

Supplementary Data

Figure S1: ¹H NMR of compound 2a

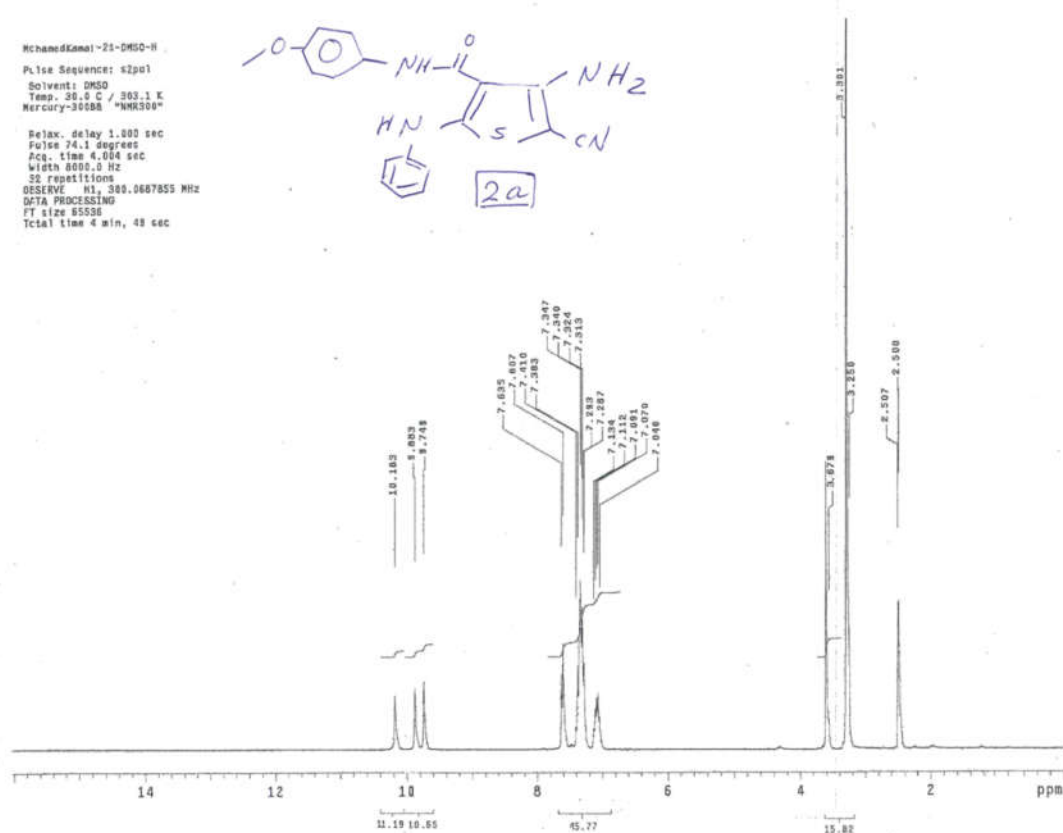


Figure S2: mass spectrum of compound 2a

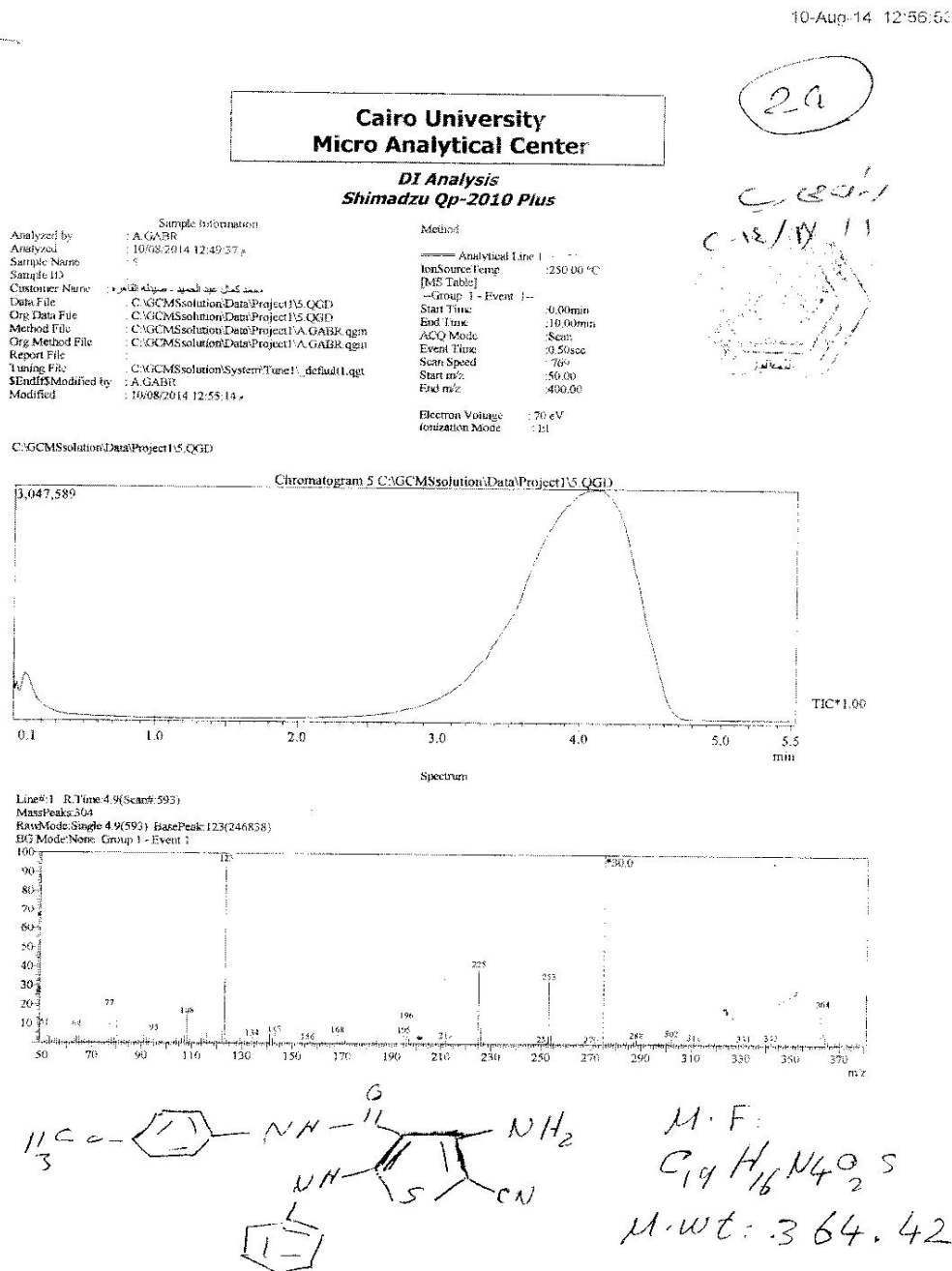


Figure S3: ¹H NMR of compound 2b

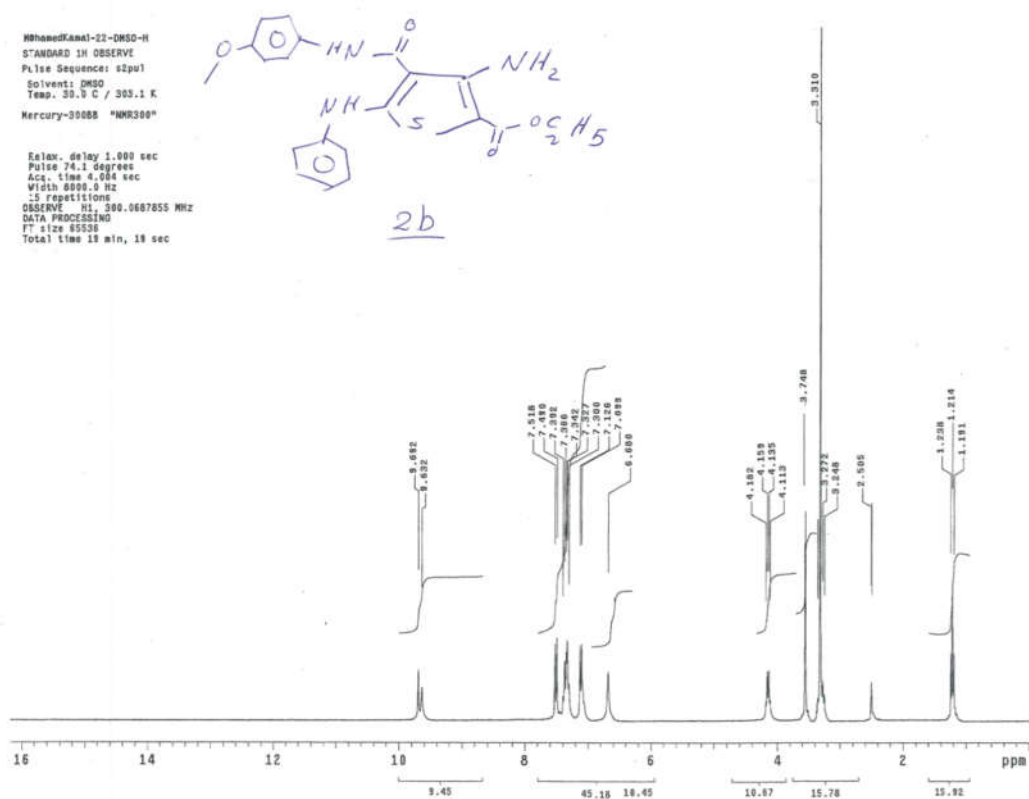


Figure S4: mass spectrum of compound 2b

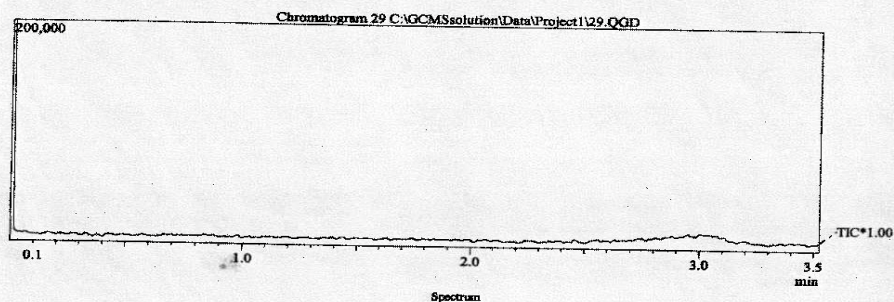
17-Sep-14 15:27:05

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**DI Analysis
Shimadzu Qp-2010 Plus**

Sample Information		Method
Analyzed by	: Mai Younis	Analytical Line 1
Analyzed	: 17/09/2014 03:20:57	IonSourceTemp
Sample Name	: 29	: 230.00 °C
Sample ID		[MS Table]
Customer Name	: Dr. Mohamed Kamil - Medicine - Cairo	-Group 1- Event 1-
Data File	: C:\GCMSolution\Data\Project1\29.QGD	Start Time
Org Data File	: C:\GCMSolution\Data\Project1\29.QGD	: 0.00min
Method File	: C:\GCMSolution\Data\Project1\A.GABR.qgm	End Time
Org Method File	: C:\GCMSolution\Data\Project1\A.GABR.qgm	: 10.00min
Report File		ACQ Mode
Tuning File	: C:\GCMSolution\System\Tune1\default1.qst	: Scan
ScanList Modified by	: Mai Younis	Event Time
Modified	: 17/09/2014 03:24:33	: 0.50sec
		Scan Speed
		: 1111
		Start m/z
		: 50.00
		End m/z
		: 550.00
		Electron Voltage
		: 70 eV
		Ionization Mode
		: EI

C:\GCMSolution\Data\Project1\29.QGD



Line#1 R.Time:3.0(Scan#:362)
MassPeak:134
RawMode:Single,3.0(362) BasePeak:123(1002)
DecMode:None Group 1-Event 1

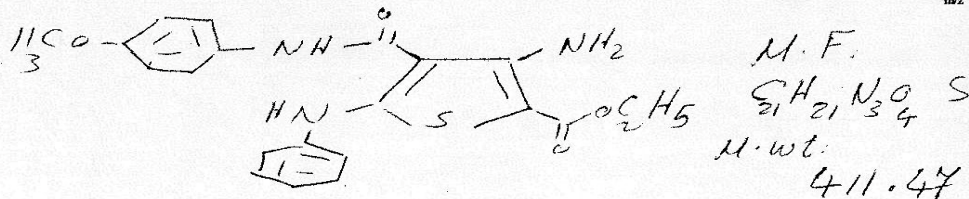
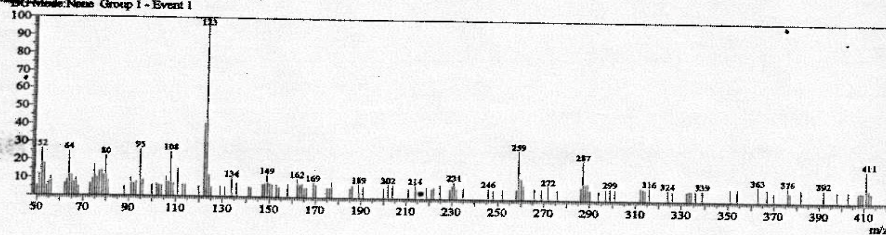


Figure S5: ¹HNMR of compound 3

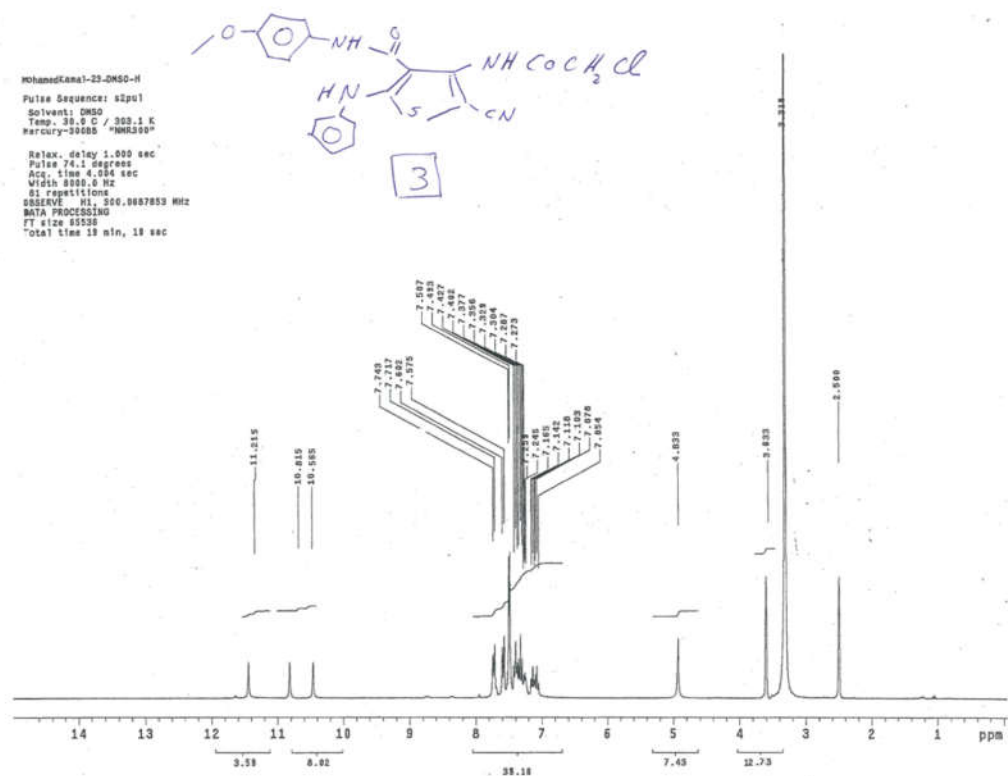


Figure S6: mass spectrum of compound 3

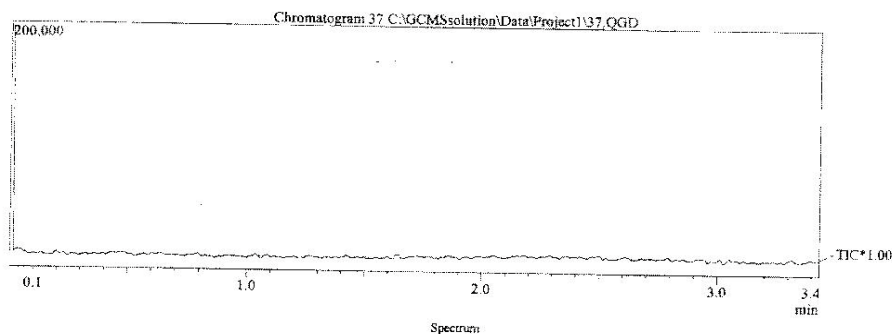
17-Sep-14 16:06:24

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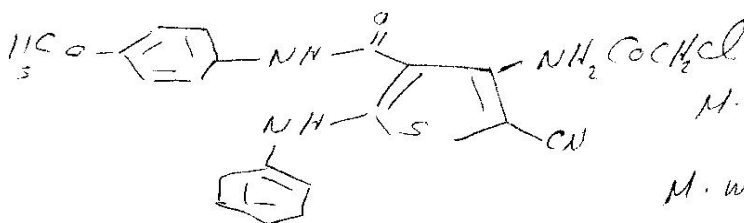
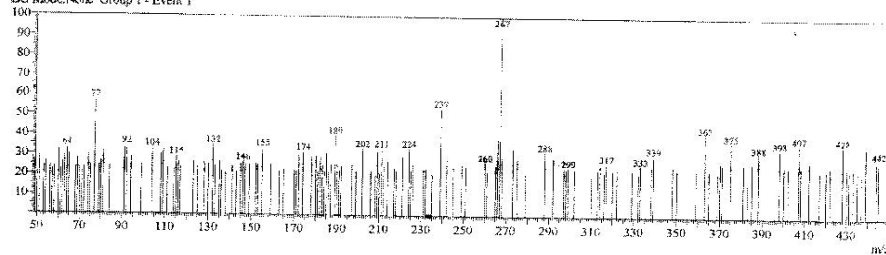
**DI Analysis
Shimadzu Qp-2010 Plus**

Sample Information		Method
Analyzed by	Mai Younis	Analytical Line 1
Analyzed	17/09/2014 03:57:22	IonSourceTemp
Sample Name	37	[MS Table]
Sample ID		Group 1 - Event 1-
Customer Name	Dr.Mohamed Kmal - Medicine - Cairo	Start Time
Data File	C:\GCMSSolution\Data\Project\37.QGD	End Time
Orig Data File	C:\GCMSSolution\Data\Project\37.QGD	Scan
Method File	C:\GCMSSolution\Data\Project\37.QGD	ACQ Mode
Orig Method File	C:\GCMSSolution\Data\Project\37.QGD	Event Time
Report File	C:\GCMSSolution\System\Tune\default1.qgt	Scan Speed
Tuning File		Start m/z
Strat/SM Modified by	Mai Younis	End m/z
Modified	17/09/2014 04:00:52	
		Electron Voltage
		Ionization Mode

C:\GCMSSolution\Data\Project\37.QGD



Line# 1 R Time: 2.7 (Scan# 326)
MassPeak: 157
RawMode: Single 2.7(326) BasePeak: 267(246)
BG Mode: None Group 1 - Event 1



M.F: $C_{21}H_{17}N_4O_5$

M. wt: 440.90

Figure S7: ¹HNMR of compound 4

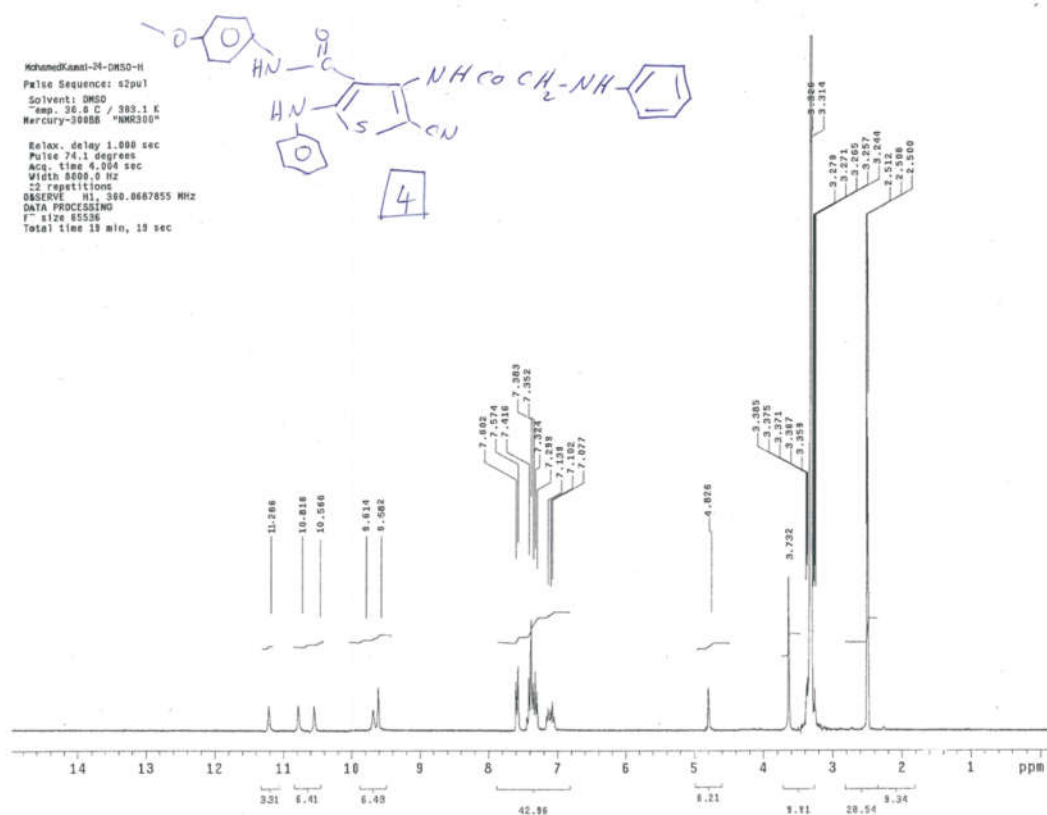


Figure S8: ¹³CNMR of compound 4

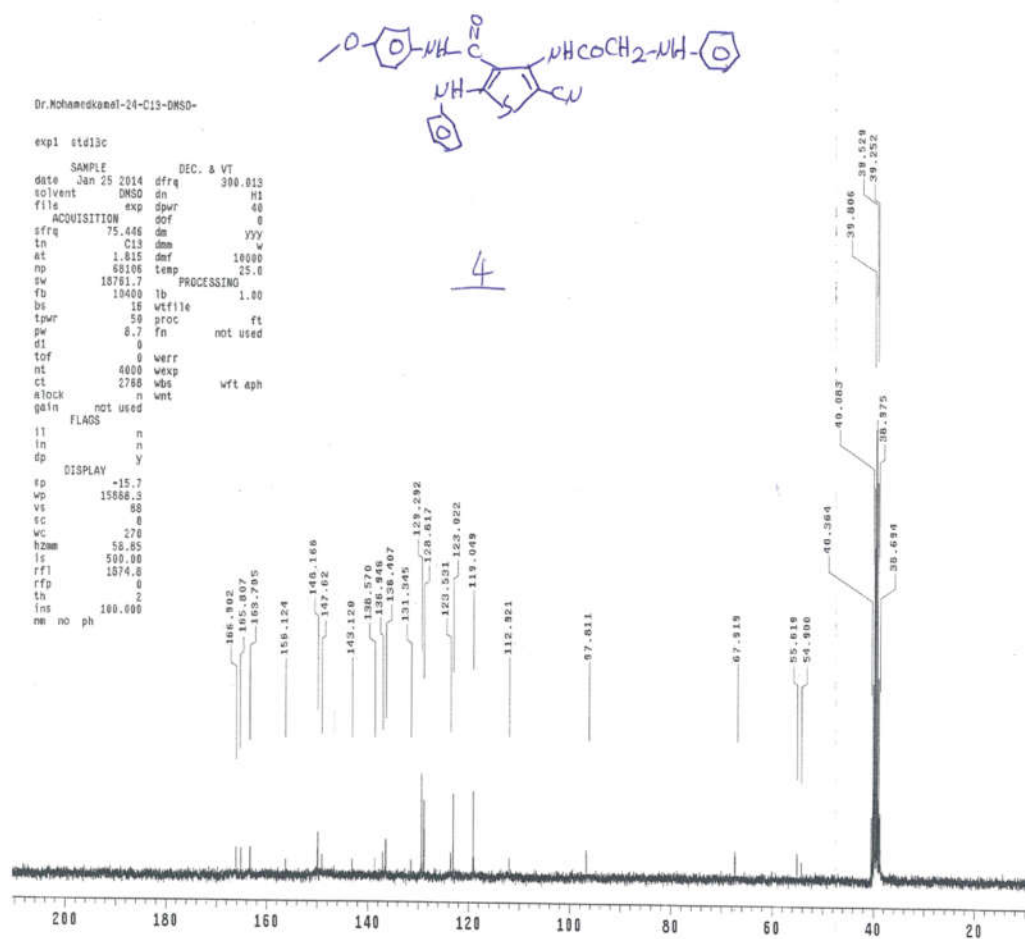


Figure S9: ¹HNMR of compound 5

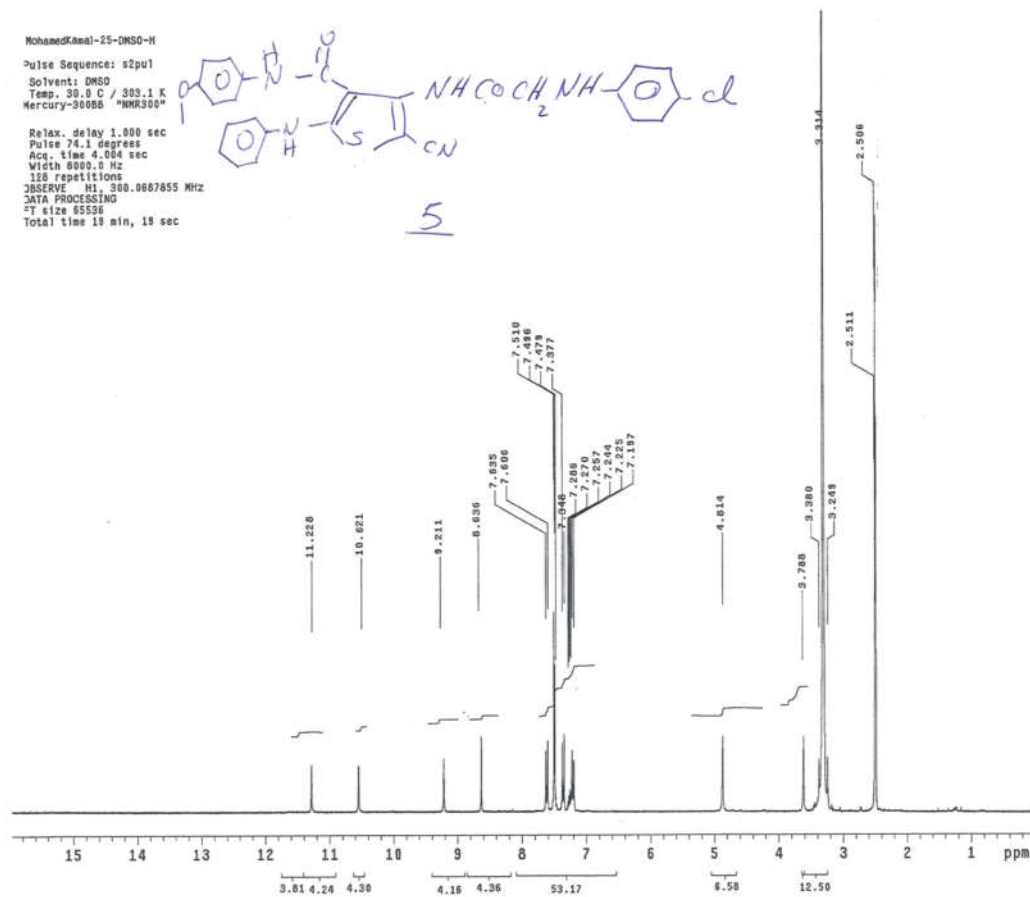


Figure S10: ¹³CNMR of compound 5

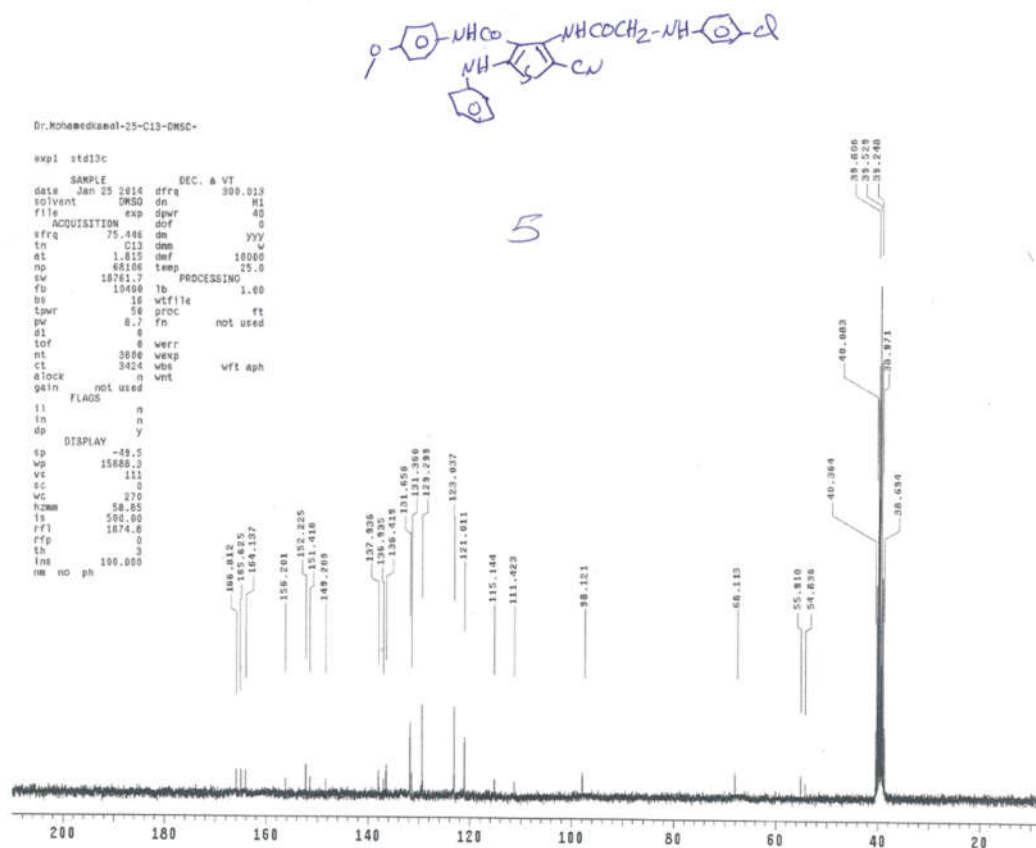


Figure S11: mass spectrum of compound 5

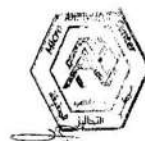
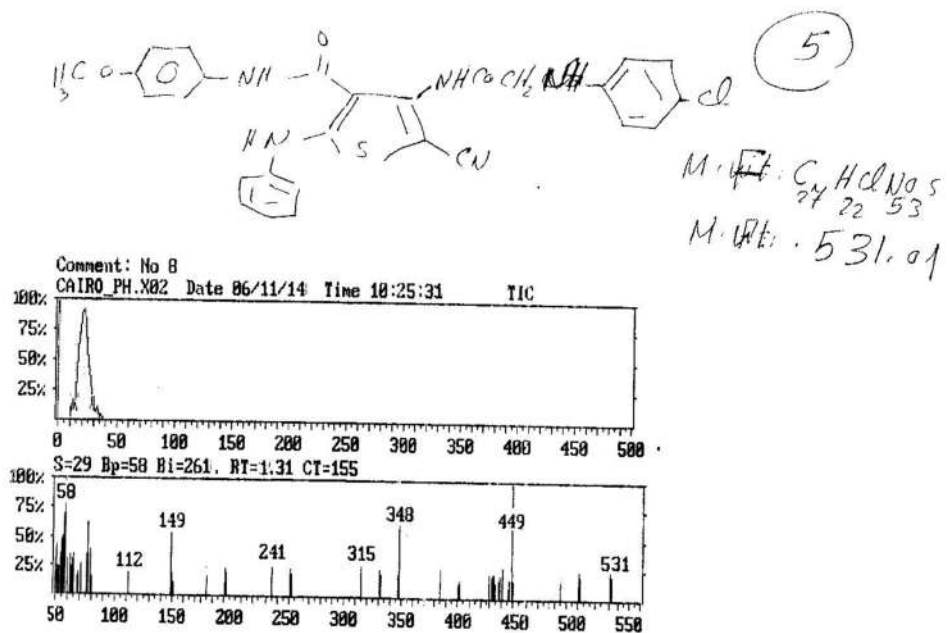


Figure S12: ¹H NMR of compound 6

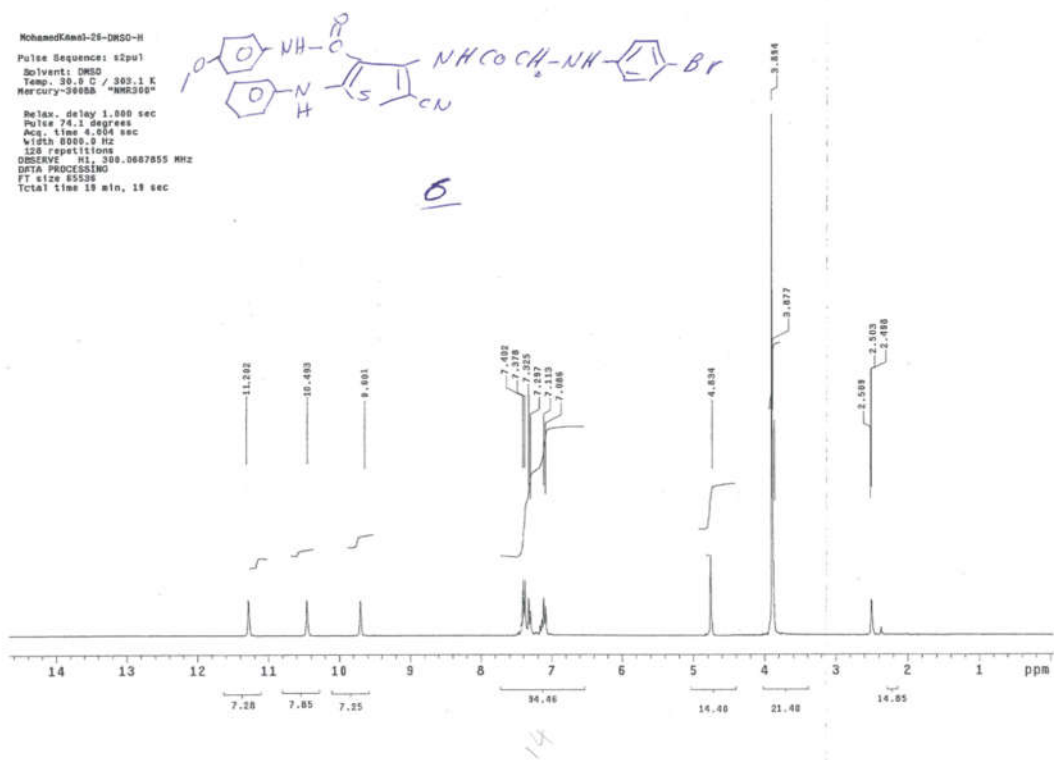


Figure S13: ¹³CNMR of compound 6

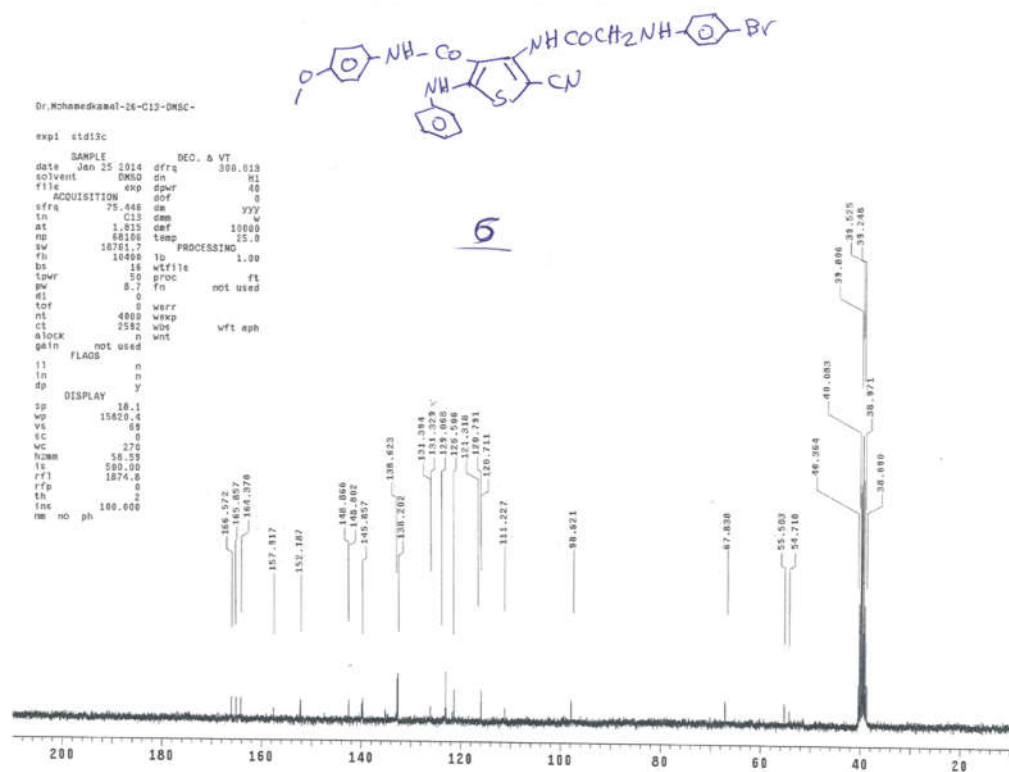


Figure S14: mass spectrum of compound 6

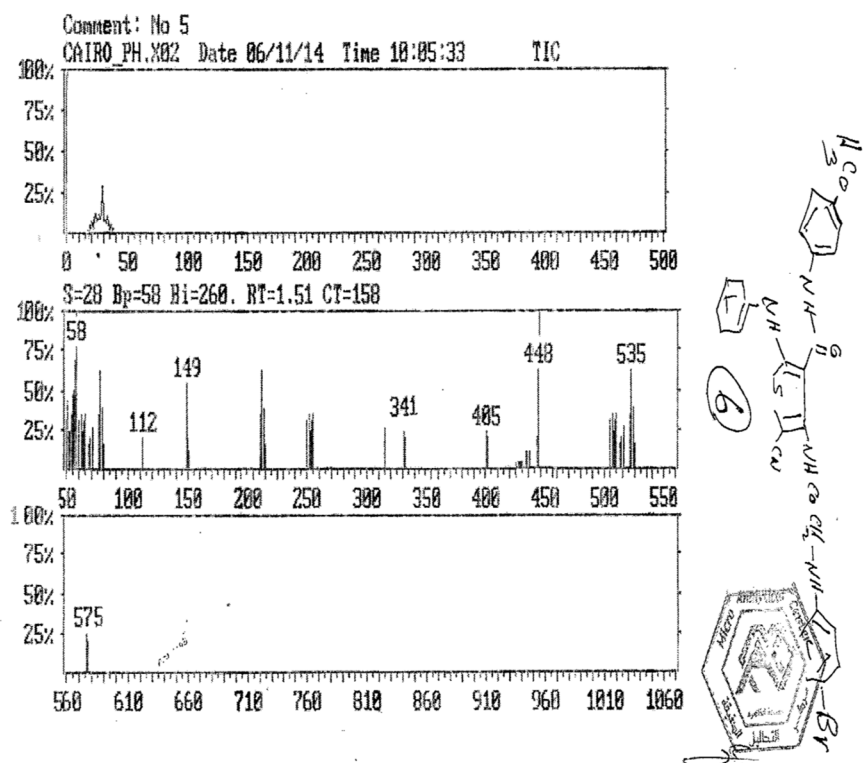


Figure S15: ¹H NMR of compound 7

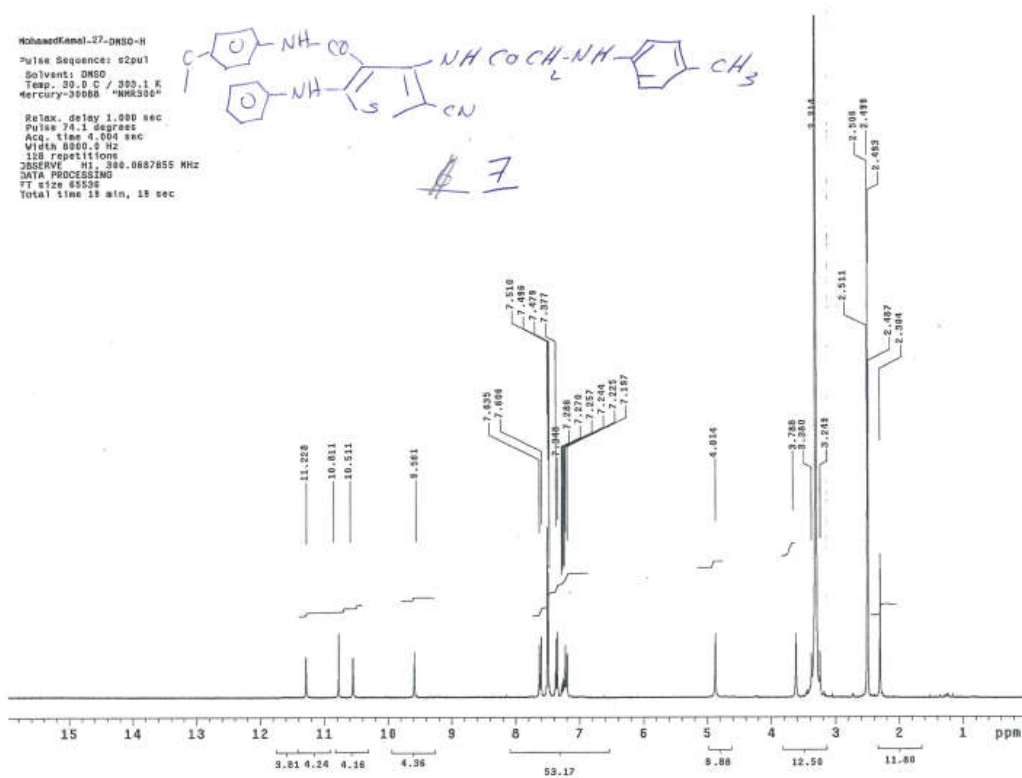


Figure S16: ¹³CNMR of compound 7

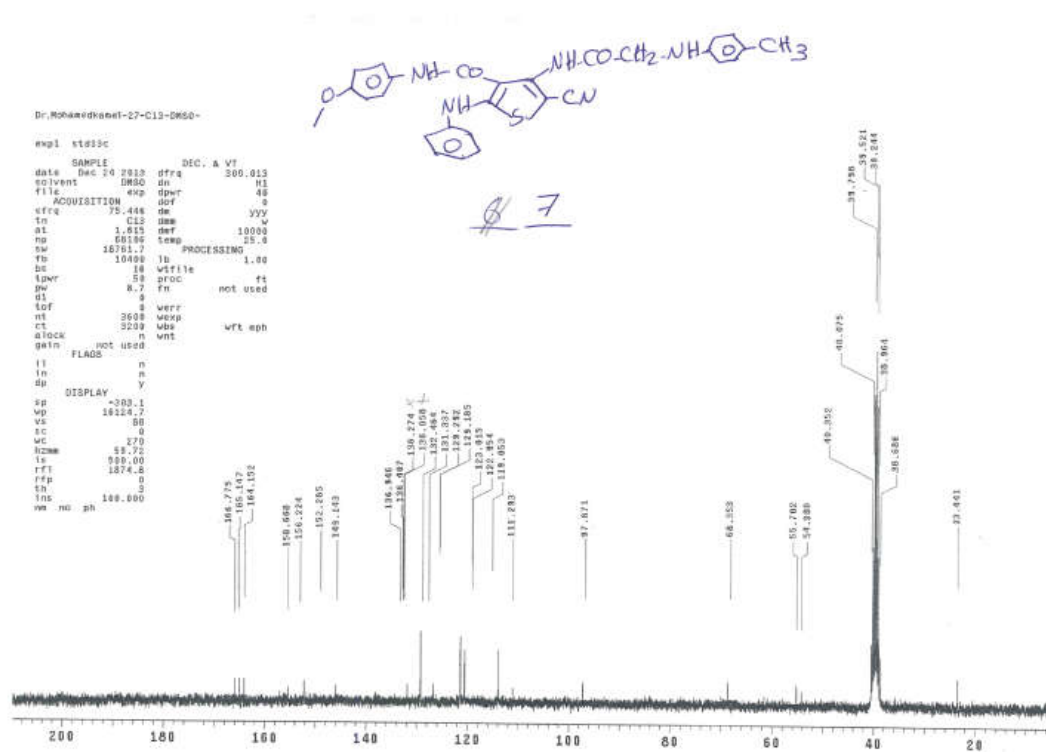


Figure S17: ¹H NMR of compound 8

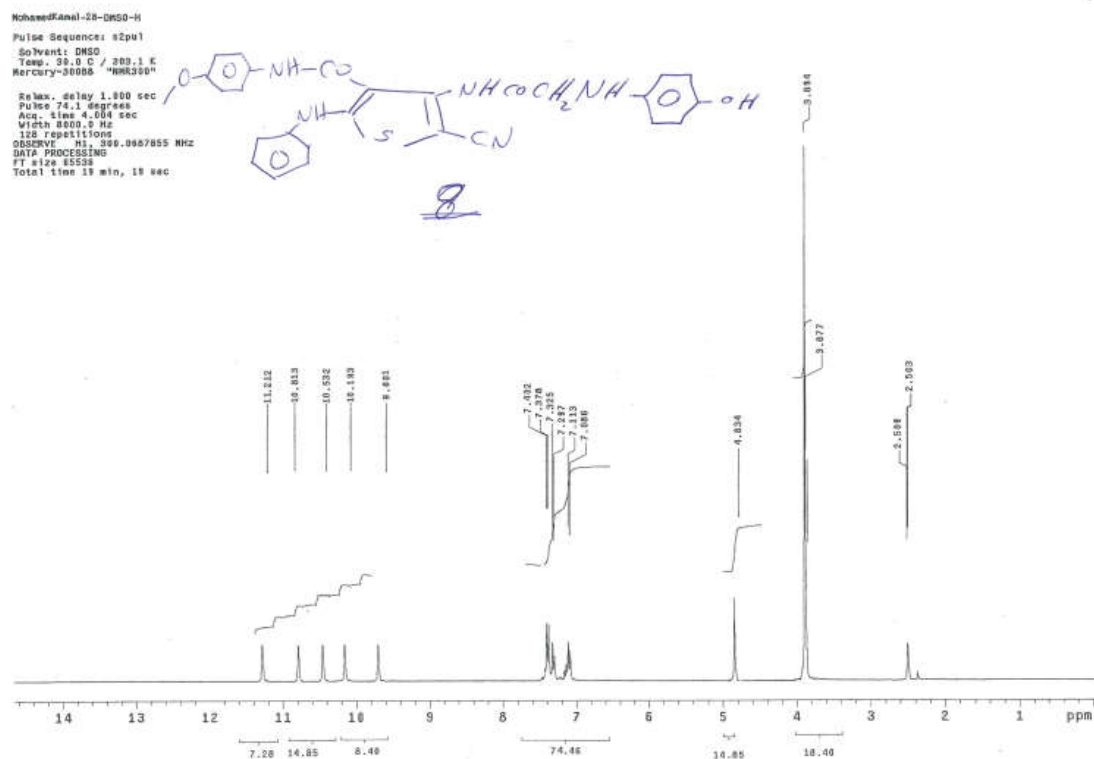


Figure S18: ¹³CNMR of compound 8

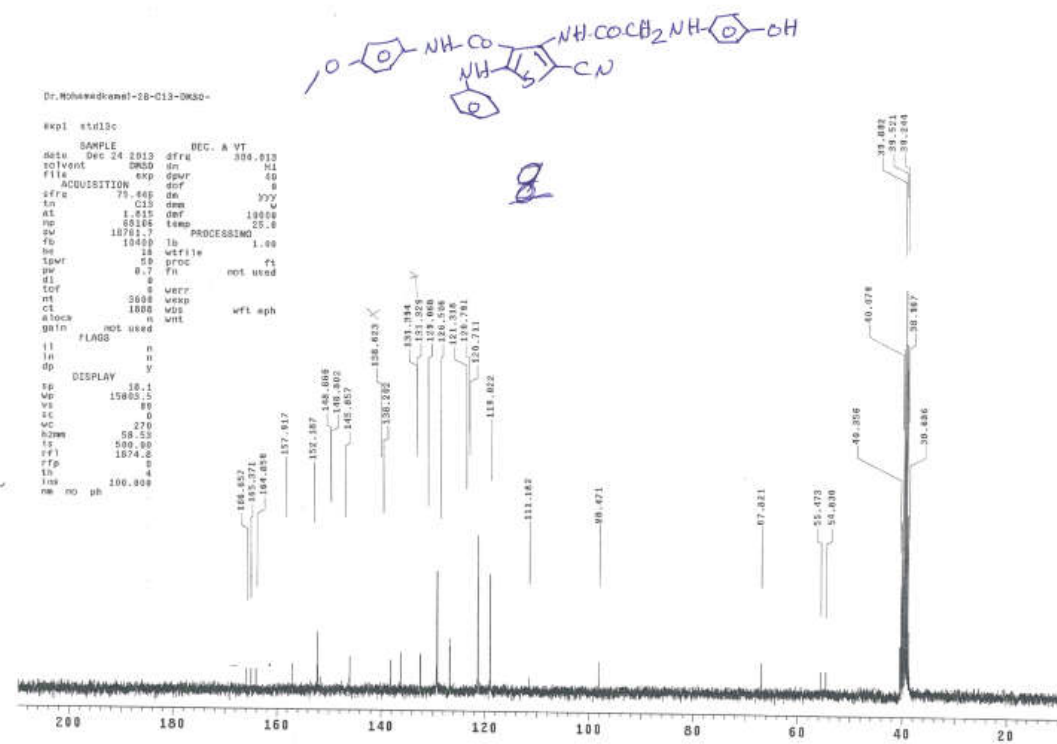


Figure S19: ¹H NMR of compound 9

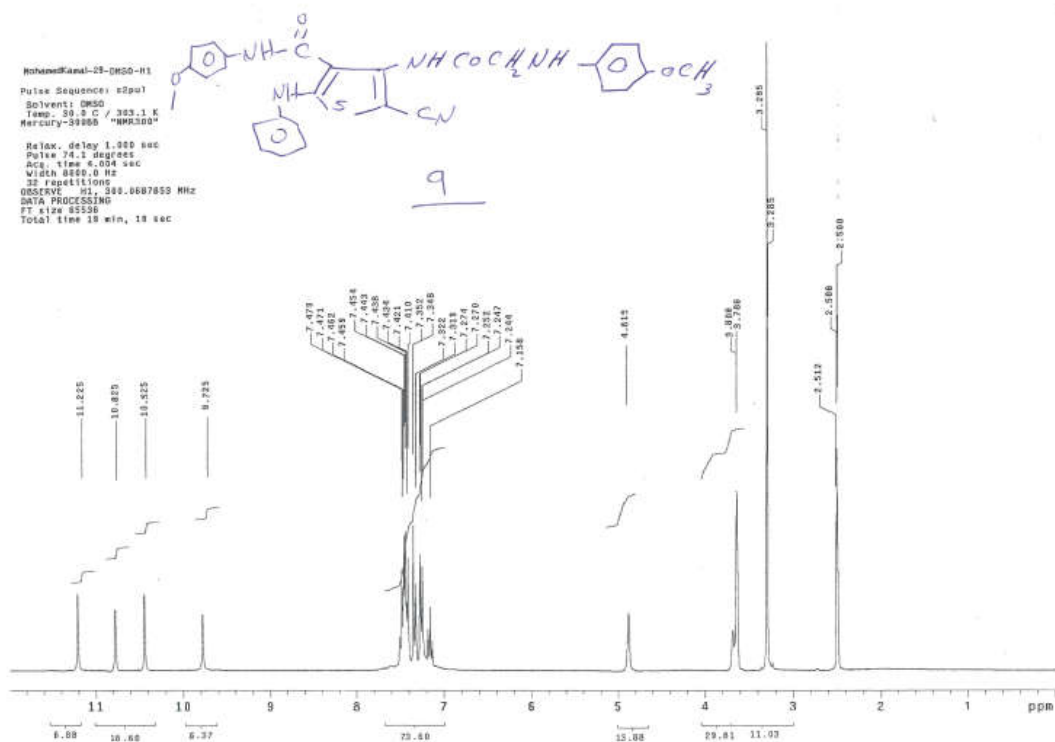


Figure S20: ¹³CNMR of compound 9

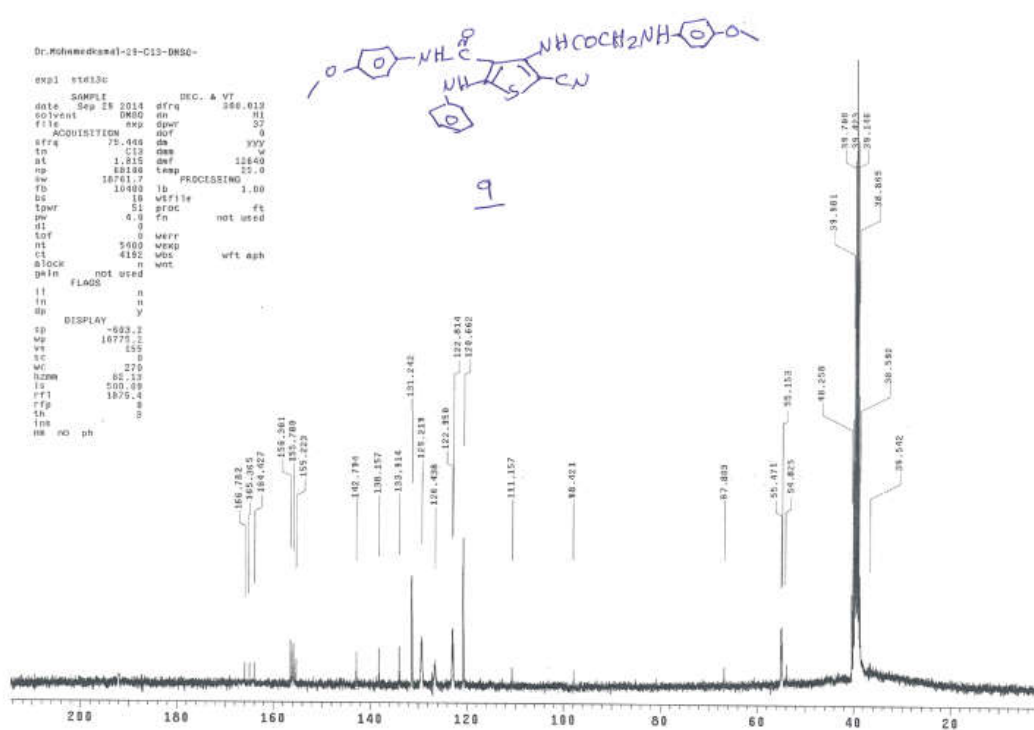


Figure S21: ¹H NMR of compound 10

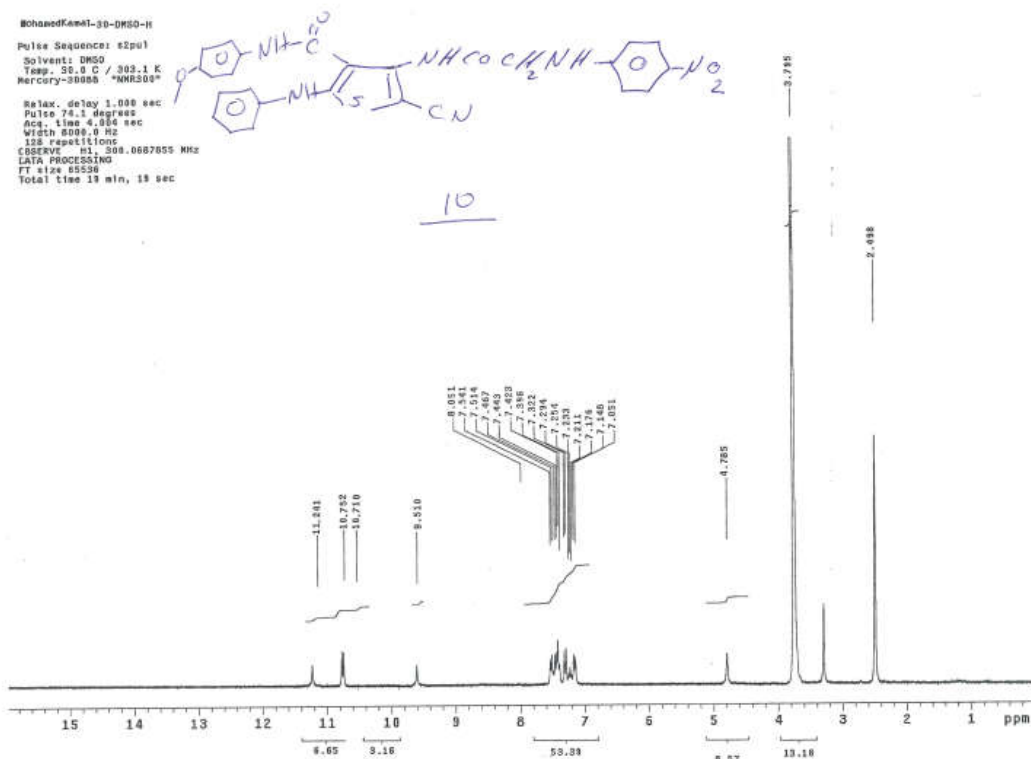


Figure S22: ¹³CNMR of compound 10

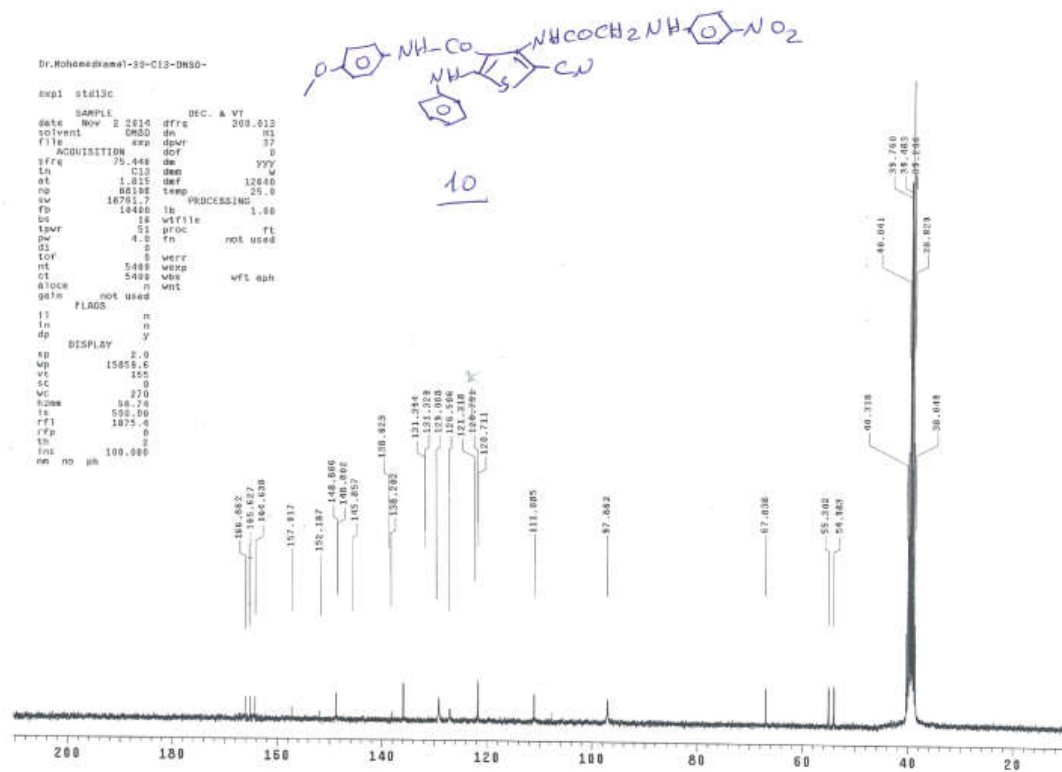


Figure S23: mass spectrum of compound 10

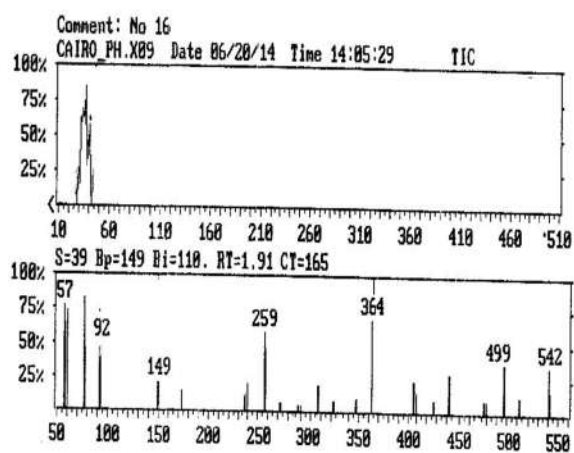
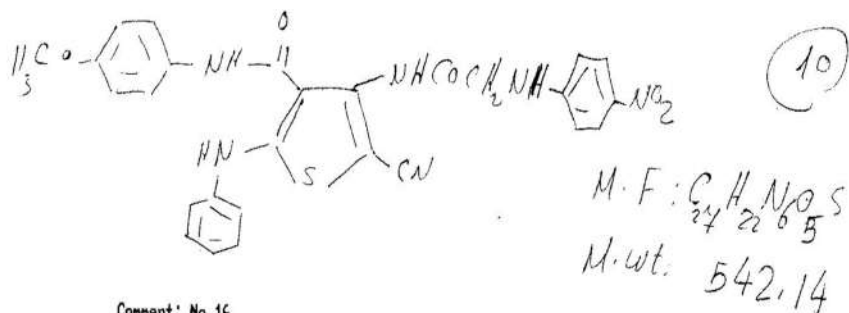


Figure S24: ¹HNMR of compound 11

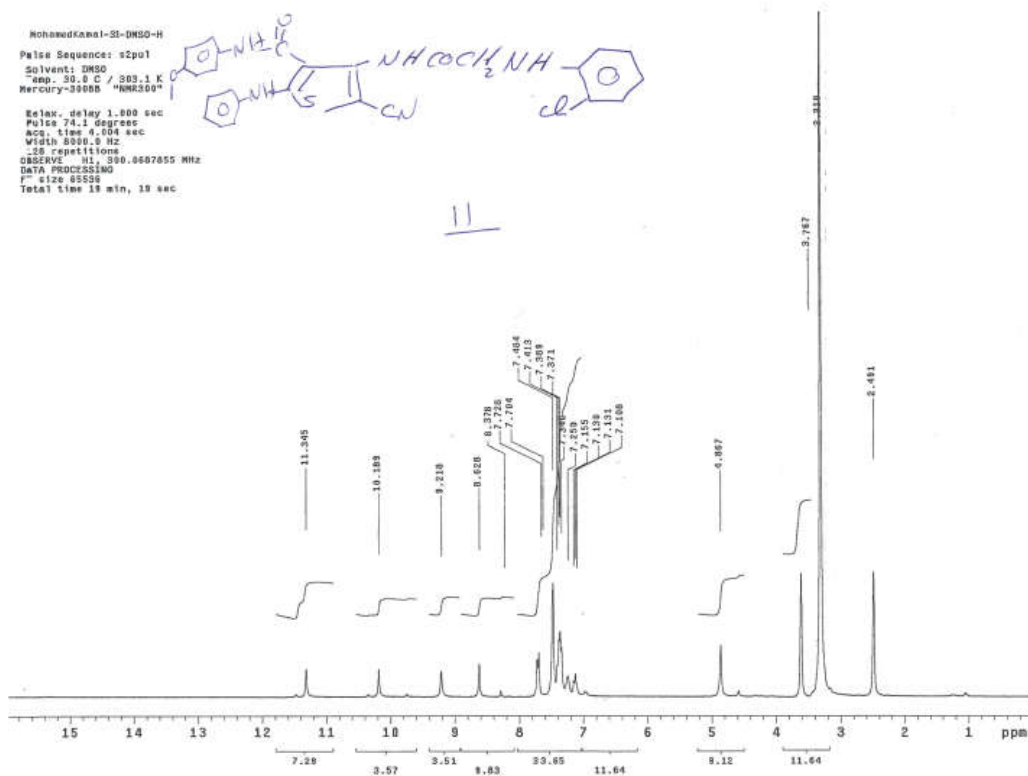


Figure S25: ¹³CNMR of compound 11

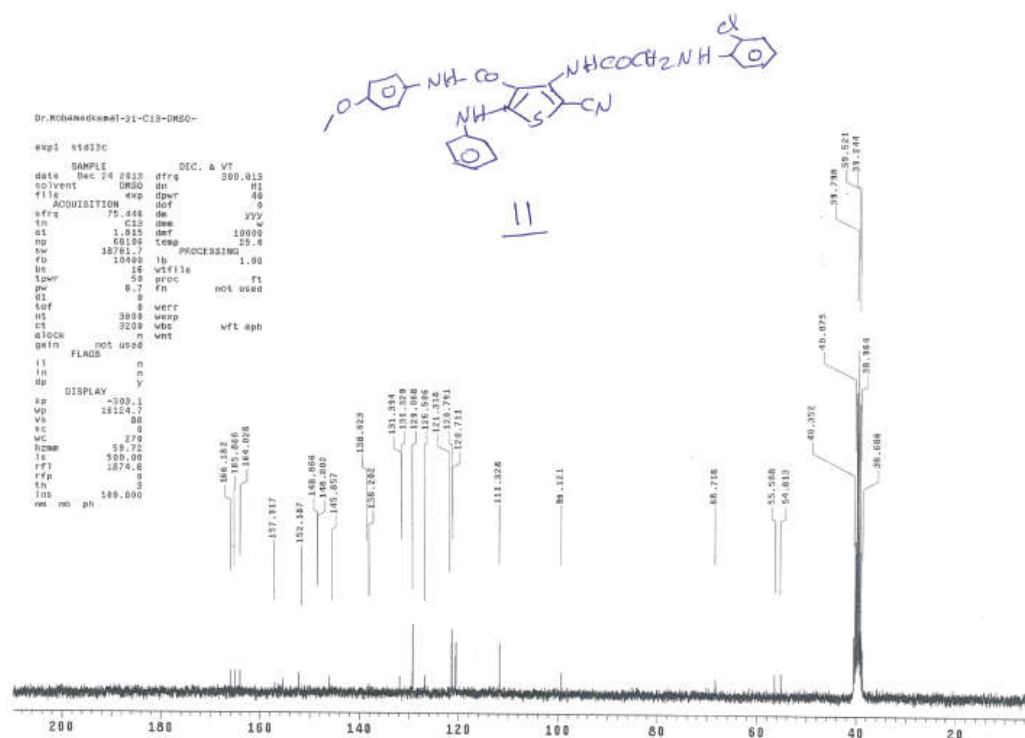


Figure S26: ¹H NMR of compound 12

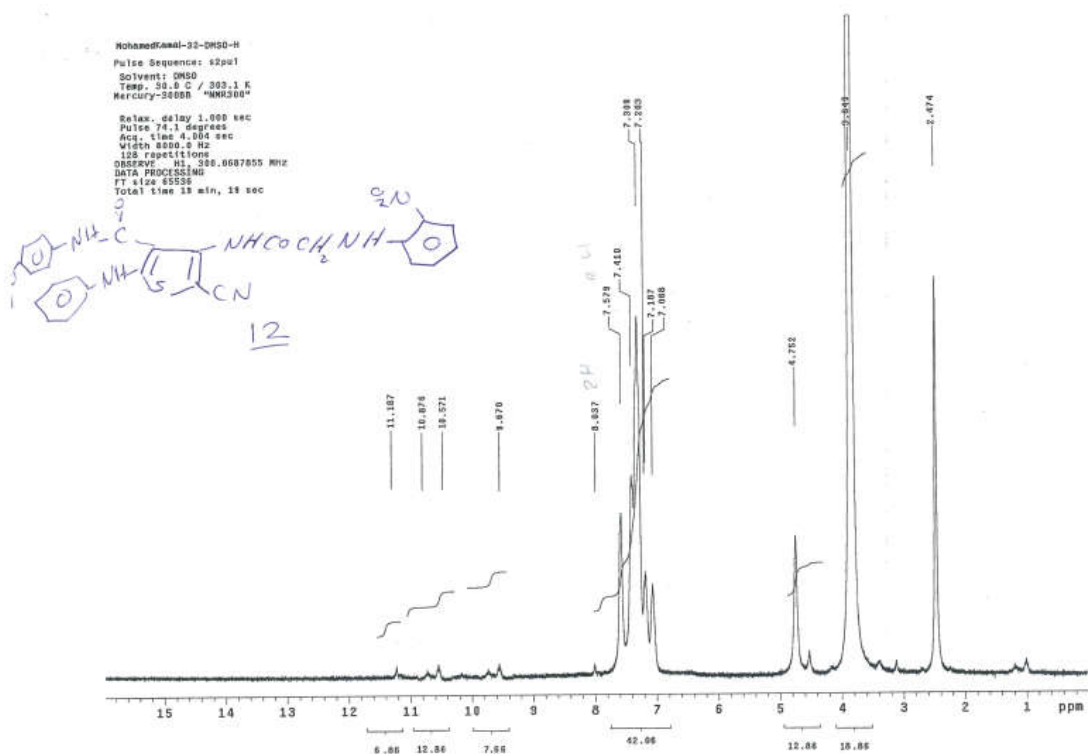


Figure S27: ¹³CNMR of compound 12

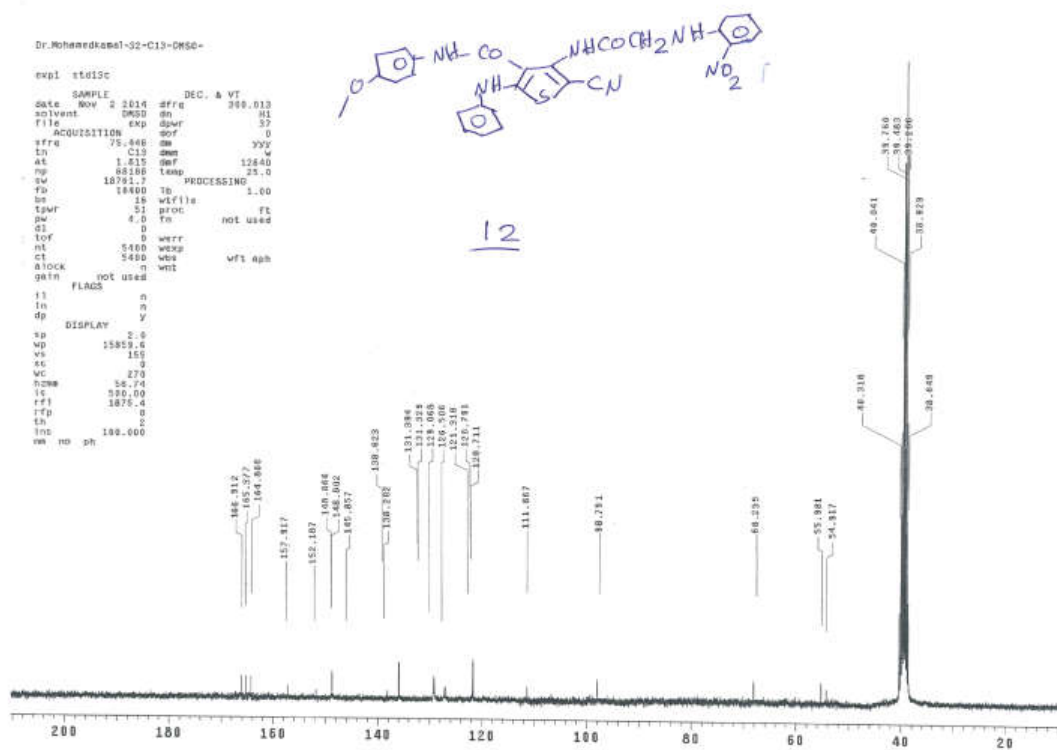


Figure S28: ¹H NMR of compound 13

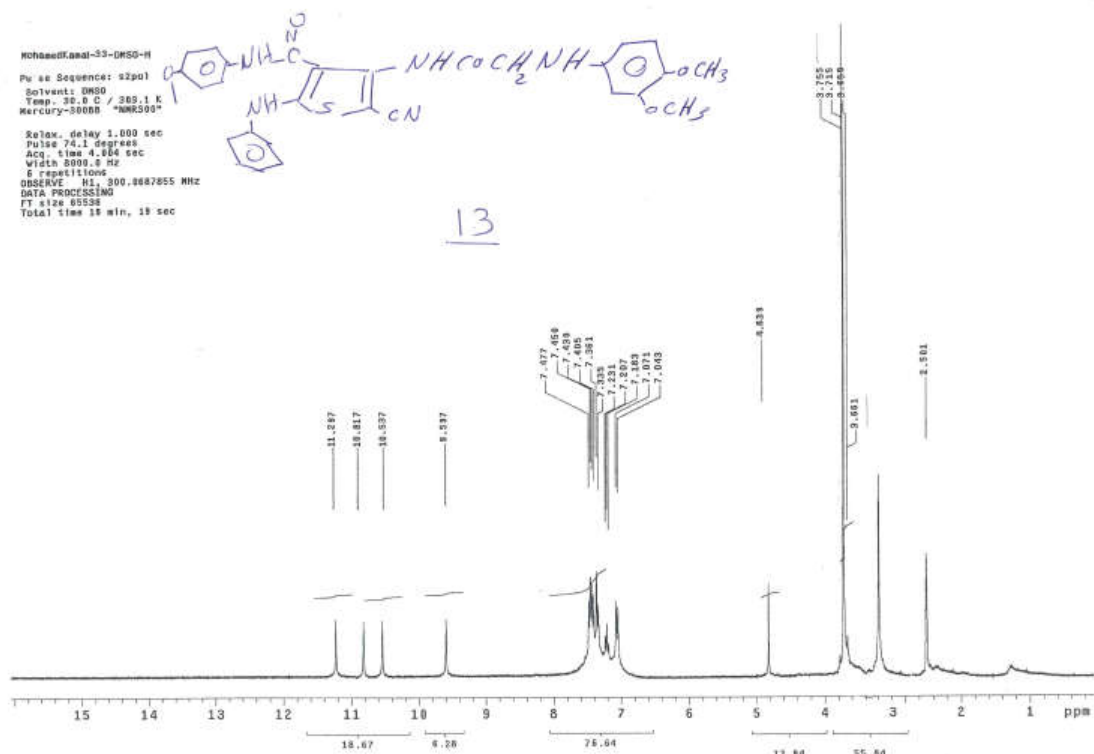


Figure S29: ¹³CNMR of compound 13

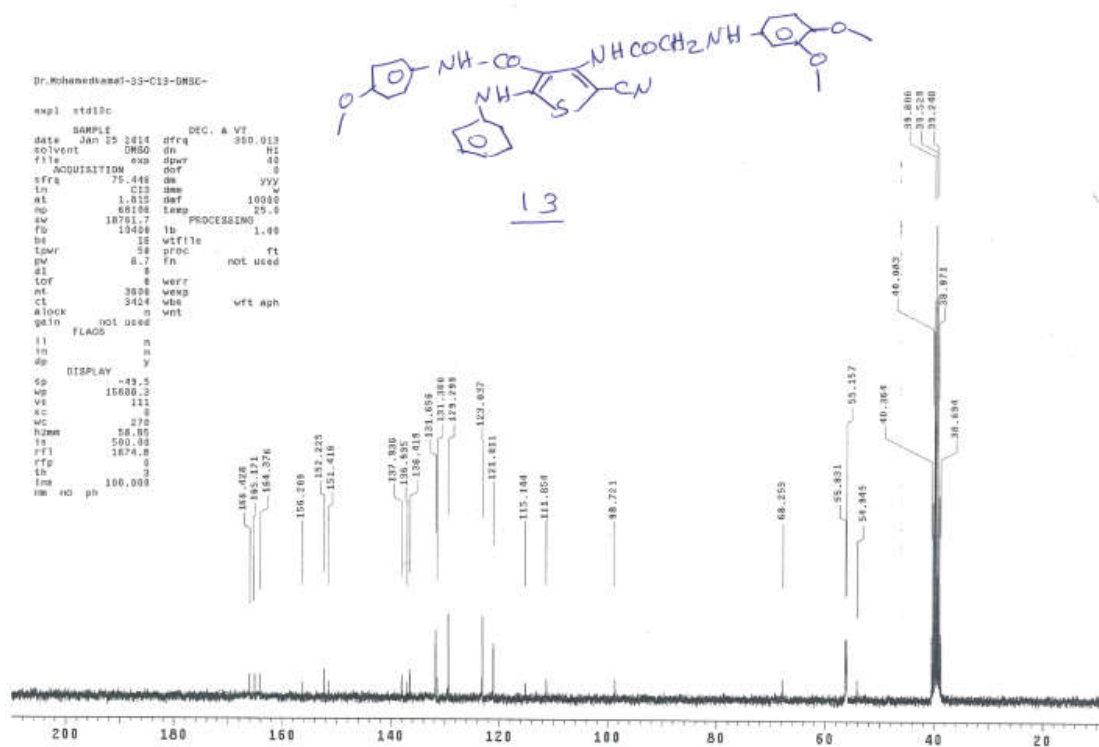


Figure S30: ¹H NMR of compound 14

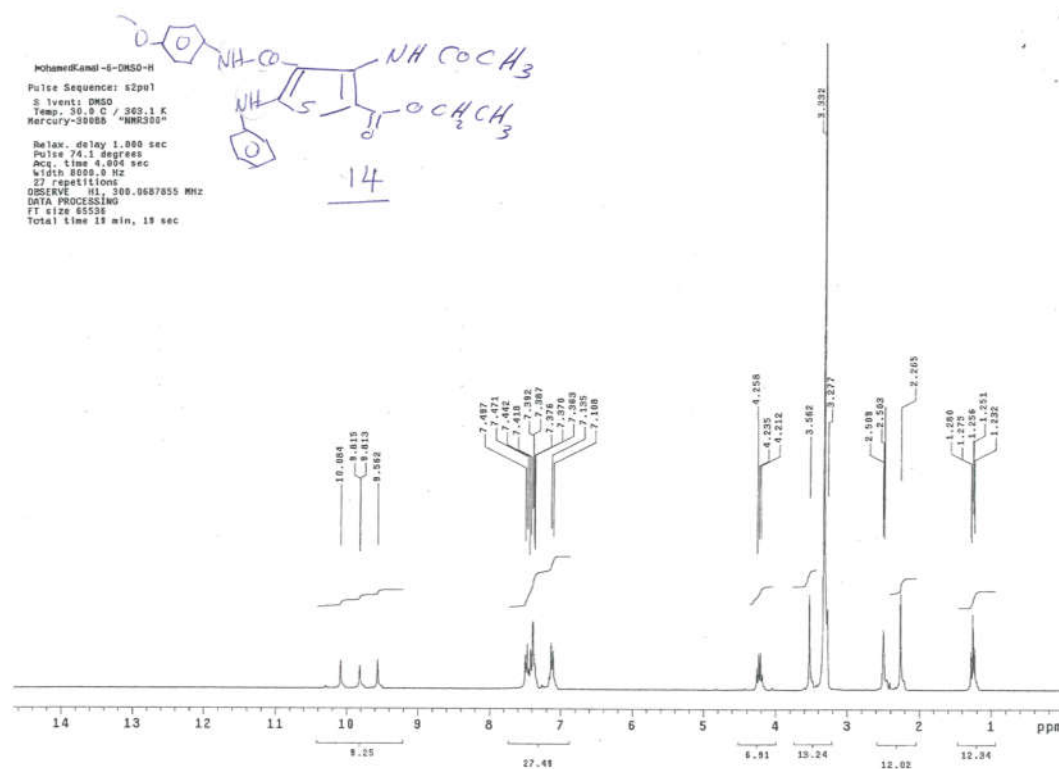


Figure S31: ¹³CNMR of compound 14

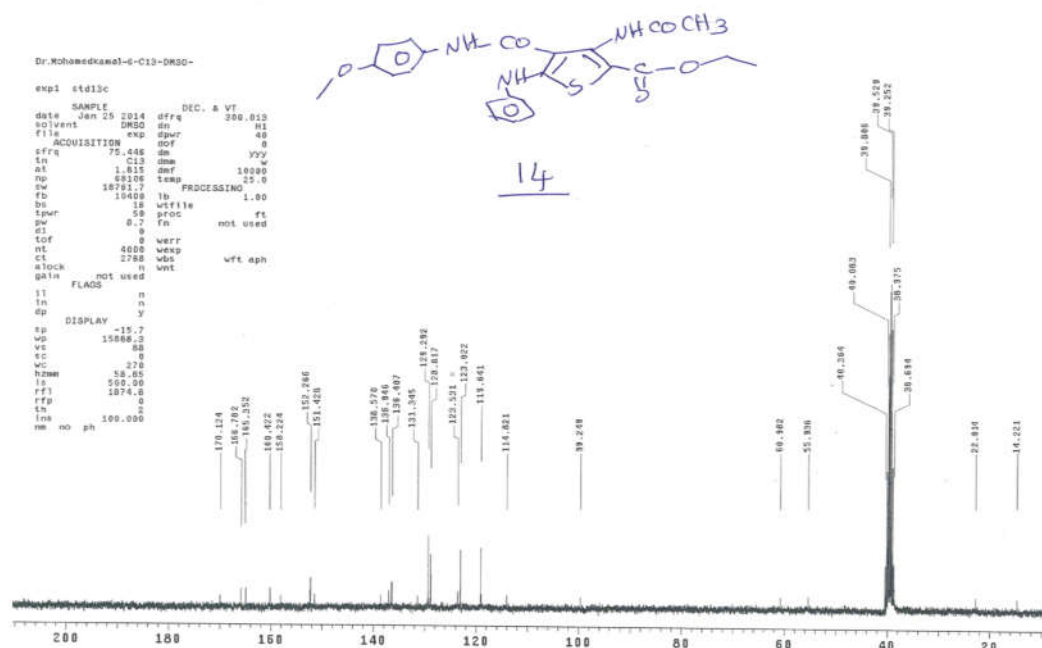


Figure S32: mass spectrum of compound 14

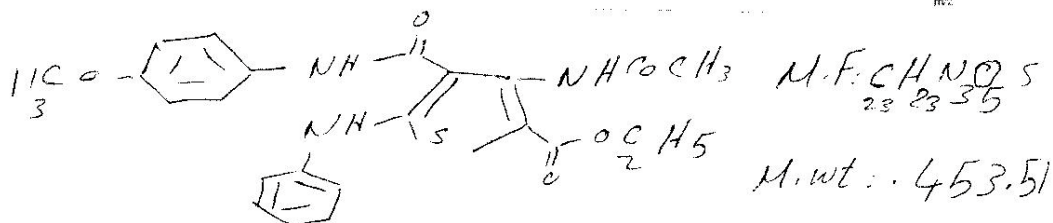
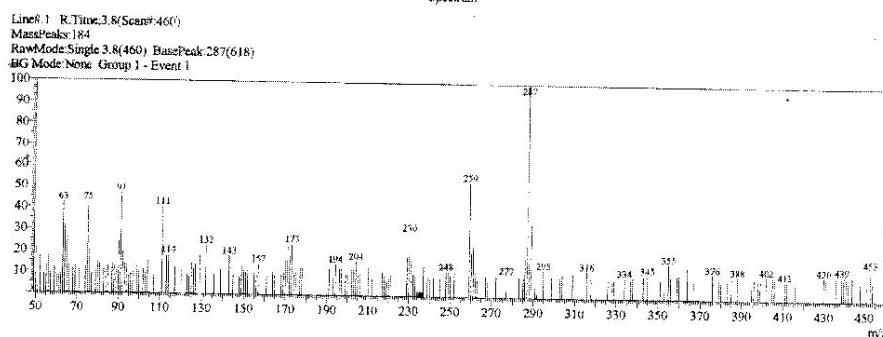
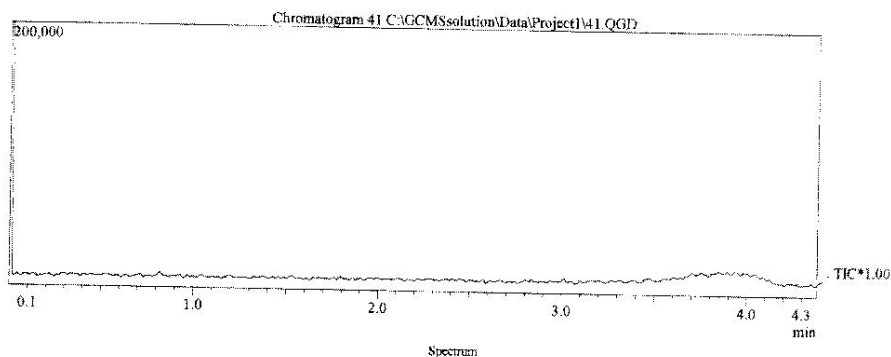
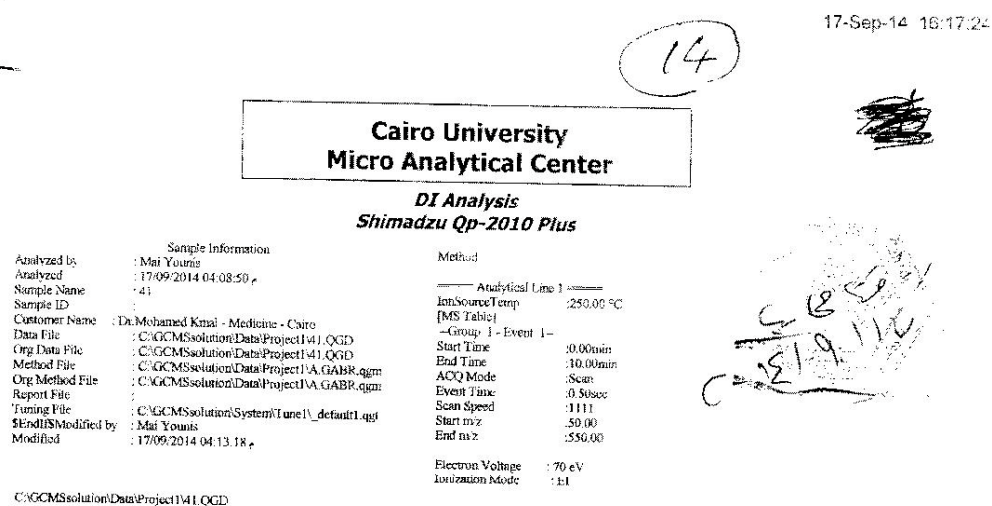


Figure S33: ¹H NMR of compound 15

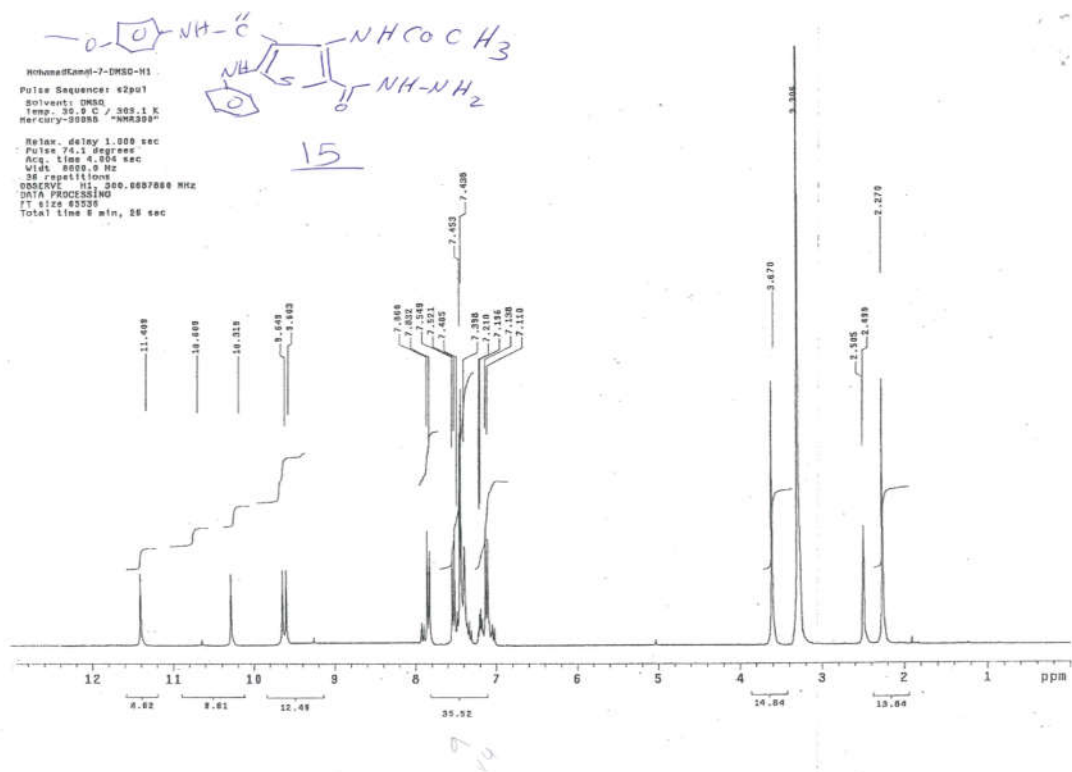


Figure S34: ¹³CNMR of compound 15

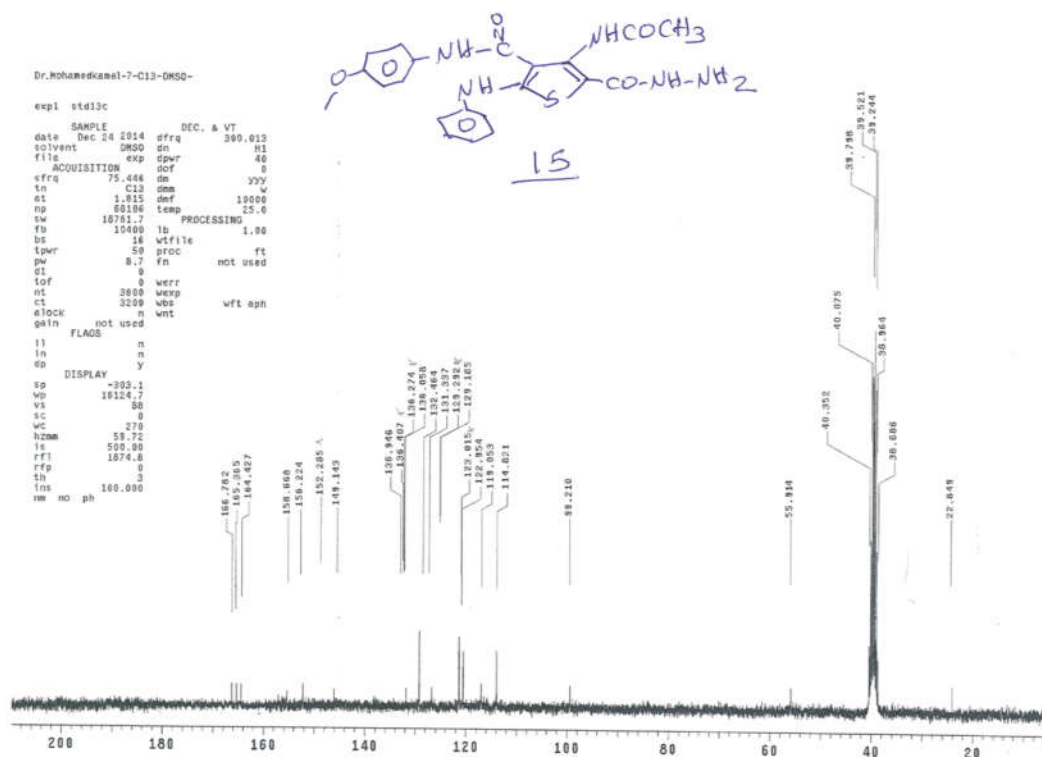


Figure S35: mass spectrum of compound 15

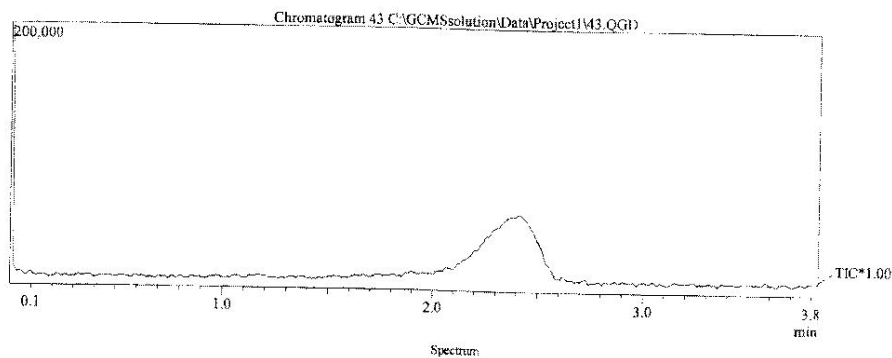
17-Sep-14 16:28:21

**Cairo University
Micro Analytical Center**

**DI Analysis
Shimadzu Qp-2010 Plus**

Sample Information		Method
Analyzed by	Mai Younis	Analytical Line 1
Analyzed	17/09/2014 04:20:52	IonSourceTemp
Sample Name	43	[MS Table]
Sample ID		~Group 1 - Event 1~
Customer Name	Dr. Mohamed Kimal - Medicine - Cairo	Start Time
Data File	C:\GCMSolution\Data\Project\43.QGD	End Time
Org Data File	C:\GCMSolution\Data\Project\43.QGD	ACQ Mode
Method File	C:\GCMSolution\Data\Project\43.GABR.qqm	Event Time
Org Method File	C:\GCMSolution\Data\Project\43.GABR.qqm	Scan Speed
Report File		Start m/z
Tuning File	C:\GCMSolution\System\Tune\1. default1.qgt	End m/z
\$End\$ Modified by	Mai Younis	Electron Voltage
Modified	17/09/2014 04:24:47	Ionization Mode

C:\GCMSolution\Data\Project\43.QGD



Line# 1 R Time: 2.4 (Scan# 289)
Mass Peaks: 210
Raw Mode: Single 2.4 (289) Base Peak: 267 (5254)
BG Mode: None Group 1 - Event 1

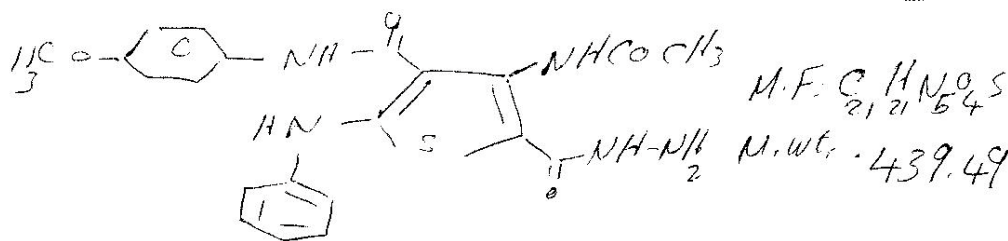
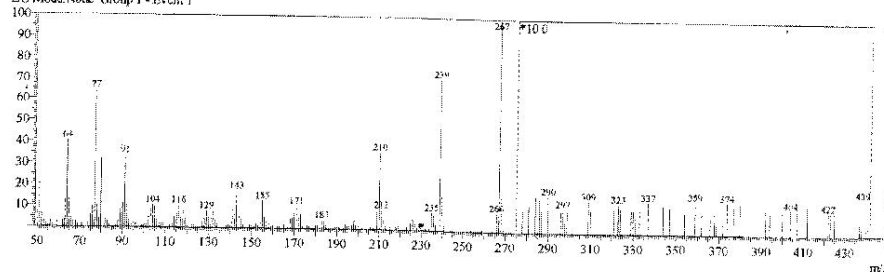


Figure S36: ¹H NMR of compound 16

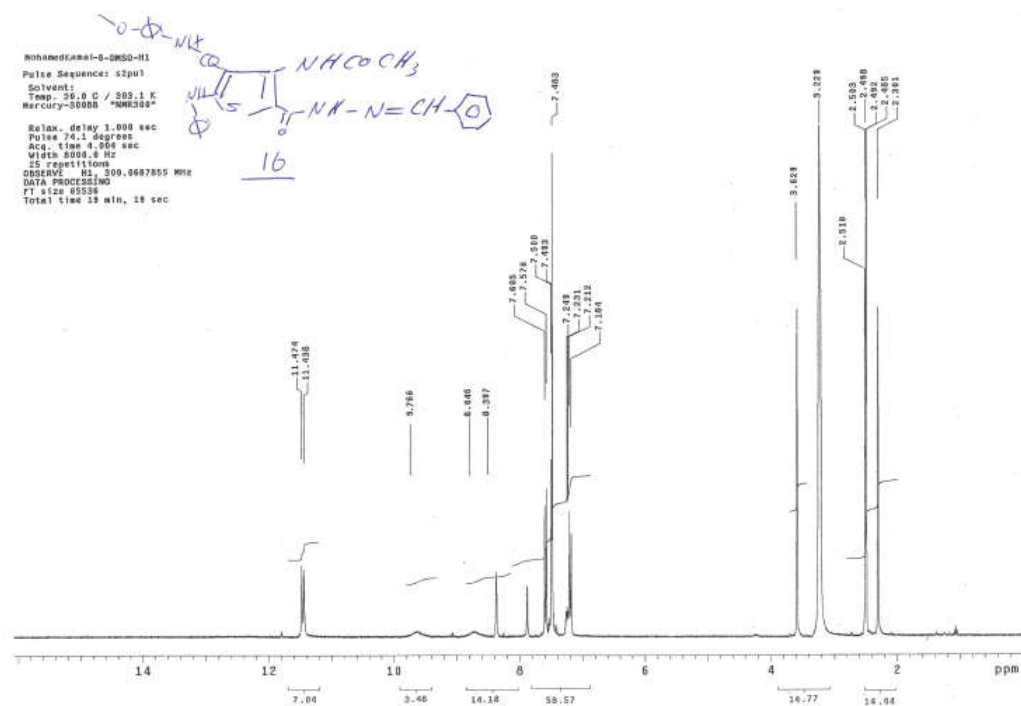


Figure S37: ¹³CNMR of compound 16

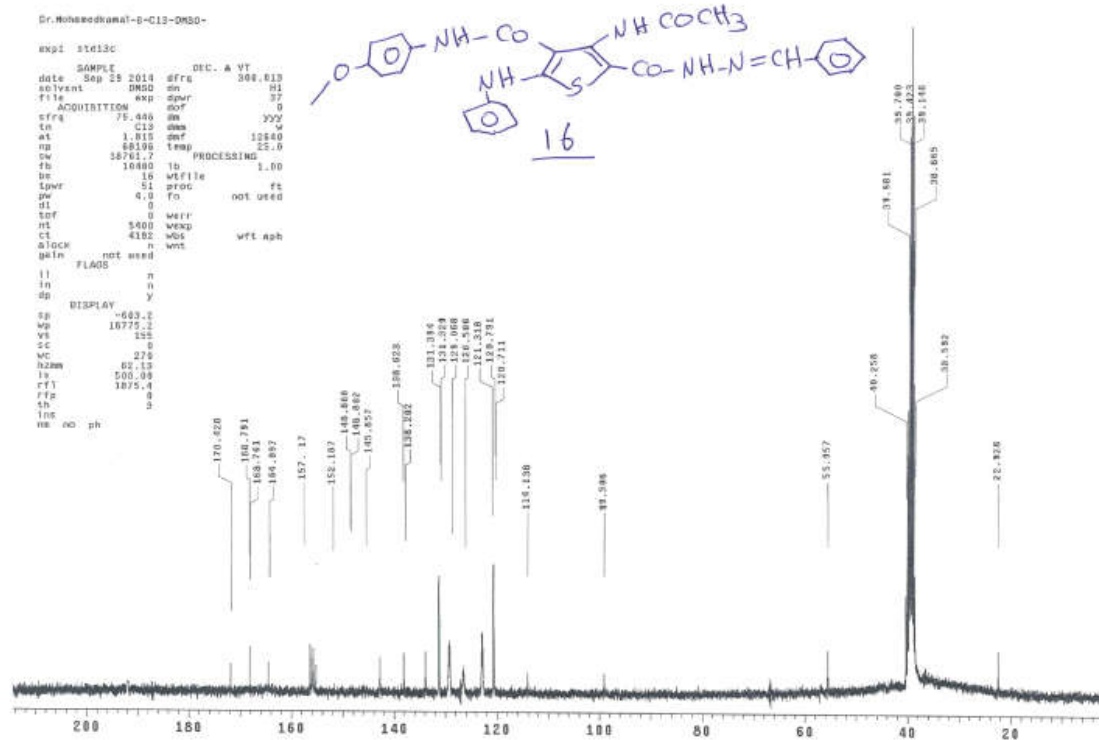
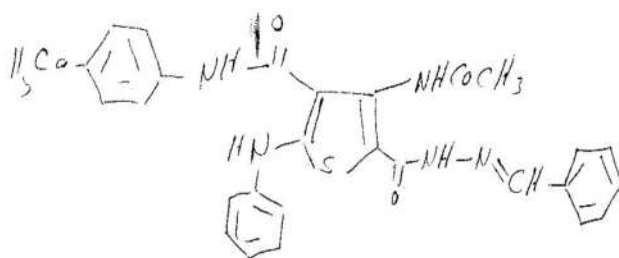
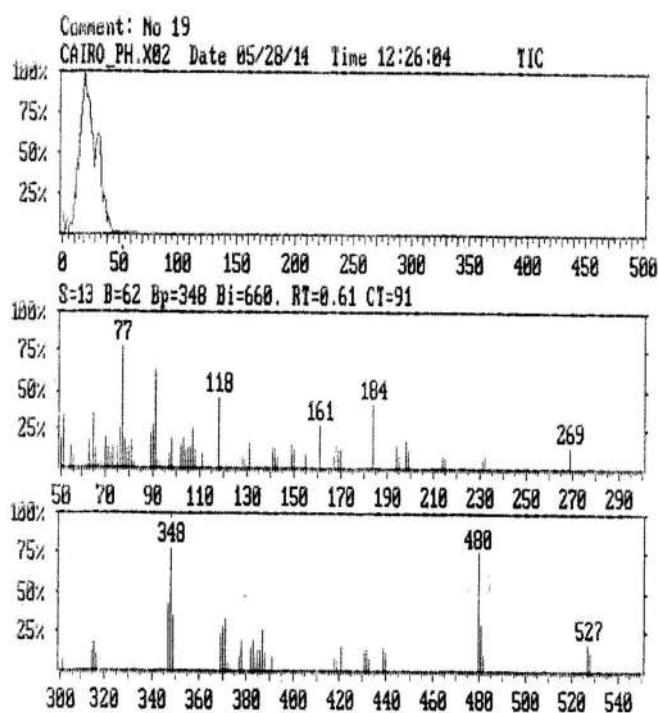


Figure S38: mass spectrum of compound 16



(16)
M.F. $C_{28}H_{25}N_5O_4S$
M.Wt.: 527.54



23

Figure S39: ¹H NMR of compound 17

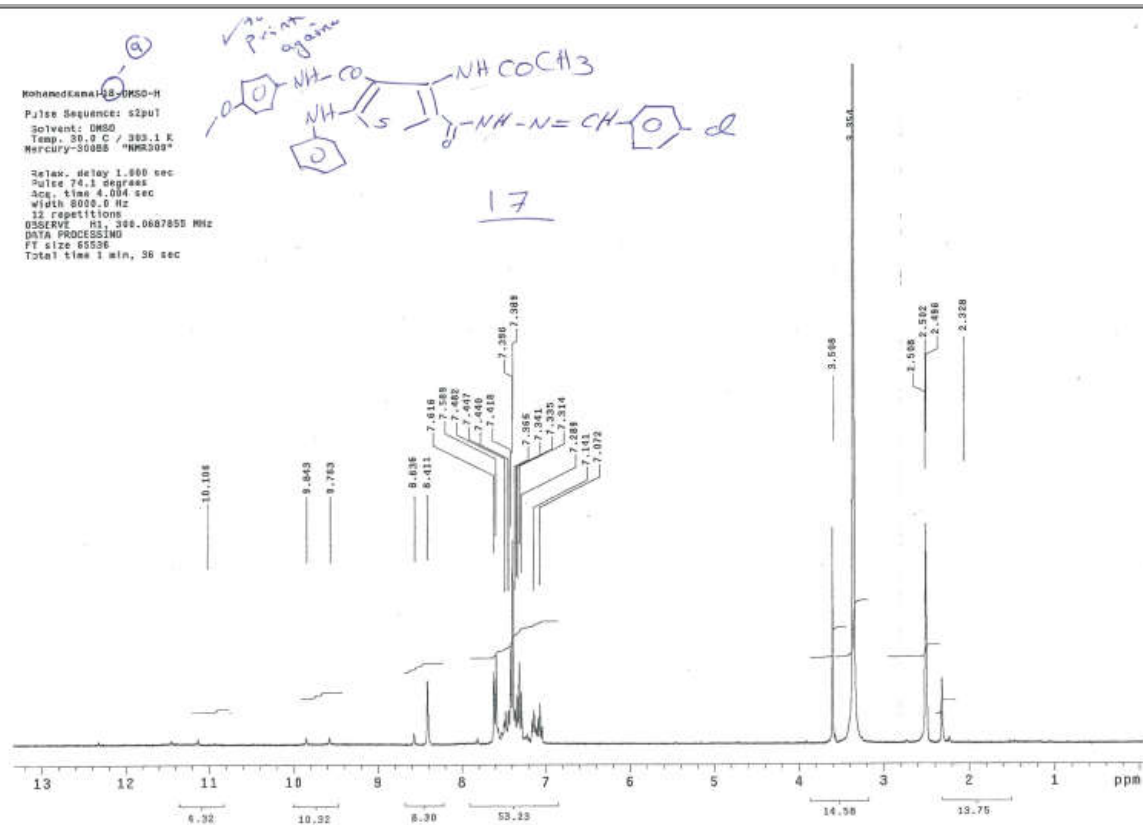


Figure S40: ¹³CNMR of compound 17

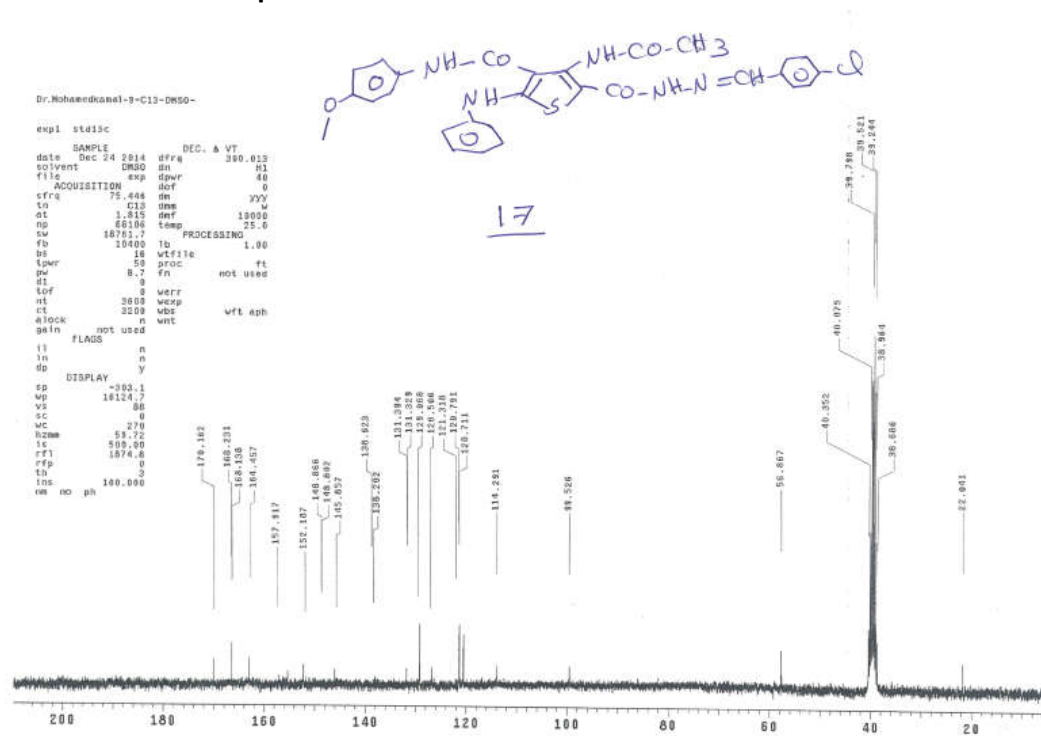
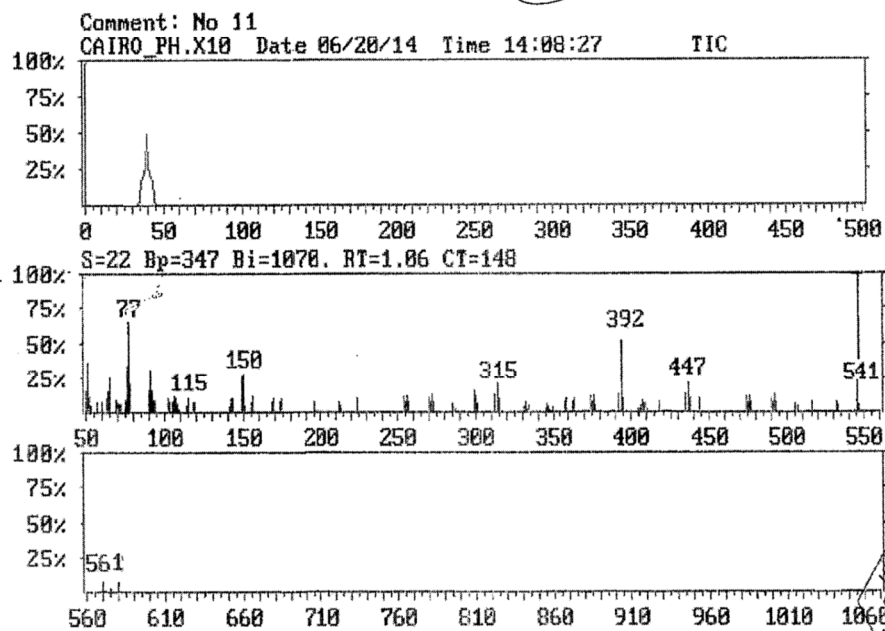
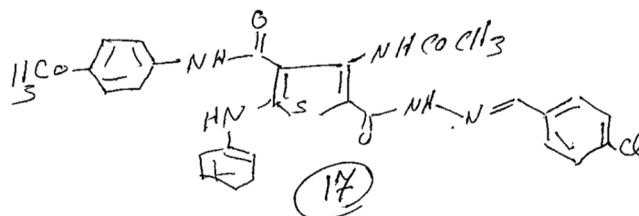


Figure S41: mass spectrum of compound 17



S List > S=22 B=0 Pos=4 Tot=4



Figure S42: ¹HNMR of compound 18

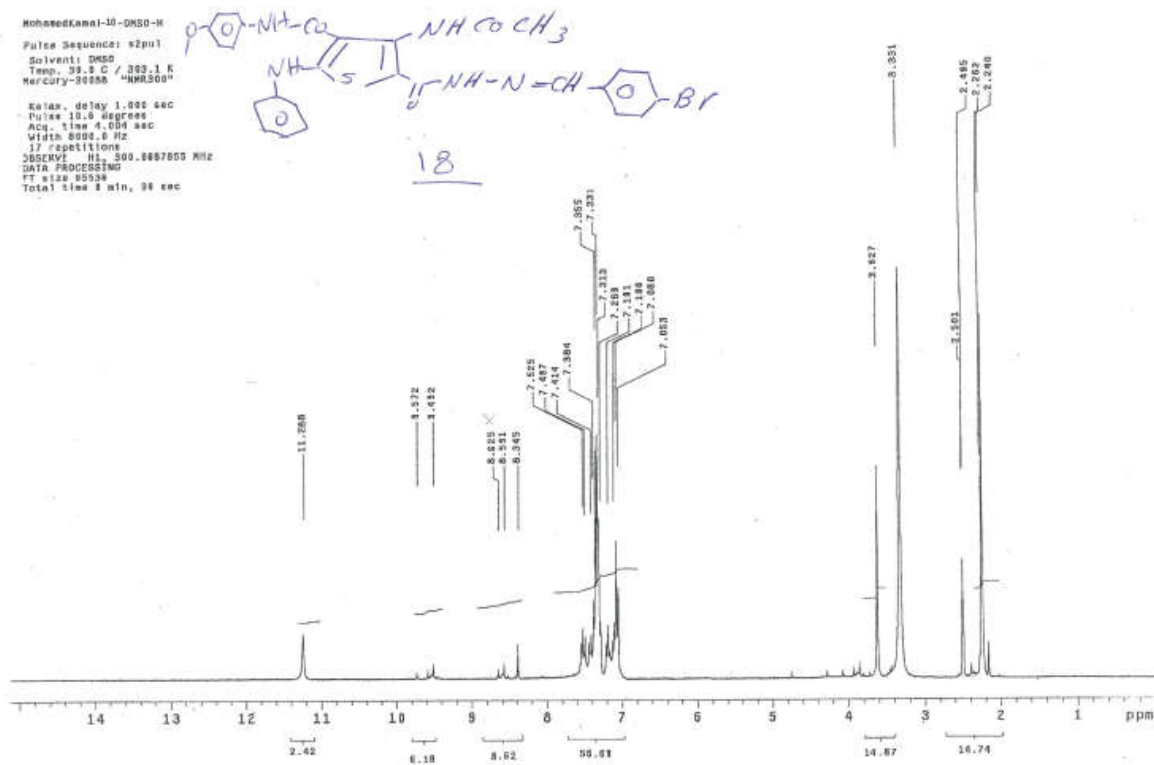


Figure S43: ¹³CNMR of compound 18

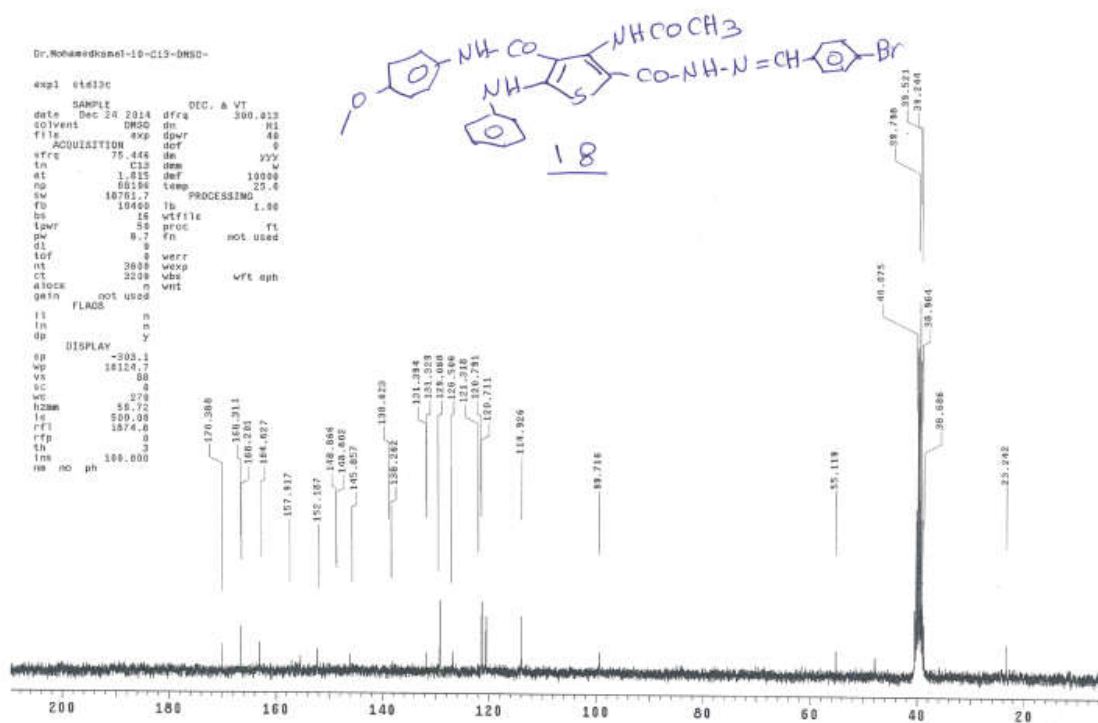


Figure S44: ¹H NMR of compound 19

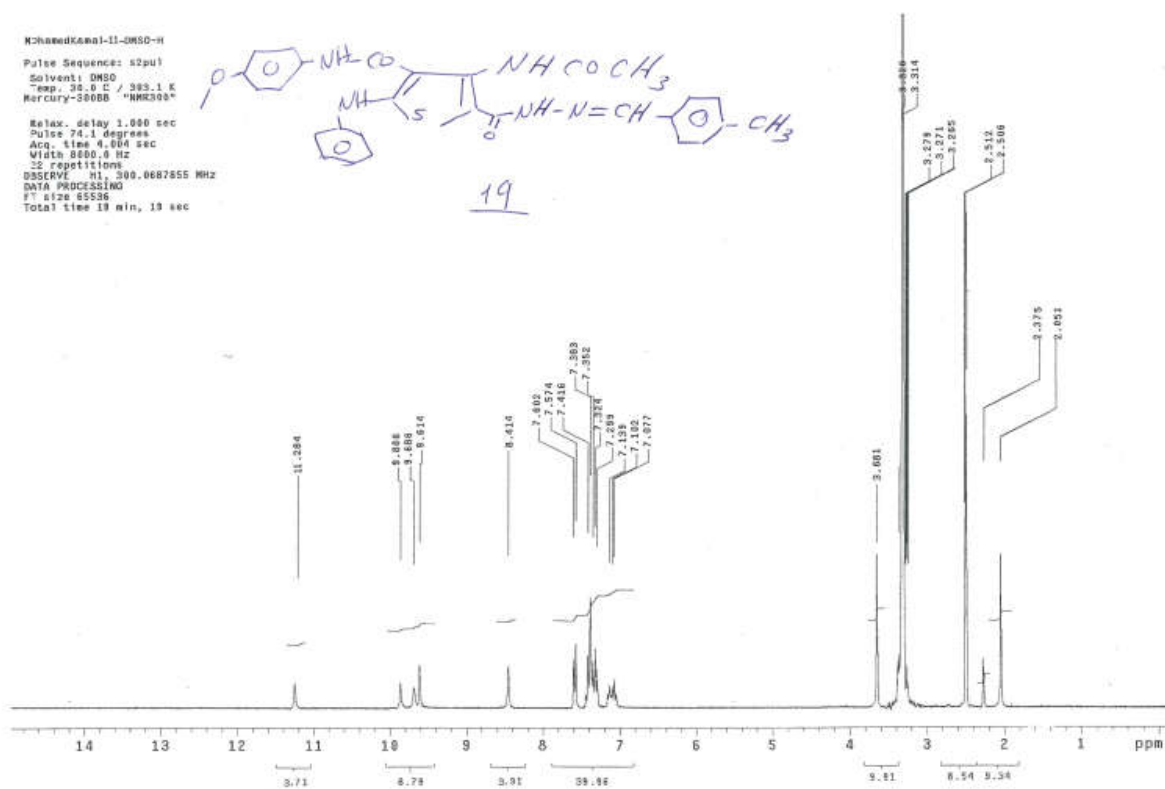


Figure S45: ¹³CNMR of compound 19

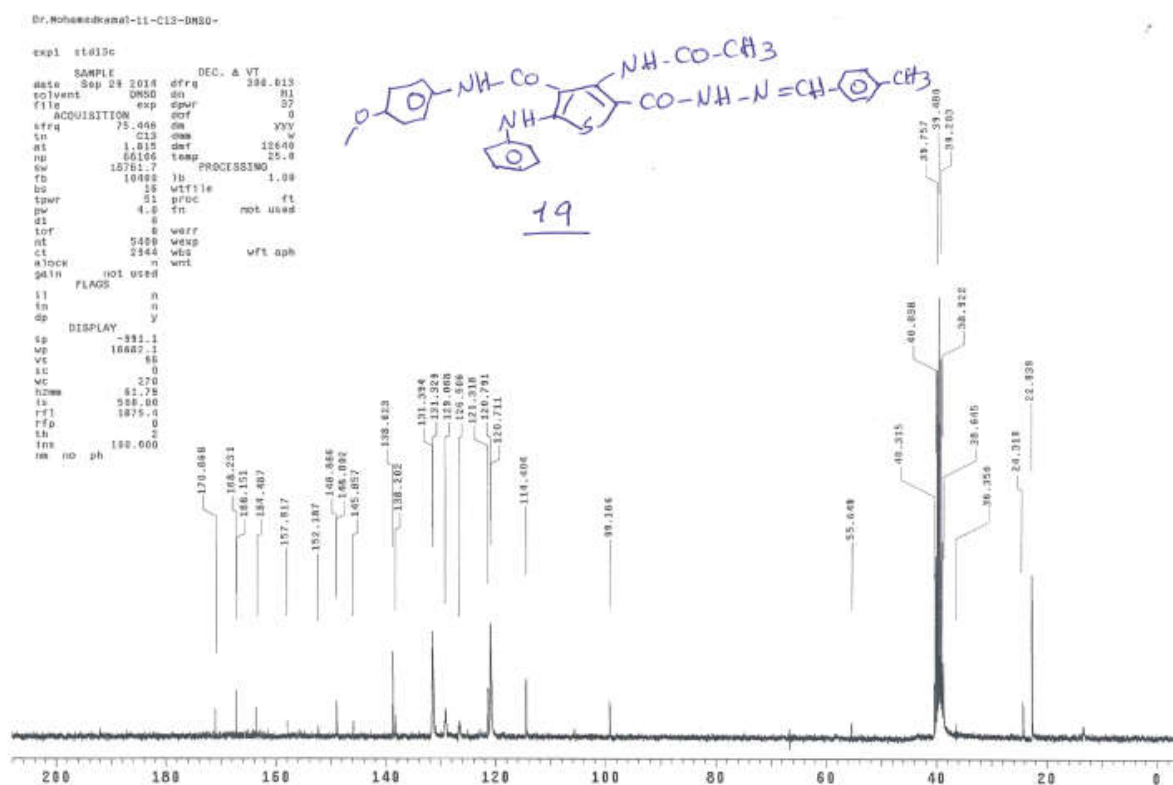
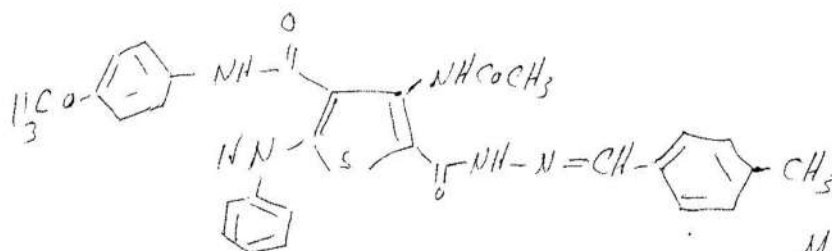


Figure S46: mass spectrum of compound 19



19

M.F: $C_{29}H_{24}NO_5S$
M.Wt: 541.62

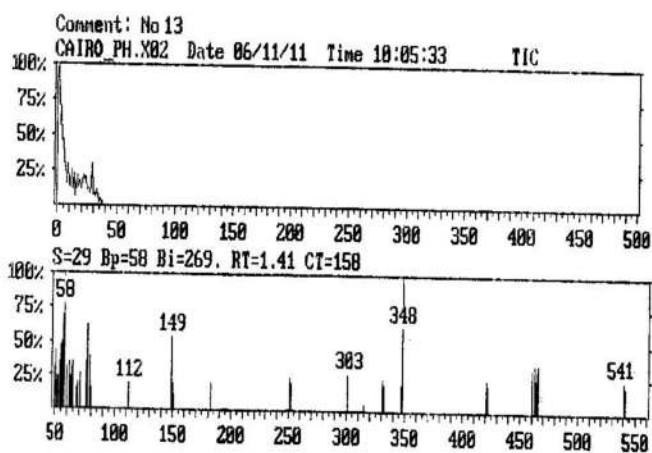


Figure S47: ¹H NMR of compound 20

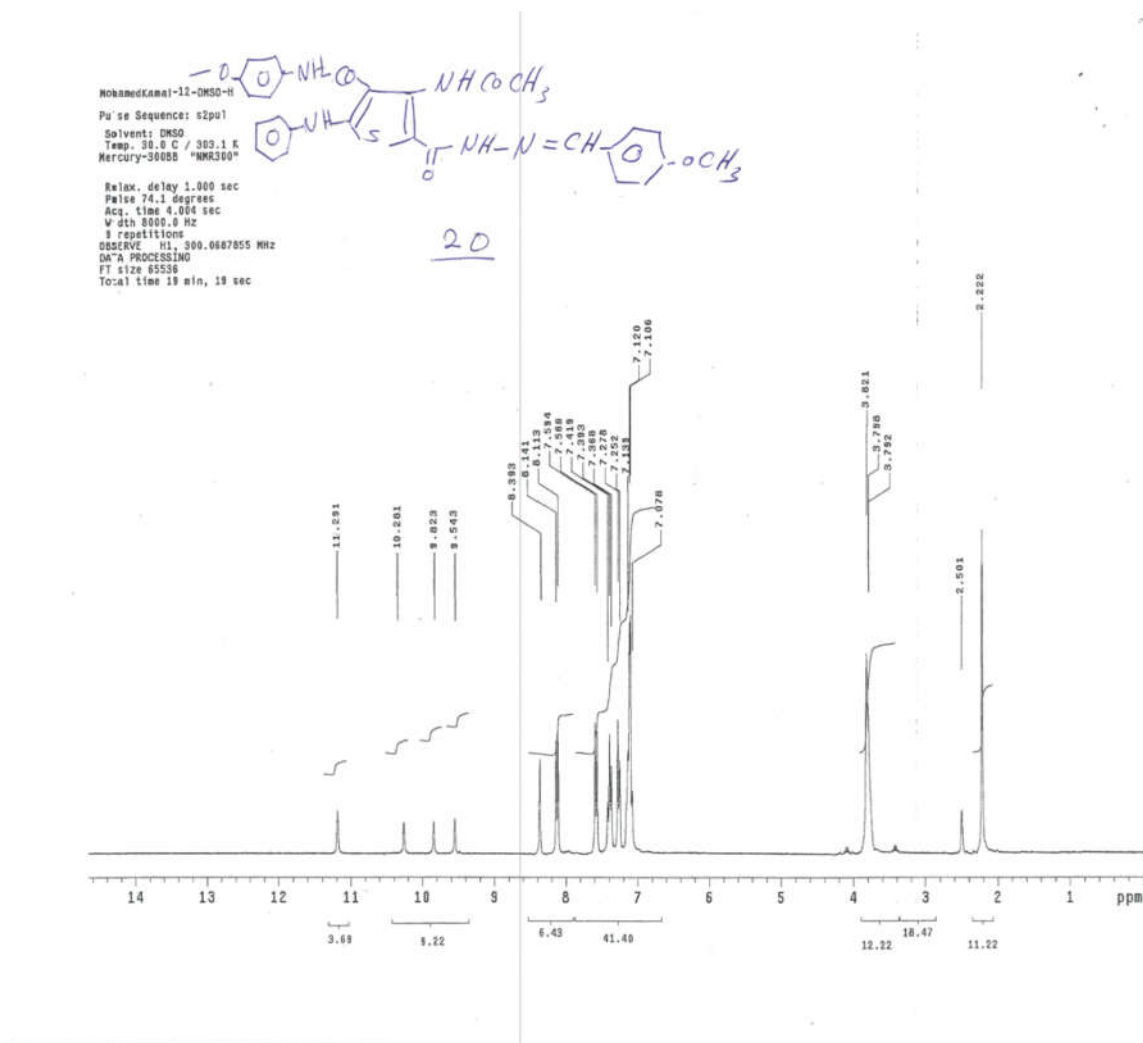


Figure S48: ¹³CNMR of compound 20

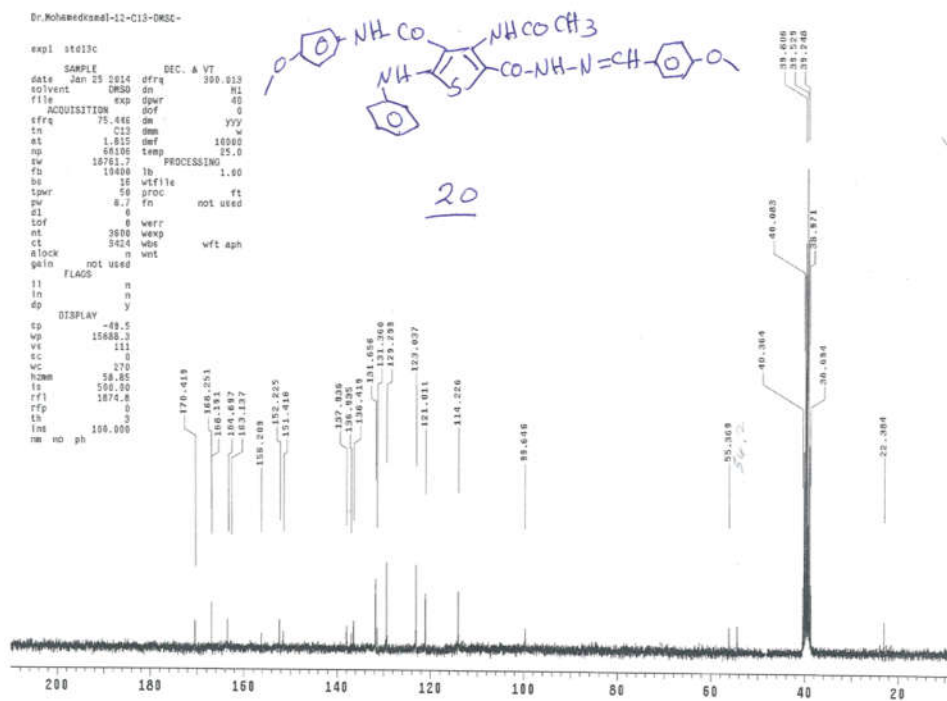


Figure S49: ¹HNMR of compound 21

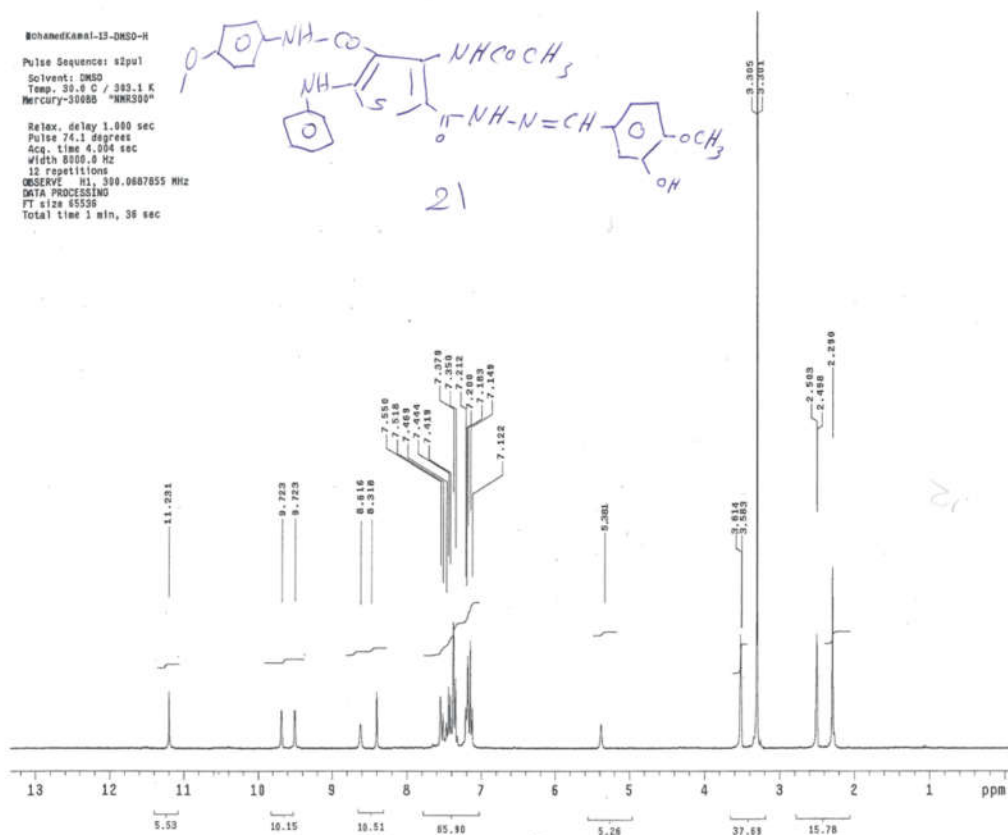


Figure S50: ¹³CNMR of compound 21

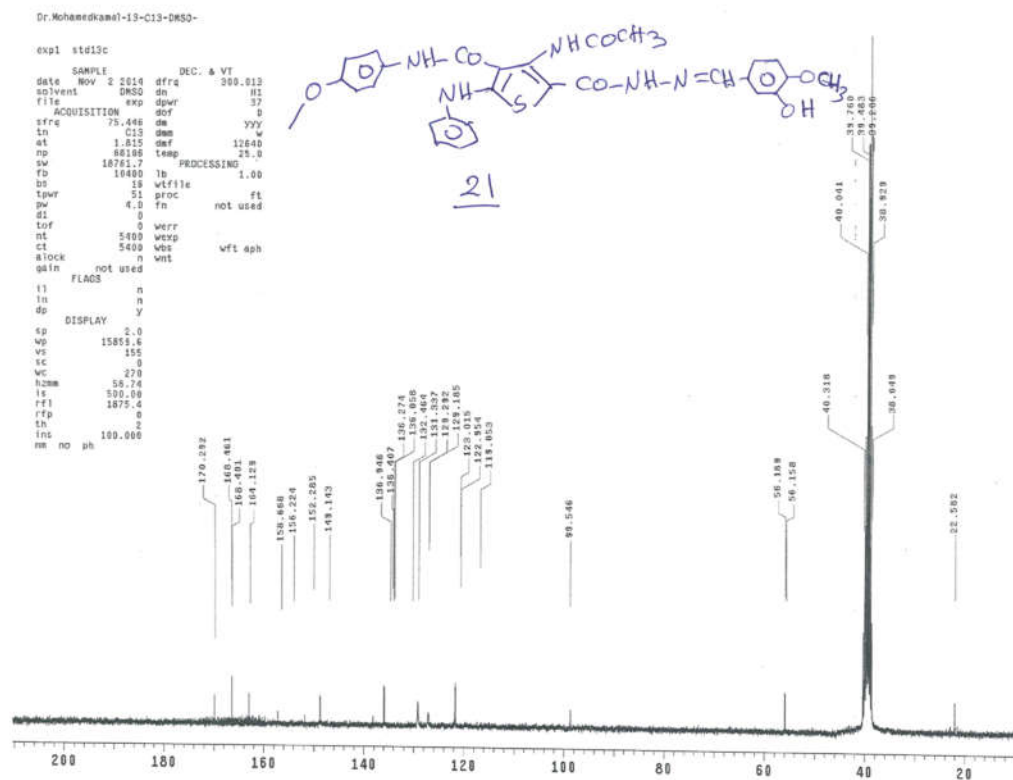


Figure S51: mass spectrum of compound 21

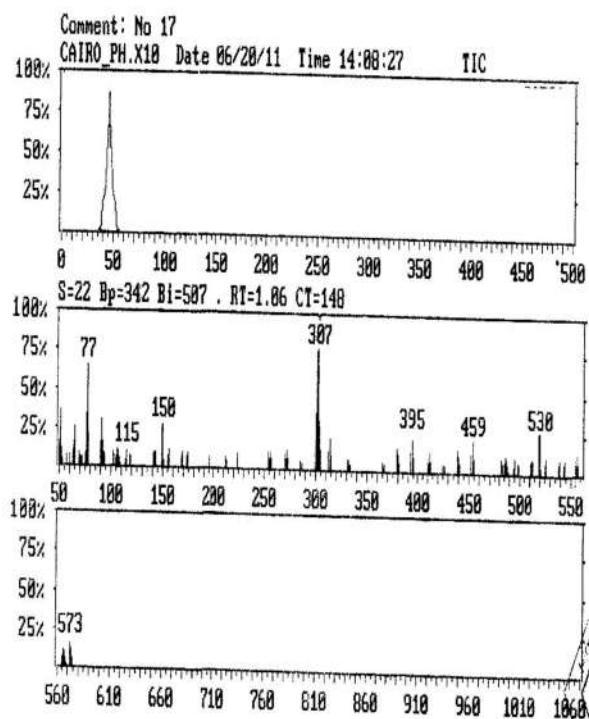
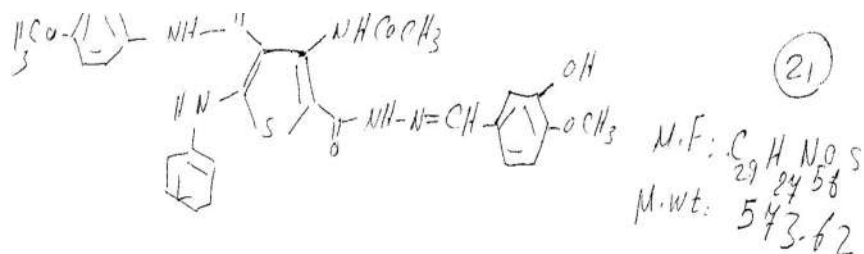


Figure S52: ¹H NMR of compound 22

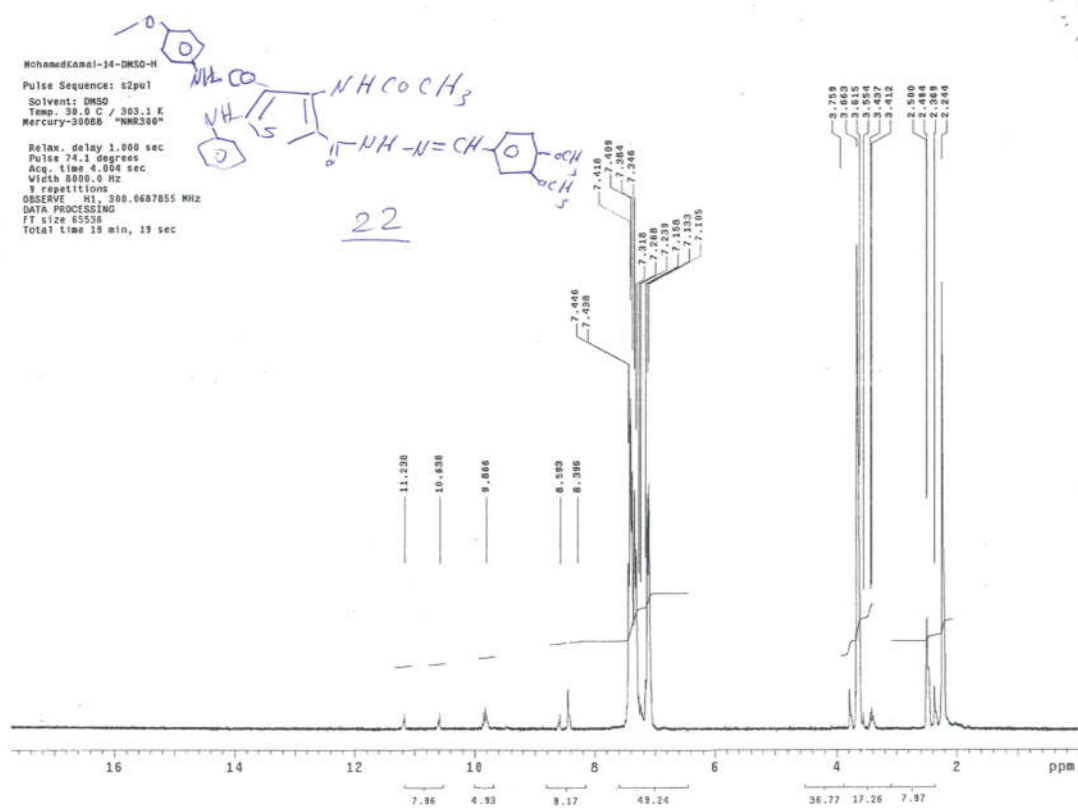


Figure S53: ¹³CNMR of compound 22

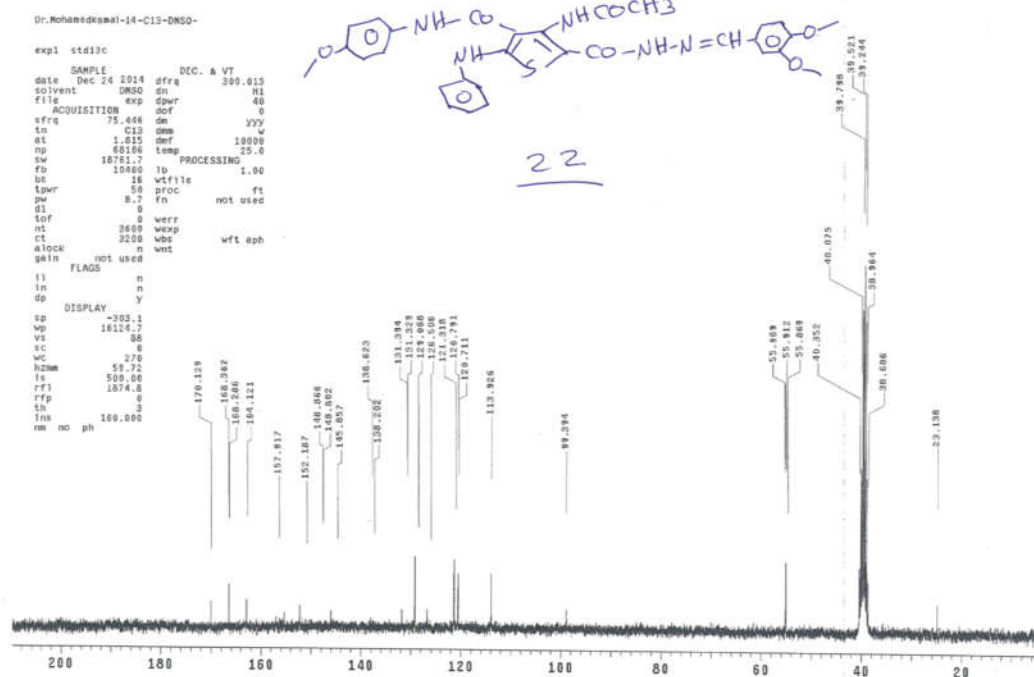
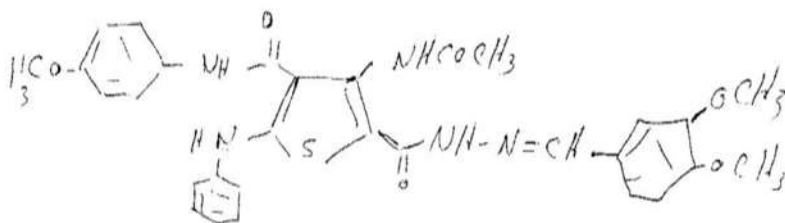
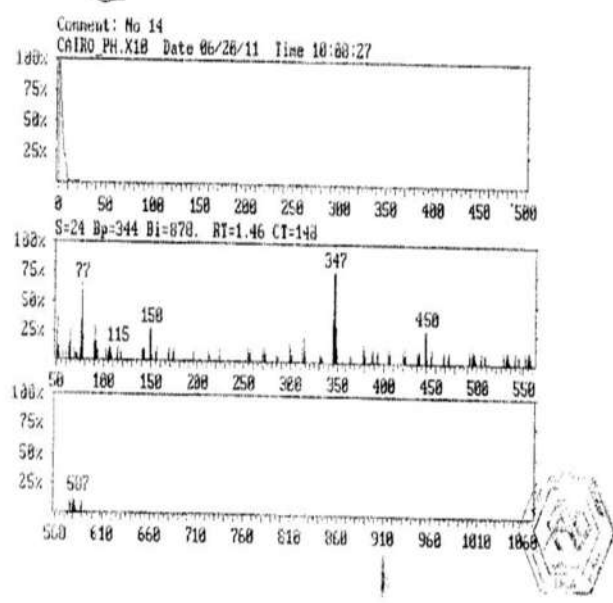


Figure S54: mass spectrum of compound 22



(22)

M.F: C₃₀ H₂₉ N₅ O₆ S
M.wt: 584.65



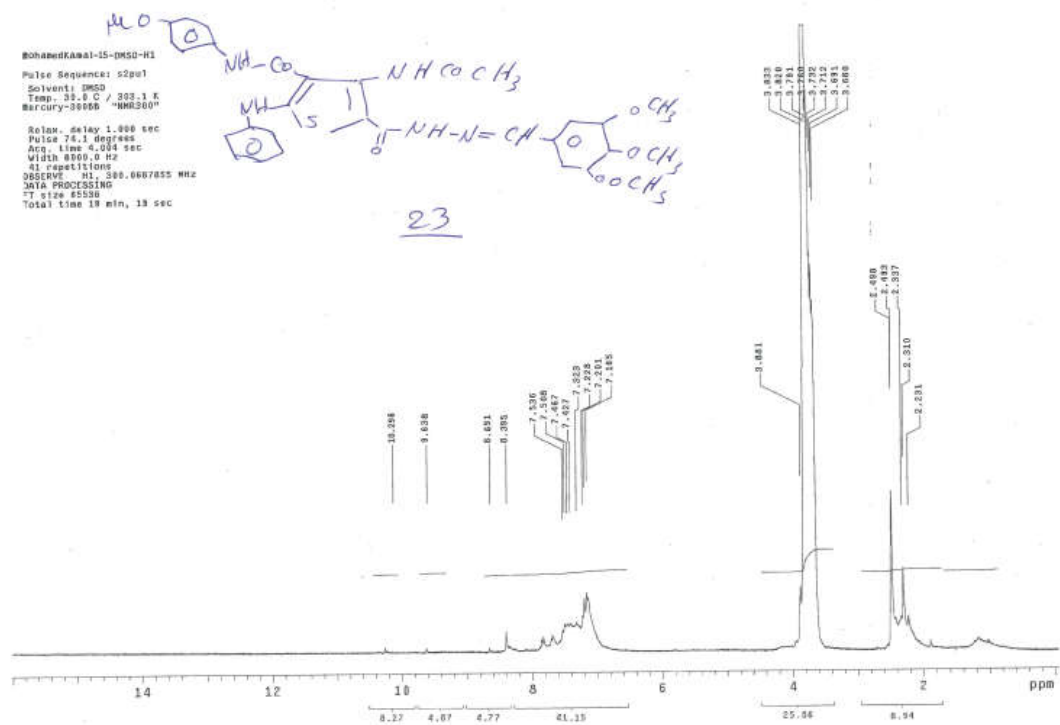


Figure S56: ¹³CNMR of compound 23

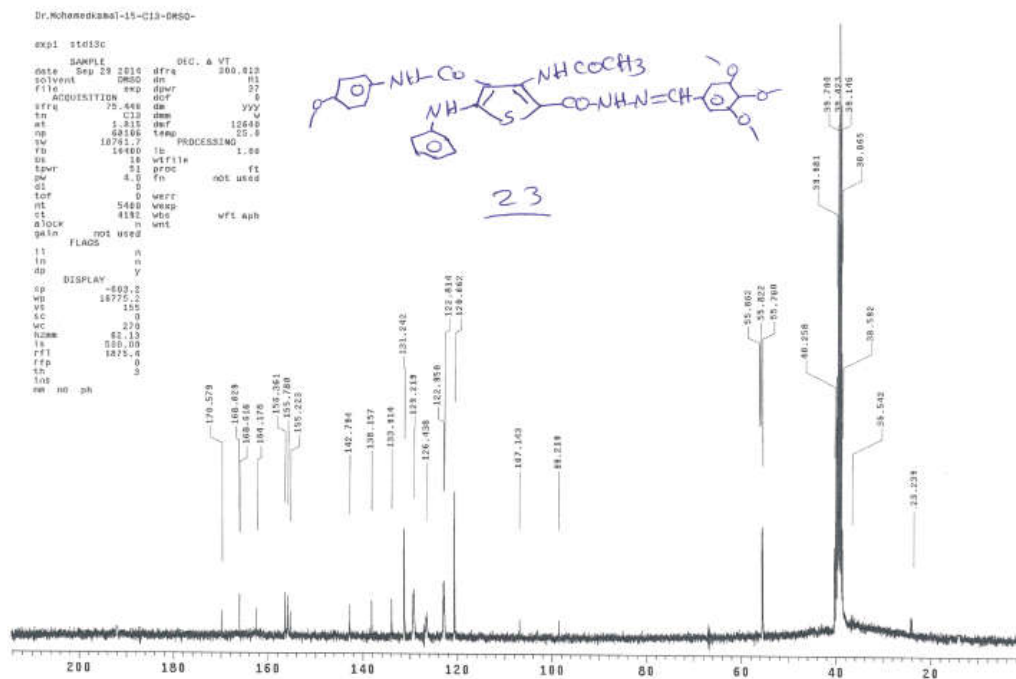


Figure S57: mass spectrum of compound 23

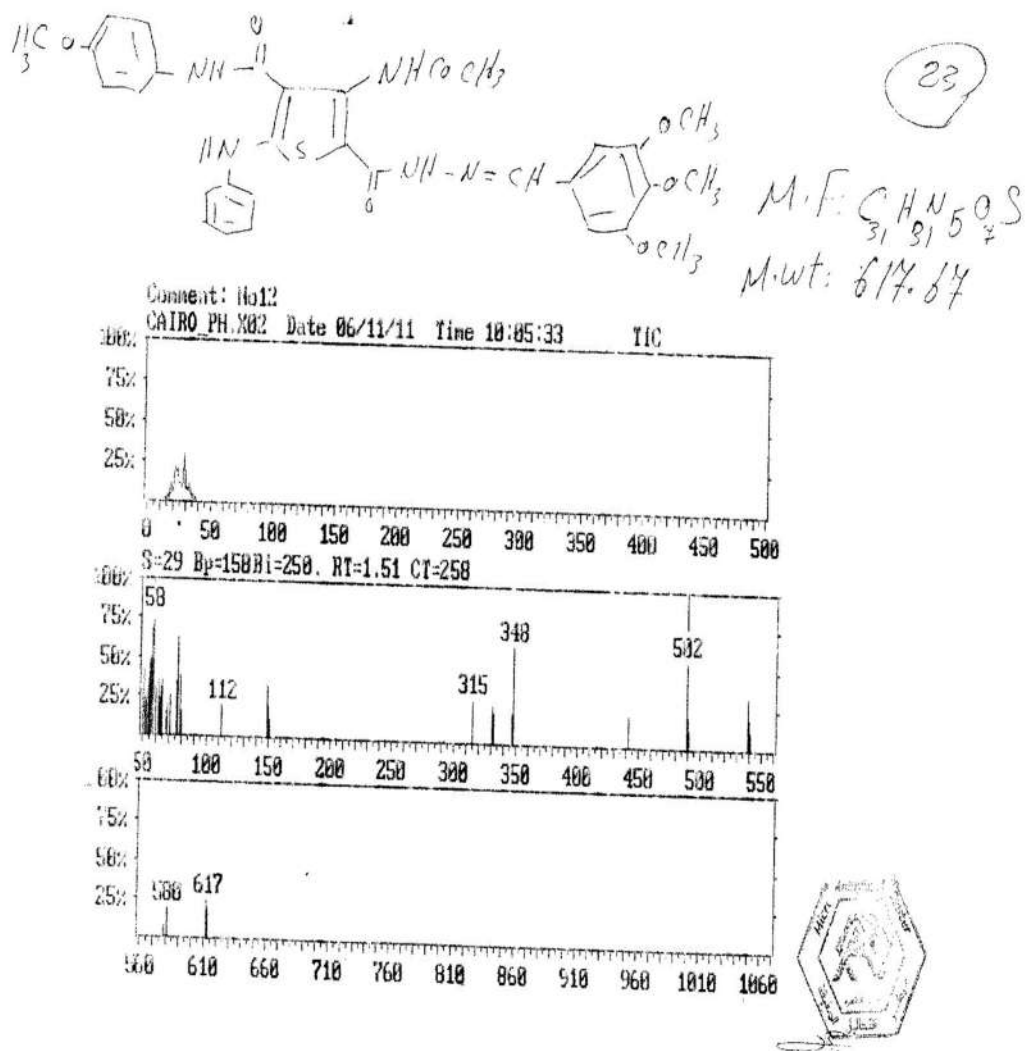


Figure S58: Docking pose displaying 2D interactions of sorafenib with VEGFR-2 active site.

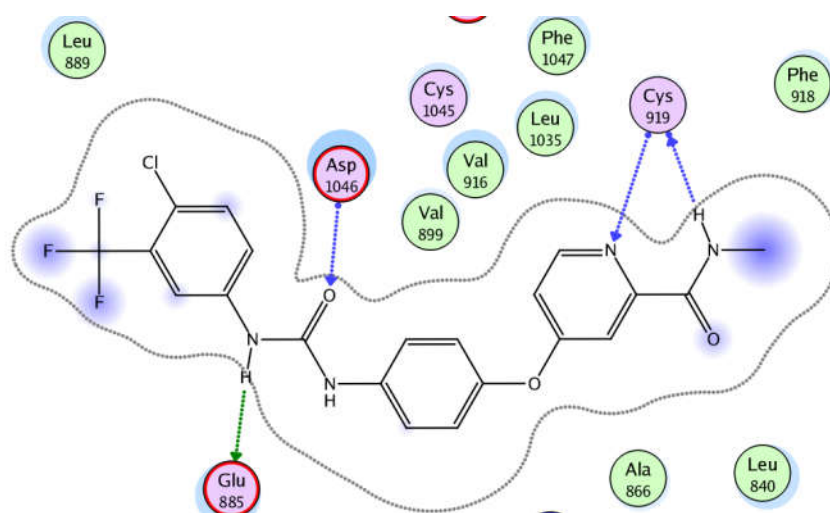


Table S1: Viability % with 8 different concentration (μM) for each compound of thiophene-3-carboxamides **4-13** and **16-23** and their IC_{50} (μM) on HCT-116 cell line.^a

Compound	Viability % at each concentration (μM)						$\text{IC}_{50}(\mu\text{M})$
	0.001	0.01	0.1	1	10	100	
4	102.02 $\pm$ 7.8	92.6 $\pm$ 6.7	81.2 $\pm$ 4.5	91.1 $\pm$ 2.3	87.22 $\pm$ 1.2	75.73 $\pm$ 0.9	64.11 $\pm$ 7.51
5	100.01 $\pm$ 7.8	85.2 $\pm$ 7.1	72.01 $\pm$ 6.2	60.12 $\pm$ 5.4	48.61 $\pm$ 2.9	33.54 $\pm$ 1.1	7.83 $\pm$ 0.61
6	101.02 $\pm$ 7.8	95.23 $\pm$ 6.6	80.6 $\pm$ 5.7	64.47 $\pm$ 4.9	55.31 $\pm$ 3.6	45.35 $\pm$ 2.64	3.13 $\pm$.21
7	100.04 $\pm$ 7.8	92.4 $\pm$ 7.1	86.74 $\pm$ 6.2	75.36 $\pm$ 5.4	68.44 $\pm$ 2.9	60.3 $\pm$ 1.1	18.41 $\pm$ 1.23
8	100.6 $\pm$ 7.8	93.1 $\pm$ 7.1	87.87 $\pm$ 6.2	77.8 $\pm$ 5.4	69.4 $\pm$ 2.9	56.9 $\pm$ 1.1	16.23 $\pm$ 1.52
9	99.45 $\pm$ 7.7	82.6 $\pm$ 6.8	74.2 $\pm$ 6.1	70.17 $\pm$ 4.6	65.47 $\pm$ 2.7	63.29 $\pm$ 0.5	21.35 $\pm$ 1.92
10	102.8 $\pm$ 7.8	92.4 $\pm$ 6.7	83.9 $\pm$ 4.5	71.4 $\pm$ 2.3	56.2 $\pm$ 1.2	41.32 $\pm$ 0.9	5.12 $\pm$ 0.42
11	99.2 $\pm$ 7.8	87.67 $\pm$ 6.6	64.34 $\pm$ 4.5	54.54 $\pm$ 2.1	62.89 $\pm$ 1.2	80.26 $\pm$ 1.03	52.21 $\pm$ 5.54
12	102.3 $\pm$ 7.8	90.41 $\pm$ 6.7	83.9 $\pm$ 4.5	81.47 $\pm$ 2.3	72.66 $\pm$ 1.2	86.48 $\pm$ 0.9	60.11 $\pm$ 7.41
13	98.1 $\pm$ 7.7	87.28 $\pm$ 7.2	76.04 $\pm$ 6.8	65.21 $\pm$ 4.2	53.64 $\pm$ 2.7	50.34 $\pm$ 1.6	10.28 $\pm$ 1.31
16	100.9 $\pm$ 7.8	93.54 $\pm$ 7.1	87.14 $\pm$ 6.2	77.3 $\pm$ 5.4	64.21 $\pm$ 2.9	58.37 $\pm$ 1.1	19.21 $\pm$ 1.46
17	101.06 $\pm$ 7.8	95.14 $\pm$ 6.6	82.46 $\pm$ 5.7	74.21 $\pm$ 4.9	61.32 $\pm$ 3.6	50.87 $\pm$ 2.6	9.24 $\pm$ 1.02
18	99.7 $\pm$ 7.8	91.31 $\pm$ 6.6	85.14 $\pm$ 4.5	72.78 $\pm$ 2.1	59.65 $\pm$ 1.2	47.34 $\pm$ 1.08	7.41 $\pm$ 0.62
19	100.2 $\pm$ 7.8	90.17 $\pm$ 7.1	80.48 $\pm$ 6.2	76.37 $\pm$ 5.4	76.26 $\pm$ 2.9	76.07 $\pm$ 1.1	21.45 $\pm$ 1.82
20	99.4 $\pm$ 7.8	86.12 $\pm$ 6.6	72.55 $\pm$ 4.5	59.4 $\pm$ 2.1	46.8 $\pm$ 1.2	40.2 $\pm$ 1.05	3.12 $\pm$ 0.31
21	100.24 $\pm$ 7.8	83.73 $\pm$ 7.1	61.44 $\pm$ 6.2	46.39 $\pm$ 5.4	35.64 $\pm$ 2.9	29.1 $\pm$ 1.1	4.32 $\pm$ 0.11
22	102.6 $\pm$ 7.8	81.28 $\pm$ 6.7	63.54 $\pm$ 4.5	48.14 $\pm$ 2.3	39.42 $\pm$ 1.2	32.36 $\pm$ 0.6	5.33 $\pm$ 0.37
23	99.05 $\pm$ 7.8	95.63 $\pm$ 6.6	86.12 $\pm$ 4.5	78.39 $\pm$ 2.1	56.34 $\pm$ 1.2	43.25 $\pm$ 1.06	6.46 $\pm$ 0.49
Sorafenib	100.1 $\pm$ 7.8	85.7 $\pm$ 6.6	72.8 $\pm$ 4.5	46.6 $\pm$ 2.1	37.14 $\pm$ 1.2	34.2 $\pm$ 0.4	3.22 $\pm$ 0.24

^a Values given are means of three experiments

Table S2: Viability % with 8 different concentration (μM) for each compound of thiophene-3-carboxamides **4-13** and **16-23** and their IC_{50} (μM) on HepG-2 cell line. ^a

Compound	Viability % at each concentration (μM)						$\text{IC}_{50}(\mu\text{M})$
	0.001	0.01	0.1	1	10	100	
4	102.05 $\pm$ 7.8	90.3 $\pm$ 6.7	82.41 $\pm$ 4.5	88.6 $\pm$ 2.3	90.37 $\pm$ 1.2	95 $\pm$ 0.9	74.32 $\pm$ 5.98
5	99.14 $\pm$ 7.8	86.1 $\pm$ 6.6	72.38 $\pm$ 4.5	45.28 $\pm$ 2.1	33.16 $\pm$ 1.2	30.14 $\pm$ 0.4	1.92 $\pm$ 0.12
6	102.3 $\pm$ 7.8	89.6 $\pm$ 6.7	70.36 $\pm$ 4.5	58.31 $\pm$ 2.3	46.21 $\pm$ 1.2	39.74 $\pm$ 0.9	3.51 $\pm$ 0.22
7	98.1 $\pm$ 7.6	88.31 $\pm$ 6.7	81.22 $\pm$ 5.9	75.88 $\pm$ 4.7	68.24 $\pm$ 2.5	62.26 $\pm$ 0.9	24.31 $\pm$ 1.96
8	101.9 $\pm$ 7.8	92.12 $\pm$ 6.6	85.61 $\pm$ 5.7	77.21 $\pm$ 4.9	61.65 $\pm$ 3.6	53.89 $\pm$ 2.6	10.42 $\pm$ 1.08
9	97.2 $\pm$ 7.7	91.09 $\pm$ 6.8	84.37 $\pm$ 6.1	71.64 $\pm$ 4.6	52.39 $\pm$ 2.7	50.33 $\pm$ 0.5	14.26 $\pm$ 1.23
10	100.3 $\pm$ 7.7	86.36 $\pm$ 7.2	75.24 $\pm$ 6.8	68.38 $\pm$ 4.2	54.11 $\pm$ 2.7	46.24 $\pm$ 1.6	9.71 $\pm$ 0.86
11	100.96 $\pm$ 7.8	88.3 $\pm$ 6.6	95.69 $\pm$ 4.5	77.25 $\pm$ 2.1	79.19 $\pm$ 1.2	90.3 $\pm$ 1.02	31.34 $\pm$ 3.61
12	102.4 $\pm$ 7.8	92.47 $\pm$ 6.7	88.31 $\pm$ 4.5	67.29 $\pm$ 2.3	84.6 $\pm$ 1.2	89.7 $\pm$ 0.9	43.32 $\pm$ 4.23
13	100.11 $\pm$ 7.8	96.14 $\pm$ 7.1	88.29 $\pm$ 6.2	83.68 $\pm$ 5.4	71.44 $\pm$ 2.9	60.6 $\pm$ 1.1	15.21 $\pm$ 1.62
16	99.3 $\pm$ 7.7	85.33 $\pm$ 6.8	78.14 $\pm$ 6.1	71.99 $\pm$ 4.6	65.3 $\pm$ 2.7	60.24 $\pm$ 0.5	21.41 $\pm$ 2.91
17	100.1 $\pm$ 7.7	95.21 $\pm$ 7.2	92.35 $\pm$ 6.8	84.34 $\pm$ 4.2	71.2 $\pm$ 2.7	52.6 $\pm$ 1.6	9.50 $\pm$ 0.86
18	100.6 $\pm$ 7.7	92.69 $\pm$ 7.2	90.26 $\pm$ 6.8	85.19 $\pm$ 4.2	73.9 $\pm$ 2.7	54.14 $\pm$ 1.6	10.13 $\pm$ 1.12
19	100.01 $\pm$ 7.7	96.34 $\pm$ 7.2	89.15 $\pm$ 6.8	82.67 $\pm$ 4.2	68.16 $\pm$ 2.7	57.33 $\pm$ 1.6	12.21 $\pm$ 1.31
20	101.68 $\pm$ 7.8	89.28 $\pm$ 6.6	76.48 $\pm$ 5.7	68.44 $\pm$ 4.9	56.27 $\pm$ 3.6	49.21 $\pm$ 2.6	4.96 $\pm$ 0.45
21	100.14 $\pm$ 7.8	82.64 $\pm$ 7.1	63.67 $\pm$ 6.2	46.54 $\pm$ 5.4	31.6 $\pm$ 2.9	22.44 $\pm$ 1.1	2.61 $\pm$ 0.12
22	99.87 $\pm$ 7.8	86.37 $\pm$ 6.6	73.95 $\pm$ 4.5	64.97 $\pm$ 2.1	53.2 $\pm$ 1.2	40.17 $\pm$ 1.06	5.12 $\pm$ 0.45
23	97.32 $\pm$ 7.8	89.19 $\pm$ 6.7	76.46 $\pm$ 4.5	58.23 $\pm$ 2.3	42.94 $\pm$ 1.2	33.87 $\pm$ 0.9	10.82 $\pm$ 0.065
Sorafenib	100.48 $\pm$ 7.8	89.17 $\pm$ 6.7	70.43 $\pm$ 4.5	58.06 $\pm$ 2.3	42.61 $\pm$ 1.2	40.3 $\pm$ 0.9	4.43 $\pm$ 0.32

^a Values given are means of three experiments

Table S3: cell cycle distribution of HepG-2 cells after treatment with thiophene-3-carboxamides **5** and **21** for 24 h with their IC₅₀ values (1.92 and 2.61 μ M) compared with control

Compound	Percentage cells in cell cycle phase			
	Apoptosis	G1	S	G2/M
Control	0.10 $\pm$ 0.05	58.59 $\pm$ 6.31	31.25 $\pm$ 4.21	10.16 $\pm$ 1.31
5	8.23 $\pm$ 0.23	45.35 $\pm$ 5.12	33.48 $\pm$ 4.32	21.17 $\pm$ 3.12
21	6.07 $\pm$ 0.42	49.49 $\pm$ 3.54	31.10 $\pm$ 2.93	19.41 $\pm$ 2.24

*The values given are means of three experiments.

Table S4: Percentage of the cells at the indicated stage after treatment with compounds **5** and **21** and staining with Annexin-V

Compound	Percentage cells			
	Normal cells Q3	Early apoptosis Q4	Late apoptosis Q2	Dead cells & cells debris Q1
Control	96.57 $\pm$ 8.42	0.72 $\pm$ 0.09	0.34 $\pm$ 0.032	0.53 $\pm$ 0.04
5	81.41 $\pm$ 9.30	5.47 $\pm$ 0.42	7.851 $\pm$ 0.95	3.14 $\pm$ 1.30
21	84.61 $\pm$ 6.23	4.19 $\pm$ 0.21	7.02 $\pm$ 0.81	2.06 $\pm$

Table S5: *In vitro* ELISA immunoassay measurement of p53, Bcl-2, Bax, caspase-3, caspase-7 proteins expression level in HepG-2 cells after treatment for 24h with thiophene-3-carboxamides **5** (1.92 μ M) or **21** (2.61 μ M).

Compound	Conc.(pg/ml)				
	p53	Bcl-2	Bax	Caspase-3	Caspase-7
5	327.70 $\pm$ 20.86	408.3 $\pm$ 18.5	120.59 $\pm$ 13.64	321.2 $\pm$ 24.78	245.9 $\pm$ 18.62
21	165.70 $\pm$ 11.0	357.4 $\pm$ 21.3	215.35 $\pm$ 30.15	263.0 $\pm$ 16.05	211.7 $\pm$ 20.86
Control	96.29 $\pm$ 13.15	899.0 $\pm$ 32.9	18.19 $\pm$ 1.29	28.59 $\pm$ 1.14	35.64 $\pm$ 13.15

*The values given are means of three experiments.

Table S6: VEGFR-2 enzyme activity % at the indicated concentration of inhibitors (μM)^a

Compound	Enzyme activity % at each concentration (μM)					IC ₅₀ (μM)
	0.01	0.1	1	10	100	
5	98.±7.21	61.34±6.85	41.11±4.22	29.61±2.72	16.54±1.60	0.59±0.21
6	93.±7.83	66.22±6.72	51.31±4.50	35.42±2.34	22.33±1.20	0.93±0.19
10	98.±7.61	86.12±6.74	79.11±4.52	71.76±2.33	68.78±1.22	3.92±0.16
17	96.14±7.13	88.29±6.23	83.68±5.41	71.44±2.90	60.62±1.12	5.91±0.23
20	96.±7.87	79.41±6.61	65.52±5.73	48.61±4.81	35.11±3.61	1.71±0.21
21	99.±6.33	83.21±5.32	63.21±2.11	46.11±1.23	28.31±2.0.6	1.29±0.13
22	96.±7.85	81.33±6.65	65.34±4.54	44.32±2.11	38.12±1.21	1.80±0.17
23	100±7.84	95.42±6.71	82.09±4.52	71.14±2.33	72.22±1.26	5.21± 0.32
Sorafenib	89.17±6.71	70.43±4.50	58.06±2.31	42.61±1.22	30.31±0.94	2.07±0.15

^a Values given are means of three experiments

Table S7: β -tubulin polymerization inhibition percentage for compounds **5** and **21** at their IC₅₀ values on HepG-2 cells ^a

Compound	percentage β -tubulin polymerization inhibition	IC ₅₀ (μM)
5	72.61±4.21	1.92
21	85.95±6.51	2.61
Colchicine	90.62±7.32	6.6

^a Values given are means of two experiments.

Table S8: Calculated descriptors (Jurs-RPCS, Rad of Gyration, PMI-mag, PMI-X and PMI-Z) of the training and test sets.

Compound	Jurs-RPCS	Rad of Gyration	PMI-mag	PMI-X	PMI-Z
4	0.46334	6.11878	6275.22	513.81	4384.21
5	0.46297	6.11979	6275.33	513.819	4384.24
6	0.48150	5.74944	6231.28	513.216	4372.26
7	0.48923	5.73846	6230.26	513.206	4372.09
8	0.48728	5.73861	6230.25	513.205	4372.08
9	0.48813	5.73846	6230.27	513.207	4372.10
10	0.48857	5.73844	6230.27	513.207	4372.10
11	0.47628	5.98973	6253.25	513.303	4375.28
13	0.46399	6.09423	6273.34	513.813	4384.16
16	0.46114	6.12616	6275.82	513.821	4384.26
17	0.45895	6.14137	6276.12	513.822	4384.46
19	0.48142	5.74949	6231.27	513.215	4372.25
20	0.49974	5.73711	6230.17	513.202	4372.07
22	0.49747	5.73749	6230.19	513.203	4372.07
12	0.60342	6.76955	6,828.57	445.616	5,033.59
18	0.60342	6.76454	6,819.87	445.119	5,027.21
21	0.58567	6.76782	6,824.31	445.008	5,030.22