Electronic Supplementary Material (ESI) for RSC Advances.

Quinoline-Sulfonamides as a Multi-targeting Neurotherapeutic for Cognitive Decline: In-vitro, In-silico studies and ADME evaluation of Monoamine Oxidases and Cholinesterases Inhibitors

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Supporting Information

1.1 ^{1}HNMR, ^{13}CNMR Spectra of the synthesized compounds

Compound a1

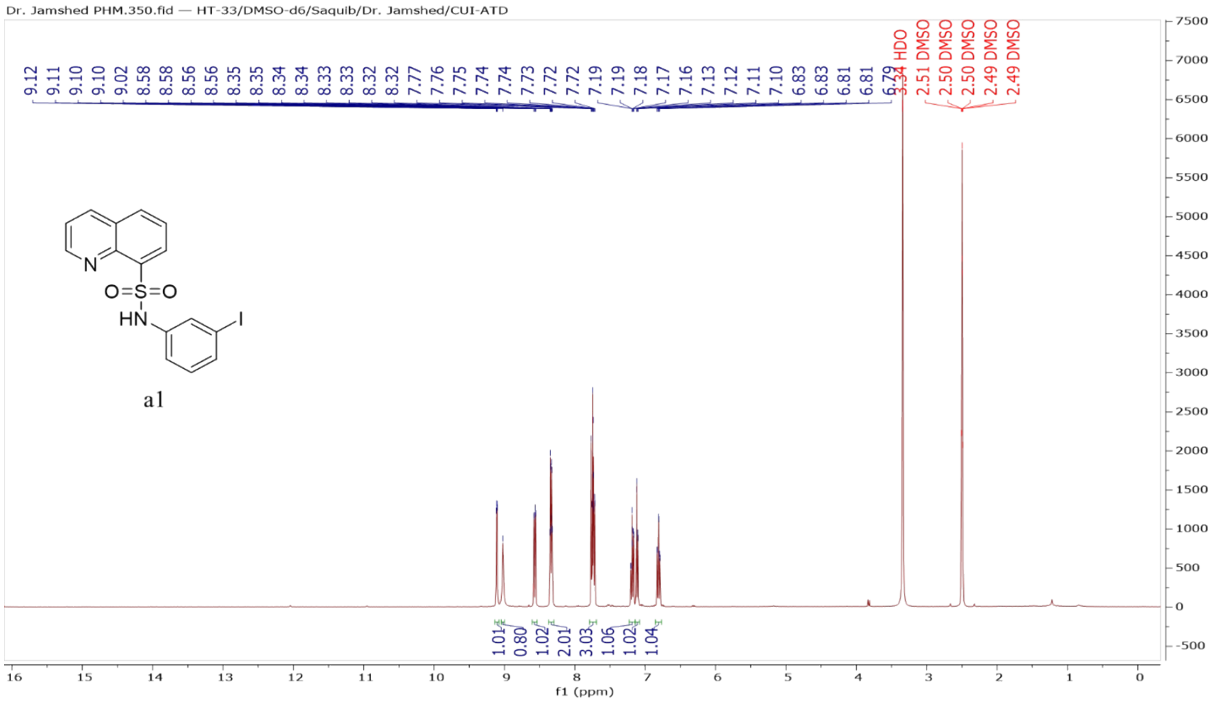


Figure 1:^{1}HNMR of compound a1

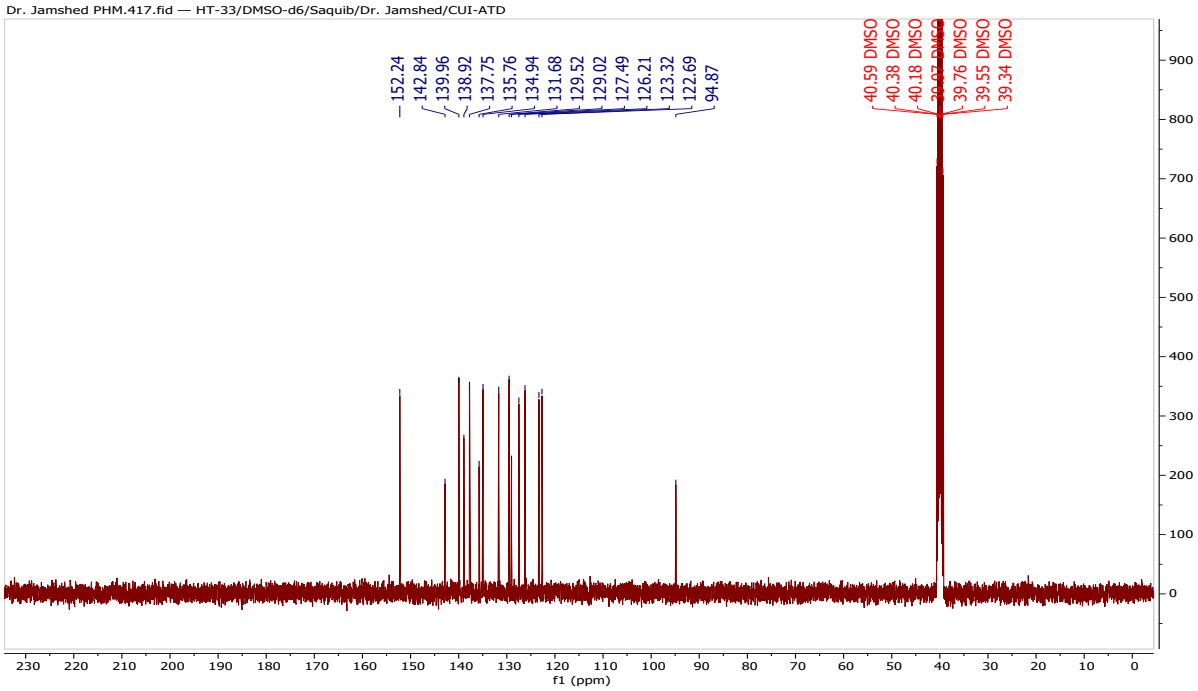


Figure 2: ^{13}CNMR of compound a1

Compound a2

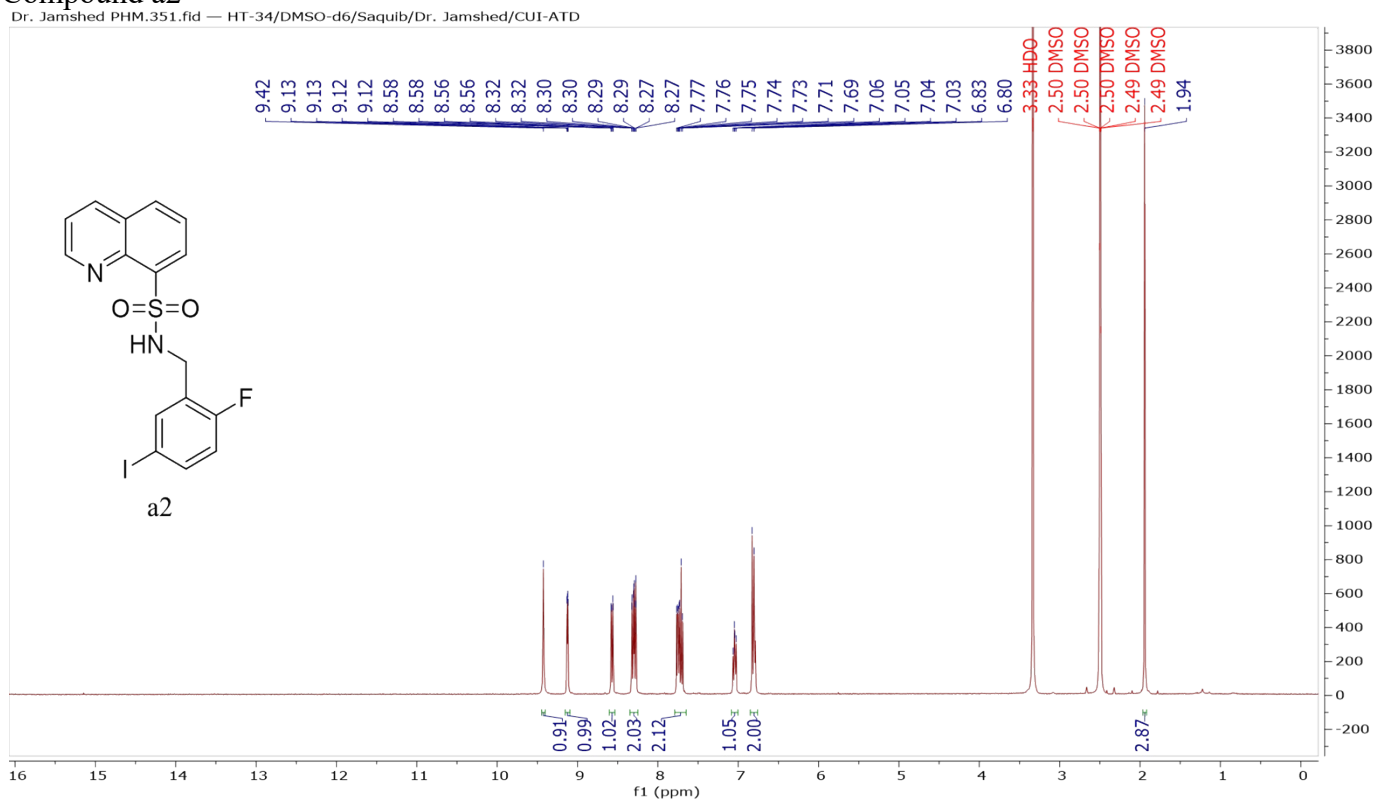


Figure 3: [1]HNMR of compound a2

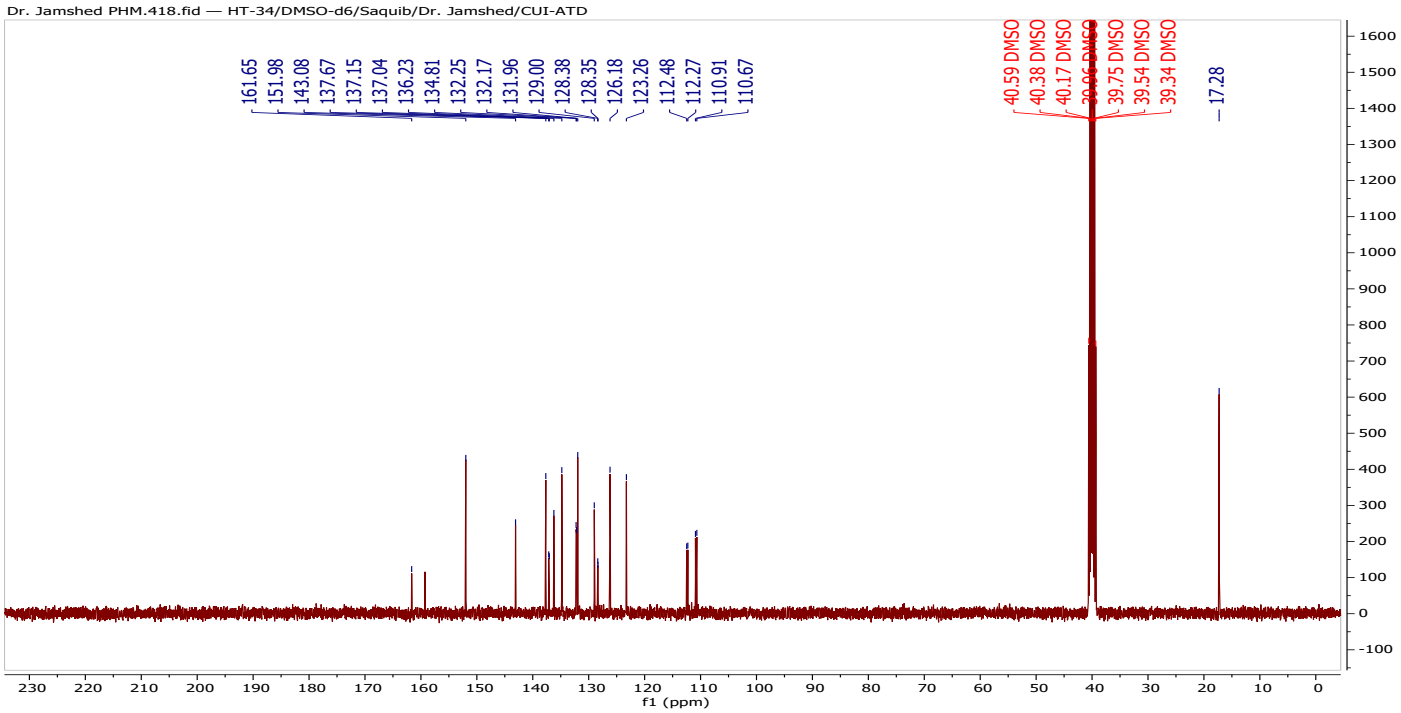


Figure 4: [13]CNMR of compound a2

Compound a3

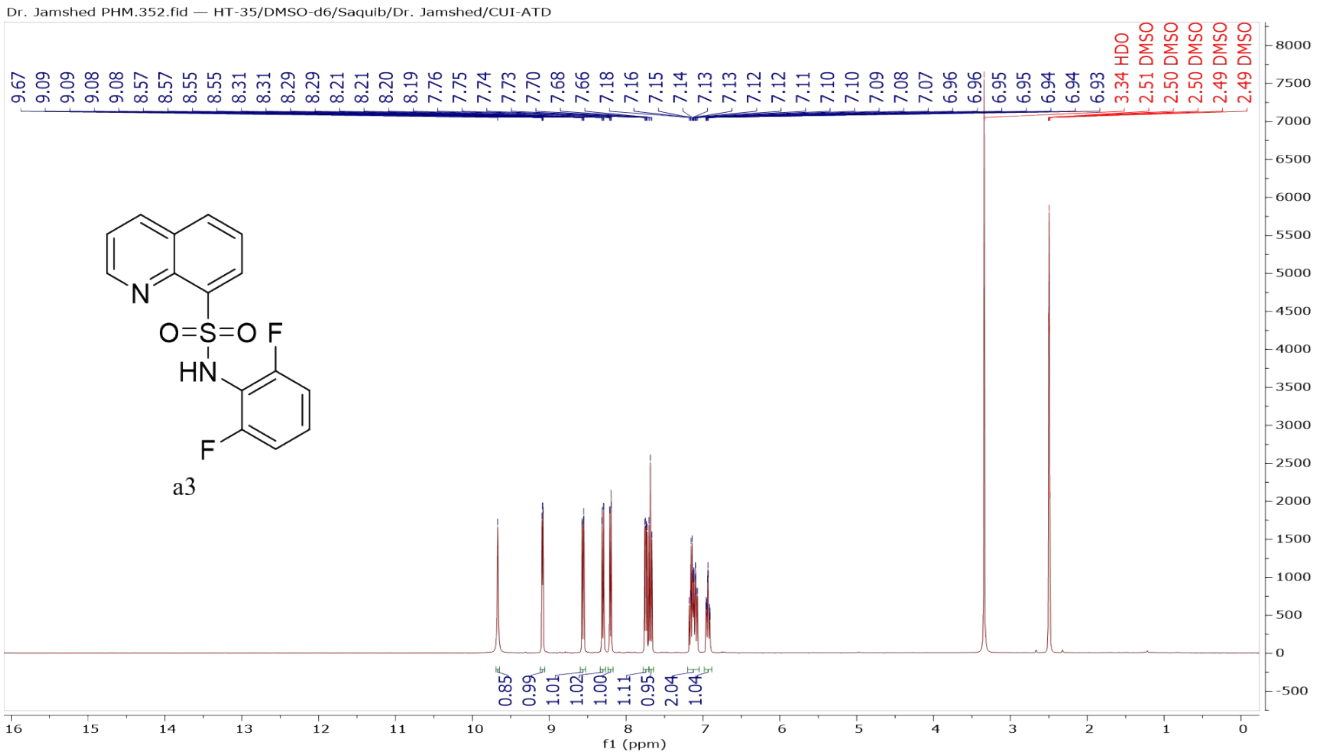


Figure 5: ^{1}HNMR of compound **a3**

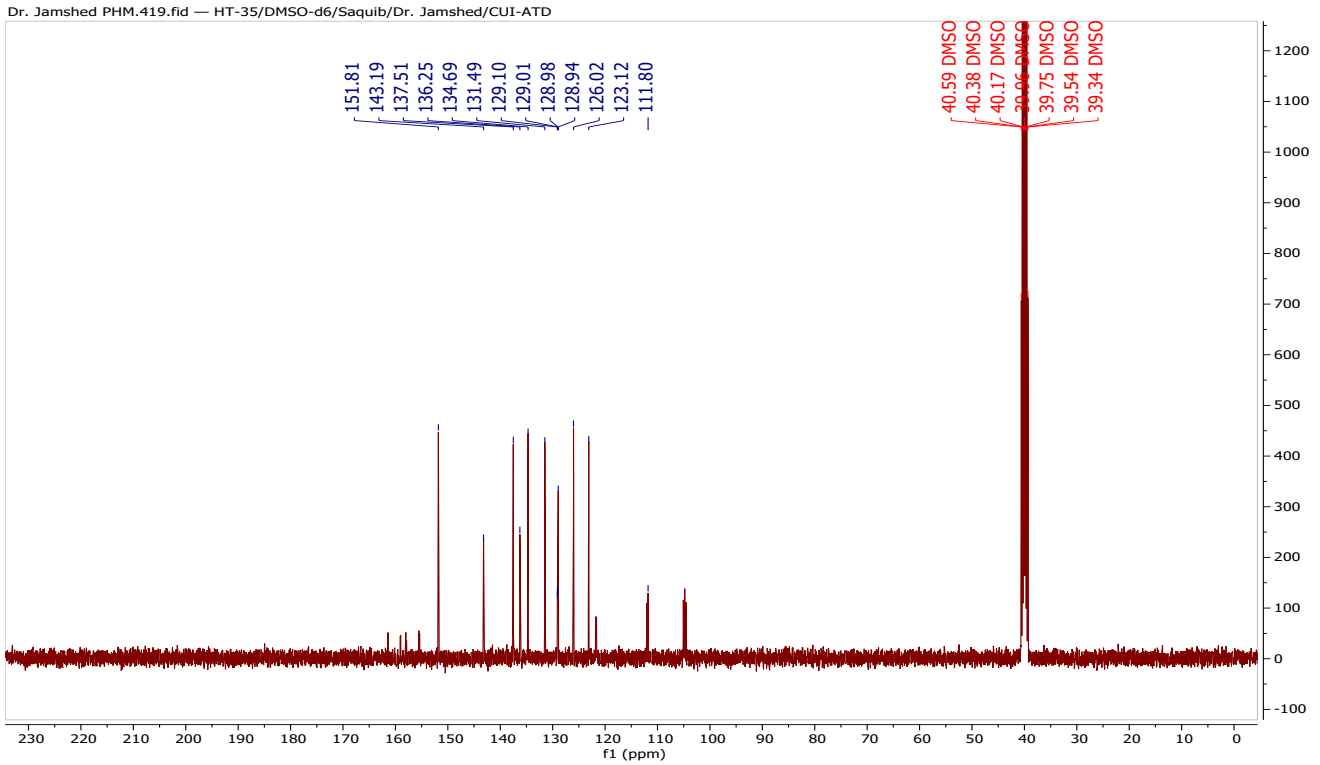


Figure 6: ^{13}CNMR of compound a3

Compound a4

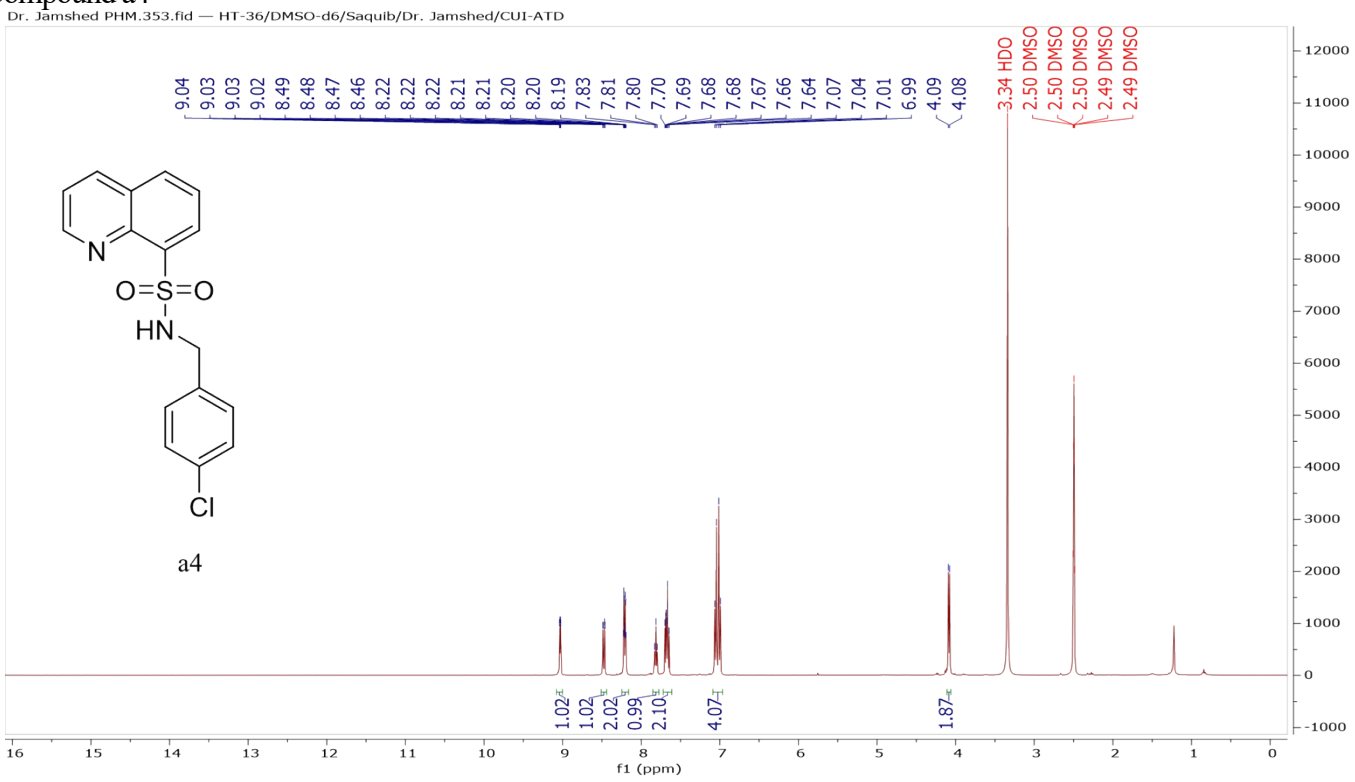


Figure 7: ^{1}HNMR of compound a4

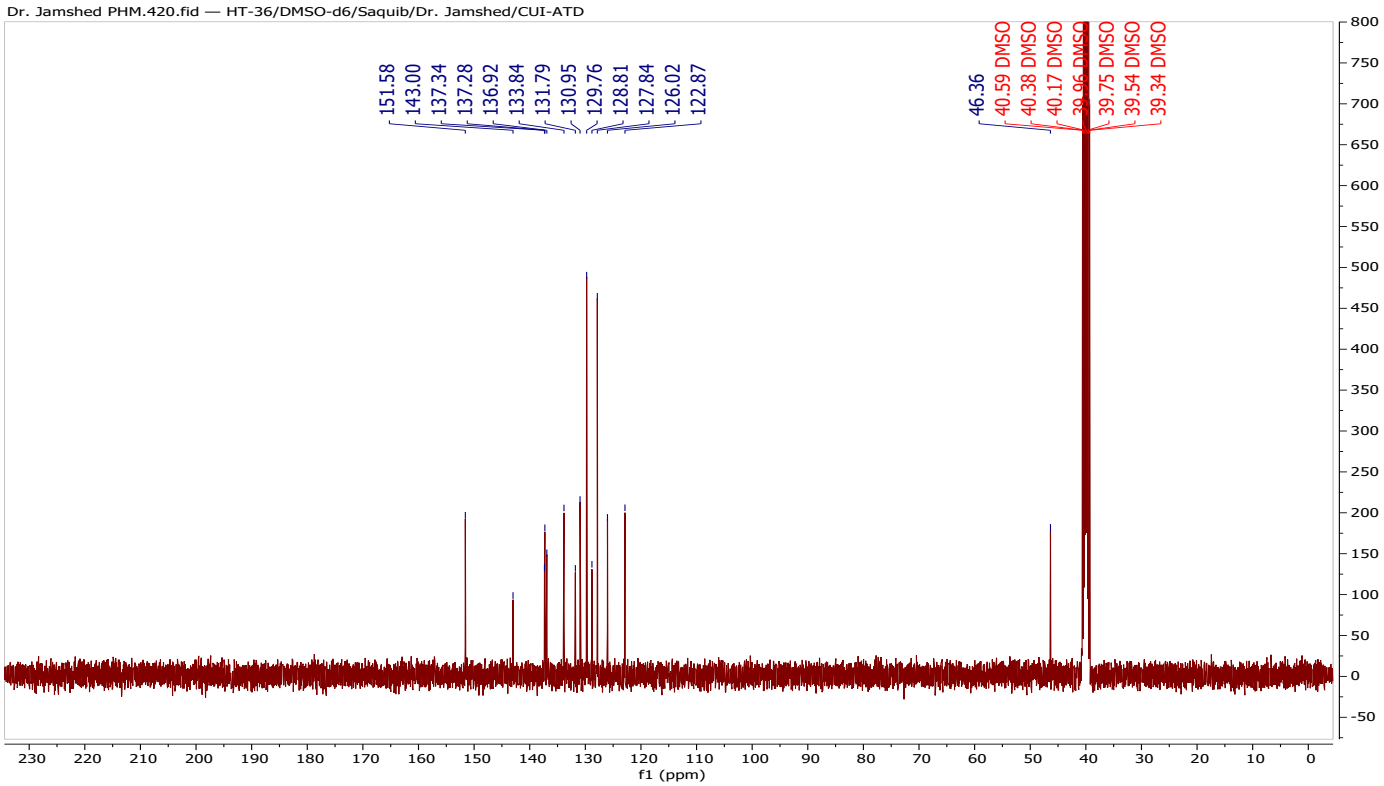


Figure 8: ^{13}CNMR of compound a4

Compound a5

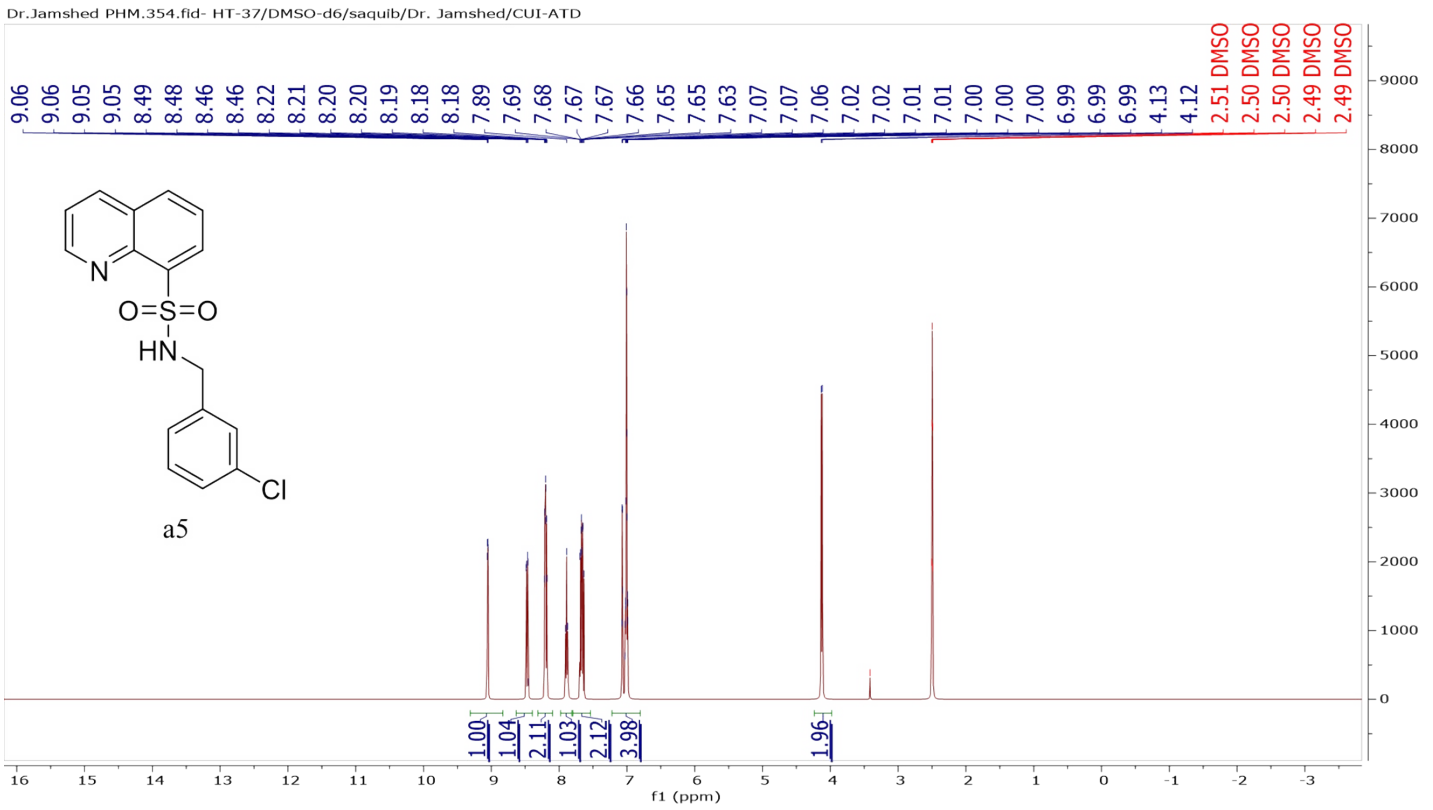


Figure 9: [1]HNMR of compound **a5**

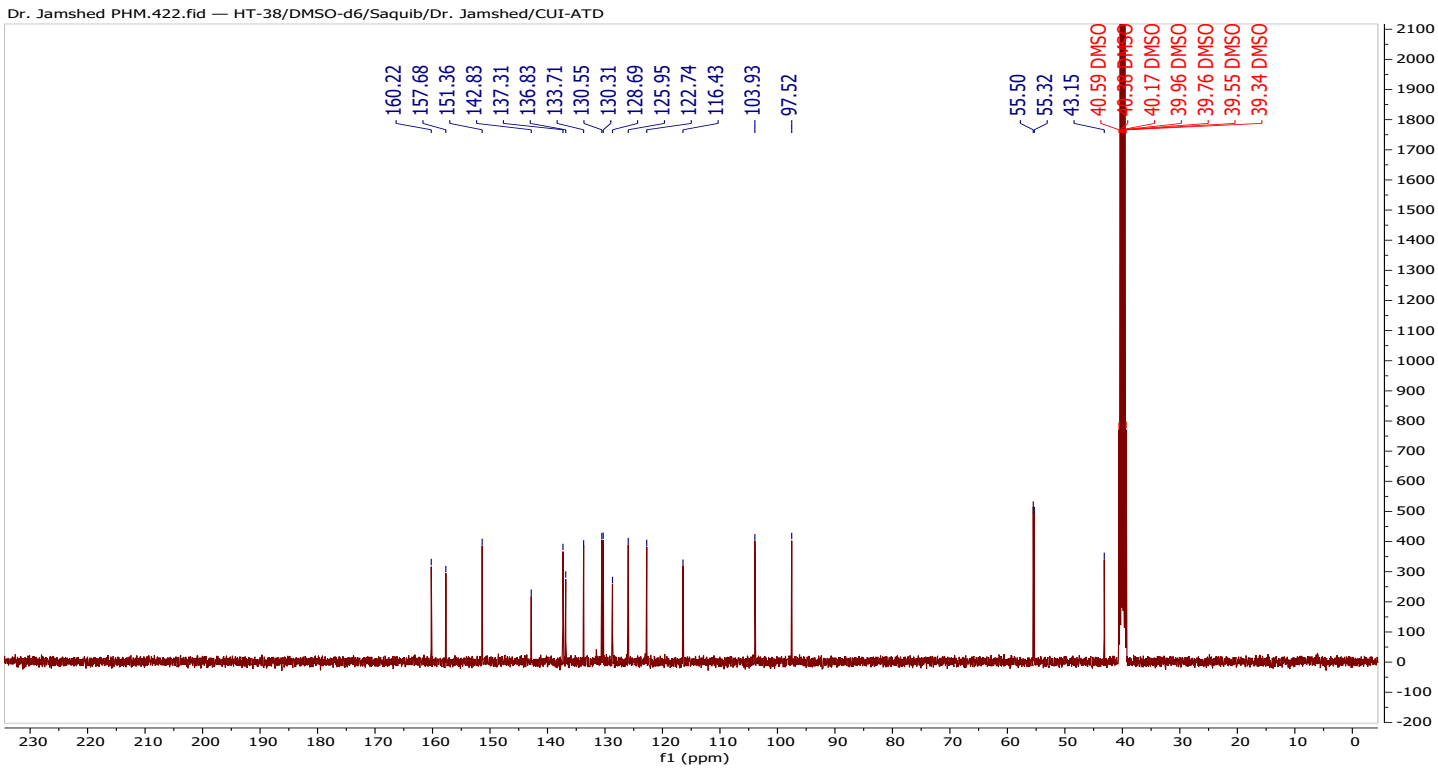


Figure 10: [13]CNMR of compound a5

Compound a6

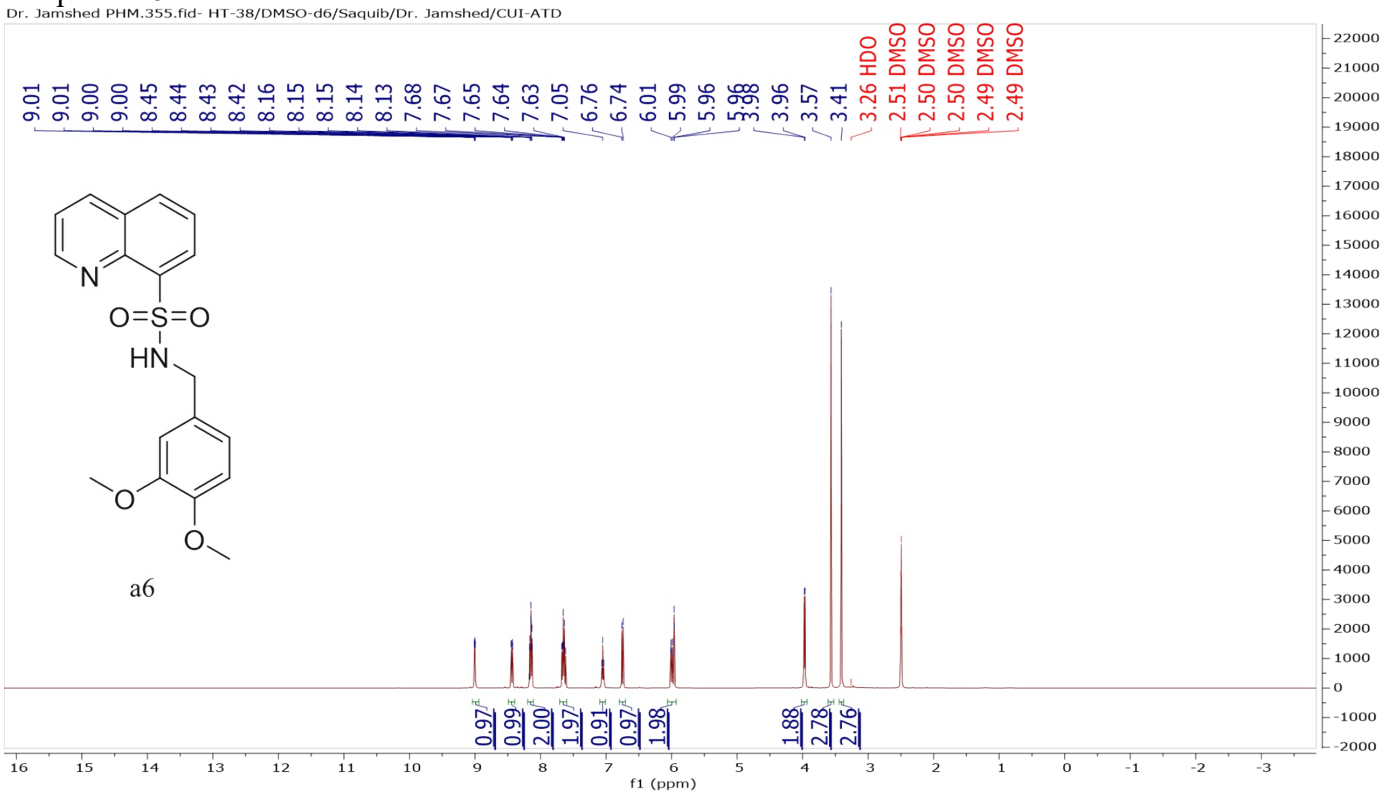


Figure 11: ^{1}HNMR of compound a6

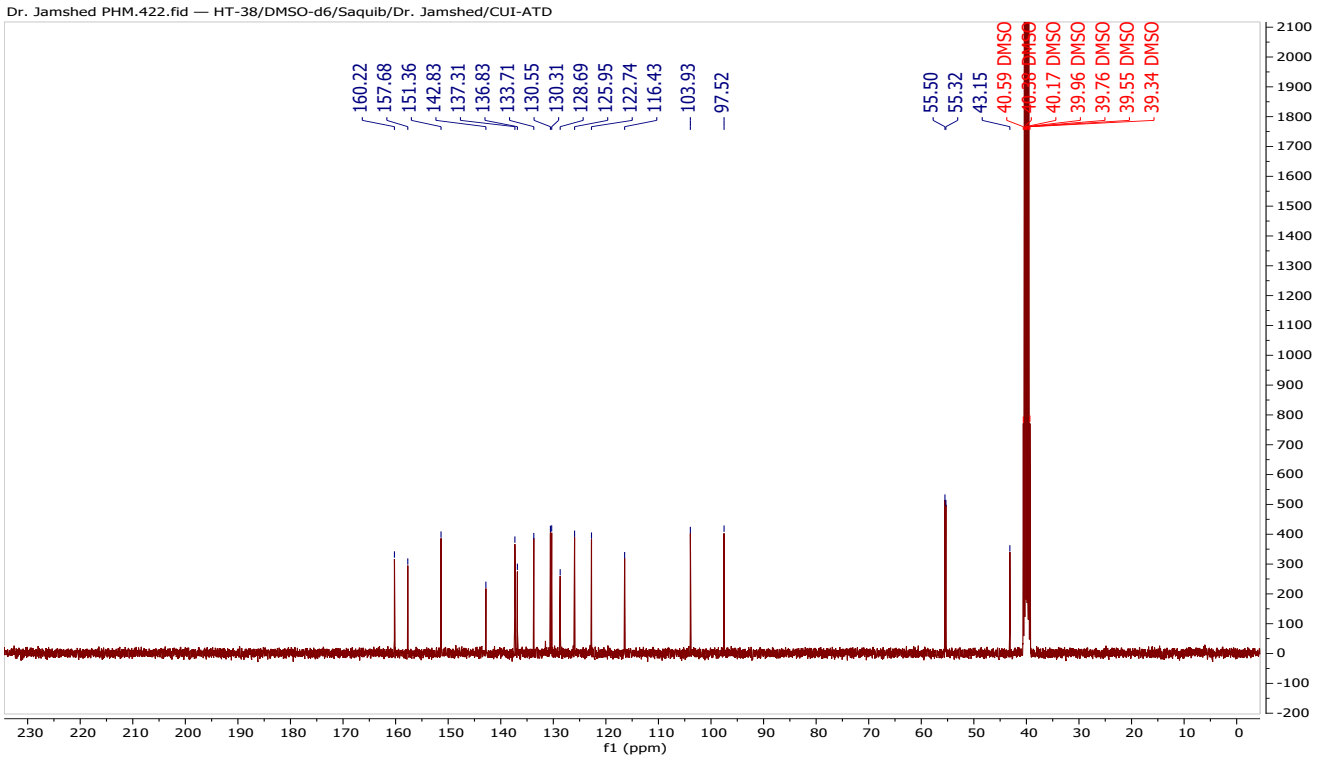


Figure 12: ^{13}CNMR of compound a6

Compound a8

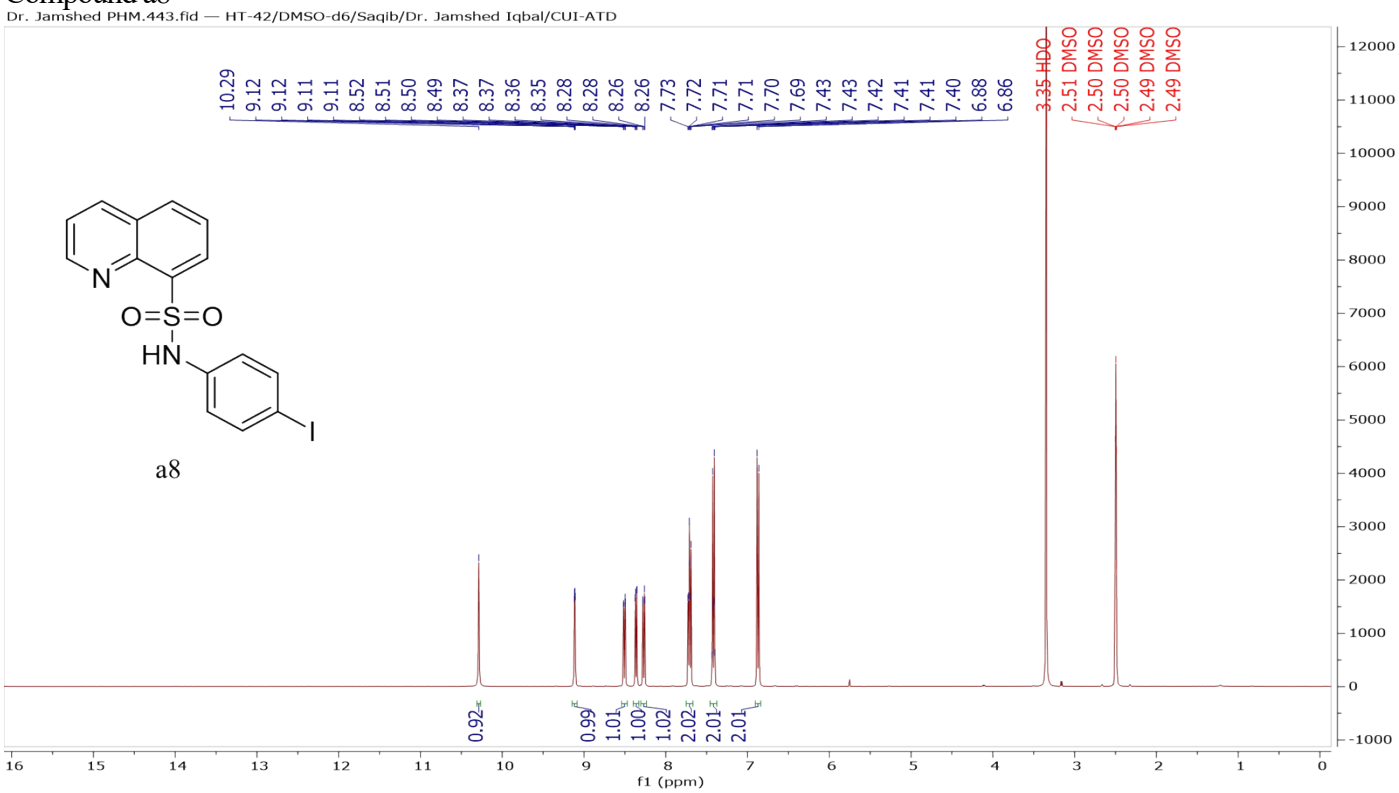


Figure 13: ^{1}HNMR of compound a8

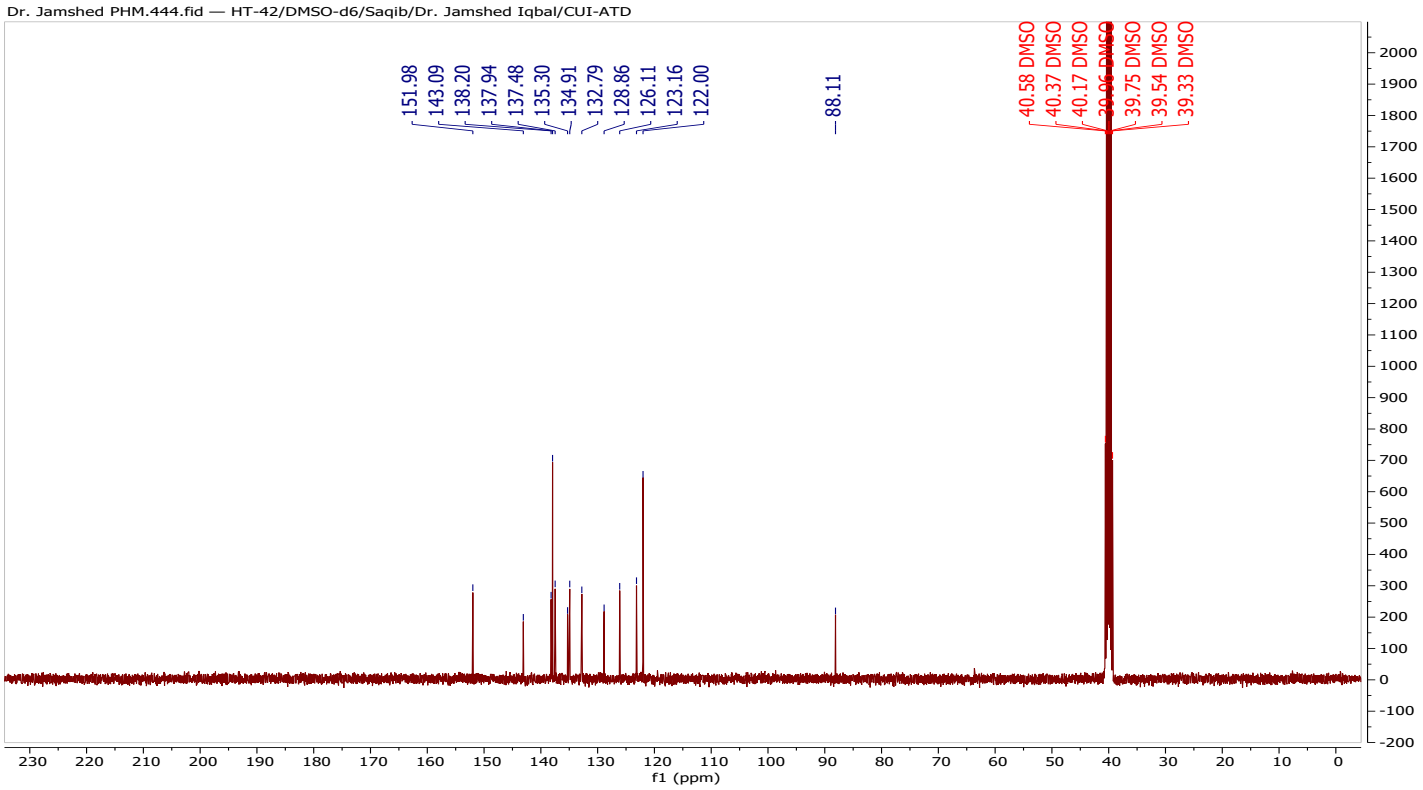
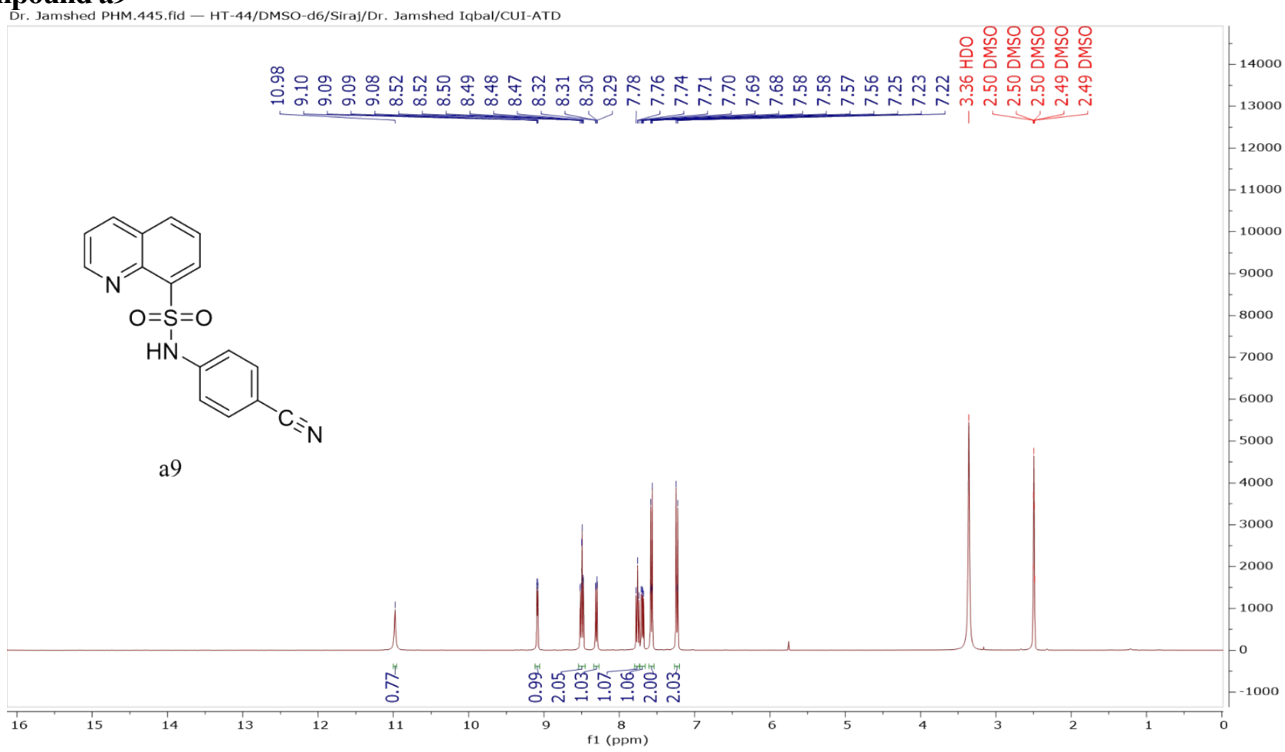


Figure 14: ^{13}CNMR of compound a8

Compound a9



a9

Figure 15: ^{1}NMR of compound **a9**

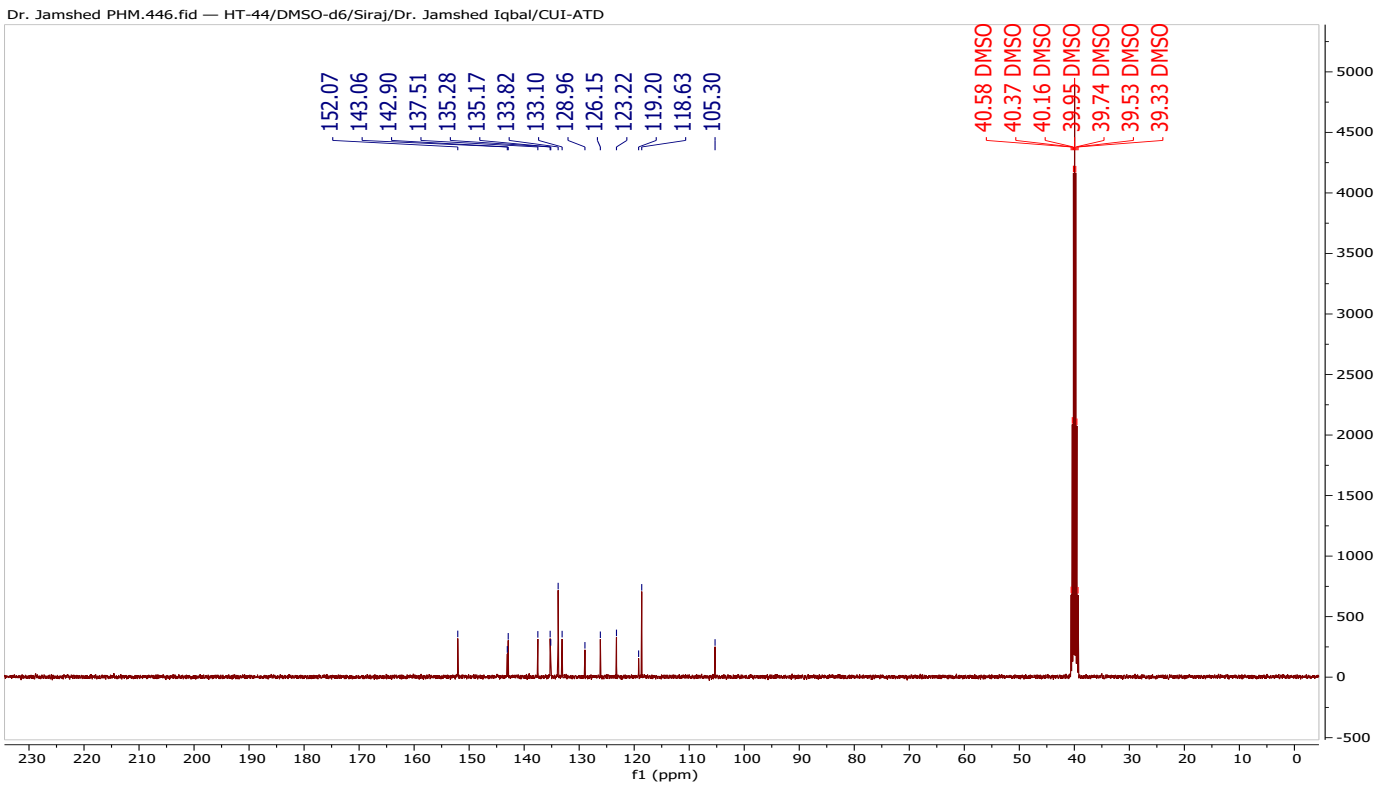


Figure 16: ^{13}CNMR of compound a9

Compound a10

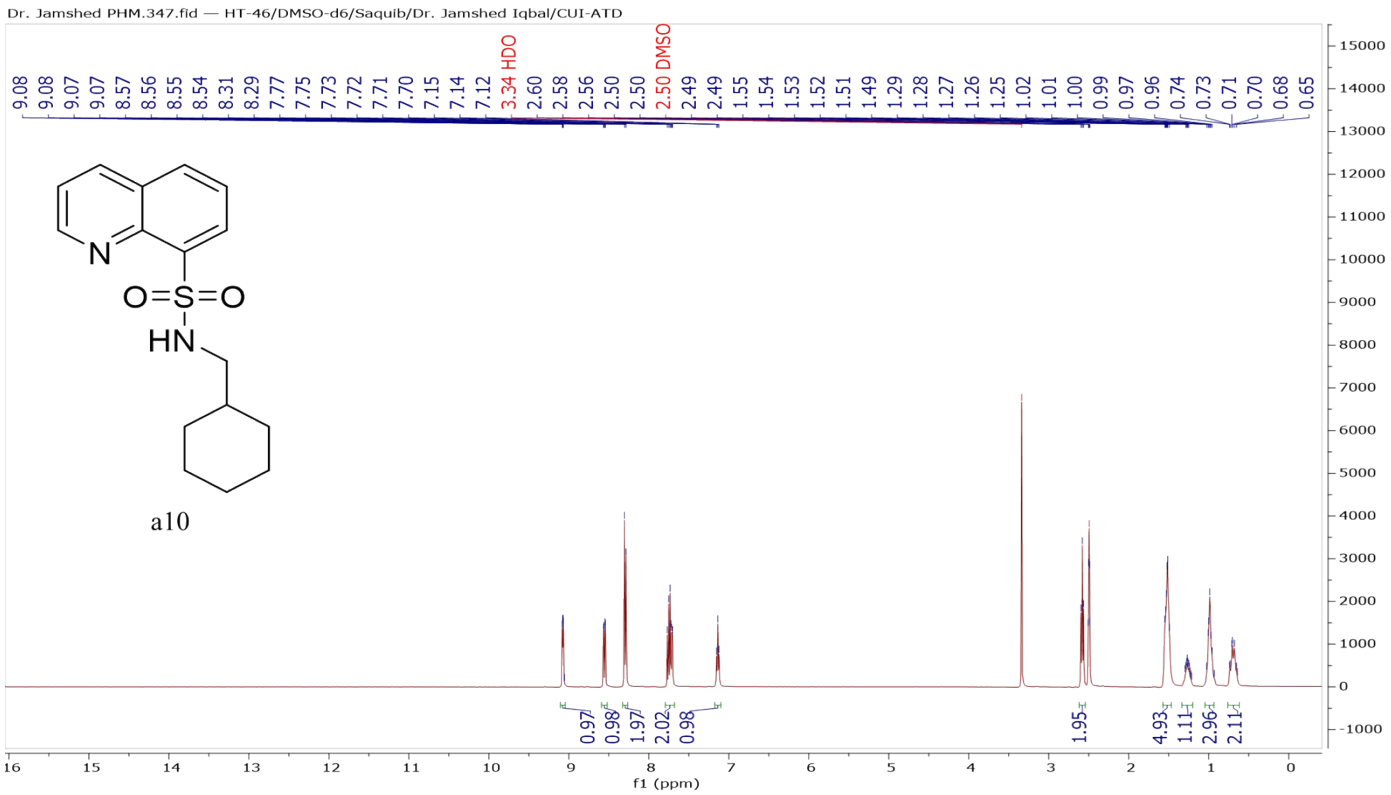


Figure 17: [1]HNMR of compound a10

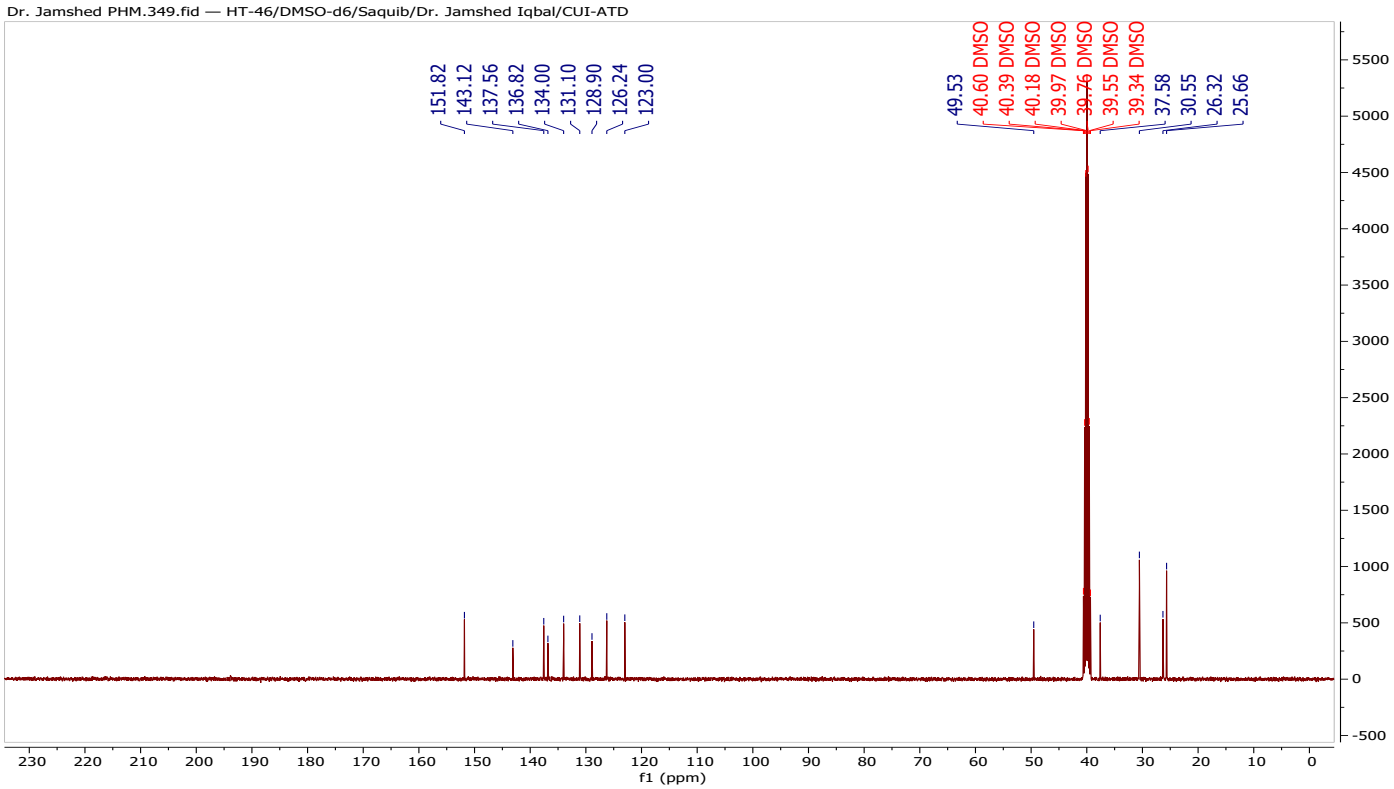


Figure 18: [13]CNMR of compound 10

Compound a11

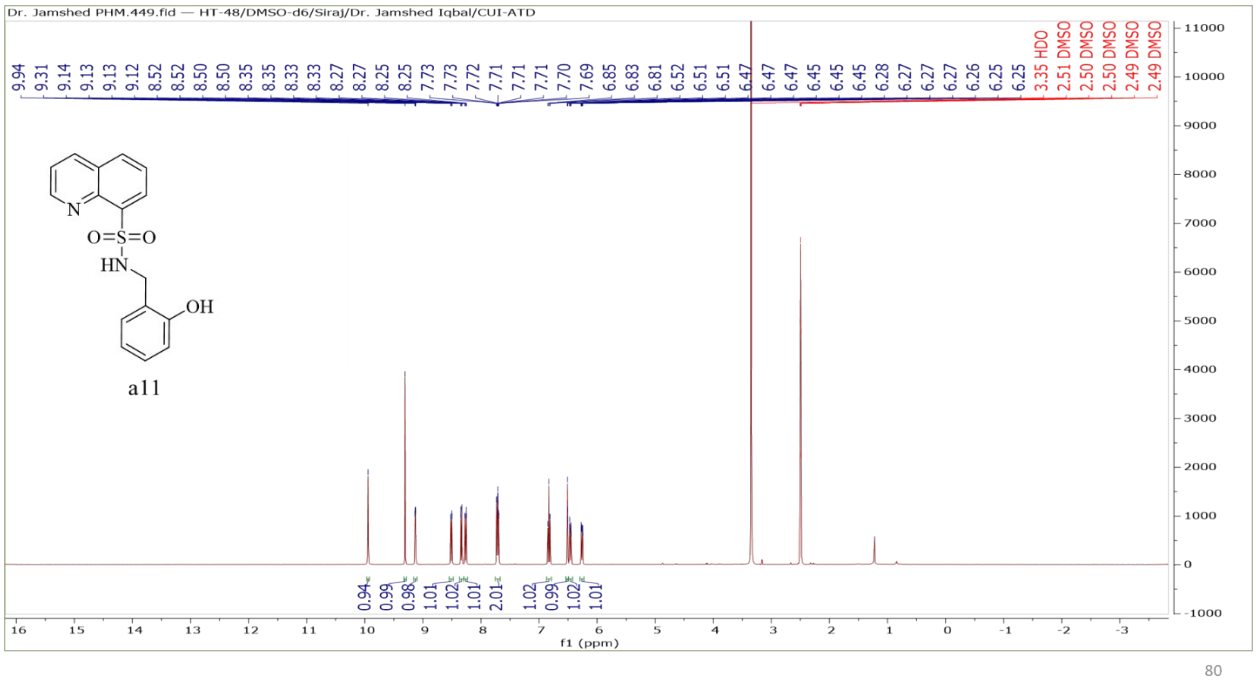


Figure 19: [1]HNMR of compound a11

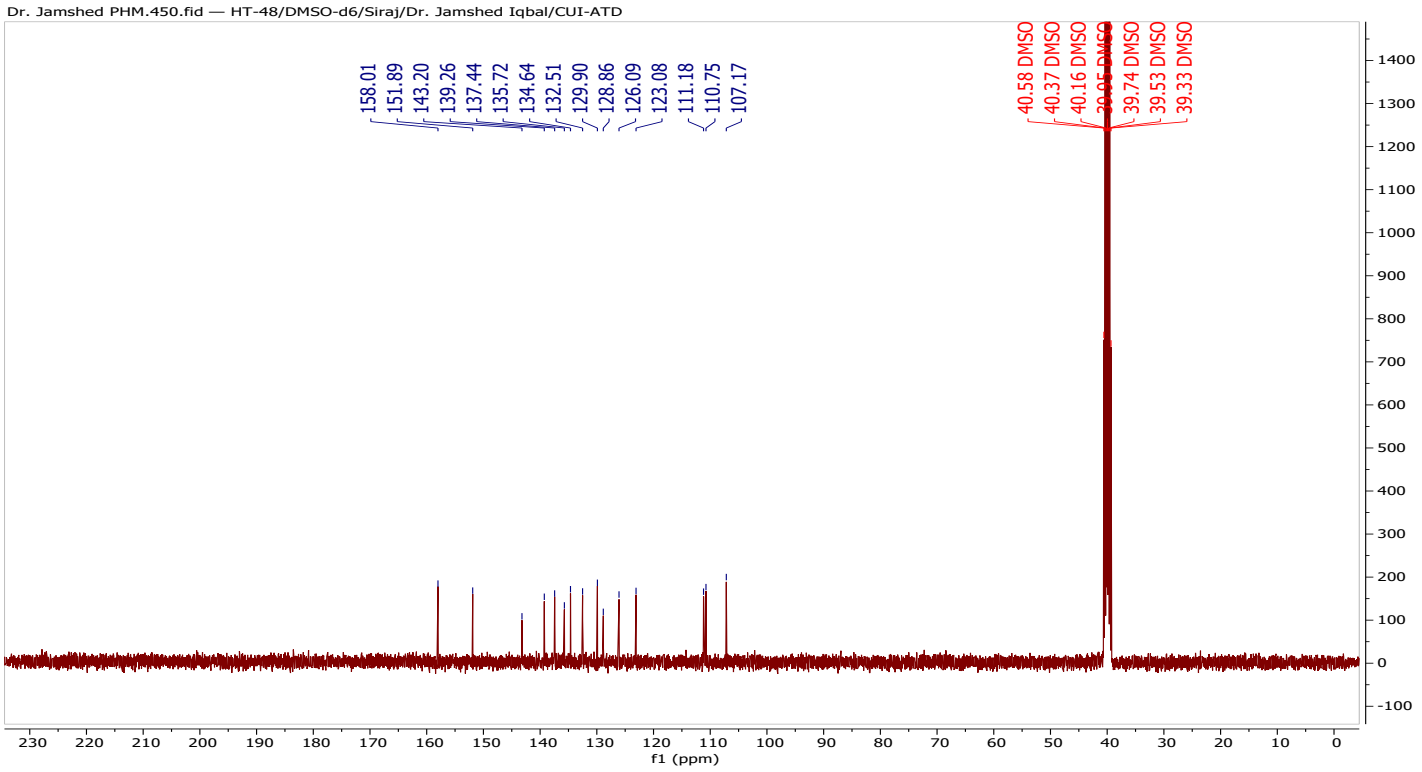


Figure 20: [13]CNMR of compound a11

Compound a12

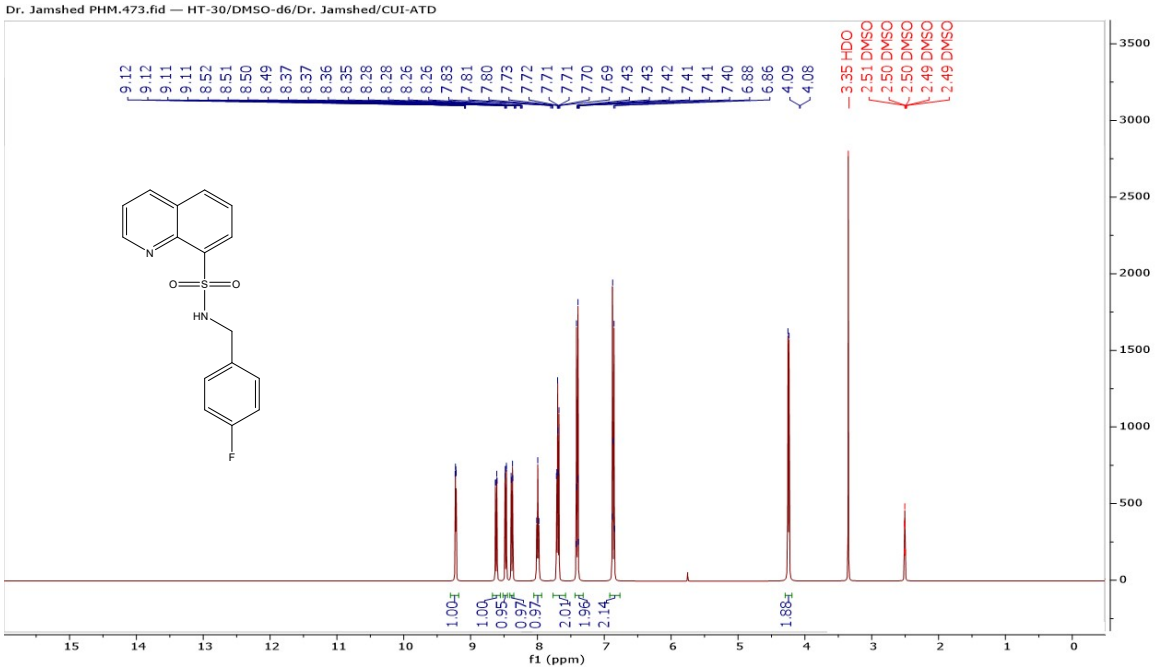


Figure 21: [1]HNMR of compound a12

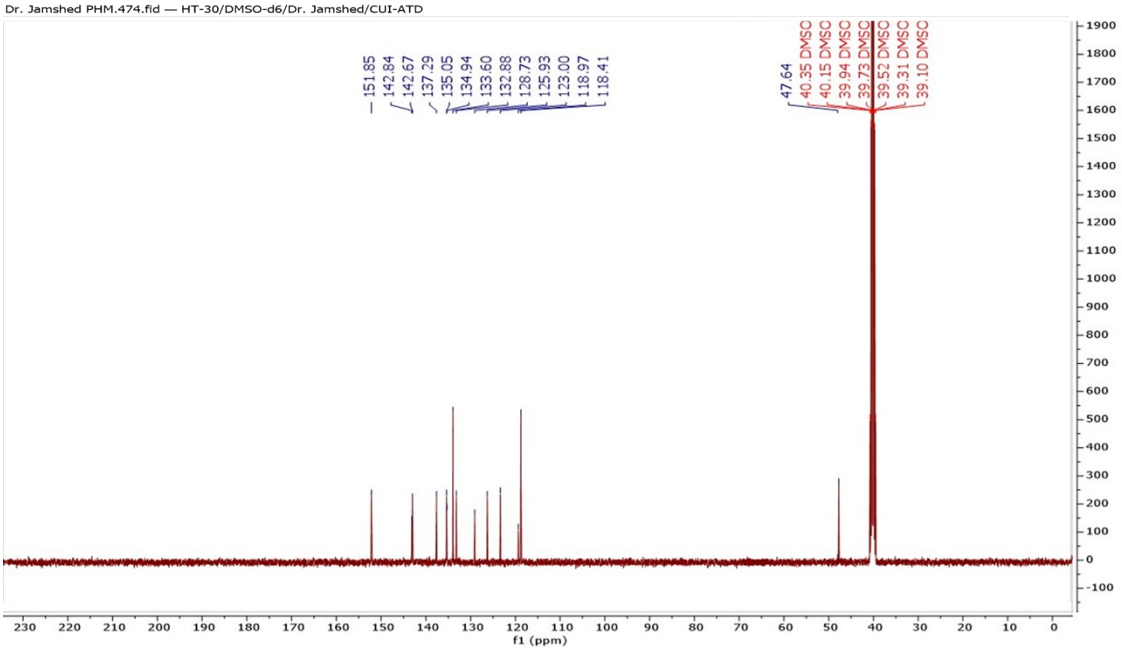


Figure 22: [13]CNMR of compound a12

Compound a14

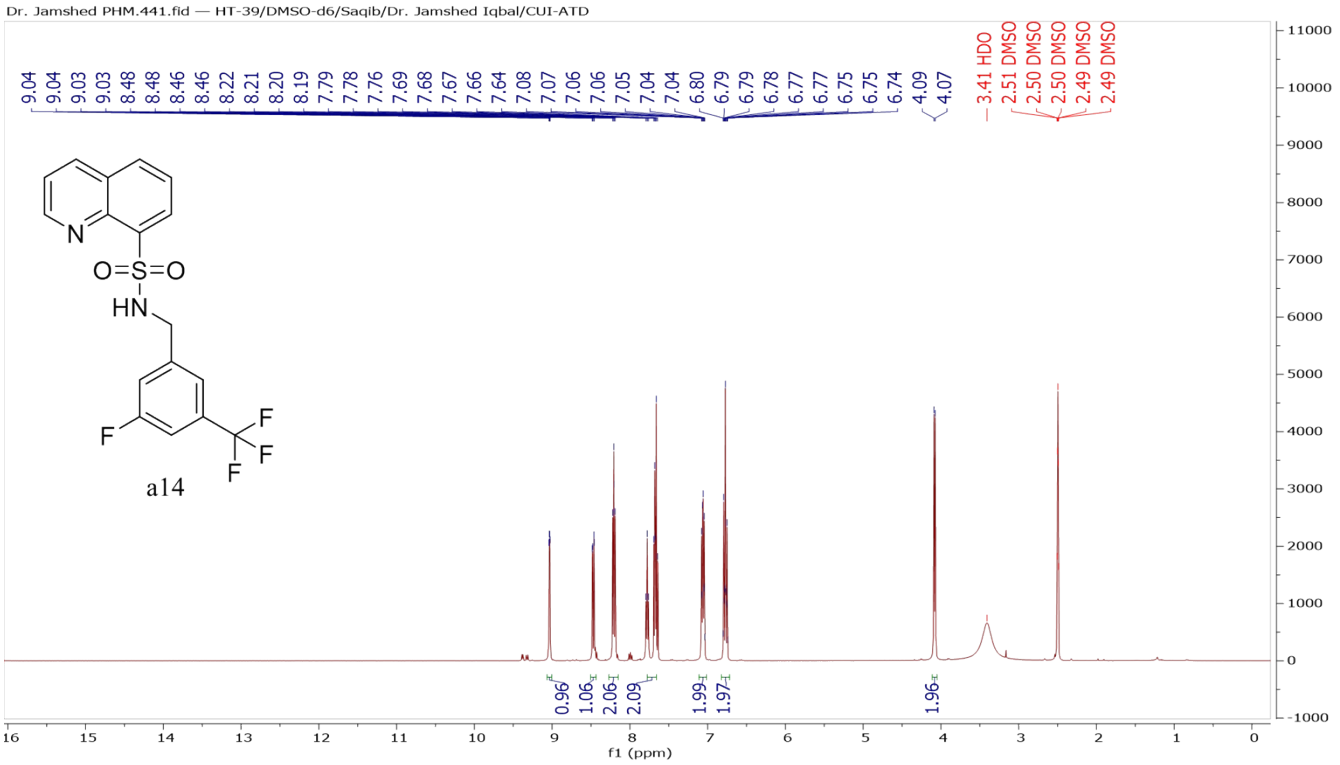


Figure 23: [1]HNMR of compound a14

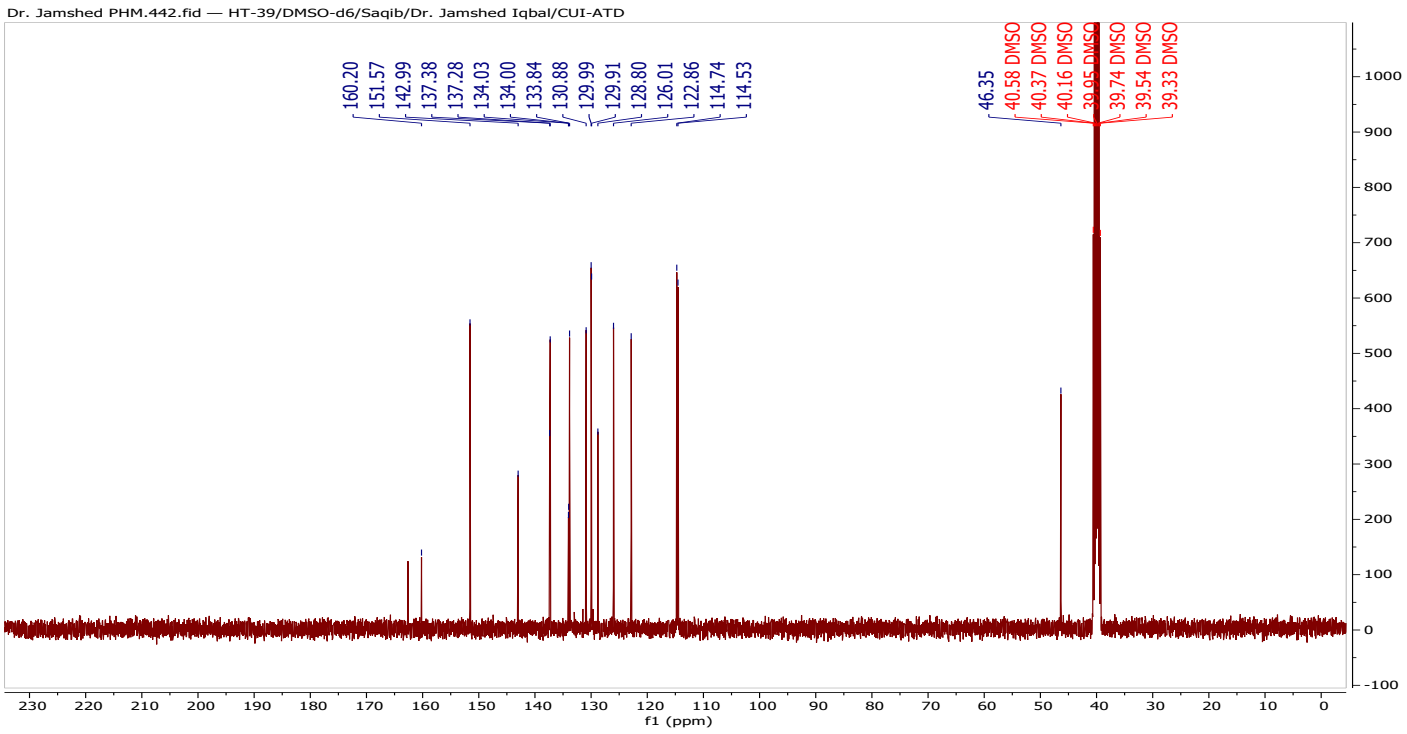


Figure 24: [13]CNMR of compound **a14**

Compound a15

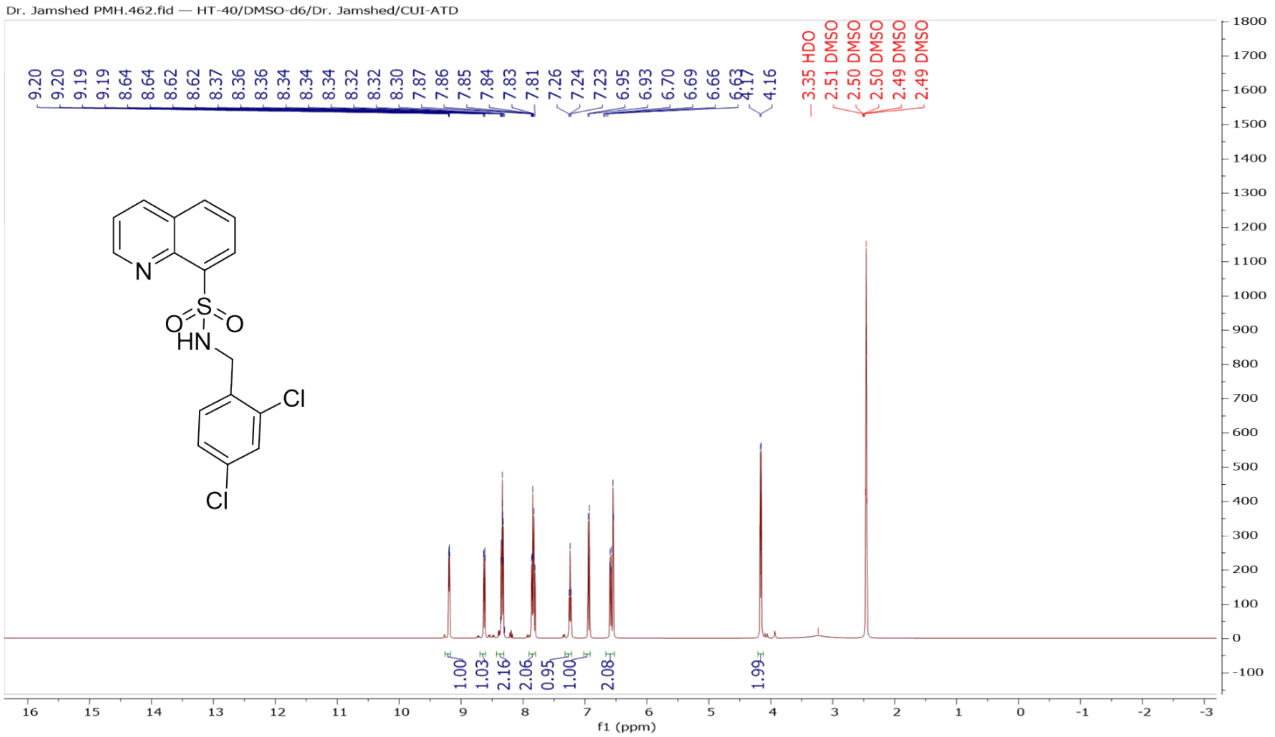


Figure 25: [1]HNMR of compound **a15**

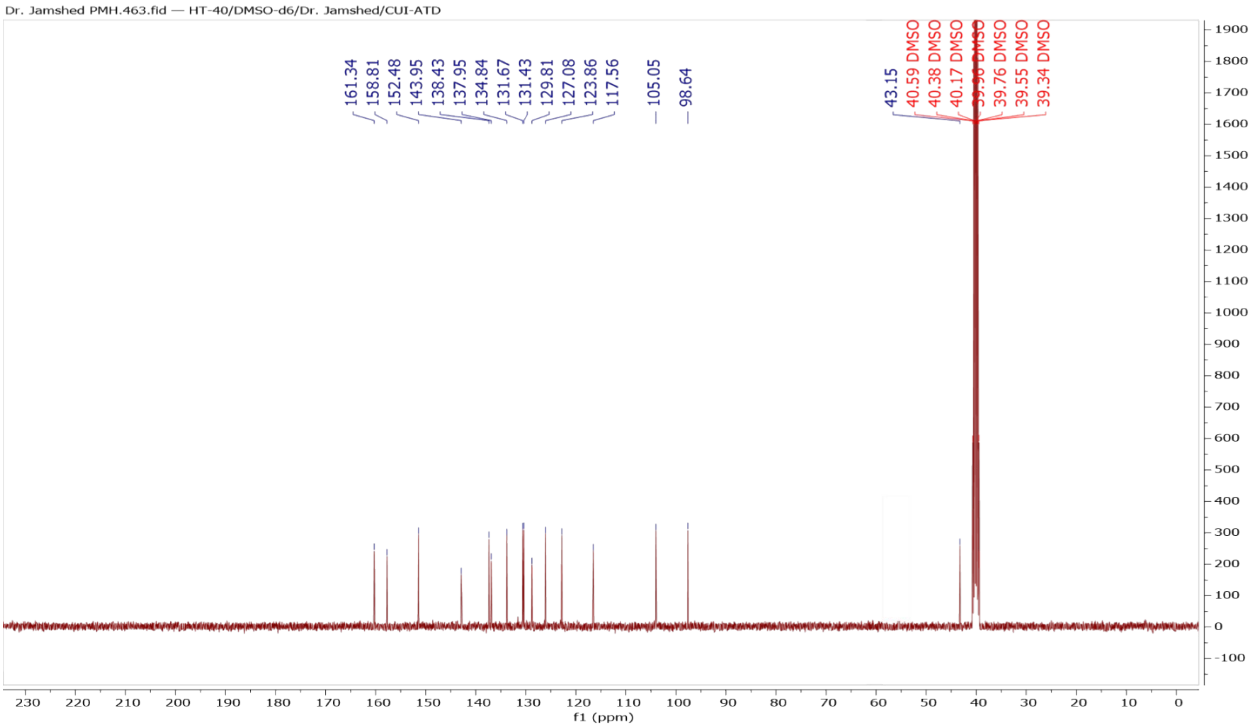


Figure 26: ^{13}CNMR of compound **a15**

Compound a16

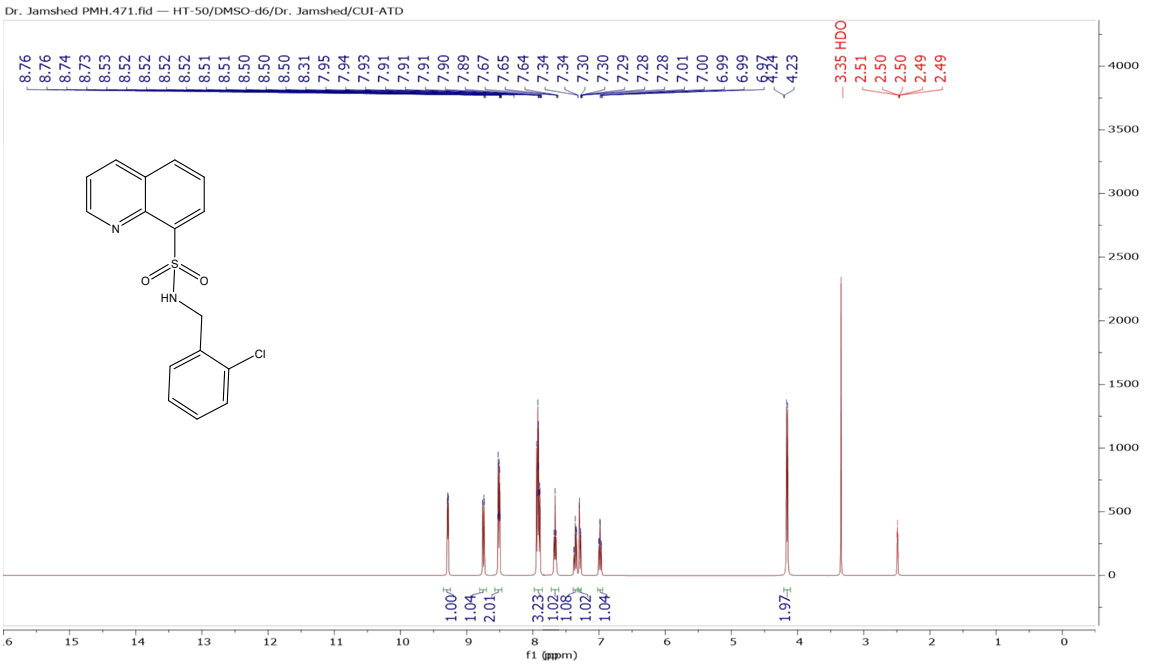


Figure 27: ^{1}HNMR of compound a16

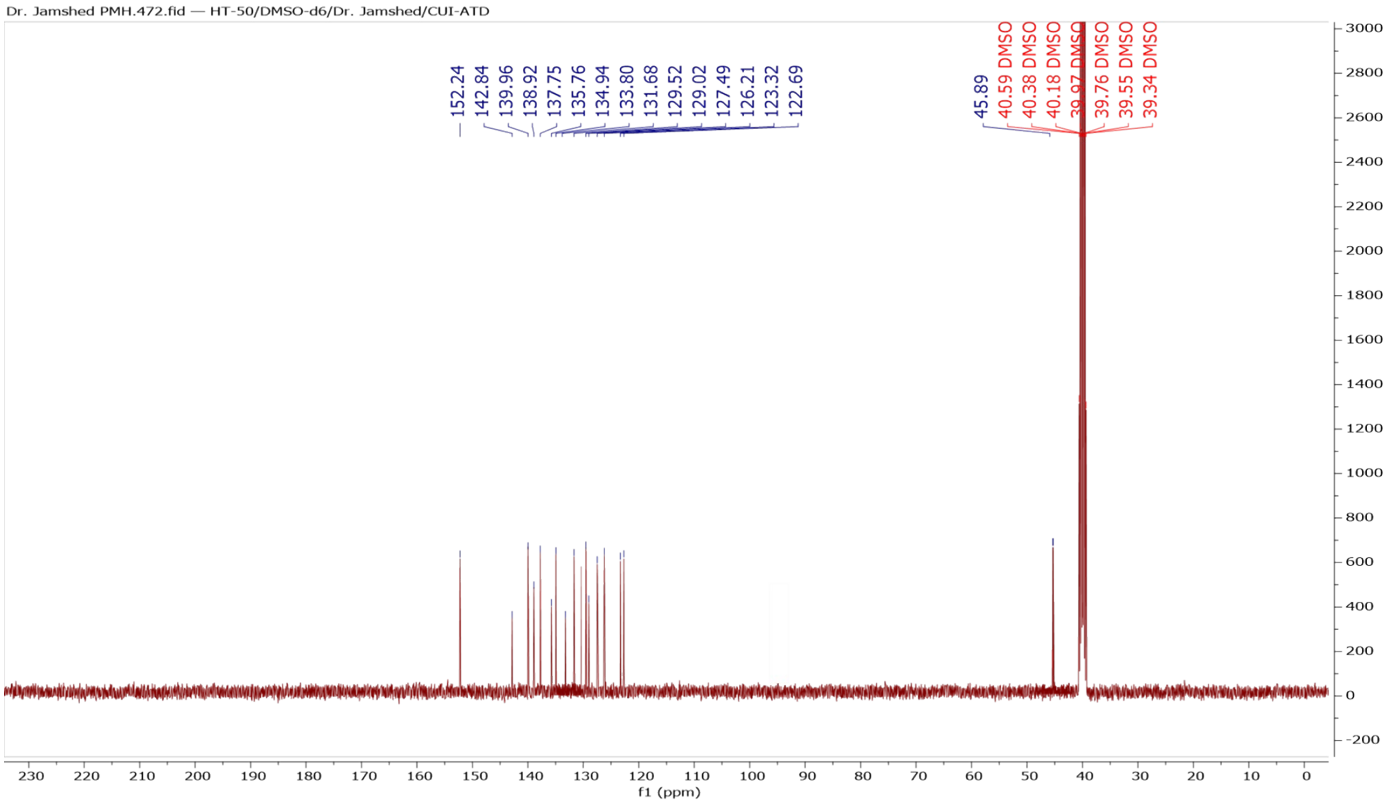


Figure 28: ^{13}CNMR of compound a16

Compound a17

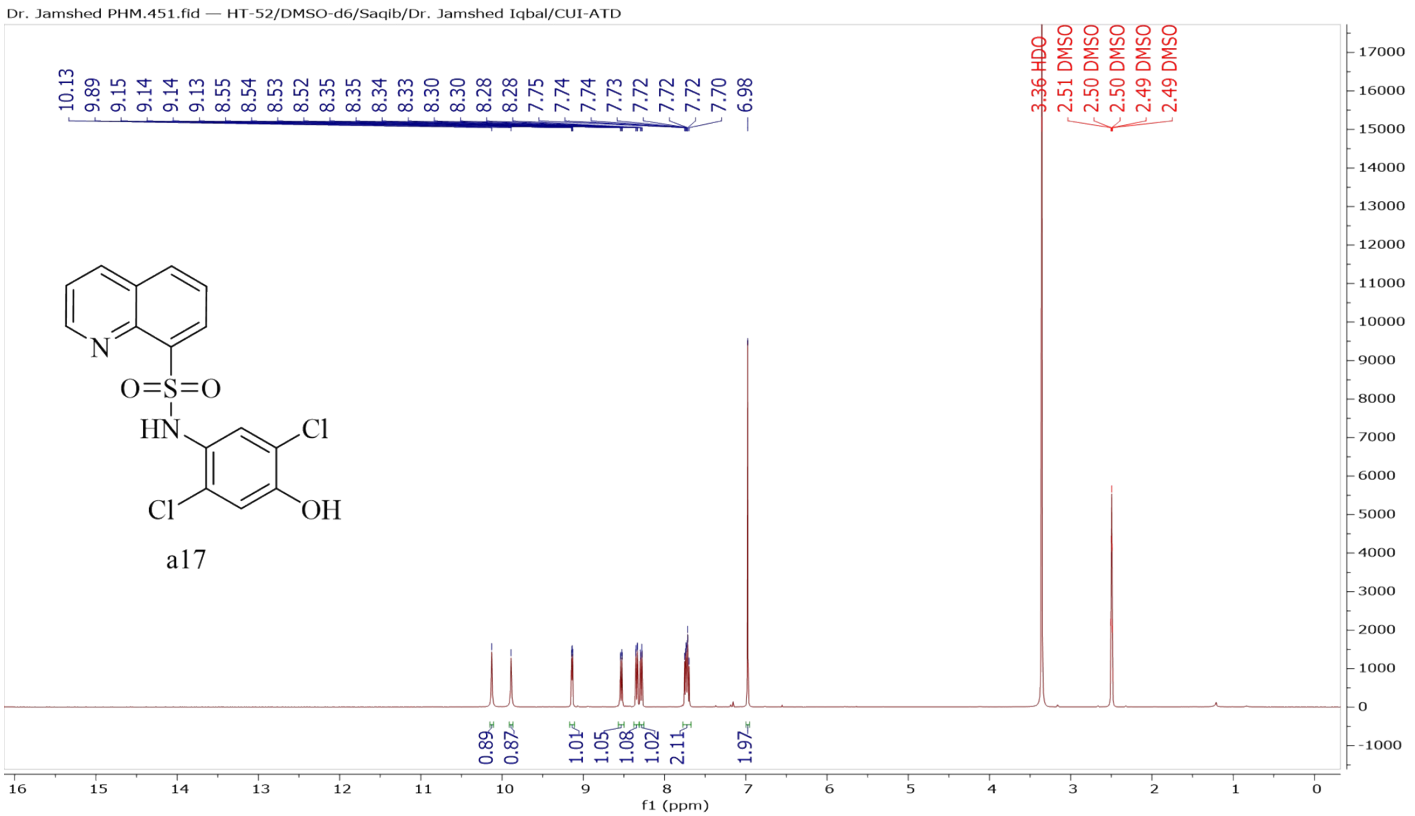


Figure 29: 1HNMR of compound **a17**

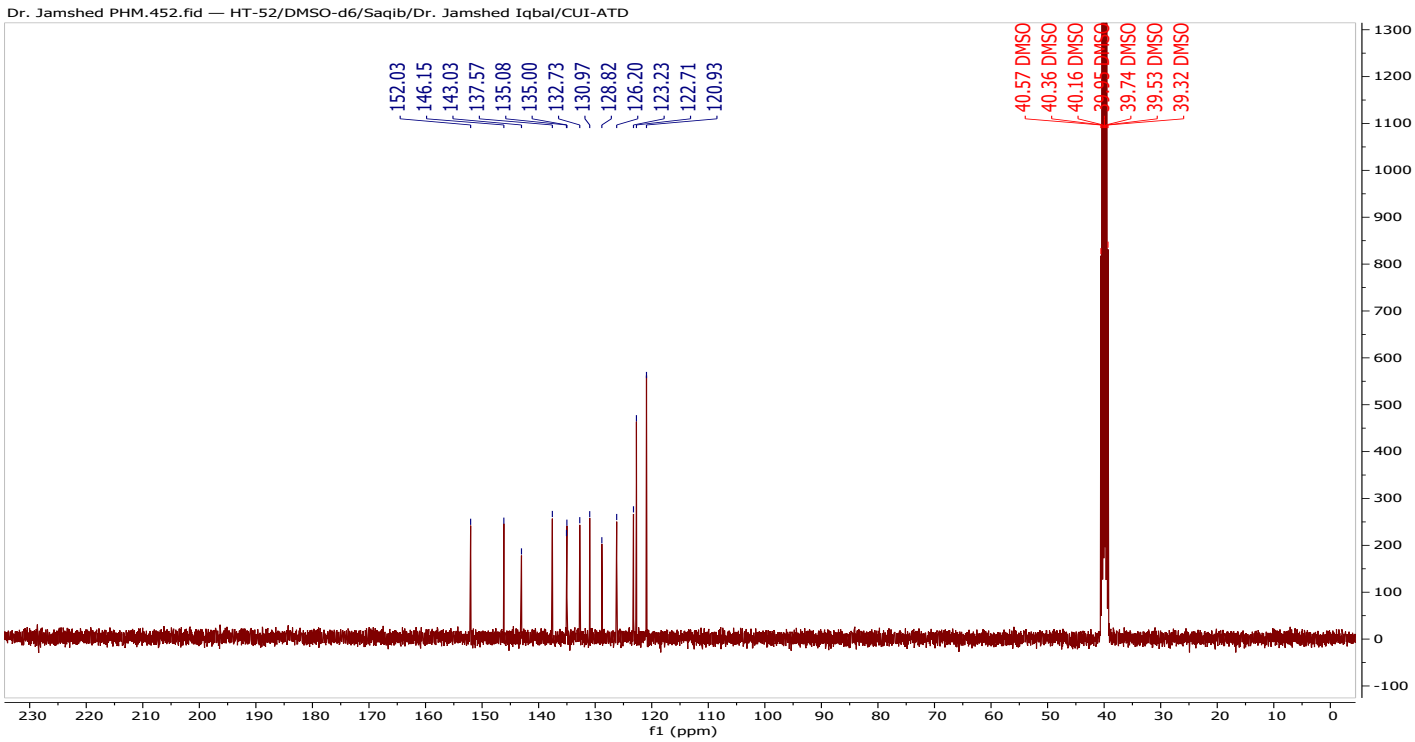


Figure 30: ^{13}CNMR of compound a17

Compound 18

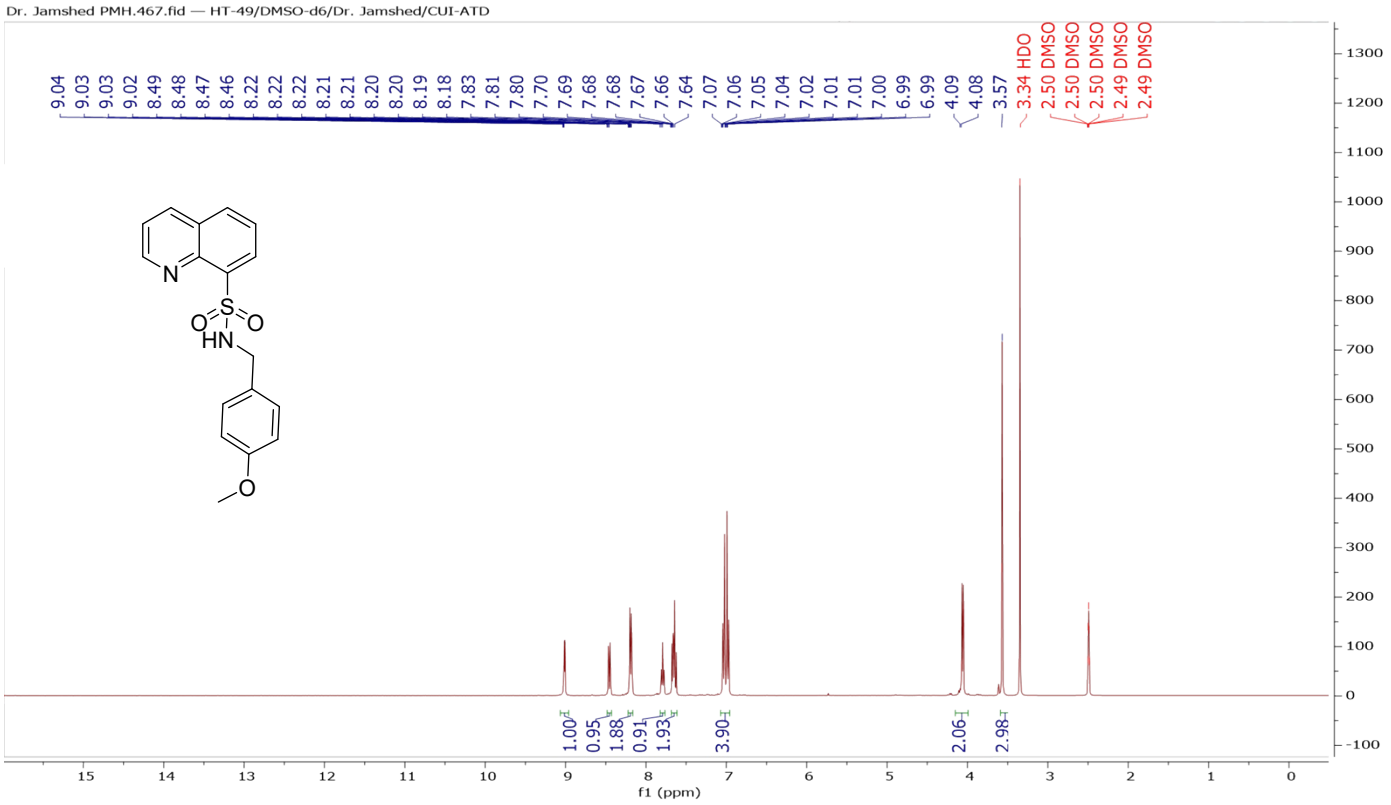


Figure 31:[1]HNMR of compound **a18**

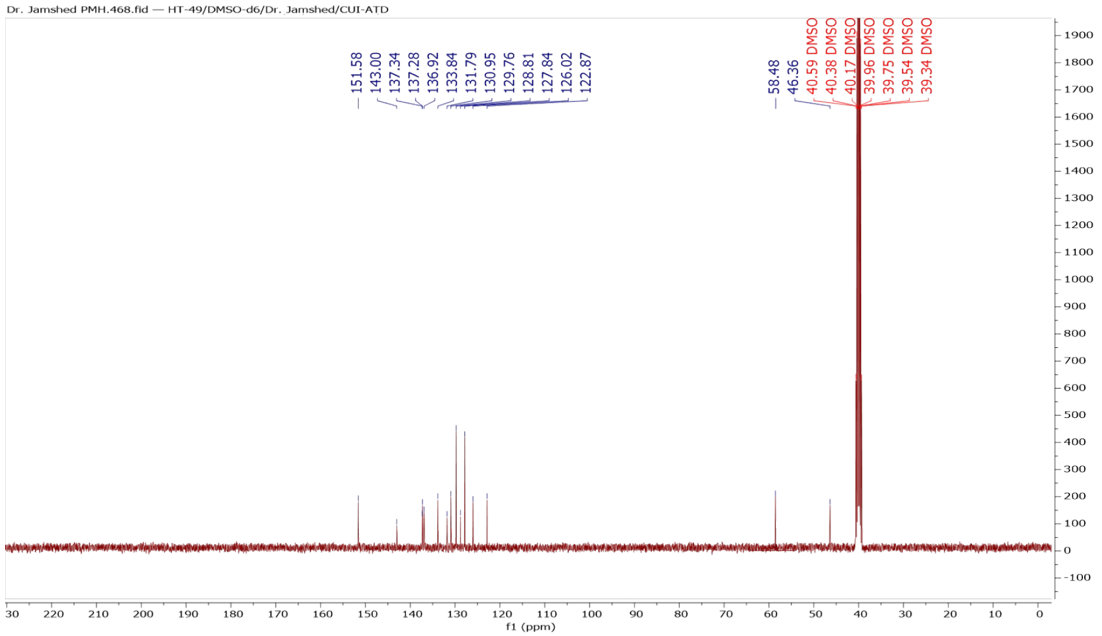


Figure 32: [13]CNMR of compound a18

1.2 FTIR analysis

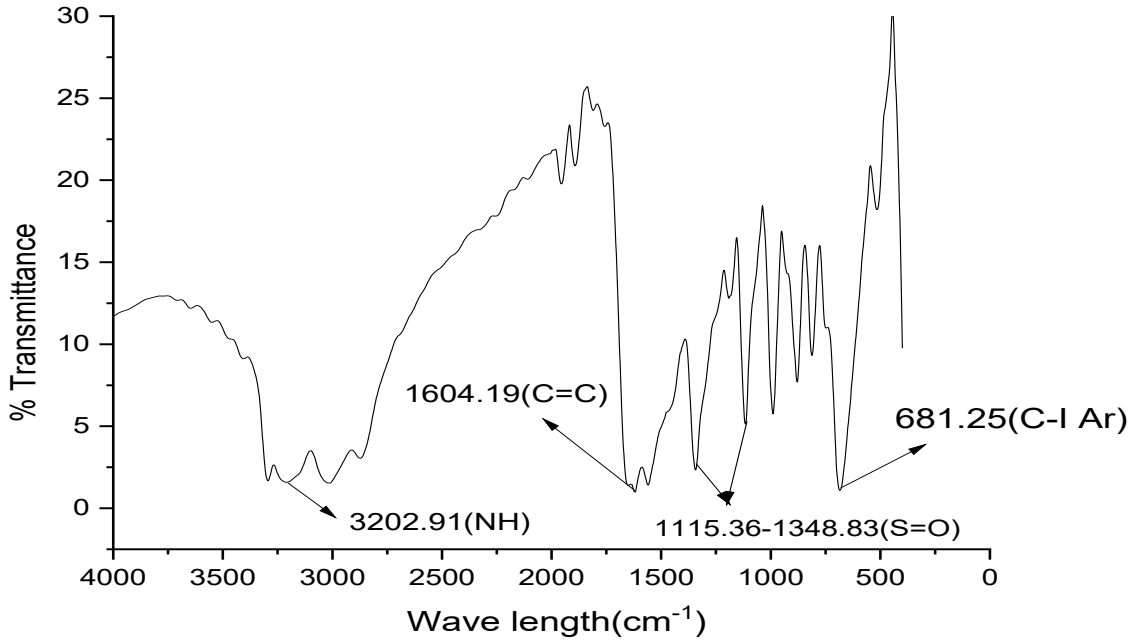


Figure 33: FTIR graph of compound **a1**

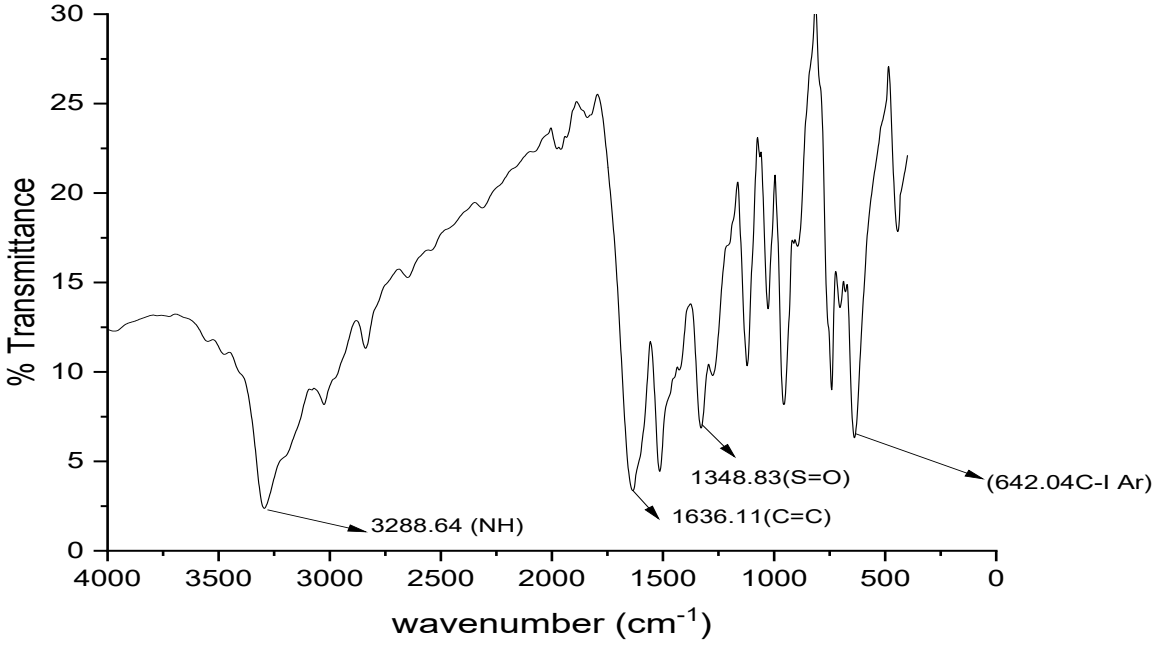


Figure 34: FTIR graph of compound **a2**

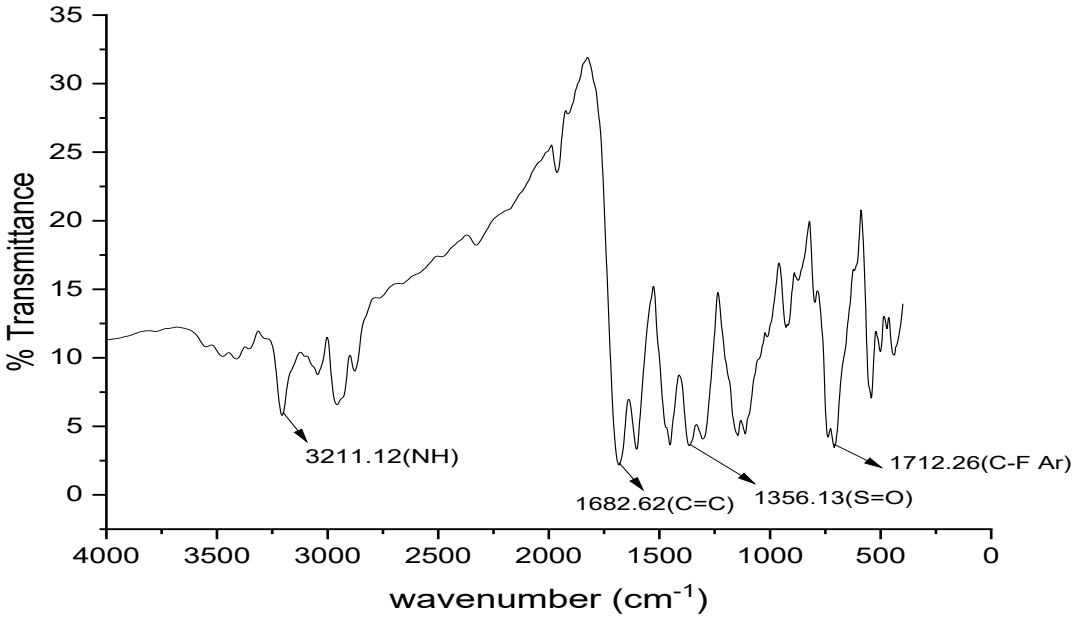


Figure 35: FTIR graph of compound **a3**

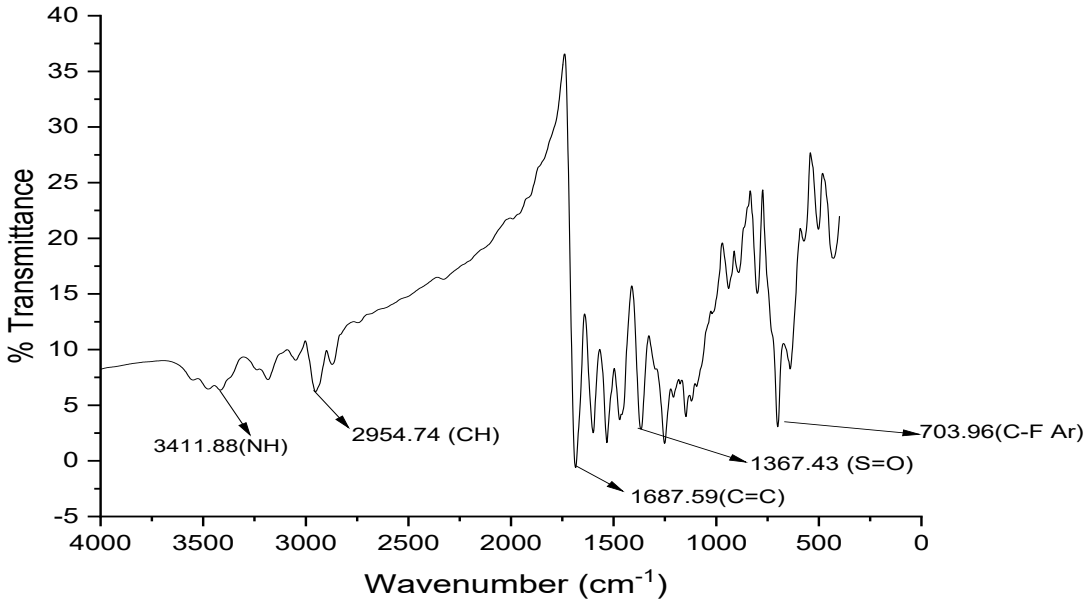


Figure 36: FTIR graph of compound **a4**

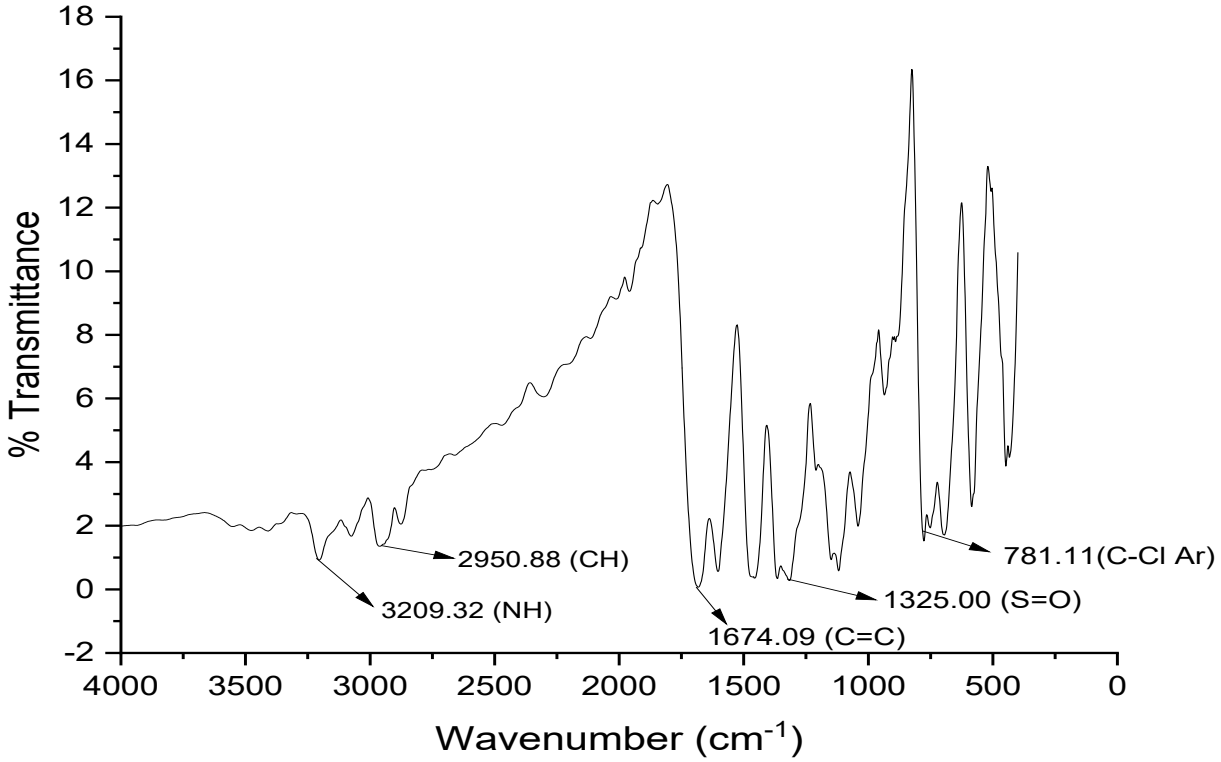


Figure 37: FTIR graph of compound **a5**

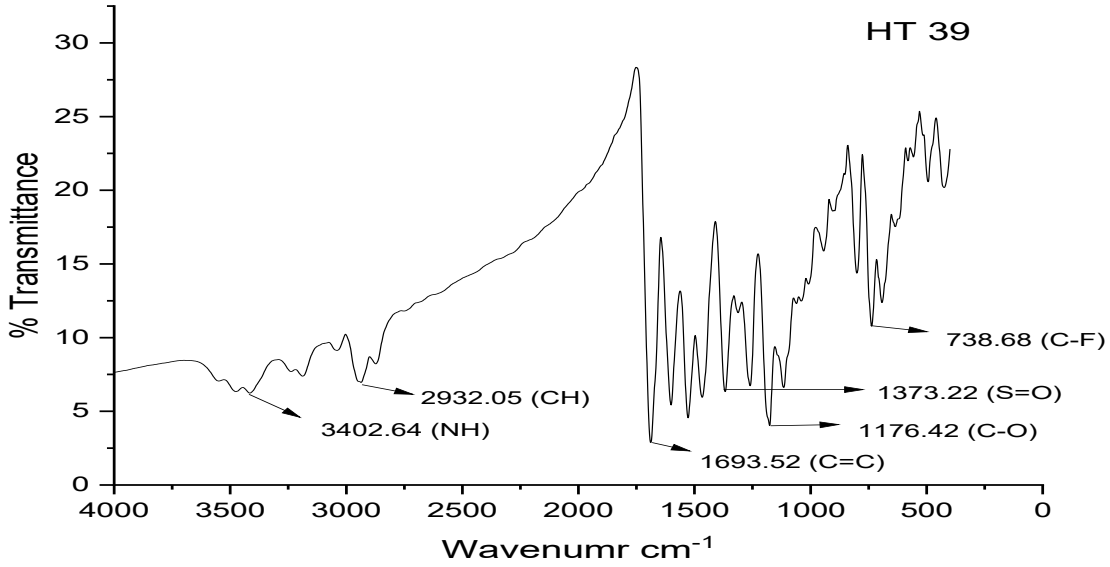


Figure 38: FTIR graph of compound **a6**

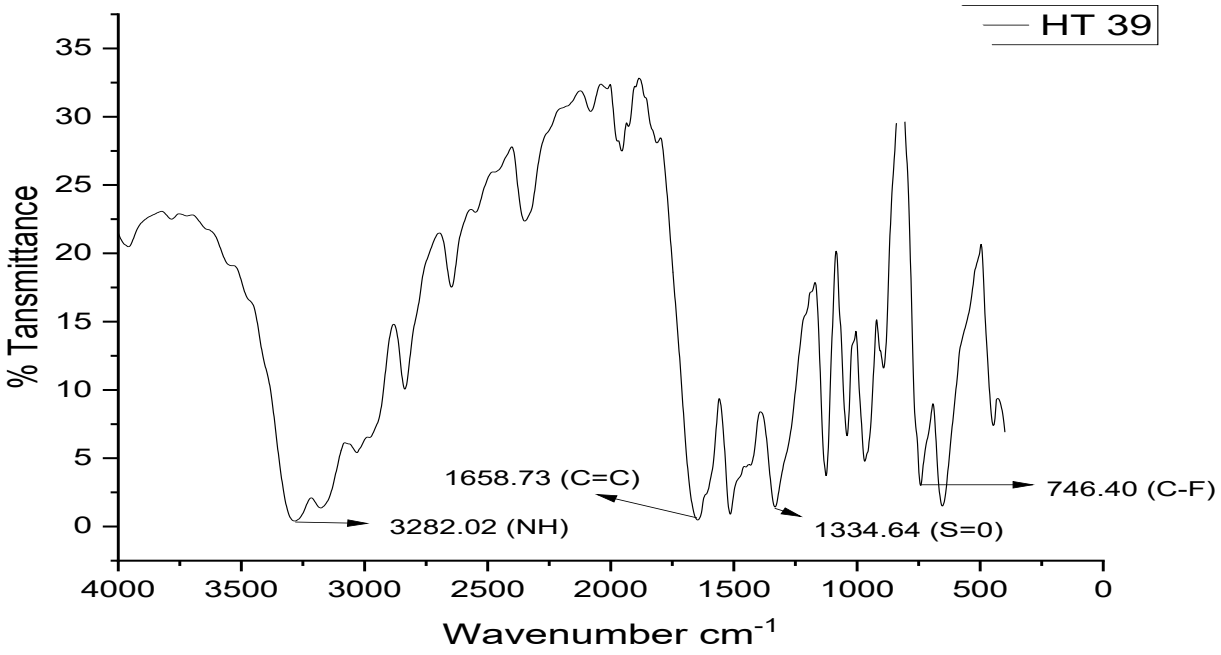


Figure 39: FTIR graph of compound **a7**

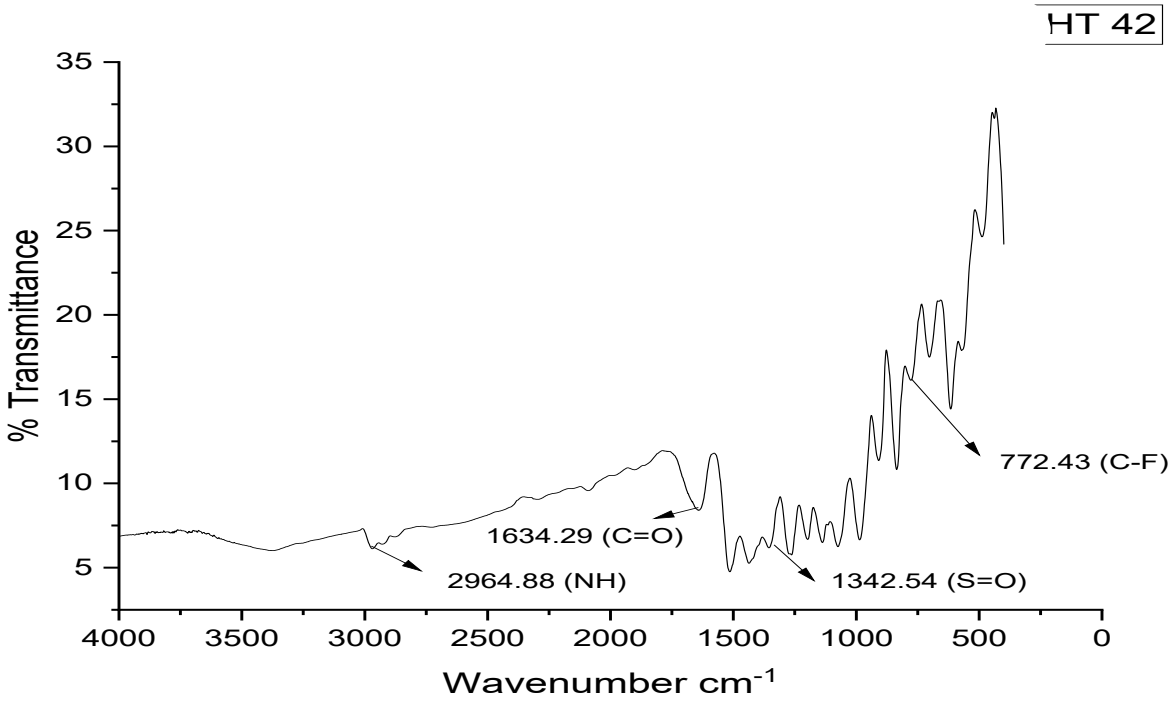


Figure 40: FTIR graph of compound **a8**

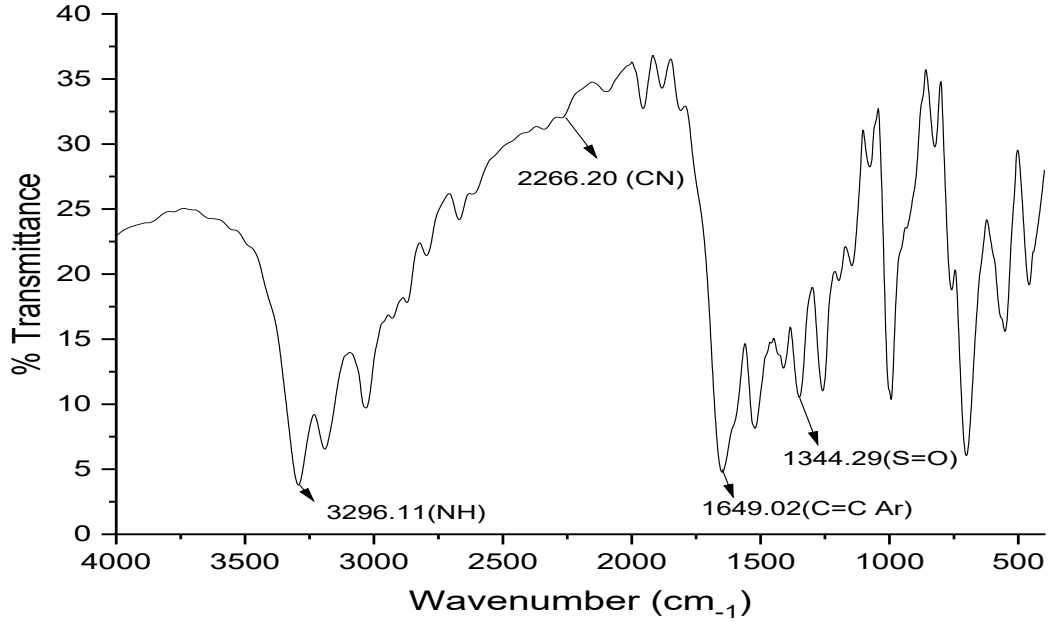


Figure 41 :FTIR graph of compound a9

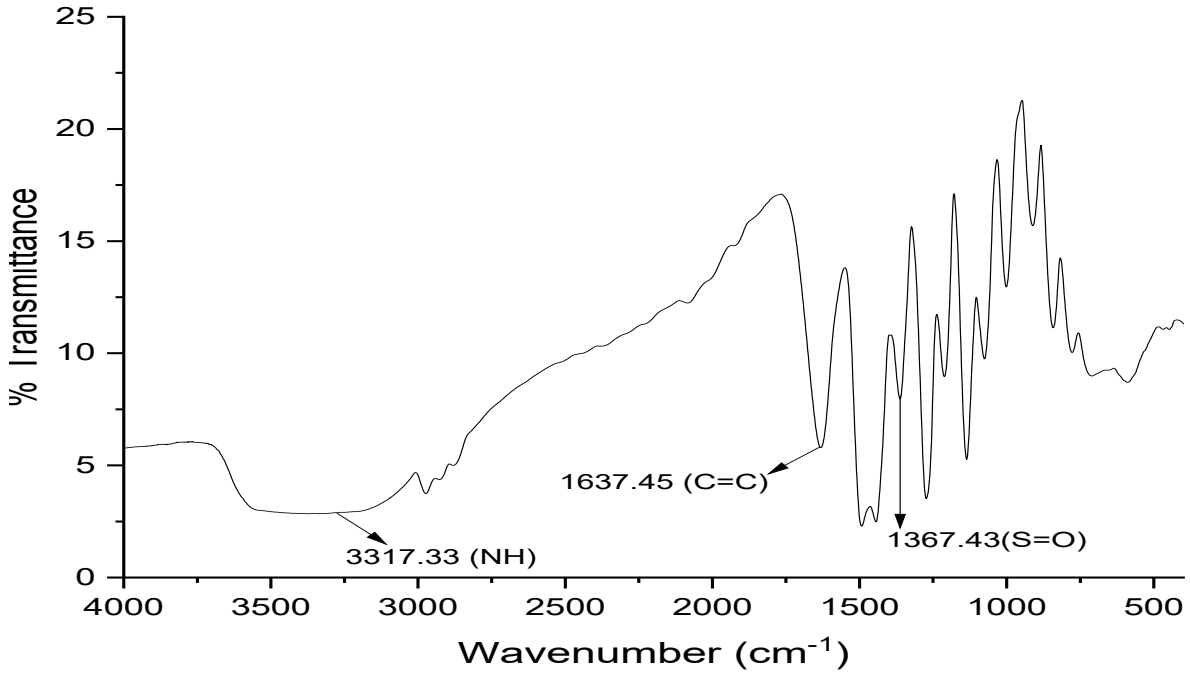


Figure 42: FTIR graph of compound a10

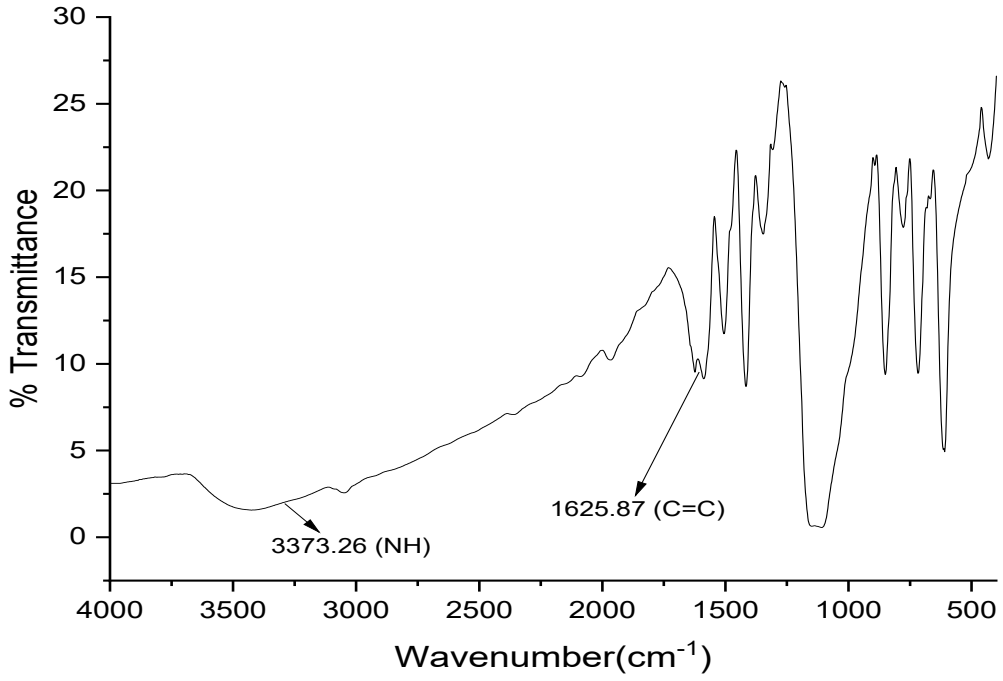


Figure 43: FTIR graph of compound **a11**

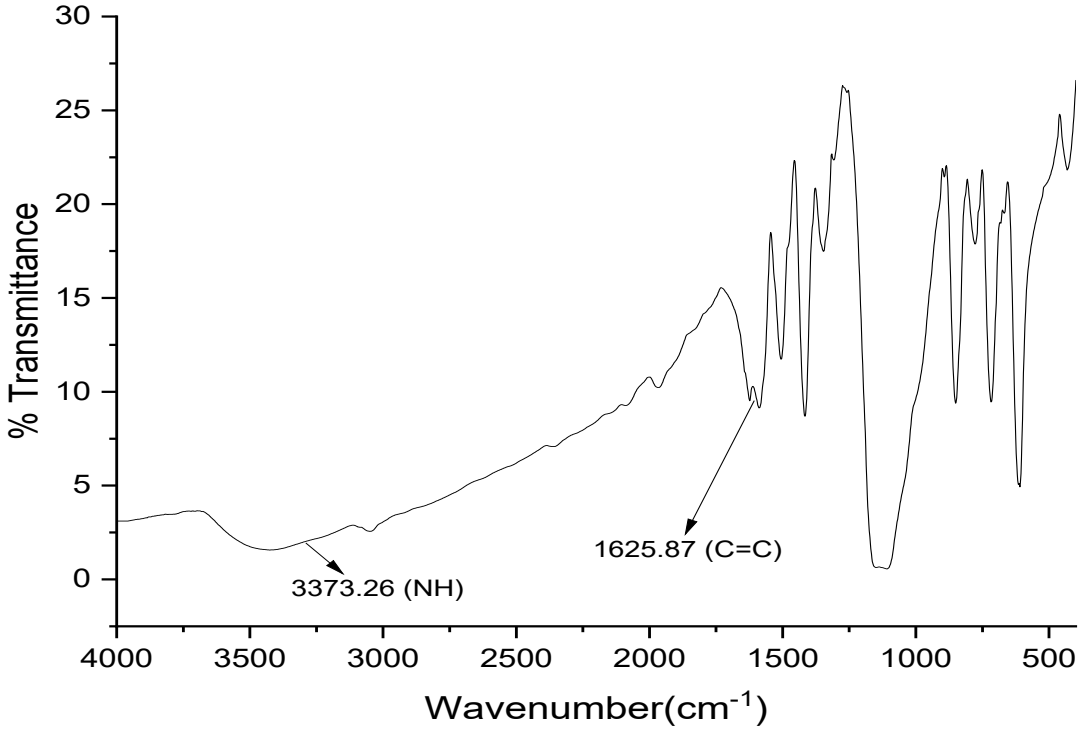


Figure 44: FTIR graph of compound **a12**

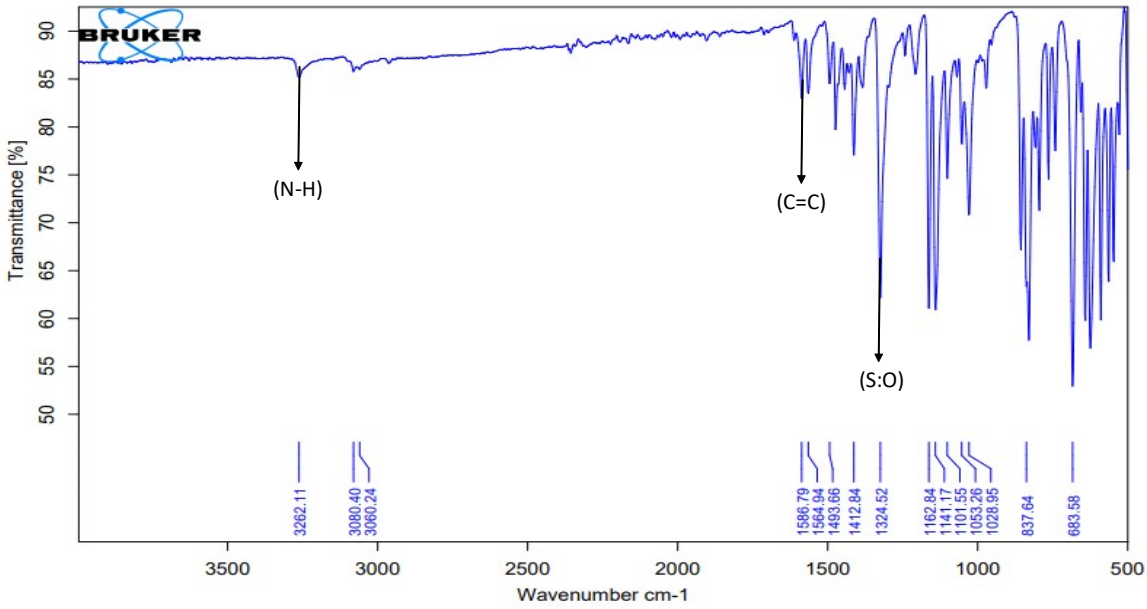


Figure 45:FTIR graph of compound a13

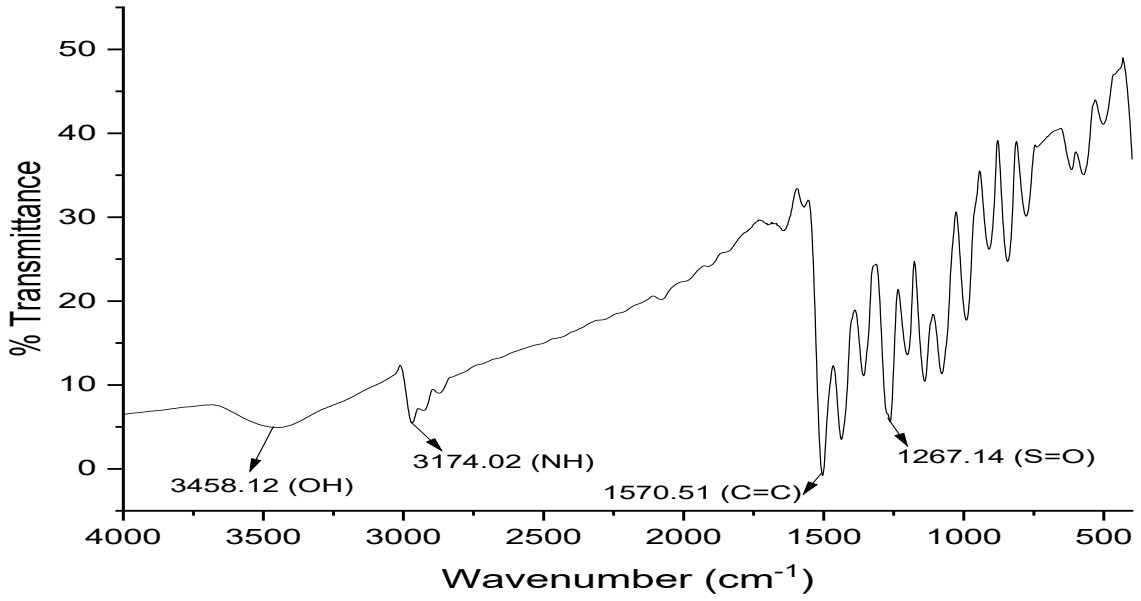


Figure 46: FTIR graph of compound **a14**

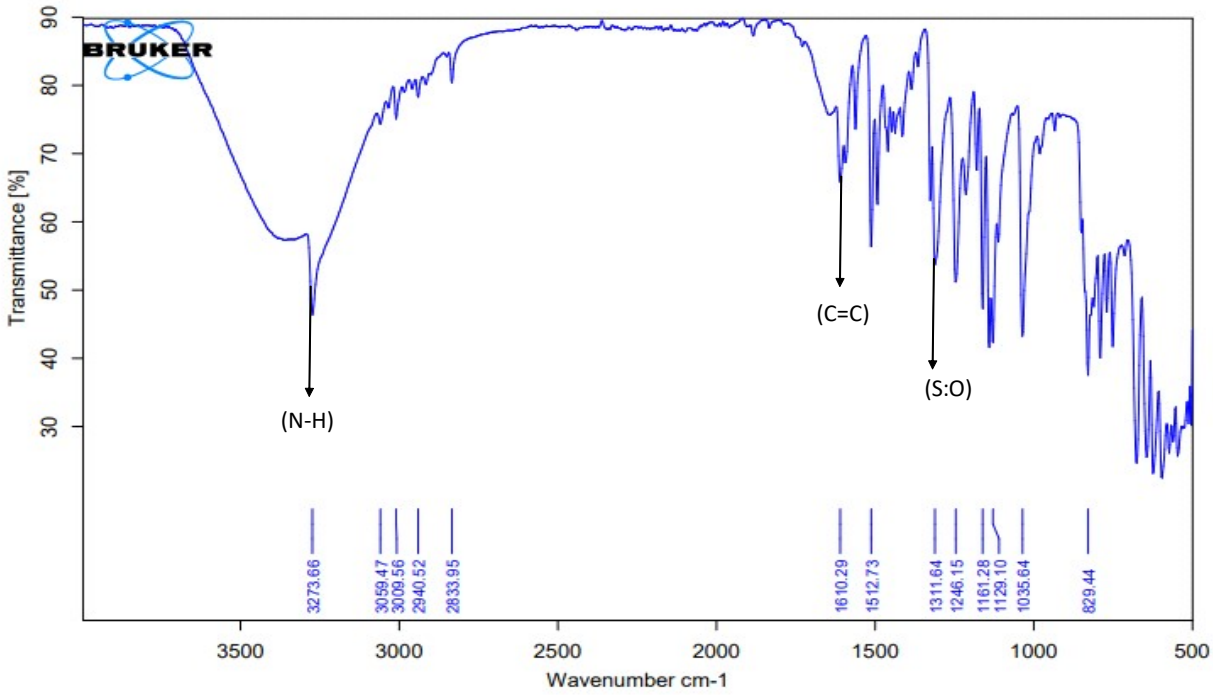


Figure 47: FTIR graph of compound a15

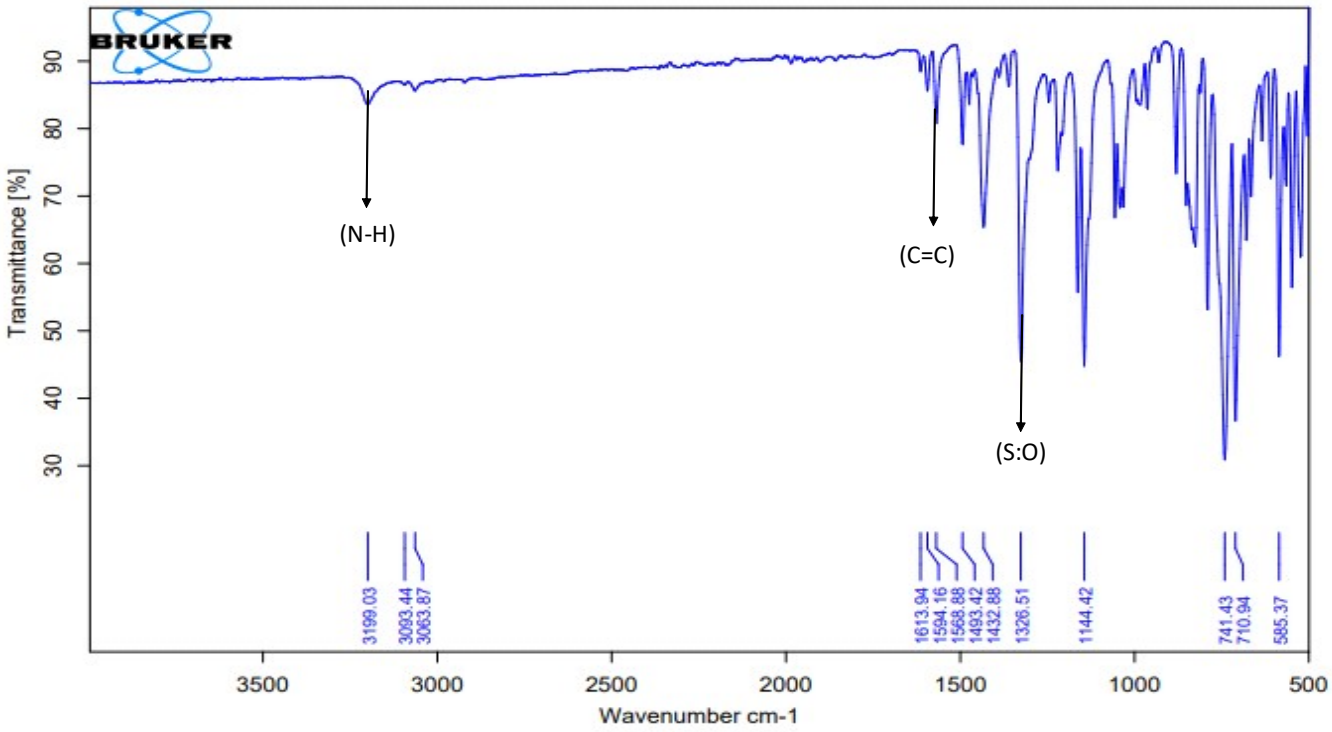


Figure 48: FTIR graph of compound **a16**

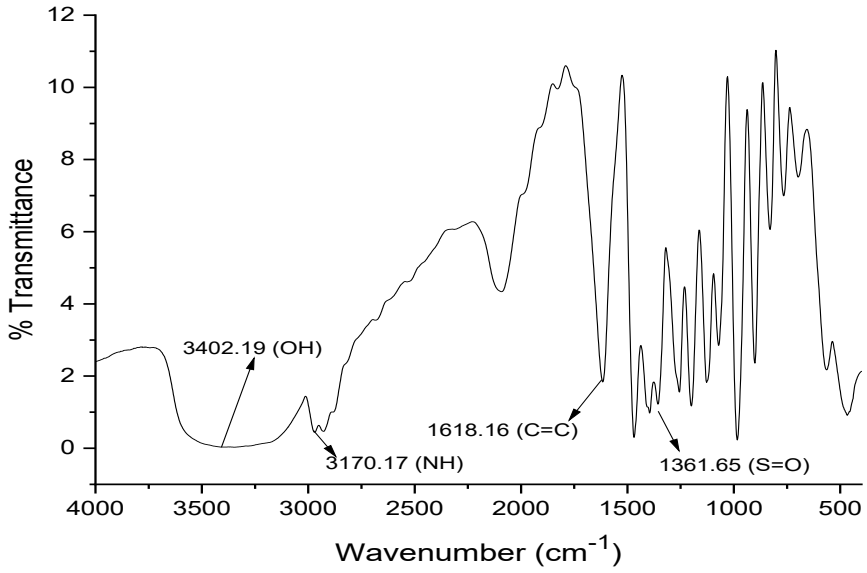


Figure 49: FTIR graph of compound **a17**

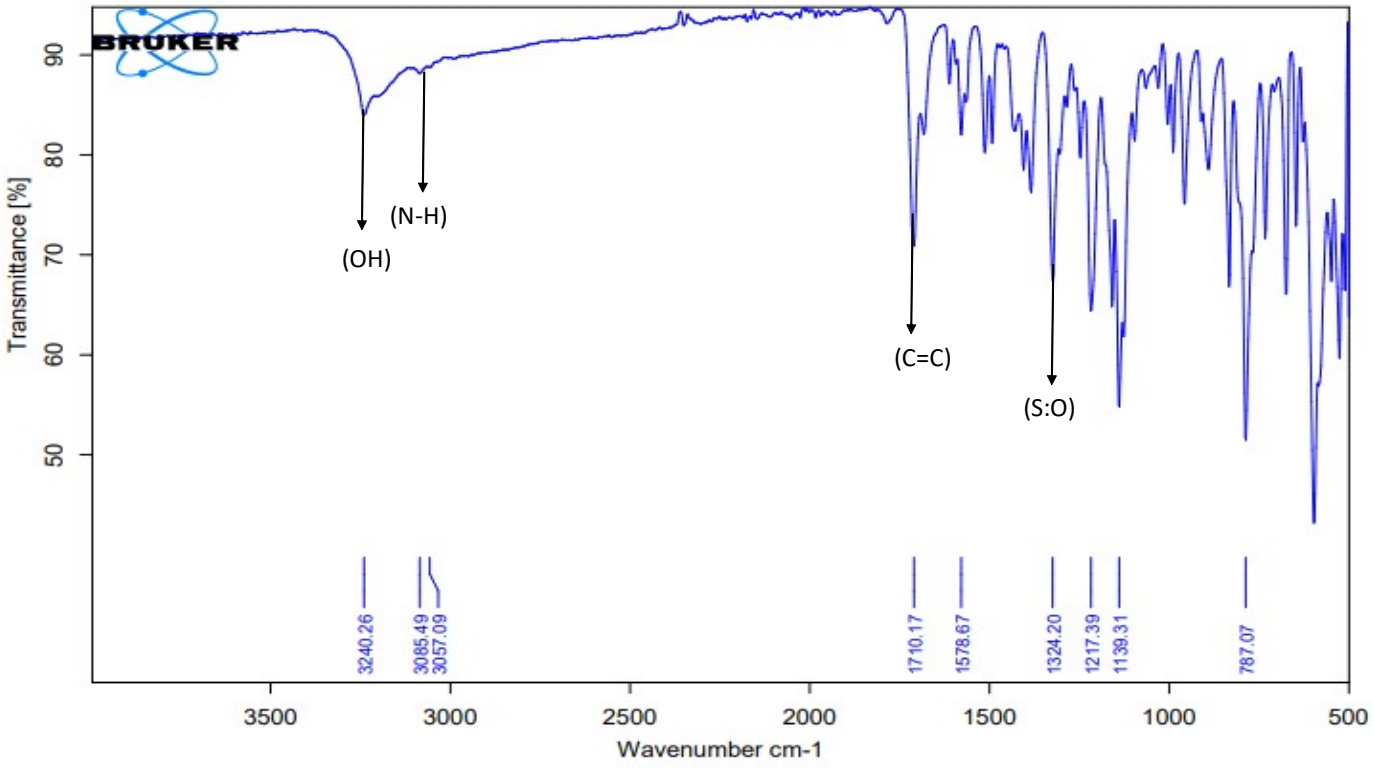


Figure 50: FTIR graph of compound a18

HPLC Chromatogram

SHIMADZU LabSolutions **Analysis Report**

<Sample Information>

Sample Name	: Saqib HT37-1 by Zubair		
Sample ID	: SHT37-1-1Z		
Data Filename	: Saqib HT37-1by Zubair Data1.lcd		
Method Filename	: Saqib HT35-1 by Zubair.lcm		
Batch Filename	:		
Vial #	: 1-1	Sample Type	: Unknown
Injection Volume	: 20 uL		
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Date Processed	: 10-Jan-24 7:31:14 PM	Processed by	: System Administrator

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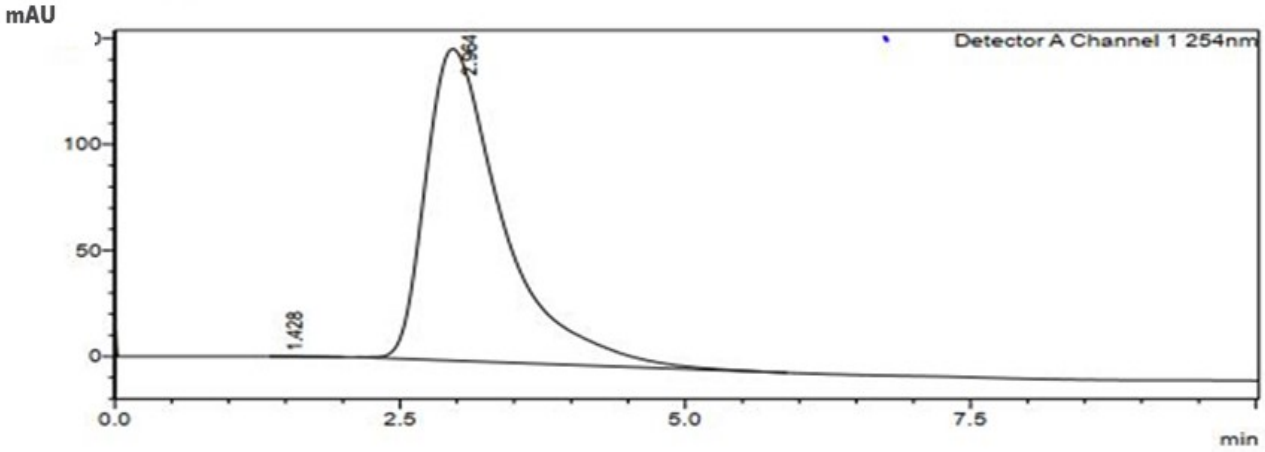

Figure 51: Chromatogram of compound **a5**

SHIMADZU LabSolutions

Analysis Report

<Sample Information>

Sample Name	: Saqib HT35-1 by Zubair		
Sample ID	: SHT35-1Z		
Data Filename	: Saqib HT35-1 by Zubair Data1.lcd		
Method Filename	: Saqib HT35-1 by Zubair.lcm		
Batch Filename	:		
Vial #	: 1-1	Sample Type	: Unknown
Injection Volume	: 20 uL		
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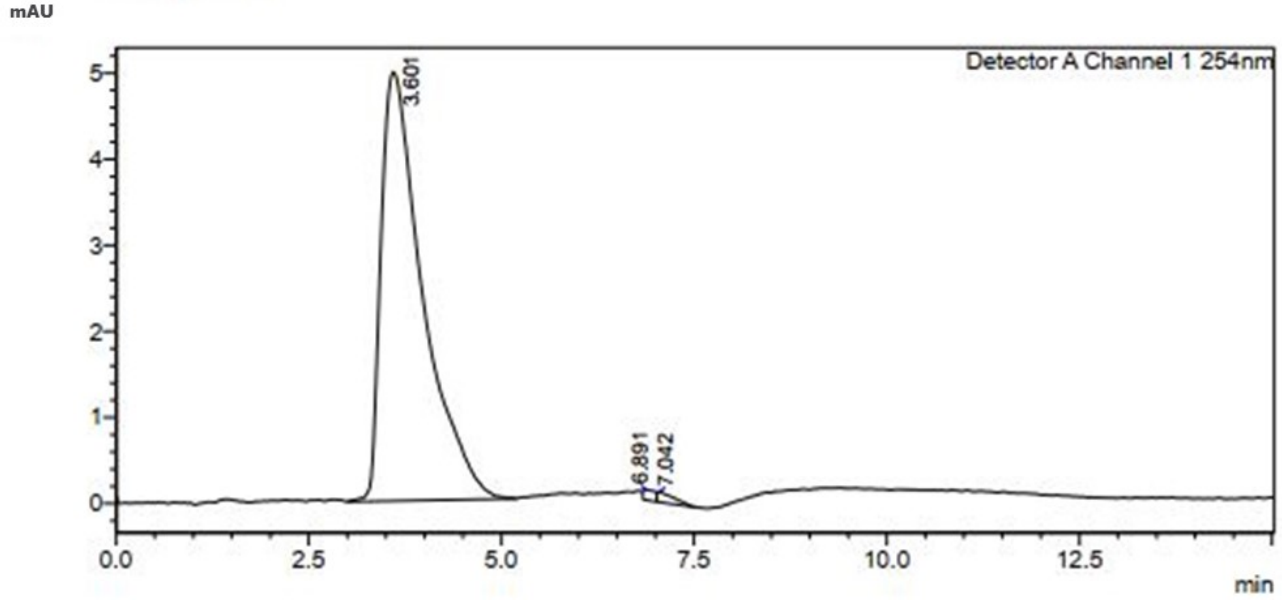


Figure 52: Chromatogram of compound **a3**

SHIMADZU LabSolutions **Analysis Report**

<Sample Information>

Sample Name	: Saqib HT36-1 by Zubair		
Sample ID	: SHT36-1Z		
Data Filename	: Saqib HT36-1 by Zubair Data1.lcd		
Method Filename	: Saqib Sample by zubair HT35.lcm		
Batch Filename	:		
Vial #	: 1-1	Sample Type	: Unknown
Injection Volume	: 20 uL		
Date Acquired	: 10-Jan-24 4:03:15 PM	Acquired by	: System Administrator
Date Processed	: 10-Jan-24 4:33:27 PM	Processed by	: System Administrator

<Chromatogram>

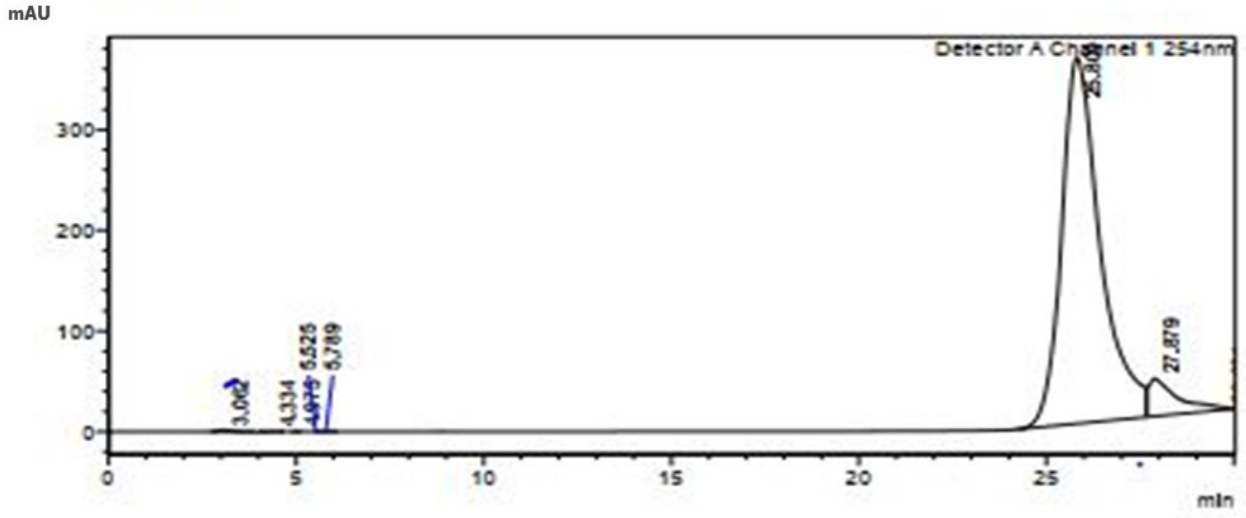
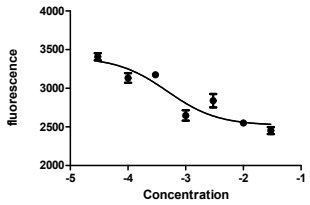
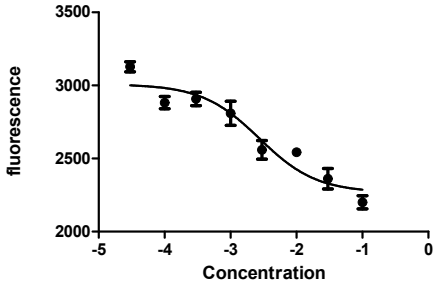
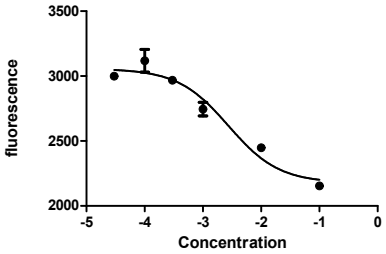
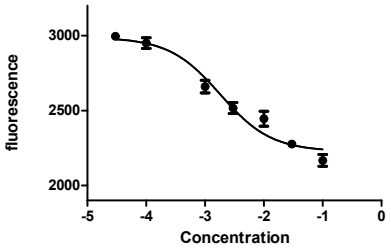
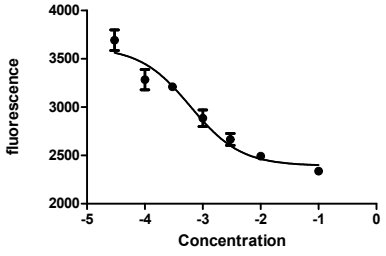
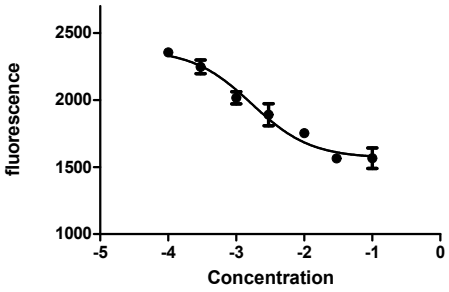
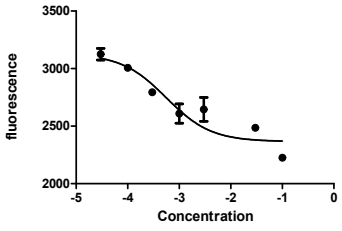
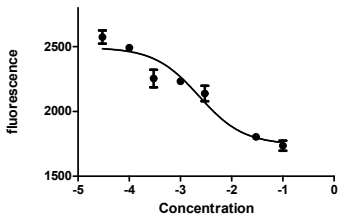
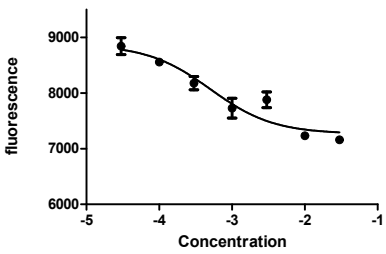
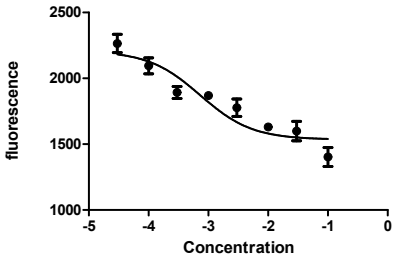


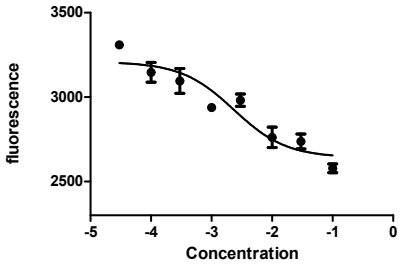
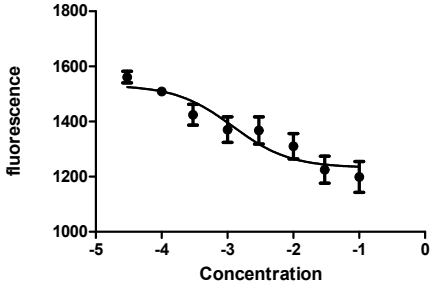
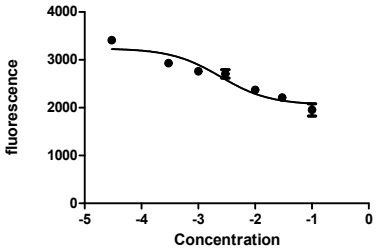
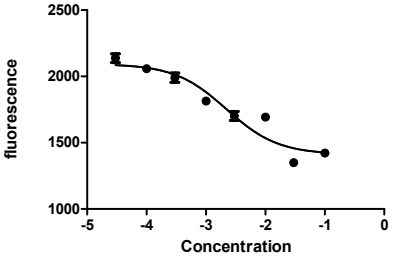
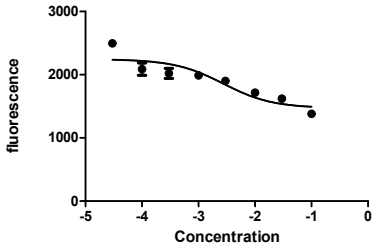
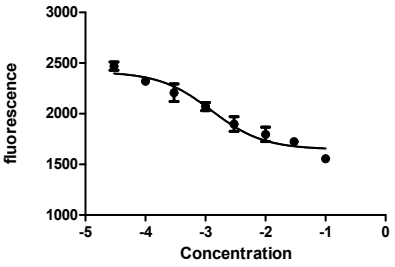
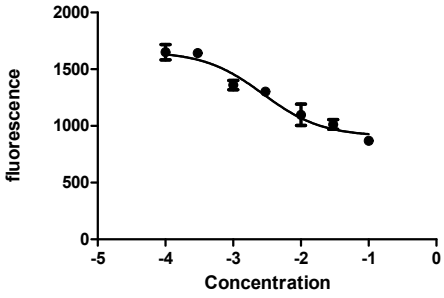
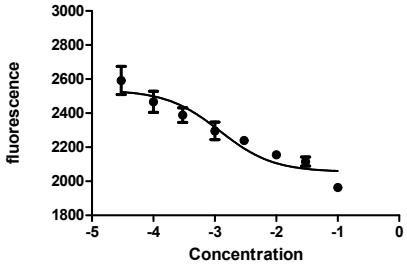
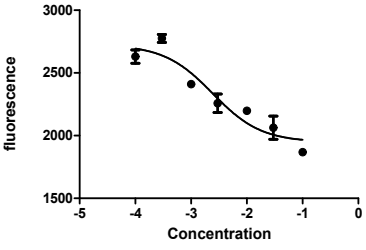
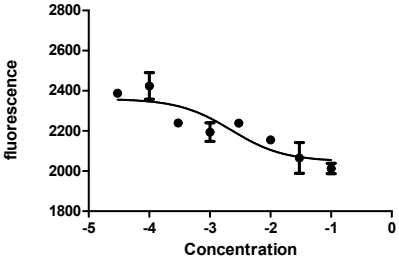
Figure 53: Chromatogram of compound **a4**

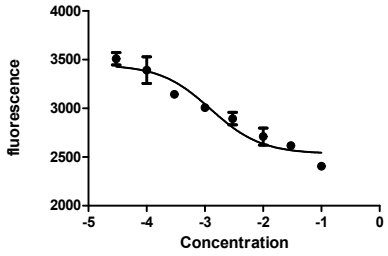
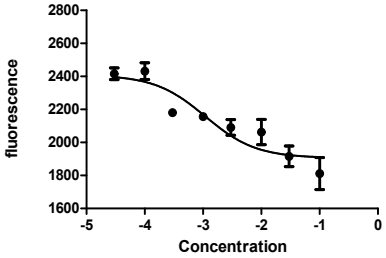
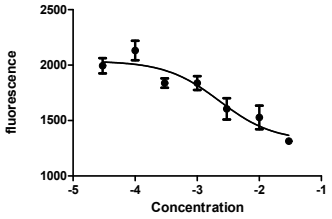
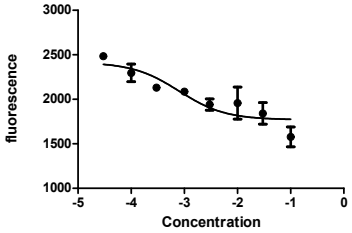
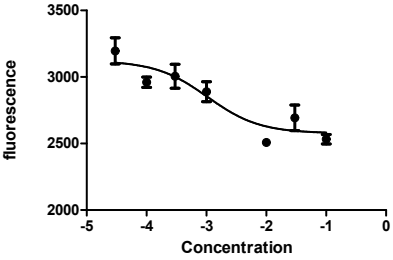
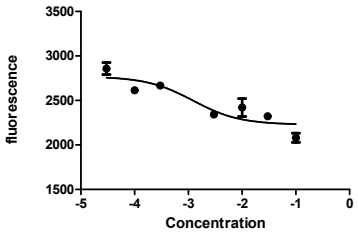
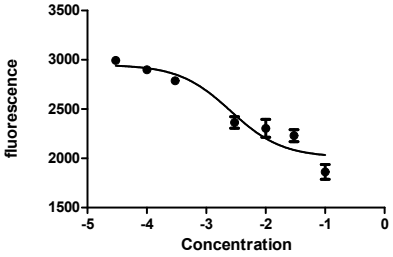
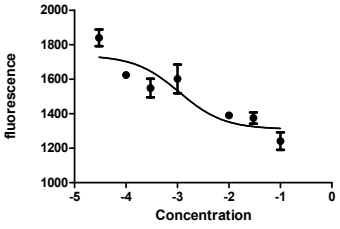
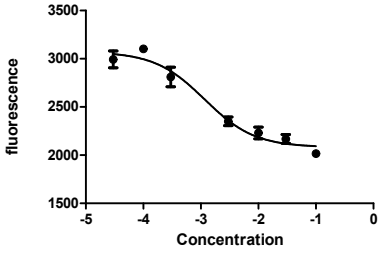
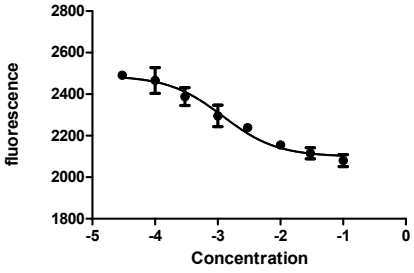
Table 1: The docking scores of synthesized compounds on MAO-A, MAO-B, AChE, and BChE

Molecule	MAO A	MAO A	AChE	BChE
	S value (kcal/mol)			
a1.	-8.76	-9.87	-8.18	-3.18
a2.	-8.50	-8.73	-7.43	-4.88
a3.	-8.55	-9.65	-7.03	-3.70
a4.	-8.62	-9.94	-8.18	-4.02
a5.	-10.40	-9.73	-5.78	-4.84
a6.	-9.26	-9.57	-7.46	-7.68
a7.	-8.79	-7.48	-3.57	-3.88
a8.	-8.51	-9.59	-2.97	-3.55
a9.	-8.58	-9.88	-4.15	-2.48
a10.	-8.36	-9.41	-7.13	-2.58
a11.	-9.36	-10.52	-8.88	-6.48
a12.	-7.39	-10.57	-7.38	-6.59
a13.	-8.76	-10.07	-6.59	-3.08
a14.	-9.23	-9.49	-7.01	-6.89
a15.	-9.41	-8.43	-7.98	-2.88
a16.	-7.54	-7.93	-7.81	-4.36
a17.	-8.90	-8.19	-6.20	-3.31
a18.	-8.54	-8.60	-7.32	-5.38

Table 2: IC_{50} values of synthesized compounds against monoamine oxidase

Code	Graph	Graph
a1		
a2		
a3		
a4		
a5		

a6		
a7		
a8		
a9		
a10		

a11		
a12		
a13		
a14		
a15		

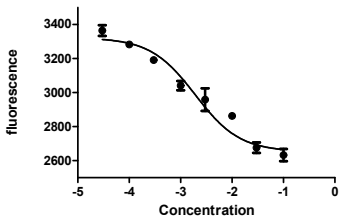
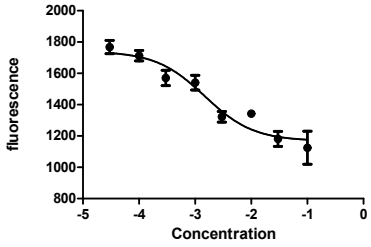
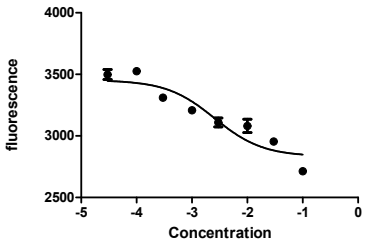
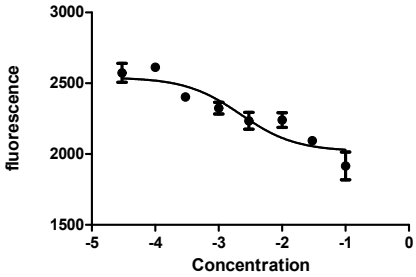
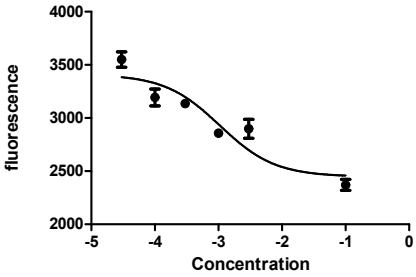
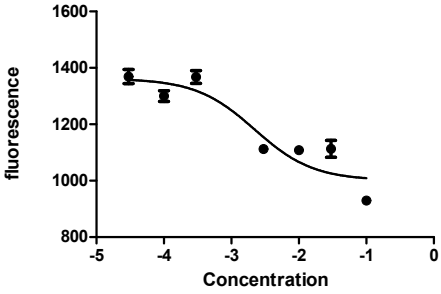
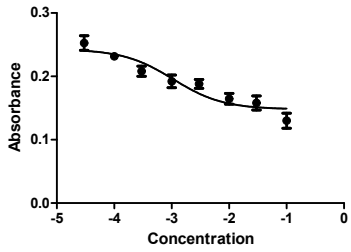
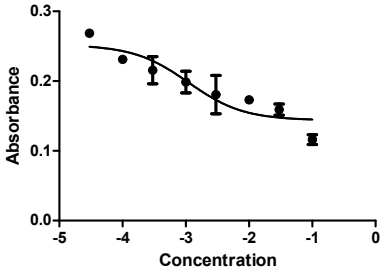
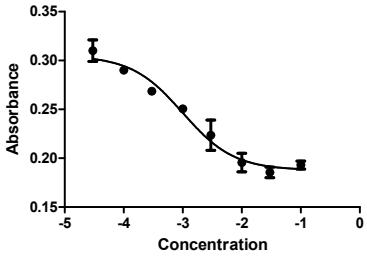
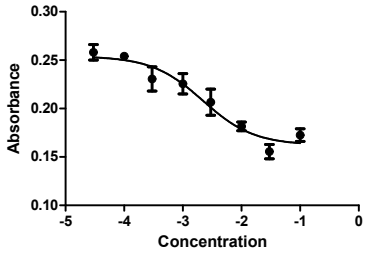
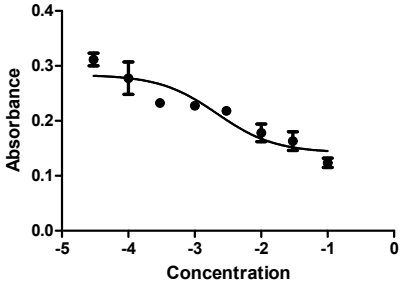
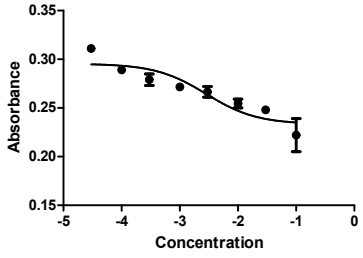
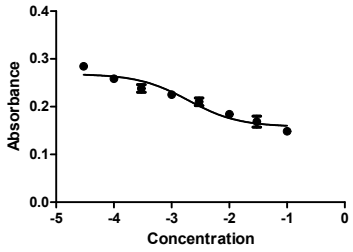
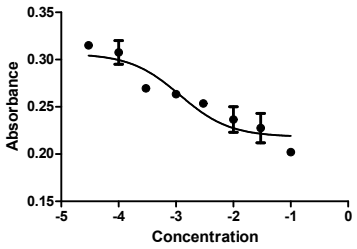
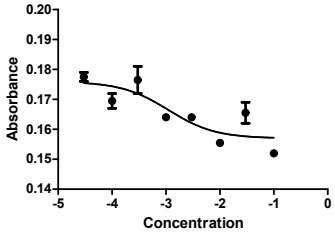
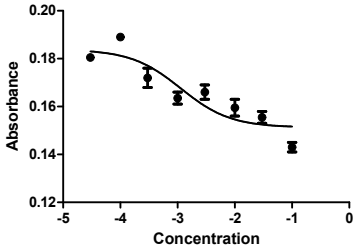
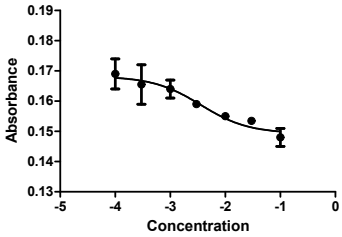
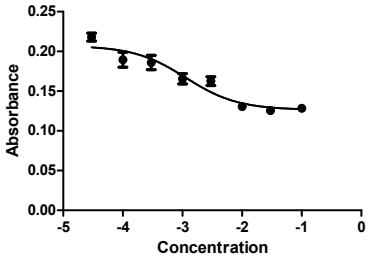
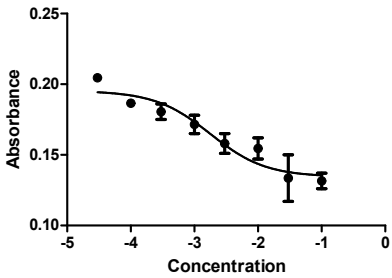
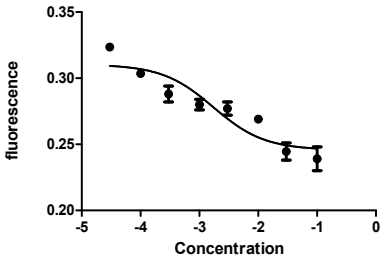
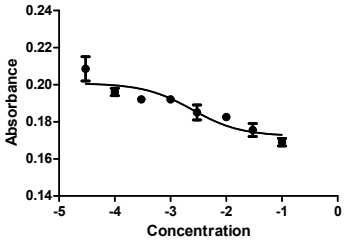
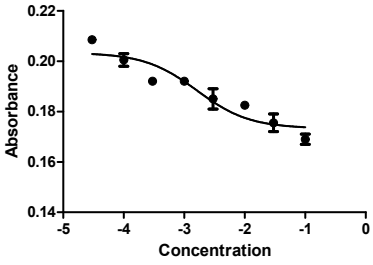
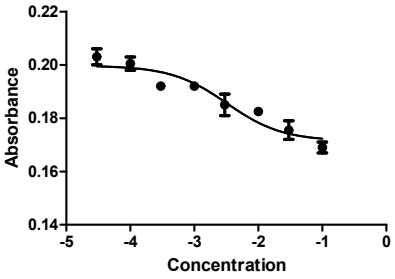
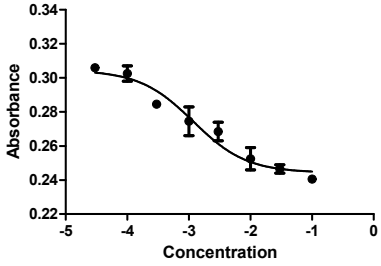
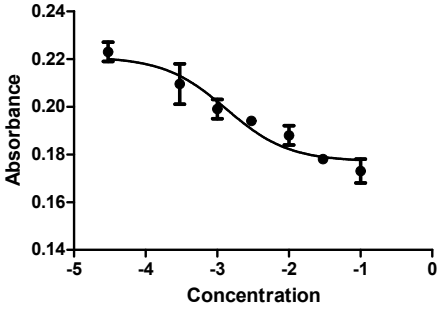
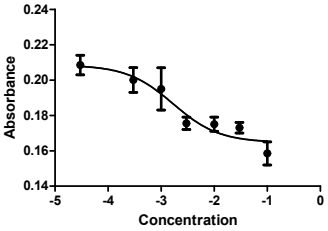
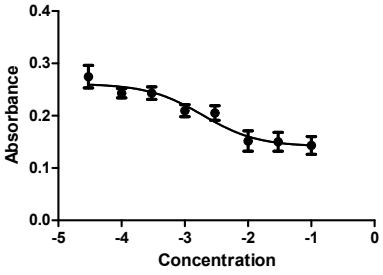
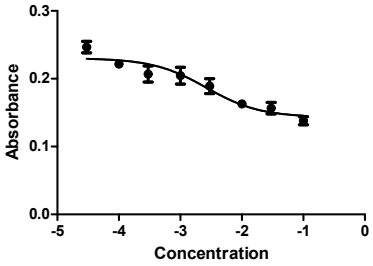
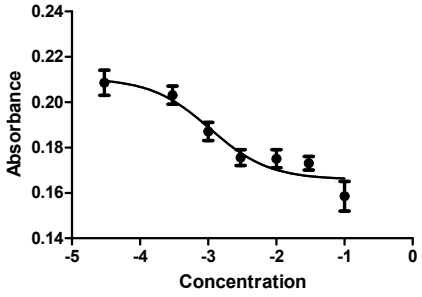
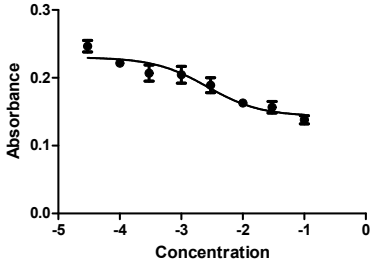
a16	 fluorescence 3400 3200 3000 2800 2600 -5 -4 -3 -2 -1 0 Concentration	 fluorescence 2000 1800 1600 1400 1200 1000 800 -5 -4 -3 -2 -1 0 Concentration
a17	 fluorescence 4000 3500 3000 2500 -5 -4 -3 -2 -1 0 Concentration	 fluorescence 3000 2500 2000 1500 -5 -4 -3 -2 -1 0 Concentration
a18	 fluorescence 4000 3500 3000 2500 2000 -5 -4 -3 -2 -1 0 Concentration	 fluorescence 1600 1400 1200 1000 800 -5 -4 -3 -2 -1 0 Concentration

Table 3: IC_{50} values of synthesized compounds against AChE and BChE

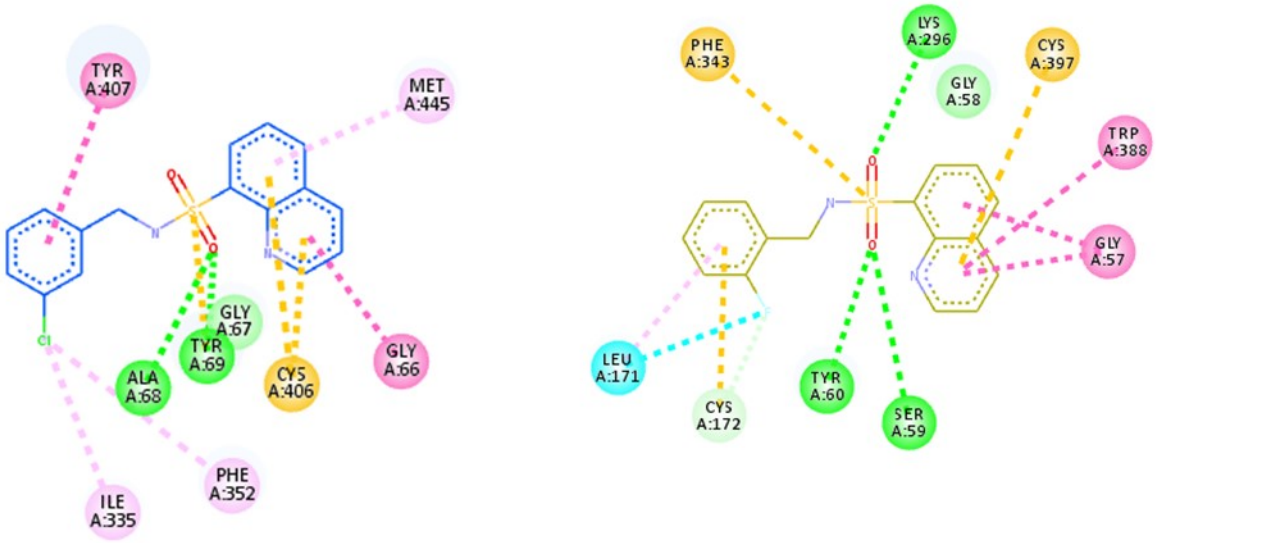
Code	AChE	BChE
a1		
a2		
a3		
a4		
a5		

a6		
a7		
a8		
a9		
a10		
a11		

a12		
a13		
a14		
a15		
a16		

a17	 0.3 0.2 0.1 0.0 Absorbance -5 -4 -3 -2 -1 0 Concentration	
a18	 0.24 0.22 0.20 0.18 0.16 0.14 Absorbance -5 -4 -3 -2 -1 0 Concentration	 0.3 0.2 0.1 0.0 Absorbance -5 -4 -3 -2 -1 0 Concentration

2D interaction of potent compounds



a b

Figure 54: 2D interaction of compound **a5** left side MAO-A (a) and **a12** right side MAO-B (b)

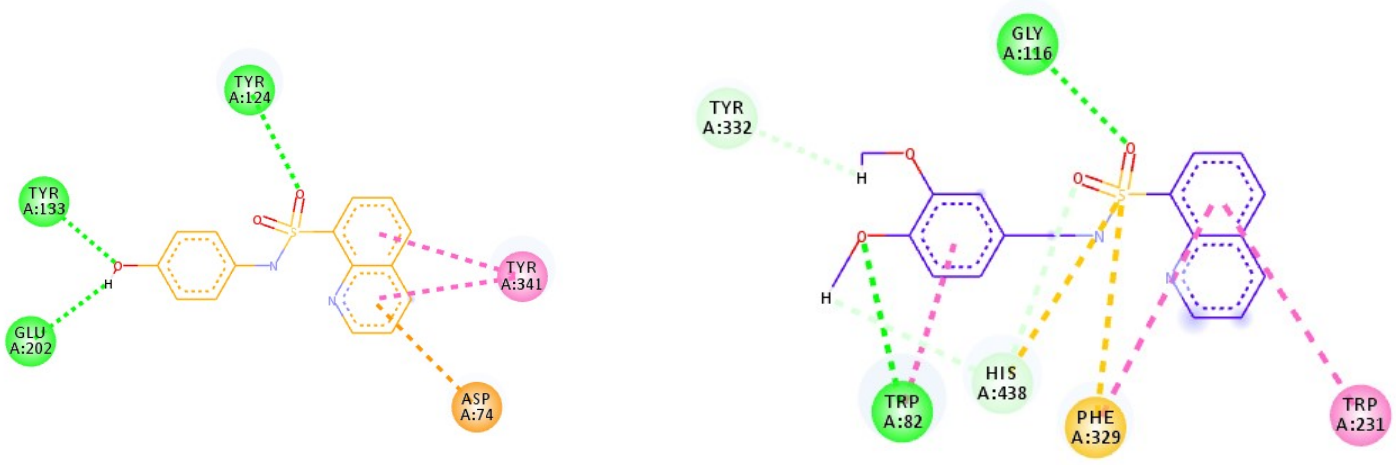


Figure 55: 2D interaction of compound **a11** left side AChE (c) and **a6** right side BChE (d)