

Supplementary Material

Synthesis of ethynylated biaryls and asymmetric diethynylated benzene *via* sequential Sonogashira and Suzuki couplings in water

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¹H NMR of compound 4

MohamadAbdelmoaty-K-106-CDCL3-H

Pulse Sequence: s2pu1

Solvent: CDCl3

Temp. 30.0 C / 303.1 K

Mercury-300BB "NMR300"

Relax. delay 1.000 sec

Pulse 74.1 degrees

Acq. time 4.007 sec

Width 9000.0 Hz

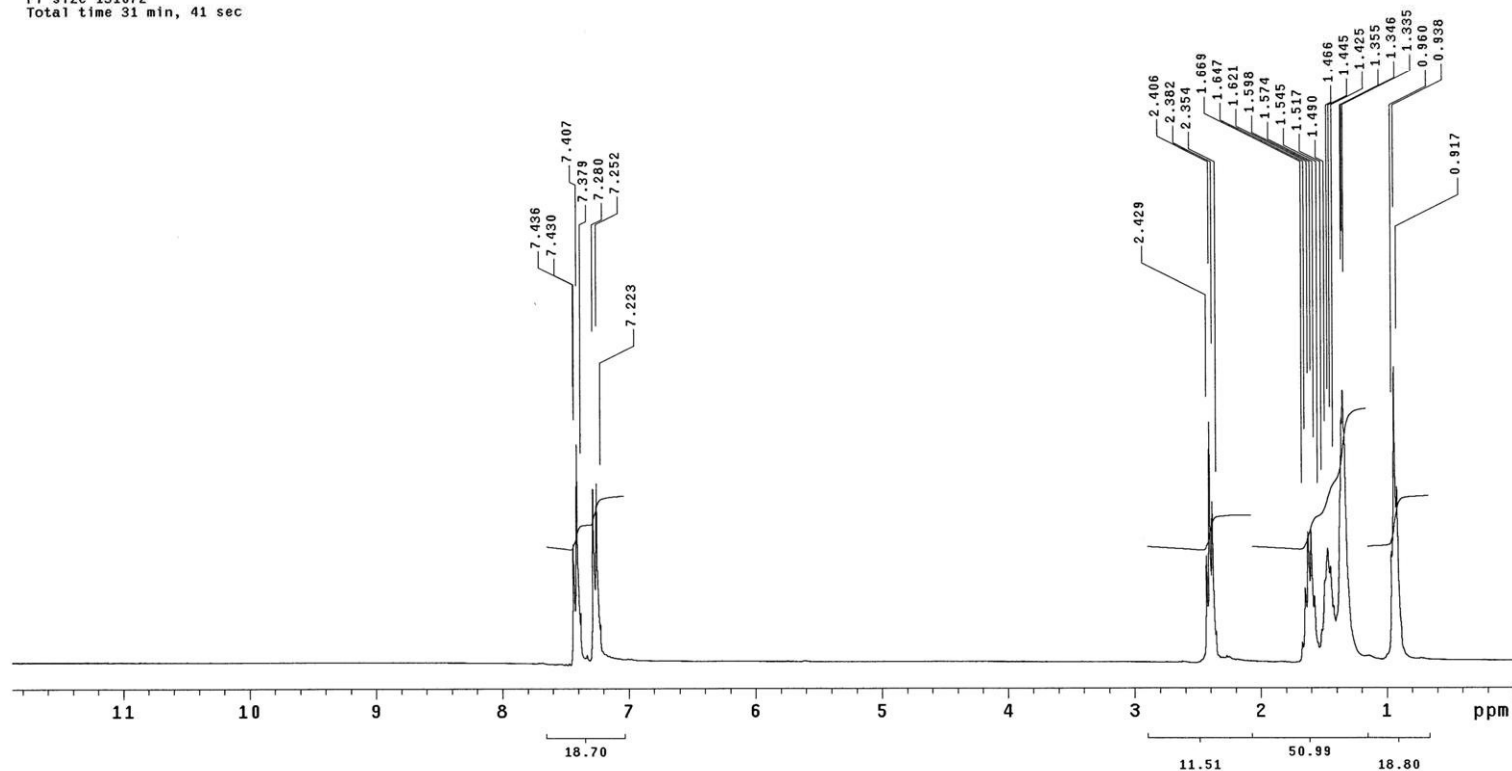
13 repetitions

OBSERVE H1, 300.0673626 MHz

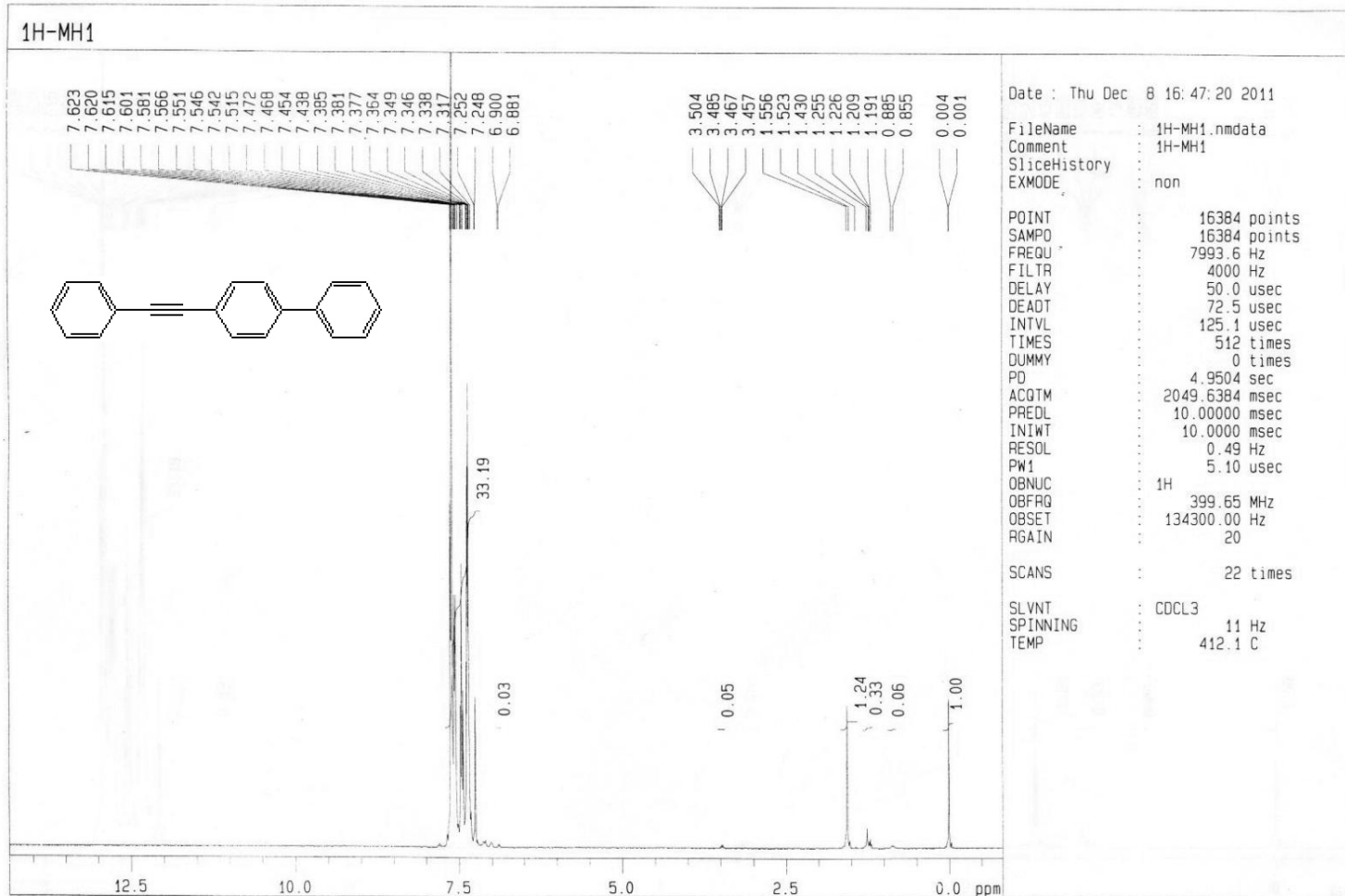
DATA PROCESSING

FT size 131072

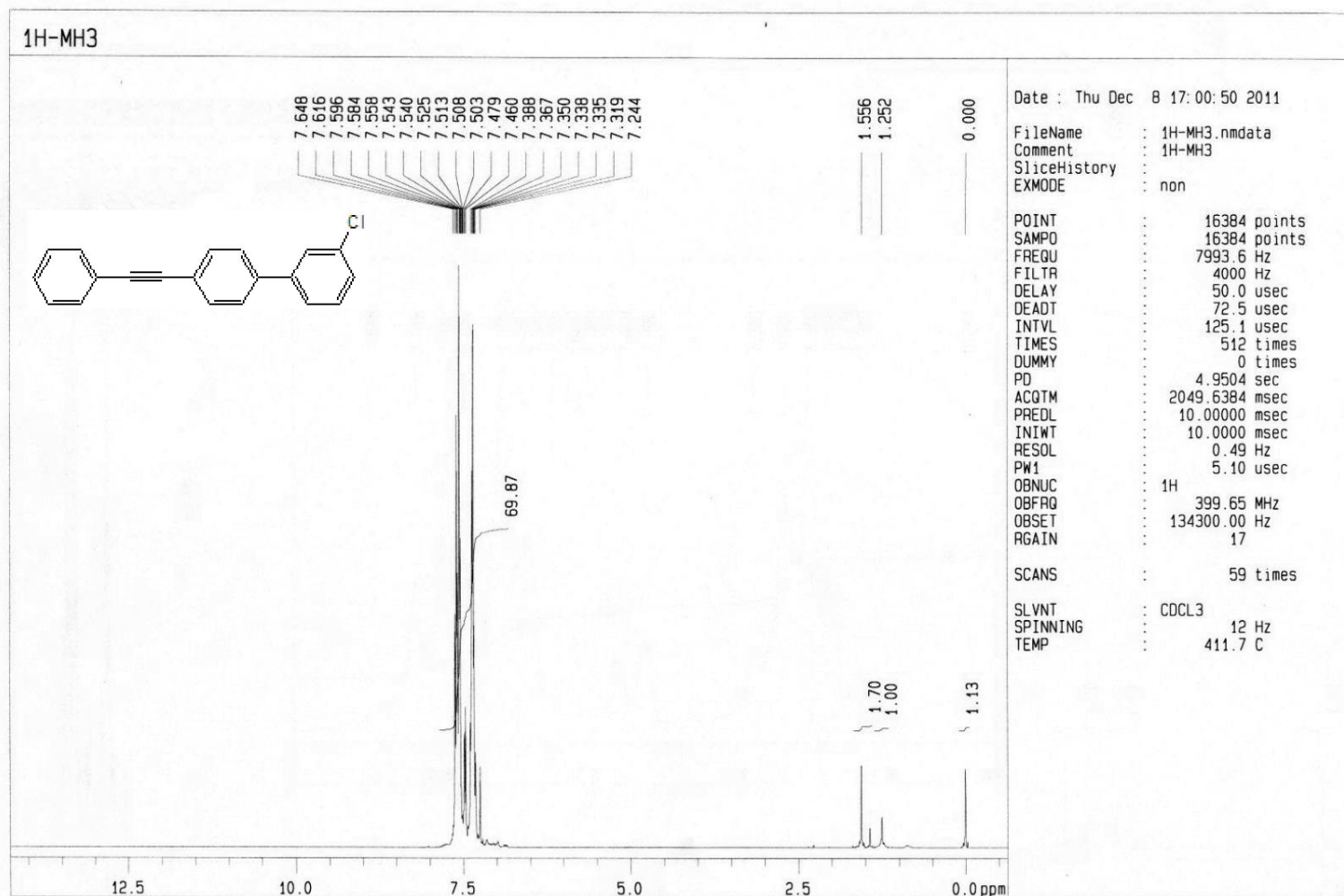
Total time 31 min, 41 sec

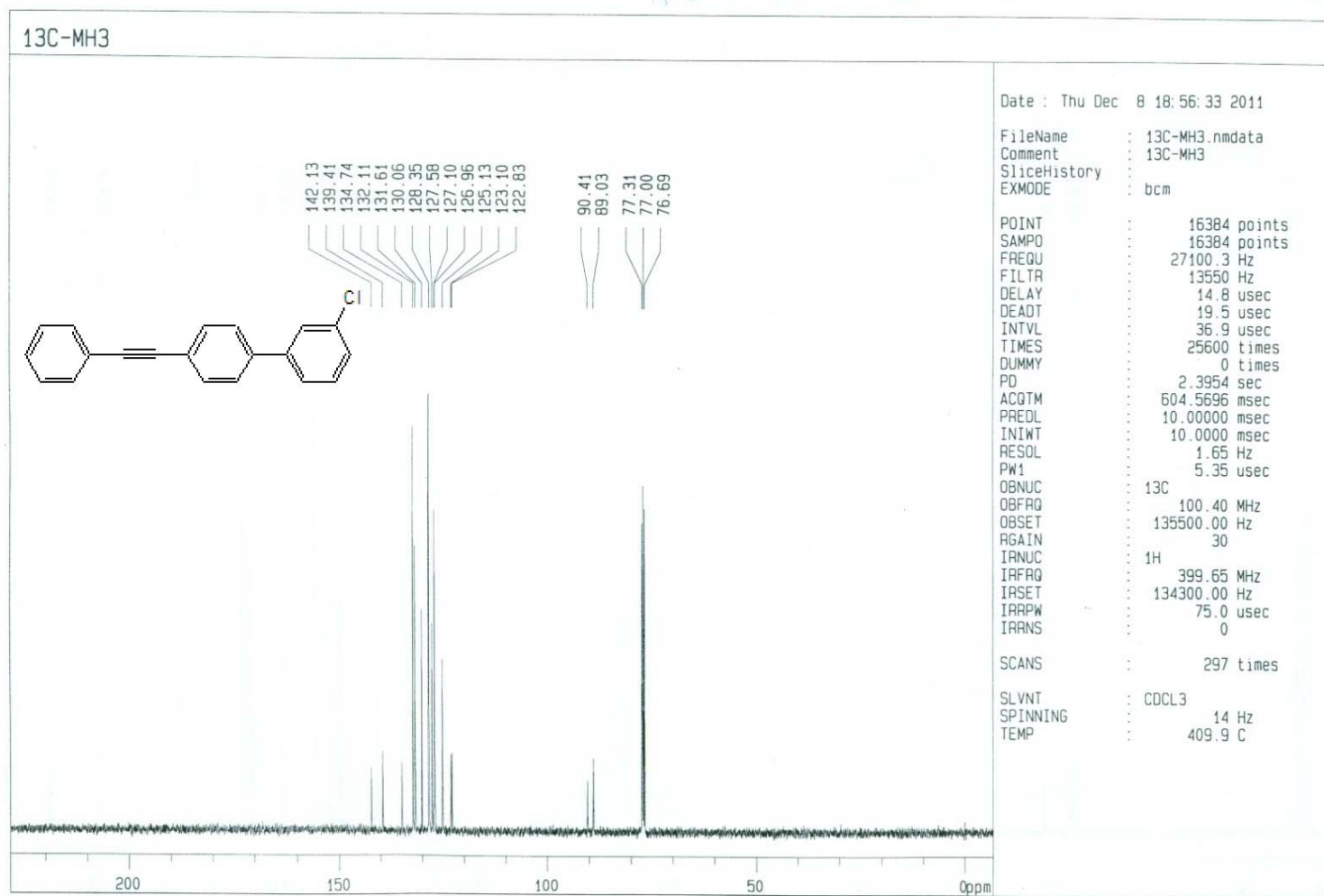


¹H NMR of compound 5

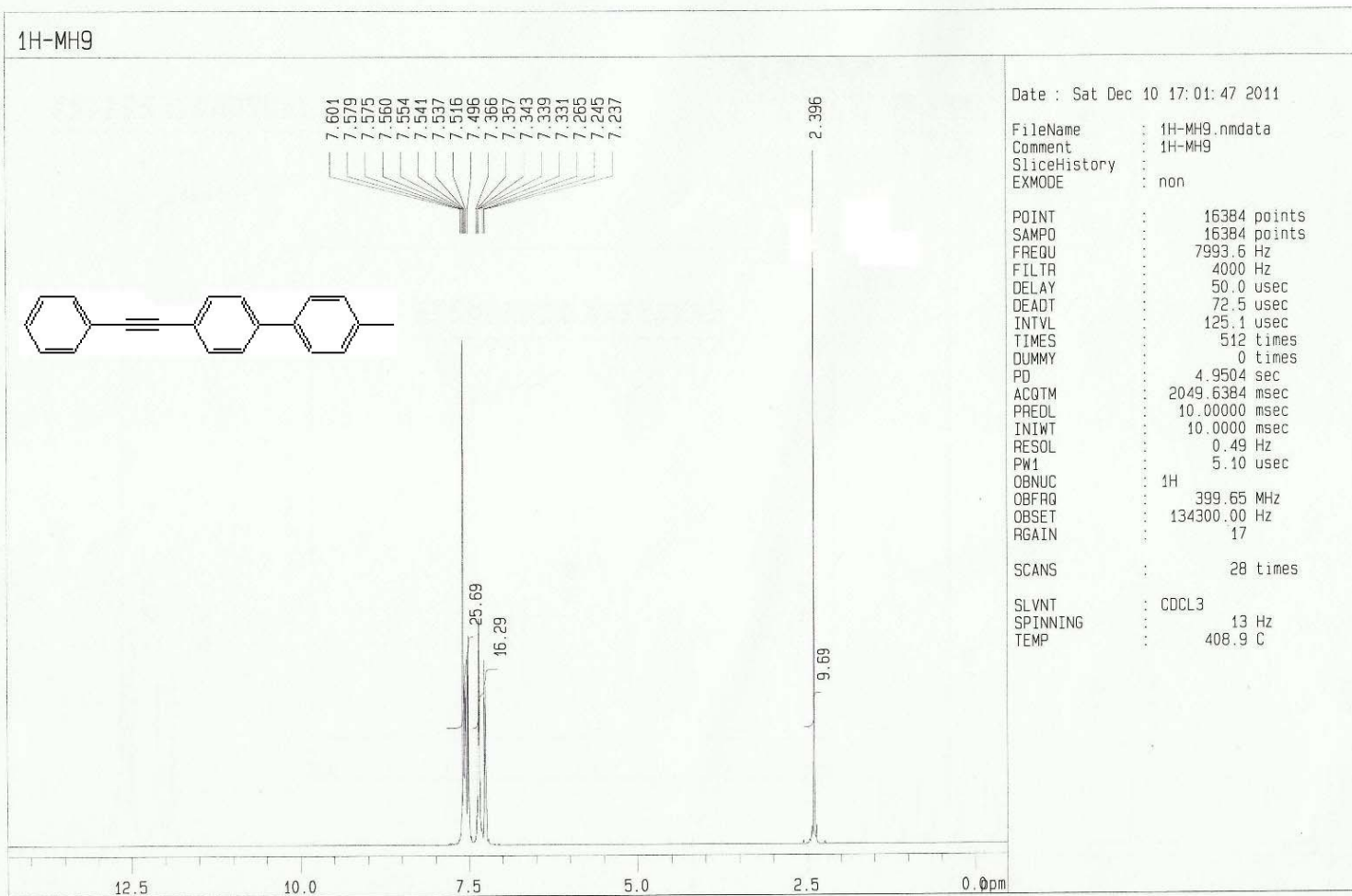


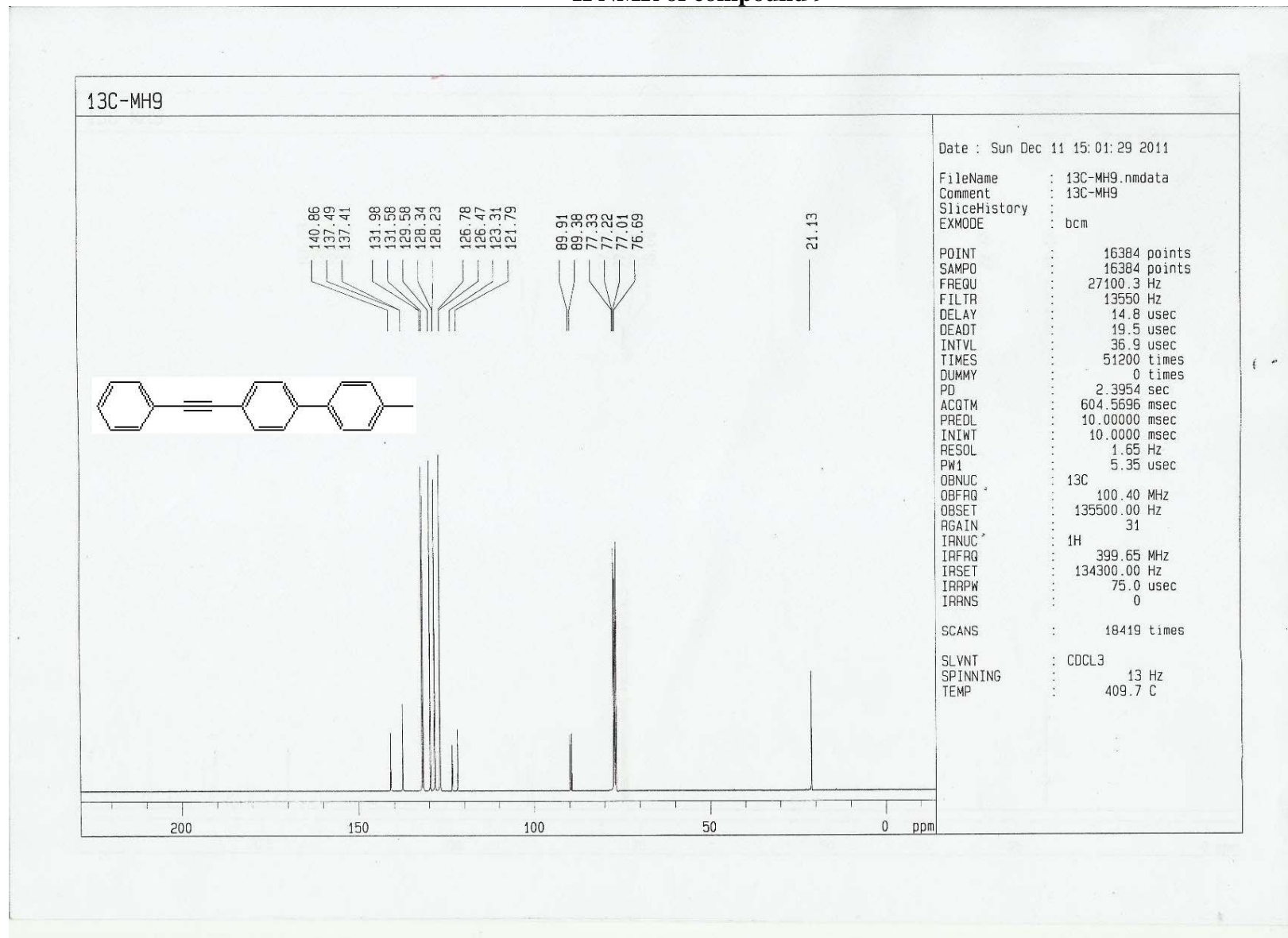
¹H NMR of compound 7



¹H NMR of compound 8

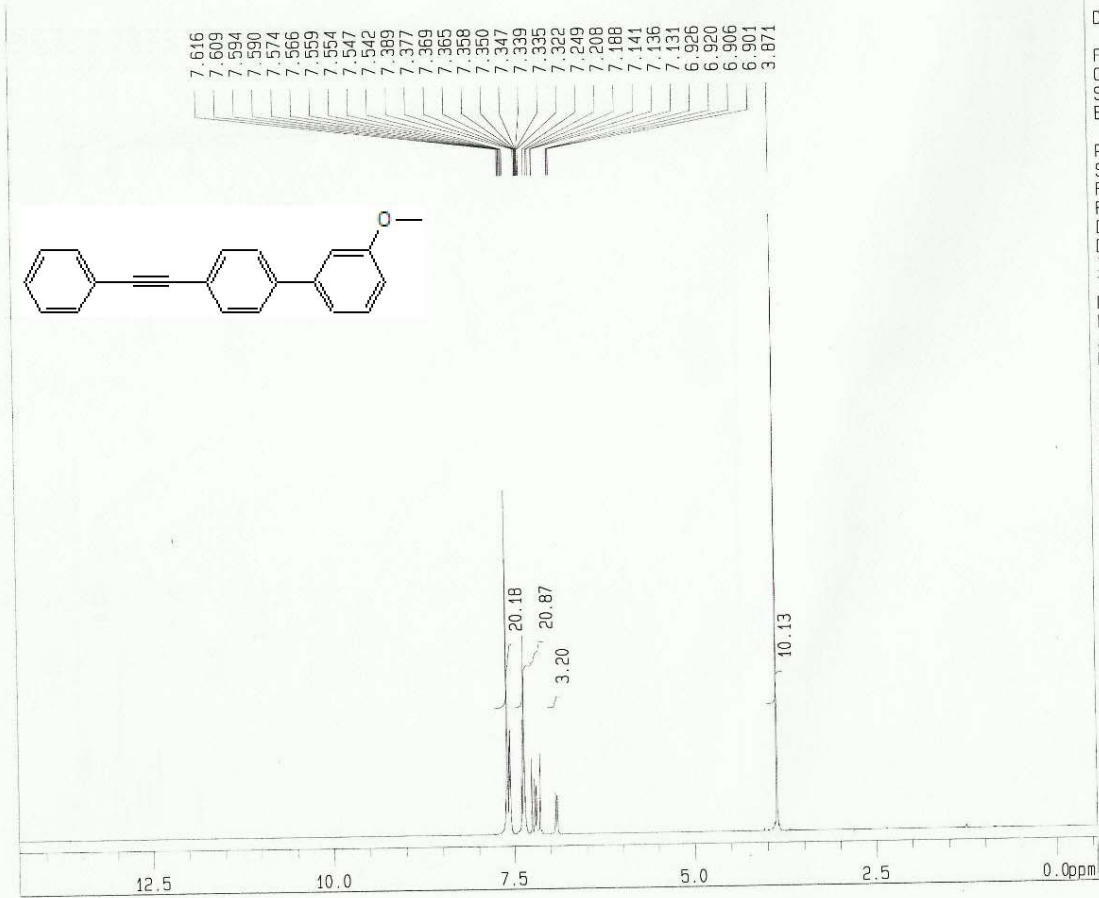
¹³C NMR of compound 8



¹H NMR of compound 9

¹³C NMR of compound 9

1H-MH13



Date : Sat Dec 10 17: 45: 42 2011

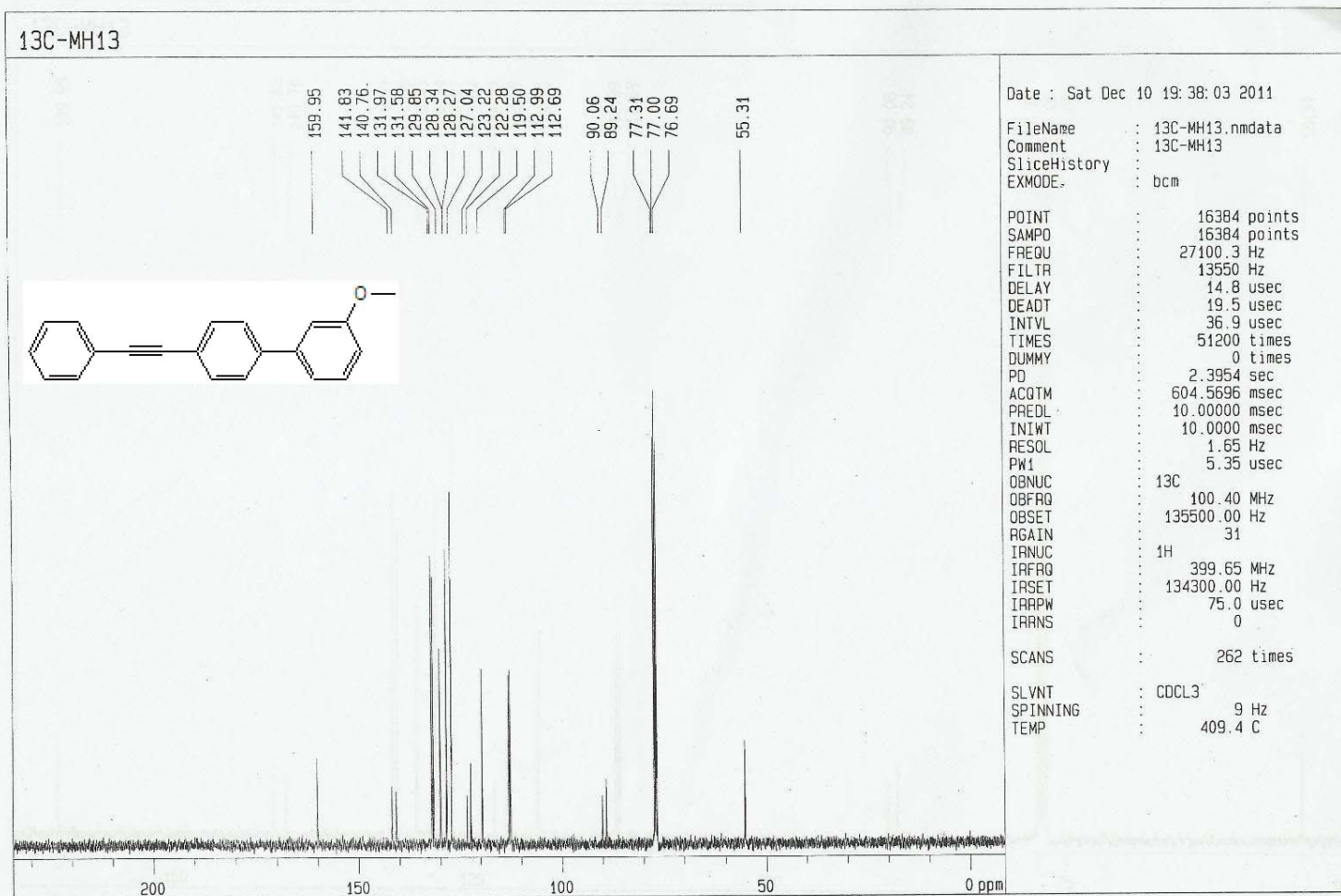
FileName : 1H-MH13.nmdata
 Comment : 1H-MH13
 SliceHistory :
 EXMODE : non

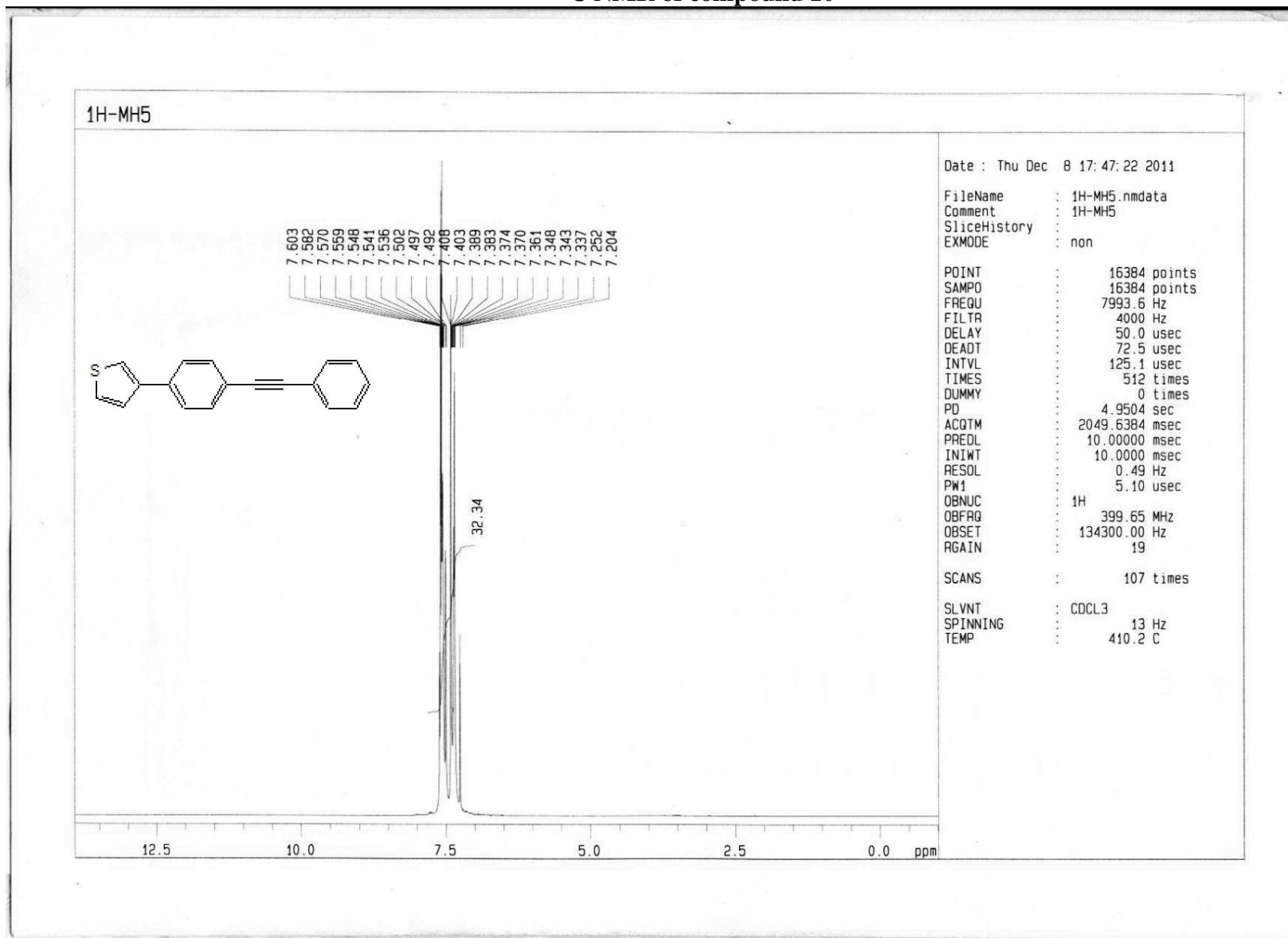
POINT : 16384 points
 SAMPO : 16384 points
 FREQU : 7993.6 Hz
 FILTR : 4000 Hz
 DELAY : 50.0 usec
 DEADT : 72.5 usec
 INTVL : 125.1 usec
 TIMES : 512 times
 DUMMY : 0 times
 PD : 4.9504 sec
 ACQTM : 2049.6384 msec
 PREDL : 10.00000 msec
 INIWT : 10.0000 msec
 RESOL : 0.49 Hz
 PW1 : 5.10 usec

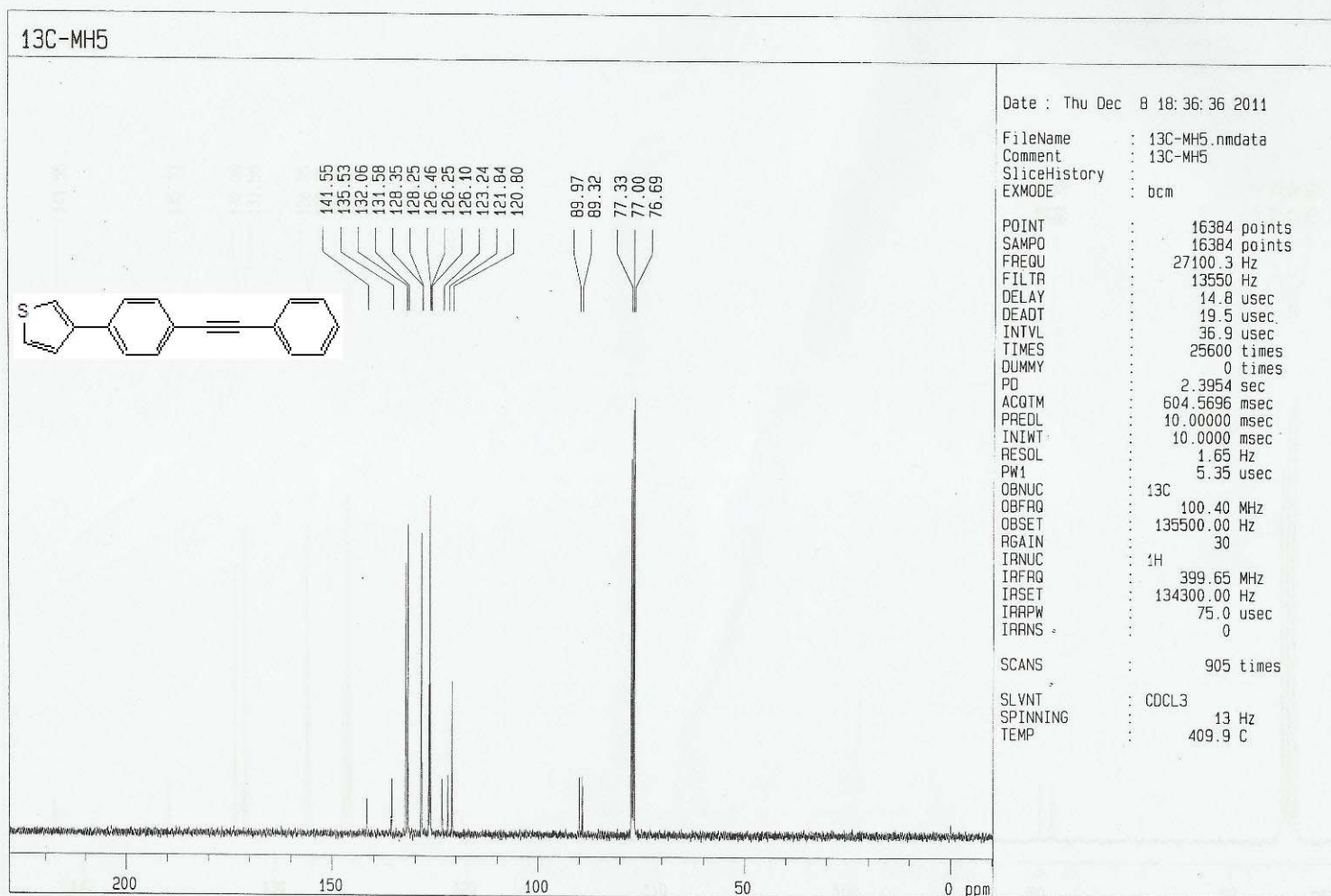
OBNUC : 1H
 OBFRQ : 399.65 MHz
 OBSET : 134300.00 Hz
 RGAIN : 17

SCANS : 9 times

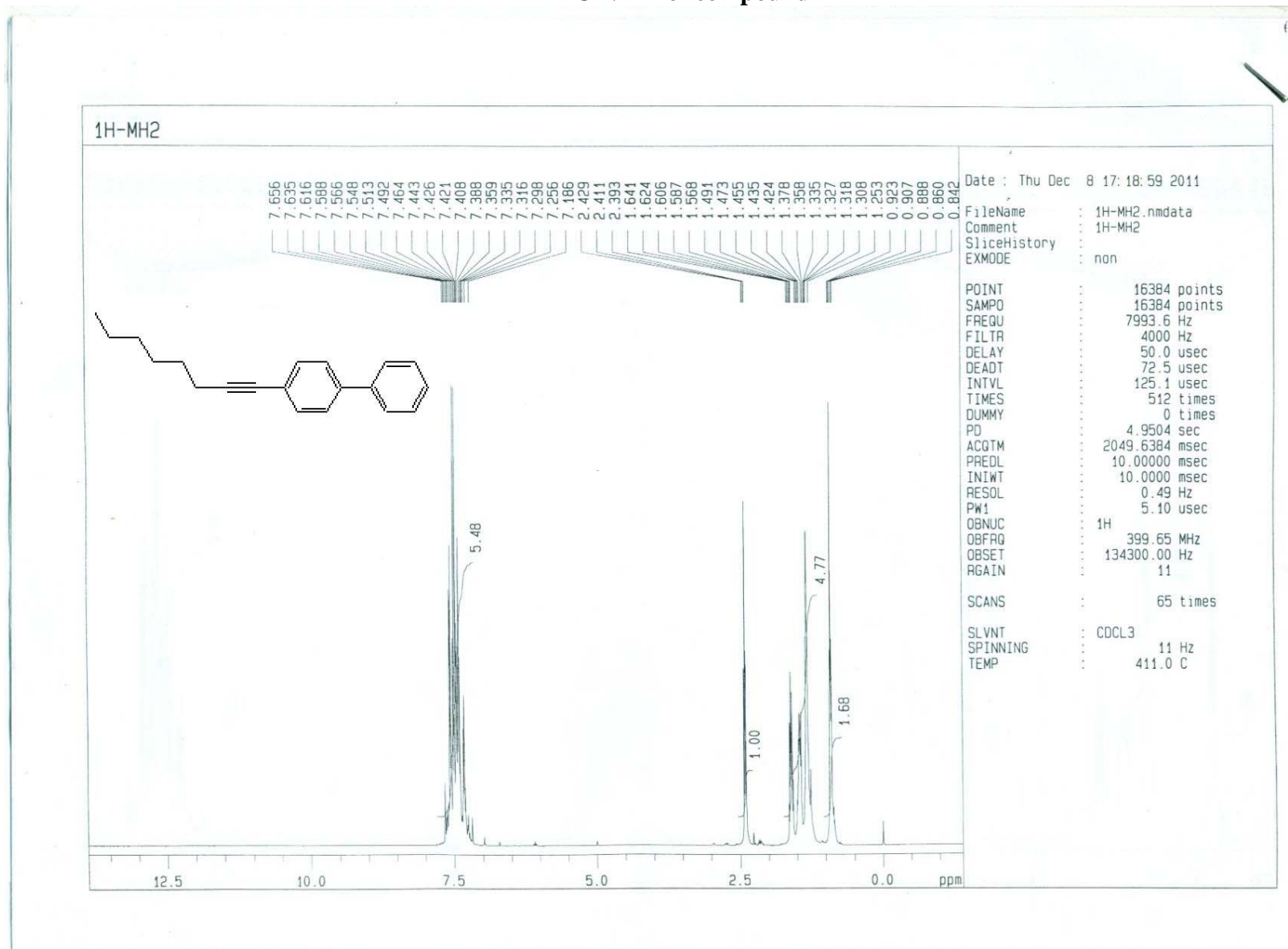
SLVNT : CDCL3
 SPINNING : 12 Hz
 TEMP : 408.9 C

¹³C NMR of compound 10

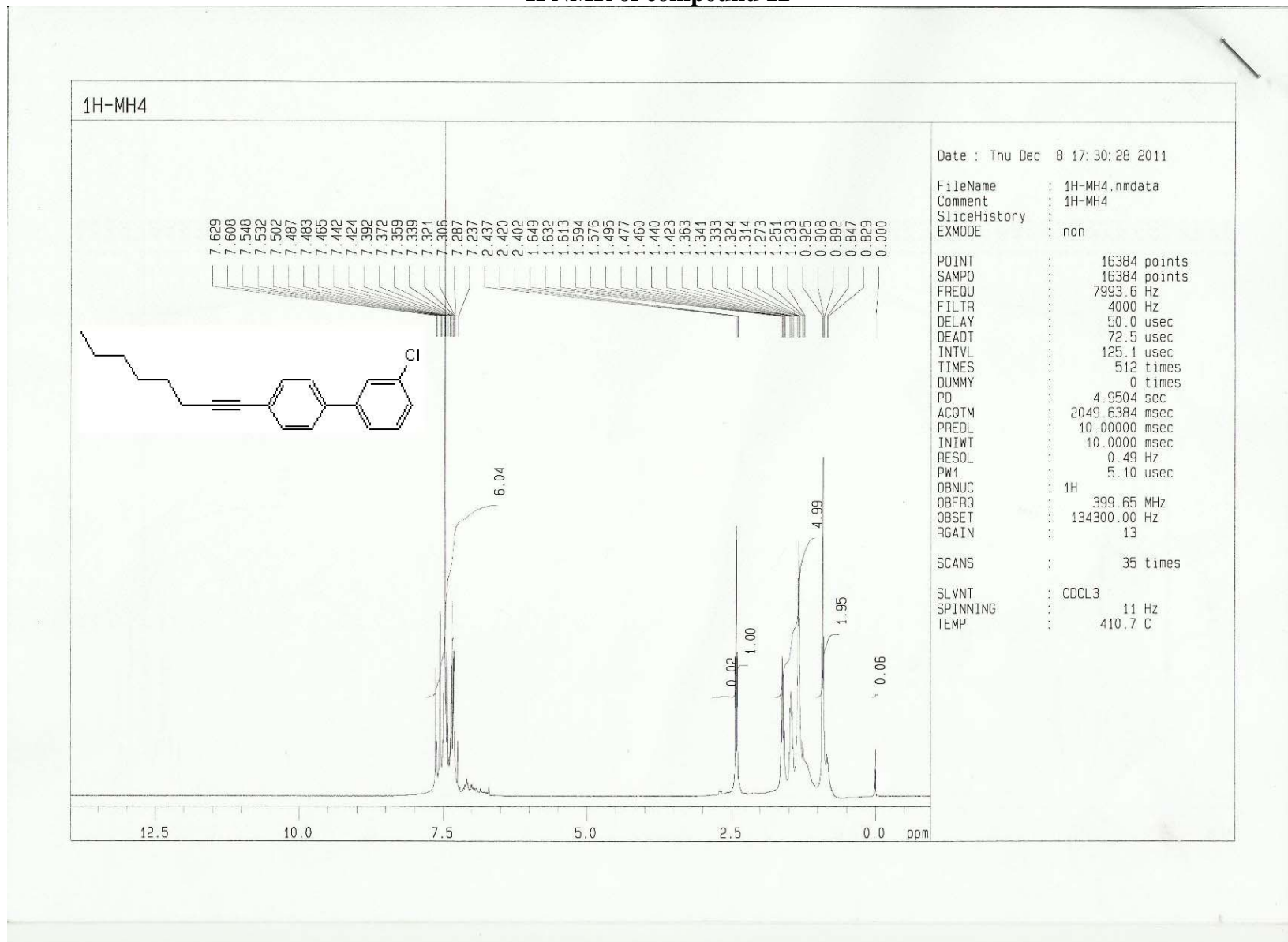
^{13}C NMR of compound 10

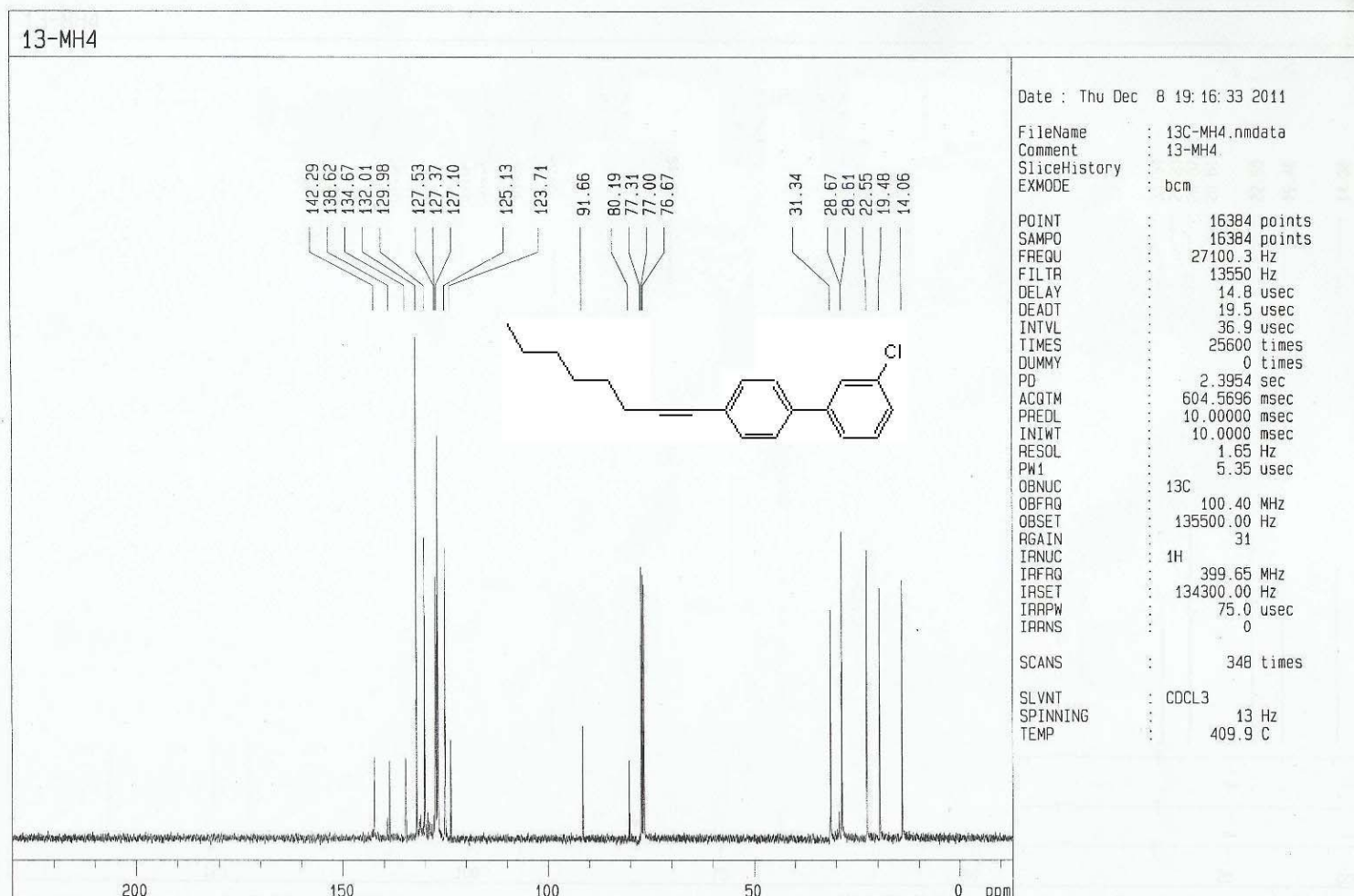
¹³C NMR of compound 11

¹³C NMR of compound 11

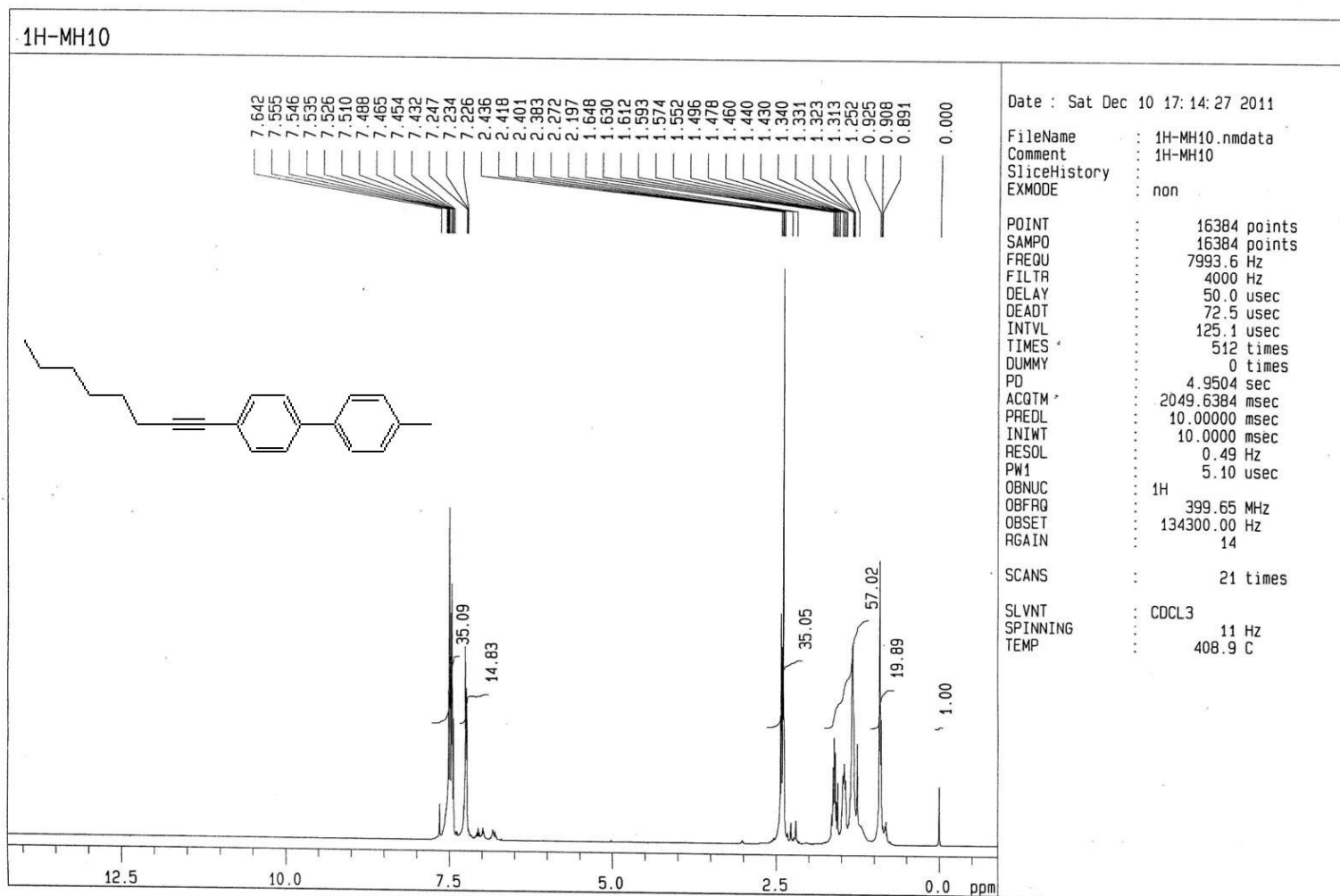


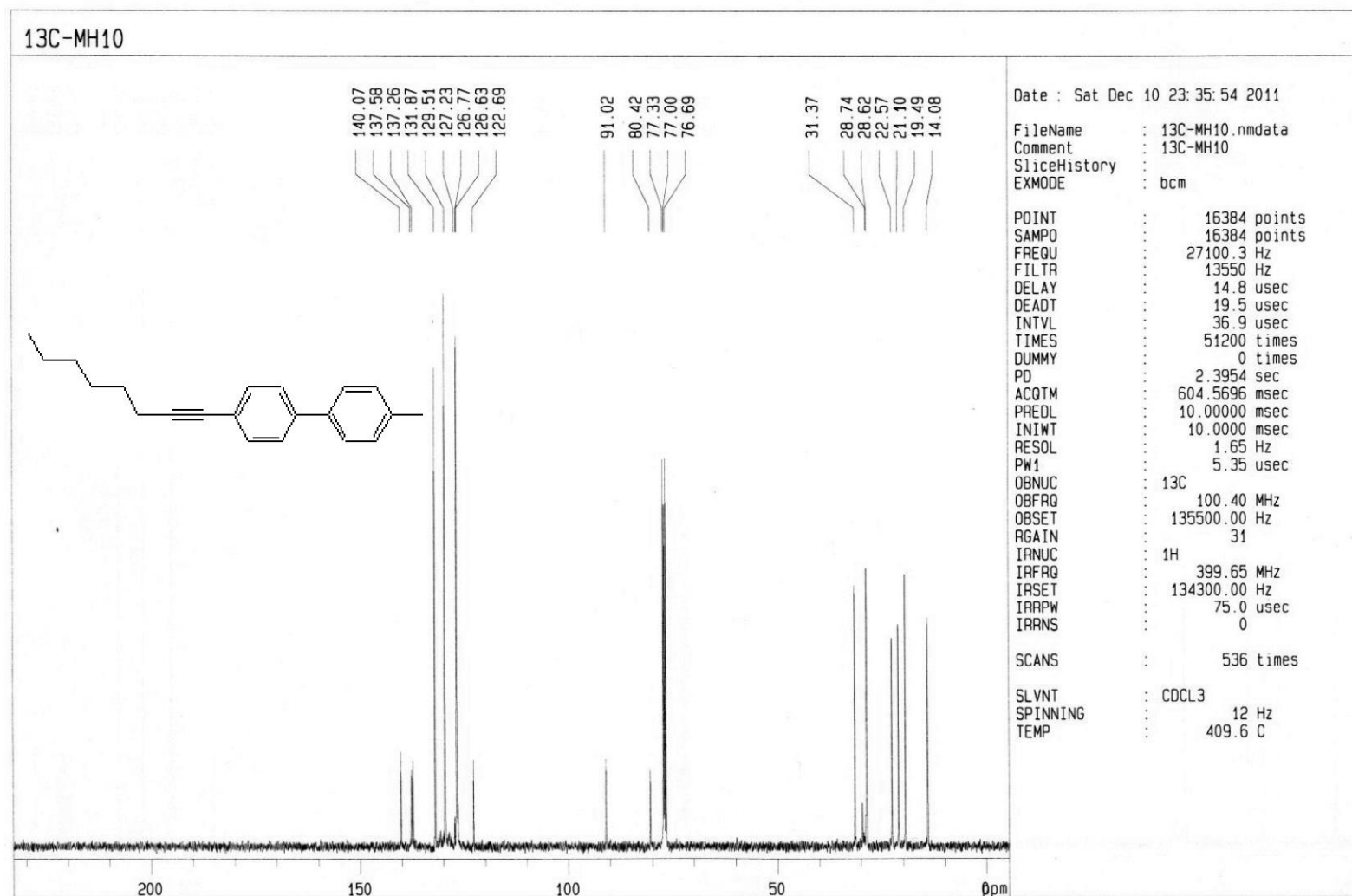
¹H NMR of compound 12



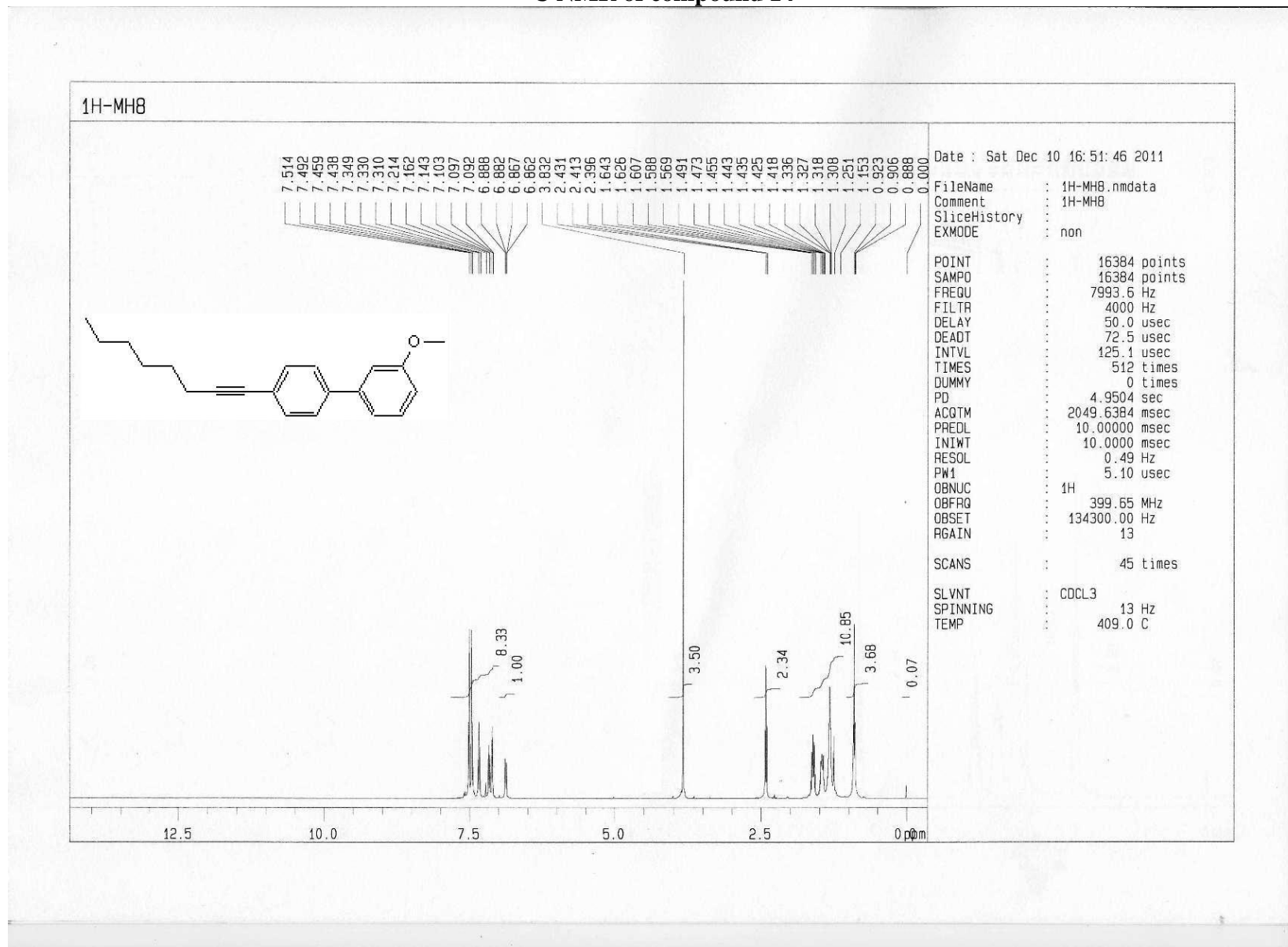
^1H NMR of compound 13

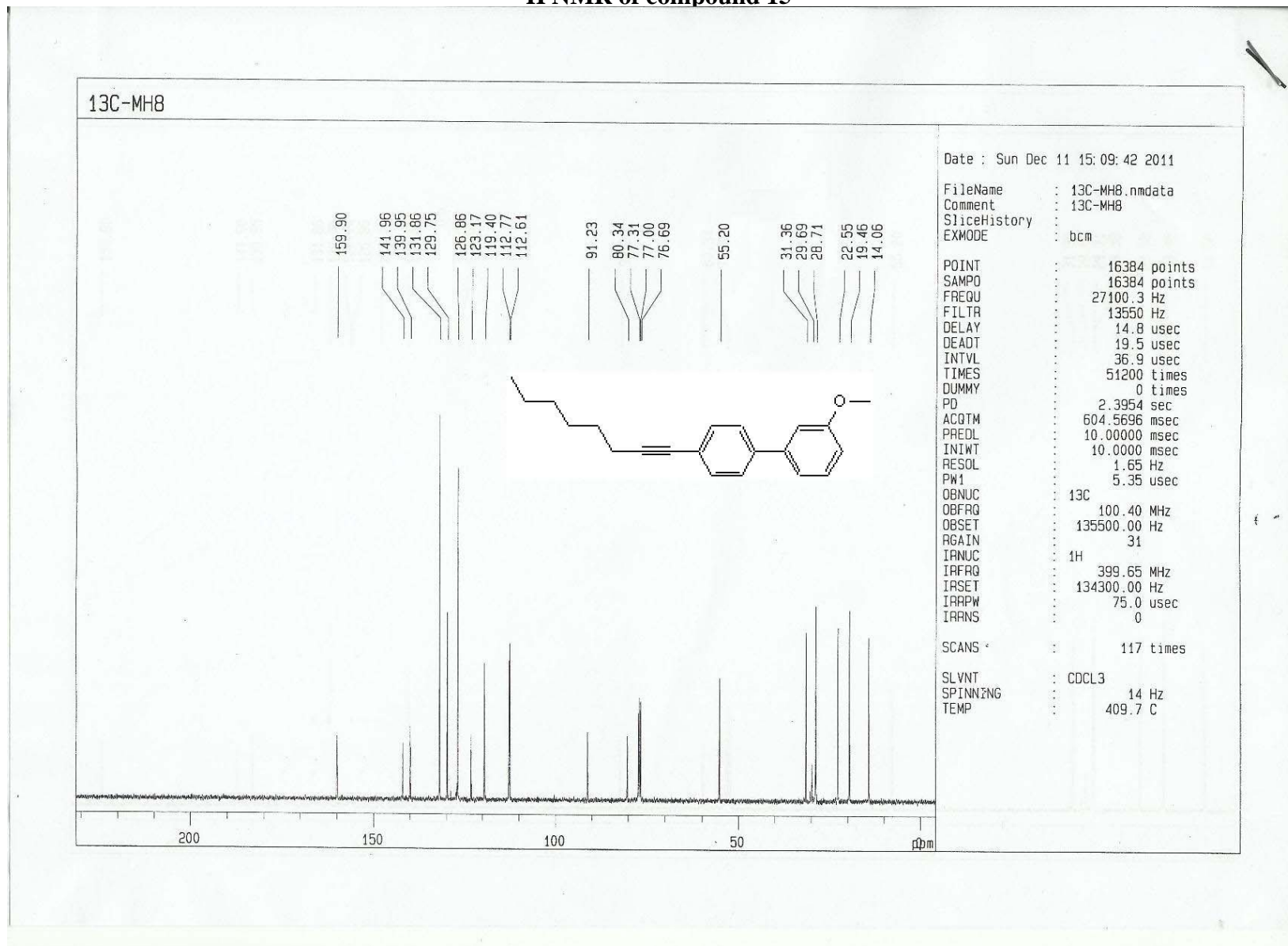
¹³C NMR of compound 13



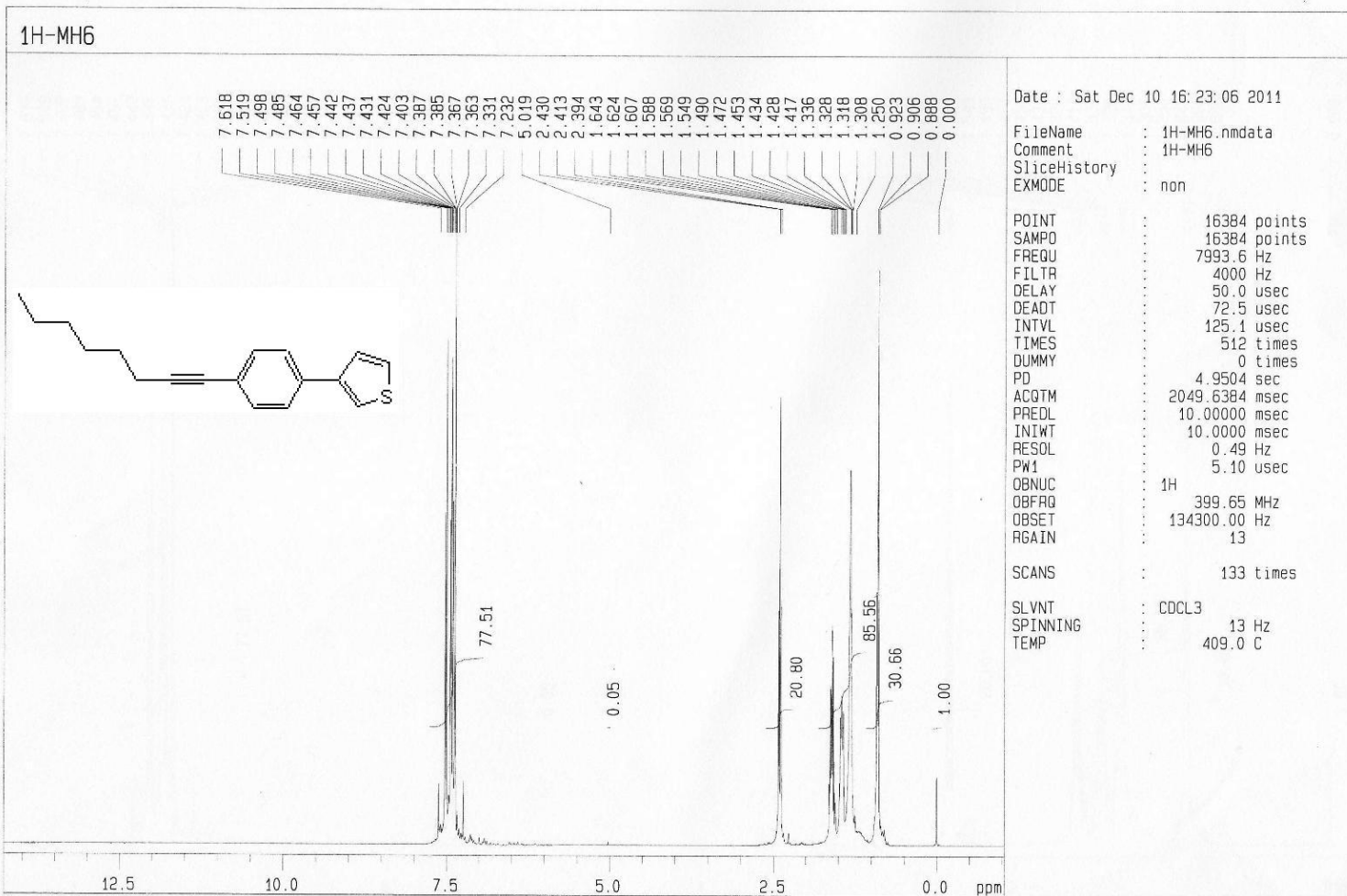
^{13}C NMR of compound 14

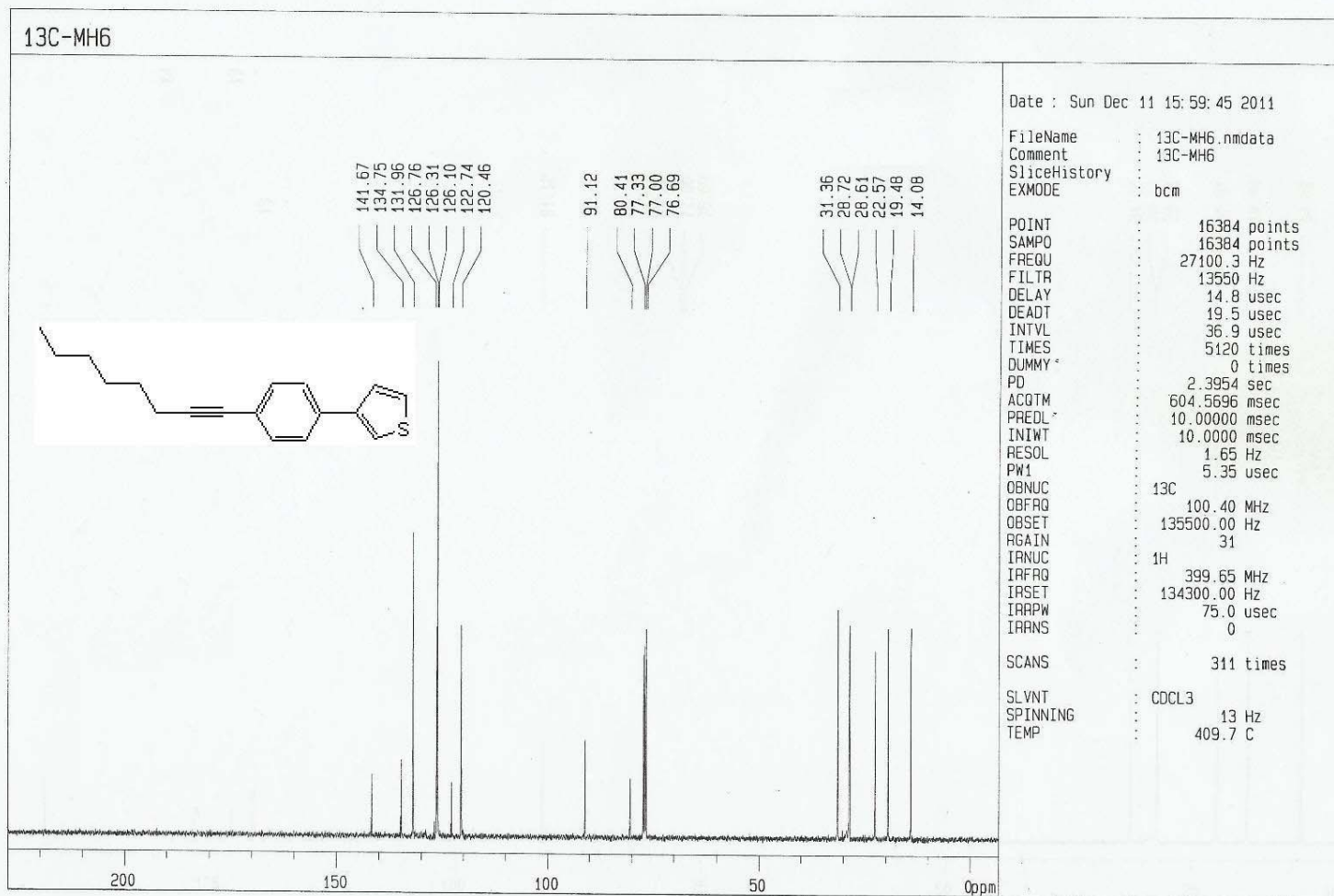
¹³C NMR of compound 14

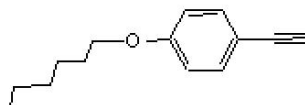


¹H NMR of compound 15

¹³C NMR of compound 15



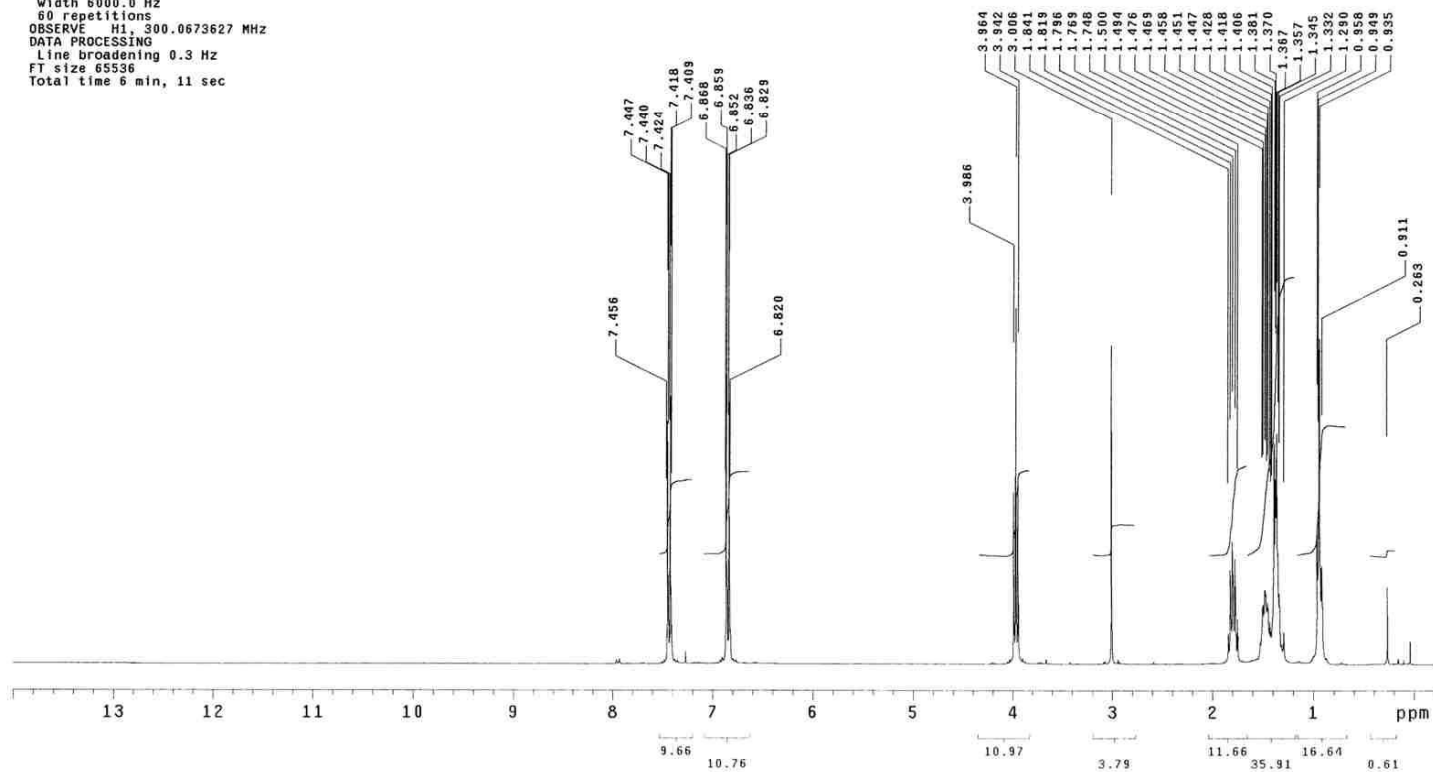
^{13}C NMR of compound 16

^{13}C NMR of compound 16

STANDARD 1H OBSERVE

Pulse Sequence: s2pu1
Solvent: CDCl3
Temp. 30.0 C / 303.1 K
File: Hayam-M16-CDCl3-H
Mercury-300BB "NMR300"

Relax. delay 1.000 sec
Pulse 75.0 degrees
Acq. time 4.005 sec
Width 6000.0 Hz
50 repetitions
OBSERVE H1, 300.0673627 MHz
DATA PROCESSING
Line broadening 0.3 Hz
FT size 65536
Total time 6 min, 11 sec

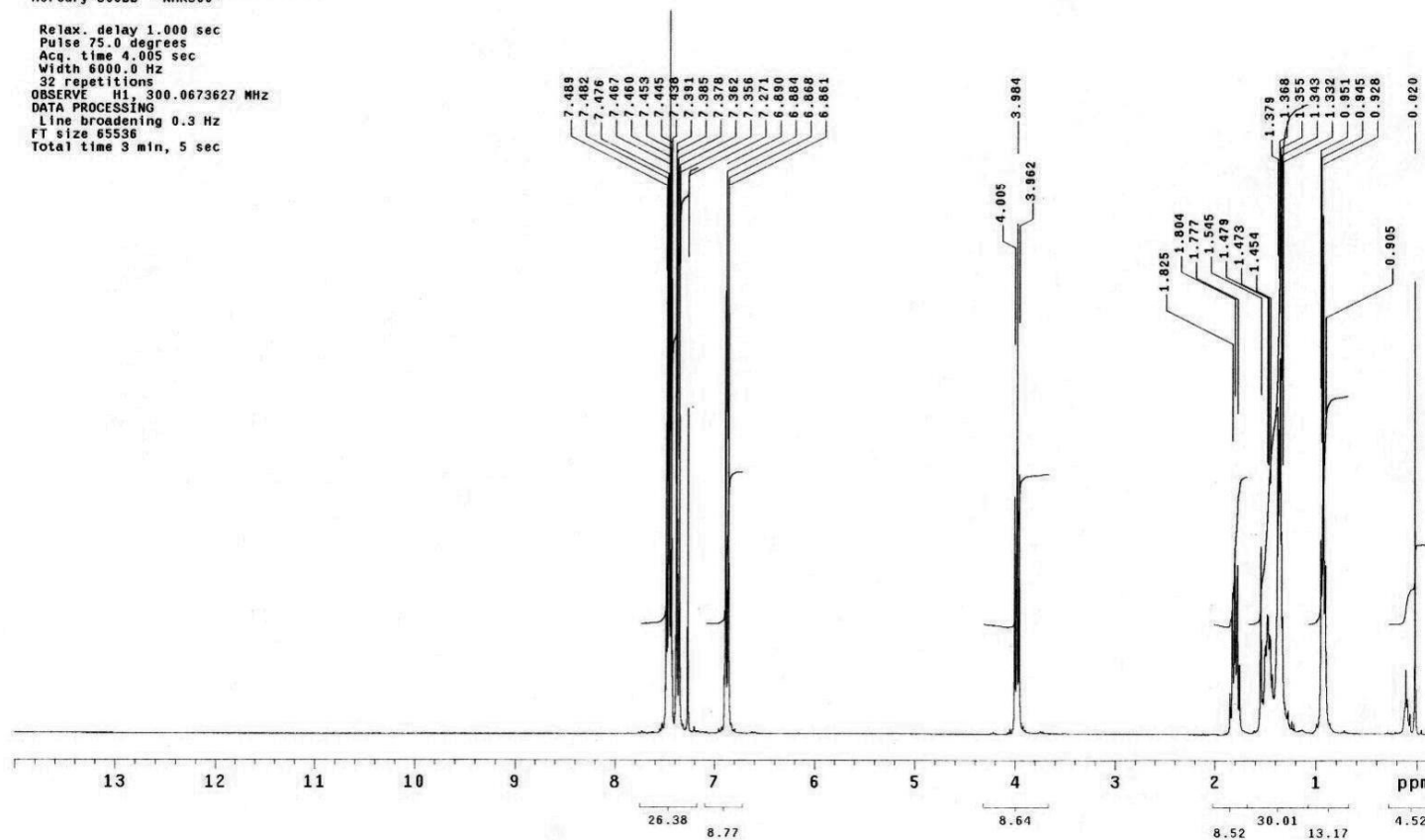
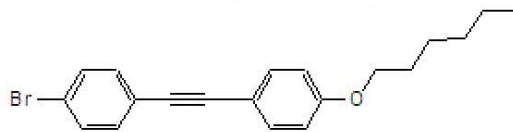


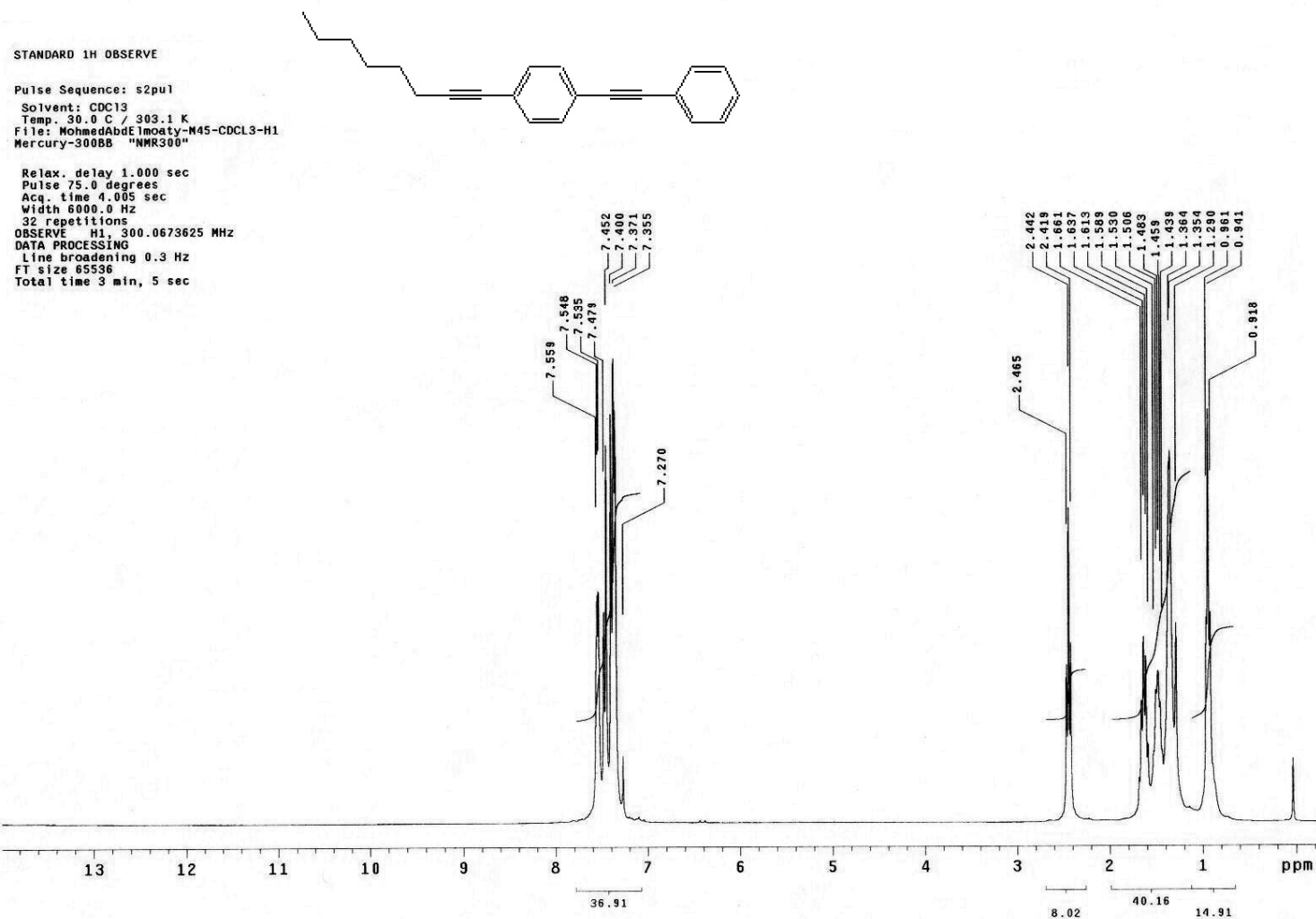
^1H NMR of compound 17

STANDARD 1H OBSERVE

Pulse Sequence: s2pu1
Solvent: CDCl3
Temp. 30.0 C / 303.1 K
File: MohmedAbdElmoaty-M42-CDCl3-H1
Mercury-300BB "NMR300"

Relax. delay 1.000 sec
Pulse 75.0 degrees
Acq. time 4.005 sec
Width 6000.0 Hz
32 repetitions
OBSERVE H1, 300.0673627 MHz
DATA PROCESSING
Line broadening 0.3 Hz
FT size 65536
Total time 3 min, 5 sec



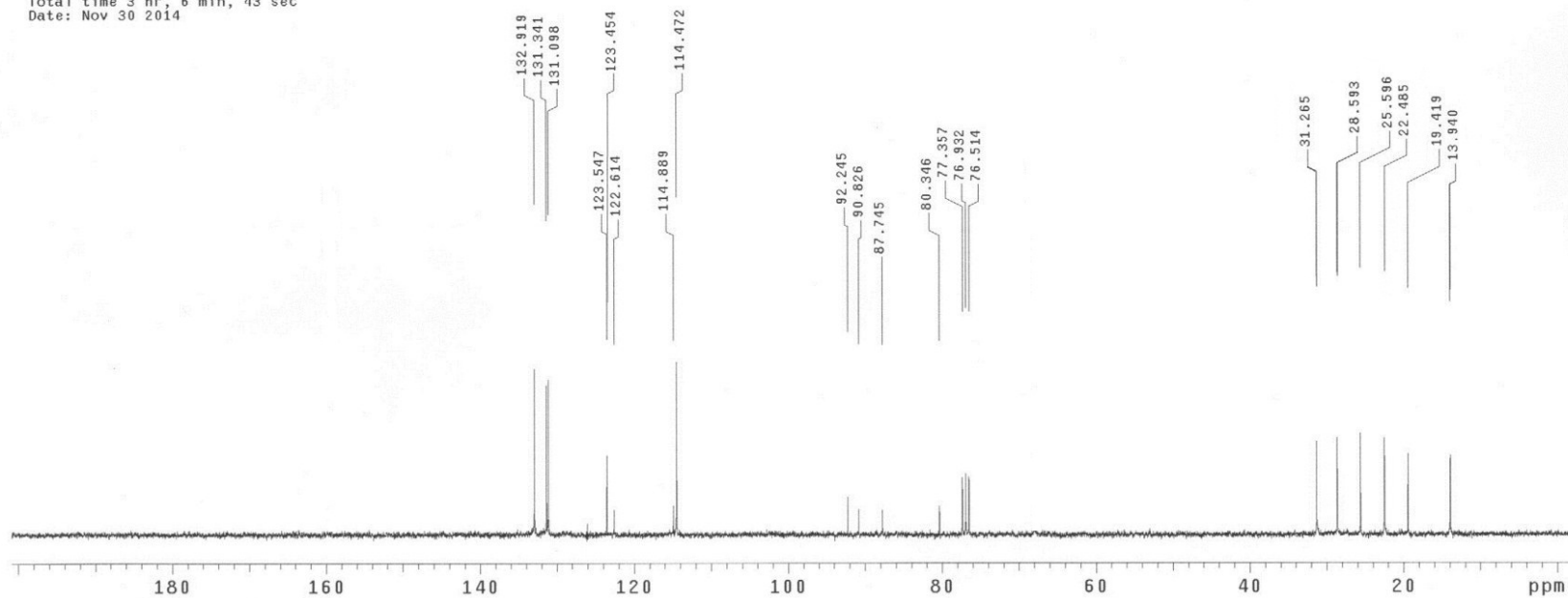
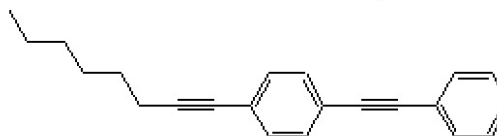
^1H NMR of compound 18

^1H NMR of compound 19

MohammedAbdo1Moaty-M43-CDC13-C13

Archive directory: /export/home/vnmr1/vnmrsys/data
Sample directory: DD5mm_test_12Mar2014-21:34:40
File: PROTON

Pulse Sequence: s2pu1

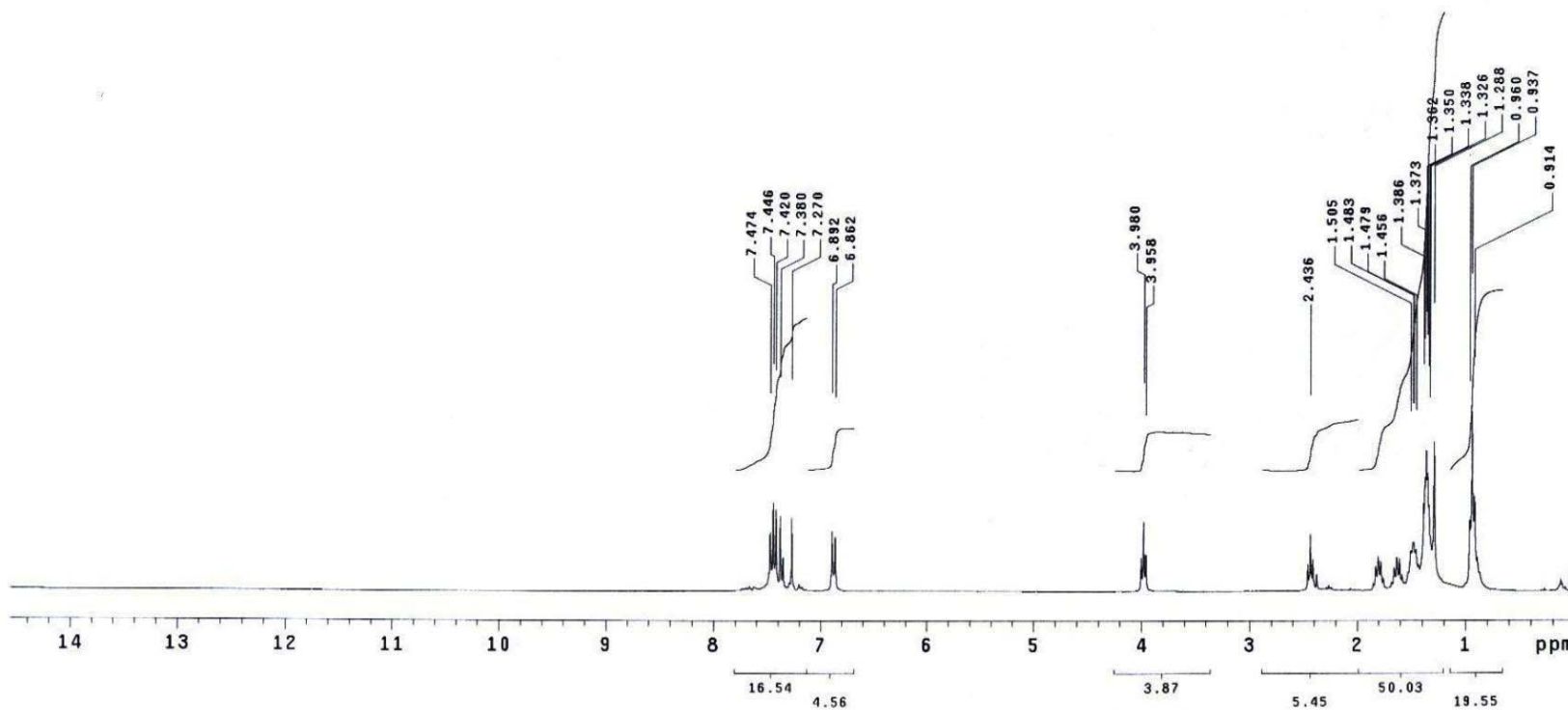
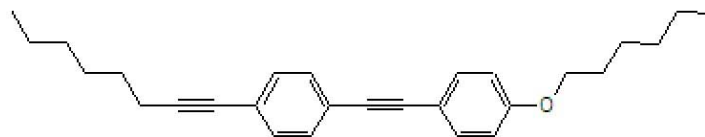
Solvent: CDC13
Temp. 30.0 C / 303.1 K
Mercury-300BB "NMR300"Pulse 48.7 degrees
Acq. time 1.707 sec
Width 18761.7 Hz
864 repetitions
OBSERVE C13, 75.452062 MHz
DECOUPLE H1, 300.0688576 MHz
Power 33 dB
continuously on
WALTZ-16 modulated
DATA PROCESSING
Line broadening 1.0 Hz
FT size 65536
Total time 3 hr, 6 min, 43 sec
Date: Nov 30 2014

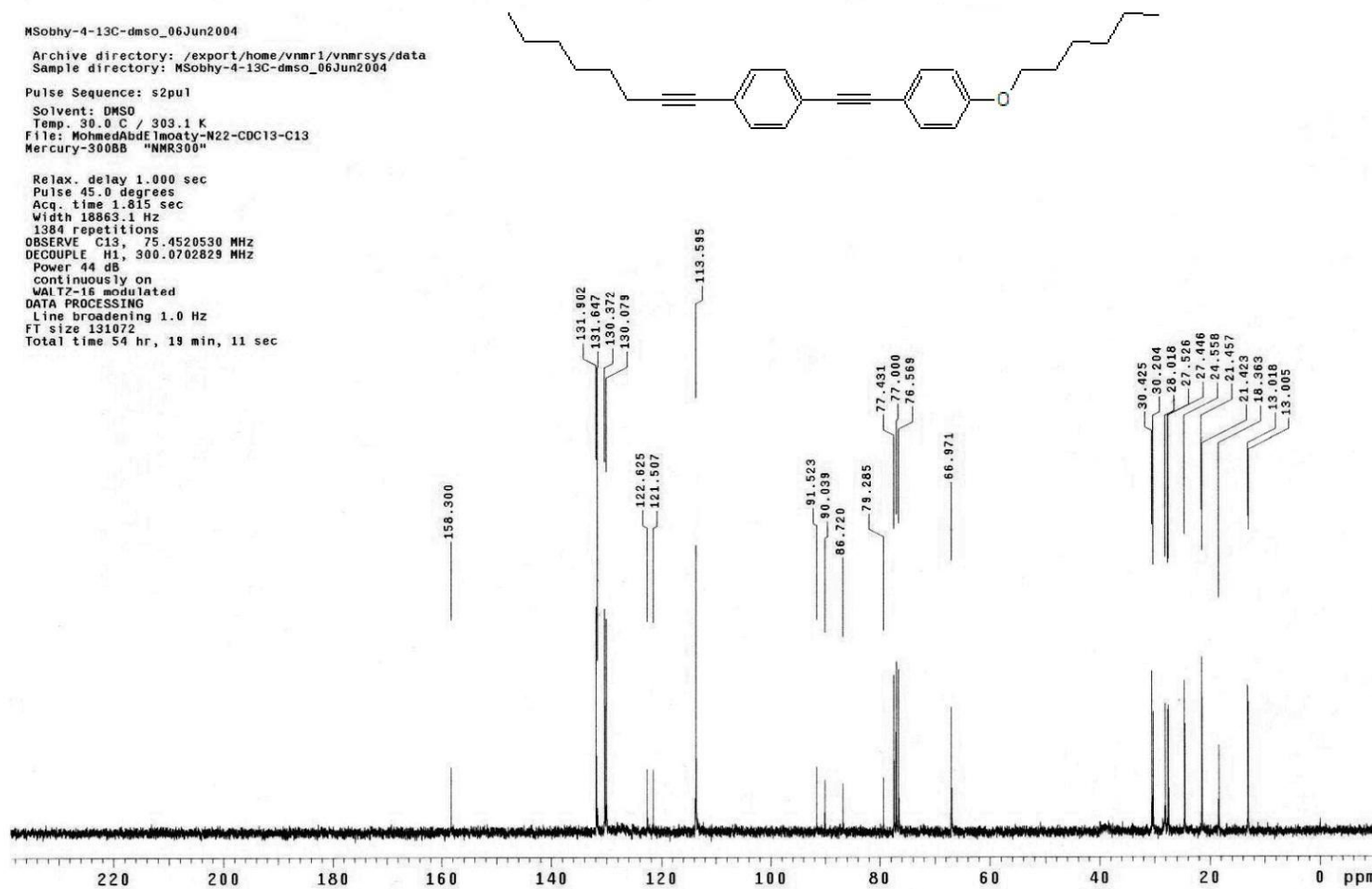
^{13}C NMR of compound 19

STANDARD 1H OBSERVE

Pulse Sequence: s2pu1
Solvent: CDCl3
Temp. 30.0 C / 303.1 K
File: MohamadAbdElmoety-MC9-CDCl3-H
Mercury-300BB "NMR300"

Relax. delay 1.000 sec
Pulse 75.0 degrees
Acq. time 4.005 sec
Width 6000.0 Hz
12 repetitions
OBSERVE H1, 300.0673627 MHz
DATA PROCESSING
Line broadening 0.3 Hz
FT size 65536
Total time 3 min, 5 sec



^1H NMR of compound 20

^{13}C NMR of compound 20