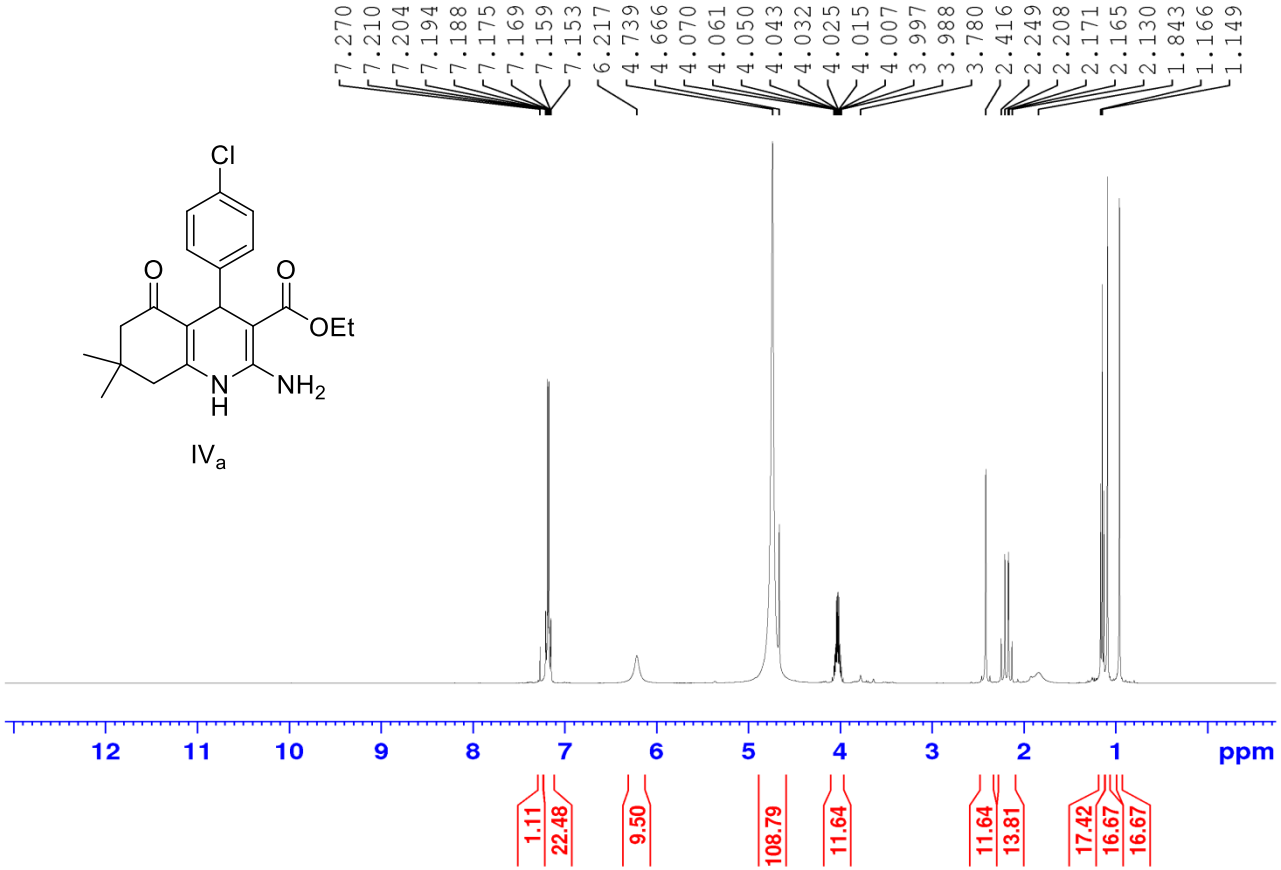
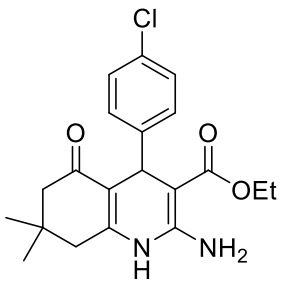
Dr.Khadiga Saad Alghamdi
Sample : 3 CDCL3
PROTON CDCl3 D:\ nmr

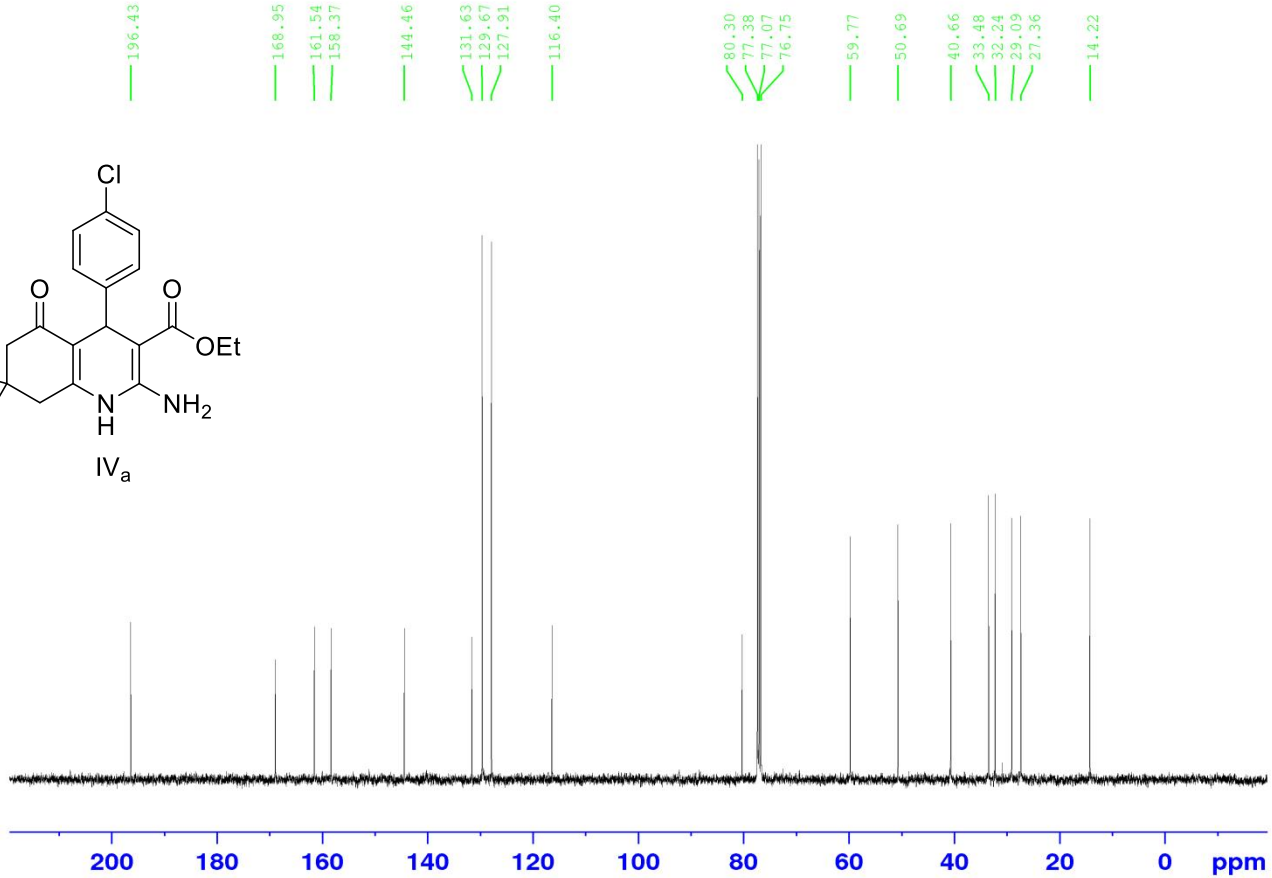



```
Current Data Parameters
NAME      KHADIGAS      3     06-11-2017
EXPNO                  10
PROCNO                  1

F2 - Acquisition Parameters
Date_            20171106
Time                14.26
INSTRUM             spect
PROBHD   5 mm PABBO BB-
PULPROG             zg30
TD                 65536
SOLVENT            CDCl3
NS                    64
DS                     2
SWH             8223.685 Hz
FIDRES          0.125483 Hz
AQ             3.9845889 sec
RG                33.34
DW                60.800 usec
DE                 6.50 usec
TE                303.0 K
D1            1.00000000 sec

======== CHANNEL f1 ========
NUC1                  1H
P1                13.84 usec
PLW1         12.39000034 W
SFO1         400.1824713 MHz

F2 - Processing parameters
SI                 65536
SF           400.1800102 MHz
WDW                   EM
SSB       0
LB                 0.30 Hz
GB        0
PC                 2.00
```

Dr.Khadiga Saad Alghamdi
Sample : 3 CDCL3
C13CPD CDCl3 D:\ nmr

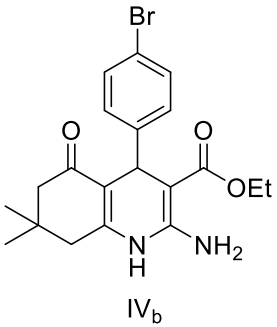



$IV_a$

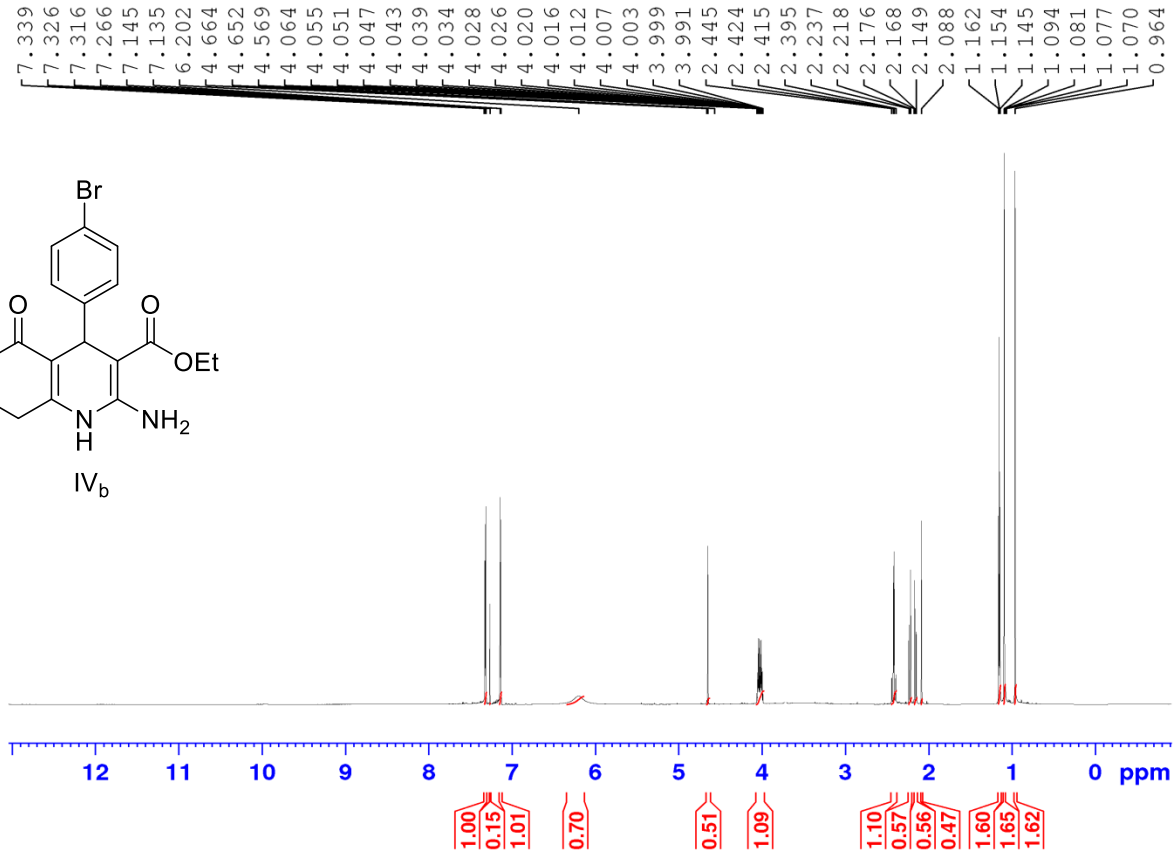



```
Current Data Parameters
NAME      KHADIGAS      3     06-11-2017
EXPNO                  11
PROCNO                  1

F2 - Acquisition Parameters
Date_            20171106
Time                14.45
INSTRUM             spect
PROBHD   5 mm PABBO BB-
PULPROG           zgpg30
TD                 65536
SOLVENT            CDCl3
NS                   295
DS                     4
SWH            24038.461 Hz
FIDRES          0.366798 Hz
AQ             1.3631488 sec
RG                198.36
DW                20.800 usec
DE                  6.50 usec
TE                 303.4 K
D1            2.00000000 sec
D11           0.03000000 sec

======== CHANNEL f1 ========
NUC1                 13C
P1                  8.87 usec
PLW1        61.00000000 W
SFO1       100.6354031 MHz

======== CHANNEL f2 ========
CPDPRG[2         waltz16
NUC2                 1H
PCPD2              90.00 usec
PLW2        12.39000034 W
PLW12        0.29299000 W
PLW13        0.14654000 W
SFO2       400.1816007 MHz

F2 - Processing parameters
SI                 32768
SF         100.6253410 MHz
WDW                   EM
SSB       0
LB                 1.50 Hz
GB        0
PC                 2.00
```

Dr.Khadiga Saad Alghamdi
Sample : 5-AC CDCL3

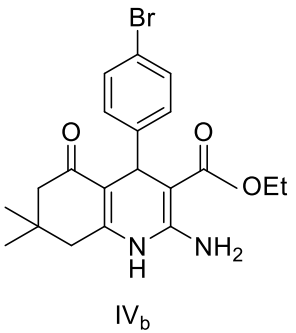



$IV_b$

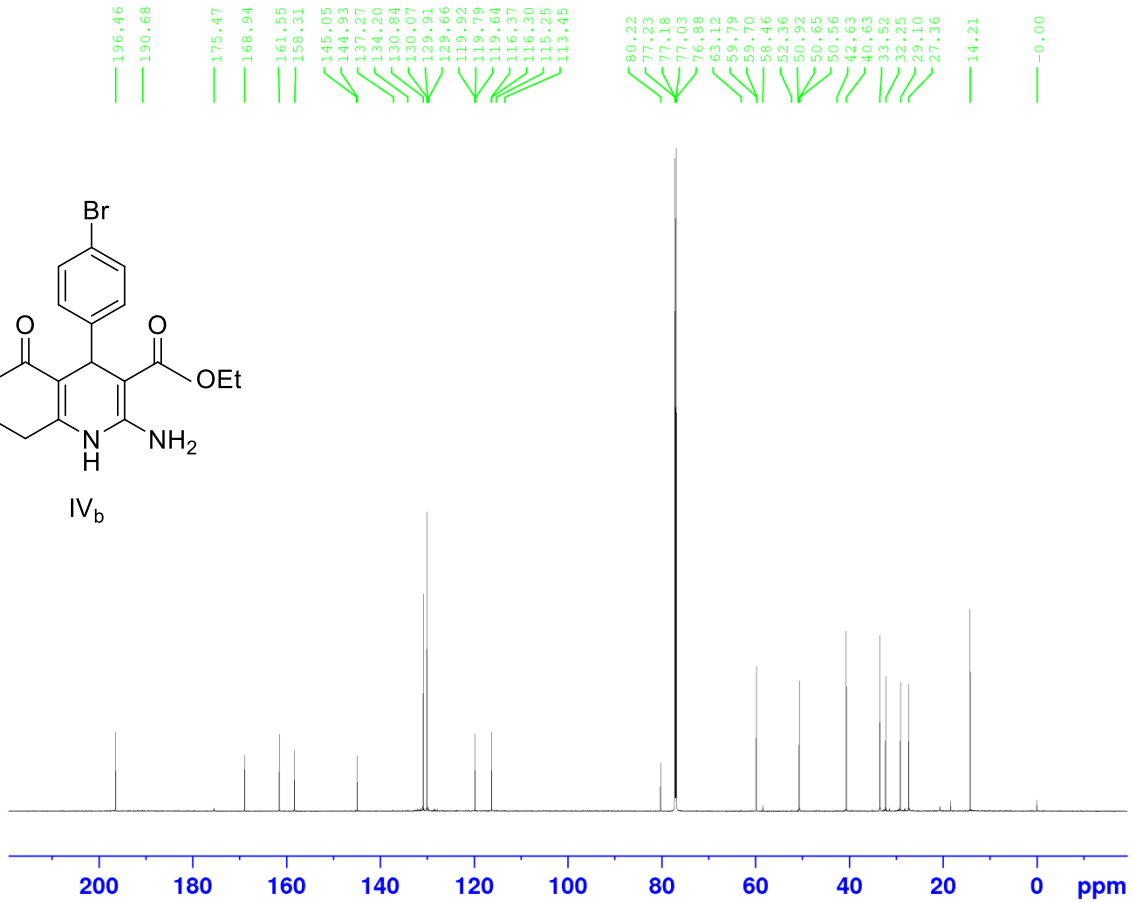



```
Current Data Parameters
NAME      KHADIGAS   5-AC    26-12-2017
EXPNO                20
PROCNO                1

F2 - Acquisition Parameters
Date_            20171226
Time               15.57
INSTRUM            spect
PROBHD   5 mm CPQCI 1H-
PULPROG             zg30
TD                 65536
SOLVENT            CDCl3
NS                    32
DS                     2
SWH            17006.803 Hz
FIDRES          0.259503 Hz
AQ             1.9267584 sec
RG                  9.04
DW                29.400 usec
DE                 10.00 usec
TE                 298.0 K
D1            1.00000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1          850.1552500 MHz
NUC1                   1H
P1                  8.00 usec
PLW1          15.30000019 W

F2 - Processing parameters
SI                 65536
SF            850.1500143 MHz
WDW                   EM
SSB       0
LB                  0.30 Hz
GB        0
PC                  1.00
```

Dr.Khadiga Saad Alghamdi
Sample : 5-AC CDCL3

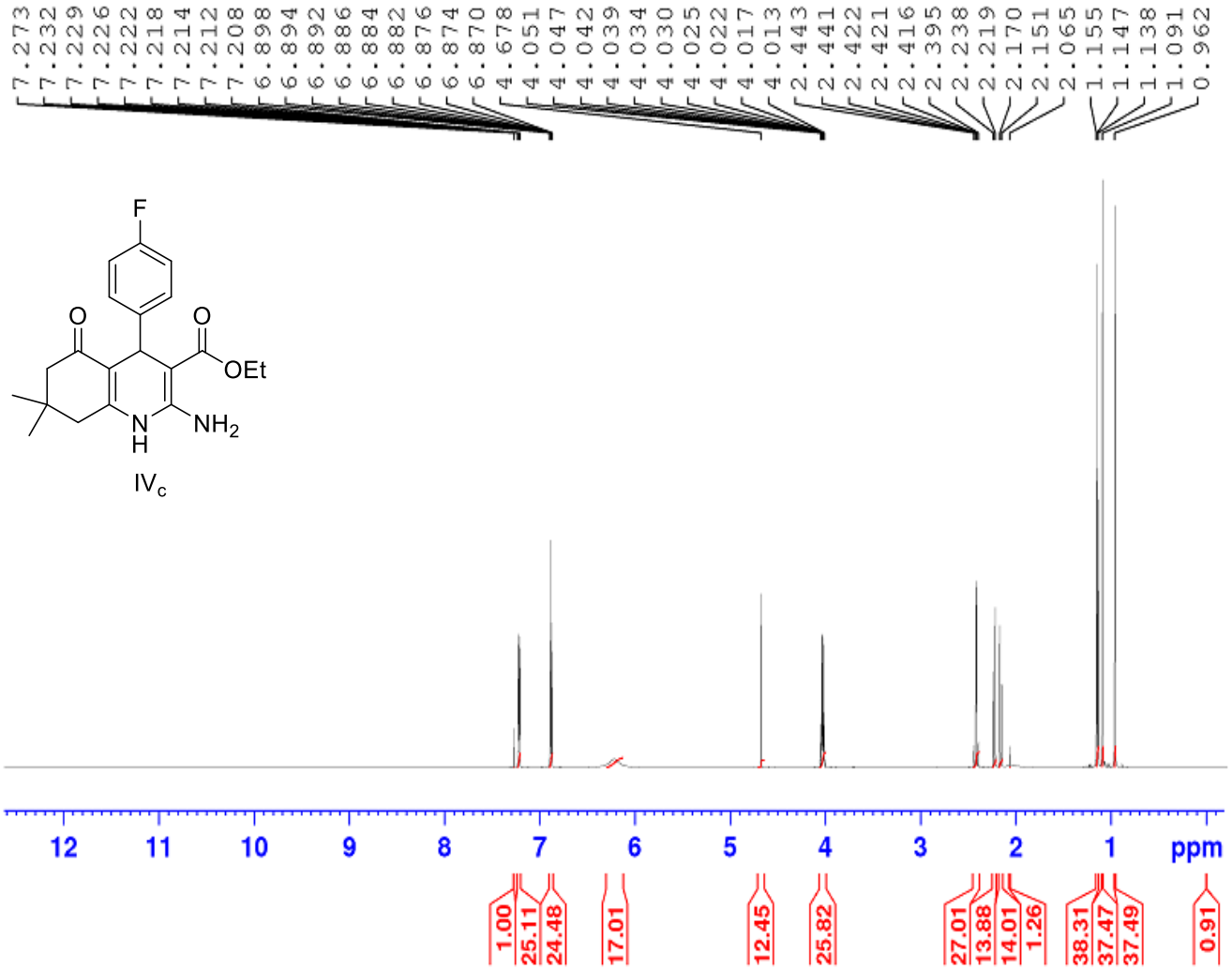



$IV_b$



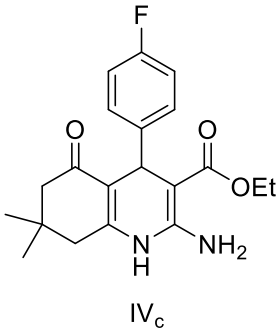

```
Current Data Parameters
NAME      KHADIGAS   5-AC    26-12-2017
EXPNO                 21
PROCNO                 1

F2 - Acquisition Parameters
Date_           20171226
Time                17.31
INSTRUM             spect
PROBHD    5 mm CPQCI 1H-
PULPROG            zgpg30
TD                  65536
SOLVENT             CDCl3
NS                   2048
DS                      4
SWH            51020.406 Hz
FIDRES          0.778510 Hz
AQ             0.6422528 sec
RG                186.93
DW                 9.800 usec
DE                18.00 usec
TE                298.0 K
D1            2.00000000 sec
D11           0.03000000 sec
TD0                     1

======== CHANNEL f1 ========
SFO1         213.7917636 MHz
NUC1                  13C
P1                  12.00 usec
PLW1        130.00000000 W

======== CHANNEL f2 ========
SFO2         850.1534006 MHz
NUC2                   1H
CPDPRG[2          waltz16
PCPD2               80.00 usec
PLW2         13.80000019 W
PLW12         0.13800000 W
PLW13         0.08832000 W

F2 - Processing parameters
SI                  32768
SF           213.7703903 MHz
WDW                    EM
SSB       0
LB                   1.00 Hz
GB        0
PC                   1.40
```

Dr.Khadigaghamdi
Sample : 7A-C CDCL3

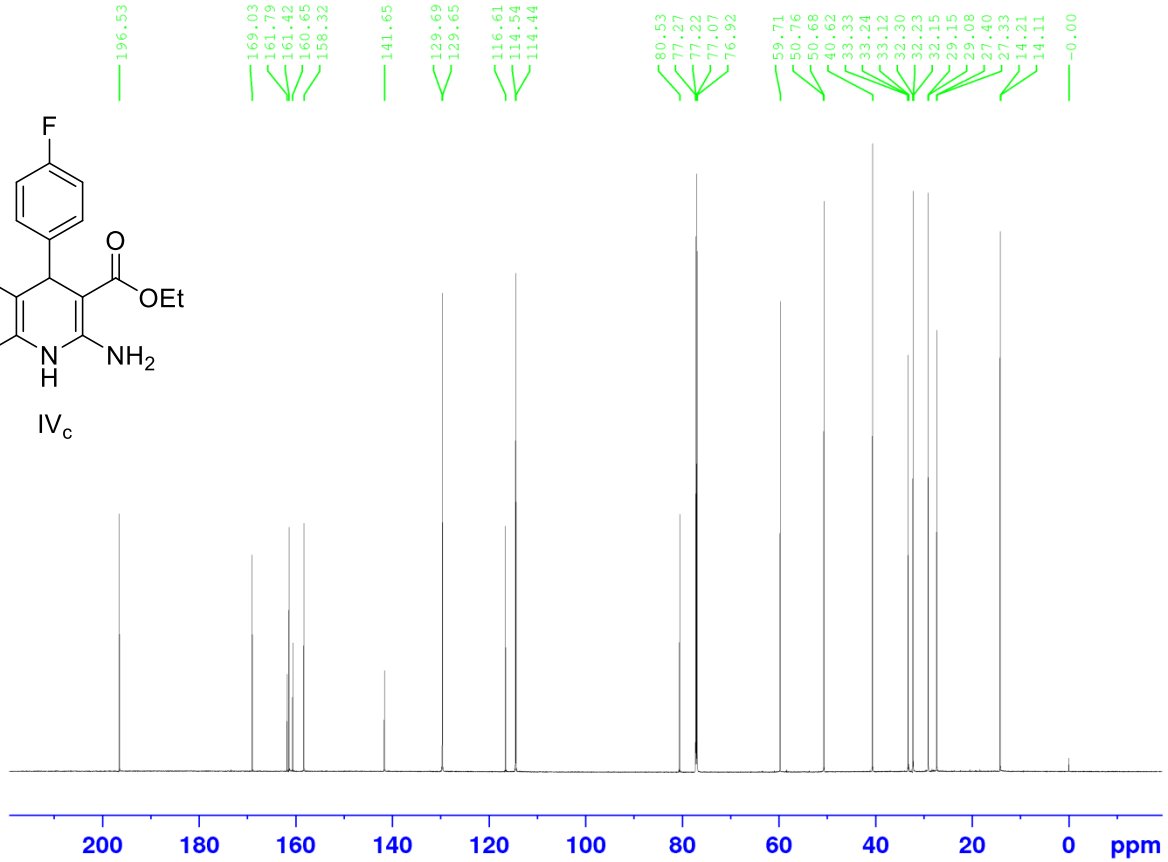



```
Current Data Parameters
NAME      8HADIGAG    7A-C     14-01-2018
EXPNO                   40
PROCNO                   1

F2 - Acquisition Parameters
Date_              20180113
Time                   2.52
INSTRUM               spect
PROBHD    5 mm CPQCI 1H-
PULPROG                zg30
TD                    65536
SOLVENT               CDCl3
NS                       32
DS                        2
SWH               17006.803 Hz
FIDRES             0.259503 Hz
AQ                1.9267584 sec
RG                      6.52
DW                    29.400 usec
DE                     10.00 usec
TE                    298.0 K
D1                1.00000000 sec
TD0                       1

======== CHANNEL f1 ========
SFO1            850.1532500 MHz
NUC1                      1H
P1                      8.00 usec
PLW1            15.30000019 W

F2 - Processing parameters
SI                    65536
SF              850.1500101 MHz
WDW                       EM
SSB       0
LB                     0.30 Hz
GB        0
PC                     1.00
```

Dr.Khadigaghamdi
Sample : 7A-C CDCL3

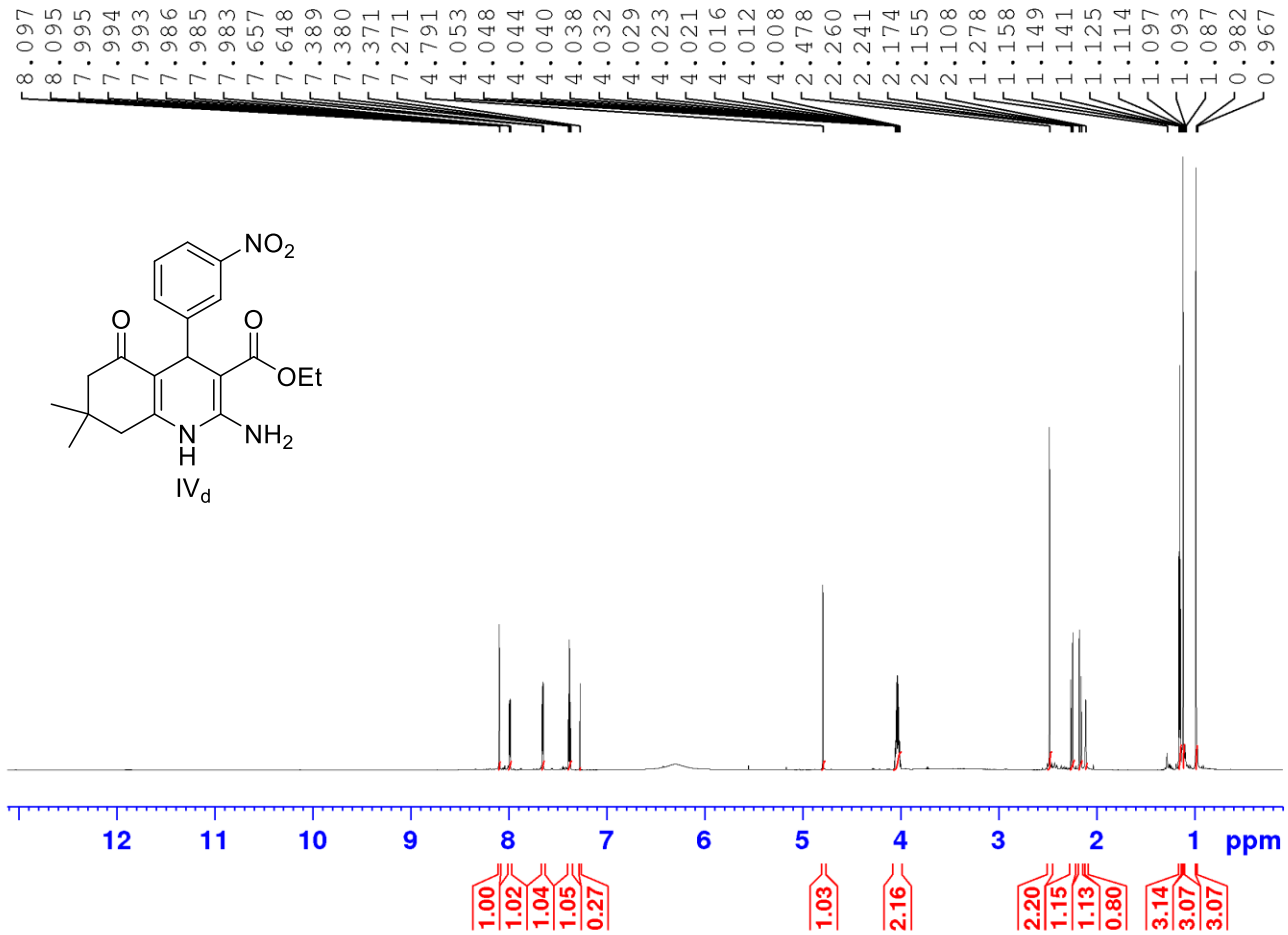



$IV_c$



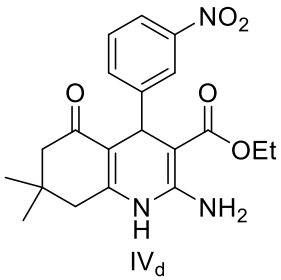

```
Current Data Parameters
NAME      KHADIGAG    7A-C     14-01-2018
EXPNO                  41
PROCNO                  1

F2 - Acquisition Parameters
Date_            20180115
Time                 4.26
INSTRUM             spect
PROBHD    5 mm CPQCI 1H-
PULPROG            zgpg30
TD                  65536
SOLVENT             CDCl3
NS                   2048
DS                      4
SWH             51020.406 Hz
FIDRES           0.778510 Hz
AQ              0.6422528 sec
RG                 186.93
DW                  9.800 usec
DE                 18.00 usec
TE                 298.0 K
D1             2.00000000 sec
D11            0.03000000 sec
TD0                     1

======== CHANNEL f1 ========
SFO1          213.7917636 MHz
NUC1                   13C
P1                  12.00 usec
PLW1        130.00000000 W

======== CHANNEL f2 ========
SFO2          850.1534006 MHz
NUC2                    1H
CPDPRG[2            waltz16
PCPD2                80.00 usec
PLW2         13.80000019 W
PLW12         0.13800000 W
PLW13         0.08832000 W

F2 - Processing parameters
SI                   32768
SF            213.7703886 MHz
WDW                     EM
SSB       0
LB                   1.00 Hz
GB        0
PC                   1.40
```

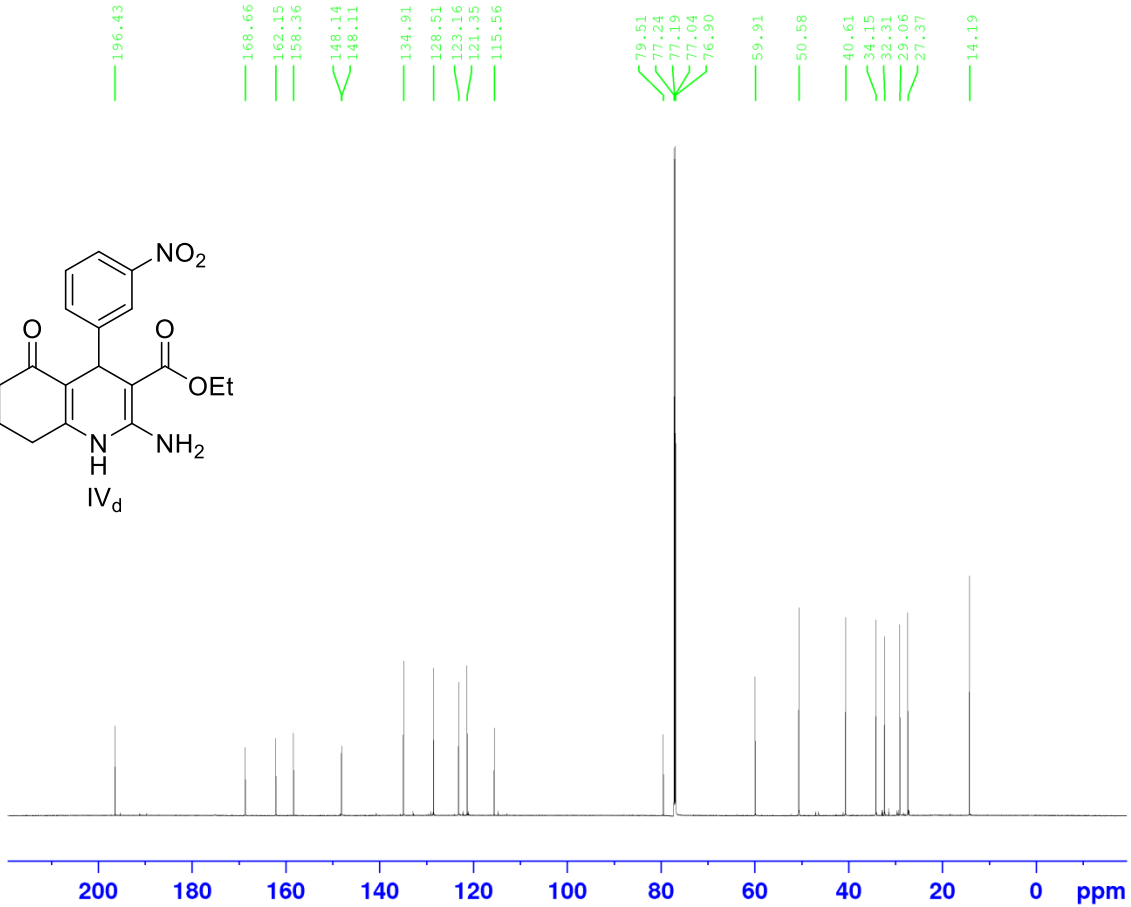
Dr.Khadigaghamdi
Sample : 9A-C CDCL3




```
Current Data Parameters
NAME      KHADIGAG   9A-C    14-01-2018
EXPNO                10
PROCNO                1

F2 - Acquisition Parameters
Date_            20180114
Time               21.54
INSTRUM            spect
PROBHD   5 mm CPQCI 1H-
PULPROG             zg30
TD                 65536
SOLVENT            CDCl3
NS                    32
DS                     2
SWH            17006.803 Hz
FIDRES          0.259503 Hz
AQ             1.9267584 sec
RG                  9.04
DW                29.400 usec
DE                 10.00 usec
TE                 298.0 K
D1            1.00000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         850.1552500 MHz
NUC1                   1H
P1                  8.00 usec
PLW1         15.30000019 W

F2 - Processing parameters
SI                 65536
SF           850.1500115 MHz
WDW                    EM
SSB       0
LB                  0.30 Hz
GB        0
PC                  1.00
```

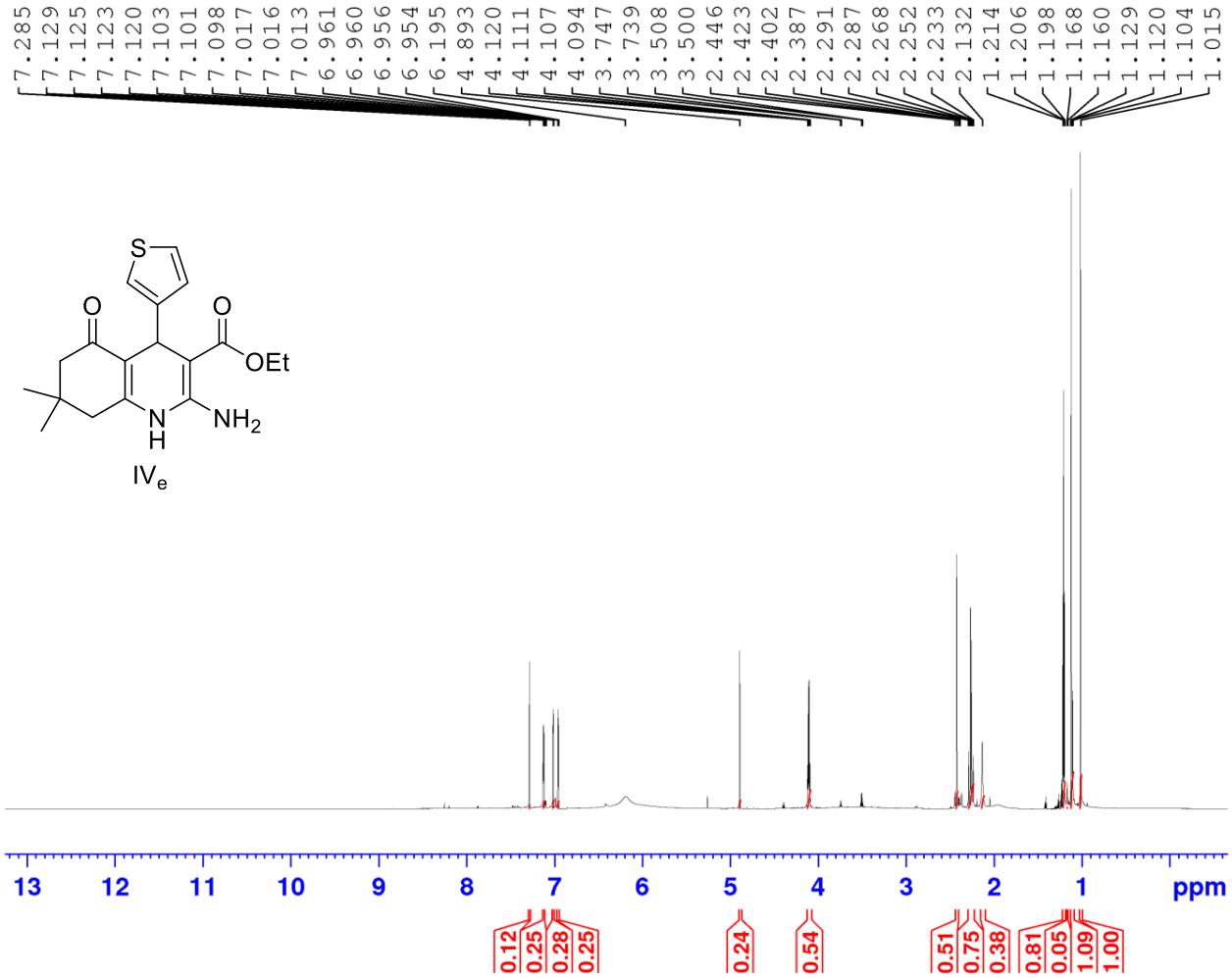
Dr.Khadigaghamdi
Sample : 9A-C CDCL3



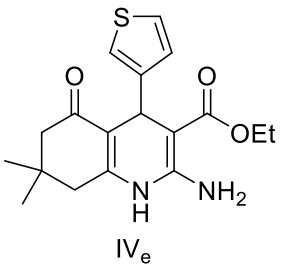

```
Current Data Parameters
NAME      KHADIGAG   9A-C     14-01-2018
EXPNO                 11
PROCNO                 1

F2 - Acquisition Parameters
Date_            20180114
Time                23.28
INSTRUM             spect
PROBHD   5 mm CPQCI 1H-
PULPROG           zgpg30
TD                 65536
SOLVENT            CDCl3
NS                  2048
DS                     4
SWH            51020.406 Hz
FIDRES          0.778510 Hz
AQ             0.6422528 sec
RG                186.93
DW                 9.800 usec
DE                18.00 usec
TE                298.0 K
D1            2.00000000 sec
D11           0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         213.7917636 MHz
NUC1                  13C
P1                 12.00 usec
PLW1        130.00000000 W

======== CHANNEL f2 ========
SFO2         850.1534006 MHz
NUC2                   1H
CPDPRG[2          waltz16
PCPD2              80.00 usec
PLW2         13.80000019 W
PLW12         0.13800000 W
PLW13         0.08832000 W

F2 - Processing parameters
SI                 32768
SF           213.7703888 MHz
WDW                   EM
SSB       0
LB                 1.00 Hz
GB        0
PC                 1.40
```

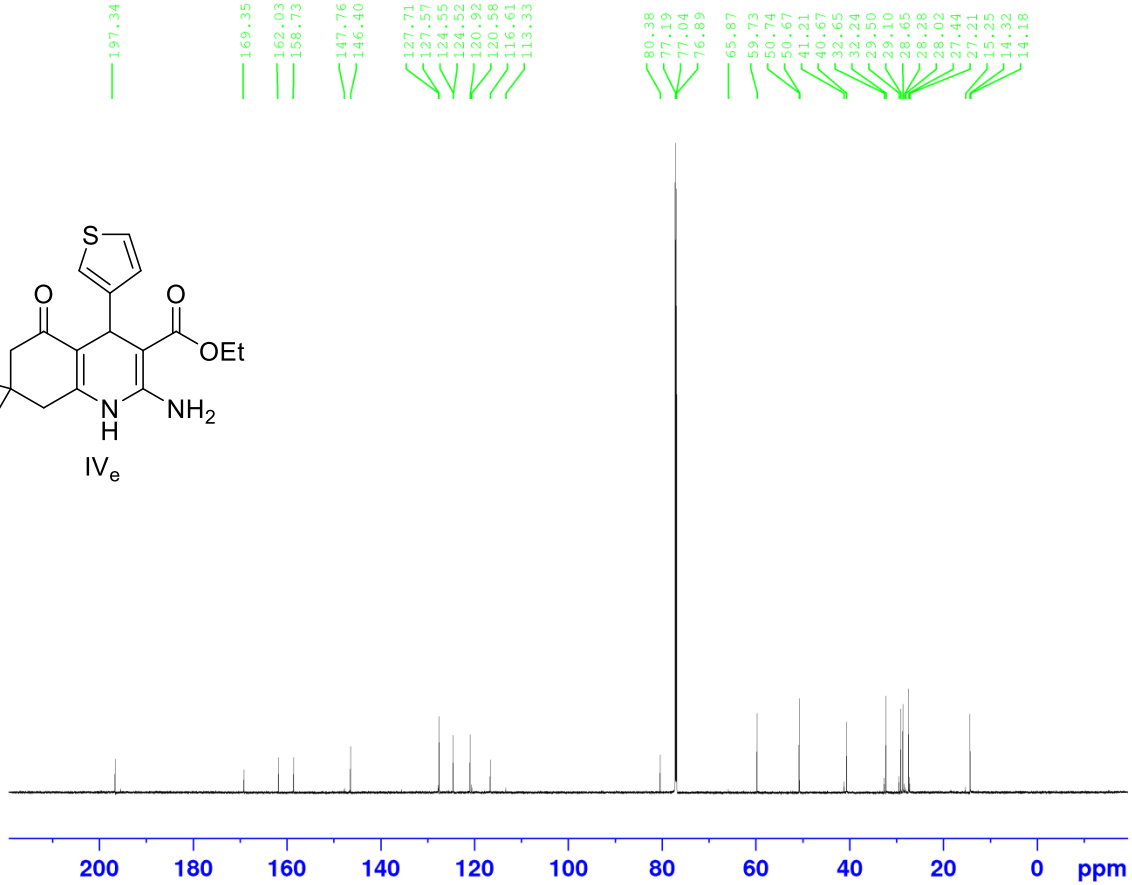
Dr.Khadiga Saad Alghamdi
Sample : 10-HC CDCL3




```
Current Data Parameters
NAME      KHADIGAG   10-HC    22-03-2018
EXPNO                 10
PROCNO                 1

F2 - Acquisition Parameters
Date_            20180322
Time               13.45
INSTRUM            spect
PROBHD   5 mm CPQCI 1H-
PULPROG              zg30
TD                  65536
SOLVENT             CDCl3
NS                     32
DS                      2
SWH            17006.803 Hz
FIDRES          0.259503 Hz
AQ             1.9267584 sec
RG                   9.04
DW                 29.400 usec
DE                 10.00 usec
TE                 298.0 K
D1             1.00000000 sec
TD0                     1

======== CHANNEL f1 ========
SFO1         850.1552500 MHz
NUC1                   1H
P1                   8.00 usec
PLW1         15.30000019 W

F2 - Processing parameters
SI                  65536
SF           850.1500000 MHz
WDW                    EM
SSB       0
LB                  0.30 Hz
GB        0
PC                  1.00
```

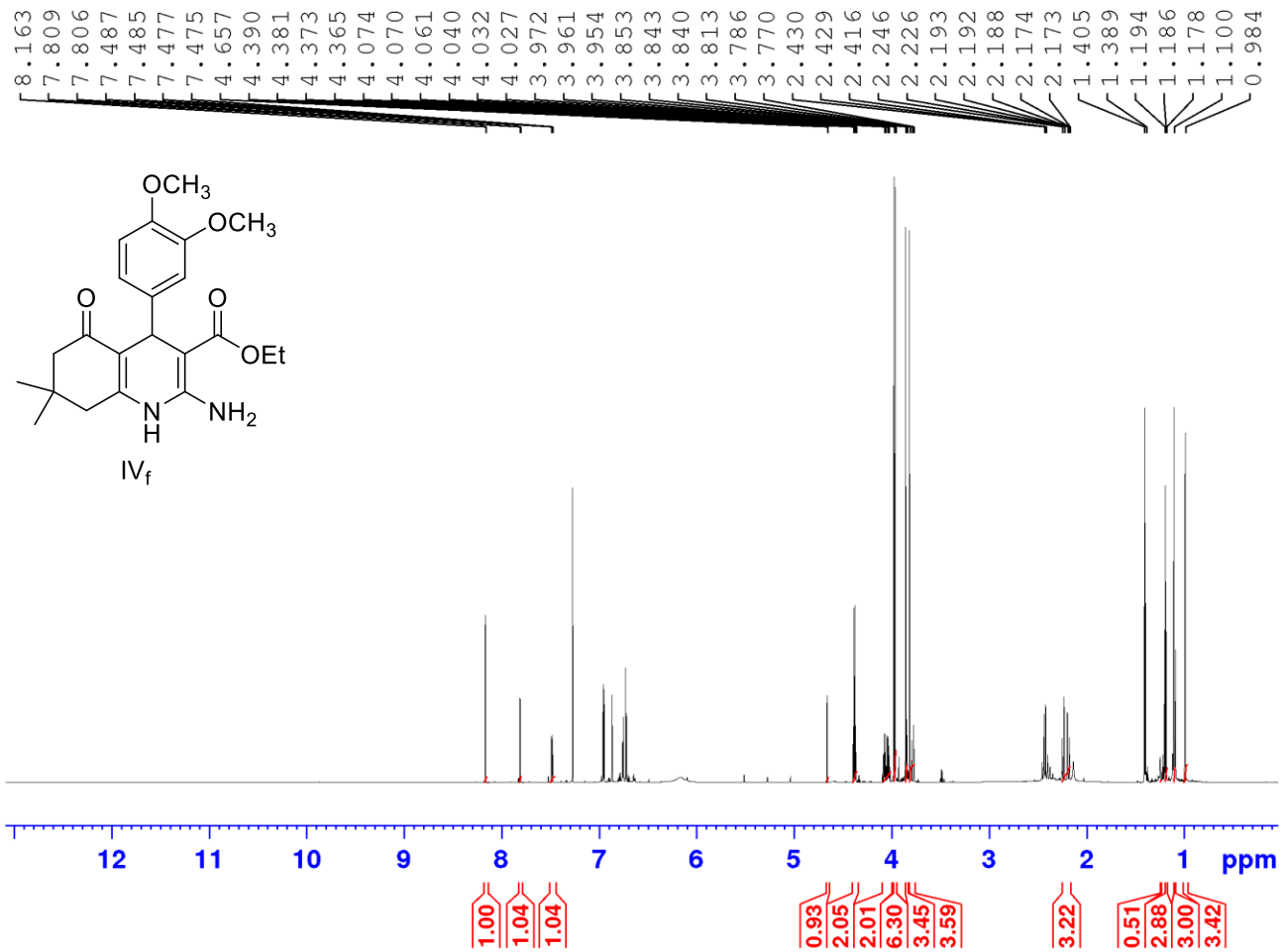
Dr.Khadiga Saad Alghamdi
Sample : 10-HC CDCL3



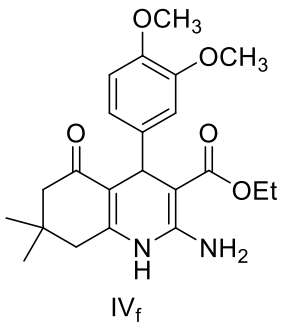

```
Current Data Parameters
NAME      KHADIGAG   10-HC   22-03-2018
EXPNO                  11
PROCNO                  1

F2 - Acquisition Parameters
Date_            20180322
Time                13.48
INSTRUM             spect
PROBHD    5 mm CPQCI 1H-
PULPROG            zgpg30
TD                  65536
SOLVENT             CDCl3
NS                    104
DS                      4
SWH            51020.406 Hz
FIDRES          0.778510 Hz
AQ             0.6422528 sec
RG                 186.93
DW                  9.800 usec
DE                 18.00 usec
TE                 298.0 K
D1             2.00000000 sec
D11            0.03000000 sec
TD0                     1

======== CHANNEL f1 =======
SFO1         213.7917636 MHz
NUC1                  13C
P1                  12.00 usec
PLW1        130.00000000 W

======== CHANNEL f2 =======
SFO2         850.1534006 MHz
NUC2                   1H
CPDPRG[2          waltz16
PCPD2               80.00 usec
PLW2         13.80000019 W
PLW12         0.13800000 W
PLW13         0.08832000 W

F2 - Processing parameters
SI                  32768
SF           213.7703875 MHz
WDW                    EM
SSB       0
LB                   1.00 Hz
GB        0
PC                   1.40
```

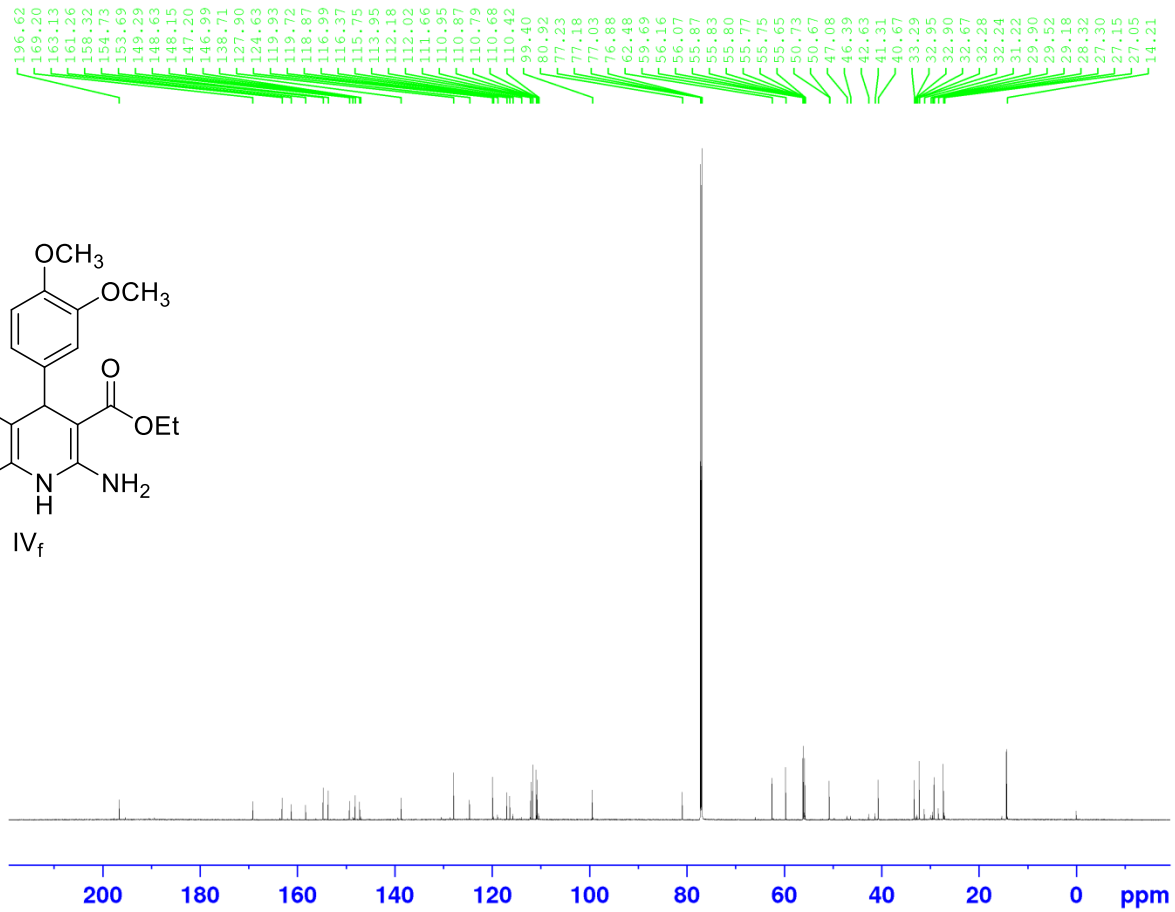
Dr.Khadiga Saad Alghamdi
Sample : 2-AC CDCL3




```
Current Data Parameters
NAME      KHADIGAS   2-AC    26-12-2017
EXPNO                 50
PROCNO                 1

F2 - Acquisition Parameters
Date_            20171226
Time                20.55
INSTRUM             spect
PROBHD   5 mm CPQCI 1H-
PULPROG              zg30
TD                  65536
SOLVENT             CDCl3
NS                     32
DS                      2
SWH             17006.803 Hz
FIDRES           0.259503 Hz
AQ              1.9267584 sec
RG                  10.55
DW                 29.400 usec
DE                 10.00 usec
TE                 298.0 K
D1            1.00000000 sec
TD0                     1

======== CHANNEL f1 ========
SFO1          850.1552500 MHz
NUC1                    1H
P1                   8.00 usec
PLW1          15.30000019 W

F2 - Processing parameters
SI                   65536
SF            850.1500122 MHz
WDW                     EM
SSB       0
LB                   0.30 Hz
GB        0
PC                   2.00
```

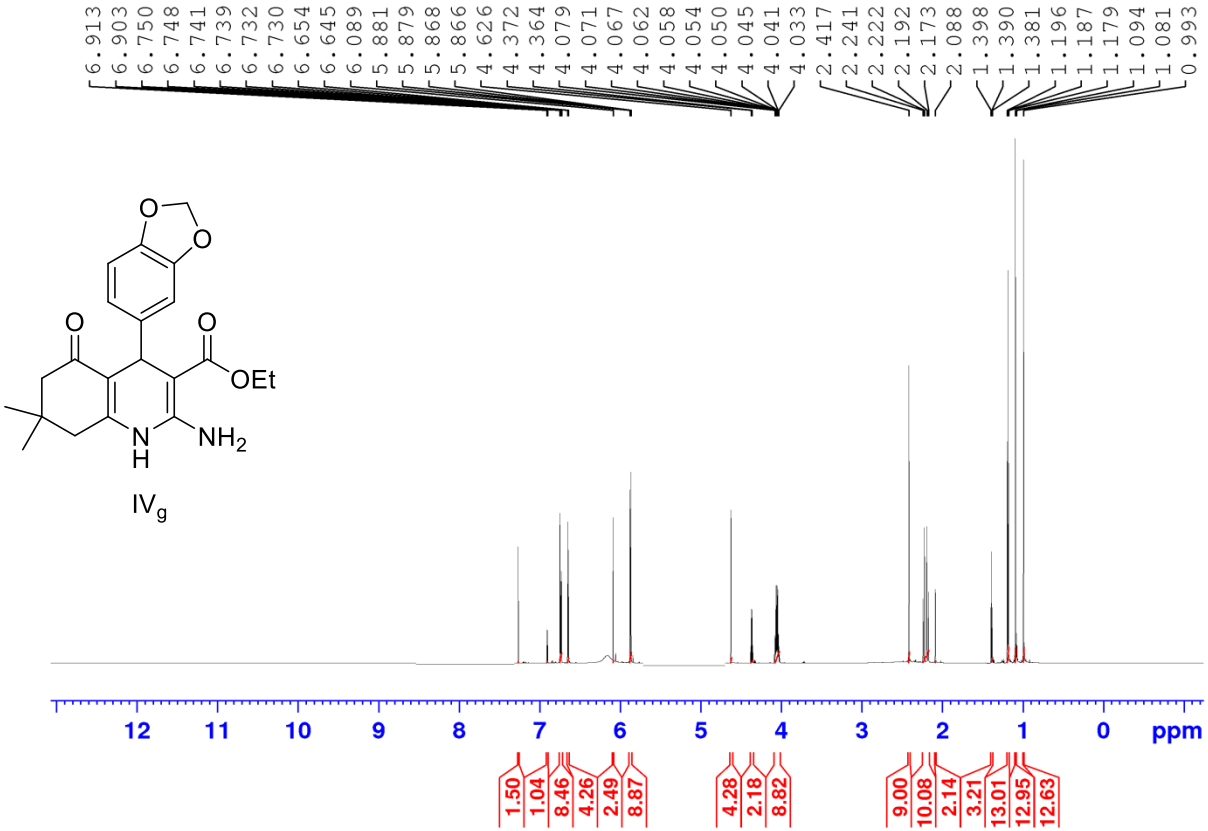
Dr.Khadiga Saad Alghamdi
Sample : 2-AC CDCL3



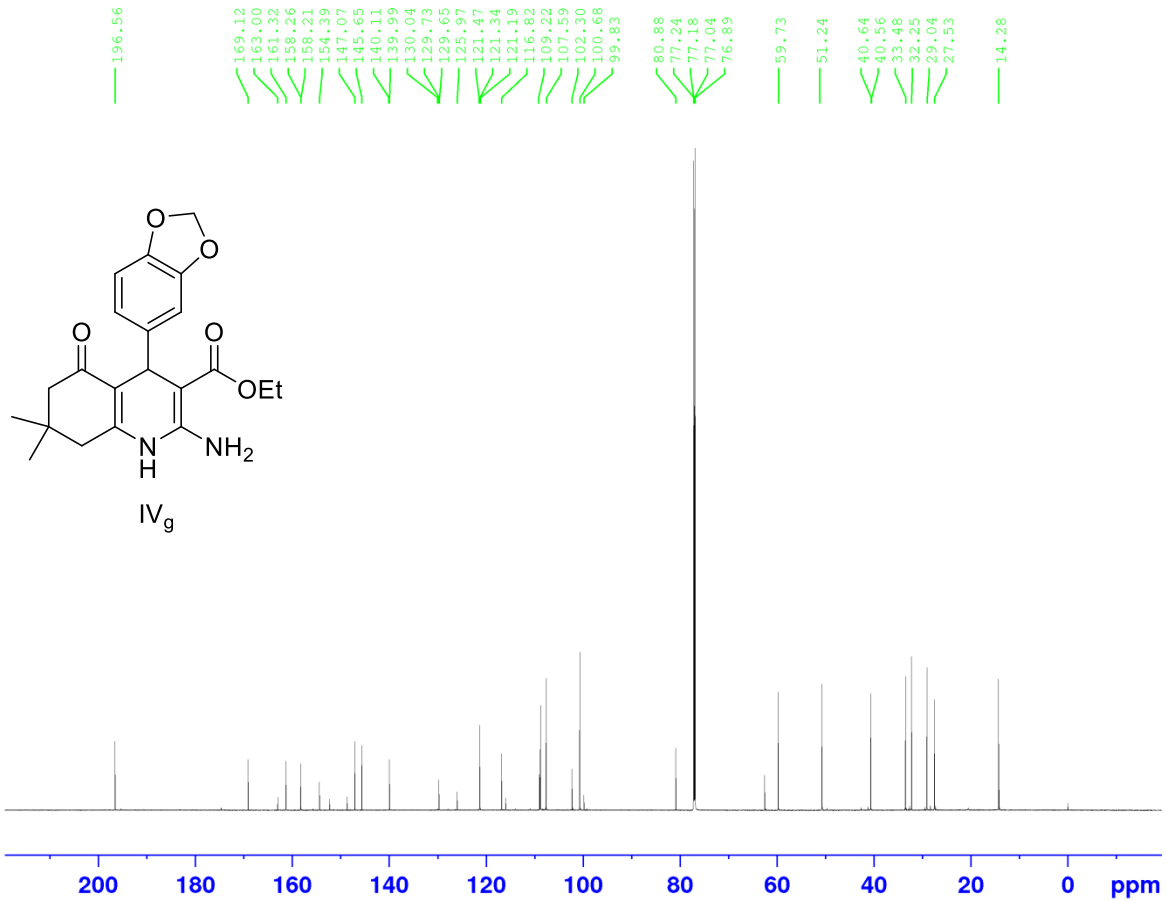

```
Current Data Parameters
NAME      KHADIGAS   2-AC   26-12-2017
EXPNO                 51
PROCNO                 1

F2 - Acquisition Parameters
Date_            20171226
Time                22.29
INSTRUM             spect
PROBHD    5 mm CPQCI 1H-
PULPROG            zgpg30
TD                  65536
SOLVENT             CDCl3
NS                   2048
DS                      4
SWH            51020.406 Hz
FIDRES          0.778510 Hz
AQ             0.6422528 sec
RG                 186.93
DW                  9.800 usec
DE                 18.00 usec
TE                 298.0 K
D1             2.00000000 sec
D11            0.03000000 sec
TD0                     1

======== CHANNEL f1 ========
SFO1         213.7917636 MHz
NUC1                  13C
P1                  12.00 usec
PLW1        130.00000000 W

======== CHANNEL f2 ========
SFO2         850.1534006 MHz
NUC2                   1H
CPDPRG[2          waltz16
PCPD2               80.00 usec
PLW2         13.80000019 W
PLW12         0.13800000 W
PLW13         0.08832000 W

F2 - Processing parameters
SI                    32768
SF           213.7703888 MHz
WDW                      EM
SSB       0
LB                   1.00 Hz
GB        0
PC                   1.40
```

Dr.Khadiga Saad Alghamdi
Sample : 6-AC CDCL3



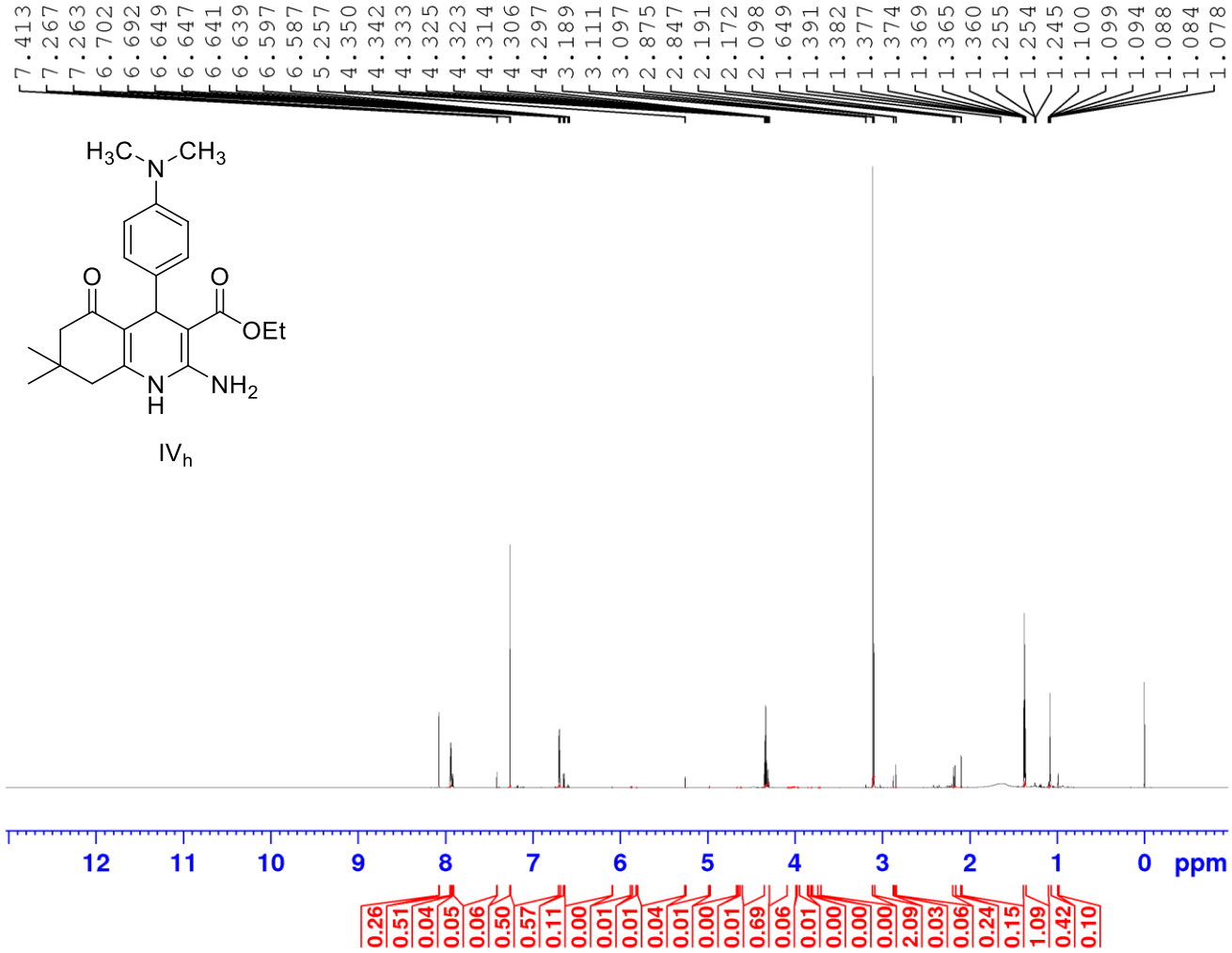

```
Current Data Parameters
NAME      KHADIGAS   6-AC    26-12-2017
EXPNO                  30
PROCNO                  1

F2 - Acquisition Parameters
Date_             20171226
Time                 17.37
INSTRUM              spect
PROBHD    5 mm CPQCI 1H-
PULPROG              zg30
TD                   65536
SOLVENT              CDCl3
NS                      32
DS                       2
SWH             17006.803 Hz
FIDRES           0.259503 Hz
AQ              1.9267584 sec
RG                    9.04
DW                  29.400 usec
DE                  10.00 usec
TE                  298.0 K
D1             1.00000000 sec
TD0                      1

======== CHANNEL f1 ========
SFO1          850.1552500 MHz
NUC1                   1H
P1                   8.00 usec
PLW1          15.30000019 W

F2 - Processing parameters
SI                   65536
SF            850.1500134 MHz
WDW                     EM
SSB       0
LB                    0.30 Hz
GB        0
PC                    1.00
```

Dr.Khadiga Saad Alghamdi
Sample : 6-AC CDCL3



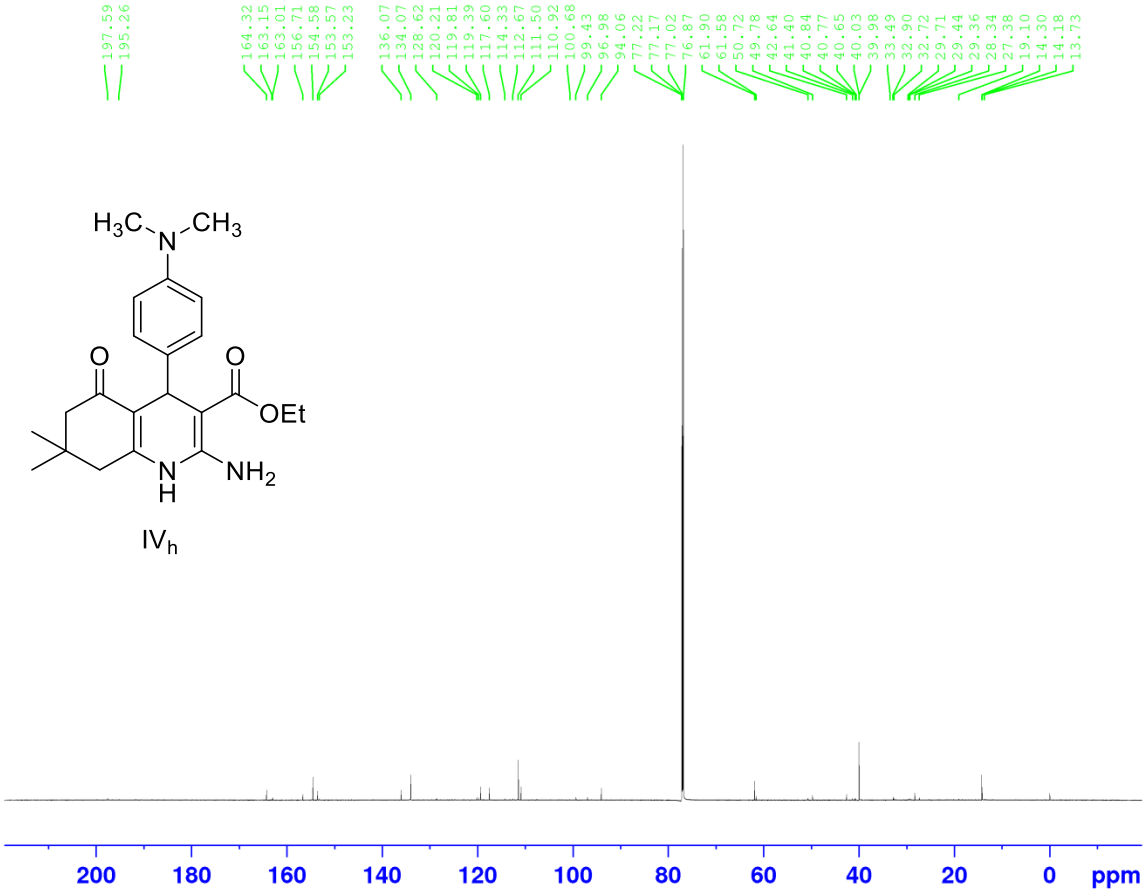

```
Current Data Parameters
NAME      KHADIGAS    6-AC    26-12-2017
EXPNO                   31
PROCNO                   1

F2 - Acquisition Parameters
Date_            20171226
Time                19.11
INSTRUM             spect
PROBHD    5 mm CPQCI 1H-
PULPROG             zgpg30
TD                   65536
SOLVENT              CDCl3
NS                    2048
DS                       4
SWH             51020.406 Hz
FIDRES           0.778510 Hz
AQ              0.6422528 sec
RG                 186.93
DW                  9.800 usec
DE                 18.00 usec
TE                 298.0 K
D1             2.00000000 sec
D11            0.03000000 sec
TD0                      1

======== CHANNEL f1 ========
SFO1          213.7917636 MHz
NUC1                   13C
P1                   12.00 usec
PLW1         130.00000000 W

======== CHANNEL f2 ========
SFO2          850.1534006 MHz
NUC2                    1H
CPDPRG[2           waltz16
PCPD2               80.00 usec
PLW2          13.80000019 W
PLW12          0.13800000 W
PLW13          0.08832000 W

F2 - Processing parameters
SI                   32768
SF            213.7703897 MHz
WDW                     EM
SSB       0
LB                   1.00 Hz
GB        0
PC                   1.40
```

Dr.Khadiga Saad Alghamdi
Sample : 3-AC CDCL3




```
Current Data Parameters
NAME      KHADIGAS   3-AC   26-12-2017
EXPNO                 40
PROCNO                 1

F2 - Acquisition Parameters
Date_             20171226
Time                19.16
INSTRUM             spect
PROBHD   5 mm CPQCI 1H-
PULPROG              zg30
TD                  65536
SOLVENT             CDCl3
NS                     32
DS                      2
SWH            17006.803 Hz
FIDRES          0.259503 Hz
AQ             1.9267584 sec
RG                  12.46
DW                 29.400 usec
DE                 10.00 usec
TE                 298.0 K
D1            1.00000000 sec
TD0                     1

======== CHANNEL f1 ========
SFO1         850.1552500 MHz
NUC1                   1H
P1                   8.00 usec
PLW1         15.30000019 W

F2 - Processing parameters
SI                  65536
SF           850.1500171 MHz
WDW                    EM
SSB       0
LB                  0.30 Hz
GB        0
PC                  1.00
```

Dr.Khadiga Saad Alghamdi
Sample : 3-AC CDCL3



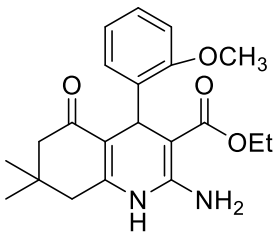




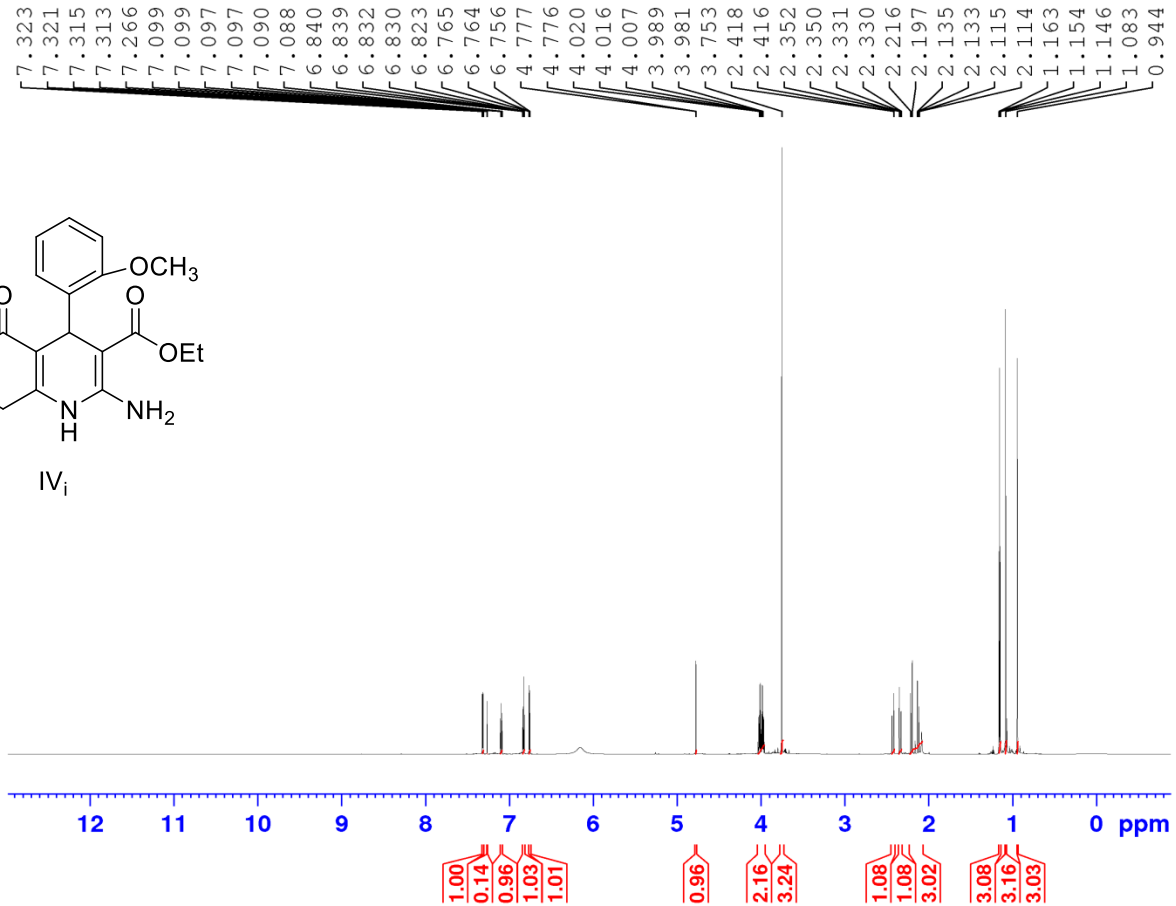
$IV_h$

```
Current Data Parameters
NAME      KHADIGAS   3-AC   26-12-2017
EXPNO                 41
PROCNO                 1

F2 - Acquisition Parameters
Date_            20171226
Time               20.50
INSTRUM            spect
PROBHD   5 mm CPQCI 1H-
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                 2048
DS                    4
SWH           51020.406 Hz
FIDRES         0.778510 Hz
AQ            0.6422528 sec
RG               186.93
DW                9.800 usec
DE               18.00 usec
TE               298.0 K
D1            2.00000000 sec
D11           0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         213.7917636 MHz
NUC1                  13C
P1                  12.00 usec
PLW1        130.00000000 W

======== CHANNEL f2 ========
SFO2         850.1534006 MHz
NUC2                   1H
CPDPRG[2          waltz16
PCPD2               80.00 usec
PLW2        13.80000019 W
PLW12        0.13800000 W
PLW13        0.08832000 W

F2 - Processing parameters
SI                  32768
SF           213.7703887 MHz
WDW                    EM
SSB       0
LB                   1.00 Hz
GB        0
PC                   1.40
```

Dr.Khadigaghamdi
Sample : 8A-C CDCL3

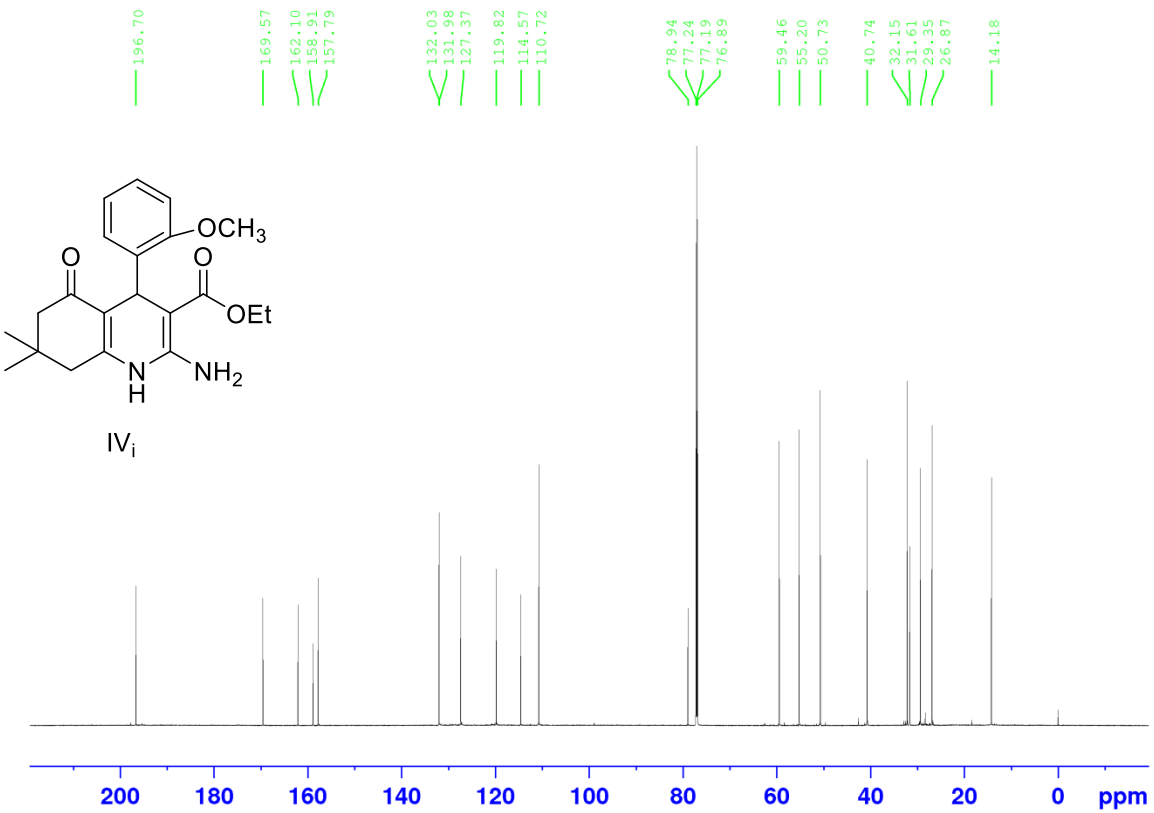



$IV_i$



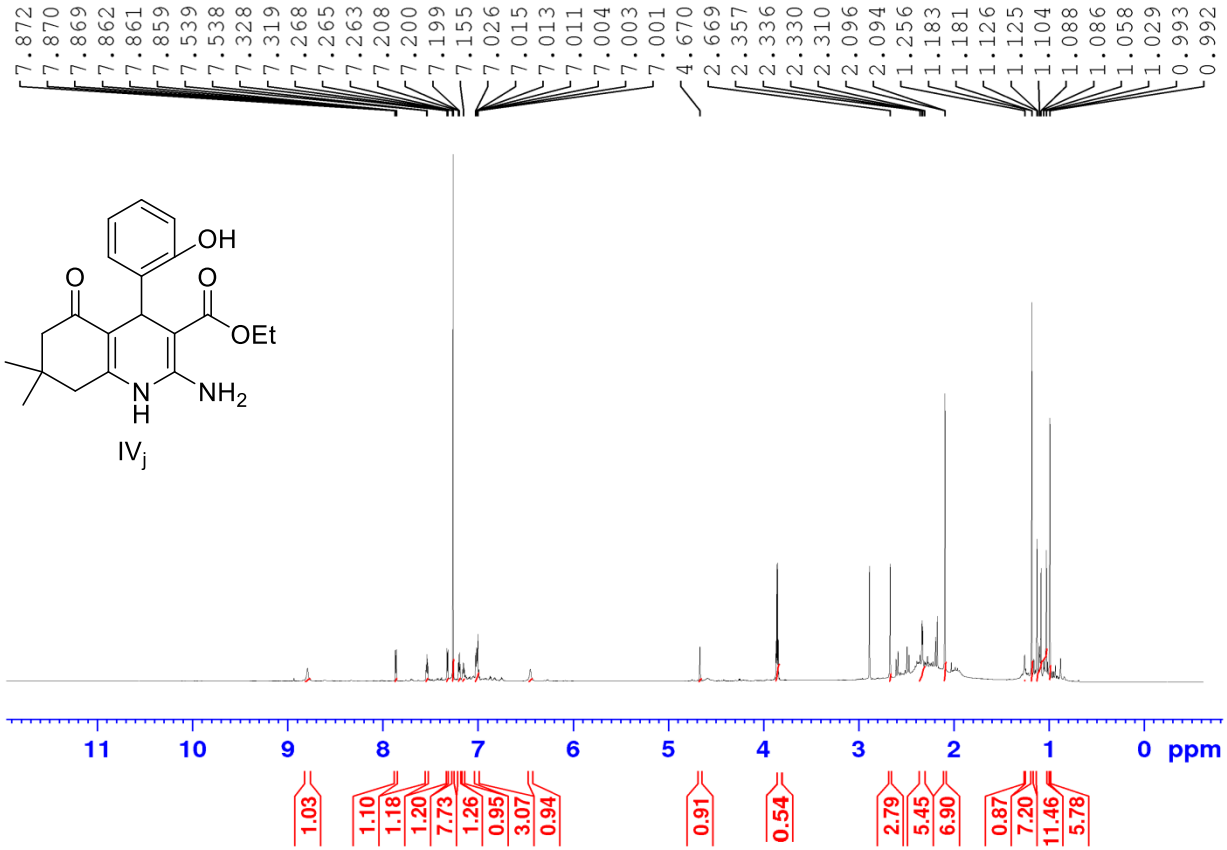

```
Current Data Parameters
NAME      KHADIGAG   8A-C     14-01-2018
EXPNO                 50
PROCNO                 1

F2 - Acquisition Parameters
Date_           20180115
Time                4.30
INSTRUM            spect
PROBHD   5 mm CPQCI 1H-
PULPROG            zg30
TD                65536
SOLVENT           CDCl3
NS                   32
DS                    2
SWH            17006.803 Hz
FIDRES          0.259503 Hz
AQ             1.9267584 sec
RG                  7.85
DW                29.400 usec
DE                 10.00 usec
TE                 298.0 K
D1             1.00000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         850.1552500 MHz
NUC1                  1H
P1                  8.00 usec
PLW1        15.30000019 W

F2 - Processing parameters
SI                 65536
SF          850.1500165 MHz
WDW                   EM
SSB       0
LB                 0.30 Hz
GB        0
PC                 1.00
```

Dr.Khadigaghamdi
Sample : 8A-C CDCL3



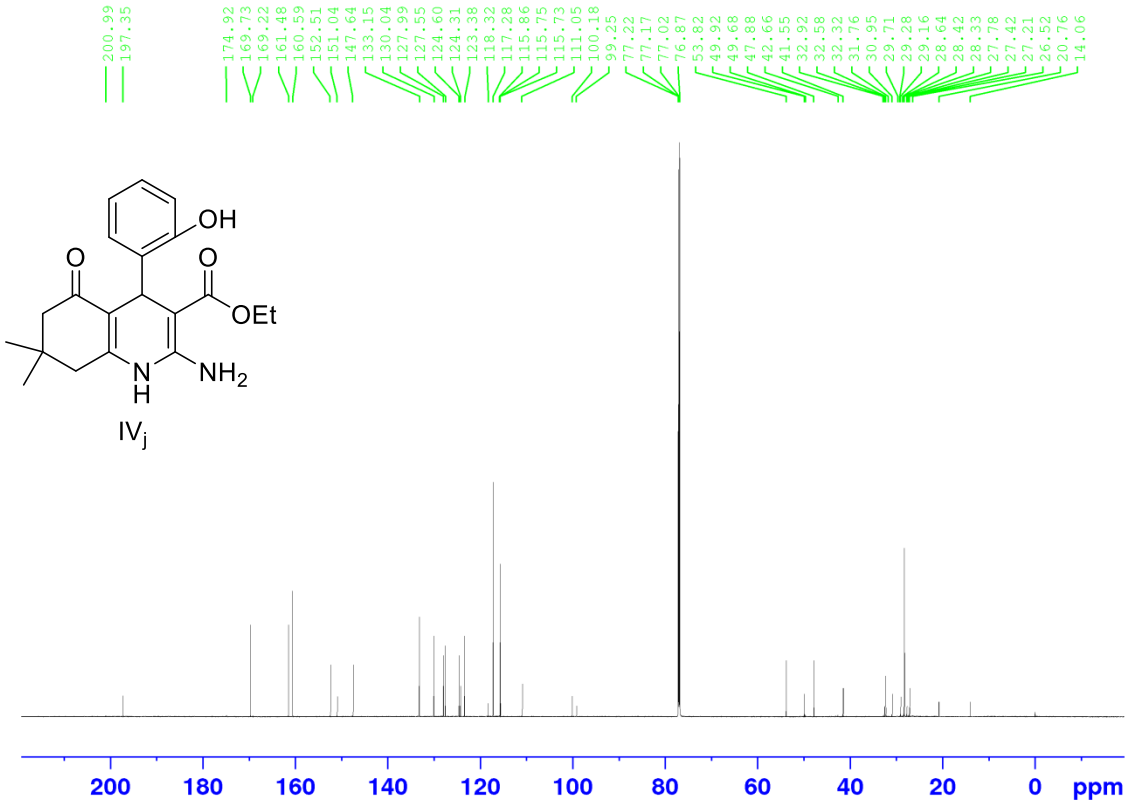

```
Current Data Parameters
NAME      KHADIGAG   8A-C    14-01-2018
EXPNO                 51
PROCNO                 1

F2 - Acquisition Parameters
Date_           20180115
Time                6.04
INSTRUM           spect
PROBHD   5 mm CPQCI 1H-
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                 2048
DS                    4
SWH           51020.406 Hz
FIDRES         0.778510 Hz
AQ            0.6422528 sec
RG               186.93
DW                9.800 usec
DE                18.00 usec
TE                298.0 K
D1           2.00000000 sec
D11          0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1        213.7917636 MHz
NUC1                 13C
P1                 12.00 usec
PLW1       130.00000000 W

======== CHANNEL f2 ========
SFO2         850.1534006 MHz
NUC2                  1H
CPDPRG[2         waltz16
PCPD2              80.00 usec
PLW2        13.80000019 W
PLW12        0.13800000 W
PLW13        0.08832000 W

F2 - Processing parameters
SI                 32768
SF          213.7703903 MHz
WDW                   EM
SSB       0
LB                 1.00 Hz
GB        0
PC                 1.40
```

Dr.Khadiga Saad Alghamdi
Sample : 4-AC CDCL3

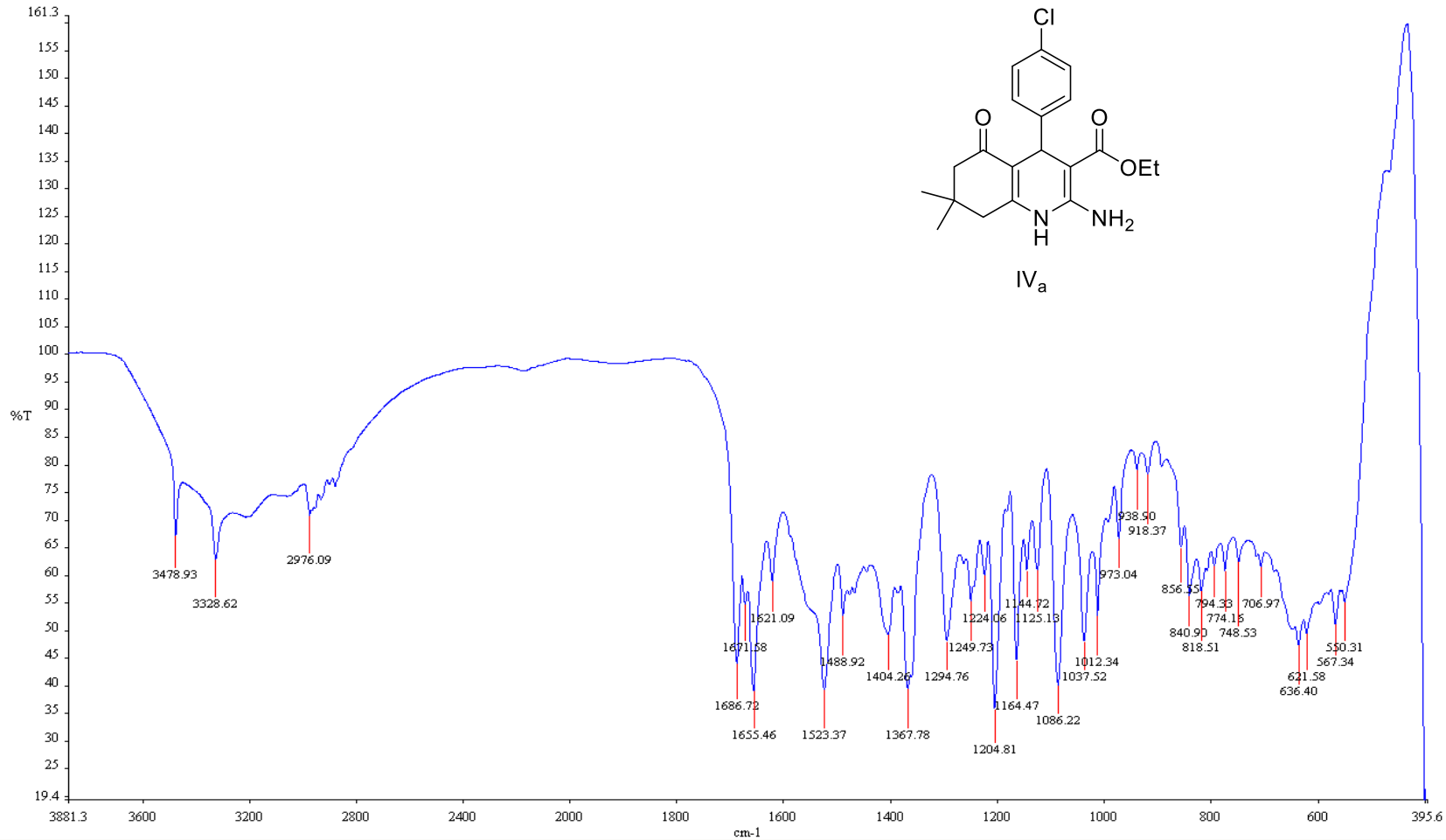


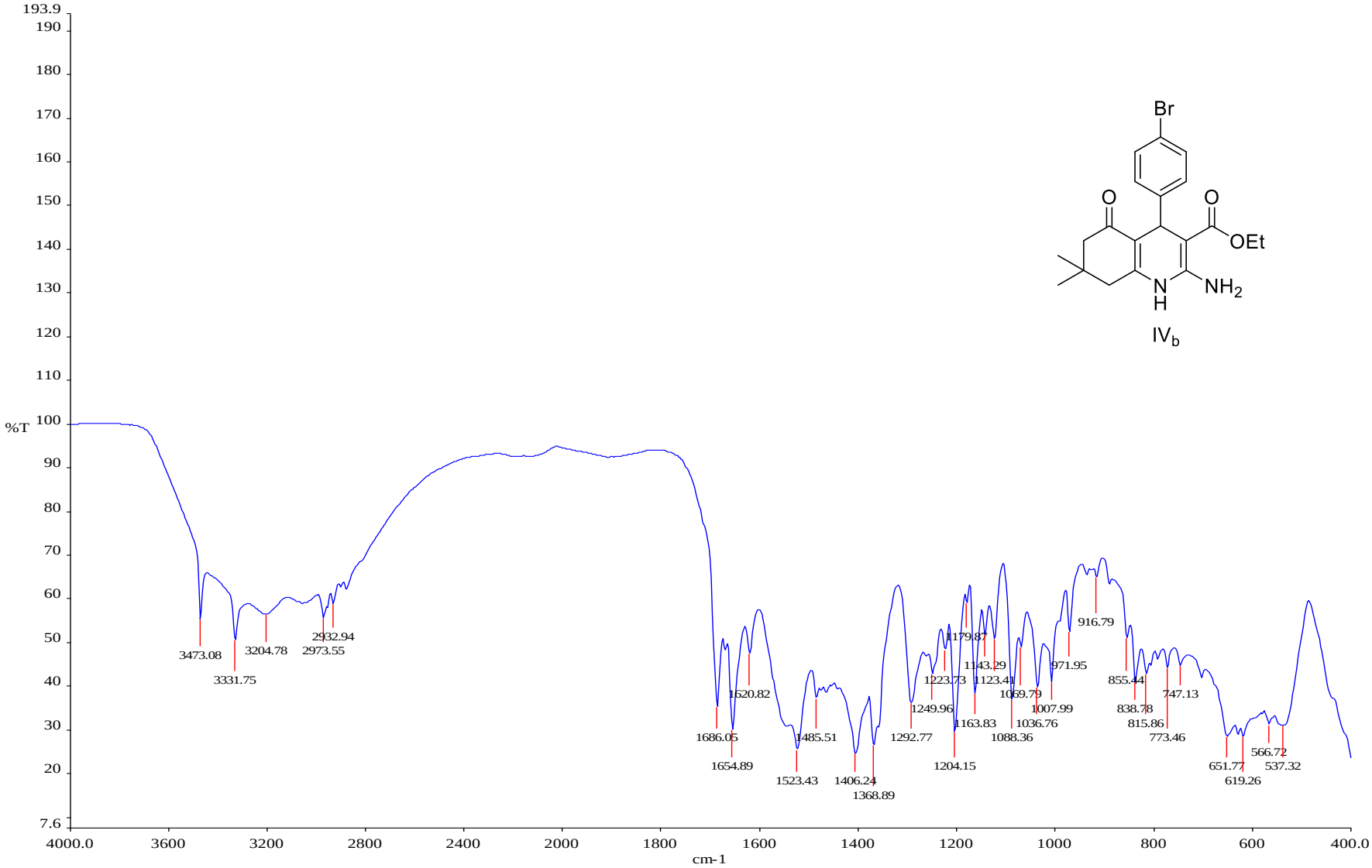

```
Current Data Parameters
NAME      KHADIGAS    4-AC    26-12-2017
EXPNO                   10
PROCNO                   1

F2 - Acquisition Parameters
Date_              20171226
Time                  14.17
INSTRUM               spect
PROBHD    5 mm CPQCI 1H-
PULPROG                zg30
TD                    65536
SOLVENT               CDCl3
NS                       32
DS                        2
SWH               17006.803 Hz
FIDRES             0.259503 Hz
AQ                1.9267584 sec
RG                    12.46
DW                   29.400 usec
DE                   10.00 usec
TE                   298.0 K
D1               1.00000000 sec
TD0                       1

======== CHANNEL f1 ========
SFO1            850.1552500 MHz
NUC1                     1H
P1                     8.00 usec
PLW1            15.30000019 W

F2 - Processing parameters
SI                    65536
SF              850.1500169 MHz
WDW                      EM
SSB         0
LB                    0.30 Hz
GB          0
PC                    1.00
```

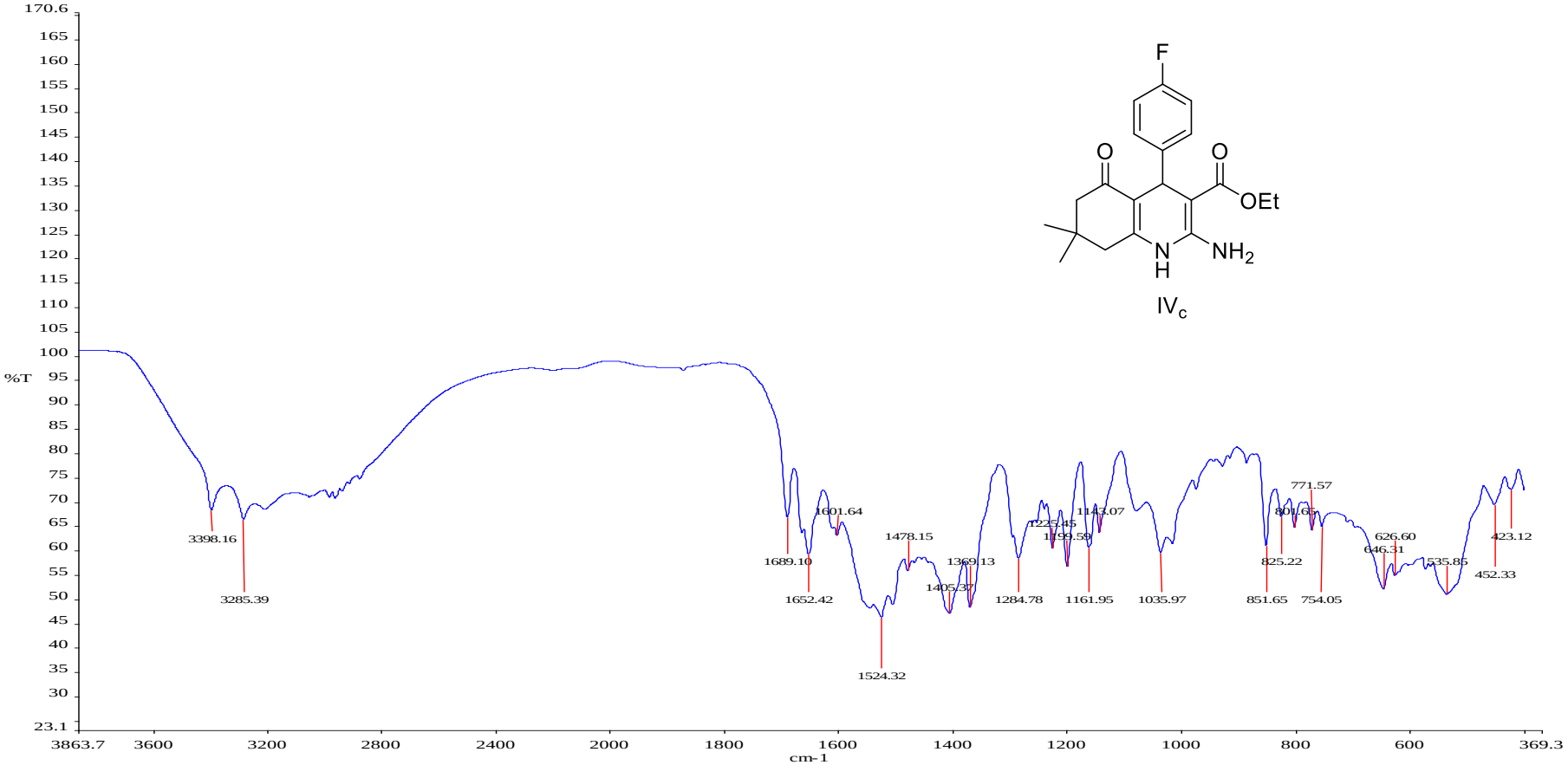
Dr.Khadiga Saad Alghamdi
Sample : 4-AC CDCL3

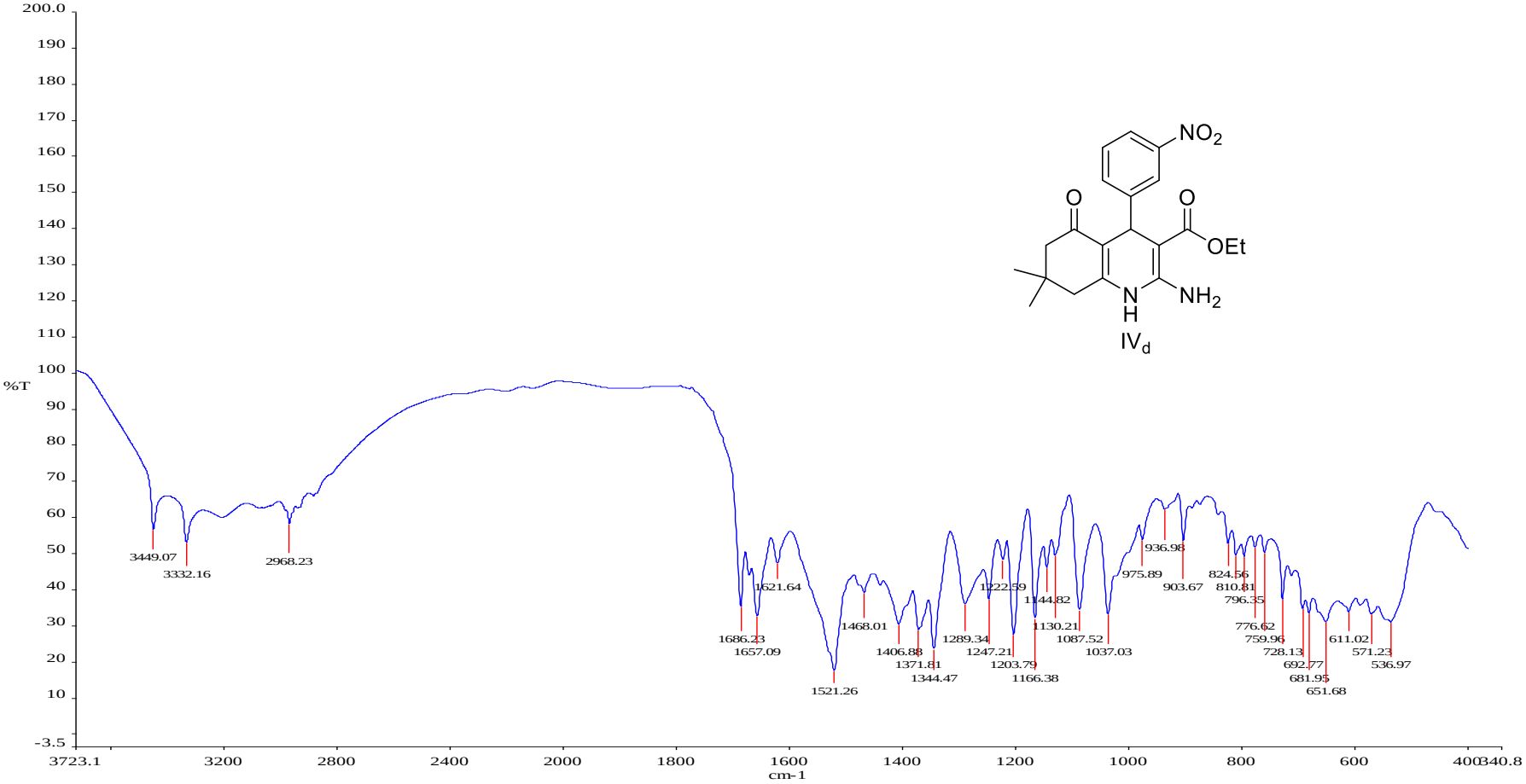


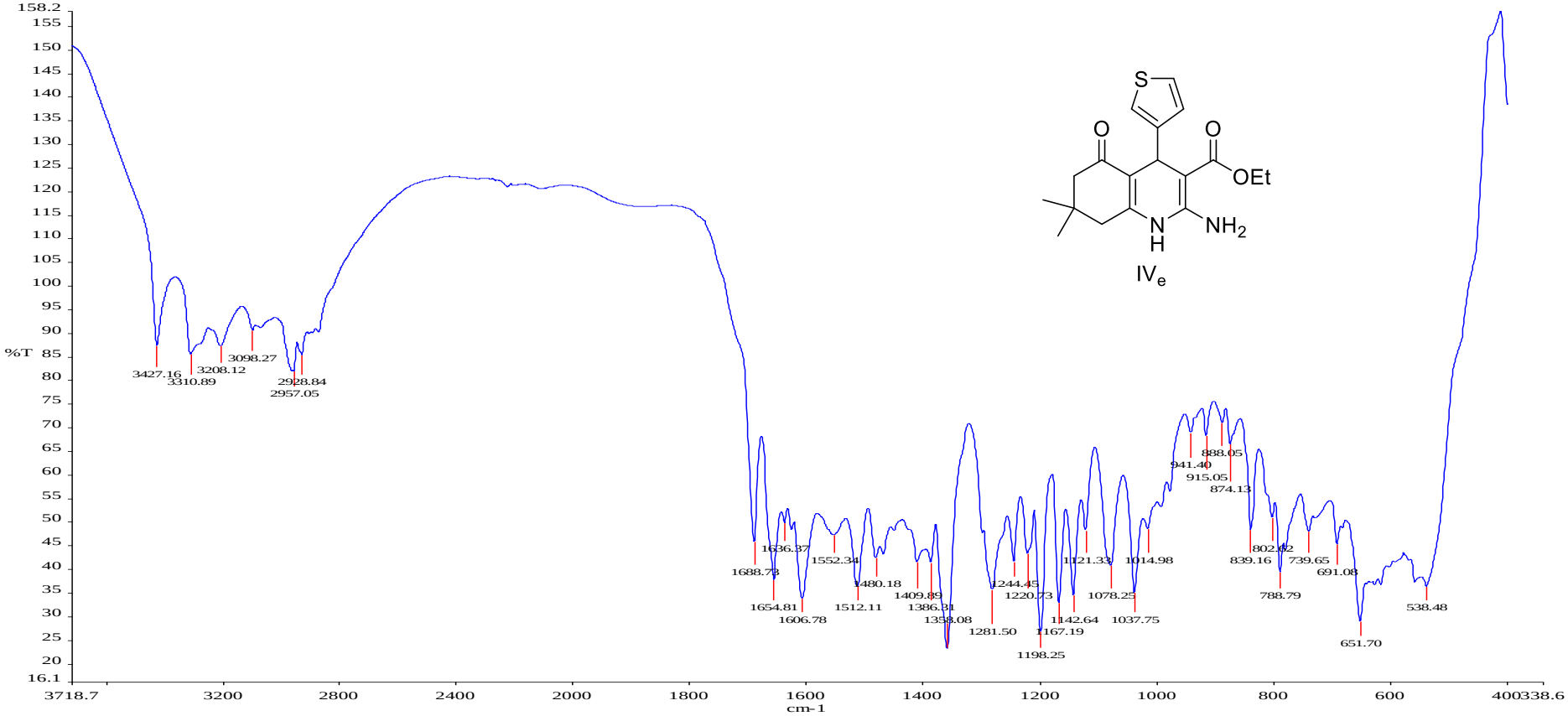

```
Current Data Parameters
NAME      KHADIGAS   4-AC   26-12-2017
EXPNO                 11
PROCNO                 1

F2 - Acquisition Parameters
Date_            20171226
Time                15.51
INSTRUM             spect
PROBHD   5 mm CPQCI 1H-
PULPROG            zgpg30
TD                  65536
SOLVENT             CDCl3
NS                   2048
DS                      4
SWH             51020.406 Hz
FIDRES           0.778510 Hz
AQ              0.6422528 sec
RG                 186.93
DW                  9.800 usec
DE                 18.00 usec
TE                 298.0 K
D1             2.00000000 sec
D11            0.03000000 sec
TD0                     1

======== CHANNEL f1 ========
SFO1         213.7917636 MHz
NUC1                  13C
P1                  12.00 usec
PLW1        130.00000000 W

======== CHANNEL f2 ========
SFO2         850.1534006 MHz
NUC2                   1H
CPDPRG[2          waltz16
PCPD2               80.00 usec
PLW2         13.80000019 W
PLW12         0.13800000 W
PLW13         0.08832000 W

F2 - Processing parameters
SI                  32768
SF           213.7703889 MHz
WDW                    EM
SSB       0
LB                   1.00 Hz
GB        0
PC                   1.40
```

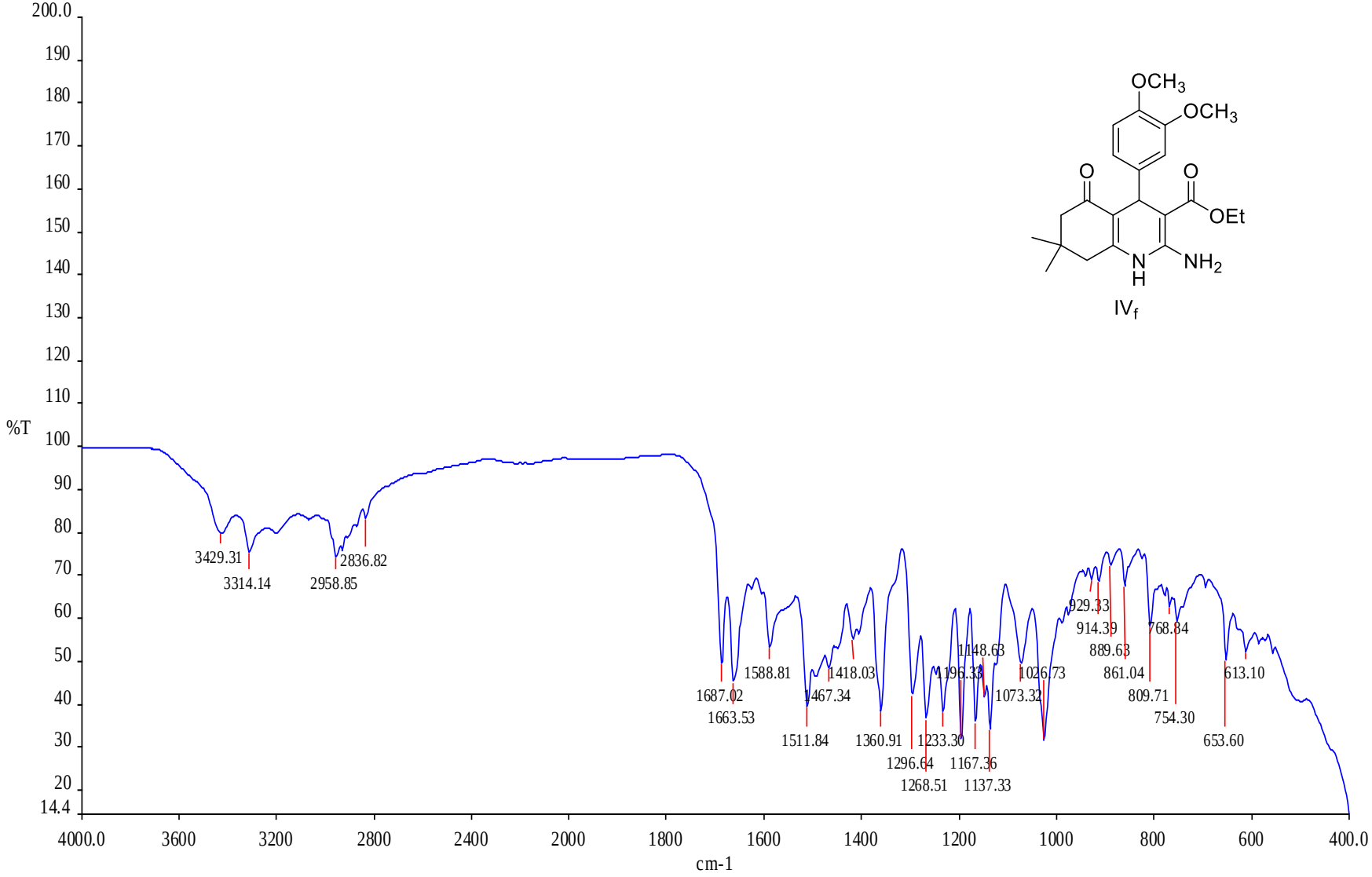

Cl
O
O
OEt
N
H
NH2
IVa
%T
cm-1
3478.93
3328.62
2976.09
1686.72
1671.58
1655.46
1621.09
1523.37
1488.92
1404.26
1367.78
1294.76
1249.73
1224.06
1204.81
1164.47
1144.72
1125.13
1086.22
1037.52
1012.34
973.04
938.90
918.37
856.55
840.90
818.51
794.33
774.16
748.53
706.97
636.40
621.58
567.34
550.31

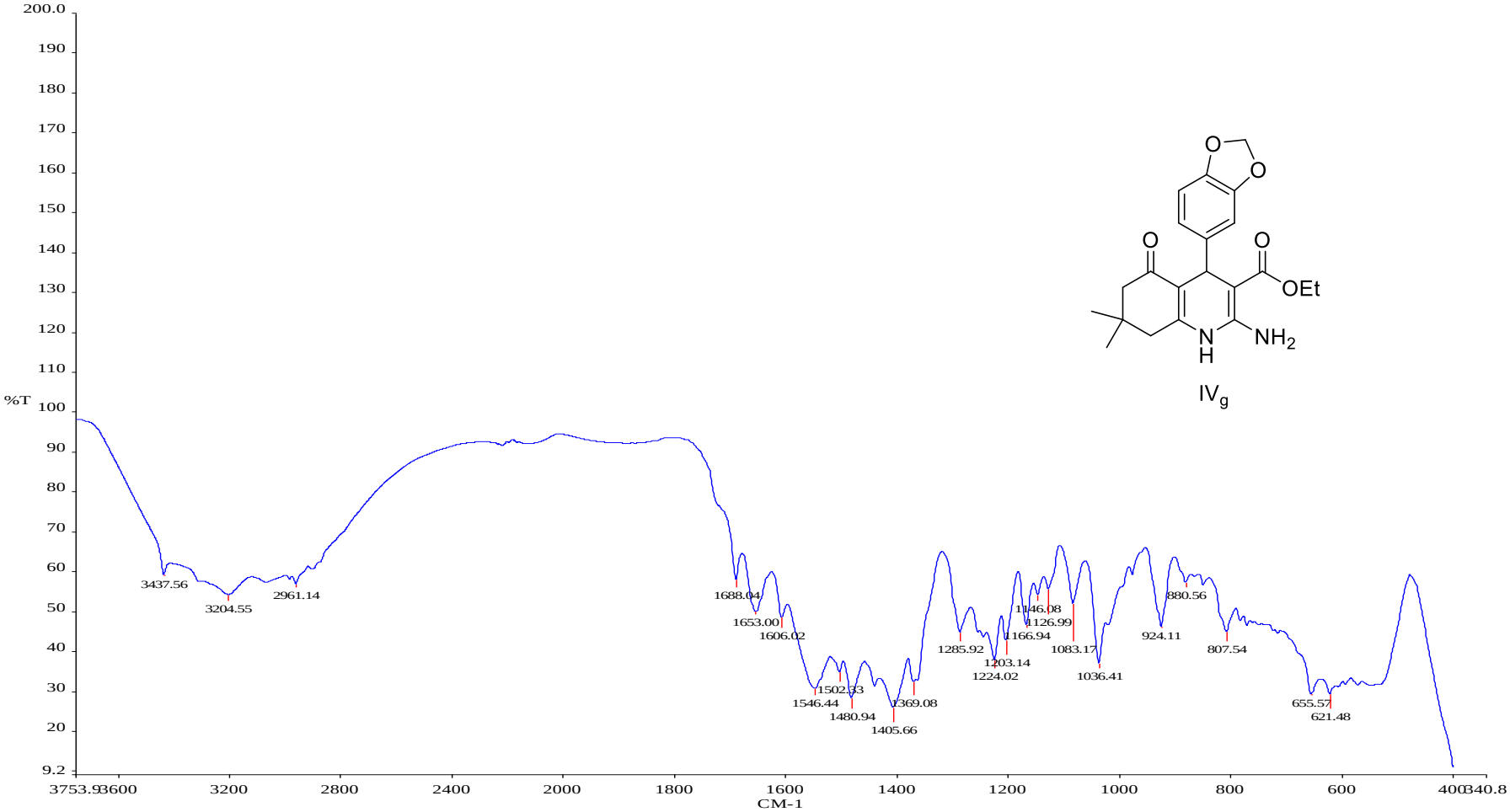

193.9
%T
cm-1
3473.08
3331.75
3204.78
2973.55
2932.94
1686.05
1654.89
1620.82
1523.43
1485.51
1406.24
1368.89
1292.77
1249.96
1223.73
1204.15
1179.87
1163.83
1143.29
1123.41
1088.36
1069.79
1036.76
1007.99
971.95
916.79
855.44
838.78
815.86
773.46
747.13
651.77
619.26
566.72
537.32
Br
O
O
OEt
N
H
NH2
IVb

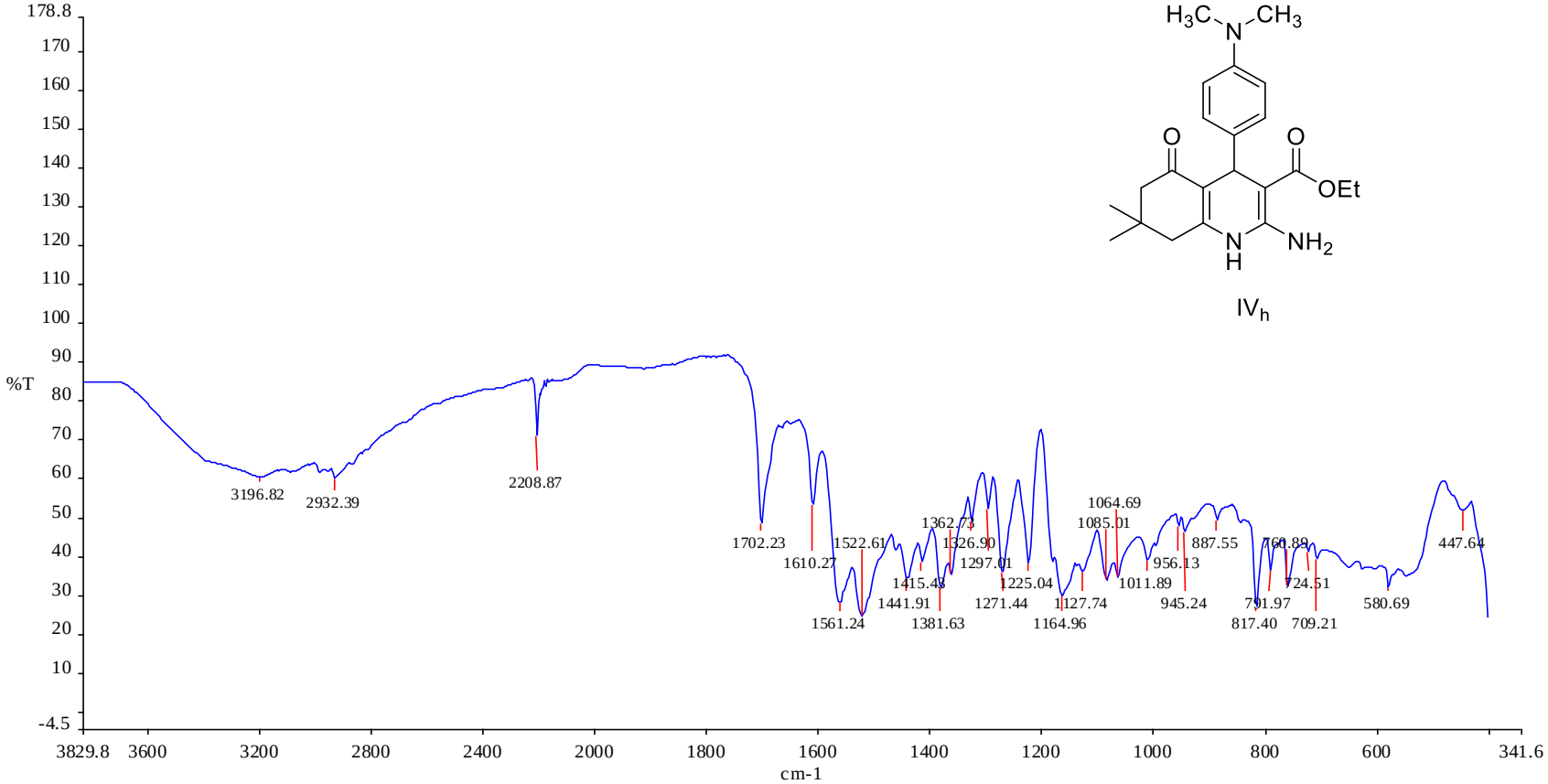

170.6
165
160
155
150
145
140
135
130
125
120
115
110
105
100
%T
95
90
85
80
75
70
65
60
55
50
45
40
35
30
23.1
3863.7
3600
3200
2800
2400
2000
1800
1600
1400
1200
1000
800
600
369.3
cm-1
3398.16
3285.39
1689.10
1652.42
1601.64
1524.32
1478.15
1405.37
1369.13
1284.78
1225.45
1199.59
1161.95
1143.07
1035.97
851.65
825.22
801.65
771.57
754.05
646.31
626.60
535.85
452.33
423.12
F
O
O
OEt
N
H
NH2
IVc

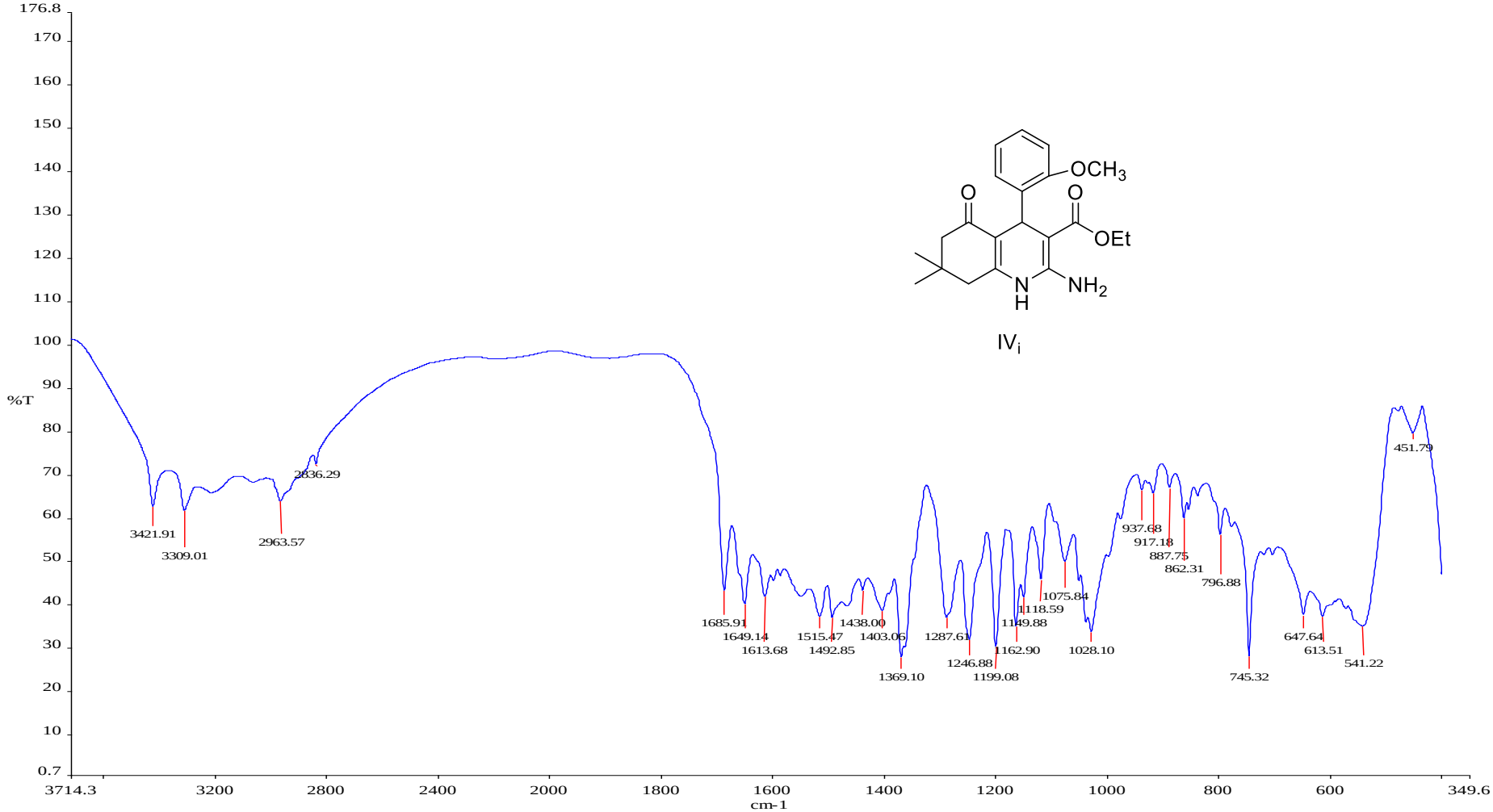

%T
cm-1
3449.07
3332.16
2968.23
1686.23
1657.09
1621.64
1521.26
1468.01
1406.88
1371.81
1344.47
1289.34
1247.21
1222.59
1203.79
1166.38
1144.82
1130.21
1087.52
1037.03
975.89
936.98
903.67
824.56
810.81
796.35
776.62
759.96
728.13
692.77
681.95
651.68
611.02
571.23
536.97
NO2
O
O
OEt
N
H
NH2
IVd


%T
cm-1
3427.16
3310.89
3208.12
3098.27
2957.05
2928.84
1688.73
1654.81
1636.37
1606.78
1552.34
1512.11
1480.18
1409.89
1386.31
1358.08
1281.50
1244.45
1220.73
1198.25
1167.19
1142.64
1121.33
1078.25
1037.75
1014.98
941.40
915.05
888.05
874.13
839.16
802.62
788.79
739.65
691.08
651.70
538.48
S
O
O
OEt
N
H
NH2
IVe

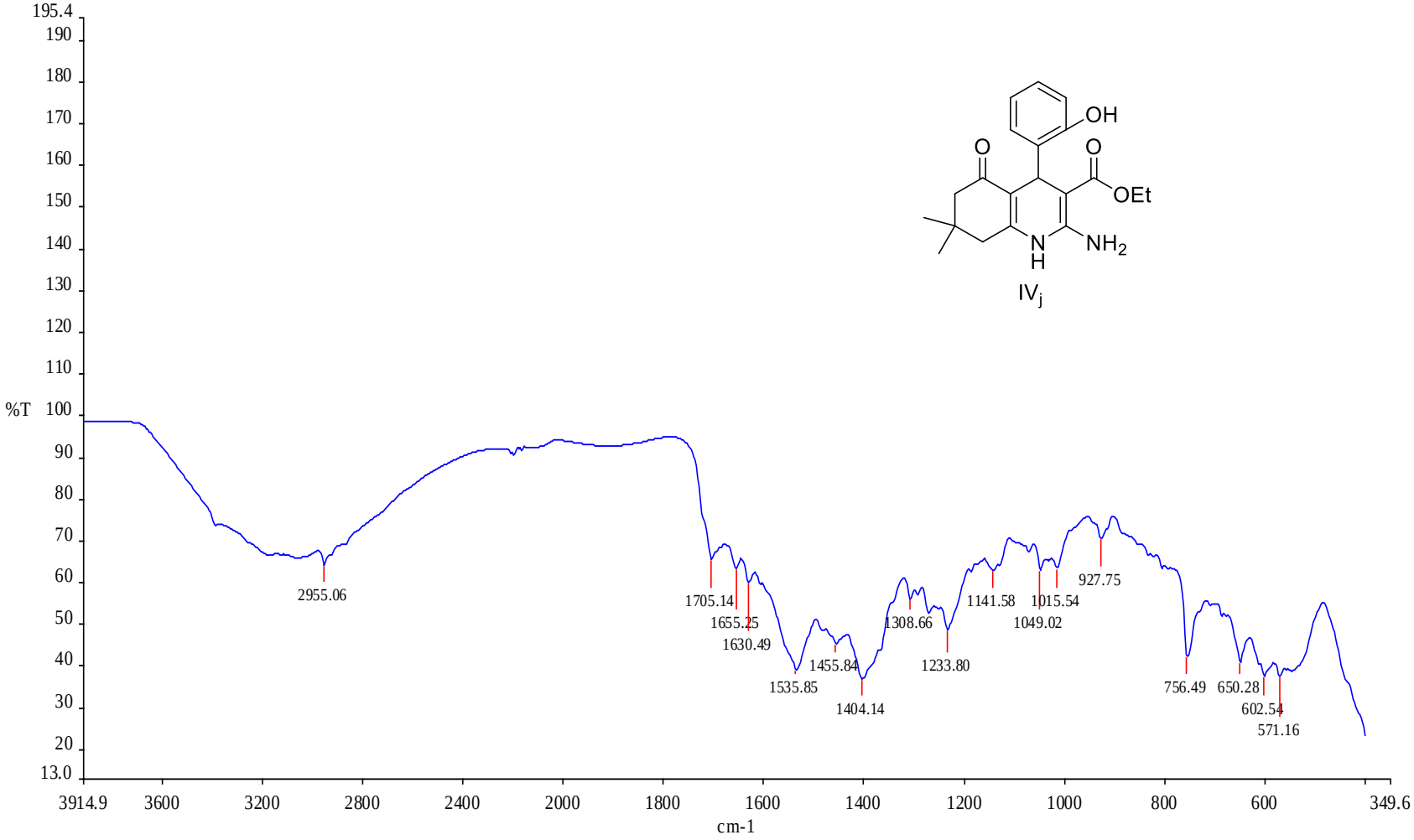

%T
cm-1
3429.31
3314.14
2958.85
2836.82
1687.02
1663.53
1588.81
1511.84
1467.34
1418.03
1360.91
1296.64
1268.51
1233.30
1196.33
1167.36
1148.63
1137.33
1073.32
1026.73
929.33
914.39
889.63
861.04
809.71
768.84
754.30
653.60
613.10
OCH3
OCH3
O
O
OEt
N
H
NH2
IVf


%T
CM-1
3437.56
3204.55
2961.14
1688.04
1653.00
1606.02
1546.44
1502.53
1480.94
1405.66
1369.08
1285.92
1224.02
1203.14
1166.94
1146.08
1126.99
1083.17
1036.41
924.11
880.56
807.54
655.57
621.48
O
O
O
O
OEt
N
H
NH2
IVg


178.8
170
160
150
140
130
120
110
100
90
%T
80
70
60
50
40
30
20
10
-4.5
3829.8
3600
3200
2800
2400
2000
1800
1600
1400
1200
1000
800
600
341.6
cm-1
3196.82
2932.39
2208.87
1702.23
1610.27
1561.24
1522.61
1441.91
1415.43
1381.63
1362.73
1326.90
1297.01
1271.44
1225.04
1164.96
1127.74
1085.01
1064.69
1011.89
956.13
945.24
887.55
817.40
791.97
760.89
724.51
709.21
580.69
447.64
H3C
N
CH3
O
O
OEt
N
H
NH2
IVh


176.8
170
160
150
140
130
120
110
100
90
%T
80
70
60
50
40
30
20
10
0.7
3714.3
3200
2800
2400
2000
1800
1600
1400
1200
1000
800
600
349.6
cm-1
3421.91
3309.01
2963.57
2836.29
1685.91
1649.14
1613.68
1515.47
1492.85
1438.00
1403.06
1369.10
1287.61
1246.88
1199.08
1162.90
1149.88
1118.59
1075.84
1028.10
937.68
917.18
887.75
862.31
796.88
745.32
647.64
613.51
541.22
451.79
OCH3
O
O
OEt
N
H
NH2

IV$_i$


195.4
190
180
170
160
150
140
130
120
110
%T 100
90
80
70
60
50
40
30
20
13.0
3914.9
3600
3200
2800
2400
2000
1800
1600
1400
1200
1000
800
600
349.6
cm-1
2955.06
1705.14
1655.25
1630.49
1535.85
1455.84
1404.14
1308.66
1233.80
1141.58
1049.02
1015.54
927.75
756.49
650.28
602.54
571.16
OH
O
O
OEt
N
H
NH2
IVj