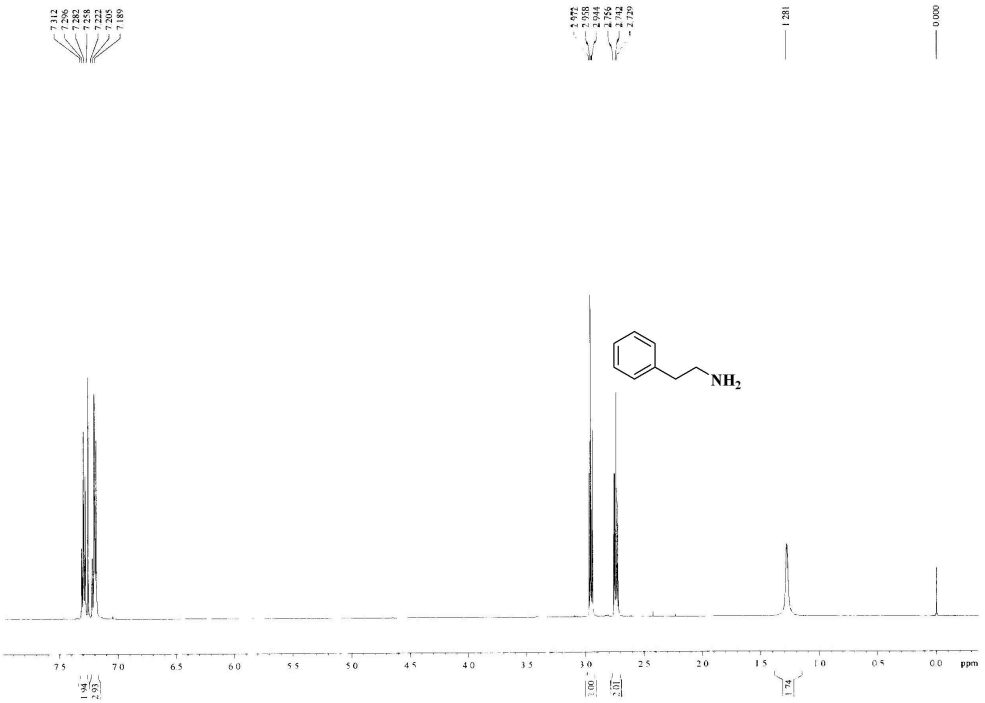



```
NAME                 2010.0612
EXPNO                       16
PROCNO                       1
Date_                 20100612
Time                     16.38
INSTRUM                  spect
PROBHD   5 mm PABBO BB-
PULPROG                 zgpg30
TD                       65536
SOLVENT                  CDCl3
NS                         322
DS                           4
SWH                29761.904 Hz
FIDRES                0.454131 Hz
AQ                    1.1010548 sec
RG                        2050
DW                   16.800 usec
DE                     6.50 usec
TE                     300.3 K
D1                 2.00000000 sec
D11                0.03000000 sec
TD0                          1

======== CHANNEL f1 ========
NUC1                      13C
P1                       9.20 usec
PL1                      3.00 dB
PL1W              47.46168682 W
SFO1              125.7703643 MHz

======== CHANNEL f2 ========
CPDPRG2                waltz16
NUC2                       1H
PCPD2                   80.00 usec
PL2                      0.00 dB
PL12                    18.06 dB
PL13                    17.50 dB
PL2W              26.62599564 W
PL12W              0.41620368 W
PL13W              0.47348461 W
SFO2              500.1320005 MHz
SI                       32768
SF                125.7577890 MHz
WDW                         EM
SSB                          0
LB                       1.00 Hz
GB                           0
PC                       1.40
```

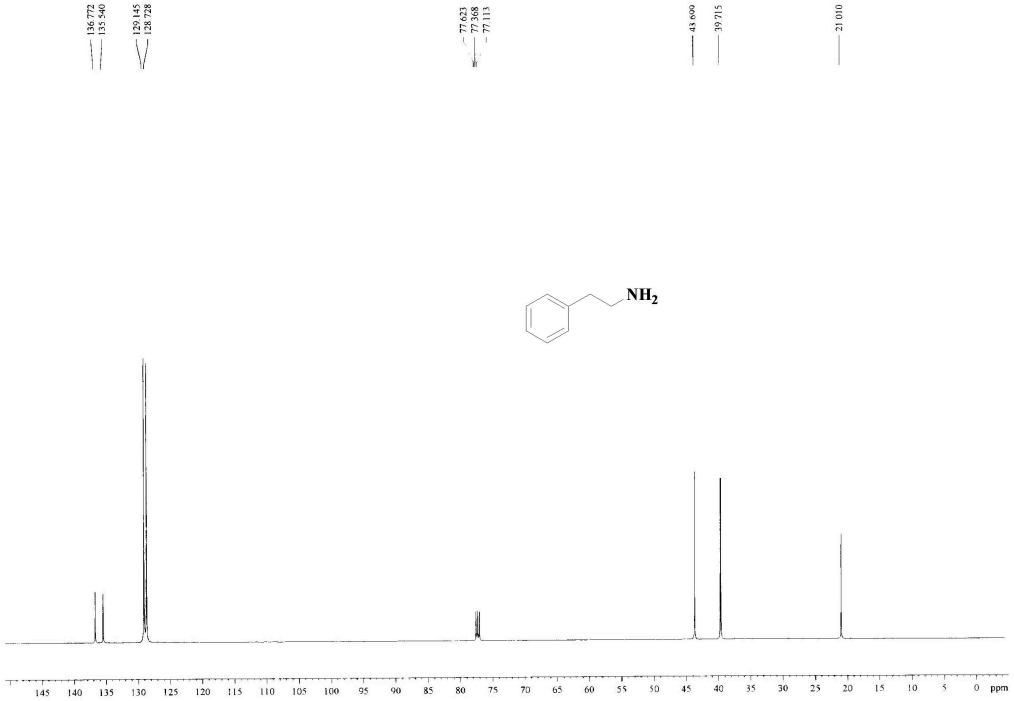
liushouxin-2-BYA




```
NAME                2010.0621
EXPNO                       1
PROCNO                      1
Date_            20100621
Time                     9.42
INSTRUM                 spect
PROBHD   5 mm PABBO BB-
PULPROG                 zg30
TD                     32768
SOLVENT                CDCl3
NS                          8
DS                          0
SWH                5000.000 Hz
FIDRES                0.152588 Hz
AQ                 3.2768500 sec
RG                       90.5
DW                    100.000 usec
DE                      6.50 usec
TE                     298.0 K
D1                 1.00000000 sec
TD0                         1

======== CHANNEL f1 ========
NUC1                       1H
P1                       9.80 usec
PL1                      0.00 dB
PL1W              26.62599564 W
SFO1             500.1322506 MHz
SI                       65536
SF                500.1300148 MHz
WDW                        EM
SSB                         0
LB                       0.30 Hz
GB                          0
PC                       1.00
```

liushouxin-BYA-C

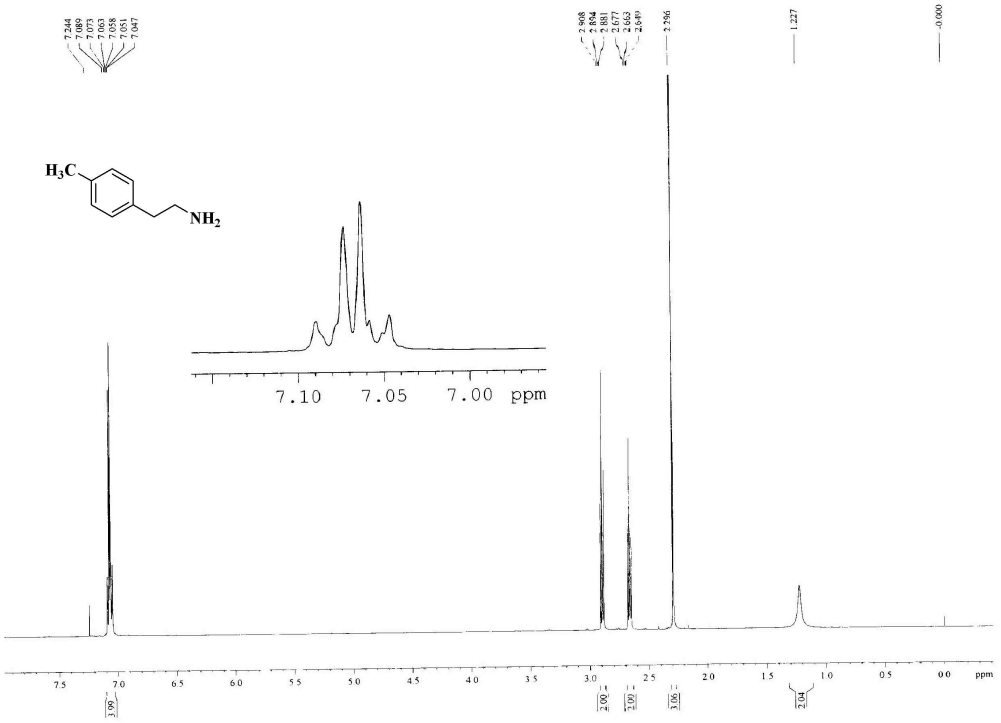



```
NAME                2010.0402
EXPNO                      21
PROCNO                      1
Date_            20100403
Time                    13.10
INSTRUM                 spect
PROBHD   5 mm PABBO BB-
PULPROG              zgpg30
TD                     16384
SOLVENT                CDCl3
NS                       3124
DS                          4
SWH               31250.000 Hz
FIDRES             1.907349 Hz
AQ                 0.2621940 sec
RG                       45.2
DW                     16.000 usec
DE                      6.50 usec
TE                     298.0 K
D1                 1.50000000 sec
D11                0.03000000 sec
TD0                         1

======== CHANNEL f1 ========
NUC1                      13C
P1                       9.20 usec
PL1                      3.00 dB
PL1W              47.46148682 W
SFO1             125.7728799 MHz

======== CHANNEL f2 ========
CPDPRG2                waltz16
NUC2                       1H
PCPD2                   80.00 usec
PL2                      0.00 dB
PL12                    18.06 dB
PL13                    17.50 dB
PL2W              26.62599564 W
PL12W              0.41620368 W
PL13W              0.47348461 W
SFO2             500.1320005 MHz
SI                       32768
SF                125.7577890 MHz
WDW                        EM
SSB                         0
LB                       5.00 Hz
GB                          0
PC                       1.40
```

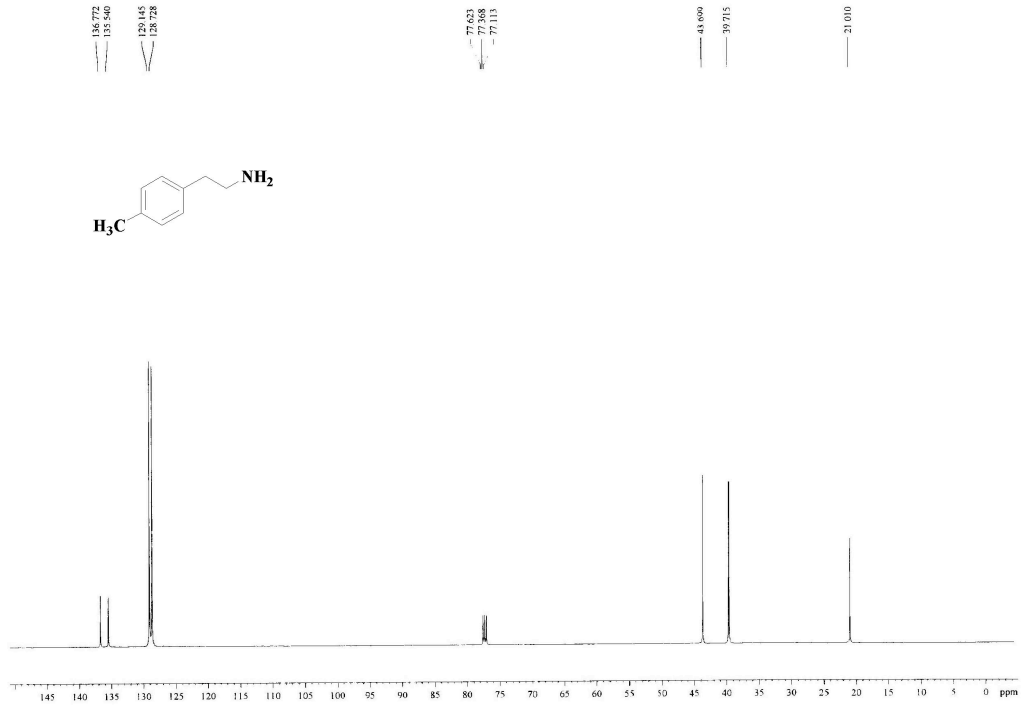
liushouxin-BYA




```
NAME                2010.0402
EXPNO                      20
PROCNO                      1
Date_                20100403
Time                    11.28
INSTRUM                 spect
PROBHD   5 mm PABBO BB-
PULPROG                 zg30
TD                     32768
SOLVENT                CDCl3
NS                         8
DS                         0
SWH                5000.000 Hz
FIDRES             0.152588 Hz
AQ                 3.2768500 sec
RG                      22.6
DW                 100.000 usec
DE                   6.50 usec
TE                   298.0 K
D1                 1.00000000 sec
TD0                        1

======== CHANNEL f1 ========
NUC1                      1H
P1                     9.80 usec
PL1                    0.00 dB
PL1W              26.62599564 W
SFO1              500.1322506 MHz
SI                     32768
SF                500.1300220 MHz
WDW                       EM
SSB                        0
LB                    0.00 Hz
GB                         0
PC                      1.00
```

liushouxin-BYA-C

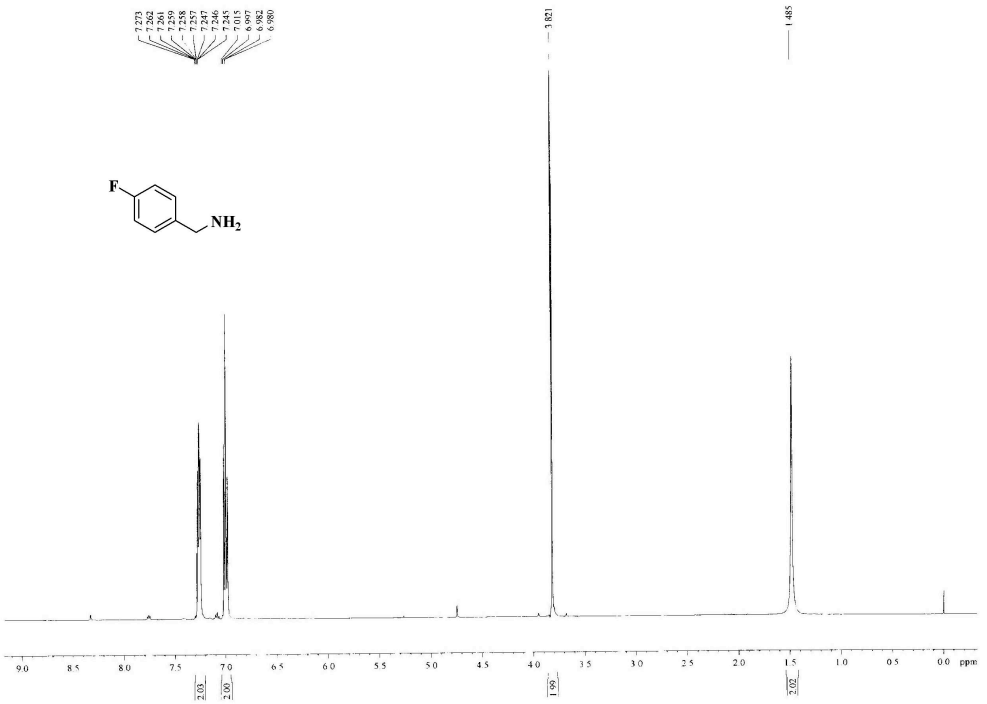



```
NAME                2010.0402
EXPNO                      21
PROCNO                      1
Date_                20100403
Time                    13.10
INSTRUM                 spect
PROBHD   5 mm PABBO BB-
PULPROG                 zgpg30
TD                     16384
SOLVENT                CDCl3
NS                      3124
DS                         4
SWH               31250.000 Hz
FIDRES             1.907349 Hz
AQ                 0.2621940 sec
RG                      45.2
DW                  16.000 usec
DE                   6.50 usec
TE                   298.0 K
D1                 1.50000000 sec
D11                0.03000000 sec
TD0                        1

======== CHANNEL f1 ========
NUC1                      13C
P1                     9.20 usec
PL1                    3.00 dB
PL1W              47.46148682 W
SFO1              125.7728799 MHz

======== CHANNEL f2 ========
CPDPRG2                waltz16
NUC2                      1H
PCPD2                 80.00 usec
PL2                    0.00 dB
PL12                  18.06 dB
PL13                  17.50 dB
PL2W              26.62599564 W
PL12W              0.41620368 W
PL13W              0.47348461 W
SFO2              500.1320005 MHz
SI                     32768
SF                125.7577890 MHz
WDW                       EM
SSB                        0
LB                    5.00 Hz
GB                         0
PC                      1.40
```

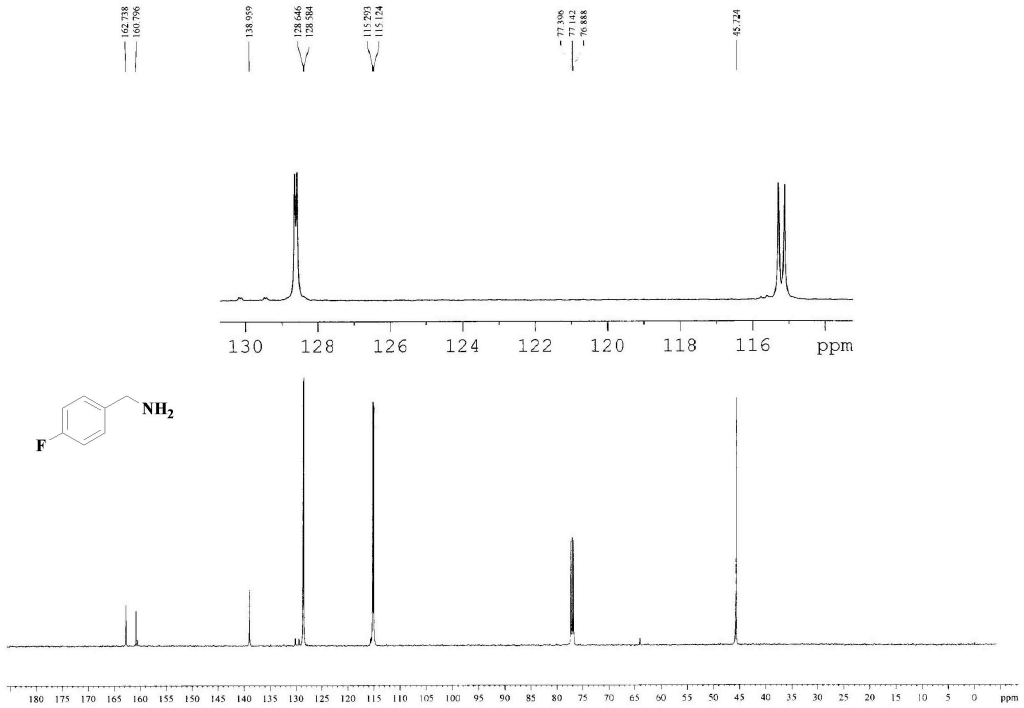
liushouxin-BA




```
NAME                2010.0403
EXPNO                       1
PROCNO                      1
Date_              20100403
Time                   15.10
INSTRUM                spect
PROBHD   5 mm PABBO BB-
PULPROG                 zg30
TD                     32768
SOLVENT                CDCl3
NS                          4
DS                          0
SWH                5000.000 Hz
FIDRES                0.152588 Hz
AQ                 3.2768500 sec
RG                          5
DW                   100.000 usec
DE                     6.50 usec
TE                   298.0 K
D1                 1.00000000 sec
TD0                         1

======== CHANNEL f1 ========
NUC1                       1H
P1                       9.80 usec
PL1                      0.00 dB
PL1W            26.62599564 W
SFO1           500.1322506 MHz
SI                      32768
SF             500.1300016 MHz
WDW                        EM
SSB                         0
LB                       0.00 Hz
GB                          0
PC                       1.00
```

liushouxin-BA-C

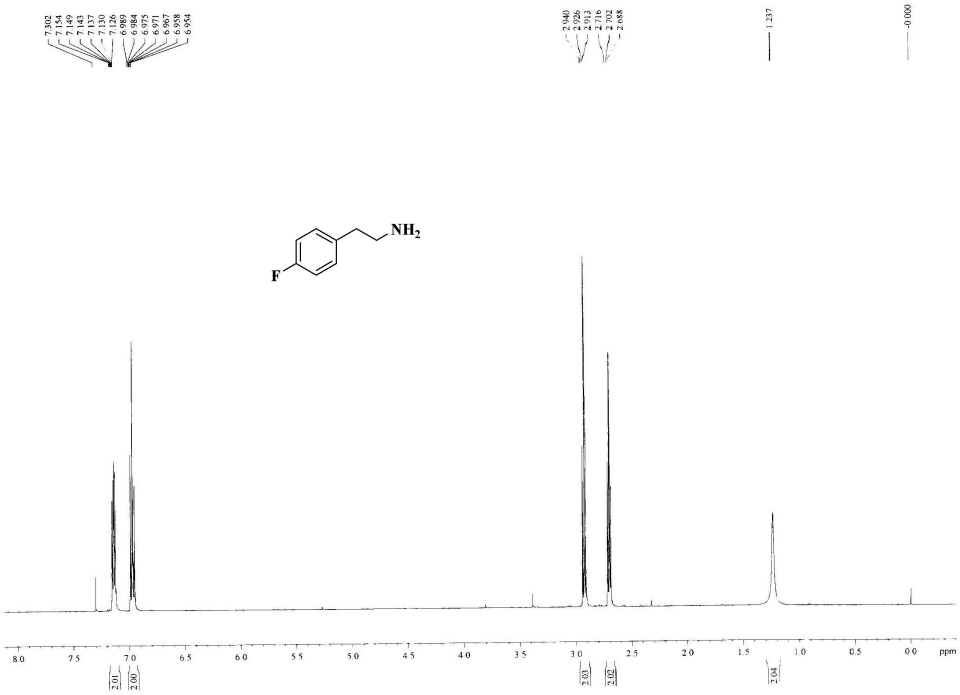



```
NAME                2010.0403
EXPNO                       2
PROCNO                      1
Date_              20100403
Time                   15.20
INSTRUM                spect
PROBHD   5 mm PABBO BB-
PULPROG             zgpg30
TD                     16384
SOLVENT                CDCl3
NS                       677
DS                          4
SWH               31250.000 Hz
FIDRES             1.907349 Hz
AQ                 0.2621440 sec
RG                       45.2
DW                   16.000 usec
DE                     6.50 usec
TE                   298.0 K
D1                 1.50000000 sec
D11                0.03000000 sec
TD0                         1

======== CHANNEL f1 ========
NUC1                       13C
P1                       9.20 usec
PL1                      3.00 dB
PL1W            47.46148682 W
SFO1           125.7728799 MHz

======== CHANNEL f2 ========
CPDPRG2                waltz16
NUC2                       1H
PCPD2                   80.00 usec
PL2                      0.00 dB
PL12                    16.06 dB
PL13                    17.50 dB
PL2W            26.62599564 W
PL12W            0.41620368 W
PL13W            0.47348461 W
SFO2           500.1320005 MHz
SI                      32768
SF             125.7577890 MHz
WDW                        EM
SSB                         0
LB                       5.00 Hz
GB                          0
PC                       1.40
```

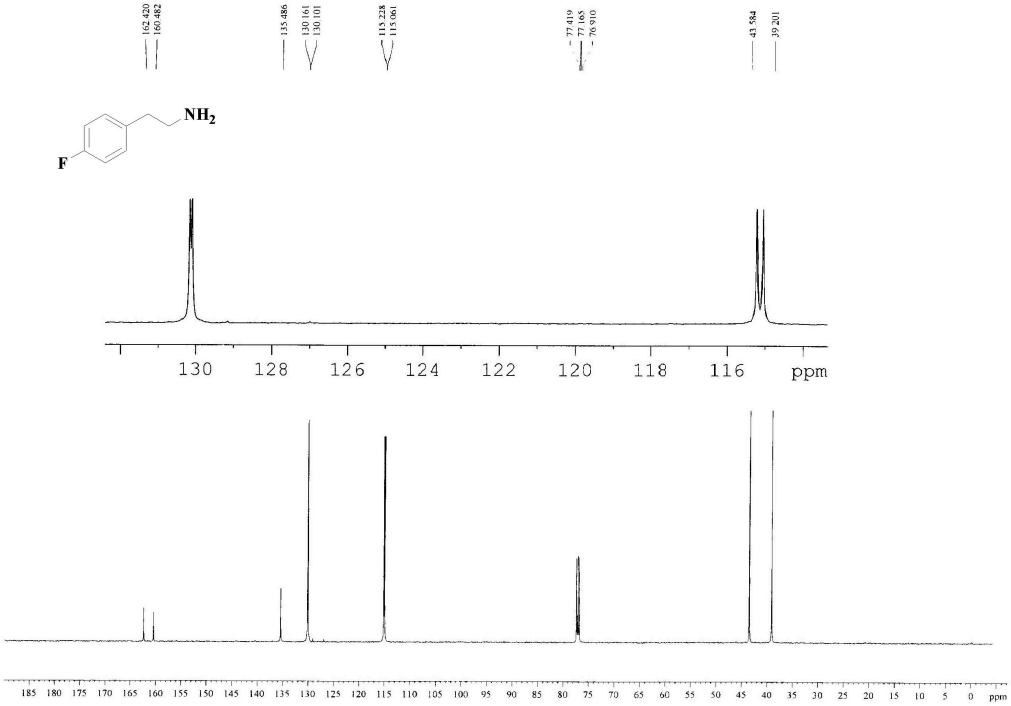
liushouxin-F-BYA




```
NAME                2010.0403
EXPNO                       3
PROCNO                      1
Date_            20100403
Time_                 15.53
INSTRUM                spect
PROBHD   5 mm PABBO BB-
PULPROG                 zg30
TD                     32768
SOLVENT                CDCl3
NS                          4
DS                          0
SWH                5000.000 Hz
FIDRES                0.152588 Hz
AQ                 3.2768500 sec
RG                          1
DW                   100.000 usec
DE                      6.50 usec
TE                     298.0 K
D1                 1.00000000 sec
TD0                         1

======== CHANNEL f1 ========
NUC1                       1H
P1                       9.80 usec
PL1                      0.00 dB
PL1W               26.62599564 W
SFO1               500.1322506 MHz
SI                         32768
SF                 500.1299927 MHz
WDW                        EM
SSB                         0
LB                       0.00 Hz
GB                          0
PC                       1.00
```

liushouxin-F-BYA-C




```
NAME                2010.0403
EXPNO                       4
PROCNO                      1
Date_            20100403
Time_                 16.01
INSTRUM                spect
PROBHD   5 mm PABBO BB-
PULPROG               zgpg30
TD                     16384
SOLVENT                CDCl3
NS                        731
DS                          4
SWH               31250.000 Hz
FIDRES             1.907349 Hz
AQ                 0.2621940 sec
RG                       45.2
DW                     16.000 usec
DE                      6.50 usec
TE                     298.0 K
D1                 1.50000000 sec
D11                0.03000000 sec
TD0                         1

======== CHANNEL f1 ========
NUC1                      13C
P1                       9.20 usec
PL1                      3.00 dB
PL1W               47.46149682 W
SFO1               125.7728799 MHz

======== CHANNEL f2 ========
CPDPRG2                waltz16
NUC2                       1H
PCPD2                   80.00 usec
PL2                      0.00 dB
PL12                    18.06 dB
PL13                    17.50 dB
PL2W               26.62599564 W
PL12W               0.41620368 W
PL13W               0.47348461 W
SFO2               500.1320005 MHz
SI                         32768
SF                 125.7577890 MHz
WDW                        EM
SSB                         0
LB                       5.00 Hz
GB                          0
PC                       1.40
```