Electronic Supplementary Material (ESI) for New Journal of Chemistry.

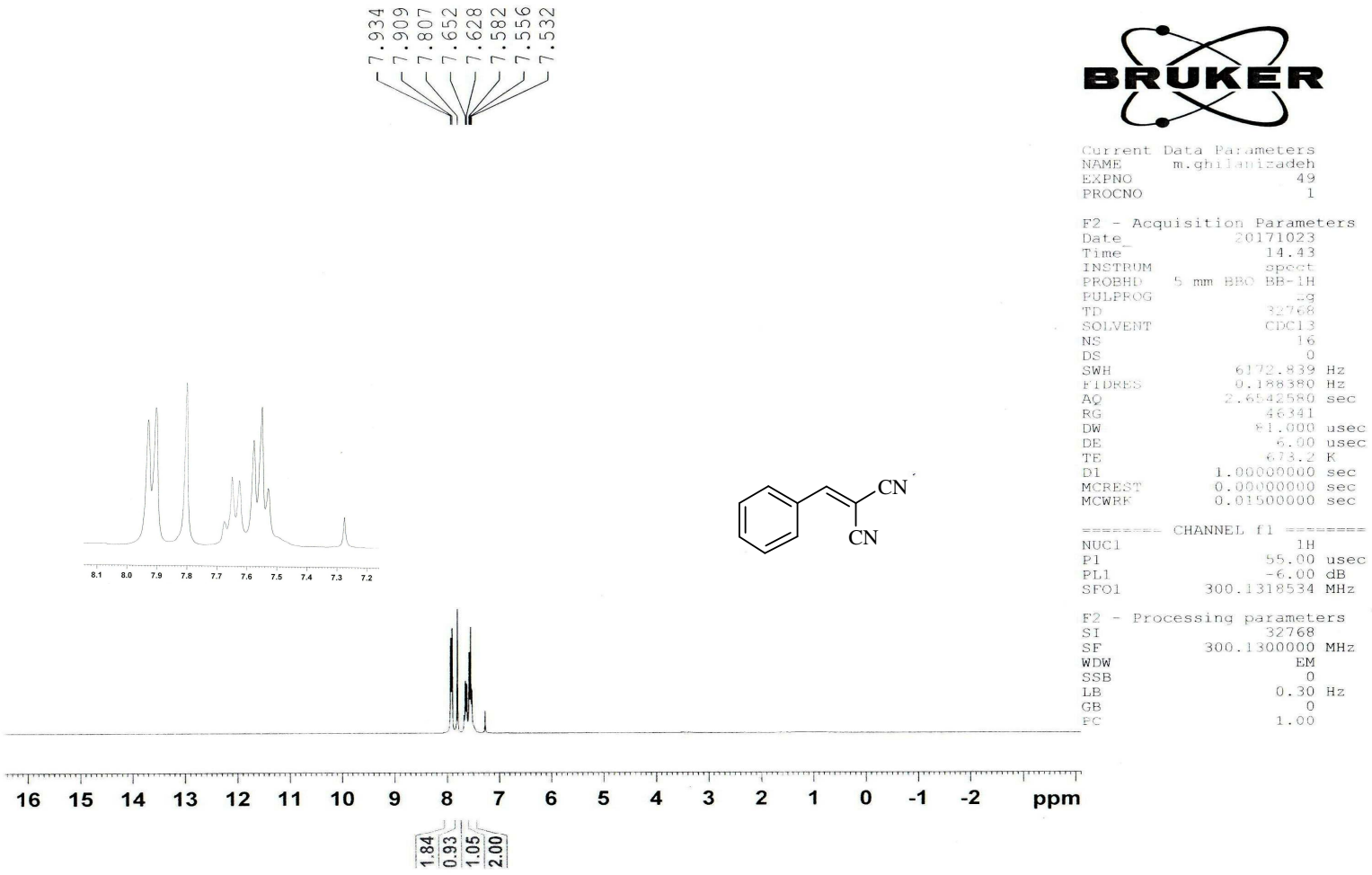
Synthesis and characterization of the immobilized Ni-Zn-Fe layered double hydroxide (LDH) on silica coated magnetite as a mesoporous and magnetically reusable catalyst for the preparation of benzylidenemalononitriles and bisdimedones (tetraketones) under green conditions

Masumeh Gilanizadeh* and Behzad Zeynizadeh

New Journal of Chemistry

(Supplementary Information)

[1]HNMR (Table 2, entry 1)



BRUKER

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Current Data Parameters
NAME      m.ghilanizadeh
EXPNO                 49
PROCNO                 1

F2 - Acquisition Parameters
Date_           20171023
Time              14.43
INSTRUM             spect
PROBHD   5 mm BBO BB-1H
PULPROG               zg
TD                 32768
SOLVENT             CDCl3
NS                     16
DS                      0
SWH             6172.839 Hz
FIDRES          0.188380 Hz
AQ              2.6542580 sec
RG                 46341
DW                81.000 usec
DE                 6.00 usec
TE                673.2 K
D1             1.00000000 sec
MCREST         0.00000000 sec
MCWRF          0.01500000 sec

======== CHANNEL f1 ========
NUC1                   1H
P1                 55.00 usec
PL1                -6.00 dB
SFO1          300.1318534 MHz

F2 - Processing parameters
SI                 32768
SF          300.1300000 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00
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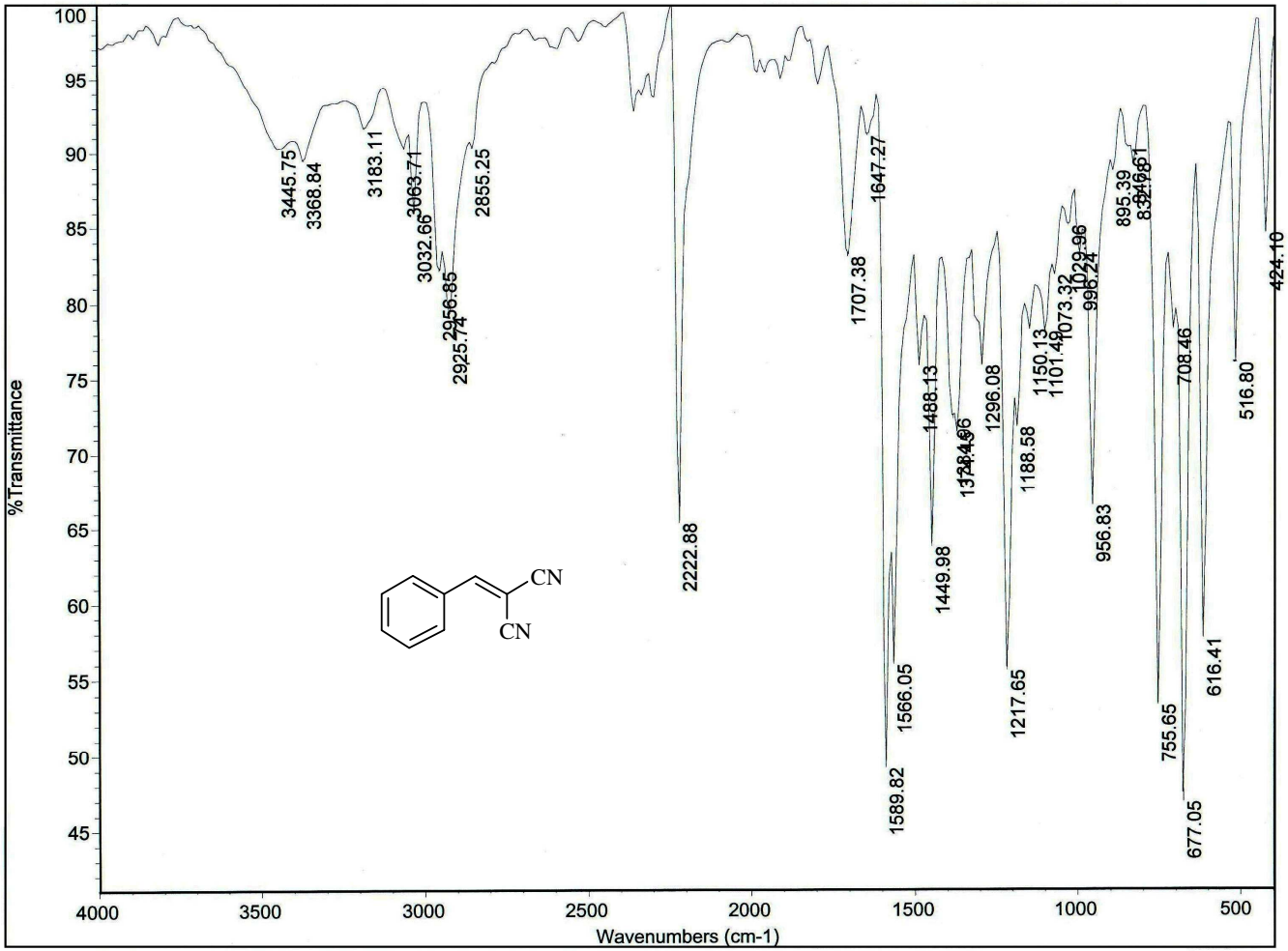
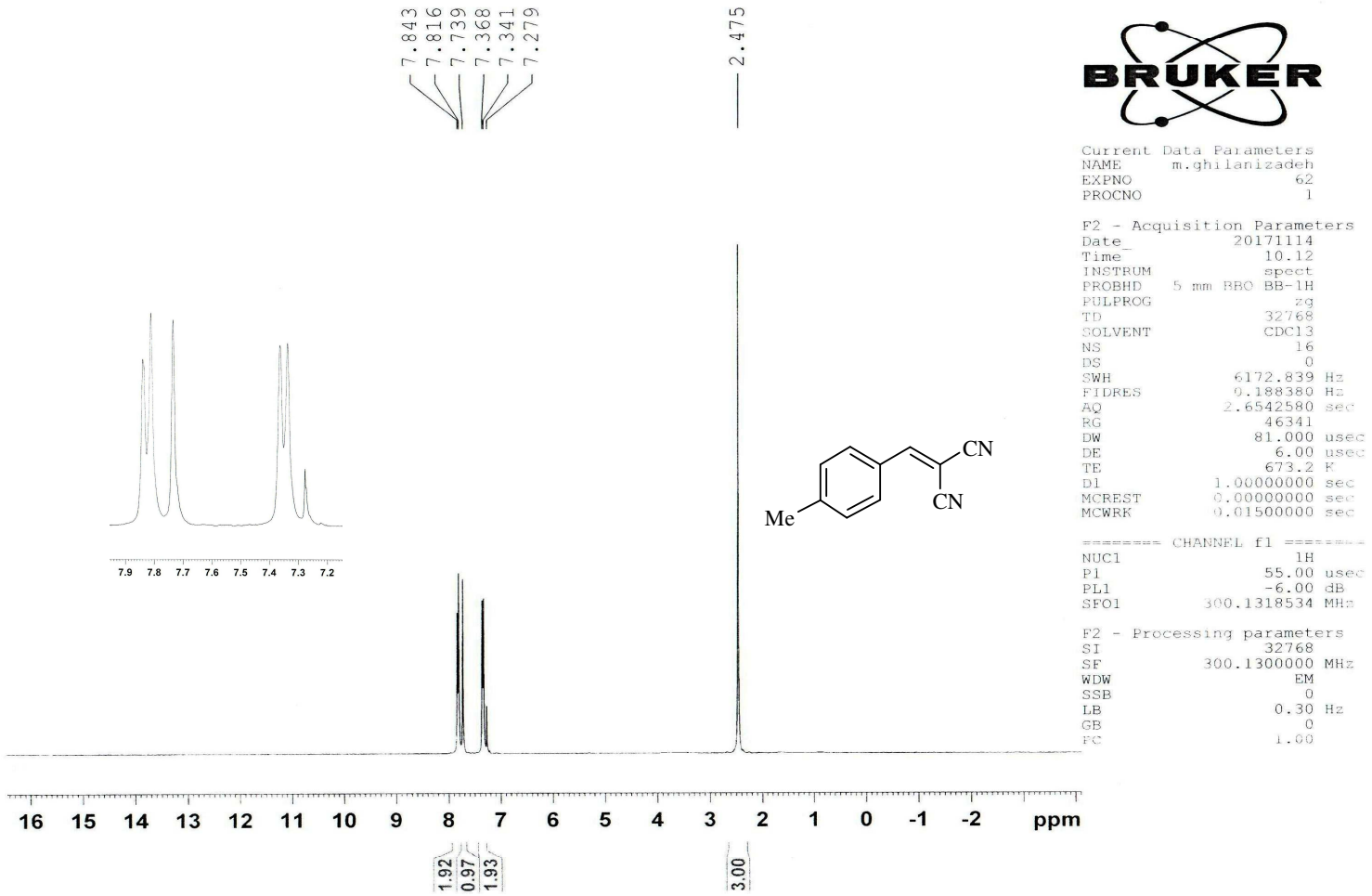
FT-IR (Table 2, entry 1)



[1]HNMR (Table 2, entry 2)

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EXPNO                 62
PROCNO                 1

F2 - Acquisition Parameters
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Time              10.12
INSTRUM           spect
PROBHD   5 mm BBO BB-1H
PULPROG               zg
TD                32768
SOLVENT           CDCl3
NS                   16
DS                    0
SWH            6172.839 Hz
FIDRES         0.188380 Hz
AQ             2.6542580 sec
RG                46341
DW               81.000 usec
DE                6.00 usec
TE               673.2 K
D1            1.00000000 sec
MCREST        0.00000000 sec
MCWRK         0.01500000 sec

======== CHANNEL f1 ========
NUC1                  1H
P1                55.00 usec
PL1               -6.00 dB
SFO1        300.1318534 MHz

F2 - Processing parameters
SI                32768
SF          300.1300000 MHz
WDW                  EM
SSB                   0
LB                 0.30 Hz
GB                    0
PC                 1.00
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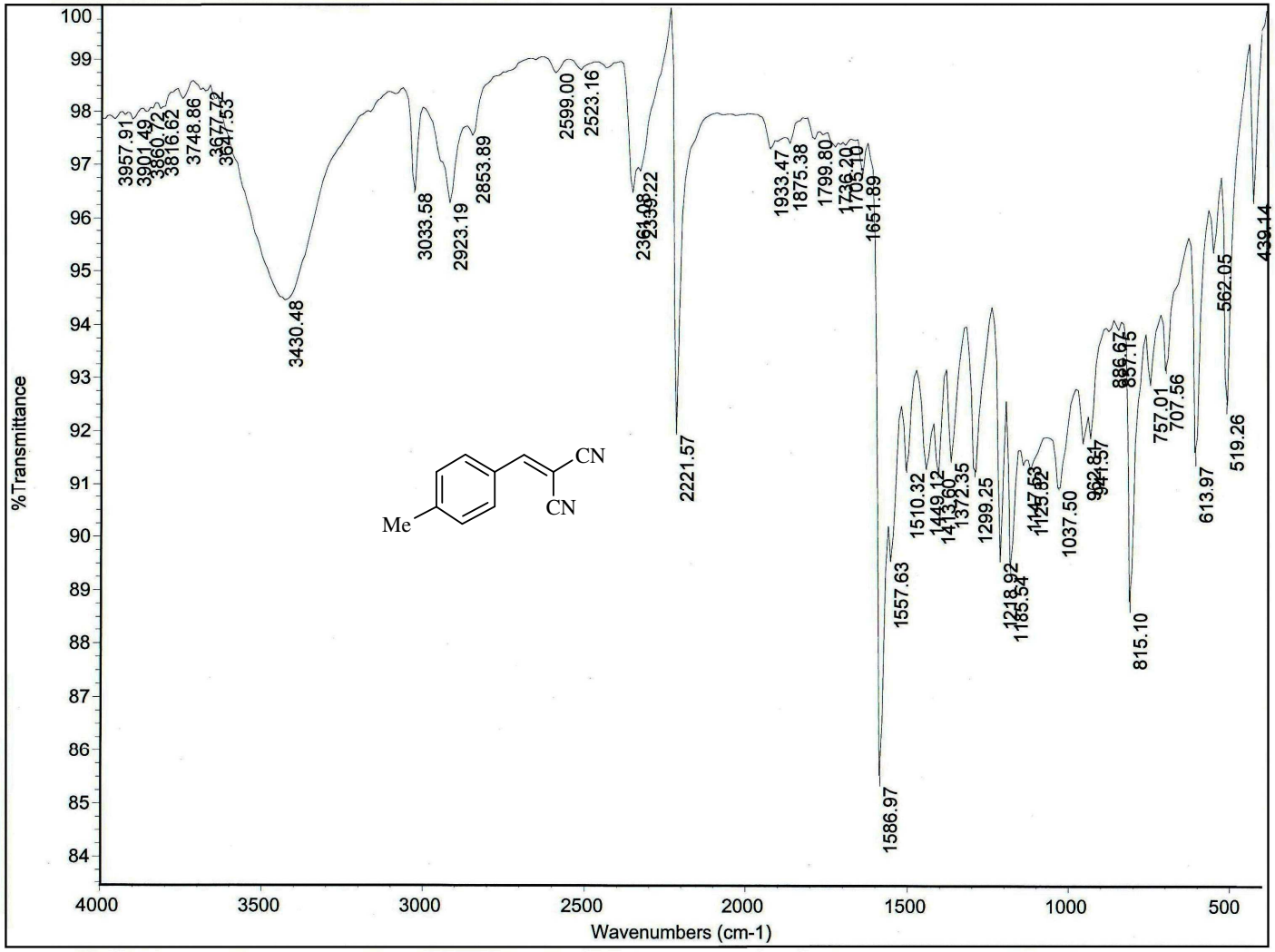
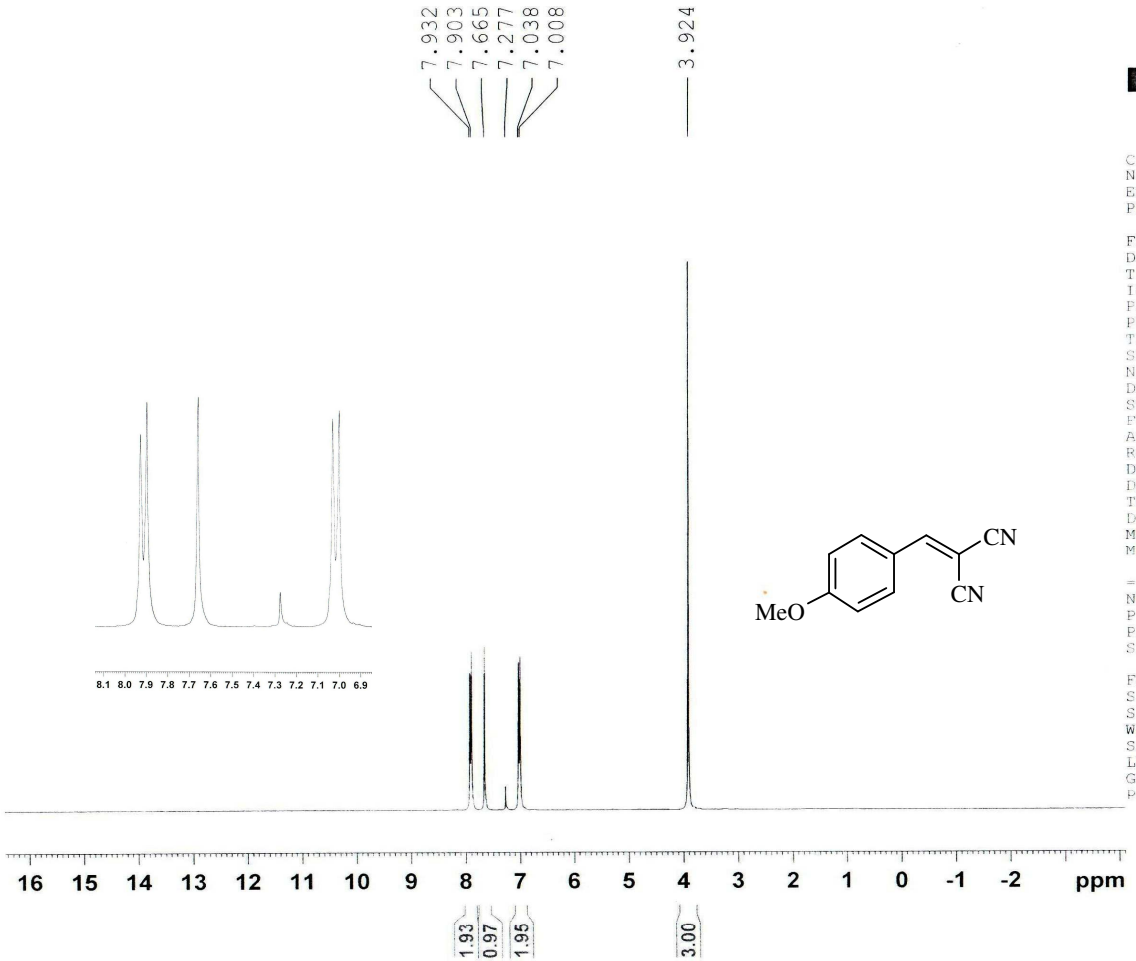
FT-IR (Table 2, entry 2)



[1]HNMR (Table 2, entry 3)



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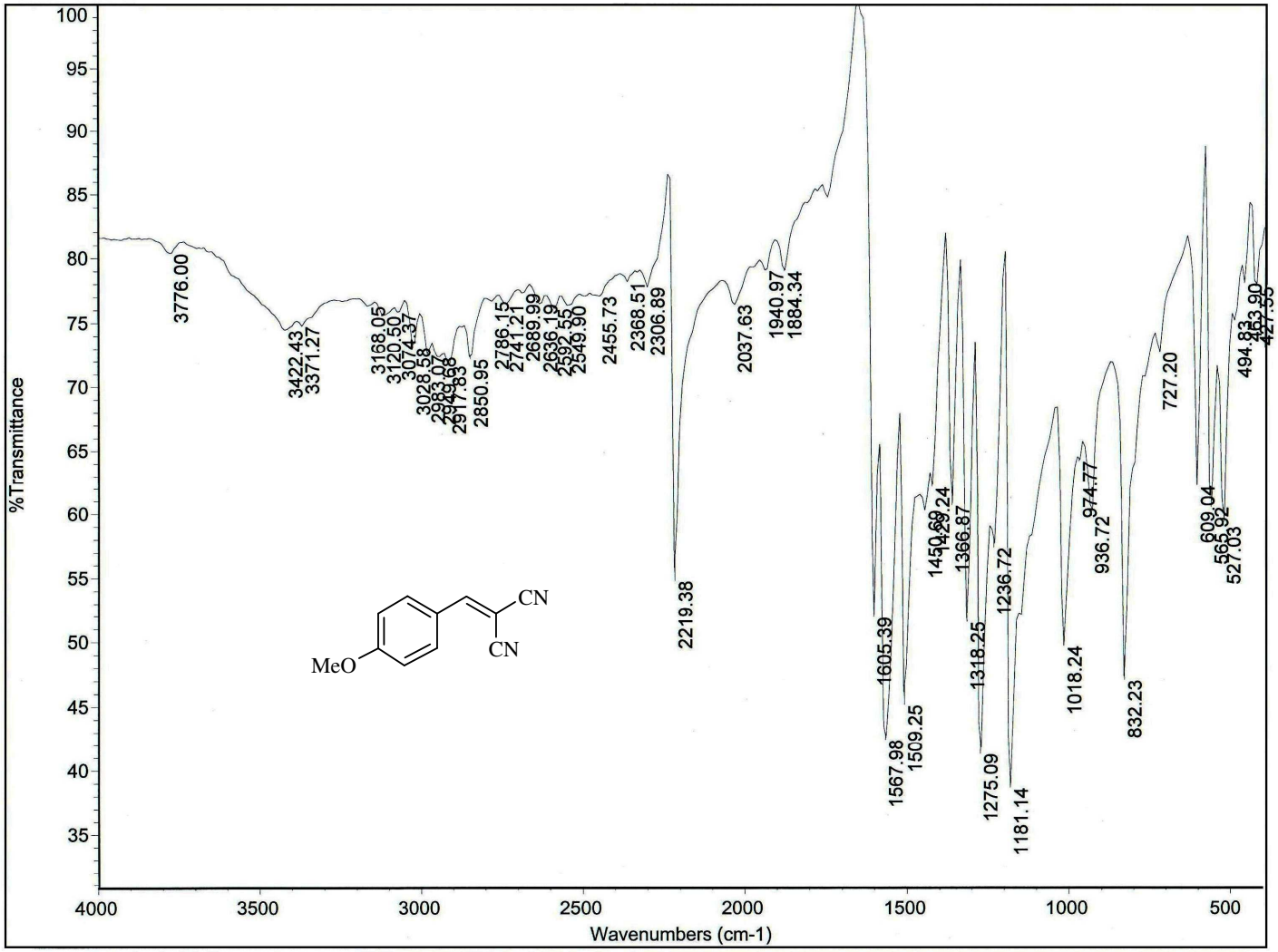
Current Data Parameters
NAME m.ghiasizadeh
EXPNO 57
PROCNO 1

F2 - Acquisition Parameters
Date 20171114
Time 9.25
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 6172.839 Hz
FIDRES 0.188380 Hz
AQ 2.6542580 sec
RG 46341
DW 81.000 usec
DE 6.00 usec
TE 273.2 K
D1 1.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec

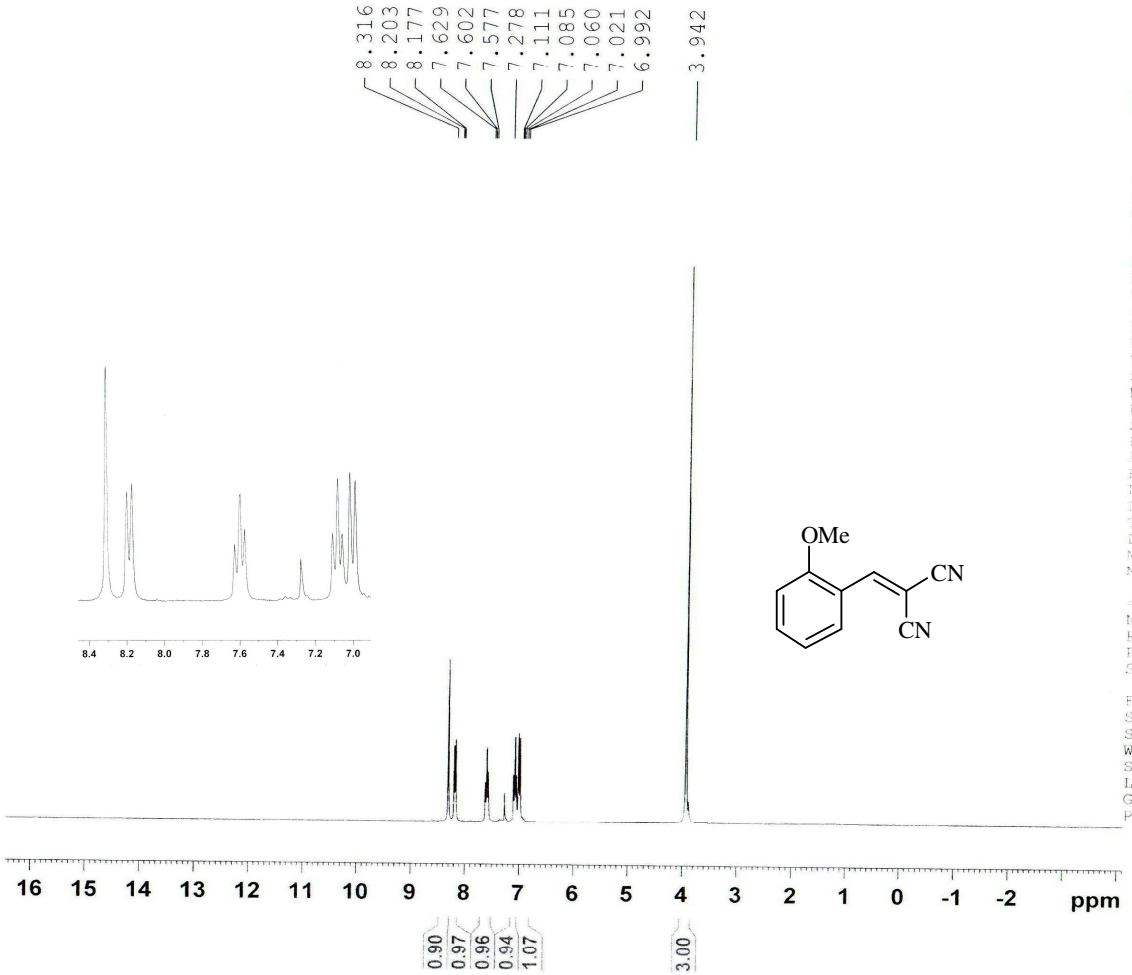
======== CHANNEL f1 ========
NUC1 1H
P1 55.00 usec
PL1 -6.00 dB
SFO1 300.1318534 MHz

F2 - Processing parameters
SI 32768
SF 300.1300000 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

FT-IR (Table 2, entry 3)



[1]HNMR (Table 2, entry 4)



BRUKER

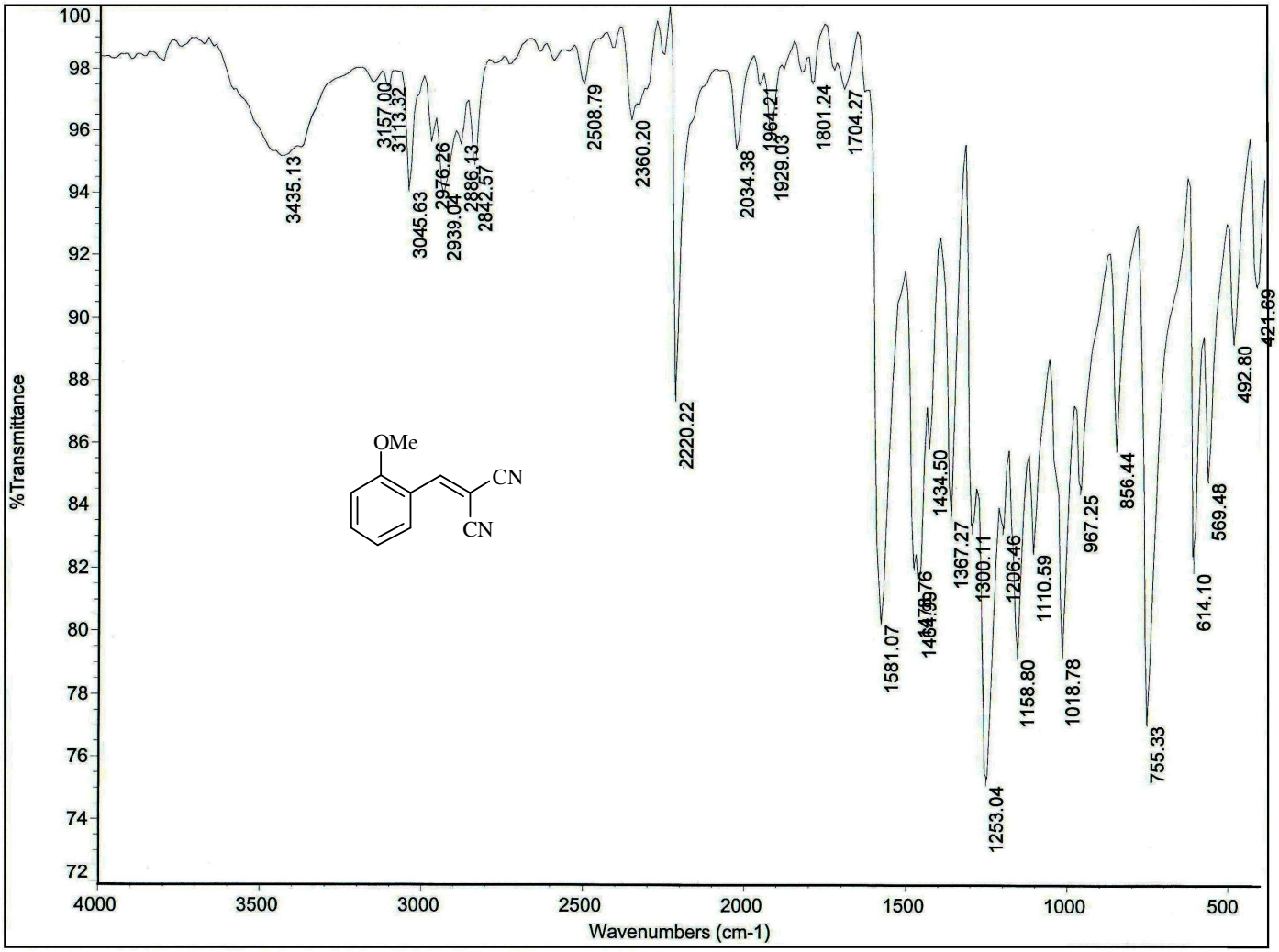
Current Data Parameters
NAME m.ghilanizadeh
EXPNO 55
PROCNO 1

F2 - Acquisition Parameters
Date_ 20171114
Time 9.06
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 6172.839 Hz
FIDRES 0.188380 Hz
AQ 2.6542580 sec
RG 46341
DW 81.000 usec
DE 6.00 usec
TE 673.2 K
D1 1.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec

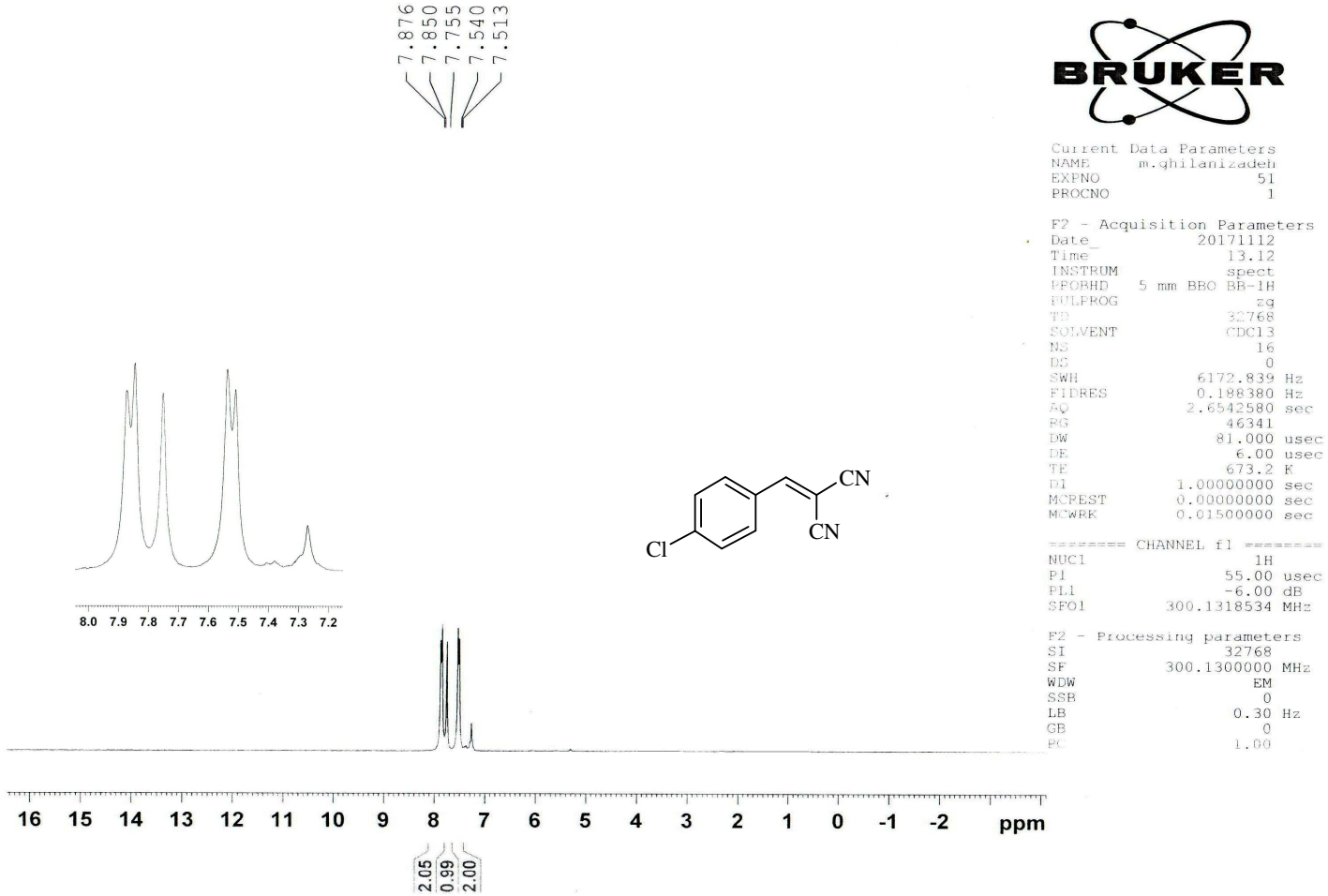
======== CHANNEL f1 ========
NUC1 1H
P1 55.00 usec
PL1 -6.00 dB
SFO1 300.1318534 MHz

F2 - Processing parameters
SI 32768
SF 300.1300000 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

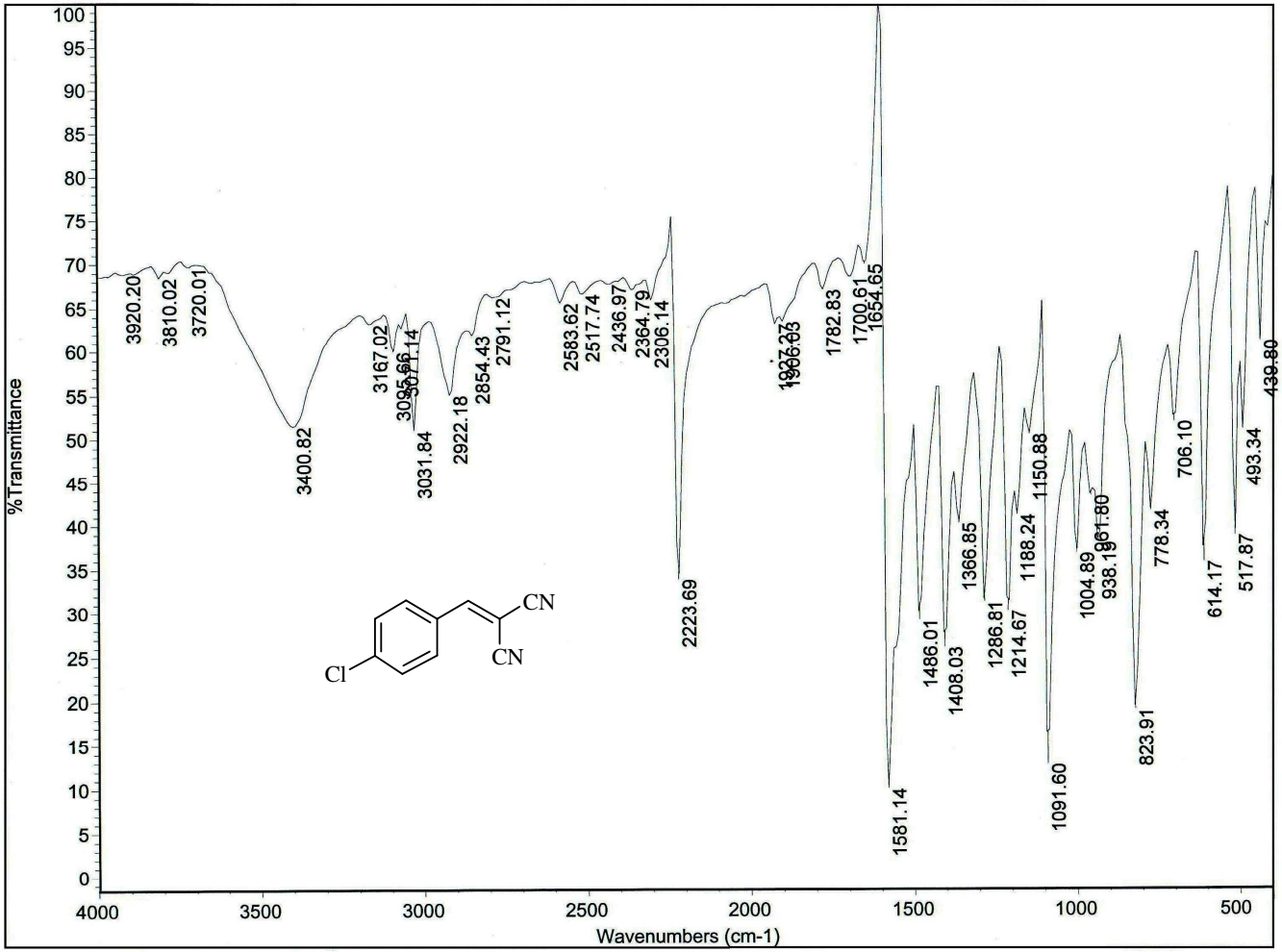
FT-IR (Table 2, entry 4)



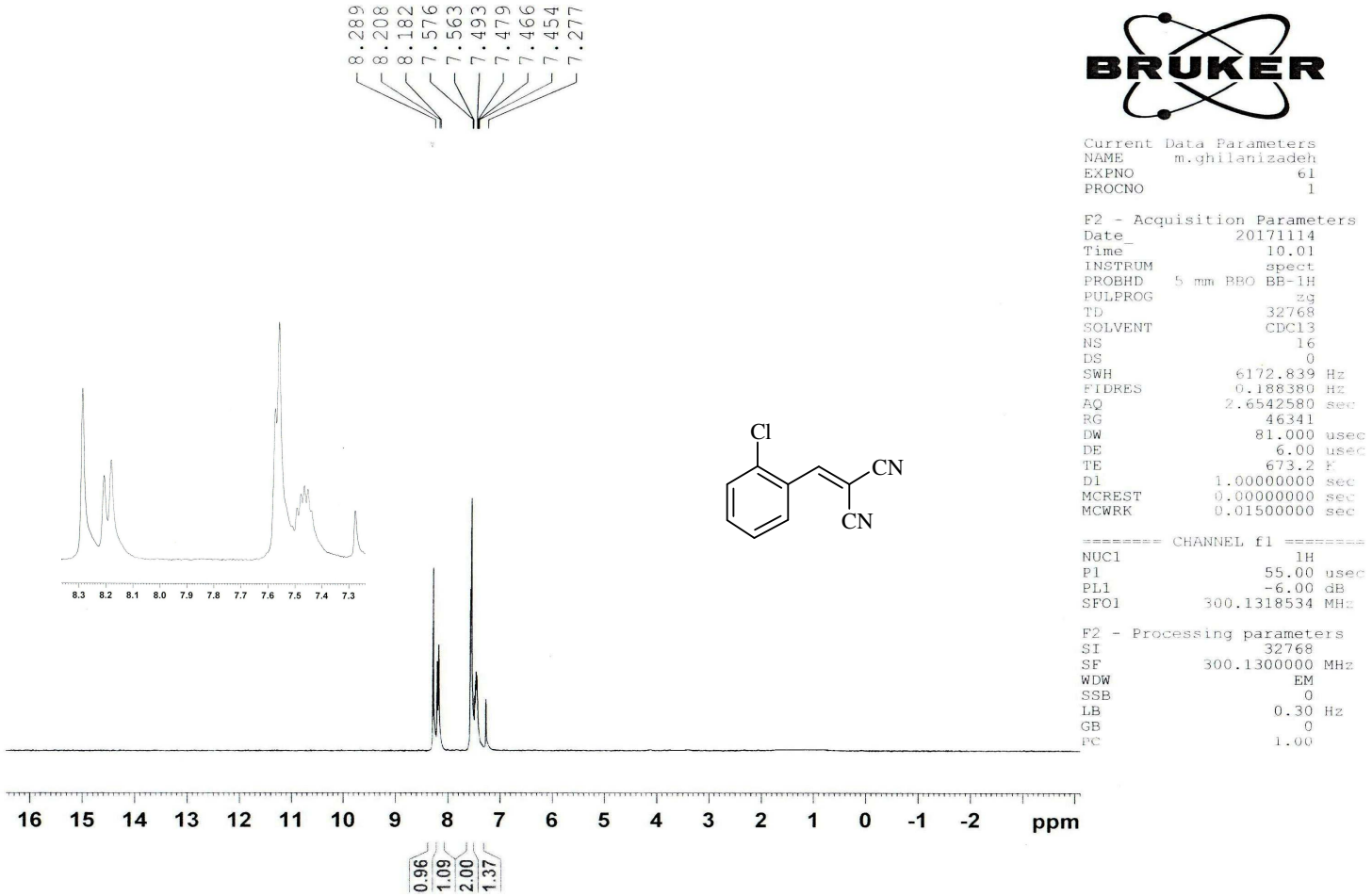
[1]HNMR (Table 2, entry 5)



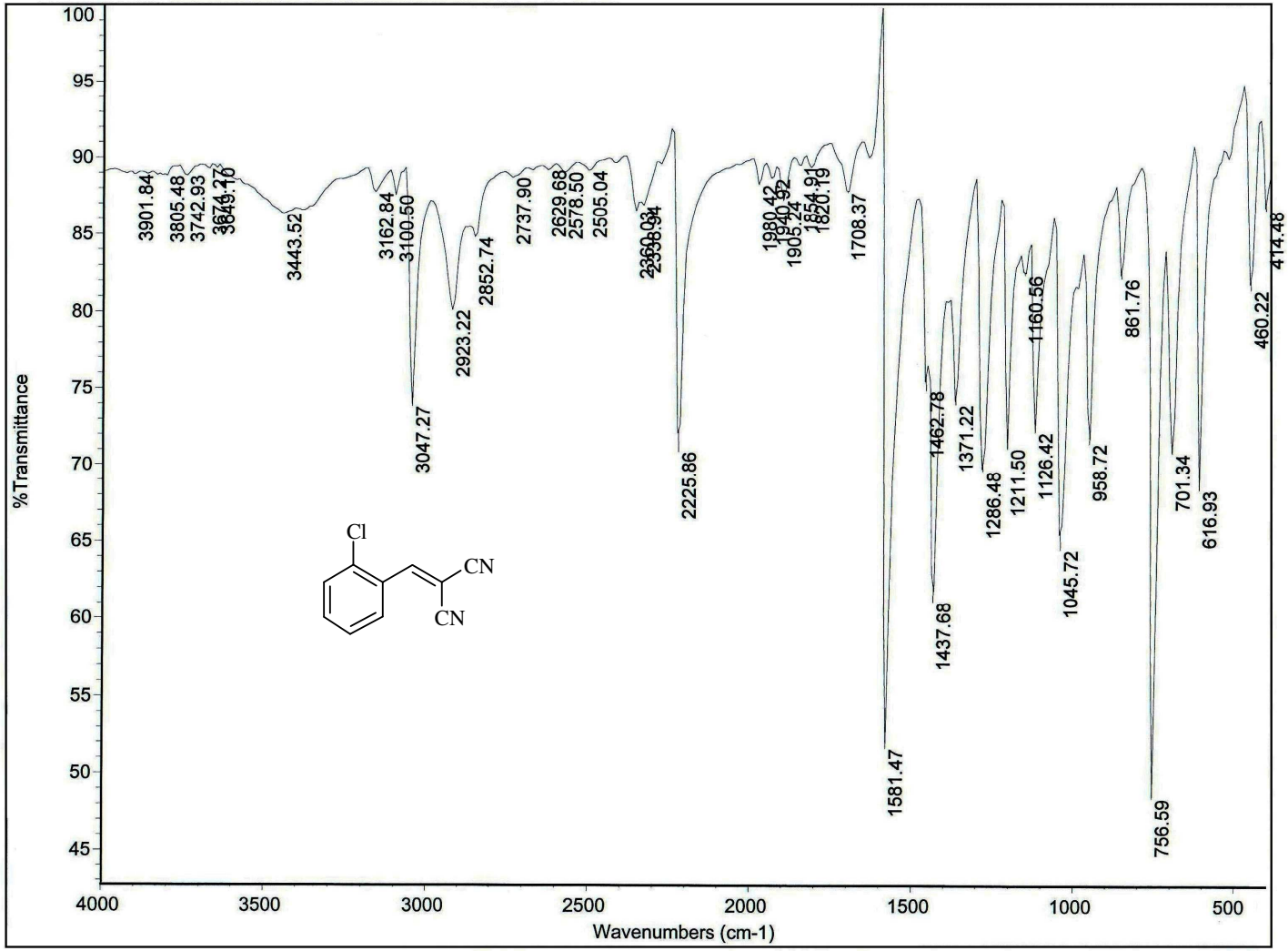
FT-IR (Table 2, entry 5)



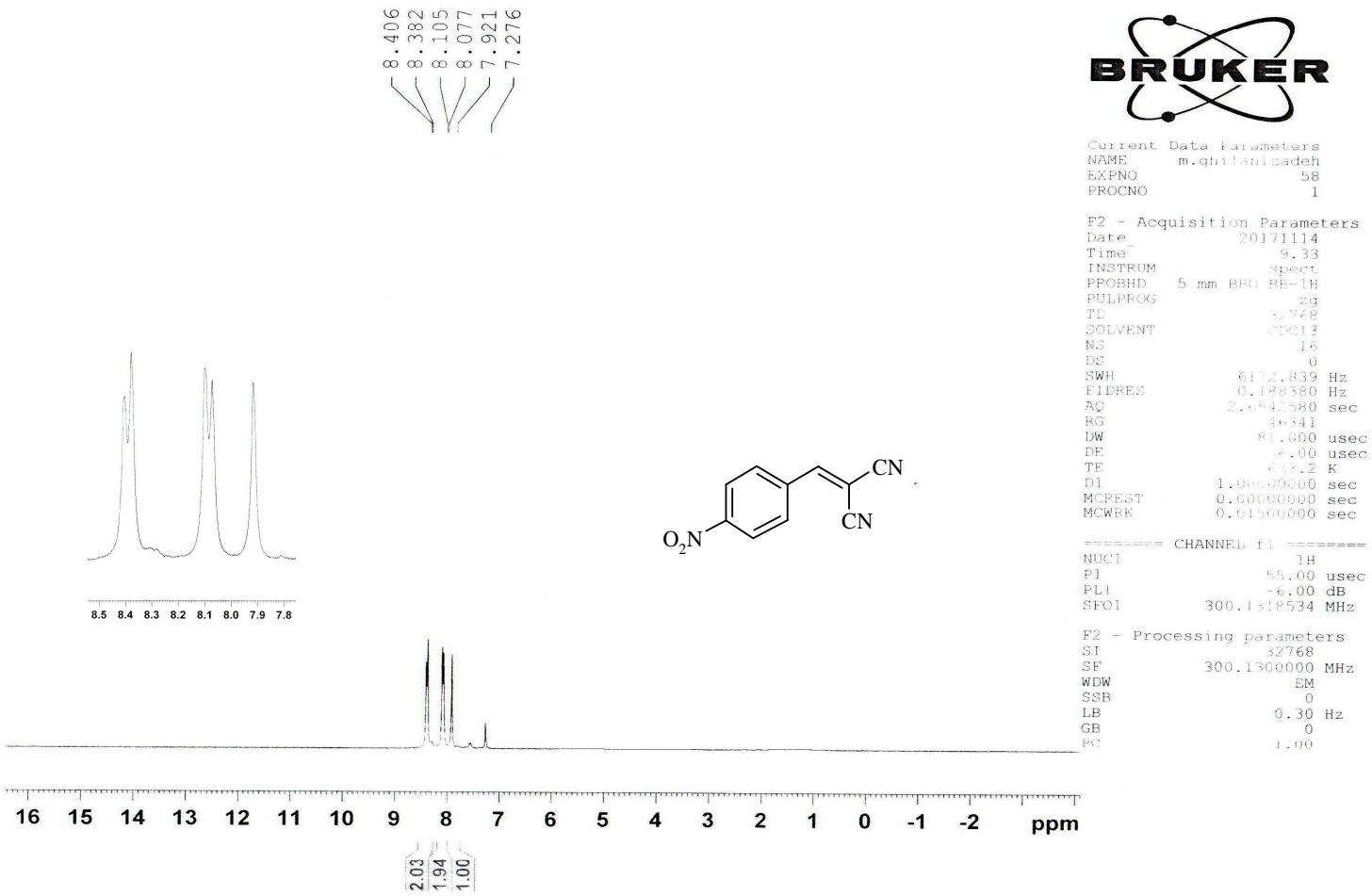
[1]HNMR (Table 2, entry 6)



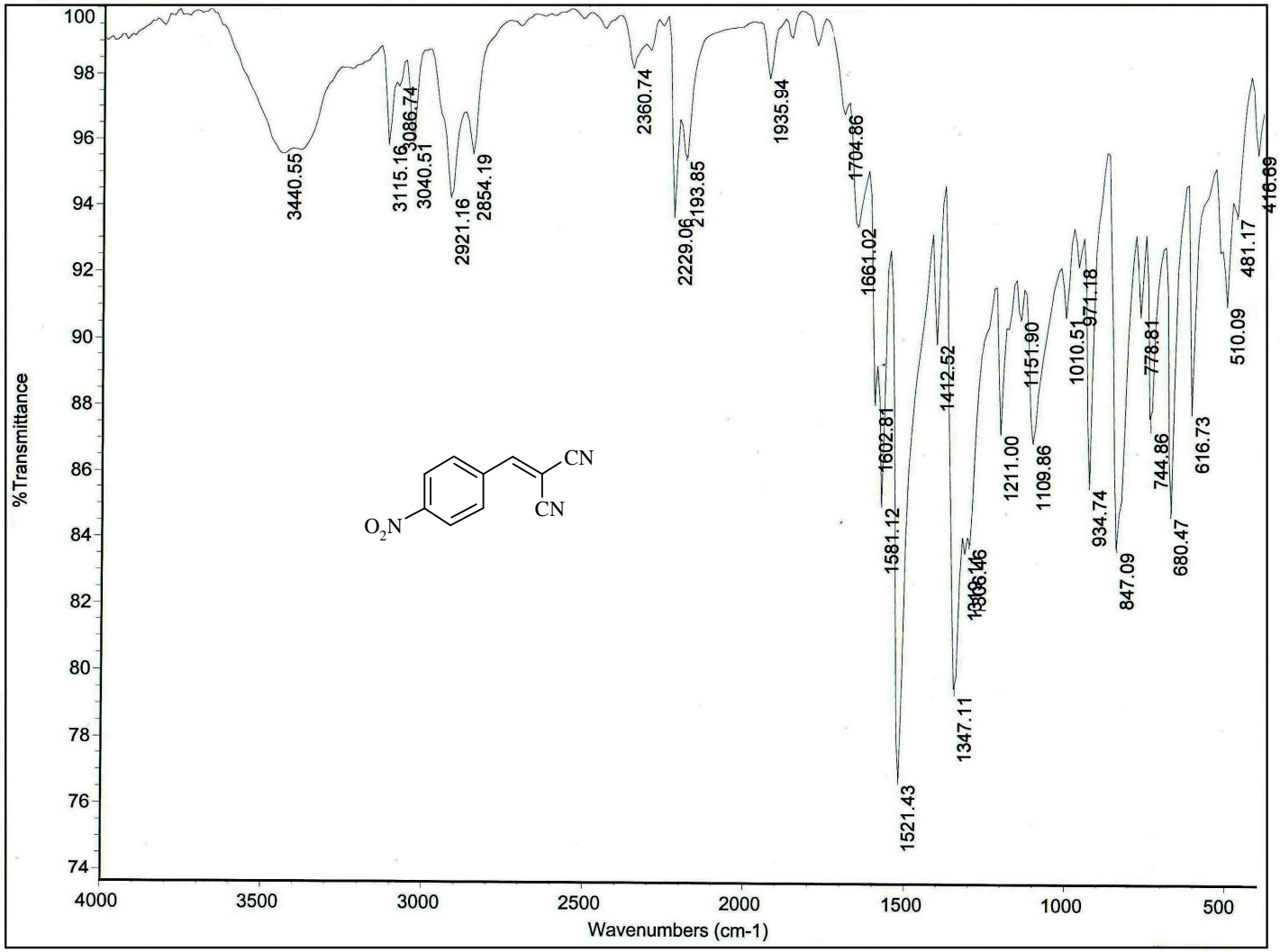
FT-IR (Table 2, entry 6)



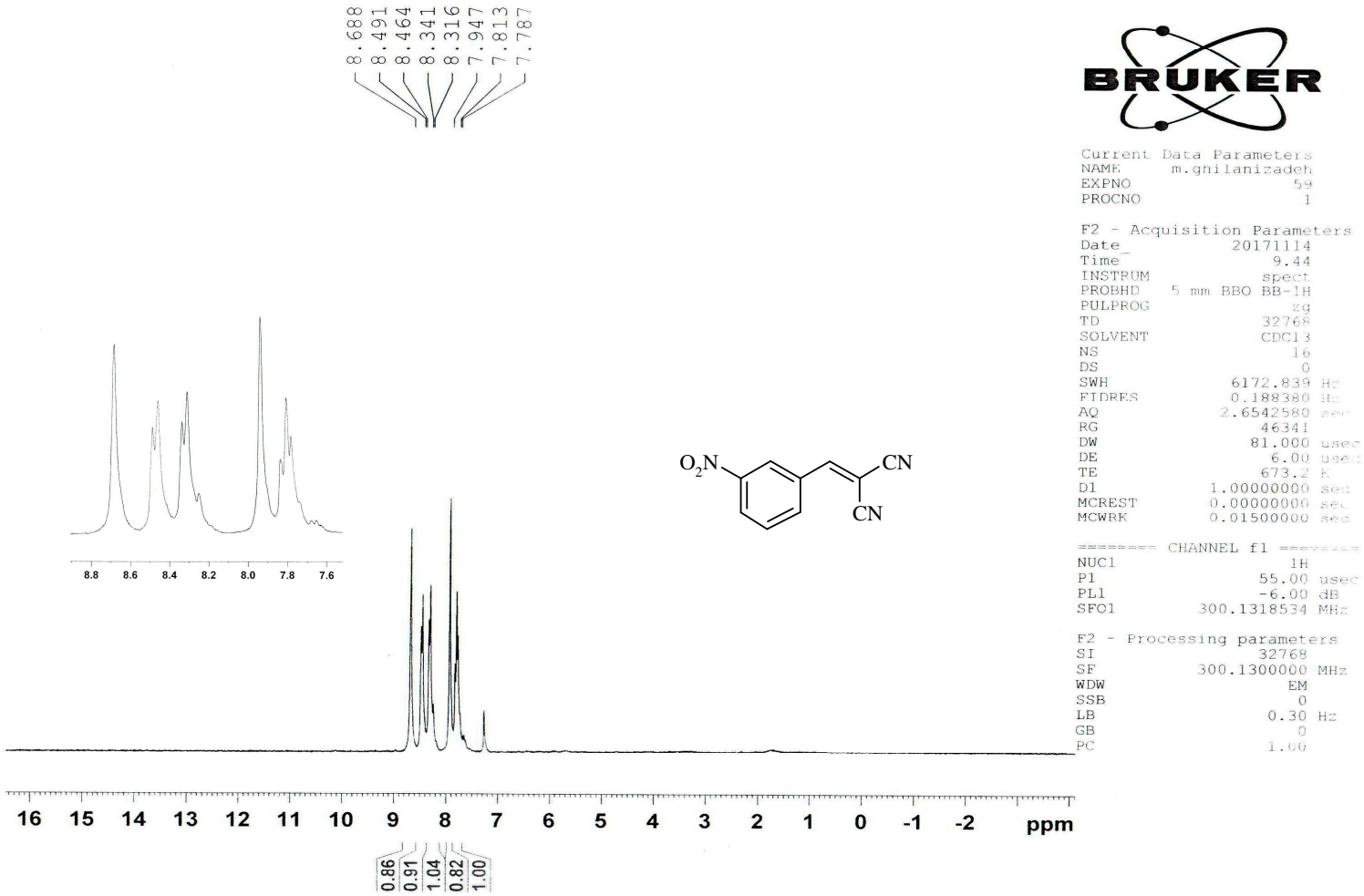
[1]HNMR (Table 2, entry 7)



FT-IR (Table 2, entry 7)



^{1}HNMR (Table 2, entry 8)



BRUKER

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Current Data Parameters
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EXPNO                   59
PROCNO                   1

F2 - Acquisition Parameters
Date_             20171114
Time                  9.44
INSTRUM               spect
PROBHD   5 mm BBO BB-1H
PULPROG                 zg
TD                   32768
SOLVENT              CDCl3
NS                      16
DS                       0
SWH              6172.839 Hz
FIDRES           0.188380 Hz
AQ               2.6542580 sec
RG                   46341
DW                81.000 usec
DE                 6.00 usec
TE                673.2 K
D1             1.00000000 sec
MCREST         0.00000000 sec
MCWRK          0.01500000 sec

======== CHANNEL f1 ========
NUC1                   1H
P1                 55.00 usec
PL1                -6.00 dB
SFO1         300.1318534 MHz

F2 - Processing parameters
SI                   32768
SF           300.1300000 MHz
WDW                     EM
SSB                      0
LB                  0.30 Hz
GB                       0
PC                    1.00
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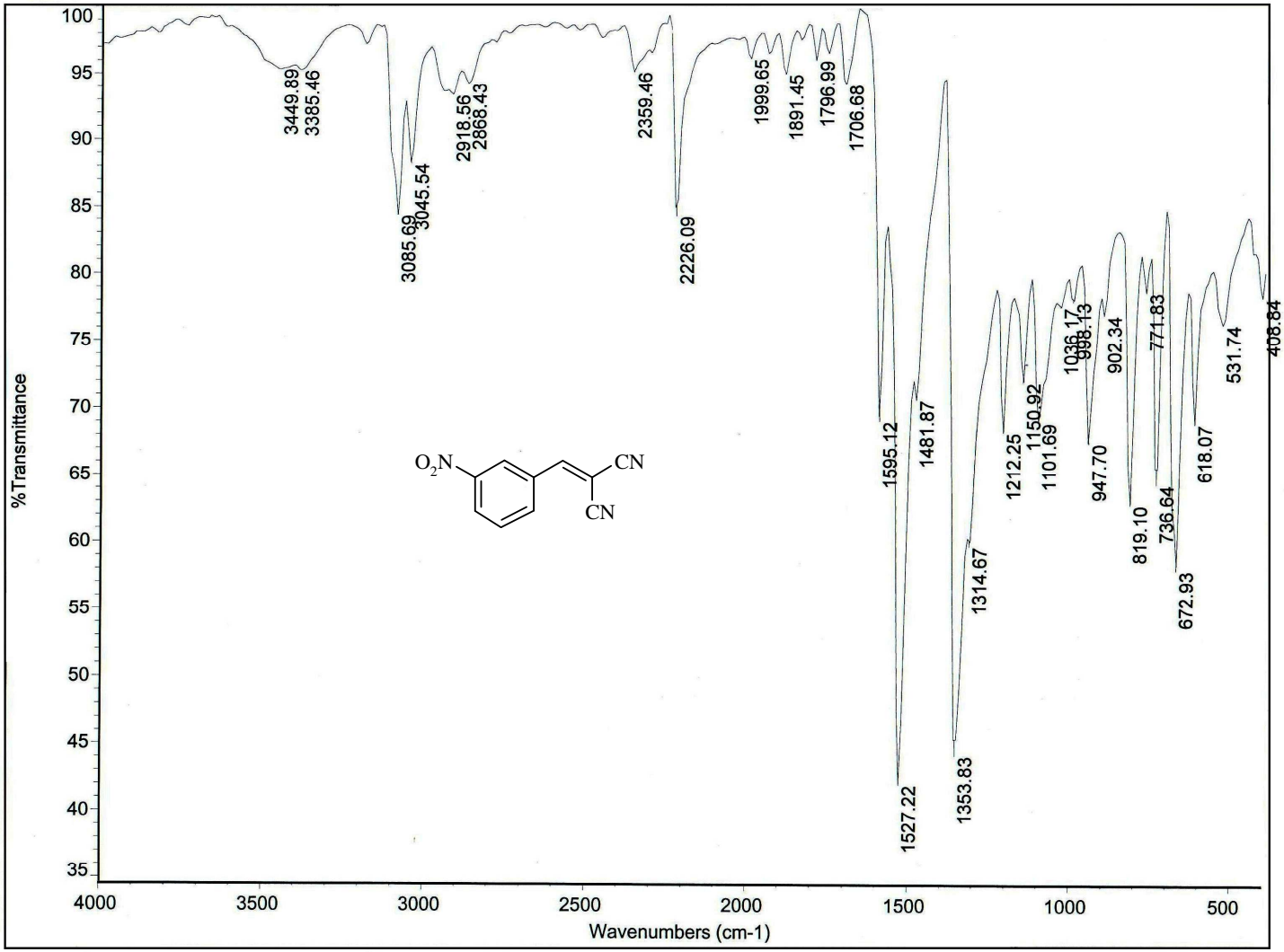
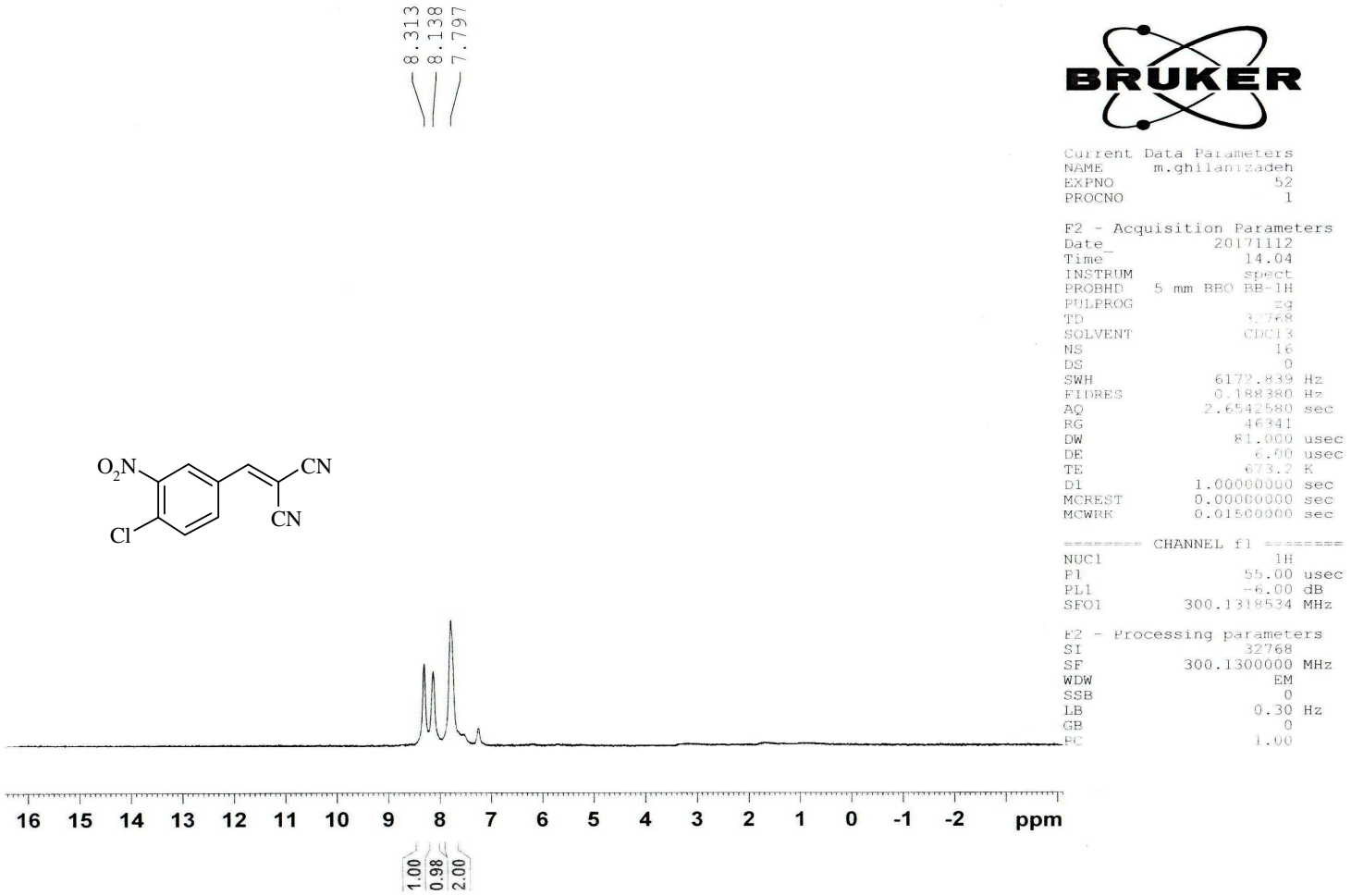
FT-IR (Table 2, entry 8)



^{1}HNMR (Table 2, entry 9)



BRUKER

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Current Data Parameters
NAME      m.ghilanizadeh
EXPNO                 52
PROCNO                 1

F2 - Acquisition Parameters
Date_           20171112
Time              14.04
INSTRUM           spect
PROBHD   5 mm BBO BB-1H
PULPROG              zg
TD                32768
SOLVENT           CDCl3
NS                   16
DS                    0
SWH            6172.839 Hz
FIDRES        0.188380 Hz
AQ            2.6542580 sec
RG                46341
DW               81.000 usec
DE                6.00 usec
TE               673.2 K
D1            1.00000000 sec
MCREST        0.00000000 sec
MCWRK         0.01500000 sec

======== CHANNEL f1 ========
NUC1                  1H
P1                55.00 usec
PL1               -6.00 dB
SFO1         300.1318534 MHz

F2 - Processing parameters
SI                32768
SF           300.1300000 MHz
WDW                  EM
SSB                   0
LB                0.30 Hz
GB                    0
PC                1.00
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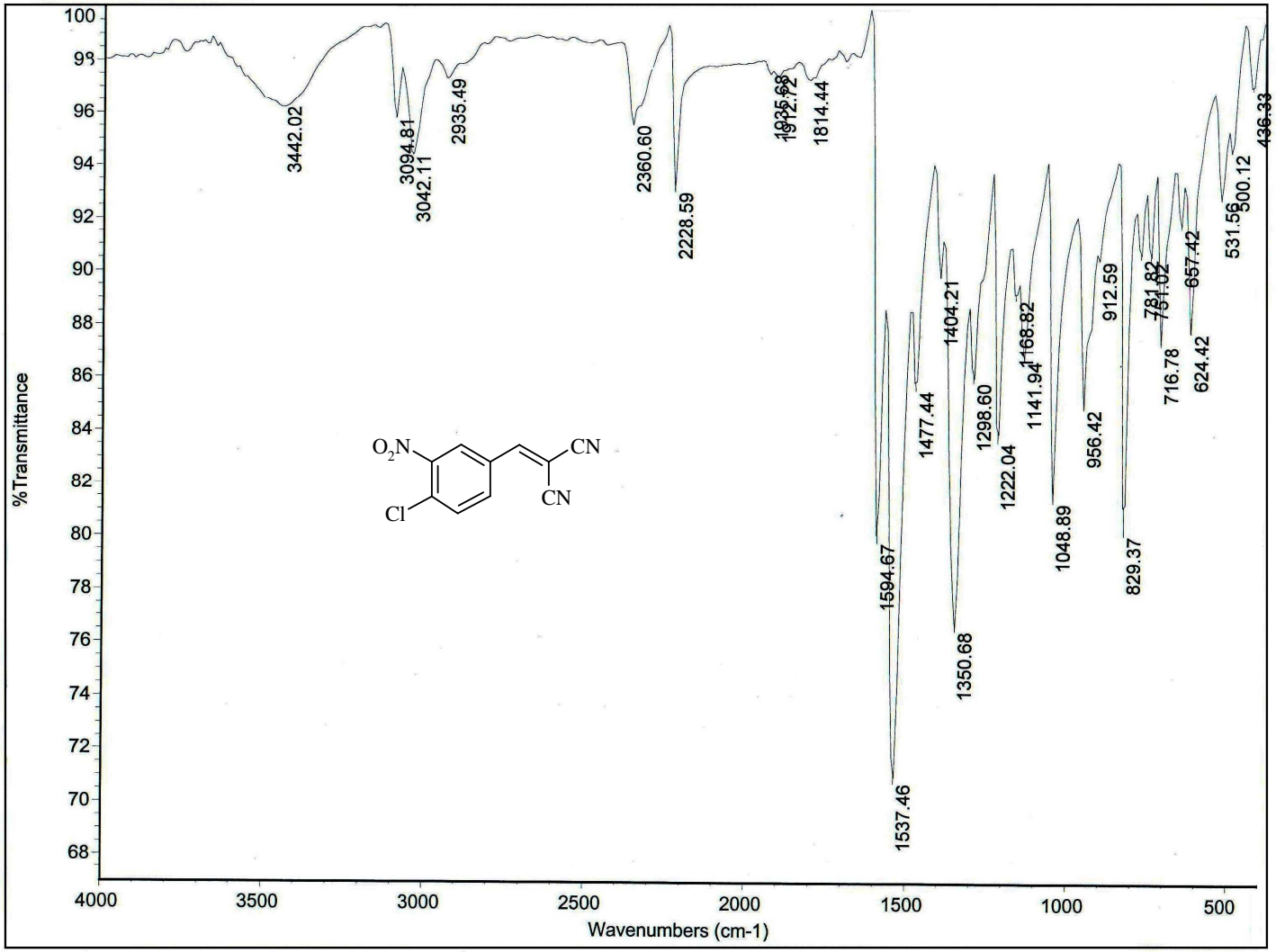
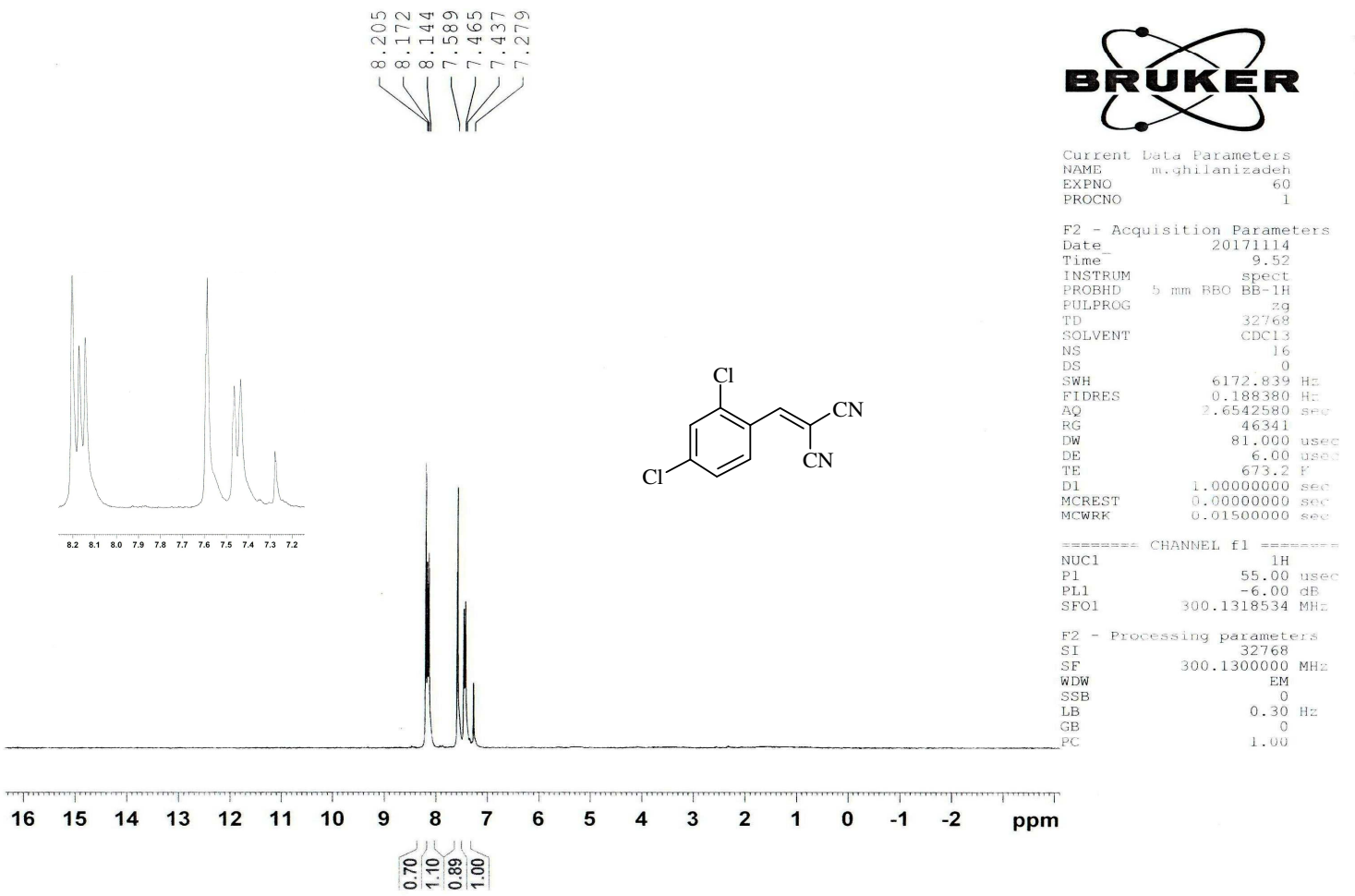
FT-IR (Table 2, entry 9)



[1]HNMR (Table 2, entry 10)



BRUKER

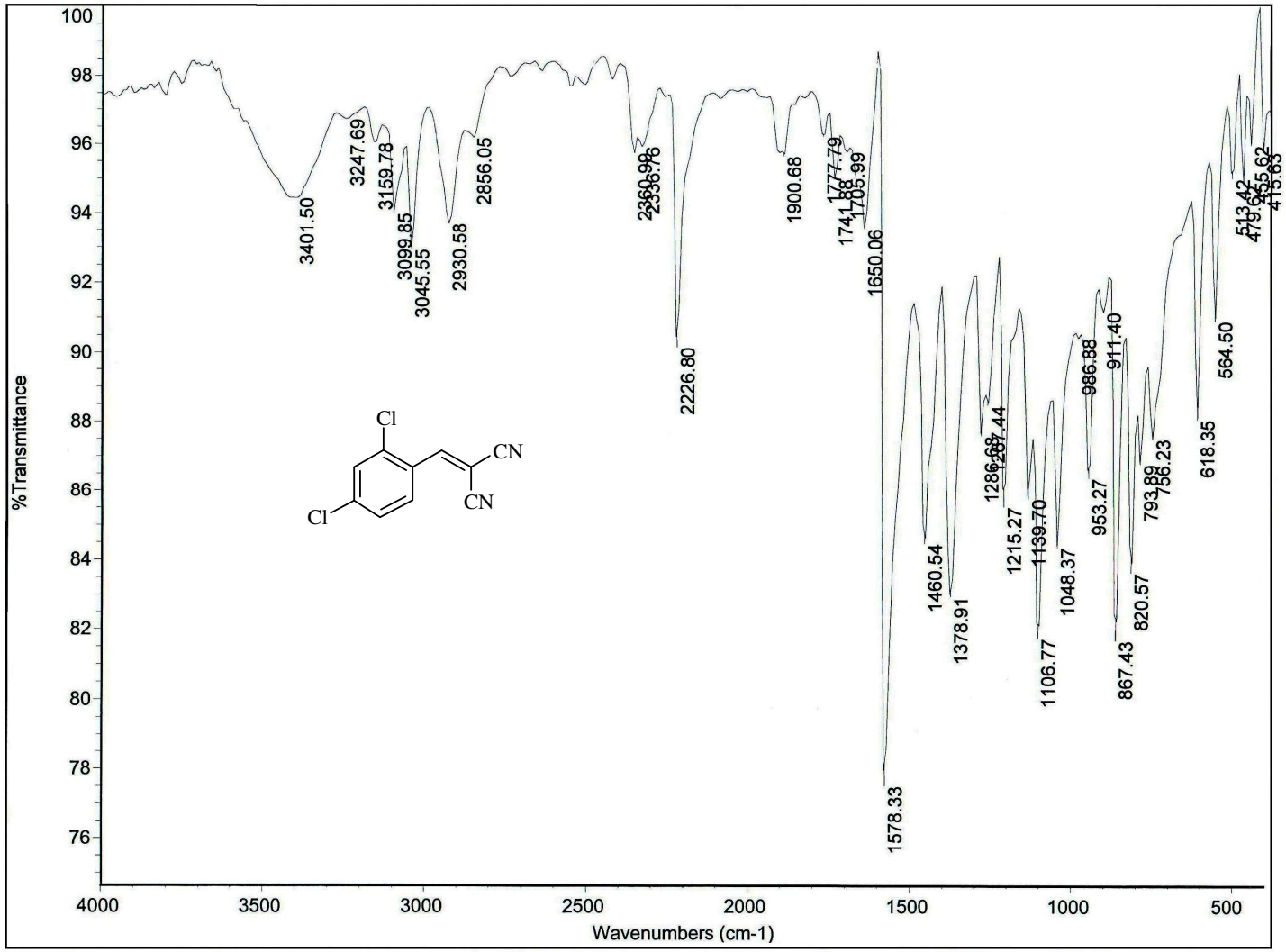
Current Data Parameters
NAME m.ghilanizadeh
EXPNO 60
PROCNO 1

F2 - Acquisition Parameters
Date_ 20171114
Time 9.52
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 6172.839 Hz
FIDRES 0.188380 Hz
AQ 2.6542580 sec
RG 46341
DW 81.000 usec
DE 6.00 usec
TE 673.2 K
D1 1.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec

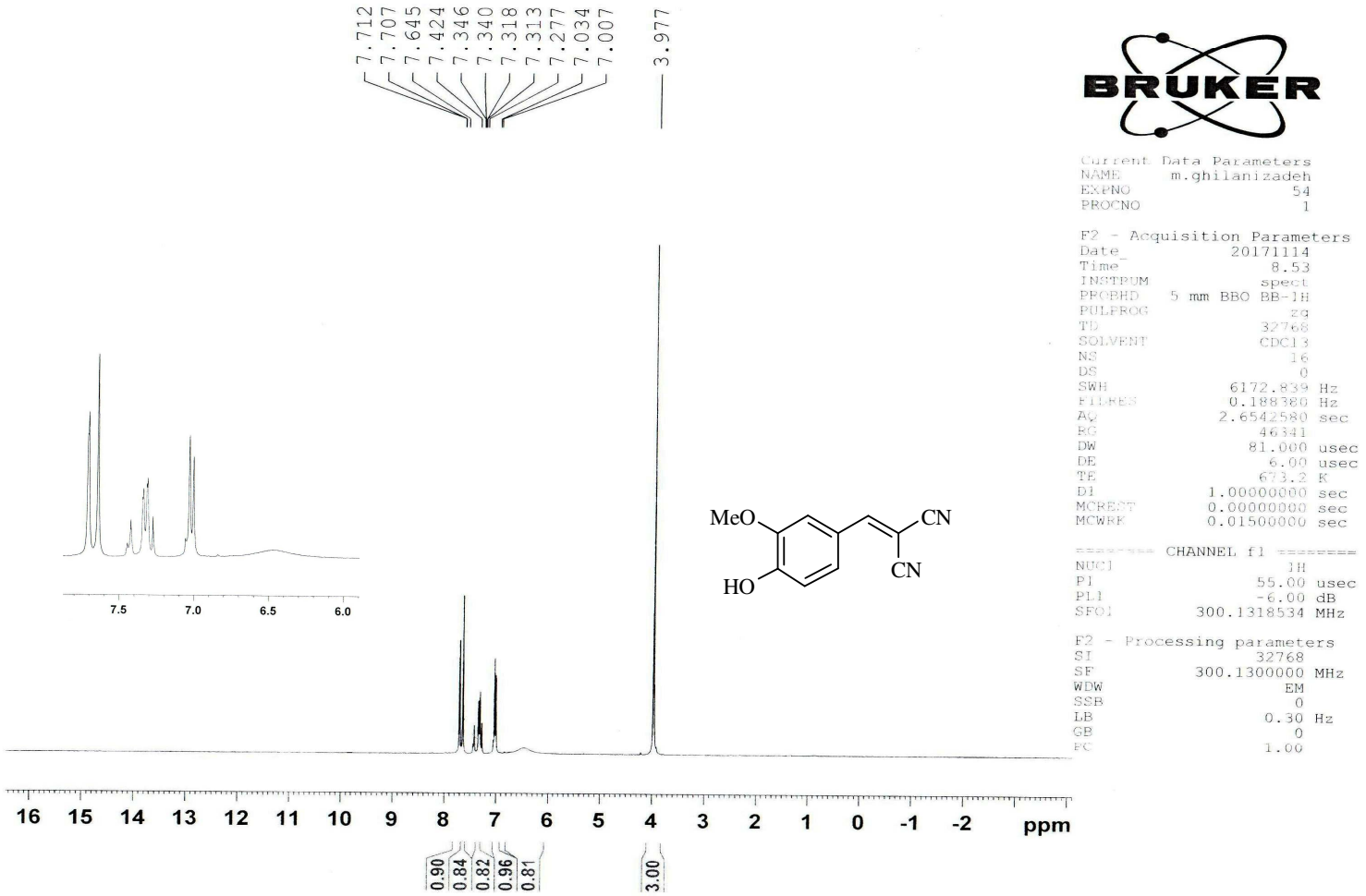
======== CHANNEL f1 ========
NUC1 1H
P1 55.00 usec
PL1 -6.00 dB
SFO1 300.1318534 MHz

F2 - Processing parameters
SI 32768
SF 300.1300000 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

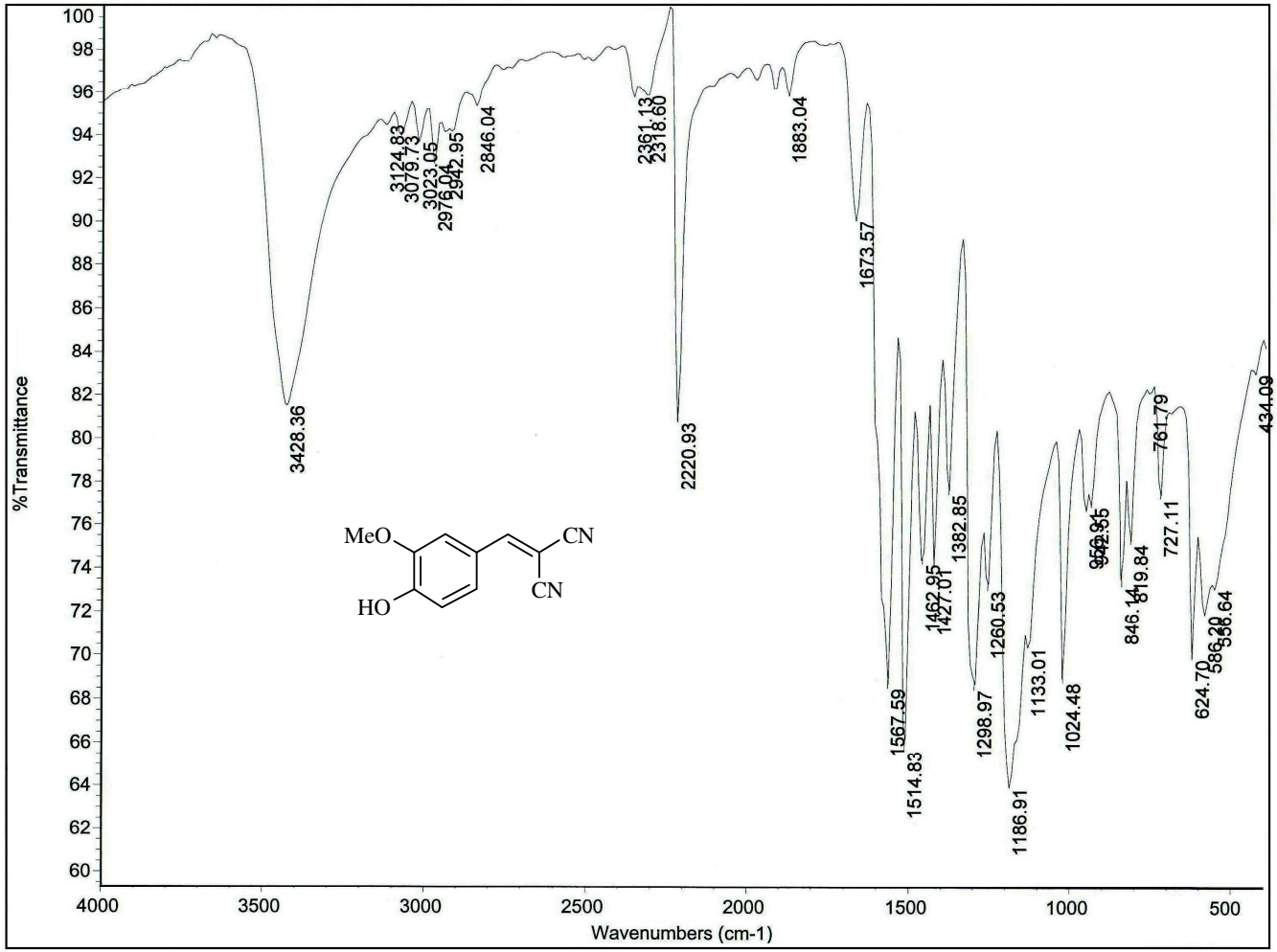
FT-IR (Table 2, entry 10)



[1]HNMR (Table 2, entry 11)



FT-IR (Table 2, entry 11)



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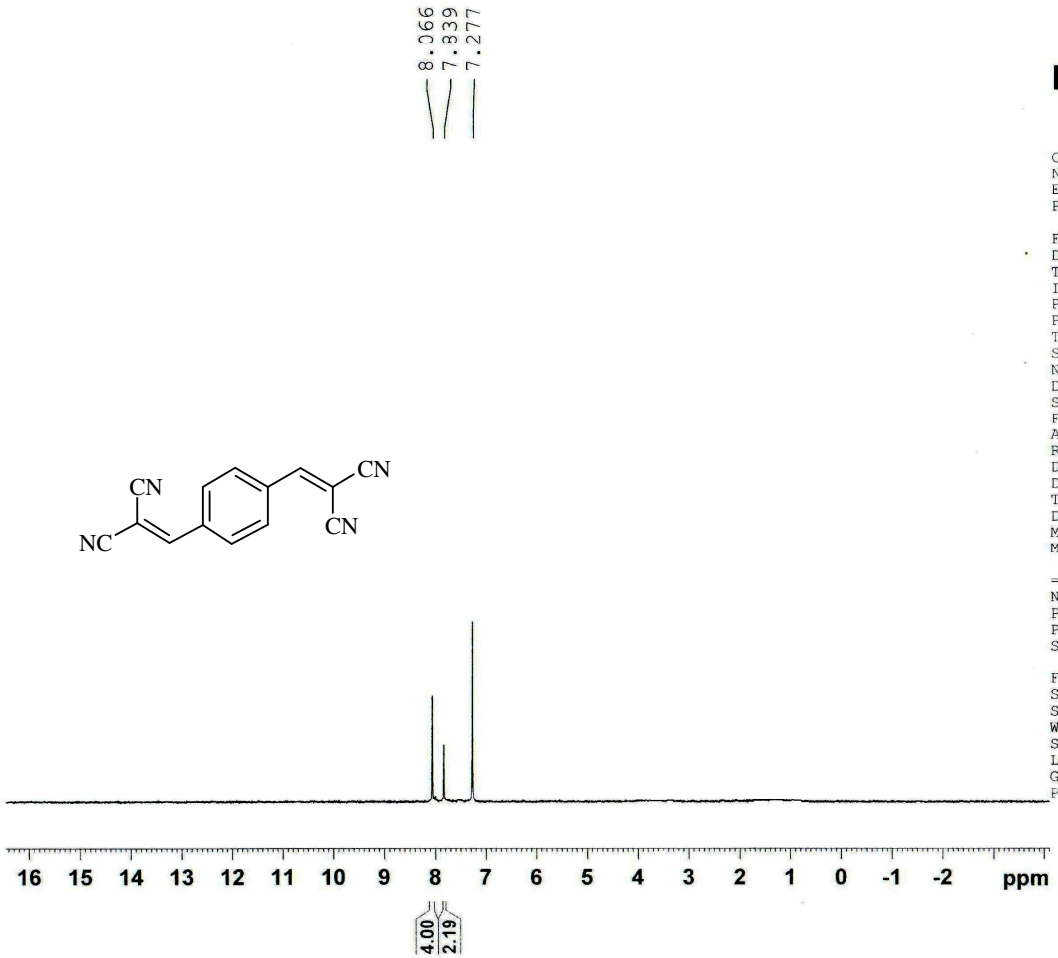

BRUKER

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EXPNO 53
PROCNO 1

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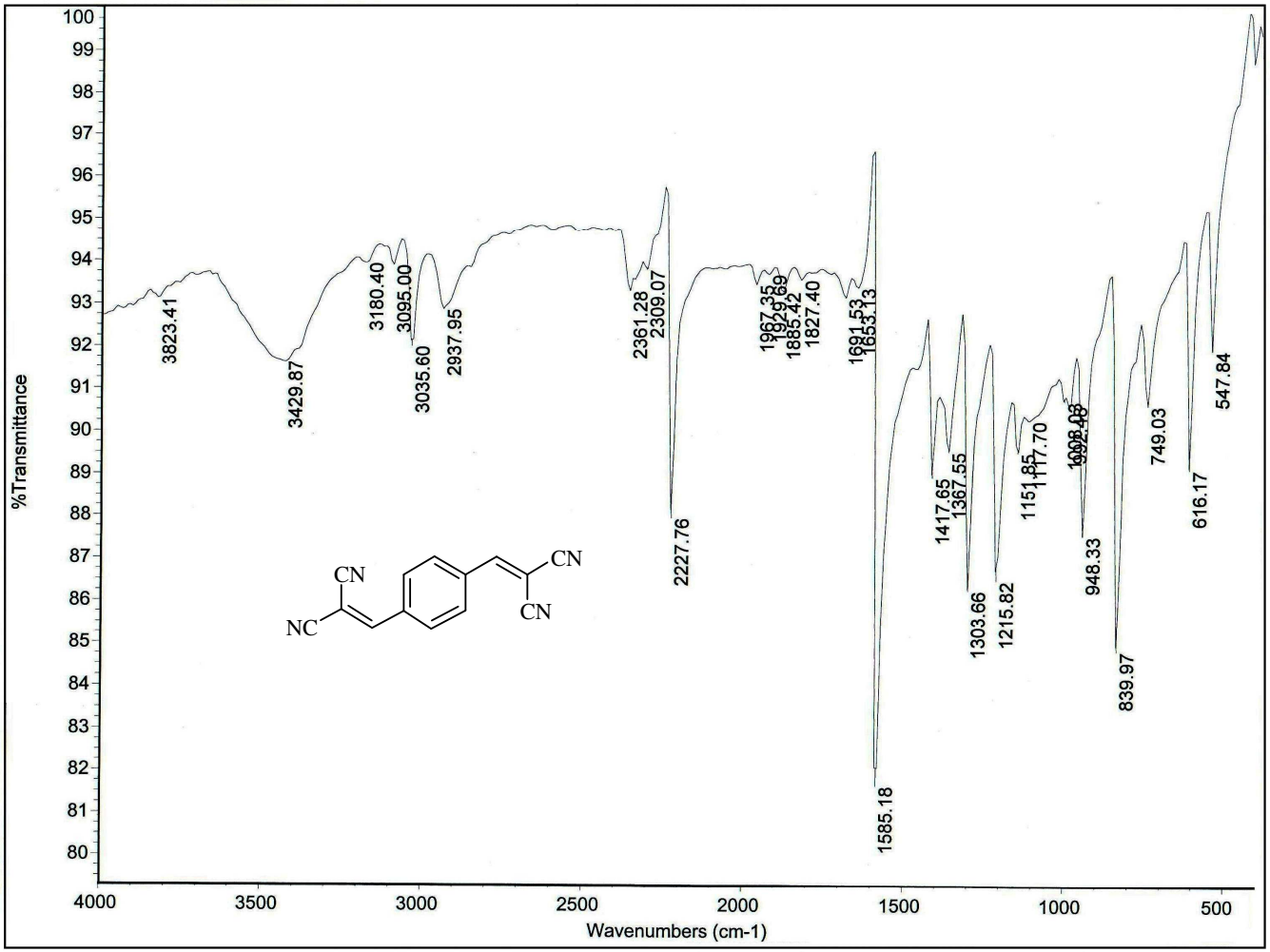
Time 14.19
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 6172.839 Hz
FIDRES 0.188380 Hz
AQ 2.6542580 sec
RG 46341
DW 81.000 usec
DE 6.00 usec
TE 673.2 K
D1 1.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec

======== CHANNEL f1 ========
NUC1 1H
P1 55.00 usec
PL1 -6.00 dB
SFO1 300.1318534 MHz

F2 - Processing parameters
SI 32768
SF 300.1300000 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

FT-IR (Table 2, entry 12)



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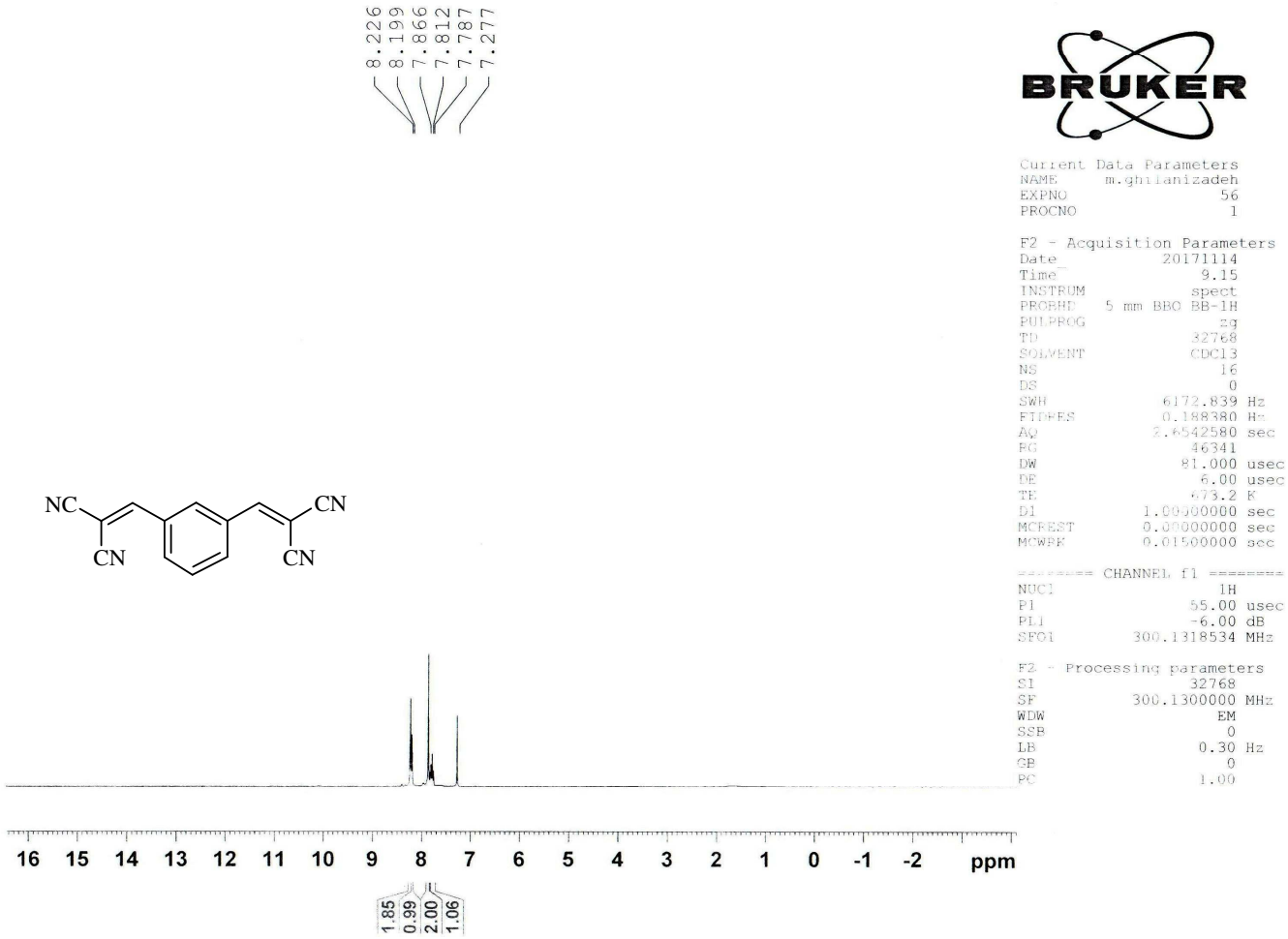

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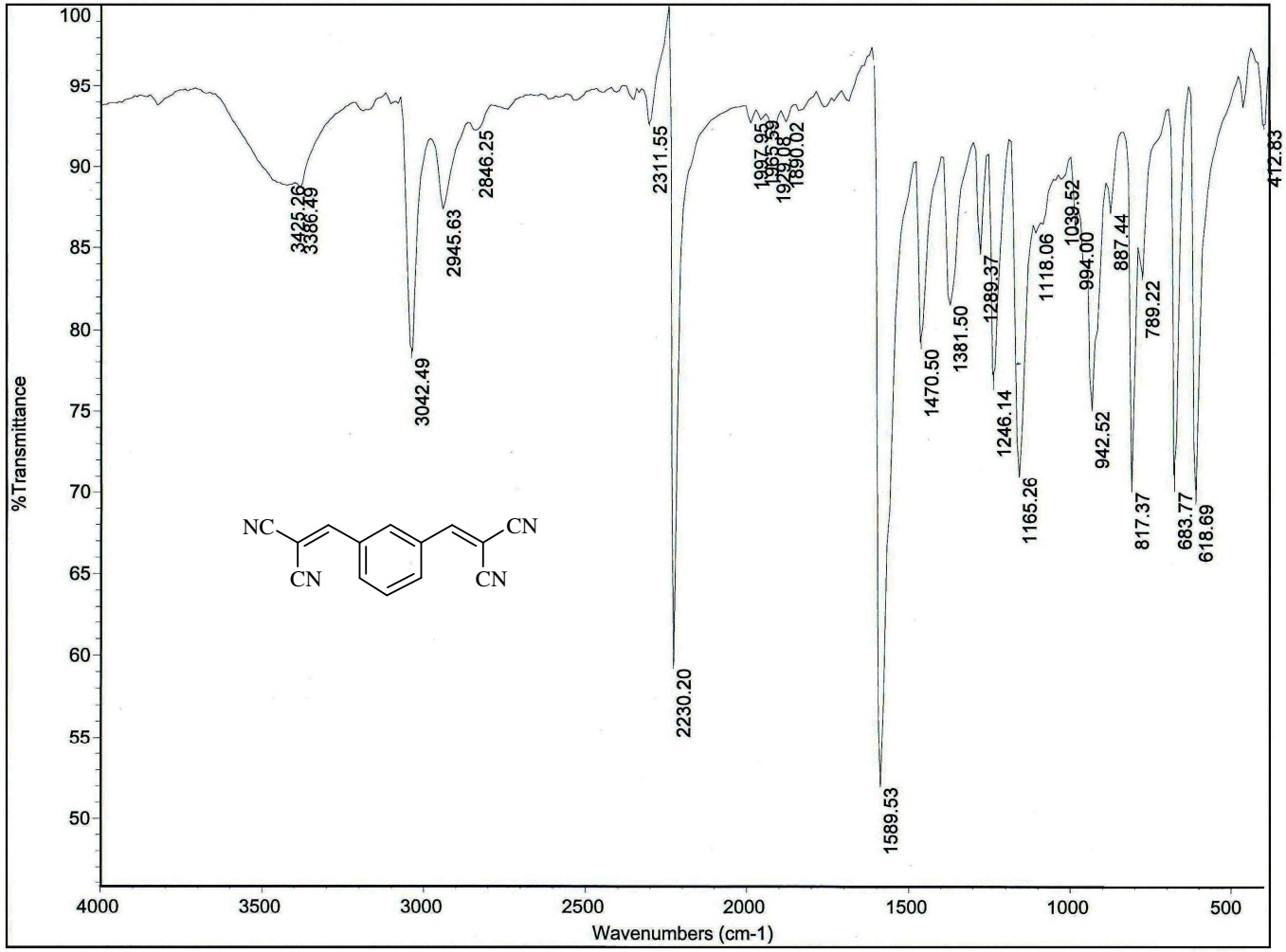

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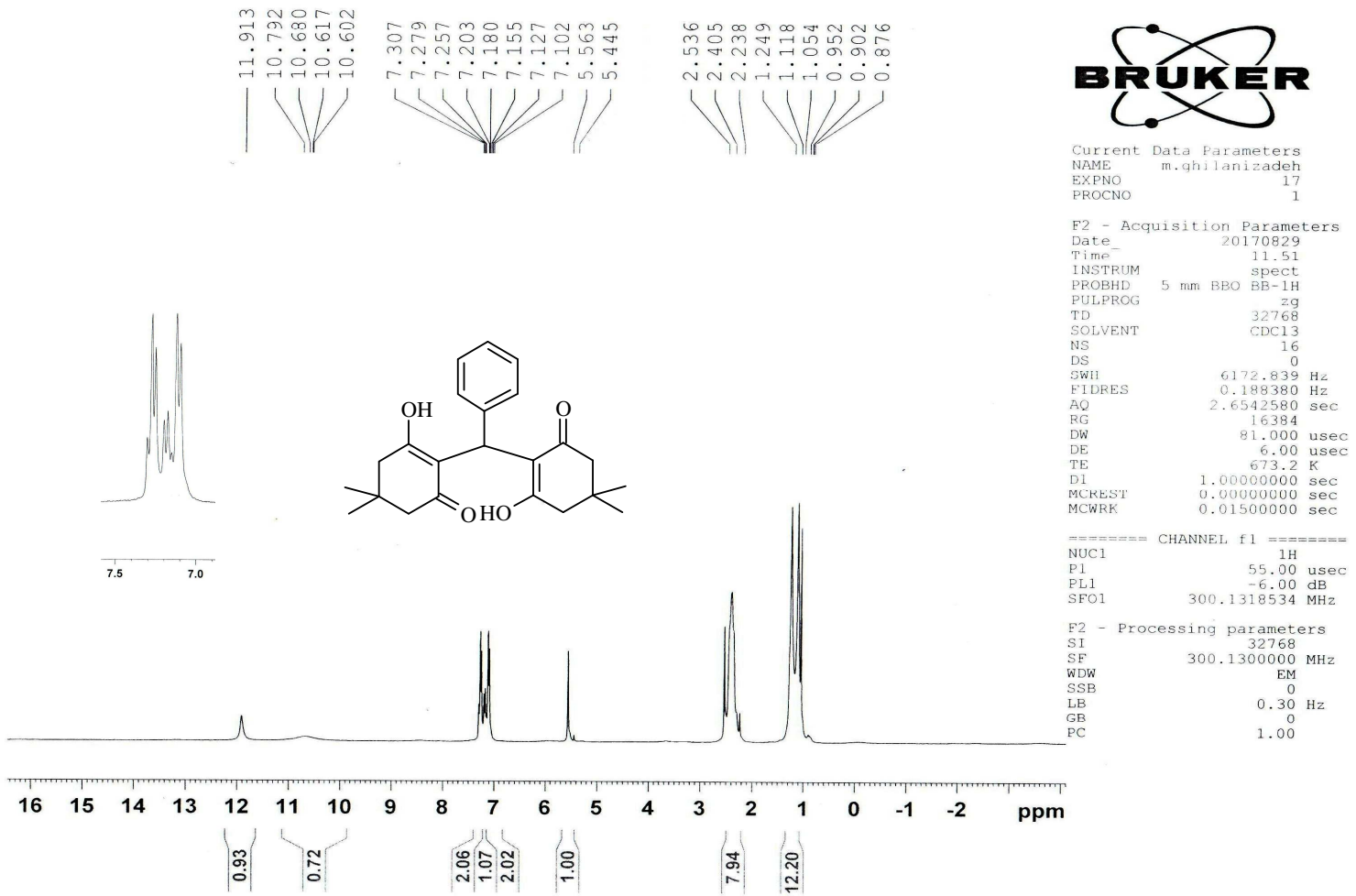


BRUKER

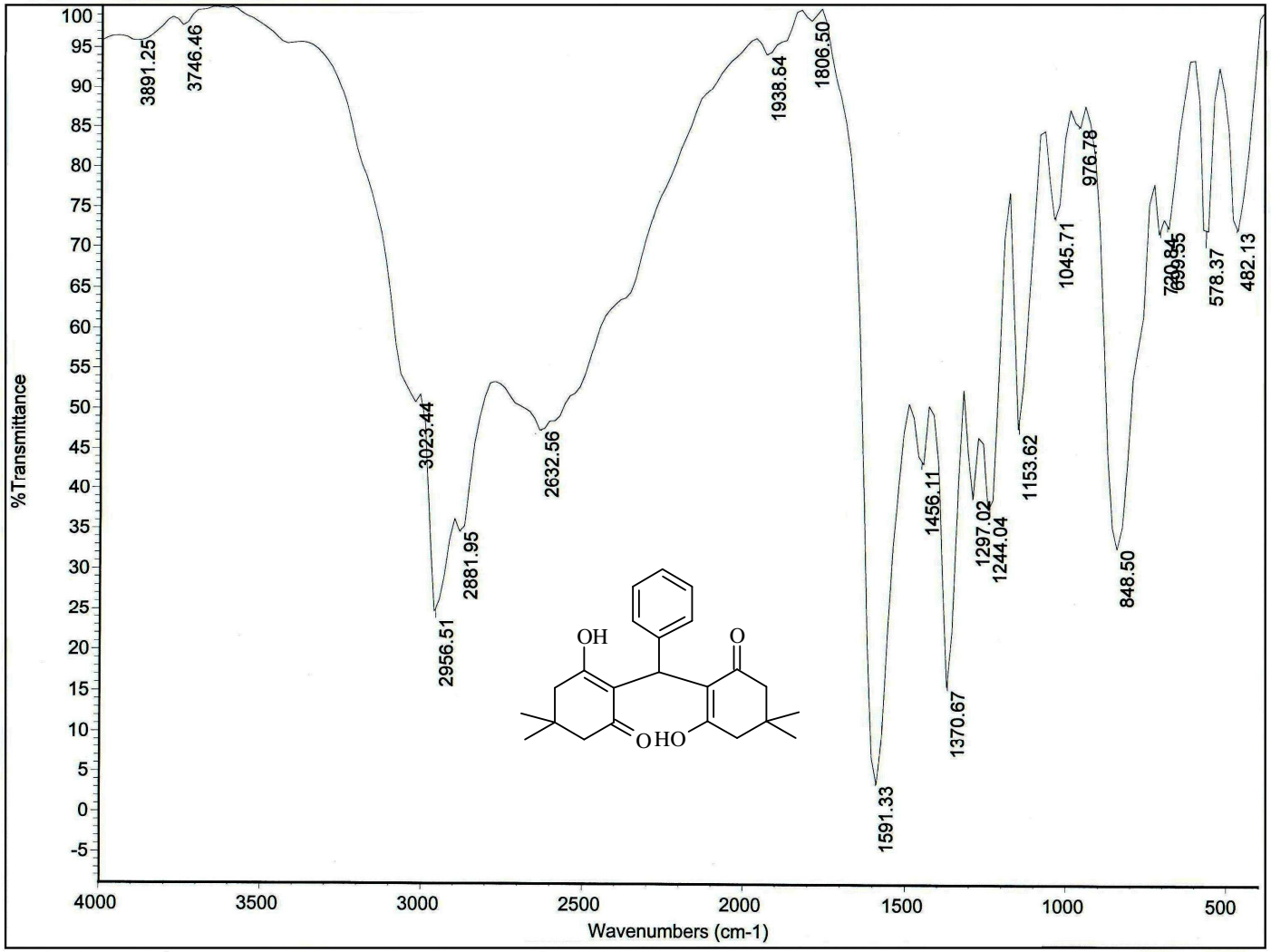
Current Data Parameters
NAME m.ghilanizadeh
EXPNO 17
PROCNO 1

F2 - Acquisition Parameters
Date_ 20170829
Time 11.51
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 6172.839 Hz
FIDRES 0.188380 Hz
AQ 2.6542580 sec
RG 16384
DW 81.000 usec
DE 6.00 usec
TE 673.2 K
D1 1.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec

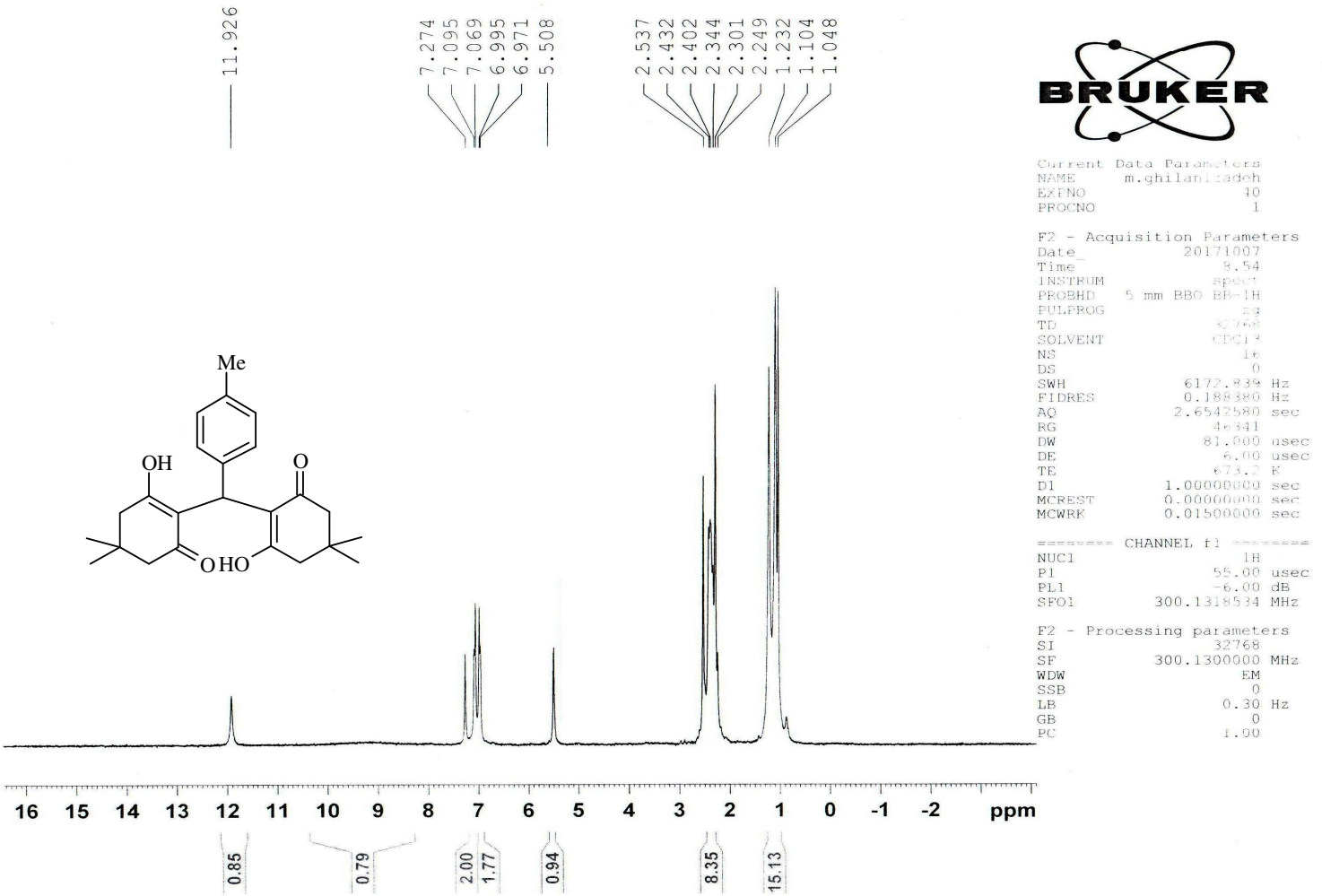
======== CHANNEL f1 ========
NUC1 1H
P1 55.00 usec
PL1 -6.00 dB
SFO1 300.1318534 MHz

F2 - Processing parameters
SI 32768
SF 300.1300000 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

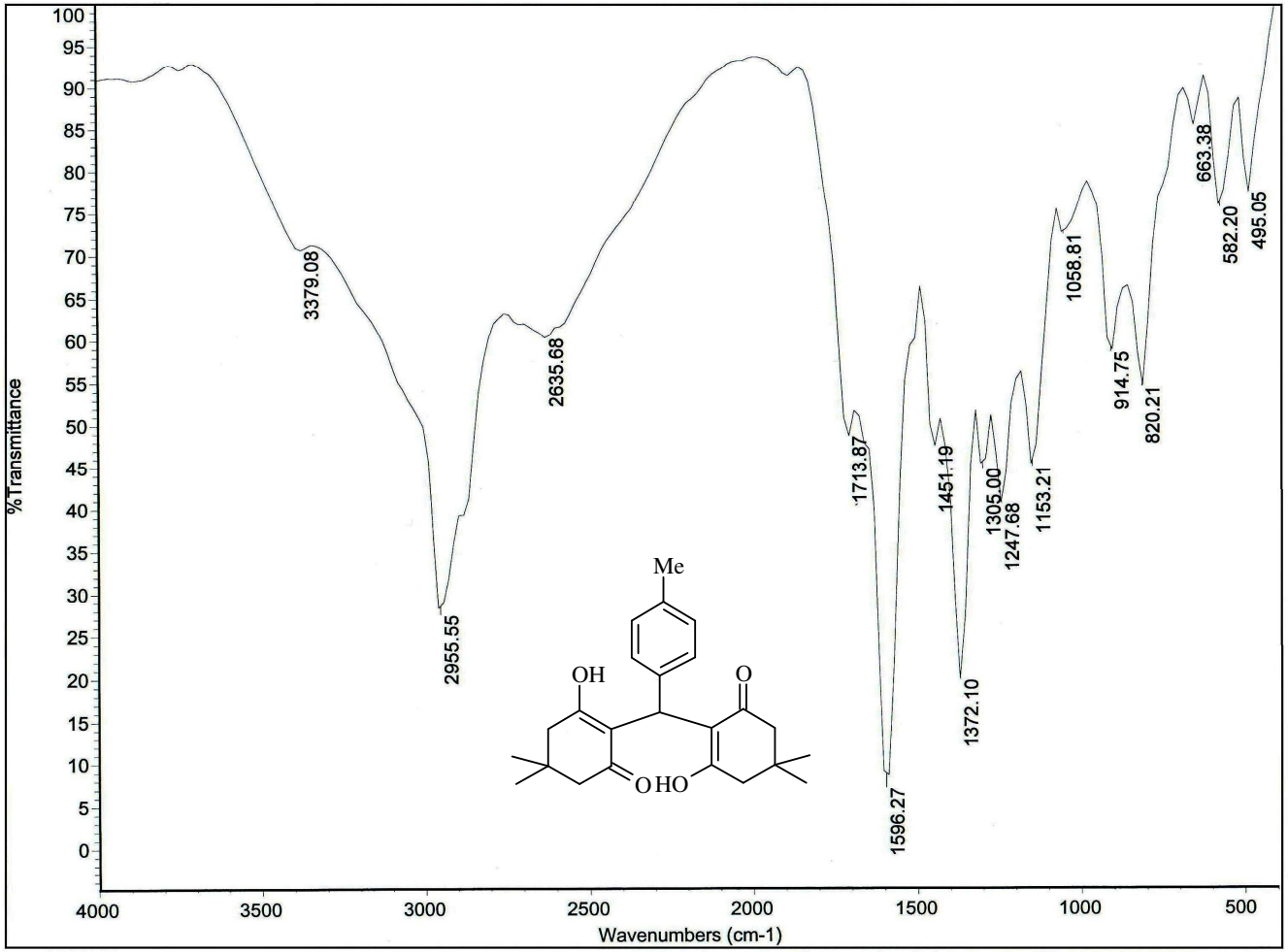
FT-IR (Table 4, entry 1)



^{1}HNMR (Table 4, entry 2)



FT-IR (Table 4, entry 2)



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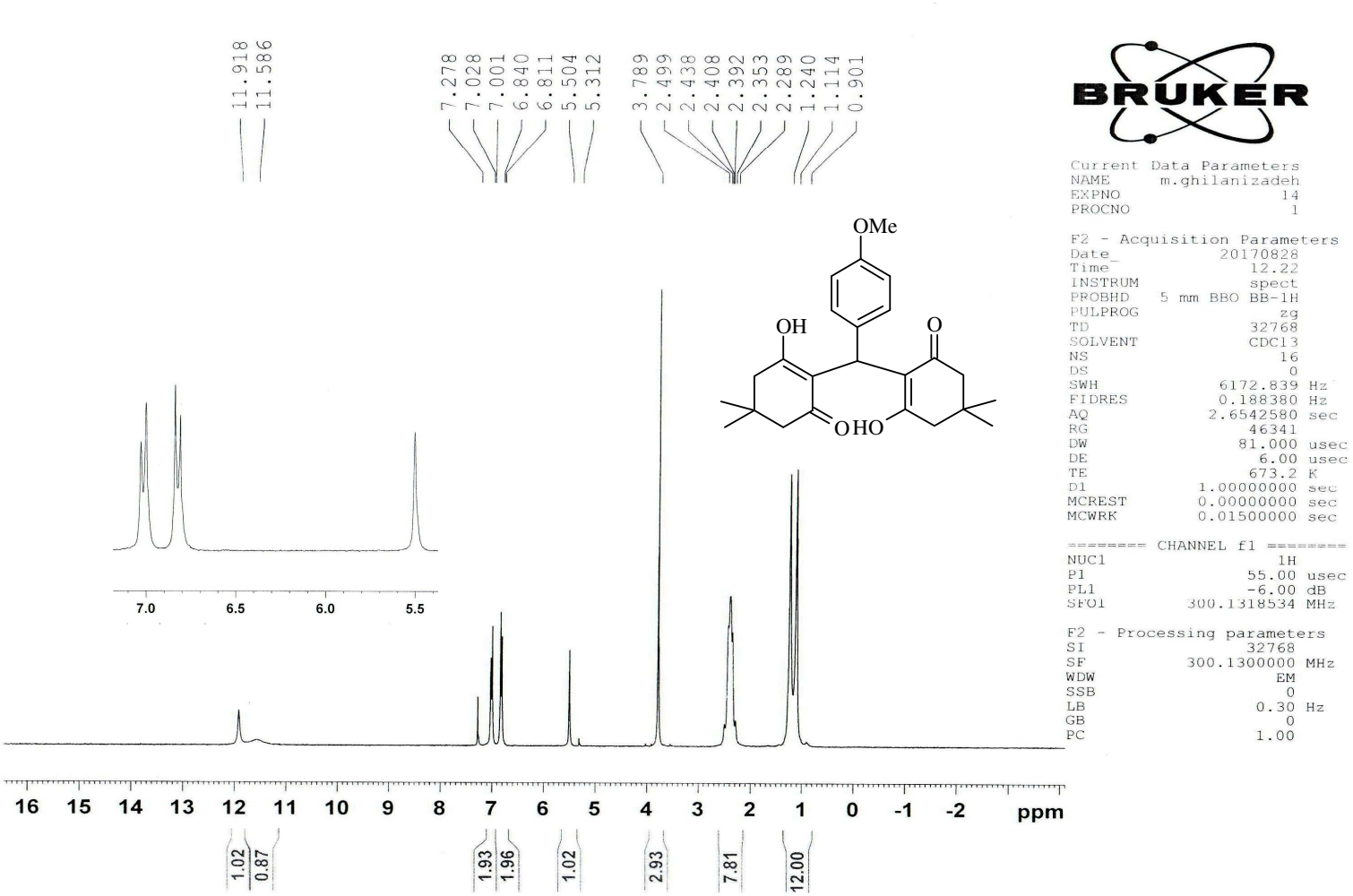

BRUKER

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Current Data Parameters
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EXPNO                   14
PROCNO                   1

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Date_             20170828
Time                 12.22
INSTRUM              spect
PROBHD    5 mm BBO BB-1H
PULPROG                 zg
TD                   32768
SOLVENT              CDCl3
NS                      16
DS                       0
SWH               6172.839 Hz
FIDRES            0.188380 Hz
AQ                2.6542580 sec
RG                   46341
DW                  81.000 usec
DE                   6.00 usec
TE                  673.2 K
D1              1.00000000 sec
MCREST          0.00000000 sec
MCWRK           0.01500000 sec

======== CHANNEL f1 ========
NUC1                    1H
P1                   55.00 usec
PL1                  -6.00 dB
SFO1          300.1318534 MHz

F2 - Processing parameters
SI                   32768
SF            300.1300000 MHz
WDW                     EM
SSB                      0
LB                    0.30 Hz
GB                       0
PC                    1.00
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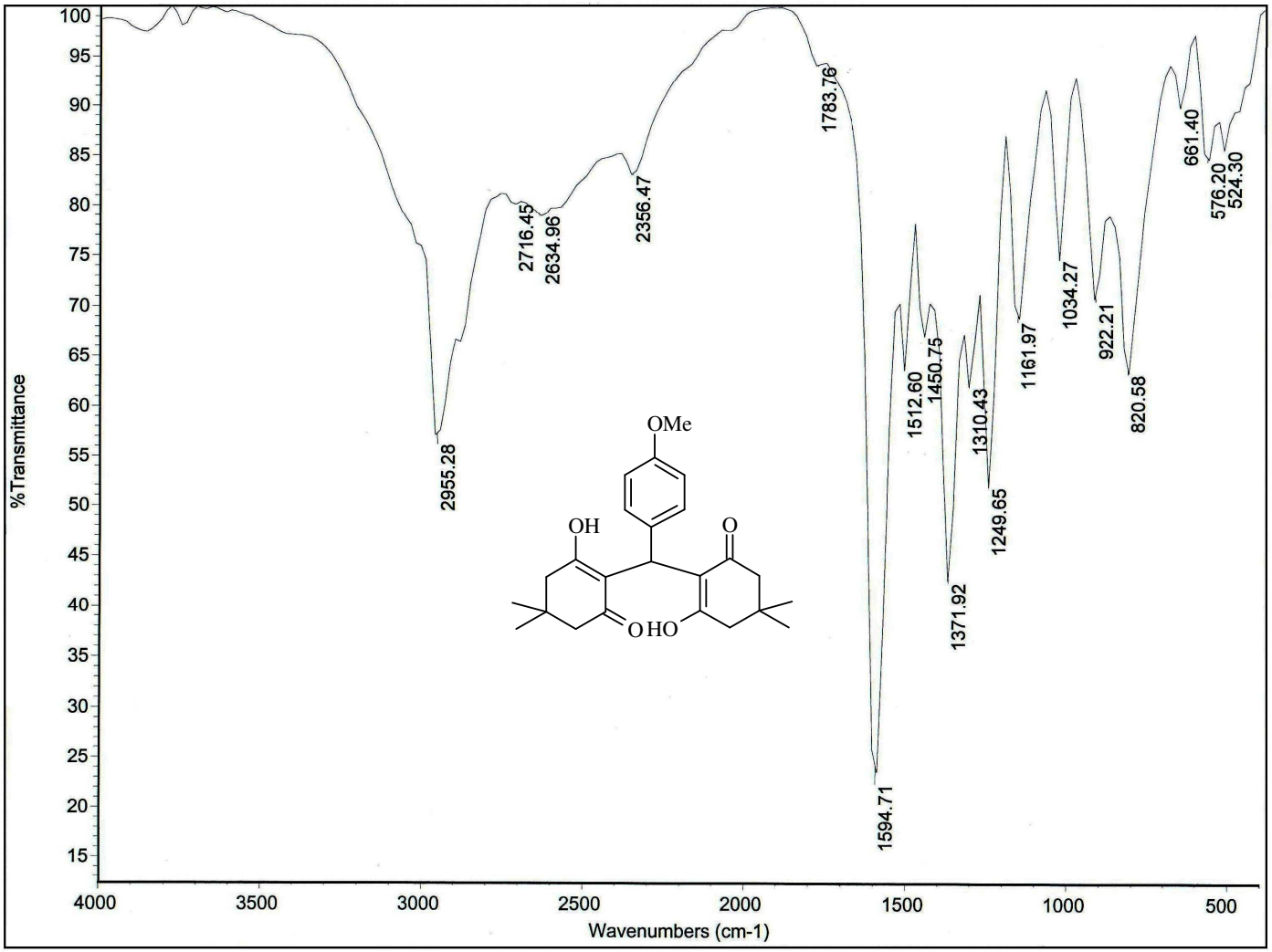
FT-IR (Table 4, entry 3)



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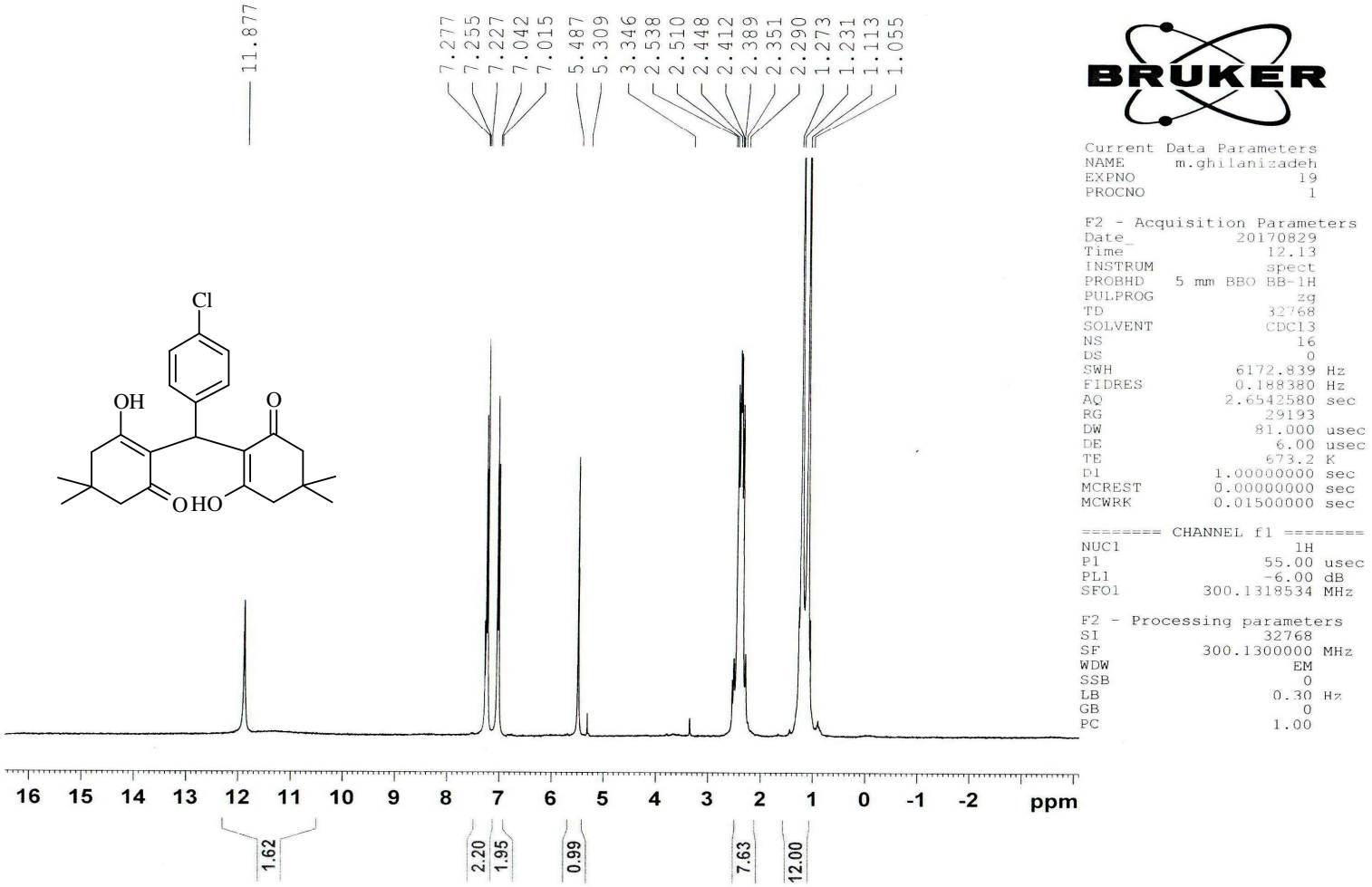
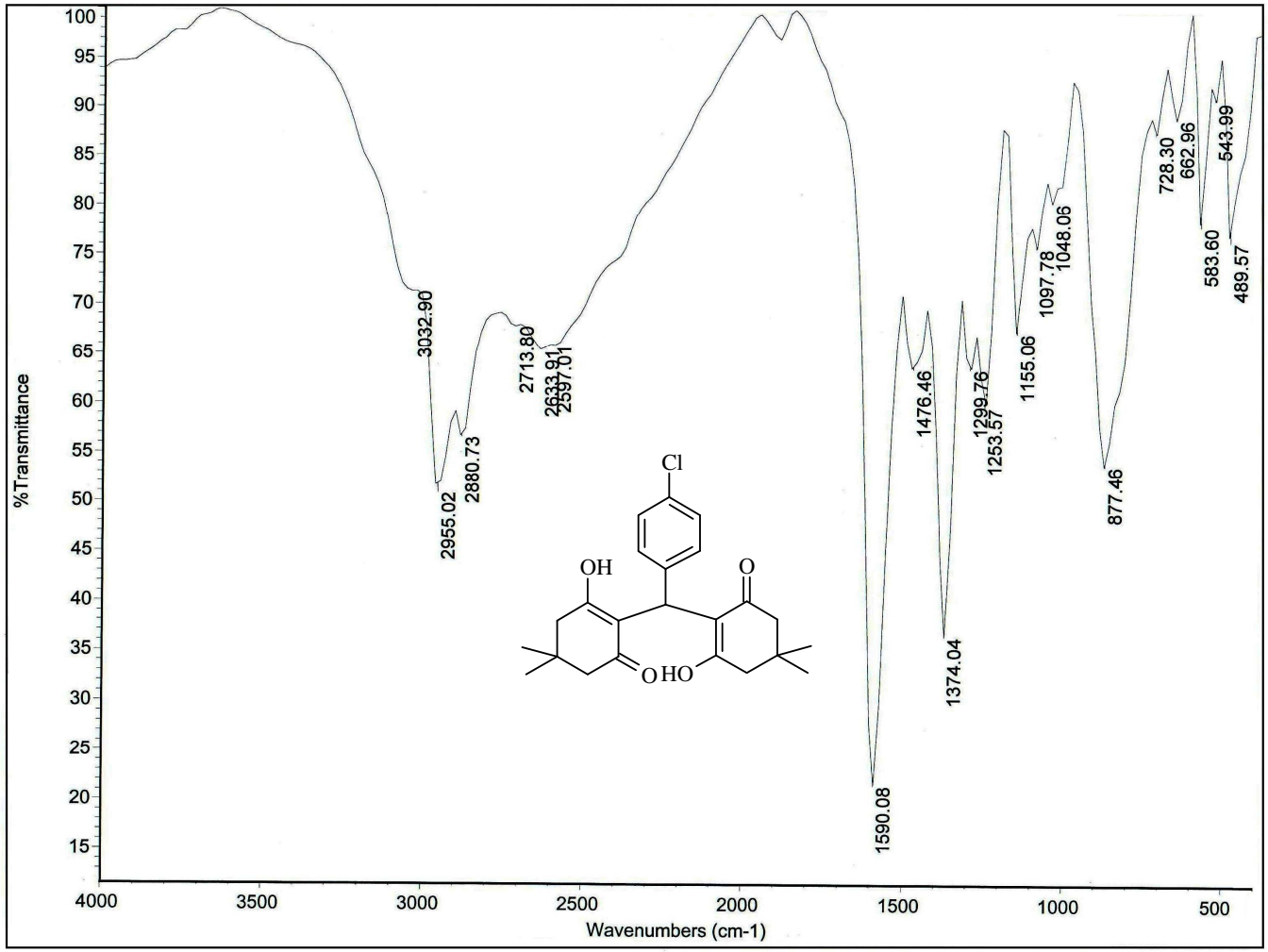


FT-IR (Table 4, entry 5)



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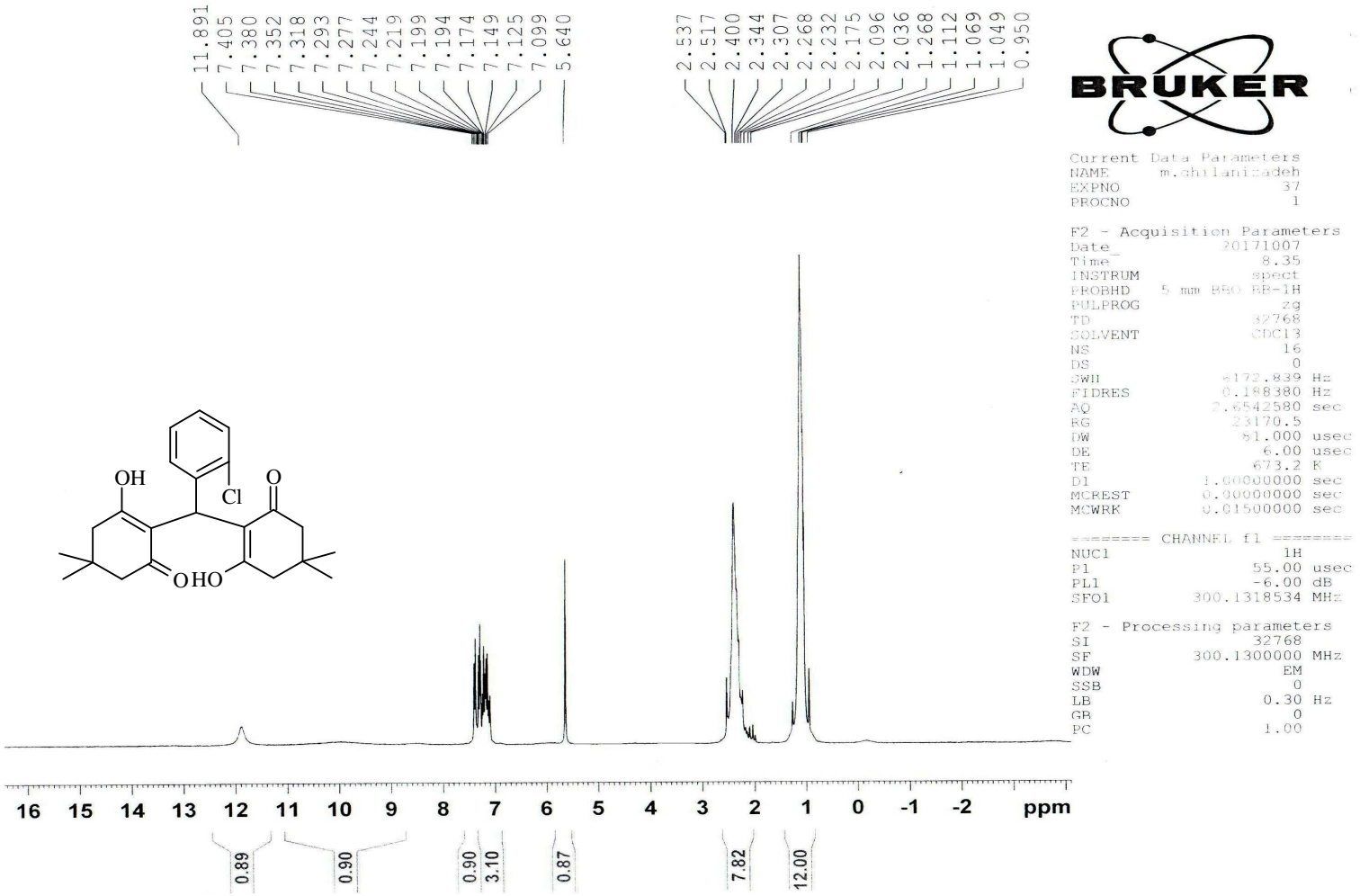
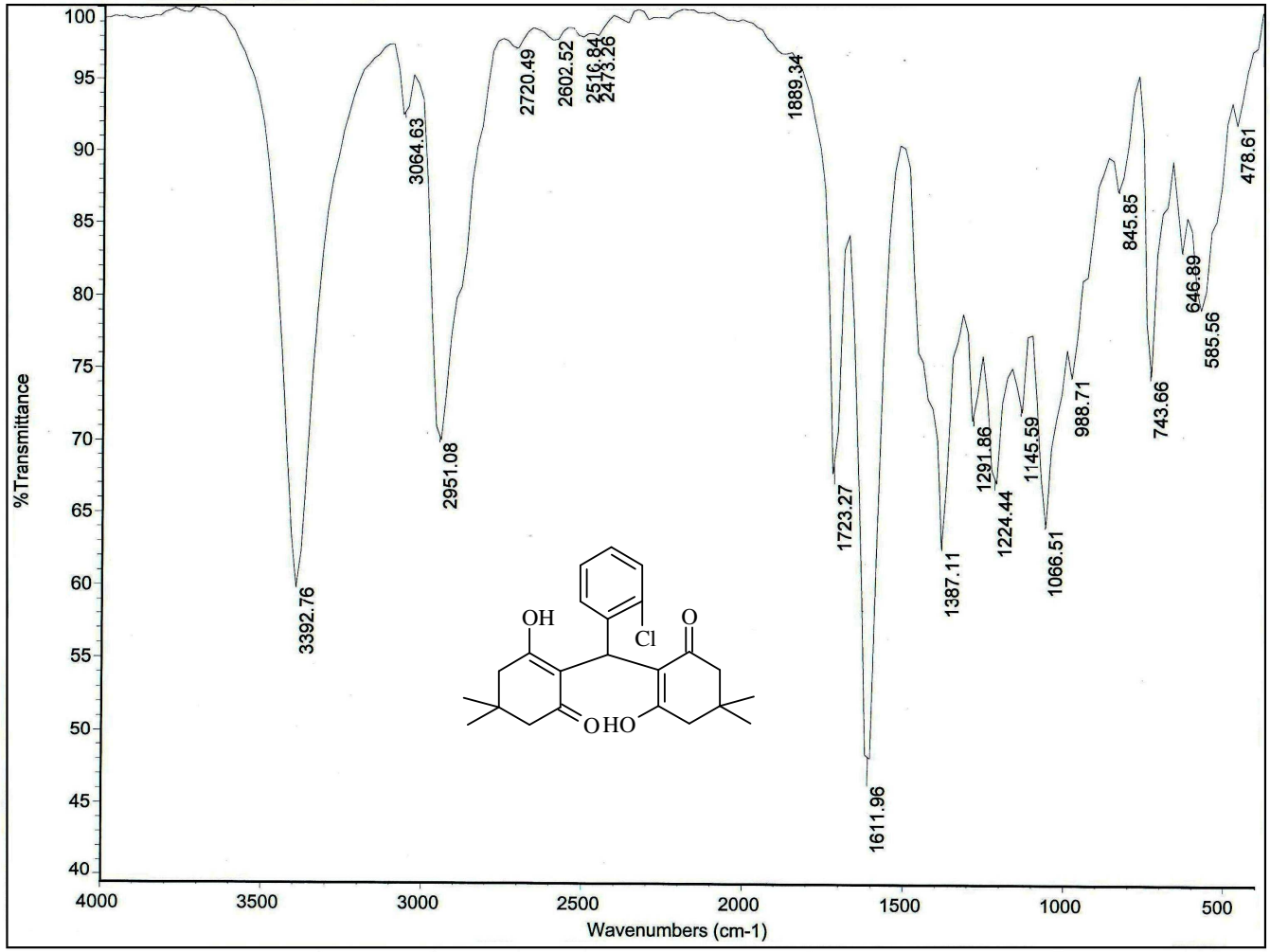
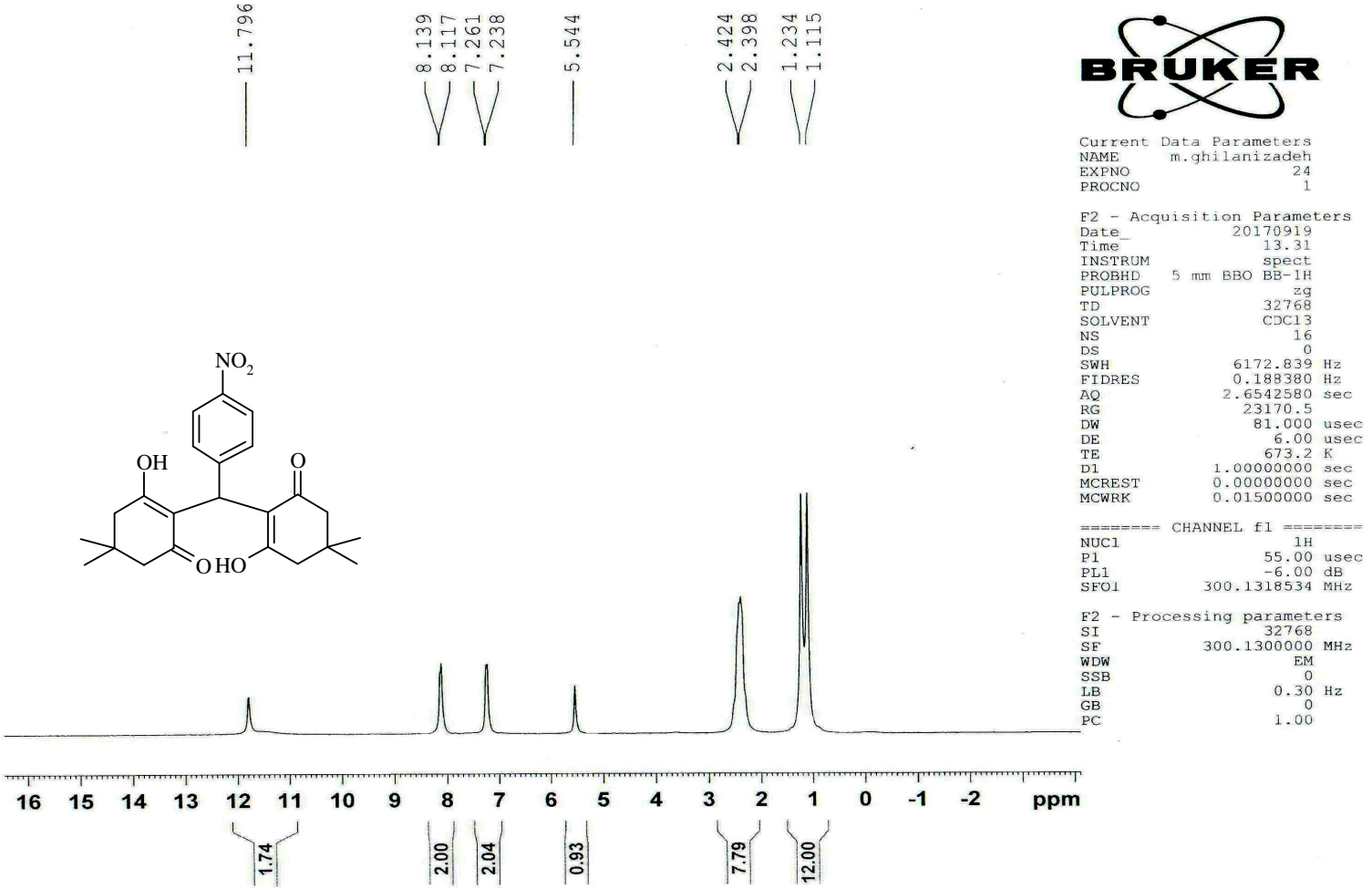


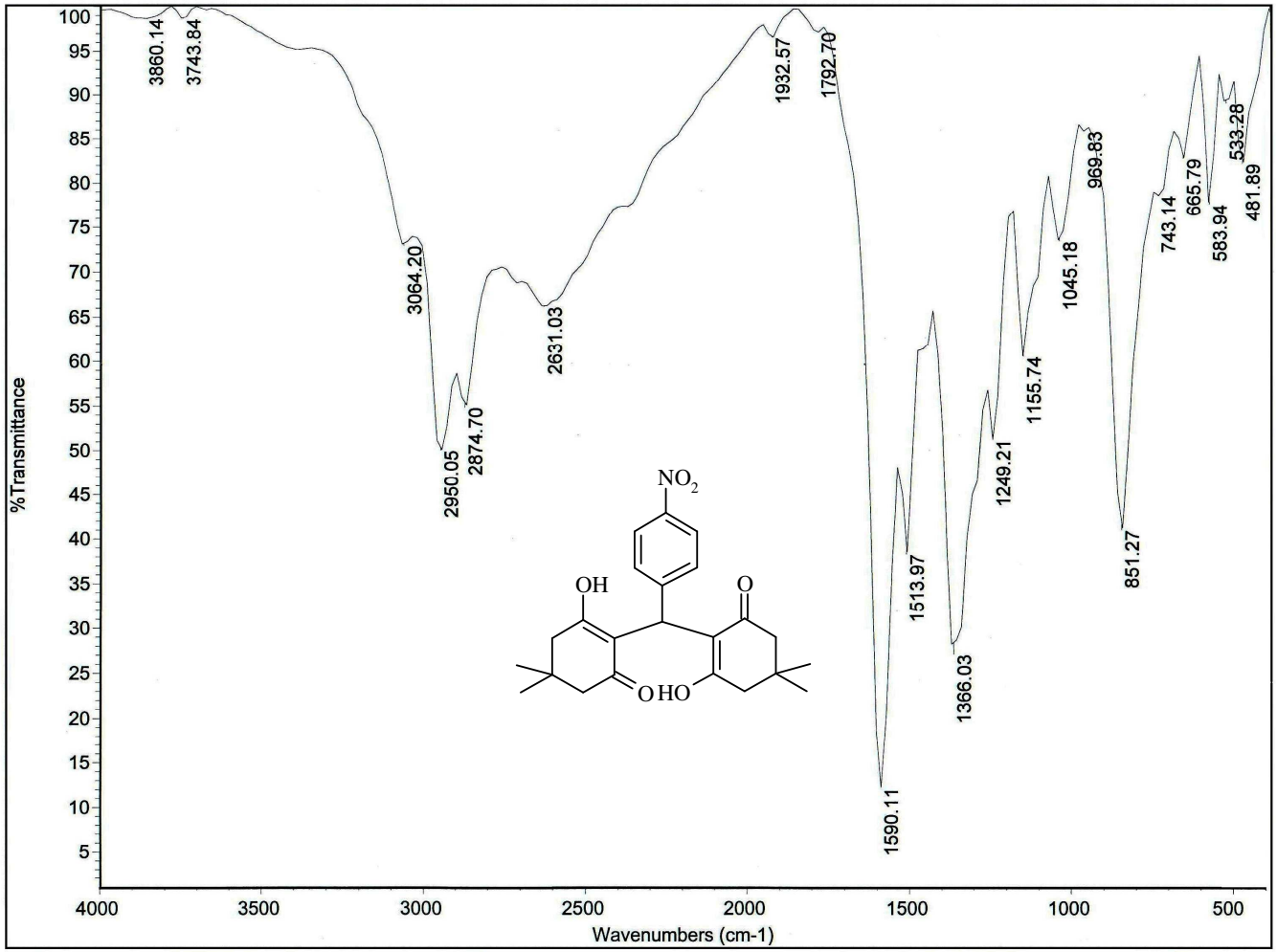
FT-IR (Table 4, entry 6)



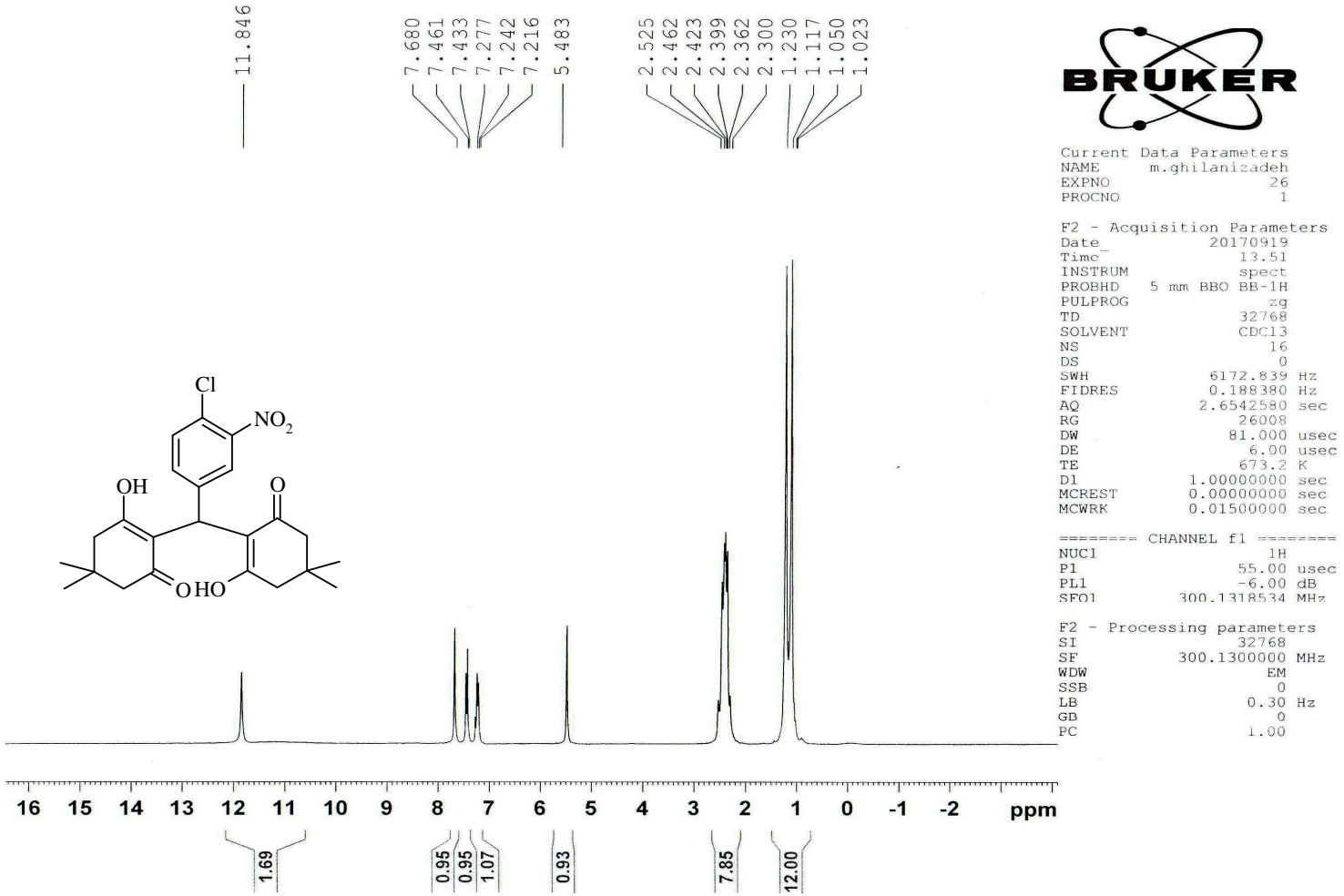
^{1}HNMR (Table 4, entry 7)



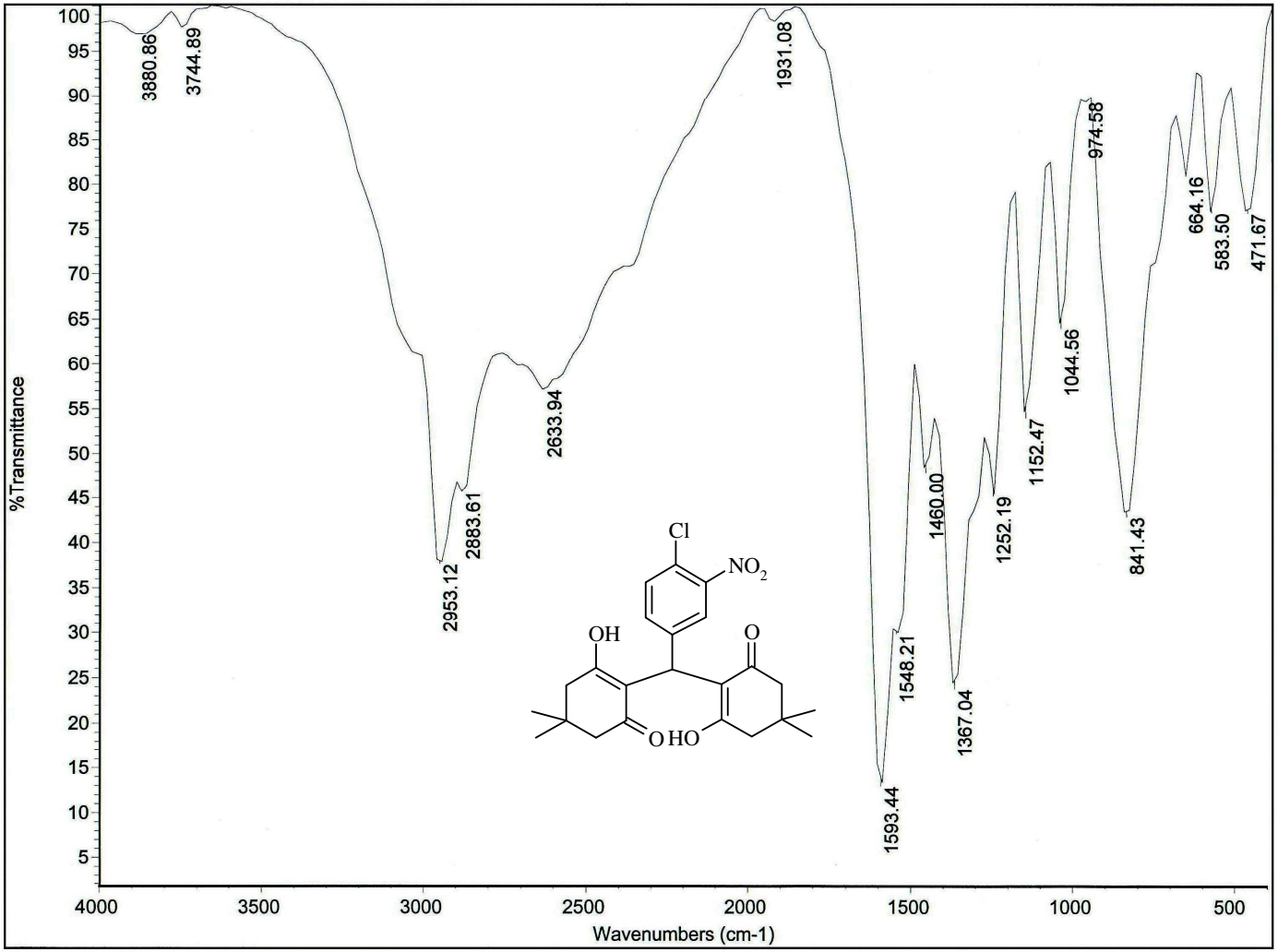
FT-IR (Table 4, entry 7)



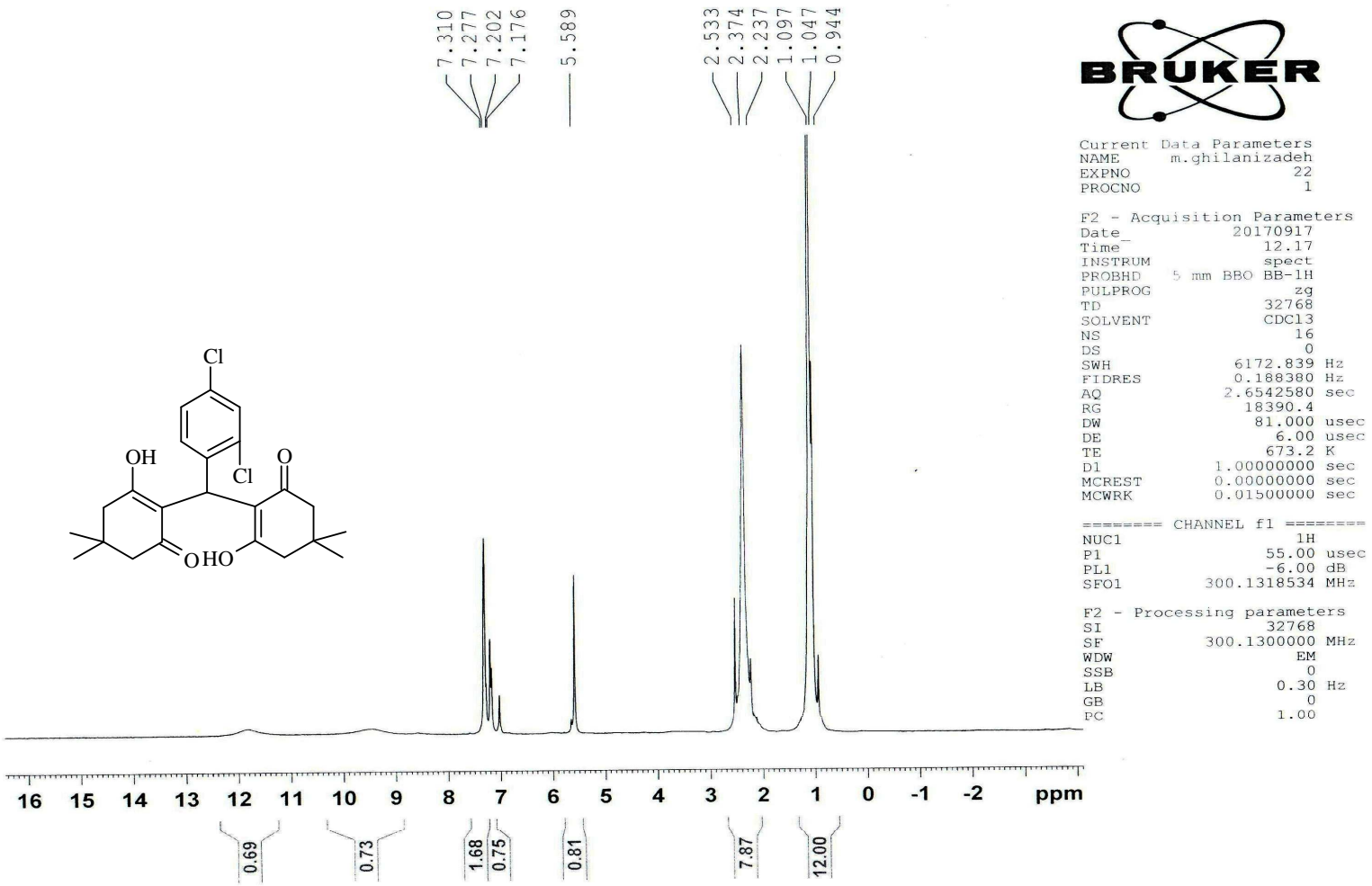
[1]HNMR (Table 4, entry 9)



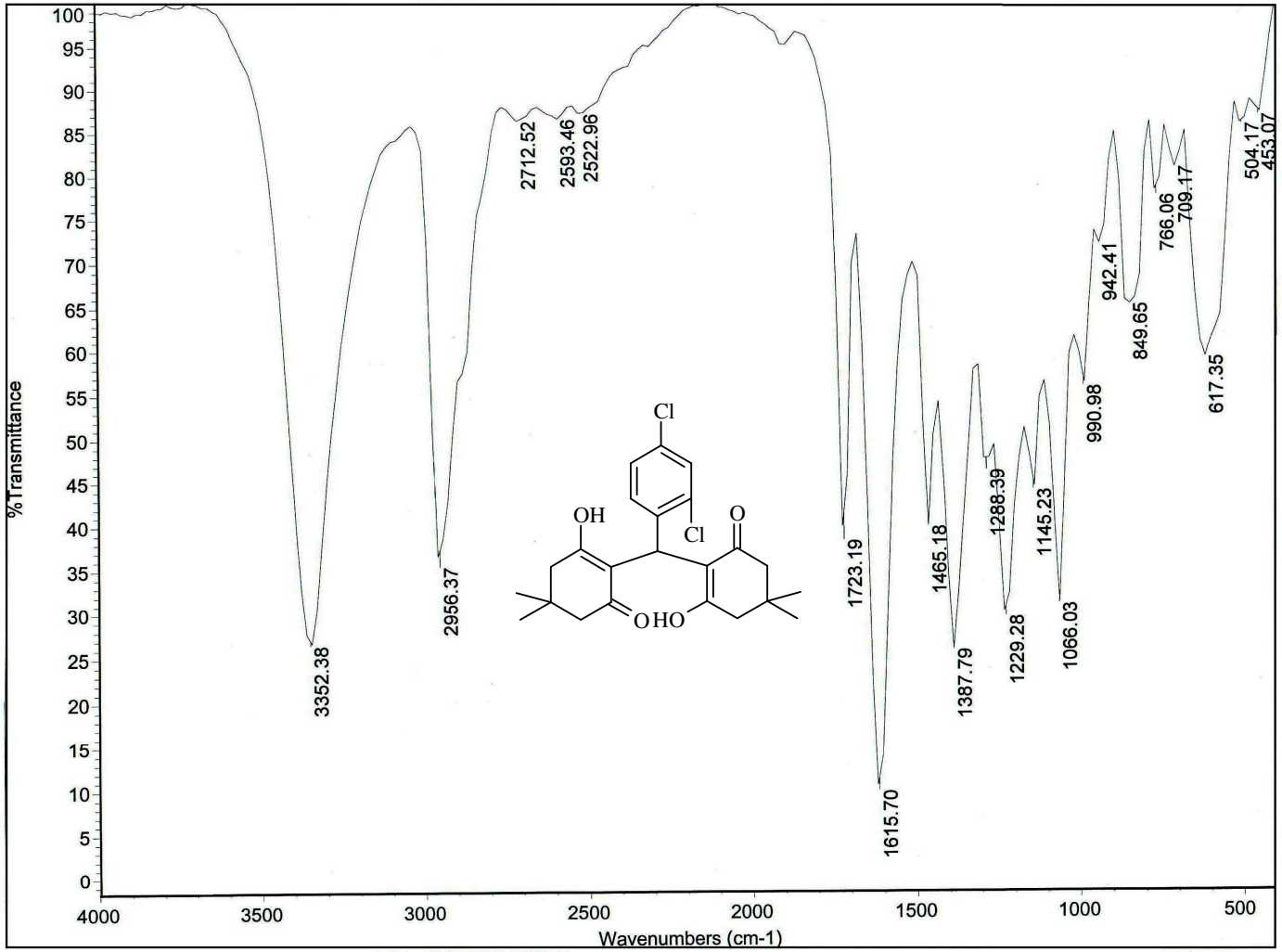
FT-IR (Table 4, entry 9)



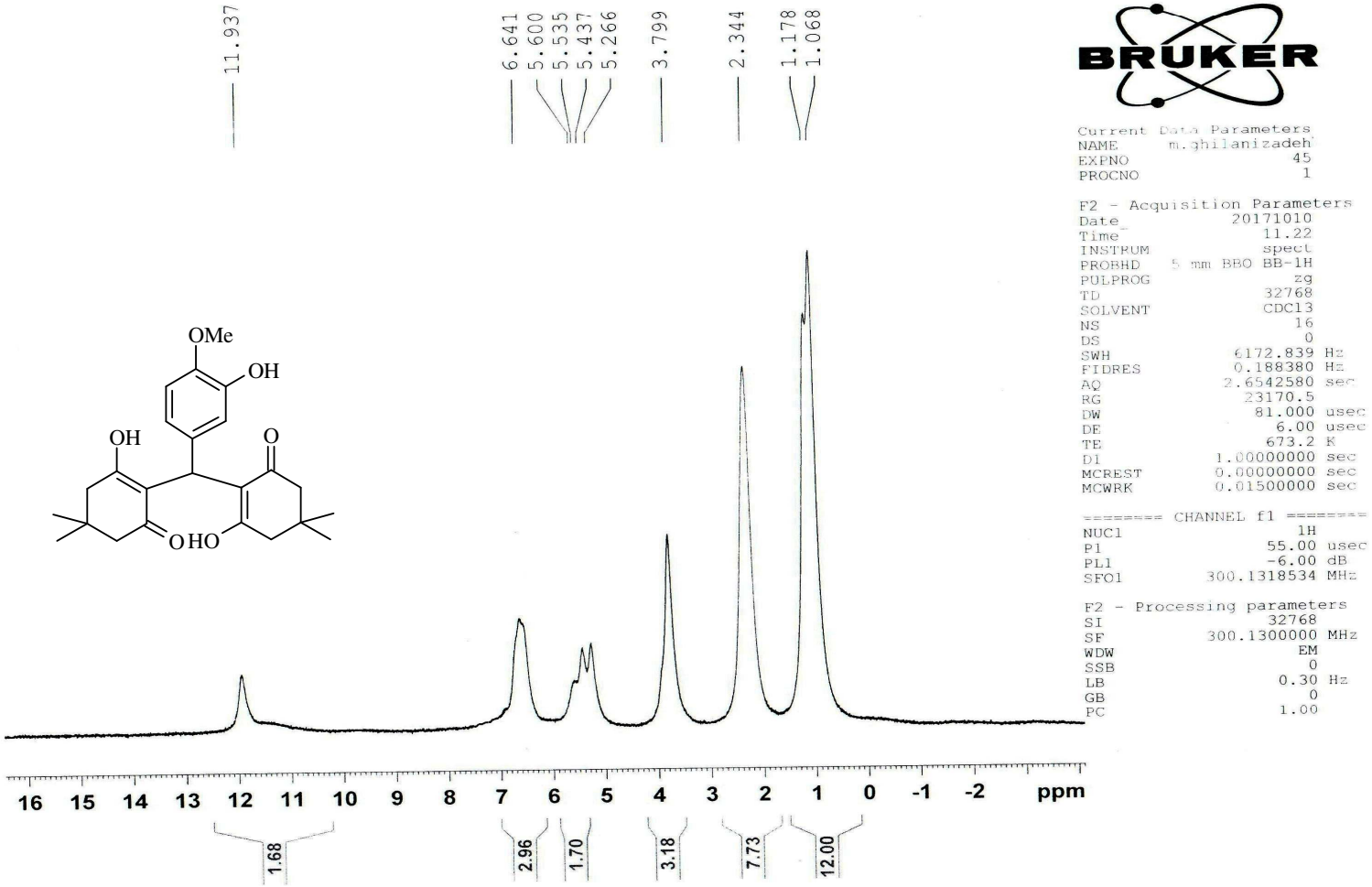
^{1}HNMR (Table 4, entry 10)



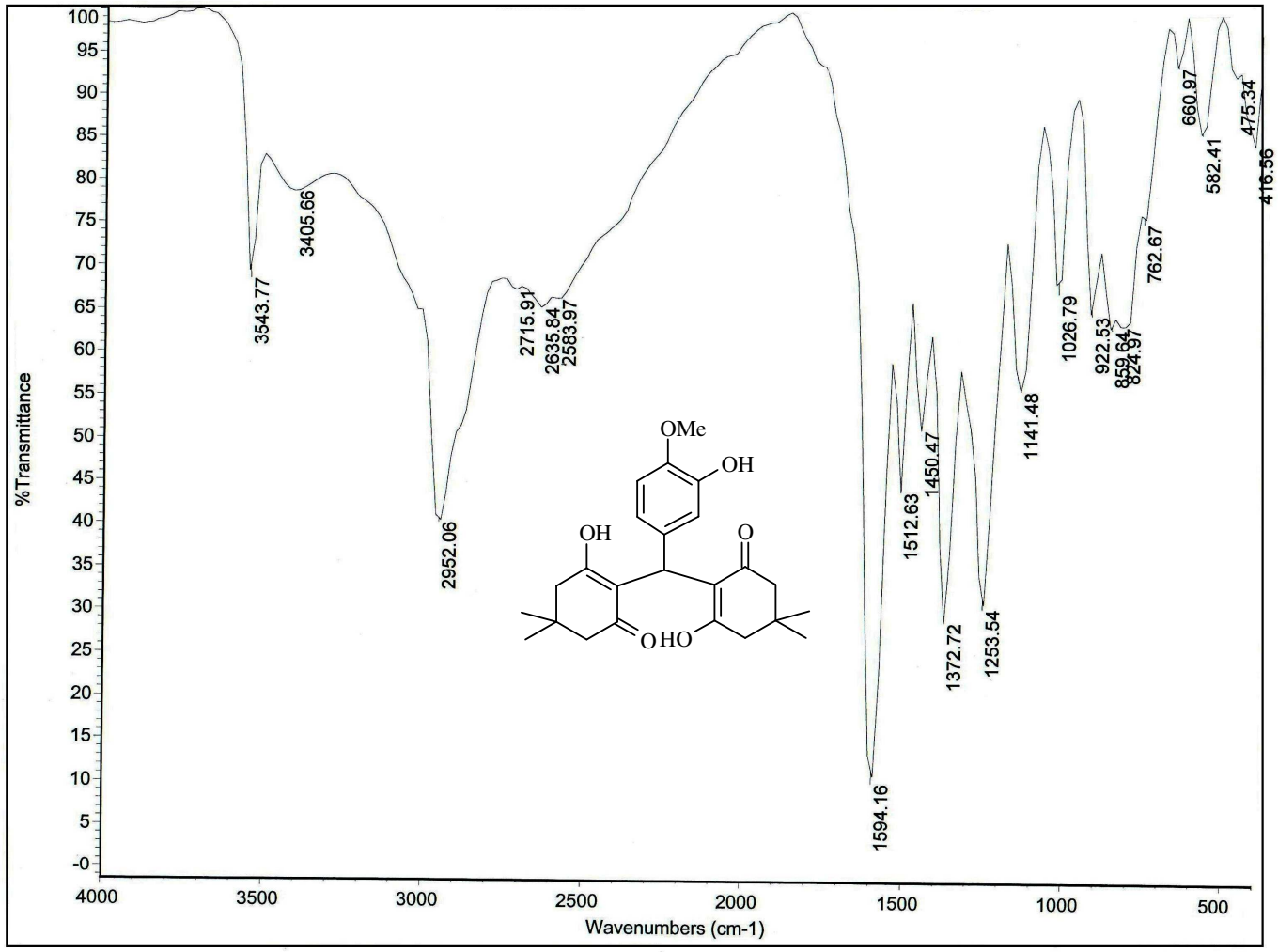
FT-IR (Table 4, entry 10)



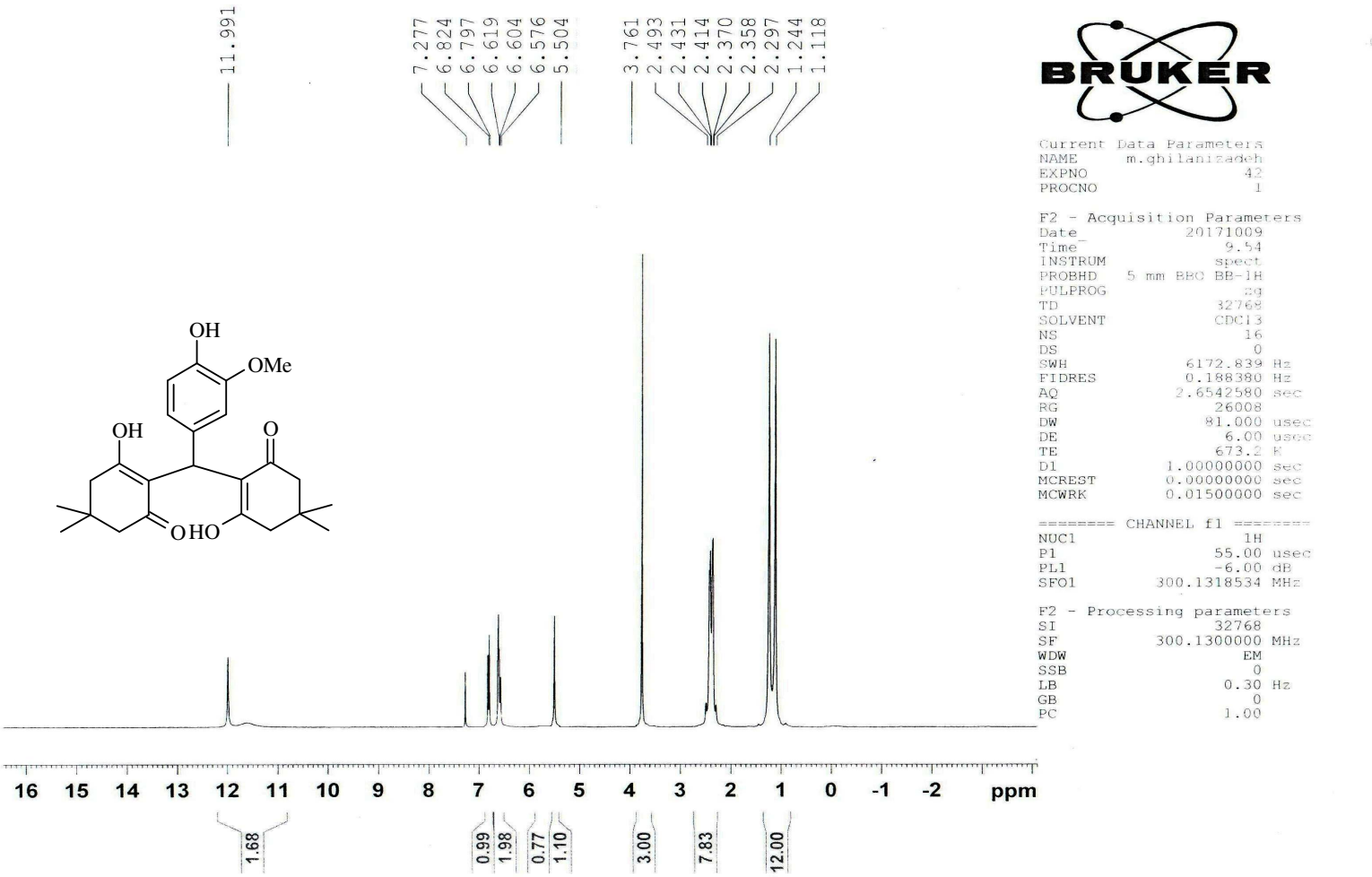
^{1}HNMR (Table 4, entry 11)



FT-IR (Table 4, entry 11)



^{1}HNMR (Table 4, entry 12)

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Current Data Parameters
NAME      m.ghilanizadeh
EXPNO                 42
PROCNO                 1

F2 - Acquisition Parameters
Date_           20171009
Time               9.54
INSTRUM            spect
PROBHD   5 mm BBO BB-1H
PULPROG              zg
TD                32768
SOLVENT           CDCl3
NS                   16
DS                    0
SWH            6172.839 Hz
FIDRES         0.188380 Hz
AQ             2.6542580 sec
RG                26008
DW               81.000 usec
DE                6.00 usec
TE               673.2 K
D1            1.00000000 sec
MCREST        0.00000000 sec
MCWRK         0.01500000 sec

========= CHANNEL f1 =========
NUC1                  1H
P1                55.00 usec
PL1               -6.00 dB
SFO1         300.1318534 MHz

F2 - Processing parameters
SI                32768
SF           300.1300000 MHz
WDW                  EM
SSB                   0
LB                 0.30 Hz
GB                    0
PC                 1.00
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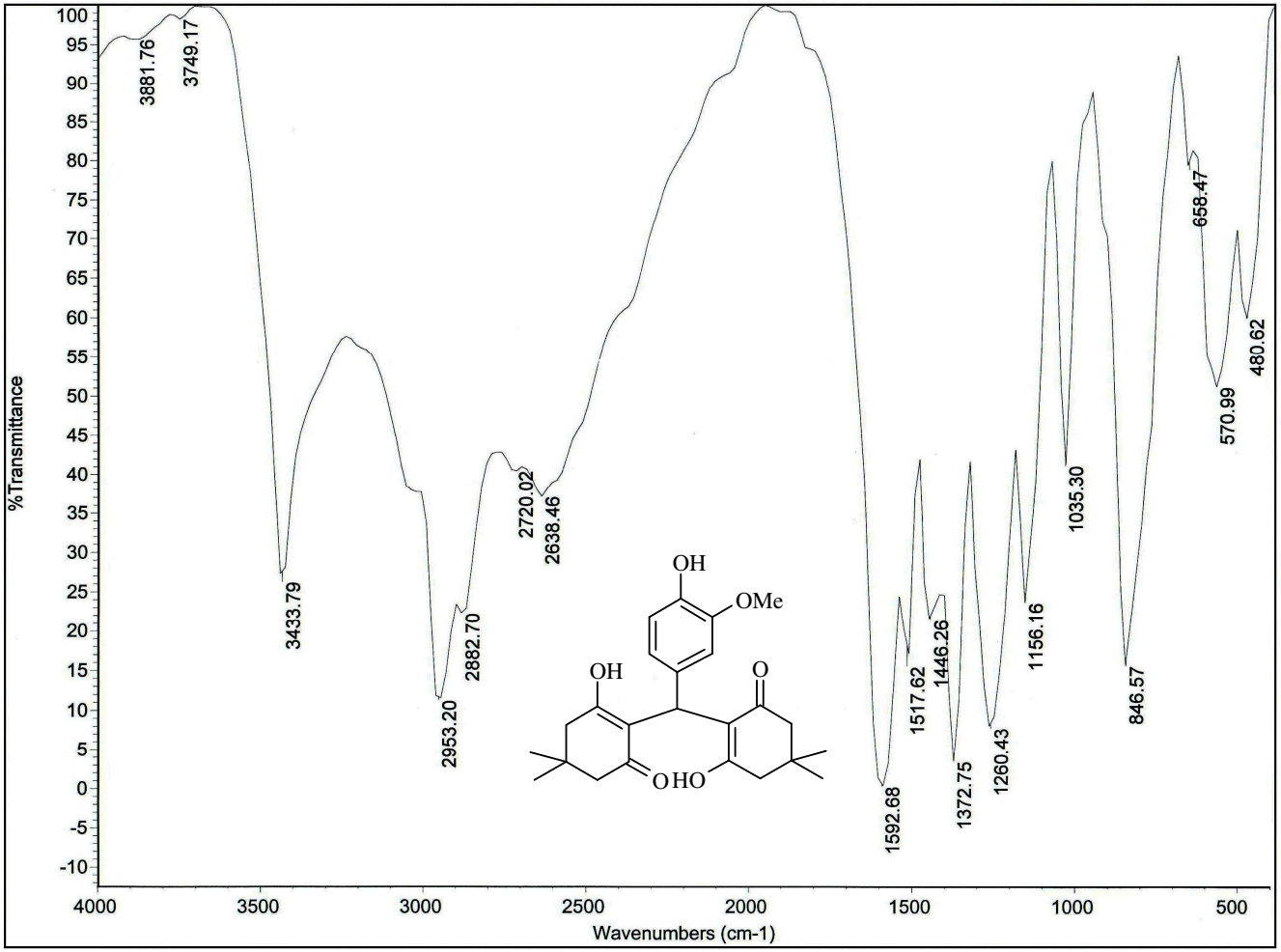
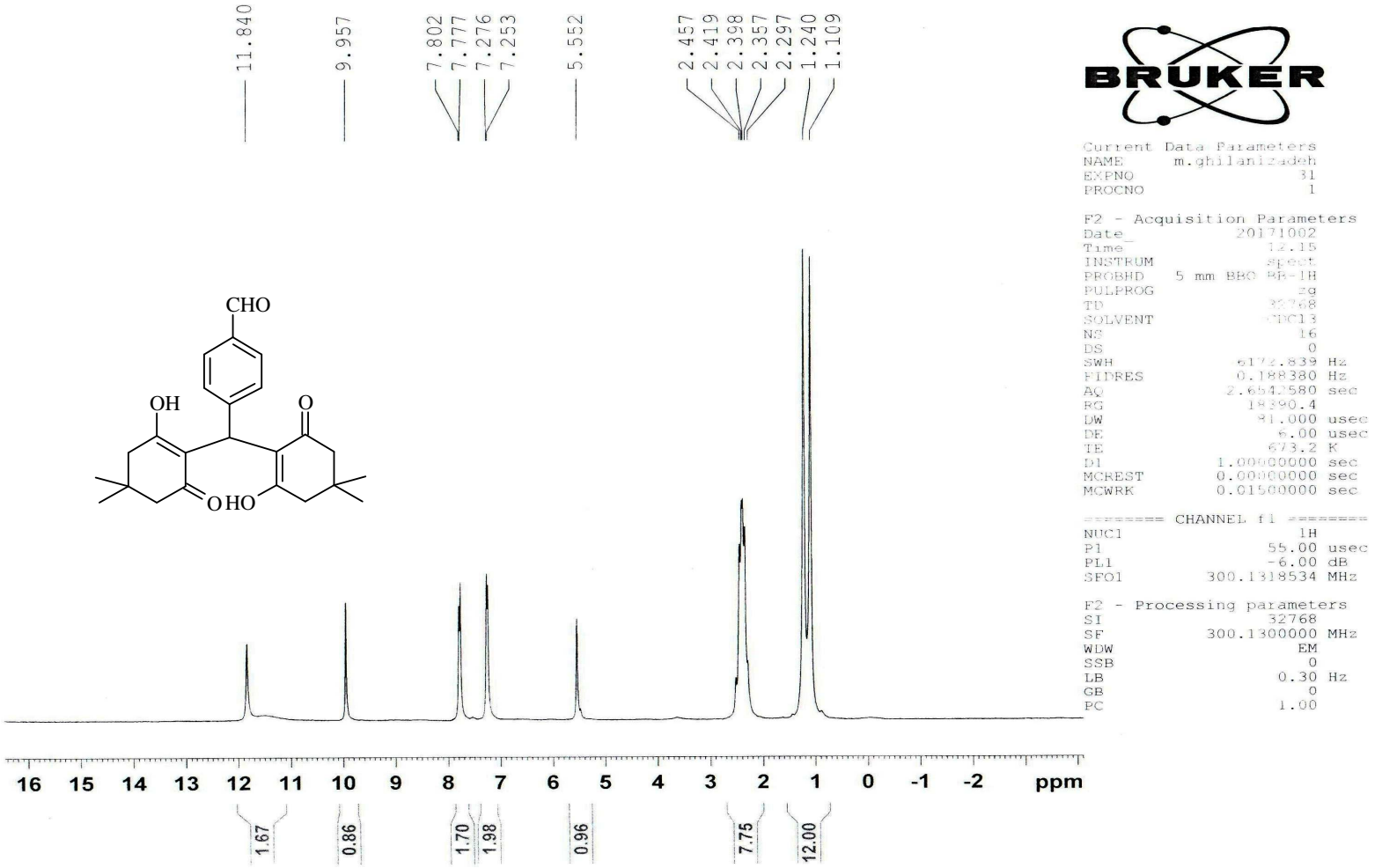
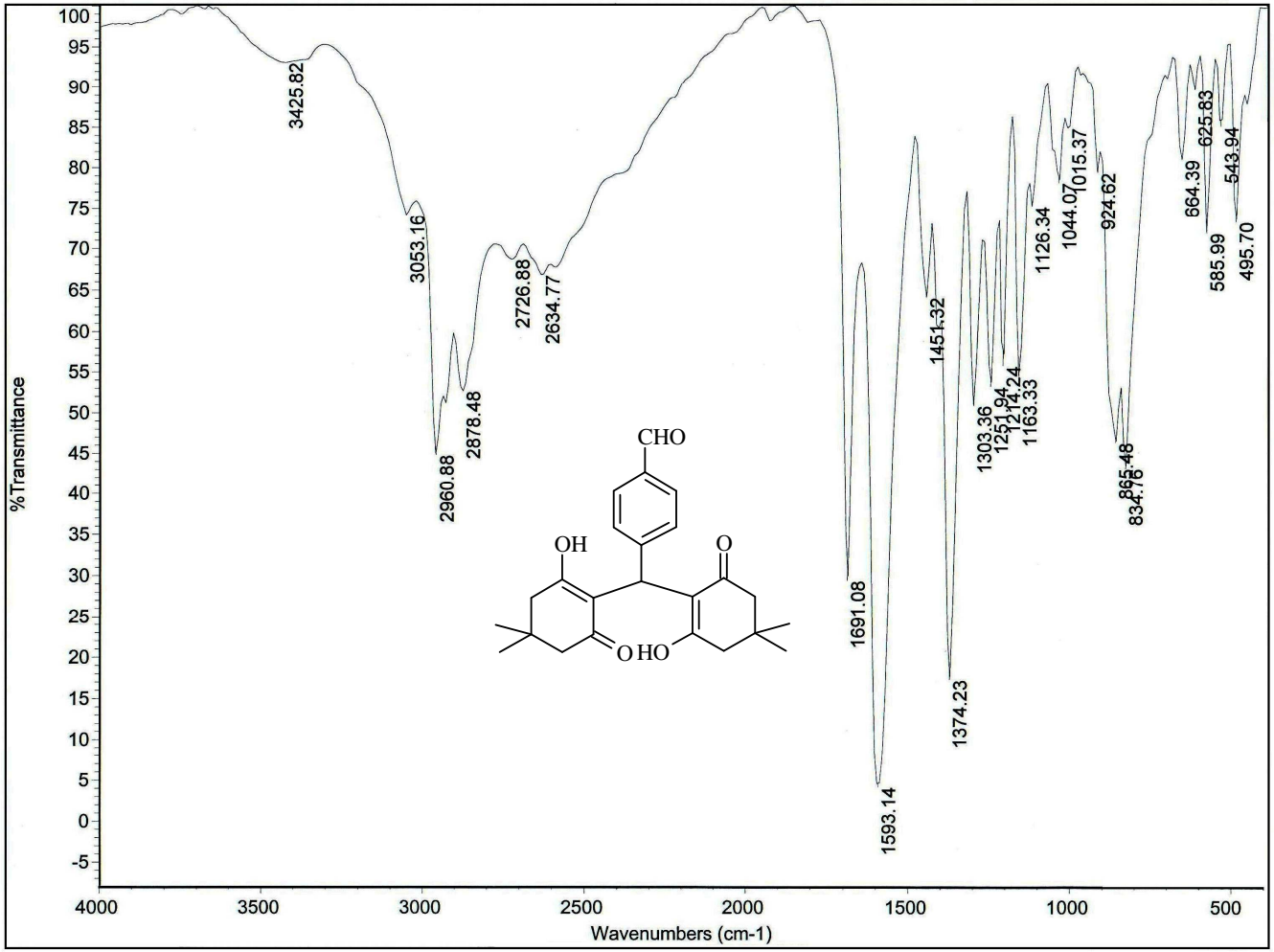
FT-IR (Table 4, entry 12)



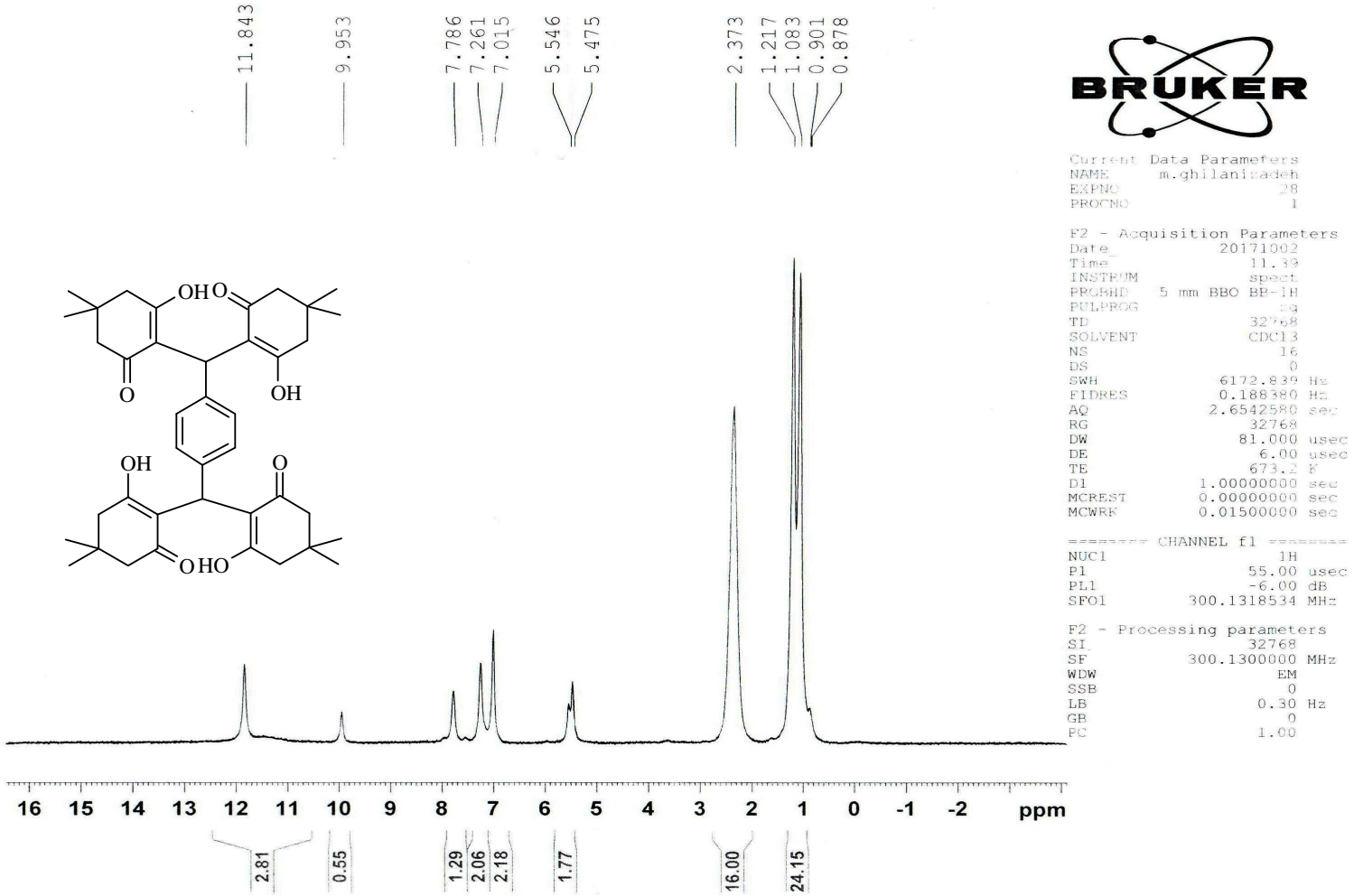
[1]HNMR (Table 4, entry 13)



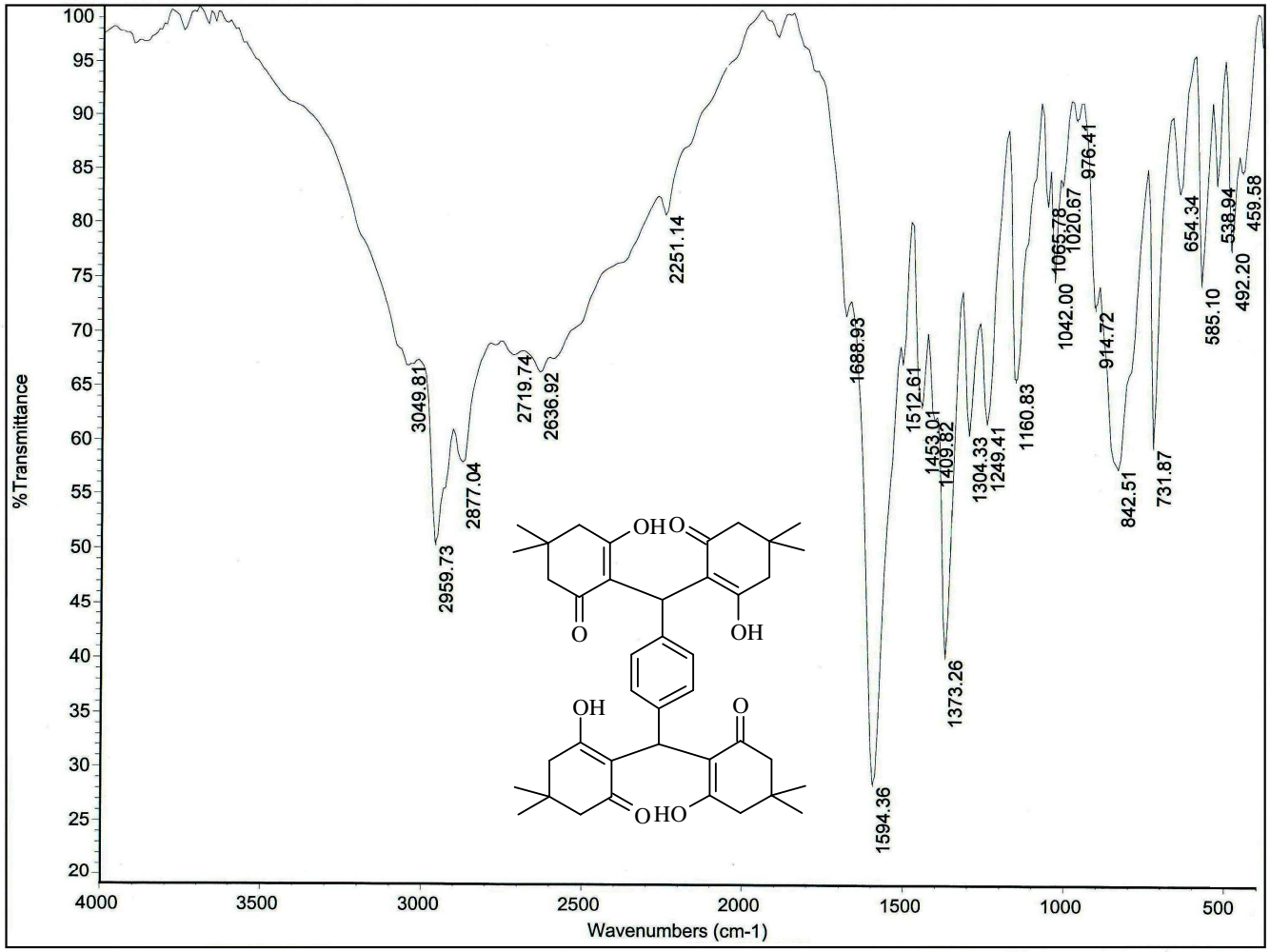
FT-IR (Table 4, entry 13)



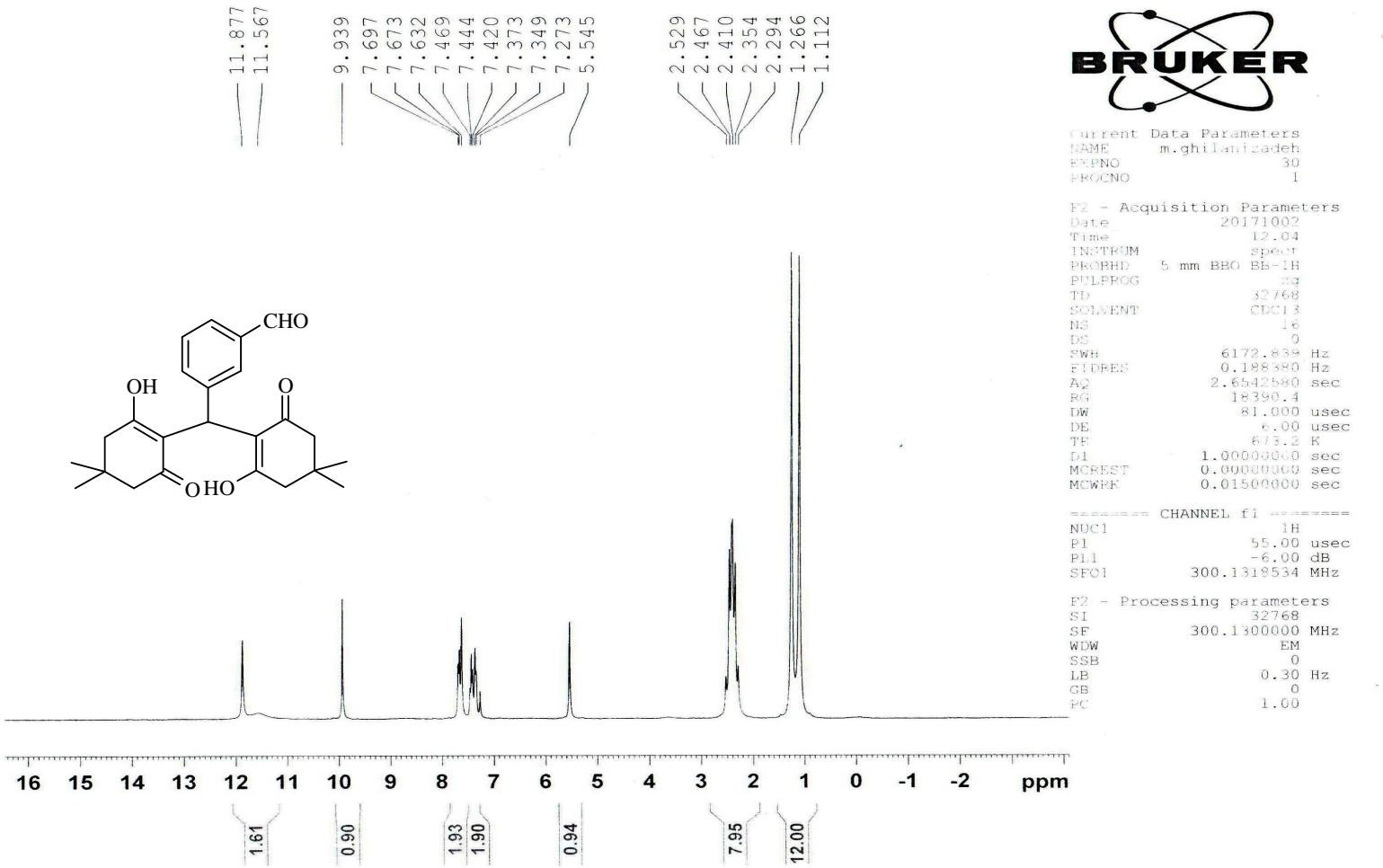
^{1}HNMR (Table 4, entry 14)



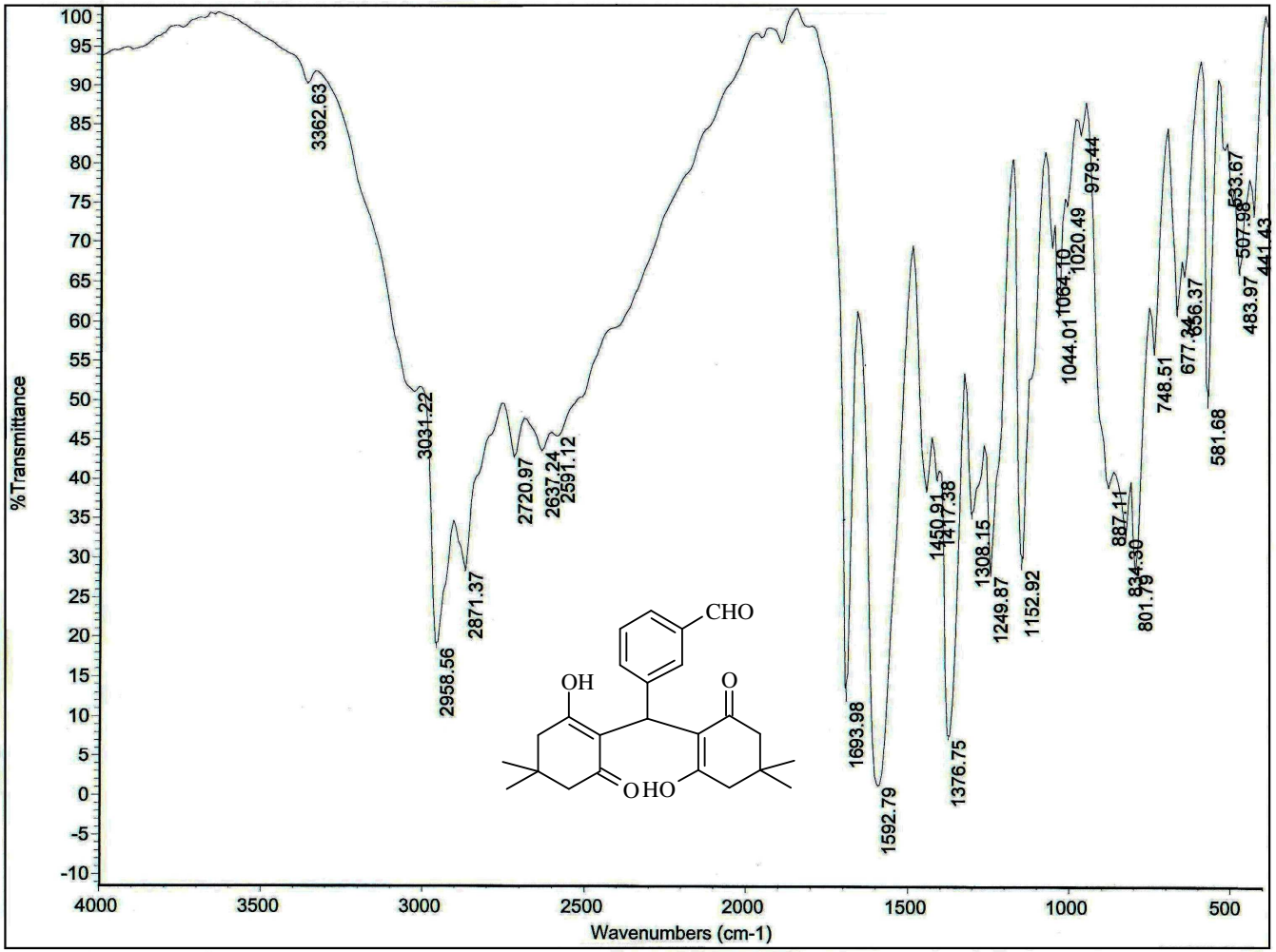
FT-IR (Table 4, entry 14)



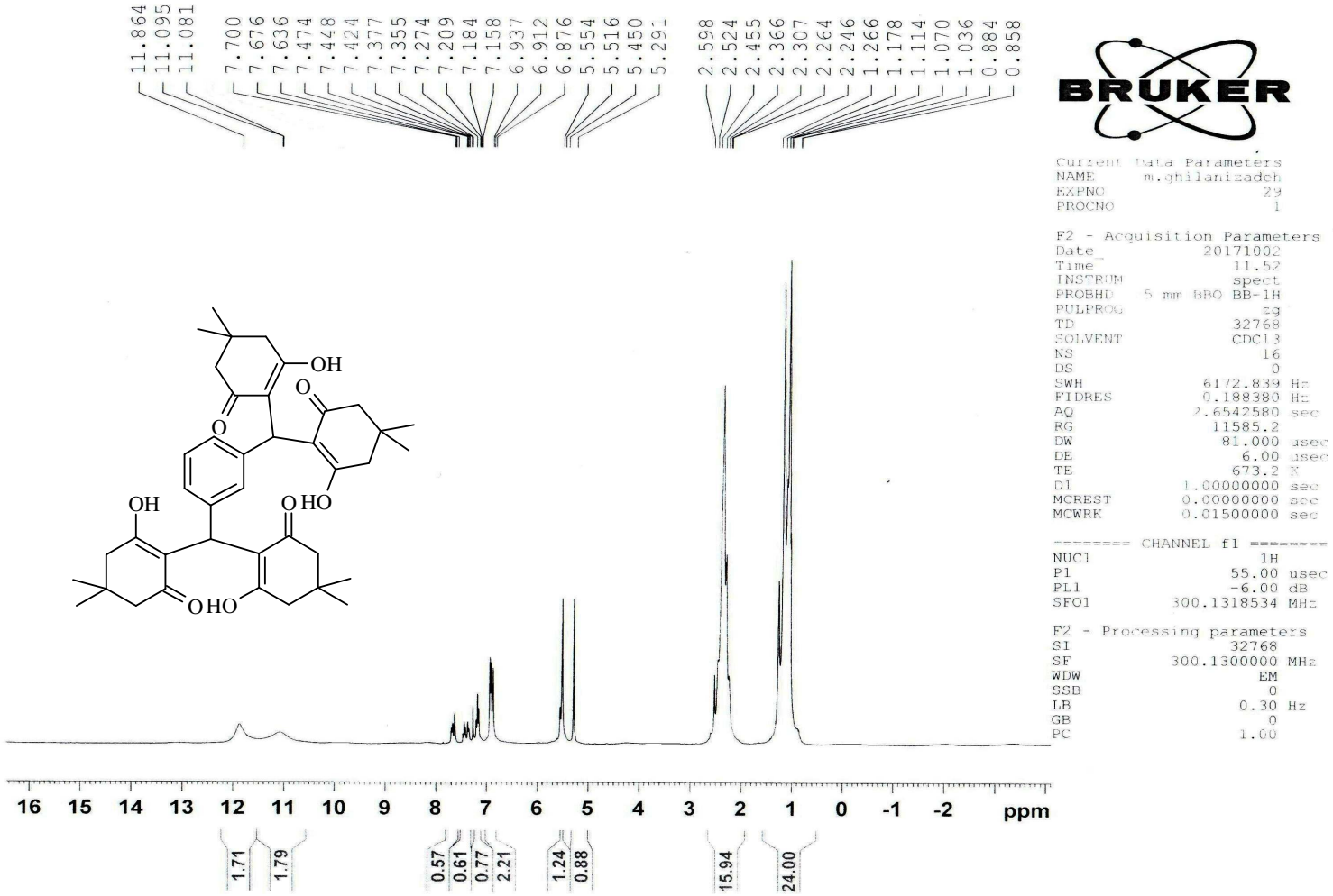
[1]HNMR (Table 4, entry 15)



FT-IR (Table 4, entry 15)



[1]HNMR (Table 4, entry 16)



BRUKER

Current Data Parameters
NAME m.ghilanizadeh
EXPNO 29
PROCNO 1

F2 - Acquisition Parameters
Date_ 20171002
Time 11.52
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 6172.839 Hz
FIDRES 0.188380 Hz
AQ 2.6542580 sec
RG 11585.2
DW 81.000 usec
DE 6.00 usec
TE 673.2 K
D1 1.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec

======== CHANNEL f1 ========
NUC1 1H
P1 55.00 usec
PL1 -6.00 dB
SFO1 300.1318534 MHz

F2 - Processing parameters
SI 32768
SF 300.1300000 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

FT-IR (Table 4, entry 16)