

Supplementary Material

Synthesis and characterization of some new thieno[2,3-*b*]pyridines, thieno[2,3-*c*][2,7]naphthyridinones and pyrazolo[3,4-*c*][2,7]naphthyridinones with expected biological activity

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IR, ¹H NMR and ¹³C NMR and MS spectra of synthesized compounds S2

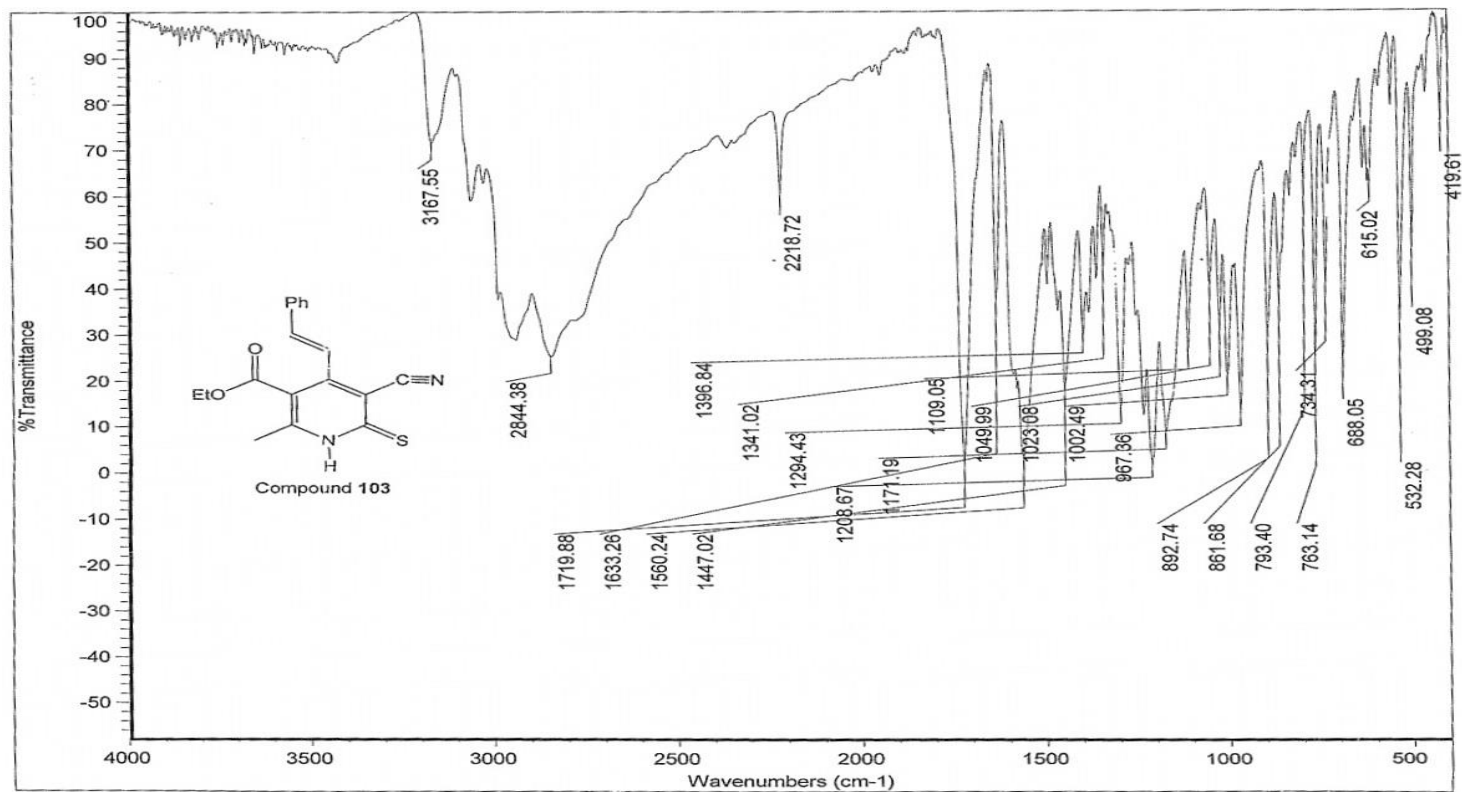


Figure S1: IR spectrum of compound 2.

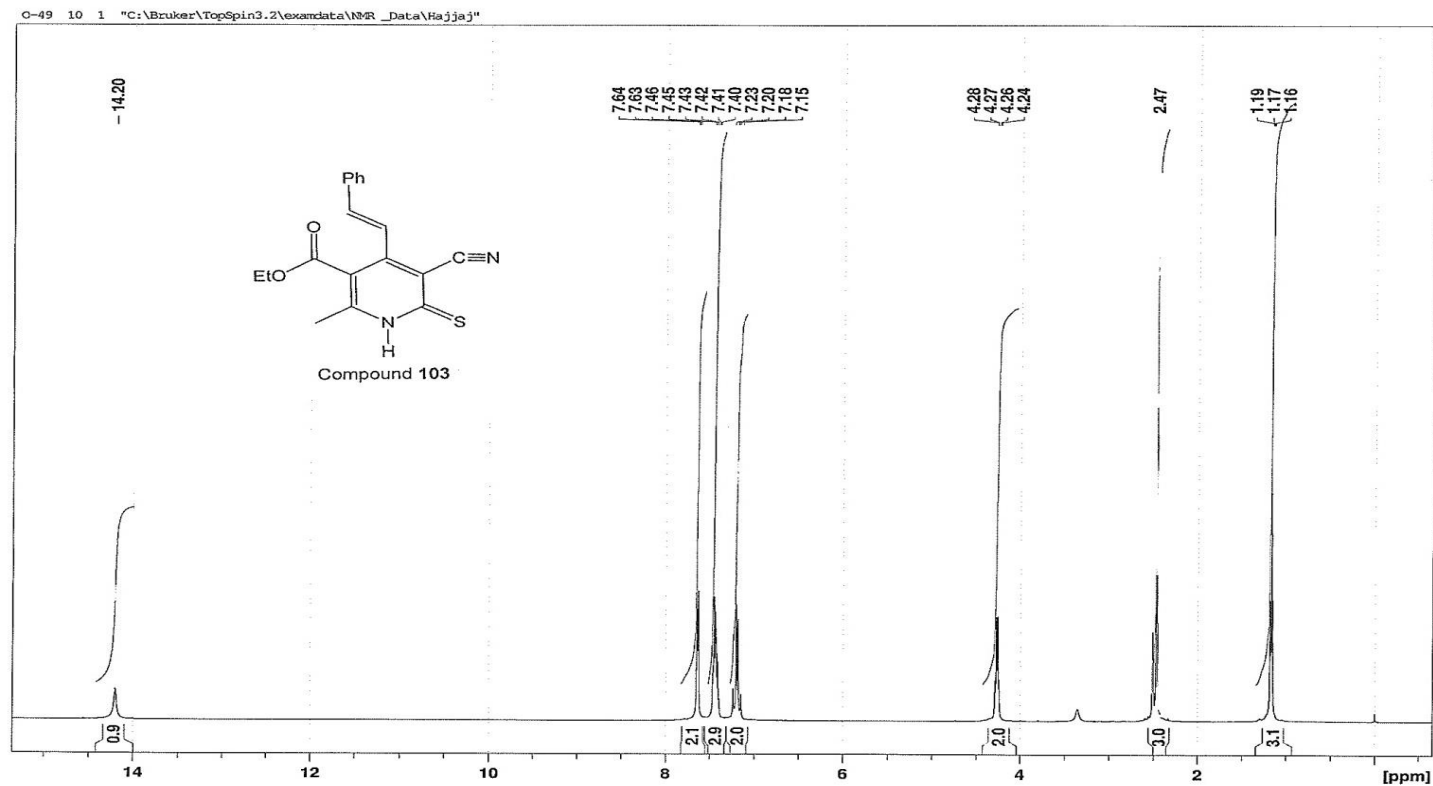


Figure S2: ^1H NMR spectrum of compound 2 in $\text{DMSO-}d_6$.

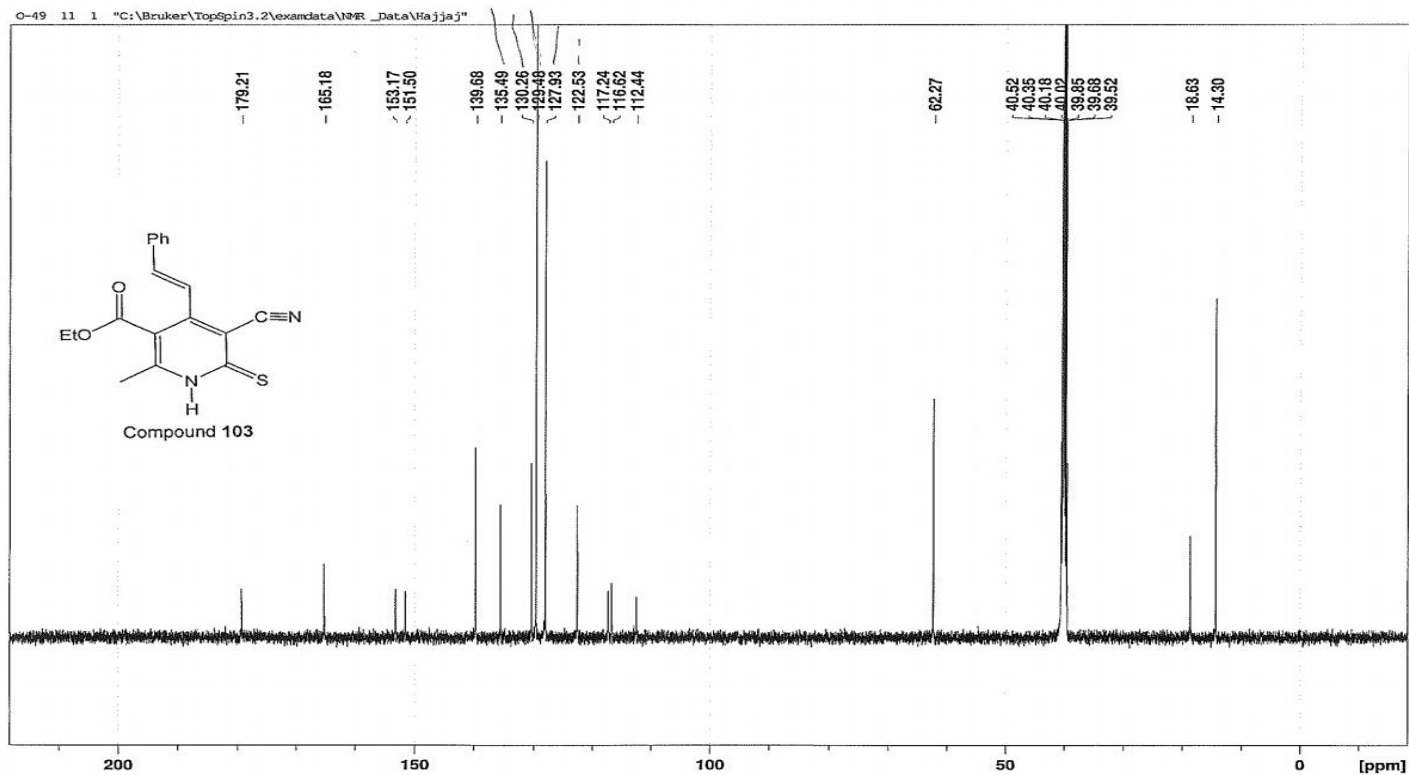


Figure S3: ^{13}C NMR spectrum of compound 2 in $\text{DMSO-}d_6$.

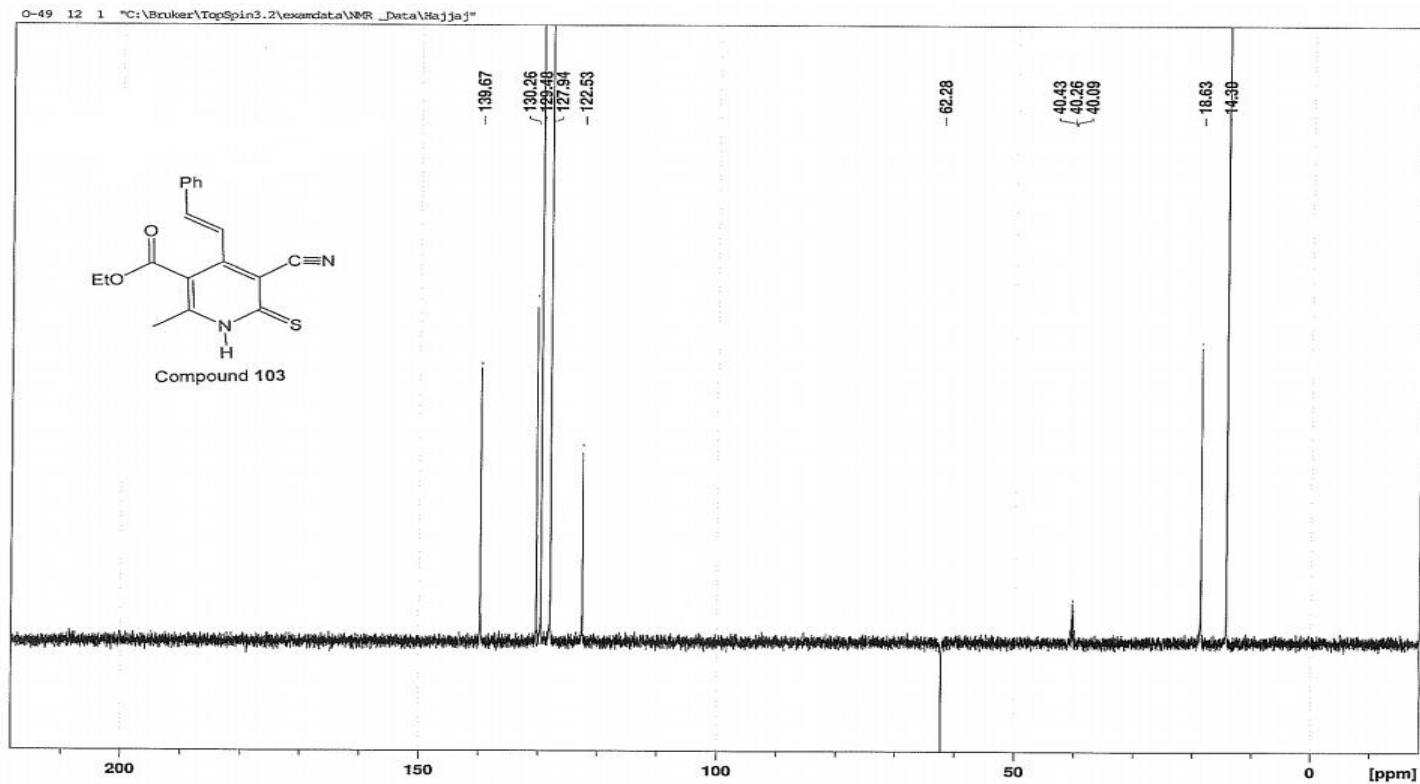


Figure S4: DEPT 135 spectrum of compound 2 in DMSO- d_6 .

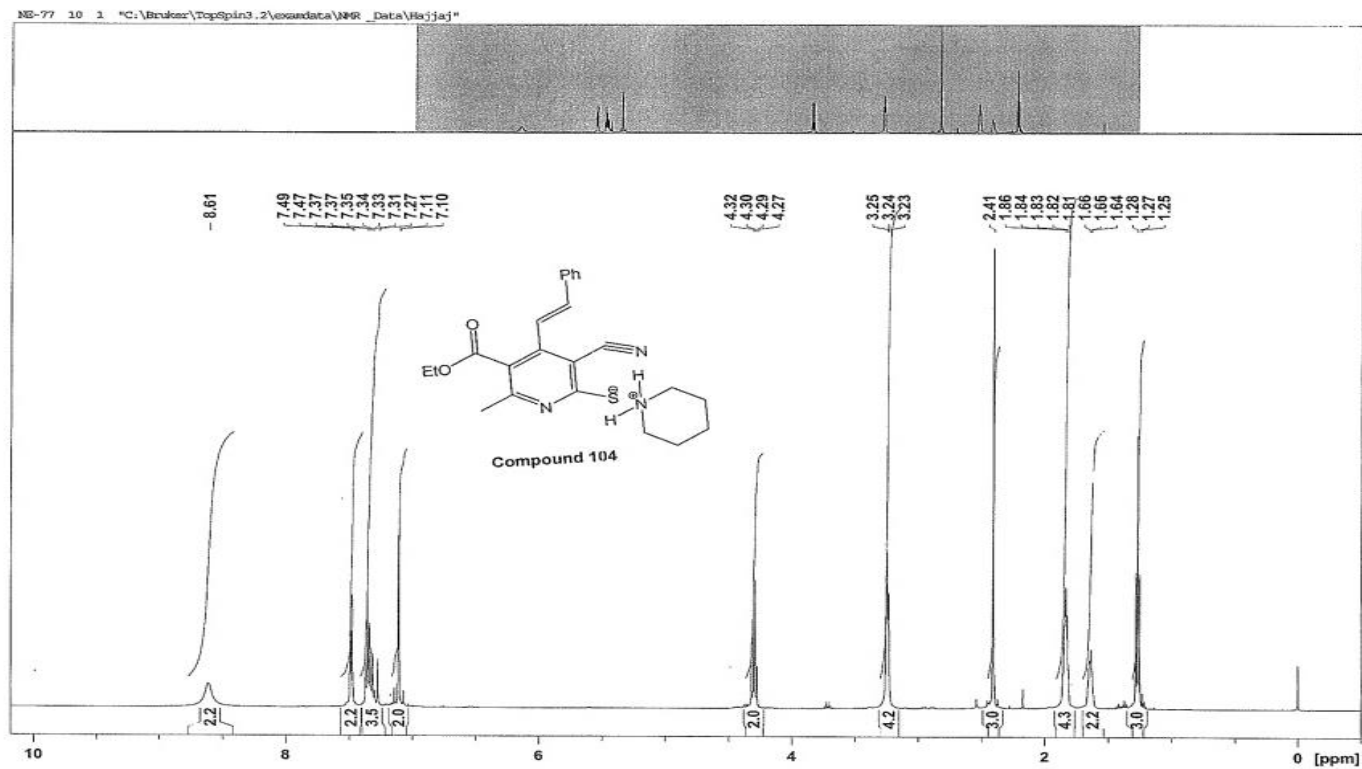


Figure S5: ^1H NMR spectrum of compound 3 in CDCl_3 .

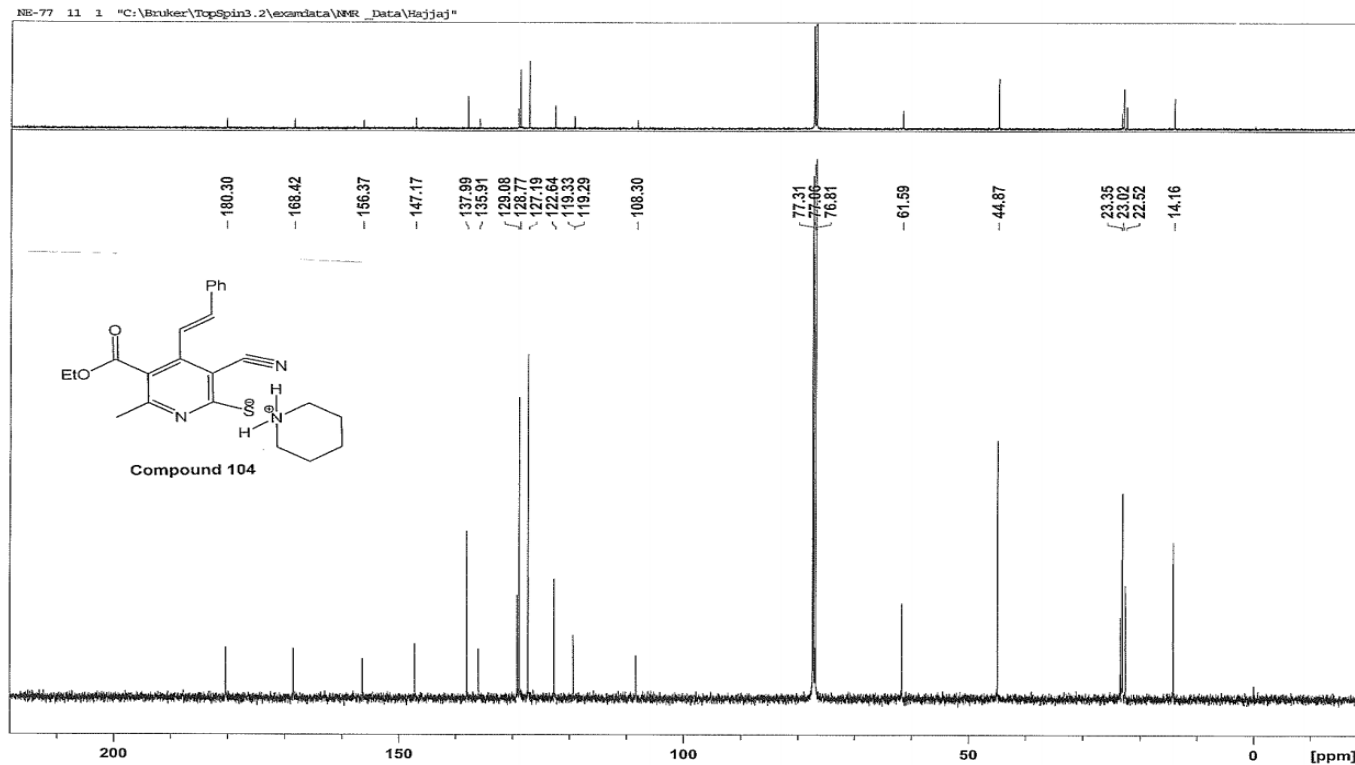


Figure S6: ¹³C NMR spectrum of compound 3 in CDCl₃.

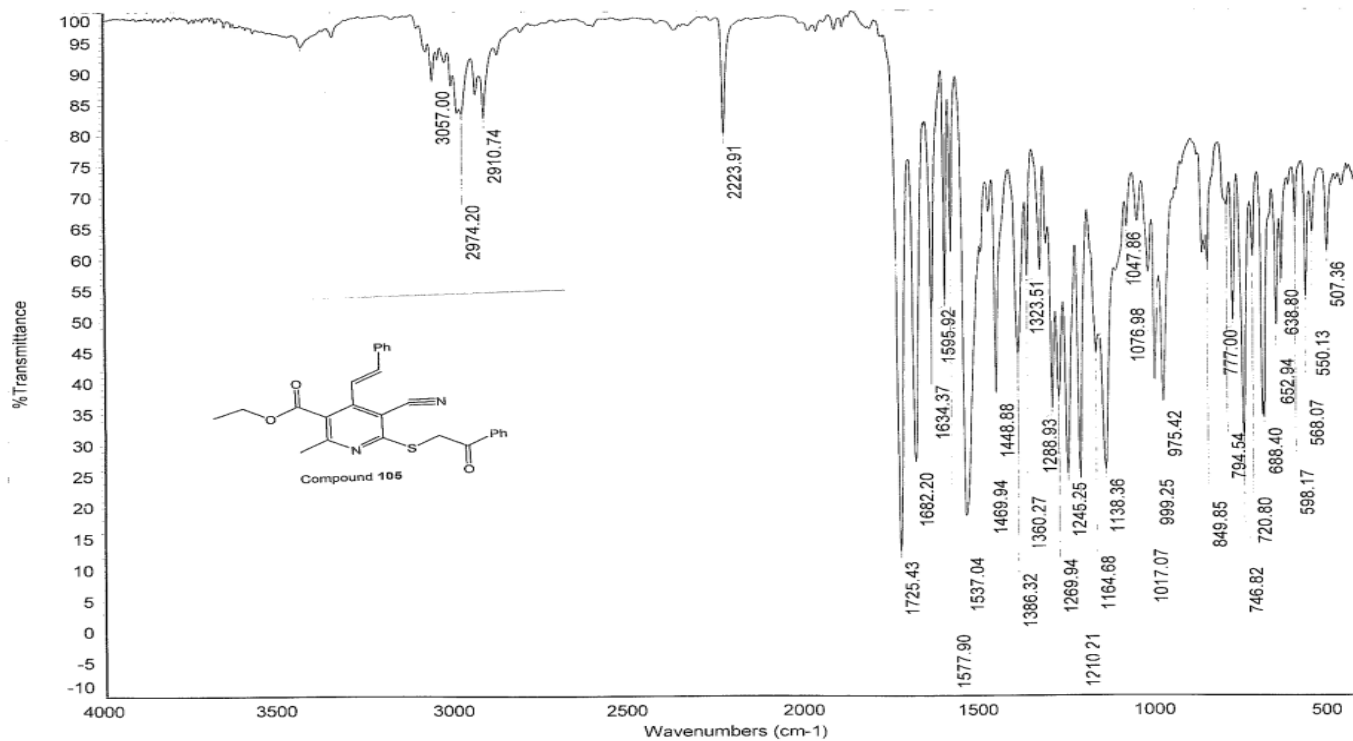


Figure. S7: IR spectrum of compound 5.

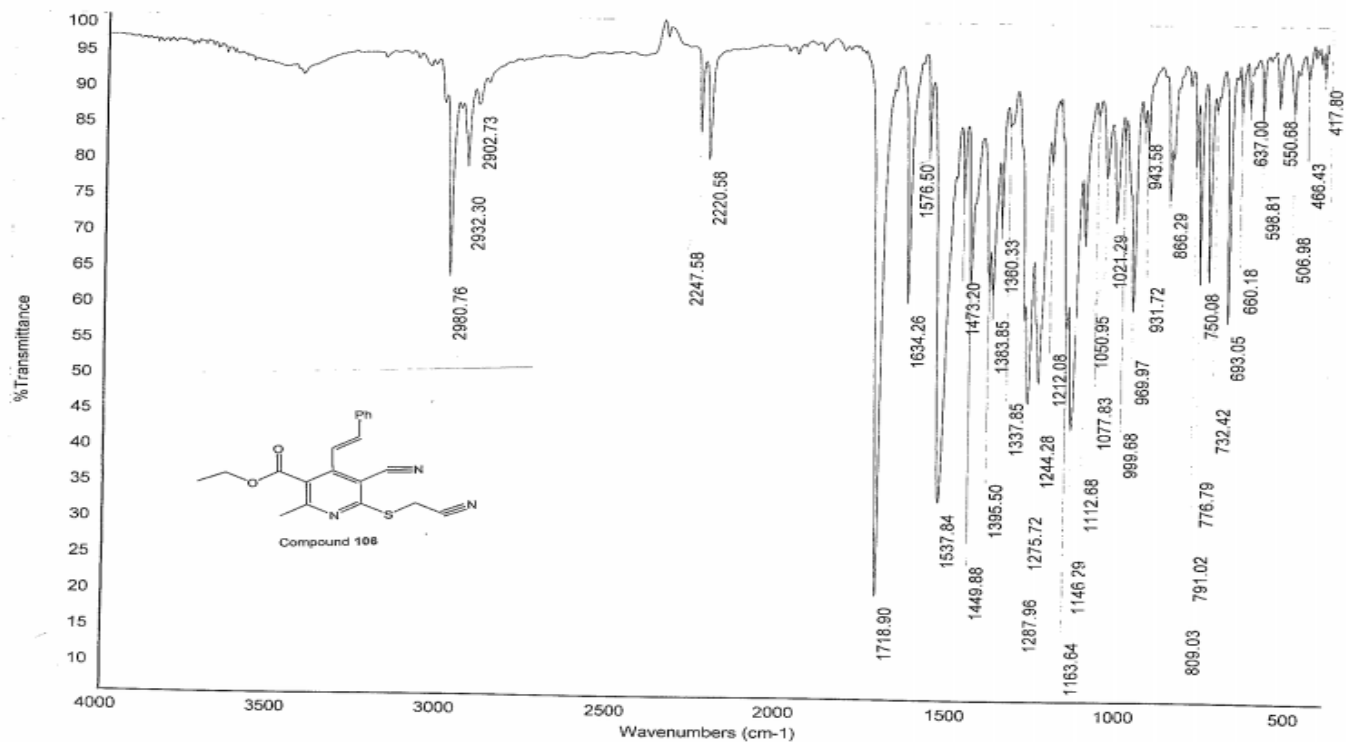


Figure S8: IR spectrum of compound 6.

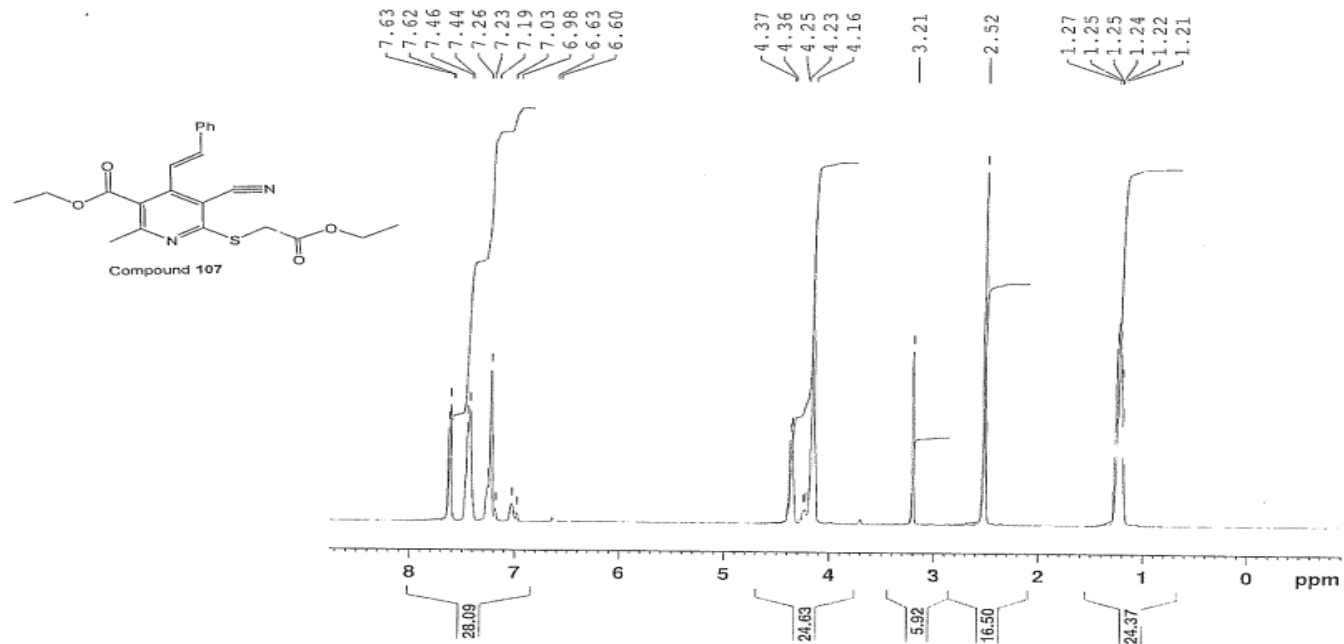


Figure S9: ¹H NMR spectrum of compound 7 in DMSO-*d*₆.

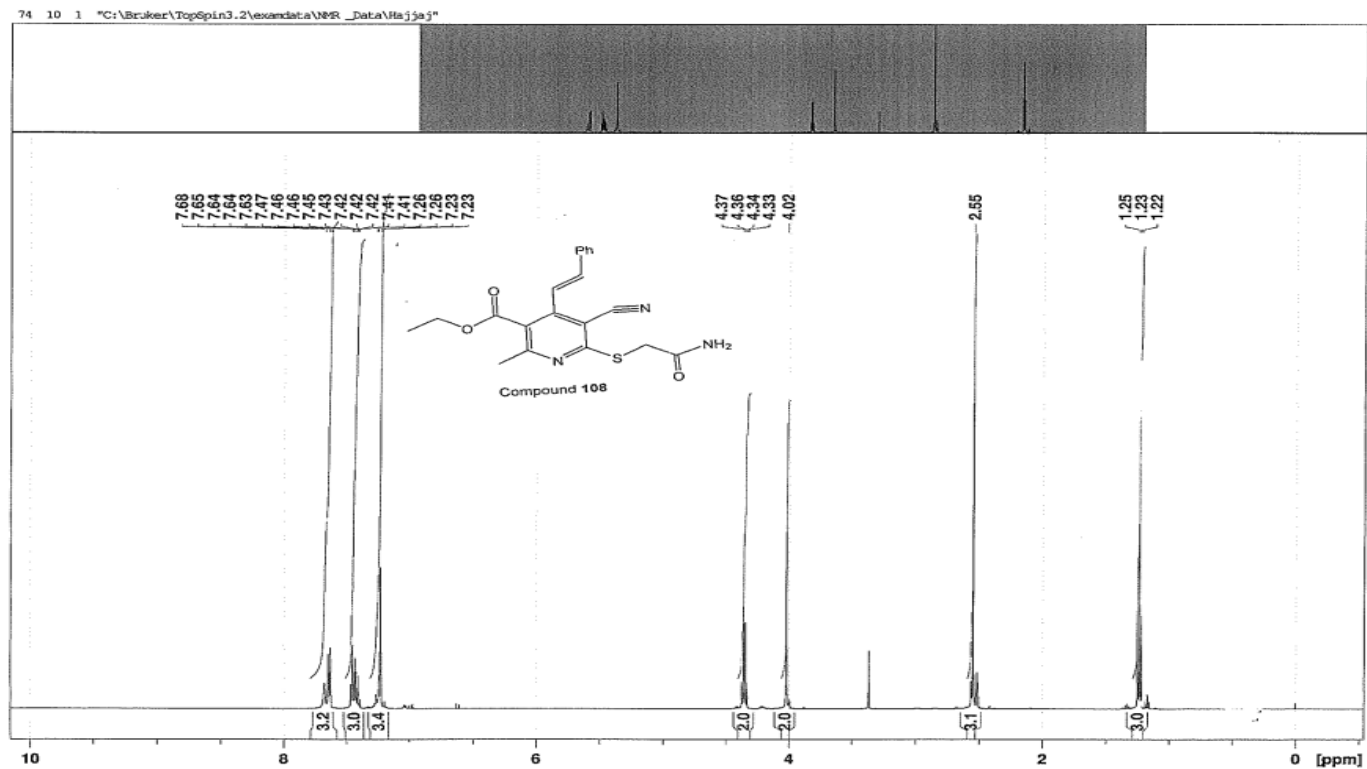


Figure S10: ^1H NMR spectrum of compound 8 in $\text{DMSO-}d_6$.

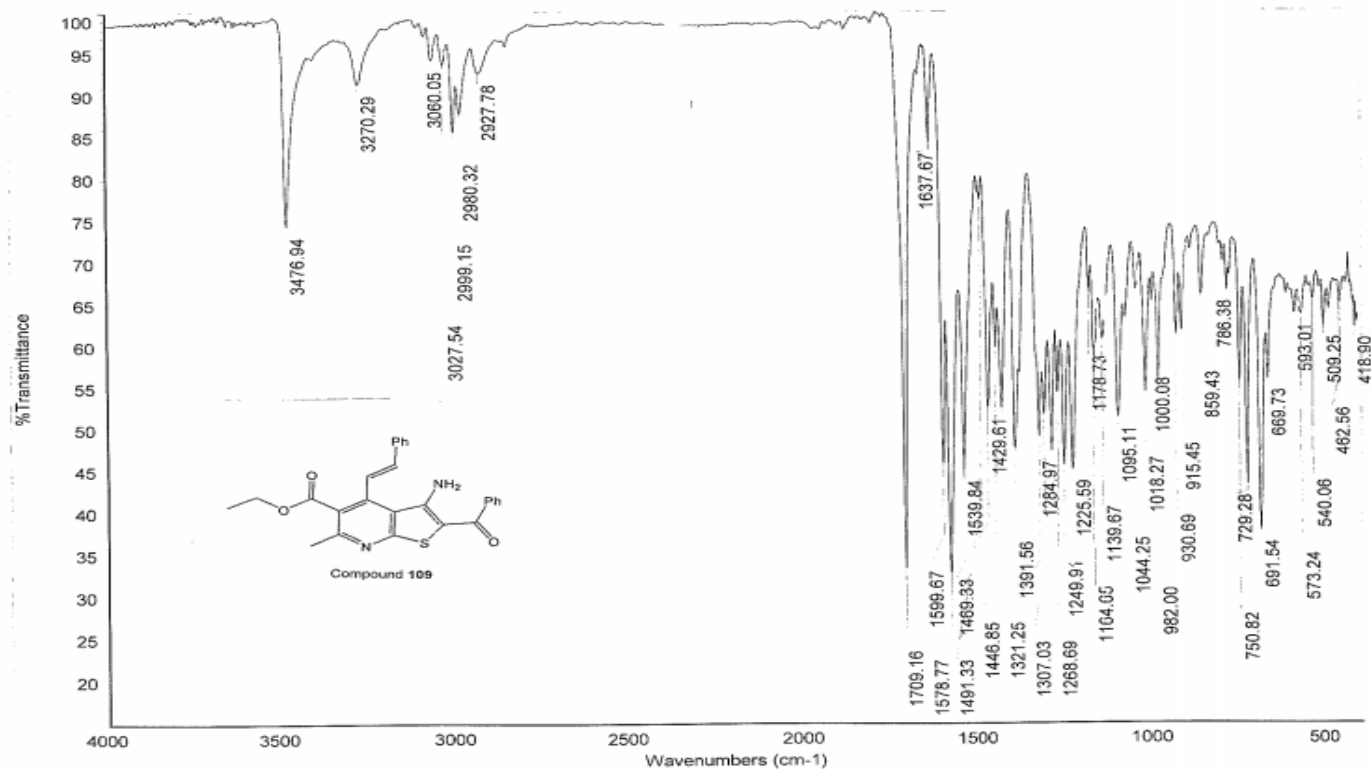


Figure S11: IR spectrum of compound 9.

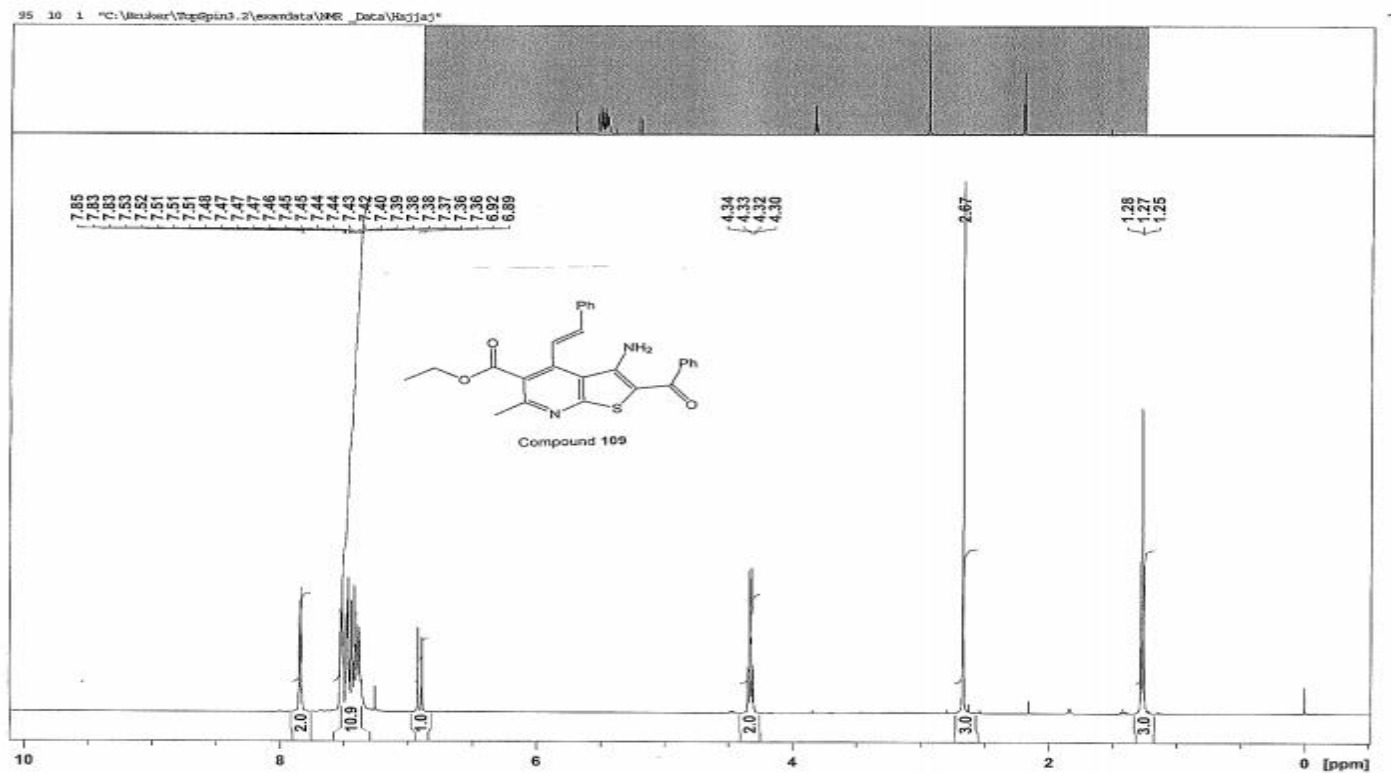


Figure S12: ^1H NMR spectrum of compound 9 in CDCl_3 .

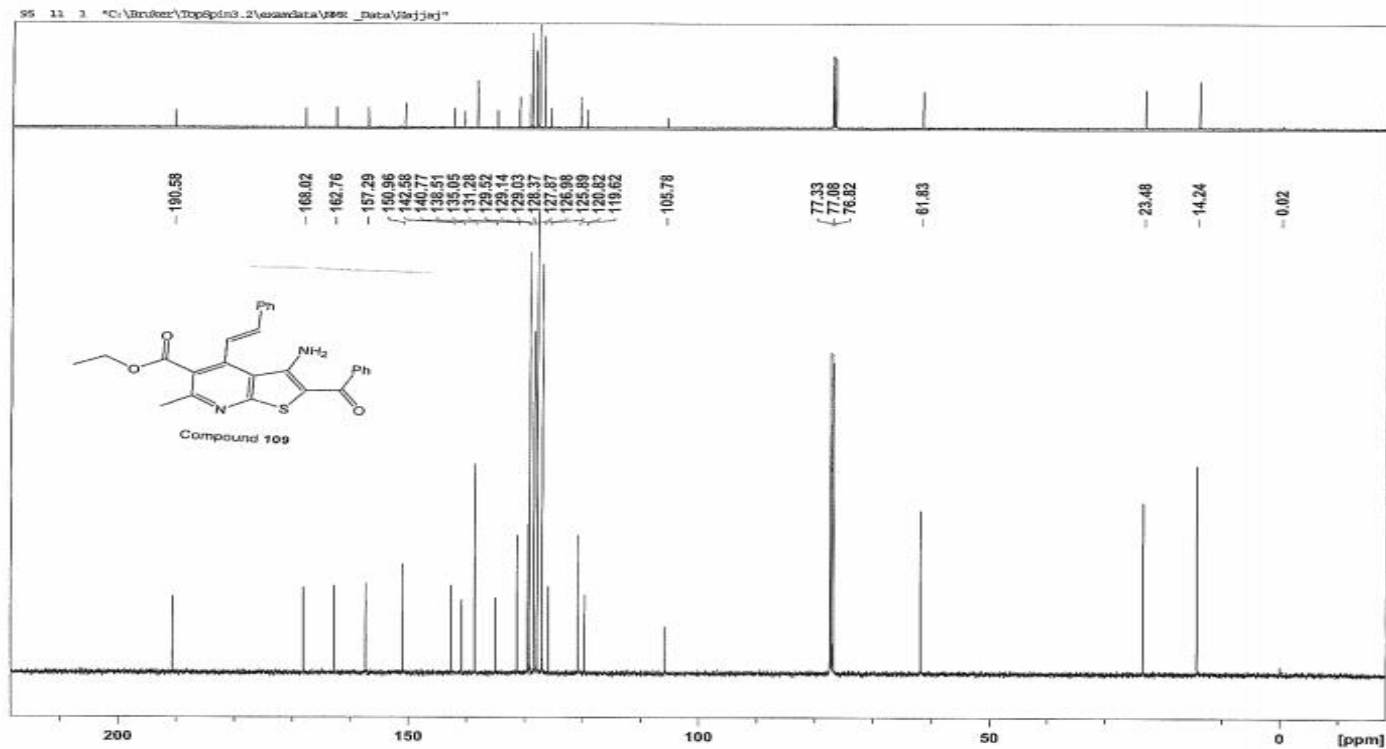


Figure S13: ^{13}C NMR spectrum of compound 9 in CDCl_3 .

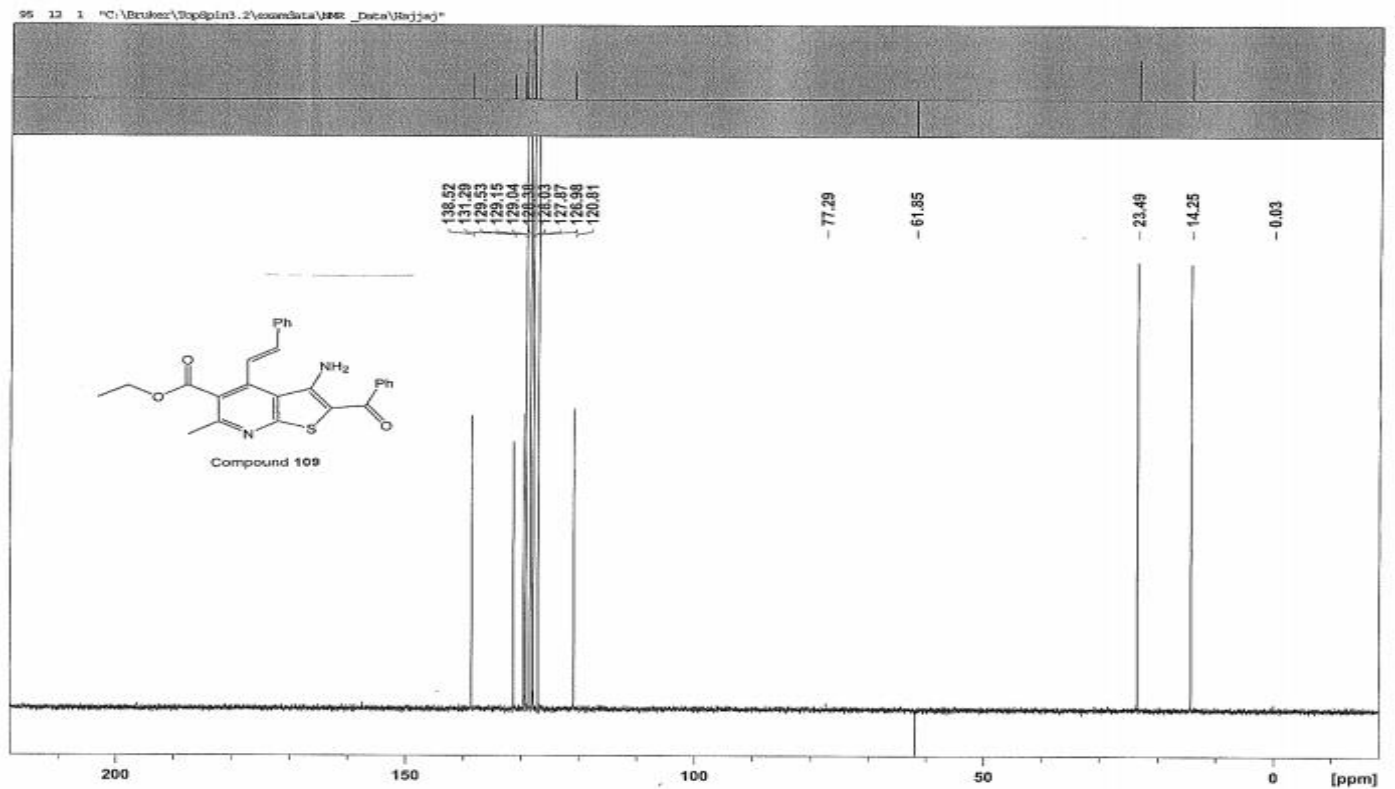


Figure S14: DEPT 135 spectrum of compound 9 in CDCl₃.

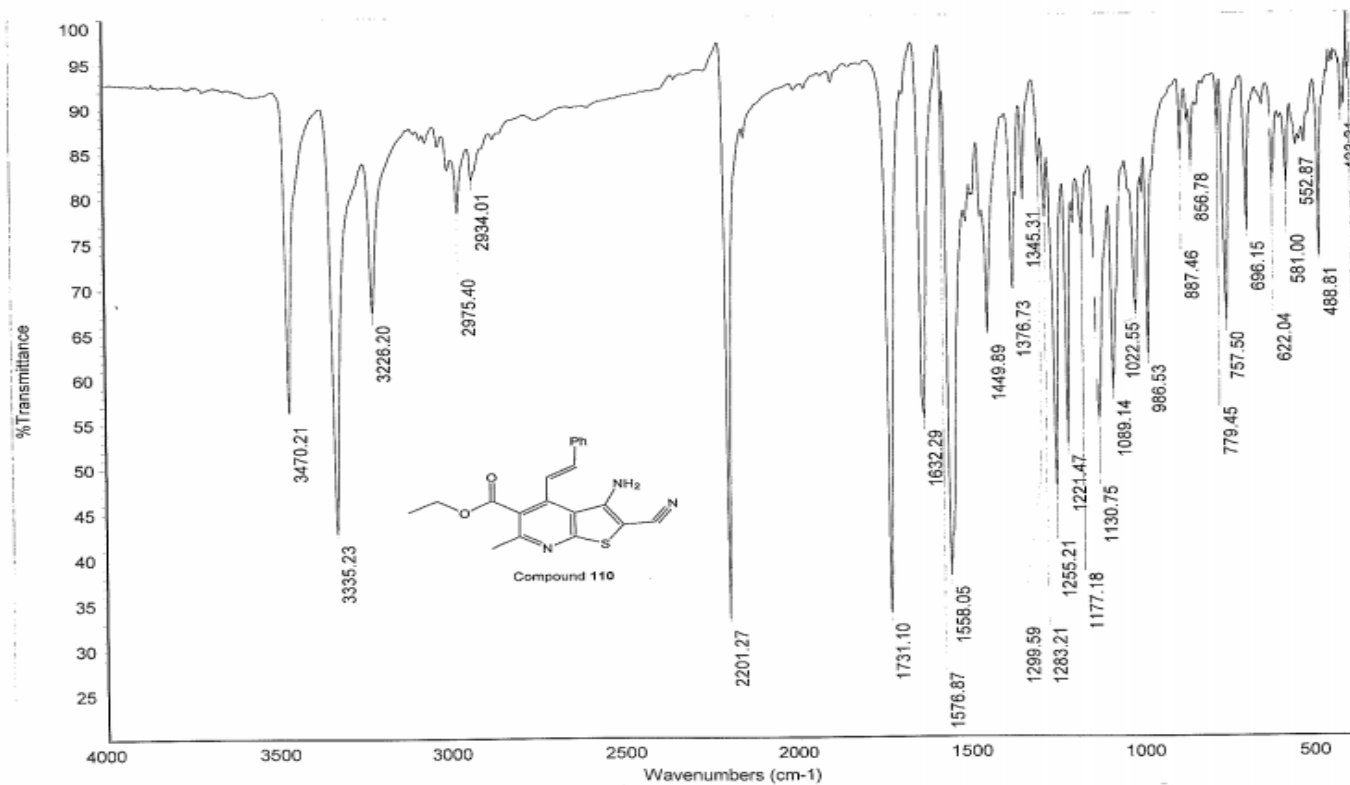


Figure S15: IR spectrum of compound 10.

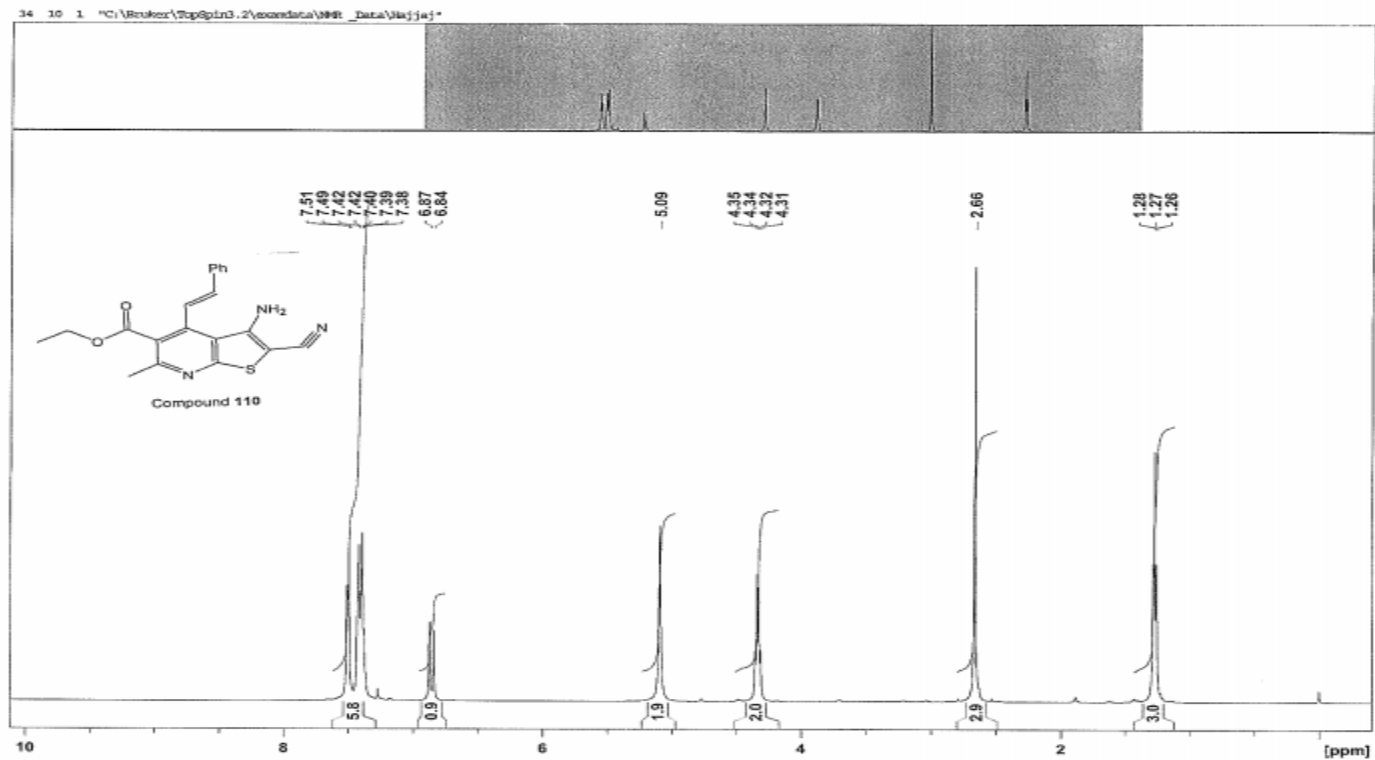


Figure S16: ^1H NMR spectrum of compound 10 in CDCl_3 .

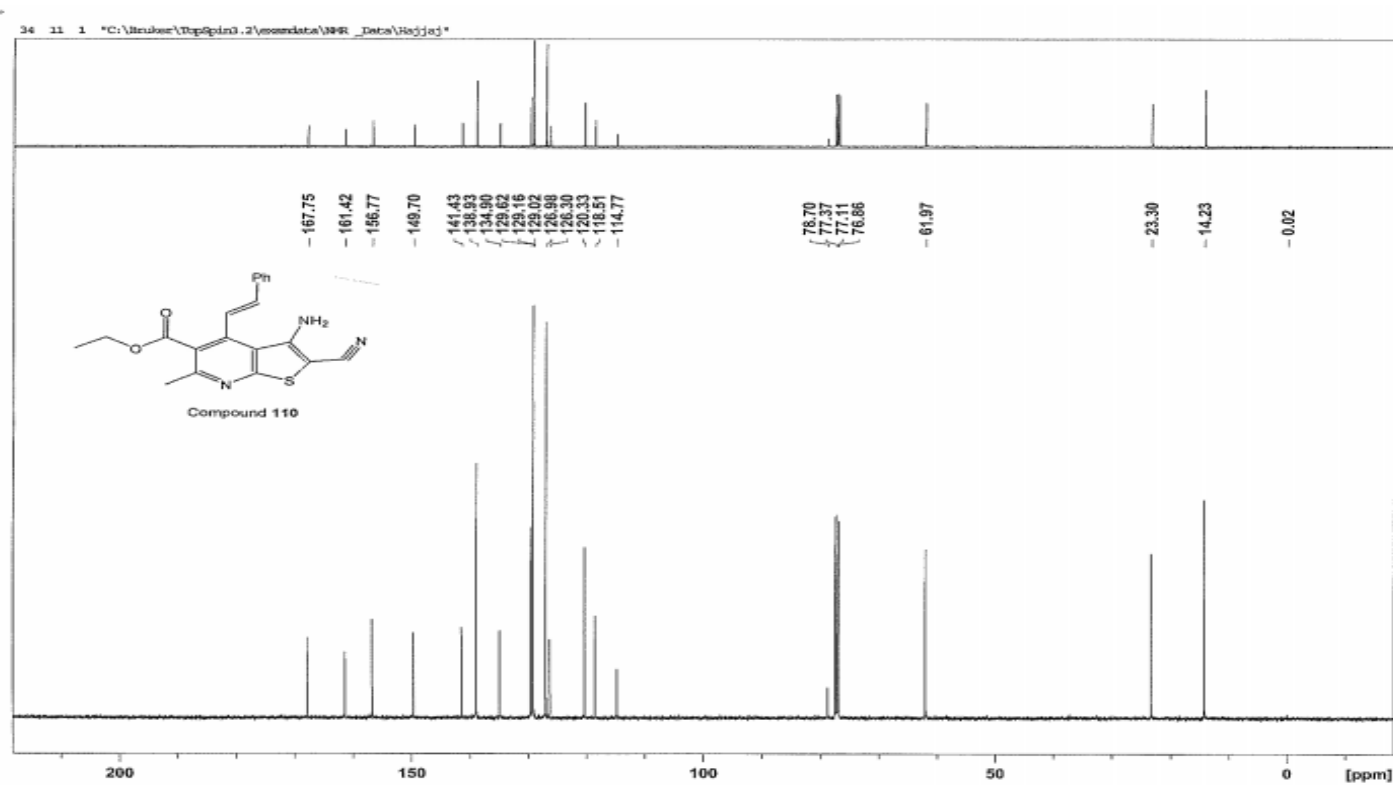


Figure S17: ^{13}C NMR spectrum of compound 10 in CDCl_3 .

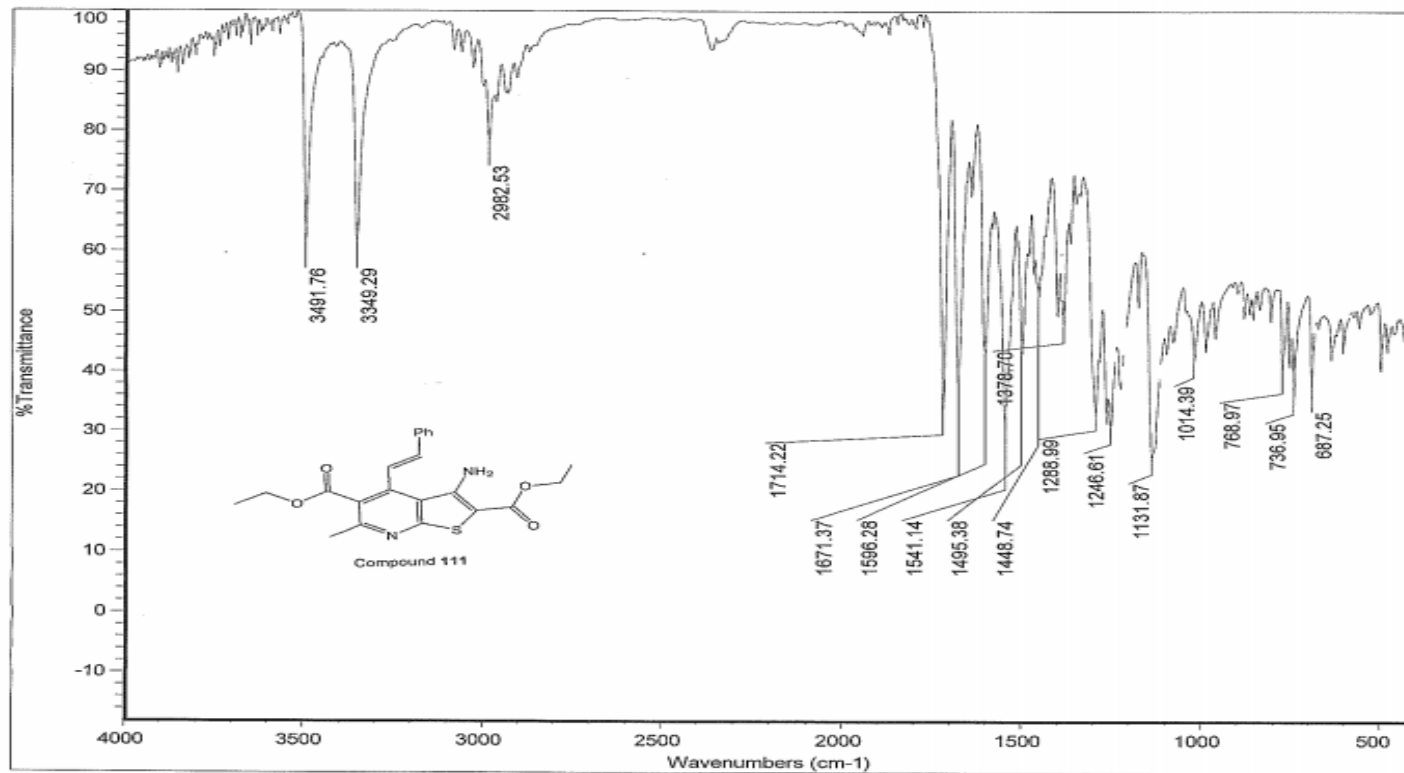


Figure S18: IR spectrum of compound 11.

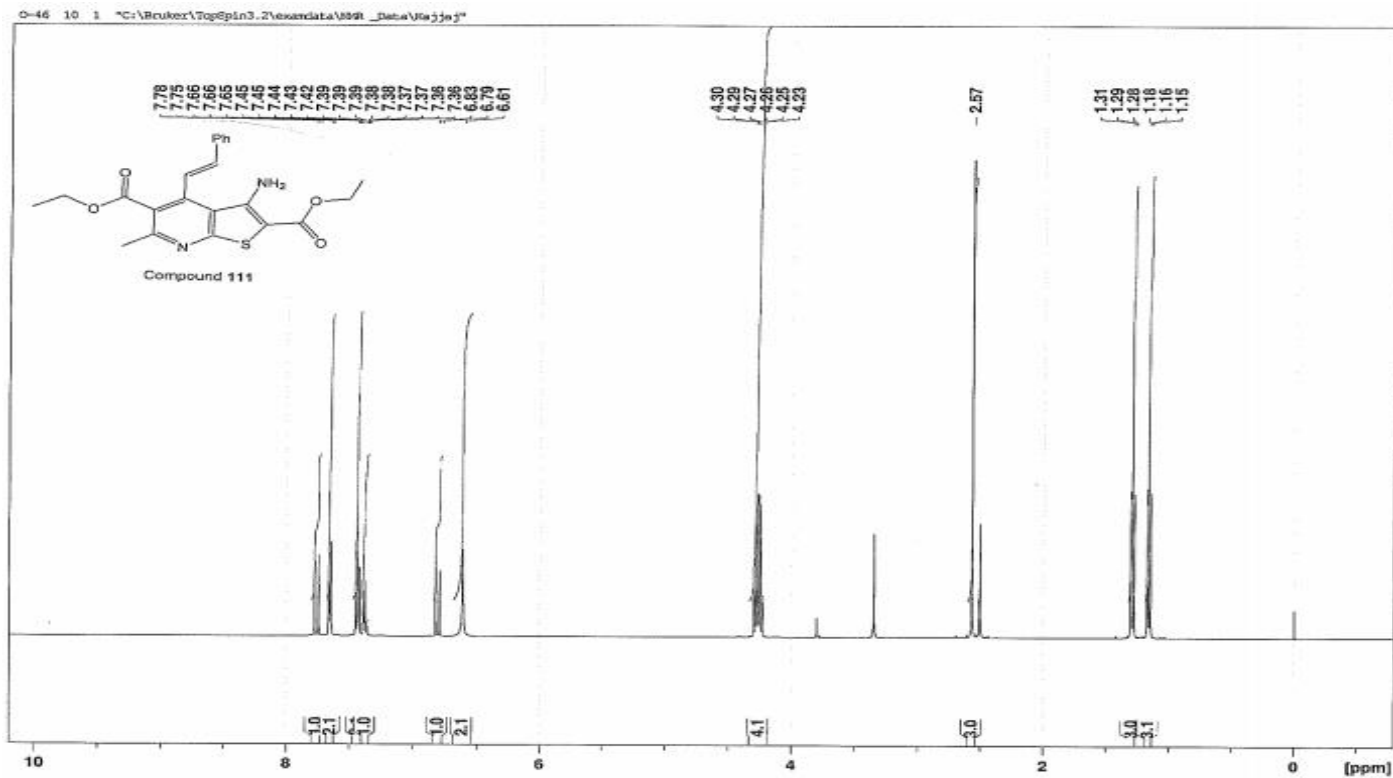


Figure S19: ^1H NMR spectrum of compound 11 in $\text{DMSO-}d_6$.

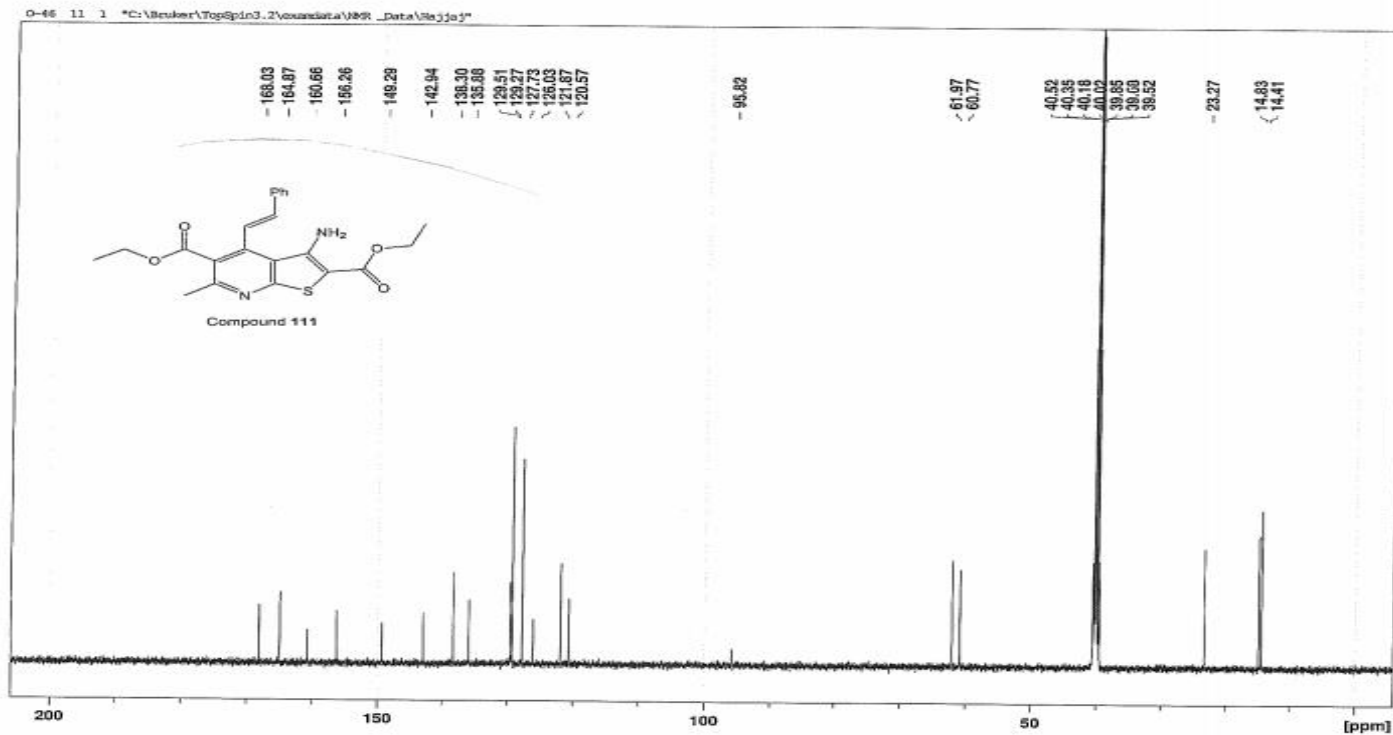


Figure S20: ^{13}C NMR spectrum of compound 11 in $\text{DMSO-}d_6$.

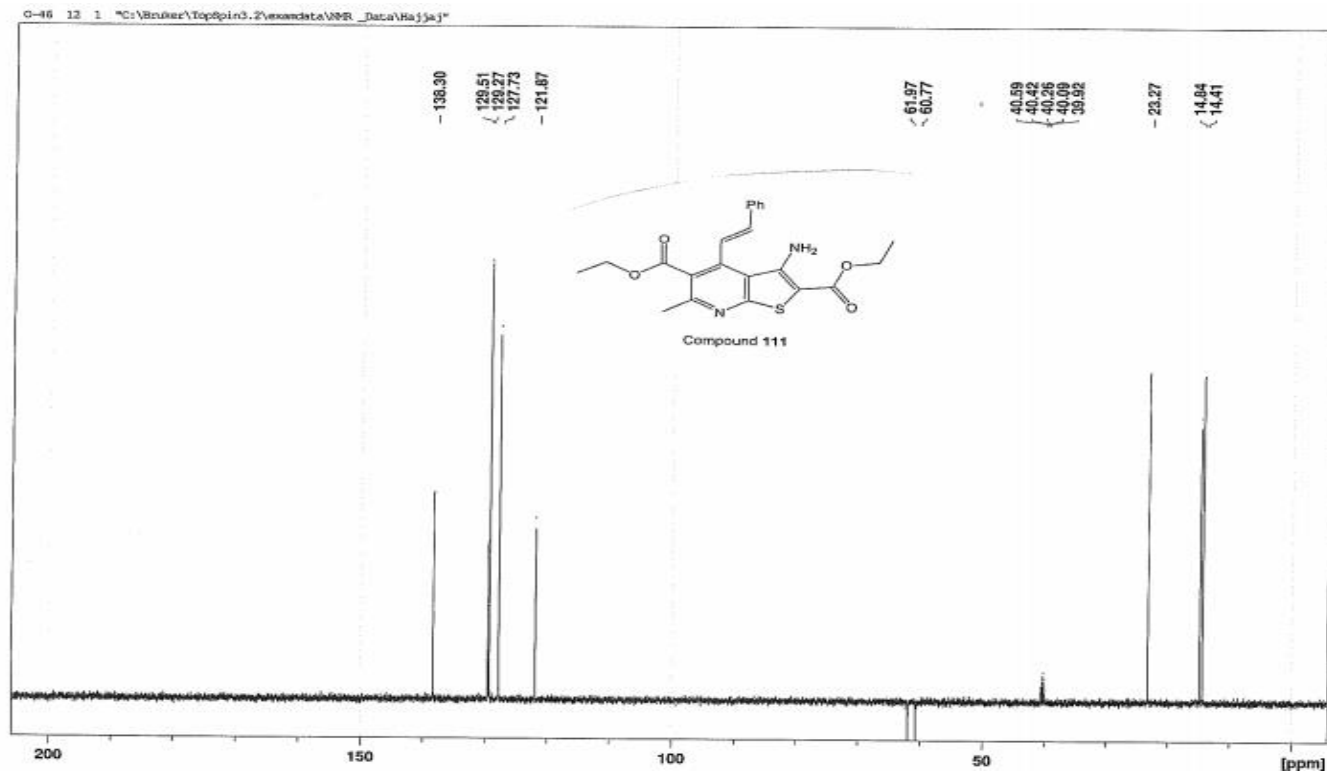


Figure S21: DEPT 135 NMR spectrum of compound 11 in DMSO-

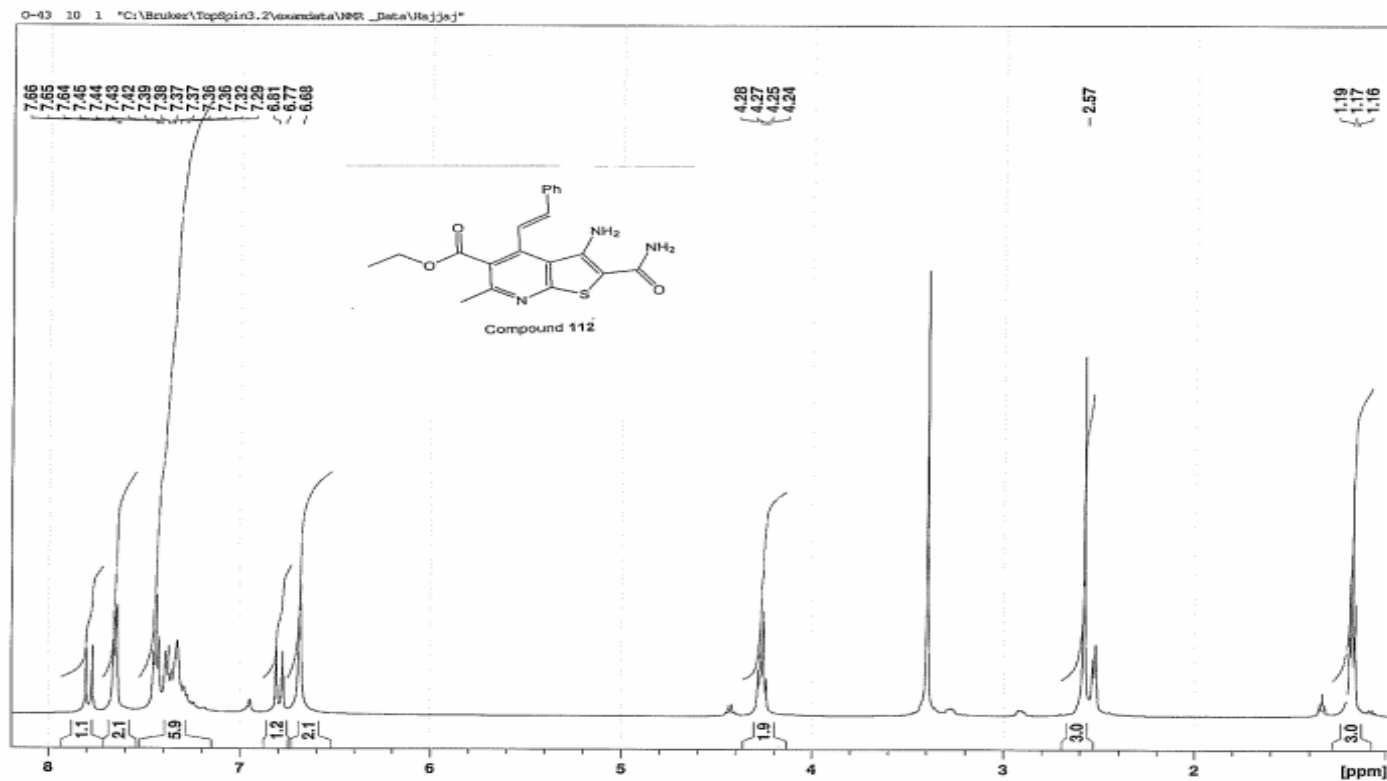


Figure S22: ^1H NMR spectrum of compound 12 in $\text{DMSO-}d_6$.

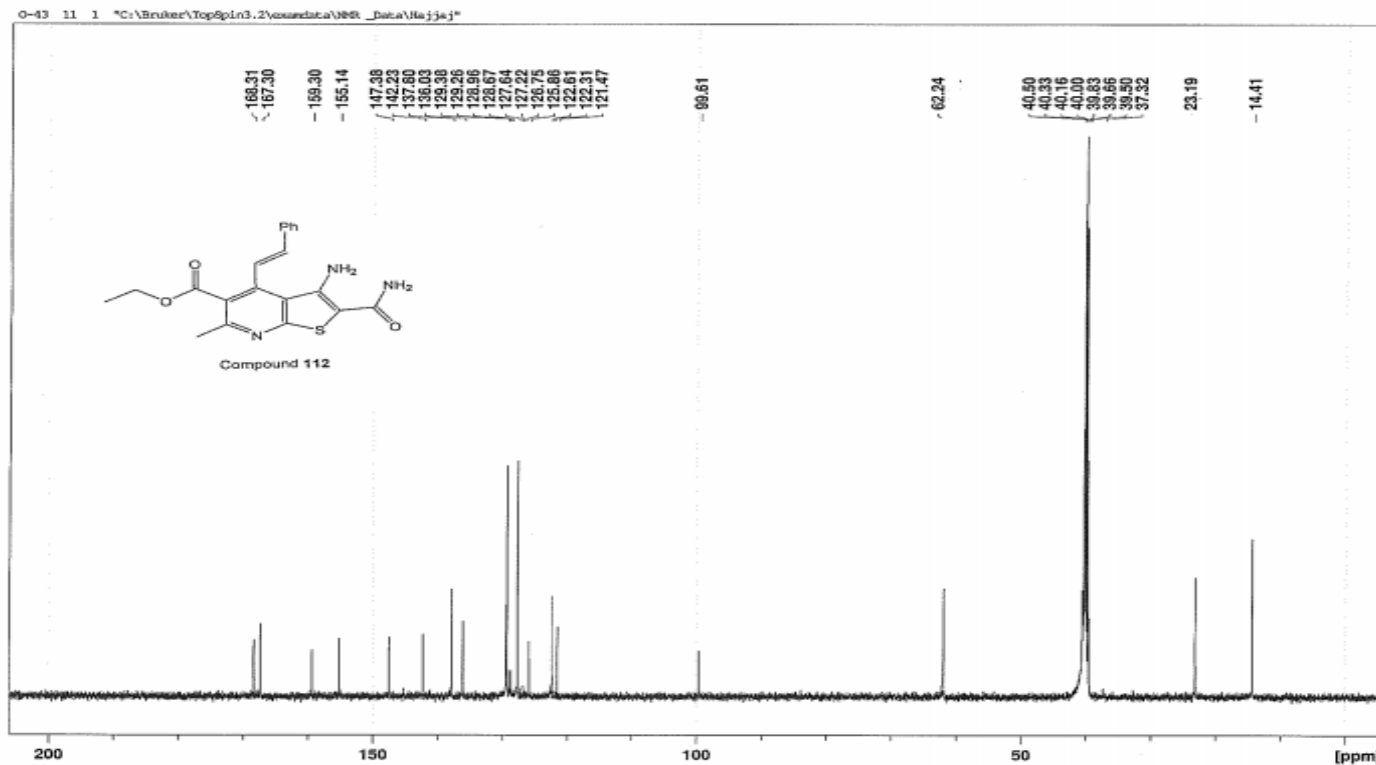


Figure S23: ^{13}C NMR spectrum of compound 12 in $\text{DMSO-}d_6$.

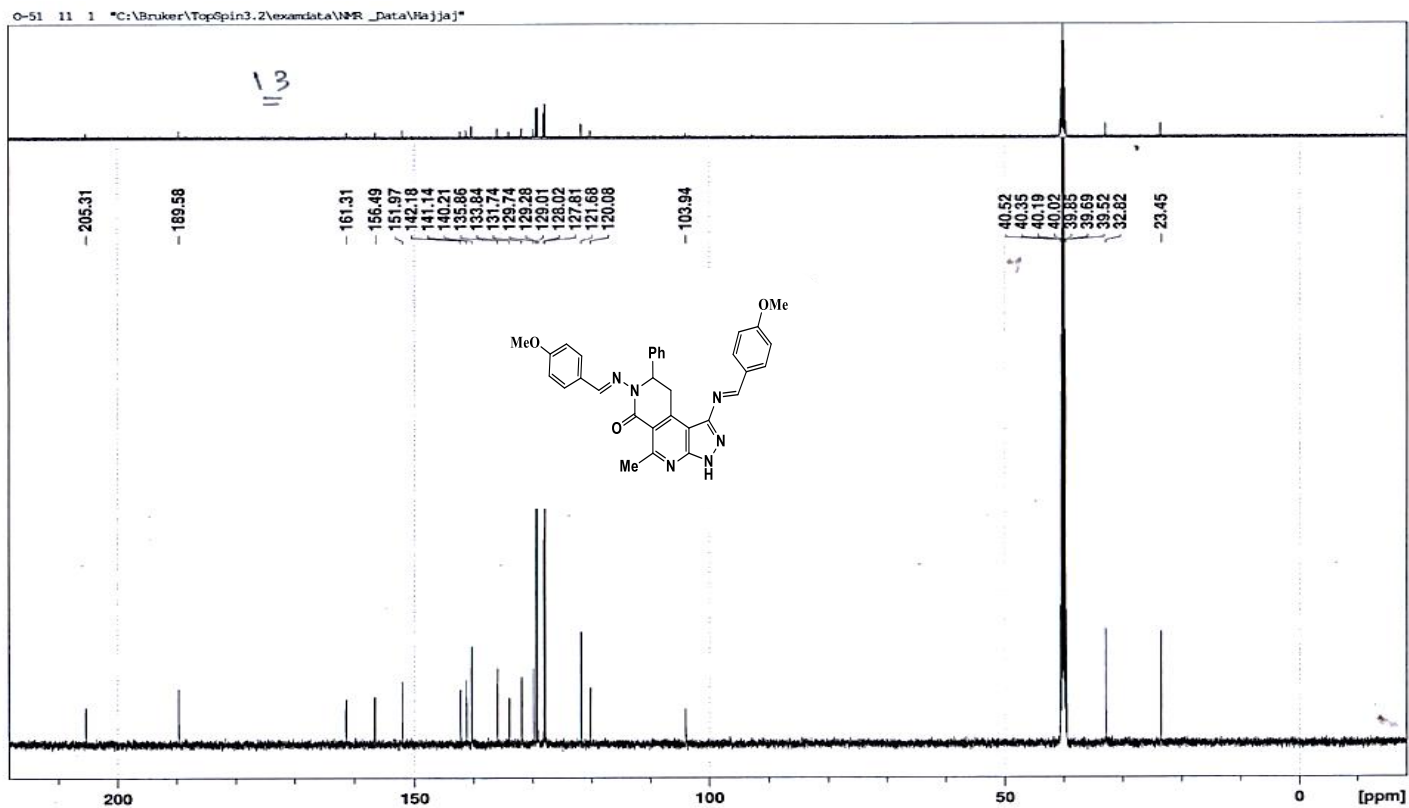


Figure S25: ^{13}C NMR spectrum of compound 13 in $\text{DMSO-}d_6$.

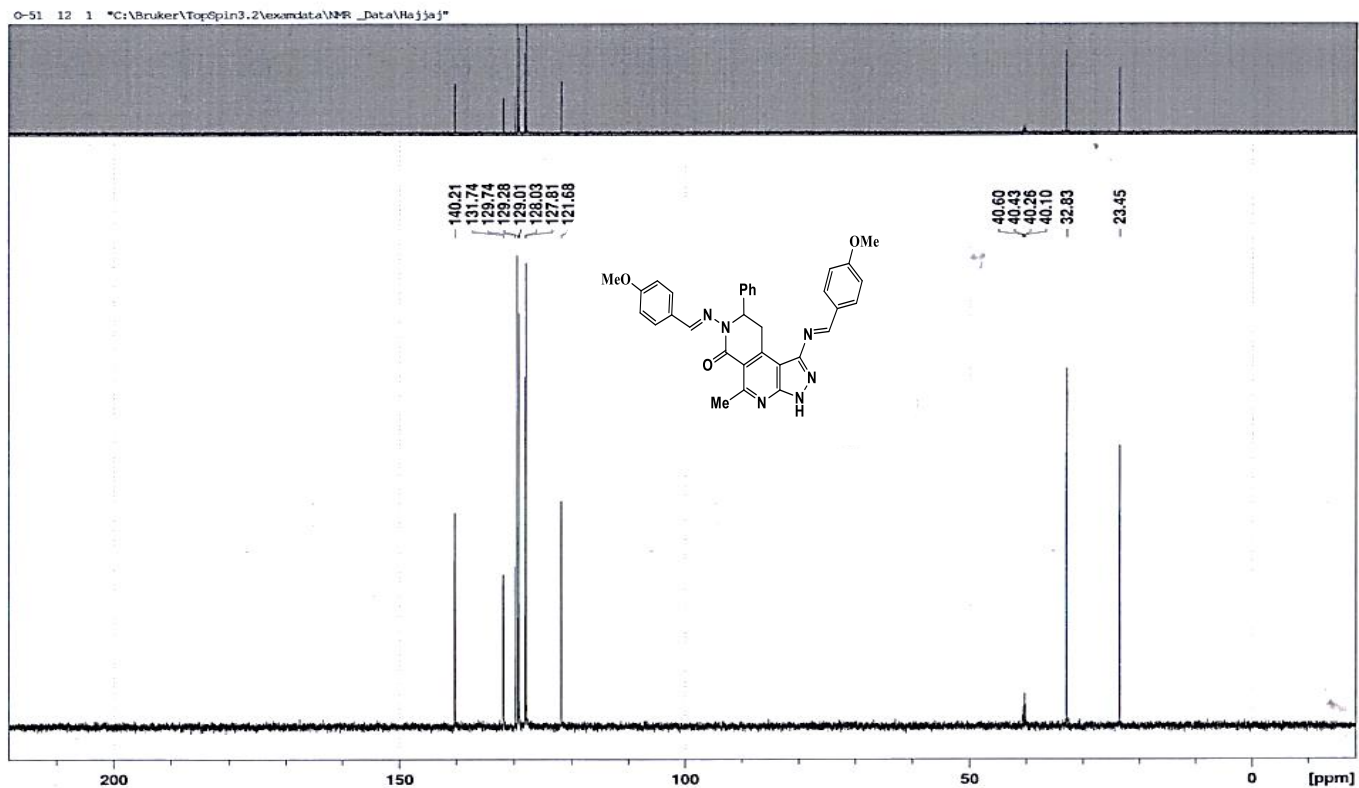


Figure S26: DEPT-135 spectrum of compound 13 in DMSO- d_6 .

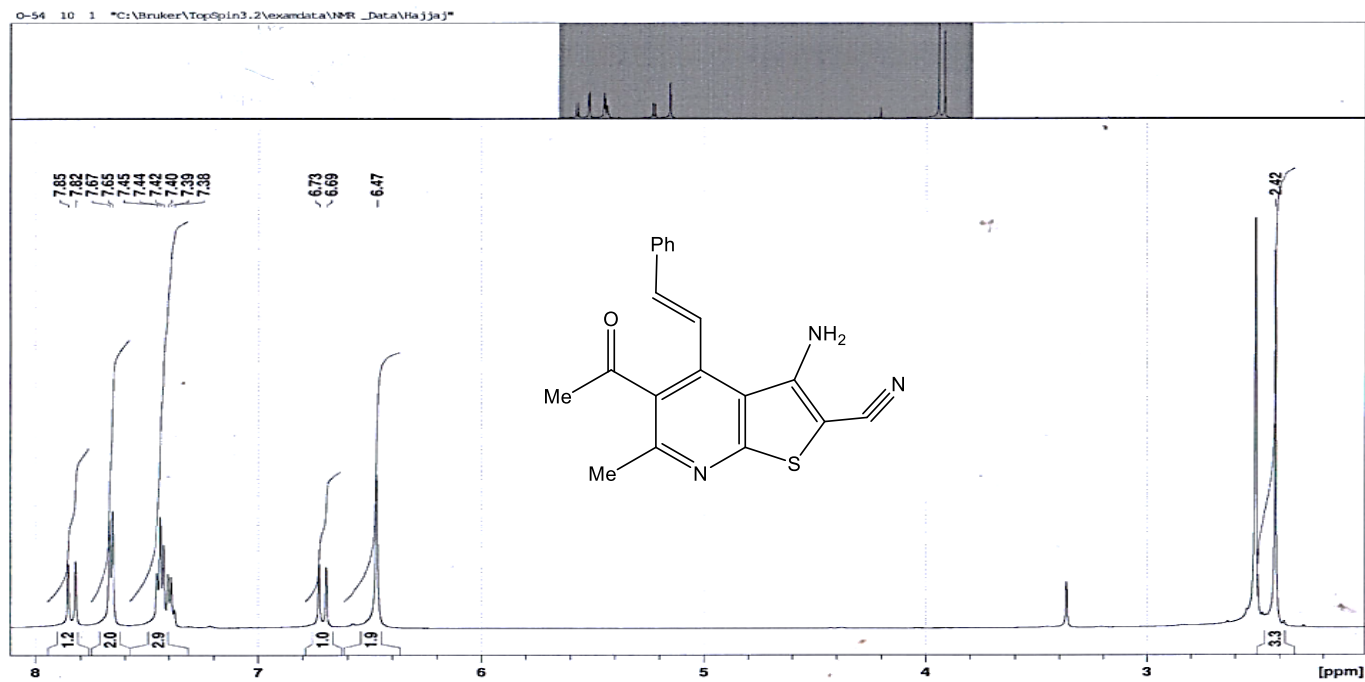


Figure S27: ^1H NMR spectrum of compound 14 in $\text{DMSO-}d_6$.

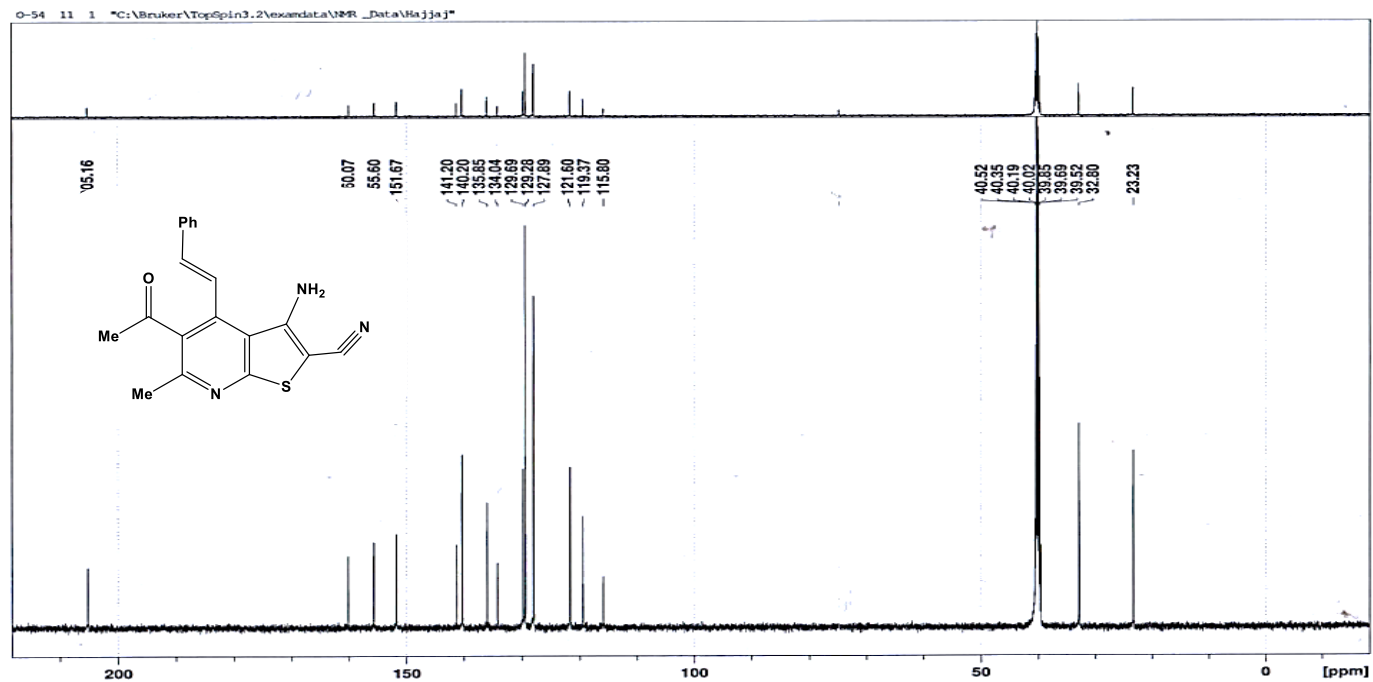


Figure S28: ^{13}C NMR spectrum of compound 14 in $\text{DMSO-}d_6$.

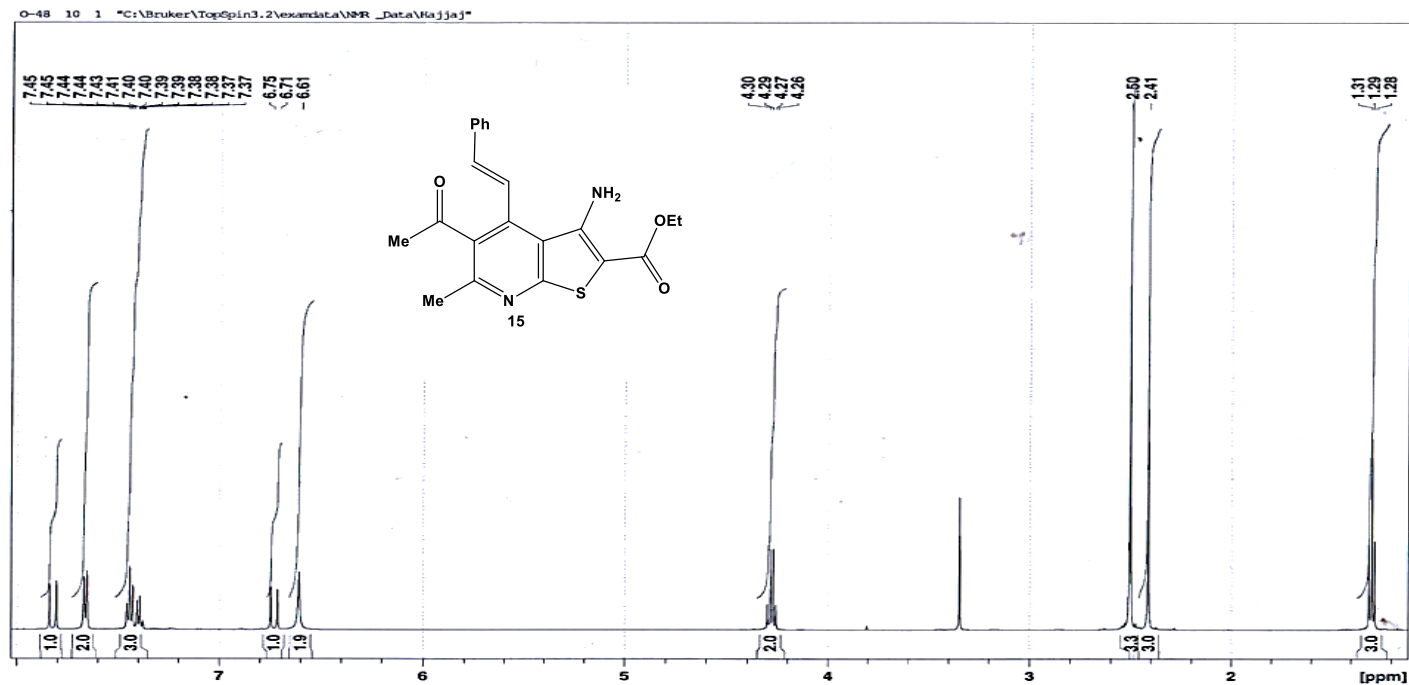


Figure S29: ¹H NMR spectrum of compound 15 in DMSO-*d*₆.

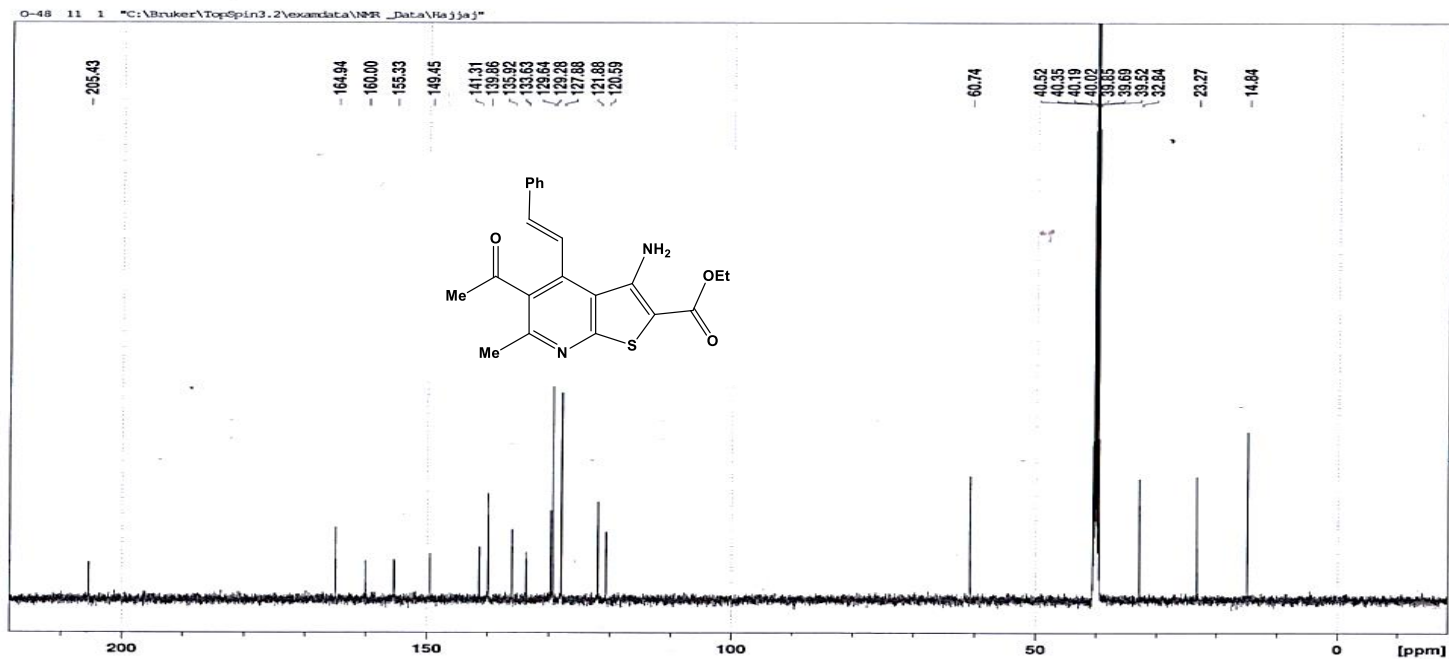


Figure S30: ^{13}C NMR spectrum of compound 15 in $\text{DMSO-}d_6$.

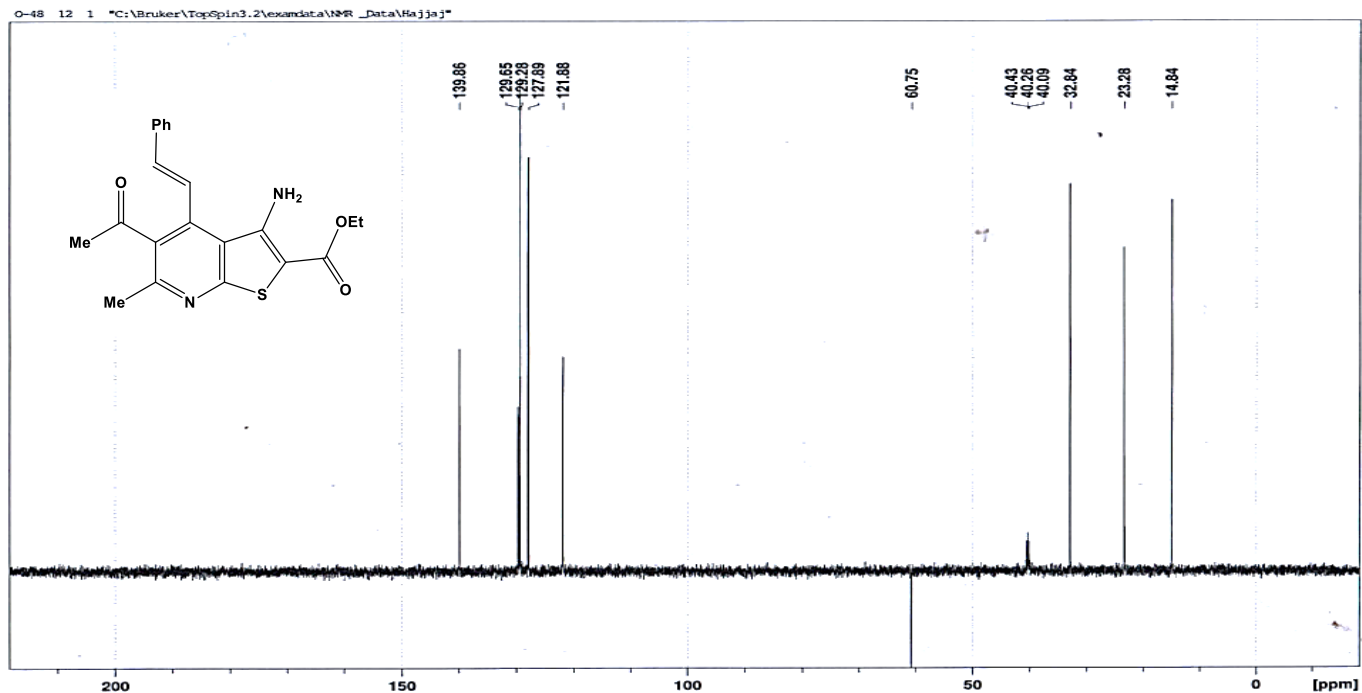


Figure S31: DEPT-135 spectrum of compound 15 in DMSO- d_6 .

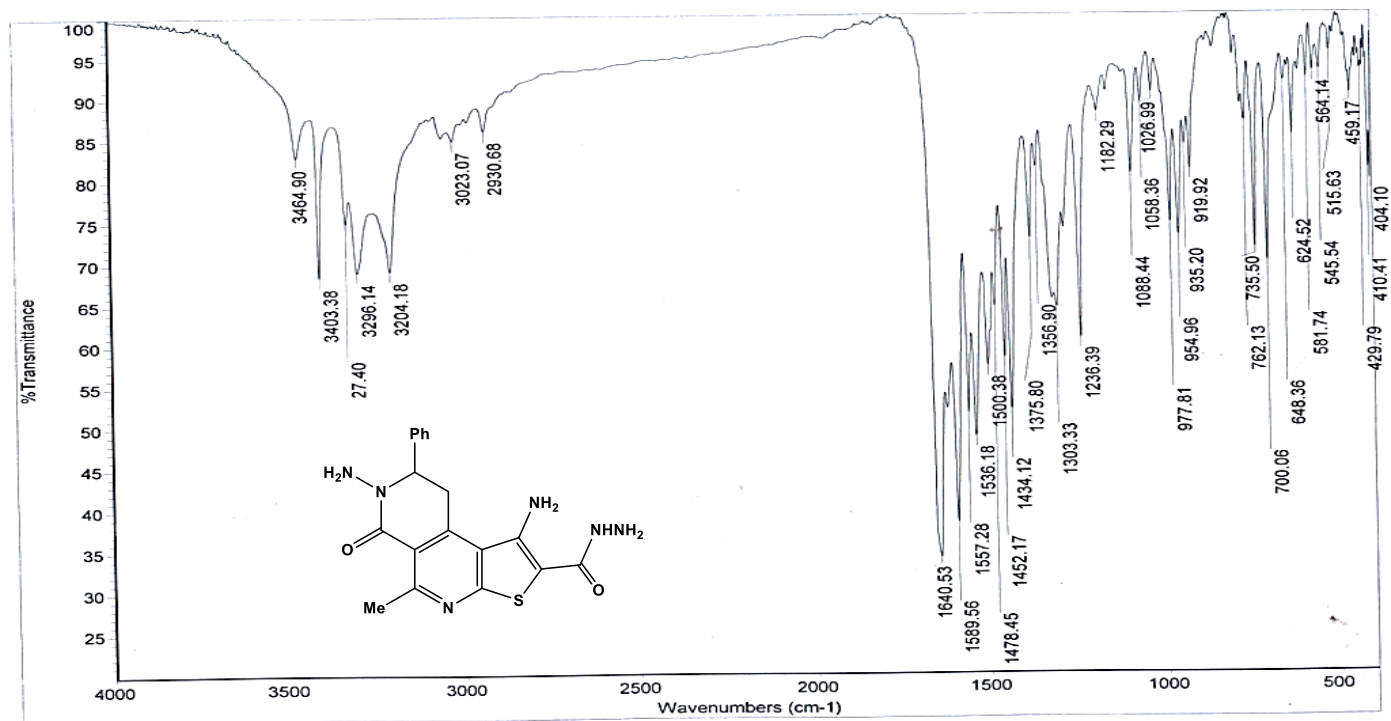
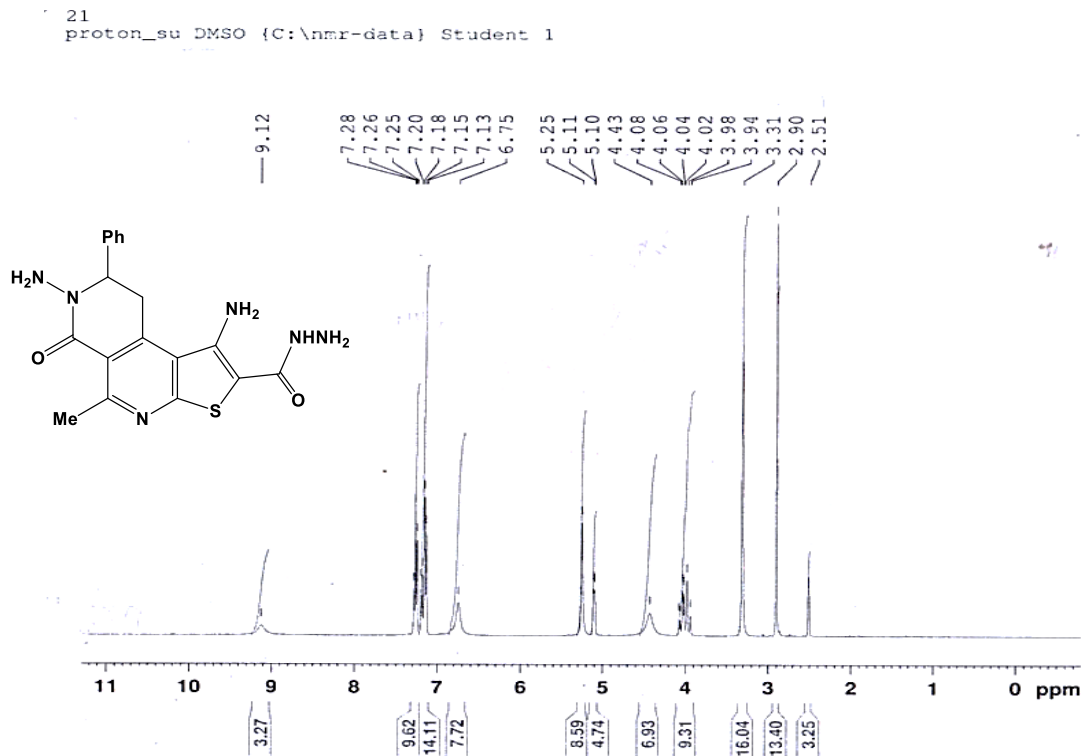


Figure S32: FT-IR spectrum of compound 17 .



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 PROCNO 1

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 SOLVENT DMSO
 NS 20
 DS 2
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 FIDRES 0.122266 Hz
 AQ 4.0894465 sec
 RG 135
 DW 62.400 usec
 DE 6.50 usec
 TE 309.1 K
 D1 1.00000000 sec
 TDO 1

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 P1 12.00 usec
 PLW1 22.00000000 W

F2 - Processing parameters
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Figure S33: ^1H NMR spectrum of compound 17 in $\text{DMSO-}d_6$.

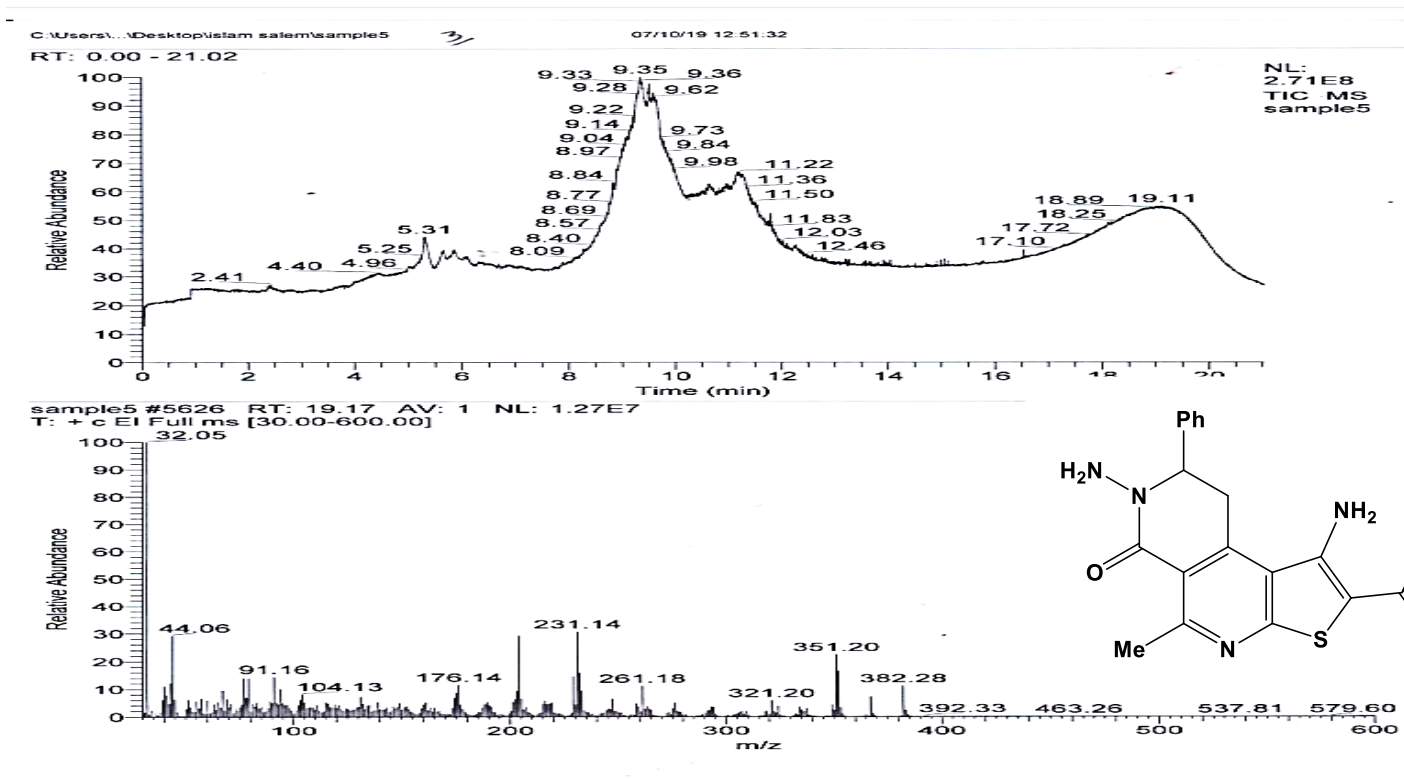


Figure S34: mass spectrometry of compound 17

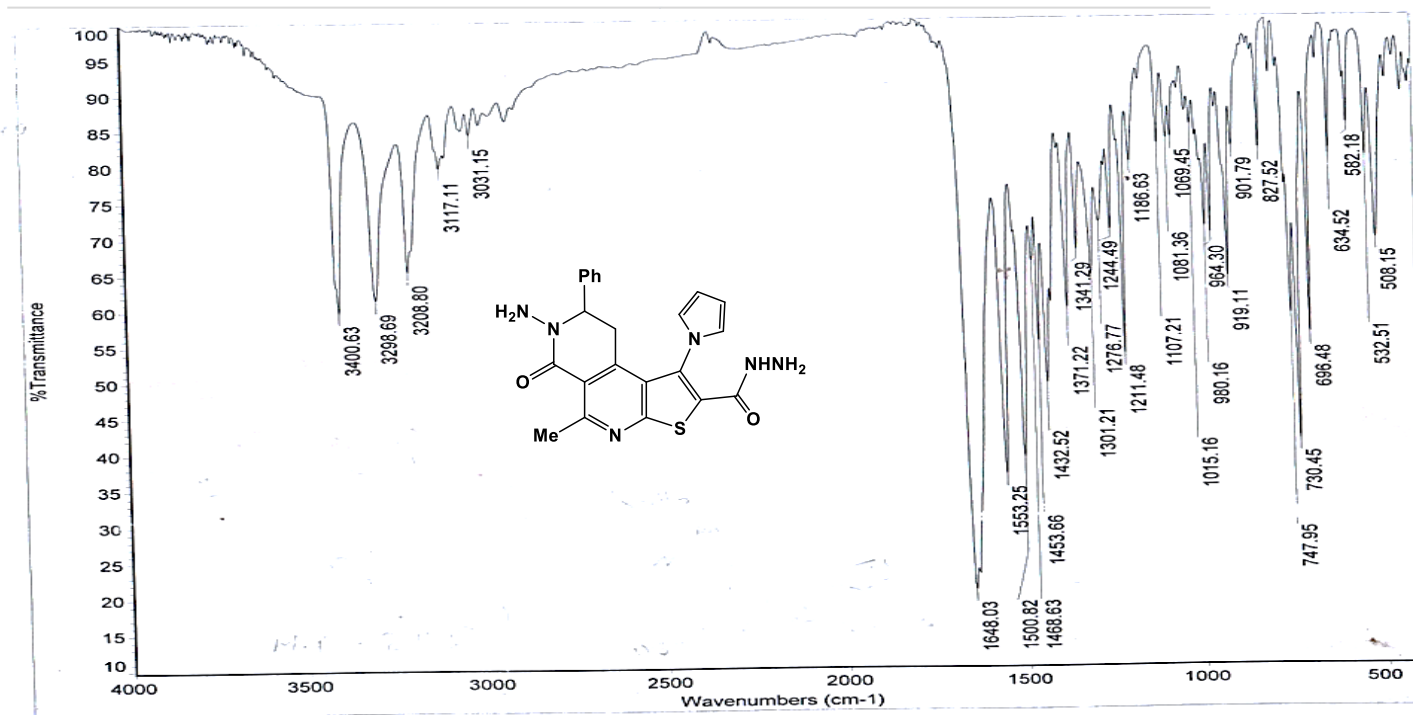
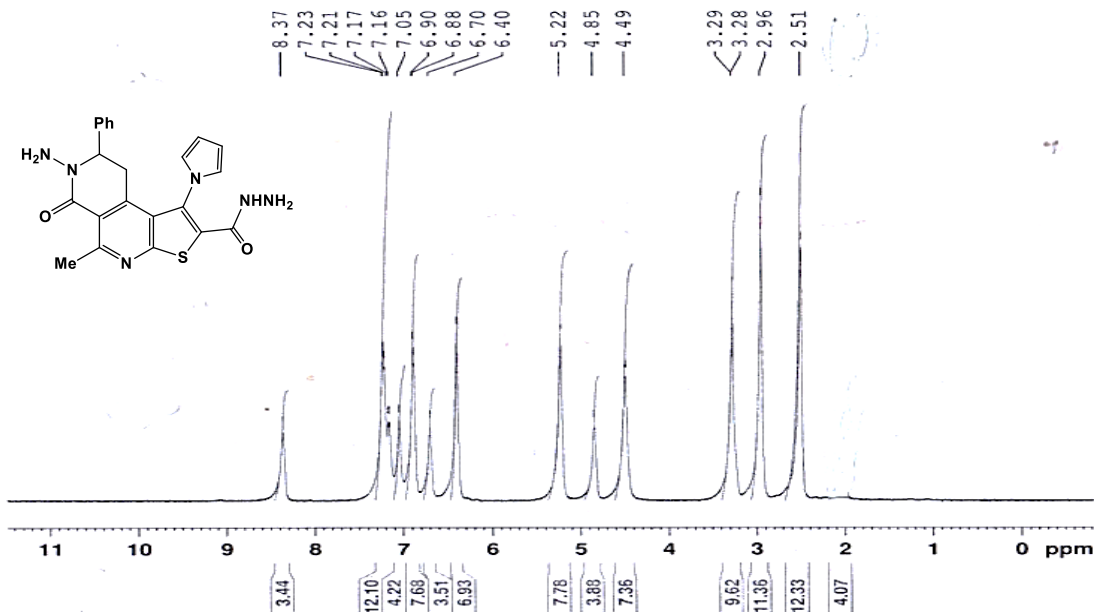


Figure S35: FT-IR spectrum of compound 19 .

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proton_su DMSO {C:\nmr-data} Student 20



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RG         199.04
DW        62.400 usec
DE        6.50 usec
TE        308.1 K
D1        1.0000000 sec
TDO       1

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NUC1     1H
P1       12.00 usec
PLW1     22.0000000 W

F2 - Processing parameters
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SF        400.1300000 MHz
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Figure S36: ^1H NMR spectrum of compound 19 in $\text{DMSO-}d_6$.

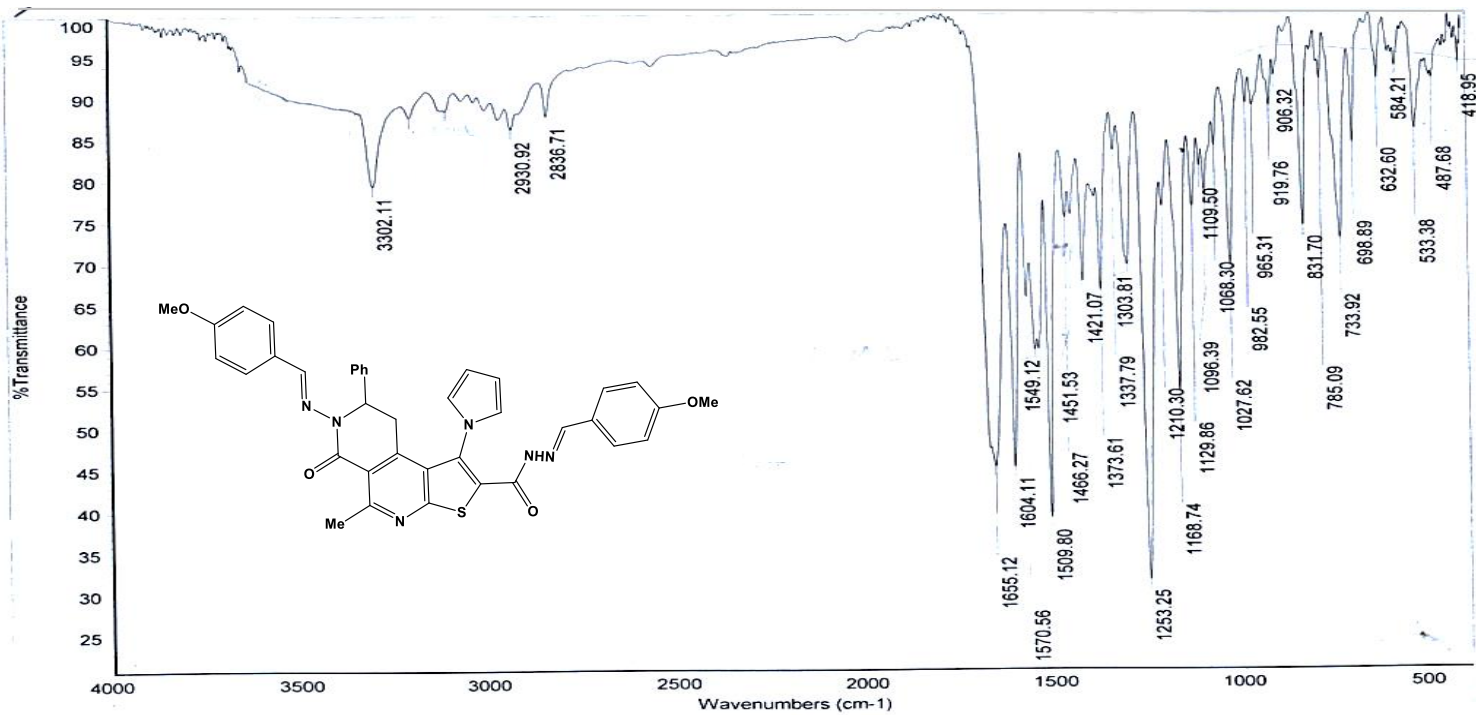
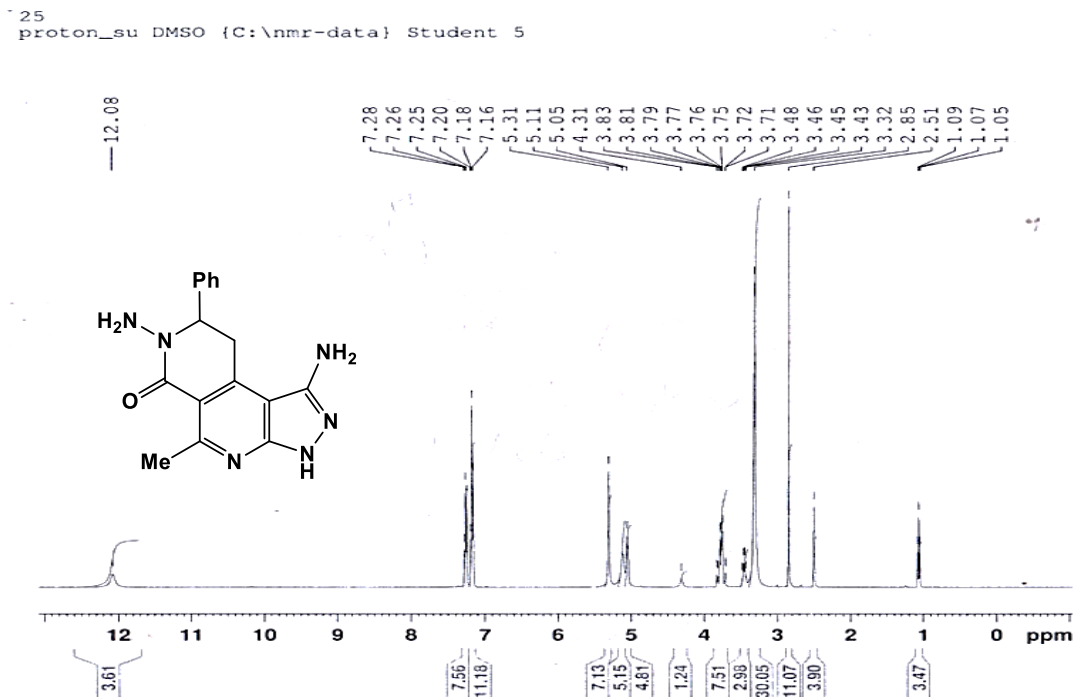


Figure S37: FT-IR spectrum of compound 20 .



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 PROCNO 1

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 PULPROG zg30
 TD 62516
 SOLVENT DMSO
 NS 20
 DS 2
 SWH 8012.820 Hz
 FIDRES 0.122266 Hz
 AQ 4.0894465 sec
 RG 158.76
 SW 62.400 usec
 DE 6.50 usec
 TE 308.2 K
 D1 1.00000000 sec
 TD0 1

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 NUC1 1H
 P1 12.00 usec
 PLW1 22.00000000 W

F2 - Processing parameters
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 GB 0
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Figure S38: ^1H NMR spectrum of compound 24 in $\text{DMSO-}d_6$.

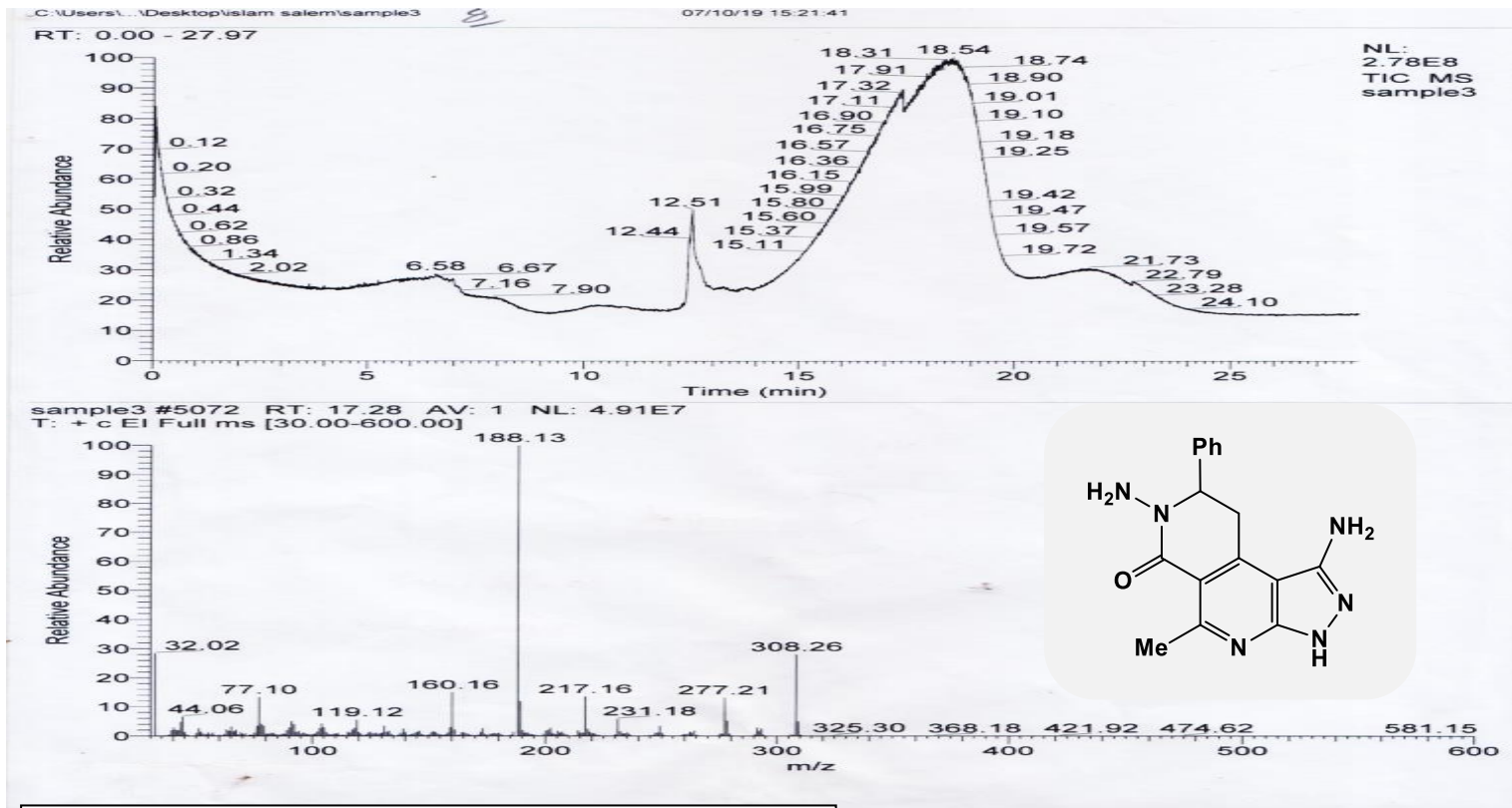


Figure S39: mass spectrometry of compound 24

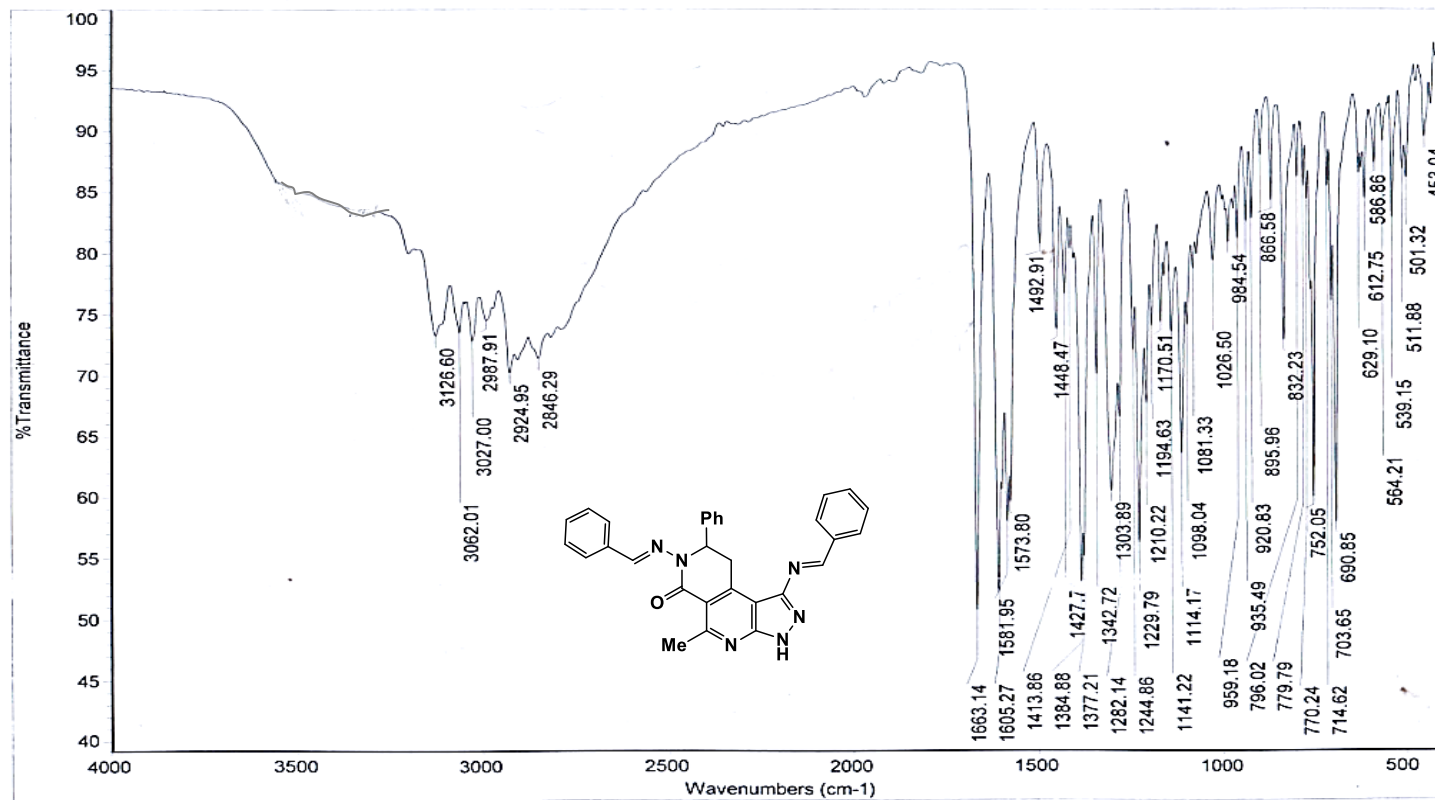
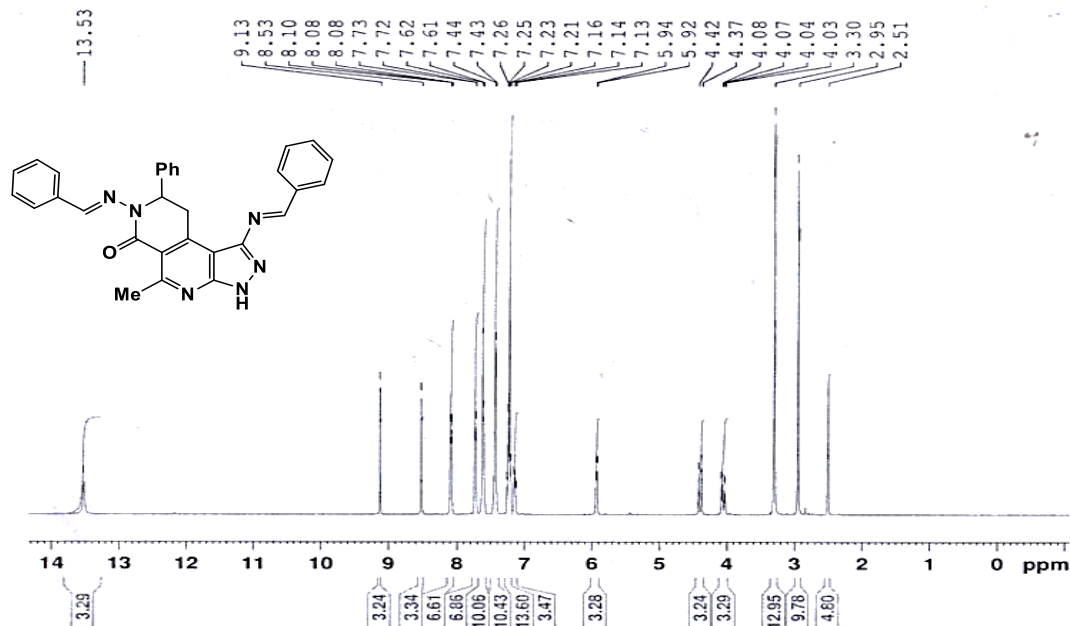


Figure S40: FT-IR spectrum of compound 25a .

26
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SOLVENT  DMSO
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Figure S41: ¹H NMR spectrum of compound 25a in DMSO-d₆.

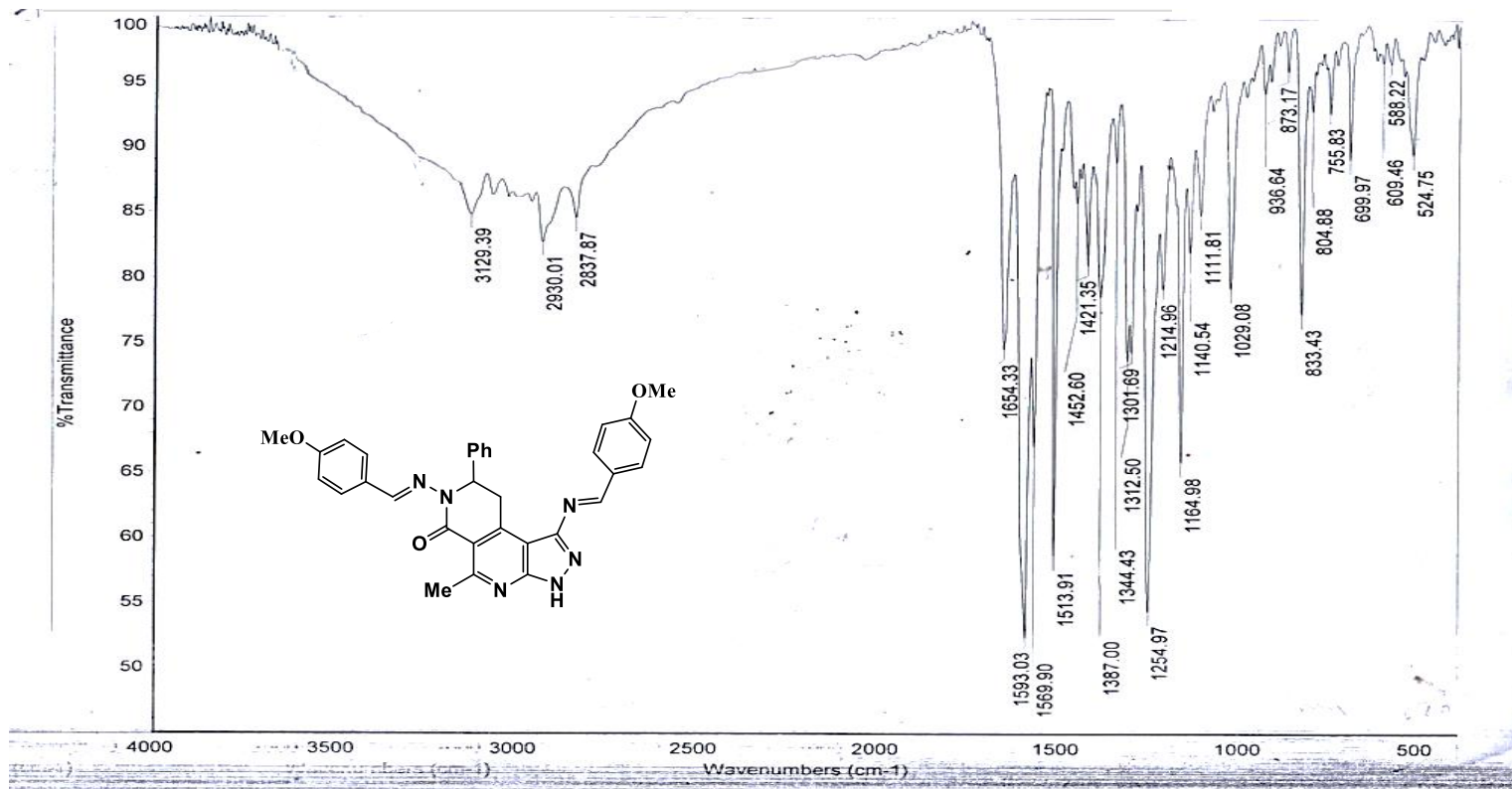


Figure S42: FT-IR spectrum of compound 25b .

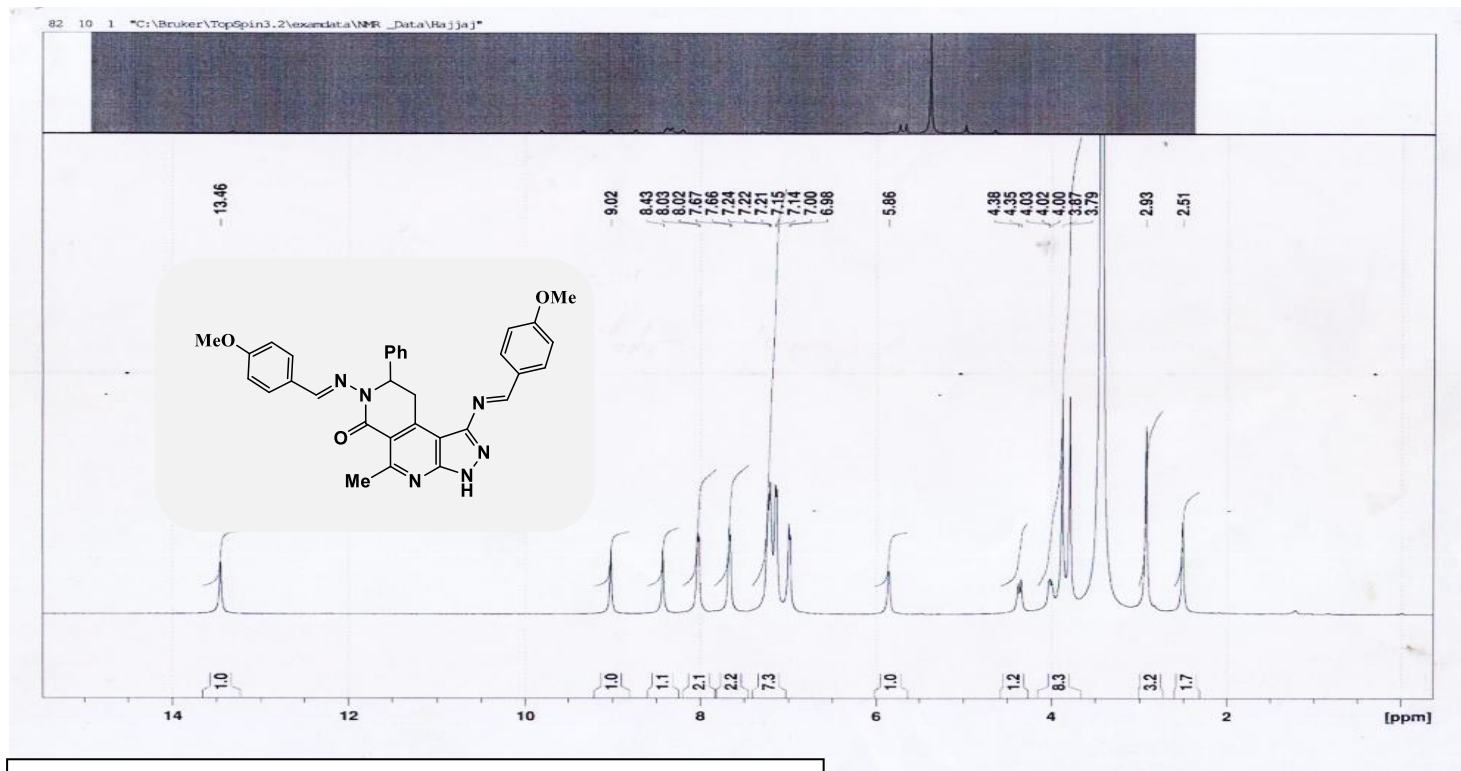


Figure S43: ^1H NMR spectrum of compound 25b in $\text{DMSO-}d_6$.

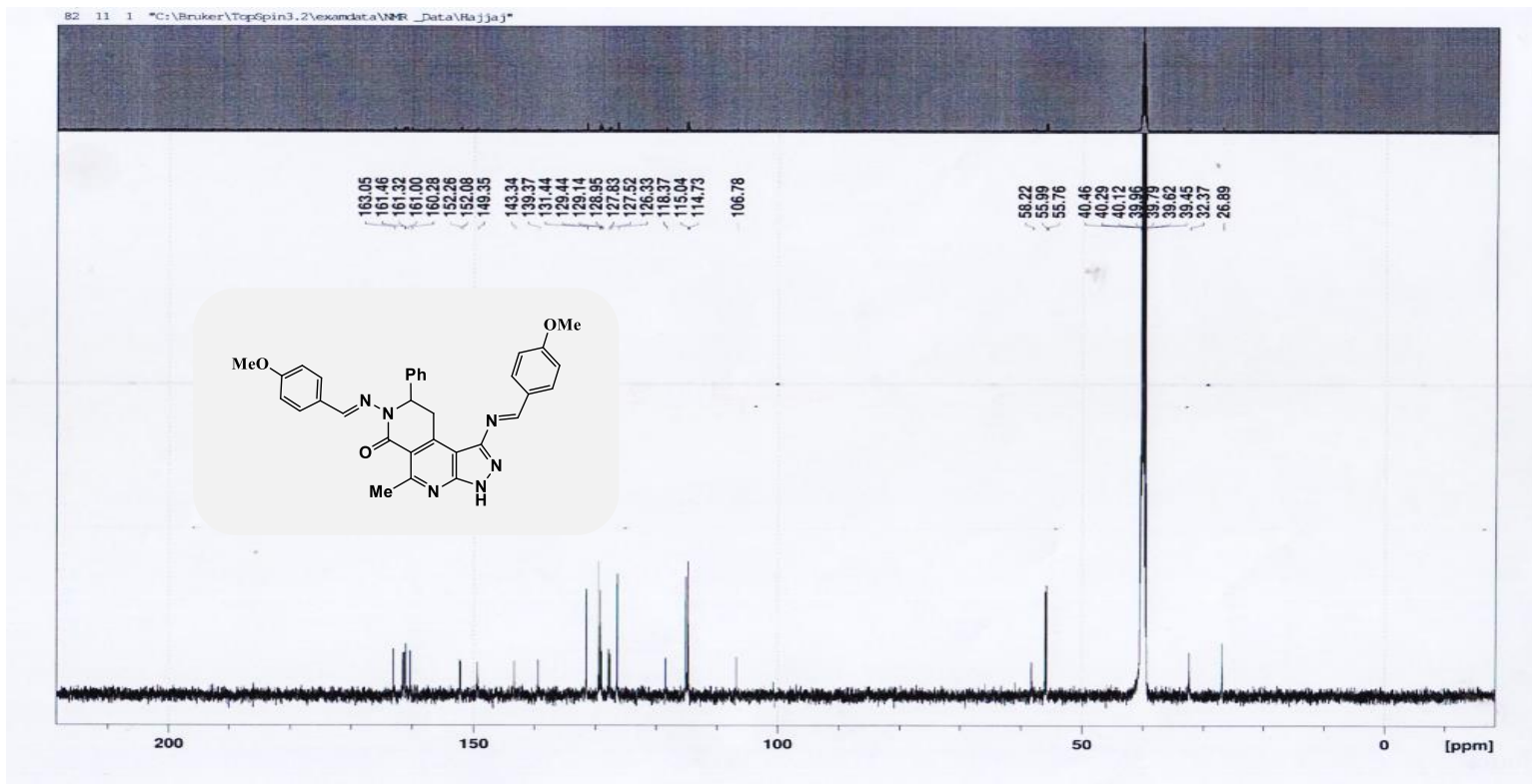


Figure S44: ¹³C NMR spectrum of compound 25b in DMSO-*d*₆.

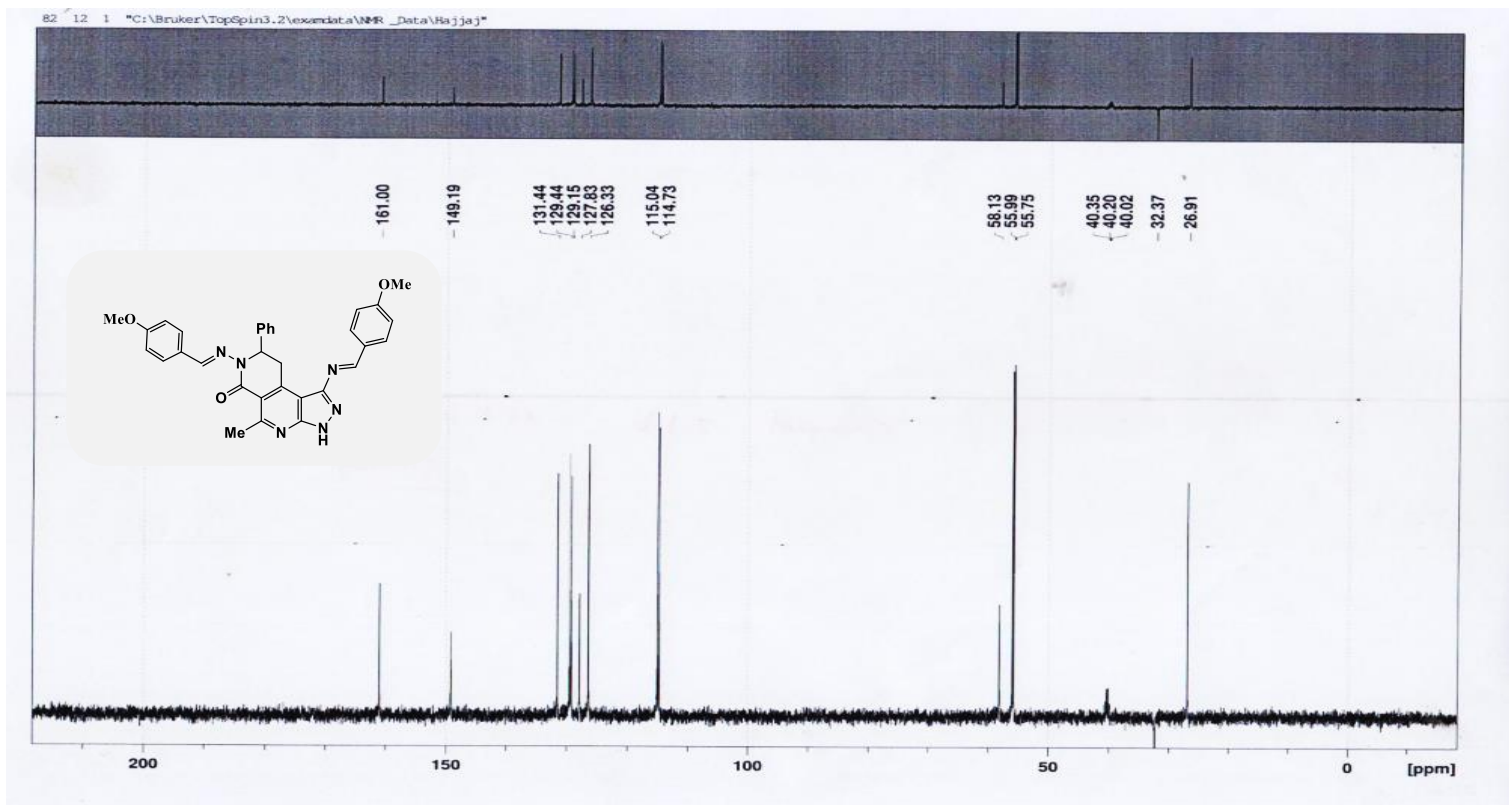


Figure S45: DEPT-135 spectrum of compound 25b in DMSO- d_6 .

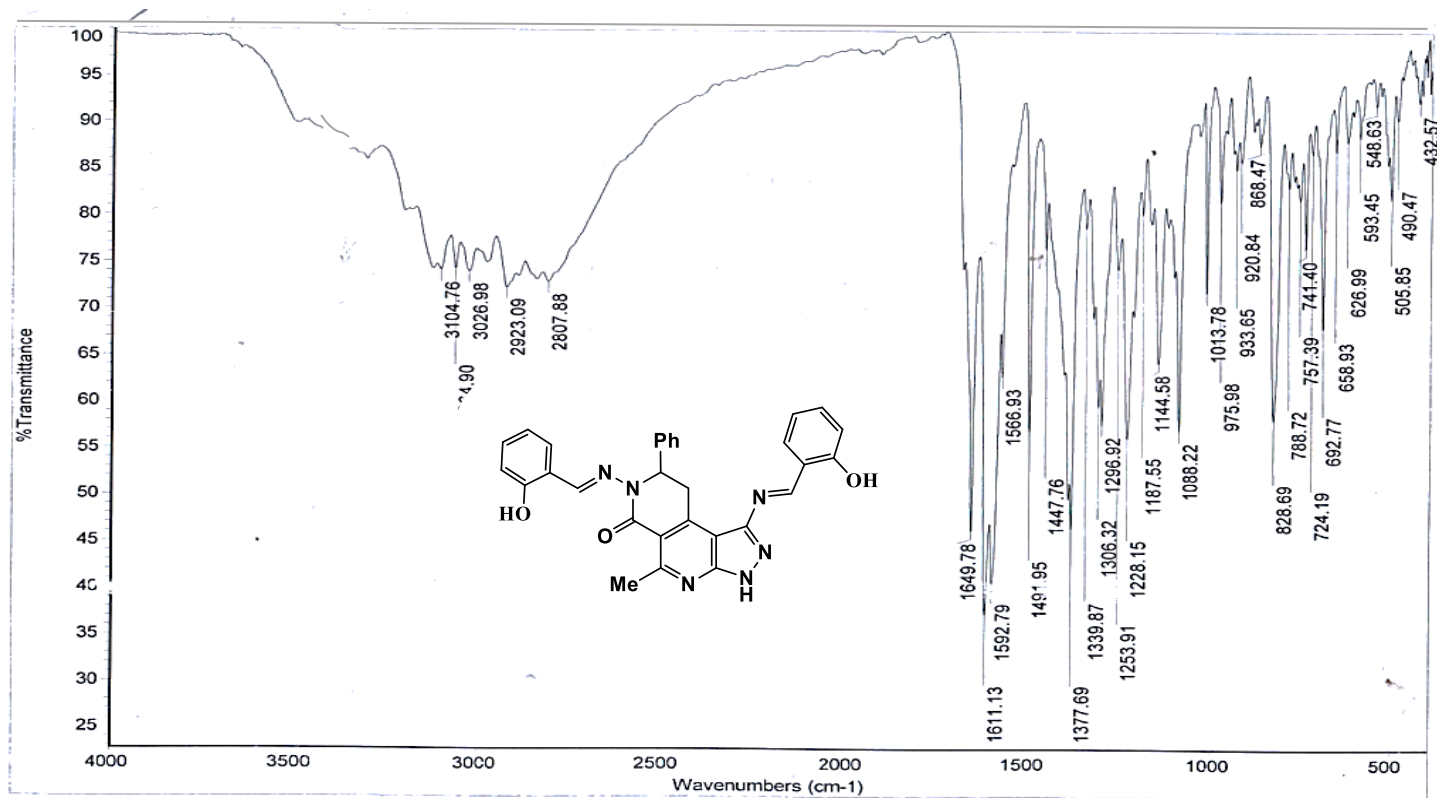
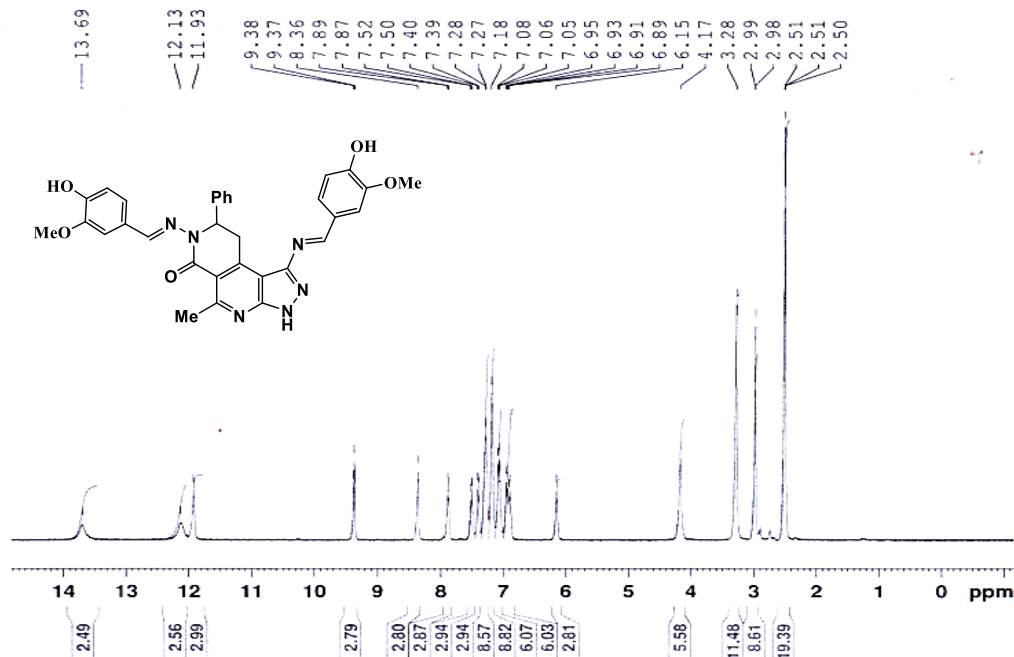


Figure S46: FT-IR spectrum of compound 25bd.

28

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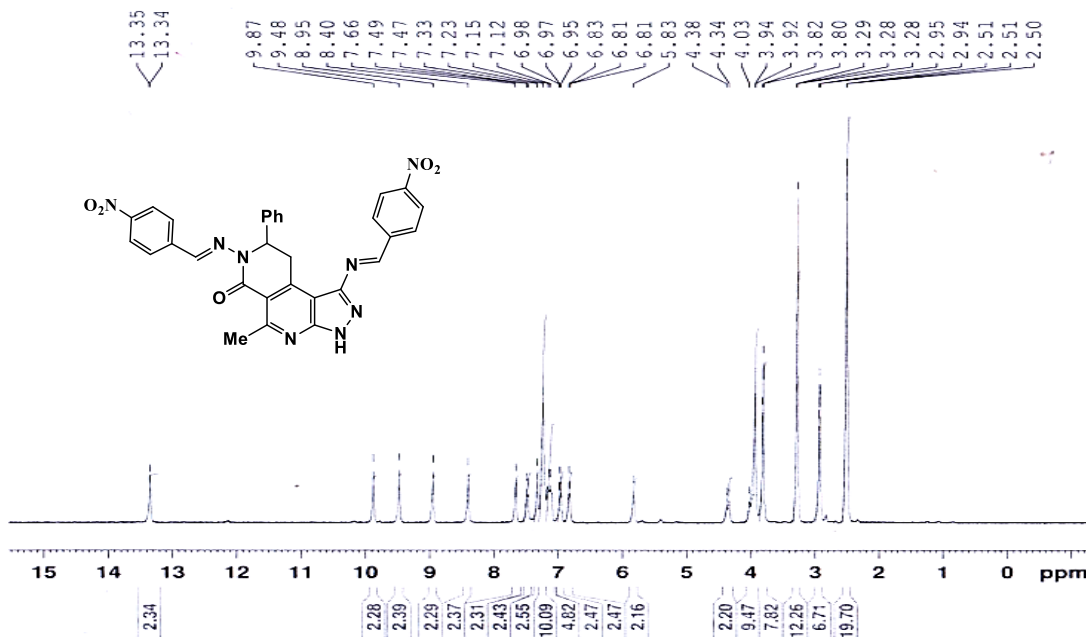
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AQ        4.089485 sec
RG        199.04
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NUC1     1H
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PLW1     22.00000000 W

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Figure S47: ^1H NMR spectrum of compound 25e in $\text{DMSO}-d_6$.

31
proton_su DMSO {C:\nmr-data} Student 21



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DS         2
SWH       8012.820 Hz
FIDRES    0.122266 Hz
AQ         4.0694465 sec
RG         129.04
SQ         62.403 usec
SE         6.50 usec
TE         308.2 K
TE        1.00000000 sec
TD0        1

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NUC1      1H
P1        12.00 usec
PLW1     22.00000000 W

F2 - Processing parameters
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SF         400.1300000 MHz
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PC         1.00
    
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Figure S48: ¹H NMR spectrum of compound 25f in DMSO-d₆.

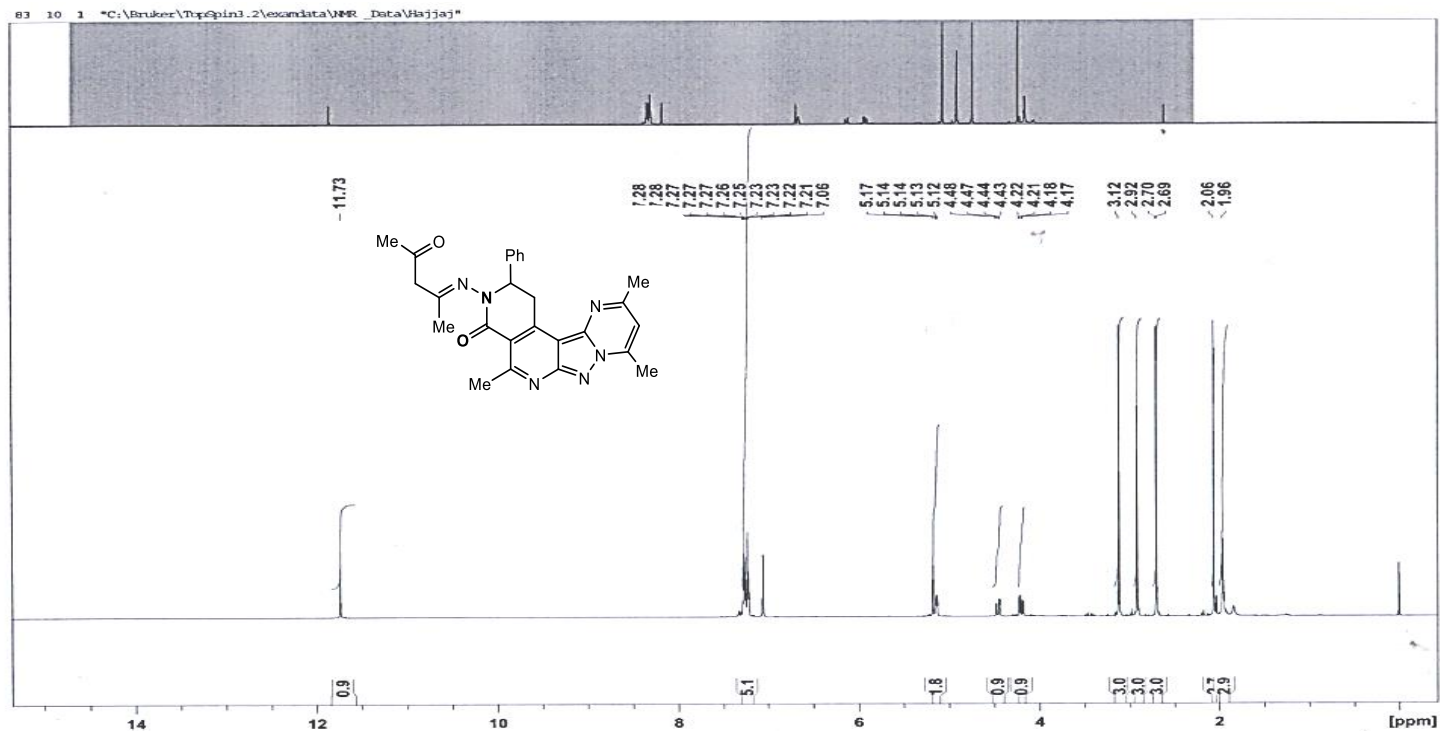


Figure S49: ^1H NMR spectrum of compound 26 in $\text{DMSO-}d_6$.

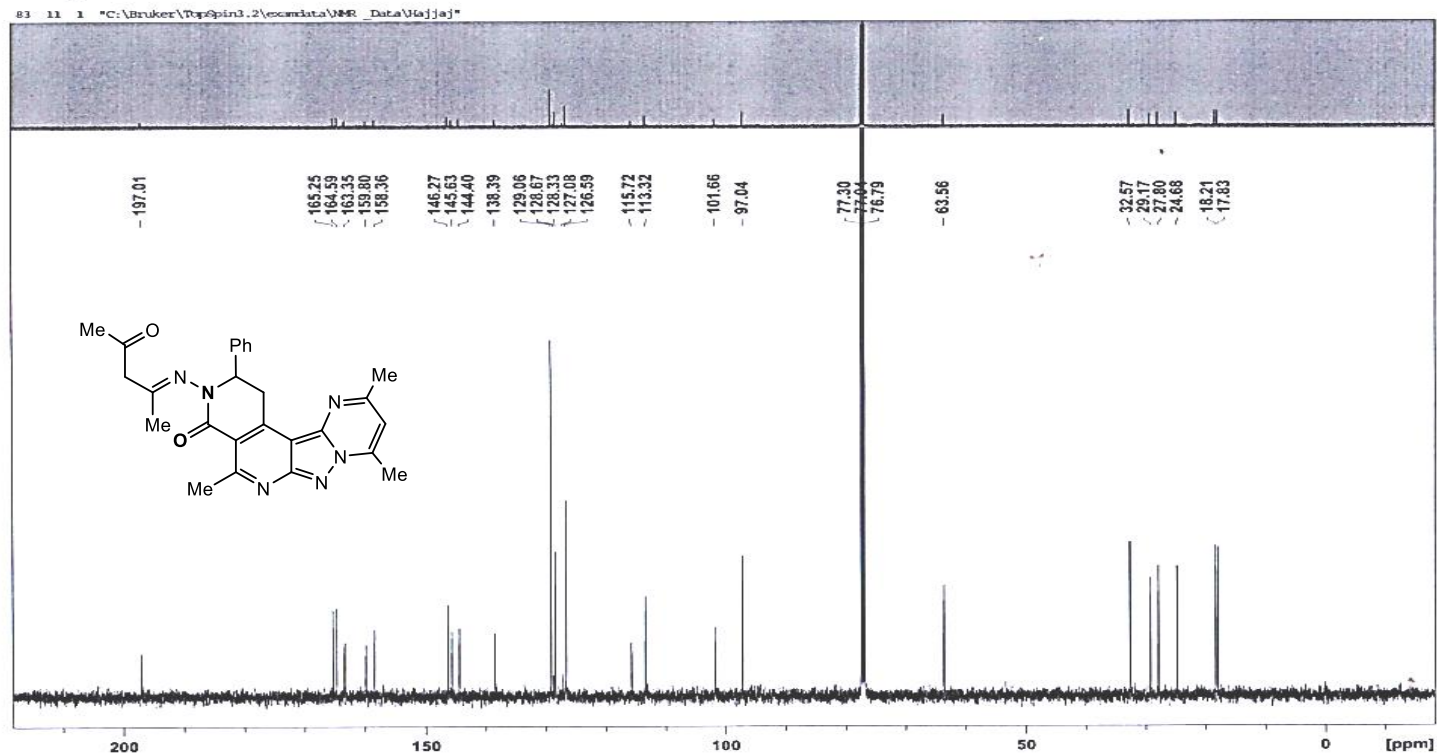


Figure S50: ^{13}C NMR spectrum of compound 26 in $\text{DMSO-}d_6$.

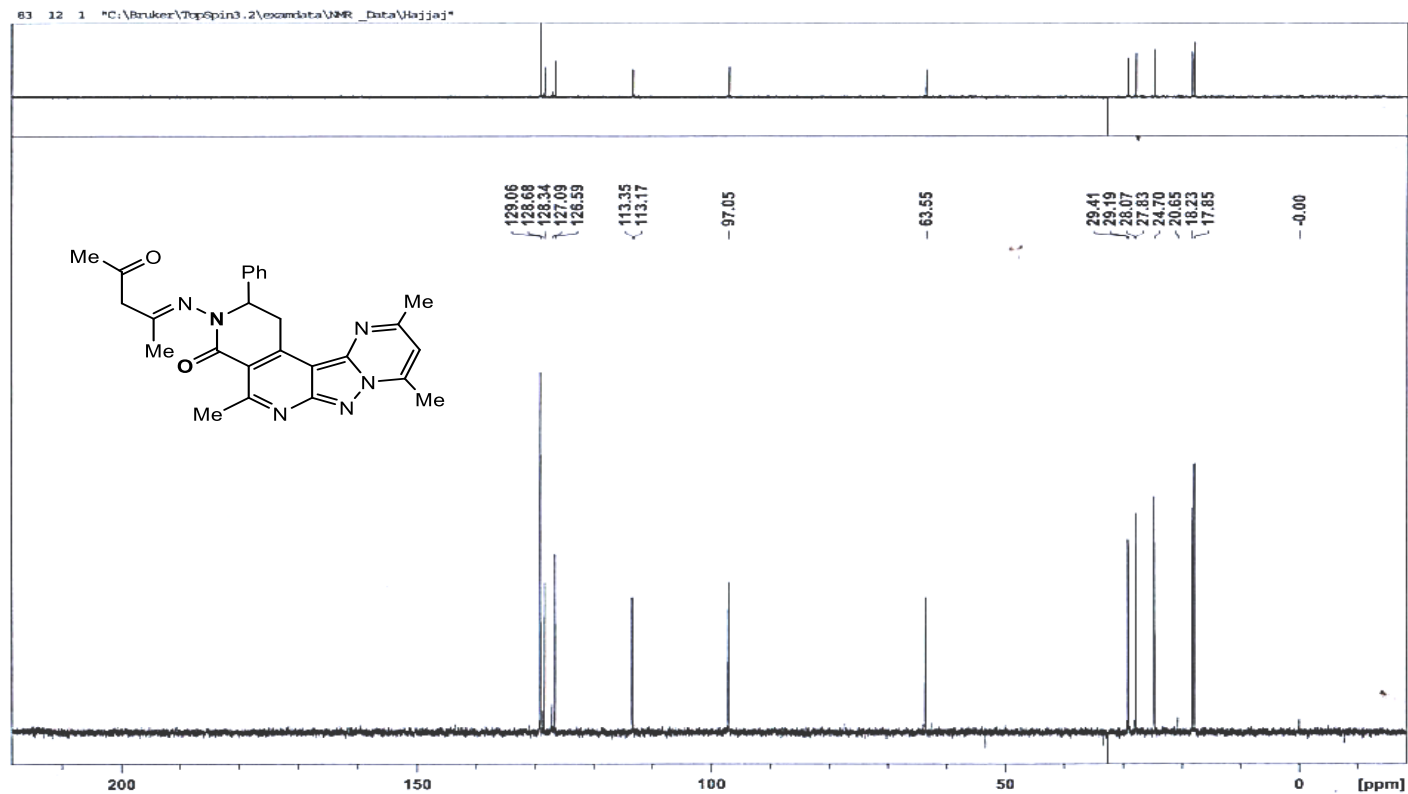


Figure S51: DEPT-135 spectrum of compound 26 in DMSO- d_6 .