by TLC analysis. After 2 hours, the reaction was deemed complete (less than 1.0% of compound 10 remaining). The reaction mixture was cooled to 0 to −5 °C and quenched with aqueous NaOH solution (2.0 M, 176 mL) followed by aqueous 30% H_2O_2 (33 mL) while maintain internal temperature 0 to 10 °C. After stirring for 1 hour, the batch was warmed to room temperature and MTBE (70 mL) was added. The layer was separated and the aqueous layer was extracted with MTBE (70 mL). Combined organic layers were washed with water (40 mL) followed by saturated $NaHCO_3$ (40 mL) and brine (40 mL), dried over $MgSO_4$, and concentrated. The crude product was purified by column chromatography eluted with 0−25% EtOAc in heptane to afford compound **12** (6.1 g, 77.7% yield) as a colorless oil (see Attachment 9).

Step 12. Preparation of Compound 13 (Ref: 09GB024)

NaH (1.28 g, 32.0 mmol), BnBr (2.32 mL, 21.3 mmol) and nBu_4NI (1.28 g) were added to a solution of compound **12** (6.0 g, 10.7 mmol) in a mixture of DMF (90 mL) and THF (90 mL) at 0 °C. The reaction mixture was stirred at room temperature and monitored by TLC analysis. After 16 hours, the reaction was deemed complete (less than 1.0% of compound 12 remaining). The reaction mixture was poured into ice cold water (60 mL) and extracted with EtOAc (2 × 60 mL). The organic layer was washed with water (30 mL), followed by brine (30 mL), dried over $MgSO_4$, and concentrated to give the crude product which was purified by column chromatography eluted with 0−10% EtOAc in heptane to afford compound **13** (6.5 g, 93% yield) as a colorless oil (see Attachment 10).

Step 13. Preparation of Compound A (Ref: 09GB025)

A solution of TBAF (1.0 M in THF, 19.6 mmol) was added to a solution of compound **13** (6.4.g, 9.8 mmol) in THF (64 mL) at room temperature. The reaction mixture was stirred at room temperature and monitored by ^1H NMR and HPLC analyses. After 40 hours, the reaction was deemed complete (less than 5.0% of compound 13 remaining). The reaction was worked up by quenching with water (64 mL) and extracting with EtOAc (2 × 96 mL). The organic layer was washed with water (32 mL), followed by brine (32 mL), dried over $MgSO_4$, and concentrated to give the crude product which was purified by column chromatography eluted with 0−25% EtOAc in heptane to afford compound **A** (4.35 g, 82% yield) as a colorless oil (see Attachment 11).

4.2 Preparation of Compound B

Step 1. Preparation of Compound 15 (Ref: 09DX014 and 14KL0187)

Compound **14** (400 g, 1.26 mol, Indofine lot # XX) and imidazole (257 g, 3.78 mol) were mixed in THF (1.6 L). TBDMSCl (284.8 g, 1.89 mol) was added. The reaction mixture was stirred at room temperature. The reaction was monitored by TLC analysis. After 16 hours, the reaction was deemed complete (less than 1.0% of compound 14 remaining). EtOAc (4 L) was added to the reaction mixture, and the solution was washed with water (3 × 2 L). The organic layer was dried over $MgSO_4$, filtered, and concentrated to dryness. The residue was loaded onto a silica column and eluted with 25% heptanes in EtOAc, EtOAc, and 5% MeOH in EtOAc. The fractions of interest were concentrated to afford compound **15** (325 g, 60% yield) as white solids (see Attachment 12).

Step 2. Preparation of Compound 16 (Ref: 09DX017, 09DX018, and 14KL0210)

Compound **15** (215 g, 0.5 mol) and $NaBH(OAc)_3$ (264 g, 1.2 mol) were mixed in THF (1075 mL). Benzaldehyde (63.4 g, 0.6 mol) was added at room temperature. The reaction mixture was stirred at room temperature and monitored by 1H NMR and TLC analyses. After 16 hours, the reaction was deemed complete (less than 1.0% of compound 15 remaining). EtOAc (1.35 L) and saturated $NaHCO_3$ (1.35 L) were added. The layers were separated and the organic layer was washed with saturated $NaHCO_3$ (1.35 L). Combined aqueous layers were extracted with EtOAc (700 mL). Combined organic layers were washed with brine (350 mL), dried over $MgSO_4$, filtered, and concentrated to dryness. The residue was combined with the crude from a 100 g run and purified by column chromatography eluted with 20% EtOAc in heptane to give compound **16** (208 g, 55% yield) as an oil (see Attachment 13).

Step 3. Preparation of Compound 17 (Ref: 24LL018)

To a solution of compound **16** (12 g, 22.99 mmol) in 2,2-dimethoxypropane (300 mL) was added *p*-TsOH•H2O (4.50 g, 23.68 mmol). The reaction mixture was stirred at room temperature for 5 hours. TLC analysis on the sample quenched with saturated $NaHCO_3$ showed there was not starting material. Ethyl acetate (150 mL) and saturated $NaHCO_3$ (60 mL) were added. The layers were separated and the aqueous layer was extracted with ethyl acetate (30 mL). Combined organic layers were washed with brine (60 mL) and concentrated. The crude material was purified chromatographically eluted with 4−10% ethyl acetate in heptane to provide compound **17** (9.24 g, 71.5% yield) as a colorless oil (see Attachment 14).

Step 4. Preparation of Compound 18 (Ref: 24LL021)

To a solution of compound **17** (9.2 g, 16.37 mmol) in THF (30 mL) was added a solution of TBAF in THF (1 M, 32.7 mL). The reaction mixture was stirred at room temperature for 1.5 hours, at which time there was almost no starting material by TLC analysis. The reaction was quenched with water (30 mL) and ethyl acetate (30 mL) was added. The layers were separated and aqueous layer was extracted with ethyl acetate (30 mL). Combined organic layers was washed with brine (30 mL) and concentrated. The crude material was purified chromatographically eluted with 25−50% ethyl acetate in heptane to give compound **18** (7.03 g, 96% yield) as a colorless oil (see Attachment 15).

Step 5. Preparation of Compound 19 (Ref: 24LL024)

To a solution of compound **18** (7 g, 15.64 mmol) in dichloromethane (50 mL) was added triethylamine (6.54 mL, 46.91 mmol). The mixture was cooled to <−70 °C. Thionyl chloride (1.31 mL, 17.98 mmol) was added. After addition, the mixture was warmed to −40 °C and stirred at −35 °C to −45 °C for 1 hour, at which time there was no starting material by

TLC analysis. The reaction was quenched with water (21 mL) and the layers were separated. Organic layer was washed with water (21 mL) and brine (21 mL), dried over MgSO4, and concentrated to give crude product **19** (9.5 g, quantitative). The material was taken to the next step without purification (see Attachment 16).

Step 6. Preparation of Compound B (Ref: 24LL025)

To a solution of compound **19** (9.5 g, crude, lot # 24LL024) in CH_3CN (112 mL) was added a solution of sodium periodate (6.7 g, 31.28 mmol) and ruthenium (III) chloride hydrate (0.16 g, 0.782 mmol) in water (56 mL) at 0−5 °C. After the addition was complete, the mixture was stirred at 0−5 °C for 15 minutes, at which time ^1H NMR analysis showed it was complete. The reaction was quenched with 20% sodium thiosulfate (40 mL). The mixture was concentrated to an aqueous residue. *tert*-Butyl methyl ether (MTBE, 50 mL) was added and the layers were separated. The aqueous layer was extracted with another MTBE (50 mL). The combined organic layers were washed with brine (21 mL), dried over $MgSO_4$, and concentrated. The crude material was purified by chromatography eluted with 5−10% ethyl acetate in heptane to provided compound **B** (6.79 g, 85% yield) as a colorless solid (see Attachment 17).

4.3 Preparation of Compound **RCAI-56**

Step 1. Preparation of Compound 25 (Ref: 09GB028)

NaH (0.117 g, 2.8 mmol) was added to a solution of compound **A** (0.5 g, 0.9 mmol) in a mixture of DMF (10 mL) and THF (5 mL) at 0 °C. After stirring at 0 °C for 1 hour, a solution of compound **B** (0.68 g, 1.3 mmol) in THF (5 mL) was added at 0 °C. The reaction mixture was slowly heated to 70 °C and stirred at that temperature for 4 hours. The reaction was monitored by TLC analysis. After 4 hours, the reaction was not completed (compound **B** was consumed but compound **A** remained ≈30% by TLC analysis). Additional NaH (0.035 g, 0.88 mmol) and a solution of compound **B** (0.23 g, 0.43 mmol) in THF (5 mL) were added at 70 °C and stirred for overnight. After overnight, the reaction was not completed (compound **B** was consumed but compound **A** remained ≈15% by TLC analysis). Additional NaH (0.035 g, 0.88 mmol) and a solution of compound **B** (0.23 g, 0.43 mmol) in THF (5 mL) were added at 70 °C and stirred for 4 hours. After 4 hours, the reaction was deemed complete (less than 5.0% of compound **A** remaining). The reaction mixture was concentrated to a residue. The residue was dissolved in MTBE (65 mL) and cooled to below 0 °C. 20% aqueous H_2SO_4 solution (60 mL) was added dropwise at 0 to 5 °C. After stirring at 0 °C for 30 minutes, the reaction mixture was neutralized with solid K_2CO_3 (pH ≈8 to 9) at 0 °C. After stirring at 0 °C for 40 minutes, MTBE (40 mL) and water (20 mL) were added to this mixture. The mixture was filtered through a pad of Celite and the pad was washed with MTBE (2 × 10 mL). Combined organic layers was washed with water (2 × 10 mL) followed by saturated $NaHCO_3$ solution (10 mL) and brine (10 mL), dried over solid K_2CO_3, filtered, and concentrated to give the crude. The crude material was purified by chromatography eluted with 0−25% ethyl acetate in heptane to afford compound **25** (0.6 g, 70% yield) as a colorless oil (see Attachment 18).

Step 2. Preparation of Compound 26 (Ref: 09GB030)

To a solution of compound **25** (0.5 g, 0.5 mmol) in MeOH (21 mL) and dichloromethane (10.5 mL) was added *p*-TsOH•H_2O (0.12 g, 1.20 equiv). The reaction mixture was stirred at 60 °C for 16 hours, at which time the reaction was complete by TLC analysis. The reaction mixture was cooled to room temperature and concentrated to a residue which was then dissolved in EtOAc (15 mL) and saturated $NaHCO_3$ (5 mL) was added. The layers were separated. The aqueous layer was extracted with EtOAc (5 mL). Combined organic layers were washed with saturated $NaHCO_3$ solution (2.5 mL) and brine (2.5 mL), dried over $MgSO_4$, filtered and concentrated to give crude material which was purified by column chromatography with 10−80% EtOAc in heptane to give compound **26** (0.37 g, 77% yield) as oil (see Attachment 19).

Step 3. Preparation of Compound 27 (Ref: 09GB031)

To a solution of compound **26** (0.35 g, 0.4 mmol) in MeOH (21.35 mL) and cyclohexene (3.5 mL) at room temperature was added 1 M HCl (0.38 mL, 0.38 mmol) and 10% Pd/C (62 mg). The reaction mixture was stirred at 65 °C for 16 hours, at which time the reaction was checked by TLC analysis which showed not complete. 6 M HCl (0.13 mL, 0.8 mmol) and Pd/C (62 mg) were and stirred for another 16 hours, at which time TLC analysis still showed starting material. The reaction mixture was filtered and concentrated. The residue was dissolved in MeOH (21.35 mL) and to the solution was charged with cyclohexene (3.5 mL), and 10% Pd/C (62 mg). The reaction mixture was currently heated at 65 °C.

5.0 Analytical (Temporary)

HPLC Method 1

Column:	Water XBridge C18, 3.5 µm, 4.6 × 75 mm, P/N 186003034
Column Temperature:	Ambient temperature
Flow Rate:	1.0 mL/min
Detection:	230 and 210 nm
Analysis Time:	36 min
Mobile Phase A:	0.05% TFA in water
Mobile Phase B:	0.05% TFA in acetonitrile

Table 29

Time (min)	% A	% B
0.0	95	5
15.0	1	99
30.0	1	99
31.0	95	5
36.0	95	5

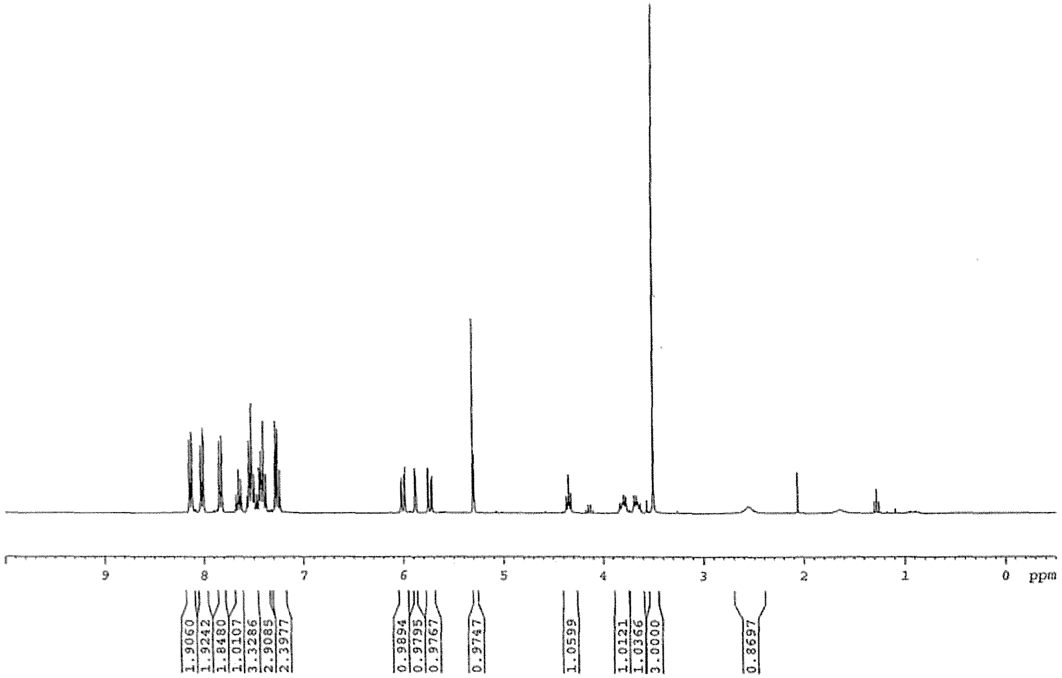
Attachment 1

AMRI SRC AV-300
location; 10

Compound 4

AMRI GLOBAL
SMARTSOURCING™

Name geeta
Date 01/14/2014
NB # 09GB03H



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PROCNO                  1
Date_            20140114
Time                10.32
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PULPROG              zg30
TD                  32768
SOLVENT             CDCl3
NS                     16
DS                      2
SWH              6172.839 Hz
FIDRES           0.188380 Hz
AQ              2.6542580 sec
RG                    256
DW                 81.000 usec
DE                   6.00 usec
TE                  300.0 K
D1             1.00000000 sec
TD0                     1

======== CHANNEL f1 ========
NUC1                   1H
P1                  12.75 usec
PL1                  2.00 dB
SFO1          300.1418534 MHz
SI                  16384
SF            300.1400000 MHz
WDW                    EM
SSB                     0
LB                   0.30 Hz
GB                      0
PC                   1.00
```

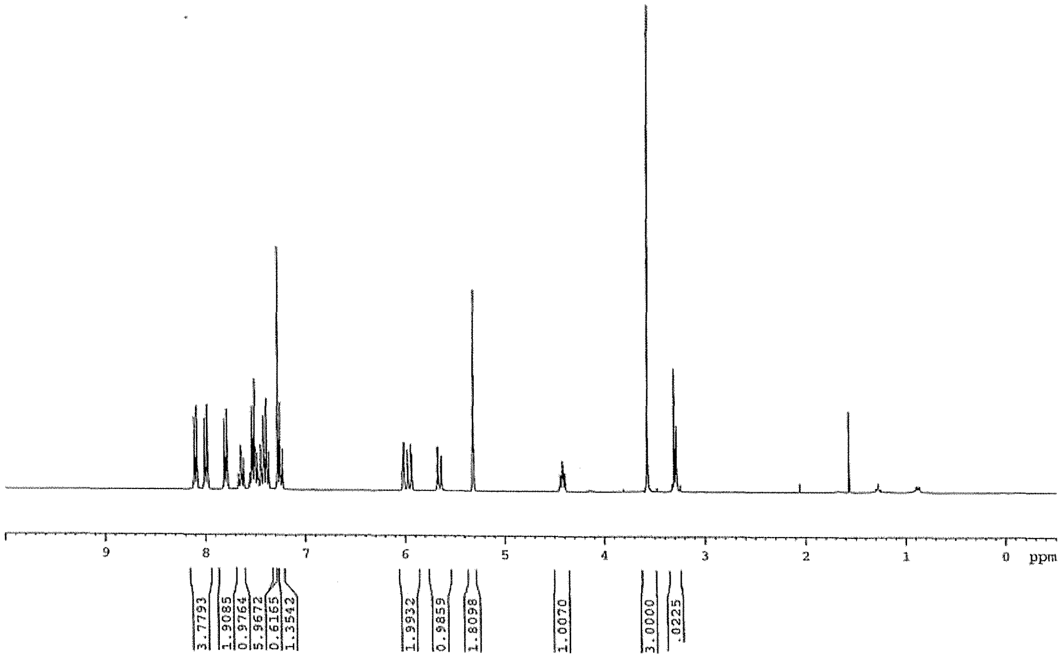
Attachment 2

AMRI SRC AV-300
location; 10

Compound 5

AMRI GLOBAL
SMARTSOURCING

Name Geetha
Date 01/16/2014
NB # 09GB04A



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PROCNO                  1
Date_            20140116
Time                11.52
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PULPROG              zg30
TD                  32768
SOLVENT             CDCl3
NS                     16
DS                      2
SWH              6172.839 Hz
FIDRES           0.188380 Hz
AQ              2.6542580 sec
RG                    362
DW                 81.000 usec
DE                   6.00 usec
TE                  300.0 K
D1             1.00000000 sec
TD0                     1

======== CHANNEL f1 ========
NUC1                   1H
P1                  12.75 usec
PL1                  2.00 dB
SFO1          300.1418534 MHz
SI                  16384
SF            300.1400000 MHz
WDW                    EM
SSB                     0
LB                   0.30 Hz
GB                      0
PC                   1.00
```

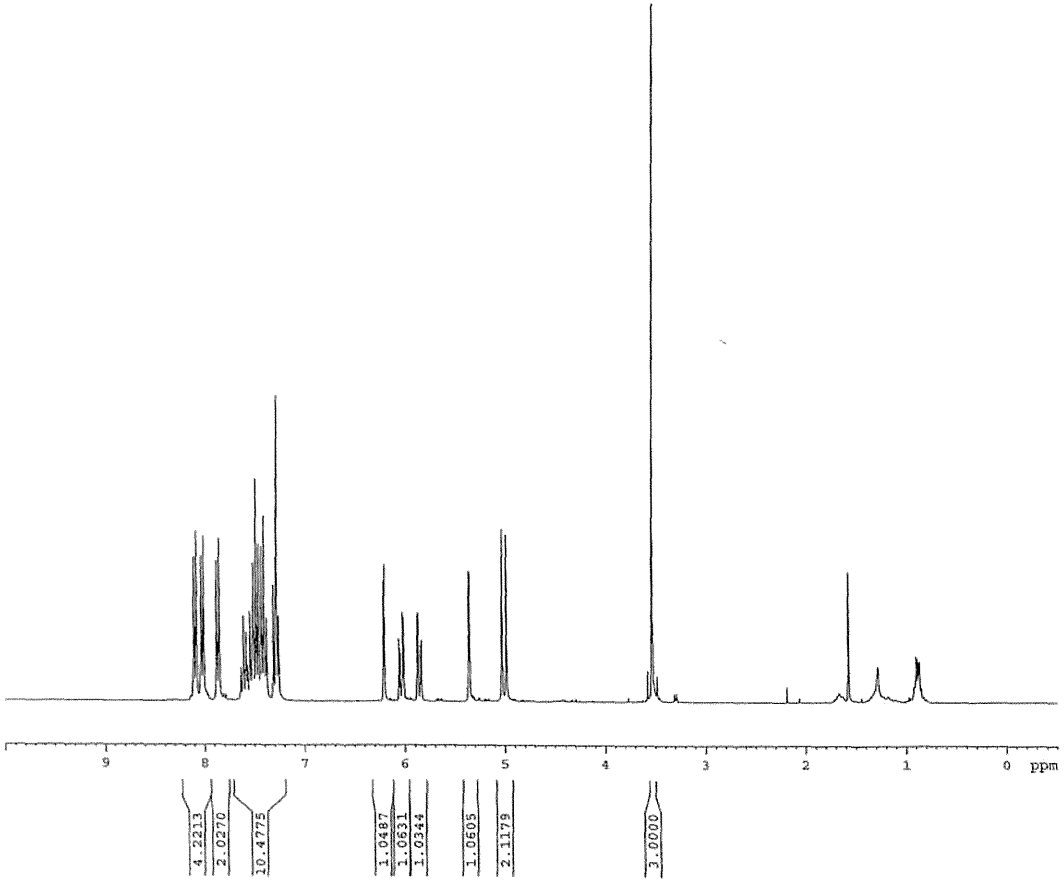
Attachment 3

AMRI SRC AV-300
location; 10

Compound 6

AMRI GLOBAL
SMARTSOURCING™

Name Geetha
Date 02/07/2014
NB # 09GB012E



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PROCNO                  1
Date_            20140207
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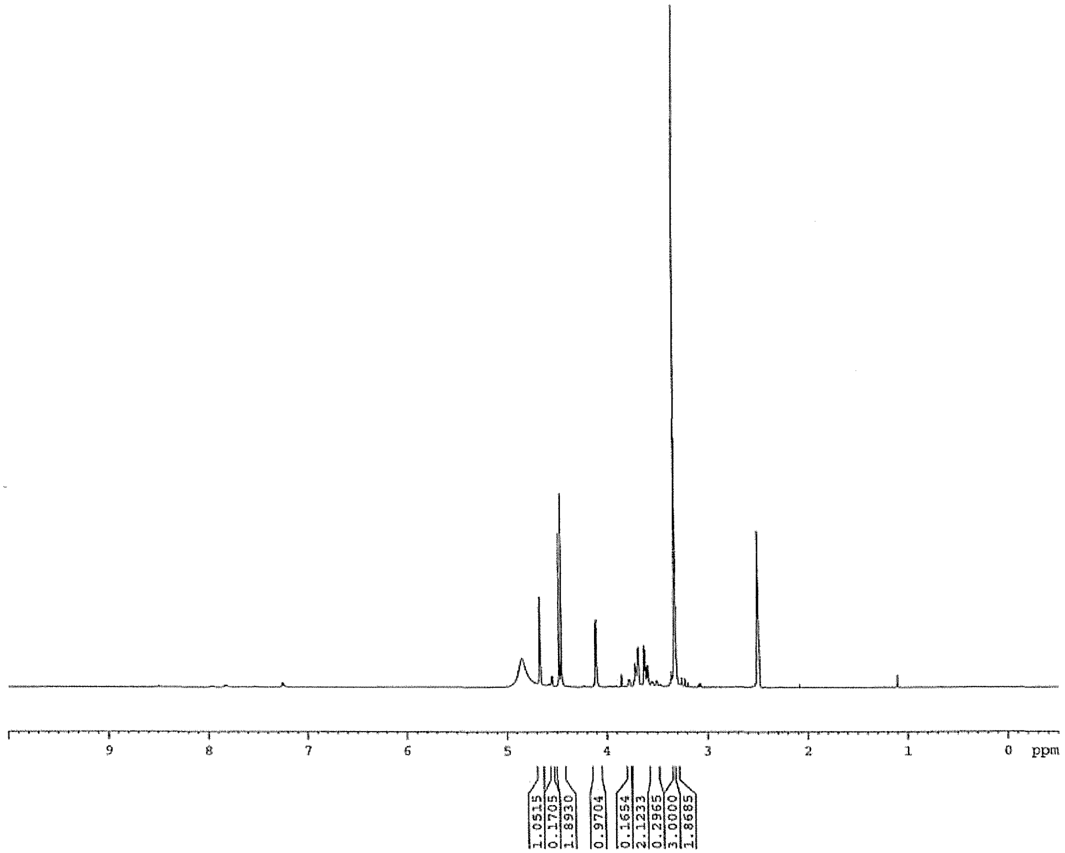
PULPROG              zg30
TD                  32768
SOLVENT             CDCl3
NS                     16
DS                      2
SWH             6172.839 Hz
FIDRES          0.188380 Hz
AQ             2.6542580 sec
RG                    362
DW                81.000 usec
DE                  6.00 usec
TE                 300.0 K
D1            1.00000000 sec
TD0                     1

======== CHANNEL f1 ========
NUC1                   1H
P1                  12.75 usec
PL1                  2.00 dB
SFO1          300.1418534 MHz
SI                  16384
SF            300.1400000 MHz
WDW                    EM
SSB                     0
LB                   0.30 Hz
GB                      0
PC                   1.00
```

Attachment 4

AMRI SRC AV-300
location; 10
Compound 7

Name Geetha
Date 01/27/2014
NB # 09GB06A



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PROCNO                  1
Date_            20140127
Time                 7.50
INSTRUM             spect
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PULPROG              zg30
TD                  32768
SOLVENT              DMSO
NS                     16
DS                      2
SWH              6172.839 Hz
FIDRES           0.188380 Hz
AQ              2.6542580 sec
RG                    362
DW                 81.000 usec
DE                   6.00 usec
TE                  300.0 K
D1             1.00000000 sec
TD0                     1

======== CHANNEL f1 ========
NUC1                   1H
P1                  12.75 usec
PL1                  2.00 dB
SFO1          300.1418534 MHz
SI                  16384
SF            300.1400000 MHz
WDW                    EM
SSB                     0
LB                   0.30 Hz
GB                      0
PC                   1.00
```

Attachment 5

AMRI SRC AV-300
location; 10

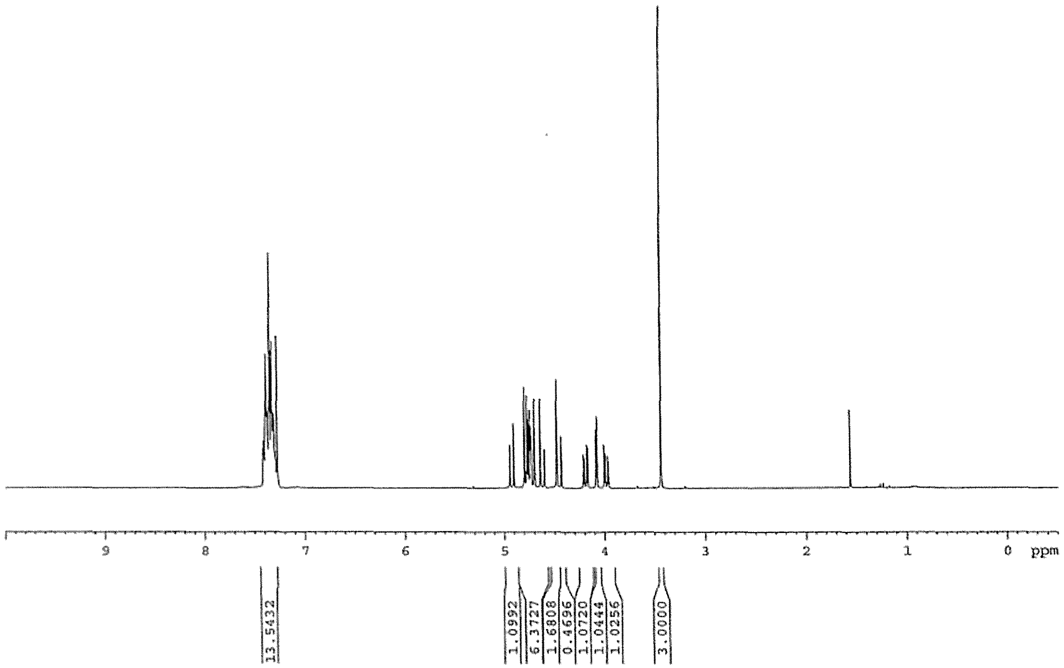
Compound 8

AMRI GLOBAL
SMARTSOURCING

Name Geeka

Date 01/31/2014

NB # 09GB09B



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PROCNO                  1
Date_            20140131
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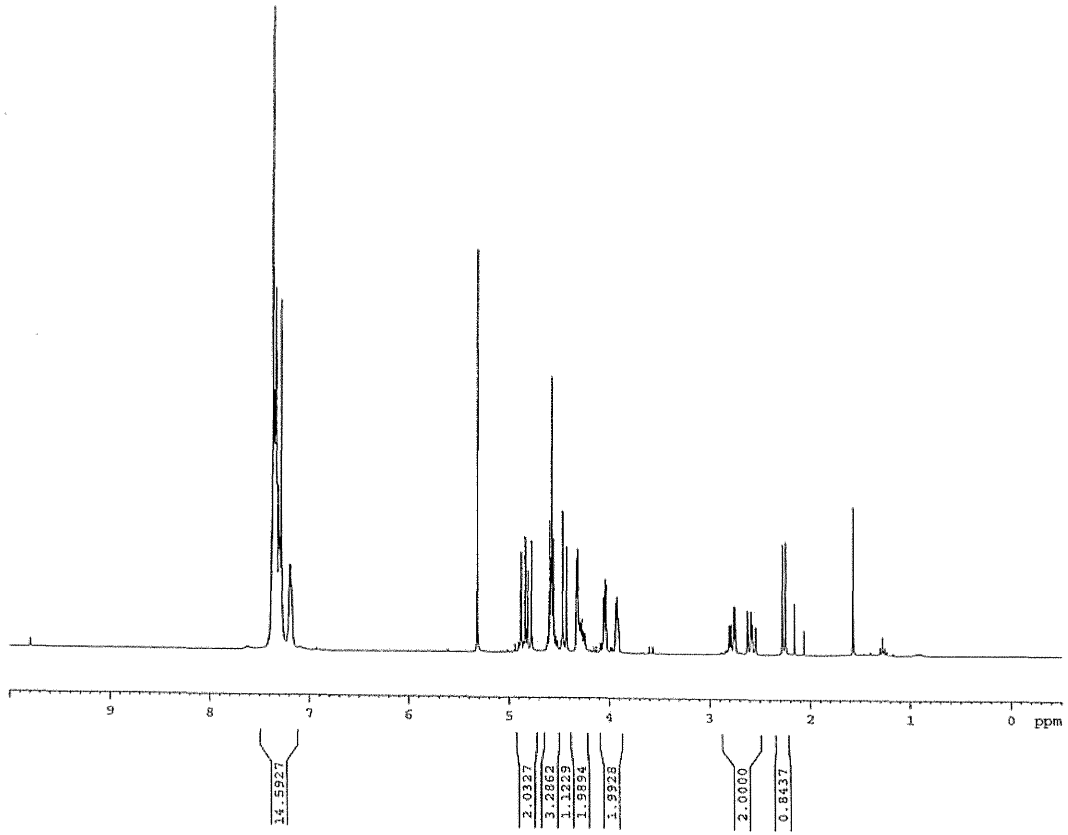
PULPROG              zg30
TD                  32768
SOLVENT             CDCl3
NS                     16
DS                      2
SWH              6172.839 Hz
FIDRES           0.188380 Hz
AQ              2.6542580 sec
RG                    362
DW                 81.000 usec
DE                   6.00 usec
TE                  300.0 K
D1             1.00000000 sec
TD0                     1

======== CHANNEL f1 ========
NUC1                   1H
P1                  12.75 usec
PL1                  2.00 dB
SFO1          300.1418534 MHz
SI                  16384
SF            300.1400000 MHz
WDW                    EM
SSB                     0
LB                   0.30 Hz
GB                      0
PC                   1.00
```

Attachment 6

AMRI SRC AV-300
location; 10
Compound 9

AMRI GLOBAL
SMARTSOURCING™



Name Geetha
Date 02/06/2014
NB # 09GB011C

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PROCNO                 1
Date_           20140206
Time                7.51
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PULPROG             zg30
TD                 32768
SOLVENT            CDCl3
NS                    16
DS                     2
SWH             6172.839 Hz
FIDRES          0.188380 Hz
AQ             2.6542580 sec
RG                   362
DW                81.000 usec
DE                  6.00 usec
TE                 300.0 K
D1            1.00000000 sec
TD0                    1

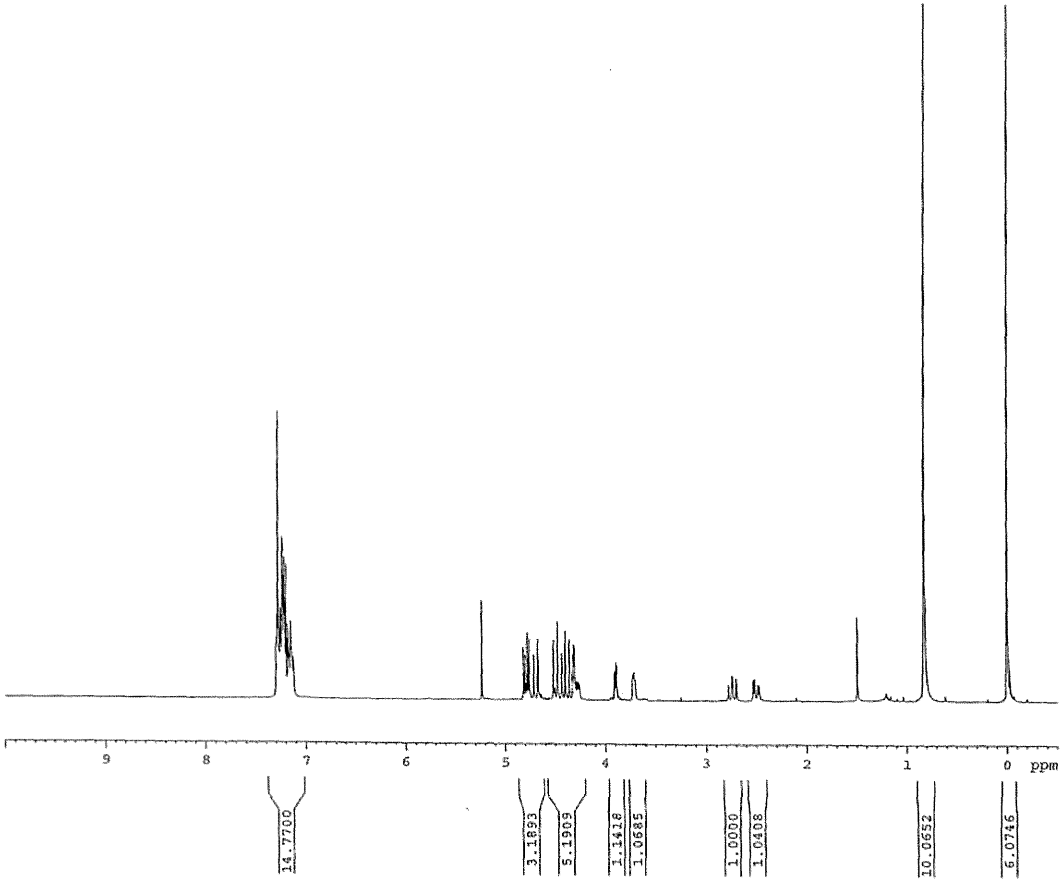
======== CHANNEL f1 ========
NUC1                  1H
P1                 12.75 usec
PL1                 2.00 dB
SFO1         300.1418534 MHz
SI                 16384
SF           300.1400000 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00
```

Attachment 7

AMRI SRC AV-300
location; 10
Compound 10

AMRI GLOBAL
SMARTSOURCING™

Name Geeta
Date 02/07/2014
NB # 09GB13B



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PROCNO                  1
Date_            20140207
Time                13.50
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PULPROG              zg30
TD                  32768
SOLVENT             CDCl3
NS                     16
DS                      2
SWH              6172.839 Hz
FIDRES           0.188380 Hz
AQ              2.6542580 sec
RG                    256
DW                 81.000 usec
DE                   6.00 usec
TE                  300.0 K
D1             1.00000000 sec
TD0                     1

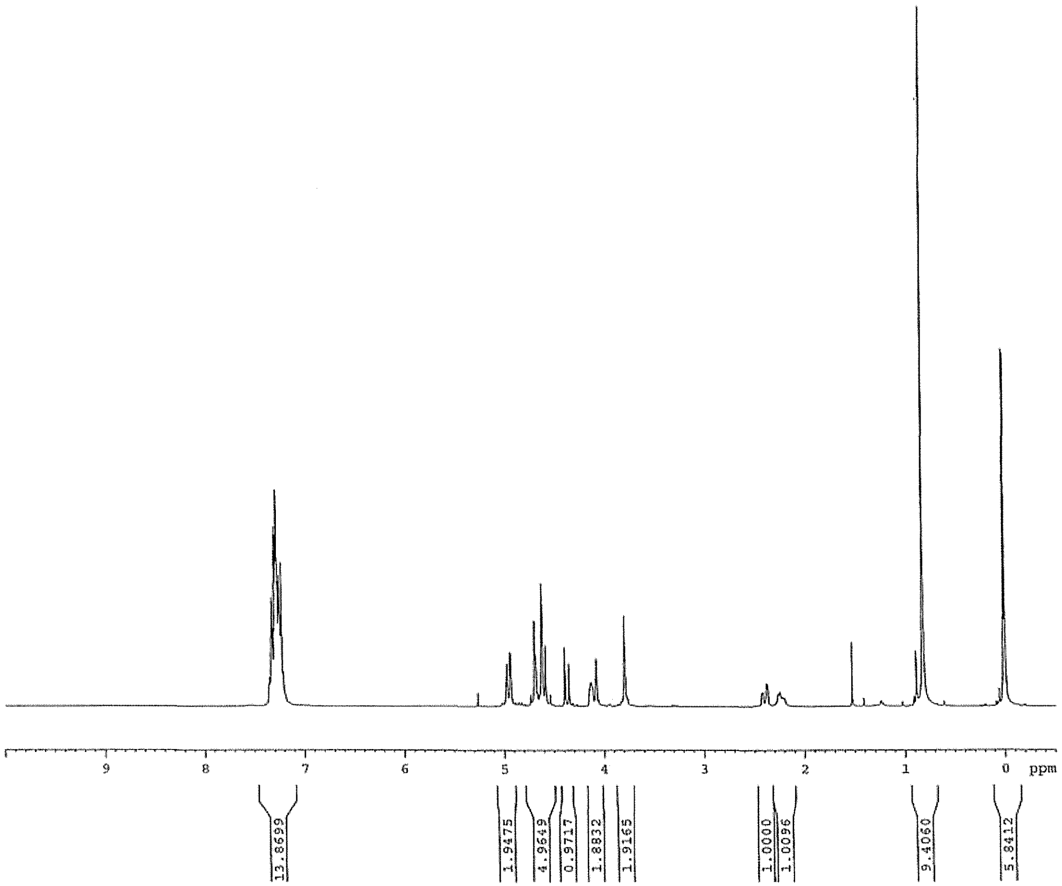
======== CHANNEL f1 ========
NUC1                   1H
P1                  12.75 usec
PL1                  2.00 dB
SFO1          300.1418534 MHz
SI                  16384
SF            300.1400234 MHz
WDW                    EM
SSB                     0
LB                   0.30 Hz
GB                      0
PC                   1.00
```

Attachment 8

AMRI SRC AV-300
location; 10
Compound 11

AMRI GLOBAL
SMARTSOURCING™

Name Geetha
Date 02/11/2014
NB # 09GB015B



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PROCNO                   1
Date_             20140211
Time                 14.36
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PULPROG               zg30
TD                   32768
SOLVENT              CDCl3
NS                      16
DS                       2
SWH              6172.839 Hz
FIDRES           0.188380 Hz
AQ              2.6542580 sec
RG                     128
DW                  81.000 usec
DE                    6.00 usec
TE                   300.0 K
D1              1.00000000 sec
TD0                      1

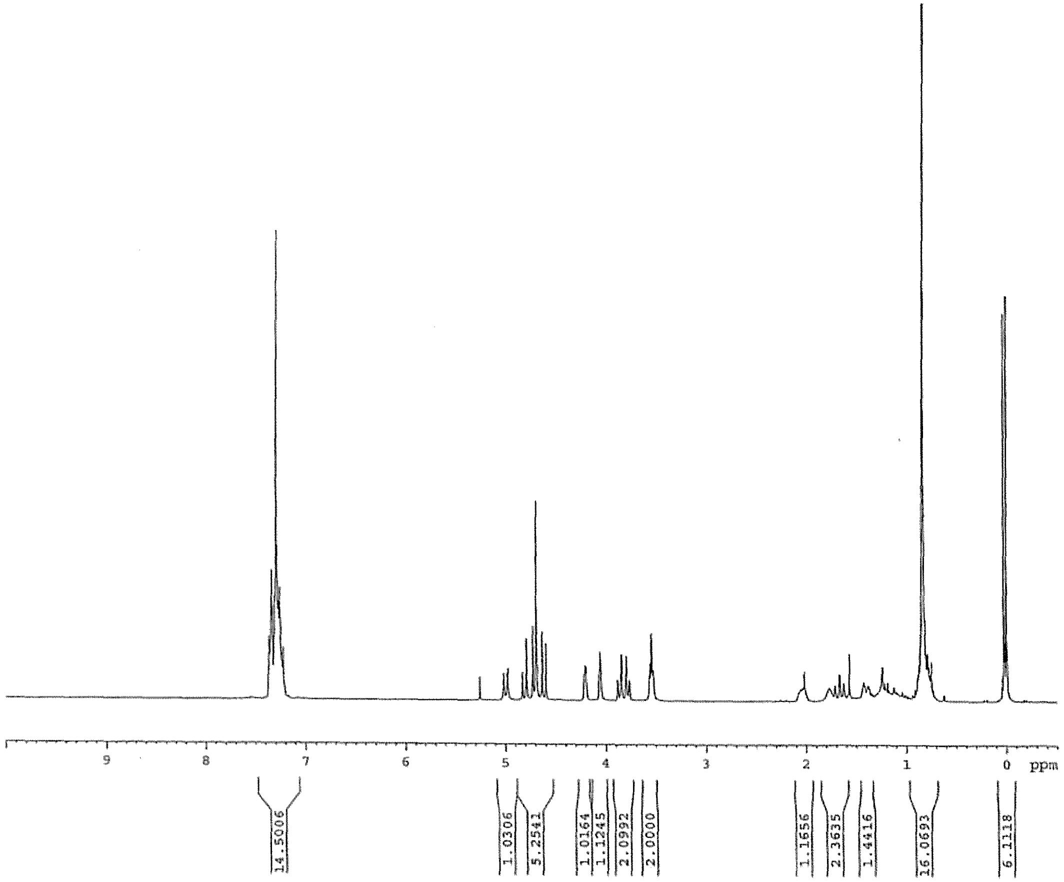
======== CHANNEL f1 ========
NUC1                    1H
P1                   12.75 usec
PL1                   2.00 dB
SFO1           300.1418534 MHz
SI                   16384
SF             300.1400146 MHz
WDW                     EM
SSB                      0
LB                    0.30 Hz
GB                       0
PC                    1.00
```

Attachment 9

AMRI SRC AV-300
location; 10
Compound 12

AMRI GLOBAL
SMARTSOURCING™

Name Geetha
Date 02/14/2014
NB # 09GB17B



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PROCNO                  1
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Time                13.54
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PULPROG              zg30
TD                  32768
SOLVENT             CDCl3
NS                     16
DS                      2
SWH              6172.839 Hz
FIDRES           0.188380 Hz
AQ              2.6542580 sec
RG                   71.8
DW                 81.000 usec
DE                   6.00 usec
TE                  300.0 K
D1             1.00000000 sec
TD0                     1

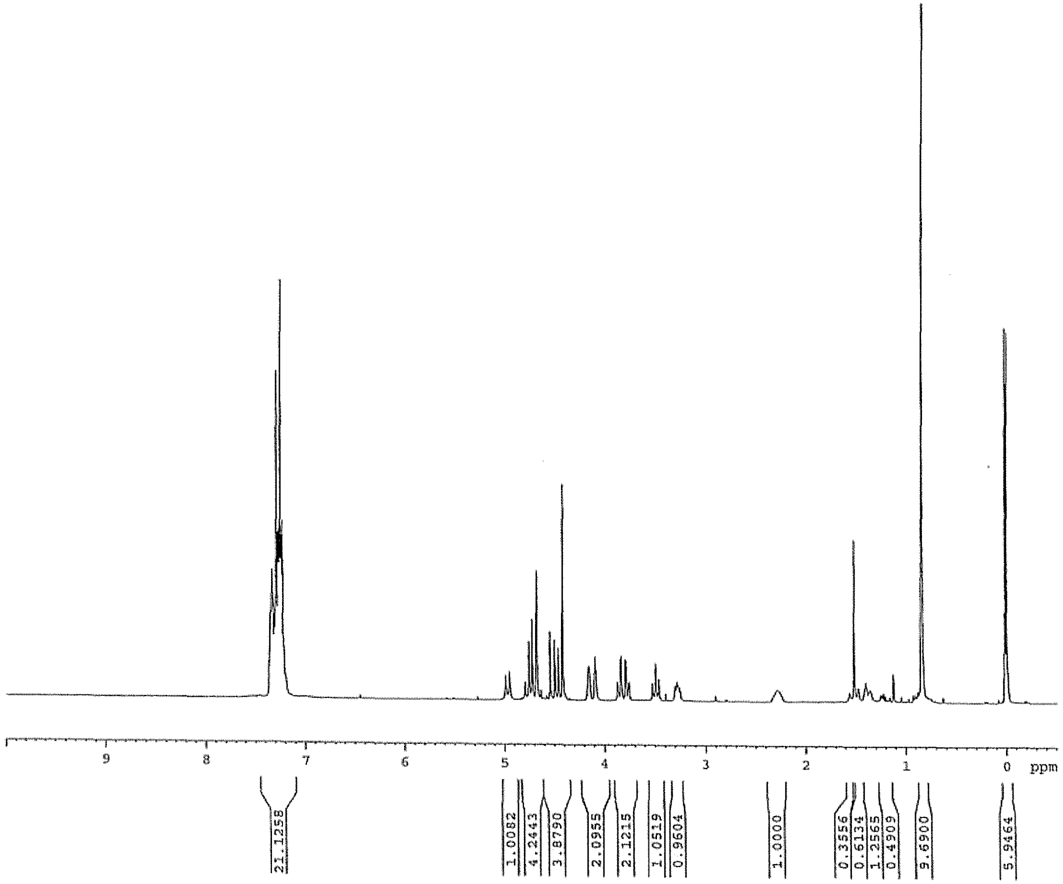
======== CHANNEL f1 ========
NUC1                   1H
P1                  12.75 usec
PL1                  2.00 dB
SFO1          300.1418534 MHz
SI                  16384
SF            300.1400174 MHz
WDW                    EM
SSB                     0
LB                   0.30 Hz
GB                      0
PC                   1.00
```

Attachment 10

AMRI SRC AV-300
location; 10
Compound 13

AMRI GLOBAL
SMARTSOURCING™

Name Geetika
Date 02/19/2014
NB # 09GB18C



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PROCNO                  1
Date_            20140219
Time                 8.06
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PULPROG              zg30
TD                  32768
SOLVENT             CDCl3
NS                     16
DS                      2
SWH              6172.839 Hz
FIDRES           0.188380 Hz
AQ              2.6542580 sec
RG                    256
DW                 81.000 usec
DE                   6.00 usec
TE                  300.0 K
D1             1.00000000 sec
TD0                     1

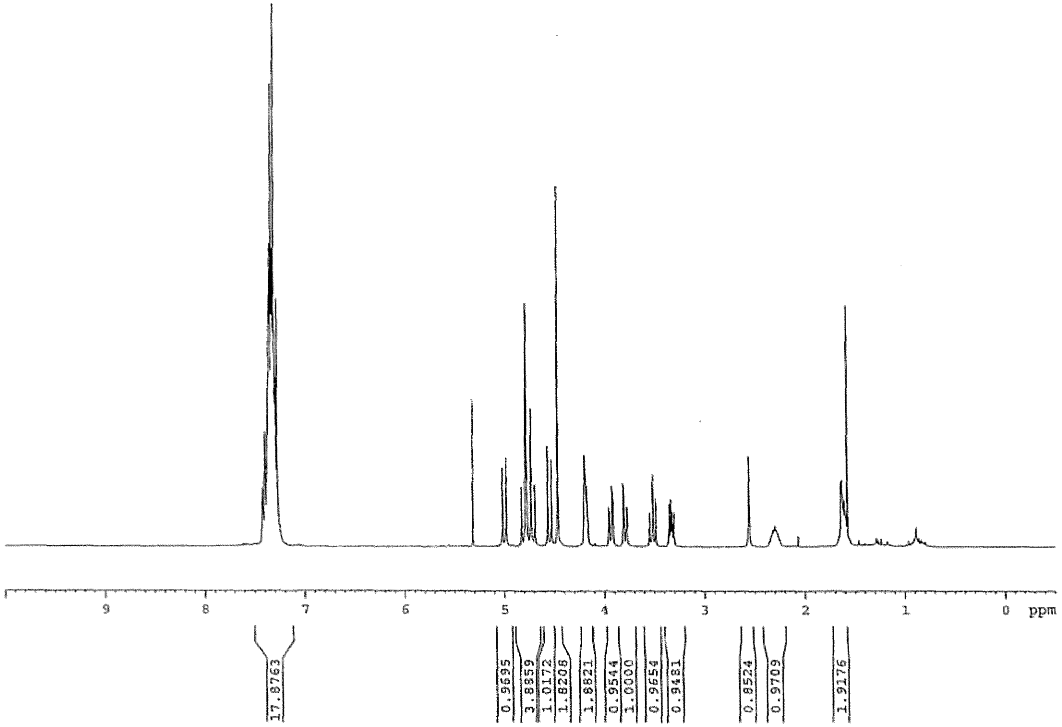
======== CHANNEL f1 ========
NUC1                   1H
P1                  12.75 usec
PL1                  2.00 dB
SFO1          300.1418534 MHz
SI                  16384
SF            300.1400135 MHz
WDW                    EM
SSB                     0
LB                   0.30 Hz
GB                      0
PC                   1.00
```

Attachment 11

AMRI SRC AV-300
location; 10
Compound A

AMRI GLOBAL
SMARTSOURCING™

Name Geetha
Date 03/13/2014
NB# 09GB025C



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PROCNO                1
Date_          20140313
Time               9.45
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PULPROG            zg30
TD                32768
SOLVENT           CDCl3
NS                   16
DS                    2
SWH            6172.839 Hz
FIDRES         0.188380 Hz
AQ            2.6542580 sec
RG                  362
DW               81.000 usec
DE                 6.00 usec
TE                300.0 K
D1           1.00000000 sec
TD0                   1

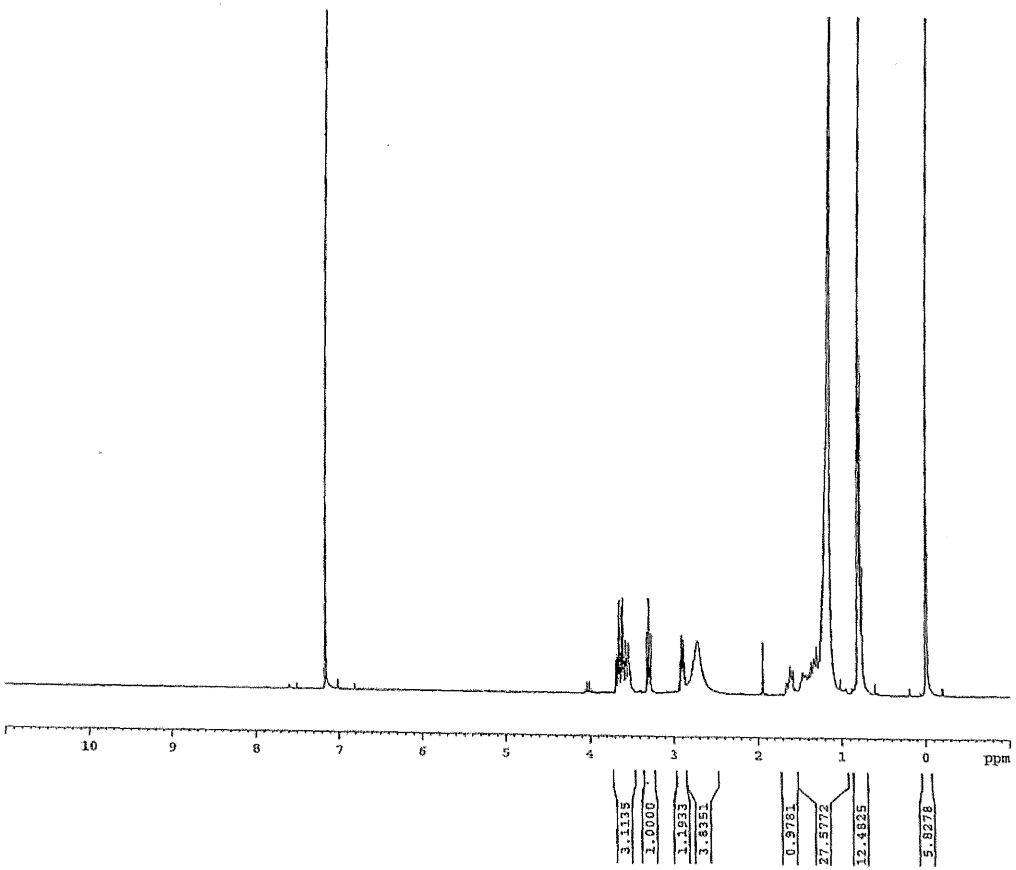
======== CHANNEL f1 ========
NUC1                 1H
P1                12.75 usec
PL1                2.00 dB
SFO1        300.1418534 MHz
SI                16384
SF          300.1400000 MHz
WDW                  EM
SSB                   0
LB                 0.30 Hz
GB                    0
PC                 1.00
```

Attachment 12

AMRI SRC AV-300
location; 10
Compound 15

AMRI GLOBAL
SMARTSOURCING™

Name Di Xu
Date 3/6/2014
NB # 14KL0187



```
NAME            14KL0187
EXPNO                 10
PROCNO                 1
Date_           20140306
Time               11.12
INSTRUM            spect
PROBHD   5 mm QNP 1H/13
PULPROG             zg30
TD                 32768
SOLVENT            CDCl3
NS                    16
DS                     2
SWH             6172.839 Hz
FIDRES          0.188380 Hz
AQ             2.6542580 sec
RG                   362
DW                81.000 usec
DE                  6.00 usec
TE                 300.0 K
D1            1.00000000 sec
TD0                    1

======== CHANNEL f1 ========
NUC1                  1H
P1                 12.75 usec
PL1                 2.00 dB
SFO1         300.1418534 MHz
SI                 16384
SF           300.1400345 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00
```

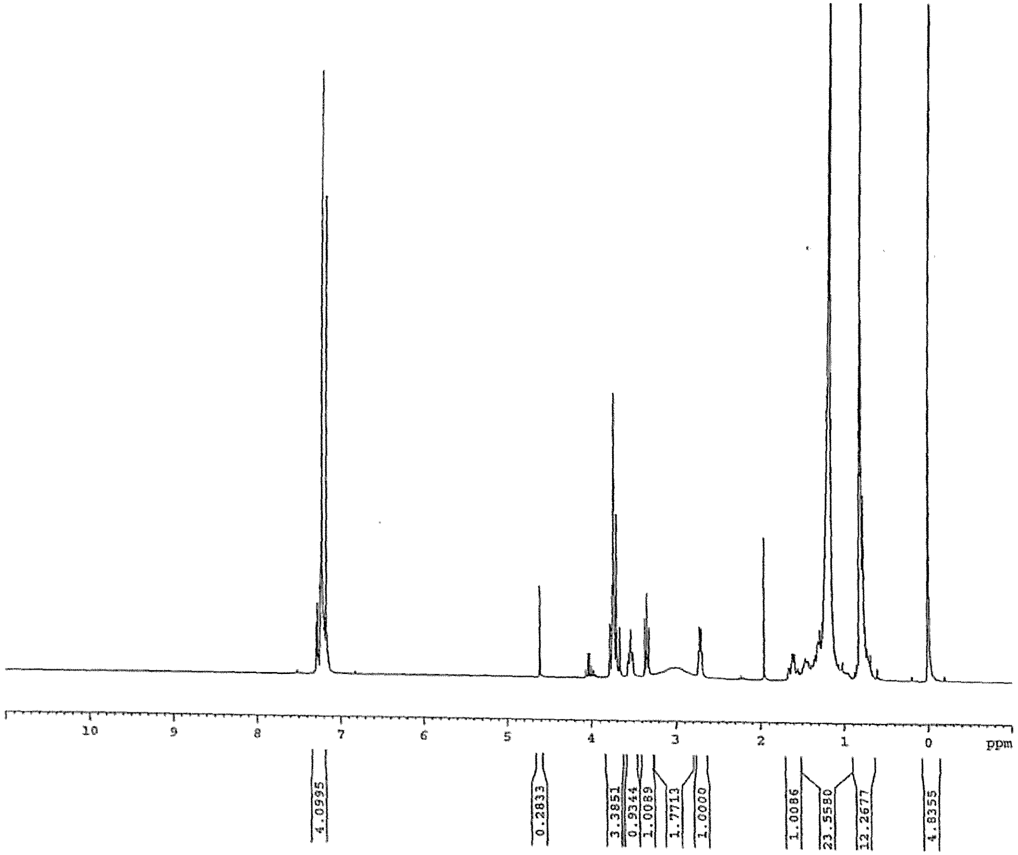
Attachment 13

AMRI SRC AV-300
location; 10

Compound 16

AMRI GLOBAL
SMARTSOURCING™

Name Di Xu
Date 3/13/2014
NB# 14KL0210



```
NAME              14KL0210
EXPNO                   10
PROCNO                   1
Date_             20140313
Time                 16.29
INSTRUM              spect
PROBHD   5 mm QNP 1H/13
PULPROG               zg30
TD                   32768
SOLVENT              CDCl3
NS                      16
DS                       2
SWH               6172.839 Hz
FIDRES            0.188380 Hz
AQ               2.6542580 sec
RG                     362
DW                  81.000 usec
DE                    6.00 usec
TE                   300.0 K
D1              1.00000000 sec
TD0                      1

======== CHANNEL f1 ========
NUC1                    1H
P1                   12.75 usec
PL1                   2.00 dB
SFO1           300.1418534 MHz
SI                   16384
SF             300.1400311 MHz
WDW                     EM
SSB                      0
LB                    0.30 Hz
GB                       0
PC                    1.00
```

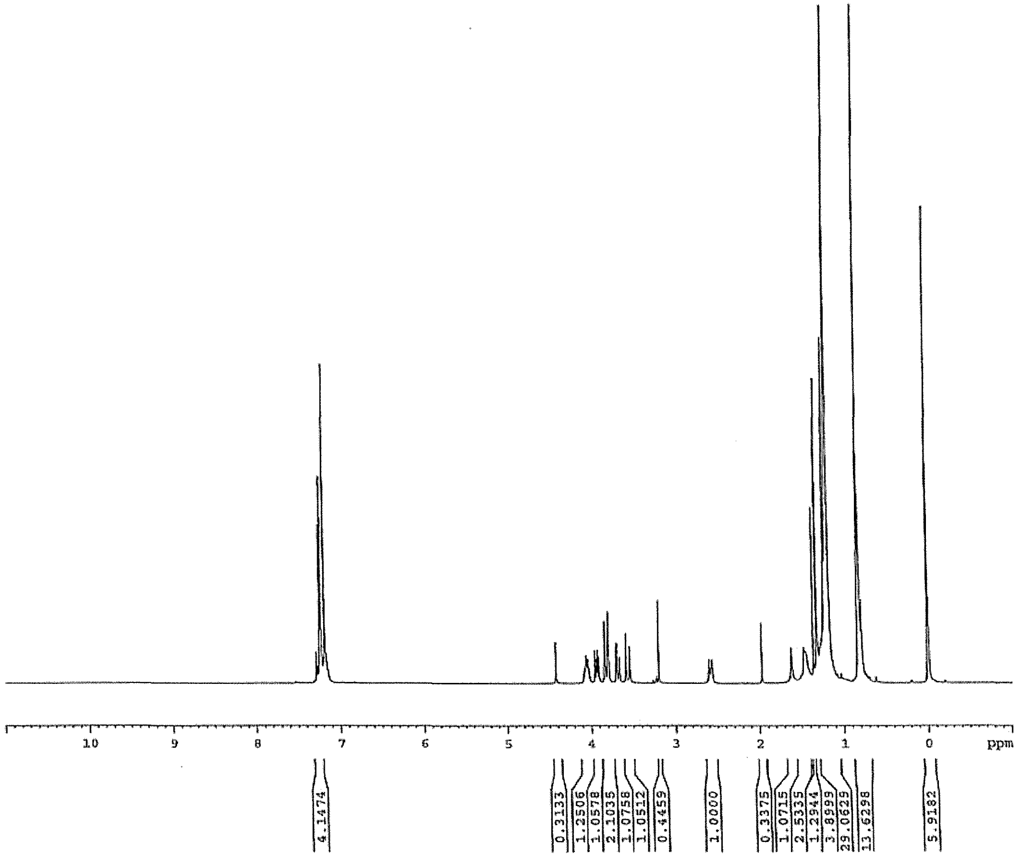
Attachment 14

AMRI SRC AV-300
location; 10

Compound 17

AMRI GLOBAL
SMARTSOURCING™

Name Di Xu
Date 03|18|2014
NB # 09DX022B



```
NAME             09DX022B
EXPNO                  10
PROCNO                  1
Date_            20140318
Time                 9.33
INSTRUM             spect
PROBHD   5 mm QNP 1H/13
PULPROG              zg30
TD                  32768
SOLVENT             CDCl3
NS                     16
DS                      2
SWH              6172.839 Hz
FIDRES           0.188380 Hz
AQ              2.6542580 sec
RG                    362
DW                 81.000 usec
DE                   6.00 usec
TE                  300.0 K
D1             1.00000000 sec
TD0                     1

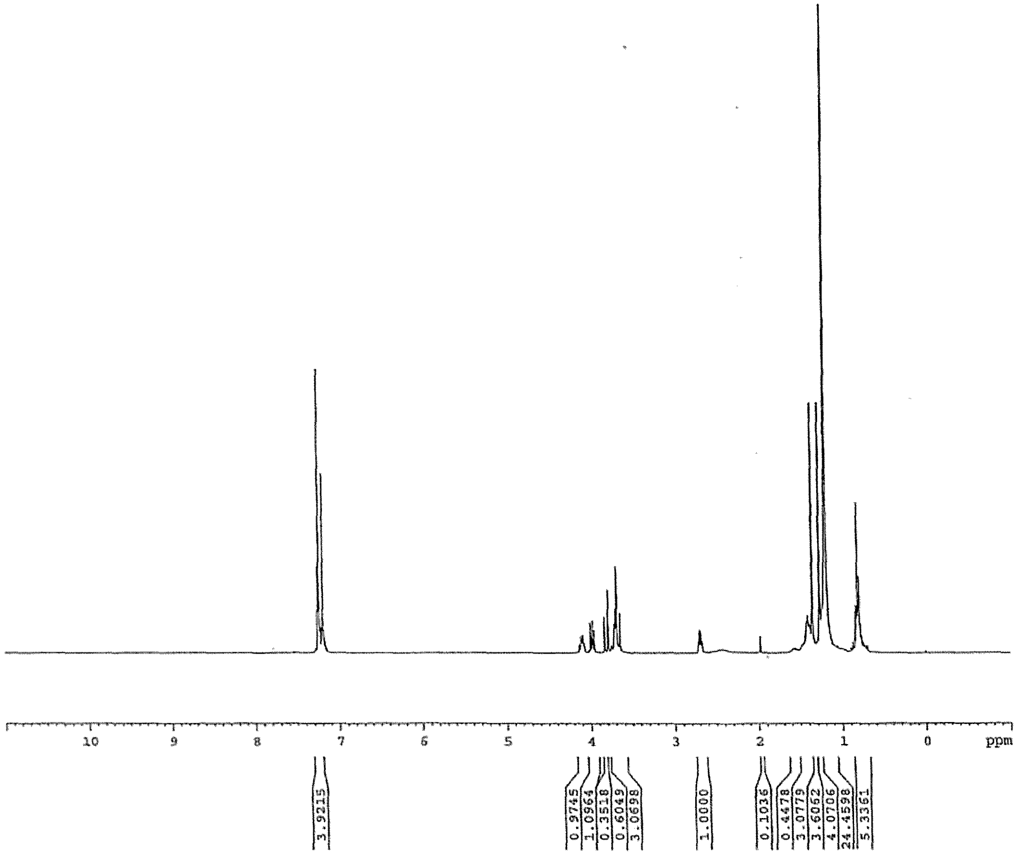
======== CHANNEL f1 ========
NUC1                   1H
P1                  12.75 usec
PL1                  2.00 dB
SFO1          300.1418534 MHz
SI                  16384
SF            300.1400268 MHz
WDW                    EM
SSB                     0
LB                   0.30 Hz
GB                      0
PC                   1.00
```

Attachment 15

AMRI SRC AV-300
location; 10
Compound 18

AMRI GLOBAL
SMARTSOURCING™

Name Di Xu
Date 3/20/2014
NB # 09DX023



```
NAME              09DX023
EXPNO                  20
PROCNO                  1
Date_            20140320
Time                12.19
INSTRUM             spect
PROBHD   5 mm QNP 1H/13
PULPROG              zg30
TD                  32768
SOLVENT             CDCl3
NS                     16
DS                      2
SWH              6172.839 Hz
FIDRES           0.188380 Hz
AQ              2.6542580 sec
RG                    256
DW                 81.000 usec
DE                   6.00 usec
TE                  300.0 K
D1             1.00000000 sec
TD0                     1

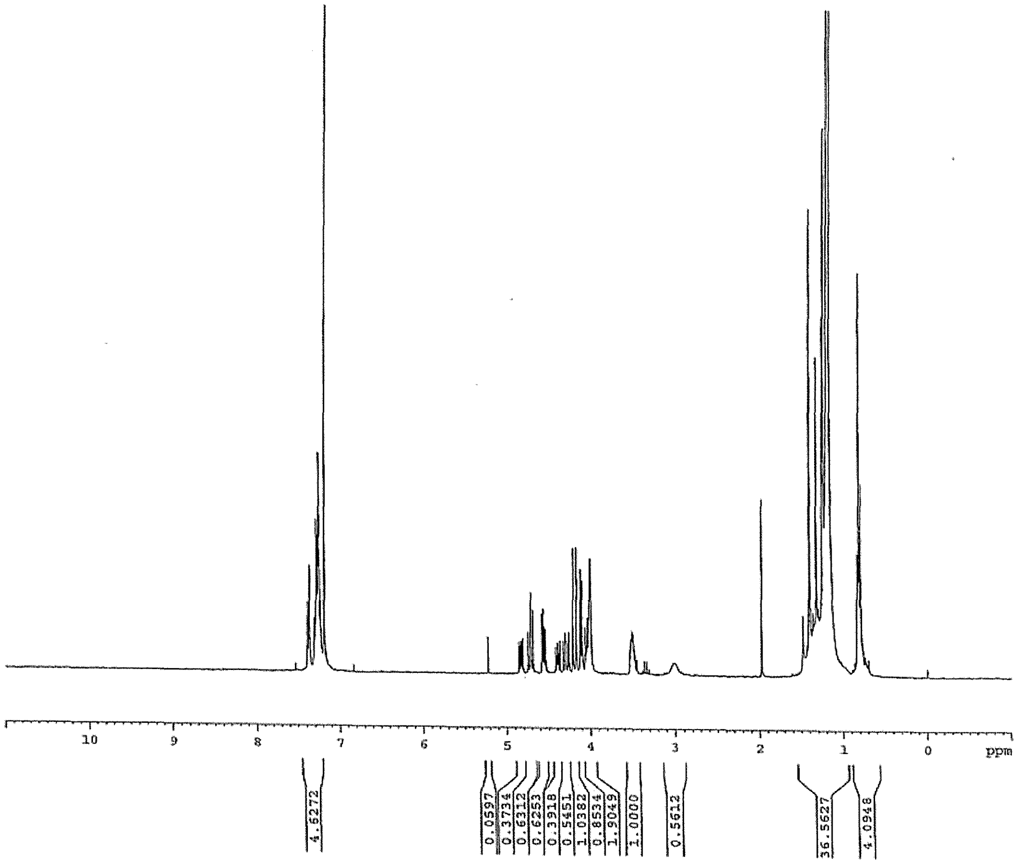
======== CHANNEL f1 ========
NUC1                   1H
P1                  12.75 usec
PL1                  2.00 dB
SFO1          300.1418534 MHz
SI                  16384
SF            300.1400268 MHz
WDW                    EM
SSB                     0
LB                   0.30 Hz
GB                      0
PC                   1.00
```

Attachment 16

AMRI SRC AV-300
location; 10
Compound 19

AMRI GLOBAL
SMARTSOURCING™

Name Di Xu
Date 03/21/2014
NB # 09DX024



```
NAME              09DX024
EXPNO                  10
PROCNO                  1
Date_            20140321
Time                10.11
INSTRUM             spect
PROBHD   5 mm QNP 1H/13
PULPROG              zg30
TD                  32768
SOLVENT             CDCl3
NS                     16
DS                      2
SWH              6172.839 Hz
FIDRES           0.188380 Hz
AQ              2.6542580 sec
RG                    362
DW                 81.000 usec
DE                   6.00 usec
TE                  300.0 K
D1             1.00000000 sec
TD0                     1

======== CHANNEL f1 ========
NUC1                   1H
P1                  12.75 usec
PL1                  2.00 dB
SFO1          300.1418534 MHz
SI                  16384
SF            300.1400264 MHz
WDW                    EM
SSB                     0
LB                   0.30 Hz
GB                      0
PC                   1.00
```