

# Anticancer, Antimicrobial, and Antioxidant Activities of Organodiselenide-Tethered Methyl Anthranilates

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<b>SUPPORTING INFORMATION</b>	<b>PAGE</b>
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## **1.1. The biological assays**

### **1.1.1. The anticancer activity**

The breast adenocarcinoma (MCF-7), Hepatocellular carcinoma (HEPG-2), and normal fibroblast (WI-38) cells were obtained from ATCC via Holding company for biological products and vaccines (VACSERA), Cairo, Egypt. The reagents RPMI-540 medium, MTT, DMSO, and fetal bovine serum was obtained from Sigma Aldrich. Dulbecco's modified Eagle's medium was used as the culture medium for the cells, and the cytotoxicity was evaluated using the reported MTT assay. Doxorubicin was used as the positive reference, and the IC<sub>50</sub> values were obtained from the corresponding dose-response curve.

#### **MTT assay[1-3]**

This colorimetric assay is based on converting the yellow tetrazolium bromide (MTT) to a purple formazan derivative by mitochondrial succinate dehydrogenase in viable cells. Cell lines were cultured in RPMI-540 medium with 10% fetal bovine serum. Antibiotics added were 100 units/ml penicillin and 100µg/ml streptomycin at 37 C in a 5% Co<sub>2</sub> incubator. The cell lines were seeded in a 96-well plate at a density of 1.0x10<sup>4</sup> cells/well. at 37 C for 48 h under 5% Co<sub>2</sub>. After incubation, the cells were treated with different concentrations of compounds and incubated for 13 h. After 13 h of drug treatment, 9 µl of MTT solution at 5mg/ml was added and incubated for 4 h. Finally, dimethyl sulfoxide (DMSO) in the volume of 100 µl is added to each well to dissolve the purple formazan formed. The colorimetric assay is measured and recorded at an absorbance of 570 nm using a plate reader (EXL 800, USA). The percentage of the relative cell viability was calculated as (A<sub>570</sub> of treated samples/A<sub>570</sub> of the untreated sample) X 100.

### **1.1.2. The antimicrobial activity**

The antimicrobial activities of the OSe compounds were evaluated against *C. albicans* yeast as well as *E. coli* gram-negative and *S. aureus* gram-positive bacteria employing the agar well diffusion assay [4].

Briefly, a concentration of 1 mM was prepared for each compound by dissolving in DMSO. Paper discs of standard size (5cm) were sterilized in an autoclave and soaked in 9  $\mu$ L of the test compounds, and placed in the Petri dishes, which in turn contain a nutrient media (agar 9 g, peptone 5 g, and beef extract 3 g) seeded with the dedicated strain. Incubation lasted for 13 h at 36  $^{\circ}$ C. Experiments were replicated three times and the antifungal clotrimazole and antibiotic ampicillin were used as standards. The % activity index for the complex was determined and depicted in table 2.

Furthermore, the MICs (in  $\mu$ M) were determined by the microdilution method according to the reported protocol.

### **1.1.3. The antioxidant activity**

#### **1.1.3.1. The DPPH bioassay**

The hydrogen atom or electron donation ability of the corresponding compounds was measured by estimating the bleaching of the purple color of a methanolic solution of DPPH [5]. This spectrophotometric assay uses stable DPPH reagent. The sample was prepared by adding 90 mL of the OSe compounds (1 mM in methanol) to 400 mL DPPH in methanol. After 30 min of incubation in the dark, the absorbance was read against a blank at 56 nm. Ascorbic acid (vitamin C) and ebselen were used as standard antioxidants (positive control). A blank sample was run without DPPH. A negative control sample was run using methanol instead of the sample. The radical scavenging activity was calculated

using the following equation:

$$\text{Inhibition\%} = (A_{\text{blank}} - A_{\text{sample}}) / (A_{\text{blank}}) * 100.$$

#### **1.1.3.2. The ABTS bioassay**

The antioxidant activity of the investigated compounds was assessed using 2,2'-azino-bis(3-ethylbenzothiazoline-6-sulphonic acid (ABTS) method [6]. The radical cation derived from ABTS was prepared by the reaction of 60 mM ABTS solution with 0.3 M manganese dioxide solution in 0.1M

phosphate buffer, pH 7. Then, the mixture was shaken, centrifuged, filtered, and the absorbance ( $A_{\text{control}}$ ) of the resulting green-blue solution (ABTS radical solution) was measured at wavelength 734 nm. Then, 50 mL of 1 mg/ml test compound in phosphate-buffered methanol was added. The absorbance ( $A_{\text{test}}$ ) was measured. The reduction in color intensity was expressed as % inhibition. The % inhibition for each compound is calculated from the following equation

$$\text{Inhibition\%} = (A_{\text{control}} - A_{\text{sample}}) / (A_{\text{control}}) * 100$$

Ascorbic acid (vitamin C) was used as a standard antioxidant (positive control). A blank sample was run without ABTS and using MeOH/phosphate buffer (1:1) instead of the sample. A negative control sample was run with MeOH/phosphate buffer (1:1) instead of a tested compound.

Methyl 2-amino-5-selenocyanatobenzoate. (4).

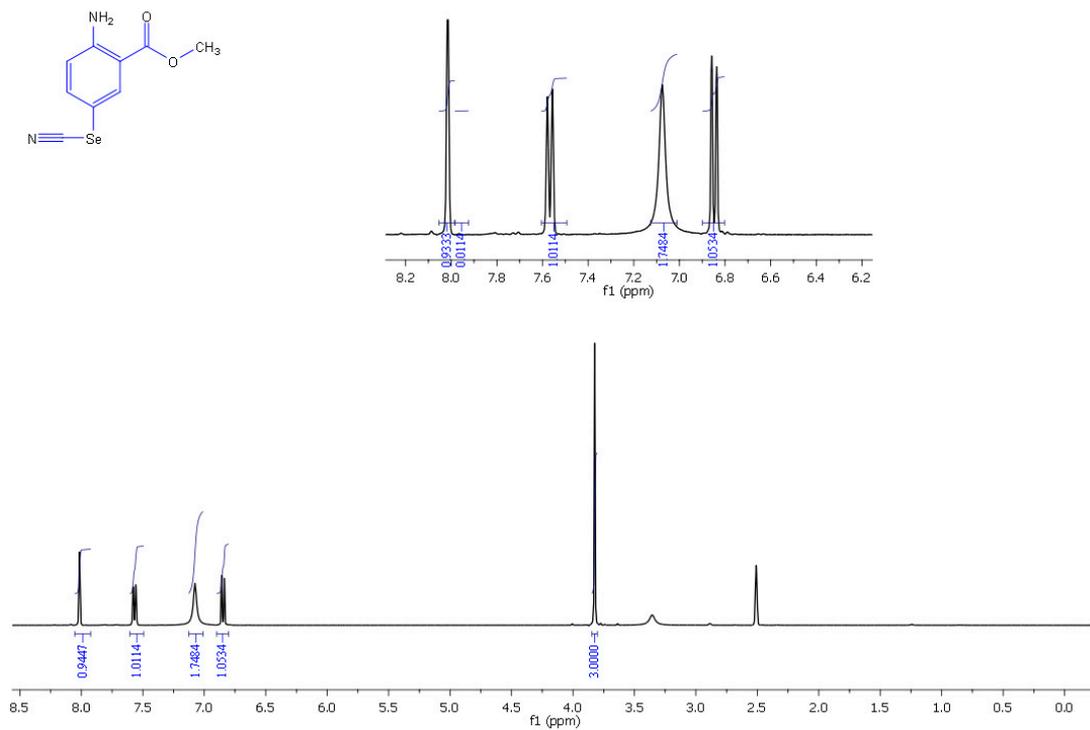


Figure S1. <sup>1</sup>H NMR chart of compound 4

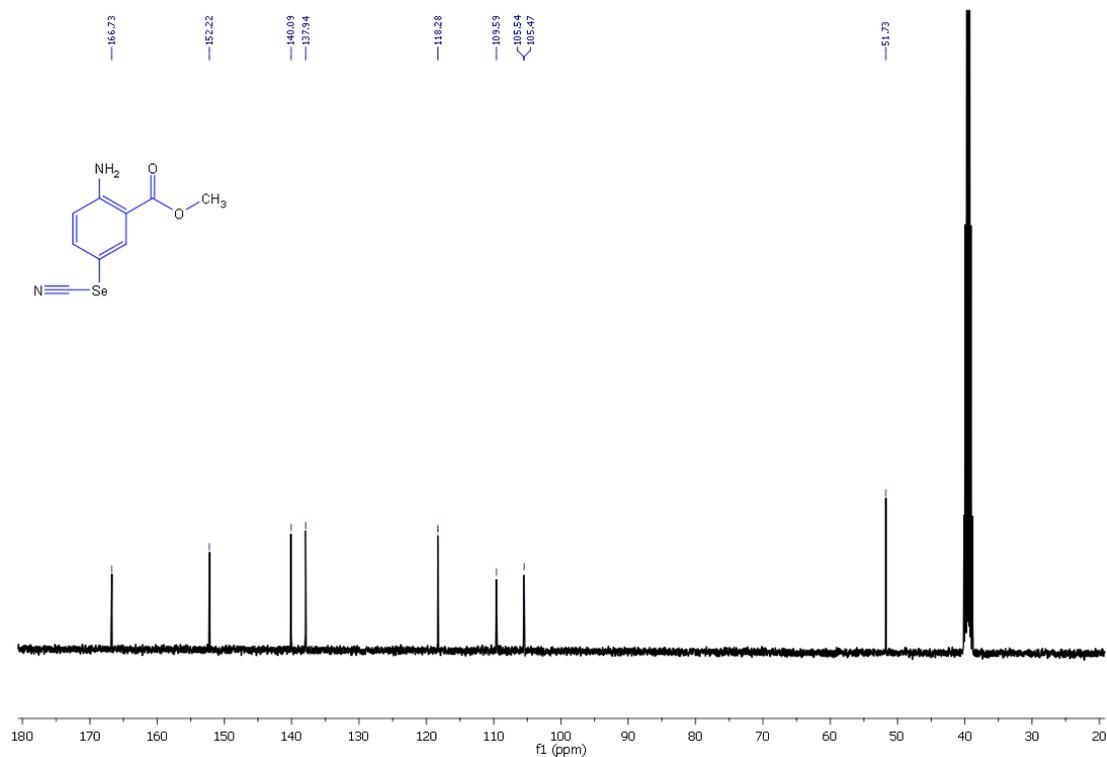
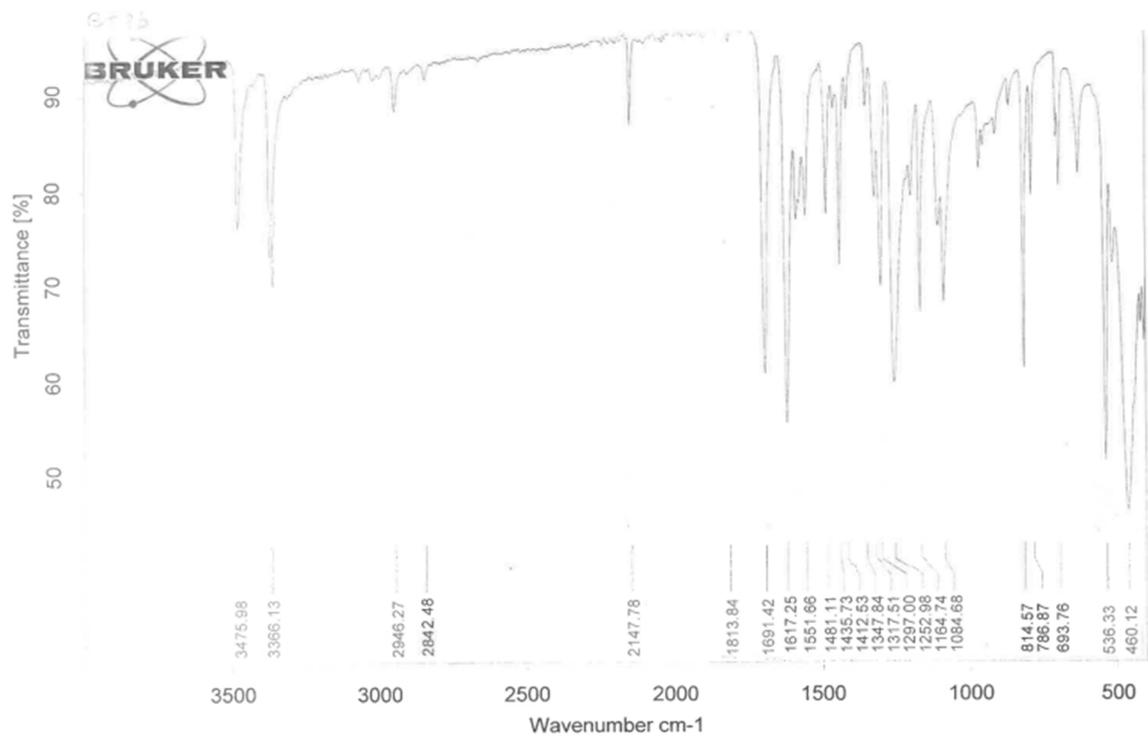


Figure S2. <sup>13</sup>C NMR chart of compound 4



**Figure S3.** IR chart of compound 4

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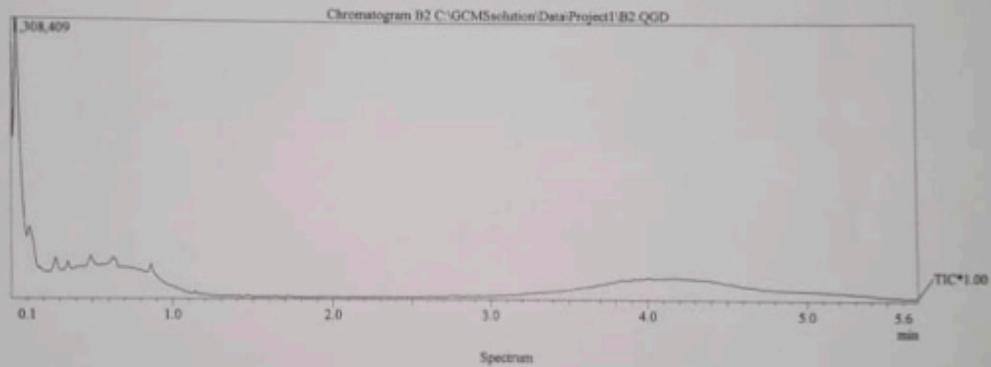
**DI Analysis  
Shimadzu Qp-2010 Plus**

*M. Younis*

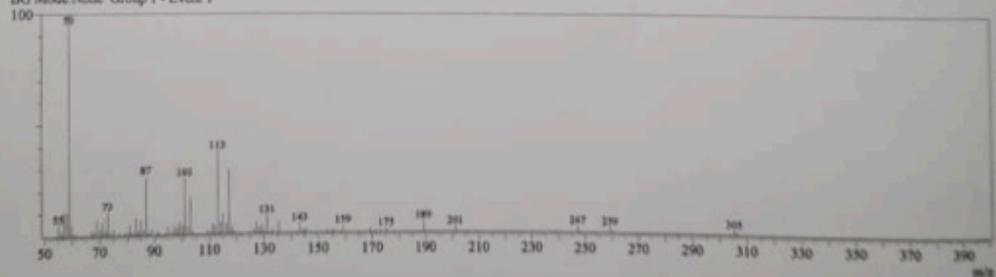


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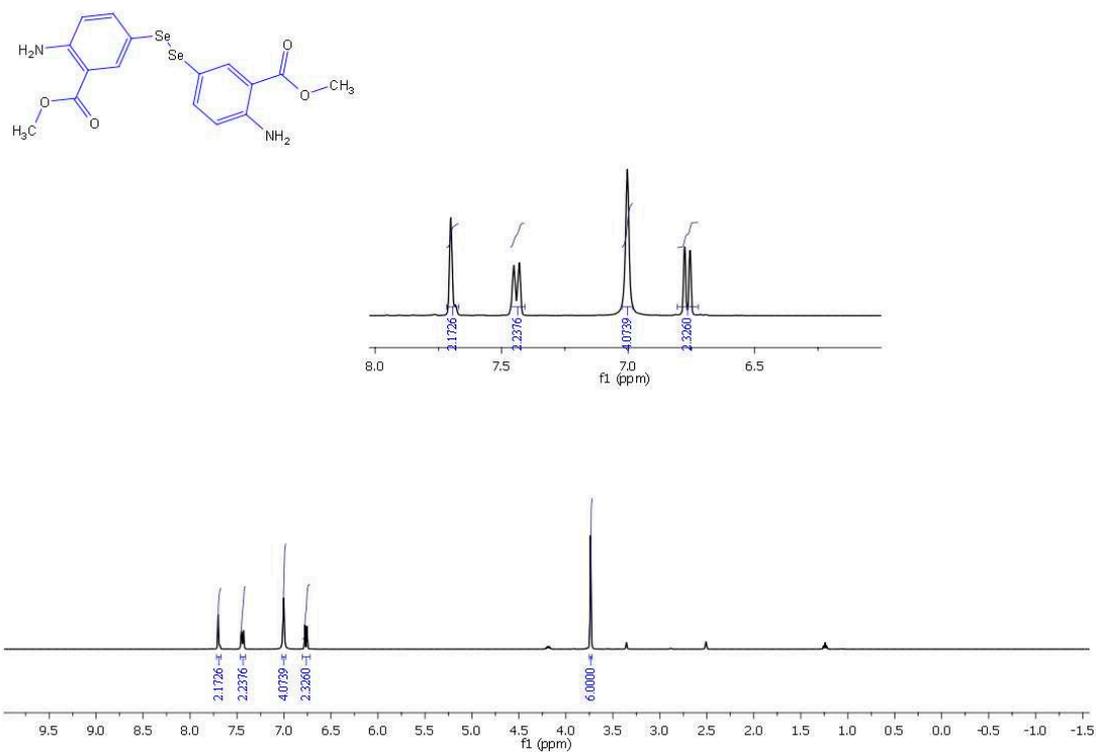
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1	55.05	1062	4.92	4	58.05	2312	10.71	7	61.00	236	1.09
2	56.05	354	1.64	5	59.00	21586	100.00	8	67.10	468	2.17
3	57.05	2418	11.20	6	59.95	1083	5.02	9	68.15	341	1.58

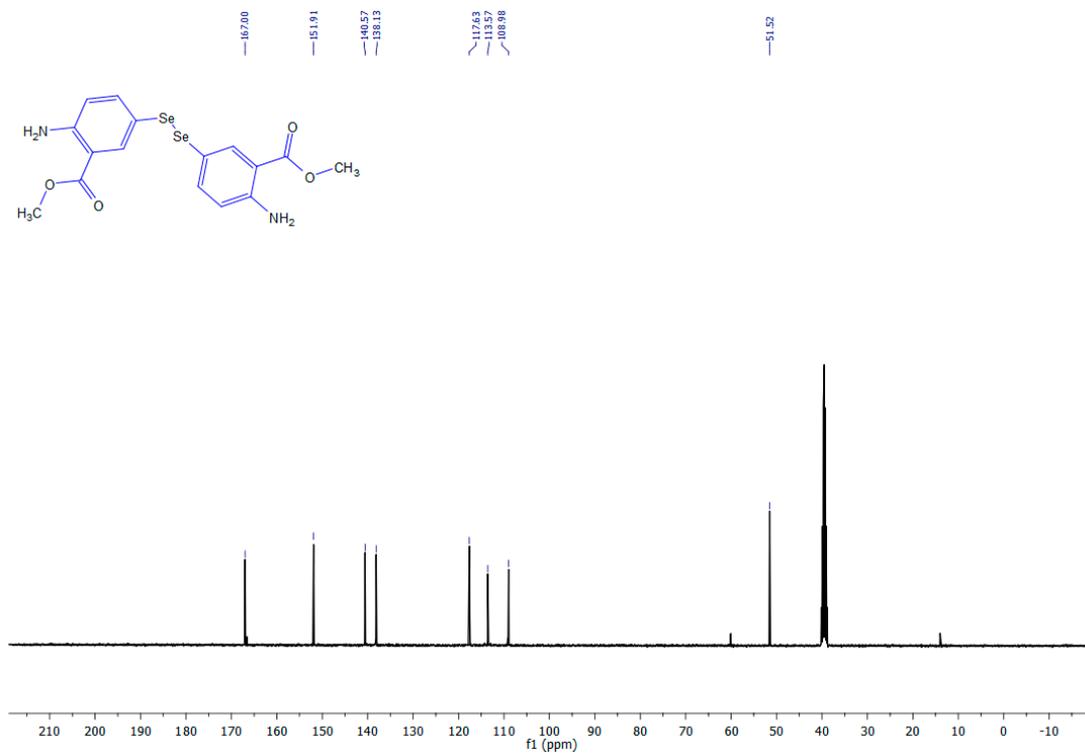
**Figure S4. Mass chart of compound 4**

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10	69.05	1515	7.02	33	97.10	945	4.38	56	130.15	304	1.41
11	70.10	633	2.93	34	98.15	599	2.77	57	131.10	1722	7.98
12	71.05	1365	6.32	35	99.10	1268	5.87	58	133.15	432	2.00
13	72.05	440	2.04	36	100.15	840	3.89	59	135.20	1132	5.24
14	73.00	2258	10.46	37	101.10	5503	25.49	60	143.10	908	4.21
15	74.00	302	1.40	38	102.15	699	3.24	61	144.10	210	0.97
16	75.05	583	2.70	39	103.10	3649	16.90	62	145.20	492	2.28
17	77.00	268	1.24	40	104.10	322	1.49	63	153.20	234	1.08
18	79.00	223	1.03	41	109.10	401	1.86	64	155.20	281	1.30
19	80.10	324	1.50	42	110.10	220	1.02	65	159.15	662	3.07
20	81.10	954	4.42	43	111.10	969	4.49	66	169.20	334	1.55
21	82.15	315	1.46	44	112.15	807	3.74	67	171.20	204	0.95
22	83.10	1628	7.54	45	113.10	8084	37.45	68	173.20	202	0.94
23	84.10	481	2.23	46	114.10	1199	5.55	69	175.20	346	1.60
24	85.05	1397	6.47	47	115.10	2001	9.27	70	189.20	1038	4.81
25	86.05	492	2.28	48	116.25	936	4.34	71	201.15	502	2.33
26	87.05	5752	26.65	49	117.15	6264	29.02	72	247.20	575	2.66
27	88.00	314	1.45	50	118.15	607	2.81	73	259.35	515	2.39
28	89.05	560	2.59	51	119.20	271	1.26	74	260.40	207	0.96
29	91.10	327	1.51	52	126.15	310	1.44	75	305.40	401	1.86
30	94.10	202	0.94	53	127.10	1102	5.11	76	306.40	281	1.30
31	95.10	807	3.74	54	128.15	589	2.73				
32	96.10	278	1.29	55	129.10	740	3.43				

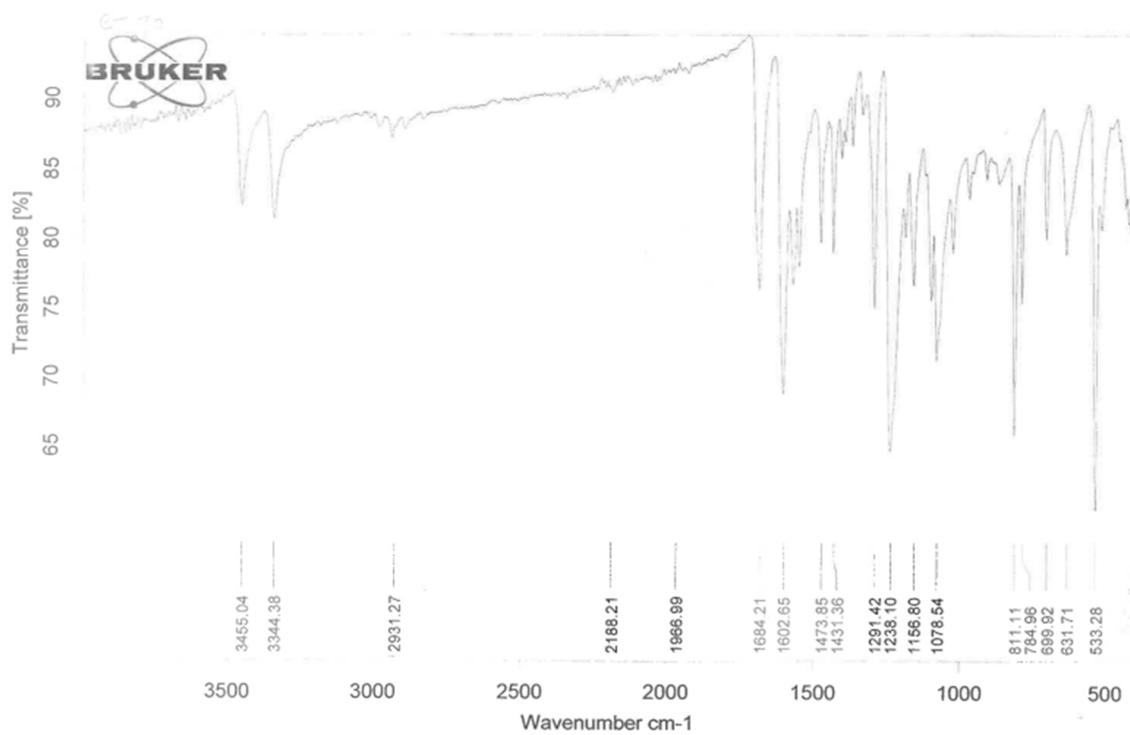
*Dimethyl 5,5'-diselanediybis(2-aminobenzoate) (5)*



**Figure S5.** <sup>1</sup>H NMR chart of compound **5**



**Figure S6.** <sup>13</sup>C NMR chart of compound **5**



**Figure S7.** IR chart of compound **5**

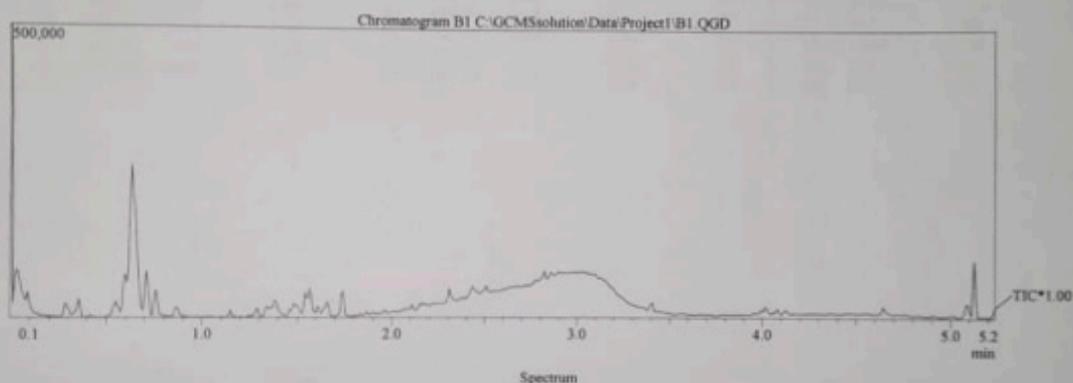
## Cairo University Micro Analytical Center

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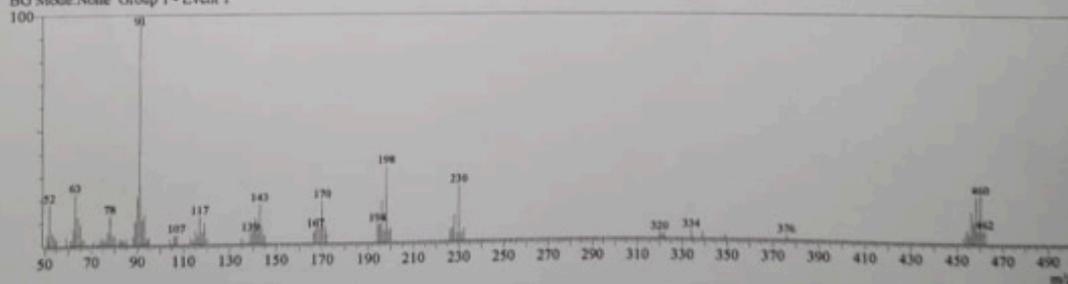
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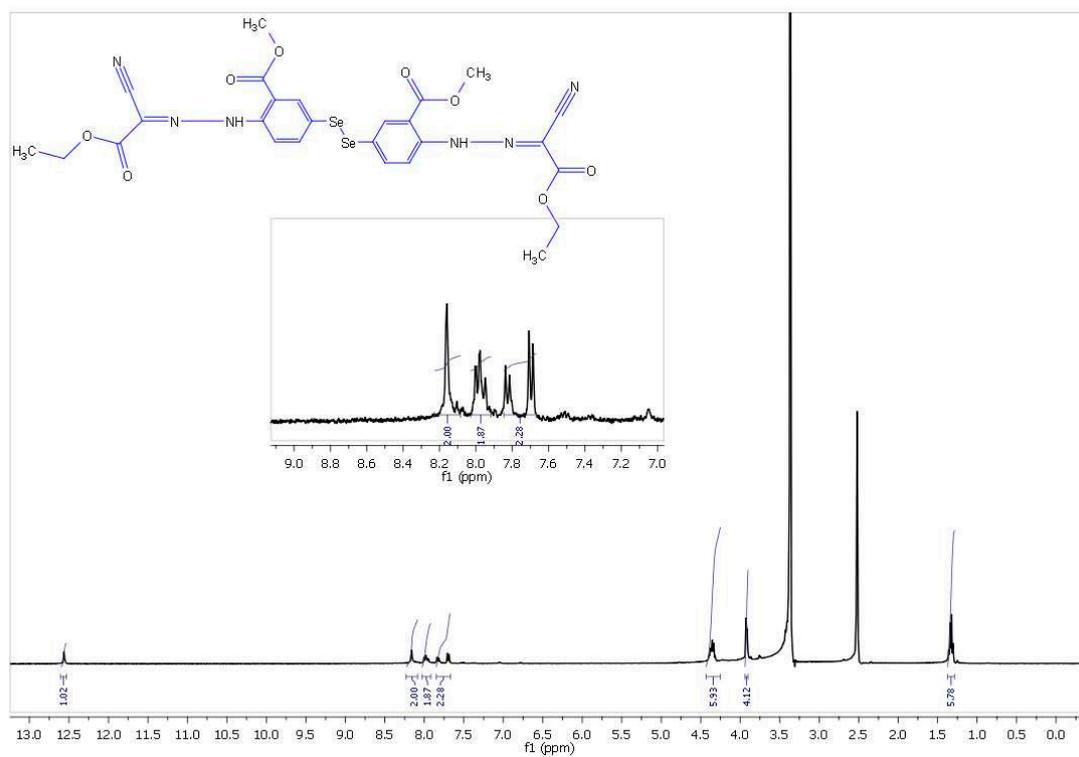
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2	51.95	1953	18.06	5	55.10	305	2.82	8	62.05	723	6.69
3	53.05	620	5.73	6	59.05	411	3.80	9	63.00	2398	22.18

Figure S8. Mass chart of compound 5

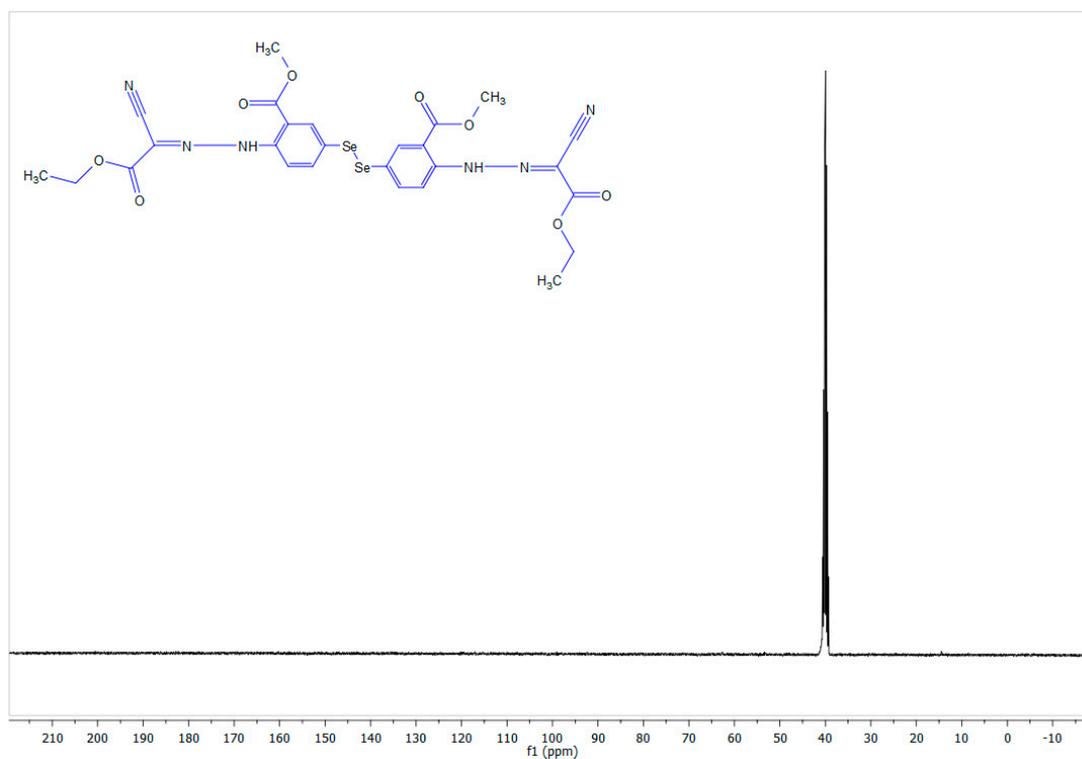
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11	65.05	960	8.88	38	113.90	222	2.05	65	199.00	591	5.47
12	66.00	278	2.57	39	114.90	636	5.88	66	200.05	690	6.38
13	67.00	247	2.28	40	116.05	385	3.56	67	226.05	505	4.67
14	71.00	202	1.87	41	117.00	1319	12.20	68	227.05	655	6.06
15	74.00	313	2.90	42	118.05	599	5.54	69	228.00	1222	11.30
16	75.00	255	2.36	43	119.10	1022	9.45	70	229.15	316	2.92
17	76.00	214	1.98	44	120.10	310	2.87	71	230.05	2640	24.42
18	77.05	571	5.28	45	135.10	289	2.67	72	231.05	347	3.21
19	78.05	1366	12.64	46	139.00	482	4.46	73	232.05	594	5.49
20	79.10	466	4.31	47	140.00	614	5.68	74	320.00	290	2.68
21	80.10	388	3.59	48	141.05	1196	11.06	75	321.00	222	2.05
22	82.10	233	2.16	49	142.05	619	5.73	76	322.00	228	2.11
23	83.10	260	2.40	50	143.00	1894	17.52	77	334.00	398	3.68
24	84.10	220	2.03	51	144.00	850	7.86	78	339.00	318	2.94
25	85.10	278	2.57	52	144.95	409	3.78	79	349.00	230	2.13
26	88.05	377	3.49	53	166.05	493	4.56	80	376.00	215	1.99
27	89.05	1081	10.00	54	167.05	639	5.91	81	453.00	263	2.43
28	90.05	2287	21.15	55	168.05	1148	10.62	82	454.20	604	5.59
29	91.05	10811	100.00	56	169.15	688	6.36	83	455.20	425	3.93
30	92.05	1150	10.64	57	170.05	2031	18.79	84	456.25	1479	13.68
31	92.95	1429	13.22	58	171.10	802	7.42	85	457.20	1015	9.39
32	94.00	254	2.35	59	172.10	420	3.88	86	458.20	2169	20.06
33	95.00	354	3.27	60	194.05	863	7.98	87	459.15	562	5.20
34	104.00	249	2.30	61	195.05	858	7.94	88	460.15	2244	20.76
35	106.10	398	3.68	62	196.00	1993	18.43	89	461.15	521	4.82
36	107.00	444	4.11	63	197.05	575	5.32	90	462.10	618	5.72

Mass chart of compound 5

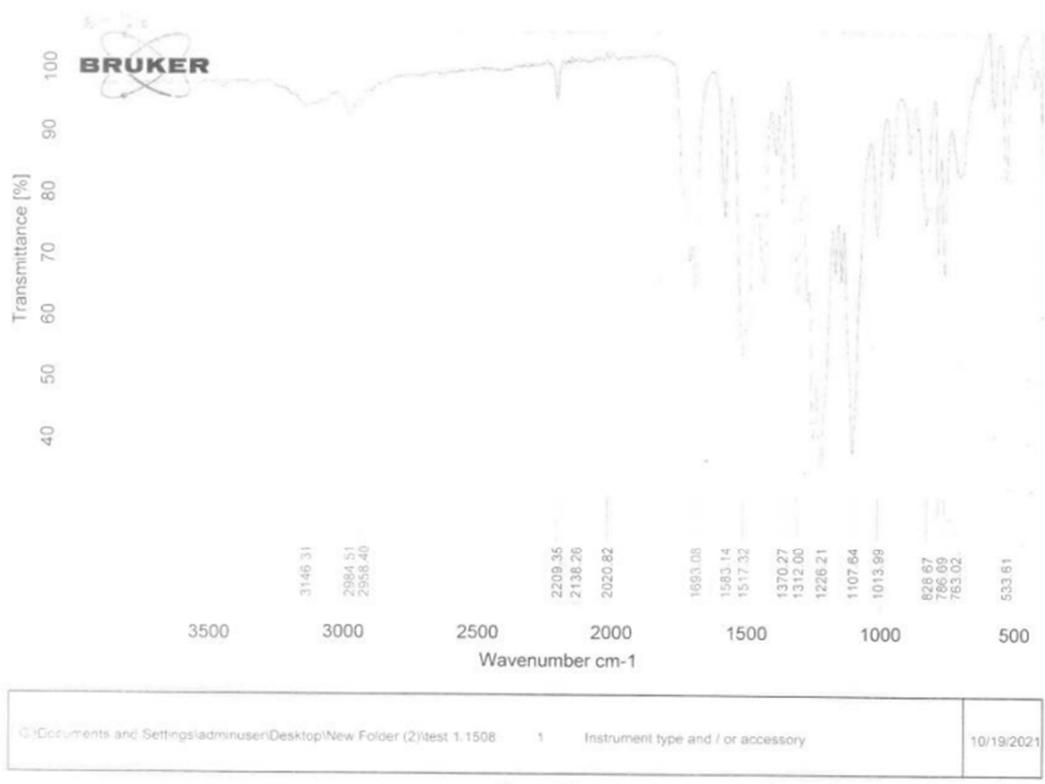
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**Figure S9.** <sup>1</sup>H NMR chart of compound 6



**Figure S10.** <sup>13</sup>C NMR chart of compound 6



**Figure S11.** IR chart of compound 6

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**DI Analysis  
Shimadzu Qp-2010 Plus**

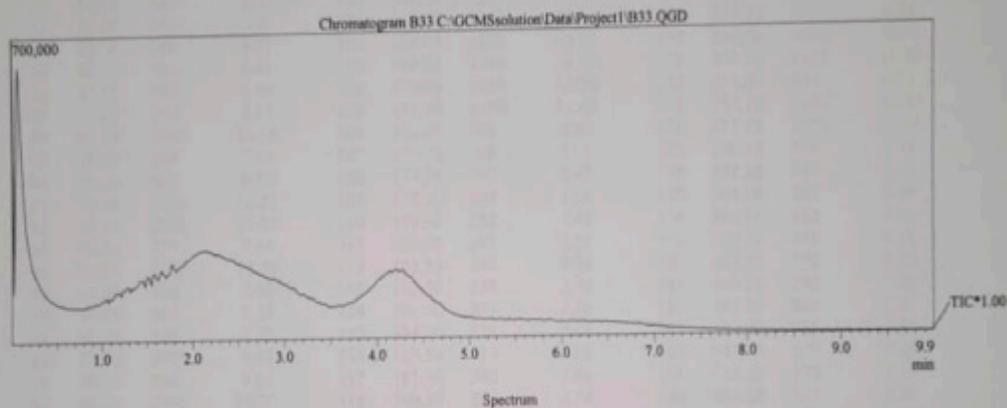
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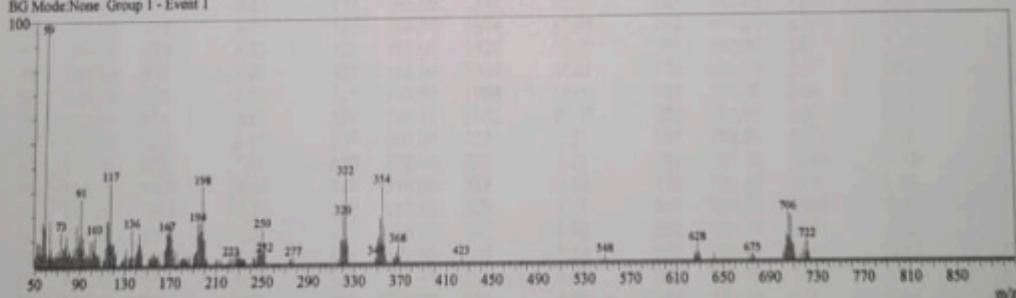
*Dr. Mohamed Soliman*  
*10/01/2007*



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2	51.00	529	5.06	5	54.10	540	5.17	8	57.10	1842	17.63
3	52.05	996	9.53	6	55.10	874	8.37	9	58.15	1622	15.53

**Figure S12. Mass chart of compound 6**

#	m/z	Abs. In	Rel. Int.	#	m/z	Abs. In	Rel. Int.	#	m/z	Abs. In	Rel. Int.
10	59.10	10447	100.00	78	134.20	279	2.67	146	242.00	268	2.57
11	60.10	566	5.42	79	135.20	359	3.44	147	243.00	273	2.61
12	61.10	330	3.16	80	136.20	1486	14.22	148	244.00	226	2.16
13	62.15	462	4.42	81	137.20	401	3.84	149	246.00	378	3.62
14	63.05	1936	18.53	82	139.20	338	3.24	150	247.05	660	6.32
15	64.05	691	6.61	83	140.20	492	4.71	151	248.00	953	9.12
16	65.00	417	3.99	84	141.10	634	6.07	152	249.00	450	4.31
17	66.00	281	2.69	85	142.10	906	8.67	153	250.10	1441	13.79
18	67.00	425	4.07	86	143.10	1346	12.88	154	251.10	647	6.19
19	68.00	385	3.69	87	144.10	777	7.44	155	252.10	422	4.04
20	69.00	537	5.14	88	145.10	502	4.81	156	274.10	204	1.95
21	70.00	377	3.61	89	151.10	319	3.05	157	275.10	228	2.18
22	71.15	662	6.34	90	152.10	244	2.34	158	277.10	249	2.38
23	72.20	422	4.04	91	153.10	385	3.69	159	316.10	228	2.18
24	73.15	1417	13.56	92	154.10	290	2.78	160	318.15	975	9.33
25	74.20	433	4.14	93	155.10	521	4.99	161	319.20	961	9.20
26	75.15	775	7.42	94	156.10	439	4.20	162	320.15	1969	18.85
27	76.15	685	6.56	95	157.10	330	3.16	163	321.15	934	8.94
28	77.15	906	8.67	96	158.10	337	3.23	164	322.15	3662	35.05
29	78.10	1233	11.80	97	159.10	450	4.31	165	323.15	1044	9.99
30	79.10	426	4.08	98	161.10	228	2.18	166	324.15	786	7.52
31	80.10	537	5.14	99	165.10	594	5.69	167	348.20	209	2.00
32	81.10	692	6.62	100	166.05	758	7.26	168	349.20	246	2.35
33	82.10	382	3.66	101	167.10	1362	13.04	169	350.20	871	8.34
34	83.10	399	3.82	102	168.05	1263	12.09	170	351.20	1094	10.47
35	84.10	482	4.61	103	169.05	1748	16.73	171	352.20	1921	18.39
36	85.15	783	7.49	104	170.05	1649	15.78	172	353.20	847	8.11
37	86.10	330	3.16	105	171.10	1199	11.48	173	354.15	3270	31.30
38	87.15	1699	16.26	106	172.10	695	6.65	174	355.10	1572	15.05
39	88.10	769	7.36	107	173.10	388	3.71	175	356.10	774	7.41
40	89.10	980	9.38	108	175.25	592	5.67	176	357.10	340	3.25
41	90.10	1276	12.21	109	177.30	204	1.95	177	364.10	255	2.44
42	91.15	2828	27.07	110	179.30	252	2.41	178	365.10	212	2.03
43	92.15	777	7.44	111	180.30	241	2.31	179	366.10	450	4.31
44	93.05	1209	11.57	112	181.30	343	3.28	180	367.10	225	2.15
45	94.10	319	3.05	113	182.30	257	2.46	181	368.15	754	7.22
46	95.10	551	5.27	114	183.30	303	2.90	182	369.20	263	2.52
47	96.10	348	3.33	115	184.30	226	2.16	183	423.20	206	1.97
48	97.10	490	4.69	116	185.30	214	2.05	184	548.20	249	2.38
49	98.20	398	3.81	117	187.30	382	3.66	185	625.20	220	2.11
50	99.20	1076	10.30	118	190.30	286	2.74	186	626.20	353	3.38
51	100.10	311	2.98	119	191.05	450	4.31	187	627.20	215	2.06
52	101.15	959	9.18	120	192.00	542	5.19	188	628.20	698	6.68
53	102.10	604	5.78	121	193.05	579	5.54	189	629.20	330	3.16
54	103.20	1239	11.86	122	194.00	1745	16.70	190	630.20	218	2.09
55	104.20	503	4.81	123	195.05	1275	12.20	191	642.20	330	3.16
56	105.20	433	4.14	124	196.00	1874	17.94	192	673.20	206	1.97
57	106.20	452	4.33	125	197.00	1420	13.59	193	675.20	222	2.13
58	107.20	415	3.97	126	198.00	3302	31.61	194	676.20	207	1.98
59	108.20	262	2.51	127	198.95	1086	10.40	195	701.20	246	2.35
60	111.20	274	2.62	128	200.00	1052	10.07	196	702.20	369	3.53
61	112.20	222	2.13	129	201.00	263	2.52	197	703.20	535	5.12
62	113.15	745	7.13	130	202.00	222	2.13	198	704.30	1047	10.02
63	114.15	1923	18.41	131	210.00	239	2.29	199	705.25	915	8.76
64	115.20	1895	18.14	132	211.00	228	2.18	200	706.25	1965	18.81
65	116.20	954	9.13	133	214.00	207	1.98	201	707.20	922	8.83
66	117.20	3516	33.66	134	221.00	238	2.28	202	708.25	1884	18.03
67	118.10	900	8.61	135	223.00	278	2.66	203	709.20	700	6.70
68	119.15	949	9.08	136	225.00	314	3.01	204	710.20	633	6.06
69	120.20	860	8.23	137	227.00	249	2.38	205	711.20	220	2.11
70	121.20	434	4.15	138	228.00	490	4.69	206	716.20	204	1.95
71	122.05	597	5.71	139	229.00	241	2.31	207	718.20	380	3.64
72	127.10	218	2.09	140	230.00	551	5.27	208	720.25	751	7.19
73	128.10	217	2.08	141	231.00	249	2.38	209	721.30	298	2.85
74	129.10	209	2.00	142	232.00	241	2.31	210	722.25	806	7.72
75	130.10	414	3.96	143	233.00	201	1.92	211	723.30	319	3.05
76	131.20	686	6.57	144	234.00	218	2.09				
77	133.20	353	3.38	145	235.00	210	2.01				

Dimethyl 5,5'-diselanediybis(2-formamidobenzoate) (7).

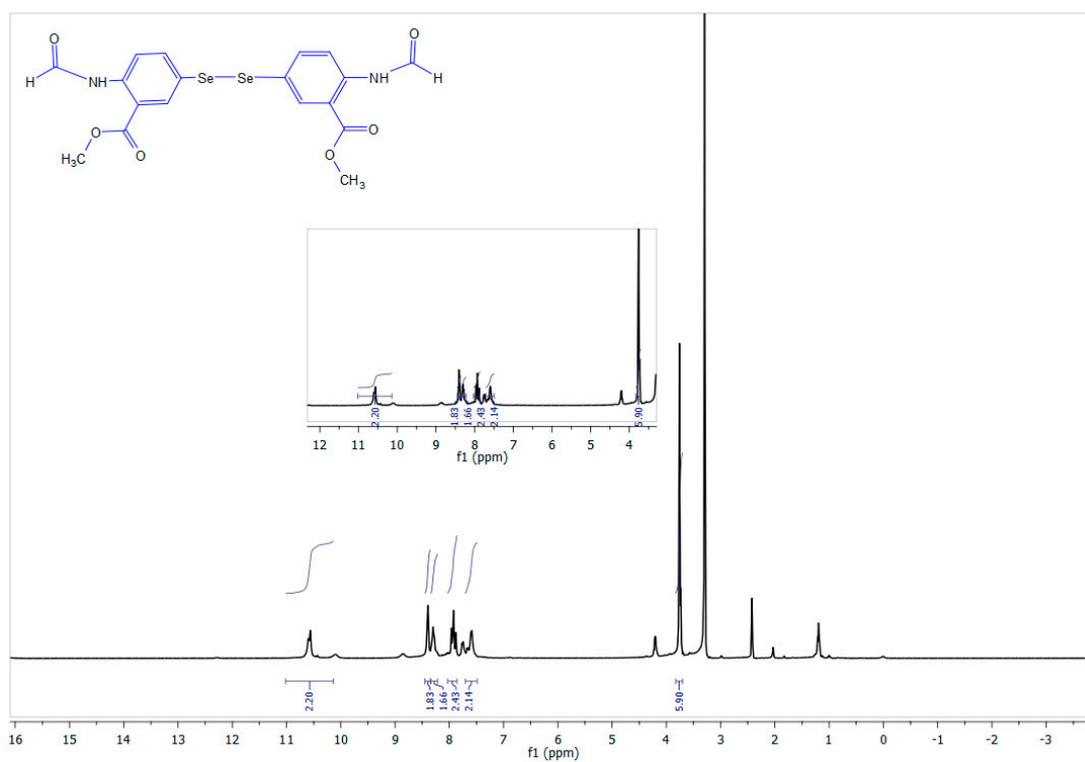


Figure S13. <sup>1</sup>H NMR chart of compound 7

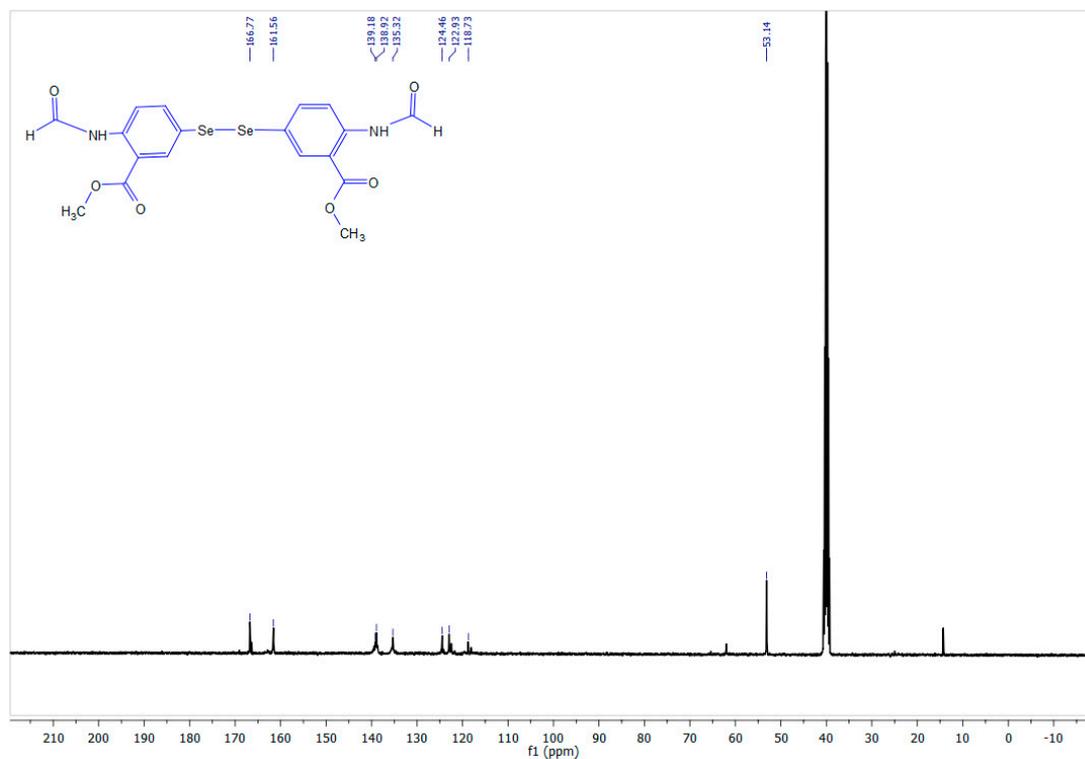
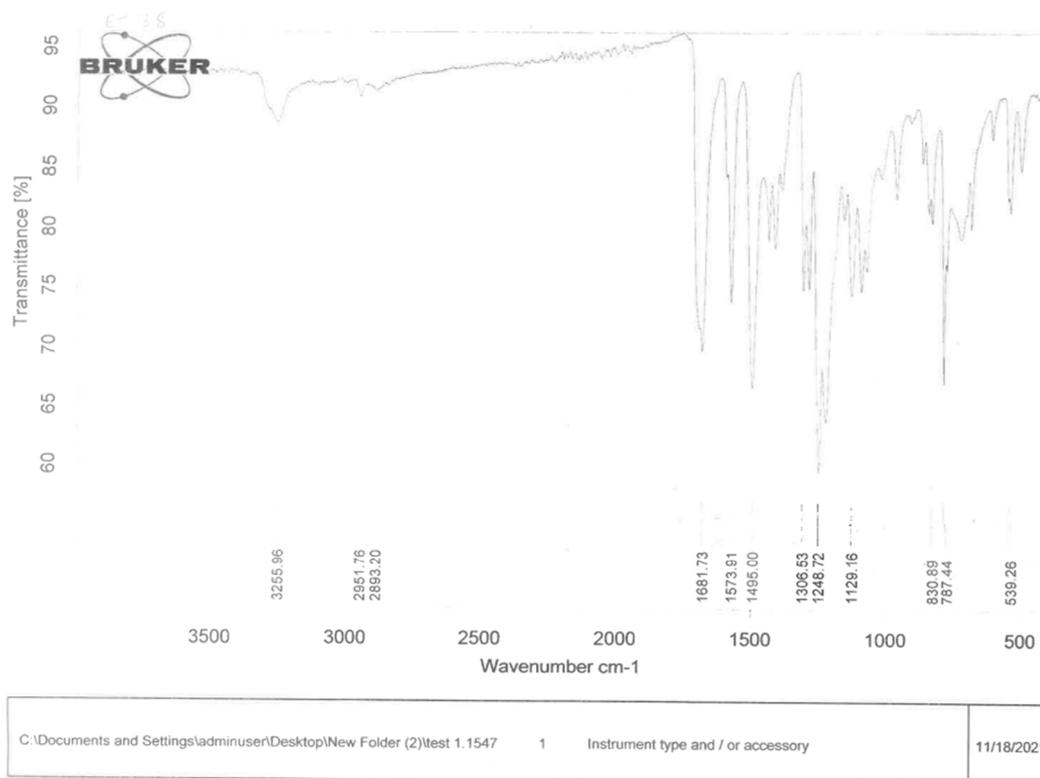


Figure S14. <sup>13</sup>C NMR chart of compound 7



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Figure S15. IR chart of compound 7

**Cairo University  
Micro Analytical Center**

*DI Analysis  
Shimadzu Qp-2010 Plus*

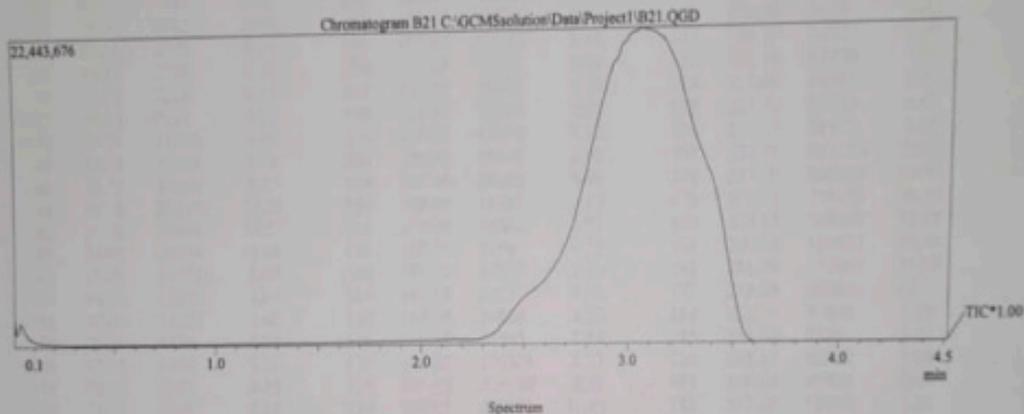
*Dr. Hany  
C. of CAU*

Sample Information  
 Analyzed by : Dr. Mai Younis  
 Analyzed : 10/01/2007 03:21:04  
 Sample Name : B21  
 Sample ID :  
 Customer Name : Dr. Mohamed Soliman - Science - Cairo  
 Data File : C:\GCMSolution\Data\Project1\B21.QGD  
 Org Data File : C:\GCMSolution\Data\Project1\B21.QGD  
 Method File : C:\GCMSolution\Data\Project1\High Temperature Op  
 Org Method File : C:\GCMSolution\Data\Project1\High Temperature Op  
 Report File :  
 Tuning File : C:\GCMSolution\System\Tune1\_default.qpt  
 \$Exit\$Modified by : Dr. Mai Younis  
 Modified : 10/01/2007 03:25:38

Method  
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 IonSourceTemp : 250.00 °C  
 [MS Table]  
 --Group 1 - Event 1--  
 Start Time : 0.00min  
 End Time : 10.00min  
 ACQ Mode : Scan  
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 Scan Speed : 2000  
 Start m/z : 50.00  
 End m/z : 1000.00  
 Electron Voltage : 70 eV  
 Ionization Mode : EI

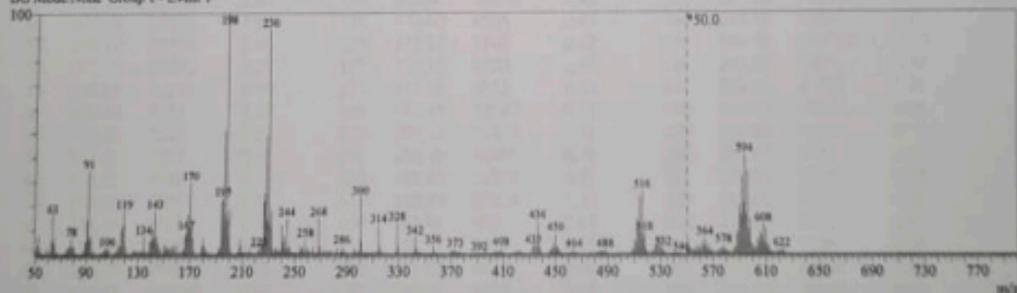


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Line# 1 R.Time:3.1(Scan# 377)

MassPeaks:570  
 RawMode:Single 3.1(377) BasePeak:198(1464969)  
 BG Mode:None Group 1 - Event 1



Mass Table

Line# 1 R.Time:3.1(Scan# 377)

MassPeaks:570  
 RawMode:Single 3.1(377) BasePeak:198(1464969)  
 BG Mode:None Group 1 - Event 1

#	m/z	Abs. In	Rel. Int.	#	m/z	Abs. In	Rel. Int.	#	m/z	Abs. In	Rel. Int.
1	50.05	24594	1.68	4	53.05	42252	2.88	7	56.05	3027	0.21
2	51.05	55368	3.78	5	54.05	20407	1.39	8	57.05	6534	0.45
3	52.05	116377	7.94	6	55.05	9644	0.66	9	58.05	9131	0.62

Figure S16. Mass chart of compound 7

#	m/z	Abs. Int.	Rel. Int.	#	m/z	Abs. Int.	Rel. Int.	#	m/z	Abs. Int.	Rel. Int.
10	59.00	36338	2.48	79	128.10	19204	1.31	148	197.05	239788	16.37
11	60.15	5776	0.39	80	129.15	18863	1.29	149	198.00	146496	100.00
12	61.15	23145	1.58	81	130.10	24905	1.70	150	198.95	206870	14.12
13	62.15	80056	5.46	82	131.15	15227	1.04	151	200.00	265948	18.15
14	63.05	234780	16.03	83	132.15	15925	1.09	152	200.95	33569	2.29
15	64.05	103512	7.07	84	133.25	21682	1.48	153	201.95	4387	0.30
16	65.05	62224	4.25	85	134.20	108370	7.40	154	203.10	2042	0.14
17	66.05	17090	1.17	86	135.15	35114	2.40	155	204.10	2559	0.17
18	67.05	10927	0.75	87	136.05	8126	0.55	156	205.05	3675	0.25
19	68.05	5612	0.38	88	137.05	12597	0.86	157	206.15	7640	0.52
20	69.05	6453	0.44	89	138.05	18067	1.23	158	207.15	34027	2.32
21	70.10	2214	0.15	90	139.05	70881	4.84	159	208.15	96895	6.61
22	71.10	4134	0.28	91	140.05	87187	5.95	160	209.10	55556	3.79
23	72.05	2060	0.14	92	141.05	150661	10.28	161	210.10	18156	1.24
24	73.05	9461	0.65	93	142.05	98499	6.72	162	211.05	7541	0.51
25	74.05	27743	1.89	94	143.05	262806	17.94	163	212.05	12728	0.87
26	75.05	39024	2.66	95	144.05	107906	7.37	164	213.05	10172	0.69
27	76.05	47488	3.24	96	145.05	69056	4.71	165	214.05	17585	1.20
28	77.05	52825	3.61	97	146.10	44022	3.00	166	215.05	5925	0.40
29	78.05	96196	6.57	98	147.10	34598	2.36	167	216.05	32339	2.21
30	79.05	41615	2.84	99	148.10	8207	0.56	168	216.95	6128	0.42
31	79.95	52962	3.62	100	149.25	11918	0.81	169	218.05	8970	0.61
32	81.05	7497	0.51	101	150.15	58987	4.03	170	219.05	4734	0.32
33	82.00	8503	0.58	102	151.15	51884	3.54	171	220.05	4698	0.32
34	83.15	4730	0.32	103	151.95	28210	1.93	172	221.10	11732	0.80
35	84.15	3783	0.26	104	152.95	38175	2.61	173	222.10	15578	1.06
36	85.15	5226	0.36	105	153.95	45823	3.13	174	223.05	34599	2.36
37	86.15	3311	0.23	106	154.95	28497	1.95	175	224.10	53783	3.67
38	87.15	11655	0.80	107	155.95	47292	3.23	176	225.15	88572	6.05
39	88.15	34322	2.34	108	156.95	39418	2.69	177	226.10	317178	21.65
40	89.15	80966	5.53	109	157.90	58238	3.98	178	227.10	365674	24.96
41	90.15	208182	14.21	110	158.95	16555	1.13	179	228.05	716179	48.89
42	91.05	506455	34.57	111	159.90	54662	3.73	180	229.15	204352	13.95
43	92.05	91654	6.26	112	160.95	5109	0.35	181	230.05	136627	93.26
44	93.00	117914	8.05	113	161.90	16975	1.16	182	231.05	171303	11.69
45	94.05	15285	1.04	114	163.05	5277	0.36	183	232.05	267631	18.27
46	95.00	24652	1.68	115	164.05	24885	1.70	184	232.95	37429	2.55
47	96.05	4228	0.29	116	165.05	34245	2.34	185	234.10	18561	1.27
48	97.15	4299	0.29	117	166.05	110381	7.53	186	235.15	28389	1.94
49	98.15	3622	0.25	118	167.05	136789	9.34	187	236.15	45786	3.13
50	99.10	3818	0.26	119	168.05	240735	16.43	188	237.15	18519	1.26
51	100.15	3684	0.25	120	169.05	157134	10.73	189	238.15	14271	0.97
52	101.15	8551	0.58	121	170.05	431966	29.49	190	239.25	26021	1.78
53	102.10	11721	0.80	122	171.05	149906	10.23	191	240.15	176287	12.03
54	103.15	20032	1.37	123	172.00	101633	6.94	192	241.15	82697	5.64
55	104.15	38808	2.65	124	173.00	28470	1.94	193	242.10	113735	7.76
56	105.05	27074	1.85	125	174.00	6508	0.44	194	243.15	32347	2.21
57	106.10	38996	2.66	126	175.15	1968	0.13	195	244.10	213769	14.59
58	107.10	33393	2.28	127	176.15	1458	0.10	196	245.05	34991	2.39
59	108.05	10011	0.68	128	177.15	3821	0.26	197	246.05	47288	3.23
60	109.10	4231	0.29	129	178.15	12523	0.85	198	247.05	13842	0.94
61	110.10	3010	0.21	130	179.15	51078	3.49	199	248.00	11108	0.76
62	111.10	5324	0.36	131	180.15	92866	6.34	200	249.05	9182	0.63
63	112.15	5457	0.37	132	181.15	50767	3.47	201	250.05	12407	0.85
64	113.10	19951	1.36	133	182.10	28319	1.93	202	251.00	9151	0.62
65	114.10	27367	1.87	134	183.05	9951	0.68	203	252.15	6532	0.45
66	115.05	56985	3.89	135	184.05	7677	0.52	204	253.25	7790	0.53
67	116.15	48386	3.30	136	185.05	4424	0.30	205	254.15	46608	3.18
68	117.05	145589	9.94	137	186.05	4173	0.28	206	255.10	29241	2.00
69	118.15	175690	11.99	138	187.05	2929	0.20	207	256.05	47888	3.27
70	119.10	263689	18.00	139	188.05	2012	0.14	208	257.15	25607	1.75
71	120.10	55866	3.81	140	189.05	2466	0.17	209	258.10	89121	6.08
72	121.10	10935	0.75	141	190.05	3154	0.22	210	259.05	36516	2.49
73	122.15	5648	0.39	142	191.05	6704	0.46	211	260.10	35807	2.44
74	123.15	4246	0.29	143	192.05	33178	2.26	212	261.10	17399	1.19
75	124.15	3163	0.22	144	193.05	42554	2.90	213	262.15	10618	0.72
76	125.15	9613	0.66	145	194.05	314135	21.44	214	263.20	21540	1.47
77	126.15	19499	1.33	146	195.05	336790	22.99	215	264.15	48109	3.28
78	127.15	34671	2.37	147	196.00	746338	50.95	216	265.15	11512	0.79

#	m/z	Abs. In	Rel. Int.	#	m/z	Abs. In	Rel. Int.	#	m/z	Abs. In	Rel. Int.
217	266.20	5574	0.38	286	335.05	4966	0.34	355	405.20	11647	0.80
218	267.25	18289	1.25	287	336.00	10442	0.71	356	406.20	19190	1.31
219	268.20	214457	14.64	288	337.05	3758	0.26	357	407.25	7865	0.54
220	269.15	50722	3.46	289	338.00	11316	0.77	358	408.20	34479	2.35
221	270.05	18993	1.30	290	339.20	3492	0.24	359	409.15	9079	0.62
222	271.15	8270	0.56	291	340.15	5991	0.41	360	410.15	7270	0.50
223	272.10	22950	1.57	292	341.25	11436	0.78	361	411.10	1921	0.13
224	273.05	12189	0.83	293	342.25	102667	7.01	362	412.15	716	0.05
225	274.00	18033	1.23	294	343.15	33975	2.32	363	413.15	1117	0.08
226	275.00	12638	0.86	295	344.05	11641	0.79	364	414.15	977	0.07
227	276.00	23305	1.59	296	345.10	14649	1.00	365	415.15	2414	0.16
228	277.05	10220	0.70	297	346.10	6401	0.44	366	416.25	1818	0.12
229	277.95	26831	1.83	298	347.05	4322	0.30	367	417.20	4686	0.32
230	278.95	7502	0.51	299	348.10	6097	0.42	368	418.20	6340	0.43
231	280.00	12959	0.88	300	349.05	2676	0.18	369	419.20	8022	0.55
232	281.25	7089	0.48	301	350.05	3422	0.23	370	420.20	12442	0.85
233	282.20	36882	2.52	302	351.15	2694	0.18	371	421.20	9254	0.63
234	283.15	11288	0.77	303	352.05	3204	0.22	372	422.20	23462	1.60
235	284.15	6929	0.47	304	353.10	3617	0.25	373	423.05	12365	0.84
236	285.25	10309	0.70	305	354.25	2467	0.17	374	424.05	7087	0.48
237	286.20	47882	3.27	306	355.25	7315	0.50	375	425.05	8548	0.58
238	287.05	19396	1.32	307	356.25	46877	3.20	376	426.00	2537	0.17
239	288.05	16595	1.13	308	357.15	13638	0.93	377	427.05	3033	0.21
240	289.05	13257	0.90	309	358.15	3305	0.23	378	428.05	1265	0.09
241	290.05	6268	0.43	310	359.10	1993	0.14	379	429.15	1679	0.11
242	291.10	4498	0.31	311	360.15	1330	0.09	380	430.15	4607	0.31
243	292.15	2391	0.16	312	361.15	1094	0.07	381	431.15	5087	0.35
244	293.15	3914	0.27	313	362.15	1676	0.11	382	432.15	37770	2.58
245	294.25	4362	0.30	314	363.05	962	0.07	383	433.15	47768	3.26
246	295.20	20102	1.37	315	364.15	1081	0.07	384	434.15	101178	6.91
247	296.15	27404	1.87	316	365.15	869	0.06	385	435.25	43189	2.95
248	297.15	7767	0.53	317	366.15	796	0.05	386	436.20	196380	13.41
249	298.25	4513	0.31	318	367.25	2136	0.15	387	437.10	54367	3.71
250	299.25	26163	1.79	319	368.25	2672	0.18	388	438.15	42121	2.88
251	300.20	341862	23.34	320	369.20	8393	0.57	389	439.10	11220	0.77
252	301.15	78463	5.36	321	370.25	23395	1.60	390	440.05	2091	0.14
253	302.15	15487	1.06	322	371.15	19186	1.31	391	441.10	658	0.04
254	303.15	5962	0.41	323	372.15	9747	0.67	392	442.15	451	0.03
255	304.00	9417	0.64	324	373.10	26022	1.78	393	443.25	974	0.07
256	305.00	6111	0.42	325	374.10	12108	0.83	394	444.20	3310	0.23
257	306.00	11102	0.76	326	375.15	10231	0.70	395	445.25	4151	0.28
258	307.00	6762	0.46	327	376.15	15771	1.08	396	446.20	25433	1.74
259	308.00	10218	0.70	328	377.10	5465	0.37	397	447.20	31066	2.12
260	309.05	8278	0.57	329	378.15	4515	0.31	398	448.20	64380	4.39
261	310.05	14253	0.97	330	379.15	1506	0.10	399	449.25	34343	2.34
262	311.20	4722	0.32	331	380.20	1839	0.13	400	450.20	122422	8.36
263	312.15	8322	0.57	332	381.20	630	0.04	401	451.10	48983	3.34
264	313.25	18558	1.27	333	382.35	803	0.05	402	452.15	32570	2.22
265	314.20	172178	11.75	334	383.35	1024	0.07	403	453.15	21234	1.45
266	315.15	47455	3.24	335	384.30	3825	0.26	404	454.00	6215	0.42
267	316.00	20338	1.39	336	385.25	2413	0.16	405	455.05	5959	0.41
268	317.00	9206	0.63	337	386.75	2422	0.17	406	456.05	3265	0.22
269	318.00	8063	0.55	338	387.65	2694	0.18	407	457.10	2191	0.15
270	319.05	4177	0.29	339	388.75	2477	0.17	408	458.10	2047	0.14
271	320.00	6754	0.46	340	389.75	4577	0.31	409	459.15	1616	0.11
272	321.10	3839	0.26	341	390.65	4336	0.30	410	460.20	6214	0.42
273	322.05	3004	0.21	342	391.75	4915	0.34	411	461.25	6400	0.44
274	323.20	2350	0.16	343	392.75	3792	0.26	412	462.20	14204	0.97
275	324.15	2187	0.15	344	393.75	6278	0.43	413	463.25	5914	0.40
276	325.15	1645	0.11	345	394.70	4116	0.28	414	464.20	24223	1.65
277	326.25	2909	0.20	346	395.75	6297	0.43	415	465.15	7959	0.54
278	327.25	12951	0.88	347	396.75	3150	0.22	416	466.20	6337	0.43
279	328.25	185457	12.66	348	397.75	6331	0.43	417	467.15	2907	0.20
280	329.15	43614	2.98	349	399.25	4067	0.28	418	468.05	1516	0.10
281	330.15	8245	0.56	350	400.15	3944	0.27	419	469.05	1649	0.11
282	331.05	2873	0.20	351	401.20	6143	0.42	420	470.05	1528	0.10
283	332.05	4167	0.28	352	402.15	4691	0.32	421	471.15	1527	0.10
284	333.05	3022	0.21	353	403.20	10460	0.71	422	472.05	2043	0.14
285	334.00	7474	0.51	354	404.15	11730	0.80	423	473.05	1822	0.12

#	m/z	Abs. In	Rel. Int.	#	m/z	Abs. In	Rel. Int.	#	m/z	Abs. In	Rel. Int.
424	474.05	2280	0.16	473	523.15	8091	0.55	522	574.05	505	0.03
425	475.15	2371	0.16	474	524.15	21834	1.49	523	575.00	247	0.02
426	476.05	2926	0.20	475	525.15	22476	1.53	524	576.05	680	0.05
427	477.15	3029	0.21	476	526.15	55056	3.76	525	576.95	551	0.04
428	478.05	4215	0.29	477	527.15	43844	2.99	526	578.00	972	0.07
429	479.15	3675	0.25	478	528.10	92798	6.33	527	579.00	415	0.03
430	480.05	5111	0.35	479	529.15	35399	2.42	528	579.85	565	0.04
431	481.15	6041	0.41	480	530.10	99618	6.80	529	580.90	292	0.02
432	482.10	9151	0.62	481	531.10	27508	1.88	530	581.90	295	0.02
433	483.10	9470	0.65	482	532.10	32623	2.23	531	583.90	313	0.02
434	484.10	16985	1.16	483	533.10	9073	0.62	532	585.00	257	0.02
435	485.10	11826	0.81	484	534.10	4012	0.27	533	586.05	744	0.05
436	486.10	22422	1.53	485	535.15	1423	0.10	534	587.05	809	0.06
437	487.15	8484	0.58	486	536.15	1038	0.07	535	588.00	2423	0.17
438	488.10	23593	1.61	487	537.20	1092	0.07	536	589.05	2699	0.18
439	489.10	5918	0.40	488	538.20	2463	0.17	537	590.05	5818	0.40
440	490.10	7351	0.50	489	539.25	2519	0.17	538	591.05	4705	0.32
441	491.15	2224	0.15	490	540.15	5813	0.40	539	592.05	9235	0.63
442	492.05	1433	0.10	491	541.20	4666	0.32	540	593.05	6356	0.43
443	493.15	895	0.06	492	542.15	8850	0.60	541	594.00	11919	0.81
444	494.15	1397	0.10	493	543.15	3404	0.23	542	595.05	4809	0.33
445	495.15	1521	0.10	494	544.15	10121	0.69	543	596.05	9954	0.68
446	496.15	2606	0.18	495	545.15	2675	0.18	544	597.05	2893	0.20
447	497.15	2497	0.17	496	546.15	3410	0.23	545	598.05	4235	0.29
448	498.20	4898	0.33	497	547.20	1230	0.08	546	599.10	1218	0.08
449	499.15	3785	0.26	498	548.15	591	0.04	547	600.10	1034	0.07
450	500.15	6737	0.46	499	549.50	644	0.04	548	601.05	567	0.04
451	501.15	3026	0.21	500	550.75	485	0.03	549	602.05	897	0.06
452	502.10	6652	0.45	501	551.80	895	0.06	550	603.05	765	0.05
453	503.15	2490	0.17	502	552.75	535	0.04	551	604.05	1812	0.12
454	504.10	2625	0.18	503	554.10	634	0.04	552	605.15	1443	0.10
455	505.15	1233	0.08	504	555.20	423	0.03	553	606.10	2610	0.18
456	506.15	2859	0.20	505	556.20	698	0.05	554	607.05	2092	0.14
457	507.15	4058	0.28	506	557.10	402	0.03	555	608.05	3528	0.24
458	508.15	18323	1.25	507	558.10	958	0.07	556	609.05	1284	0.09
459	509.15	28542	1.95	508	559.15	515	0.04	557	610.05	2987	0.20
460	510.10	80658	5.51	509	560.10	1039	0.07	558	611.05	928	0.06
461	511.15	79167	5.40	510	561.05	753	0.05	559	612.00	1057	0.07
462	512.10	210383	14.36	511	562.10	1583	0.11	560	613.00	426	0.03
463	513.15	165589	11.30	512	563.10	938	0.06	561	614.00	295	0.02
464	514.10	346700	23.67	513	564.05	1915	0.13	562	615.00	231	0.02
465	515.15	130687	8.92	514	564.95	663	0.05	563	616.00	218	0.01
466	516.10	377607	25.78	515	566.00	1260	0.09	564	618.00	262	0.02
467	517.10	103930	7.09	516	566.95	441	0.03	565	619.00	242	0.02
468	518.10	122695	8.38	517	568.00	676	0.05	566	620.00	412	0.03
469	519.05	31496	2.15	518	569.00	327	0.02	567	621.00	337	0.02
470	520.10	15218	1.04	519	570.00	327	0.02	568	622.00	554	0.04
471	521.10	4263	0.29	520	572.00	258	0.02	569	623.00	289	0.02
472	522.15	5536	0.38	521	573.00	207	0.01	570	624.00	510	0.03

Dimethyl 5,5'-diselanediybis(2-acetamidobenzoate) (**8**).

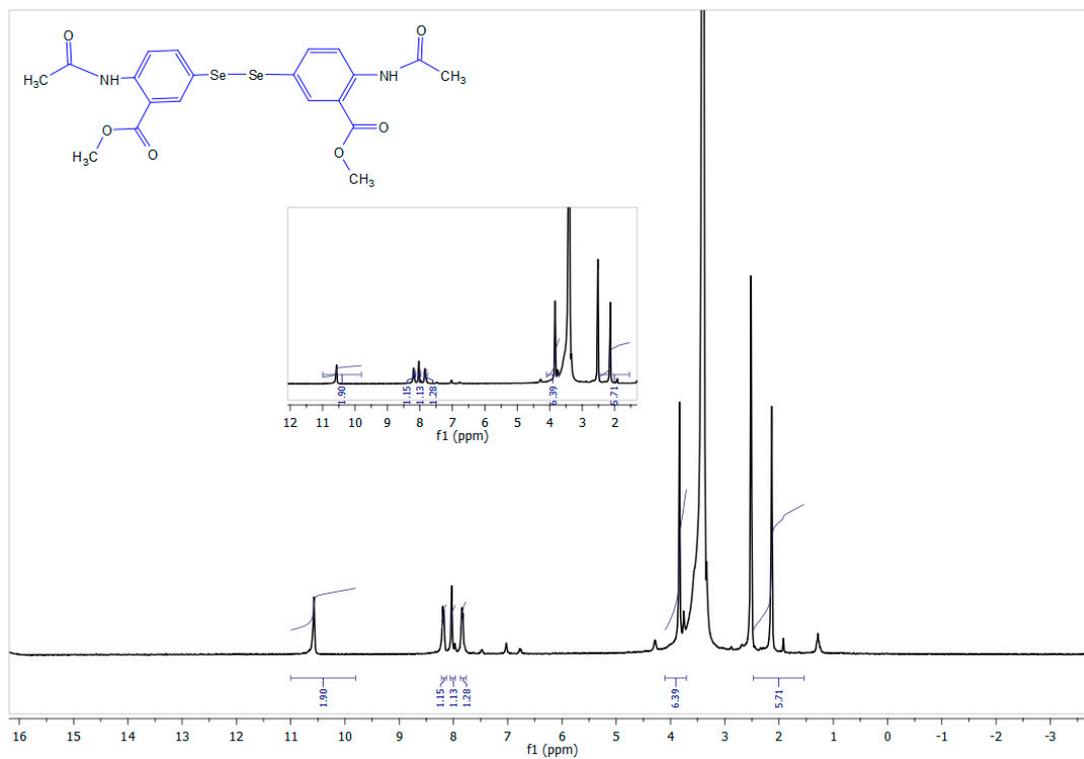


Figure S17. <sup>1</sup>H NMR chart of compound **8**

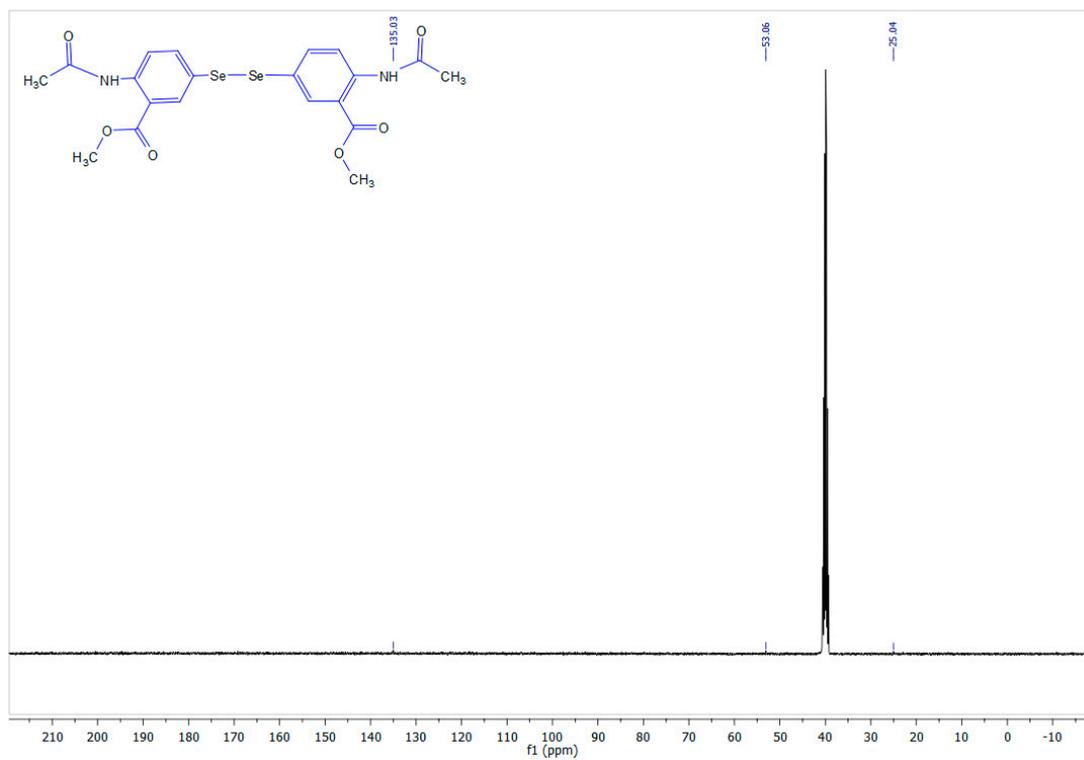
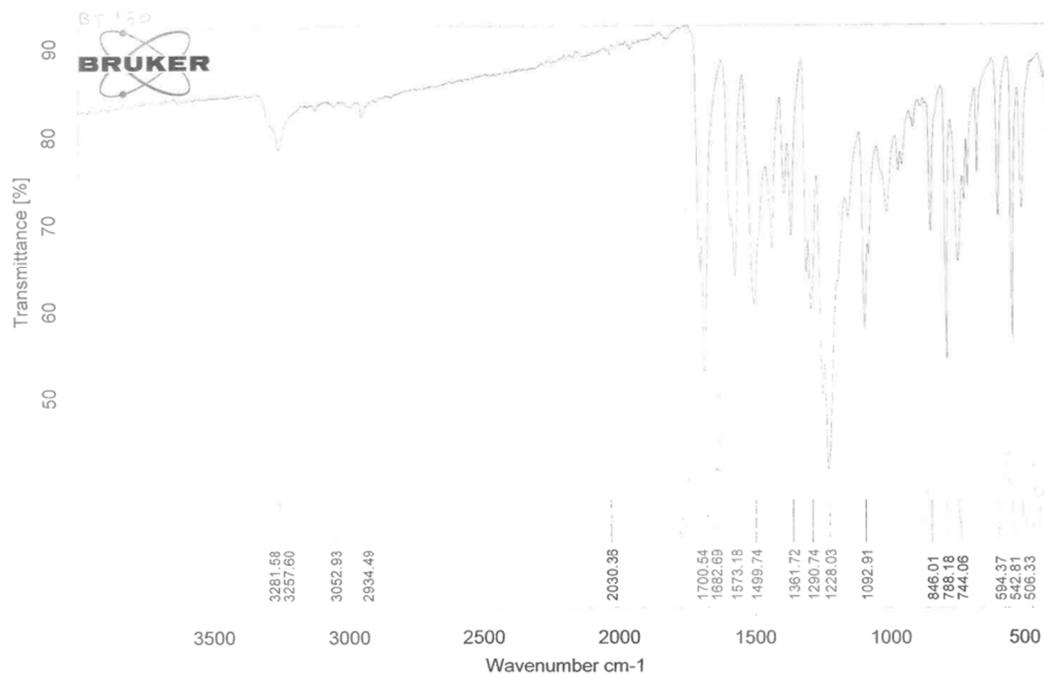


Figure S18. <sup>13</sup>C NMR chart of compound **8**



C:\Documents and Settings\adminuser\Desktop\New Folder (2)\test 1.1490	1	Instrument type and / or accessory	9/30/2021
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**Figure S19.** IR chart of compound **8**

**Cairo University  
Micro Analytical Center**

*DI Analysis  
Shimadzu Qp-2010 Plus*

Sample Information  
 Analyzed by : Dr. Mai Younis  
 Analyzed : 26/01/2007 03:04:59  
 Sample Name : B20  
 Sample ID :  
 Customer Name : Dr. Mohamed Soliman - Science - Cairo  
 Data File : C:\GCMSolution\Data\Project1\B20.QGD  
 Org Data File : C:\GCMSolution\Data\Project1\B20.QGD  
 Method File : C:\GCMSolution\Data\Project1\High Temperature Op  
 Org Method File : C:\GCMSolution\Data\Project1\High Temperature Op  
 Report File :  
 Tuning File : C:\GCMSolution\System\Tune1\_default.qgt  
 \$EndIf\$Modified by : Dr. Mai Younis  
 Modified : 26/01/2007 03:14:59

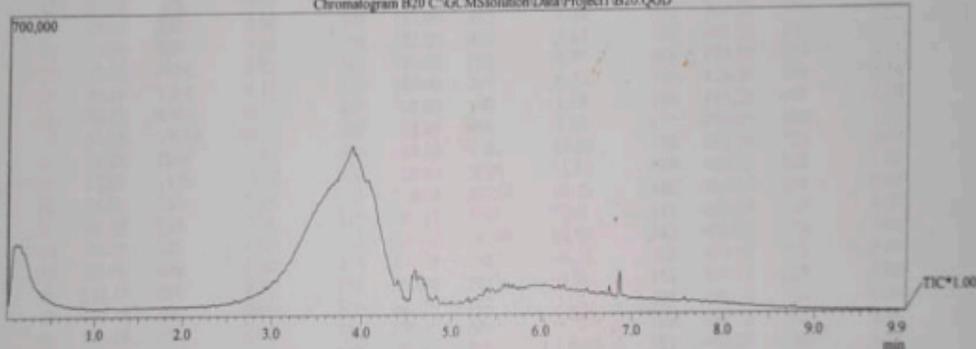
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 [MS Table]  
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 End Time : 10.00min  
 ACQ Mode : Scan  
 Event Time : 0.50sec  
 Scan Speed : 2000  
 Start m/z : 50.00  
 End m/z : 1000.00  
 Electron Voltage : 70 eV  
 Ionization Mode : EI

*Dr. Hoda  
C.C.C.S.M.C.*



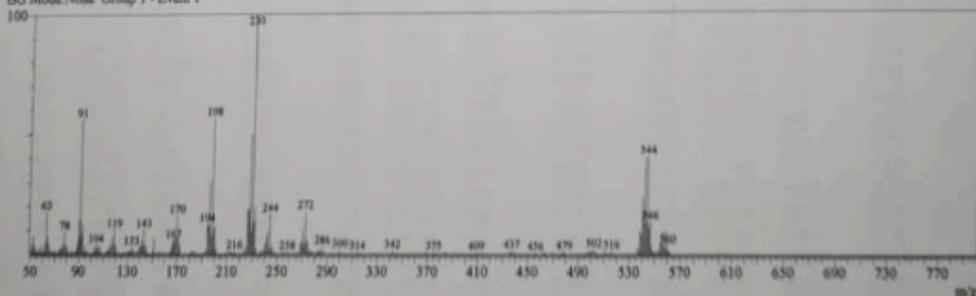
C:\GCMSolution\Data\Project1\B20.QGD

Chromatogram B20 C:\GCMSolution\Data\Project1\B20.QGD



Spectrum

Line#:1 R.Time:3.9(Scan#:466)  
 MassPeaks:225(Peak Elimination m/z: 570.20)  
 RawMode:Single 3.9(466) BasePeak:230(33772)  
 BG Mode:None Group 1 - Event 1



Mass Table

Line#:1 R.Time:3.9(Scan#:466)  
 MassPeaks:225(Peak Elimination m/z: 570.20)  
 RawMode:Single 3.9(466) BasePeak:230(33772)  
 BG Mode:None Group 1 - Event 1

#	m/z	Abs. In	Rel. Int.	#	m/z	Abs. In	Rel. Int.	#	m/z	Abs. In	Rel. Int.
1	50.00	503	1.49	4	53.05	1107	3.28	7	56.10	265	0.78
2	51.10	1241	3.67	5	54.10	612	1.81	8	57.10	674	2.00
3	52.10	2558	7.57	6	55.10	522	1.55	9	58.10	350	1.04

Figure S20. Mass chart of compound 8

#	m/z	Abs. In	Rel. Int.	#	m/z	Abs. In	Rel. Int.	#	m/z	Abs. In	Rel. Int.
10	59.10	1150	3.41	79	141.10	2124	6.29	148	258.10	273	0.81
11	60.10	262	0.78	80	142.10	1193	3.53	149	266.10	234	0.69
12	61.10	506	1.50	81	143.10	3423	10.14	150	268.20	1455	4.31
13	62.15	1522	4.51	82	144.15	1202	3.56	151	269.20	1751	5.18
14	63.10	5911	17.50	83	145.05	866	2.56	152	270.20	3359	9.95
15	64.10	2404	7.12	84	146.10	302	0.89	153	271.25	1293	3.83
16	65.10	1428	4.23	85	150.25	468	1.39	154	272.15	5965	17.66
17	66.10	606	1.79	86	151.20	2284	6.76	155	273.10	1935	5.73
18	67.10	402	1.19	87	153.20	401	1.19	156	274.15	1566	4.64
19	68.10	263	0.78	88	155.20	258	0.76	157	275.10	511	1.51
20	69.10	545	1.61	89	156.20	297	0.88	158	276.10	406	1.20
21	70.10	249	0.74	90	158.20	242	0.72	159	278.10	484	1.43
22	71.10	266	0.79	91	159.20	210	0.62	160	280.10	234	0.69
23	73.10	303	0.90	92	161.20	202	0.60	161	282.10	306	0.91
24	74.10	714	2.11	93	164.20	212	0.63	162	283.10	310	0.92
25	75.10	783	2.32	94	165.15	640	1.90	163	284.10	610	1.81
26	76.15	822	2.43	95	166.10	1361	4.03	164	285.10	385	1.14
27	77.15	1711	5.07	96	167.10	1886	5.58	165	286.15	1014	3.00
28	78.10	3119	9.24	97	168.10	3095	9.16	166	287.20	265	0.78
29	79.20	1262	3.74	98	169.10	2214	6.56	167	300.20	559	1.66
30	80.15	1005	2.98	99	170.05	5367	15.89	168	314.20	247	0.73
31	81.20	351	1.04	100	171.10	2543	7.53	169	342.20	441	1.31
32	83.20	350	1.04	101	172.00	1362	4.03	170	369.20	207	0.61
33	84.20	223	0.66	102	173.00	492	1.46	171	375.20	222	0.66
34	85.20	335	0.99	103	181.00	257	0.76	172	384.20	226	0.67
35	87.20	420	1.24	104	182.00	420	1.24	173	409.20	246	0.73
36	88.15	1036	3.07	105	183.00	252	0.75	174	435.20	254	0.75
37	89.10	2164	6.41	106	185.00	247	0.73	175	436.20	255	0.76
38	90.15	4905	14.52	107	192.00	398	1.18	176	437.20	449	1.33
39	91.15	18935	56.07	108	193.10	466	1.38	177	439.20	449	1.33
40	92.05	2859	8.47	109	194.10	4161	12.32	178	456.20	226	0.67
41	93.05	4108	12.16	110	195.10	3886	11.51	179	462.20	302	0.89
42	94.00	383	1.13	111	196.05	10254	30.36	180	464.20	231	0.68
43	95.10	938	2.78	112	197.15	2506	7.42	181	468.20	260	0.77
44	96.10	225	0.67	113	198.05	19109	56.58	182	470.20	274	0.81
45	97.10	406	1.20	114	199.05	3453	10.22	183	477.20	215	0.64
46	101.10	238	0.70	115	200.05	3845	11.39	184	478.20	222	0.66
47	102.10	306	0.91	116	201.10	748	2.21	185	479.20	316	0.94
48	103.15	954	2.82	117	209.10	260	0.77	186	496.20	292	0.86
49	104.20	1278	3.78	118	211.10	350	1.04	187	498.20	420	1.24
50	105.15	849	2.51	119	212.10	367	1.09	188	499.20	318	0.94
51	106.10	1078	3.19	120	213.10	263	0.78	189	500.30	630	1.87
52	107.20	913	2.70	121	214.10	266	0.79	190	501.30	233	0.69
53	108.20	226	0.67	122	216.10	414	1.23	191	502.30	638	1.89
54	109.20	236	0.70	123	223.10	278	0.82	192	504.30	351	1.04
55	112.20	214	0.63	124	224.15	929	2.75	193	510.30	252	0.75
56	113.20	431	1.28	125	225.15	732	2.17	194	511.30	228	0.68
57	114.05	520	1.54	126	226.10	6334	18.76	195	512.30	263	0.78
58	115.05	1330	3.94	127	227.10	6332	18.75	196	515.30	215	0.64
59	116.10	806	2.39	128	228.10	16798	49.74	197	516.30	447	1.32
60	117.10	2417	7.16	129	229.15	3157	9.35	198	528.30	212	0.63
61	118.15	1273	3.77	130	230.10	33772	100.00	199	536.25	679	2.01
62	119.15	3449	10.21	131	231.05	4489	13.29	200	537.20	929	2.75
63	120.20	974	2.88	132	232.10	6570	19.45	201	538.25	3310	9.80
64	121.20	334	0.99	133	233.05	864	2.56	202	539.35	2783	8.24
65	123.20	225	0.67	134	236.10	206	0.61	203	540.30	7903	23.40
66	126.20	242	0.72	135	237.10	294	0.87	204	541.25	6033	17.86
67	127.20	244	0.72	136	238.10	487	1.44	205	542.30	13409	39.70
68	129.20	390	1.15	137	239.15	676	2.00	206	543.35	4404	13.04
69	130.20	354	1.05	138	240.15	1315	3.89	207	544.30	13558	40.15
70	131.20	332	0.98	139	241.15	2341	6.93	208	545.30	3666	10.86
71	132.20	703	2.08	140	242.15	3157	9.35	209	546.30	4534	13.43
72	133.20	946	2.80	141	243.25	991	2.93	210	547.25	1122	3.32
73	134.20	370	1.10	142	244.15	5586	16.54	211	548.15	686	2.03
74	135.20	602	1.78	143	245.15	702	2.08	212	549.10	242	0.72
75	137.20	324	0.96	144	246.15	1116	3.30	213	550.10	311	0.92
76	138.20	313	0.93	145	248.10	225	0.67	214	551.10	215	0.64
77	139.15	868	2.57	146	254.10	257	0.76	215	552.30	695	2.06
78	140.10	1078	3.19	147	256.10	231	0.68	216	553.30	588	1.74

dimethyl 5,5'-diselanediyylbis(2-(2-chloroacetamido) benzoate) (9).

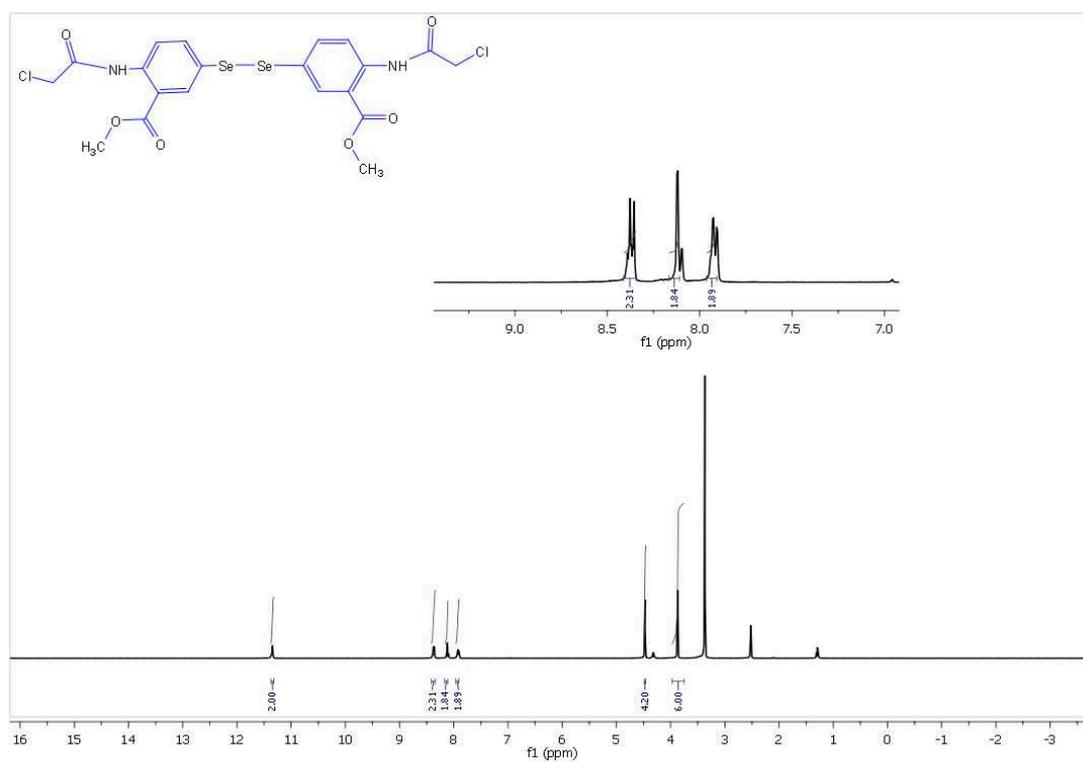


Figure S21. <sup>1</sup>H NMR chart of compound 9

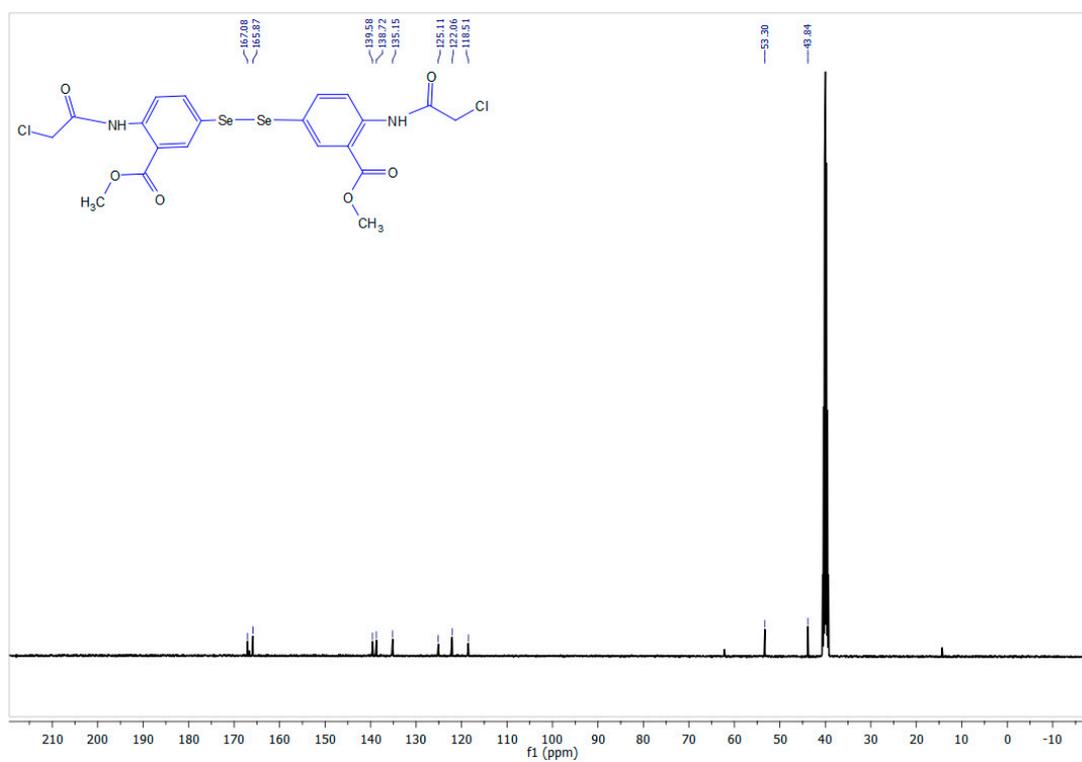
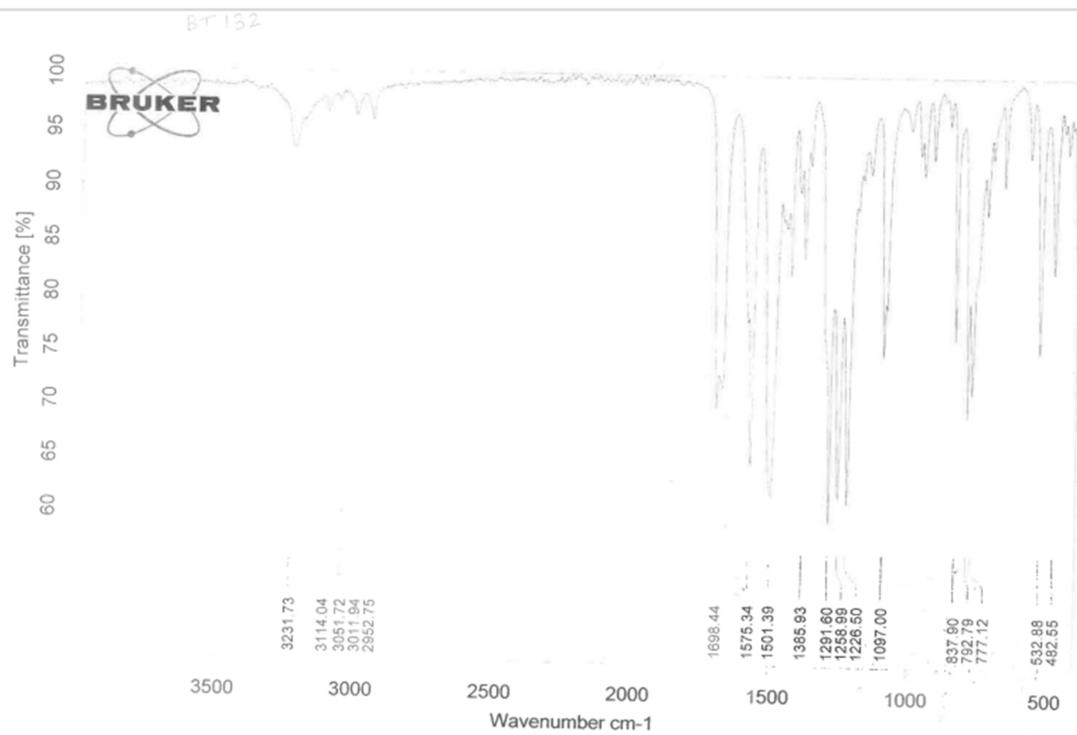
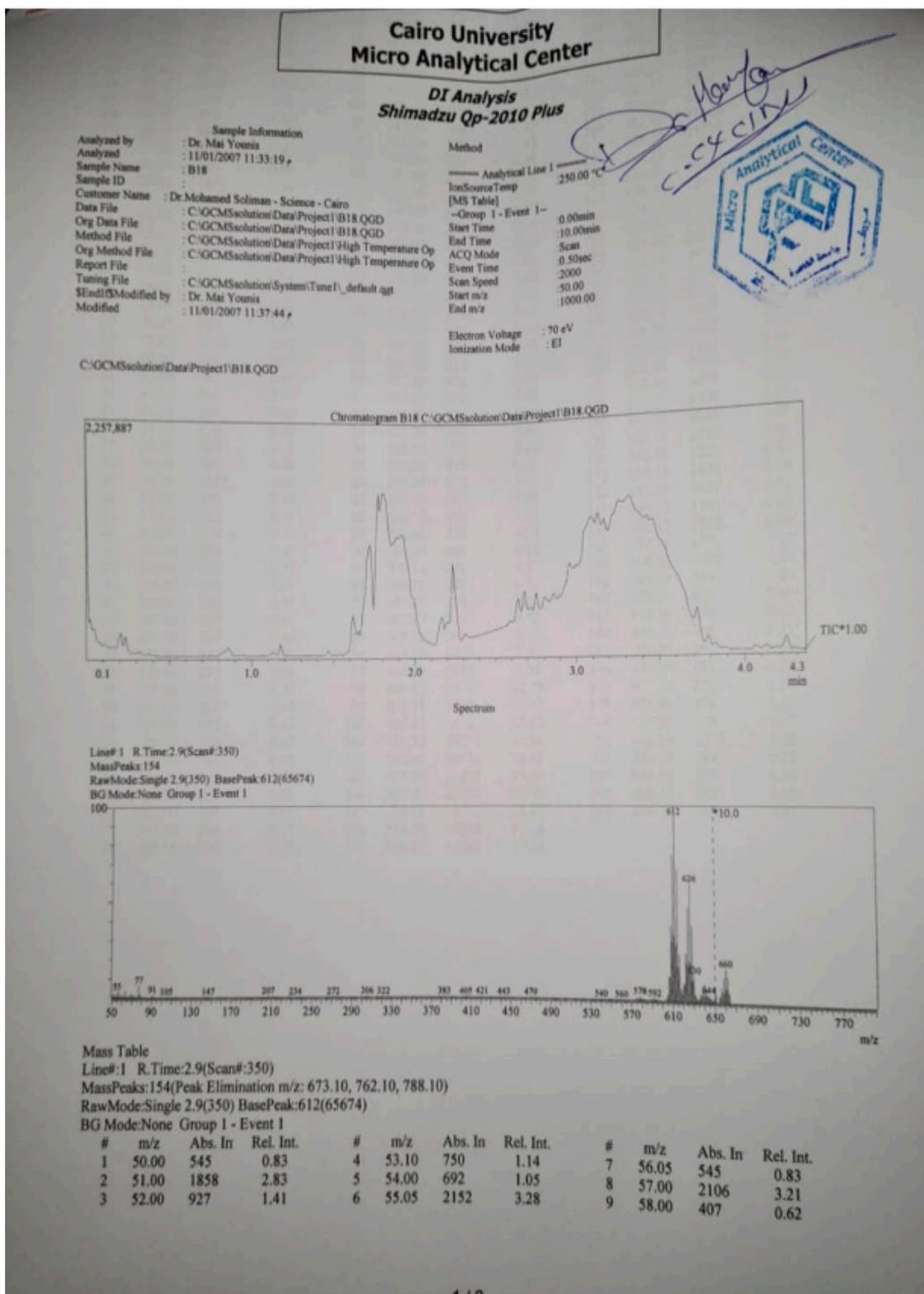


Figure S22. <sup>13</sup>C NMR chart of compound 9



**Figure S23.** IR chart of compound **9**



**Figure S24. Mass chart of compound 9**

#	m/z	Abs. In	Rel. Int.	#	m/z	Abs. In	Rel. Int.	#	m/z	Abs. In	Rel. Int.
10	59.05	954	1.45	59	407.00	273	0.42	108	616.10	15687	23.89
11	60.05	1042	1.59	60	421.00	374	0.57	109	617.10	3929	5.98
12	61.10	380	0.58	61	435.00	201	0.31	110	618.15	4328	6.59
13	61.95	614	0.93	62	443.00	215	0.33	111	619.15	2547	3.88
14	63.05	2356	3.59	63	470.00	292	0.44	112	620.15	5955	9.07
15	64.10	710	1.08	64	472.00	268	0.41	113	621.15	5755	8.76
16	65.10	558	0.85	65	540.00	218	0.33	114	622.15	16067	24.46
17	66.10	282	0.43	66	544.00	215	0.33	115	623.15	12409	18.89
18	67.15	803	1.22	67	548.00	354	0.54	116	624.15	31335	47.71
19	68.10	415	0.63	68	550.00	210	0.32	117	625.15	13327	20.29
20	69.10	1537	2.34	69	552.00	255	0.39	118	626.15	39401	59.99
21	70.10	551	0.84	70	560.00	246	0.37	119	627.15	12515	19.06
22	71.10	1018	1.55	71	562.00	231	0.35	120	628.15	25447	38.75
23	73.05	824	1.25	72	574.00	569	0.87	121	629.10	6876	10.47
24	74.00	465	0.71	73	575.00	402	0.61	122	630.15	8710	13.26
25	75.00	278	0.42	74	576.10	1110	1.69	123	631.15	2531	3.85
26	76.05	703	1.07	75	577.00	353	0.54	124	632.15	2020	3.08
27	77.05	4277	6.51	76	578.00	1385	2.11	125	633.20	815	1.24
28	78.05	980	1.49	77	579.20	434	0.66	126	634.15	1129	1.72
29	79.05	1359	2.07	78	580.20	778	1.18	127	635.15	1040	1.58
30	80.00	284	0.43	79	581.20	217	0.33	128	636.20	2655	4.04
31	81.00	262	0.40	80	582.20	436	0.66	129	637.20	2030	3.09
32	83.00	462	0.70	81	583.20	278	0.42	130	638.15	4478	6.82
33	84.00	286	0.44	82	585.20	234	0.36	131	639.15	2428	3.70
34	85.00	274	0.42	83	587.20	327	0.50	132	640.20	6089	9.27
35	89.00	209	0.32	84	588.20	327	0.50	133	641.15	2269	3.45
36	90.00	250	0.38	85	589.20	415	0.63	134	642.15	4222	6.43
37	91.00	1057	1.61	86	590.20	673	1.02	135	643.15	1834	2.79
38	92.00	278	0.42	87	591.10	295	0.45	136	644.15	2467	3.76
39	93.00	223	0.34	88	592.15	860	1.31	137	645.15	1182	1.80
40	99.00	204	0.31	89	593.10	378	0.58	138	646.10	1898	2.89
41	105.00	284	0.43	90	594.10	602	0.92	139	647.15	677	1.03
42	115.00	210	0.32	91	595.10	276	0.42	140	648.10	1182	1.80
43	125.00	204	0.31	92	596.10	281	0.43	141	649.10	454	0.69
44	147.00	206	0.31	93	597.10	218	0.33	142	650.10	526	0.80
45	207.00	407	0.62	94	602.10	346	0.53	143	651.10	260	0.40
46	209.00	300	0.46	95	603.10	295	0.45	144	654.10	201	0.31
47	212.00	527	0.80	96	604.10	1833	2.79	145	655.10	202	0.31
48	234.00	223	0.34	97	605.15	2195	3.34	146	656.10	481	0.73
49	272.00	209	0.32	98	606.15	8221	12.52	147	657.10	326	0.50
50	304.00	286	0.44	99	607.15	8098	12.33	148	658.20	833	1.27
51	306.00	415	0.63	100	608.10	25362	38.62	149	659.20	377	0.57
52	308.00	426	0.65	101	609.15	19573	29.80	150	660.20	1118	1.70
53	320.00	313	0.48	102	610.10	49014	74.63	151	661.10	494	0.75
54	322.00	276	0.42	103	611.15	21892	33.33	152	662.10	855	1.30
55	326.00	204	0.31	104	612.10	65674	100.00	153	663.10	343	0.52
56	383.00	305	0.46	105	613.15	18961	28.87	154	664.10	310	0.47
57	391.00	206	0.31	106	614.10	44318	67.48				
58	405.00	230	0.35	107	615.15	11267	17.16				

Mass chart of compound 9

dimethyl 5,5'-diselanediyldis(2-(2-phenoxyacetamido) benzoate) (10).

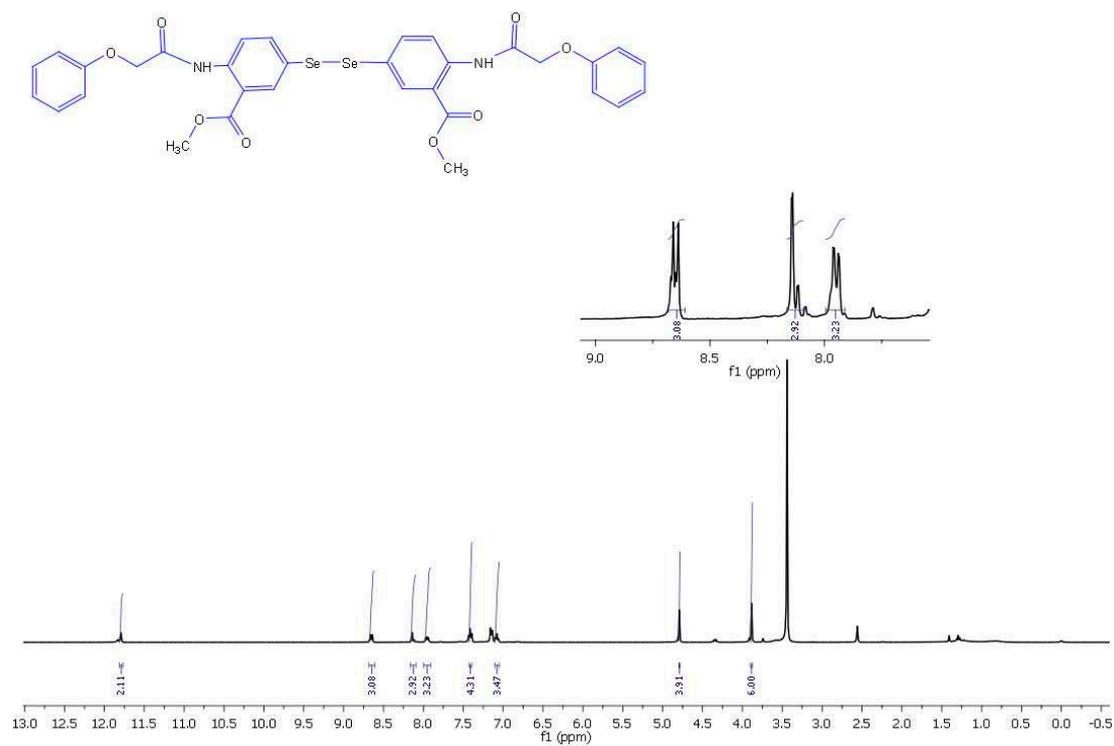


Figure S25. <sup>1</sup>H NMR chart of compound 10

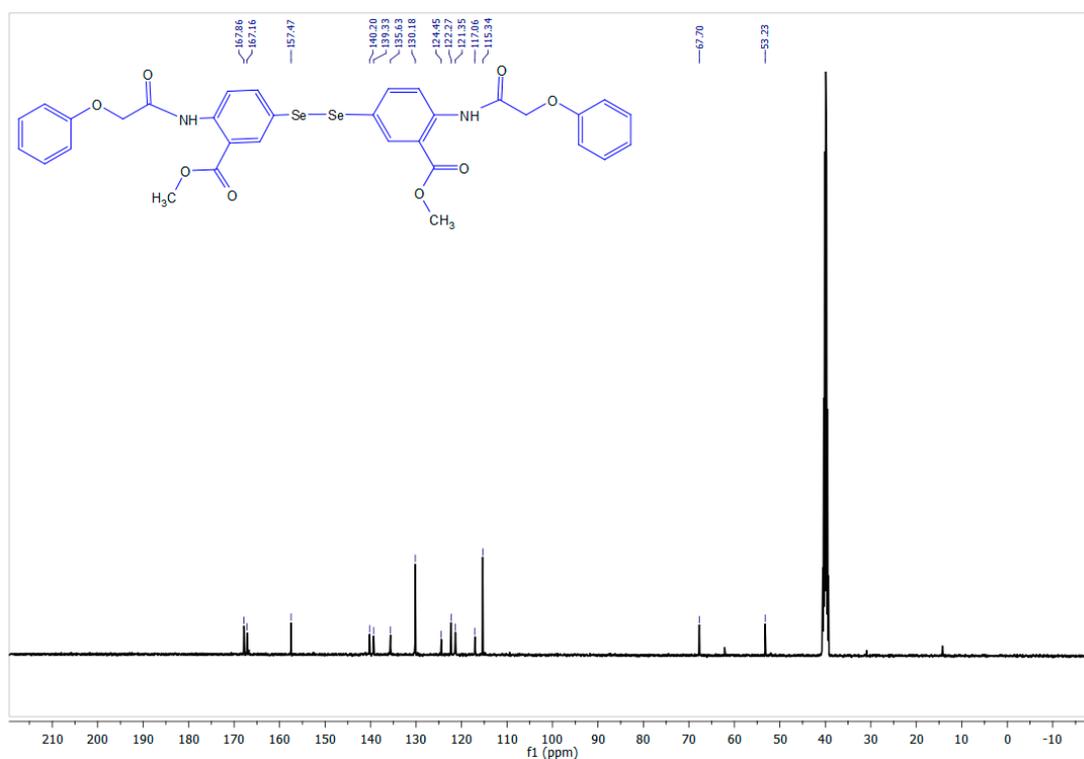
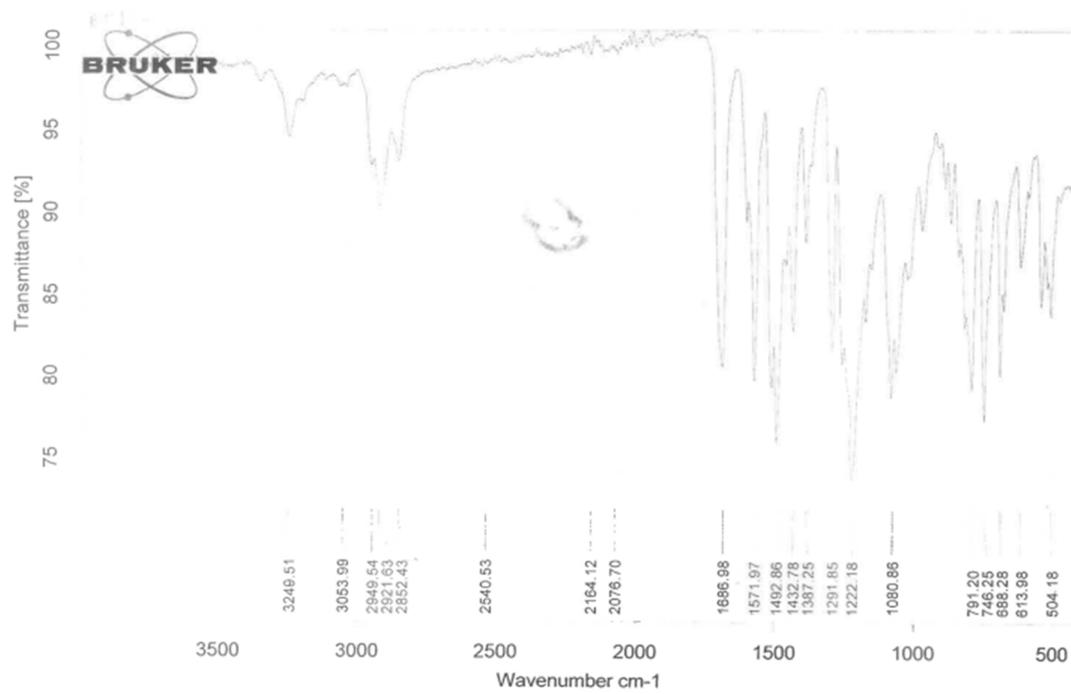


Figure S26. <sup>13</sup>C NMR chart of compound 10



**Figure S27.** IR chart of compound **10**

**Cairo University  
Micro Analytical Center**

**DI Analysis  
Shimadzu Qp-2010 Plus**

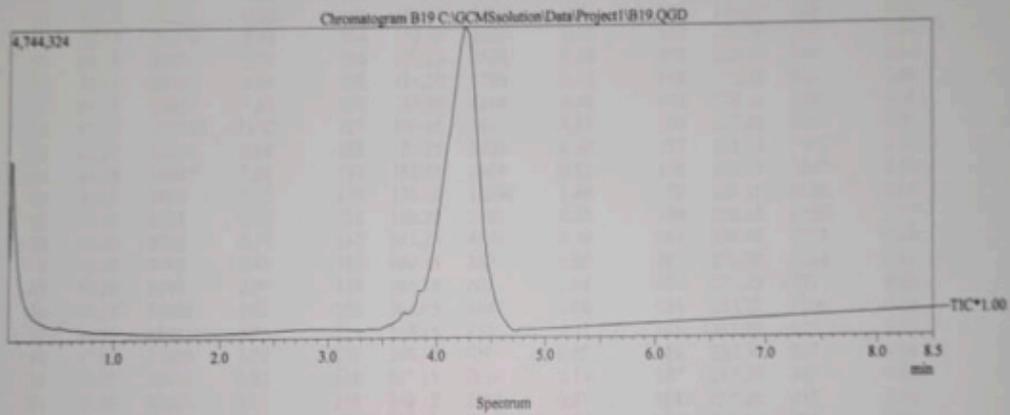
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 Analyzed : 10/01/2007 01:52:05  
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 Customer Name : Dr. Mohamed Soliman - Science - Cairo  
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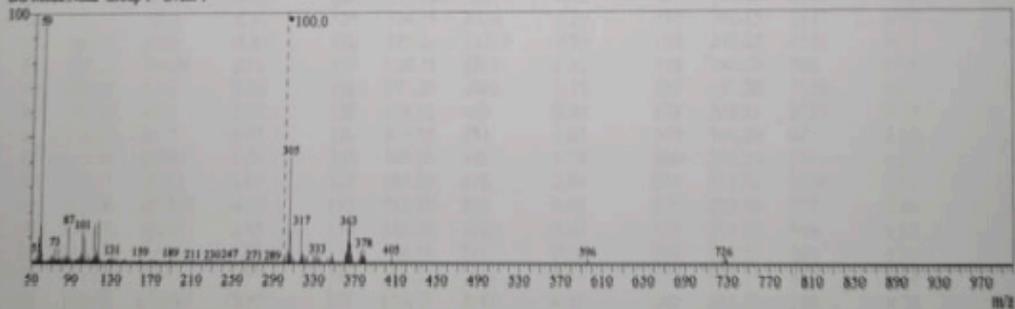
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 BG Mode:None Group 1 - Event 1



Mass Table

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MassPeaks:273

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BG Mode:None Group 1 - Event 1

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1	50.15	2698	0.22	4	53.10	3495	0.28	7	56.15	19746	1.60
2	51.05	9293	0.75	5	54.15	5683	0.46	8	57.10	123422	9.99
3	52.05	2888	0.23	6	55.10	37022	3.00	9	58.15	183707	14.87

Figure S28. Mass chart of compound 10

#	m/z	Abs. In	Rel. Int.	#	m/z	Abs. In	Rel. Int.	#	m/z	Abs. In	Rel. Int.
10	59.10	123580	100.00	79	128.25	9913	0.80	148	197.15	1106	0.09
11	60.05	51056	4.13	80	129.20	12753	1.03	149	198.05	3266	0.26
12	61.10	9529	0.77	81	130.25	6350	0.51	150	199.20	1182	0.10
13	62.15	1694	0.14	82	131.20	27886	2.26	151	200.15	1450	0.12
14	63.10	4455	0.36	83	132.25	5385	0.44	152	201.25	5737	0.46
15	64.15	2465	0.20	84	133.20	8585	0.69	153	202.20	1385	0.11
16	65.10	7606	0.62	85	134.25	2900	0.23	154	203.25	2177	0.18
17	66.15	3107	0.25	86	135.25	16736	1.35	155	204.25	591	0.05
18	67.10	8836	0.72	87	136.25	1396	0.11	156	205.30	774	0.06
19	68.15	5741	0.46	88	137.20	1366	0.11	157	206.10	412	0.03
20	69.10	29596	2.39	89	138.25	929	0.08	158	207.05	1397	0.11
21	70.15	13485	1.09	90	139.20	3474	0.28	159	208.10	1767	0.14
22	71.10	35452	2.87	91	140.25	2026	0.16	160	209.05	3204	0.26
23	72.15	16940	1.37	92	141.20	4914	0.40	161	210.15	1494	0.12
24	73.10	68638	5.55	93	142.25	4078	0.33	162	211.05	5748	0.47
25	74.15	7886	0.64	94	143.20	18249	1.48	163	212.15	1930	0.16
26	75.15	16723	1.35	95	144.20	4407	0.36	164	213.15	2716	0.22
27	76.15	7868	0.64	96	145.20	7615	0.62	165	214.25	634	0.05
28	77.10	68041	5.51	97	146.25	2609	0.21	166	215.30	631	0.05
29	78.15	8611	0.70	98	147.20	2892	0.23	167	216.20	326	0.03
30	79.15	20331	1.65	99	148.20	695	0.06	168	217.25	1847	0.15
31	80.15	4425	0.36	100	149.20	524	0.04	169	218.20	431	0.03
32	81.10	18788	1.52	101	150.25	768	0.06	170	219.25	888	0.07
33	82.15	6220	0.50	102	151.15	3815	0.31	171	220.30	226	0.02
34	83.15	31274	2.53	103	152.20	1241	0.10	172	221.30	362	0.03
35	84.15	8991	0.73	104	153.25	2176	0.18	173	222.10	444	0.04
36	85.15	32933	2.66	105	154.25	1750	0.14	174	223.05	502	0.04
37	86.15	22687	1.84	106	155.20	4334	0.35	175	224.10	748	0.06
38	87.15	175790	14.22	107	156.15	1810	0.15	176	225.20	826	0.07
39	88.15	11668	0.94	108	157.25	3483	0.28	177	226.15	1951	0.16
40	89.15	19847	1.61	109	158.25	2669	0.22	178	227.25	2247	0.18
41	90.15	3460	0.28	110	159.20	18396	1.49	179	228.15	2010	0.16
42	91.10	8958	0.72	111	160.20	2502	0.20	180	229.15	2126	0.17
43	92.25	2326	0.19	112	161.20	4391	0.36	181	230.10	3233	0.26
44	93.15	4945	0.40	113	162.15	562	0.05	182	231.30	1500	0.12
45	94.20	6799	0.55	114	163.15	601	0.05	183	232.25	751	0.06
46	95.15	17605	1.42	115	164.05	1041	0.08	184	233.25	1206	0.10
47	96.25	6501	0.53	116	165.15	911	0.07	185	234.30	623	0.05
48	97.15	21616	1.75	117	166.15	916	0.07	186	235.30	537	0.04
49	98.25	10122	0.82	118	167.15	2014	0.16	187	237.30	343	0.03
50	99.20	43671	3.53	119	168.15	2058	0.17	188	238.20	457	0.04
51	100.25	31258	2.53	120	169.15	6783	0.55	189	239.20	786	0.06
52	101.15	153243	12.40	121	170.15	3140	0.25	190	240.15	1168	0.09
53	102.25	24631	1.99	122	171.20	4726	0.38	191	241.15	1605	0.13
54	103.20	126102	10.20	123	172.25	2644	0.21	192	242.15	1190	0.10
55	104.20	9614	0.78	124	173.25	5320	0.43	193	243.15	2822	0.23
56	105.15	3811	0.31	125	174.35	2414	0.20	194	244.15	1111	0.09
57	106.25	4406	0.36	126	175.25	11526	0.93	195	245.20	1655	0.13
58	107.15	31609	2.56	127	176.25	1872	0.15	196	246.35	792	0.06
59	108.20	4266	0.35	128	177.20	1862	0.15	197	247.30	7518	0.61
60	109.20	4473	0.36	129	178.15	463	0.04	198	248.25	2307	0.19
61	110.25	3933	0.32	130	179.20	351	0.03	199	249.20	607	0.05
62	111.20	20081	1.62	131	180.20	449	0.04	200	250.20	201	0.02
63	112.25	23111	1.87	132	181.20	618	0.05	201	251.30	1330	0.11
64	113.20	181367	14.68	133	182.10	582	0.05	202	252.30	372	0.03
65	114.25	32131	2.60	134	183.20	1009	0.08	203	253.30	346	0.03
66	115.20	56626	4.58	135	184.15	771	0.06	204	254.30	282	0.02
67	116.25	32977	2.67	136	185.20	1758	0.14	205	255.15	530	0.04
68	117.20	203367	16.46	137	186.25	2042	0.17	206	256.20	398	0.03
69	118.20	16386	1.33	138	187.20	2170	0.18	207	257.20	1063	0.09
70	119.20	7193	0.58	139	188.25	1449	0.12	208	258.35	802	0.06
71	120.20	1370	0.11	140	189.25	13930	1.13	209	259.30	5948	0.48
72	121.25	1279	0.10	141	190.15	2482	0.20	210	260.25	1128	0.09
73	122.20	641	0.05	142	191.25	1682	0.14	211	261.30	1122	0.09
74	123.20	1988	0.16	143	192.35	657	0.05	212	262.30	423	0.03
75	124.25	935	0.08	144	193.30	4294	0.35	213	263.30	452	0.04
76	125.25	3399	0.28	145	194.25	982	0.08	214	265.30	354	0.03
77	126.25	5894	0.48	146	195.05	1093	0.09	215	269.30	262	0.02
78	127.25	20610	1.67	147	196.05	1690	0.14	216	270.30	220	0.02

#	m/z	Abs. In	Rel. Int.	#	m/z	Abs. In	Rel. Int.	#	m/z	Abs. In	Rel. Int.
217	271.30	897	0.07	236	305.40	5145	0.42	255	361.35	496	0.04
218	272.30	358	0.03	237	306.35	1560	0.13	256	362.30	1012	0.08
219	273.40	642	0.05	238	307.40	399	0.03	257	363.35	1701	0.14
220	274.40	302	0.02	239	309.40	244	0.02	258	364.30	2038	0.16
221	275.40	406	0.03	240	316.40	233	0.02	259	365.25	907	0.07
222	276.40	212	0.02	241	317.40	1713	0.14	260	366.30	455	0.04
223	277.20	591	0.05	242	318.40	458	0.04	261	367.30	238	0.02
224	283.20	225	0.02	243	319.40	343	0.03	262	374.30	204	0.02
225	285.40	577	0.05	244	321.40	233	0.02	263	375.50	628	0.05
226	286.40	340	0.03	245	323.40	308	0.02	264	376.50	380	0.03
227	287.40	542	0.04	246	329.40	319	0.03	265	377.50	298	0.02
228	288.40	244	0.02	247	331.40	287	0.02	266	378.40	642	0.05
229	289.35	635	0.05	248	333.40	338	0.03	267	379.40	314	0.03
230	290.30	287	0.02	249	335.40	244	0.02	268	380.40	204	0.02
231	291.30	382	0.03	250	343.40	202	0.02	269	405.40	286	0.02
232	293.30	308	0.02	251	346.40	247	0.02	270	596.40	217	0.02
233	301.30	255	0.02	252	347.40	462	0.04	271	726.40	231	0.02
234	303.45	574	0.05	253	348.40	247	0.02	272	728.40	281	0.02
235	304.40	390	0.03	254	360.40	358	0.03	273	729.40	209	0.02

4,4'-((diselenediylbis(2-(methoxycarbonyl)-4,1-phenylene)) bis(azanediy)) bis (4-oxobutanoic acid (**11**)).

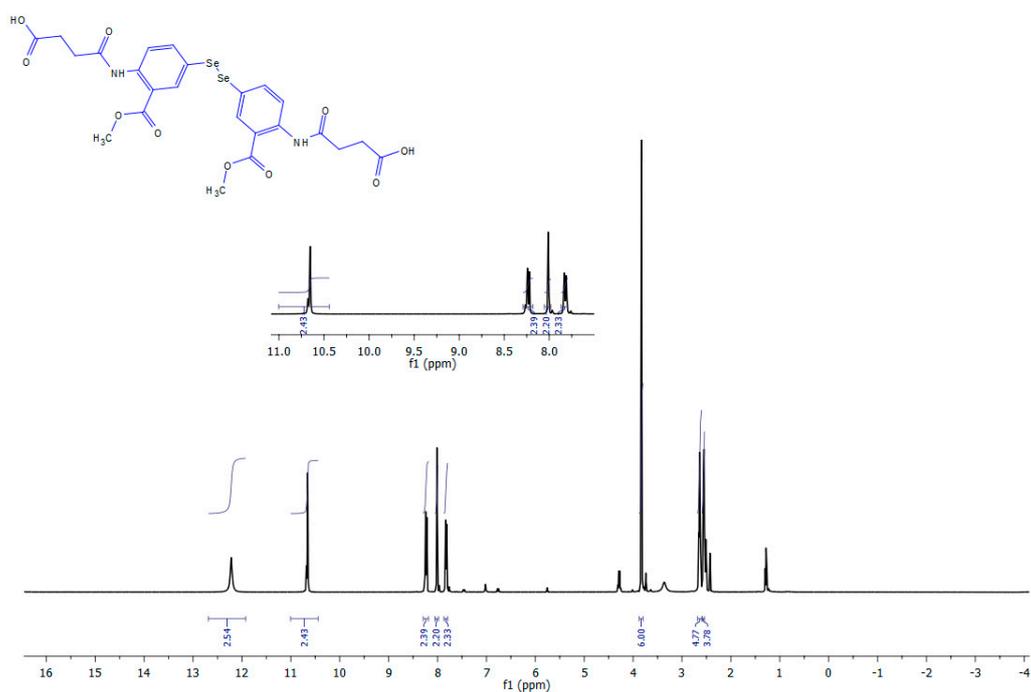


Figure S29. <sup>1</sup>H NMR chart of compound 11

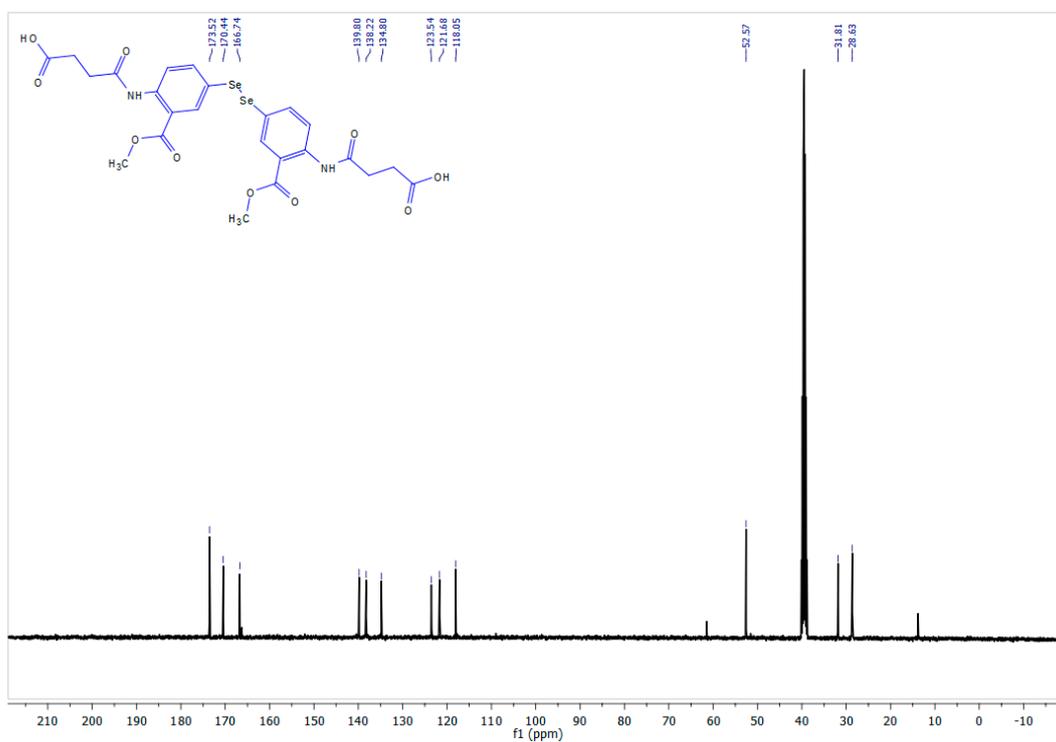
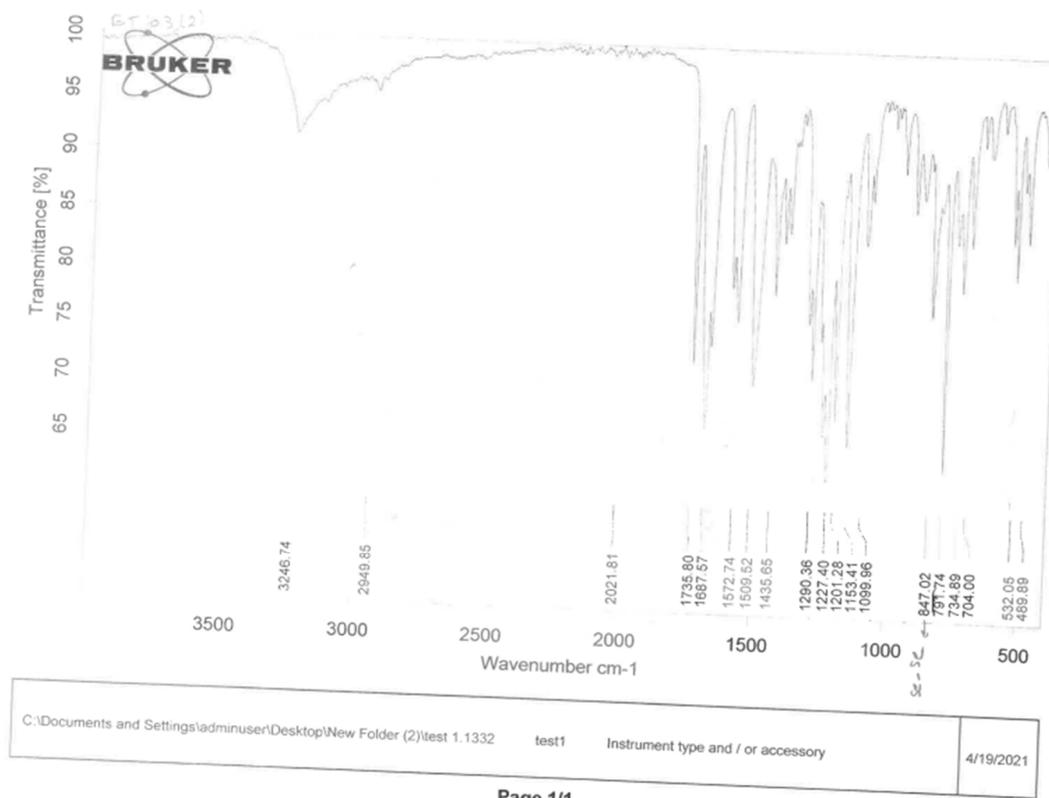


Figure S30. <sup>13</sup>C NMR chart of compound 11



Page 1/1

Figure S31. IR chart of compound 11

**Cairo University  
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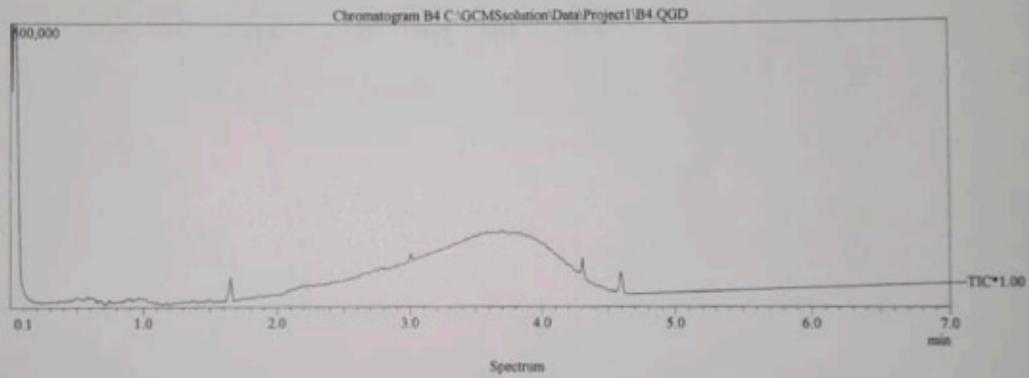
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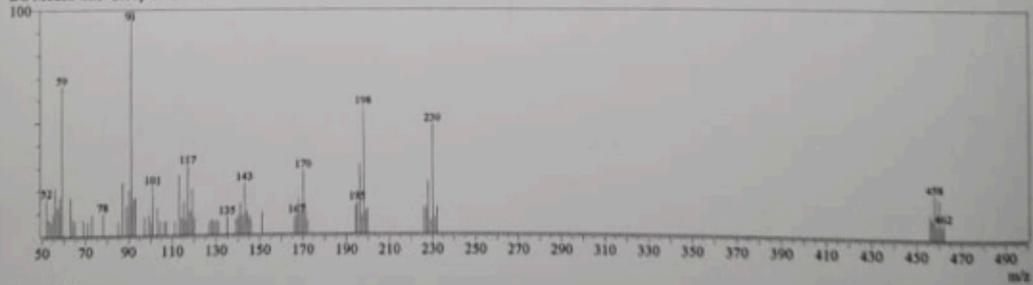
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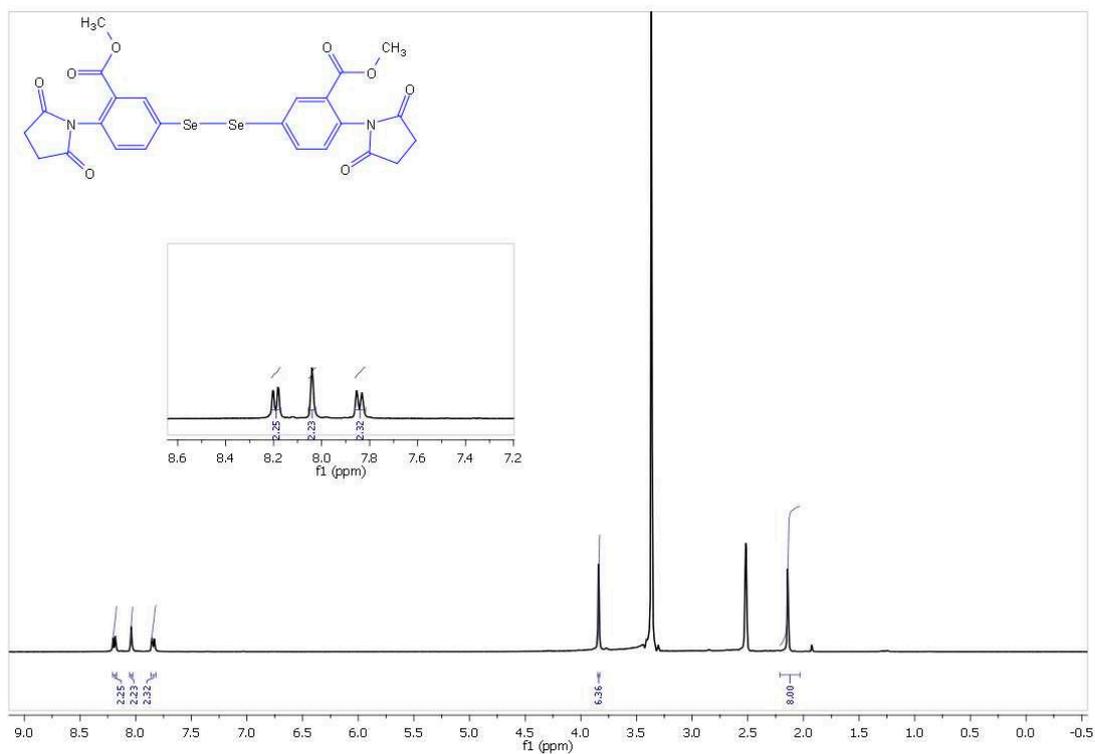
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#	m/z	Abs. In	Rel. Int.	#	m/z	Abs. In	Rel. Int.	#	m/z	Abs. In	Rel. Int.
1	52.00	598	16.15	4	55.05	361	9.75	7	58.15	626	16.91
2	53.00	262	7.08	5	56.00	780	21.07	8	59.05	2447	66.10
3	54.00	220	5.94	6	57.10	463	12.51	9	63.00	620	16.75

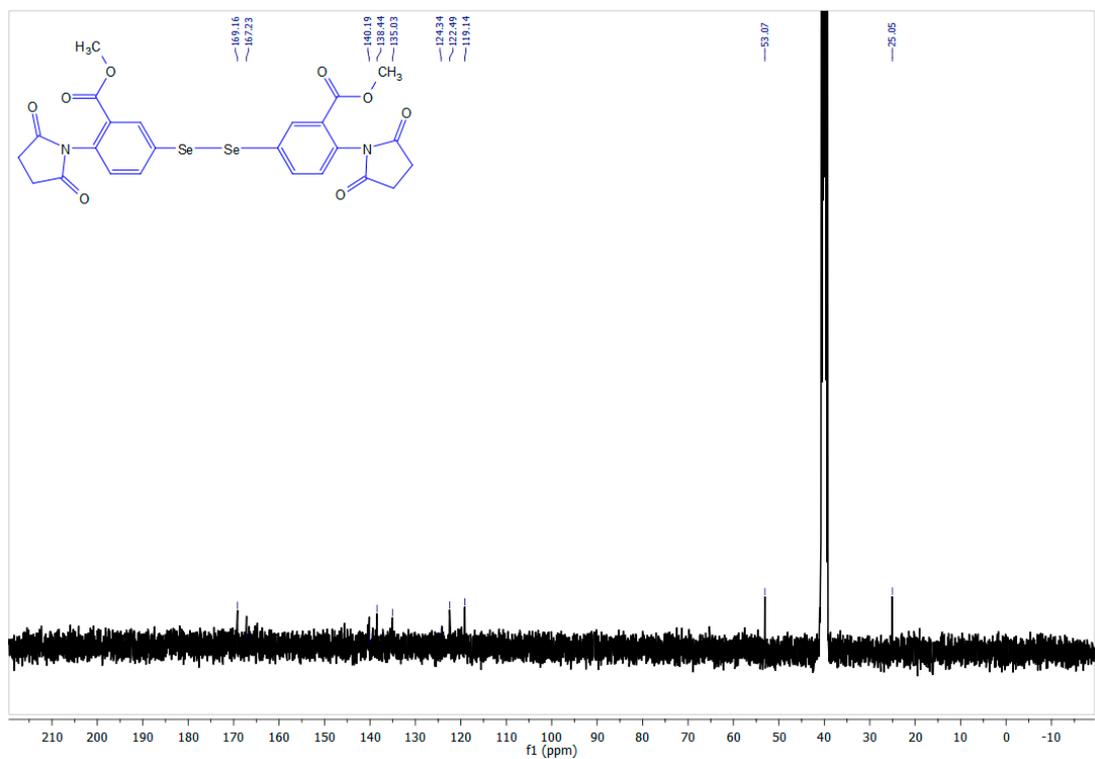
**Figure S32. Mass chart of compound 11**

#	m/z	Abs. In	Rel. Int.	#	m/z	Abs. In	Rel. Int.	#	m/z	Abs. In	Rel. Int.
10	64.00	270	7.29	35	116.10	262	7.08	60	170.95	510	13.78
11	65.00	234	6.32	36	117.10	1126	30.42	61	172.00	222	6.00
12	69.00	254	6.86	37	118.10	388	10.48	62	194.05	462	12.48
13	71.00	220	5.94	38	119.10	758	20.48	63	195.05	505	13.64
14	73.00	335	9.05	39	120.10	289	7.81	64	196.05	1148	31.01
15	78.00	354	9.56	40	127.10	217	5.86	65	197.05	314	8.48
16	85.00	222	6.00	41	128.10	244	6.59	66	198.00	2086	56.35
17	87.15	873	23.58	42	129.10	214	5.78	67	198.95	381	10.29
18	89.10	486	13.13	43	130.10	247	6.67	68	199.90	409	11.05
19	90.15	748	20.21	44	131.10	212	5.73	69	226.15	416	11.24
20	91.15	3702	100.00	45	135.10	287	7.75	70	227.10	439	11.86
21	92.20	594	16.05	46	139.10	258	6.97	71	228.10	846	22.85
22	93.05	632	17.07	47	140.10	303	8.18	72	229.10	215	5.81
23	97.10	292	7.89	48	141.00	505	13.64	73	230.05	1796	48.51
24	99.10	335	9.05	49	142.00	314	8.48	74	231.10	278	7.51
25	100.10	218	5.89	50	143.05	840	22.69	75	232.10	430	11.62
26	101.10	798	21.56	51	144.00	372	10.05	76	456.20	398	10.75
27	103.20	449	12.13	52	145.00	313	8.45	77	457.20	319	8.62
28	104.20	231	6.24	53	146.00	249	6.73	78	458.25	706	19.07
29	106.20	214	5.78	54	151.00	358	9.67	79	459.20	209	5.65
30	107.20	233	6.29	55	166.00	284	7.67	80	460.20	654	17.67
31	111.20	206	5.56	56	167.00	297	8.02	81	461.20	204	5.51
32	113.15	978	26.42	57	168.00	606	16.37	82	462.20	249	6.73
33	114.20	276	7.46	58	169.05	320	8.64				
34	115.15	543	14.67	59	170.05	1038	28.04				

*Dimethyl 5,5'-diselanediybis(2-(2,5-dioxopyrrolidin-1-yl) benzoate (12).*



**Figure S33.** <sup>1</sup>H NMR chart of compound 12



**Figure S34.** <sup>13</sup>C NMR chart of compound 12

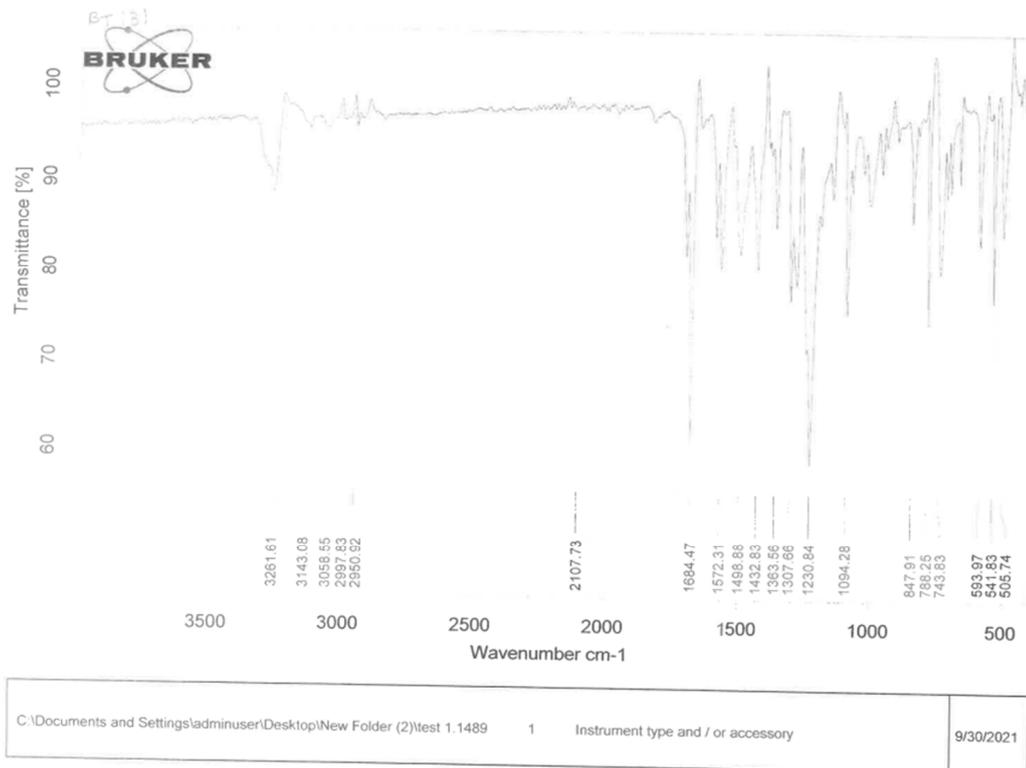


Figure S35. IR chart of compound 12

**Cairo University  
Micro Analytical Center**

**DI Analysis  
Shimadzu Qp-2010 Plus**

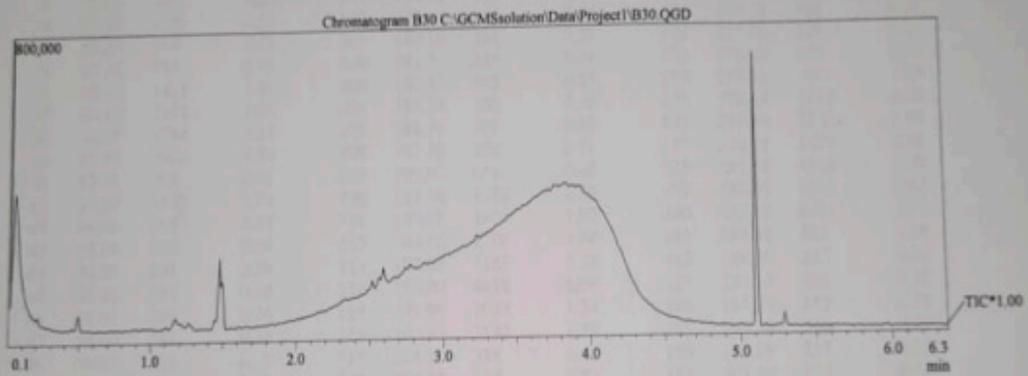
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 Electron Voltage : 70 eV  
 Ionization Mode : EI

*Dr. Hany  
C. Essam*

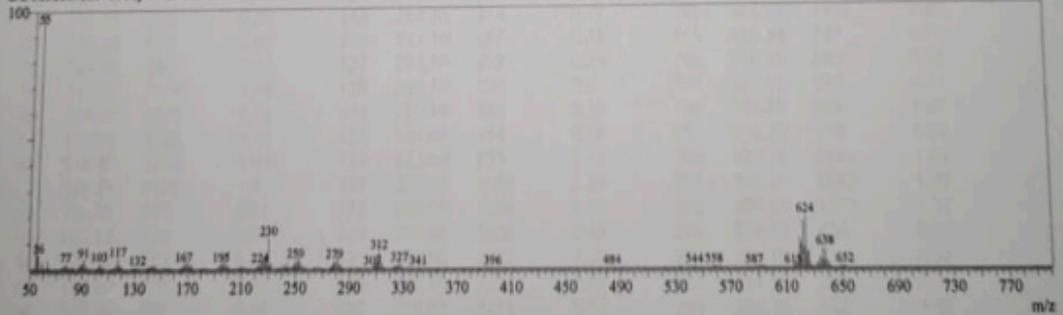


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Spectrum

Line# 1 R.Time:3.8(Scan#:452)  
 MassPeaks:265  
 RawMode:Single 3.8(452) BasePeak:55(76957)  
 BG Mode:None Group 1 - Event 1



Mass Table  
 Line#:1 R.Time:3.8(Scan#:452)  
 MassPeaks:265  
 RawMode:Single 3.8(452) BasePeak:55(76957)  
 BG Mode:None Group 1 - Event 1

#	m/z	Abs. In	Rel. Int.	#	m/z	Abs. In	Rel. Int.	#	m/z	Abs. In	Rel. Int.
1	50.00	295	0.38	4	53.15	727	0.94	7	56.05	4335	5.63
2	51.00	596	0.77	5	54.15	6098	7.92	8	57.10	753	0.98
3	52.00	551	0.72	6	55.05	76957	100.00	9	58.10	346	0.45

**Figure S36. Mass chart of compound 12**

#	m/z	Abs. In	Rel. Int.	#	m/z	Abs. In	Rel. Int.	#	m/z	Abs. In	Rel. Int.
10	59.05	2361	3.07	79	144.15	948	1.23	148	241.15	534	0.69
11	60.05	769	1.00	80	145.10	1273	1.65	149	242.10	1250	1.62
12	61.10	284	0.37	81	146.15	770	1.00	150	243.10	390	0.51
13	62.15	847	1.10	82	148.10	226	0.29	151	244.10	1682	2.19
14	63.10	2718	3.53	83	151.10	551	0.72	152	245.10	369	0.48
15	64.10	796	1.03	84	152.10	236	0.31	153	246.10	542	0.70
16	65.10	623	0.81	85	153.10	394	0.51	154	247.10	399	0.52
17	66.10	353	0.46	86	154.10	369	0.48	155	248.10	938	1.22
18	67.10	374	0.49	87	155.10	340	0.44	156	249.05	1283	1.67
19	69.10	495	0.64	88	156.10	537	0.70	157	250.10	2476	3.22
20	70.10	338	0.44	89	157.10	406	0.53	158	251.15	1626	2.11
21	71.10	439	0.57	90	160.10	297	0.39	159	252.10	3532	4.59
22	73.20	650	0.84	91	164.10	234	0.30	160	253.05	2638	3.43
23	74.20	556	0.72	92	165.10	548	0.71	161	254.00	1634	2.12
24	75.10	860	1.12	93	166.05	806	1.05	162	255.05	588	0.76
25	76.10	1014	1.32	94	167.00	1514	1.97	163	256.15	586	0.76
26	77.10	1638	2.13	95	168.05	1127	1.46	164	258.10	322	0.42
27	78.10	1244	1.62	96	169.00	2329	3.03	165	263.10	228	0.30
28	79.10	572	0.74	97	170.05	1484	1.93	166	264.10	262	0.34
29	80.10	590	0.77	98	171.00	1124	1.46	167	265.10	487	0.63
30	81.10	446	0.58	99	172.10	1340	1.74	168	266.10	266	0.35
31	82.10	874	1.14	100	173.10	929	1.21	169	267.10	633	0.82
32	83.05	682	0.89	101	174.10	346	0.45	170	268.10	322	0.42
33	84.10	410	0.53	102	178.10	265	0.34	171	269.10	202	0.26
34	85.10	359	0.47	103	180.10	284	0.37	172	275.10	226	0.29
35	87.10	737	0.96	104	181.10	335	0.44	173	276.10	348	0.45
36	88.10	1428	1.86	105	182.10	406	0.53	174	277.15	1017	1.32
37	89.10	1534	1.99	106	183.10	303	0.39	175	278.15	1615	2.10
38	90.15	1794	2.33	107	184.10	527	0.68	176	279.10	2262	2.94
39	91.10	2926	3.80	108	192.10	390	0.51	177	280.15	1661	2.16
40	92.05	704	0.91	109	193.00	351	0.46	178	281.10	4306	5.60
41	93.05	1337	1.74	110	194.00	1180	1.53	179	282.05	1565	2.03
42	94.00	268	0.35	111	195.05	1476	1.92	180	283.15	821	1.07
43	95.00	506	0.66	112	196.00	2799	3.64	181	284.10	881	1.14
44	96.00	201	0.26	113	197.05	1155	1.50	182	286.10	247	0.32
45	97.00	354	0.46	114	198.00	4618	6.00	183	290.10	201	0.26
46	98.00	201	0.26	115	199.00	1033	1.34	184	294.10	215	0.28
47	99.00	233	0.30	116	200.05	1152	1.50	185	296.10	226	0.29
48	100.00	238	0.31	117	201.00	385	0.50	186	298.10	257	0.33
49	101.00	330	0.43	118	204.00	234	0.30	187	307.10	274	0.36
50	102.25	730	0.95	119	206.00	239	0.31	188	308.15	1182	1.54
51	103.15	1742	2.26	120	207.00	300	0.39	189	309.15	1355	1.76
52	104.20	1383	1.80	121	208.00	337	0.44	190	310.15	3102	4.03
53	105.10	663	0.86	122	209.10	825	1.07	191	311.15	1824	2.37
54	106.10	506	0.66	123	210.10	361	0.47	192	312.15	4948	6.43
55	107.10	458	0.60	124	211.10	886	1.15	193	313.10	2505	3.26
56	111.10	226	0.29	125	212.10	314	0.41	194	314.10	1455	1.89
57	113.20	519	0.67	126	213.10	265	0.34	195	315.10	545	0.71
58	114.20	394	0.51	127	214.10	278	0.36	196	316.10	249	0.32
59	115.15	1136	1.48	128	216.10	236	0.31	197	322.10	252	0.33
60	116.15	1241	1.61	129	220.10	252	0.33	198	323.20	628	0.82
61	117.15	3180	4.13	130	221.00	454	0.59	199	324.20	718	0.93
62	118.10	1263	1.64	131	222.00	855	1.11	200	325.15	816	1.06
63	119.15	1086	1.41	132	223.05	1068	1.39	201	326.10	1060	1.38
64	120.10	703	0.91	133	223.95	1204	1.56	202	327.15	1320	1.72
65	121.10	226	0.29	134	225.05	2025	2.63	203	328.10	436	0.57
66	127.10	294	0.38	135	226.00	2782	3.62	204	329.10	412	0.54
67	128.10	294	0.38	136	227.10	2271	2.95	205	341.10	270	0.35
68	129.10	497	0.65	137	228.05	4414	5.74	206	396.10	212	0.28
69	130.10	482	0.63	138	229.15	955	1.24	207	484.10	223	0.29
70	131.10	473	0.61	139	230.05	8970	11.66	208	533.10	246	0.32
71	132.20	641	0.83	140	231.05	1386	1.80	209	534.10	217	0.28
72	133.20	566	0.74	141	232.05	1683	2.19	210	540.10	254	0.33
73	136.20	225	0.29	142	233.10	270	0.35	211	542.10	374	0.49
74	139.20	554	0.72	143	236.10	206	0.27	212	544.10	433	0.56
75	140.10	521	0.68	144	237.10	367	0.48	213	545.10	276	0.36
76	141.10	903	1.17	145	238.10	250	0.32	214	556.10	252	0.33
77	142.05	880	1.14	146	239.00	276	0.36	215	557.10	330	0.43
78	143.10	1281	1.66	147	240.05	904	1.17	216	558.10	521	0.68

Mass chart of compound 12

#	m/z	Abs. In	Rel. Int.	#	m/z	Abs. In	Rel. Int.	#	m/z	Abs. In	Rel. Int.
217	559.10	444	0.58	234	617.15	1317	1.71	251	634.20	3026	3.93
218	560.10	386	0.50	235	618.20	3140	4.08	252	635.25	2389	3.10
219	561.10	442	0.57	236	619.25	2905	3.77	253	636.25	5588	7.26
220	562.10	348	0.45	237	620.20	8630	11.21	254	637.20	2172	2.82
221	563.10	326	0.42	238	621.20	6727	8.74	255	638.20	5702	7.41
222	566.10	202	0.26	239	622.20	13474	17.51	256	639.20	1810	2.35
223	587.10	239	0.31	240	623.20	5658	7.35	257	640.20	1945	2.53
224	588.10	202	0.26	241	624.20	14886	19.34	258	641.20	566	0.74
225	589.10	287	0.37	242	625.20	4374	5.68	259	642.20	327	0.42
226	590.10	318	0.41	243	626.20	4846	6.30	260	648.20	294	0.38
227	591.10	550	0.71	244	627.20	1631	2.12	261	649.20	425	0.55
228	592.10	244	0.32	245	628.20	578	0.75	262	650.20	466	0.61
229	593.20	690	0.90	246	629.20	281	0.37	263	651.20	258	0.34
230	594.20	249	0.32	247	630.20	300	0.39	264	652.20	598	0.78
231	595.20	326	0.42	248	631.20	550	0.71	265	653.20	214	0.28
232	615.20	217	0.28	249	632.25	1257	1.63				
233	616.25	961	1.25	250	633.25	1235	1.60				

Mass chart of compound 12

(2Z,2'Z)-4,4'-((diselenediylbis(2-(methoxycarbonyl)-4,1-phenylene)) bis(azanediyl)) bis(4-oxobut-2-enoic acid) (13).

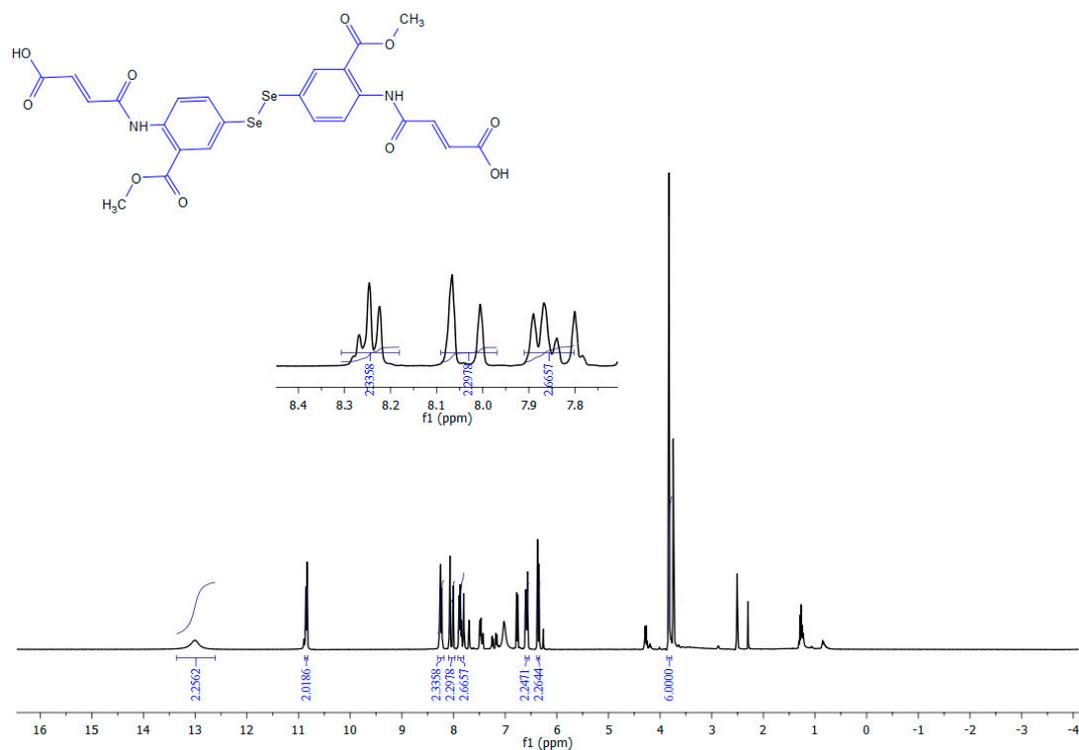


Figure S37. <sup>1</sup>H NMR chart of compound 13

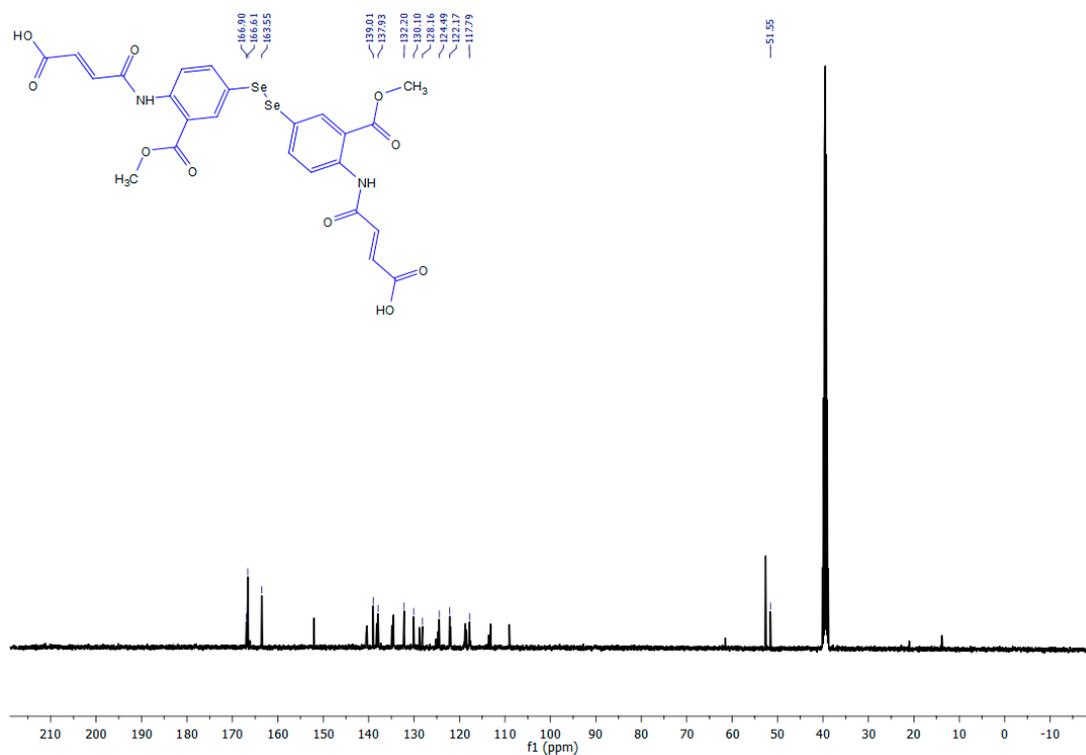
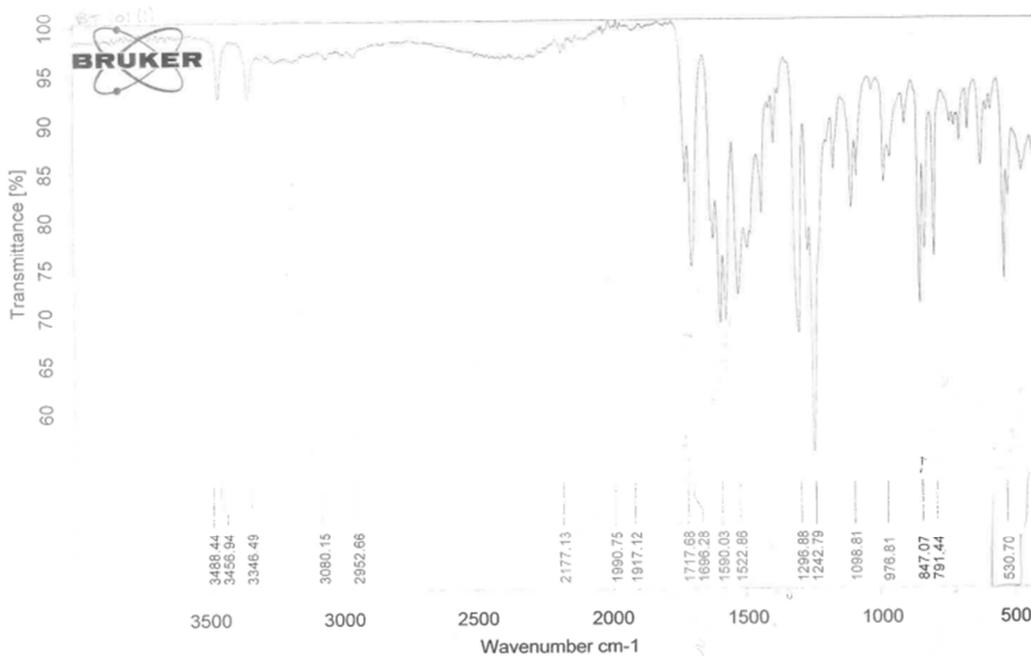


Figure S38. <sup>13</sup>C NMR chart of compound 13



C:\Documents and Settings\adminuser\Desktop\New Folder (2)\test 1.1231	FL-HG-TU	Instrument type and / or accessory	3/16/2021
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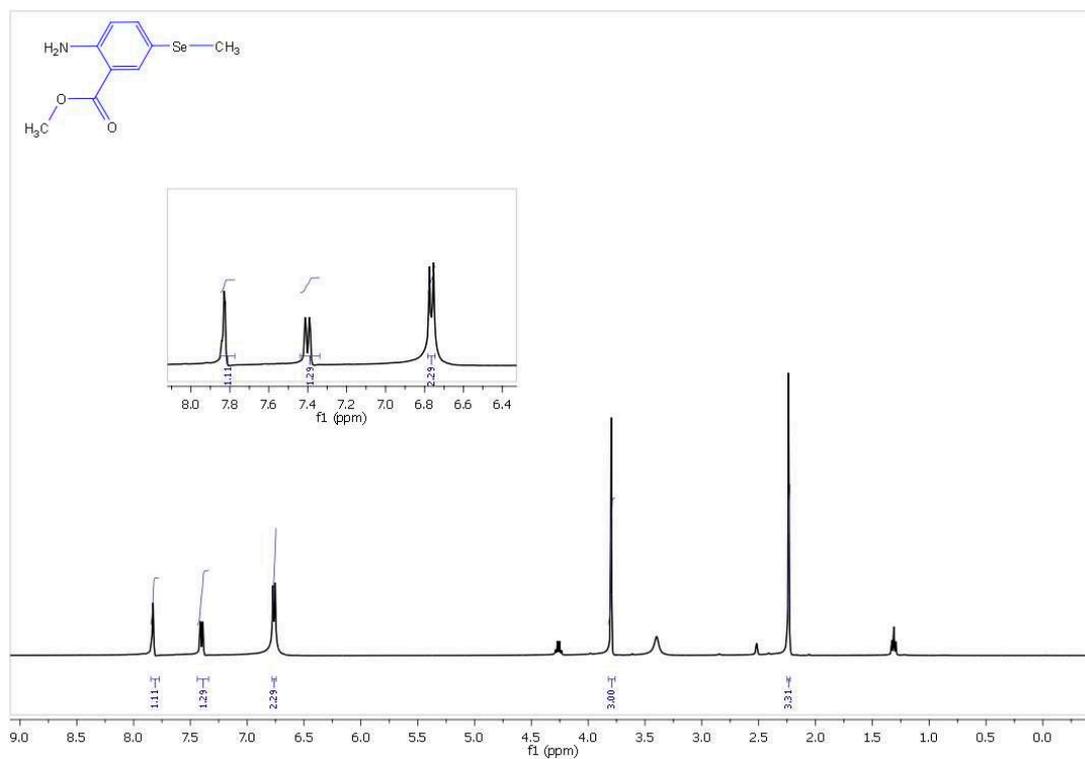
**Figure S39.** IR chart of compound **13**



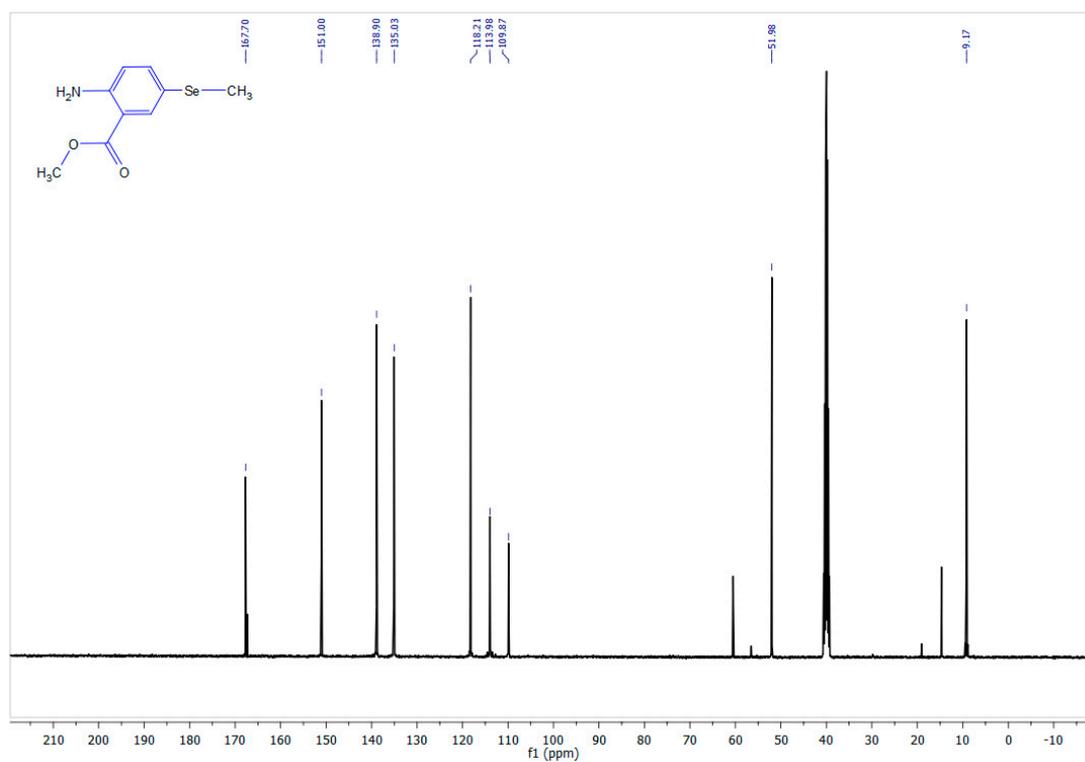
#	m/z	Abs. In	Rel. Int.	#	m/z	Abs. In	Rel. Int.	#	m/z	Abs. In	Rel. Int.
10	59.05	796	3.11	23	72.05	521	2.04	36	92.10	225	0.88
11	60.00	1414	5.53	24	73.00	1263	4.94	37	98.10	209	0.82
12	60.95	613	2.40	25	74.00	391	1.53	38	321.10	258	1.01
13	62.05	489	1.91	26	75.00	334	1.31	39	336.10	350	1.37
14	63.05	1781	6.97	27	76.00	244	0.95	40	378.10	212	0.83
15	64.05	961	3.76	28	76.95	919	3.59	41	380.10	263	1.03
16	65.05	949	3.71	29	78.00	487	1.90	42	429.10	201	0.79
17	66.10	327	1.28	30	79.00	273	1.07	43	431.10	204	0.80
18	67.00	860	3.36	31	81.00	207	0.81	44	647.70	1241	4.85
19	68.15	800	3.13	32	82.00	210	0.82	45	648.65	719	2.81
20	69.05	2439	9.54	33	83.00	279	1.09	46	649.60	246	0.96
21	70.05	817	3.20	34	85.00	239	0.93	47	662.60	518	2.03
22	71.05	1665	6.51	35	91.10	807	3.16	48	663.60	239	0.93

Mass chart of compound 13

*Methyl 2-amino-5-(methylselanyl) benzoate (14).*



**Figure S41.** <sup>1</sup>H NMR chart of compound 14



**Figure S42.** <sup>13</sup>C NMR chart of compound 14

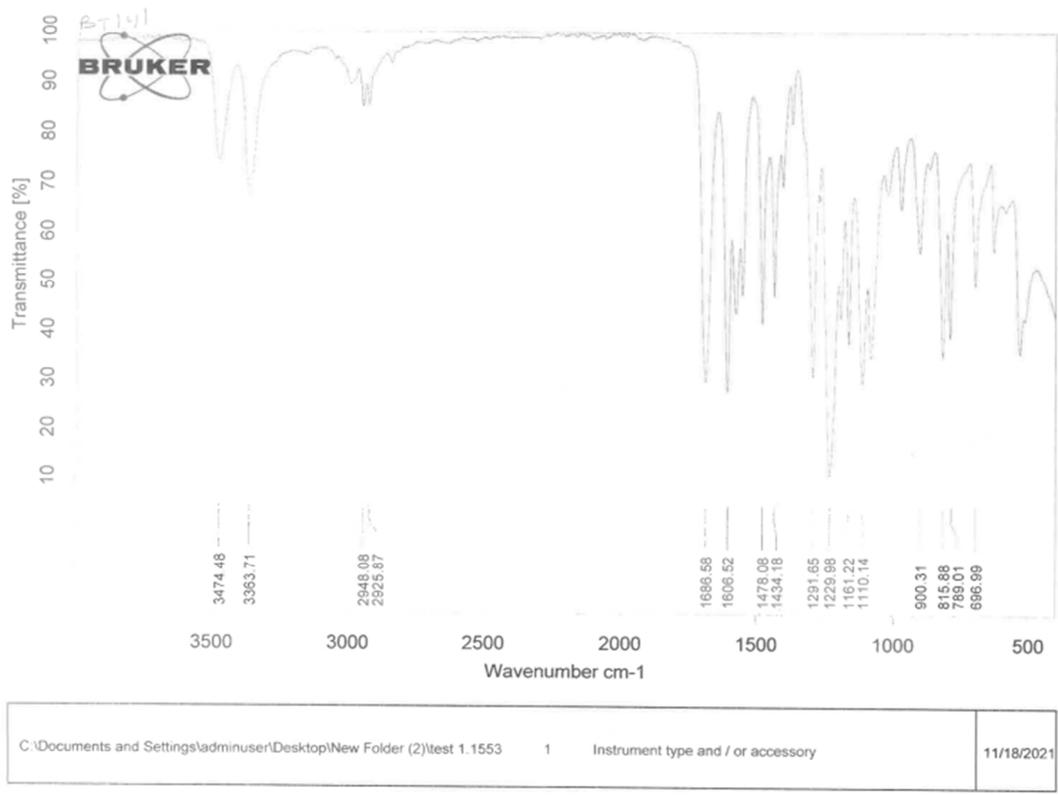


Figure S43. IR chart of compound 14

**Cairo University  
Micro Analytical Center**

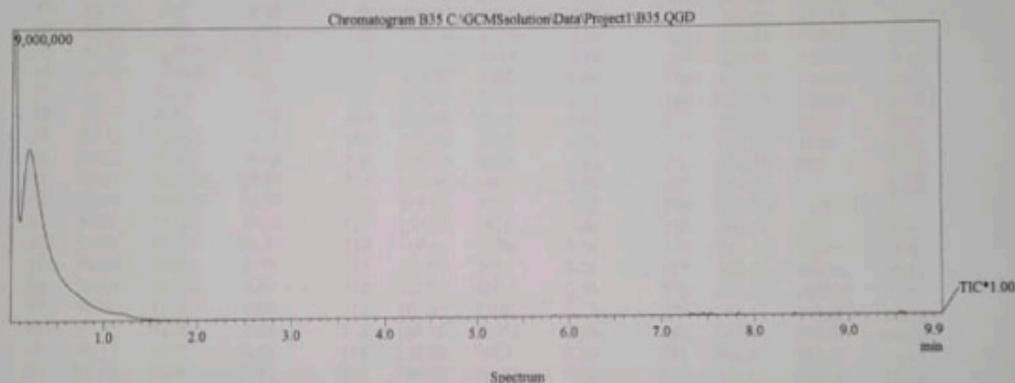
**DI Analysis  
Shimadzu Qp-2010 Plus**

Sample Information  
 Analyzed by : Dr. Mai Younis  
 Analyzed : 16/01/2007 03:02:11  
 Sample Name : B35  
 Sample ID :  
 Customer Name : Dr. Mohamed Soliman - Science - Cairo  
 Data File : C:\GCMSolution\Data\Project1\B35.QGD  
 Org Data File : C:\GCMSolution\Data\Project1\B35.QGD  
 Method File : C:\GCMSolution\Data\Project1\High Temperature Op  
 Org Method File : C:\GCMSolution\Data\Project1\High Temperature Op  
 Report File :  
 Tuning File : C:\GCMSolution\System\Tune1\_default.qgt  
 \$End\$\$Modified by : Dr. Mai Younis  
 Modified : 16/01/2007 03:12:11

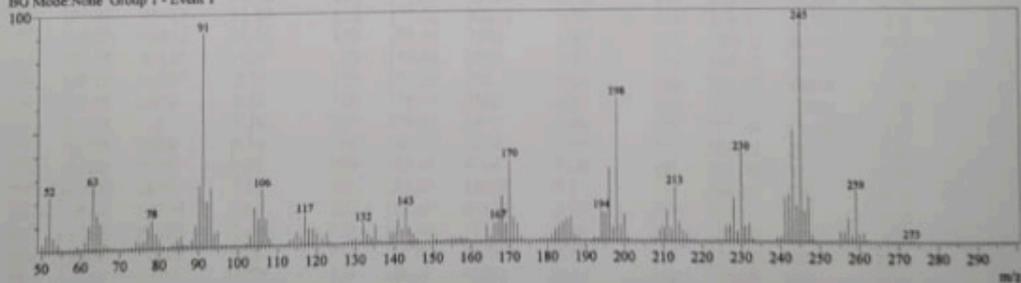
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 Start Time : 0.00min  
 End Time : 10.00min  
 ACQ Mode : Scan  
 Event Time : 0.50sec  
 Scan Speed : 1000  
 Start m/z : 50.00  
 End m/z : 310.00  
 Electron Voltage : 70 eV  
 Ionization Mode : EI



C:\GCMSolution\Data\Project1\B35.QGD



Line#:1 R.Time:0.2(Scan#:26)  
 MassPeaks:205  
 RawMode:Single 0.2(26) BasePeak:245(391154)  
 BG Mode:None Group 1 - Event 1



Mass Table  
 Line#:1 R.Time:0.2(Scan#:26)  
 MassPeaks:205  
 RawMode:Single 0.2(26) BasePeak:245(391154)  
 BG Mode:None Group 1 - Event 1

#	m/z	Abs. In	Rel. Int.	#	m/z	Abs. In	Rel. Int.
1	50.05	10411	2.66	4	53.00	21482	5.49
2	51.05	26260	6.71	5	54.05	11184	2.86
3	52.00	89298	22.83	6	55.00	2246	0.57
				7	56.05	488	0.12
				8	57.05	709	0.18
				9	58.05	1164	0.30

**Figure S44. Mass chart of compound 14**

#	m/z	Abs. In	Rel. Int.	#	m/z	Abs. In	Rel. Int.	#	m/z	Abs. In	Rel. Int.
10	59.00	6150	1.57	76	126.05	2179	0.56	142	195.00	47017	12.02
11	60.05	1575	0.40	77	127.05	3204	0.82	143	196.00	122146	31.23
12	61.05	14415	3.69	78	128.00	4023	1.03	144	197.05	22307	5.70
13	62.05	39733	10.16	79	129.05	5617	1.44	145	198.00	241660	61.78
14	63.05	103836	26.55	80	130.00	7762	1.98	146	198.95	25629	6.55
15	64.05	57318	14.65	81	131.15	4478	1.14	147	200.00	43719	11.18
16	65.05	43819	11.20	82	132.10	33902	8.67	148	200.95	4204	1.07
17	66.10	9838	2.52	83	133.10	15628	4.00	149	201.95	533	0.14
18	67.05	4572	1.17	84	134.15	8746	2.24	150	207.00	2228	0.57
19	68.05	2933	0.75	85	135.10	31116	7.95	151	208.05	2526	0.65
20	69.10	1041	0.27	86	136.15	5476	1.40	152	209.05	20084	5.13
21	70.05	837	0.21	87	137.00	2783	0.71	153	210.05	23473	6.00
22	71.05	1646	0.42	88	138.05	3352	0.86	154	211.00	50268	12.85
23	72.05	1669	0.43	89	139.00	15473	3.96	155	212.05	22070	5.64
24	72.95	2952	0.75	90	140.00	17660	4.51	156	213.00	91327	23.35
25	74.05	12141	3.10	91	141.00	39022	9.98	157	214.00	31220	7.98
26	75.10	10198	2.61	92	142.05	21311	5.45	158	215.00	18164	4.64
27	76.10	12385	3.17	93	143.00	58711	15.01	159	216.00	12508	3.20
28	77.10	36498	9.33	94	144.00	25175	6.44	160	216.95	1191	0.30
29	78.05	47310	12.09	95	145.00	13801	3.53	161	218.00	1618	0.41
30	79.10	24441	6.25	96	146.00	5042	1.29	162	224.00	2599	0.66
31	80.00	15313	3.91	97	147.00	1039	0.27	163	225.05	1510	0.39
32	81.00	4794	1.23	98	148.10	804	0.21	164	226.05	26426	6.76
33	82.55	1873	0.48	99	149.15	1515	0.39	165	227.05	28172	7.20
34	83.55	6981	1.78	100	150.10	13154	3.36	166	228.05	72774	18.60
35	84.55	13095	3.35	101	151.10	4439	1.13	167	229.05	16399	4.19
36	85.50	19868	5.08	102	151.95	1797	0.46	168	230.05	148867	38.06
37	86.10	5970	1.53	103	153.00	3161	0.81	169	231.00	25292	6.47
38	87.05	4792	1.23	104	154.00	3514	0.90	170	232.05	29923	7.65
39	88.10	12948	3.31	105	155.00	5122	1.31	171	233.00	4730	1.21
40	89.10	37161	9.50	106	156.00	4514	1.15	172	233.95	605	0.15
41	90.15	101589	25.97	107	157.05	6492	1.66	173	238.15	734	0.19
42	91.10	358905	91.76	108	158.00	3975	1.02	174	239.10	6298	1.61
43	92.05	75198	19.22	109	159.00	5625	1.44	175	240.15	7887	2.02
44	93.00	97377	24.89	110	160.00	1470	0.38	176	241.10	72847	18.62
45	94.00	22561	5.77	111	161.00	1084	0.28	177	242.10	80234	20.51
46	95.00	26670	6.82	112	162.00	380	0.10	178	243.10	187193	47.86
47	96.00	4114	1.05	113	163.15	1307	0.33	179	244.15	60066	15.36
48	97.05	4225	1.08	114	164.10	28951	7.40	180	245.10	391154	100.00
49	98.35	2449	0.63	115	165.05	9689	2.48	181	246.05	51306	13.12
50	99.30	3386	0.87	116	166.00	30183	7.72	182	247.05	74480	19.04
51	100.25	1374	0.35	117	167.05	33926	8.67	183	248.05	8926	2.28
52	101.05	1757	0.45	118	168.00	75583	19.32	184	249.05	953	0.24
53	102.10	5450	1.39	119	169.05	30276	7.74	185	253.10	1460	0.37
54	103.15	15671	4.01	120	170.00	137220	35.08	186	254.15	1011	0.26
55	104.15	62814	16.06	121	171.00	40180	10.27	187	255.10	15329	3.92
56	105.25	45718	11.69	122	172.00	30348	7.76	188	256.15	16105	4.12
57	106.20	94842	24.25	123	173.00	7290	1.86	189	257.10	40538	10.36
58	107.15	45188	11.55	124	174.00	1239	0.32	190	258.15	9549	2.44
59	108.15	10687	2.73	125	177.20	238	0.06	191	259.10	84319	21.56
60	109.05	2089	0.53	126	178.15	3162	0.81	192	260.05	12047	3.08
61	110.05	710	0.18	127	179.05	1817	0.46	193	261.10	15478	3.96
62	111.05	1314	0.34	128	180.00	3514	0.90	194	262.05	2350	0.60
63	112.05	1199	0.31	129	181.05	9794	2.50	195	263.05	335	0.09
64	113.00	7610	1.95	130	182.00	19970	5.11	196	264.10	220	0.06
65	114.00	10354	2.65	131	183.00	25158	6.43	197	269.15	730	0.19
66	115.00	21430	5.48	132	184.00	31201	7.98	198	270.15	629	0.16
67	116.05	12818	3.28	133	185.00	38050	9.73	199	271.15	1493	0.38
68	117.05	50031	12.79	134	186.00	40924	10.46	200	272.25	533	0.14
69	118.05	27671	7.07	135	187.00	10028	2.56	201	273.15	2823	0.72
70	119.10	26692	6.82	136	188.00	6714	1.72	202	274.20	558	0.14
71	120.10	18391	4.70	137	189.00	868	0.22	203	275.20	654	0.17
72	121.55	12099	3.09	138	191.05	296	0.08	204	276.20	290	0.07
73	122.60	19750	5.05	139	192.00	4826	1.23	205	277.10	369	0.09
74	123.55	4338	1.11	140	193.05	2875	0.74				
75	125.05	1061	0.27	141	194.00	49812	12.73				

Mass chart of compound 14

Methyl 2-amino-5-(benzylselanyl) benzoate (**15**).

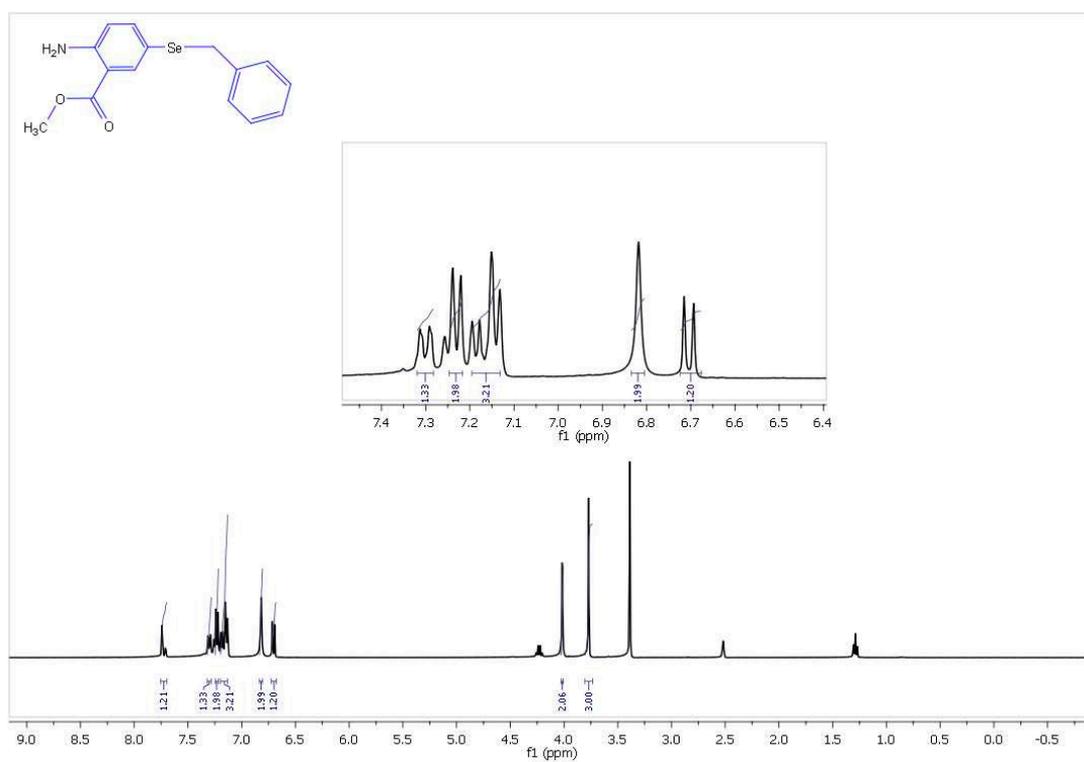


Figure S45. <sup>1</sup>H NMR chart of compound **15**

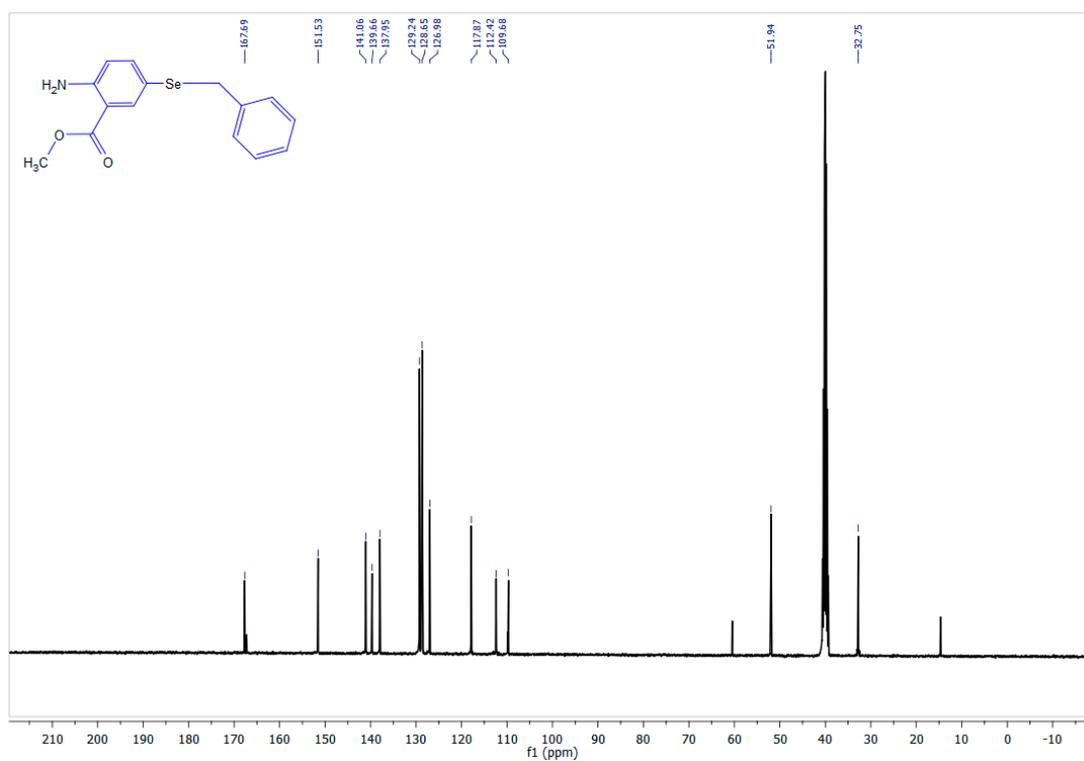
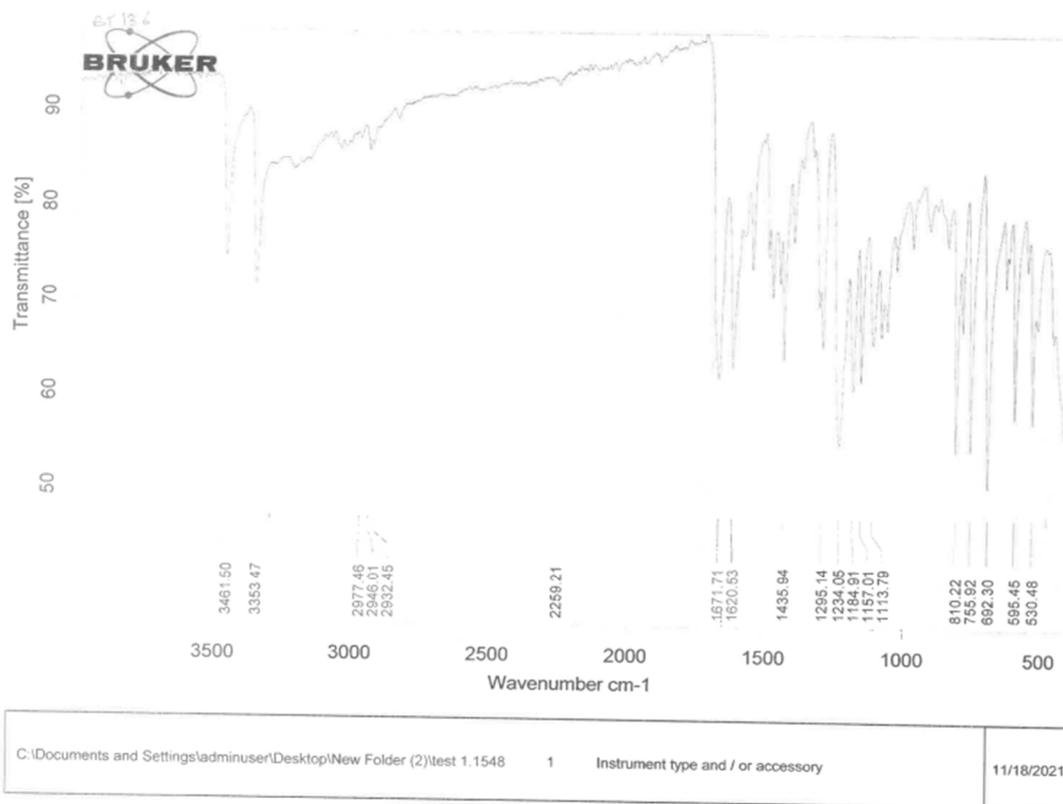


Figure S46. <sup>13</sup>C NMR chart of compound **15**



Page 1/1

**Figure S47.** IR chart of compound **15**

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Micro Analytical Center**

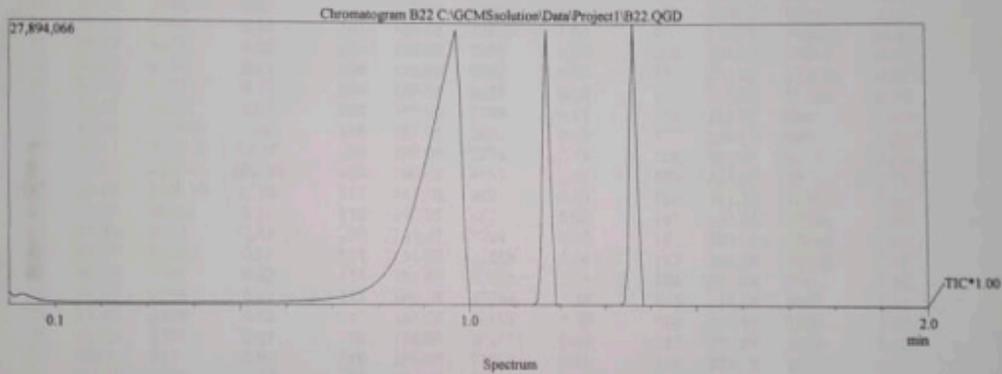
**DI Analysis  
Shimadzu Qp-2010 Plus**

**Sample Information**  
 Analyzed by : Dr. Mai Younis  
 Analyzed : 06/01/2007 07:49:46  
 Sample Name : B22  
 Sample ID :  
 Customer Name : Dr. Mohamed Soliman - Science - Cairo  
 Data File : C:\GCMSolution\Data\Project1\B22.QGD  
 Org Data File : C:\GCMSolution\Data\Project1\B22.QGD  
 Method File : C:\GCMSolution\Data\Project1\High Temperature Op  
 Org Method File : C:\GCMSolution\Data\Project1\High Temperature Op  
 Report File :  
 Tuning File : C:\GCMSolution\System1\Tune1\_default.qgt  
 \$EndIf\$Modified by : Dr. Mai Younis  
 Modified : 06/01/2007 07:51:49

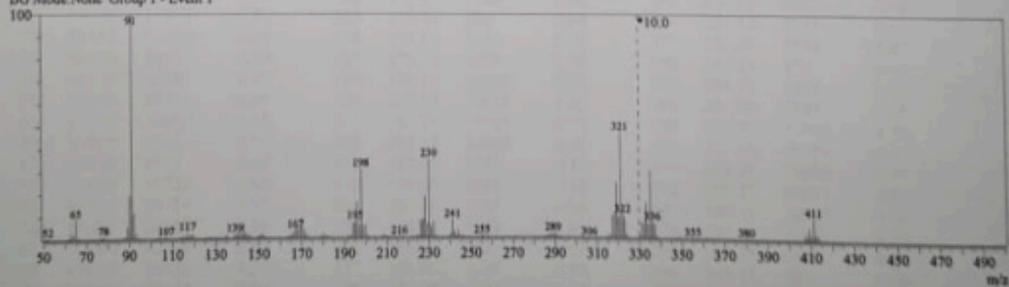
**Method**  
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 [MS Table]  
 -Group 1 - Event 1-  
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 End Time : 10.00min  
 ACQ Mode : Scan  
 Event Time : 0.50sec  
 Scan Speed : 1000  
 Start m/z : 50.00  
 End m/z : 510.00  
 Electron Voltage : 70 eV  
 Ionization Mode : EI

*Dr. Mohamed Soliman*  
*Waleed*  


C:\GCMSolution\Data\Project1\B22.QGD



Line# 1 R.Time: 1.2(Scan#: 143)  
 MassPeaks: 244(Peak Elimination m/z: 423.20, 425.30)  
 RawMode: Single 1.2(143) BasePeak: 91(2025185)  
 BG Mode: None Group 1 - Event 1



**Mass Table**  
 Line# 1 R.Time: 1.2(Scan#: 143)  
 MassPeaks: 244(Peak Elimination m/z: 423.20, 425.30)  
 RawMode: Single 1.2(143) BasePeak: 91(2025185)  
 BG Mode: None Group 1 - Event 1

#	m/z	Abs. In	Rel. Int.	#	m/z	Abs. In	Rel. Int.	#	m/z	Abs. In	Rel. Int.
1	50.05	5073	0.25	4	52.95	3146	0.16	7	57.00	1097	0.05
2	51.00	11465	0.57	5	54.00	1751	0.09	8	58.05	483	0.02
3	52.00	13521	0.67	6	55.00	583	0.03	9	59.00	2993	0.15

**Figure S48.** Mass chart of compound 15

#	m/z	Abs. In	Rel. Int.	#	m/z	Abs. In	Rel. Int.	#	m/z	Abs. In	Rel. Int.
10	60.05	391	0.02	79	129.05	9313	0.46	148	201.95	1028	0.05
11	61.05	3772	0.19	80	130.05	11086	0.55	149	204.25	5464	0.27
12	62.05	17107	0.84	81	131.10	5054	0.25	150	205.15	701	0.03
13	63.00	56926	2.81	82	132.05	10987	0.54	151	206.20	1020	0.05
14	64.05	36812	1.82	83	133.10	3684	0.18	152	207.25	2877	0.14
15	65.00	176463	8.71	84	134.15	9264	0.46	153	208.20	14284	0.71
16	65.95	12878	0.64	85	135.05	30121	1.49	154	209.15	17645	0.87
17	67.00	1580	0.08	86	136.05	4109	0.20	155	210.05	5896	0.29
18	68.05	483	0.02	87	137.05	5343	0.26	156	211.15	1898	0.09
19	69.10	985	0.05	88	138.05	7879	0.39	157	212.05	5471	0.27
20	70.10	1497	0.07	89	139.00	35607	1.76	158	213.10	2154	0.11
21	71.10	1663	0.08	90	140.05	41787	2.06	159	214.05	4336	0.21
22	72.05	379	0.02	91	141.00	77244	3.81	160	215.15	994	0.05
23	73.05	2080	0.10	92	142.05	47101	2.33	161	216.10	6855	0.34
24	74.05	4921	0.24	93	142.95	126529	6.25	162	217.05	395	0.02
25	75.05	5212	0.26	94	143.95	48735	2.41	163	218.10	921	0.05
26	76.05	6114	0.30	95	144.95	28945	1.43	164	221.20	846	0.04
27	77.05	10886	0.54	96	146.05	23129	1.14	165	223.15	1595	0.08
28	78.05	20811	1.03	97	146.95	4067	0.20	166	224.10	14468	0.71
29	79.05	8101	0.40	98	148.15	1843	0.09	167	225.15	19403	0.96
30	80.00	5090	0.25	99	149.15	8597	0.42	168	226.10	153471	7.58
31	81.05	1605	0.08	100	150.15	20578	1.02	169	227.15	166163	8.20
32	82.15	1045	0.05	101	151.05	33271	1.64	170	228.10	368934	18.22
33	83.10	2590	0.13	102	152.05	32505	1.61	171	229.15	120571	5.95
34	84.15	2599	0.13	103	153.05	20872	1.03	172	230.10	706377	34.88
35	85.15	4470	0.22	104	154.05	7855	0.39	173	231.05	94541	4.67
36	86.05	4174	0.21	105	155.00	4855	0.24	174	232.10	132870	6.56
37	87.15	6312	0.31	106	155.95	3585	0.18	175	233.05	15116	0.75
38	88.15	20787	1.03	107	157.00	3398	0.17	176	234.05	960	0.05
39	89.15	110480	5.46	108	157.95	2693	0.13	177	238.15	969	0.05
40	90.15	391518	19.33	109	159.05	2274	0.11	178	239.25	4131	0.20
41	91.05	202518	100.00	110	160.05	4165	0.21	179	240.25	35113	1.73
42	92.05	228419	11.28	111	161.00	602	0.03	180	241.25	155831	7.69
43	93.05	46032	2.27	112	162.05	482	0.02	181	242.10	54386	2.69
44	94.00	4180	0.21	113	163.05	3714	0.18	182	243.15	12588	0.62
45	95.00	8522	0.42	114	164.05	12889	0.64	183	244.10	56178	2.77
46	96.15	1388	0.07	115	165.05	22436	1.11	184	245.05	8044	0.40
47	97.10	2596	0.13	116	166.05	47284	2.33	185	246.10	9770	0.48
48	98.10	2490	0.12	117	167.05	66556	3.29	186	247.10	1503	0.07
49	99.10	2721	0.13	118	168.00	102111	5.04	187	254.35	1823	0.09
50	100.15	911	0.04	119	169.05	77098	3.81	188	255.25	10721	0.53
51	101.10	2750	0.14	120	169.95	174770	8.63	189	256.15	3888	0.19
52	102.10	4402	0.22	121	170.95	74461	3.68	190	257.15	1891	0.09
53	103.10	7242	0.36	122	172.00	39018	1.93	191	258.15	4289	0.21
54	104.05	11796	0.58	123	172.95	11808	0.58	192	259.15	3074	0.15
55	105.05	7012	0.35	124	173.95	1305	0.06	193	260.15	2910	0.14
56	106.10	11636	0.57	125	176.15	889	0.04	194	261.15	2231	0.11
57	107.05	13258	0.65	126	177.15	2401	0.12	195	262.20	1594	0.08
58	108.00	3873	0.19	127	178.15	5969	0.29	196	283.25	376	0.02
59	109.15	1378	0.07	128	179.15	10187	0.50	197	284.25	1803	0.09
60	110.05	979	0.05	129	180.15	36701	1.81	198	285.20	7185	0.35
61	111.05	2440	0.12	130	181.10	18865	0.93	199	286.20	14742	0.73
62	112.05	2793	0.14	131	182.15	14965	0.74	200	287.15	23239	1.15
63	113.05	9979	0.49	132	183.05	3441	0.17	201	288.20	24534	1.21
64	114.05	12822	0.63	133	184.00	2350	0.12	202	289.15	36611	1.81
65	115.00	27724	1.37	134	185.10	1281	0.06	203	290.15	36028	1.78
66	116.05	18052	0.89	135	186.05	1167	0.06	204	291.10	11612	0.57
67	117.00	53988	2.67	136	190.05	602	0.03	205	292.15	6462	0.32
68	118.05	26835	1.33	137	191.05	1736	0.09	206	293.15	552	0.03
69	119.05	43451	2.15	138	192.05	12467	0.62	207	306.20	302	0.01
70	120.05	15785	0.78	139	193.05	17901	0.88	208	308.10	636	0.03
71	121.10	4878	0.24	140	194.05	131489	6.49	209	310.05	707	0.03
72	122.05	2063	0.10	141	195.05	146464	7.23	210	314.25	1728	0.09
73	123.10	1527	0.08	142	196.00	323593	15.98	211	315.20	18481	0.91
74	124.05	682	0.03	143	197.05	113333	5.60	212	316.25	23945	1.18
75	125.05	4002	0.20	144	198.00	620129	30.62	213	317.20	196281	9.69
76	126.05	5459	0.27	145	198.95	99120	4.89	214	318.25	227987	11.26
77	127.05	10480	0.52	146	200.00	113441	5.60	215	319.20	494574	24.42
78	128.05	10844	0.54	147	200.95	16159	0.80	216	320.25	188395	9.30

Mass chart of compound 15

#	m/z	Abs. In	Rel. Int.	#	m/z	Abs. In	Rel. Int.	#	m/z	Abs. In	Rel. Int.
217	321.20	949119	46.87	227	334.25	12617	0.62	237	407.30	3812	0.19
218	322.15	206457	10.19	228	335.20	61590	3.04	238	408.35	4545	0.22
219	323.15	182324	9.00	229	336.15	14251	0.70	239	409.25	10425	0.51
220	324.05	37472	1.85	230	337.20	12284	0.61	240	410.35	4385	0.22
221	325.05	4024	0.20	231	338.15	2137	0.11	241	411.25	19850	0.98
222	329.25	824	0.04	232	347.20	470	0.02	242	412.25	5834	0.29
223	330.25	1720	0.08	233	349.20	1524	0.08	243	413.25	4131	0.20
224	331.20	13207	0.65	234	355.20	474	0.02	244	414.15	786	0.04
225	332.25	14297	0.71	235	378.20	226	0.01				
226	333.20	31734	1.57	236	380.20	604	0.03				

Mass chart of compound 15

Methyl 2-amino-5-((2-oxo-2-(phenylamino) ethyl) selenyl) benzoate (16).

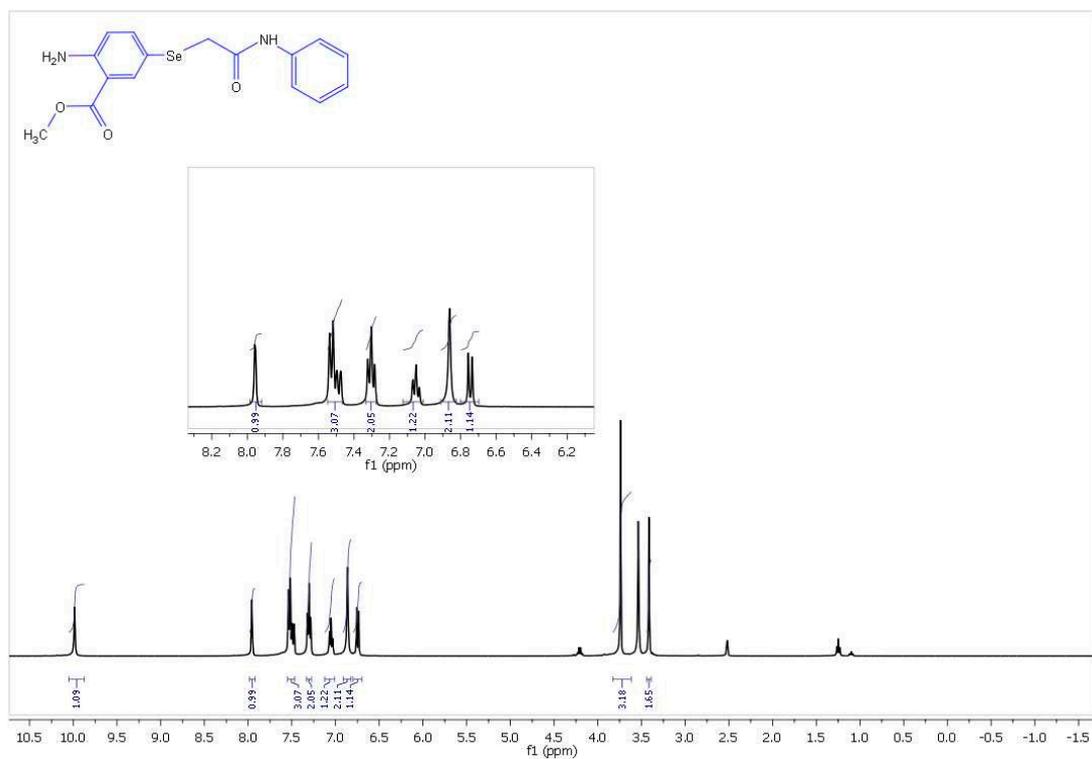


Figure S49. <sup>1</sup>H NMR chart of compound 16

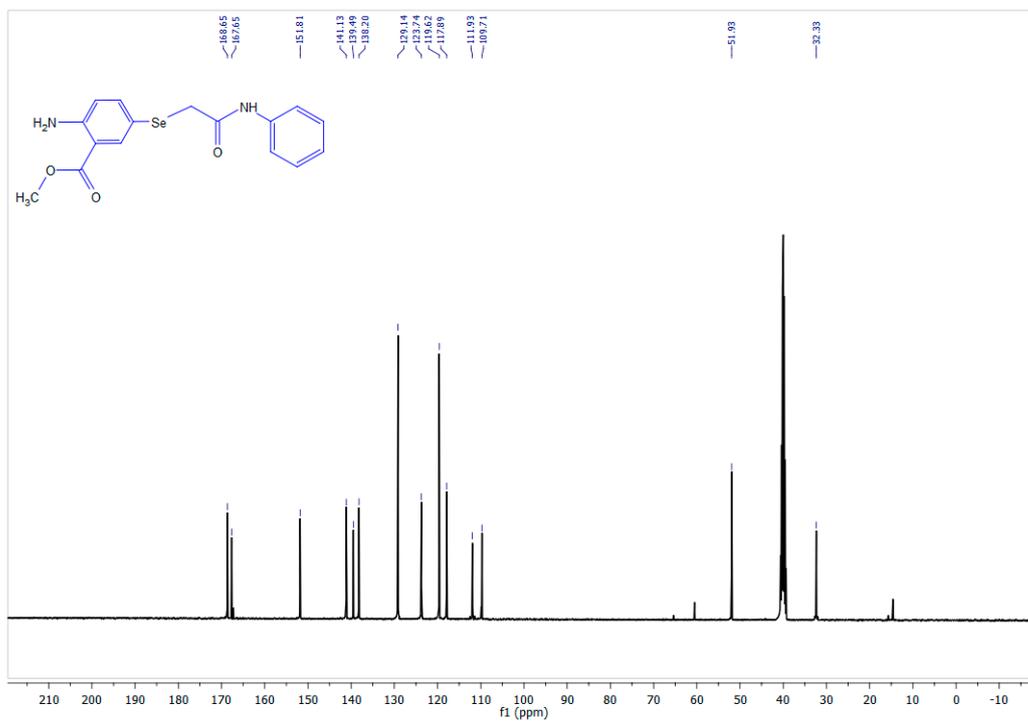
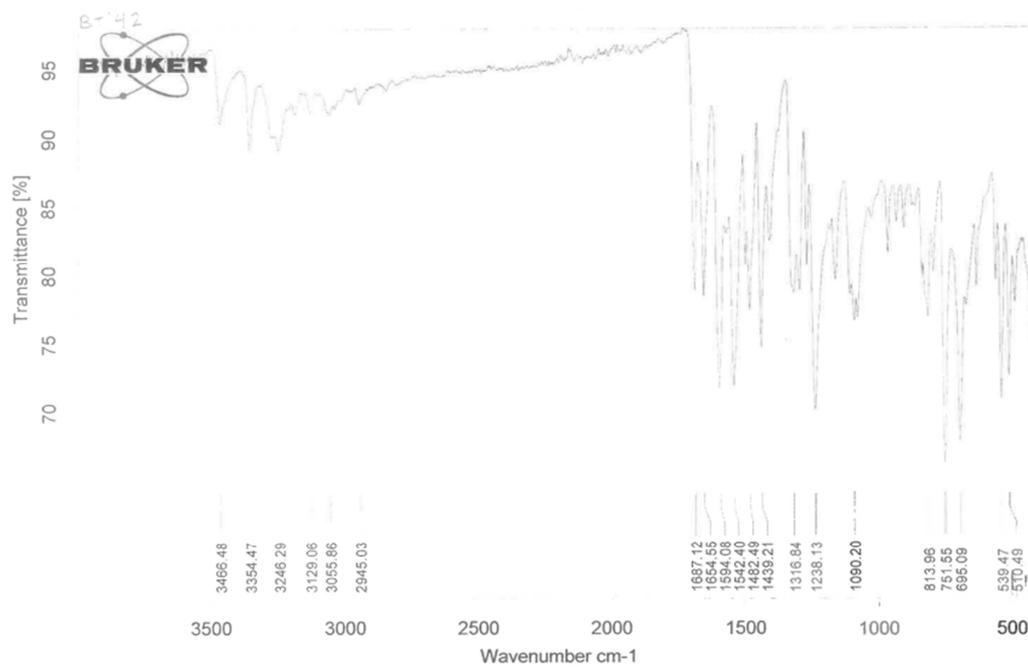


Figure S50. <sup>13</sup>C NMR chart of compound 16



C:\Documents and Settings\adminuser\Desktop\New Folder (2)\test 1.1549	1	Instrument type and / or accessory	11/18/2021
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**Figure S51.** IR chart of compound 16

**Cairo University  
Micro Analytical Center**

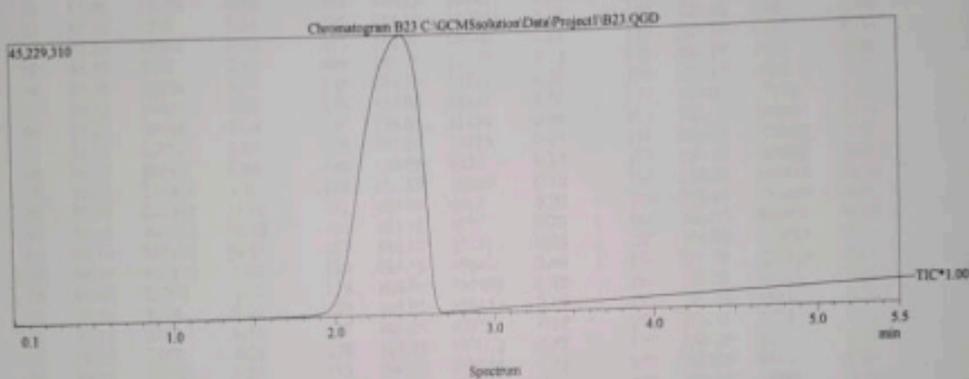
**DI Analysis  
Shimadzu Qp-2010 Plus**

Sample Information  
 Analyzed by : Dr. Mai Younis  
 Analyzed : 06/01/2007 08:03:42  
 Sample Name : B23  
 Sample ID :  
 Customer Name : Dr. Mohamed Soliman - Science - Cairo  
 Data File : C:\GCMSolution\Data\Project1\B23.QGD  
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 Report File :  
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 Modified : 06/01/2007 08:06:25

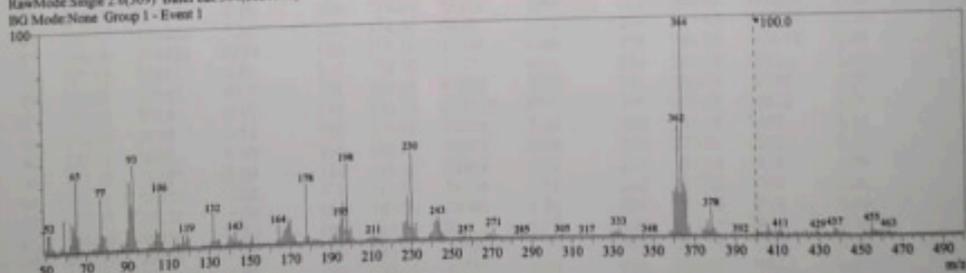
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 End Time : 10:00min  
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 Event Time : 0:50sec  
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 End m/z : 510.00  
 Electron Voltage : 70 eV  
 Ionization Mode : EI



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Line# 1 R. Time: 2.6 (Scan# 309)  
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 RawMode: Single 2.6 (309) BasePeak: 364 (2220999)  
 BG Mode: None Group 1 - Event 1



Mass Table  
 Line# 1 R. Time: 2.6 (Scan# 309)  
 MassPeaks: 395 (Peak Elimination m/z: 467.40, 468.40, 469.60, 473.60, 487.60)  
 RawMode: Single 2.6 (309) BasePeak: 364 (2220999)  
 BG Mode: None Group 1 - Event 1

#	m/z	Abs. In	Rel. Int.	#	m/z	Abs. In	Rel. Int.	#	m/z	Abs. In	Rel. Int.
1	50.05	51768	2.33	4	53.00	56865	2.56	7	56.05	7933	0.36
2	51.00	187841	8.46	5	54.00	39409	1.77	8	57.05	37932	1.71
3	52.00	198514	8.94	6	55.00	21300	0.96	9	58.05	57716	2.60

**Figure S52. Mass chart of compound 16**

#	m/z	Abs. In	Rel. Int.	#	m/z	Abs. In	Rel. Int.	#	m/z	Abs. In	Rel. Int.
10	59.00	323380	14.56	79	128.15	17920	0.81	148	197.05	127657	5.75
11	60.00	19518	0.88	80	129.15	16582	0.75	149	198.00	802486	36.13
12	61.05	25294	1.14	81	130.15	23991	1.08	150	198.95	111117	5.00
13	62.05	85663	3.86	82	131.15	62358	2.81	151	200.00	147049	6.62
14	63.05	284974	12.83	83	132.10	333977	15.04	152	201.00	27327	1.23
15	64.05	250676	11.29	84	133.15	66067	2.97	153	202.05	6591	0.30
16	65.00	718538	32.35	85	134.15	78340	3.53	154	203.15	3651	0.16
17	66.00	152620	6.87	86	135.15	69517	3.13	155	204.15	2634	0.12
18	66.95	28433	1.28	87	136.15	11769	0.53	156	205.10	8610	0.39
19	68.05	8877	0.40	88	137.10	7681	0.35	157	206.05	3512	0.16
20	69.05	15359	0.69	89	138.15	13090	0.59	158	207.05	11680	0.53
21	70.05	8547	0.38	90	139.15	52322	2.36	159	208.05	15928	0.72
22	71.05	14796	0.67	91	140.10	117575	5.29	160	209.05	33769	1.52
23	72.05	7256	0.33	92	141.05	90195	4.06	161	210.05	30291	1.36
24	73.05	29968	1.35	93	142.05	52676	2.37	162	211.05	55042	2.48
25	74.05	26922	1.21	94	143.00	141599	6.38	163	212.05	30408	1.37
26	75.05	38018	1.71	95	144.00	54009	2.43	164	213.05	31320	1.41
27	76.05	89648	4.04	96	145.05	43425	1.96	165	214.05	18869	0.85
28	77.05	535908	24.13	97	146.05	54032	2.43	166	215.05	9367	0.42
29	78.05	171575	7.73	98	147.10	12569	0.57	167	216.05	19840	0.89
30	79.05	144276	6.50	99	148.10	17756	0.80	168	217.05	4333	0.20
31	80.05	37639	1.69	100	149.15	8208	0.37	169	218.05	4479	0.20
32	81.05	11176	0.50	101	150.15	38743	1.74	170	219.10	2612	0.12
33	82.15	5419	0.24	102	151.10	102964	4.64	171	220.10	778	0.04
34	83.10	15562	0.70	103	152.05	16710	0.75	172	221.15	1397	0.06
35	84.15	7935	0.36	104	153.10	11177	0.50	173	222.15	1142	0.05
36	85.10	16374	0.74	105	154.10	14711	0.66	174	223.15	4881	0.22
37	86.15	16002	0.72	106	155.05	15641	0.70	175	224.05	17976	0.81
38	87.10	69636	3.14	107	156.05	11100	0.50	176	225.15	20916	0.94
39	88.15	32733	1.47	108	157.05	15214	0.69	177	226.10	174902	7.87
40	89.15	88448	3.98	109	158.05	8233	0.37	178	227.15	189200	8.52
41	90.15	210874	9.49	110	159.10	16986	0.76	179	228.05	447454	20.15
42	91.10	688561	31.00	111	160.05	4503	0.20	180	229.15	133404	6.01
43	92.15	463765	20.88	112	161.15	4537	0.20	181	230.05	899020	40.48
44	93.10	862055	38.81	113	162.15	5173	0.23	182	231.05	114924	5.17
45	94.05	112159	5.05	114	163.15	35647	1.60	183	232.05	173318	7.80
46	95.00	27708	1.25	115	164.10	195450	8.80	184	233.05	21637	0.97
47	96.10	5274	0.24	116	165.05	50811	2.29	185	234.05	3484	0.16
48	97.10	9146	0.41	117	166.05	92270	4.15	186	235.15	3179	0.14
49	98.15	5237	0.24	118	167.05	149172	6.72	187	236.15	3807	0.17
50	99.10	12962	0.58	119	168.05	172761	7.78	188	237.05	8985	0.40
51	100.15	13487	0.61	120	169.05	226041	10.18	189	238.15	10887	0.49
52	101.10	60012	2.70	121	170.00	257615	11.60	190	239.10	48174	2.17
53	102.15	30642	1.38	122	171.00	96798	4.36	191	240.10	75681	3.41
54	103.15	88585	3.99	123	172.00	69998	3.15	192	241.10	157647	7.10
55	104.10	204116	9.19	124	173.00	21033	0.95	193	242.15	186228	8.38
56	105.15	159966	7.20	125	174.10	7897	0.36	194	243.10	230793	10.39
57	106.10	568420	25.59	126	175.15	17735	0.80	195	244.05	179124	8.07
58	107.10	76871	3.46	127	176.15	7737	0.35	196	245.05	65413	2.95
59	108.05	12580	0.57	128	177.15	62536	2.82	197	246.05	36727	1.65
60	109.10	3719	0.17	129	178.10	605762	27.27	198	247.20	22822	1.03
61	110.15	3039	0.14	130	179.05	72024	3.24	199	248.15	7827	0.35
62	111.15	9856	0.44	131	180.05	20815	0.94	200	249.15	2124	0.10
63	112.15	15347	0.69	132	181.10	26969	1.21	201	250.25	1855	0.08
64	113.10	93678	4.22	133	182.05	36544	1.65	202	251.20	7351	0.33
65	114.15	34219	1.54	134	183.10	28086	1.26	203	252.15	3123	0.14
66	115.10	49390	2.22	135	184.05	26423	1.19	204	253.15	6626	0.30
67	116.15	38664	1.74	136	185.00	19938	0.90	205	254.15	7024	0.32
68	117.10	130407	5.87	137	186.00	10751	0.48	206	255.10	19212	0.87
69	118.15	63644	2.87	138	187.05	6516	0.29	207	256.15	19273	0.87
70	119.10	142945	6.44	139	188.25	4750	0.21	208	257.10	29007	1.31
71	120.10	98100	4.42	140	189.15	25047	1.13	209	258.15	10175	0.46
72	121.05	14291	0.64	141	190.15	9994	0.45	210	259.20	21718	0.98
73	122.10	5969	0.27	142	191.15	57570	2.59	211	260.15	6061	0.27
74	123.05	3081	0.14	143	192.10	82754	3.73	212	261.15	4356	0.20
75	124.15	1538	0.07	144	193.05	33585	1.51	213	262.15	3391	0.15
76	125.15	3955	0.18	145	194.05	172249	7.76	214	263.15	3353	0.15
77	126.15	7068	0.32	146	195.05	249002	11.21	215	264.10	1687	0.08
78	127.15	19469	0.88	147	196.00	413670	18.63	216	265.15	3515	0.16

Mass chart of compound 16

#	m/z	Abs. In	Rel. Int.	#	m/z	Abs. In	Rel. Int.	#	m/z	Abs. In	Rel. Int.
217	266.15	2637	0.12	277	326.15	836	0.04	337	387.30	279	0.01
218	267.10	18146	0.82	278	327.15	2834	0.13	338	388.25	396	0.02
219	268.15	20158	0.91	279	328.15	6050	0.27	339	389.35	651	0.03
220	269.10	46786	2.11	280	329.15	23275	1.05	340	390.25	1290	0.06
221	270.15	15694	0.71	281	330.15	29151	1.31	341	391.35	1022	0.05
222	271.10	96137	4.33	282	331.15	50733	2.28	342	392.30	1966	0.09
223	272.05	16070	0.72	283	332.15	33893	1.53	343	393.35	1297	0.06
224	273.10	21305	0.96	284	333.15	88344	3.98	344	394.30	940	0.04
225	274.05	3890	0.18	285	334.05	24078	1.08	345	395.30	473	0.02
226	275.15	1899	0.09	286	335.15	19856	0.89	346	396.45	384	0.02
227	276.25	1345	0.06	287	336.15	4538	0.20	347	397.50	1070	0.05
228	277.20	2796	0.13	288	337.15	1006	0.05	348	398.45	585	0.03
229	278.15	1435	0.06	289	338.25	662	0.03	349	399.45	317	0.01
230	279.15	898	0.04	290	339.30	1508	0.07	350	400.20	370	0.02
231	280.15	727	0.03	291	340.25	578	0.03	351	401.20	289	0.01
232	281.15	2478	0.11	292	341.25	684	0.03	352	402.20	250	0.01
233	282.15	2409	0.11	293	342.25	584	0.03	353	403.20	257	0.01
234	283.10	5790	0.26	294	343.25	805	0.04	354	404.45	336	0.02
235	284.15	3531	0.16	295	344.20	1958	0.09	355	405.40	1146	0.05
236	285.10	12303	0.55	296	345.25	2706	0.12	356	406.35	447	0.02
237	286.15	5148	0.23	297	346.20	3890	0.18	357	407.40	271	0.01
238	287.10	5833	0.26	298	347.25	4640	0.21	358	409.45	410	0.02
239	288.25	2633	0.12	299	348.20	7434	0.33	359	410.50	282	0.01
240	289.15	7201	0.32	300	349.15	2578	0.12	360	411.50	583	0.03
241	290.15	2596	0.12	301	350.15	2611	0.12	361	412.50	284	0.01
242	291.20	2186	0.10	302	351.20	977	0.04	362	415.50	254	0.01
243	292.15	1131	0.05	303	352.15	764	0.03	363	417.50	207	0.01
244	293.25	1594	0.07	304	353.25	847	0.04	364	418.50	257	0.01
245	294.25	1118	0.05	305	354.15	553	0.02	365	419.50	354	0.02
246	295.20	5345	0.24	306	355.25	657	0.03	366	421.50	326	0.01
247	296.15	1761	0.08	307	356.25	704	0.03	367	423.50	396	0.02
248	297.25	811	0.04	308	357.25	3443	0.16	368	425.50	250	0.01
249	298.35	617	0.03	309	358.20	42783	1.93	369	426.50	212	0.01
250	299.30	823	0.04	310	359.25	41697	1.88	370	428.35	430	0.02
251	300.25	1273	0.06	311	360.20	448631	20.20	371	429.30	458	0.02
252	301.25	1429	0.06	312	361.25	490508	22.09	372	430.30	231	0.01
253	302.25	2061	0.09	313	362.20	113024	50.89	373	432.30	222	0.01
254	303.30	3346	0.15	314	363.25	433043	19.50	374	433.30	212	0.01
255	304.35	3895	0.18	315	364.20	222099	100.00	375	434.30	201	0.01
256	305.30	14001	0.63	316	365.15	516139	23.24	376	436.40	250	0.01
257	306.20	5601	0.25	317	366.15	453240	20.41	377	437.45	688	0.03
258	307.15	2298	0.10	318	367.15	94607	4.26	378	438.35	497	0.02
259	308.15	902	0.04	319	368.15	13453	0.61	379	439.50	431	0.02
260	309.30	892	0.04	320	369.15	2332	0.10	380	441.50	303	0.01
261	310.25	583	0.03	321	370.30	4468	0.20	381	442.50	233	0.01
262	311.35	721	0.03	322	371.25	1831	0.08	382	444.50	210	0.01
263	312.35	712	0.03	323	372.20	5146	0.23	383	451.50	289	0.01
264	313.35	1160	0.05	324	373.25	5093	0.23	384	452.50	233	0.01
265	314.35	803	0.04	325	374.25	54806	2.47	385	454.45	304	0.01
266	315.35	918	0.04	326	375.25	61887	2.79	386	455.40	1105	0.05
267	316.35	904	0.04	327	376.20	144442	6.50	387	456.35	499	0.02
268	317.30	4386	0.20	328	377.25	48025	2.16	388	457.10	265	0.01
269	318.25	2391	0.11	329	378.20	271025	12.20	389	458.15	443	0.02
270	319.25	2801	0.13	330	379.15	67760	3.05	390	459.10	218	0.01
271	320.25	1770	0.08	331	380.20	56982	2.57	391	460.20	433	0.02
272	321.20	4260	0.19	332	381.15	13270	0.60	392	462.20	287	0.01
273	322.25	2058	0.09	333	382.15	2182	0.10	393	463.40	473	0.02
274	323.25	2501	0.11	334	383.20	484	0.02	394	464.40	252	0.01
275	324.25	848	0.04	335	384.20	236	0.01	395	466.40	212	0.01
276	325.15	508	0.02	336	386.20	215	0.01				

## Mass chart of compound 16