Supporting Information

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"Synthesis of monochlorosilyl derivatives of dialkyloligothiophenes for self-assembling monolayer field-effect transistors"

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Synthetic procedures for known compounds:

2-(5-Hexen-1-yl)-thiophene (11). Thiophene (6.1 mL, 76 mmol) was added dropwise to the solution of *n*-butyllithium (58 mmol) in 54 mL of THF-hexane mixture at 0 °C. Then the temperature was raised to +20 °C and 6-bromo-1-hexene (9.48 g, 5.8 mmol) was added to the reaction mixture. The temperature increased itself further till 32°C, and as soon as it became falling down, the reaction mixture was additionally heated and stirred for 3h at +50 °C. After completion of the reaction, the mixture was poured into a mixture of ice water (100 mL) and freshly distilled diethyl ether (200 mL). The organic layer was washed with water and dried with Na_2SO_4. The solvent was evaporated by Rotary evaporator to give 9.84 g of a crude product. After vacuum distillation 6.61 g (68%) of pure compound **11** with b.p. 106—108 °C (15 mBar) was obtained. ^{1}H NMR (250 MHz, δ in $CDCl_3$, TMS/ppm): 1.50 (m, 2H, *J* = 7.3 Hz, -CH_2-C*H*$_2$-CH_2-) 1.72 (m, 2H, *J* = 7.3 Hz, T-CH_2-C*H*$_2$-), 2.10 (m, 2H, *J* = 7.3 Hz, CH_2=CH-C*H*$_2$-), 2.86 (t, 2H, *J* = 7.3 Hz, -T-C*H*$_2$-CH_2-), 4.99 (m, 2H, C*H*$_2$=CH-CH_2-), 5.84 (m, 1H, CH_2=C*H*-CH_2-), 6.80 (dd, 1H, J_1 = 3.1 Hz, J_2 = 1.2 Hz, thiophene-H), 6.94 (dd, 1H, J_1 = 4.9 Hz, J_2 = 3.1 Hz, thiophene-H), 7.12 (dd, 1H, J_1 = 4.9 Hz, J_2 = 1.2 Hz, thiophene-H).

2-Bromo-5-ethylthiophene (16) In the strong absence of light, a solution of 35.6 g (0.2 mol) of NBS in 100 mL DMF was slowly added dropwise below -6 °C to a solution of 22,44 g (0.2 mol) of 2-ethylthiophene in 100 ml DMF and stirring for 4 hours at room temperature. Then the reaction mixture was poured into ice-water (400 mL) and extracted 3 times with dichloromethane. The organic layer was washed with water and dried with Na_2SO_4. The solvent was evaporated to give 51.78 g of a crude product. Vacuum distillation gave 28.1 g (73.5%) of compound **16** with b.p. 71-72 °C (6 mBar). ^{13}C NMR (δ in $CDCl_3$): 15.70, 23.67, 108.54, 123.66, 129.40, 149.11.

5-Ethyl-2,2-bithiophene (17) In an inert atmosphere, to a suspension of 3.65 g (152 mmol) of magnesium in 20 mL of anhydrous ether was slowly added dropwise a solution of 22.5 g (138 mmol) of 2-bromothiophene in 180 mL of anhydrous ether. The corresponding

Grignard reagent was refluxed for 5 hours, then cooled to room temperature and added dropwise to an ice-cooled solution of compound **16** (24.0 g, 126 mmol) and 435 mg (0.62 mmol) of $Pd(dppf)Cl_2$ in 150 mL of anhydrous ether. Then the cooling bath was removed and stirring was continued for 2 h at room temperature. Afterwards the reaction mixture was hydrolyzed dropwise with 150 mL of 1N HCl and immediately poured into 500 mL of ice-water and extracted twice with freshly distilled diethyl ether (600 mL). The organic phase was separated, washed with water, dried over sodium sulfate and evaporated to yield 24.4 g of a crude product. Vacuum distillation gave 21.94 g (90%) of compound **17** with b.p. 93-94 °C (0.3 mBar). ^{1}H NMR (400 MHz, δ in $CDCl_3$, TMS/ppm): 1.36 (t, 3H, J = 7.3 Hz, -CH_2-CH_3), 2.87 (qd, 2H, J_1 = 7.3 Hz, J_2 = 1.0 Hz, -T-CH_2-CH_3), 6.73 (dt, 1H, J_1 = 3.4 Hz, J_2 = 1.0 Hz, thiophene-H), 7.02 (dd, 1H, J_1 = 4.9 Hz, J_2 = 3.4 Hz, thiophene-H), 7.03 (d, 1H, J = 3.4 Hz, thiophene-H), 7.14 (dd, 1H, J_1 = 3.4 Hz, J_2 = 1.0 Hz, thiophene-H), 7.19 (dd, 1H, J_1 = 4.9 Hz, J_2 = 1.0 Hz, thiophene-H). ^{13}C NMR (δ in $CDCl_3$): 15.81, 23.44, 122.93, 123.35, 123.63, 123.99, 127.60, 134.67, 137.90, 146.71.

2-(10-Undecen-1-yl)-thiophene (20). Anhydrous THF (150 mL) was slowly added dropwise to a 2.5 M solution of BuLi (86 mL, 0.21 mol) in hexane, the temperature being maintained in the range of –10 to 0°C. Thiophene (21.65 g, 0.26 mol) was slowly added dropwise, the temperature being maintained in the range of 0 to +10 °C. Then the reaction mixture was warmed up to room temperature and 11-bromoundec-1-ene (50 g, 0.21 mol) was added. The reaction mixture was stirred for 1 hour at +50 °C. After completion of the reaction, the mixture was poured into a mixture of ice water (300 mL) and freshly distilled ether (300 mL). The organic layer was washed with water and dried with Na_2SO_4. The solvent was evaporated to give 49.74 g of a crude product. Vacuum distillation gave 35.84 g (71%) of compound **20** with b.p. 119—121 °C (1 mBar). ^{1}H NMR (250 MHz, δ in $CDCl_3$, TMS/ppm): 1.22-1.45 (overlapped peaks with a max. at 1.29, 12H, -CH_2-CH_2-CH_2-), 1.68 (m, 2H, J = 7.3 Hz, -T-CH_2-CH_2-), 2.05 (m, 2H, J = 7.3 Hz, CH_2=CH-CH_2-), 2.83 (t, 2H, J = 7.3 Hz,

T-CH_2-CH_2-), 4.97 (m, 2H, CH_2=CH-CH_2-), 5.81 (m, 1H, CH_2=CH-CH_2-), 6.79 (dd, 1H, J_1 = 1.2 Hz, J_2 = 3.7 Hz, thiophene-H), 6.92 (dd, 1H, J_1 = 3.7 Hz, J_2 = 4.9 Hz, thiophene-H), 7.12 (dd, 1H, J_1 = 1.2 Hz, J_2 = 4.9 Hz, thiophene-H). ^{13}C NMR (δ in $CDCl_3$): 28.99, 29.16, 29.40, 29.51, 29.54, 29.96, 31.85, 33.86, 114.14, 122.67, 123.85, 126.58, 139.14, 145.77.

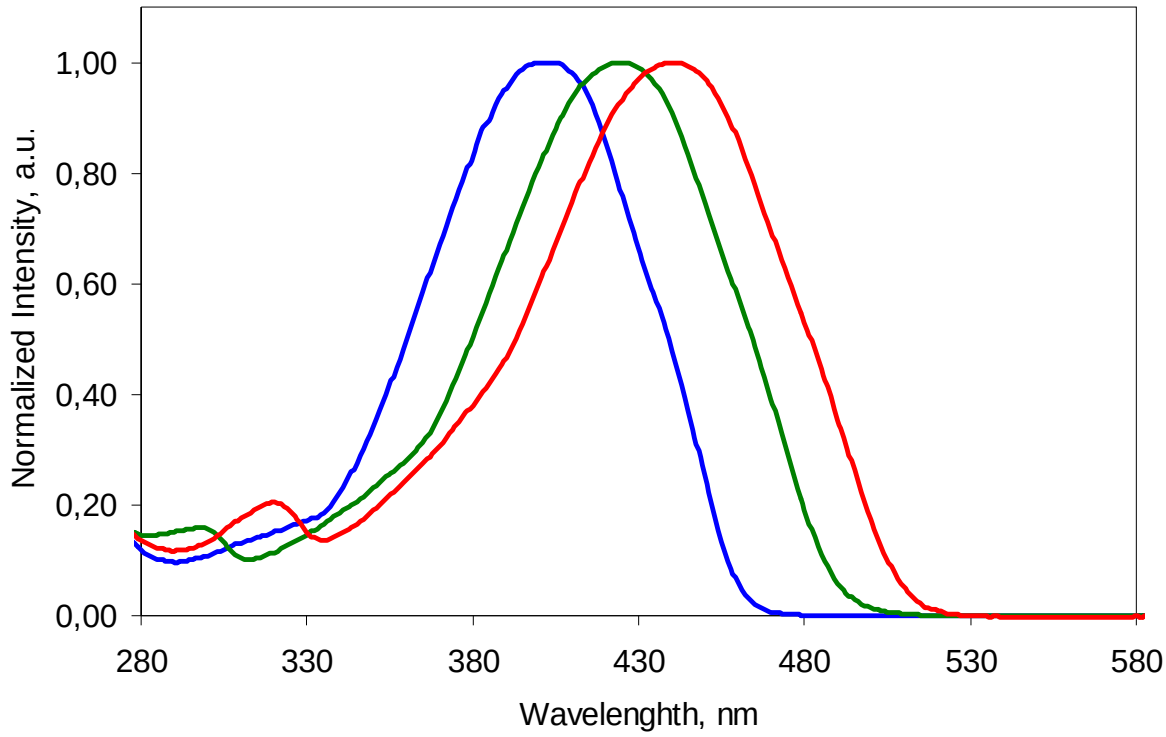


Figure S 1. UV-Vis absorbance spectra for monochlorosilyl-functionalized oligothiophenes **1** (blue curve), **2** (green curve) and **3** (red curve) in dilute THF solutions at 40 ºC.

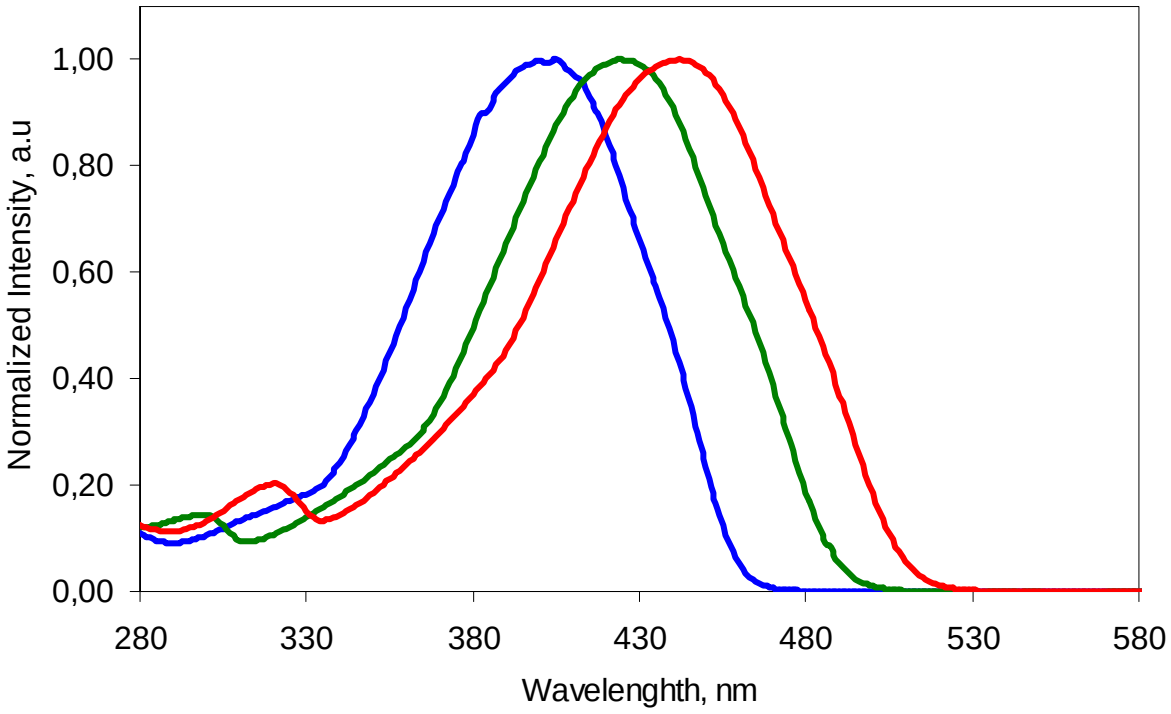


Figure S 2. UV-Vis absorbance spectra for initial oligothiophenes **6** (blue curve), **7** (green curve) and **8** (red curve) in dilute THF solutions at 40 ºC.

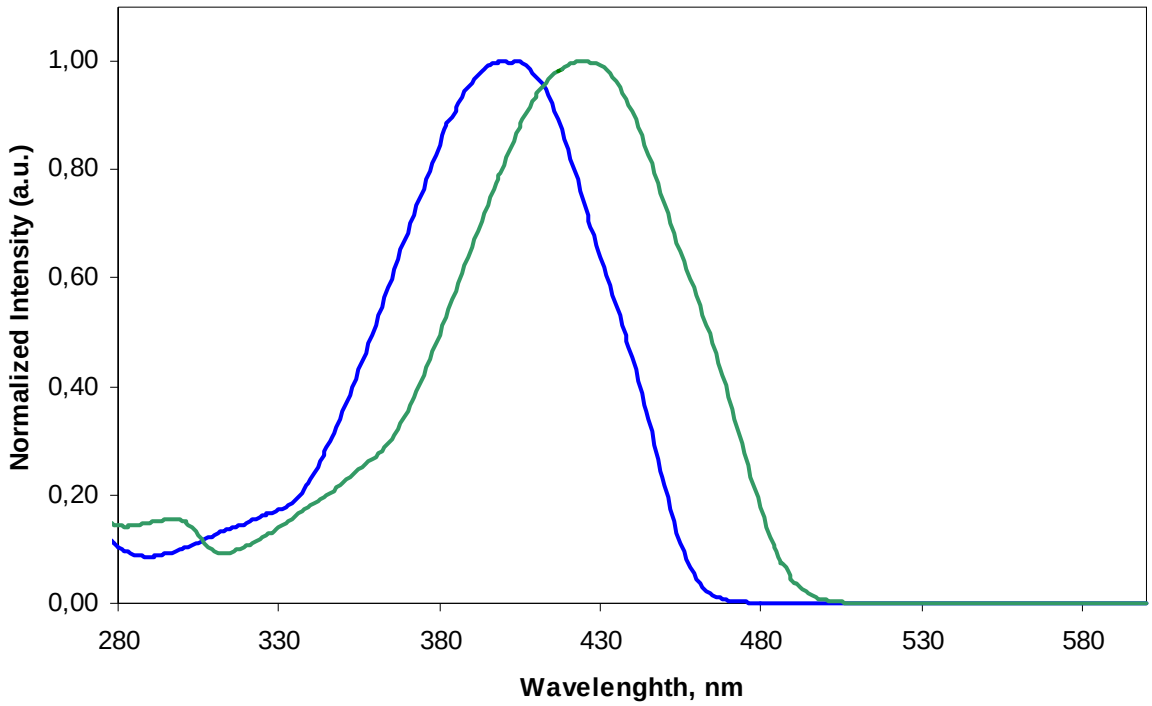


Figure S 3. UV-Vis absorbance spectra for monochlorosilyl-functionalized oligothiophenes **9** (blue curve) and **10** (green curve) in dilute THF solutions at 40 ºC.

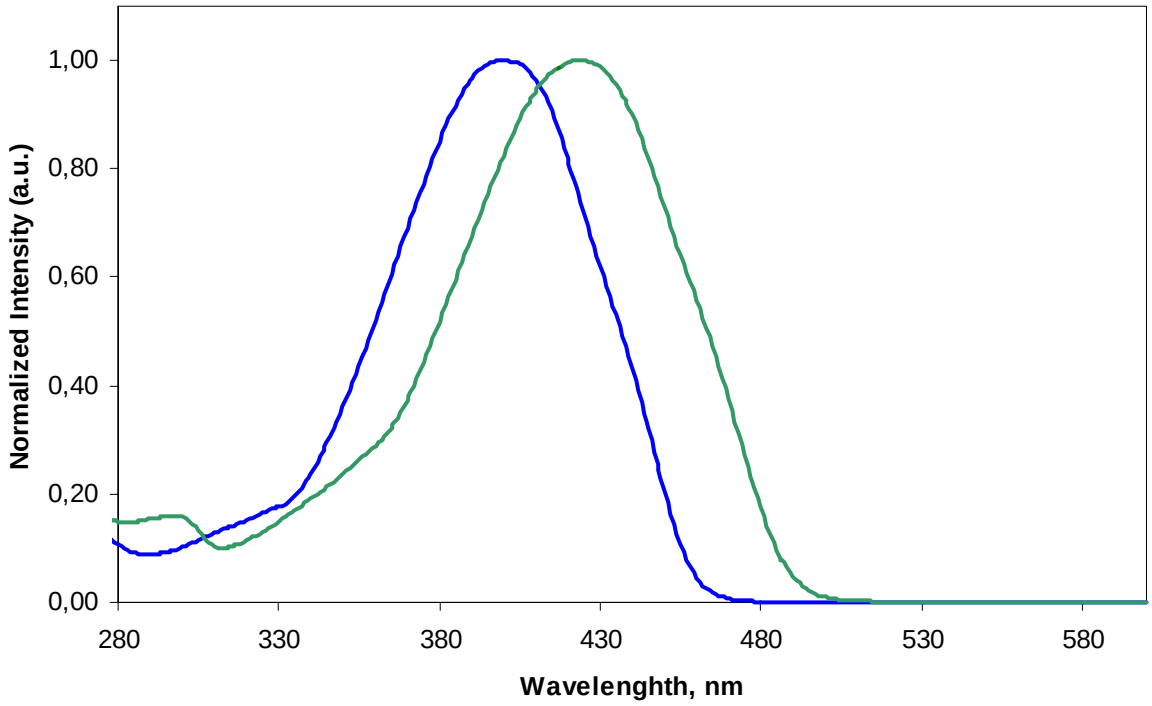


Figure S 4. UV-Vis absorbance spectra for initial oligothiophenes **4** (blue curve) and **5** (green curve) in dilute THF solutions at 40 ºC.

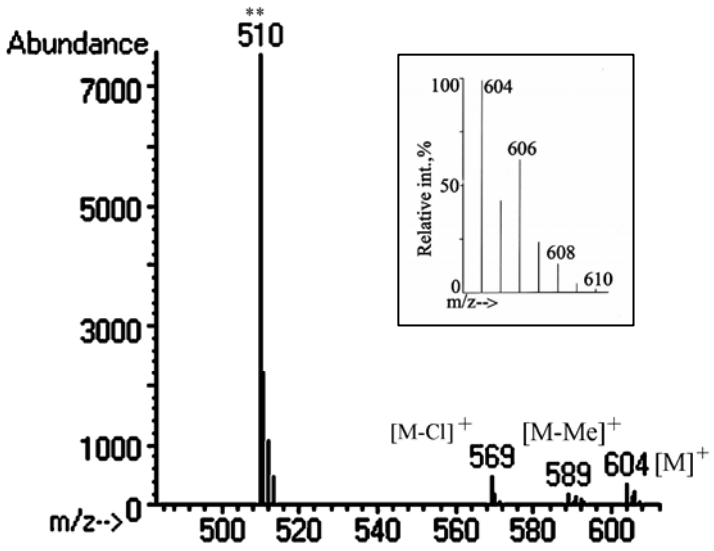


Figure S 5. MS DCI spectrum for compound **4**. Peaks of molecular ions M^+ as well as characteristic defragmentation ions $[M\text{-}CH_3]^+$ and $[M\text{-}Cl]^+$ are shown. Insert shows calculated isotopic distributions for the molecular ions of compound **4**.

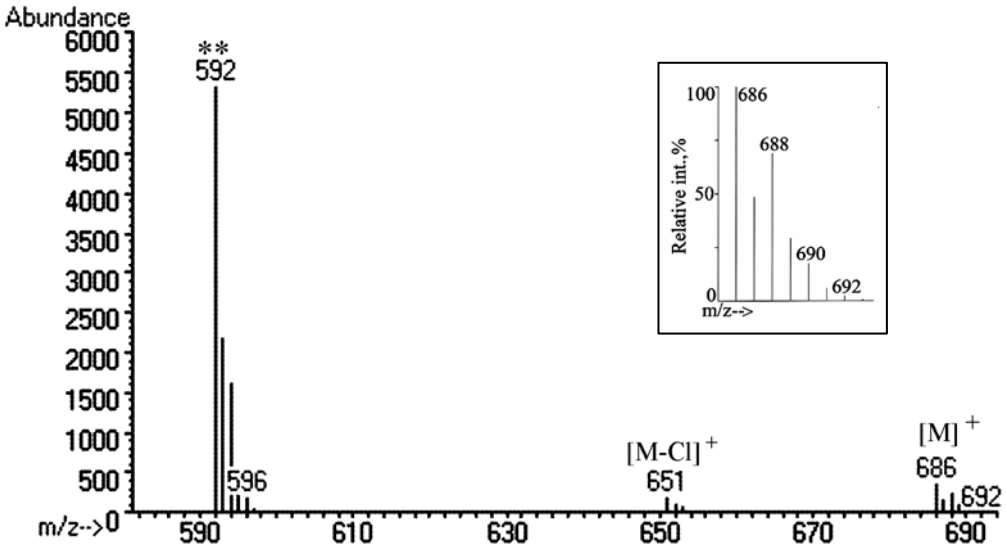


Figure S 6. MS DCI spectrum for compound **5**. Peaks of molecular ions M^+ and characteristic defragmentation ion $[M\text{-}Cl]^+$ are shown. Insert shows calculated isotopic distributions for the molecular ions of compound **5**.

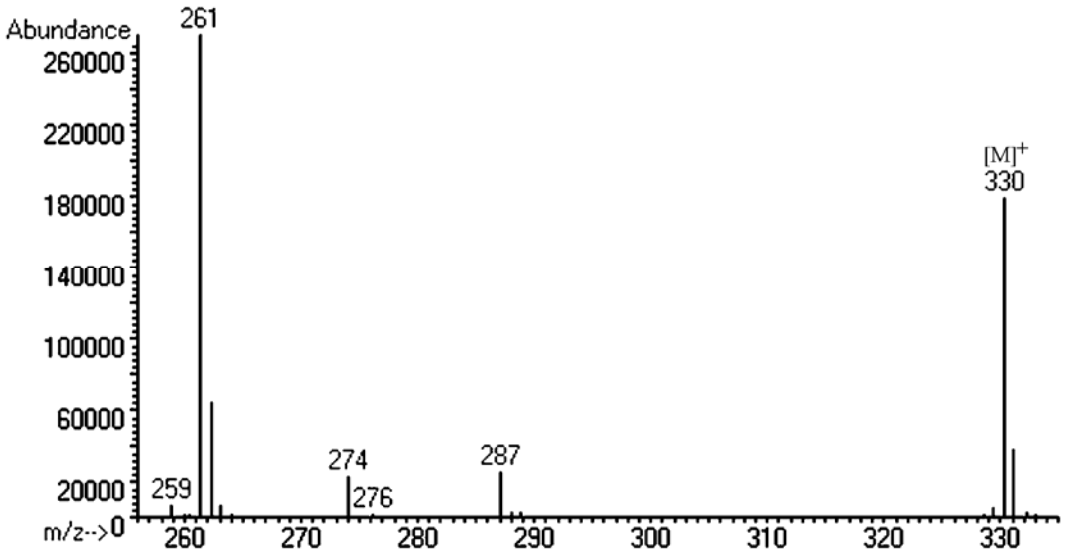


Figure S 7. MS EI spectra for compound **14**.

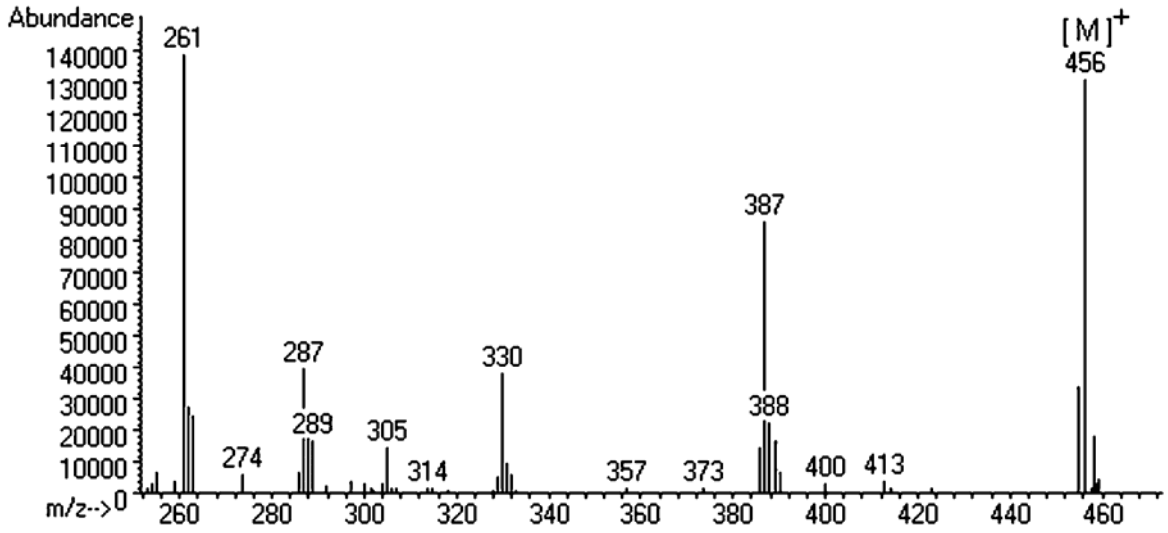
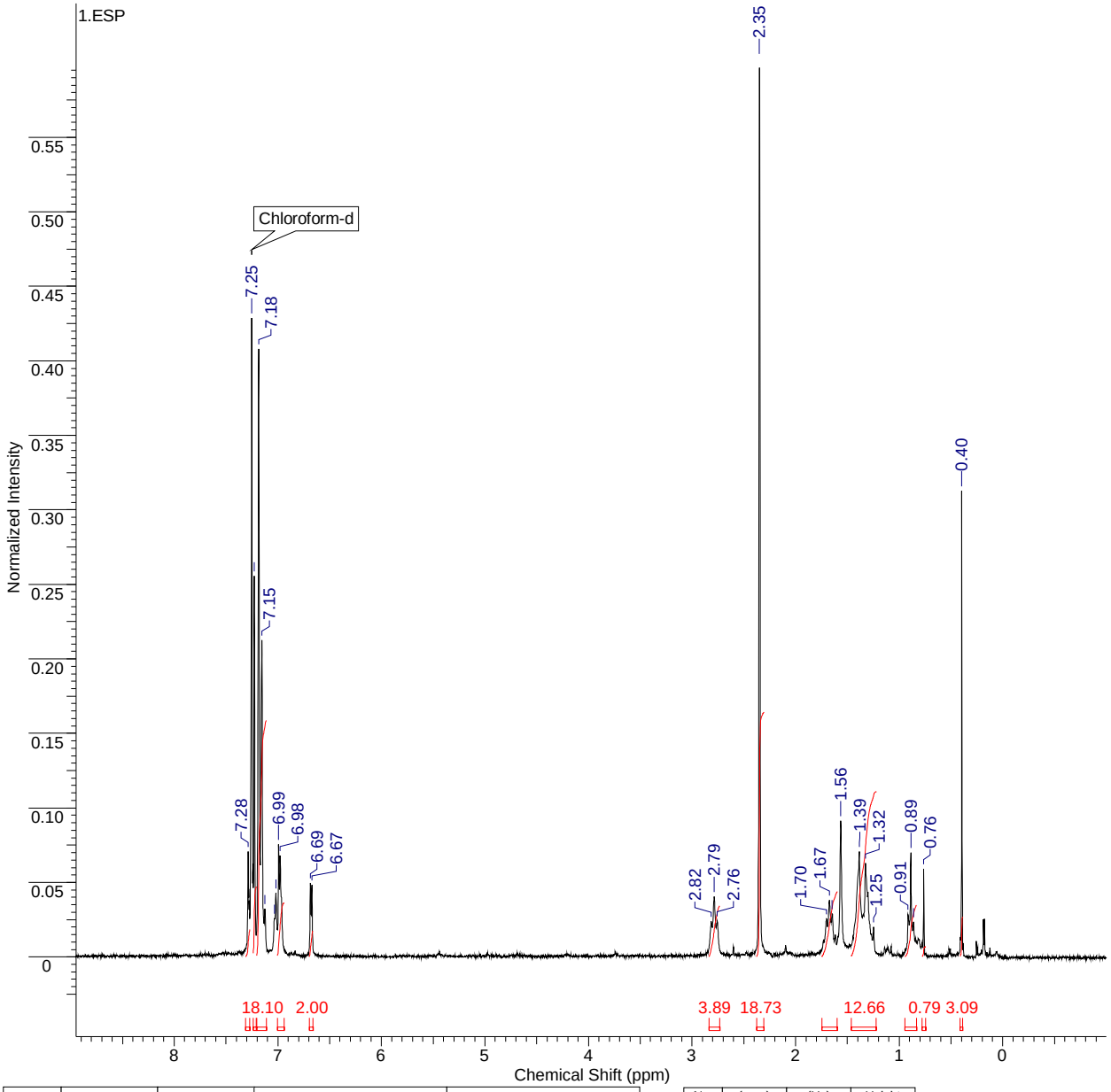


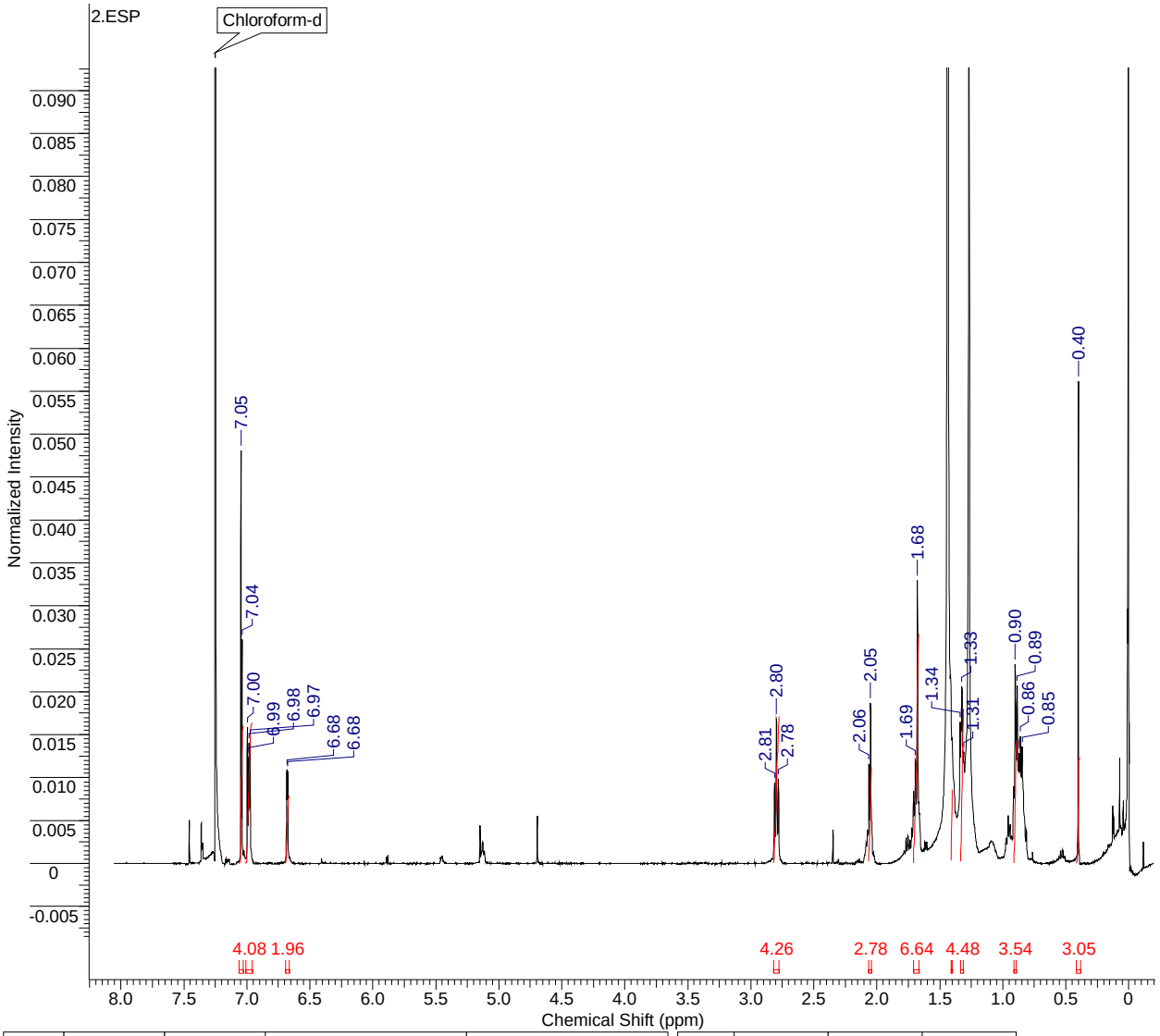
Figure S 8. MS EI spectra for compound **15**.



No.	(ppm)	Value	Absolute Value	Non-Negative Value
1	[0.3876 .. 0.4120]	3.08616924	2.11530100e+6	3.08616924
2	[0.7439 .. 0.7780]	0.79219663	5.42982000e+5	0.79219663
3	[0.8342 .. 0.9440]	3.95153642	2.70843500e+6	3.95153642
4	[1.2222 .. 1.4638]	12.65799332	8.67595500e+6	12.65799332
5	[1.5980 .. 1.7469]	5.00220060	3.42857400e+6	5.00220060
6	[2.3057 .. 2.3789]	18.72870636	1.28369010e+7	18.72870636
7	[2.7352 .. 2.8377]	3.89080358	2.66680800e+6	3.89080358
8	[6.6594 .. 6.6960]	2.00008559	1.37088500e+6	2.00008559
9	[6.9401 .. 7.0035]	4.13770151	2.83603500e+6	4.13770151
10	[7.1085 .. 7.2036]	18.10300446	1.24080370e+7	18.10300446
11	[7.2061 .. 7.2378]	5.37512016	3.68417800e+6	5.37512016
12	[7.2695 .. 7.3086]	2.11608720	1.45039400e+6	2.11608720

No.	(ppm)	(Hz)	Height
1	0.40	99.4	0.3126
2	0.76	191.0	0.0590
3	0.86	216.0	0.0236
4	0.89	222.1	0.0699
5	0.91	228.8	0.0286
6	1.25	311.8	0.0203
7	1.32	331.3	0.0630
8	1.39	346.6	0.0706
9	1.56	391.2	0.0914
10	1.65	411.9	0.0288
11	1.67	418.6	0.0380
12	1.70	425.4	0.0254
13	2.35	588.3	1.0000
14	2.76	689.7	0.0241
15	2.79	697.0	0.0405
16	2.82	704.3	0.0240
17	6.67	1668.8	0.0483
18	6.69	1672.5	0.0496
19	6.98	1745.1	0.0678
20	6.99	1748.8	0.0754
21	7.02	1755.5	0.0429
22	7.03	1759.1	0.0259
23	7.12	1781.7	0.0325
24	7.15	1789.0	0.2124
25	7.18	1797.0	0.4079
26	7.23	1808.0	0.2558
27	7.25	1813.5	0.4287
28	7.28	1822.0	0.0707

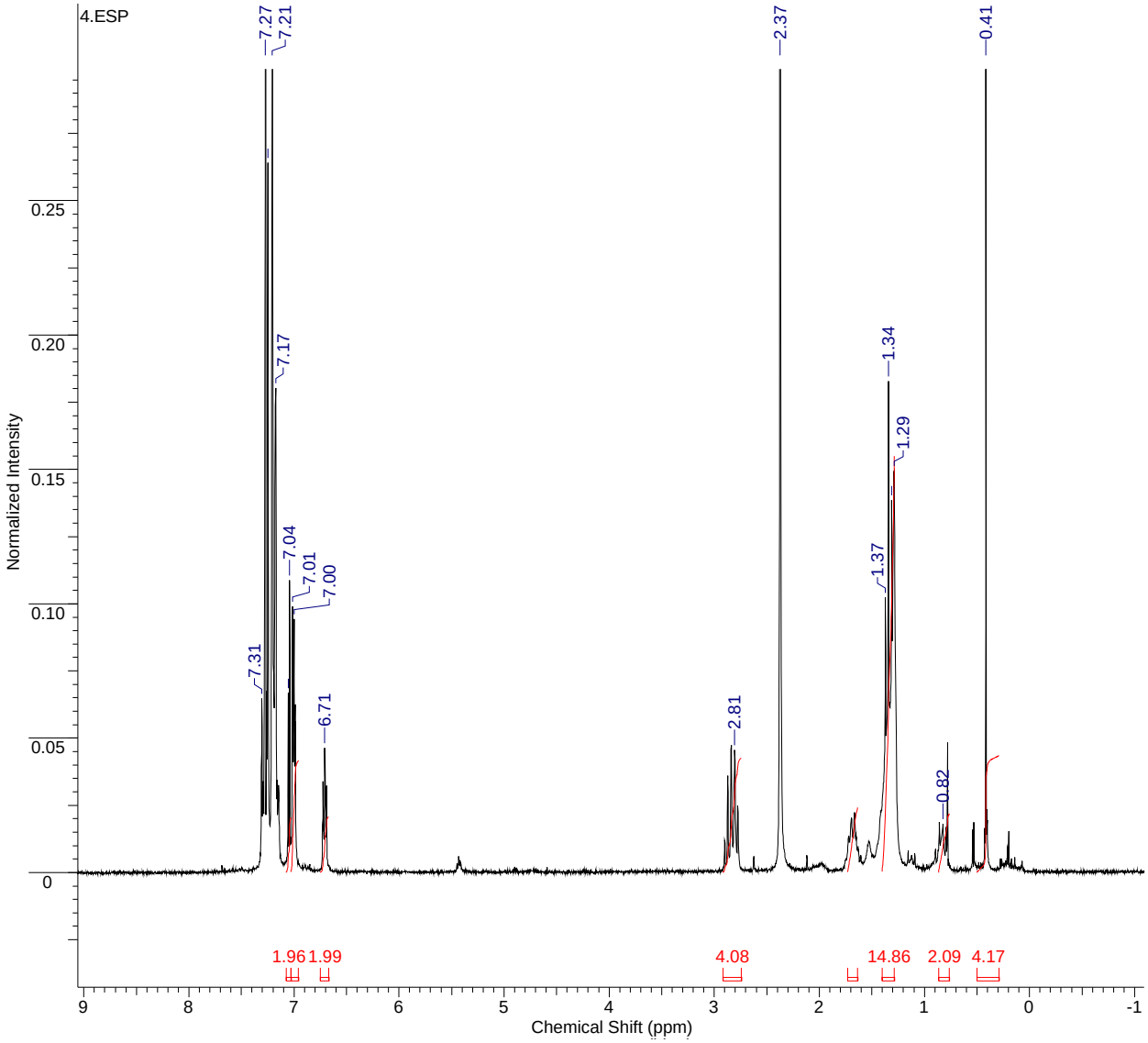
Figure S 9. ^{1}H NMR spectra for compound **1**



No.	(ppm)	Value	Absolute Value	Non-Negative Value
1	[0.3811 .. 0.4169]	3.04620337	9.22302856e+2	3.04620337
2	[0.8927 .. 0.9103]	3.54379535	1.07295947e+3	3.54379535
3	[1.3122 .. 1.3327]	4.48150301	1.35687036e+3	4.48150301
4	[1.4005 .. 1.4097]	2.13647866	6.46864380e+2	2.13647866
5	[1.6667 .. 1.7084]	6.63927650	2.01018213e+3	6.63927650
6	[2.0411 .. 2.0626]	2.77958560	8.41578674e+2	2.77958560
7	[2.7750 .. 2.8179]	4.25667334	1.28879834e+3	4.25667334
8	[6.6617 .. 6.6952]	1.95689595	5.92491882e+2	1.95689595
9	[6.9572 .. 7.0079]	4.07736778	1.23450989e+3	4.07736778
10	[7.0265 .. 7.0636]	4.00000000	1.21108508e+3	4.00000000

No.	(ppm)	(Hz)	Height
1	0.40	200.7	0.0562
2	0.85	422.8	0.0136
3	0.86	430.2	0.0148
4	0.87	435.7	0.0129
5	0.89	443.0	0.0207
6	0.90	450.9	0.0232
7	1.31	654.8	0.0130
8	1.33	662.7	0.0206
9	1.33	665.8	0.0164
10	1.34	669.4	0.0165
11	1.68	839.1	0.0330
12	1.69	847.0	0.0120
13	2.05	1025.3	0.0187
14	2.06	1031.4	0.0116
15	2.78	1390.9	0.0098
16	2.80	1398.8	0.0168
17	2.81	1406.1	0.0094
18	6.68	3339.1	0.0108
19	6.68	3342.1	0.0109
20	6.97	3488.0	0.0145
21	6.98	3491.7	0.0140
22	6.99	3495.3	0.0124
23	7.00	3499.0	0.0159
24	7.04	3520.4	0.0261
25	7.05	3524.0	0.0481

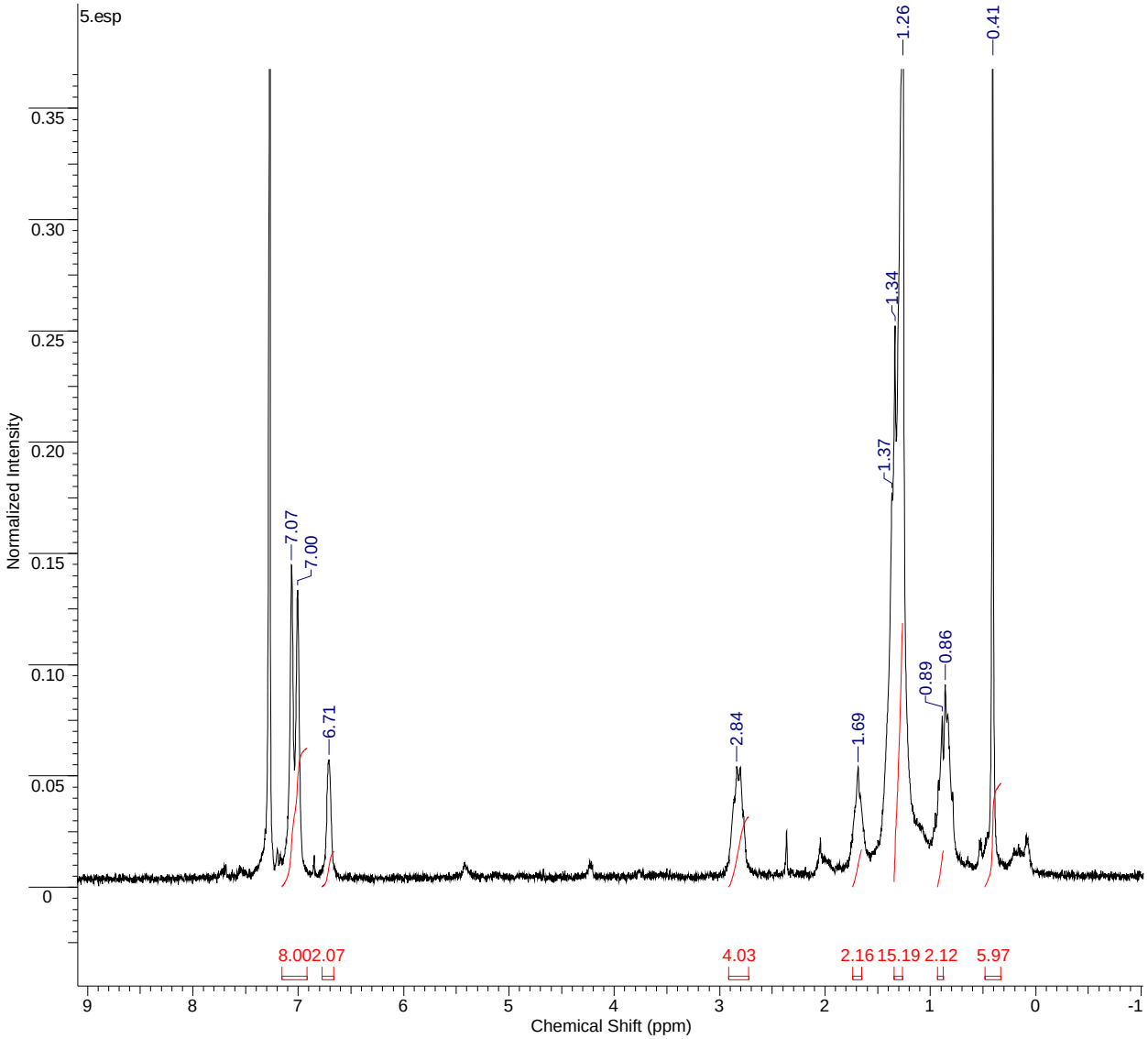
Figure S 10. ^{1}H NMR spectra for compound **2**



No.	(ppm)	Value	Absolute Value	Non-Negative Value
1	[0.2916 .. 0.5008]	4.17496300	2.51862125e+6	4.17496300
2	[0.7621 .. 0.8644]	2.08751774	1.25933225e+6	2.08751774
3	[1.2857 .. 1.4018]	14.86179924	8.96564500e+6	14.86179924
4	[1.6348 .. 1.7311]	2.32121038	1.40031150e+6	2.32121038
5	[2.7431 .. 2.9176]	4.07820702	2.46025100e+6	4.07820702
6	[6.6705 .. 6.7506]	1.98874271	1.19974450e+6	1.98874271
7	[6.9559 .. 7.0272]	4.00714970	2.41738450e+6	4.00714970
8	[7.0305 .. 7.0733]	1.95759737	1.18095550e+6	1.95759737

No.	(ppm)	(Hz)	Height
1	0.41	103.2	0.3859
2	0.82	205.7	0.0182
3	1.29	322.3	0.1495
4	1.31	327.8	0.1385
5	1.34	335.1	0.1827
6	1.37	343.1	0.1023
7	2.37	593.3	1.0000
8	2.81	702.0	0.0456
9	6.71	1678.1	0.0464
10	7.00	1750.7	0.0944
11	7.01	1754.4	0.0990
12	7.04	1761.1	0.1087
13	7.06	1764.7	0.0668
14	7.17	1794.7	0.1803
15	7.21	1802.6	0.3704
16	7.25	1813.0	0.2642
17	7.27	1818.5	0.5596
18	7.31	1827.6	0.0646

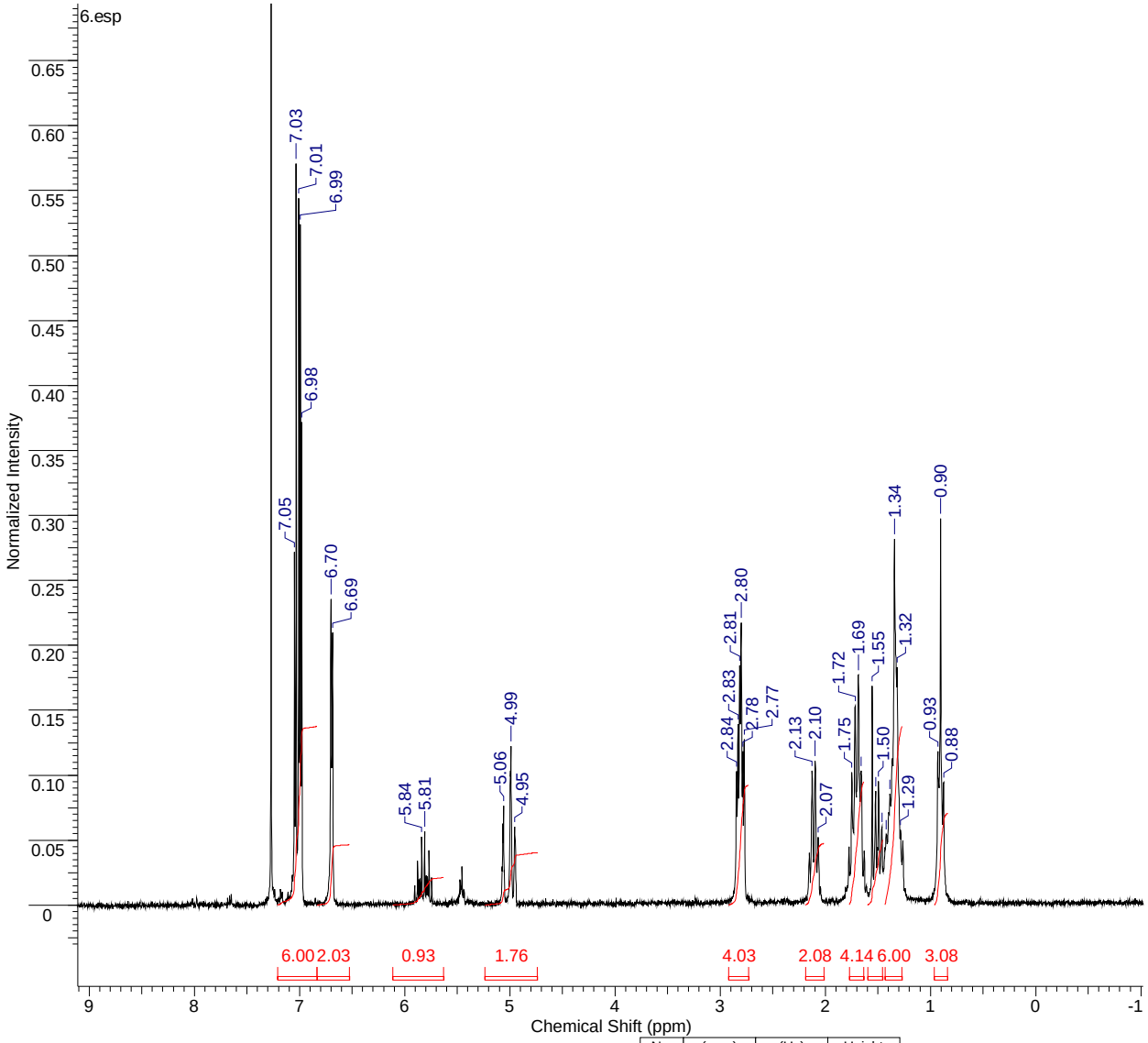
Figure S 11. ^{1}H NMR spectra for compound **4**.



No.	(ppm)	Value	Absolute Value	Non-Negative Value
1	[0.3309 .. 0.4813]	5.96919441	1.02033810e+7	5.96919441
2	[0.8765 .. 0.9330]	2.11990356	3.62363550e+6	2.11990356
3	[1.2655 .. 1.3471]	15.18542957	2.59570580e+7	15.18542957
4	[1.6545 .. 1.7361]	2.16314411	3.69754800e+6	2.16314411
5	[2.7274 .. 2.9156]	4.02865791	6.88634500e+6	4.02865791
6	[6.6613 .. 6.7743]	2.06693649	3.53309675e+6	2.06693649
7	[6.9162 .. 7.1565]	8.00000000	1.36747180e+7	8.00000000

No.	(ppm)	(Hz)	Height
1	0.41	101.9	0.4628
2	0.86	214.9	0.0909
3	0.89	221.6	0.0769
4	1.26	315.0	0.5210
5	1.34	334.5	0.2524
6	1.37	341.8	0.1772
7	1.69	421.8	0.0542
8	2.84	709.9	0.0543
9	6.71	1678.1	0.0574
10	7.00	1751.9	0.1337
11	7.07	1767.2	0.1448

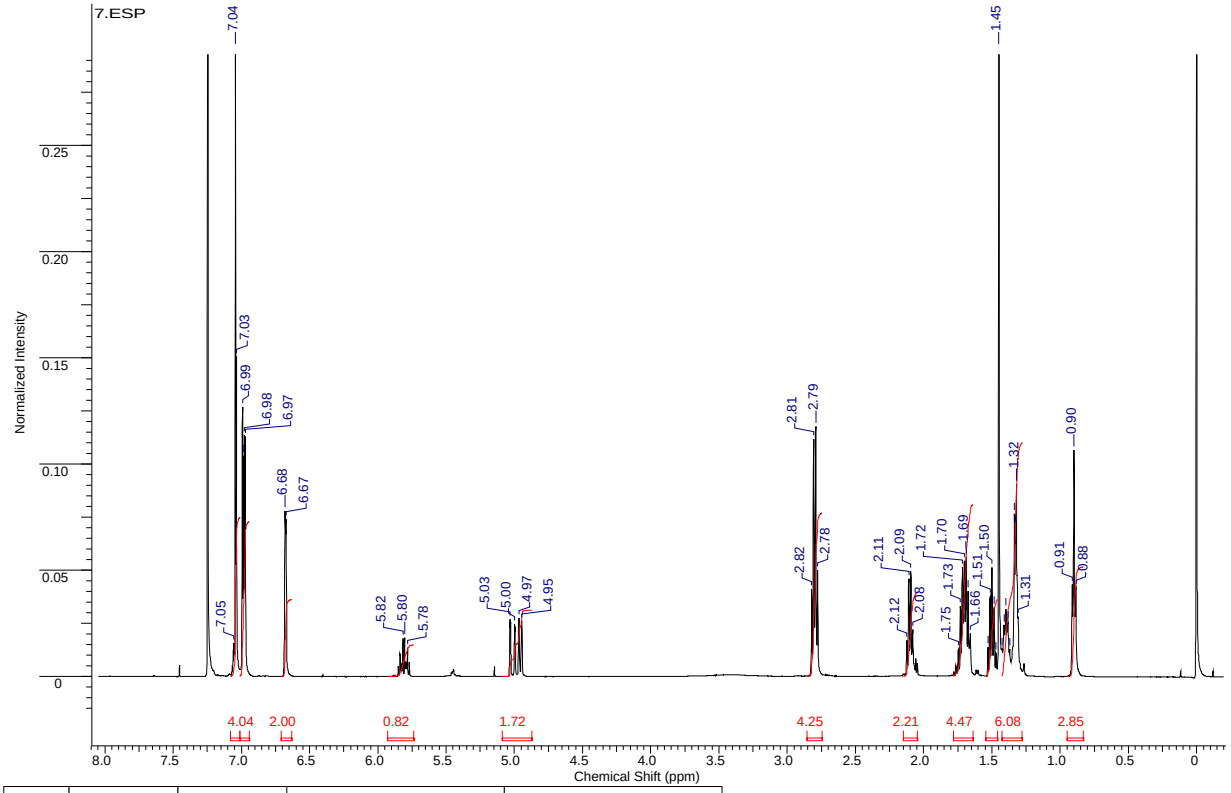
Figure S 12. ^{1}H NMR spectra for compound **5**



No.	(ppm)	Value	Absolute Value	Non-Negative Value
1	[0.8380 .. 0.9614]	3.08394289	1.16693090e+7	3.08394289
2	[1.2725 .. 1.4306]	6.00131893	2.27083500e+7	6.00131893
3	[1.4549 .. 1.5943]	2.18534899	8.26912600e+6	2.18534899
4	[1.6372 .. 1.7713]	4.14092922	1.56688340e+7	4.14092922
5	[2.0127 .. 2.1897]	2.07784414	7.86234000e+6	2.07784414
6	[2.7315 .. 2.9192]	4.02723789	1.52386360e+7	4.02723789
7	[4.7402 .. 5.2374]	1.76273322	6.66999400e+6	1.76273322
8	[5.6318 .. 6.1120]	0.92760217	3.50994725e+6	0.92760217
9	[6.5235 .. 6.8322]	2.02880216	7.67677000e+6	2.02880216
10	[6.8322 .. 7.2094]	6.00025415	2.27043200e+7	6.00025415

No.	(ppm)	(Hz)	Height
1	0.88	219.1	0.0944
2	0.90	225.9	0.2978
3	0.93	232.6	0.1185
4	1.29	321.7	0.0579
5	1.32	329.6	0.1831
6	1.34	335.7	0.2821
7	1.39	346.7	0.0858
8	1.42	355.3	0.0549
9	1.46	365.7	0.0603
10	1.50	374.2	0.0952
11	1.52	380.9	0.0878
12	1.55	388.8	0.1689
13	1.66	415.1	0.1036
14	1.69	421.8	0.1771
15	1.72	429.1	0.1536
16	1.75	437.1	0.1023
17	2.07	517.6	0.0525
18	2.10	524.4	0.1113
19	2.13	531.7	0.1035
20	2.77	692.8	0.1277
21	2.78	696.5	0.1184
22	2.80	700.8	0.2175
23	2.81	703.8	0.1845
24	2.83	708.1	0.1392
25	2.84	711.2	0.1030
26	4.95	1239.2	0.0605
27	4.99	1248.3	0.1225
28	5.06	1265.4	0.0763
29	5.81	1453.4	0.0565
30	5.84	1460.1	0.0527
31	6.69	1672.6	0.2099
32	6.70	1676.2	0.2357
33	6.98	1745.8	0.3719
34	6.99	1748.9	0.5240
35	7.01	1752.5	0.5441
36	7.03	1759.3	0.5705
37	7.05	1762.9	0.2716

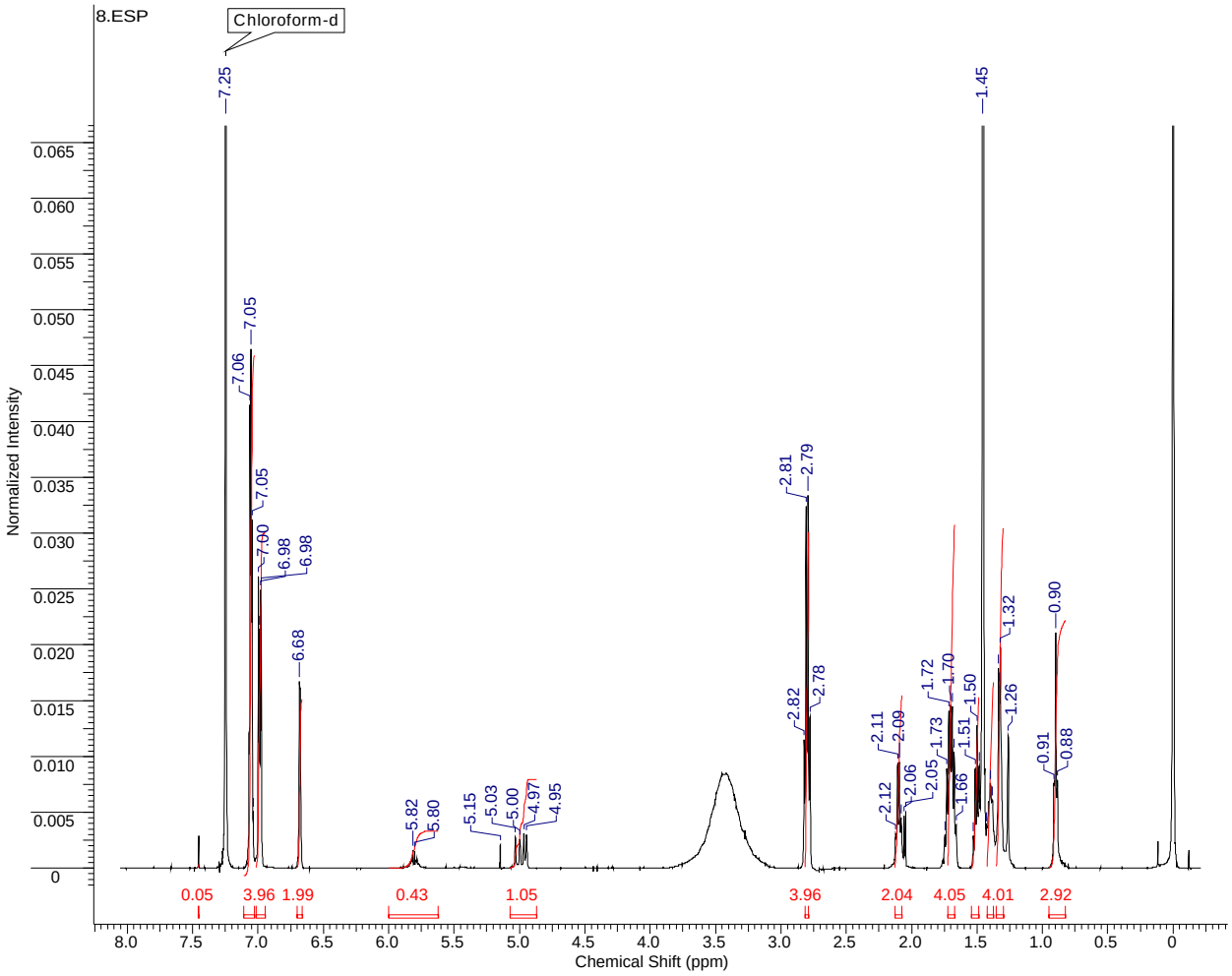
Figure S 13. ^{1}H NMR spectra for compound **6**



No.	(ppm)	Value	Absolute Value	Non-Negative Value
1	[0.8316 .. 0.9475]	2.84606218	1.35226934e+4	2.84606218
2	[1.2771 .. 1.4243]	6.07879925	2.88826230e+4	6.07879925
3	[1.4605 .. 1.5456]	1.99972618	9.50143848e+3	1.99972618
4	[1.6378 .. 1.7796]	4.46972561	2.12373184e+4	4.46972561
5	[2.0468 .. 2.1484]	2.21192122	1.05096553e+4	2.21192122
6	[2.7442 .. 2.8553]	4.24926758	2.01898418e+4	4.24926758
7	[4.8730 .. 5.0879]	1.71992517	8.17200000e+3	1.71992517
8	[5.7386 .. 5.9296]	0.81681710	3.88100000e+3	0.81681710
9	[6.6288 .. 6.7068]	1.99998248	9.50265625e+3	1.99998248
10	[6.9409 .. 7.0094]	4.03618717	1.91774180e+4	4.03618717
11	[7.0118 .. 7.0780]	4.13784456	1.96604297e+4	4.13784456

Figure S 14. ^{1}H NMR spectra for compound **7**

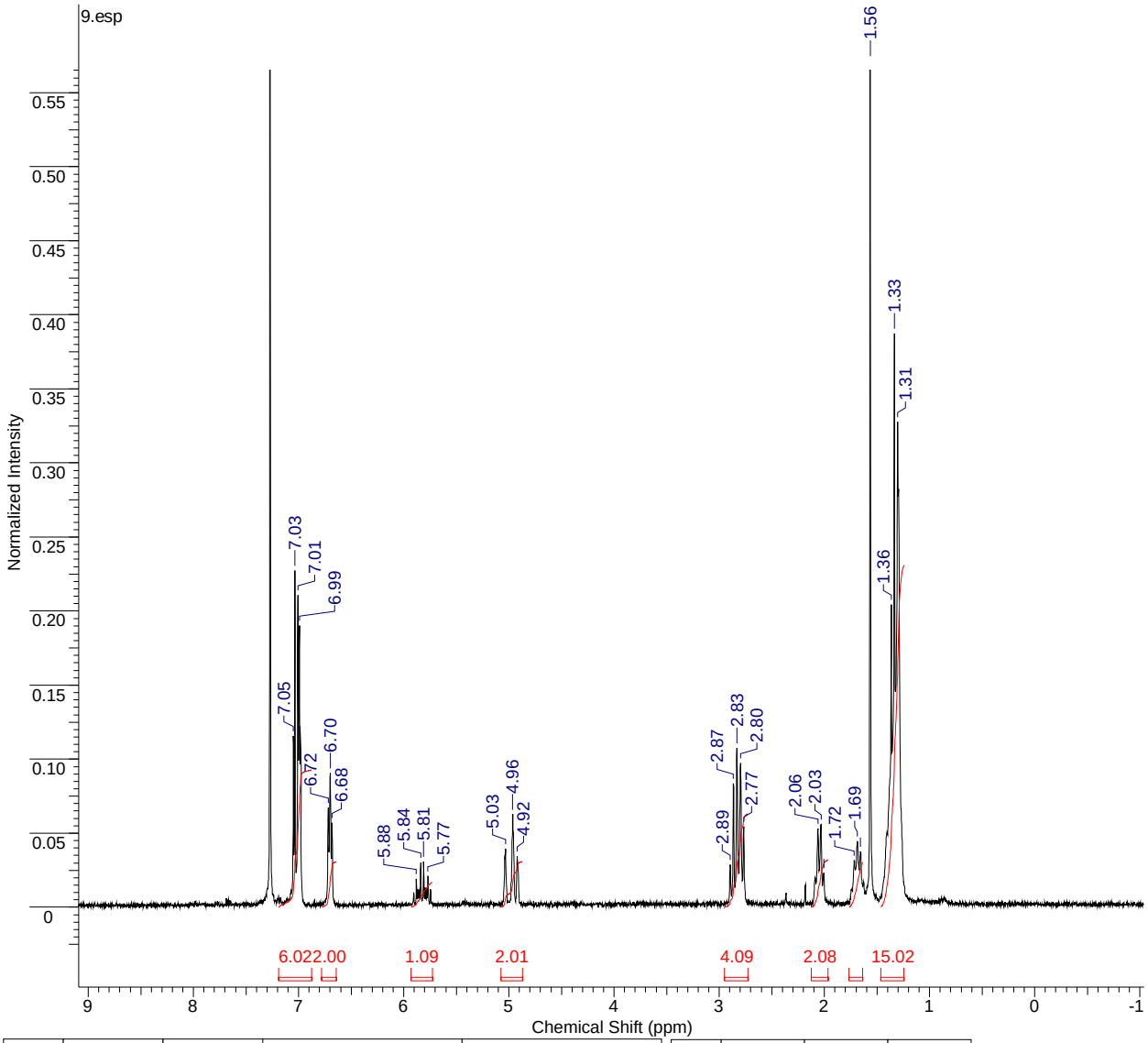
No.	(ppm)	(Hz)	Height
1	0.88	442.5	0.0418
2	0.90	449.2	0.1066
3	0.91	455.9	0.0433
4	1.31	653.7	0.0281
5	1.32	661.0	0.0904
6	1.33	664.7	0.0710
7	1.34	667.7	0.0766
8	1.37	684.8	0.0130
9	1.38	690.9	0.0255
10	1.40	698.8	0.0317
11	1.41	705.6	0.0241
12	1.43	712.9	0.0131
13	1.45	724.5	0.8027
14	1.47	734.9	0.0111
15	1.48	742.2	0.0326
16	1.50	749.5	0.0514
17	1.51	756.8	0.0378
18	1.53	764.8	0.0140
19	1.66	829.5	0.0203
20	1.67	837.4	0.0402
21	1.69	844.7	0.0562
22	1.70	850.8	0.0542
23	1.72	858.1	0.0513
24	1.73	865.5	0.0331
25	1.75	872.8	0.0129
26	2.08	1040.0	0.0222
27	2.09	1047.4	0.0494
28	2.11	1054.7	0.0460
29	2.12	1061.4	0.0170
30	2.78	1389.1	0.0500
31	2.79	1395.9	0.1178
32	2.81	1403.2	0.1118
33	2.82	1410.5	0.0412
34	4.95	2473.7	0.0261
35	4.97	2484.1	0.0275
36	5.00	2499.4	0.0246
37	5.03	2516.5	0.0269
38	5.78	2891.8	0.0135
39	5.80	2902.2	0.0183
40	5.82	2908.9	0.0180
41	6.67	3337.4	0.0741
42	6.68	3341.0	0.0780
43	6.97	3486.3	0.1129
44	6.98	3489.4	0.1138
45	6.98	3493.0	0.1039
46	6.99	3496.7	0.1270
47	7.03	3518.0	0.1506
48	7.04	3521.7	0.3177
49	7.05	3527.8	0.0156



No.	(ppm)	Value	Absolute Value	Non-Negative Value
1	[0.8226 .. 0.9479]	2.92071366	3.07647949e+3	2.92071366
2	[1.2988 .. 1.3521]	4.00546122	4.21907813e+3	4.00546122
3	[1.3756 .. 1.4237]	2.18456531	2.30107129e+3	2.18456531
4	[1.4865 .. 1.5443]	2.00990033	2.11709106e+3	2.00990033
5	[1.6734 .. 1.7240]	4.04729652	4.26314453e+3	4.04729652
6	[2.0756 .. 2.1279]	2.03647518	2.14508325e+3	2.03647518
7	[2.7901 .. 2.8132]	3.95898294	4.17012109e+3	3.95898294
8	[4.8681 .. 5.0731]	1.04525506	1.10100000e+3	1.04525506
9	[5.6219 .. 6.0006]	0.43386155	4.57000000e+2	0.43386155
10	[6.6620 .. 6.7011]	1.98987710	2.09600000e+3	1.98987710
11	[6.9439 .. 7.0159]	3.96076679	4.17200000e+3	3.96076679
12	[7.0281 .. 7.1087]	6.12817574	6.45500000e+3	6.12817574
13	[7.4516 .. 7.4565]	0.04746844	5.00000000e+1	0.04746844

No.	(ppm)	(Hz)	Height
1	0.88	441.9	0.0079
2	0.90	449.2	0.0211
3	0.91	455.9	0.0076
4	1.26	631.1	0.0119
5	1.32	661.0	0.0198
6	1.33	664.1	0.0163
7	1.34	667.7	0.0179
8	1.38	690.9	0.0061
9	1.40	698.2	0.0076
10	1.42	712.3	0.0038
11	1.45	727.5	1.0000
12	1.48	742.2	0.0092
13	1.50	749.5	0.0128
14	1.51	756.8	0.0089
15	1.53	764.8	0.0029
16	1.66	829.5	0.0039
17	1.68	838.0	0.0104
18	1.69	844.7	0.0145
19	1.70	850.8	0.0146
20	1.72	858.1	0.0141
21	1.73	866.1	0.0089
22	1.75	873.4	0.0030
23	2.05	1023.6	0.0051
24	2.06	1029.7	0.0047
25	2.08	1040.0	0.0045
26	2.09	1046.7	0.0095
27	2.11	1054.1	0.0094
28	2.12	1060.8	0.0031
29	2.78	1389.1	0.0136
30	2.79	1397.1	0.0334
31	2.81	1404.4	0.0324
32	2.82	1411.1	0.0115
33	4.95	2474.3	0.0030
34	4.97	2483.5	0.0031
35	5.00	2500.0	0.0026
36	5.03	2516.5	0.0028
37	5.15	2573.8	0.0021
38	5.80	2902.2	0.0015
39	5.82	2908.9	0.0016
40	6.68	3342.3	0.0167
41	6.98	3488.7	0.0252
42	6.98	3491.8	0.0249
43	6.99	3496.1	0.0214
44	7.00	3499.7	0.0261
45	7.04	3518.6	0.0051
46	7.05	3523.5	0.0312
47	7.05	3528.4	0.0465
48	7.06	3531.5	0.0415
49	7.25	3624.8	0.5986

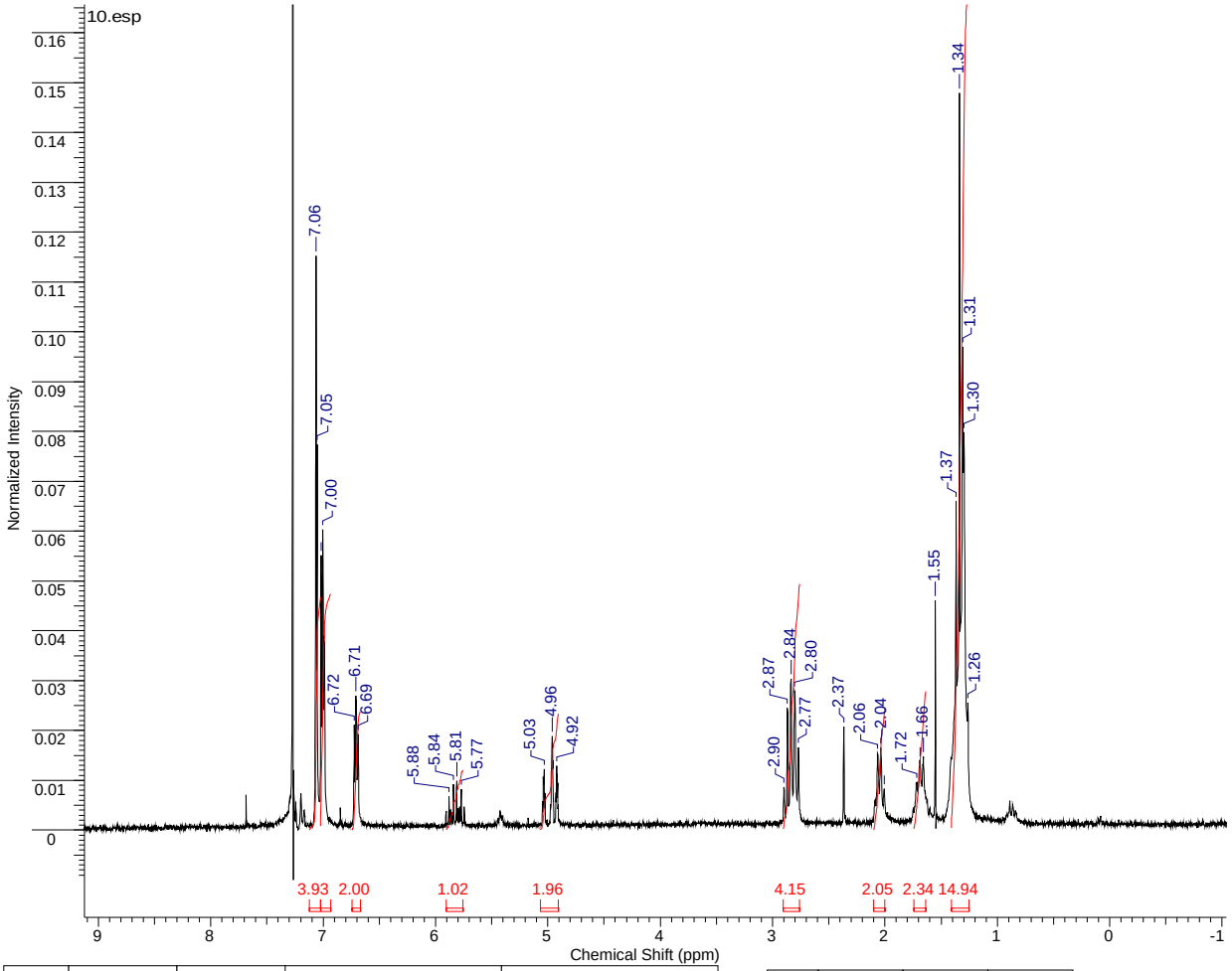
Figure S 15. ^{1}H NMR spectra for compound **8**



No.	(ppm)	Value	Absolute Value	Non-Negative Value
1	[1.2432 .. 1.4642]	15.01693153	2.39584700e+7	15.01693153
2	[1.6374 .. 1.7670]	1.97770894	3.15529675e+6	1.97770894
3	[1.9641 .. 2.1253]	2.08052039	3.31932550e+6	2.08052039
4	[2.7286 .. 2.9495]	4.09499979	6.53328700e+6	4.09499979
5	[4.8727 .. 5.0757]	2.01234984	3.21056425e+6	2.01234984
6	[5.7285 .. 5.9298]	1.09303975	1.74386888e+6	1.09303975
7	[6.6405 .. 6.7797]	1.99923515	3.18964050e+6	1.99923515
8	[6.8752 .. 7.1918]	6.02160978	9.60705900e+6	6.02160978

No.	(ppm)	(Hz)	Height
1	1.31	326.6	0.3278
2	1.33	333.9	0.3873
3	1.36	341.2	0.2044
4	1.56	391.3	1.0000
5	1.66	415.1	0.0376
6	1.69	421.8	0.0448
7	1.72	429.1	0.0316
8	2.01	501.8	0.0232
9	2.03	508.5	0.0559
10	2.06	515.8	0.0531
11	2.77	692.2	0.0547
12	2.80	700.2	0.0974
13	2.83	708.7	0.1077
14	2.87	716.6	0.0834
15	2.89	724.0	0.0289
16	4.92	1231.2	0.0345
17	4.96	1241.6	0.0628
18	5.03	1258.7	0.0394
19	5.77	1443.7	0.0212
20	5.81	1453.4	0.0309
21	5.84	1460.1	0.0302
22	5.88	1470.5	0.0192
23	6.68	1672.0	0.0570
24	6.70	1675.6	0.0907
25	6.72	1680.5	0.0671
26	6.99	1748.9	0.1902
27	7.01	1752.5	0.2107
28	7.03	1759.3	0.2274
29	7.05	1763.5	0.1158

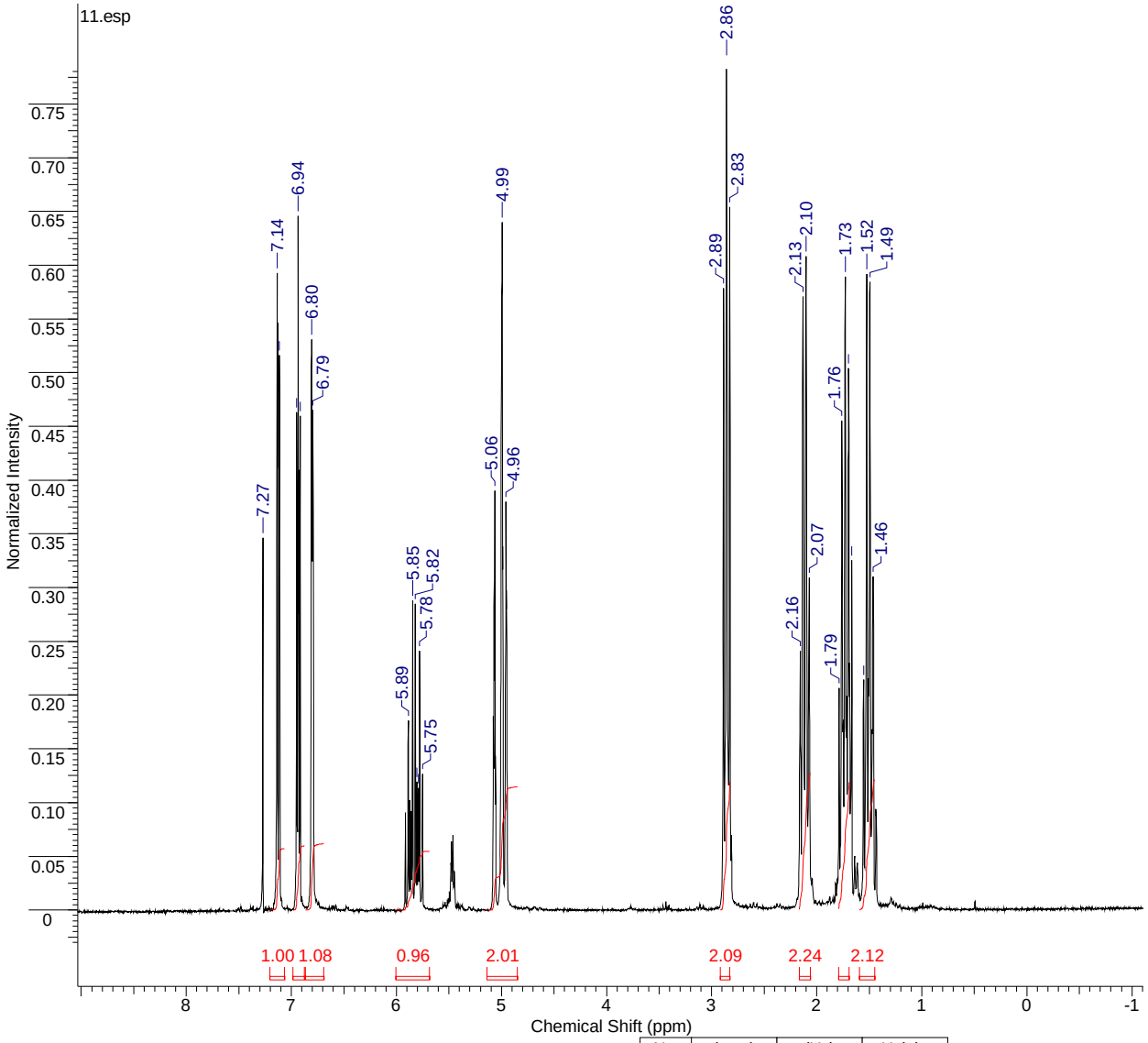
Figure S 16. ^{1}H NMR spectra for compound **9**



No.	(ppm)	Value	Absolute Value	Non-Negative Value
1	[1.2514 .. 1.4093]	14.94449806	6.70306850e+6	14.94449806
2	[1.6368 .. 1.7421]	2.34005618	1.04958738e+6	2.34005618
3	[1.9996 .. 2.0993]	2.05374146	9.21166375e+5	2.05374146
4	[2.7591 .. 2.9039]	4.15295935	1.86273038e+6	4.15295935
5	[4.9049 .. 5.0647]	1.96217573	8.80096250e+5	1.96217573
6	[5.7544 .. 5.9029]	1.01632500	4.55853063e+5	1.01632500
7	[6.6707 .. 6.7440]	2.00000000	8.97061625e+5	2.00000000
8	[6.9339 .. 7.0234]	3.98123741	1.78570763e+6	3.98123741
9	[7.0234 .. 7.1219]	3.93369675	1.76438425e+6	3.93369675

No.	(ppm)	(Hz)	Height
1	1.26	315.6	0.0256
2	1.30	324.1	0.0798
3	1.31	327.2	0.0970
4	1.34	334.5	0.1479
5	1.37	341.8	0.0660
6	1.55	388.2	0.0461
7	1.66	415.1	0.0148
8	1.69	422.4	0.0140
9	1.72	429.7	0.0096
10	2.01	502.4	0.0083
11	2.04	509.7	0.0166
12	2.06	516.4	0.0155
13	2.37	592.1	0.0208
14	2.77	692.8	0.0167
15	2.80	701.4	0.0280
16	2.84	709.3	0.0304
17	2.87	717.9	0.0245
18	2.90	725.2	0.0086
19	4.92	1231.2	0.0129
20	4.96	1241.6	0.0189
21	5.03	1258.7	0.0122
22	5.77	1443.7	0.0083
23	5.81	1453.4	0.0099
24	5.84	1460.8	0.0092
25	5.88	1470.5	0.0068
26	6.69	1673.2	0.0193
27	6.71	1678.1	0.0269
28	6.72	1681.7	0.0211
29	7.00	1751.3	0.0603
30	7.02	1755.6	0.0551
31	7.05	1764.1	0.0774
32	7.06	1766.6	0.1152

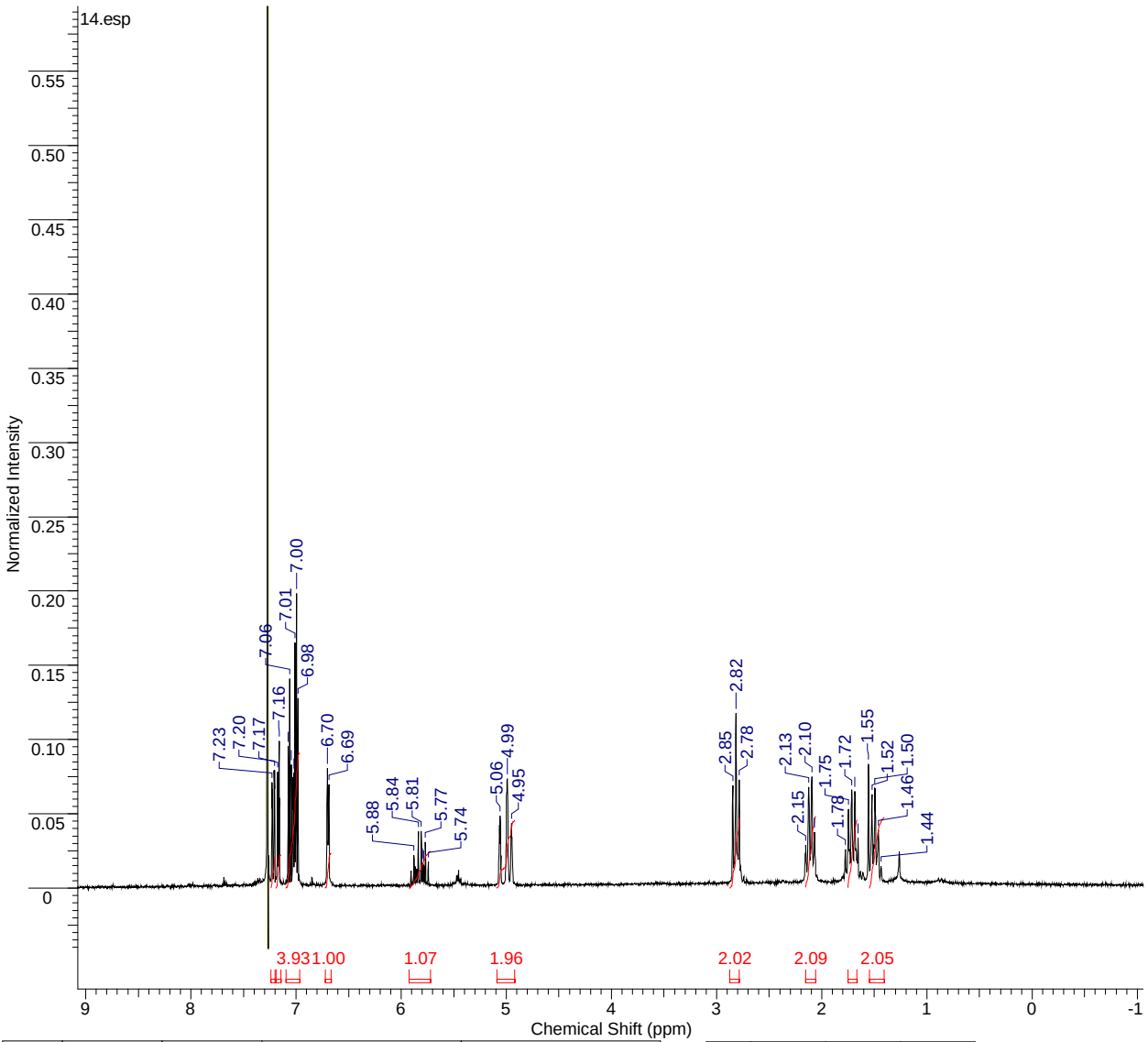
Figure S 17. ^{1}H NMR spectra for compound **10**



No.	(ppm)	Value	Absolute Value	Non-Negative Value
1	[1.4500 .. 1.5931]	2.11872983	4.57436400e+7	2.11872983
2	[1.6917 .. 1.7904]	2.08337879	4.49804120e+7	2.08337879
3	[2.0618 .. 2.1654]	2.23698211	4.82967240e+7	2.23698211
4	[2.8265 .. 2.9153]	2.09181142	4.51624720e+7	2.09181142
5	[4.8513 .. 5.1364]	2.00873041	4.33687400e+7	2.00873041
6	[5.6838 .. 6.0031]	0.95901215	2.07051920e+7	0.95901215
7	[6.6930 .. 6.8640]	1.08177567	2.33556700e+7	1.08177567
8	[6.8754 .. 6.9837]	1.04668748	2.25981140e+7	1.04668748
9	[7.0636 .. 7.2061]	1.00018942	2.15942140e+7	1.00018942

Figure S 18. ^{1}H NMR spectra for compound **11**

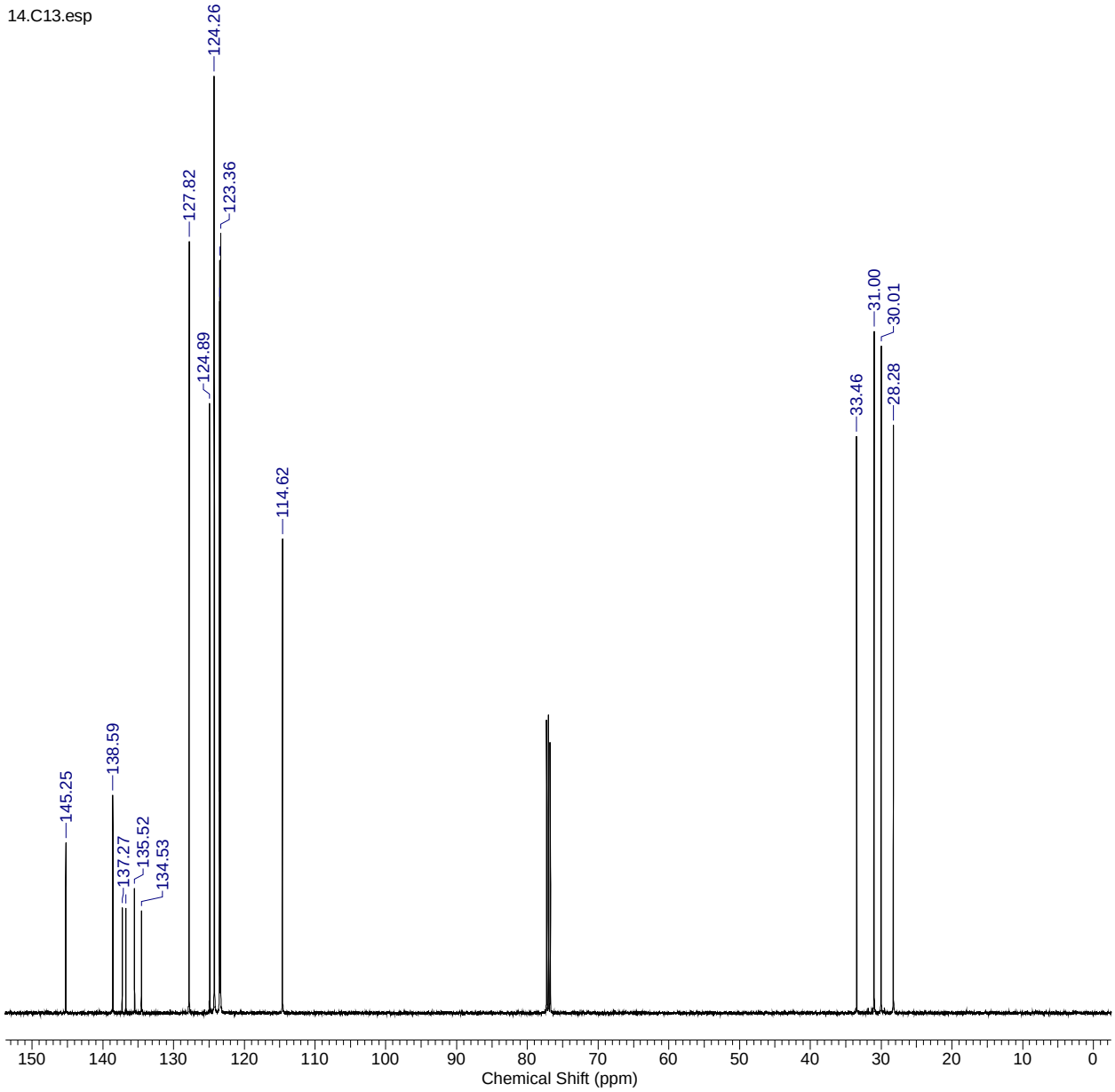
No.	(ppm)	(Hz)	Height
1	1.46	366.3	0.3102
2	1.49	373.6	0.5844
3	1.52	380.9	0.5920
4	1.55	388.8	0.2145
5	1.67	416.9	0.3255
6	1.70	424.3	0.5043
7	1.73	432.2	0.5893
8	1.76	440.1	0.4556
9	1.79	447.4	0.2066
10	2.07	518.3	0.3092
11	2.10	525.6	0.6085
12	2.13	532.9	0.5706
13	2.16	539.6	0.2410
14	2.83	707.5	0.6539
15	2.86	714.8	1.0000
16	2.89	722.1	0.5788
17	4.96	1239.8	0.3798
18	4.99	1248.9	0.6398
19	5.06	1266.0	0.3902
20	5.75	1438.8	0.1269
21	5.78	1445.5	0.2413
22	5.79	1448.5	0.1137
23	5.81	1452.2	0.1194
24	5.82	1455.9	0.2850
25	5.85	1462.6	0.2881
26	5.89	1472.4	0.1764
27	6.79	1699.4	0.4652
28	6.80	1701.9	0.5308
29	6.92	1730.0	0.4596
30	6.94	1734.8	0.6460
31	6.95	1738.5	0.4634
32	7.11	1779.4	0.5163
33	7.14	1784.9	0.5926
34	7.27	1818.5	0.3461



No.	(ppm)	Value	Absolute Value	Non-Negative Value
1	[1.4064 .. 1.5451]	2.05368209	5.16385550e+6	2.05368209
2	[1.6659 .. 1.7507]	1.97450638	4.96477350e+6	1.97450638
3	[2.0600 .. 2.1548]	2.08570504	5.24437550e+6	2.08570504
4	[2.7834 .. 2.8737]	2.02149606	5.08292600e+6	2.02149606
5	[4.9198 .. 5.0912]	1.95872951	4.92510350e+6	1.95872951
6	[5.7194 .. 5.9240]	1.06840515	2.68643825e+6	1.06840515
7	[6.6694 .. 6.7229]	1.00307333	2.52216550e+6	1.00307333
8	[6.9660 .. 7.0946]	3.93390727	9.89156500e+6	3.93390727
9	[7.1449 .. 7.1878]	0.96163416	2.41796925e+6	0.96163416
10	[7.1974 .. 7.2403]	0.93251014	2.34473875e+6	0.93251014

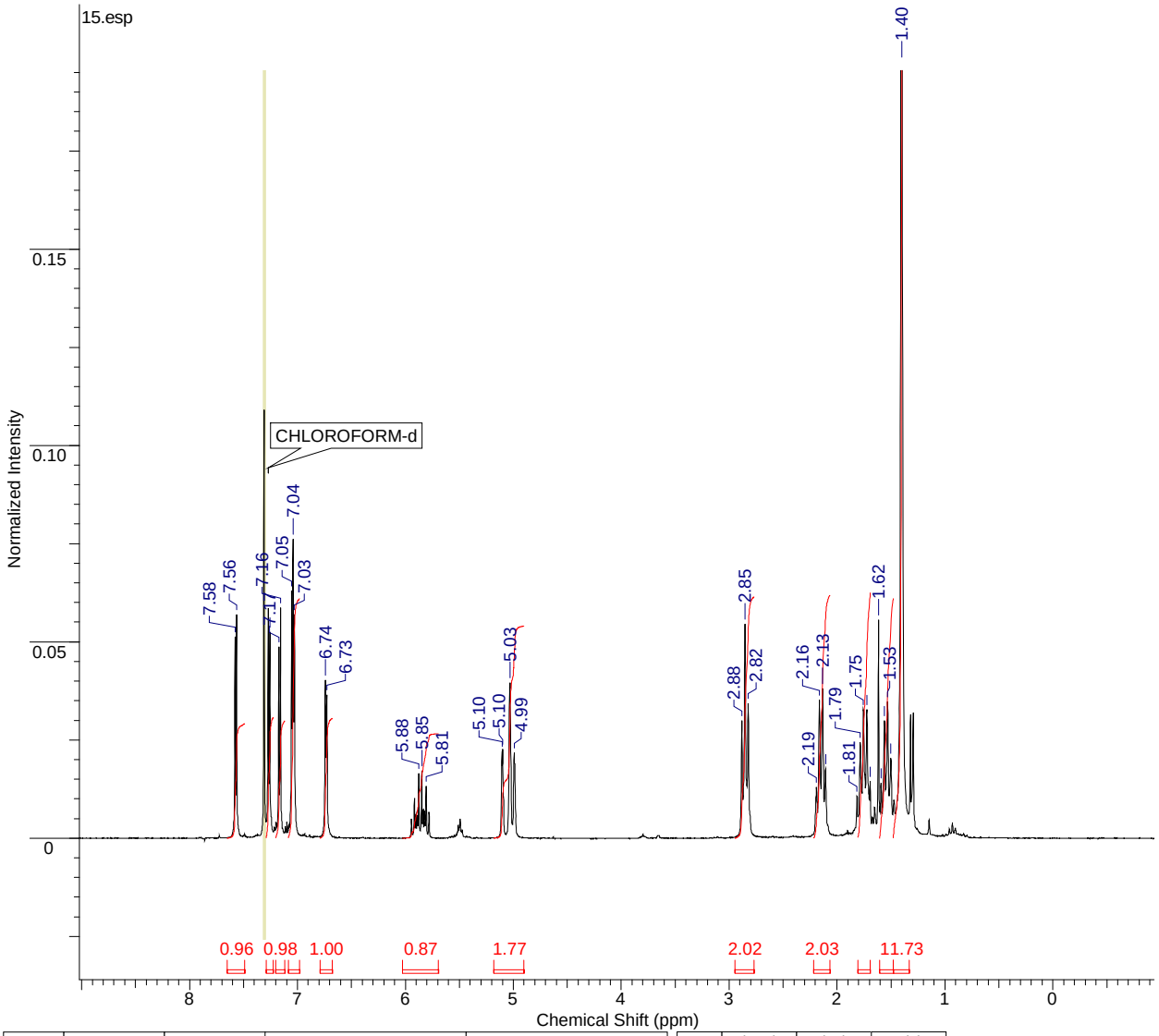
No.	(ppm)	(Hz)	Height
1	1.44	359.5	0.0147
2	1.46	366.3	0.0392
3	1.50	374.2	0.0673
4	1.52	380.9	0.0630
5	1.55	388.8	0.0834
6	1.65	413.9	0.0337
7	1.68	421.2	0.0652
8	1.72	429.1	0.0662
9	1.75	437.1	0.0530
10	1.78	444.4	0.0262
11	2.07	517.0	0.0378
12	2.10	524.4	0.0751
13	2.13	531.7	0.0680
14	2.15	538.4	0.0288
15	2.78	696.5	0.0728
16	2.82	704.4	0.1177
17	2.85	711.8	0.0689
18	4.95	1238.6	0.0438
19	4.99	1248.3	0.0736
20	5.06	1265.4	0.0485
21	5.74	1436.3	0.0175
22	5.77	1443.1	0.0311
23	5.78	1446.7	0.0156
24	5.80	1449.8	0.0168
25	5.81	1453.4	0.0382
26	5.84	1460.1	0.0380
27	5.88	1470.5	0.0221
28	6.69	1673.2	0.0696
29	6.70	1676.2	0.0806
30	6.98	1746.4	0.1280
31	7.00	1750.1	0.1982
32	7.01	1753.8	0.1653
33	7.02	1756.2	0.0777
34	7.04	1761.7	0.0830
35	7.06	1766.0	0.1410
36	7.07	1769.6	0.0955
37	7.16	1791.0	0.0991
38	7.17	1794.7	0.0781
39	7.20	1802.0	0.0792
40	7.23	1808.1	0.0711
41	7.27	1818.5	1.0000

Figure S 19. ^{1}H NMR spectra for compound **14**



No.	(ppm)	(Hz)	Height
1	28.28	3555.9	0.6274
2	30.01	3773.7	0.7122
3	31.00	3898.5	0.7275
4	33.46	4207.5	0.6159
5	114.62	14414.3	0.5064
6	123.36	15513.0	0.8322
7	123.49	15529.3	0.7595
8	123.52	15533.2	0.8035
9	124.24	15624.3	0.9853
10	124.26	15626.3	1.0000
11	124.89	15705.9	0.6509
12	127.82	16074.4	0.8237
13	134.53	16918.8	0.1092
14	135.52	17042.6	0.1331
15	136.76	17199.0	0.1119
16	137.27	17263.3	0.1123
17	138.59	17428.3	0.2327
18	145.25	18266.0	0.1819

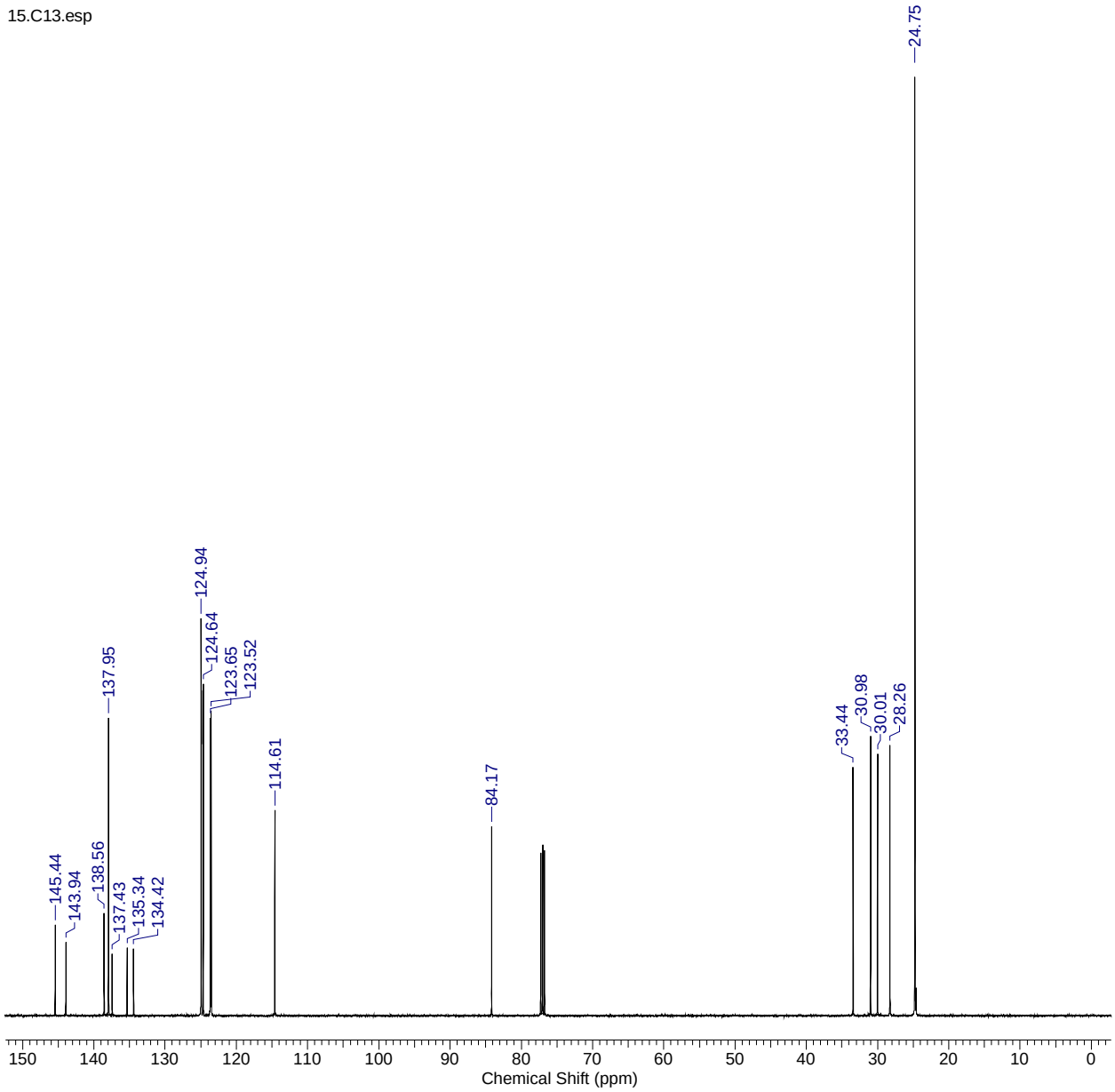
Figure S 20. ^{13}C NMR spectra for compound **14**



No.	(ppm)	Value	Absolute Value	Non-Negative Value
1	[1.2948 .. 1.4395]	11.73398113	3.05957180e+7	11.73398113
2	[1.4395 .. 1.5651]	2.00399876	5.22531850e+6	2.00399876
3	[1.6534 .. 1.7662]	2.05211473	5.35077800e+6	2.05211473
4	[2.0270 .. 2.1770]	2.03044009	5.29426300e+6	2.03044009
5	[2.7314 .. 2.9044]	2.01594543	5.25646850e+6	2.01594543
6	[4.8619 .. 5.1418]	1.77323508	4.62361450e+6	1.77323508
7	[5.6569 .. 5.9857]	0.87207311	2.27388350e+6	0.87207311
8	[6.6399 .. 6.7499]	1.00065267	2.60914775e+6	1.00065267
9	[6.9412 .. 7.0460]	2.00285578	5.22233800e+6	2.00285578
10	[7.0805 .. 7.1593]	0.97884750	2.55229200e+6	0.97884750
11	[7.1875 .. 7.2504]	1.00760591	2.62727800e+6	1.00760591
12	[7.4509 .. 7.6094]	0.95750141	2.49663325e+6	0.95750141

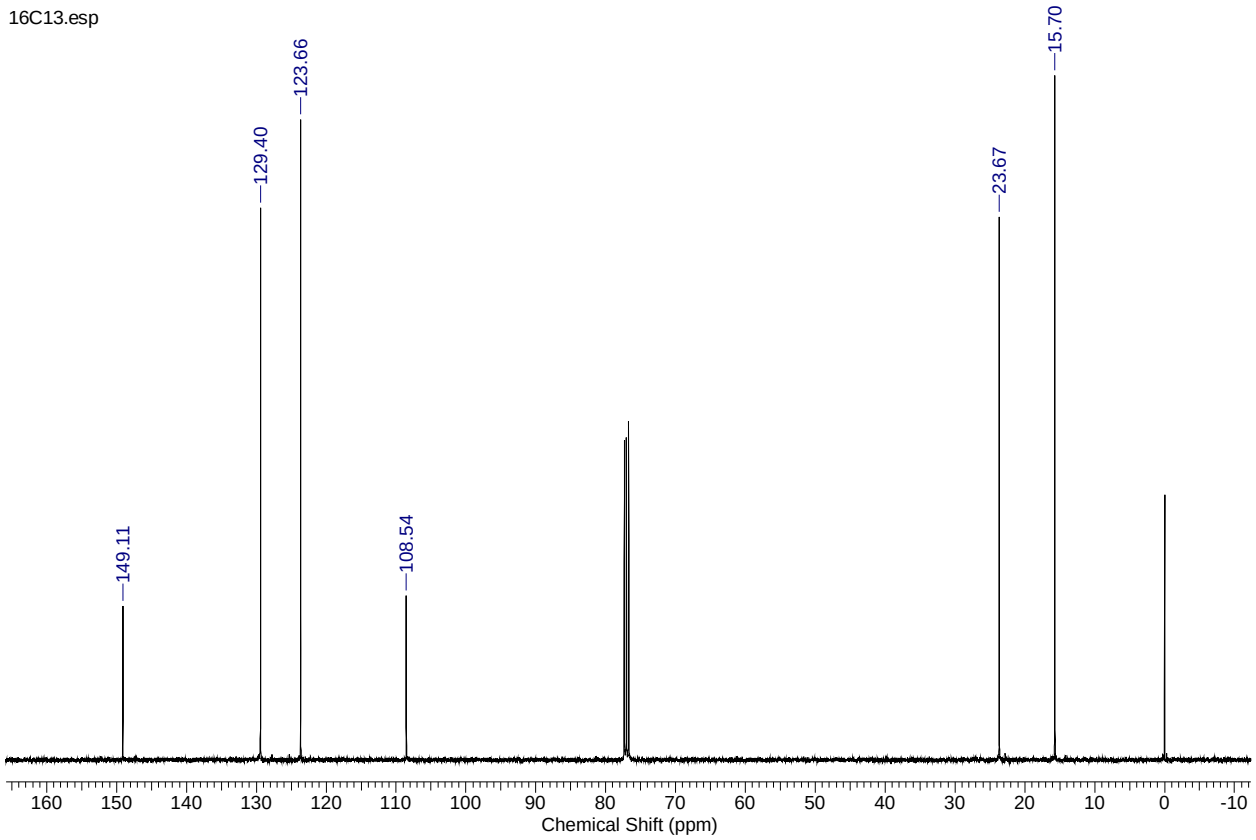
No.	(ppm)	(Hz)	Height
1	1.36	340.6	1.0000
2	1.46	365.9	0.0203
3	1.49	373.5	0.0348
4	1.52	380.5	0.0300
5	1.55	388.5	0.0141
6	1.58	394.4	0.0556
7	1.65	413.8	0.0144
8	1.68	421.1	0.0327
9	1.72	429.1	0.0327
10	1.75	436.8	0.0244
11	1.78	444.1	0.0107
12	2.07	516.8	0.0177
13	2.10	524.1	0.0382
14	2.12	531.1	0.0352
15	2.15	538.4	0.0130
16	2.78	696.3	0.0344
17	2.81	704.0	0.0546
18	2.84	711.3	0.0300
19	4.95	1238.7	0.0217
20	4.99	1247.9	0.0396
21	5.06	1265.1	0.0227
22	5.06	1266.9	0.0221
23	5.77	1442.7	0.0132
24	5.81	1452.9	0.0171
25	5.84	1459.9	0.0164
26	6.69	1673.0	0.0365
27	6.70	1676.3	0.0403
28	6.99	1747.9	0.0569
29	7.00	1751.2	0.0762
30	7.01	1754.1	0.0629
31	7.12	1780.5	0.0587
32	7.13	1784.1	0.0488
33	7.22	1804.9	0.0525
34	7.23	1808.6	0.0586
35	7.27	1818.5	0.1091
36	7.52	1882.1	0.0569
37	7.54	1885.7	0.0514

Figure S 21. ^{1}H NMR spectra for compound **15**



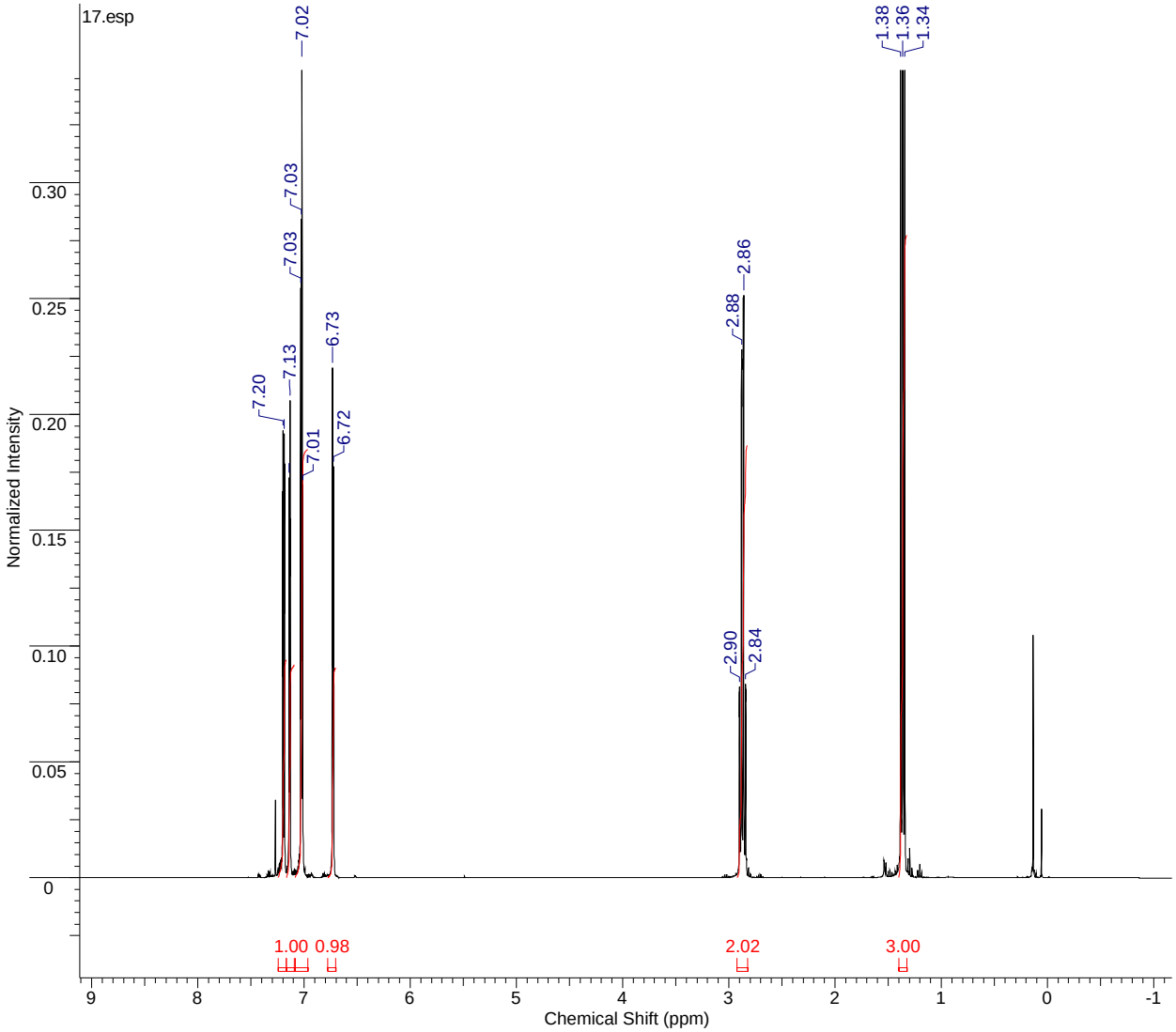
No.	(ppm)	(Hz)	Height
1	24.75	3112.6	1.0000
2	28.26	3554.0	0.1709
3	30.01	3773.7	0.1655
4	30.98	3896.6	0.1765
5	33.44	4205.5	0.1571
6	84.17	10584.7	0.1196
7	114.61	14413.4	0.1298
8	123.52	15534.1	0.1927
9	123.65	15549.5	0.1882
10	124.64	15674.2	0.2096
11	124.93	15710.7	0.2055
12	124.94	15712.6	0.2512
13	134.42	16904.4	0.0422
14	135.34	17019.5	0.0428
15	137.43	17282.5	0.0392
16	137.95	17347.7	0.1881
17	138.56	17425.4	0.0647
18	143.94	18101.0	0.0465
19	145.44	18290.0	0.0574

Figure S 22. ^{13}C NMR spectra for compound **15**



No.	(ppm)	(Hz)	Height
1	15.70	1579.7	1.0000
2	23.67	2380.8	0.7933
3	108.54	10917.8	0.2397
4	123.66	12438.8	0.9355
5	129.40	13015.9	0.8066
6	149.11	14998.6	0.2247

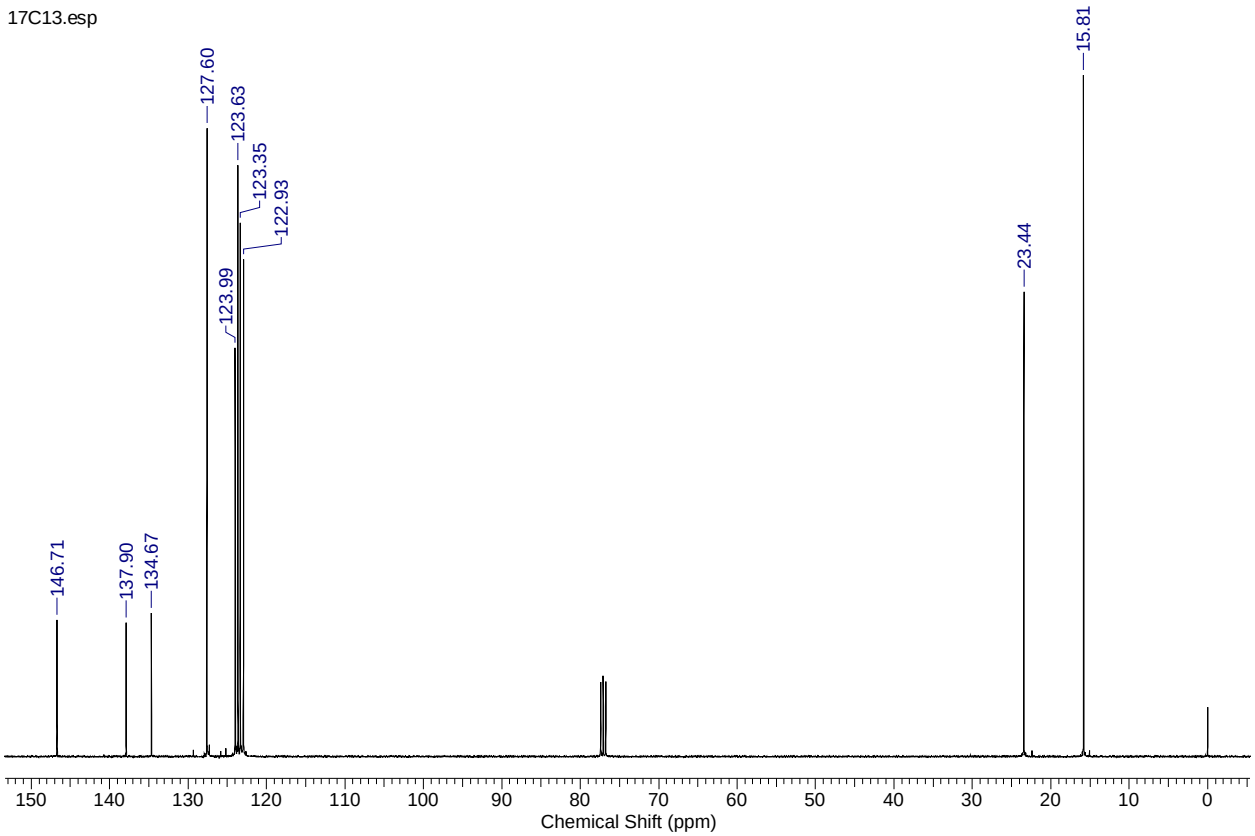
Figure S 23. ^{13}C NMR spectra for compound **16**



No.	(ppm)	Value	Absolute Value	Non-Negative Value
1	[1.3245 .. 1.3986]	3.00081086	2.10557222e+9	3.00081086
2	[2.8256 .. 2.9227]	2.02031469	1.41758963e+9	2.02031469
3	[6.7007 .. 6.7767]	0.97951692	6.87295424e+8	0.97951692
4	[6.9667 .. 7.0836]	1.99980617	1.40319949e+9	1.99980617
5	[7.0913 .. 7.1660]	0.99619192	6.98995712e+8	0.99619192
6	[7.1698 .. 7.2420]	1.01850963	7.14655360e+8	1.01850963

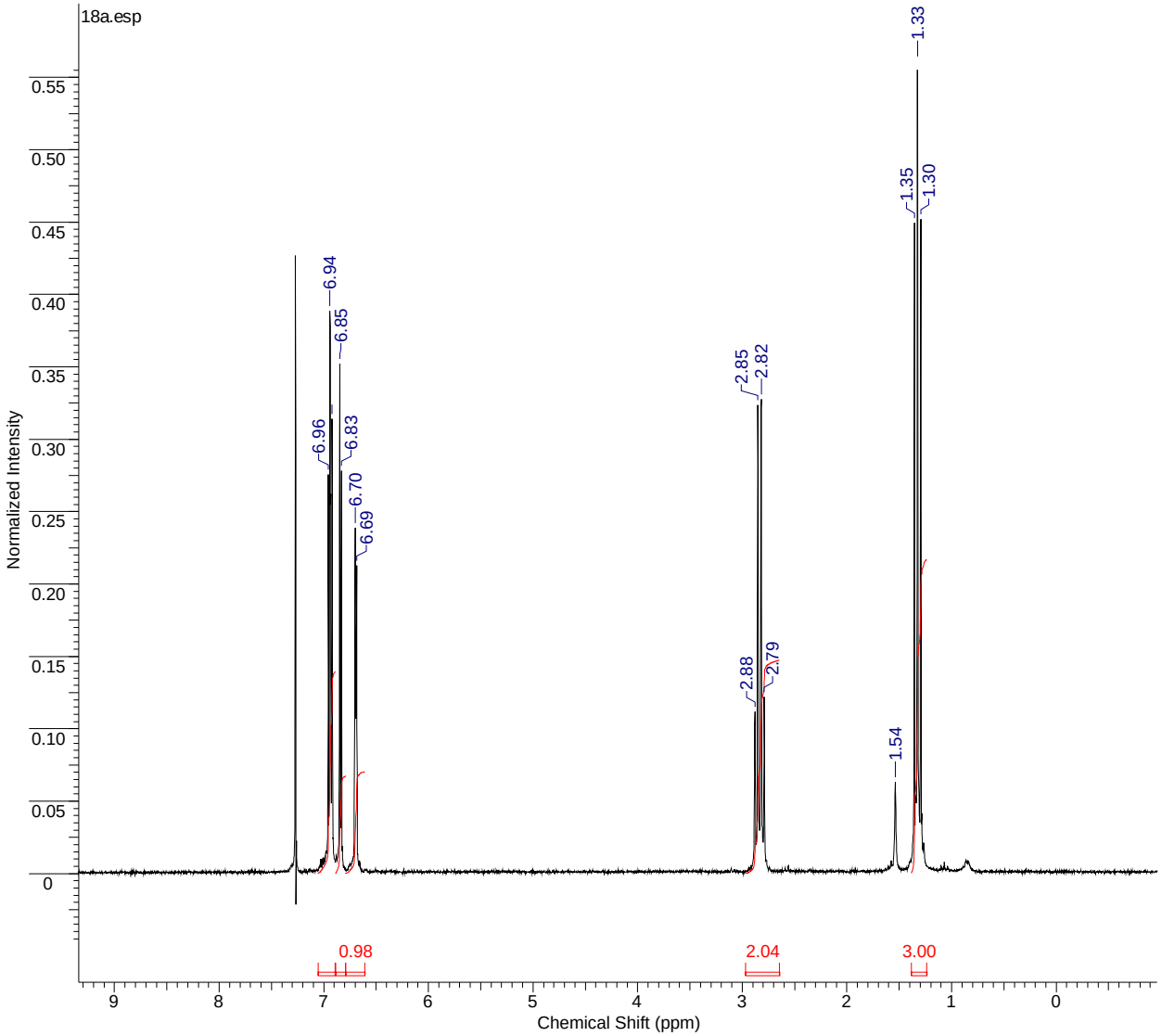
No.	(ppm)	(Hz)	Height
1	1.34	538.0	0.5179
2	1.36	545.3	1.0000
3	1.38	553.1	0.4735
4	2.84	1137.1	0.0835
5	2.86	1144.4	0.2514
6	2.88	1152.7	0.2281
7	2.90	1159.6	0.0825
8	6.72	2690.3	0.1776
9	6.73	2693.8	0.2202
10	7.01	2805.3	0.1694
11	7.02	2808.7	0.3800
12	7.03	2812.1	0.2842
13	7.03	2814.1	0.2547
14	7.13	2854.2	0.2060
15	7.14	2857.6	0.1726
16	7.19	2876.2	0.1918
17	7.20	2880.1	0.1930

Figure S 24. ^{1}H NMR spectra for compound **17**



No.	(ppm)	(Hz)	Height
1	15.81	1590.7	1.0000
2	23.44	2357.5	0.6823
3	122.93	12365.7	0.7296
4	123.35	12407.8	0.7833
5	123.63	12436.1	0.8676
6	123.99	12472.3	0.6002
7	127.60	12835.2	0.9226
8	134.67	13546.3	0.2105
9	137.90	13871.0	0.1967
10	146.71	14757.2	0.2009

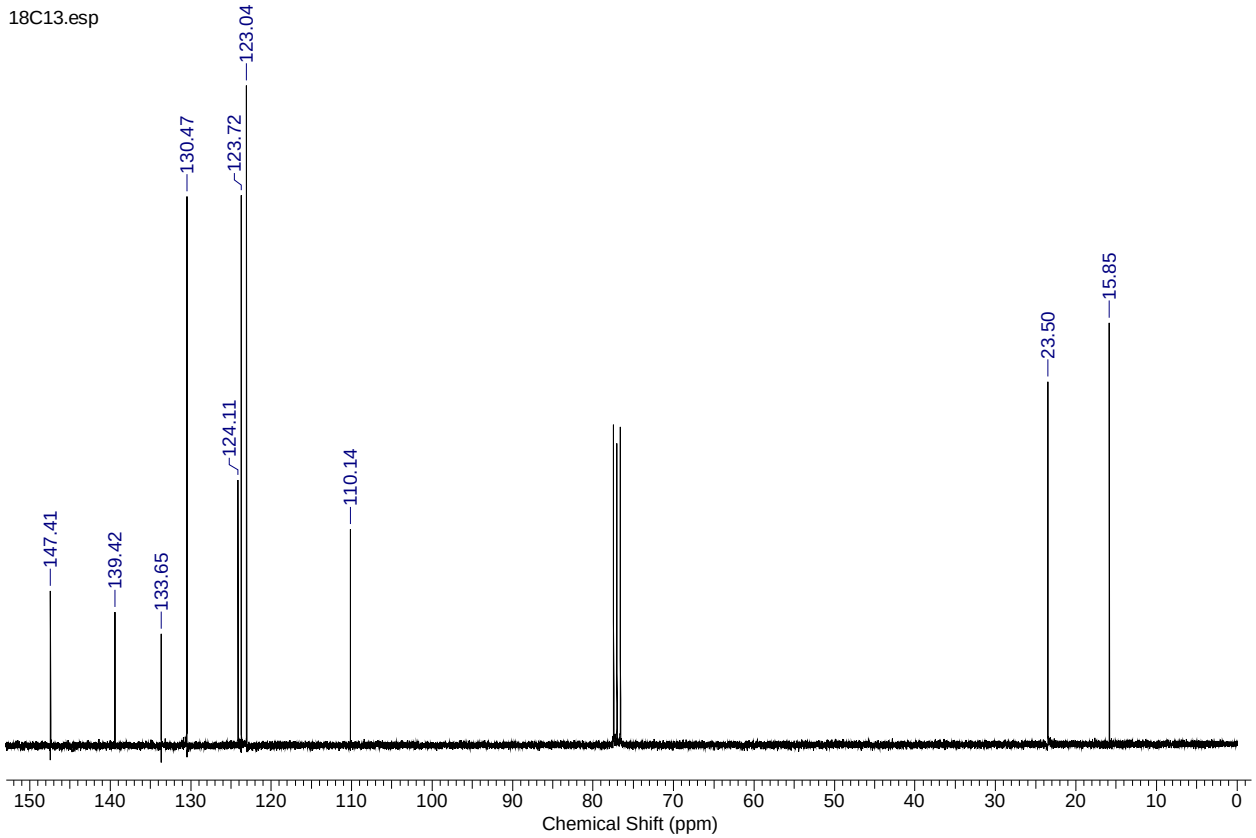
Figure S 25. ^{13}C NMR spectra for compound **17**



No.	(ppm)	Value	Absolute Value	Non-Negative Value
1	[1.2398 .. 1.38	3.00000000	1.92479100e+7	3.00000000
2	[2.6448 .. 2.96	2.04000950	1.30886390e+7	2.04000950
3	[6.6067 .. 6.79	0.97536480	6.25791150e+6	0.97536480
4	[6.7902 .. 6.88	0.93271869	5.98429500e+6	0.93271869
5	[6.8915 .. 7.05	1.93255067	1.23991870e+7	1.93255067

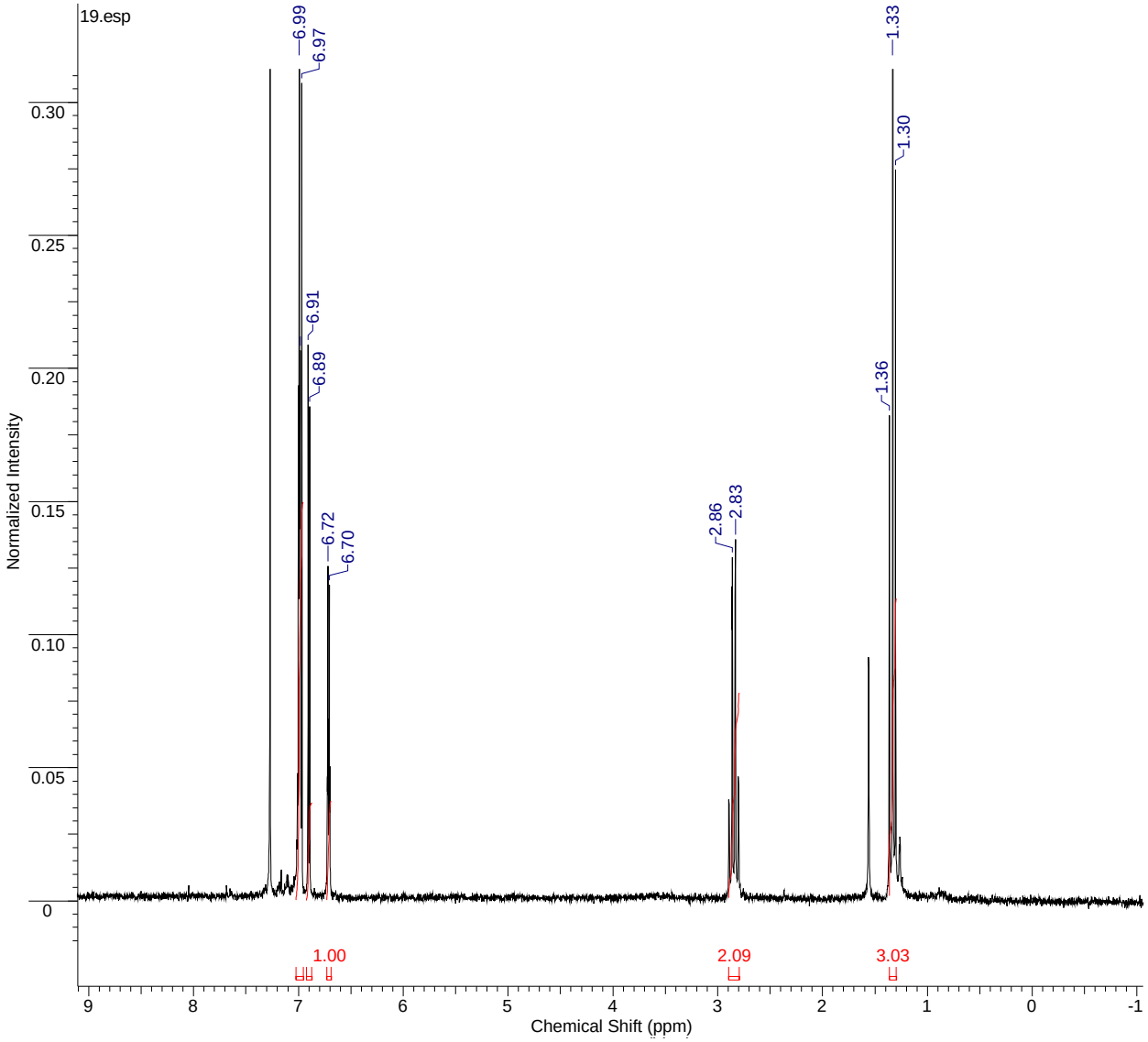
No.	(ppm)	(Hz)	Height
1	1.30	324.1	0.4521
2	1.33	331.5	1.0000
3	1.35	338.8	0.4493
4	1.54	384.6	0.0631
5	2.79	697.7	0.1221
6	2.82	705.0	0.3278
7	2.85	713.0	0.3236
8	2.88	720.3	0.1117
9	6.69	1672.6	0.2129
10	6.70	1676.2	0.2389
11	6.83	1709.2	0.2784
12	6.85	1712.9	0.3520
13	6.92	1731.2	0.3141
14	6.94	1736.1	0.3888
15	6.96	1740.3	0.2759

Figure S 26. ^{1}H NMR spectra for compound **18**



No.	(ppm)	(Hz)	Height
1	15.85	1196.3	0.6390
2	23.50	1773.8	0.5493
3	110.14	8314.4	0.3251
4	123.04	9288.2	1.0000
5	123.72	9339.1	0.8324
6	124.11	9368.8	0.3992
7	130.47	9848.8	0.8310
8	133.65	10088.8	0.1655
9	139.42	10524.3	0.1986
10	147.41	11127.2	0.2311

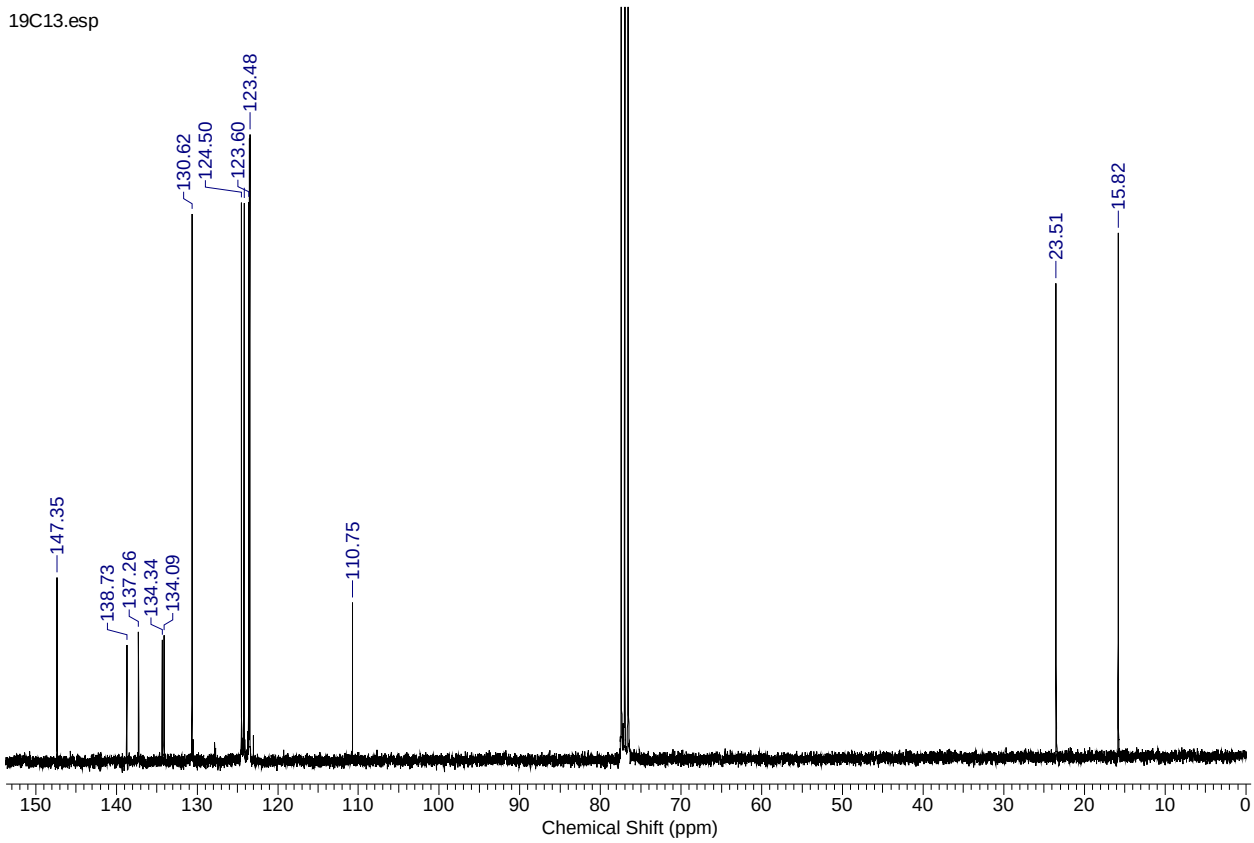
Figure S 27. ^{13}C NMR spectra for compound **18**



No.	(ppm)	Value	Absolute Value	Non-Negative Value
1	[1.2978 .. 1.3648]	3.03173733	8.60805000e+6	3.03173733
2	[2.7967 .. 2.8968]	2.08804941	5.92862500e+6	2.08804941
3	[6.6889 .. 6.7265]	1.00000000	2.83931250e+6	1.00000000
4	[6.8734 .. 6.9245]	0.98235893	2.78922400e+6	0.98235893
5	[6.9544 .. 7.0247]	3.99861145	1.13533070e+7	3.99861145

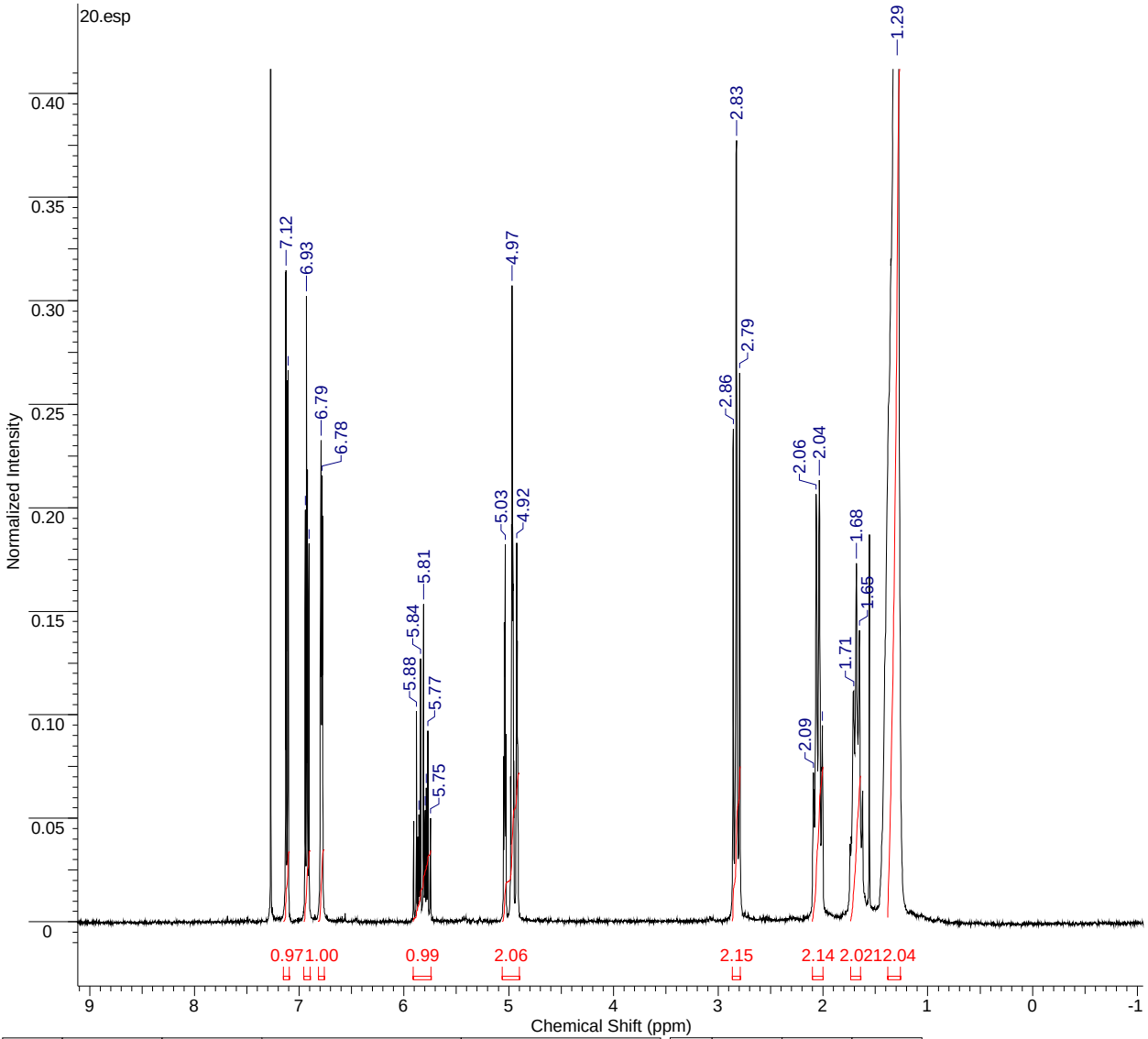
No.	(ppm)	(Hz)	Height
1	1.30	326.0	0.2745
2	1.33	333.3	0.5538
3	1.36	341.2	0.1824
4	2.83	708.1	0.1358
5	2.86	715.4	0.1291
6	6.70	1676.8	0.1187
7	6.72	1680.5	0.1258
8	6.89	1723.8	0.1857
9	6.91	1727.5	0.2088
10	6.97	1742.8	0.3071
11	6.98	1746.4	0.2068
12	6.99	1748.9	0.6051

Figure S 28. ^{1}H NMR spectra for compound **19**



No.	(ppm)	(Hz)	Height
1	15.82	1193.9	0.4950
2	23.51	1774.6	0.4461
3	110.75	8359.2	0.1391
4	123.48	9319.7	0.5894
5	123.49	9321.1	0.5853
6	123.60	9328.7	0.5243
7	124.18	9373.0	0.5231
8	124.50	9396.8	0.5239
9	130.62	9858.6	0.5129
10	134.09	10120.6	0.1076
11	134.34	10139.4	0.1029
12	137.26	10359.8	0.1109
13	138.73	10470.8	0.0983
14	147.35	11121.9	0.1633

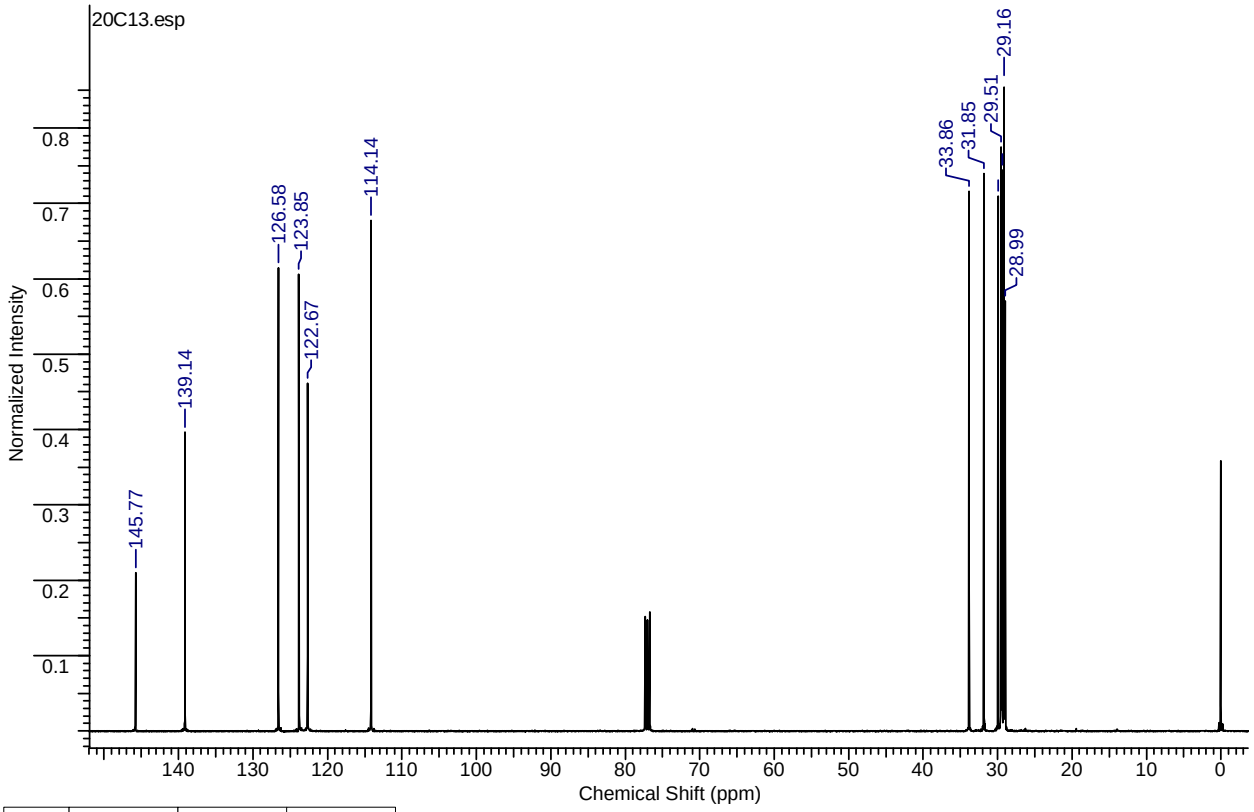
Figure S 29. ^{13}C NMR spectra for compound **19**



No.	(ppm)	Value	Absolute Value	Non-Negative Value
1	[1.2622 .. 1.3824]	12.03774834	8.27890080e+7	12.03774834
2	[1.6413 .. 1.7360]	2.01898193	1.38854480e+7	2.01898193
3	[2.0018 .. 2.1012]	2.14406013	1.47456670e+7	2.14406013
4	[2.7923 .. 2.8663]	2.15174389	1.47985120e+7	2.15174389
5	[4.8971 .. 5.0634]	2.05555701	1.41369920e+7	2.05555701
6	[5.7423 .. 5.9131]	0.98517418	6.77548600e+6	0.98517418
7	[6.7600 .. 6.8161]	1.00000000	6.87745000e+6	1.00000000
8	[6.8942 .. 6.9552]	0.98370516	6.76538300e+6	0.98370516
9	[7.0943 .. 7.1480]	0.96968150	6.66893600e+6	0.96968150

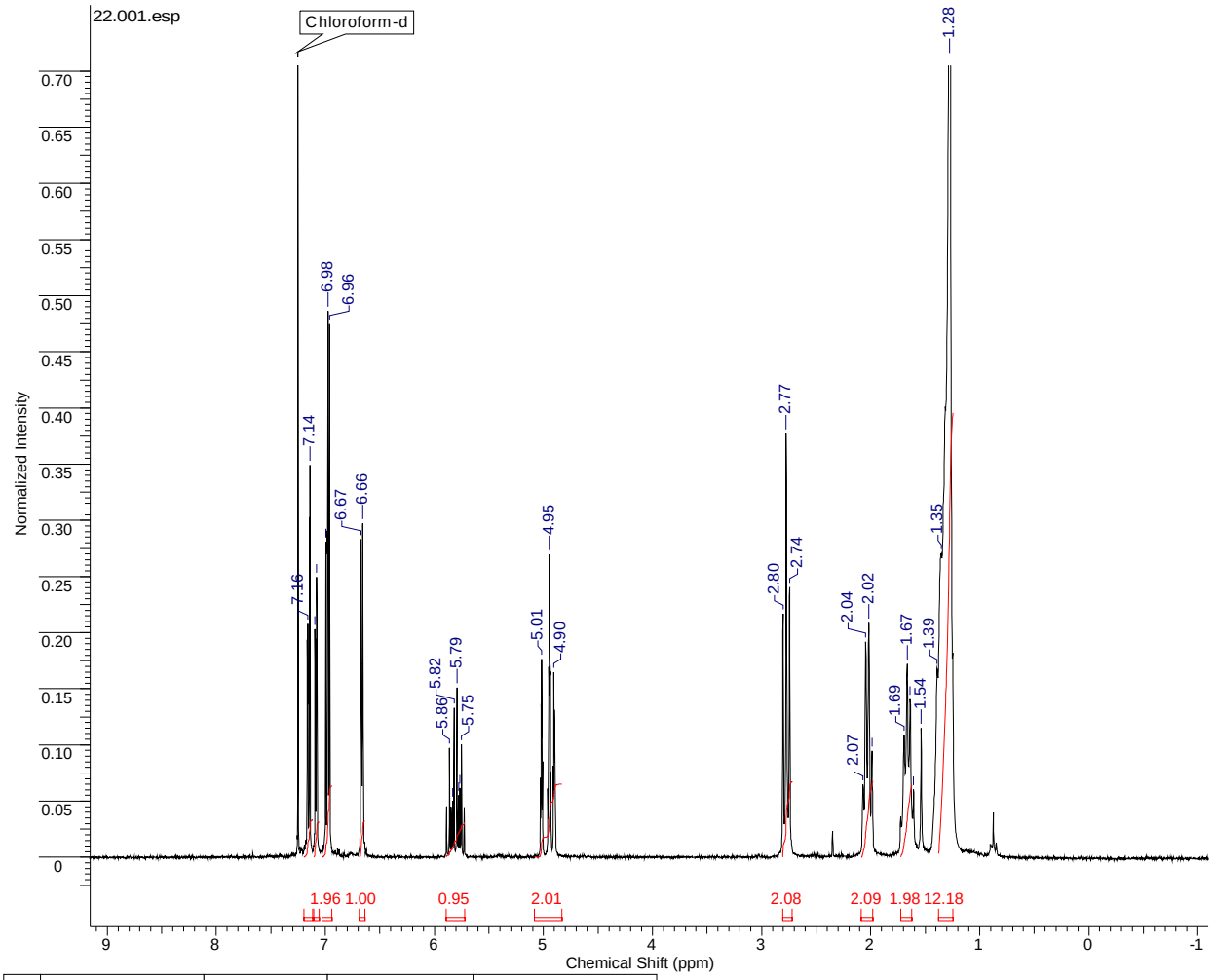
No.	(ppm)	(Hz)	Height
1	1.29	322.9	1.0000
2	1.65	413.3	0.1409
3	1.68	420.6	0.1733
4	1.71	427.3	0.1114
5	2.01	502.4	0.0947
6	2.04	509.1	0.2134
7	2.06	516.4	0.2065
8	2.09	523.1	0.0720
9	2.79	698.9	0.2651
10	2.83	706.9	0.3774
11	2.86	714.2	0.2380
12	4.92	1231.8	0.1830
13	4.97	1242.2	0.3074
14	5.03	1259.3	0.1823
15	5.75	1437.6	0.0501
16	5.77	1443.7	0.0922
17	5.79	1447.3	0.0647
18	5.80	1450.4	0.0538
19	5.81	1454.0	0.1534
20	5.84	1460.8	0.1271
21	5.85	1464.4	0.0517
22	5.88	1471.1	0.1016
23	6.78	1696.4	0.2156
24	6.79	1698.8	0.2325
25	6.91	1727.5	0.1828
26	6.93	1733.0	0.3023
27	6.94	1736.1	0.1990
28	7.10	1777.0	0.2663
29	7.12	1781.8	0.3148

Figure S 30. ^{1}H NMR spectra for compound **20**



No.	(ppm)	(Hz)	Height
1	28.99	2916.1	0.5709
2	29.16	2933.7	1.0000
3	29.40	2957.2	0.7441
4	29.51	2968.9	0.7750
5	29.54	2971.8	0.6147
6	29.96	3013.9	0.7098
7	31.85	3203.6	0.7398
8	33.86	3406.1	0.7162
9	114.14	11482.7	0.6773
10	122.67	12340.4	0.4610
11	123.85	12459.7	0.6061
12	126.58	12733.6	0.6149
13	139.14	13997.2	0.3958
14	145.77	14664.2	0.2102

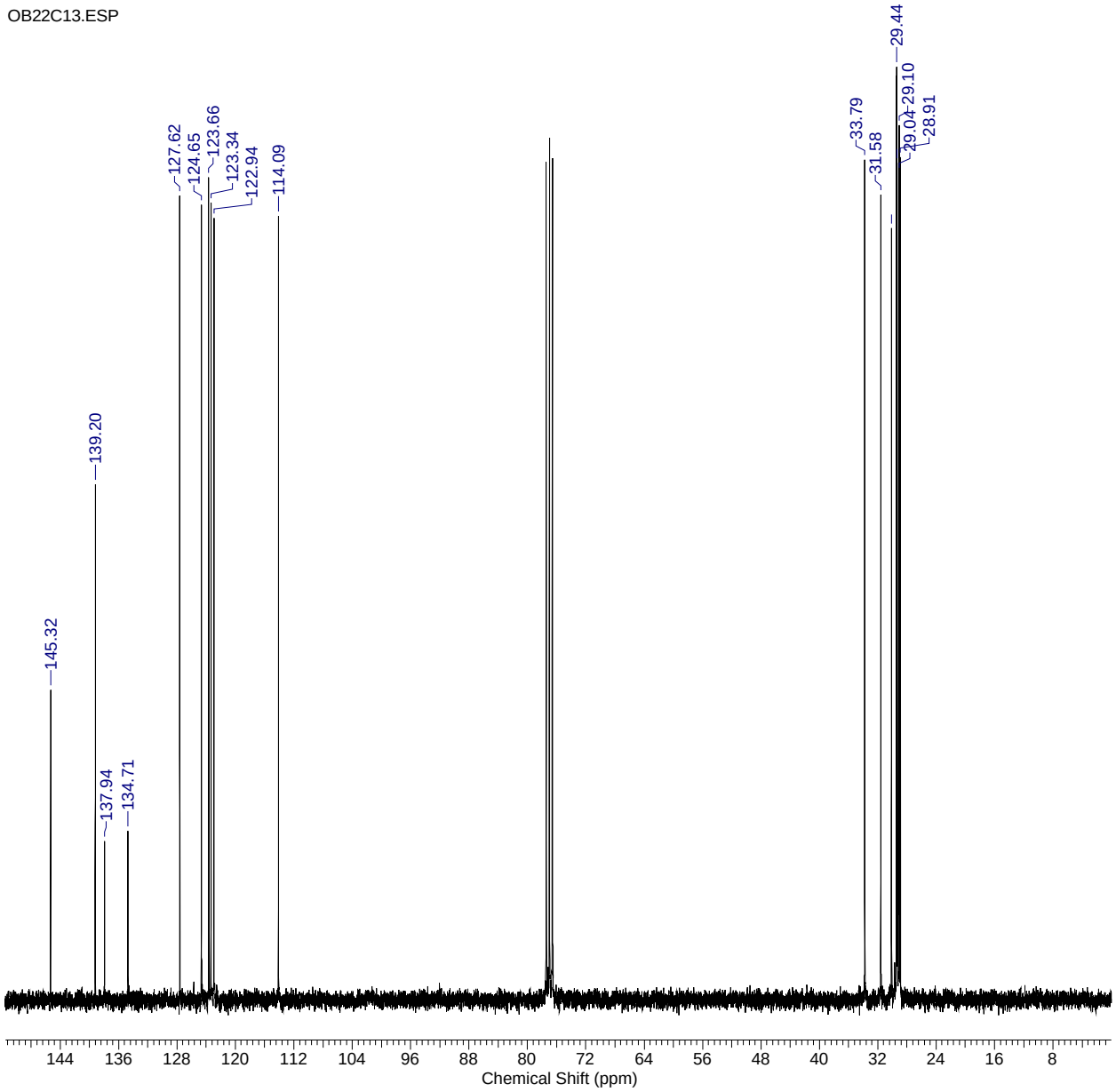
Figure S 31. ^{13}C NMR spectra for compound **20**



No.	(ppm)	Value	Absolute Value	Non-Negative Value
1	[1.2449 .. 1.3759]	12.18101978	5.54340640e+7	12.18101978
2	[1.6227 .. 1.7234]	1.98032808	9.01218800e+6	1.98032808
3	[1.9803 .. 2.0860]	2.09279037	9.52398700e+6	2.09279037
4	[2.7206 .. 2.8062]	2.07836056	9.45832000e+6	2.07836056
5	[4.8291 .. 5.0829]	2.01009560	9.14765600e+6	2.01009560
6	[5.7223 .. 5.8907]	0.95177698	4.33140000e+6	0.95177698
7	[6.6375 .. 6.6887]	1.00000000	4.55085600e+6	1.00000000
8	[6.9401 .. 7.0304]	1.96126020	8.92541300e+6	1.96126020
9	[7.0548 .. 7.1085]	0.97053498	4.41676500e+6	0.97053498
10	[7.1182 .. 7.1963]	1.02328765	4.65683500e+6	1.02328765

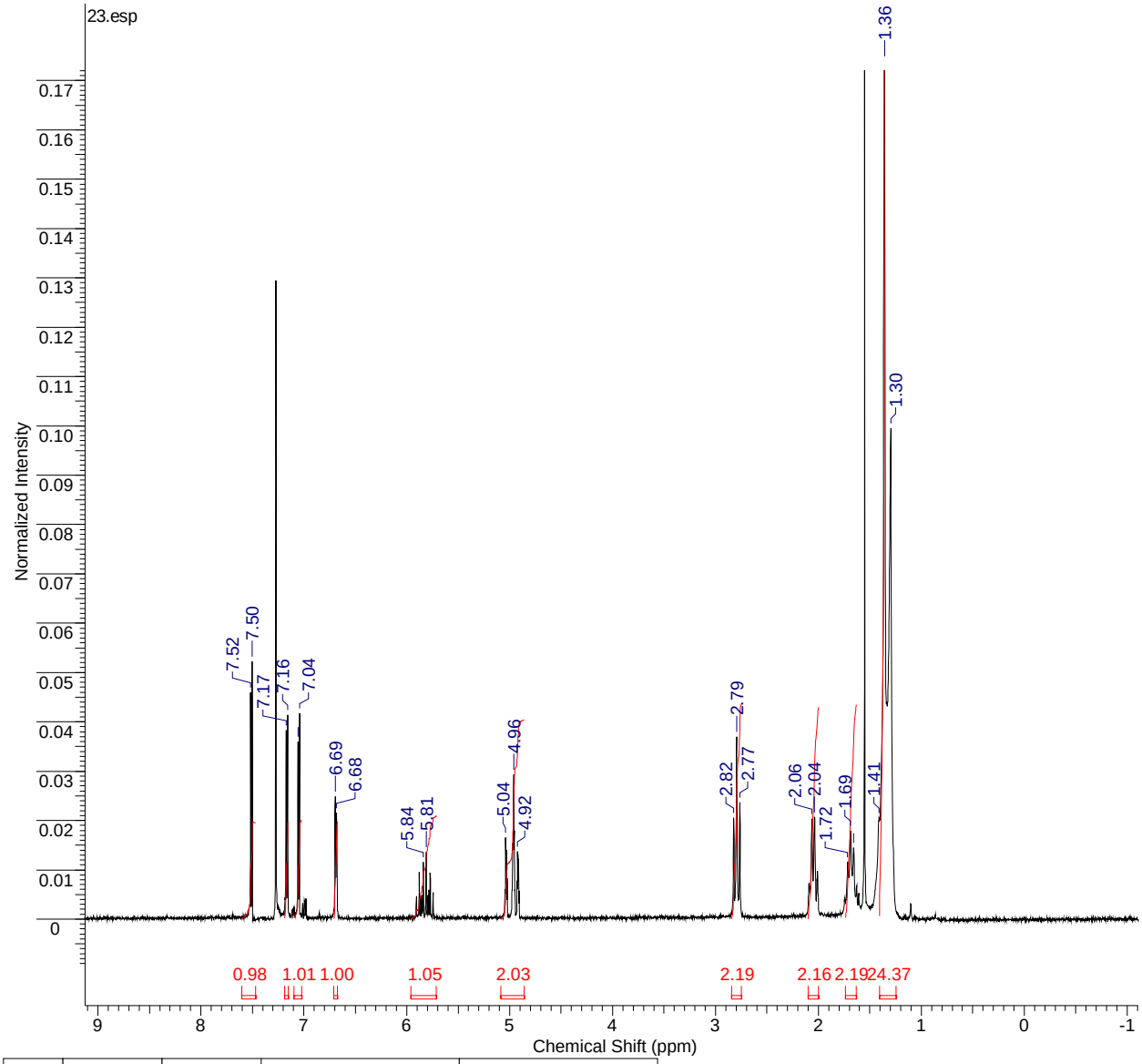
No.	(ppm)	(Hz)	Height
1	1.28	319.1	1.0000
2	1.35	338.7	0.2704
3	1.39	347.8	0.1683
4	1.54	384.5	0.1147
5	1.61	402.2	0.0602
6	1.64	409.5	0.1407
7	1.67	416.8	0.1722
8	1.69	423.5	0.1088
9	1.99	497.4	0.0949
10	2.02	504.1	0.2088
11	2.04	511.4	0.1918
12	2.07	518.1	0.0646
13	2.74	686.0	0.2405
14	2.77	693.9	0.3770
15	2.80	701.3	0.2169
16	4.90	1226.8	0.1647
17	4.95	1237.2	0.2697
18	5.01	1254.3	0.1763
19	5.75	1438.7	0.1002
20	5.77	1442.3	0.0615
21	5.78	1445.4	0.0553
22	5.79	1449.0	0.1509
23	5.82	1455.8	0.1331
24	5.83	1459.4	0.0502
25	5.86	1466.1	0.0971
26	6.66	1665.1	0.2970
27	6.67	1668.8	0.2830
28	6.96	1741.4	0.4746
29	6.98	1745.1	0.4861
30	7.00	1750.0	0.2810
31	7.08	1770.7	0.2495
32	7.09	1774.4	0.2030
33	7.14	1786.0	0.3490
34	7.16	1790.9	0.2076

Figure S 32. ^{1}H NMR spectra for compound **22**



No.	(ppm)	(Hz)	Height
1	28.91	2181.7	0.9033
2	29.04	2191.7	0.8869
3	29.10	2196.3	0.9376
4	29.31	2212.5	0.8971
5	29.44	2221.7	1.0000
6	29.46	2223.4	0.9901
7	30.12	2273.5	0.8269
8	31.58	2383.3	0.8628
9	33.79	2550.5	0.9006
10	114.09	8611.4	0.8402
11	122.94	9278.9	0.8382
12	123.34	9309.3	0.8541
13	123.66	9333.4	0.8813
14	124.65	9408.5	0.8522
15	127.62	9632.7	0.8620
16	134.71	10167.9	0.1820
17	137.94	10411.3	0.1709
18	139.20	10506.8	0.5531
19	145.32	10968.4	0.3329

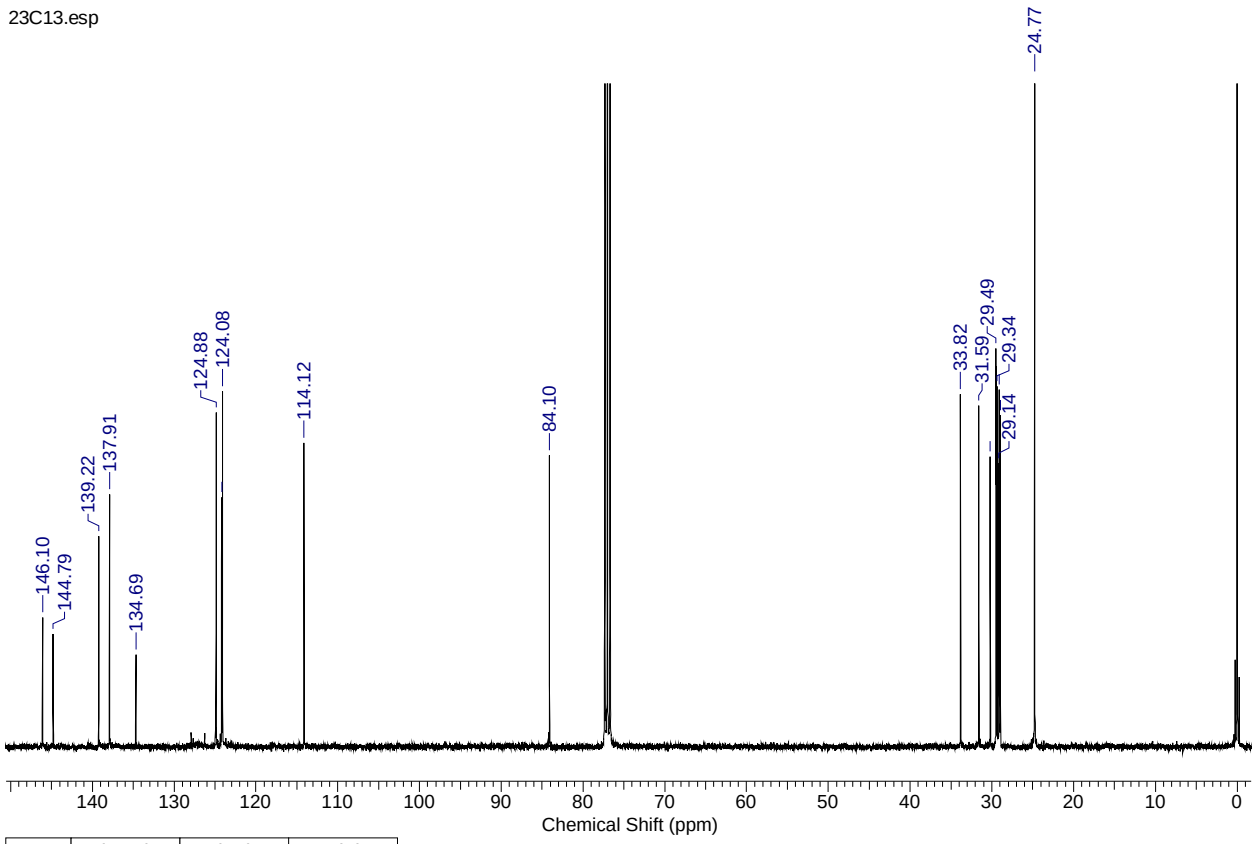
Figure S 33. ^{13}C NMR spectra for compound **22**



No.	(ppm)	Value	Absolute Value	Non-Negative Value
1	[1.2478 .. 1.4089]	24.36882782	1.48307510e+7	24.36882782
2	[1.6344 .. 1.7374]	2.18796921	1.33158738e+6	2.18796921
3	[1.9984 .. 2.1015]	2.16331553	1.31658325e+6	2.16331553
4	[2.7490 .. 2.8456]	2.19391751	1.33520763e+6	2.19391751
5	[4.8613 .. 5.0868]	2.03309846	1.23733388e+6	2.03309846
6	[5.7118 .. 5.9598]	1.05360031	6.41216063e+5	1.05360031
7	[6.6718 .. 6.7072]	0.99618602	6.06274000e+5	0.99618602
8	[7.0197 .. 7.0938]	1.01163220	6.15674438e+5	1.01163220
9	[7.1529 .. 7.1870]	0.98898423	6.01891000e+5	0.98898423
10	[7.4675 .. 7.6028]	0.98344892	5.98522250e+5	0.98344892

No.	(ppm)	(Hz)	Height
1	1.30	324.8	0.0995
2	1.36	339.4	1.0000
3	1.41	352.8	0.0205
4	1.66	415.1	0.0145
5	1.69	422.4	0.0179
6	1.72	429.1	0.0116
7	2.04	509.7	0.0206
8	2.06	516.4	0.0203
9	2.77	691.6	0.0237
10	2.79	698.9	0.0370
11	2.82	706.3	0.0206
12	4.92	1231.2	0.0138
13	4.96	1241.0	0.0294
14	5.04	1260.5	0.0165
15	5.81	1453.4	0.0137
16	5.84	1460.1	0.0116
17	6.68	1671.4	0.0215
18	6.69	1674.4	0.0249
19	7.04	1761.7	0.0418
20	7.06	1765.4	0.0361
21	7.16	1790.4	0.0414
22	7.17	1794.0	0.0383
23	7.50	1876.5	0.0523
24	7.52	1880.1	0.0460

Figure S 34. ^{1}H NMR spectra for compound **23**



No.	(ppm)	(Hz)	Height
1	24.77	2491.6	0.4904
2	28.95	2912.2	0.1191
3	29.08	2924.9	0.1284
4	29.14	2930.8	0.1019
5	29.34	2951.3	0.1297
6	29.47	2964.0	0.1368
7	29.49	2966.0	0.1433
8	30.19	3036.4	0.1043
9	31.59	3177.3	0.1226
10	33.82	3402.2	0.1268
11	84.10	8459.2	0.1047
12	114.12	11478.6	0.1093
13	124.08	12481.2	0.1278
14	124.19	12492.0	0.0896
15	124.88	12561.4	0.1202
16	134.69	13548.4	0.0332
17	137.91	13872.1	0.0907
18	139.22	14004.2	0.0757
19	144.79	14563.7	0.0405
20	146.10	14695.7	0.0464

Figure S 35. ^{13}C NMR spectra for compound **23**