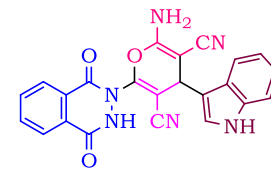


**Ionic liquid mediated four-component synthesis of novel
phthalazinone based indole-pyran hybrids as cytotoxic agents**

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Moataz Morad^a, Rabab S. Jassas^c, Munirah M. Al-Rooqi^a, Abdulrahman A. Alsimaree^d,
Hatem M. Altass^a, Basim H. Asghar^a, Abdelrahman S. Khder^{a,e}, Saleh A. Ahmed^{a,f *}

Supporting information



5a

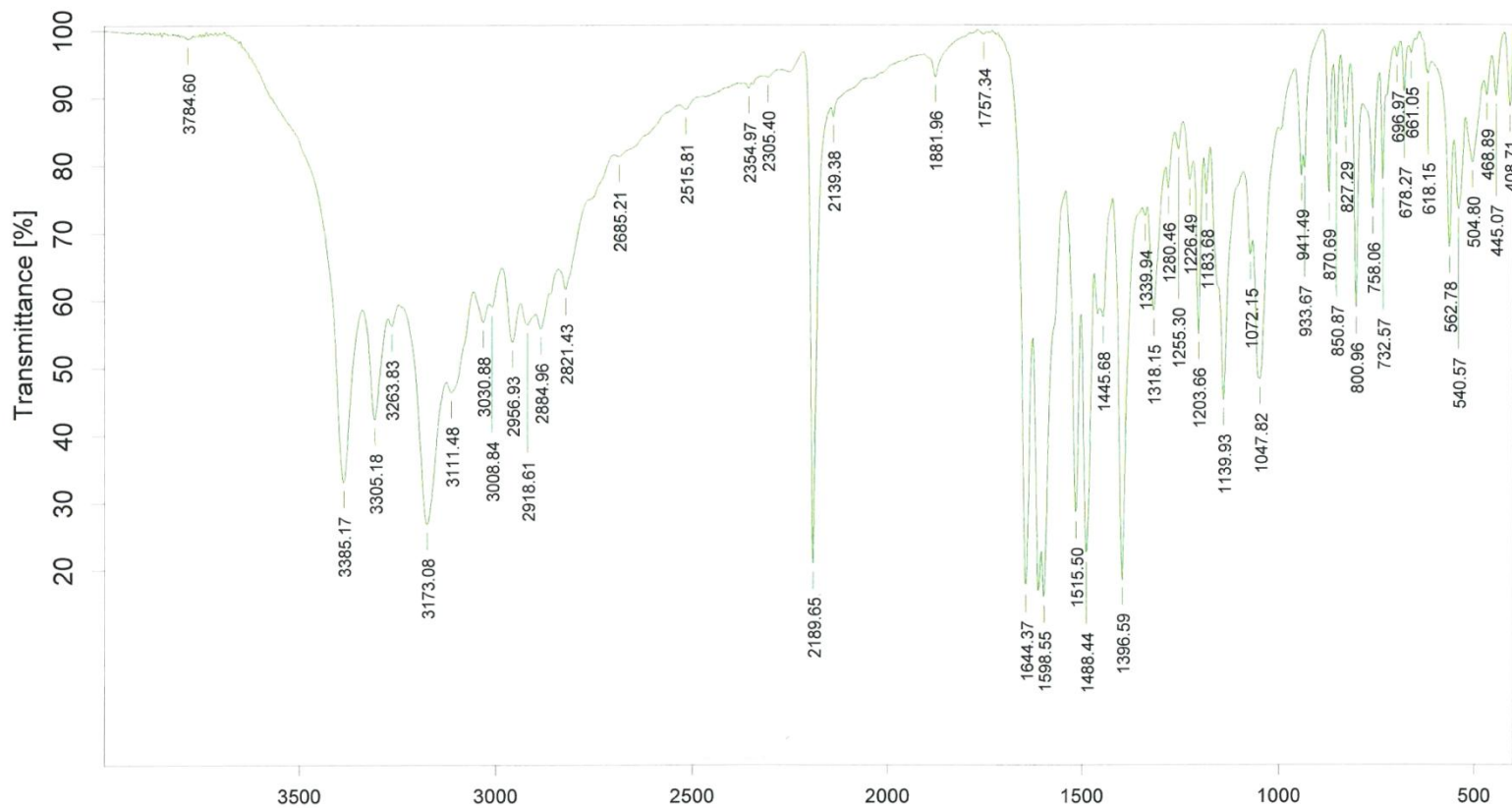
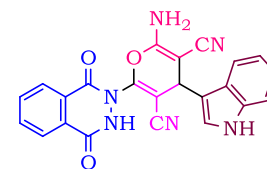


Fig. 1: IR spectrum of compound 5a

^1H NMR IN DMSO- d_6
AV 400MHz



5a

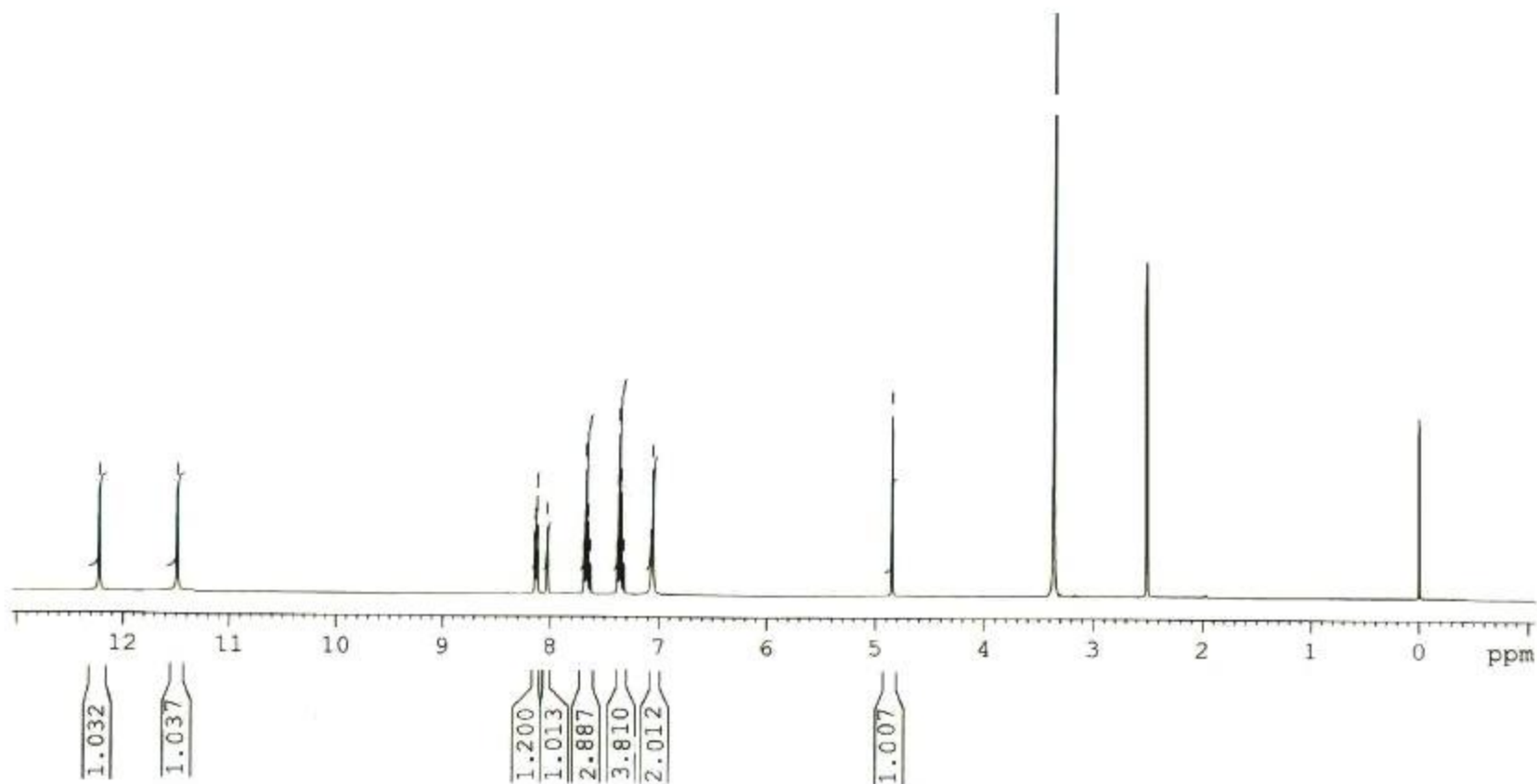
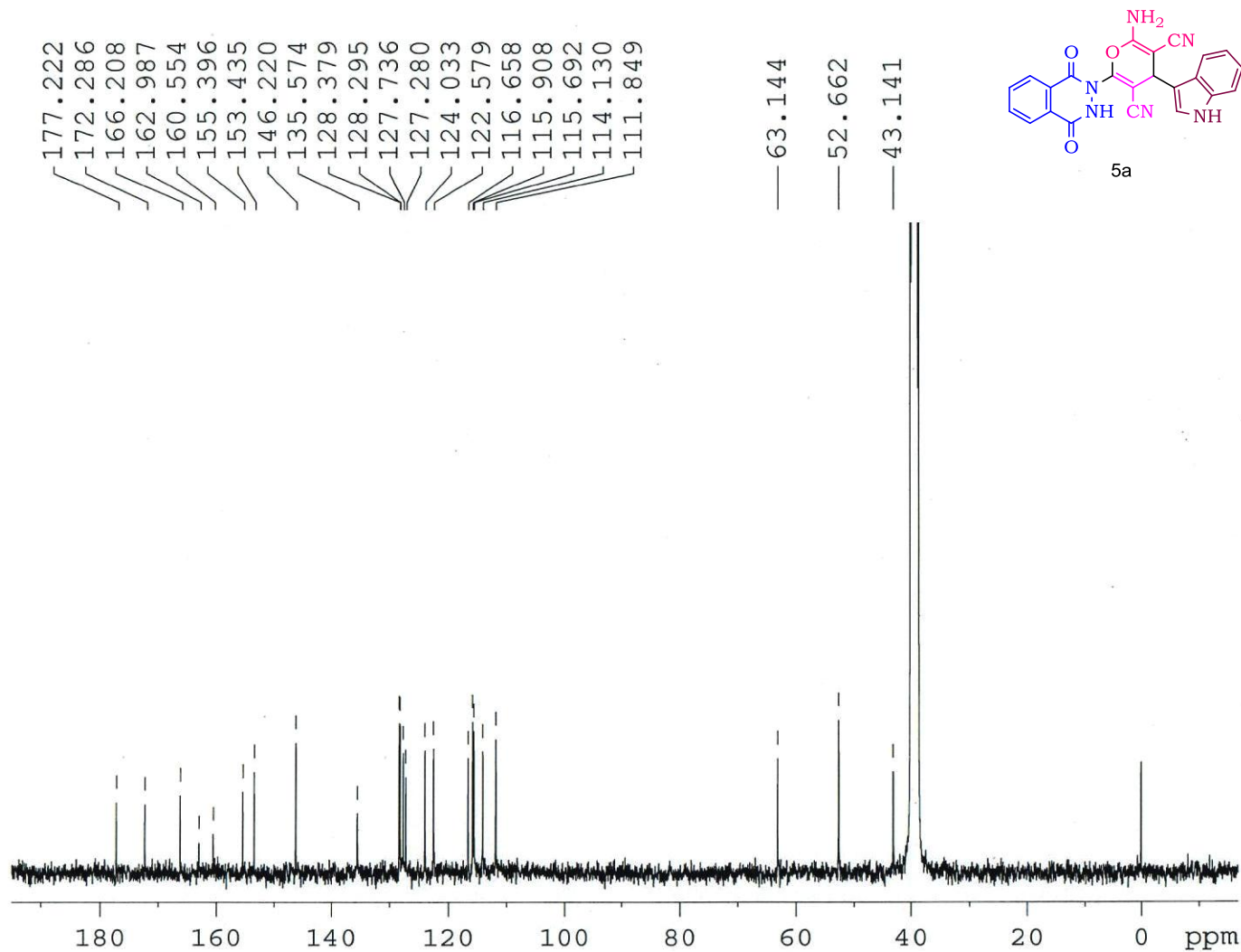


Fig. 2: ^1H NMR spectrum of compound 5a

¹³C NMR IN DMSO-d₆

Instrument : 400MHz
Make/Model : Bruker/AVANCE-III 400



Current Data Parameters
NAME 29-TTS-VII-001-15-13C
EXPNO 1
PROCNO 1

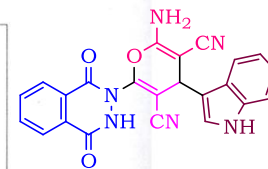
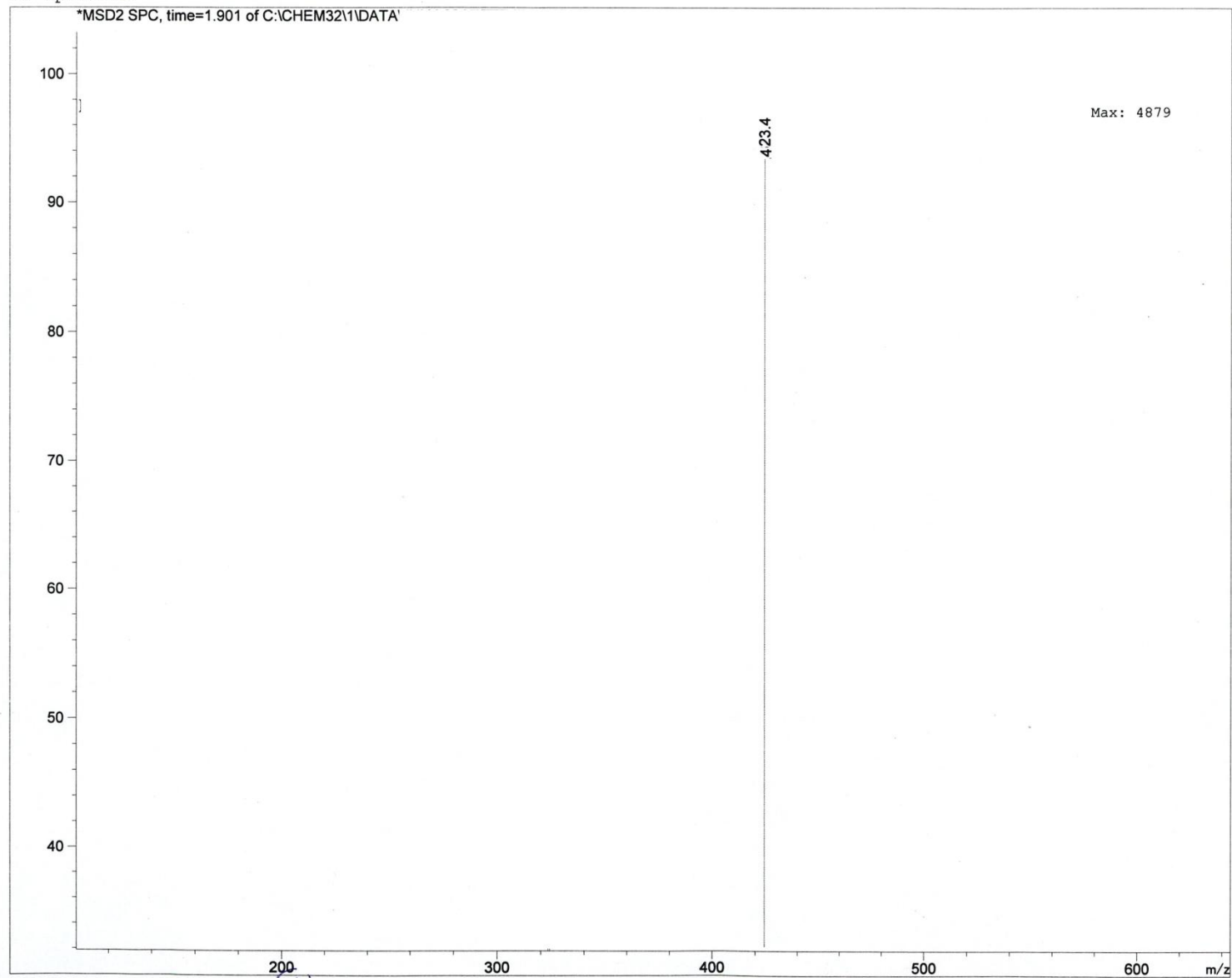
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SOLVENT DMSO
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DS 4
SWH 24038.461 Hz
FIDRES 1.000102 Hz
AQ 0.4999488 sec
RG 203
DW 20.800 usec
DE 6.50 usec
TE 298.2 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
SFO1 100.6228298 MHz
NUC1 13C
P1 10.00 usec
PLW1 51.54999924 W
SFO2 400.1316005 MHz
NUC2 1H
CPDPRG[2] waltz16
PCPD2 90.00 usec
PLW2 12.80700016 W
PLW12 0.34165999 W
PLW13 0.17185000 W

F2 - Processing parameters
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SF 100.6128187 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 1.40

Fig. 3: ¹³C NMR spectrum of compound 5a

MS Spectrum



5a

Fig. 4: Mass spectrum of compound 5a

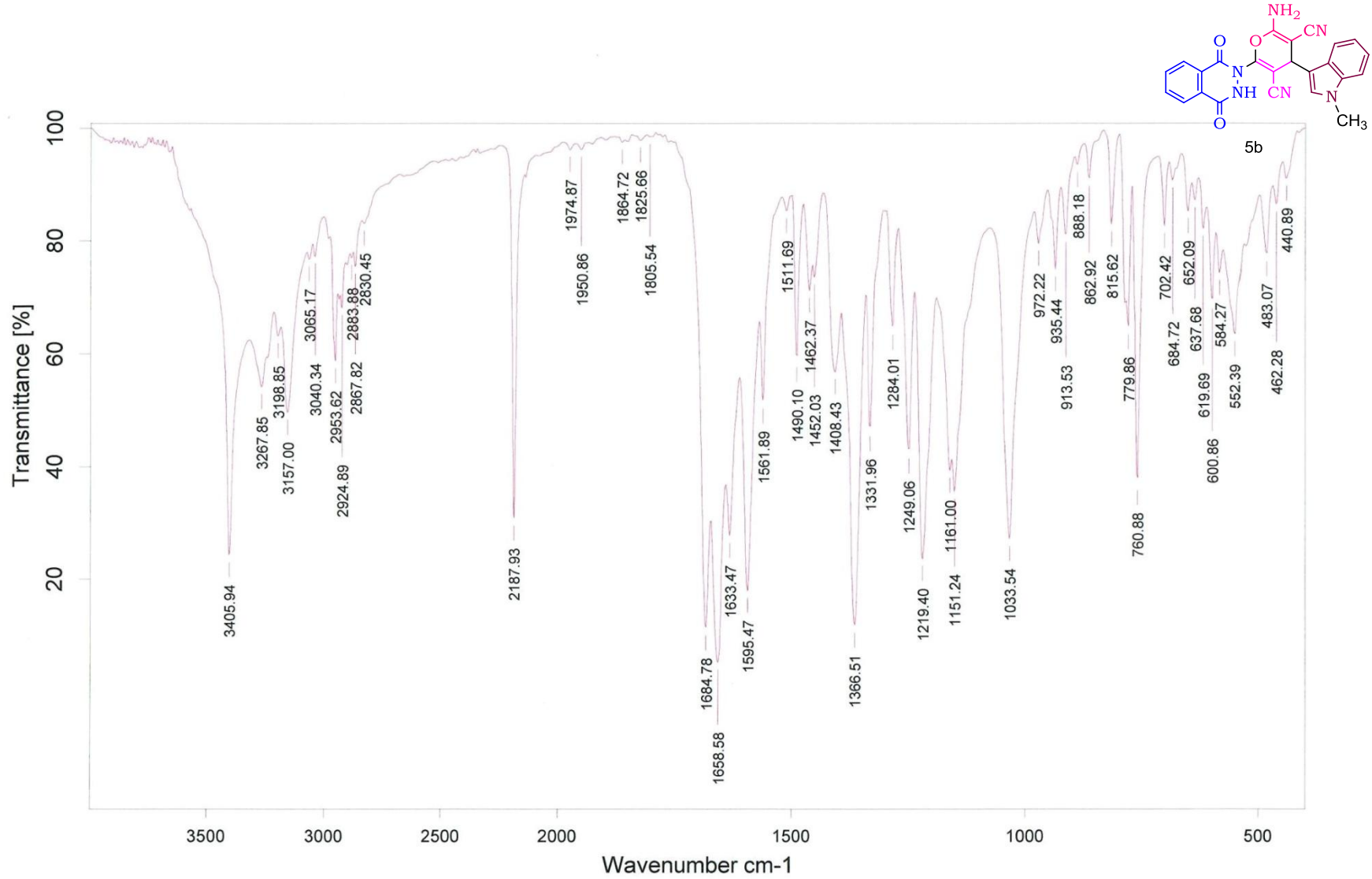
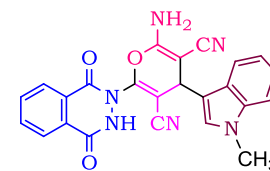


Fig. 5: IR spectrum of compound 5b

¹H NMR IN DMSO-d₆
AV 400MHz



5b

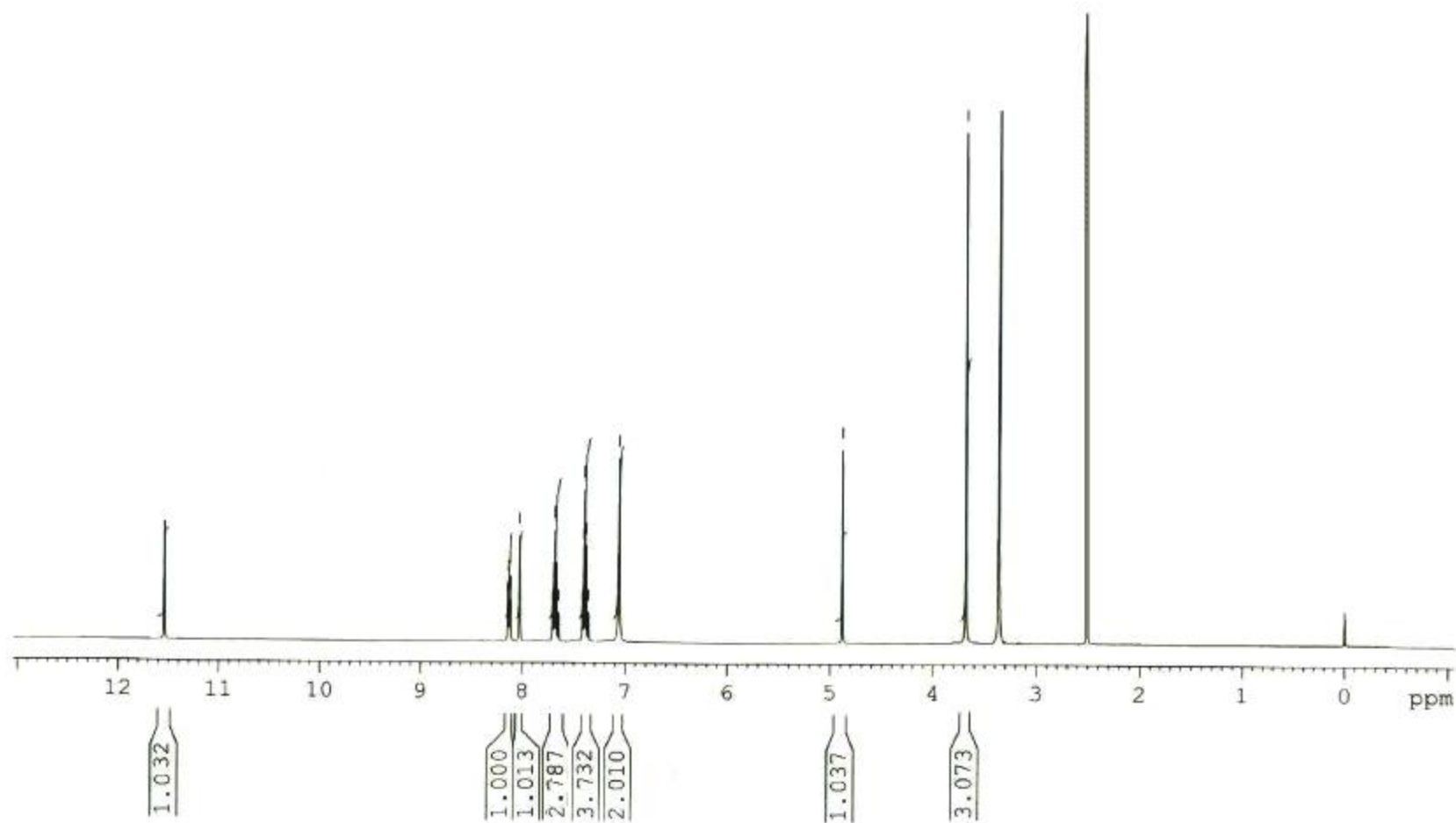
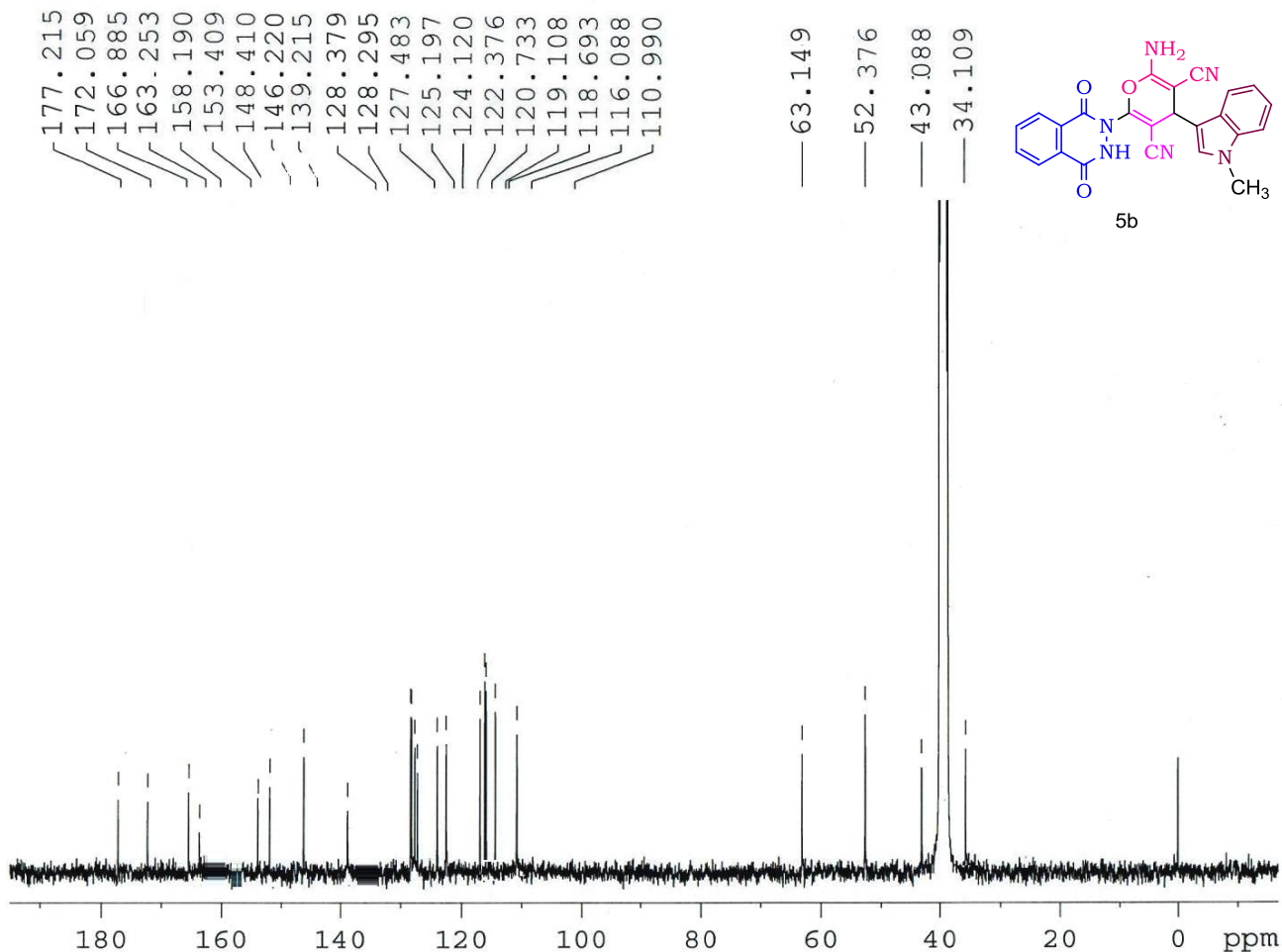


Fig. 6: ¹H NMR spectrum of compound 5b

¹³C NMR IN DMSO-d₆

Instrument : 400MHz
Make/Model : Bruker/AVANCE-III 400



Current Data Parameters
NAME 29-TTS-VII-001-15-13C
EXPNO 1
PROCNO 1

F2 - Acquisition Parameters

Time 18.01 h
INSTRUM spect
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PULPROG zgpg30
TD 24036
SOLVENT DMSO
NS 20480
DS 4
SWH 24038.461 Hz
FIDRES 1.000102 Hz
AQ 0.4999488 sec
RG 203
DW 20.800 usec
DE 6.50 usec
TE 298.2 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
SFO1 100.6228298 MHz
NUC1 13C
P1 10.00 usec
PLW1 51.54999924 W
SFO2 400.1316005 MHz
NUC2 1H
CPDPRG[2] waltz16
PCPD2 90.00 usec
PLW2 12.80700016 W
PLW12 0.34165999 W
PLW13 0.17185000 W

F2 - Processing parameters
SI 32768
SF 100.6128187 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 1.40

Fig. 7: ¹³C NMR spectrum of compound 5b

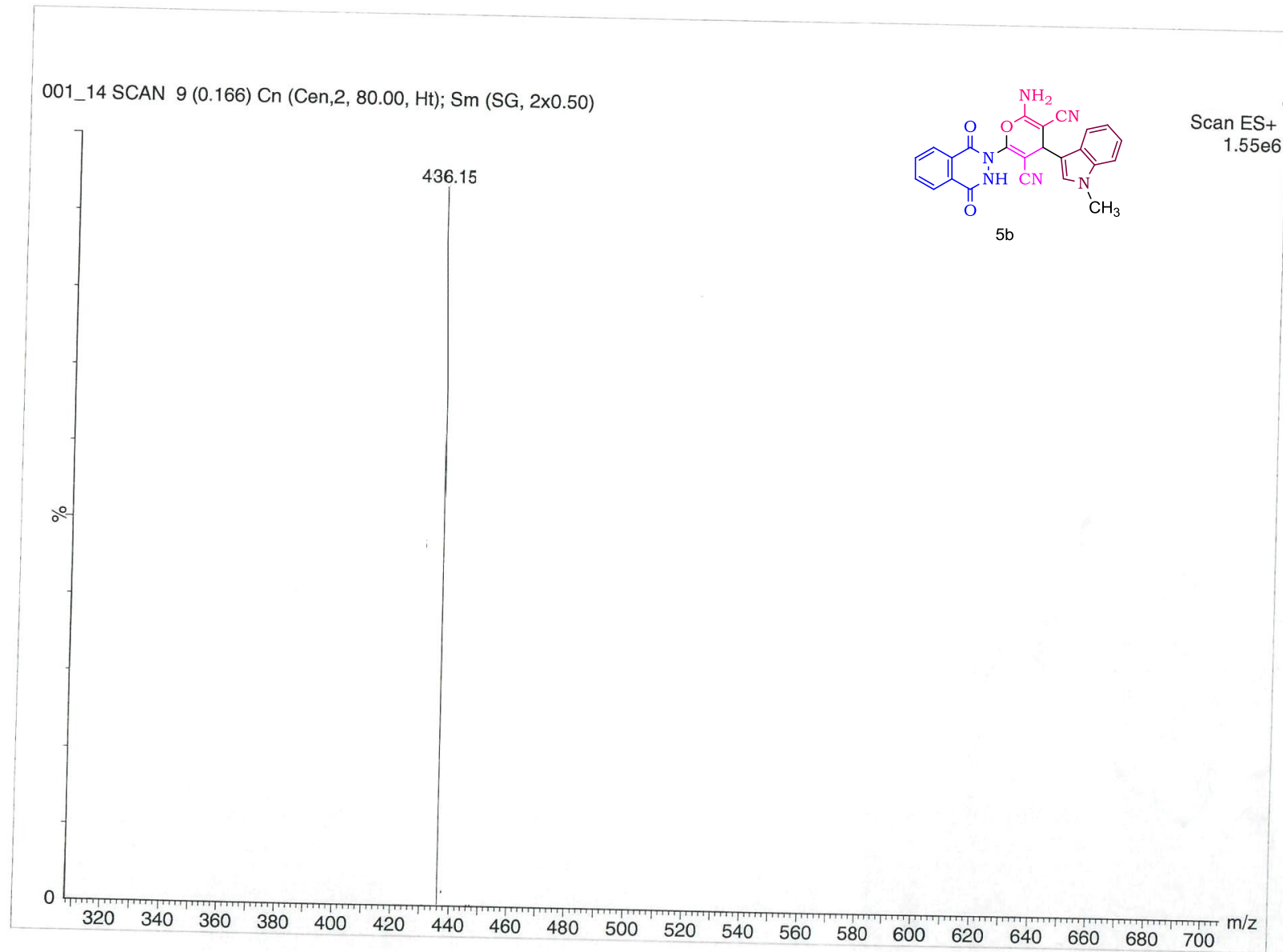


Fig. 8: Mass spectrum of compound 5b

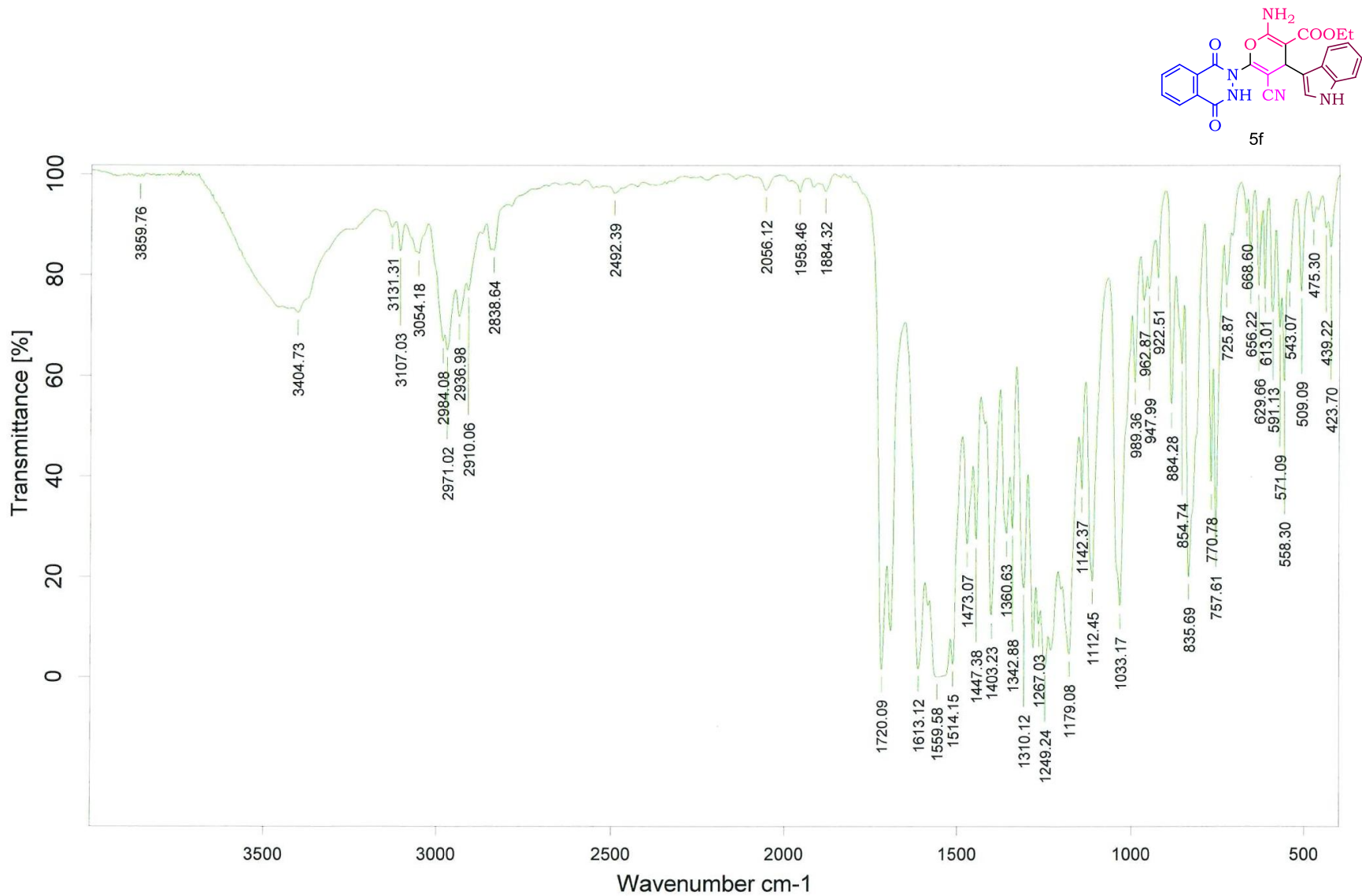


Fig. 9: IR spectrum of compound 5f

¹H NMR IN DMSO-D6
AV 400MHz

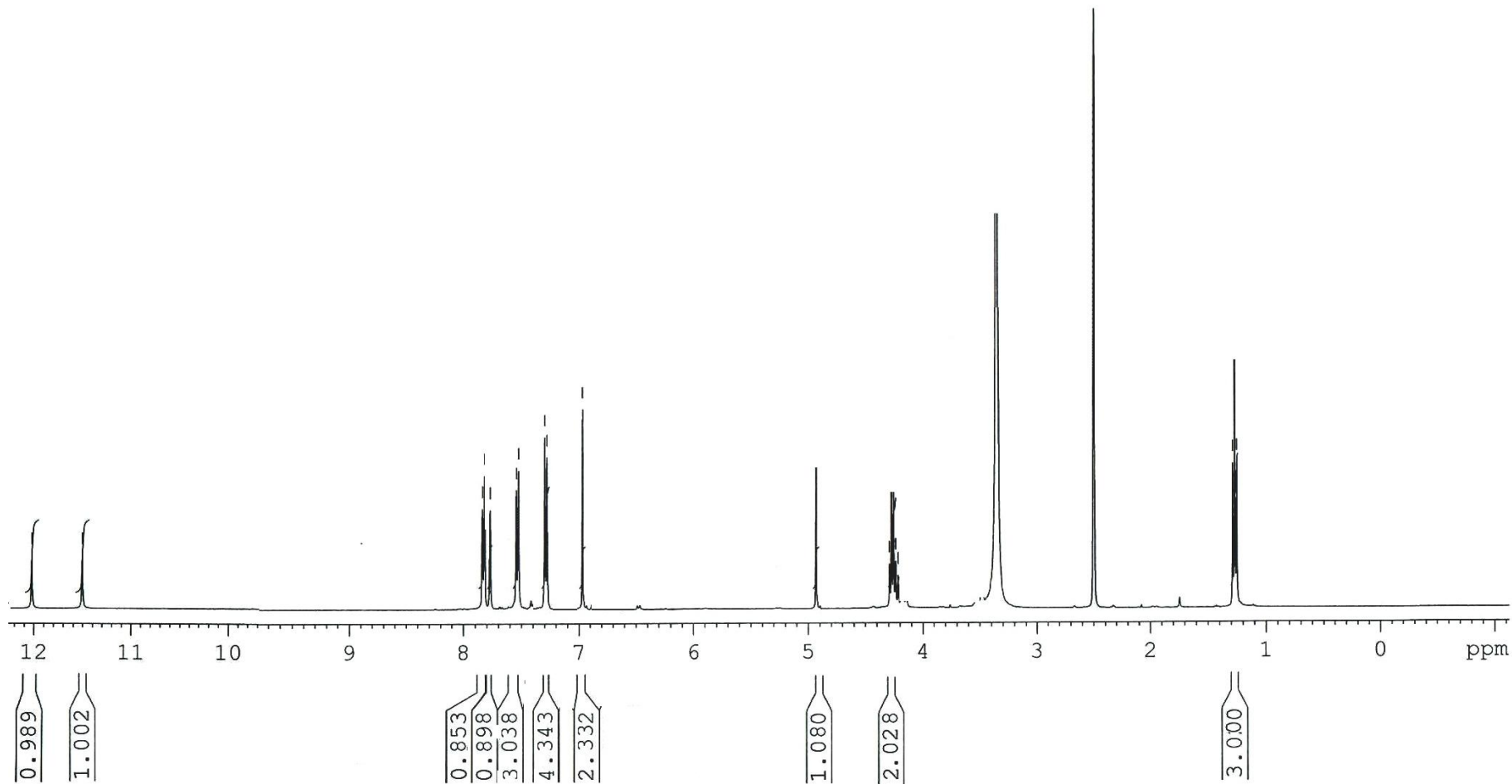
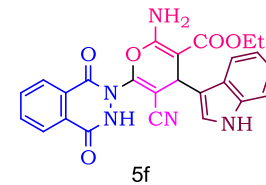
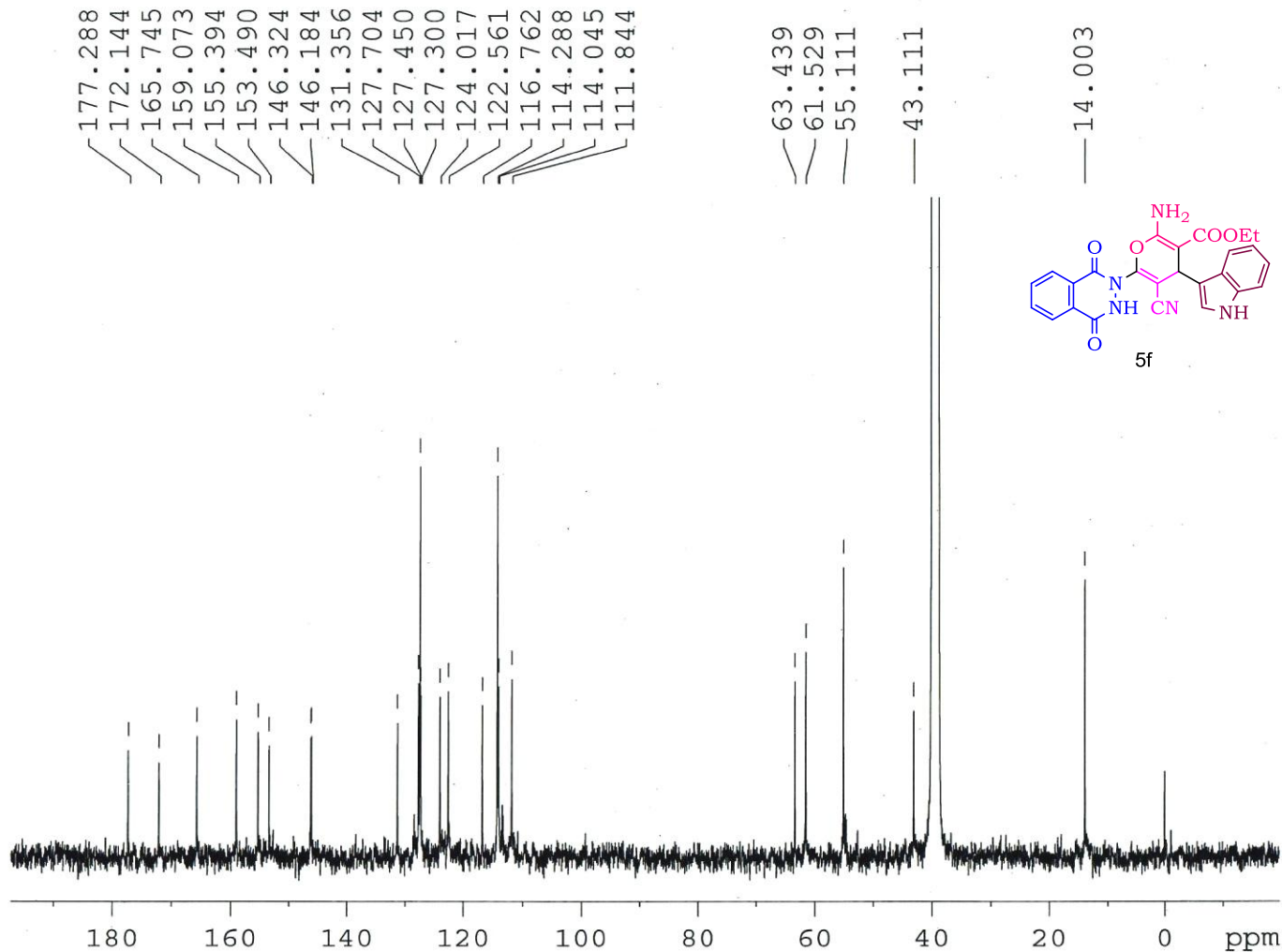


Fig. 10: ¹H NMR spectrum of compound 5f

¹³C NMR IN DMSO-d₆

Instrument : 400MHz
Make/Model : Bruker/AVANCE-III 400



Current Data Parameters
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EXPNO 1
PROCNO 1

F2 - Acquisition Parameters

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SOLVENT DMSO
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FIDRES 1.000102 Hz
AQ 0.4999488 sec
RG 203
DW 20.800 usec
DE 6.50 usec
TE 298.4 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
SFO1 100.6228298 MHz
NUC1 13C
P1 9.90 usec
PLW1 54.59999847 W
SFO2 400.1316005 MHz
NUC2 1H
CPDPRG[2] waltz16
PCPD2 90.00 usec
PLW2 12.80700016 W
PLW12 0.34165999 W
PLW13 0.17185000 W

F2 - Processing parameters
SI 32768
SF 100.6128186 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 1.40

Fig. 11: ¹³C NMR spectrum of compound 5f

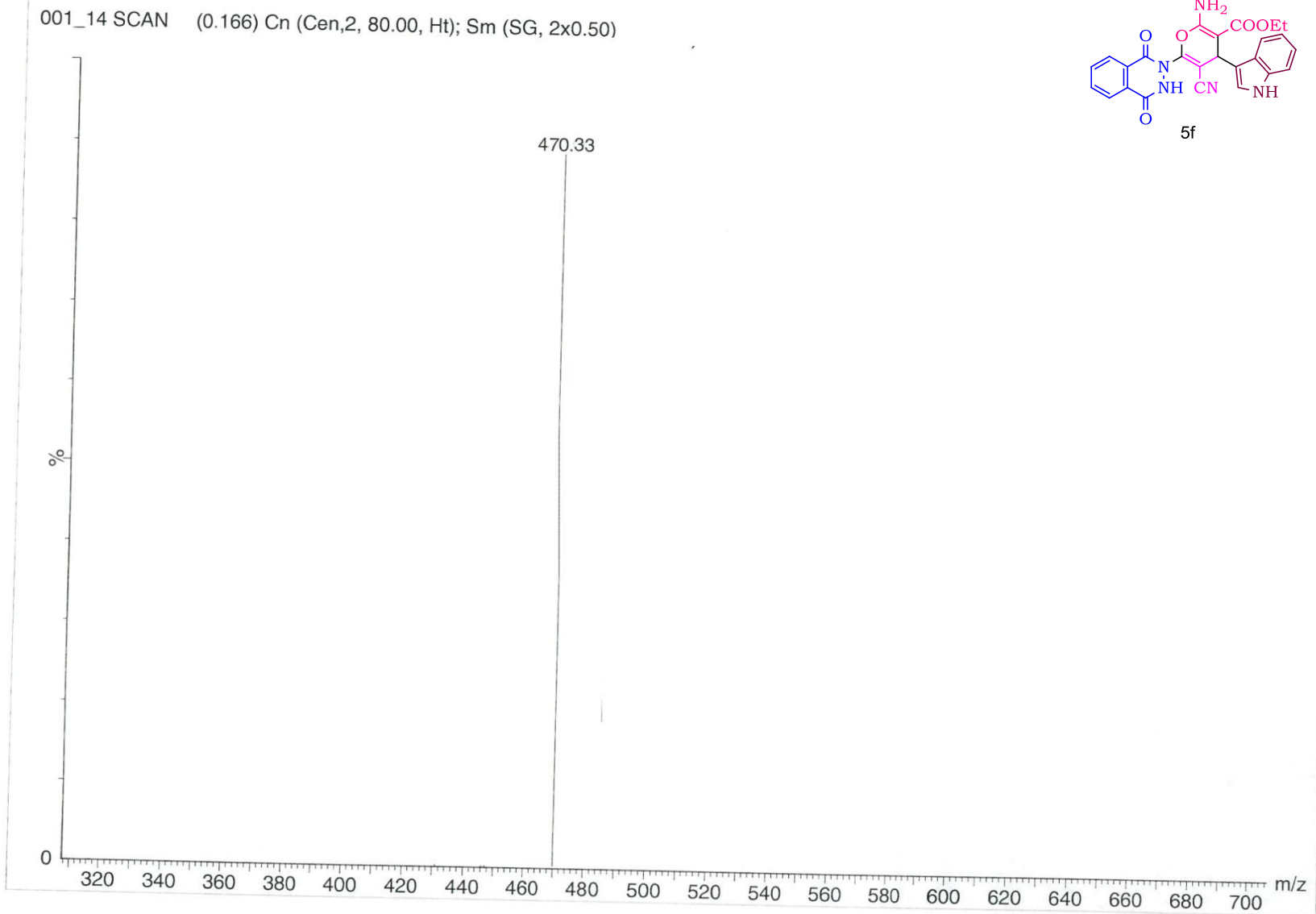


Fig. 12: Mass spectrum of compound 5f

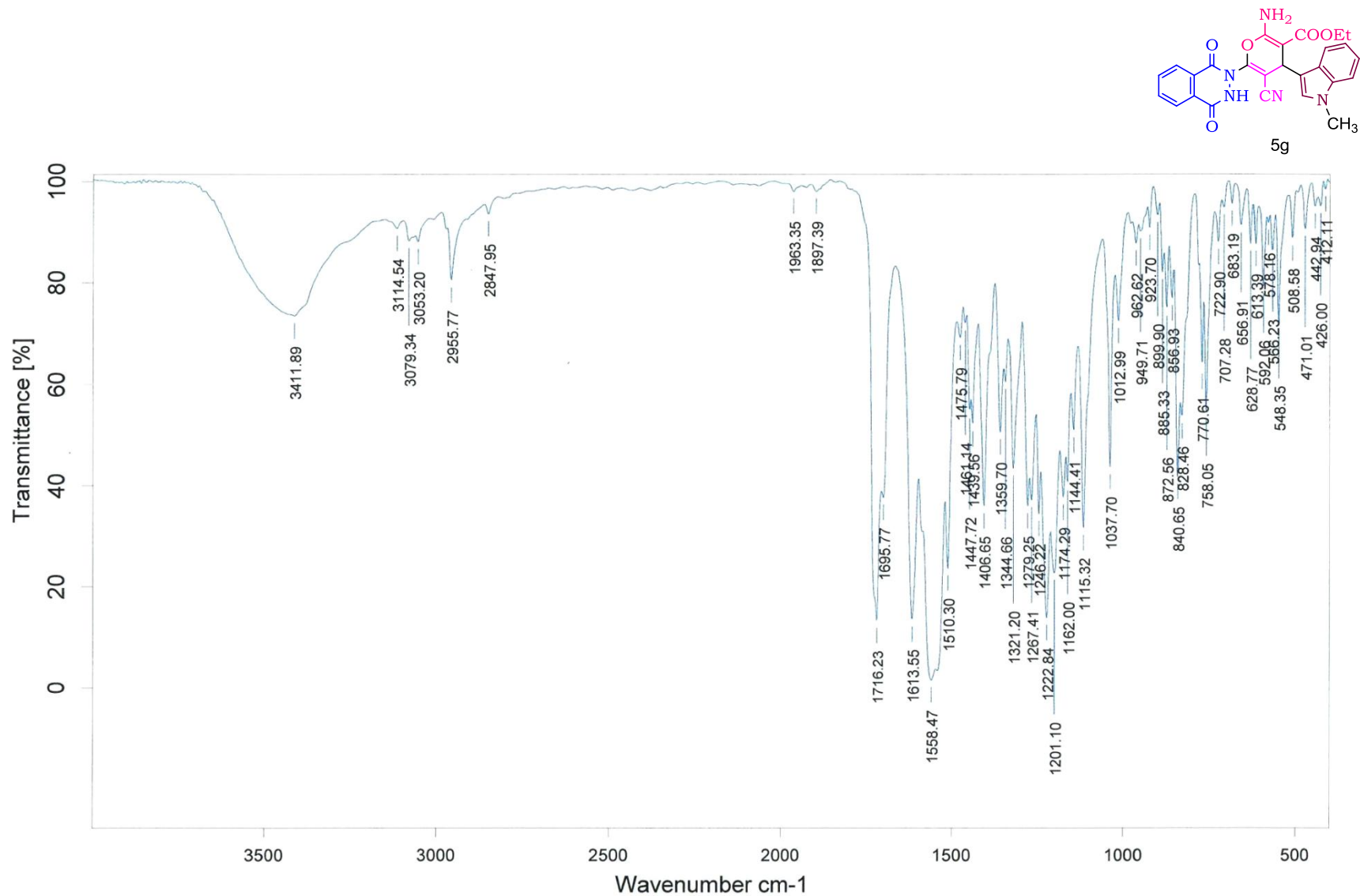


Fig. 13: IR spectrum of compound 5g

^1H NMR IN DMSO-D₆
AV 400MHz

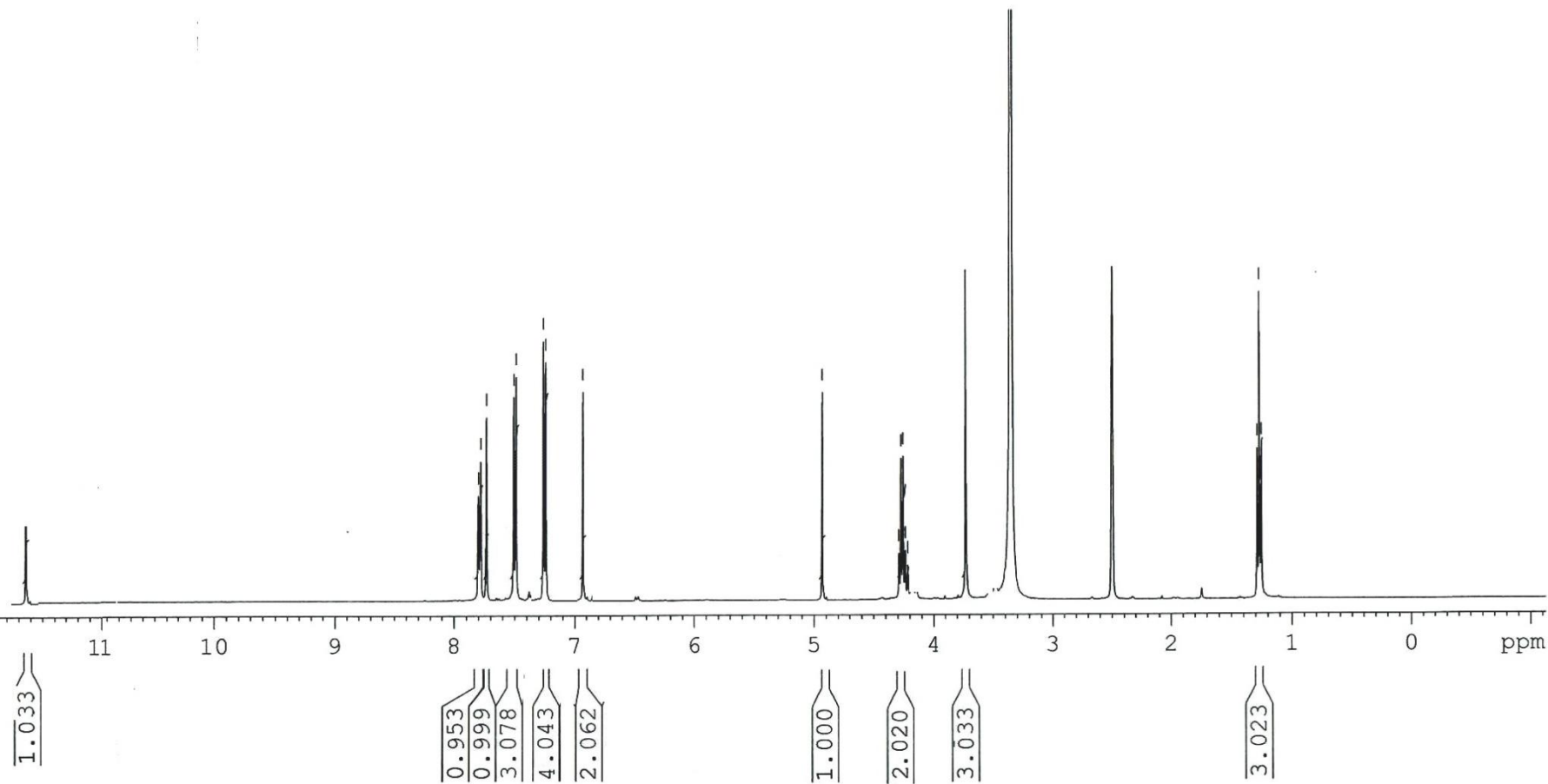
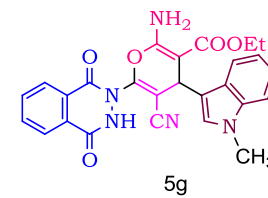


Fig. 14: ^1H NMR spectrum of compound 5g

^{13}C NMR IN DMSO- D_6
AV 400MHz

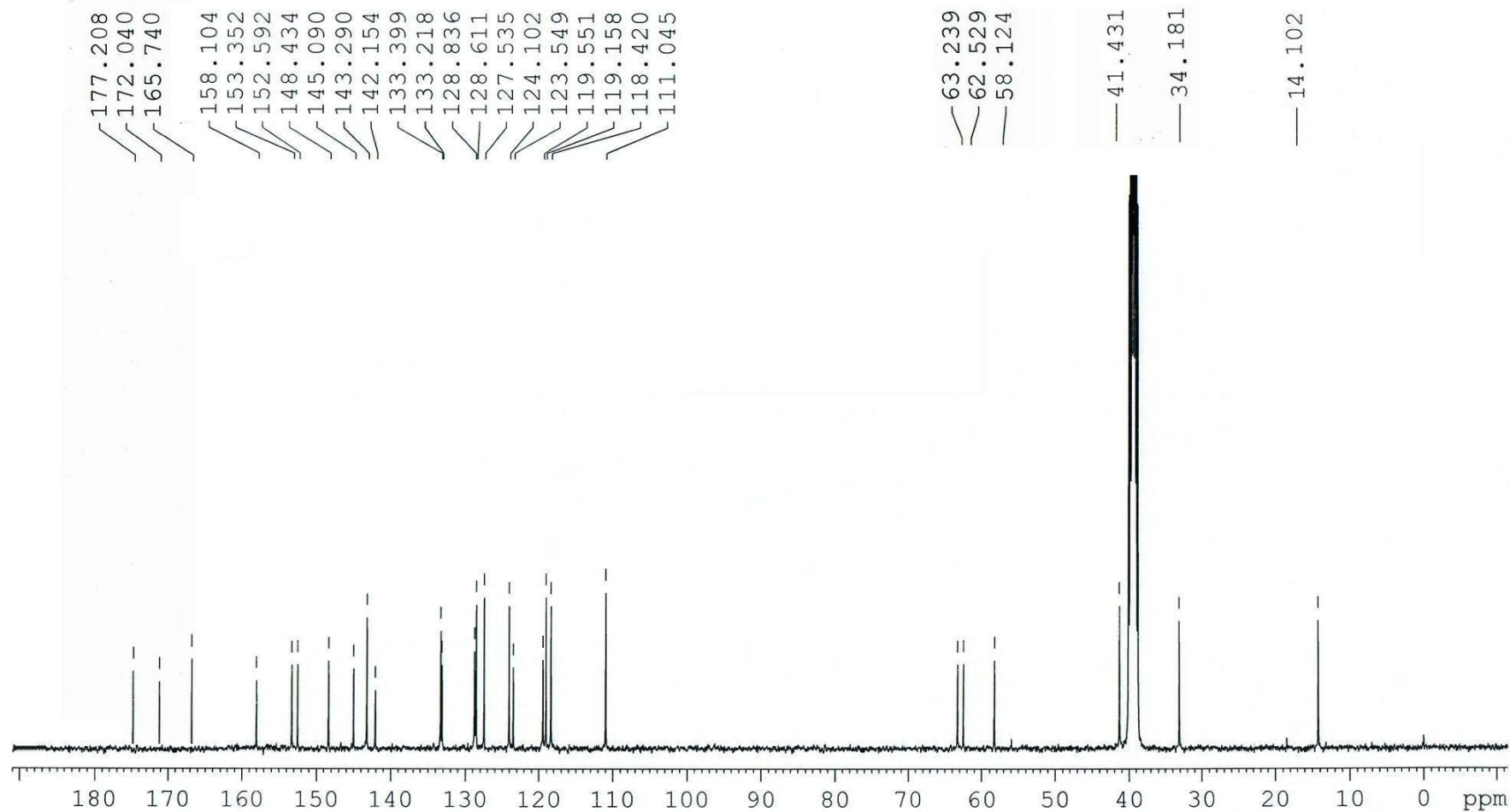
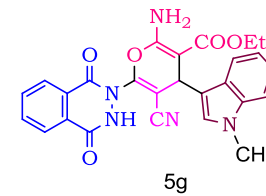


Fig. 15: ^{13}C NMR spectrum of compound 5g

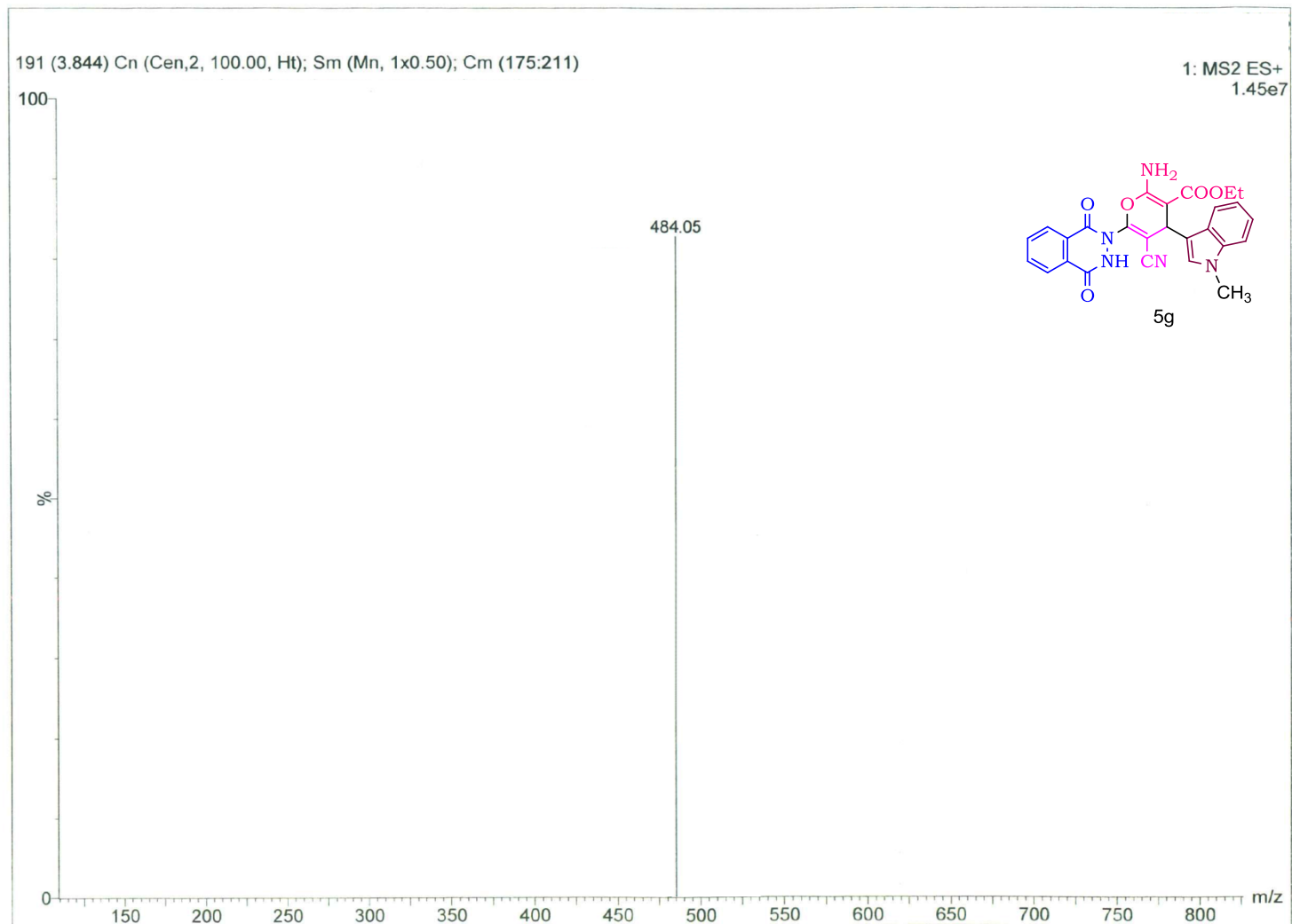


Fig. 16: Mass spectrum of compound 5g