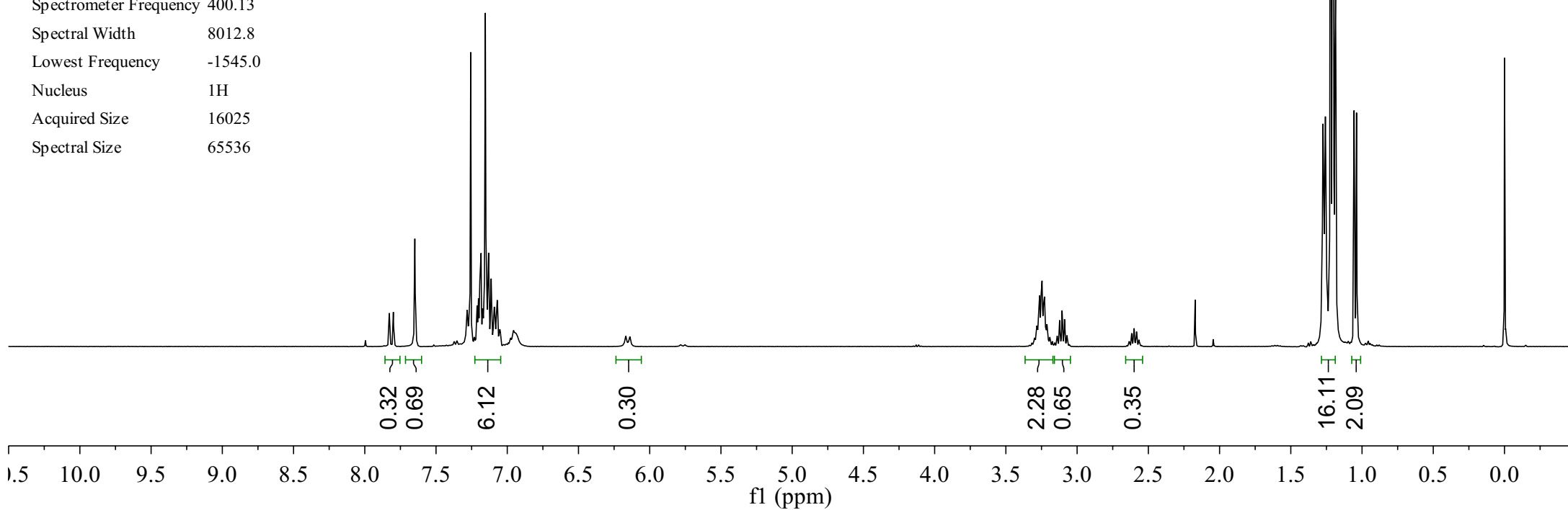
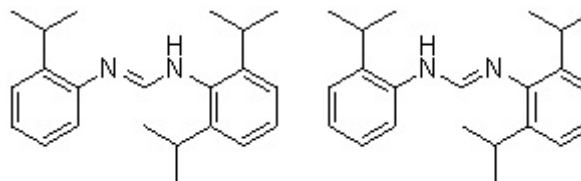


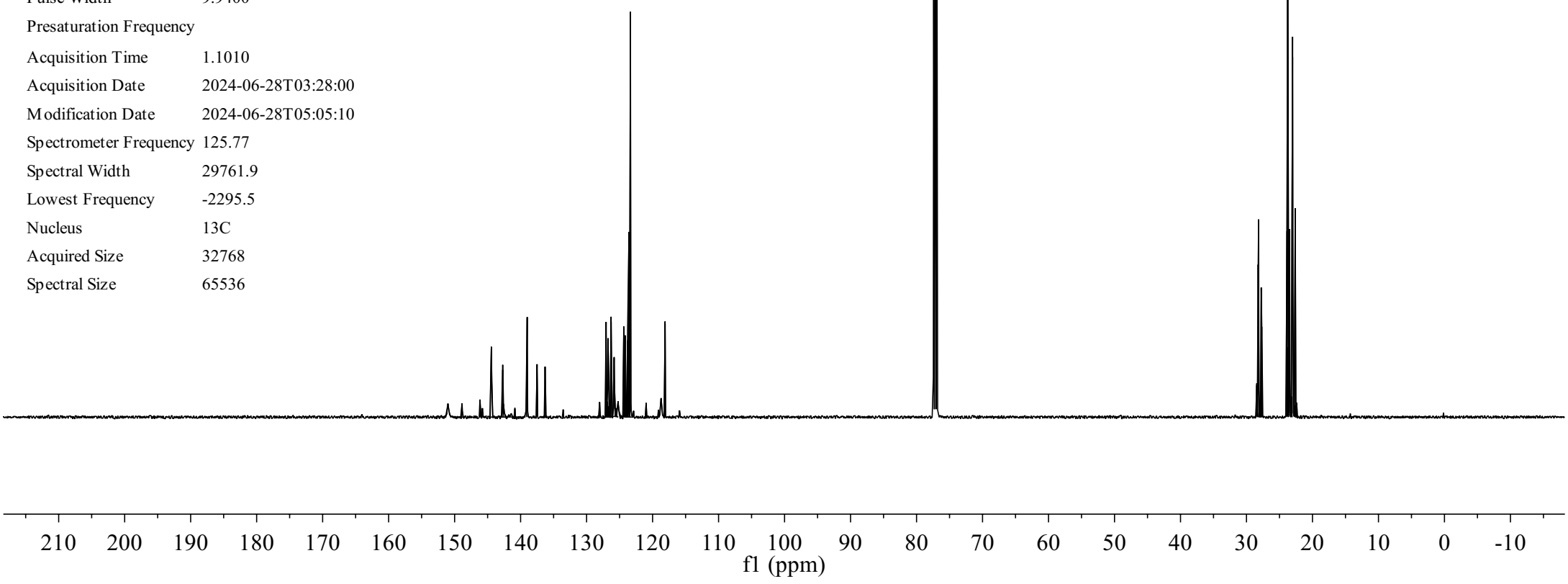
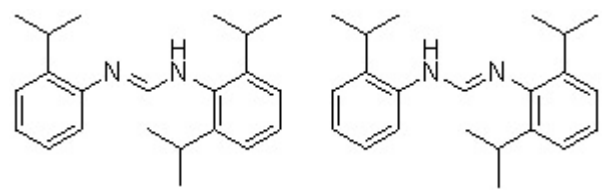
## Synthesis of L6·HBF<sub>4</sub>

Parameter	Value
Title	YM-20210316-2.1.fid
Comment	
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDC13
Temperature	296.1
Pulse Sequence	zg30
Experiment	1D
Number of Scans	16
Receiver Gain	111.4
Relaxation Delay	1.0000
Pulse Width	9.1500
Presaturation Frequency	
Acquisition Time	1.9999
Acquisition Date	2021-03-16T11:28:42
Modification Date	2021-03-16T12:43:33
Spectrometer Frequency	400.13
Spectral Width	8012.8
Lowest Frequency	-1545.0
Nucleus	<sup>1</sup> H
Acquired Size	16025
Spectral Size	65536



151.0  
148.9  
146.2  
145.8  
144.4  
142.7  
142.6  
140.9  
139.0  
137.5  
136.3  
133.5  
128.0  
127.0  
127.0  
126.9  
126.7  
126.7  
126.6  
126.5  
126.4  
126.3  
125.8  
125.5  
125.2  
124.4  
124.2  
124.1  
123.9  
123.8  
123.8  
123.6  
123.4  
121.0  
119.1  
118.7  
118.1  
115.9  
28.4  
28.2  
28.2  
28.0  
28.0  
27.9  
27.8  
27.7  
27.7  
23.9  
23.8  
23.7  
23.5  
23.2  
23.0  
22.6  
22.6  
22.4

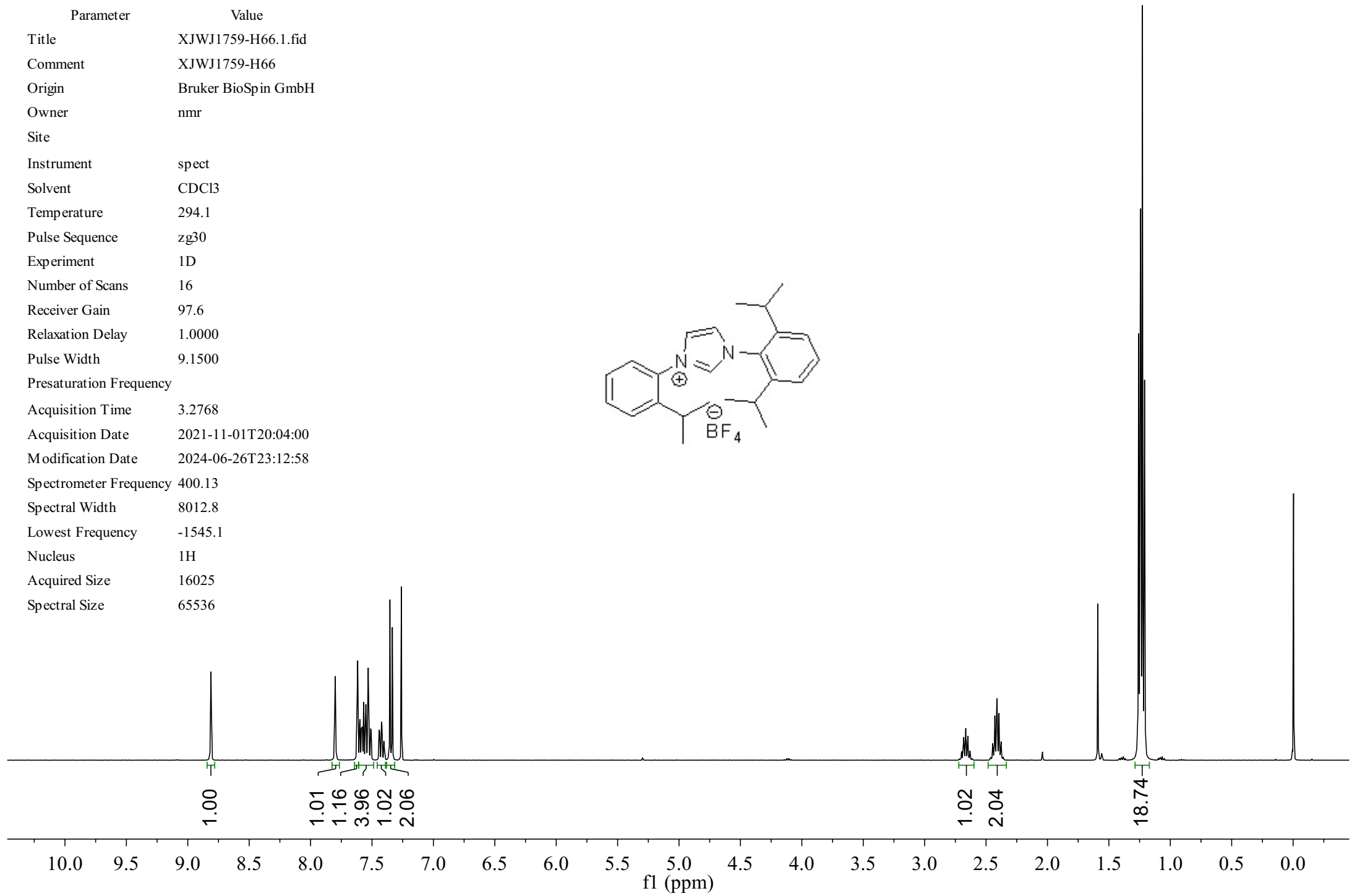
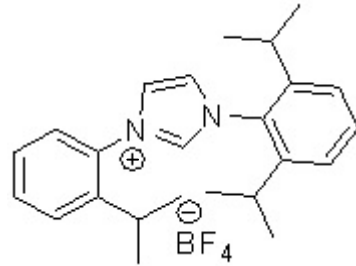
Parameter	Value
Title	YM-20240627-1.3.fid
Comment	L3 zhong
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDCl3
Temperature	296.1
Pulse Sequence	zgp30
Experiment	1D
Number of Scans	485
Receiver Gain	193.1
Relaxation Delay	2.0000
Pulse Width	9.9400
Presaturation Frequency	
Acquisition Time	1.1010
Acquisition Date	2024-06-28T03:28:00
Modification Date	2024-06-28T05:05:10
Spectrometer Frequency	125.77
Spectral Width	29761.9
Lowest Frequency	-2295.5
Nucleus	13C
Acquired Size	32768
Spectral Size	65536



XJWJ1759-H66.1.fid

XJWJ1759-H66

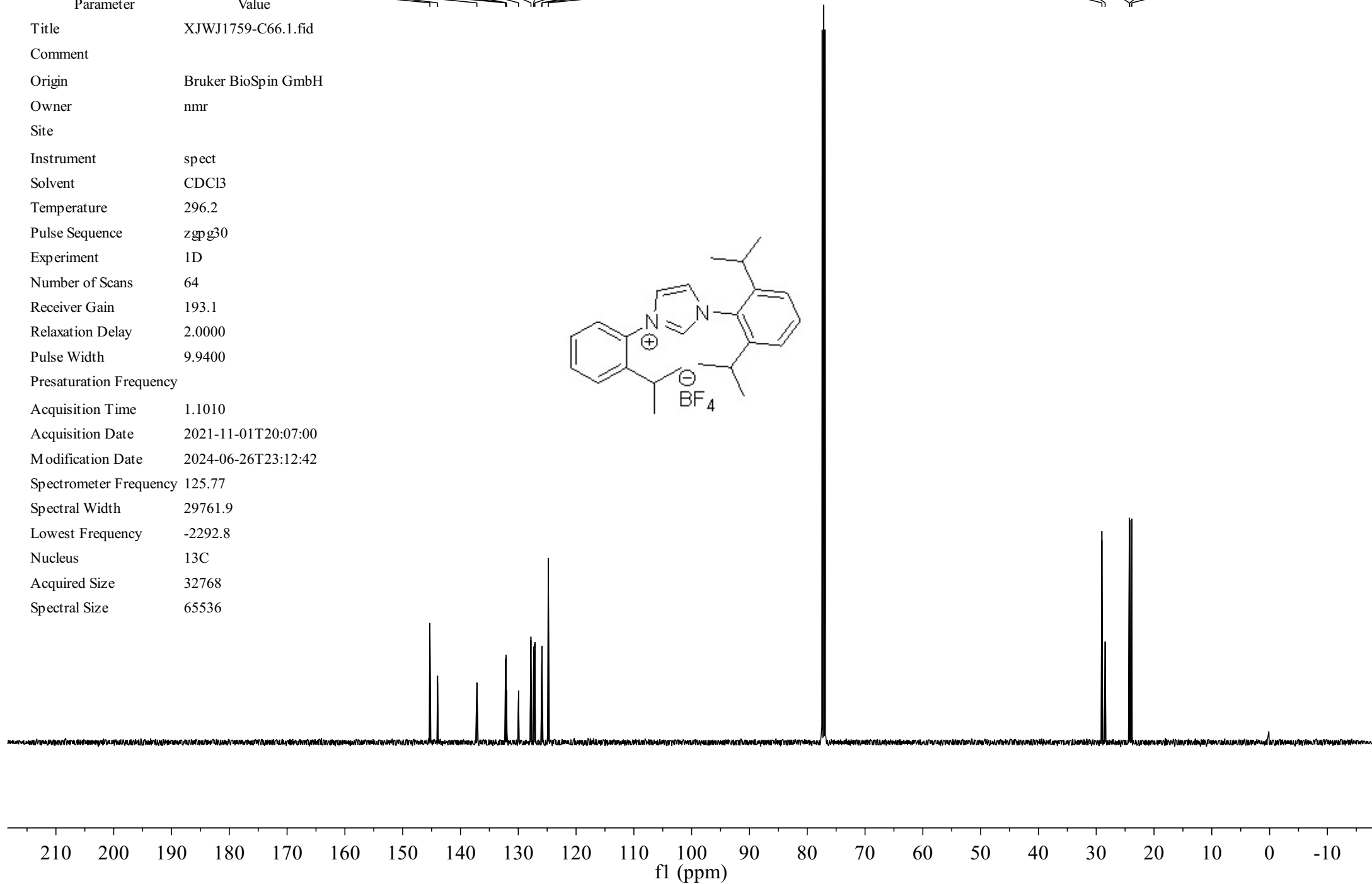
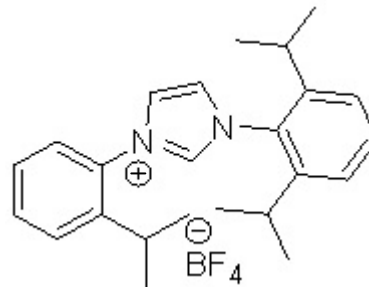
Parameter	Value
Title	XJWJ1759-H66.1.fid
Comment	XJWJ1759-H66
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDC13
Temperature	294.1
Pulse Sequence	zg30
Experiment	1D
Number of Scans	16
Receiver Gain	97.6
Relaxation Delay	1.0000
Pulse Width	9.1500
Presaturation Frequency	
Acquisition Time	3.2768
Acquisition Date	2021-11-01T20:04:00
Modification Date	2024-06-26T23:12:58
Spectrometer Frequency	400.13
Spectral Width	8012.8
Lowest Frequency	-1545.1
Nucleus	<sup>1</sup> H
Acquired Size	16025
Spectral Size	65536



Parameter	Value
Title	XJWJ1759-C66.1.fid
Comment	
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDCl3
Temperature	296.2
Pulse Sequence	zgpg30
Experiment	1D
Number of Scans	64
Receiver Gain	193.1
Relaxation Delay	2.0000
Pulse Width	9.9400
Presaturation Frequency	
Acquisition Time	1.1010
Acquisition Date	2021-11-01T20:07:00
Modification Date	2024-06-26T23:12:42
Spectrometer Frequency	125.77
Spectral Width	29761.9
Lowest Frequency	-2292.8
Nucleus	<sup>13</sup> C
Acquired Size	32768
Spectral Size	65536

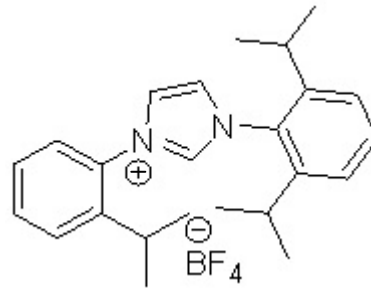
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144.0  
137.2  
132.2  
132.1  
132.0  
129.9  
127.8  
127.3  
127.1  
125.9  
125.9  
124.8

29.0  
28.5  
24.3  
24.2  
23.8



XJWJ1759-F66.1.fid  
XJWJ1759-F66

Parameter	Value
Title	XJWJ1759-F66.1.fid
Comment	XJWJ1759-F66
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDC13
Temperature	294.1
Pulse Sequence	zgfhigqn.2
Experiment	1D
Number of Scans	16
Receiver Gain	196.4
Relaxation Delay	1.0000
Pulse Width	16.4100
Presaturation Frequency	
Acquisition Time	0.7340
Acquisition Date	2021-10-31T18:40:34
Modification Date	2024-06-26T23:12:45
Spectrometer Frequency	376.46
Spectral Width	89285.7
Lowest Frequency	-82292.7
Nucleus	19F
Acquired Size	65536
Spectral Size	131072

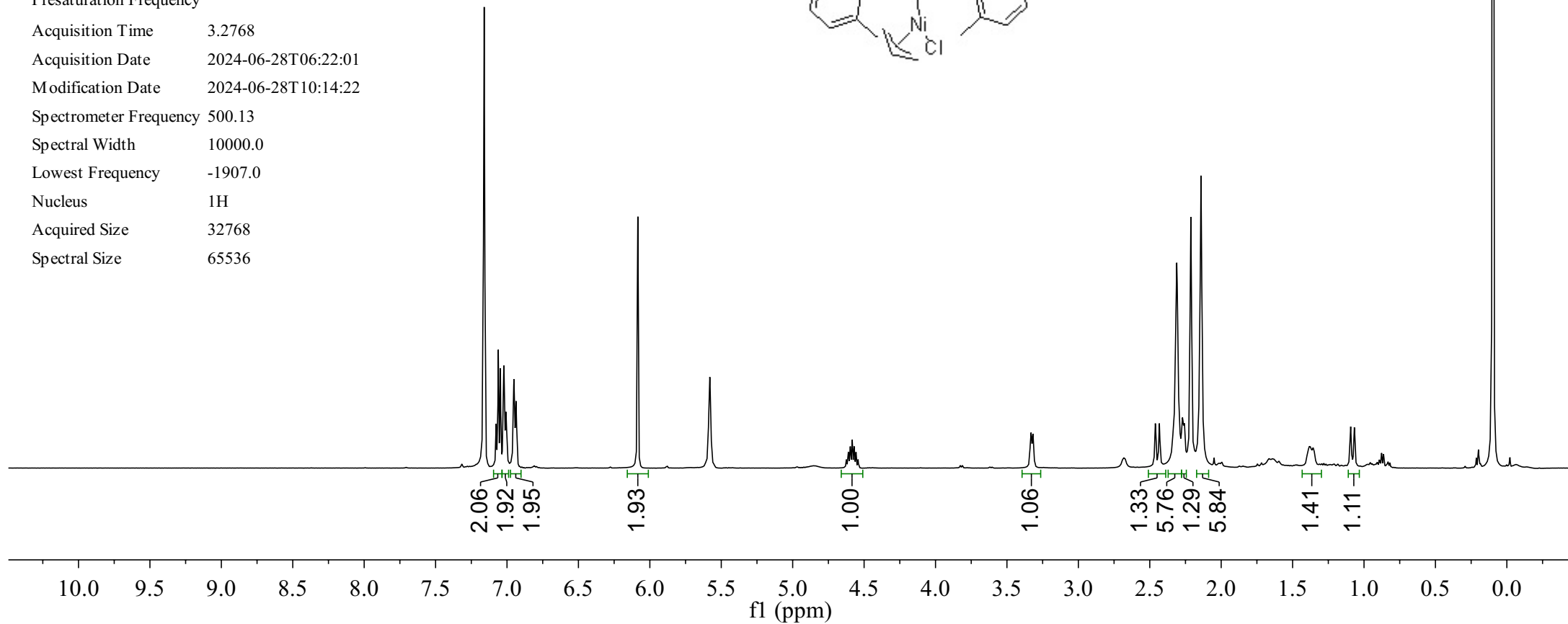
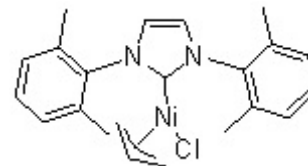


152.3  
152.3  
152.3

10 0 -10 -20 -30 -40 -50 -60 -70 -80 -90 -100 -110 -120 -130 -140 -150 -160 -170 -180 -190 -200 -210  
f1 (ppm)

[NHC-Ni(allyl)Cl]

IME	Parameter	Value
	Title	YM-20240628-1.3.fid
	Comment	IME
	Origin	Bruker BioSpin GmbH
	Owner	nmr
	Site	
	Instrument	spect
	Solvent	C6D6
	Temperature	296.2
	Pulse Sequence	zg30
	Experiment	1D
	Number of Scans	16
	Receiver Gain	62.9
	Relaxation Delay	1.0000
	Pulse Width	11.3200
	Presaturation Frequency	
	Acquisition Time	3.2768
	Acquisition Date	2024-06-28T06:22:01
	Modification Date	2024-06-28T10:14:22
	Spectrometer Frequency	500.13
	Spectral Width	10000.0
	Lowest Frequency	-1907.0
	Nucleus	1H
	Acquired Size	32768
	Spectral Size	65536





YM-20240628-1.4.fid  
IME

—186.1

139.0

136.4

129.3

122.7

—107.6

—69.9

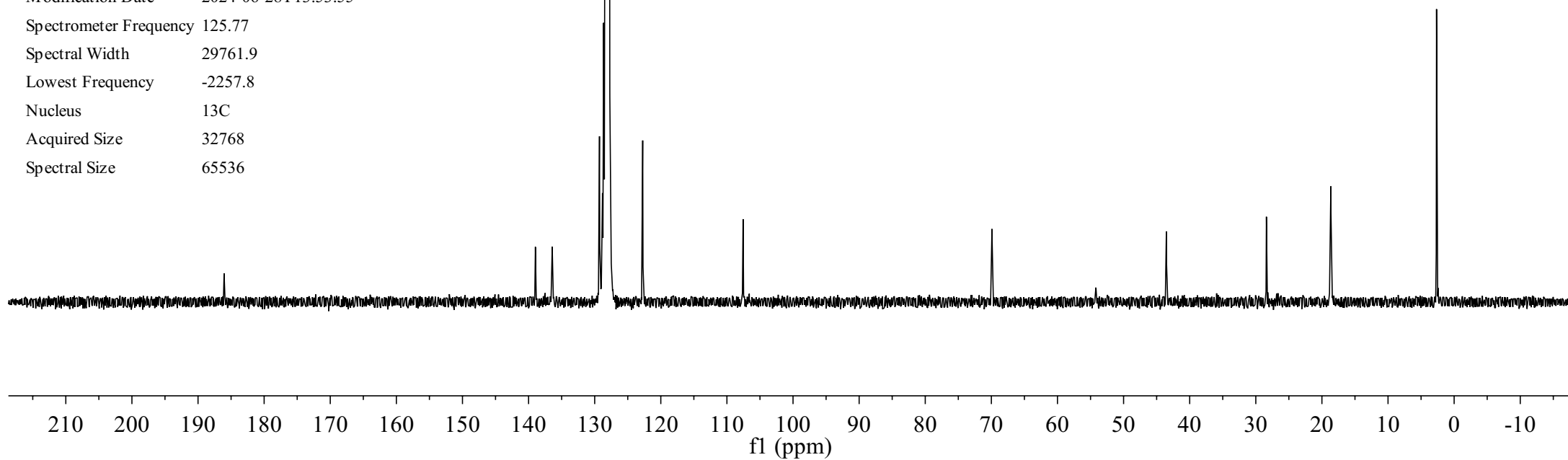
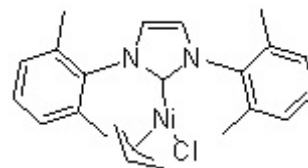
—43.5

—28.4

18.8

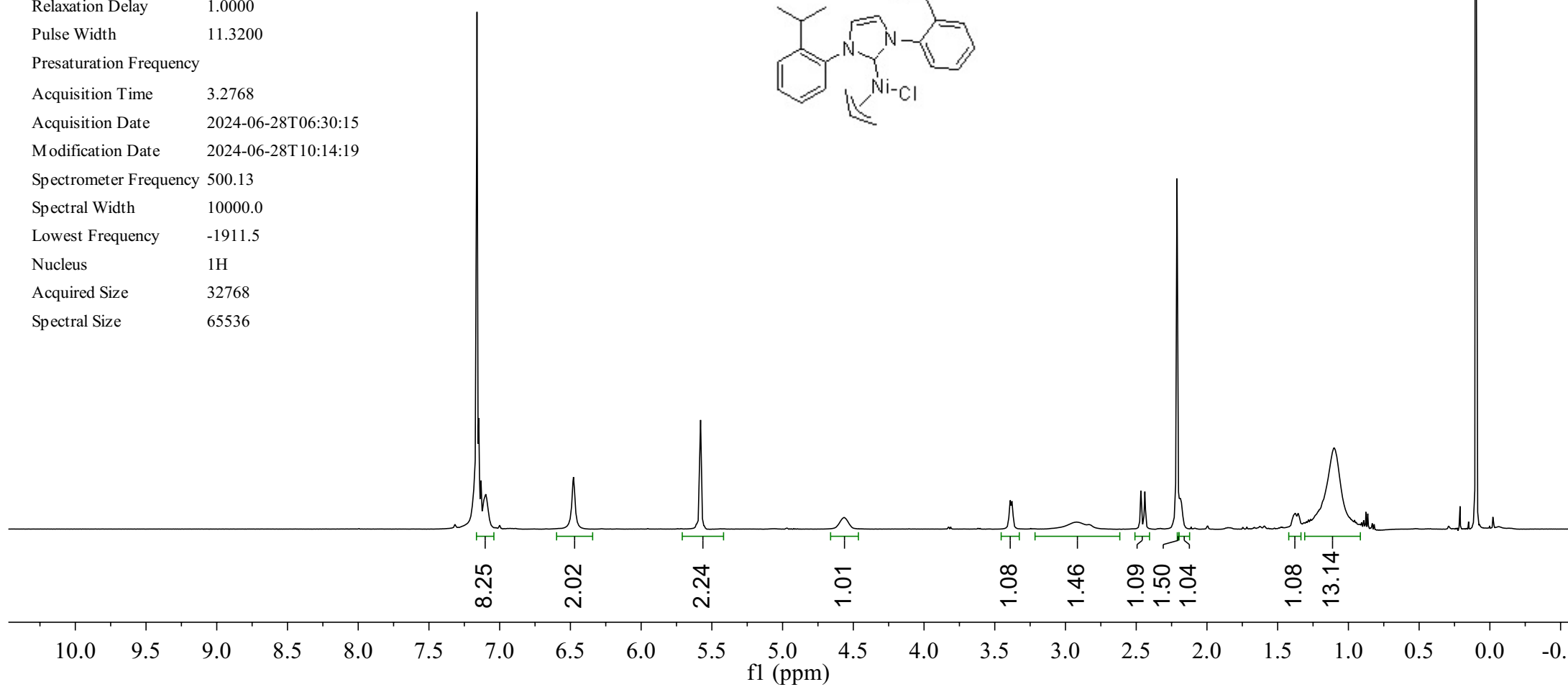
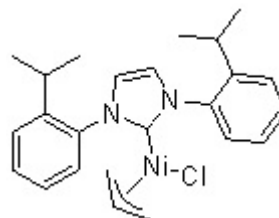
18.7

Parameter	Value
Title	YM-20240628-1.4.fid
Comment	IME
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	C6D6
Temperature	296.2
Pulse Sequence	zpgg30
Experiment	1D
Number of Scans	896
Receiver Gain	193.1
Relaxation Delay	2.0000
Pulse Width	9.9400
Presaturation Frequency	
Acquisition Time	1.1010
Acquisition Date	2024-06-28T09:01:27
Modification Date	2024-06-28T13:53:55
Spectrometer Frequency	125.77
Spectral Width	29761.9
Lowest Frequency	-2257.8
Nucleus	<sup>13</sup> C
Acquired Size	32768
Spectral Size	65536



YM-20240628-2.3.fid

L2	Parameter	Value
	Title	YM-20240628-2.3.fid
	Comment	L2
	Origin	Bruker BioSpin GmbH
	Owner	nmr
	Site	
	Instrument	spect
	Solvent	C6D6
	Temperature	296.1
	Pulse Sequence	zg30
	Experiment	1D
	Number of Scans	16
	Receiver Gain	48.5
	Relaxation Delay	1.0000
	Pulse Width	11.3200
	Presaturation Frequency	
	Acquisition Time	3.2768
	Acquisition Date	2024-06-28T06:30:15
	Modification Date	2024-06-28T10:14:19
	Spectrometer Frequency	500.13
	Spectral Width	10000.0
	Lowest Frequency	-1911.5
	Nucleus	1H
	Acquired Size	32768
	Spectral Size	65536



YM-20240628-2.5.fid  
L2

188.0

138.3

129.9

128.8

128.4

123.3

107.5

68.5

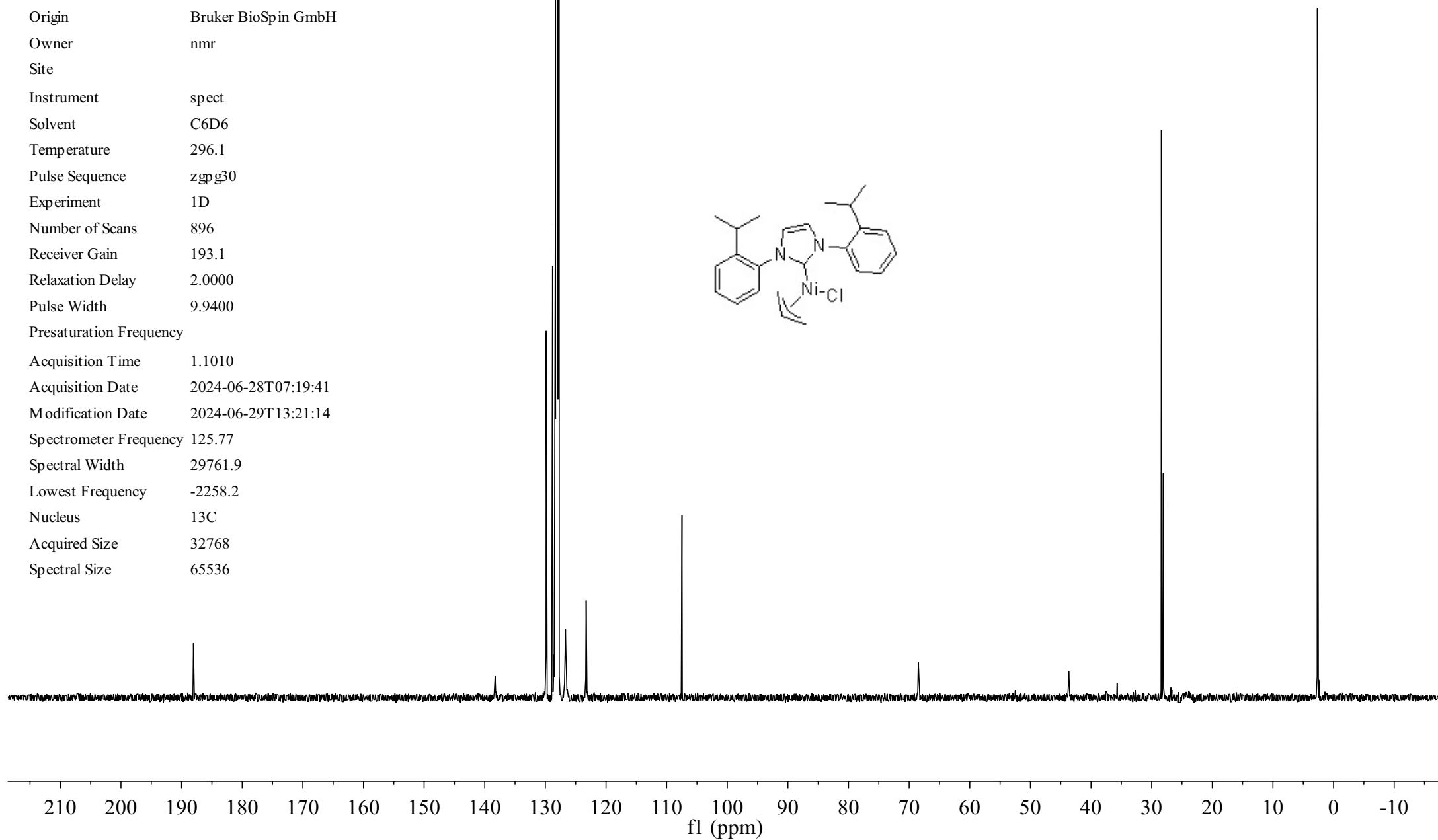
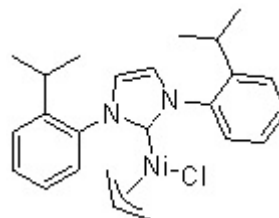
43.7

35.7

28.4

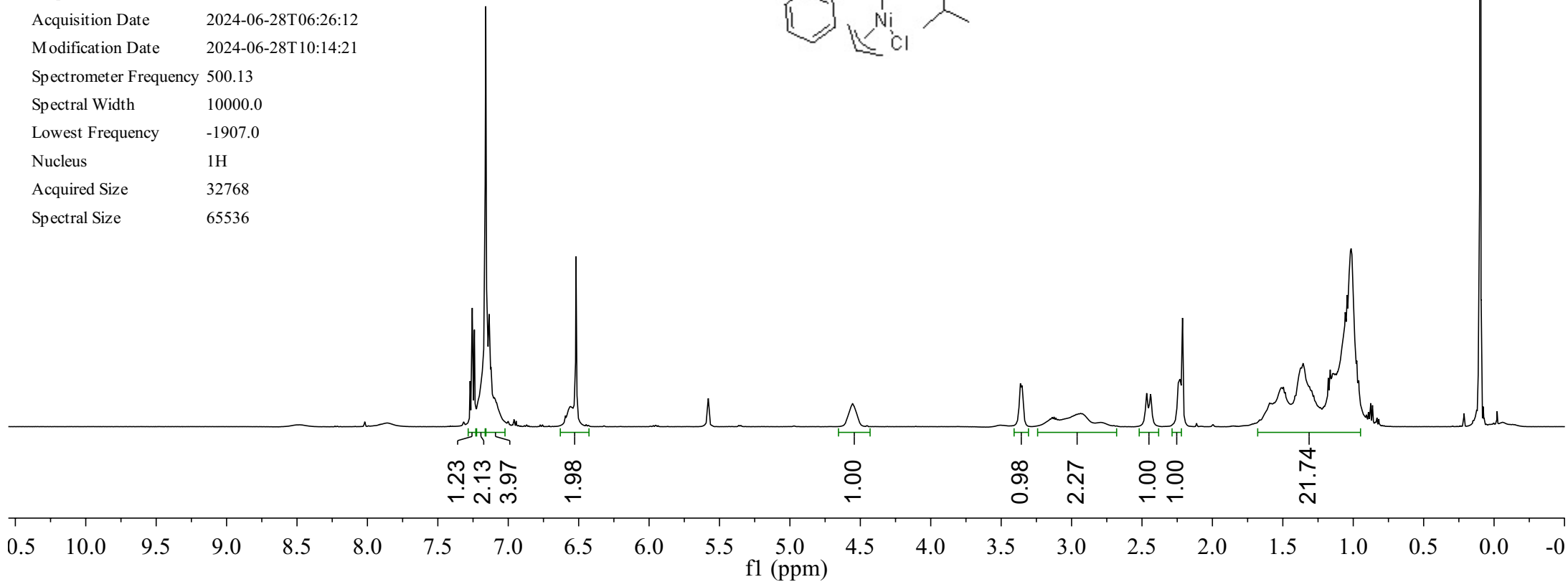
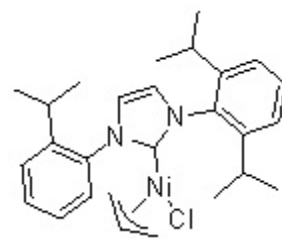
28.1

Parameter	Value
Title	YM-20240628-2.5.fid
Comment	L2
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	C6D6
Temperature	296.1
Pulse Sequence	zpg30
Experiment	1D
Number of Scans	896
Receiver Gain	193.1
Relaxation Delay	2.0000
Pulse Width	9.9400
Presaturation Frequency	
Acquisition Time	1.1010
Acquisition Date	2024-06-28T07:19:41
Modification Date	2024-06-29T13:21:14
Spectrometer Frequency	125.77
Spectral Width	29761.9
Lowest Frequency	-2258.2
Nucleus	13C
Acquired Size	32768
Spectral Size	65536



YM-20240628-3.3.fid

L3	Parameter	Value
	Title	YM-20240628-3.3.fid
	Comment	L3
	Origin	Bruker BioSpin GmbH
	Owner	nmr
	Site	
	Instrument	spect
	Solvent	C6D6
	Temperature	296.1
	Pulse Sequence	zg30
	Experiment	1D
	Number of Scans	16
	Receiver Gain	31.1
	Relaxation Delay	1.0000
	Pulse Width	11.3200
	Presaturation Frequency	
	Acquisition Time	3.2768
	Acquisition Date	2024-06-28T06:26:12
	Modification Date	2024-06-28T10:14:21
	Spectrometer Frequency	500.13
	Spectral Width	10000.0
	Lowest Frequency	-1907.0
	Nucleus	1H
	Acquired Size	32768
	Spectral Size	65536



YM-20240628-3.4.fid  
L3

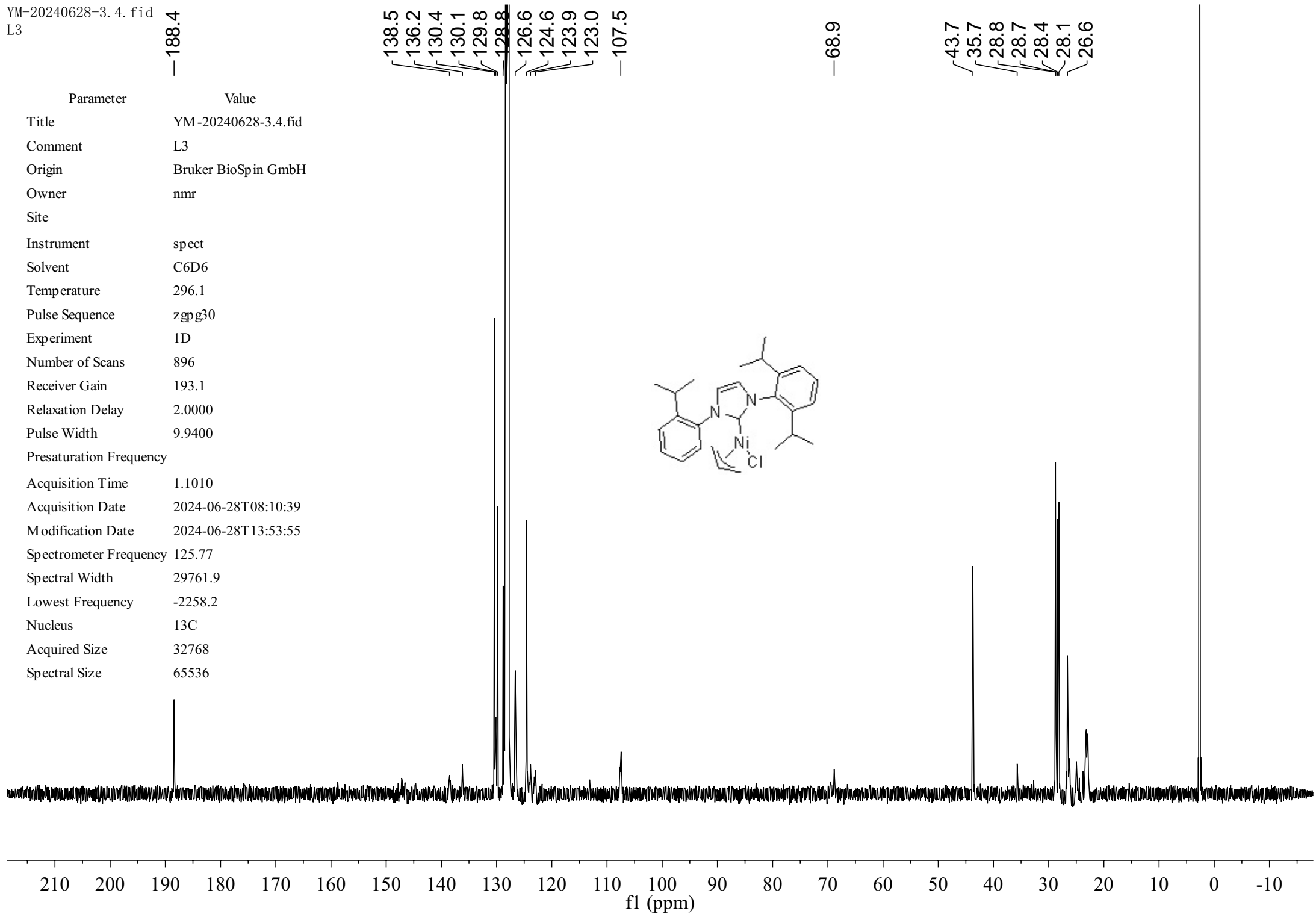
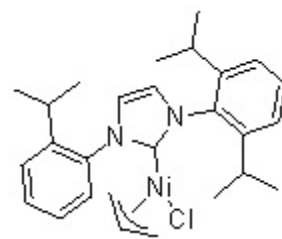
188.4

138.5  
136.2  
130.4  
130.1  
129.8  
128.8  
126.6  
124.6  
123.9  
123.0  
107.5

68.9

43.7  
35.7  
28.8  
28.7  
28.4  
28.1  
26.6

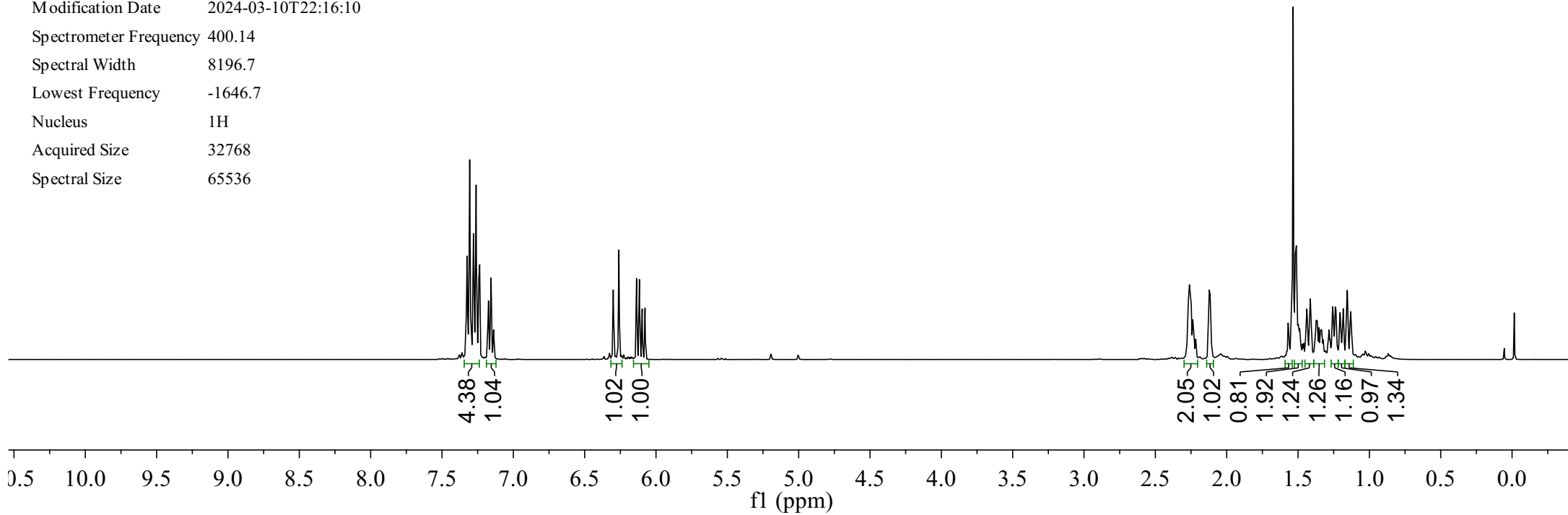
Parameter	Value
Title	YM-20240628-3.4.fid
Comment	L3
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	C6D6
Temperature	296.1
Pulse Sequence	zgpg30
Experiment	1D
Number of Scans	896
Receiver Gain	193.1
Relaxation Delay	2.0000
Pulse Width	9.9400
Presaturation Frequency	
Acquisition Time	1.1010
Acquisition Date	2024-06-28T08:10:39
Modification Date	2024-06-28T13:53:55
Spectrometer Frequency	125.77
Spectral Width	29761.9
Lowest Frequency	-2258.2
Nucleus	<sup>13</sup> C
Acquired Size	32768
Spectral Size	65536



Cross hydroalkenylation Products in Table 1



Parameter	Value
Title	YM-20240306-5-iso.1.fid
Comment	s4
Origin	Bruker BioSpin GmbH
Owner	nmrsu
Site	
Instrument	Avance NEO 400
Solvent	CDCl <sub>3</sub>
Temperature	296.4
Pulse Sequence	zg30
Experiment	1D
Number of Scans	16
Receiver Gain	90.5
Relaxation Delay	1.0000
Pulse Width	8.0000
Presaturation Frequency	
Acquisition Time	3.9977
Acquisition Date	2024-03-10T22:01:21
Modification Date	2024-03-10T22:16:10
Spectrometer Frequency	400.14
Spectral Width	8196.7
Lowest Frequency	-1646.7
Nucleus	<sup>1</sup> H
Acquired Size	32768
Spectral Size	65536



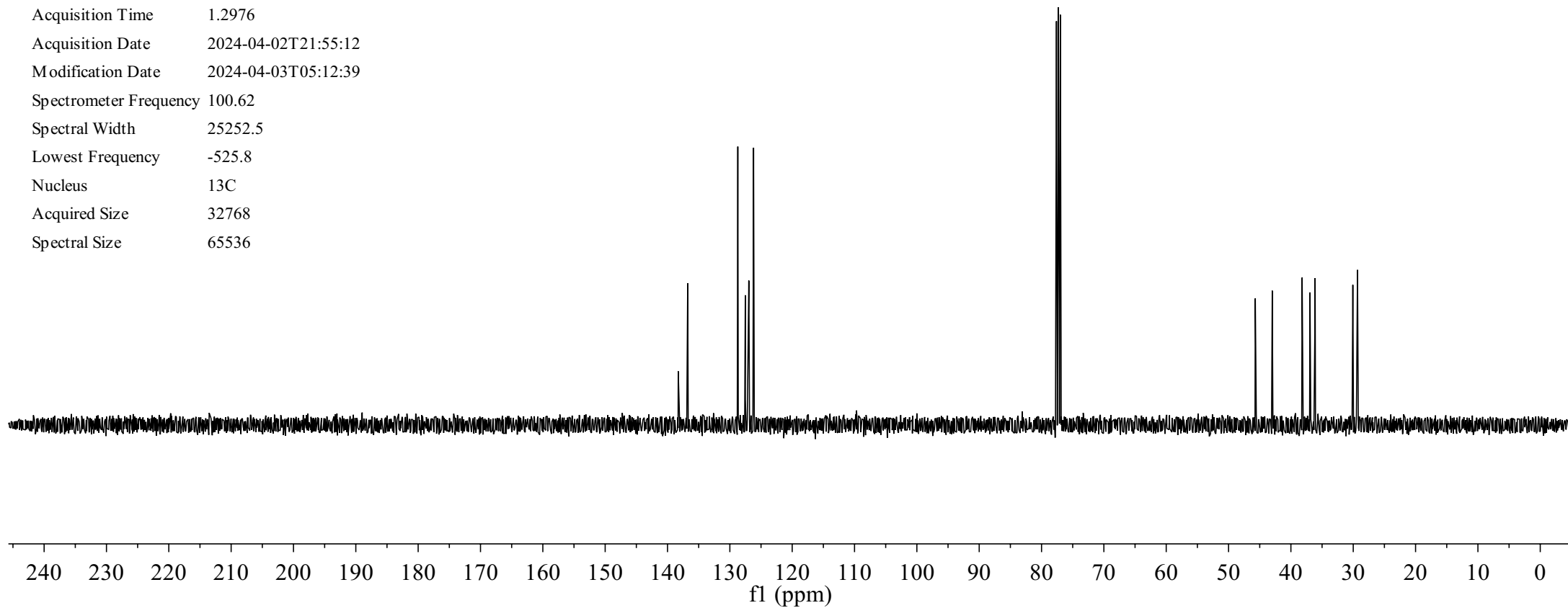
YM-20240306-5-iso.8.fid

Parameter	Value
Title	YM-20240306-5-iso.8.fid
Comment	s4
Origin	Bruker BioSpin GmbH
Owner	PC
Site	
Instrument	spect
Solvent	CDC13
Temperature	297.6
Pulse Sequence	zgpg30
Experiment	1D
Number of Scans	64
Receiver Gain	196.4
Relaxation Delay	2.0000
Pulse Width	10.2200
Presaturation Frequency	
Acquisition Time	1.2976
Acquisition Date	2024-04-02T21:55:12
Modification Date	2024-04-03T05:12:39
Spectrometer Frequency	100.62
Spectral Width	25252.5
Lowest Frequency	-525.8
Nucleus	13C
Acquired Size	32768
Spectral Size	65536

138.1  
136.6  
128.6  
127.4  
126.8  
126.1

45.6  
42.9  
38.1  
36.8  
36.0  
29.9  
29.2

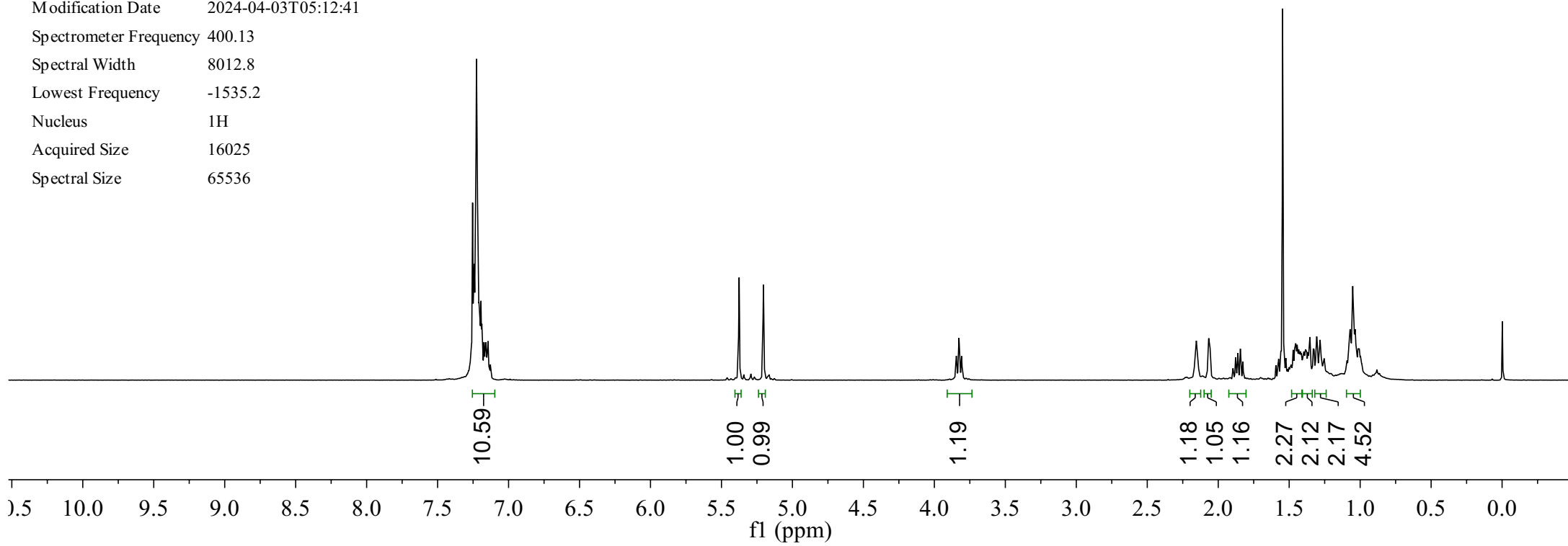
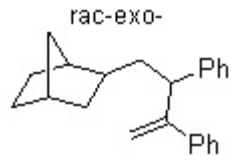
rac-exo-*E*





YM-20240331-1-iso.3.fid

Parameter	Value
Title	YM-20240331-1-iso.3.fid
Comment	S15
Origin	Bruker BioSpin GmbH
Owner	PC
Site	
Instrument	spect
Solvent	CDC13
Temperature	297.4
Pulse Sequence	zg30
Experiment	1D
Number of Scans	8
Receiver Gain	126.1
Relaxation Delay	1.0000
Pulse Width	9.2600
Presaturation Frequency	
Acquisition Time	1.9999
Acquisition Date	2024-04-02T21:45:22
Modification Date	2024-04-03T05:12:41
Spectrometer Frequency	400.13
Spectral Width	8012.8
Lowest Frequency	-1535.2
Nucleus	1H
Acquired Size	16025
Spectral Size	65536

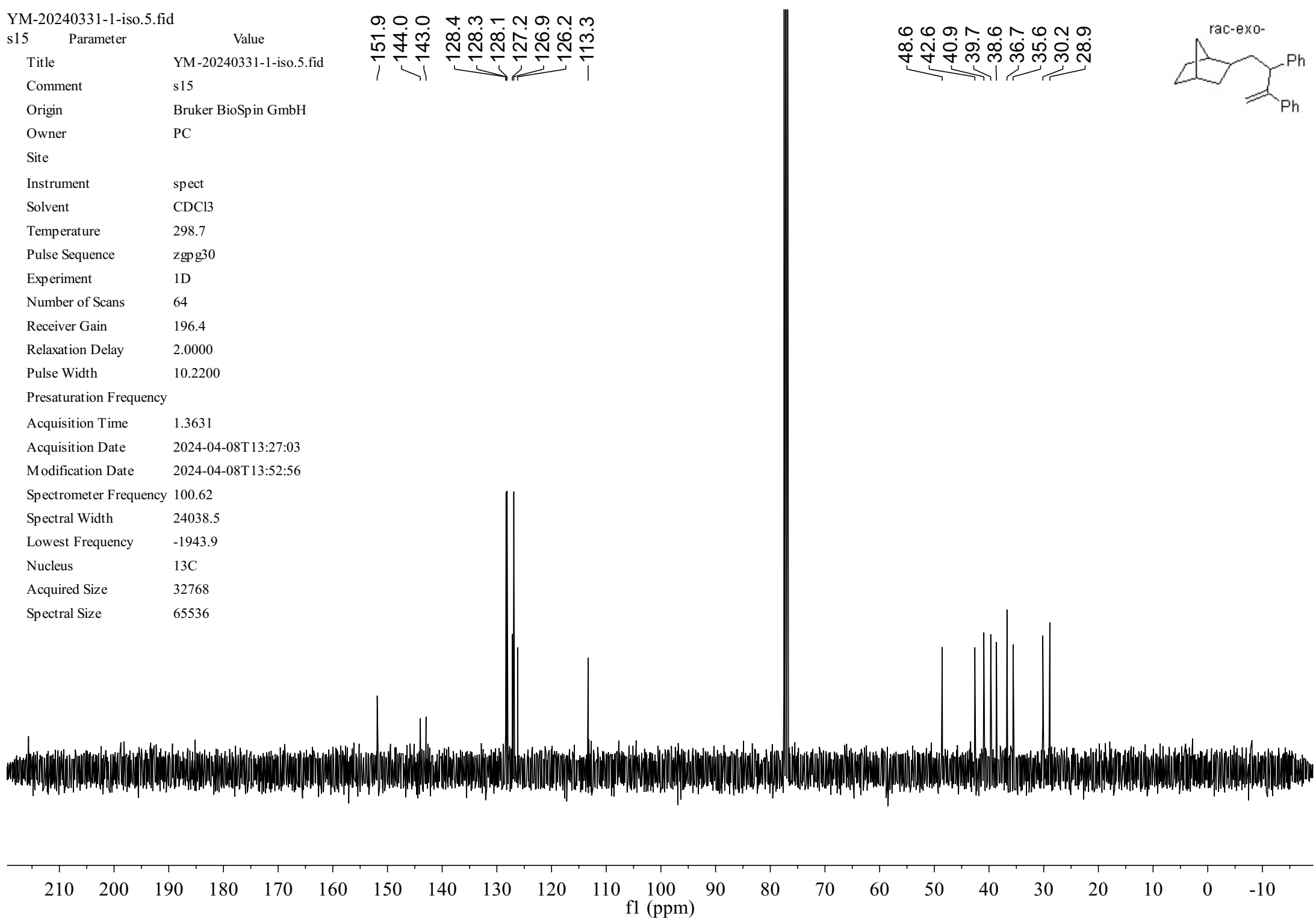
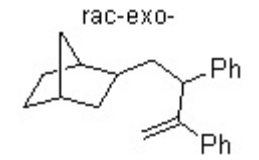


YM-20240331-1-iso.5.fid

s15      Parameter                      Value  
Title                      YM-20240331-1-iso.5.fid  
Comment                      s15  
Origin                      Bruker BioSpin GmbH  
Owner                      PC  
Site  
Instrument                      spect  
Solvent                      CDC13  
Temperature                      298.7  
Pulse Sequence                      zgpg30  
Experiment                      1D  
Number of Scans                      64  
Receiver Gain                      196.4  
Relaxation Delay                      2.0000  
Pulse Width                      10.2200  
Presaturation Frequency  
Acquisition Time                      1.3631  
Acquisition Date                      2024-04-08T13:27:03  
Modification Date                      2024-04-08T13:52:56  
Spectrometer Frequency                      100.62  
Spectral Width                      24038.5  
Lowest Frequency                      -1943.9  
Nucleus                      13C  
Acquired Size                      32768  
Spectral Size                      65536

151.9  
144.0  
143.0  
128.4  
128.3  
128.1  
127.2  
126.9  
126.2  
113.3

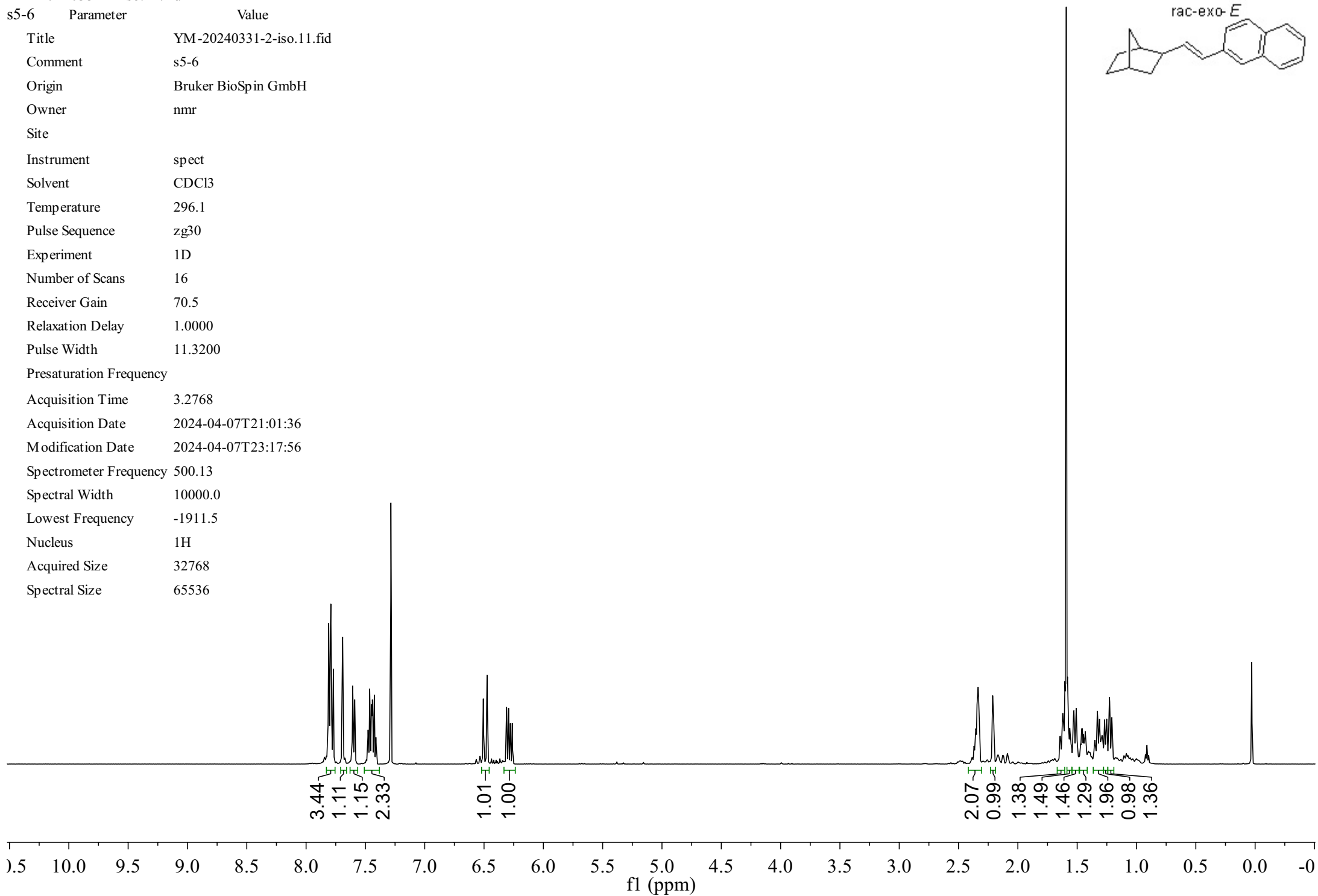
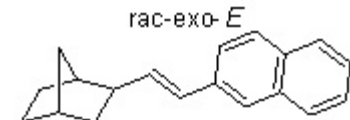
48.6  
42.6  
40.9  
39.7  
38.6  
36.7  
35.6  
30.2  
28.9



Cross hydroalkenylation Major Products in Table 2

YM-20240331-2-iso.11.fid

Parameter	Value
Title	YM-20240331-2-iso.11.fid
Comment	s5-6
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDC13
Temperature	296.1
Pulse Sequence	zg30
Experiment	1D
Number of Scans	16
Receiver Gain	70.5
Relaxation Delay	1.0000
Pulse Width	11.3200
Presaturation Frequency	
Acquisition Time	3.2768
Acquisition Date	2024-04-07T21:01:36
Modification Date	2024-04-07T23:17:56
Spectrometer Frequency	500.13
Spectral Width	10000.0
Lowest Frequency	-1911.5
Nucleus	1H
Acquired Size	32768
Spectral Size	65536



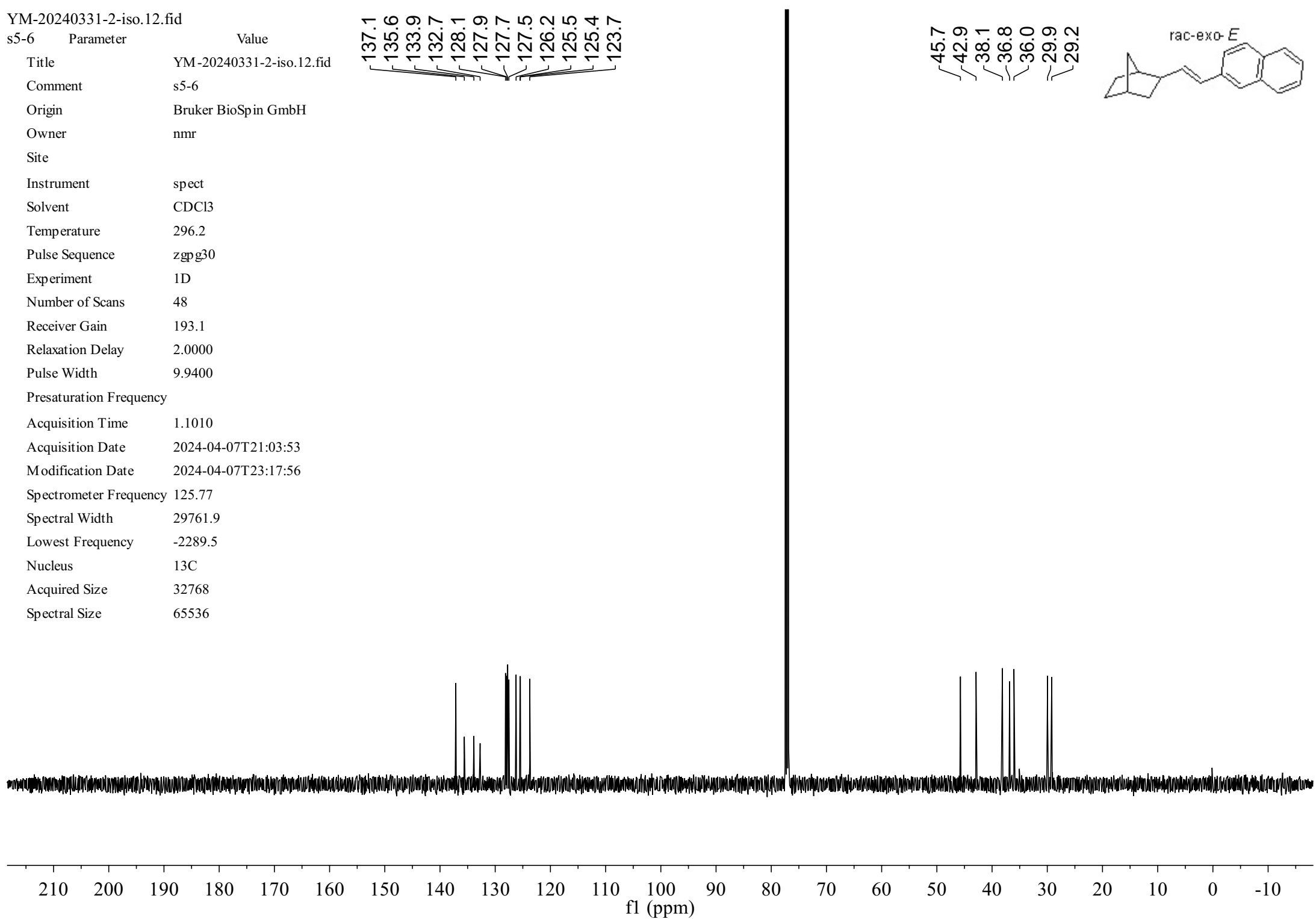
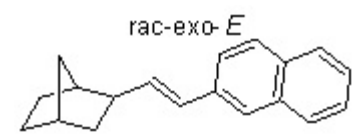
YM-20240331-2-iso.12.fid

s5-6

Parameter	Value
Title	YM-20240331-2-iso.12.fid
Comment	s5-6
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDC13
Temperature	296.2
Pulse Sequence	zgpg30
Experiment	1D
Number of Scans	48
Receiver Gain	193.1
Relaxation Delay	2.0000
Pulse Width	9.9400
Presaturation Frequency	
Acquisition Time	1.1010
Acquisition Date	2024-04-07T21:03:53
Modification Date	2024-04-07T23:17:56
Spectrometer Frequency	125.77
Spectral Width	29761.9
Lowest Frequency	-2289.5
Nucleus	<sup>13</sup> C
Acquired Size	32768
Spectral Size	65536

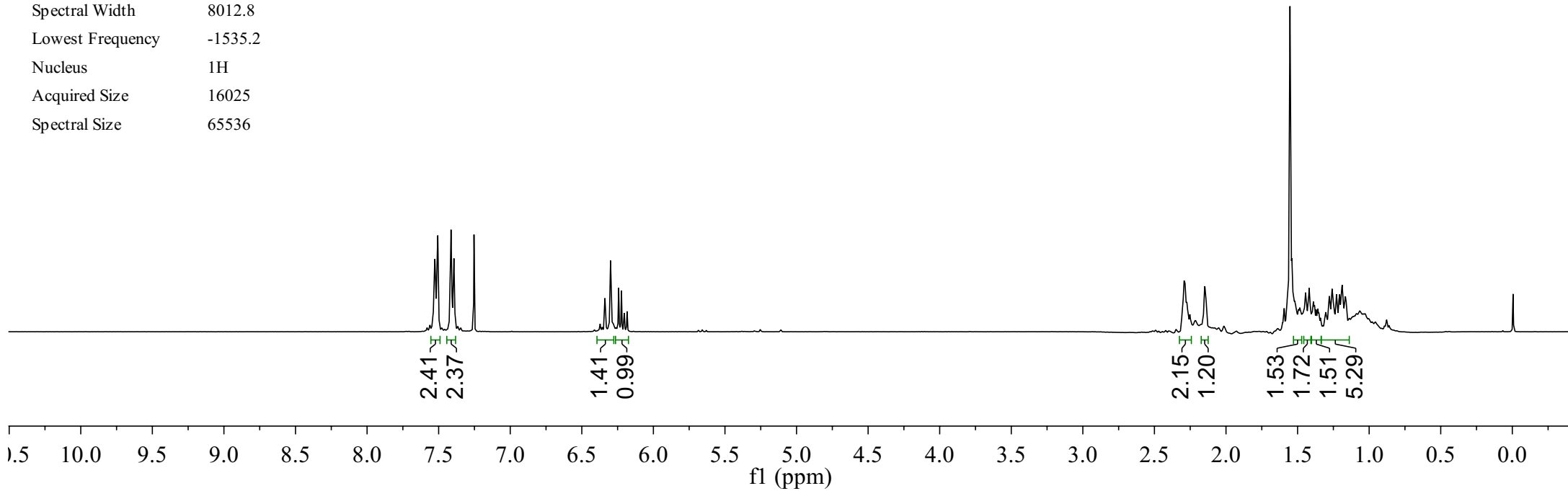
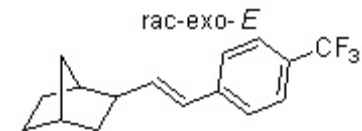
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135.6  
133.9  
132.7  
128.1  
127.9  
127.7  
127.5  
126.2  
125.5  
125.4  
123.7

45.7  
42.9  
38.1  
36.8  
36.0  
29.9  
29.2



YM-20240402-3-isoa.4.fid

s7	Parameter	Value
	Title	YM-20240402-3-isoa.4.fid
	Comment	s7
	Origin	Bruker BioSpin GmbH
	Owner	PC
	Site	
	Instrument	spect
	Solvent	CDC13
	Temperature	297.8
	Pulse Sequence	zg30
	Experiment	1D
	Number of Scans	8
	Receiver Gain	111.4
	Relaxation Delay	1.0000
	Pulse Width	9.2600
	Presaturation Frequency	
	Acquisition Time	1.9999
	Acquisition Date	2024-04-08T21:22:09
	Modification Date	2024-04-09T09:40:31
	Spectrometer Frequency	400.13
	Spectral Width	8012.8
	Lowest Frequency	-1535.2
	Nucleus	1H
	Acquired Size	16025
	Spectral Size	65536

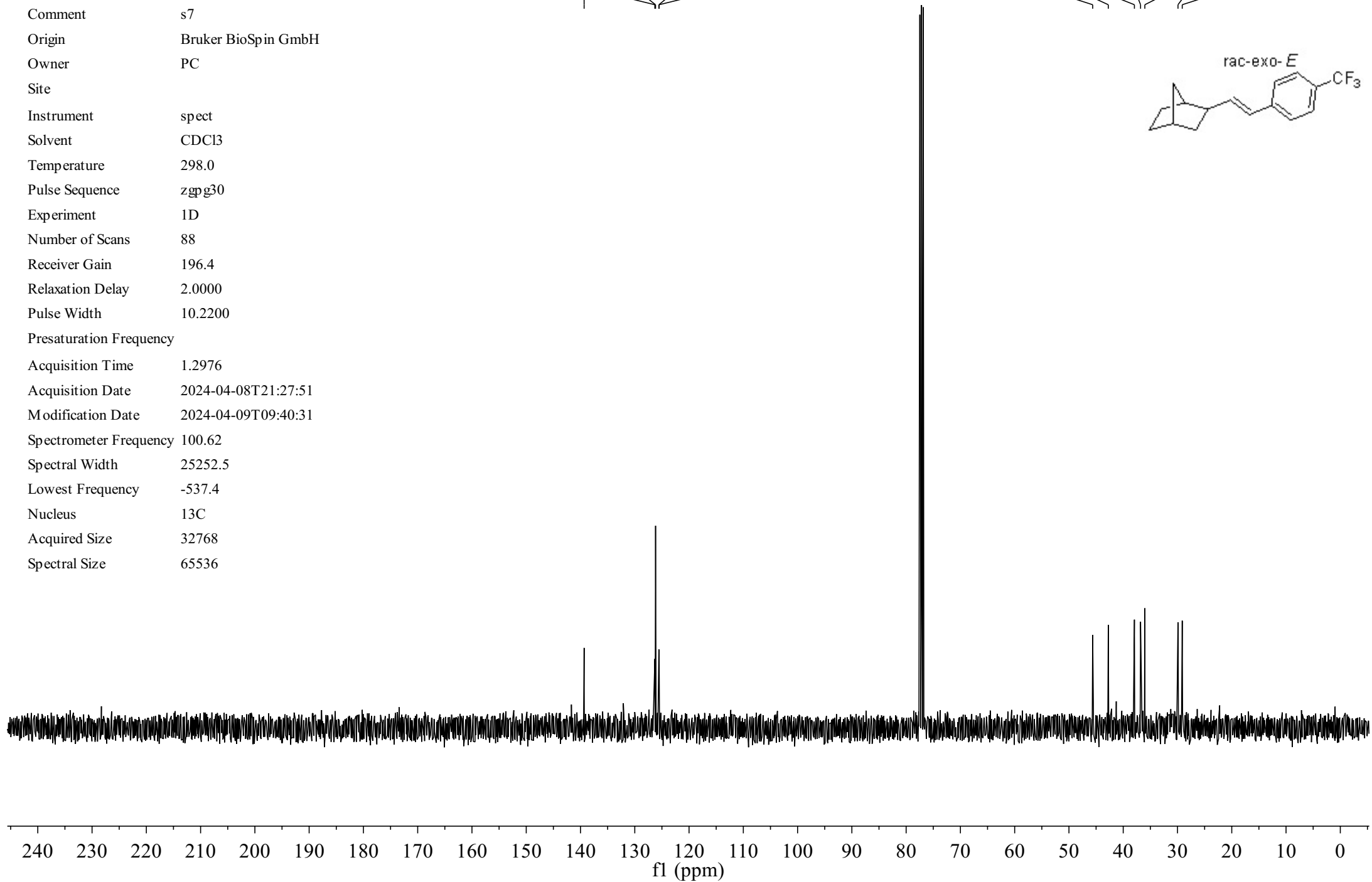
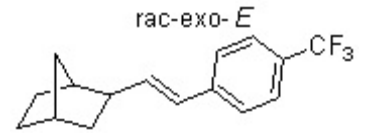


YM-20240402-3-isoa.6.fid

Parameter	Value
Title	YM-20240402-3-isoa.6.fid
Comment	s7
Origin	Bruker BioSpin GmbH
Owner	PC
Site	
Instrument	spect
Solvent	CDC13
Temperature	298.0
Pulse Sequence	zgpg30
Experiment	1D
Number of Scans	88
Receiver Gain	196.4
Relaxation Delay	2.0000
Pulse Width	10.2200
Presaturation Frequency	
Acquisition Time	1.2976
Acquisition Date	2024-04-08T21:27:51
Modification Date	2024-04-09T09:40:31
Spectrometer Frequency	100.62
Spectral Width	25252.5
Lowest Frequency	-537.4
Nucleus	<sup>13</sup> C
Acquired Size	32768
Spectral Size	65536

— 139.3  
126.3  
126.2  
125.6  
125.5

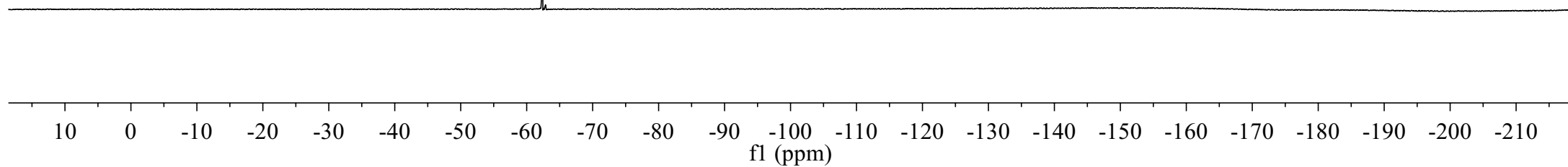
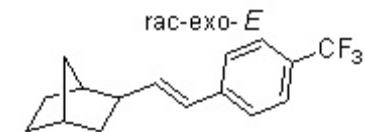
45.6  
42.8  
37.9  
36.8  
36.0  
29.9  
29.1



YM-20240402-3-isoa.5.fid

Parameter	Value
Title	YM-20240402-3-isoa.5.fid
Comment	s7
Origin	Bruker BioSpin GmbH
Owner	PC
Site	
Instrument	spect
Solvent	CDCI3
Temperature	297.8
Pulse Sequence	zgfgq
Experiment	1D
Number of Scans	16
Receiver Gain	196.4
Relaxation Delay	1.0000
Pulse Width	16.4100
Presaturation Frequency	
Acquisition Time	0.7340
Acquisition Date	2024-04-08T21:25:07
Modification Date	2024-04-09T09:40:31
Spectrometer Frequency	376.46
Spectral Width	89285.7
Lowest Frequency	-82292.7
Nucleus	19F
Acquired Size	65536
Spectral Size	131072

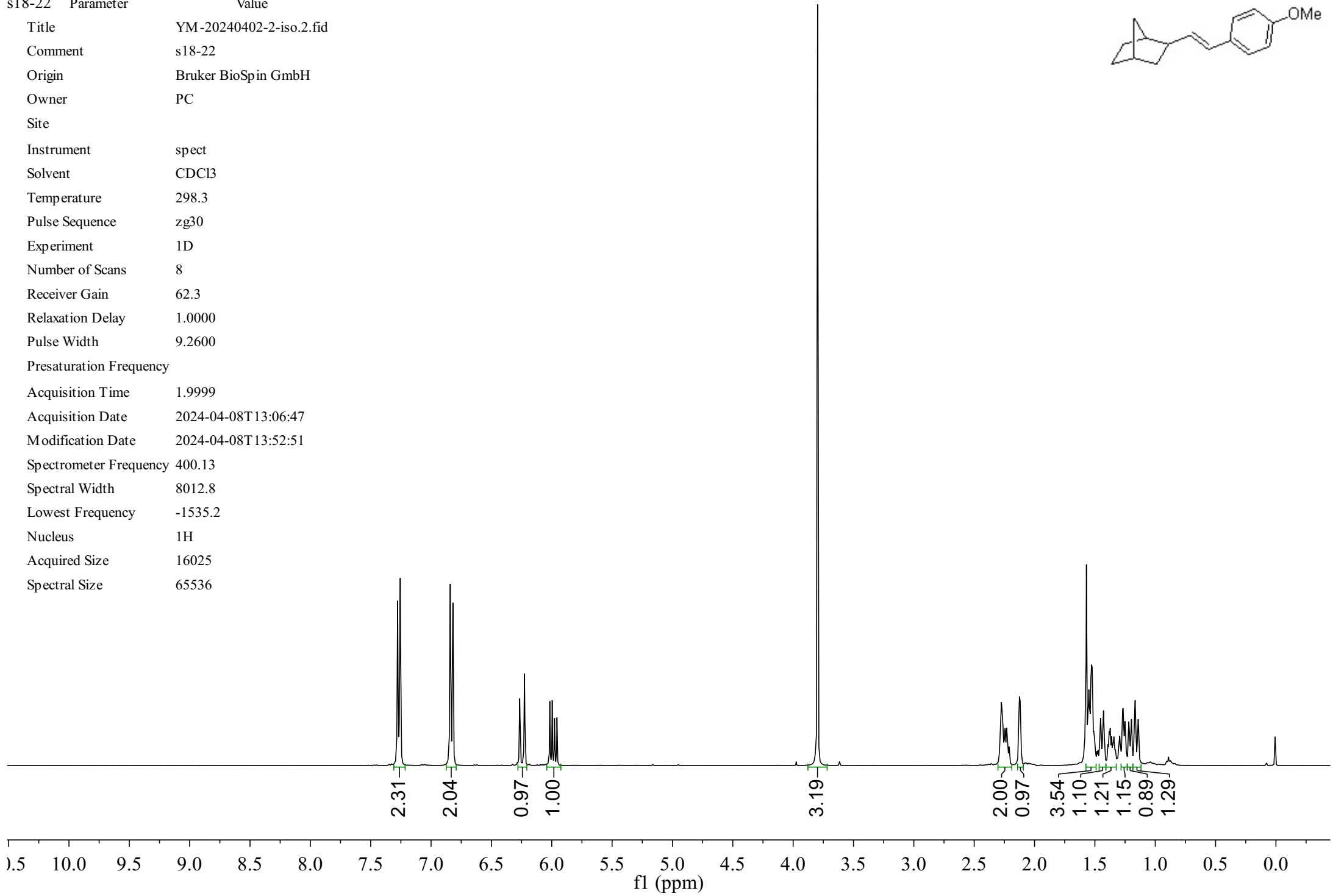
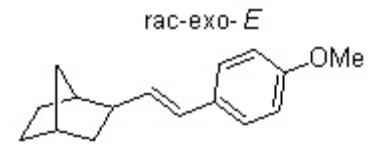
62.4





YM-20240402-2-iso.2.fid

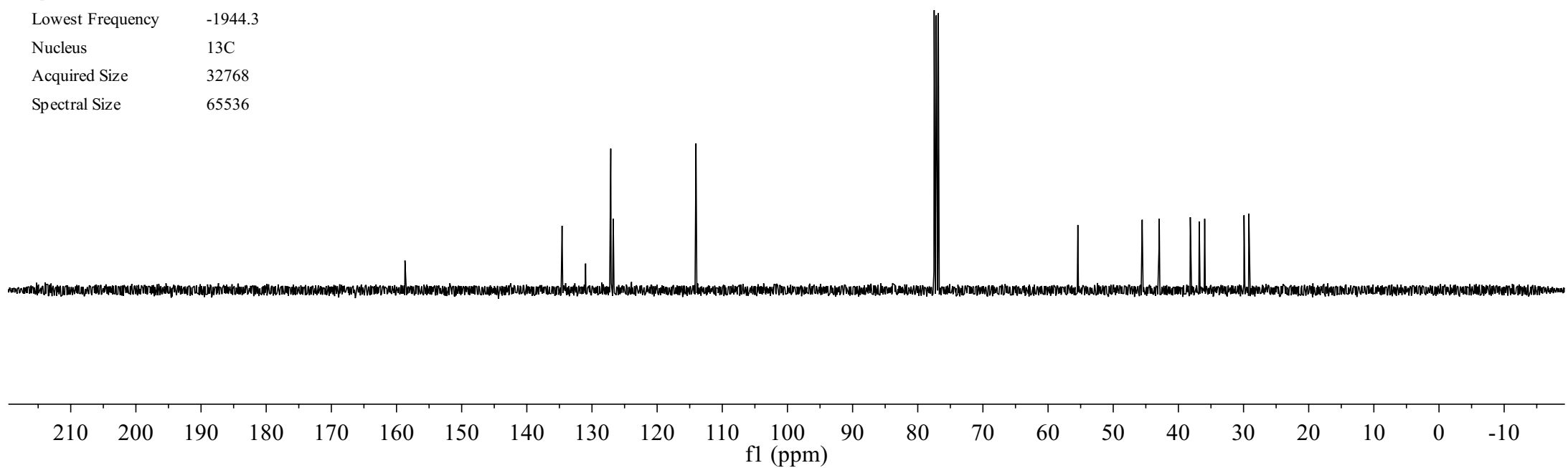
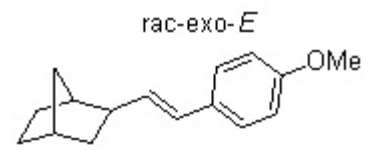
Parameter	Value
Title	YM-20240402-2-iso.2.fid
Comment	s18-22
Origin	Bruker BioSpin GmbH
Owner	PC
Site	
Instrument	spect
Solvent	CDC13
Temperature	298.3
Pulse Sequence	zg30
Experiment	1D
Number of Scans	8
Receiver Gain	62.3
Relaxation Delay	1.0000
Pulse Width	9.2600
Presaturation Frequency	
Acquisition Time	1.9999
Acquisition Date	2024-04-08T13:06:47
Modification Date	2024-04-08T13:52:51
Spectrometer Frequency	400.13
Spectral Width	8012.8
Lowest Frequency	-1535.2
Nucleus	<sup>1</sup> H
Acquired Size	16025
Spectral Size	65536



YM-20240402-2-iso.3.fid

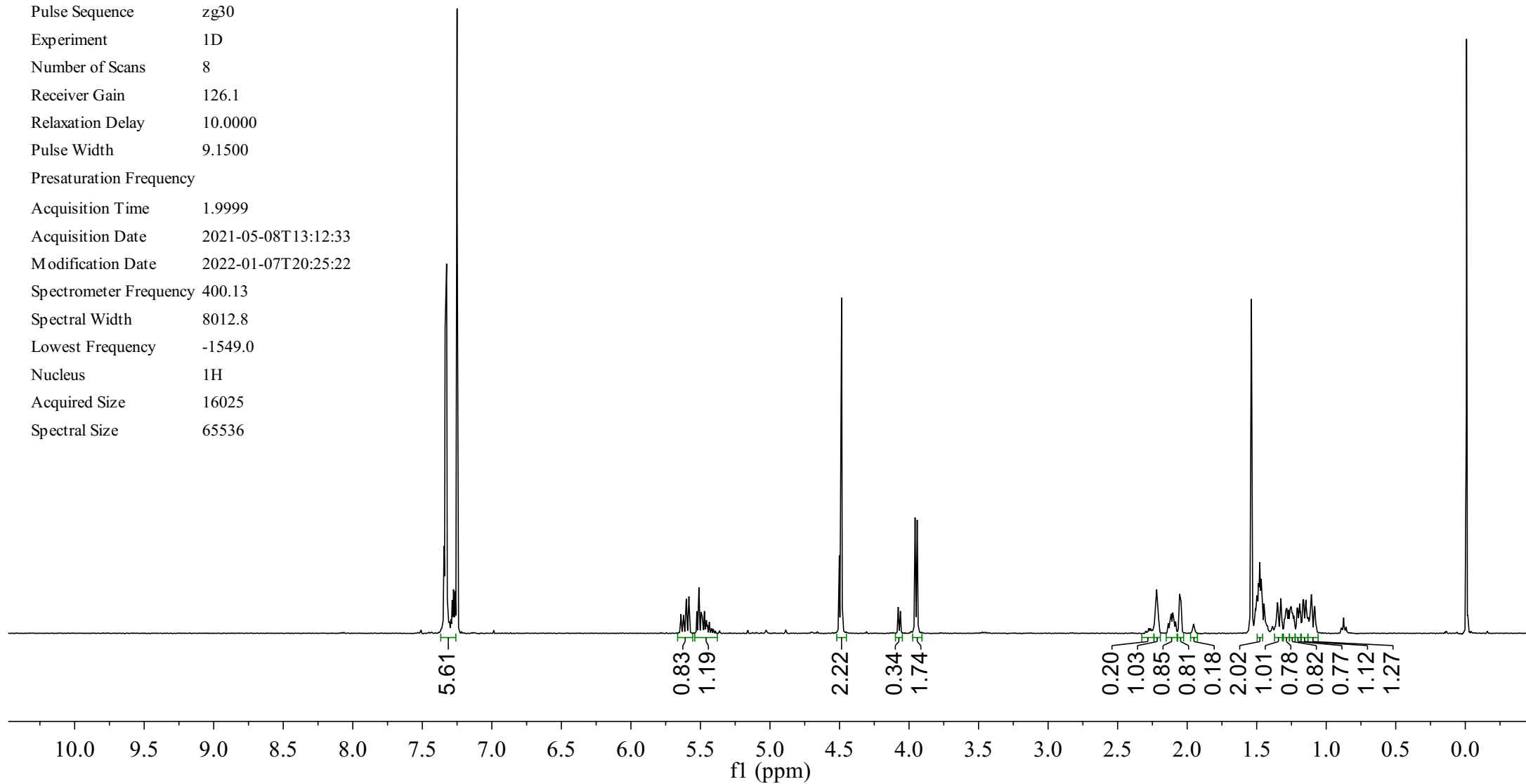
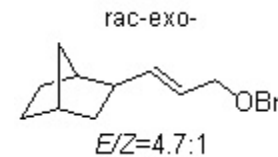
Parameter	Value
Title	YM-20240402-2-iso.3.fid
Comment	s18-22
Origin	Bruker BioSpin GmbH
Owner	PC
Site	
Instrument	spect
Solvent	CDC13
Temperature	298.7
Pulse Sequence	zgpg30
Experiment	1D
Number of Scans	48
Receiver Gain	196.4
Relaxation Delay	2.0000
Pulse Width	10.2200
Presaturation Frequency	
Acquisition Time	1.3631
Acquisition Date	2024-04-08T13:09:26
Modification Date	2024-04-08T13:52:51
Spectrometer Frequency	100.62
Spectral Width	24038.5
Lowest Frequency	-1944.3
Nucleus	<sup>13</sup> C
Acquired Size	32768
Spectral Size	65536

158.7  
134.6  
131.0  
127.1  
126.7  
114.0  
55.4  
45.6  
42.9  
38.2  
36.8  
36.0  
29.9  
29.2



YM-20210506-1-2-s7.1.fid

Parameter	Value
Title	YM-20210506-1-2-s7.1.fid
Comment	
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDC13
Temperature	297.8
Pulse Sequence	zg30
Experiment	1D
Number of Scans	8
Receiver Gain	126.1
Relaxation Delay	10.0000
Pulse Width	9.1500
Presaturation Frequency	
Acquisition Time	1.9999
Acquisition Date	2021-05-08T13:12:33
Modification Date	2022-01-07T20:25:22
Spectrometer Frequency	400.13
Spectral Width	8012.8
Lowest Frequency	-1549.0
Nucleus	1H
Acquired Size	16025
Spectral Size	65536



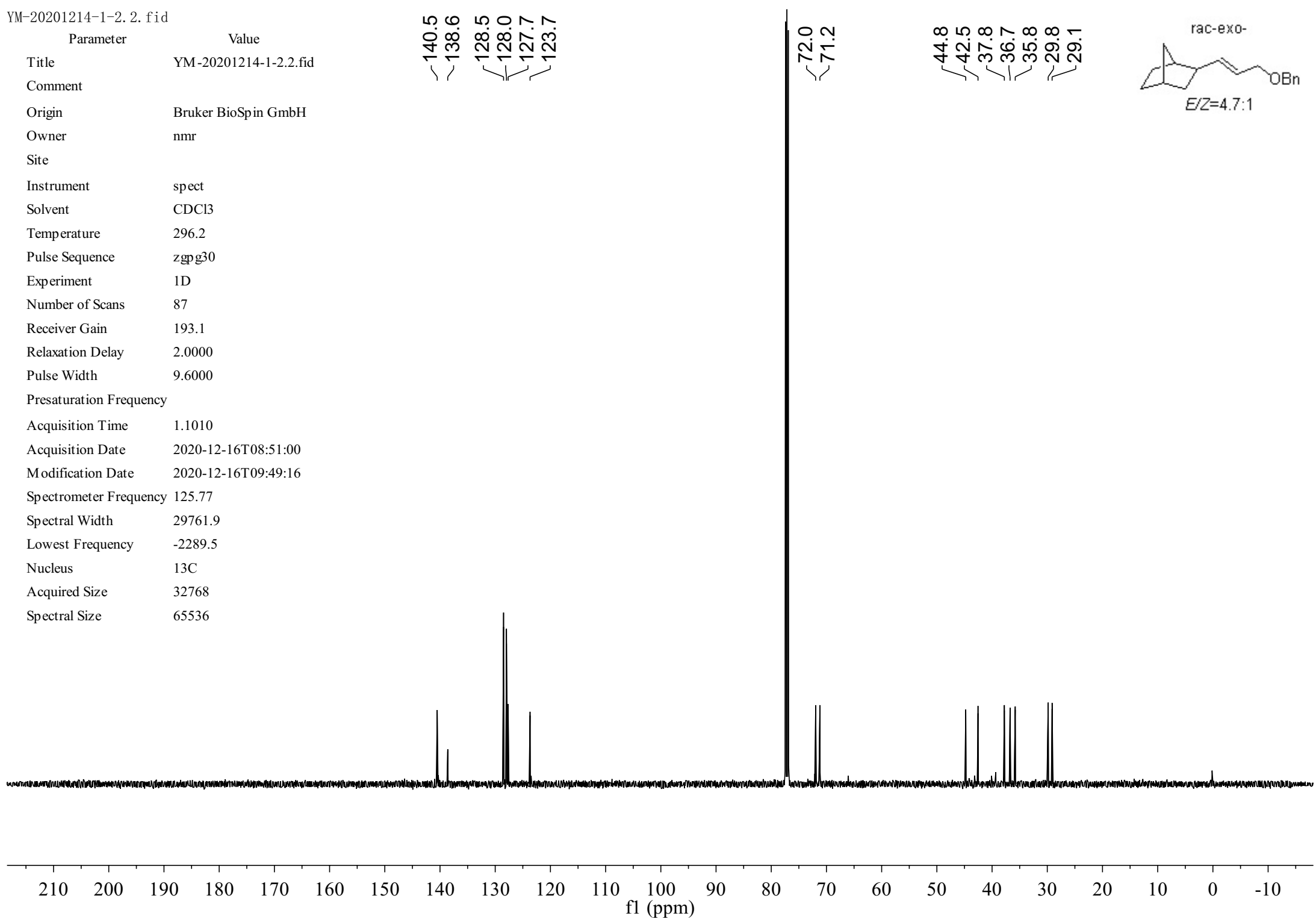
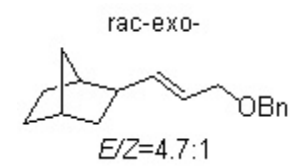
YM-20201214-1-2. 2. fid

Parameter	Value
Title	YM-20201214-1-2.2.fid
Comment	
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDC13
Temperature	296.2
Pulse Sequence	zgpg30
Experiment	1D
Number of Scans	87
Receiver Gain	193.1
Relaxation Delay	2.0000
Pulse Width	9.6000
Presaturation Frequency	
Acquisition Time	1.1010
Acquisition Date	2020-12-16T08:51:00
Modification Date	2020-12-16T09:49:16
Spectrometer Frequency	125.77
Spectral Width	29761.9
Lowest Frequency	-2289.5
Nucleus	13C
Acquired Size	32768
Spectral Size	65536

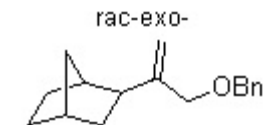
140.5  
138.6  
128.5  
128.0  
127.7  
123.7

72.0  
71.2

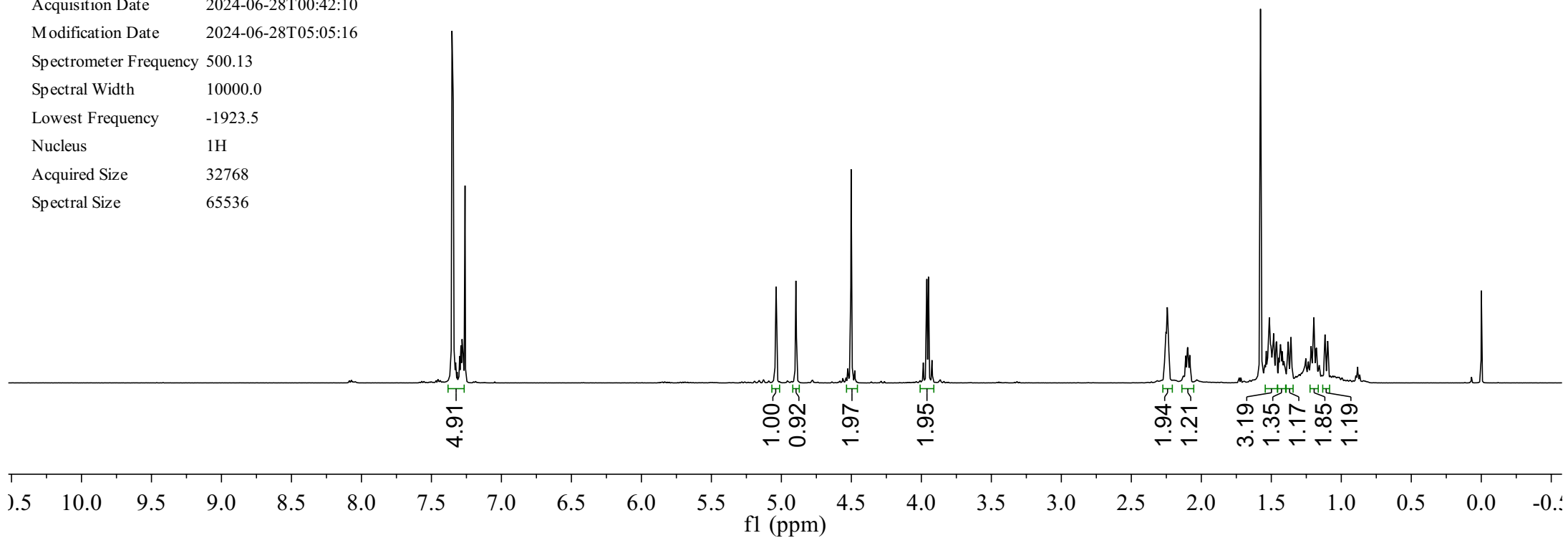
44.8  
42.5  
37.8  
36.7  
35.8  
29.8  
29.1



YM-20240623-2.1.fid  
29-32, T



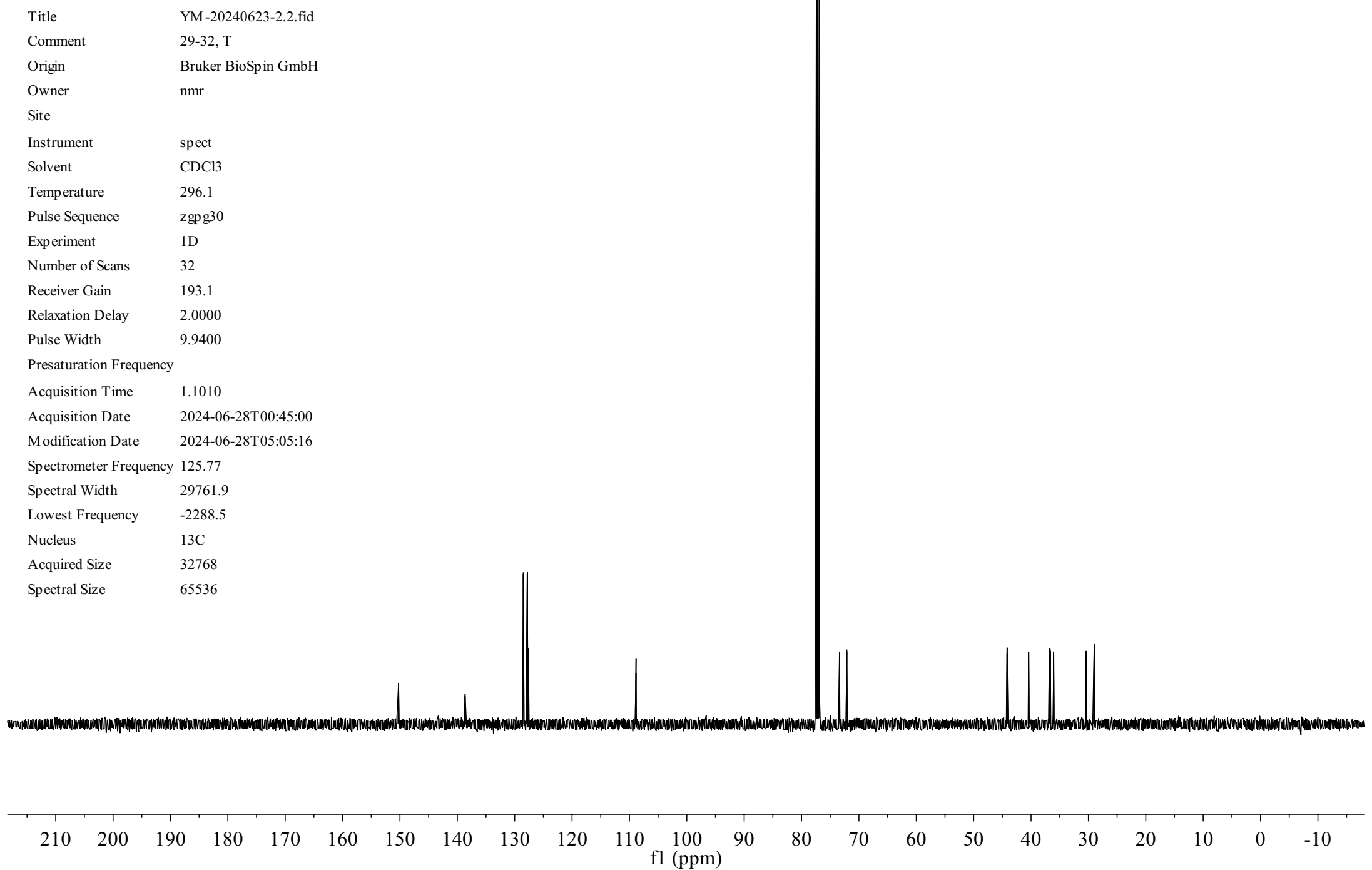
Parameter	Value
Title	YM-20240623-2.1.fid
Comment	29-32, T
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDC13
Temperature	296.1
Pulse Sequence	zg30
Experiment	1D
Number of Scans	16
Receiver Gain	70.5
Relaxation Delay	1.0000
Pulse Width	11.3200
Presaturation Frequency	
Acquisition Time	3.2768
Acquisition Date	2024-06-28T00:42:10
Modification Date	2024-06-28T05:05:16
Spectrometer Frequency	500.13
Spectral Width	10000.0
Lowest Frequency	-1923.5
Nucleus	1H
Acquired Size	32768
Spectral Size	65536



YM-20240623-2.2.fid  
29-32, T

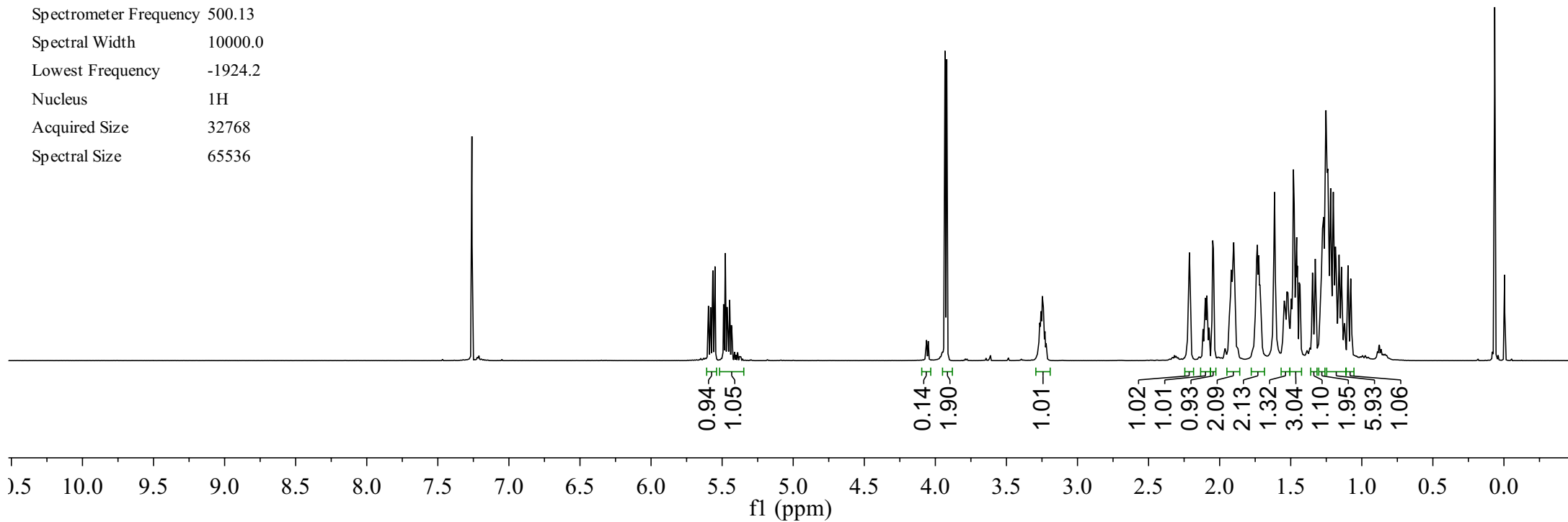
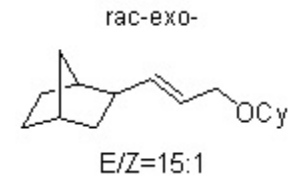
Parameter	Value
Title	YM-20240623-2.2.fid
Comment	29-32, T
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDC13
Temperature	296.1
Pulse Sequence	zgpg30
Experiment	1D
Number of Scans	32
Receiver Gain	193.1
Relaxation Delay	2.0000
Pulse Width	9.9400
Presaturation Frequency	
Acquisition Time	1.1010
Acquisition Date	2024-06-28T00:45:00
Modification Date	2024-06-28T05:05:16
Spectrometer Frequency	125.77
Spectral Width	29761.9
Lowest Frequency	-2288.5
Nucleus	13C
Acquired Size	32768
Spectral Size	65536

—150.2 —138.6 {128.5 {127.8 {127.6 —108.9 {73.4 {72.1 {44.2 {40.4 {36.8 {36.7 {36.1 {30.4 {29.0



YM-20240617-1.2.fid

S21-24	Parameter	Value
	Title	YM-20240617-1.2.fid
	Comment	S21-24
	Origin	Bruker BioSpin GmbH
	Owner	nmr
	Site	
	Instrument	spect
	Solvent	CDC13
	Temperature	296.1
	Pulse Sequence	zg30
	Experiment	1D
	Number of Scans	16
	Receiver Gain	54.3
	Relaxation Delay	1.0000
	Pulse Width	11.3200
	Presaturation Frequency	
	Acquisition Time	3.2768
	Acquisition Date	2024-06-17T21:59:00
	Modification Date	2024-06-18T09:37:39
	Spectrometer Frequency	500.13
	Spectral Width	10000.0
	Lowest Frequency	-1924.2
	Nucleus	1H
	Acquired Size	32768
	Spectral Size	65536



YM-20240617-1.3.fid

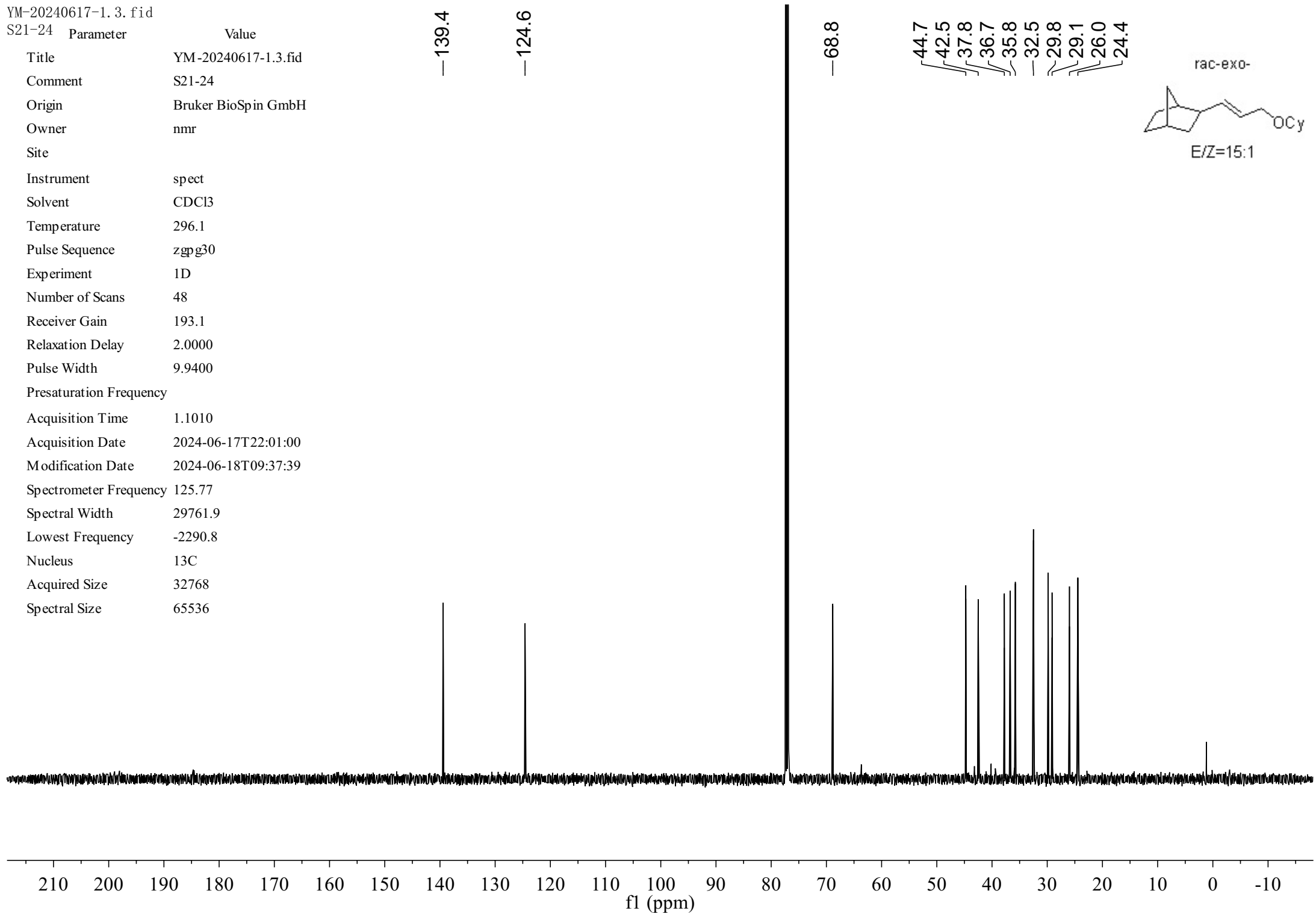
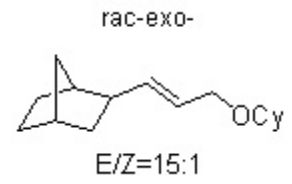
Parameter	Value
Title	YM-20240617-1.3.fid
Comment	S21-24
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDC13
Temperature	296.1
Pulse Sequence	zgpg30
Experiment	1D
Number of Scans	48
Receiver Gain	193.1
Relaxation Delay	2.0000
Pulse Width	9.9400
Presaturation Frequency	
Acquisition Time	1.1010
Acquisition Date	2024-06-17T22:01:00
Modification Date	2024-06-18T09:37:39
Spectrometer Frequency	125.77
Spectral Width	29761.9
Lowest Frequency	-2290.8
Nucleus	13C
Acquired Size	32768
Spectral Size	65536

—139.4

—124.6

—68.8

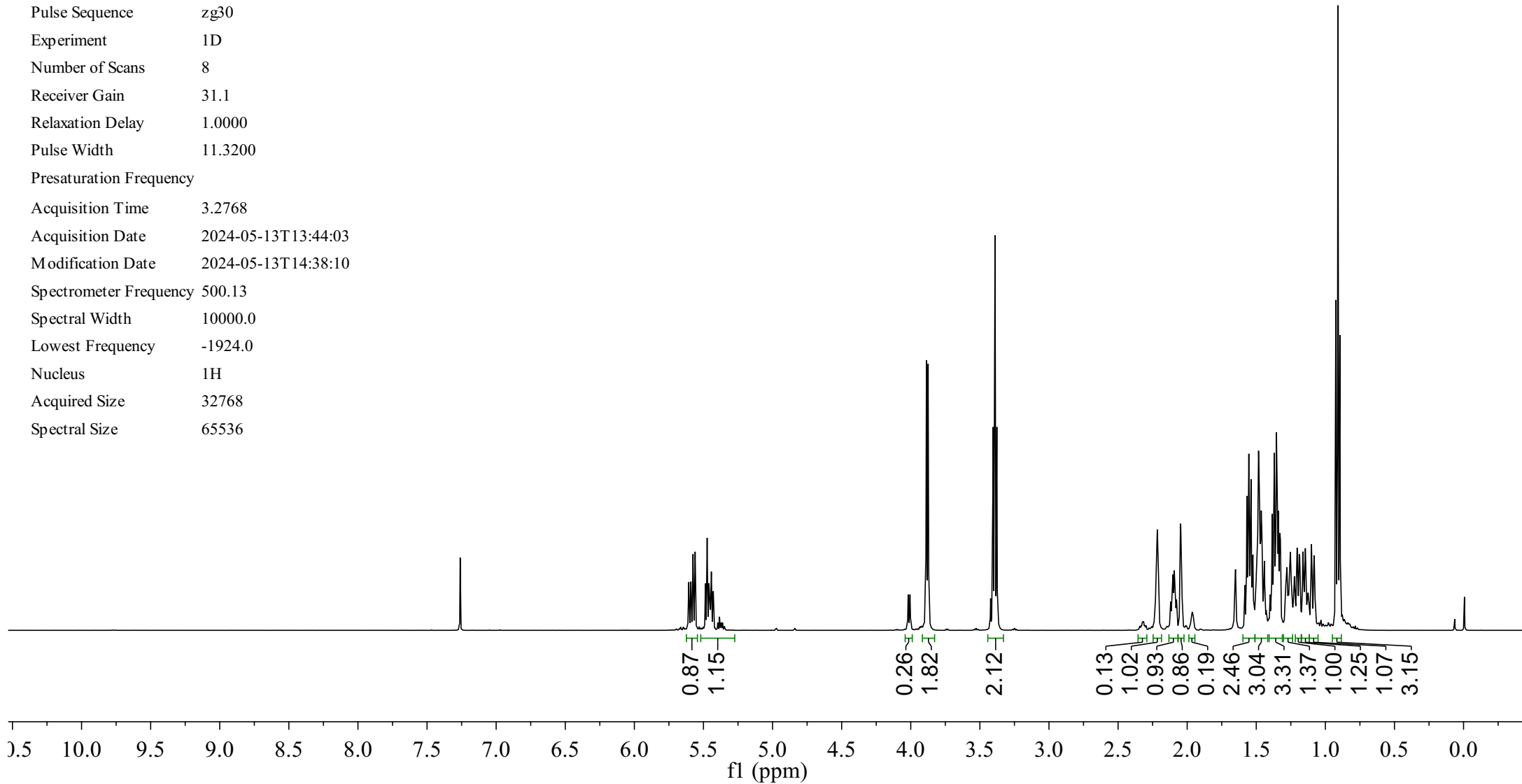
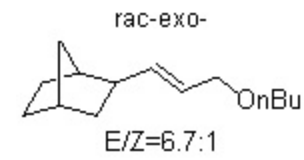
44.7  
42.5  
37.8  
36.7  
35.8  
32.5  
29.8  
29.1  
26.0  
24.4





YM-20240511-1.1.fid

Parameter	Value
Title	YM-20240511-1.1.fid
Comment	s22-25
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDC13
Temperature	296.1
Pulse Sequence	zg30
Experiment	1D
Number of Scans	8
Receiver Gain	31.1
Relaxation Delay	1.0000
Pulse Width	11.3200
Presaturation Frequency	
Acquisition Time	3.2768
Acquisition Date	2024-05-13T13:44:03
Modification Date	2024-05-13T14:38:10
Spectrometer Frequency	500.13
Spectral Width	10000.0
Lowest Frequency	-1924.0
Nucleus	1H
Acquired Size	32768
Spectral Size	65536



YM-20240511-1.2.fid

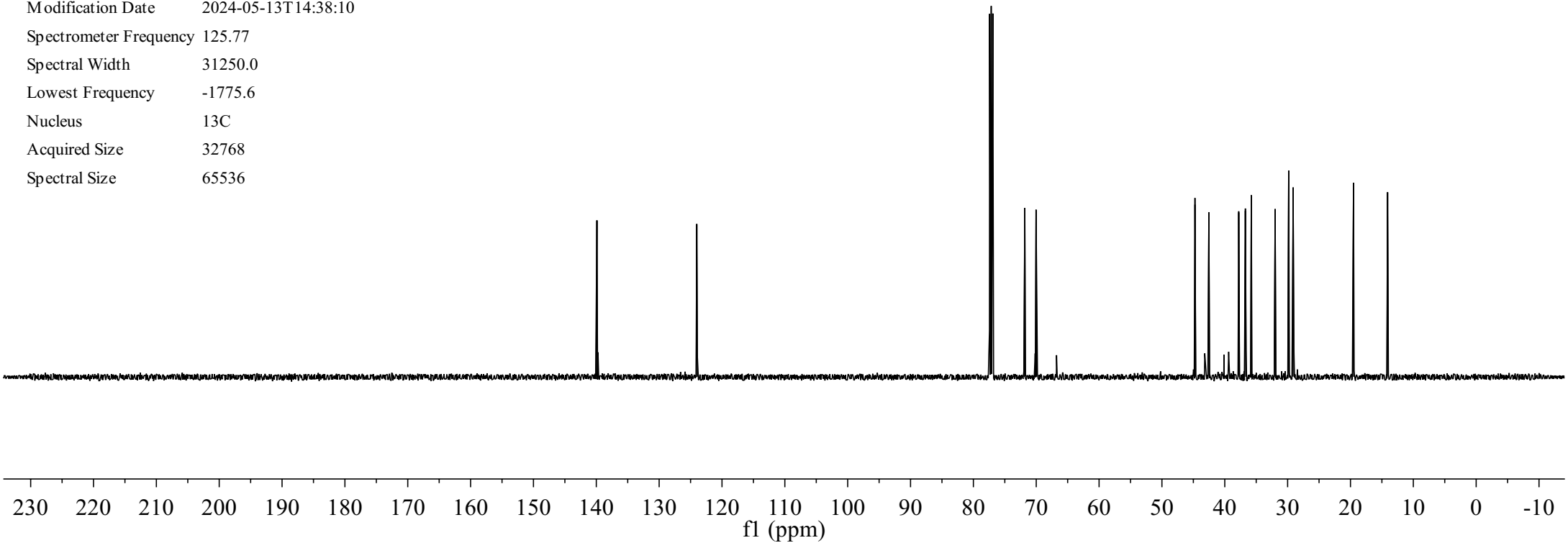
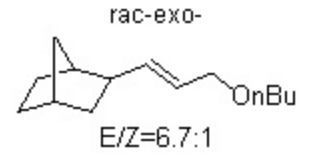
Parameter	Value
Title	YM-20240511-1.2.fid
Comment	s22-25
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDC13
Temperature	296.2
Pulse Sequence	zgpg30
Experiment	1D
Number of Scans	24
Receiver Gain	193.1
Relaxation Delay	2.0000
Pulse Width	9.9400
Presaturation Frequency	
Acquisition Time	1.0486
Acquisition Date	2024-05-13T13:46:39
Modification Date	2024-05-13T14:38:10
Spectrometer Frequency	125.77
Spectral Width	31250.0
Lowest Frequency	-1775.6
Nucleus	13C
Acquired Size	32768
Spectral Size	65536

—139.9

—124.0

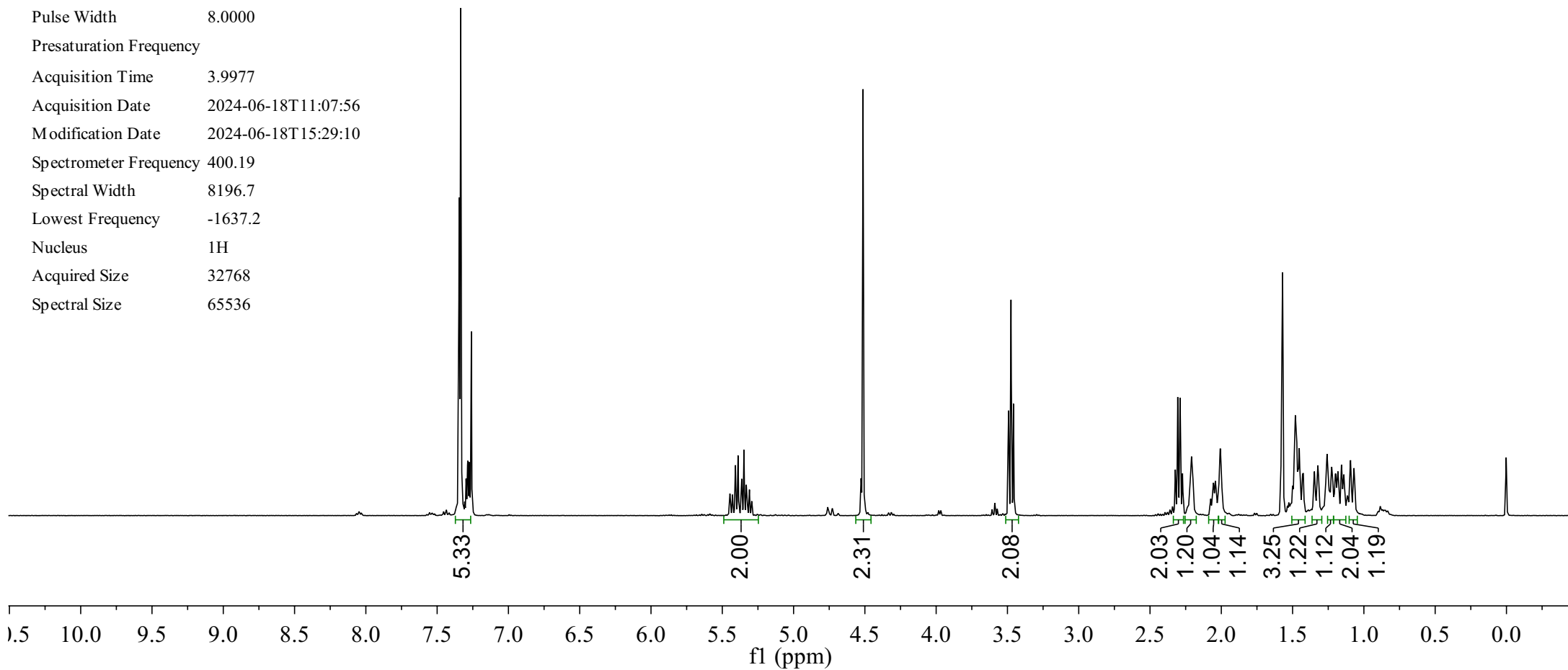
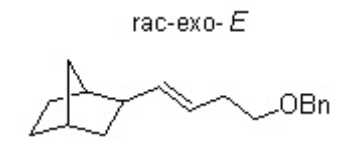
~71.8  
~70.0

44.7  
42.5  
37.8  
36.7  
35.8  
32.0  
29.8  
29.1  
19.5  
14.1



YM-20240614-1-iso.2.fid

Parameter	Value
Title	YM-20240614-1-iso.2.fid
Comment	S23-28
Origin	Bruker BioSpin GmbH
Owner	nmrsu
Site	
Instrument	Avance NEO 400
Solvent	CDC13
Temperature	299.2
Pulse Sequence	zg30
Experiment	1D
Number of Scans	8
Receiver Gain	101.0
Relaxation Delay	1.0000
Pulse Width	8.0000
Presaturation Frequency	
Acquisition Time	3.9977
Acquisition Date	2024-06-18T11:07:56
Modification Date	2024-06-18T15:29:10
Spectrometer Frequency	400.19
Spectral Width	8196.7
Lowest Frequency	-1637.2
Nucleus	1H
Acquired Size	32768
Spectral Size	65536



YM-20240614-1-iso. 3. fid

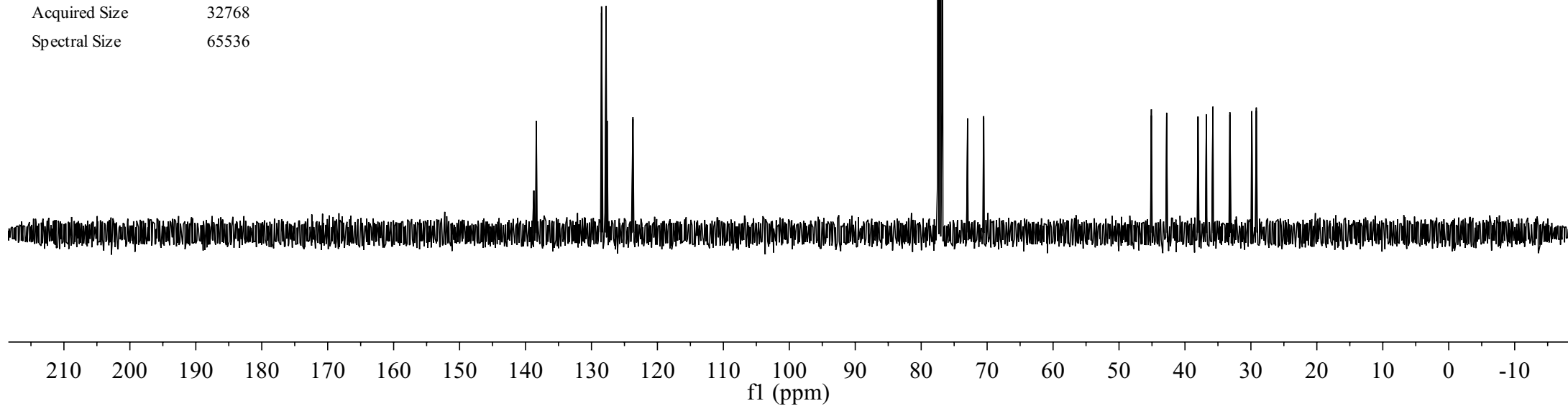
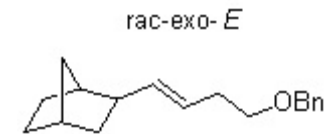
S23-28

Parameter	Value
Title	YM-20240614-1-iso.3.fid
Comment	S23-28
Origin	Bruker BioSpin GmbH
Owner	nmrsu
Site	
Instrument	Avance NEO 400
Solvent	CDC13
Temperature	299.4
Pulse Sequence	zgpg30
Experiment	1D
Number of Scans	64
Receiver Gain	101.0
Relaxation Delay	2.0000
Pulse Width	8.0000
Presaturation Frequency	
Acquisition Time	1.3763
Acquisition Date	2024-06-18T11:14:40
Modification Date	2024-06-18T15:29:11
Spectrometer Frequency	100.64
Spectral Width	23809.5
Lowest Frequency	-1827.7
Nucleus	<sup>13</sup> C
Acquired Size	32768
Spectral Size	65536

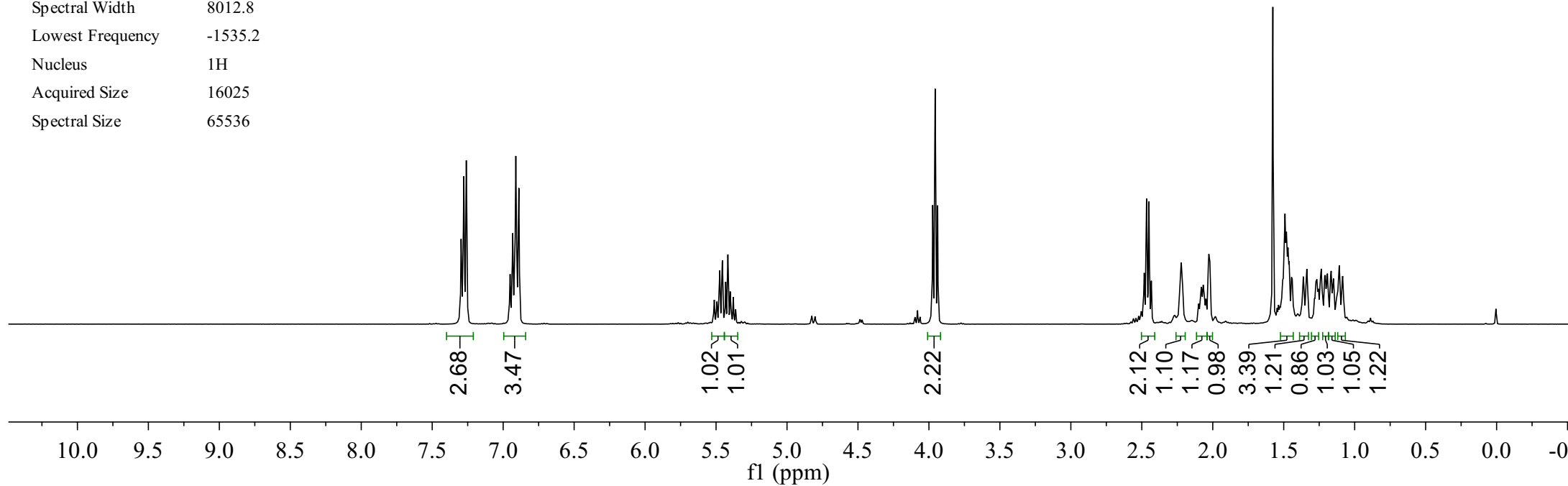
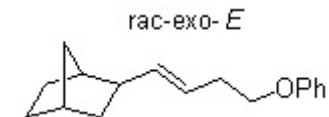
138.7  
138.4  
128.5  
127.8  
127.6  
123.7

73.0  
70.5

45.1  
42.8  
38.0  
36.8  
35.8  
33.2  
29.9  
29.2



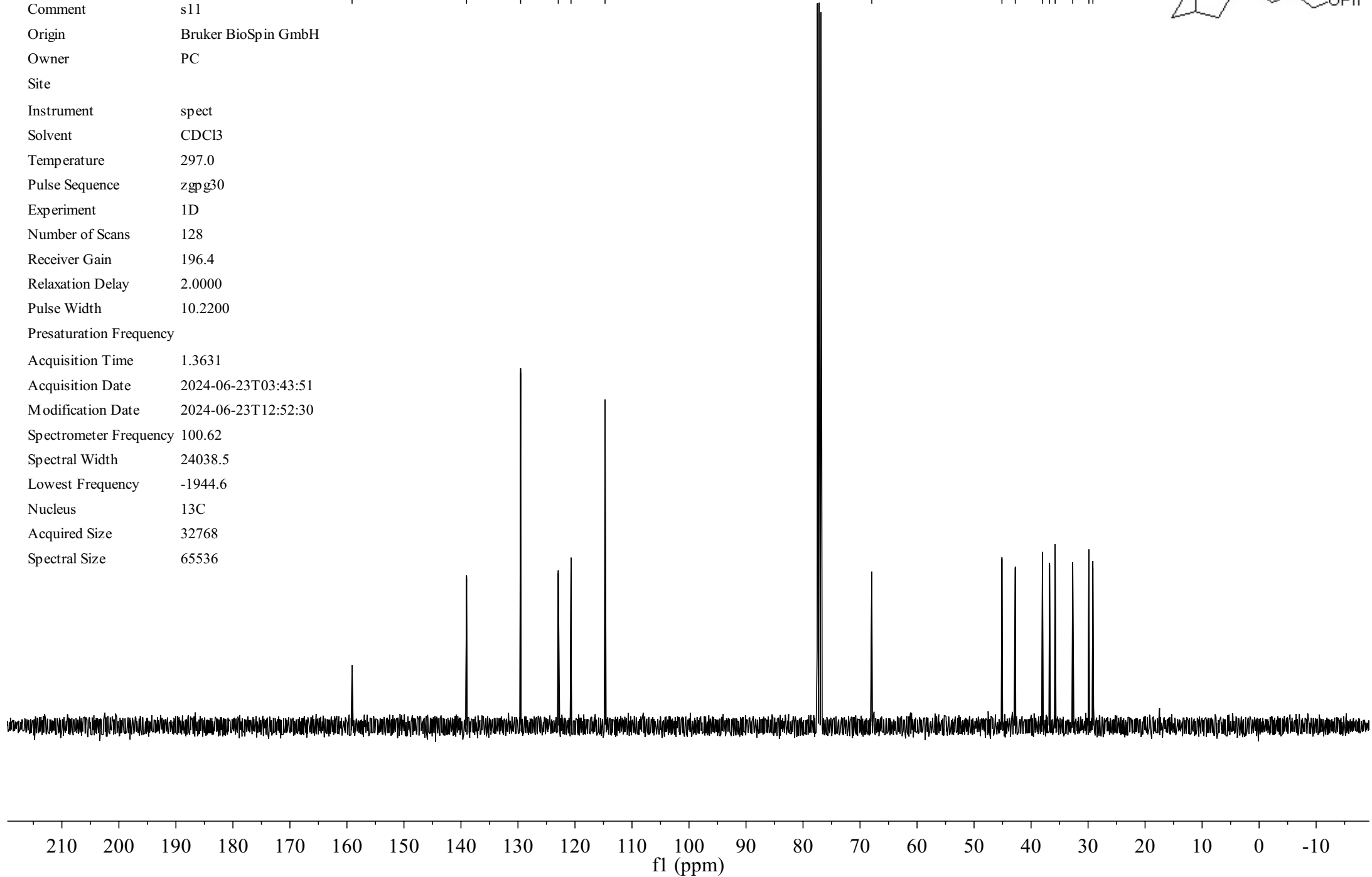
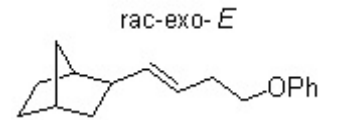
s11	Parameter	Value
	Title	YM-20240619-9-iso.2.fid
	Comment	s11
	Origin	Bruker BioSpin GmbH
	Owner	PC
	Site	
	Instrument	spect
	Solvent	CDC13
	Temperature	296.4
	Pulse Sequence	zg30
	Experiment	1D
	Number of Scans	8
	Receiver Gain	62.3
	Relaxation Delay	1.0000
	Pulse Width	9.2600
	Presaturation Frequency	
	Acquisition Time	1.9999
	Acquisition Date	2024-06-21T22:40:49
	Modification Date	2024-06-22T13:29:55
	Spectrometer Frequency	400.13
	Spectral Width	8012.8
	Lowest Frequency	-1535.2
	Nucleus	1H
	Acquired Size	16025
	Spectral Size	65536



s11

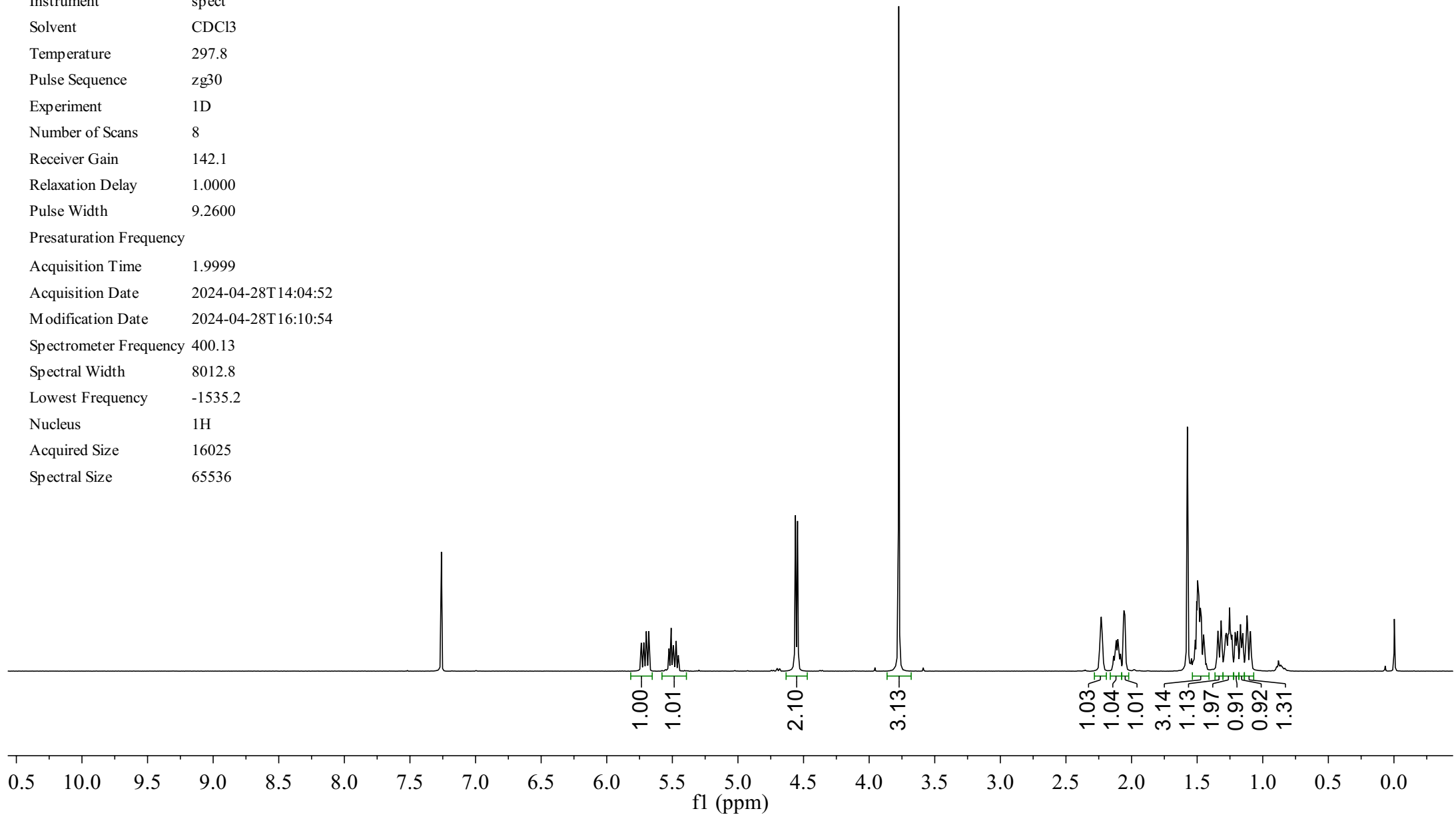
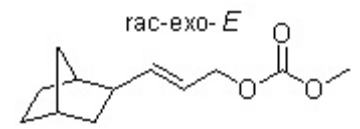
Parameter	Value
Title	YM-20240619-9-iso.4.fid
Comment	s11
Origin	Bruker BioSpin GmbH
Owner	PC
Site	
Instrument	spect
Solvent	CDC13
Temperature	297.0
Pulse Sequence	zgp30
Experiment	1D
Number of Scans	128
Receiver Gain	196.4
Relaxation Delay	2.0000
Pulse Width	10.2200
Presaturation Frequency	
Acquisition Time	1.3631
Acquisition Date	2024-06-23T03:43:51
Modification Date	2024-06-23T12:52:30
Spectrometer Frequency	100.62
Spectral Width	24038.5
Lowest Frequency	-1944.6
Nucleus	13C
Acquired Size	32768
Spectral Size	65536

—159.1 —139.0 ~129.5 ~122.9 ~120.7 ~114.7 —67.9 45.1 42.8 38.0 36.8 35.8 32.7 29.9 29.2



YM-20230414-1.3.fid

Parameter	Value
Title	YM-20230414-1.3.fid
Comment	S45-60
Origin	Bruker BioSpin GmbH
Owner	PC
Site	
Instrument	spect
Solvent	CDC13
Temperature	297.8
Pulse Sequence	zg30
Experiment	1D
Number of Scans	8
Receiver Gain	142.1
Relaxation Delay	1.0000
Pulse Width	9.2600
Presaturation Frequency	
Acquisition Time	1.9999
Acquisition Date	2024-04-28T14:04:52
Modification Date	2024-04-28T16:10:54
Spectrometer Frequency	400.13
Spectral Width	8012.8
Lowest Frequency	-1535.2
Nucleus	1H
Acquired Size	16025
Spectral Size	65536



YM-20230414-1.2.fid

Parameter	Value
Title	YM-20230414-1.2.fid
Comment	S45-60
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDC13
Temperature	296.1
Pulse Sequence	zgpg30
Experiment	1D
Number of Scans	32
Receiver Gain	193.1
Relaxation Delay	2.0000
Pulse Width	9.9400
Presaturation Frequency	
Acquisition Time	1.1010
Acquisition Date	2024-04-27T17:51:32
Modification Date	2024-04-27T20:10:58
Spectrometer Frequency	125.77
Spectral Width	29761.9
Lowest Frequency	-2289.3
Nucleus	13C
Acquired Size	32768
Spectral Size	65536

—155.8

—142.8

—120.7

—69.0

—54.8

44.7

42.3

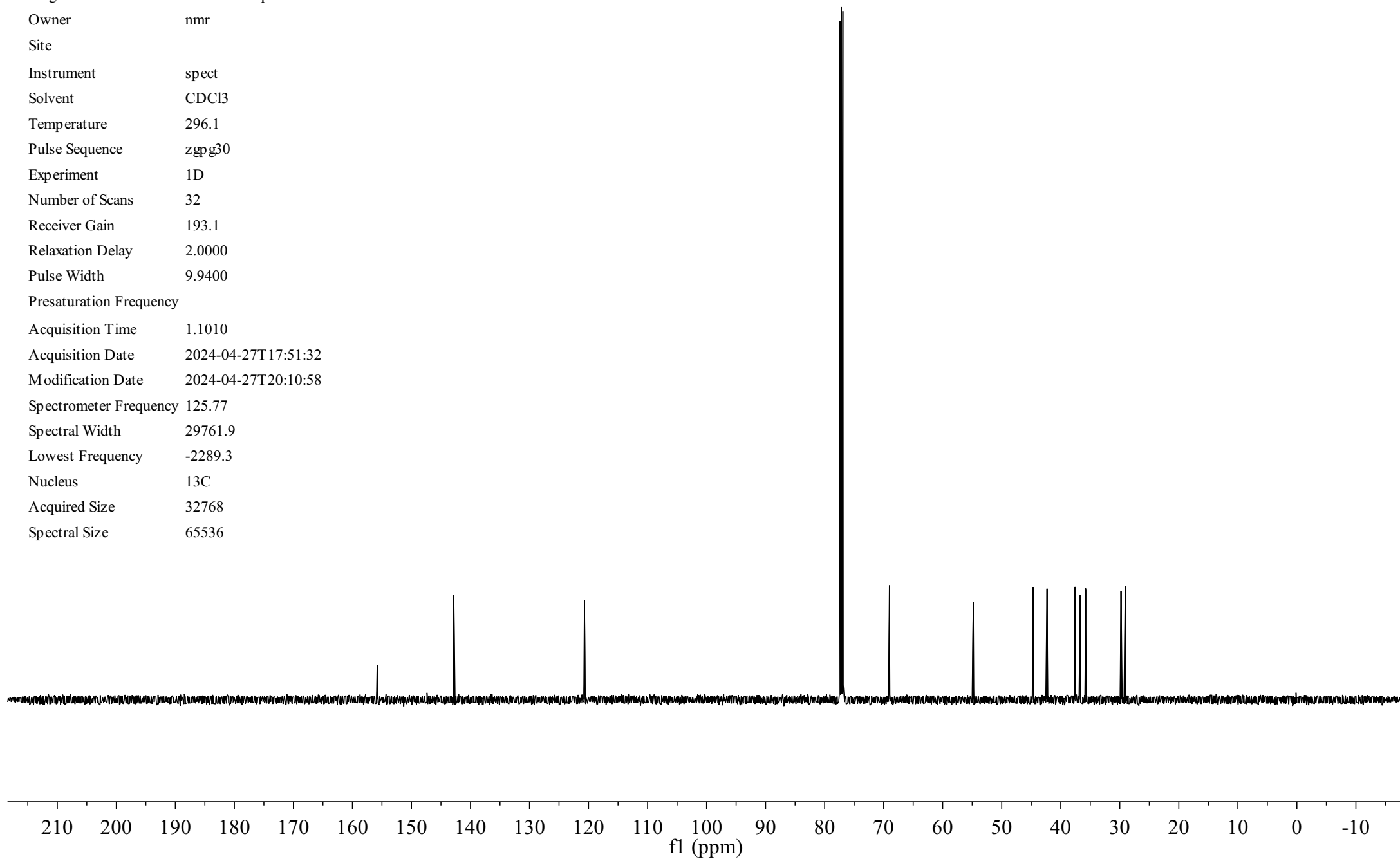
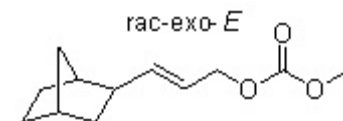
37.6

36.7

35.8

29.8

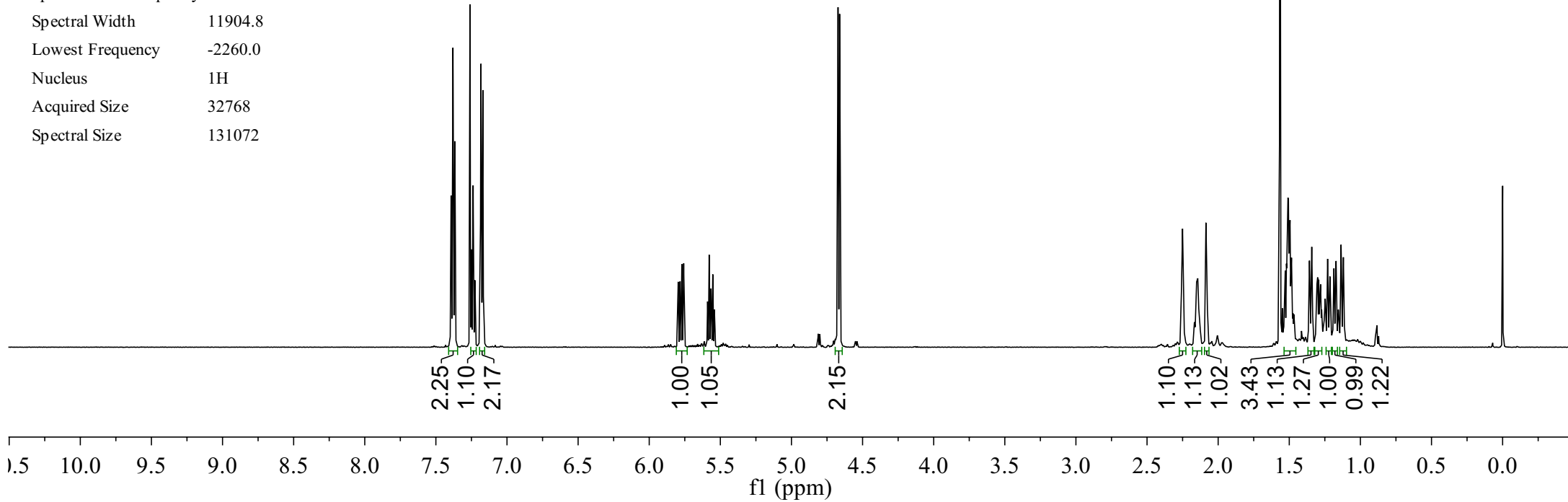
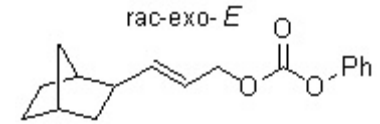
29.1





YM-20240422-5-iso. 3. fid

Parameter	Value
Title	YM-20240422-5-iso.3.fid
Comment	S50
Origin	Bruker BioSpin GmbH
Owner	nmrsu
Site	
Instrument	Avance NEO 600
Solvent	CDC13
Temperature	293.2
Pulse Sequence	zg30
Experiment	1D
Number of Scans	12
Receiver Gain	101.0
Relaxation Delay	1.0000
Pulse Width	9.2200
Presaturation Frequency	
Acquisition Time	2.7525
Acquisition Date	2024-04-27T13:11:29
Modification Date	2024-04-27T13:19:50
Spectrometer Frequency	600.20
Spectral Width	11904.8
Lowest Frequency	-2260.0
Nucleus	1H
Acquired Size	32768
Spectral Size	131072



YM-20240422-5-iso. 2. fid

S51

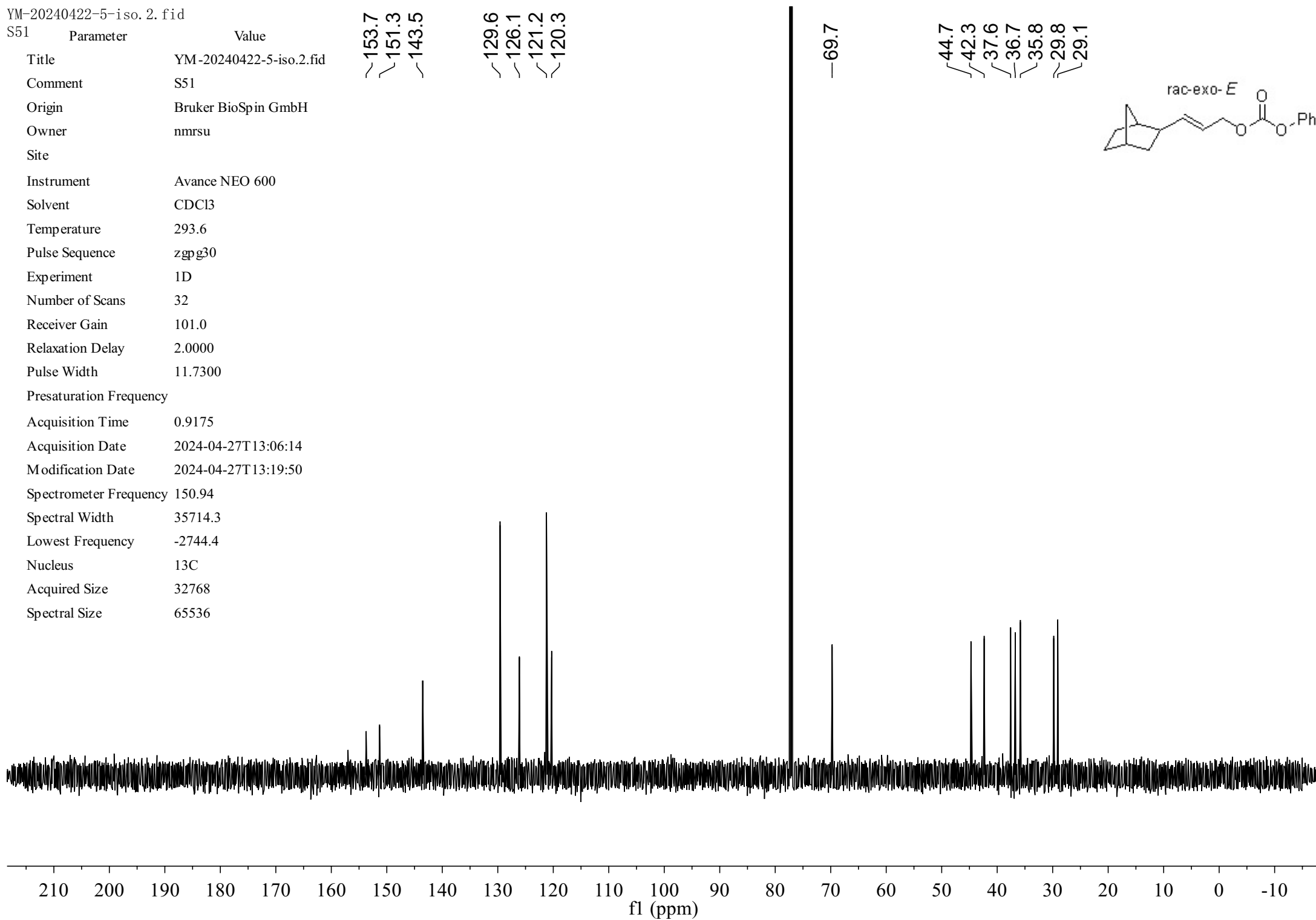
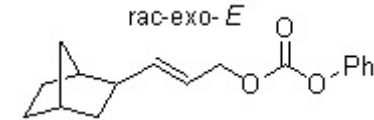
Parameter	Value
Title	YM-20240422-5-iso.2.fid
Comment	S51
Origin	Bruker BioSpin GmbH
Owner	nmrsu
Site	
Instrument	Avance NEO 600
Solvent	CDC13
Temperature	293.6
Pulse Sequence	zgpg30
Experiment	1D
Number of Scans	32
Receiver Gain	101.0
Relaxation Delay	2.0000
Pulse Width	11.7300
Presaturation Frequency	
Acquisition Time	0.9175
Acquisition Date	2024-04-27T13:06:14
Modification Date	2024-04-27T13:19:50
Spectrometer Frequency	150.94
Spectral Width	35714.3
Lowest Frequency	-2744.4
Nucleus	<sup>13</sup> C
Acquired Size	32768
Spectral Size	65536

153.7  
151.3  
143.5

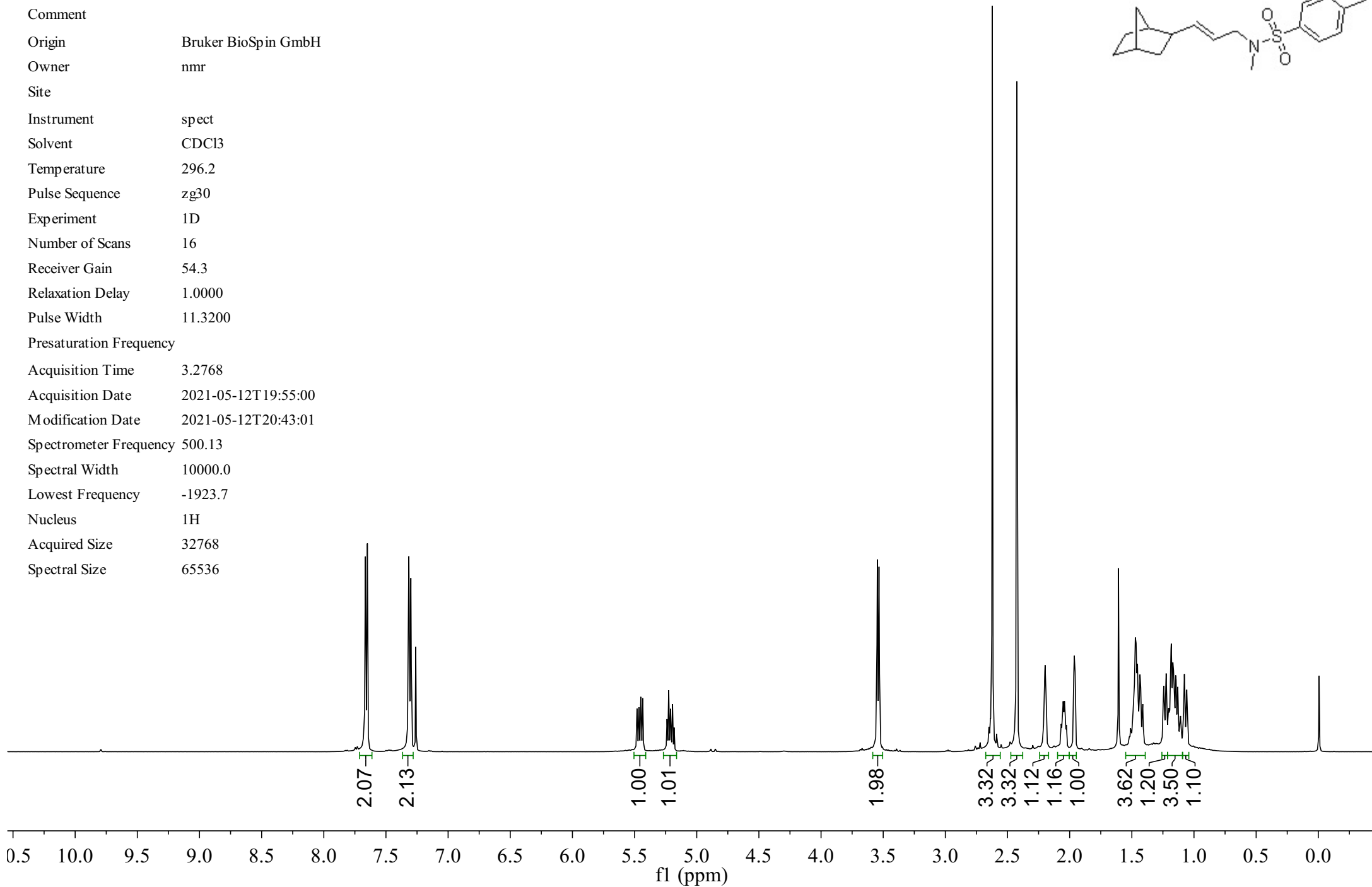
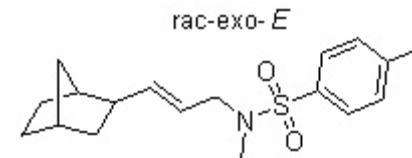
129.6  
126.1  
121.2  
120.3

69.7

44.7  
42.3  
37.6  
36.7  
35.8  
29.8  
29.1



Parameter	Value
Title	YM-20210427-4-1.1.fid
Comment	
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDCl3
Temperature	296.2
Pulse Sequence	zg30
Experiment	1D
Number of Scans	16
Receiver Gain	54.3
Relaxation Delay	1.0000
Pulse Width	11.3200
Presaturation Frequency	
Acquisition Time	3.2768
Acquisition Date	2021-05-12T19:55:00
Modification Date	2021-05-12T20:43:01
Spectrometer Frequency	500.13
Spectral Width	10000.0
Lowest Frequency	-1923.7
Nucleus	1H
Acquired Size	32768
Spectral Size	65536

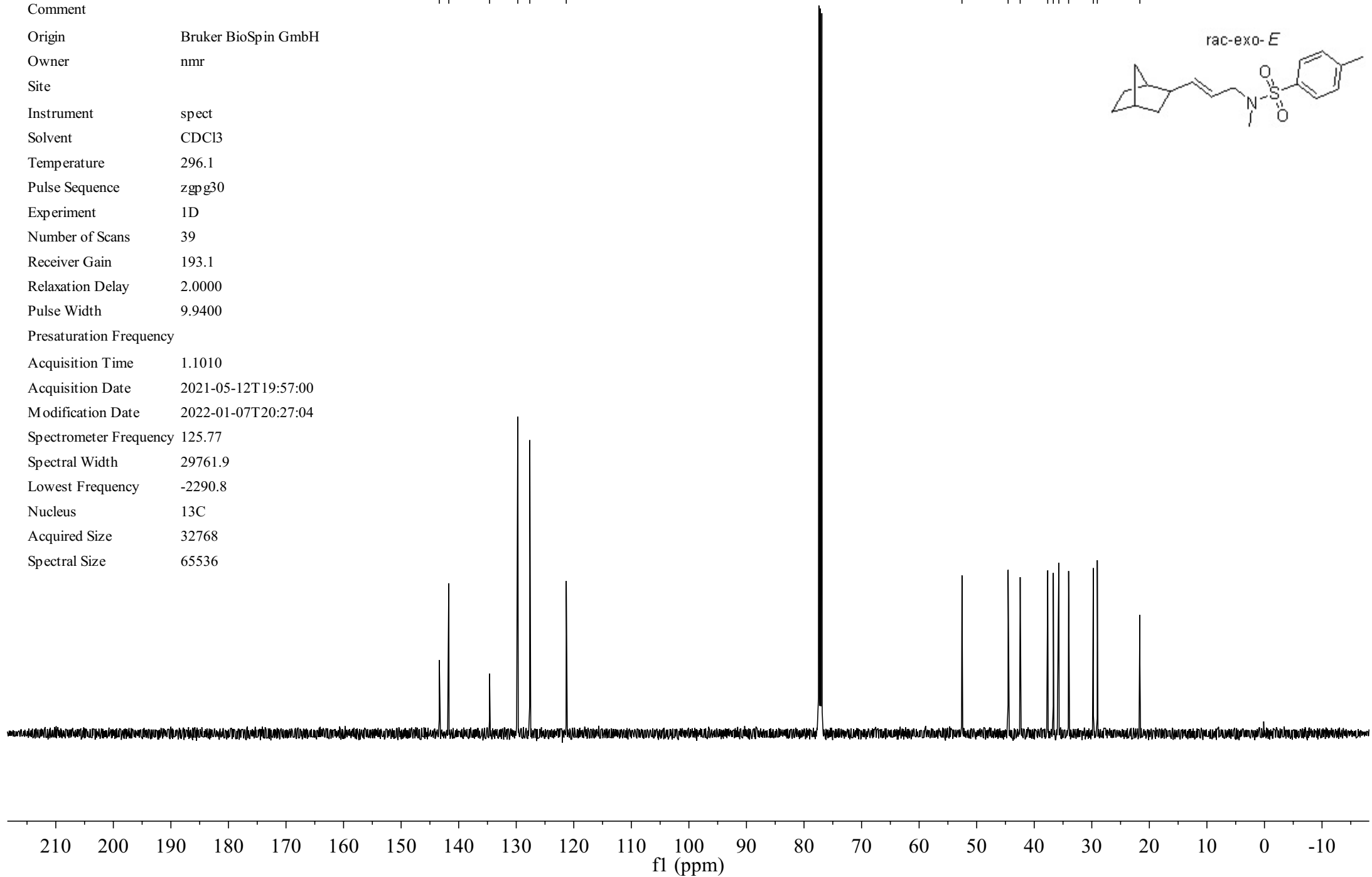
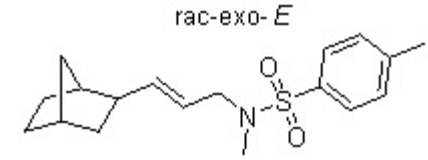


YM-20210427-4-1.2.fid

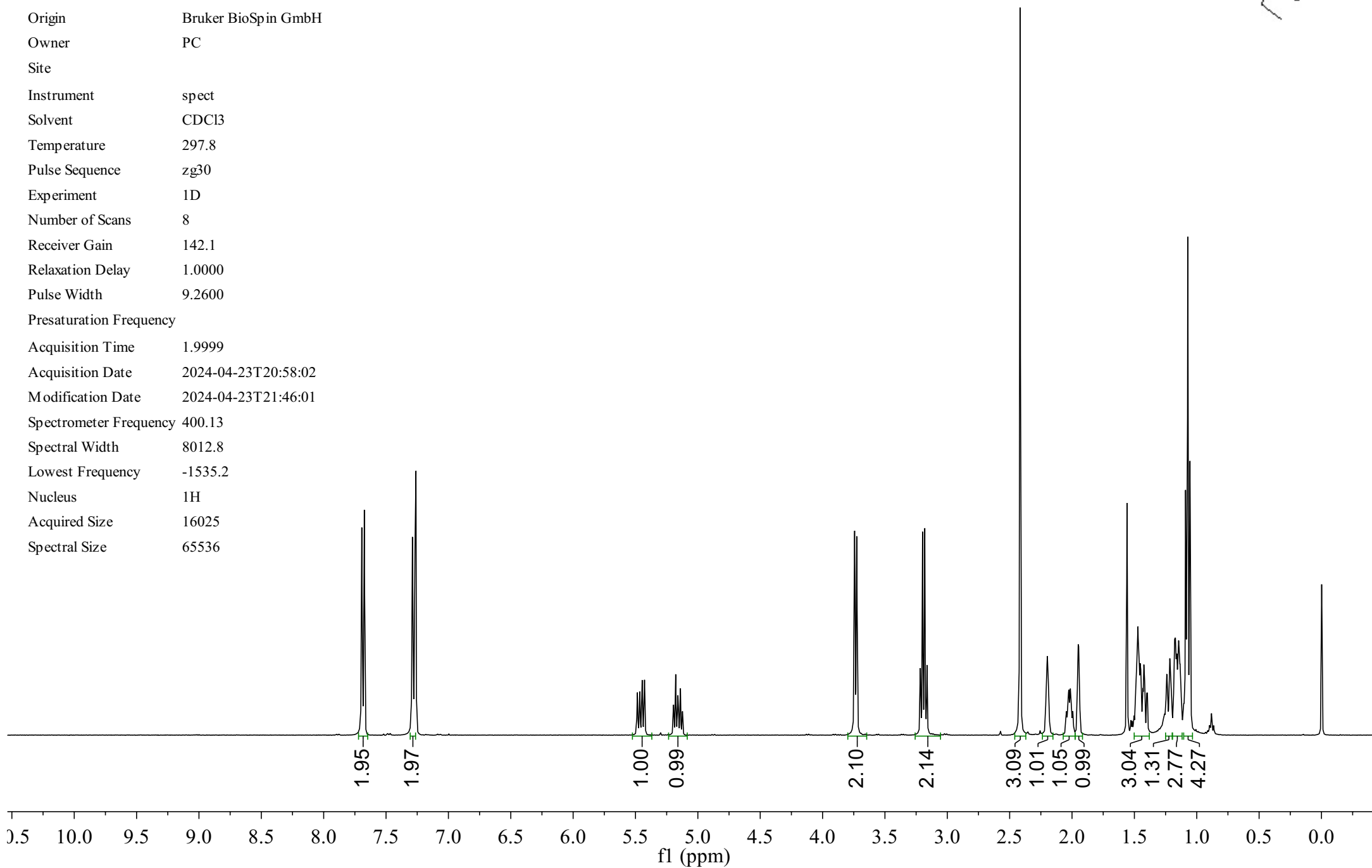
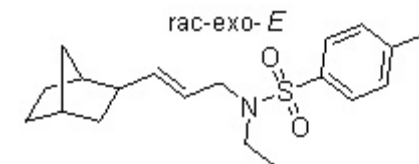
Parameter	Value
Title	YM-20210427-4-1.2.fid
Comment	
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDC13
Temperature	296.1
Pulse Sequence	zgpg30
Experiment	1D
Number of Scans	39
Receiver Gain	193.1
Relaxation Delay	2.0000
Pulse Width	9.9400
Presaturation Frequency	
Acquisition Time	1.1010
Acquisition Date	2021-05-12T19:57:00
Modification Date	2022-01-07T20:27:04
Spectrometer Frequency	125.77
Spectral Width	29761.9
Lowest Frequency	-2290.8
Nucleus	<sup>13</sup> C
Acquired Size	32768
Spectral Size	65536

143.4  
141.7  
134.6  
129.7  
127.6  
121.3

52.6  
44.5  
42.4  
37.7  
36.7  
35.7  
34.0  
29.7  
29.0  
21.6



Parameter	Value
Title	YM-20240423-1.3.fid
Comment	s17
Origin	Bruker BioSpin GmbH
Owner	PC
Site	
Instrument	spect
Solvent	CDC13
Temperature	297.8
Pulse Sequence	zg30
Experiment	1D
Number of Scans	8
Receiver Gain	142.1
Relaxation Delay	1.0000
Pulse Width	9.2600
Presaturation Frequency	
Acquisition Time	1.9999
Acquisition Date	2024-04-23T20:58:02
Modification Date	2024-04-23T21:46:01
Spectrometer Frequency	400.13
Spectral Width	8012.8
Lowest Frequency	-1535.2
Nucleus	<sup>1</sup> H
Acquired Size	16025
Spectral Size	65536



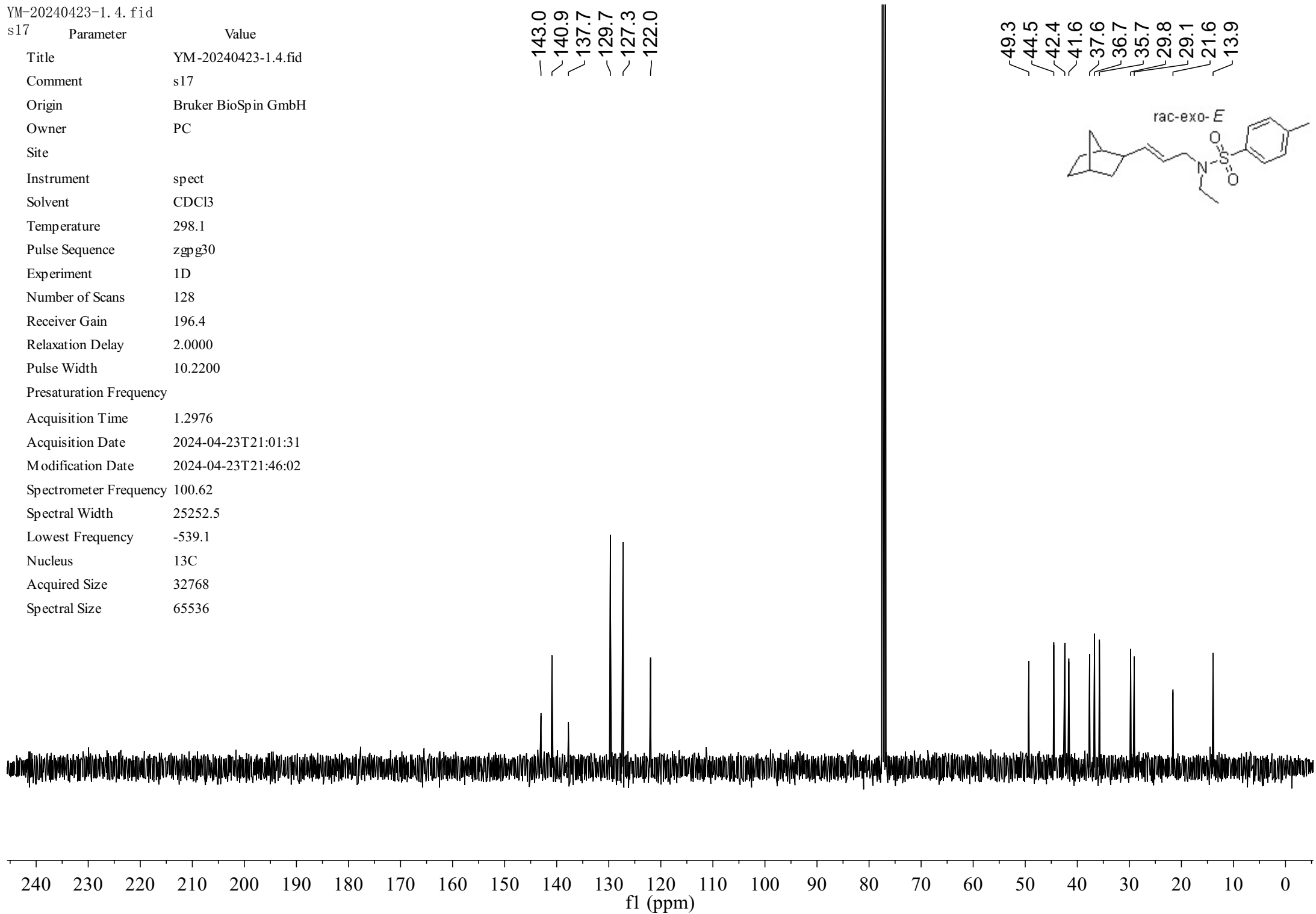
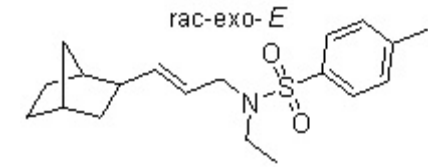
YM-20240423-1.4.fid

s17

Parameter	Value
Title	YM-20240423-1.4.fid
Comment	s17
Origin	Bruker BioSpin GmbH
Owner	PC
Site	
Instrument	spect
Solvent	CDC13
Temperature	298.1
Pulse Sequence	zgpg30
Experiment	1D
Number of Scans	128
Receiver Gain	196.4
Relaxation Delay	2.0000
Pulse Width	10.2200
Presaturation Frequency	
Acquisition Time	1.2976
Acquisition Date	2024-04-23T21:01:31
Modification Date	2024-04-23T21:46:02
Spectrometer Frequency	100.62
Spectral Width	25252.5
Lowest Frequency	-539.1
Nucleus	13C
Acquired Size	32768
Spectral Size	65536

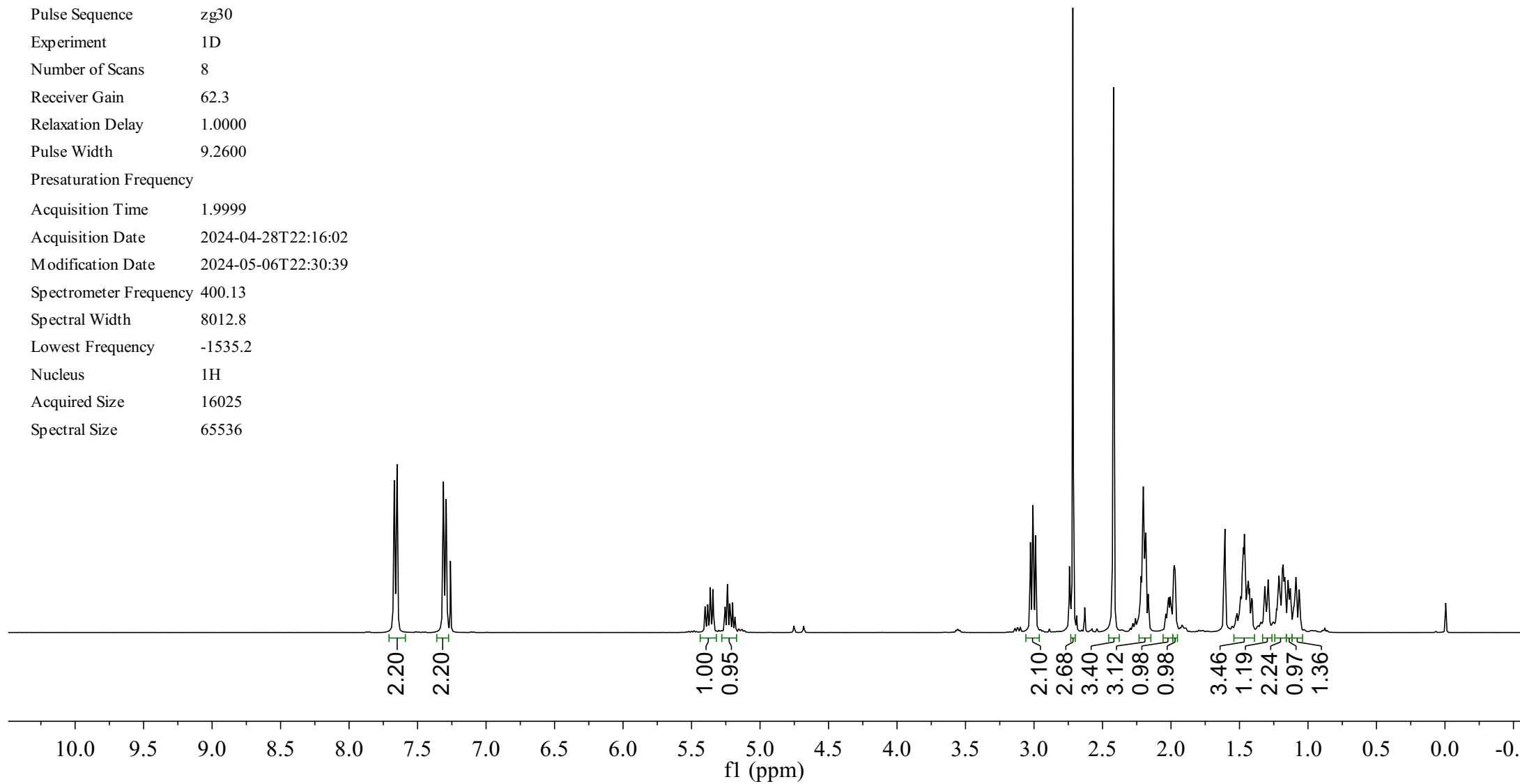
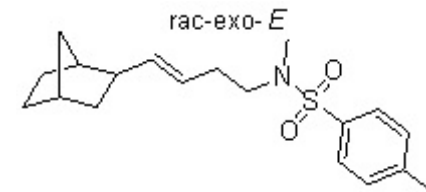
143.0  
140.9  
137.7  
129.7  
127.3  
122.0

49.3  
44.5  
42.4  
41.6  
37.6  
36.7  
35.7  
29.8  
29.1  
21.6  
13.9



YM-20240422-4-iso.4.fid

Parameter	Value
Title	YM-20240422-4-iso.4.fid
Comment	s15
Origin	Bruker BioSpin GmbH
Owner	PC
Site	
Instrument	spect
Solvent	CDC13
Temperature	297.5
Pulse Sequence	zg30
Experiment	1D
Number of Scans	8
Receiver Gain	62.3
Relaxation Delay	1.0000
Pulse Width	9.2600
Presaturation Frequency	
Acquisition Time	1.9999
Acquisition Date	2024-04-28T22:16:02
Modification Date	2024-05-06T22:30:39
Spectrometer Frequency	400.13
Spectral Width	8012.8
Lowest Frequency	-1535.2
Nucleus	1H
Acquired Size	16025
Spectral Size	65536

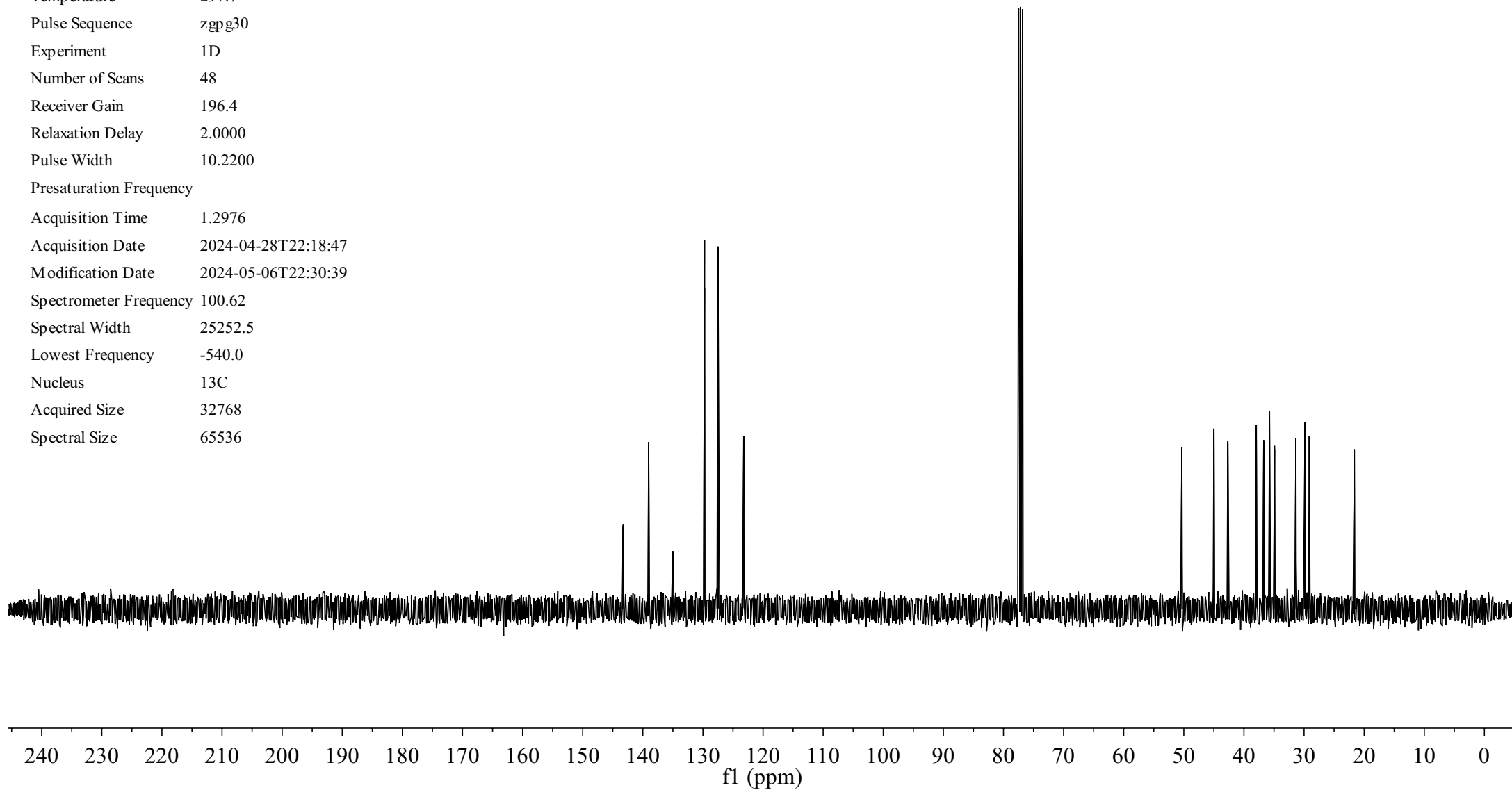
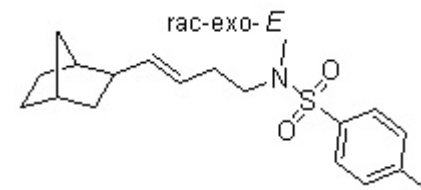


s15

Parameter	Value
Title	YM-20240422-4-iso. 5. fid
Comment	s15
Origin	Bruker BioSpin GmbH
Owner	PC
Site	
Instrument	spect
Solvent	CDC13
Temperature	297.7
Pulse Sequence	zgpg30
Experiment	1D
Number of Scans	48
Receiver Gain	196.4
Relaxation Delay	2.0000
Pulse Width	10.2200
Presaturation Frequency	
Acquisition Time	1.2976
Acquisition Date	2024-04-28T22:18:47
Modification Date	2024-05-06T22:30:39
Spectrometer Frequency	100.62
Spectral Width	25252.5
Lowest Frequency	-540.0
Nucleus	13C
Acquired Size	32768
Spectral Size	65536

~143.3  
~139.0  
~135.0  
~129.7  
~127.5  
~123.2

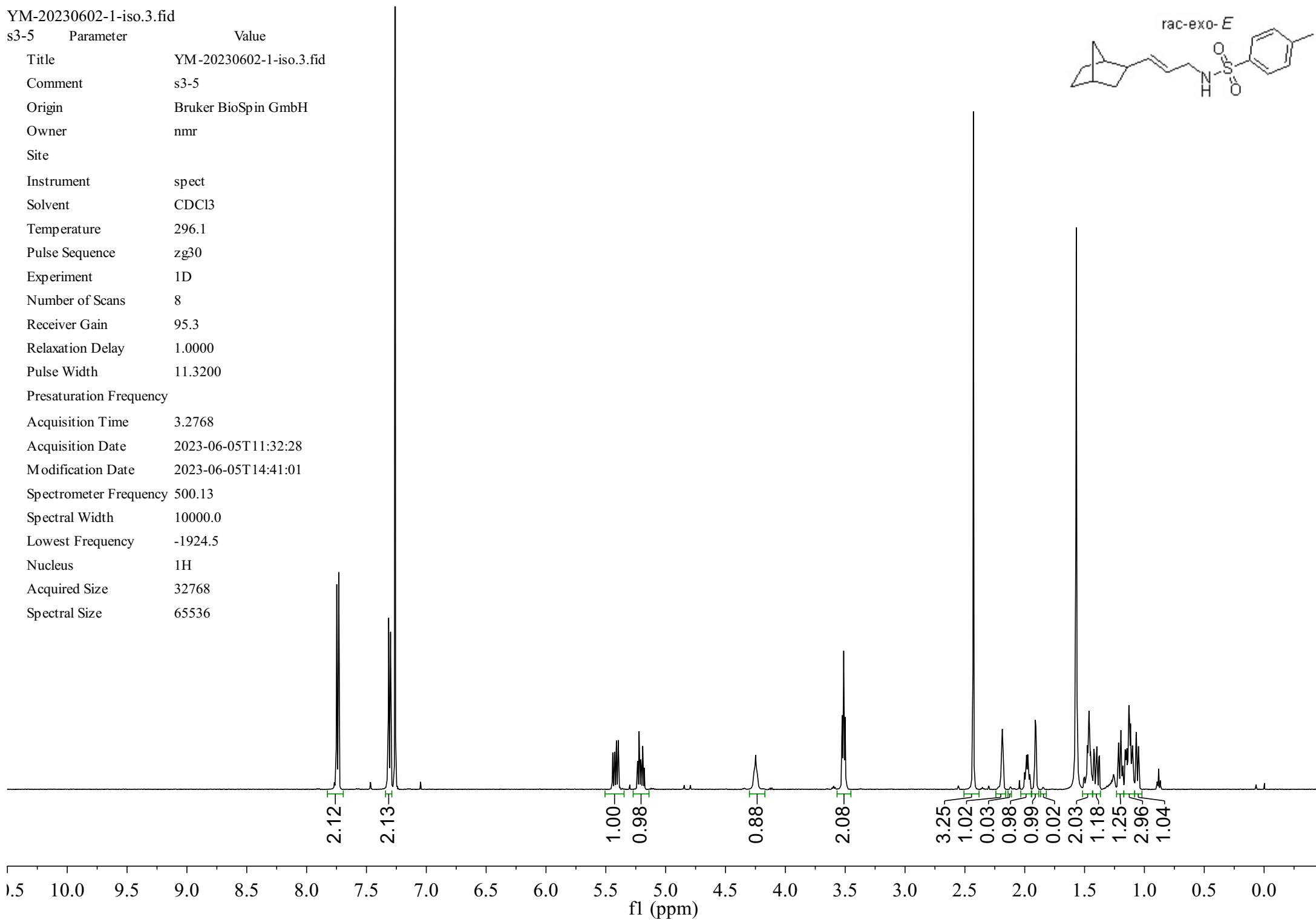
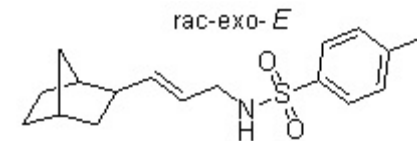
50.3  
45.0  
42.7  
37.9  
36.7  
35.7  
34.9  
31.4  
29.8  
29.1  
21.6





YM-20230602-1-iso.3.fid

Parameter	Value
Title	YM-20230602-1-iso.3.fid
Comment	s3-5
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDC13
Temperature	296.1
Pulse Sequence	zg30
Experiment	1D
Number of Scans	8
Receiver Gain	95.3
Relaxation Delay	1.0000
Pulse Width	11.3200
Presaturation Frequency	
Acquisition Time	3.2768
Acquisition Date	2023-06-05T11:32:28
Modification Date	2023-06-05T14:41:01
Spectrometer Frequency	500.13
Spectral Width	10000.0
Lowest Frequency	-1924.5
Nucleus	1H
Acquired Size	32768
Spectral Size	65536

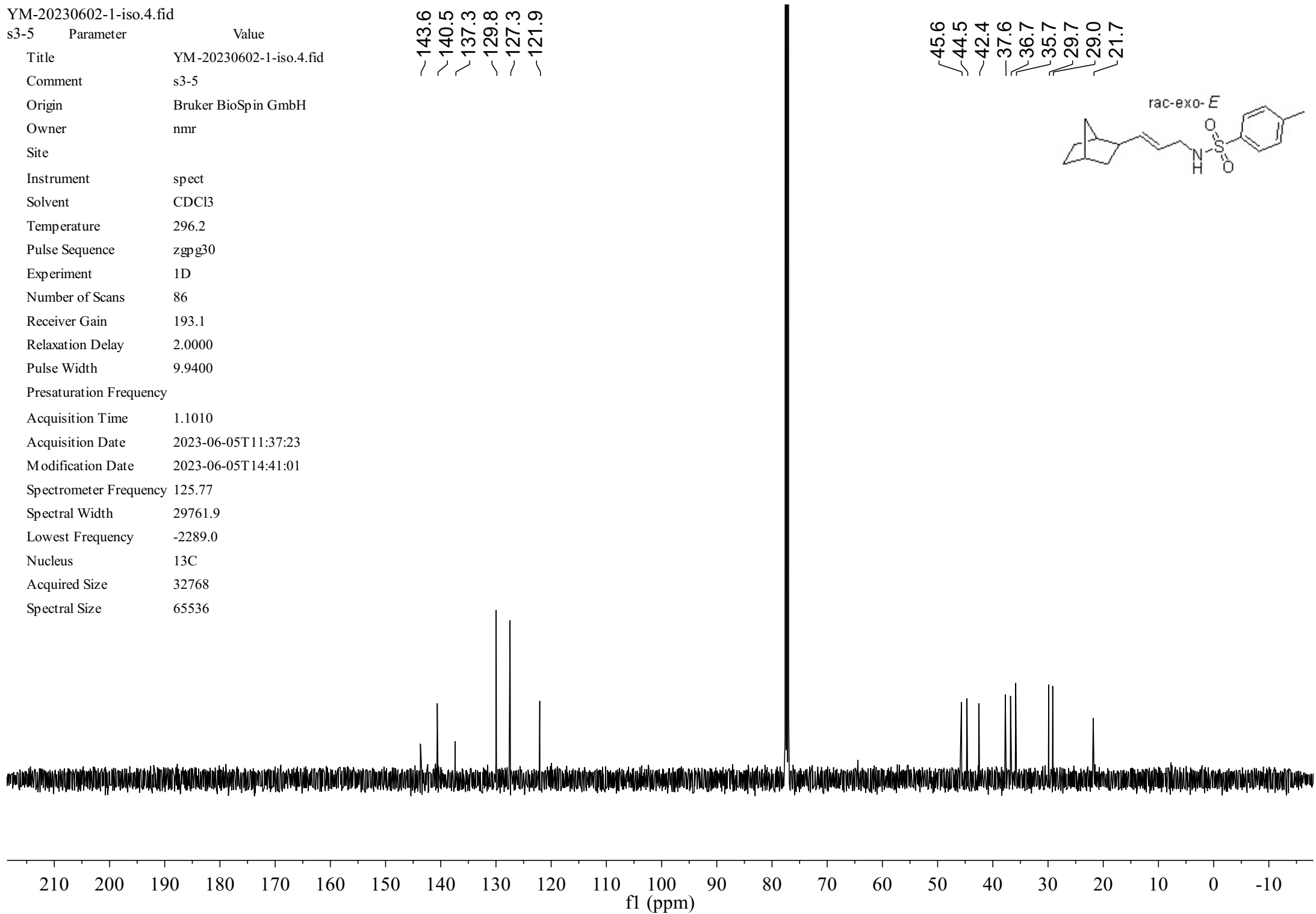
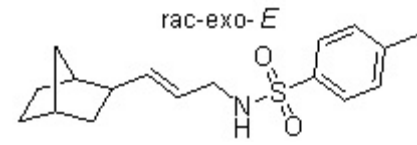


YM-20230602-1-iso.4.fid

Parameter	Value
Title	YM-20230602-1-iso.4.fid
Comment	s3-5
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDC13
Temperature	296.2
Pulse Sequence	zgpg30
Experiment	1D
Number of Scans	86
Receiver Gain	193.1
Relaxation Delay	2.0000
Pulse Width	9.9400
Presaturation Frequency	
Acquisition Time	1.1010
Acquisition Date	2023-06-05T11:37:23
Modification Date	2023-06-05T14:41:01
Spectrometer Frequency	125.77
Spectral Width	29761.9
Lowest Frequency	-2289.0
Nucleus	13C
Acquired Size	32768
Spectral Size	65536

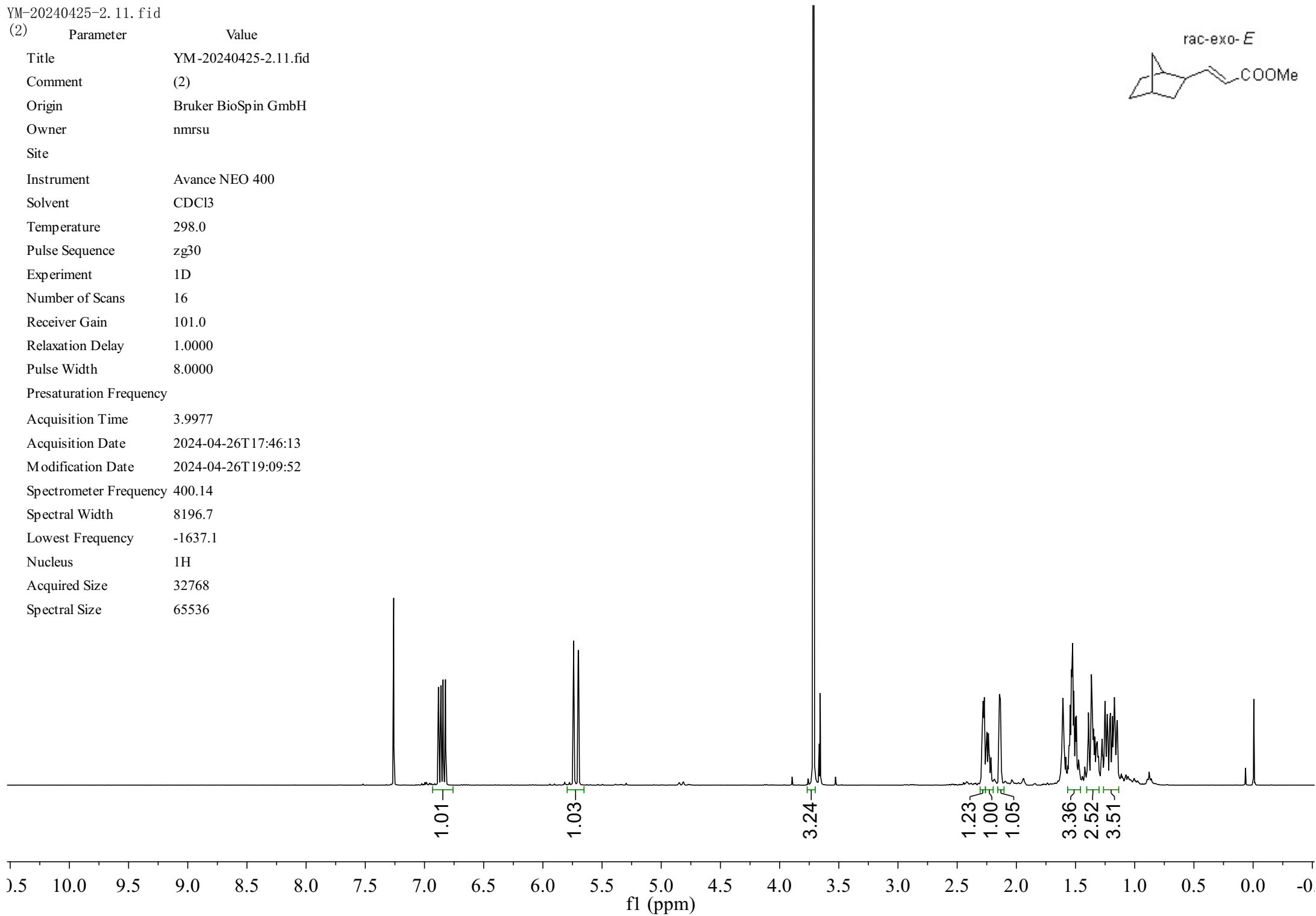
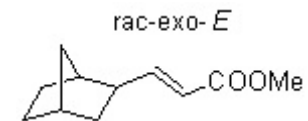
~143.6  
~140.5  
~137.3  
~129.8  
~127.3  
~121.9

45.6  
44.5  
42.4  
37.6  
36.7  
35.7  
29.7  
29.0  
21.7



YM-20240425-2.11.fid

(2)	Parameter	Value
	Title	YM-20240425-2.11.fid
	Comment	(2)
	Origin	Bruker BioSpin GmbH
	Owner	nmrsu
	Site	
	Instrument	Avance NEO 400
	Solvent	CDC13
	Temperature	298.0
	Pulse Sequence	zg30
	Experiment	1D
	Number of Scans	16
	Receiver Gain	101.0
	Relaxation Delay	1.0000
	Pulse Width	8.0000
	Presaturation Frequency	
	Acquisition Time	3.9977
	Acquisition Date	2024-04-26T17:46:13
	Modification Date	2024-04-26T19:09:52
	Spectrometer Frequency	400.14
	Spectral Width	8196.7
	Lowest Frequency	-1637.1
	Nucleus	1H
	Acquired Size	32768
	Spectral Size	65536



YM-20240425-2.12.fid

(2) E

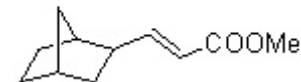
—167.7

—154.3

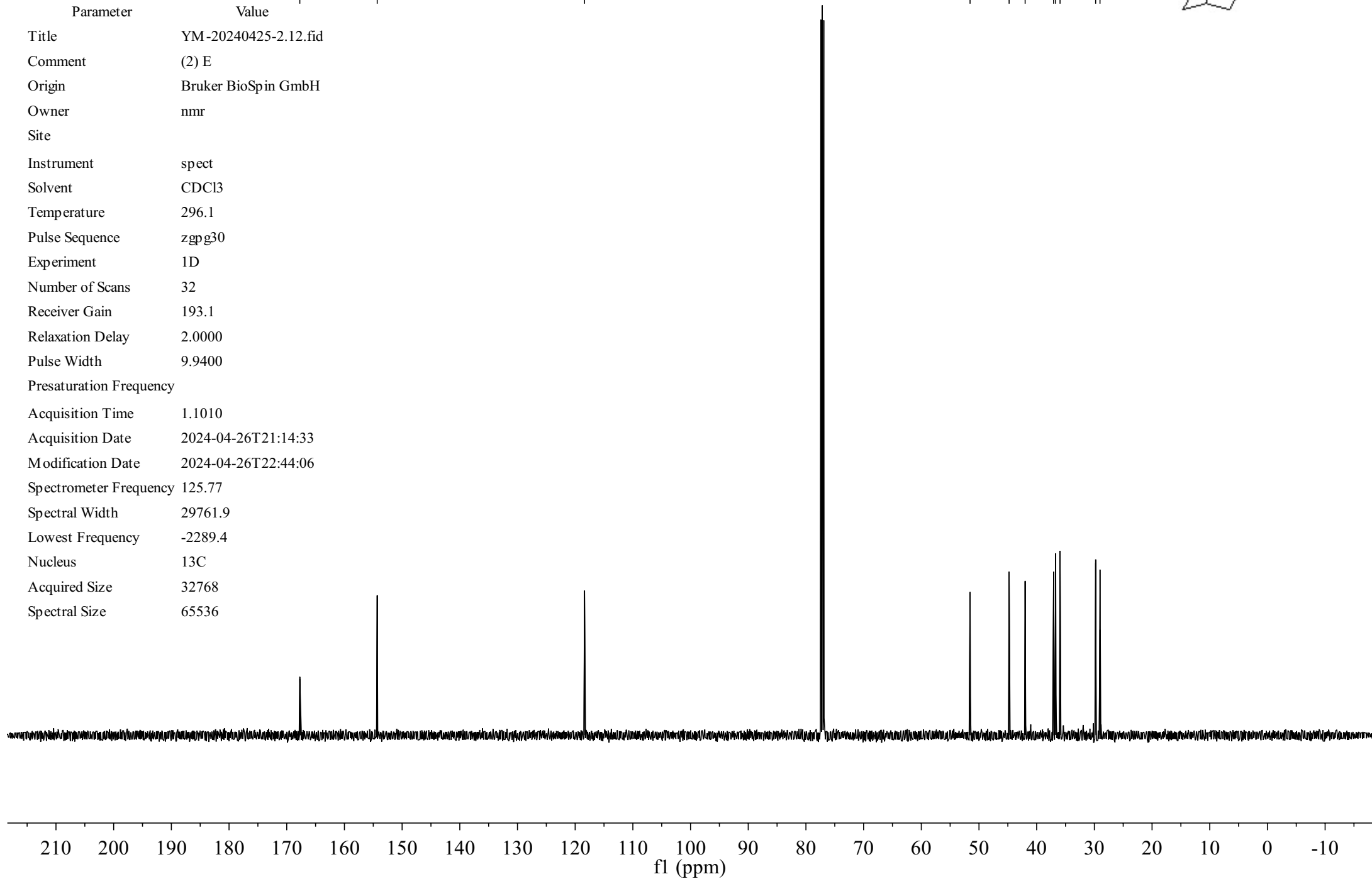
—118.4

51.5  
44.8  
42.0  
37.1  
36.7  
35.9  
29.8  
29.0

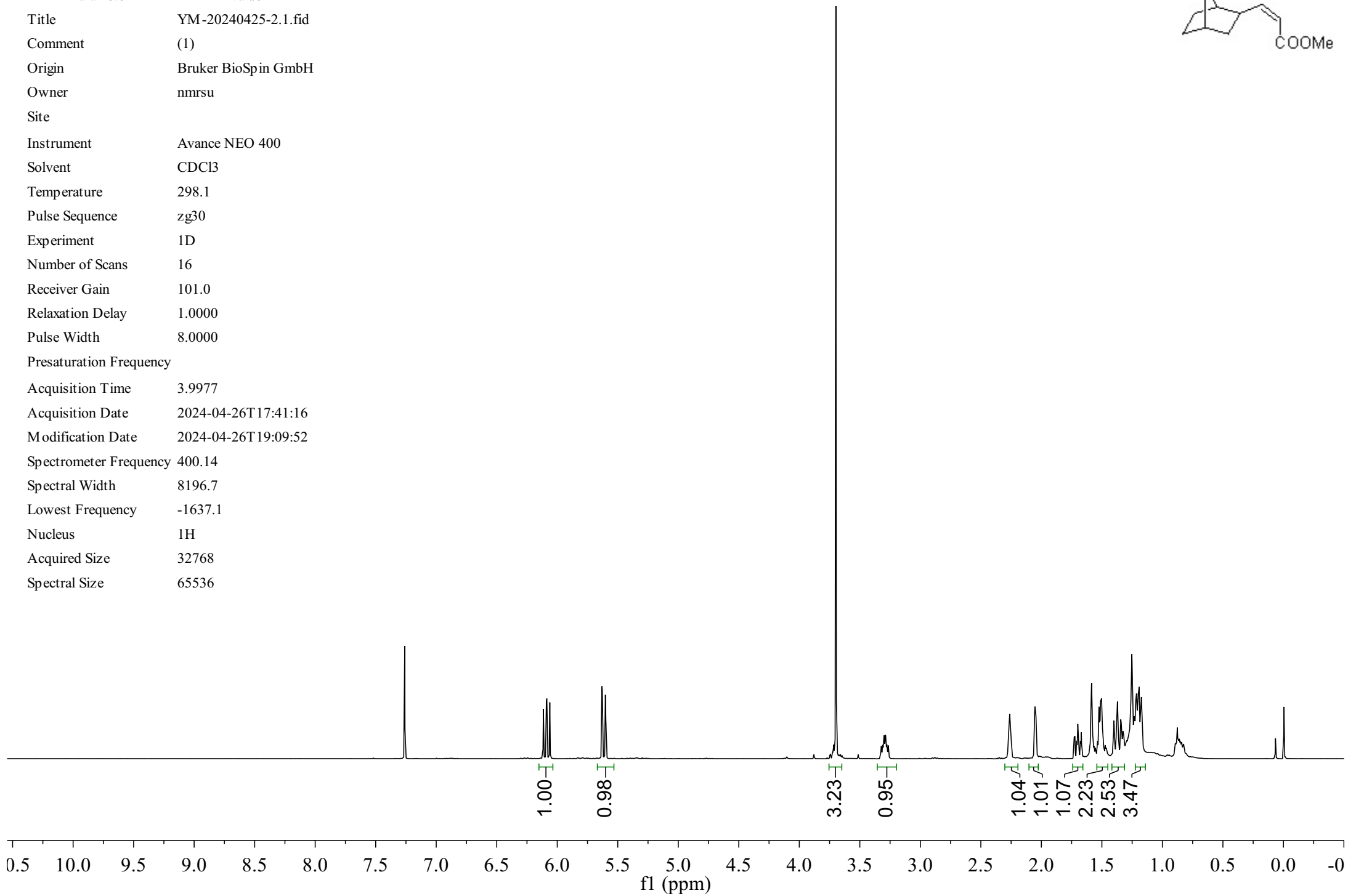
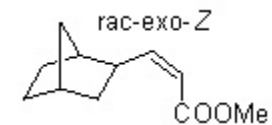
rac-exo-*E*



Parameter	Value
Title	YM-20240425-2.12.fid
Comment	(2) E
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDC13
Temperature	296.1
Pulse Sequence	zgpg30
Experiment	1D
Number of Scans	32
Receiver Gain	193.1
Relaxation Delay	2.0000
Pulse Width	9.9400
Presaturation Frequency	
Acquisition Time	1.1010
Acquisition Date	2024-04-26T21:14:33
Modification Date	2024-04-26T22:44:06
Spectrometer Frequency	125.77
Spectral Width	29761.9
Lowest Frequency	-2289.4
Nucleus	13C
Acquired Size	32768
Spectral Size	65536



(1) Parameter	Value
Title	YM-20240425-2.1.fid
Comment	(1)
Origin	Bruker BioSpin GmbH
Owner	nmrsu
Site	
Instrument	Avance NEO 400
Solvent	CDC13
Temperature	298.1
Pulse Sequence	zg30
Experiment	1D
Number of Scans	16
Receiver Gain	101.0
Relaxation Delay	1.0000
Pulse Width	8.0000
Presaturation Frequency	
Acquisition Time	3.9977
Acquisition Date	2024-04-26T17:41:16
Modification Date	2024-04-26T19:09:52
Spectrometer Frequency	400.14
Spectral Width	8196.7
Lowest Frequency	-1637.1
Nucleus	<sup>1</sup> H
Acquired Size	32768
Spectral Size	65536



YM-20240425-2.2.fid

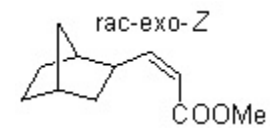
(1) Z

—167.0

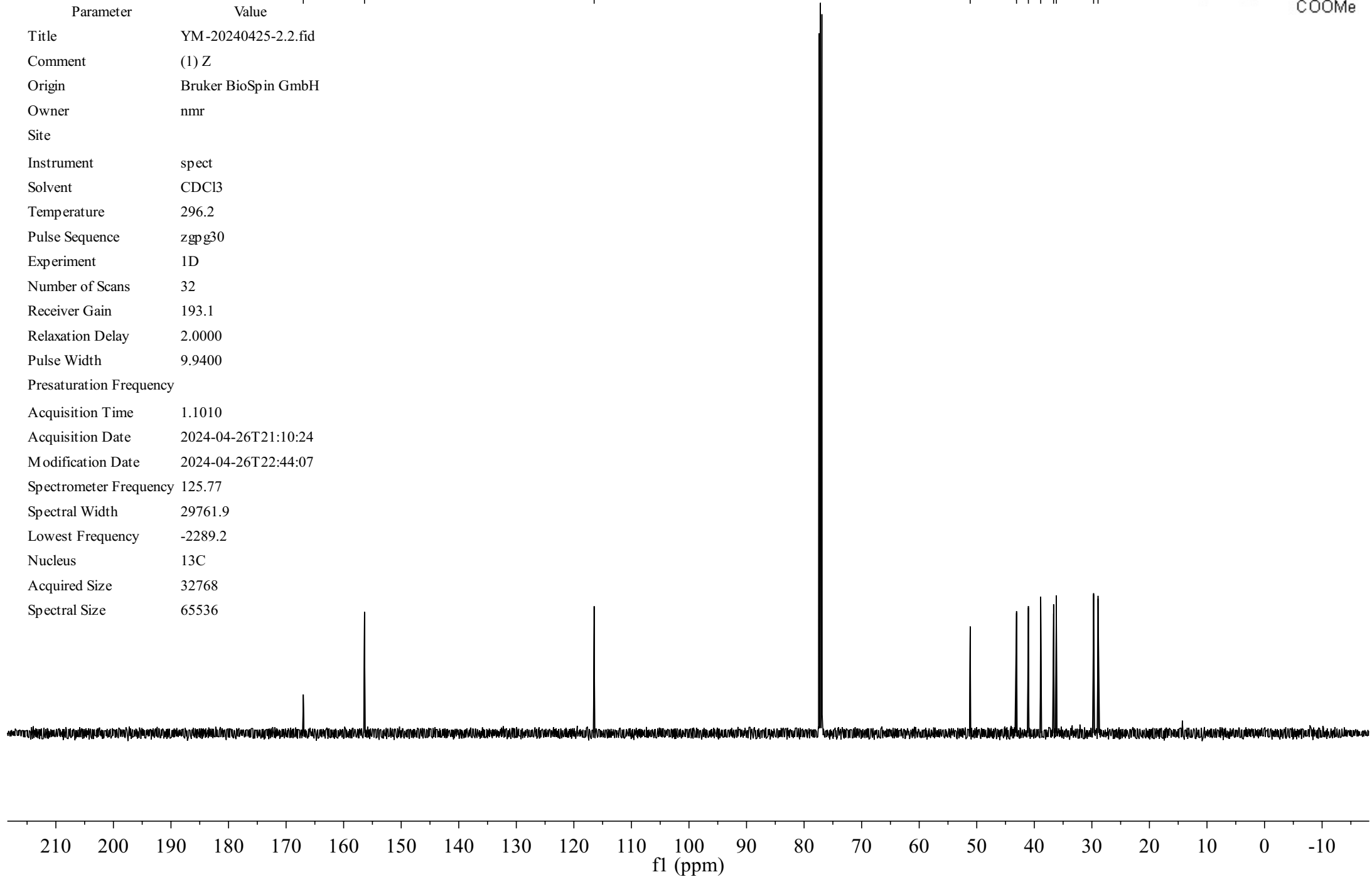
—156.4

—116.5

51.1  
43.1  
41.0  
38.9  
36.6  
36.2  
29.7  
28.9

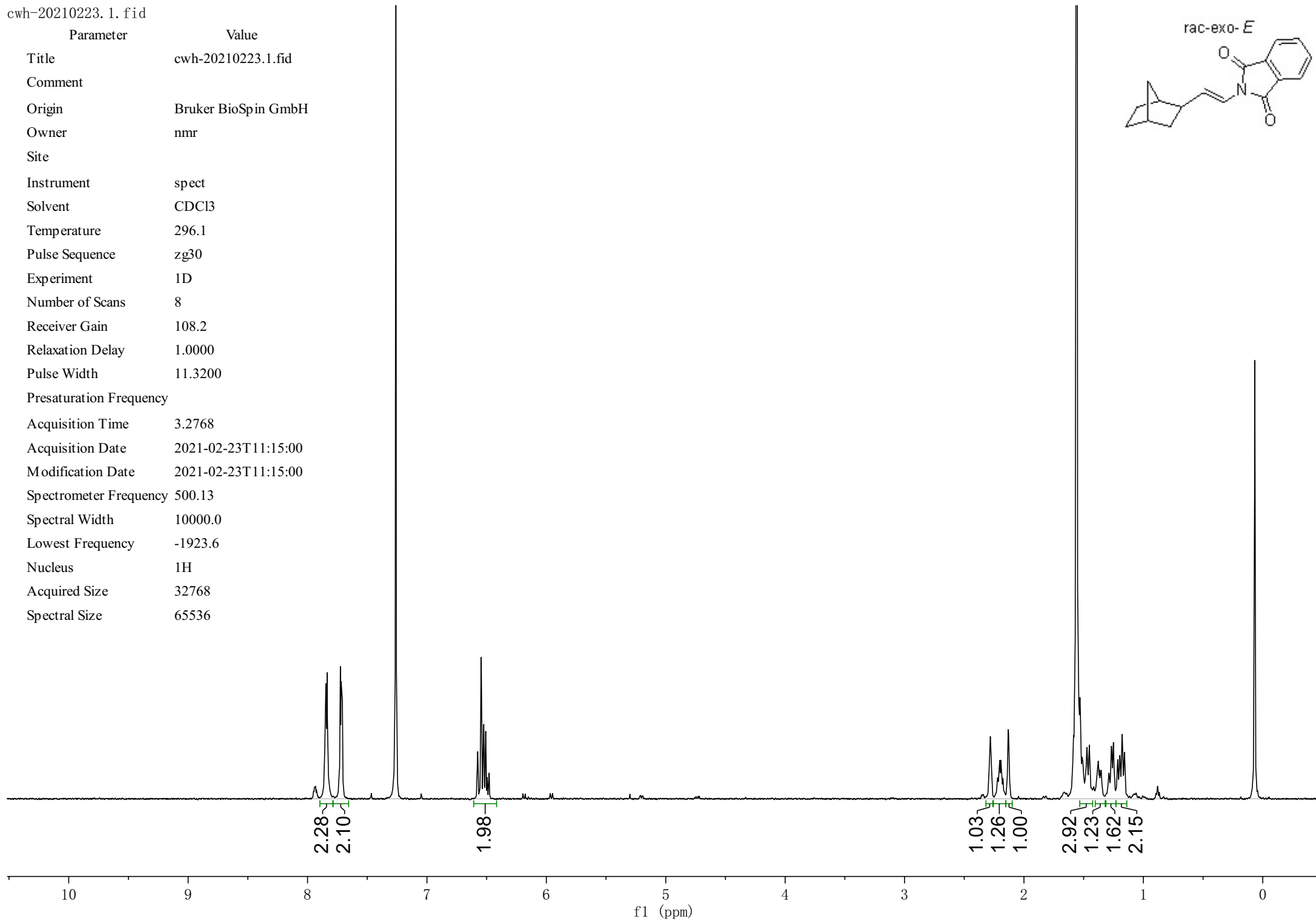
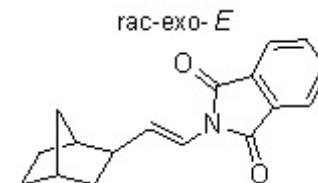


Parameter	Value
Title	YM-20240425-2.2.fid
Comment	(1) Z
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDC13
Temperature	296.2
Pulse Sequence	zgpg30
Experiment	1D
Number of Scans	32
Receiver Gain	193.1
Relaxation Delay	2.0000
Pulse Width	9.9400
Presaturation Frequency	
Acquisition Time	1.1010
Acquisition Date	2024-04-26T21:10:24
Modification Date	2024-04-26T22:44:07
Spectrometer Frequency	125.77
Spectral Width	29761.9
Lowest Frequency	-2289.2
Nucleus	13C
Acquired Size	32768
Spectral Size	65536



cwh-20210223.1.fid

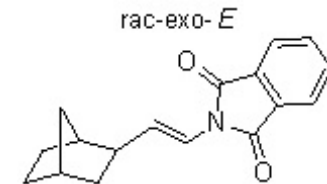
Parameter	Value
Title	cwh-20210223.1.fid
Comment	
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDC13
Temperature	296.1
Pulse Sequence	zg30
Experiment	1D
Number of Scans	8
Receiver Gain	108.2
Relaxation Delay	1.0000
Pulse Width	11.3200
Presaturation Frequency	
Acquisition Time	3.2768
Acquisition Date	2021-02-23T11:15:00
Modification Date	2021-02-23T11:15:00
Spectrometer Frequency	500.13
Spectral Width	10000.0
Lowest Frequency	-1923.6
Nucleus	1H
Acquired Size	32768
Spectral Size	65536



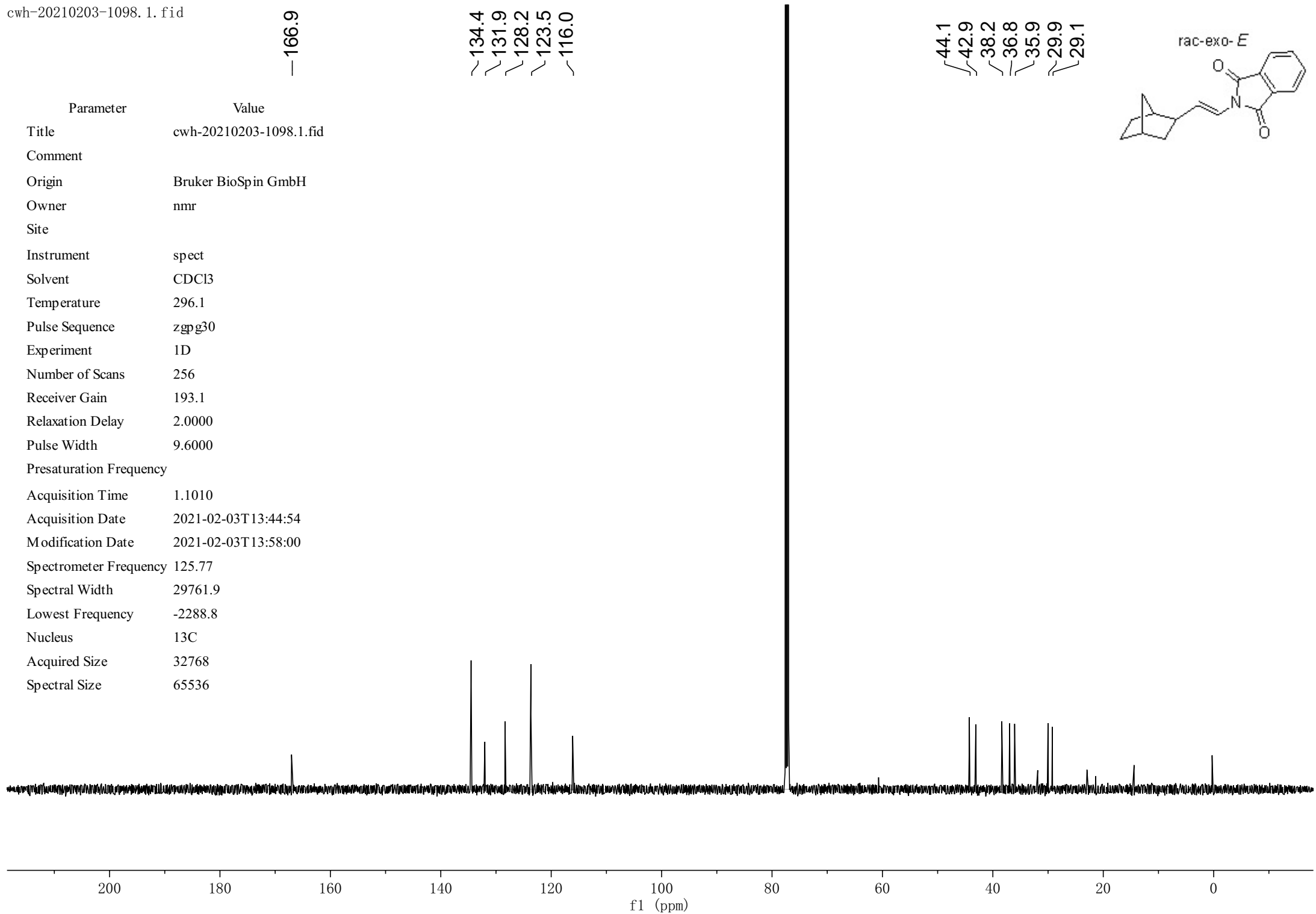
—166.9

~134.4  
~131.9  
~128.2  
~123.5  
~116.0

~44.1  
~42.9  
~38.2  
~36.8  
~35.9  
~29.9  
~29.1

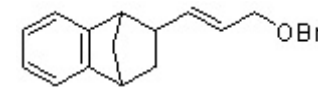


Parameter	Value
Title	cwh-20210203-1098.1.fid
Comment	
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDC13
Temperature	296.1
Pulse Sequence	zgp30
Experiment	1D
Number of Scans	256
Receiver Gain	193.1
Relaxation Delay	2.0000
Pulse Width	9.6000
Presaturation Frequency	
Acquisition Time	1.1010
Acquisition Date	2021-02-03T13:44:54
Modification Date	2021-02-03T13:58:00
Spectrometer Frequency	125.77
Spectral Width	29761.9
Lowest Frequency	-2288.8
Nucleus	13C
Acquired Size	32768
Spectral Size	65536

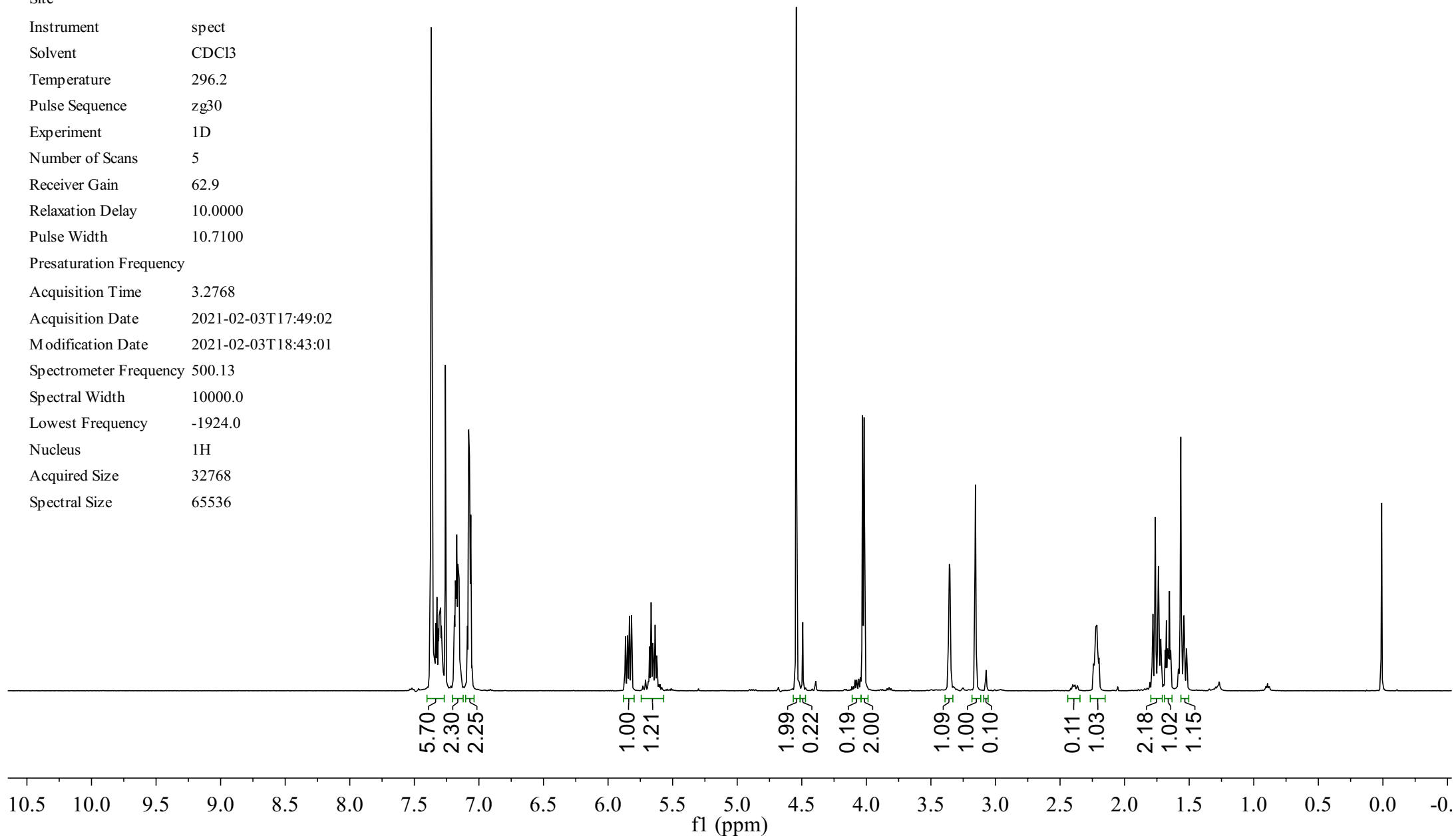




Parameter	Value
Title	YM-20210203-2-1.1.fid
Comment	
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDC13
Temperature	296.2
Pulse Sequence	zg30
Experiment	1D
Number of Scans	5
Receiver Gain	62.9
Relaxation Delay	10.0000
Pulse Width	10.7100
Presaturation Frequency	
Acquisition Time	3.2768
Acquisition Date	2021-02-03T17:49:02
Modification Date	2021-02-03T18:43:01
Spectrometer Frequency	500.13
Spectral Width	10000.0
Lowest Frequency	-1924.0
Nucleus	<sup>1</sup> H
Acquired Size	32768
Spectral Size	65536



rac-exo-  
E/Z=10:1



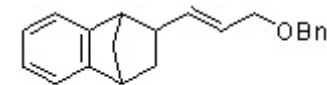
YM-20210203-2-1.2.fid

Parameter	Value
Title	YM-20210203-2-1.2.fid
Comment	
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDC13
Temperature	296.1
Pulse Sequence	zgpg30
Experiment	1D
Number of Scans	54
Receiver Gain	193.1
Relaxation Delay	2.0000
Pulse Width	9.6000
Presaturation Frequency	
Acquisition Time	1.1010
Acquisition Date	2021-02-04T14:36:29
Modification Date	2021-03-03T14:33:55
Spectrometer Frequency	125.77
Spectral Width	29761.9
Lowest Frequency	-2291.3
Nucleus	<sup>13</sup> C
Acquired Size	32768
Spectral Size	65536

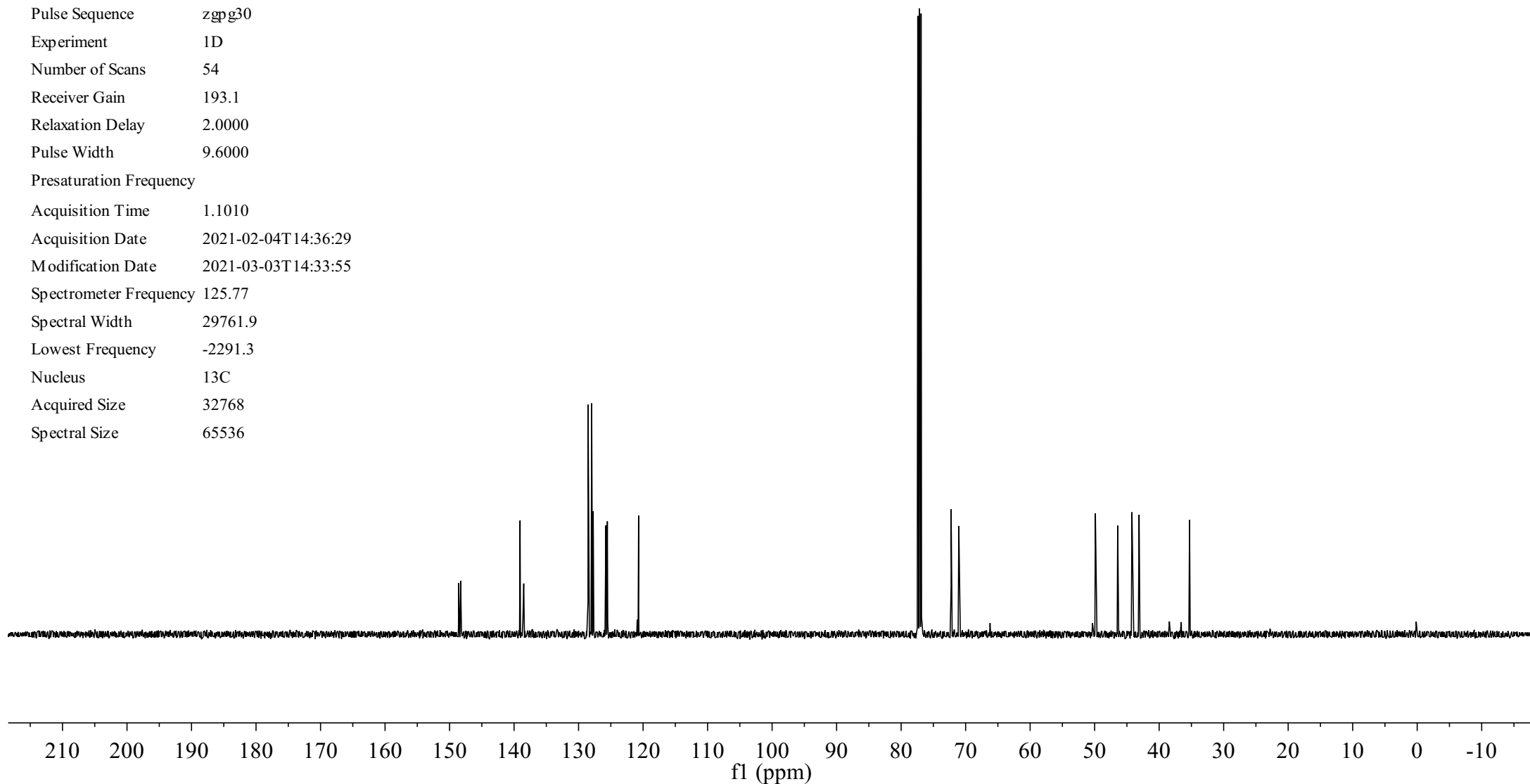
148.6  
148.3  
139.1  
138.5  
128.5  
128.0  
127.7  
125.8  
125.7  
125.5  
120.8  
120.7

72.2  
71.1

49.9  
46.4  
44.2  
43.1  
35.3

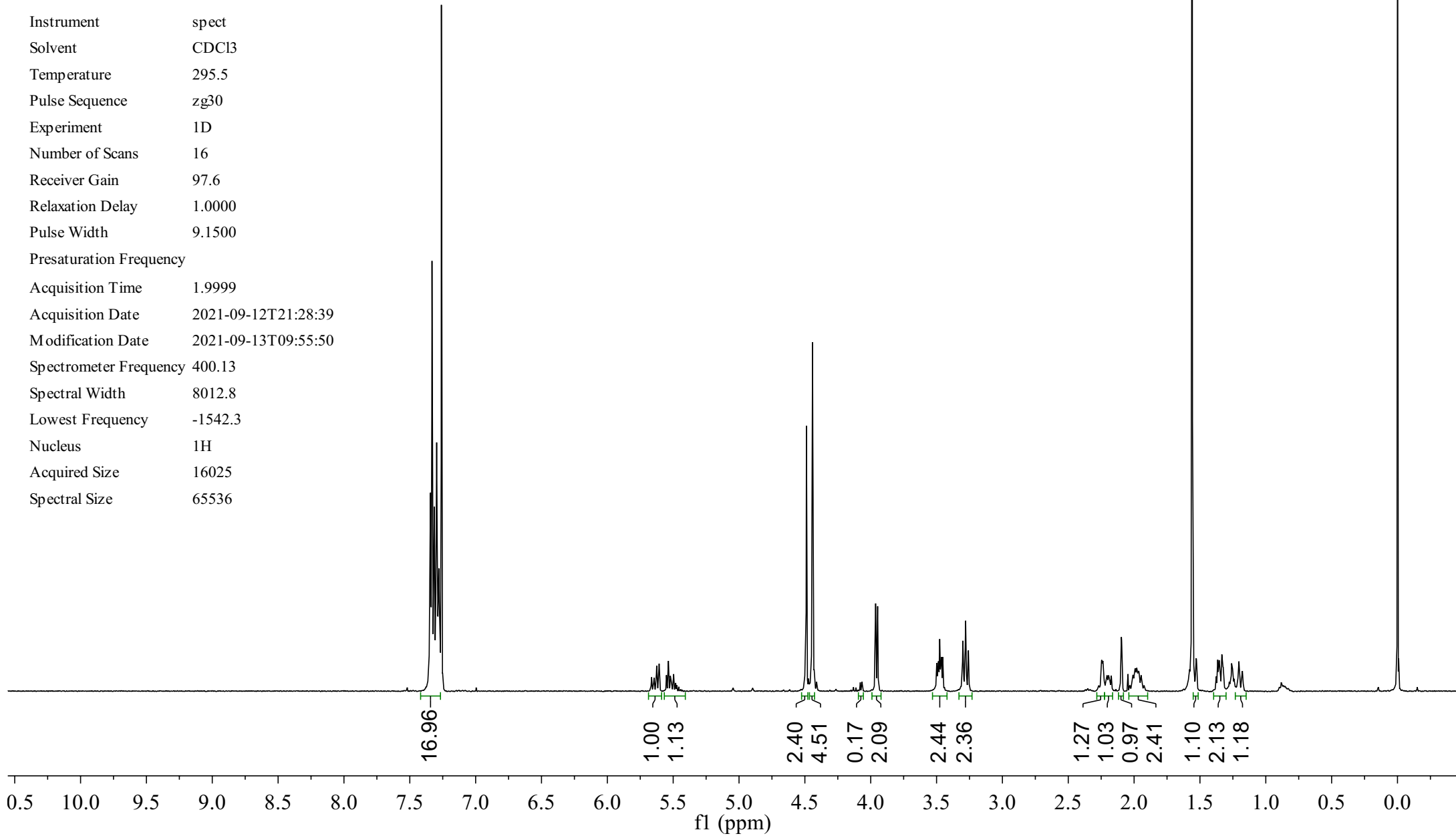
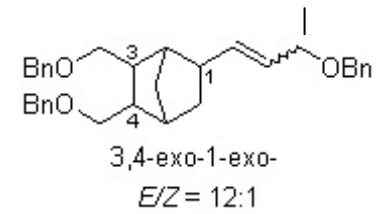


rac-exo-  
E/Z=10:1



YM-20210901-5-5.1.fid

Parameter	Value
Title	YM-20210901-5-5.1.fid
Comment	
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDC13
Temperature	295.5
Pulse Sequence	zg30
Experiment	1D
Number of Scans	16
Receiver Gain	97.6
Relaxation Delay	1.0000
Pulse Width	9.1500
Presaturation Frequency	
Acquisition Time	1.9999
Acquisition Date	2021-09-12T21:28:39
Modification Date	2021-09-13T09:55:50
Spectrometer Frequency	400.13
Spectral Width	8012.8
Lowest Frequency	-1542.3
Nucleus	1H
Acquired Size	16025
Spectral Size	65536



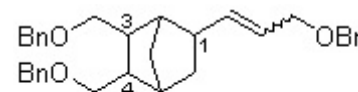
YM-20210901-5-5.2.fid

Parameter	Value
Title	YM-20210901-5-5.2.fid
Comment	
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDC13
Temperature	296.2
Pulse Sequence	zgpg30
Experiment	1D
Number of Scans	183
Receiver Gain	193.1
Relaxation Delay	2.0000
Pulse Width	9.9400
Presaturation Frequency	
Acquisition Time	1.1010
Acquisition Date	2021-09-13T14:44:34
Modification Date	2021-09-13T16:24:12
Spectrometer Frequency	125.77
Spectral Width	29761.9
Lowest Frequency	-2288.9
Nucleus	<sup>13</sup> C
Acquired Size	32768
Spectral Size	65536

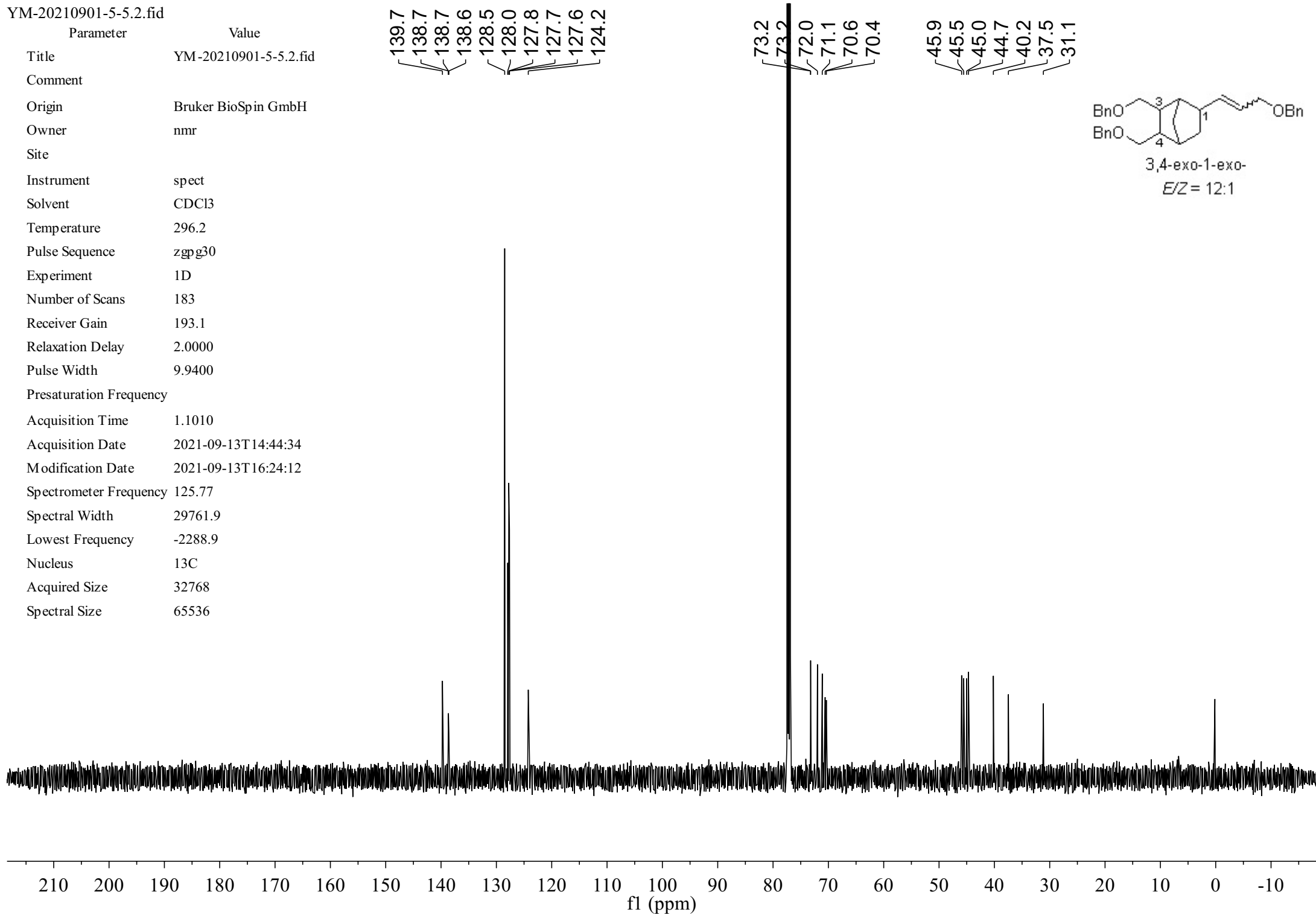
139.7  
138.7  
138.7  
138.6  
128.5  
128.0  
127.8  
127.7  
127.6  
124.2

73.2  
73.2  
72.0  
71.1  
70.6  
70.4

45.9  
45.5  
45.0  
44.7  
40.2  
37.5  
31.1

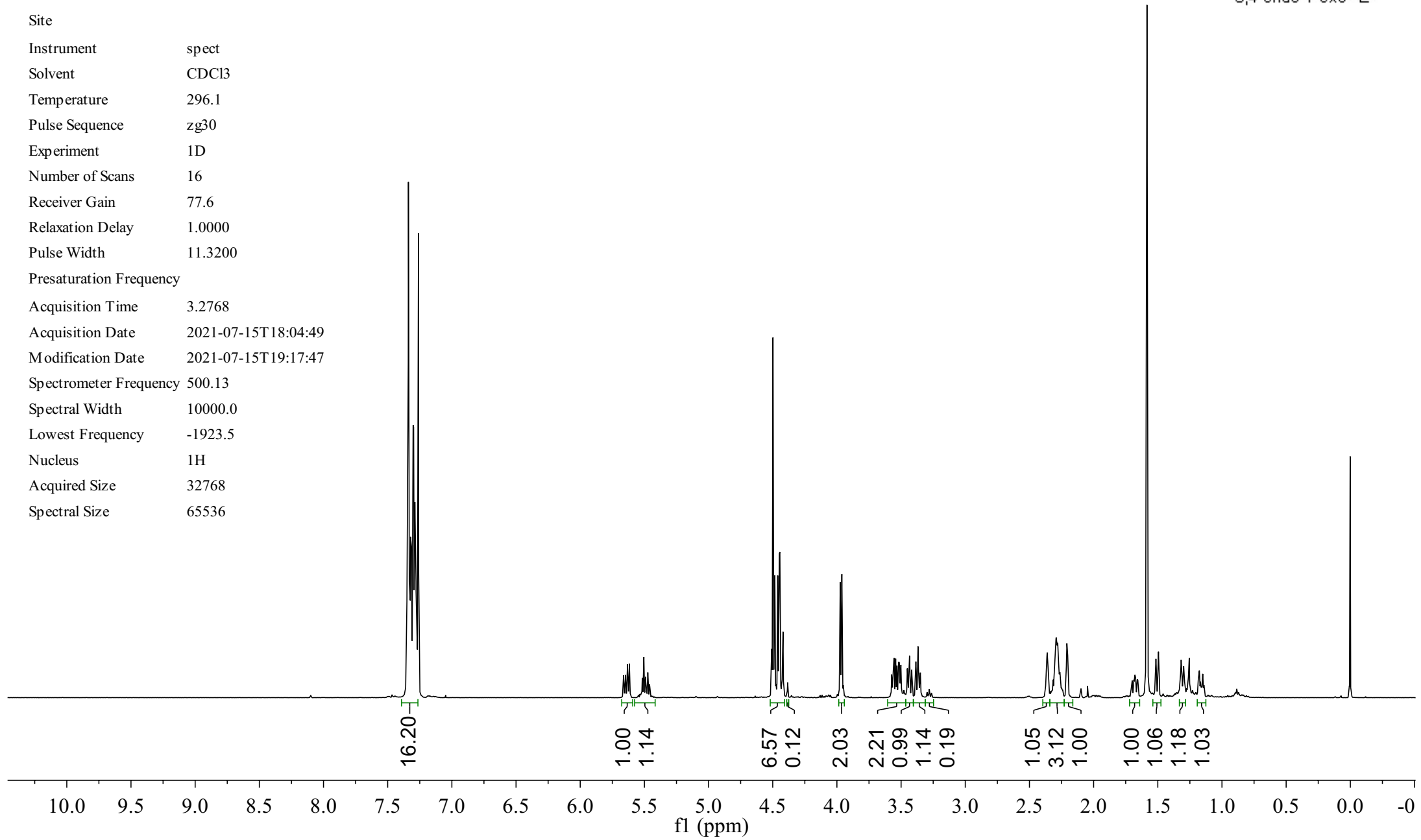
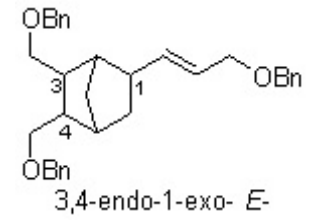


3,4-exo-1-exo-  
*E/Z* = 12:1



YM-20210707-10-4.3.fid

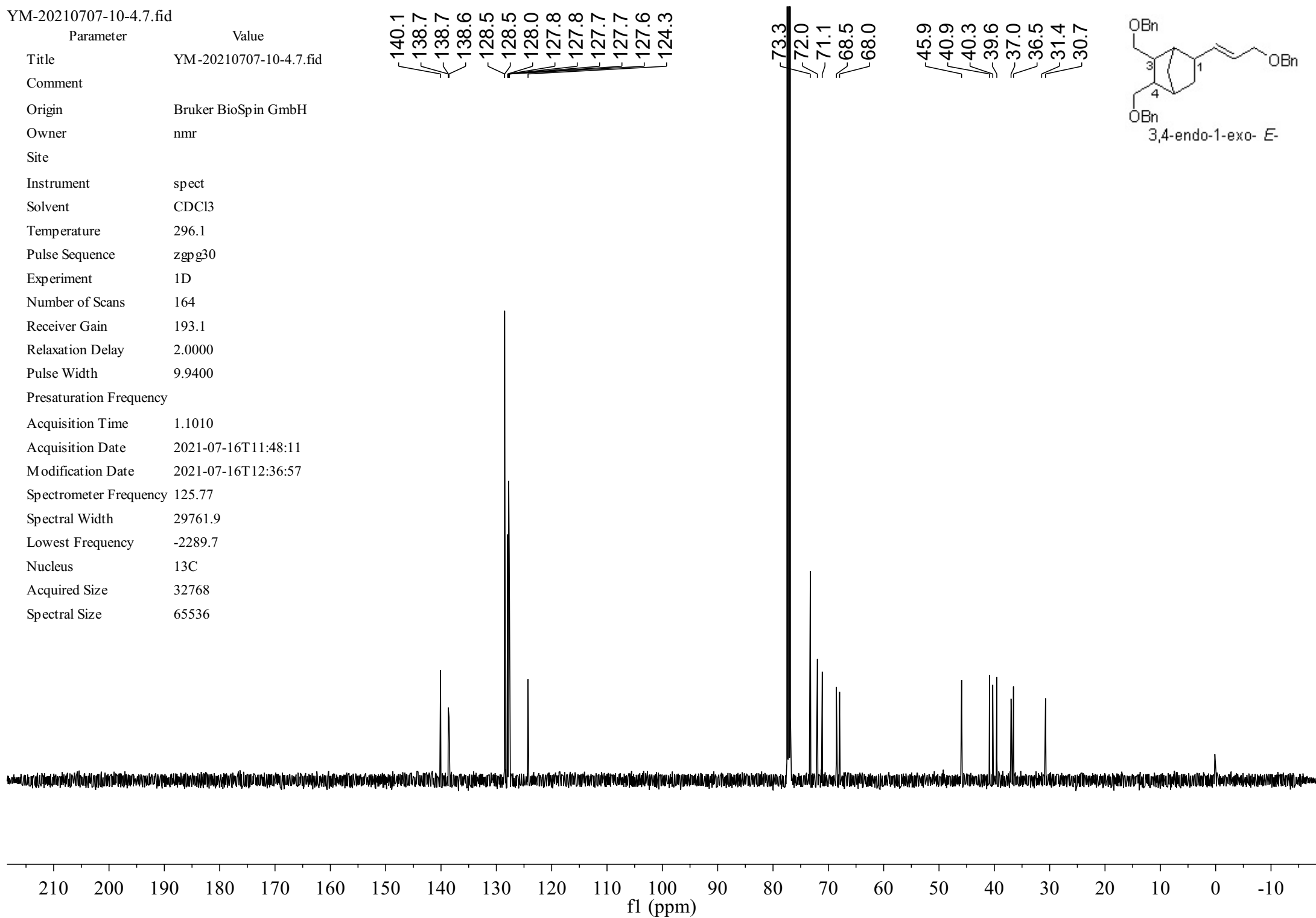
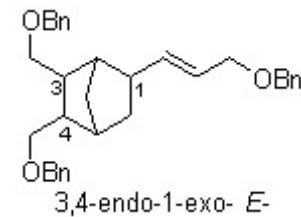
Parameter	Value
Title	YM-20210707-10-4.3.fid
Comment	
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDC13
Temperature	296.1
Pulse Sequence	zg30
Experiment	1D
Number of Scans	16
Receiver Gain	77.6
Relaxation Delay	1.0000
Pulse Width	11.3200
Presaturation Frequency	
Acquisition Time	3.2768
Acquisition Date	2021-07-15T18:04:49
Modification Date	2021-07-15T19:17:47
Spectrometer Frequency	500.13
Spectral Width	10000.0
Lowest Frequency	-1923.5
Nucleus	1H
Acquired Size	32768
Spectral Size	65536



YM-20210707-10-4.7.fid

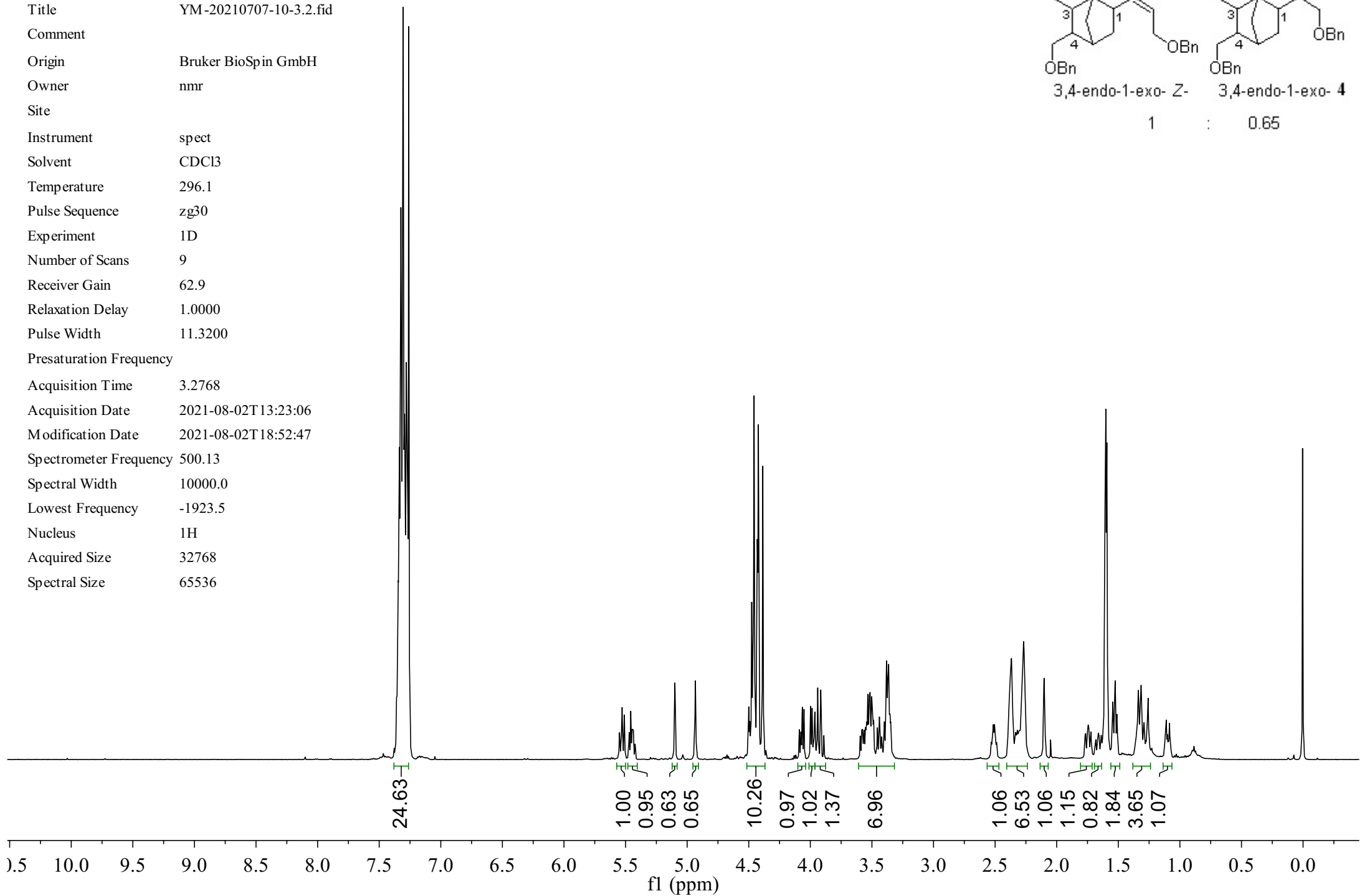
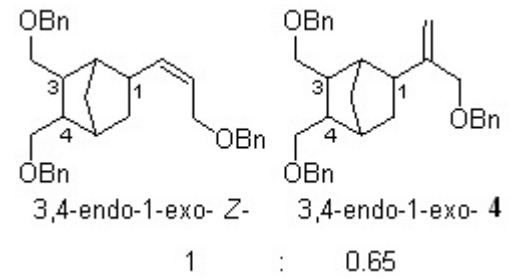
Parameter	Value
Title	YM-20210707-10-4.7.fid
Comment	
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDC13
Temperature	296.1
Pulse Sequence	zgpg30
Experiment	1D
Number of Scans	164
Receiver Gain	193.1
Relaxation Delay	2.0000
Pulse Width	9.9400
Presaturation Frequency	
Acquisition Time	1.1010
Acquisition Date	2021-07-16T11:48:11
Modification Date	2021-07-16T12:36:57
Spectrometer Frequency	125.77
Spectral Width	29761.9
Lowest Frequency	-2289.7
Nucleus	<sup>13</sup> C
Acquired Size	32768
Spectral Size	65536

140.1  
138.7  
138.7  
138.6  
128.5  
128.5  
128.0  
127.8  
127.8  
127.7  
127.7  
127.6  
124.3  
73.3  
72.0  
71.1  
68.5  
68.0  
45.9  
40.9  
40.3  
39.6  
37.0  
36.5  
31.4  
30.7



YM-20210707-10-3.2.fid

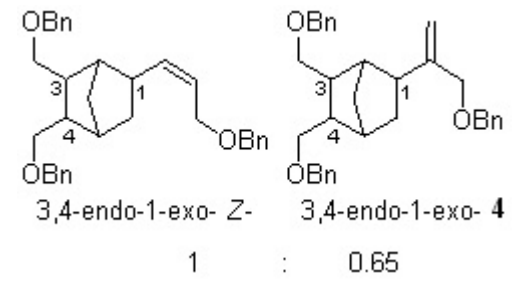
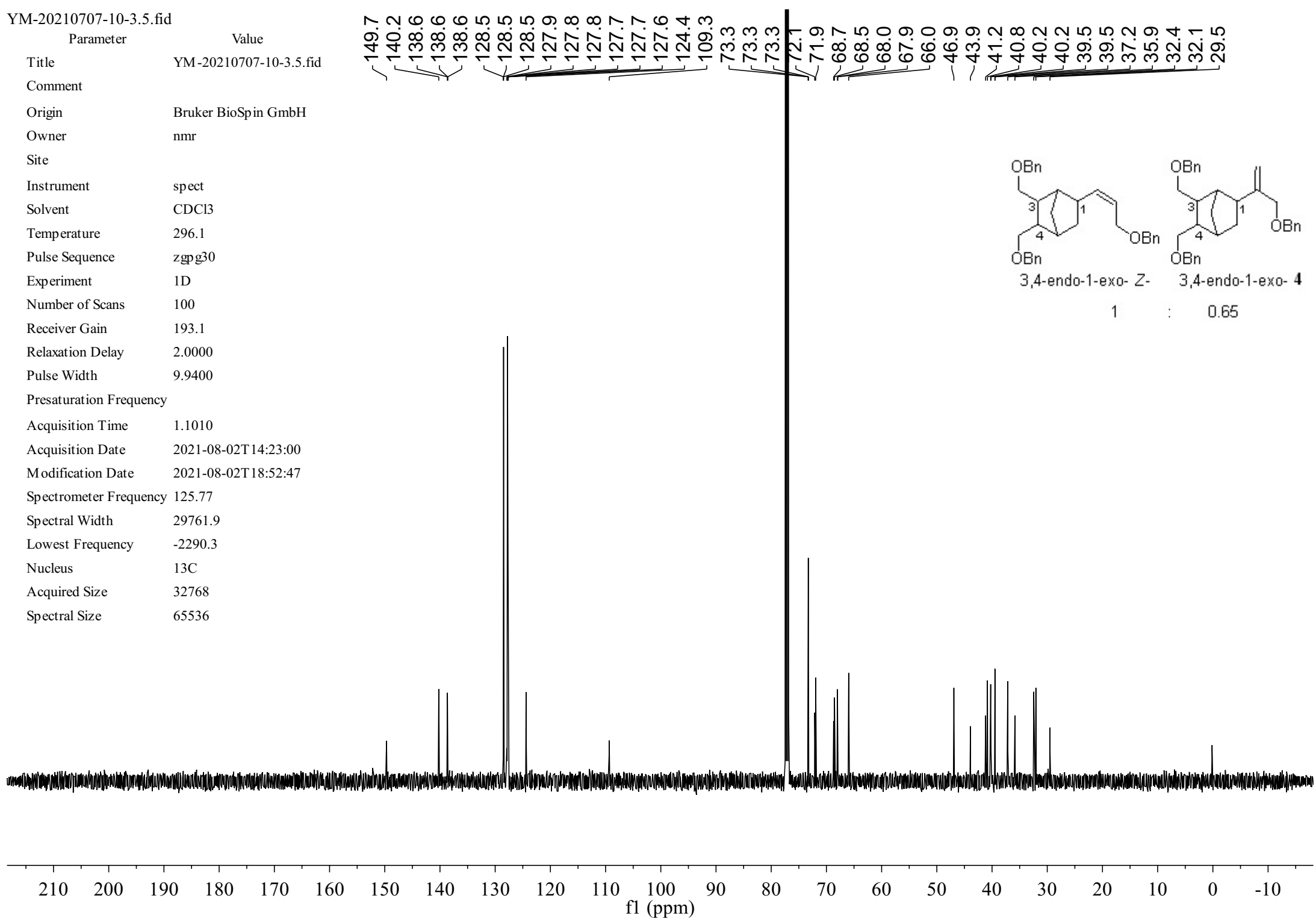
Parameter	Value
Title	YM-20210707-10-3.2.fid
Comment	
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDC13
Temperature	296.1
Pulse Sequence	zg30
Experiment	1D
Number of Scans	9
Receiver Gain	62.9
Relaxation Delay	1.0000
Pulse Width	11.3200
Presaturation Frequency	
Acquisition Time	3.2768
Acquisition Date	2021-08-02T13:23:06
Modification Date	2021-08-02T18:52:47
Spectrometer Frequency	500.13
Spectral Width	10000.0
Lowest Frequency	-1923.5
Nucleus	1H
Acquired Size	32768
Spectral Size	65536



YM-20210707-10-3.5.fid

Parameter	Value
Title	YM-20210707-10-3.5.fid
Comment	
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDC13
Temperature	296.1
Pulse Sequence	zgpg30
Experiment	1D
Number of Scans	100
Receiver Gain	193.1
Relaxation Delay	2.0000
Pulse Width	9.9400
Presaturation Frequency	
Acquisition Time	1.1010
Acquisition Date	2021-08-02T14:23:00
Modification Date	2021-08-02T18:52:47
Spectrometer Frequency	125.77
Spectral Width	29761.9
Lowest Frequency	-2290.3
Nucleus	13C
Acquired Size	32768
Spectral Size	65536

149.7 140.2 138.6 138.6 138.6 128.5 128.5 128.5 127.9 127.8 127.8 127.7 127.7 127.6 124.4 109.3 73.3 73.3 73.3 72.1 71.9 68.7 68.5 68.0 67.9 66.0 46.9 43.9 41.2 40.8 40.2 40.2 39.5 39.5 37.2 35.9 32.4 32.1 29.5

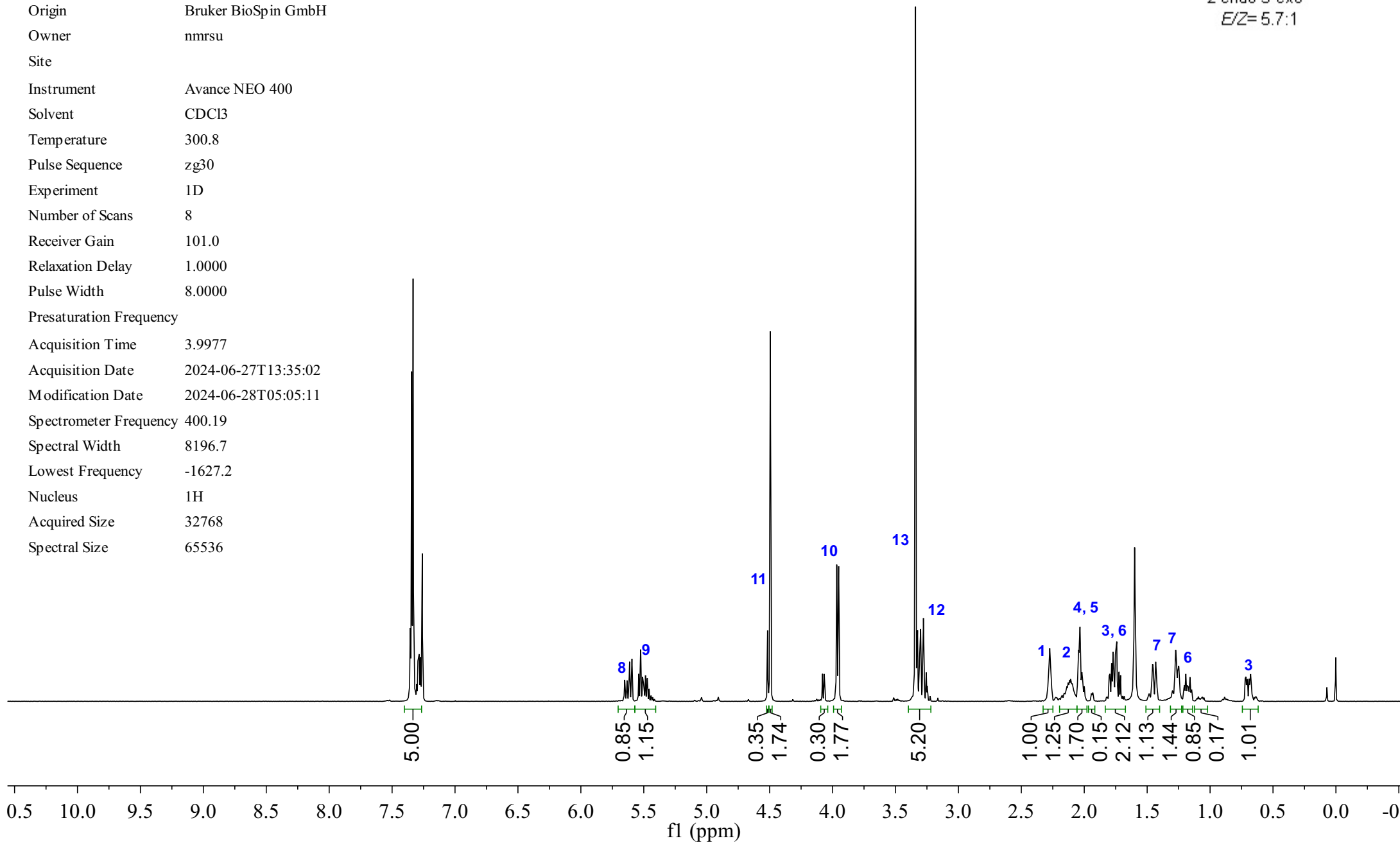
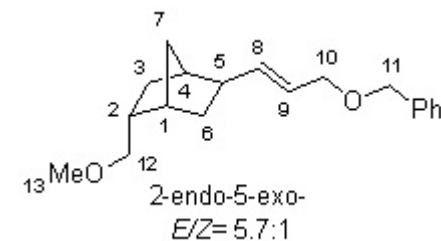




Cross hydroalkenylation Major Products in Table 3

YM-20240626-1.1.fid  
gx 26-27

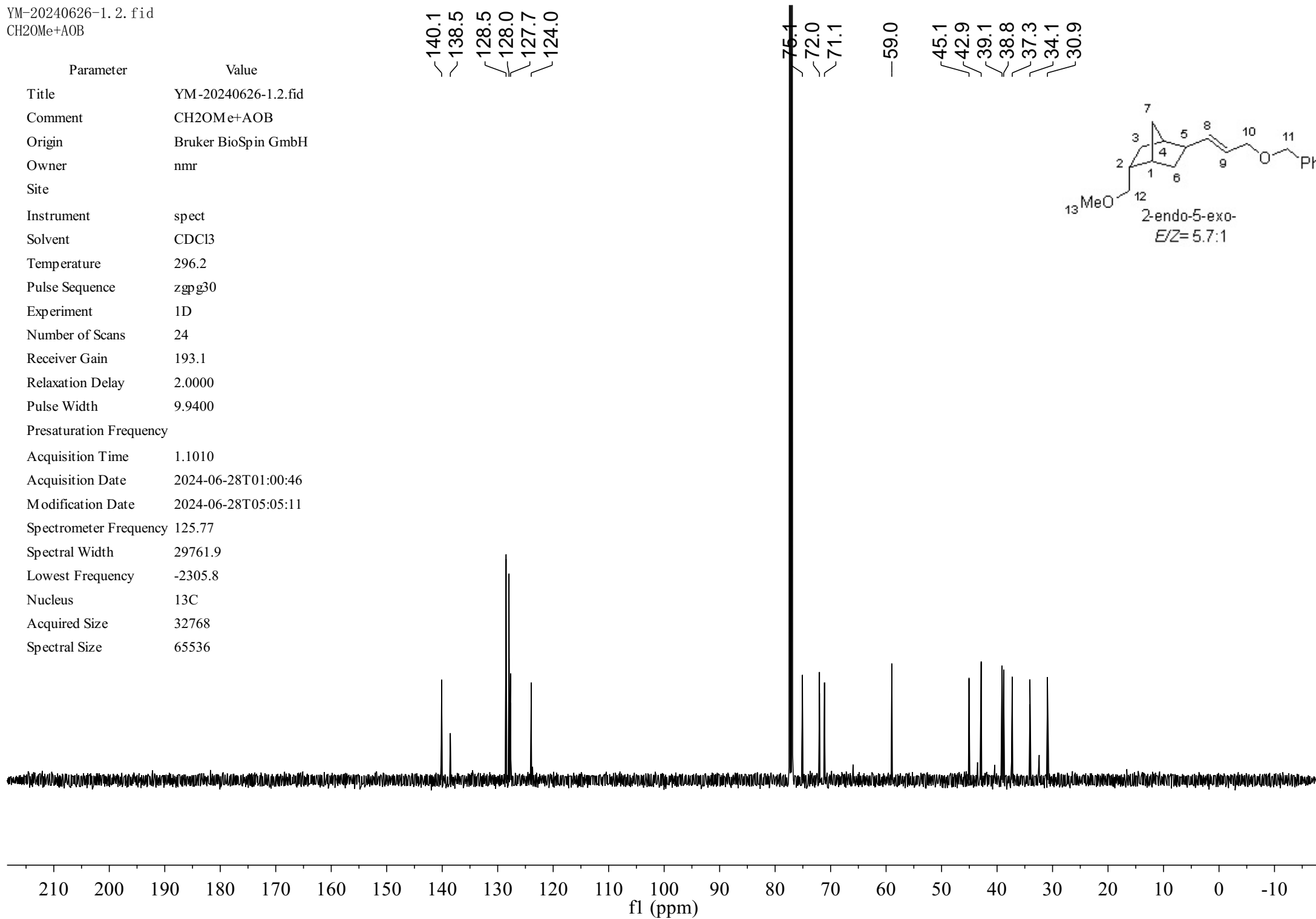
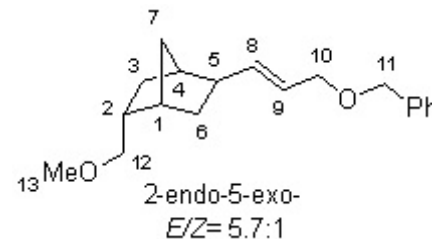
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Title	YM-20240626-1.1.fid
Comment	gx 26-27
Origin	Bruker BioSpin GmbH
Owner	nmrsu
Site	
Instrument	Avance NEO 400
Solvent	CDCl3
Temperature	300.8
Pulse Sequence	zg30
Experiment	1D
Number of Scans	8
Receiver Gain	101.0
Relaxation Delay	1.0000
Pulse Width	8.0000
Presaturation Frequency	
Acquisition Time	3.9977
Acquisition Date	2024-06-27T13:35:02
Modification Date	2024-06-28T05:05:11
Spectrometer Frequency	400.19
Spectral Width	8196.7
Lowest Frequency	-1627.2
Nucleus	1H
Acquired Size	32768
Spectral Size	65536



YM-20240626-1.2.fid  
CH2OMe+AOB

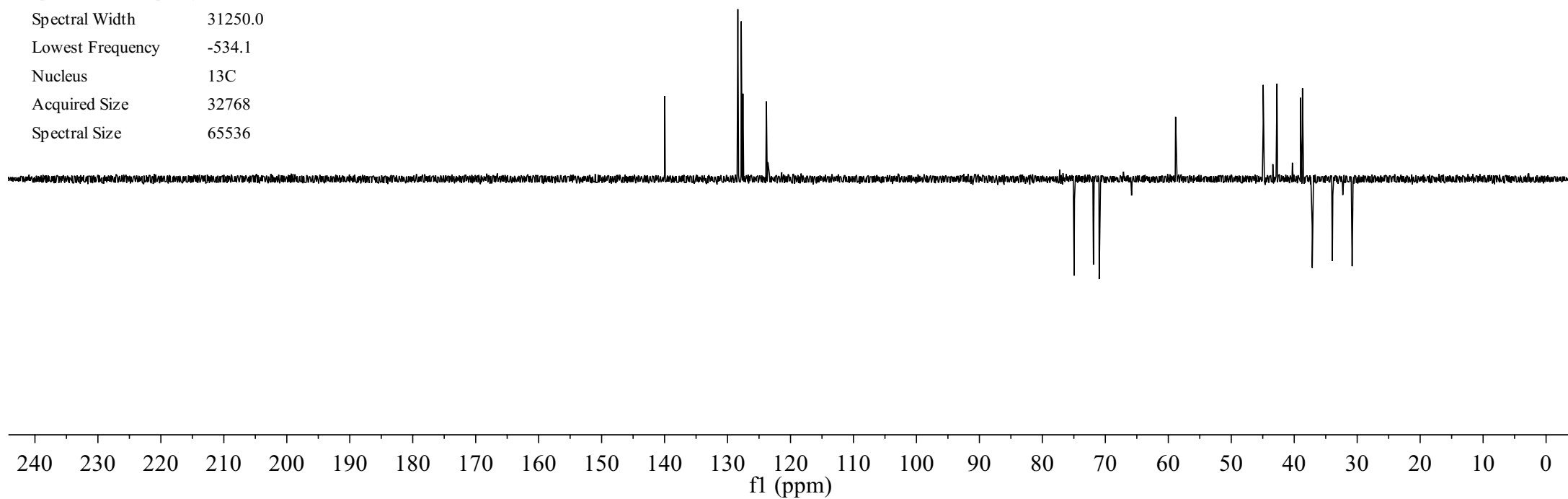
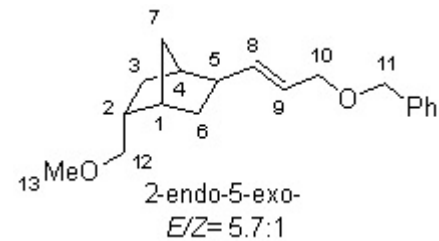
Parameter	Value
Title	YM-20240626-1.2.fid
Comment	CH2OMe+AOB
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDC13
Temperature	296.2
Pulse Sequence	zgpg30
Experiment	1D
Number of Scans	24
Receiver Gain	193.1
Relaxation Delay	2.0000
Pulse Width	9.9400
Presaturation Frequency	
Acquisition Time	1.1010
Acquisition Date	2024-06-28T01:00:46
Modification Date	2024-06-28T05:05:11
Spectrometer Frequency	125.77
Spectral Width	29761.9
Lowest Frequency	-2305.8
Nucleus	<sup>13</sup> C
Acquired Size	32768
Spectral Size	65536

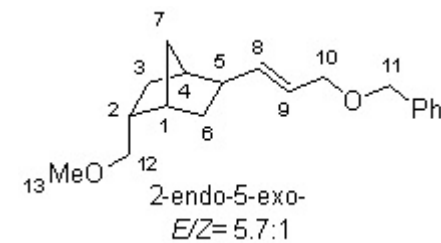
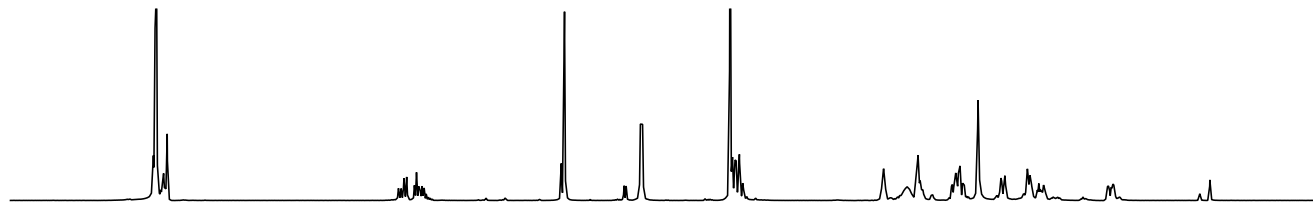
140.1  
138.5  
128.5  
128.0  
127.7  
124.0  
75.1  
72.0  
71.1  
59.0  
45.1  
42.9  
39.1  
38.8  
37.3  
34.1  
30.9



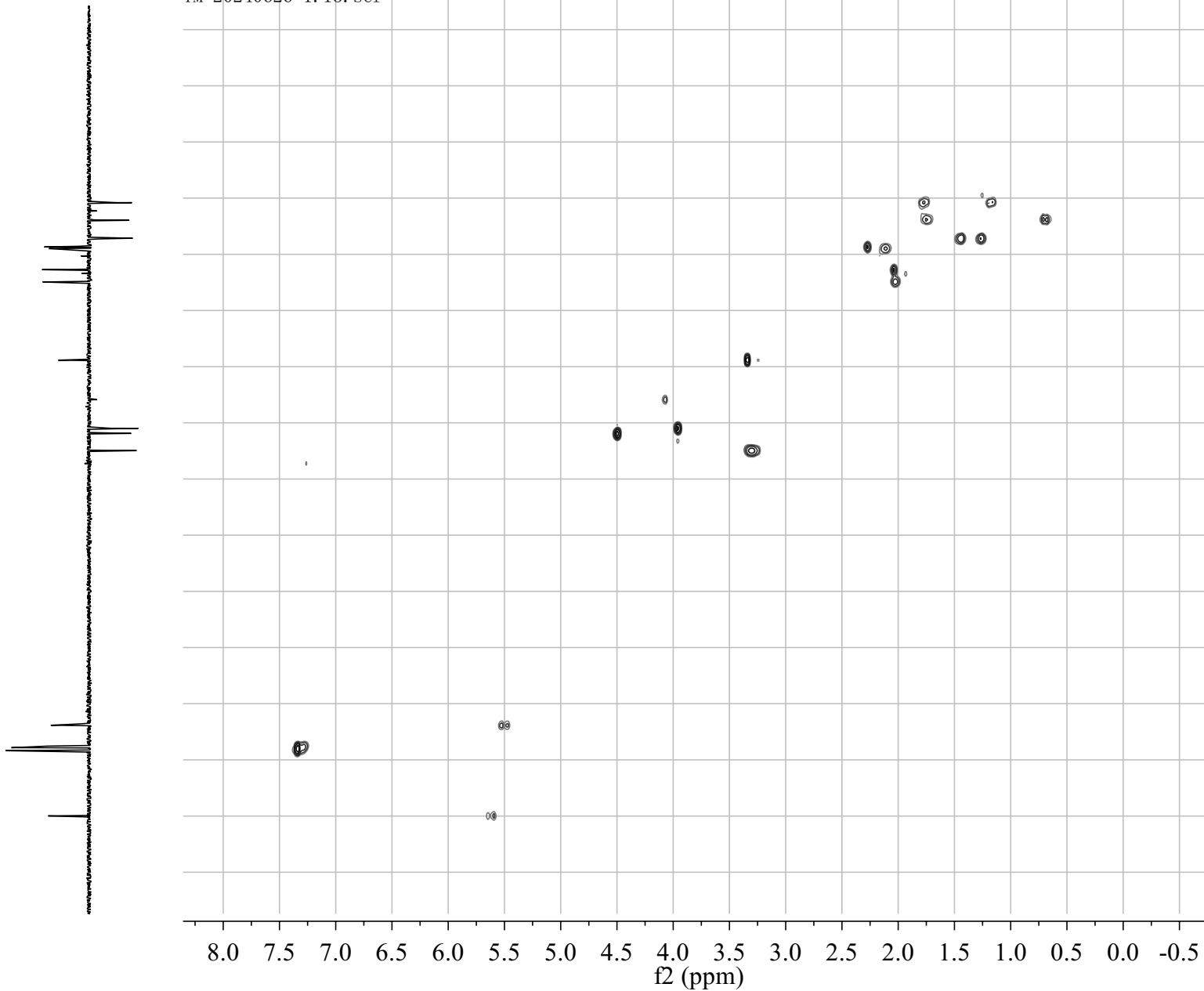
YM-20240626-1.3.fid

Parameter	Value
Title	YM-20240626-1.3.fid
Comment	CH2OMe+AOB
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDC13
Temperature	296.2
Pulse Sequence	depts135
Experiment	DEPT-135
Number of Scans	19
Receiver Gain	193.1
Relaxation Delay	2.0000
Pulse Width	9.9400
Presaturation Frequency	
Acquisition Time	1.0486
Acquisition Date	2024-06-28T01:03:07
Modification Date	2024-06-28T05:05:12
Spectrometer Frequency	125.77
Spectral Width	31250.0
Lowest Frequency	-534.1
Nucleus	<sup>13</sup> C
Acquired Size	32768
Spectral Size	65536

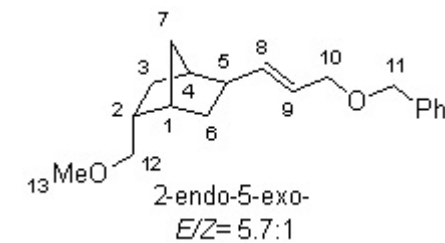
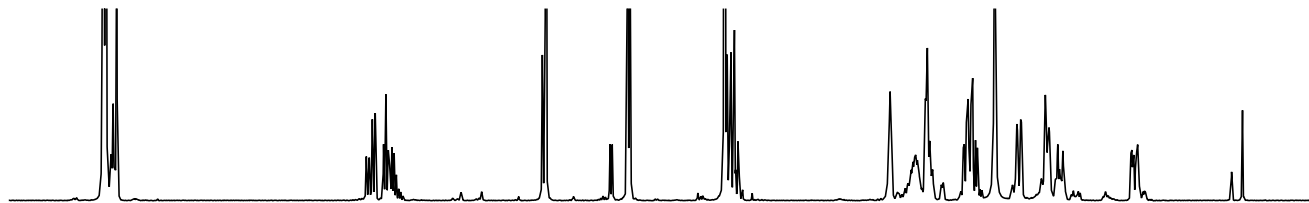




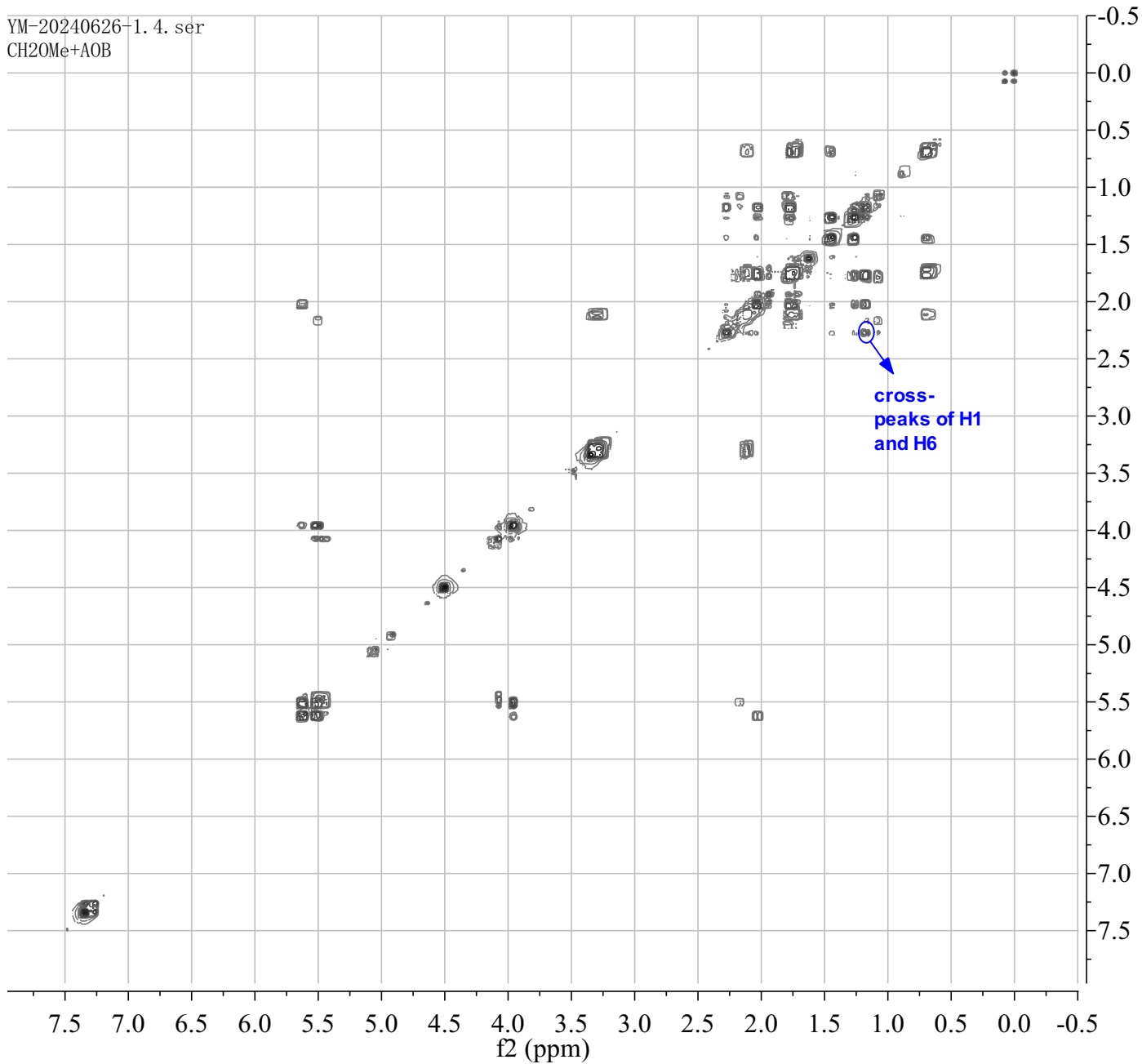
YM-20240626-1.13.ser



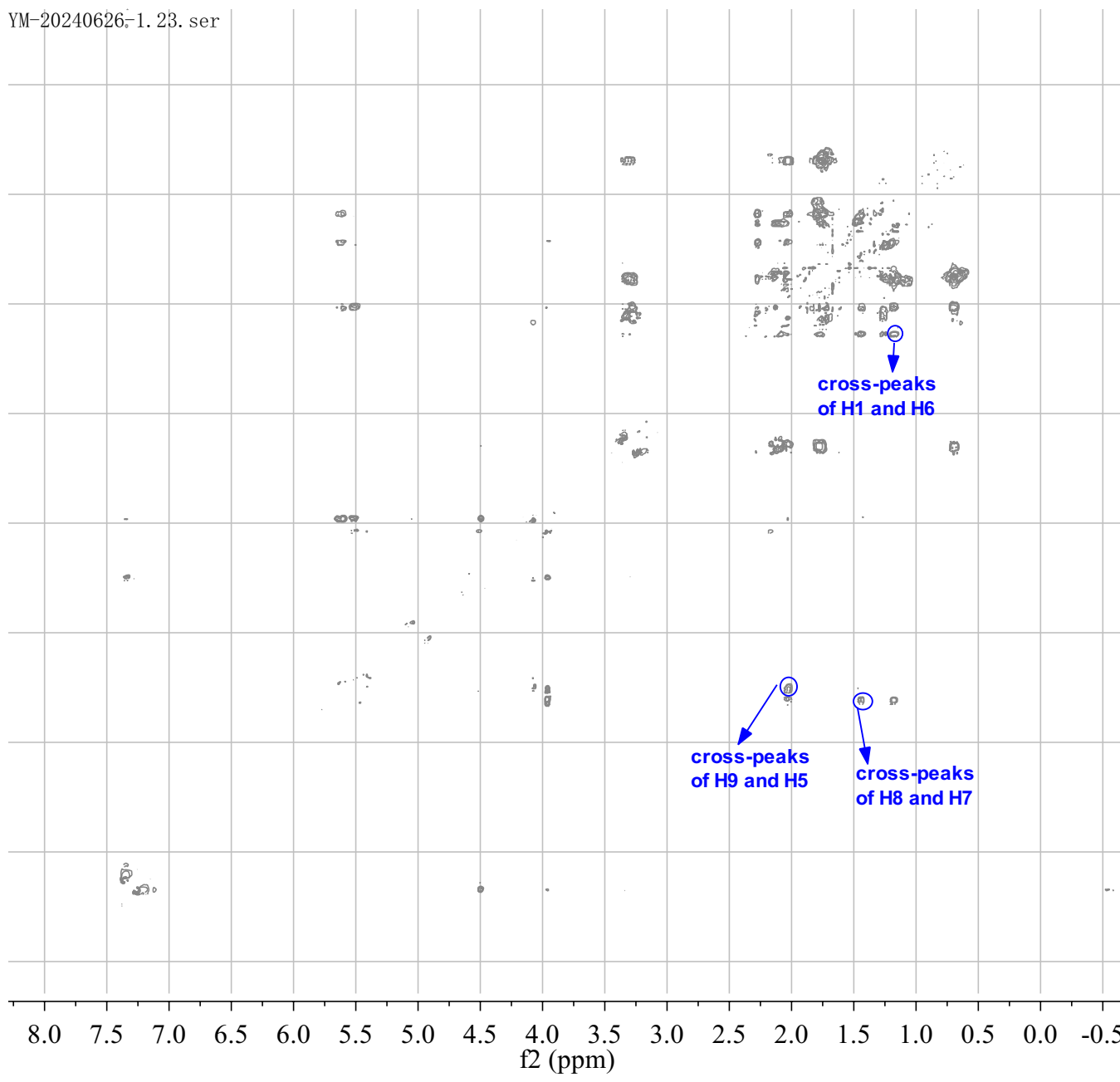
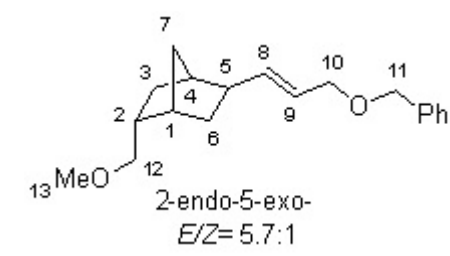
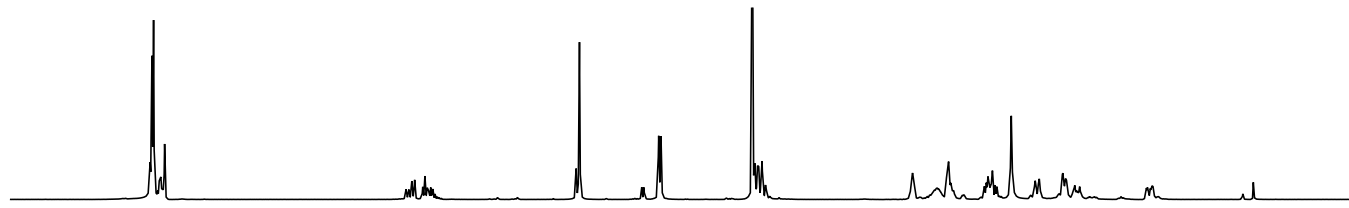
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Title	YM-20240626-1.13.ser
Comment	
Origin	Bruker BioSpin GmbH
Owner	PC
Site	
Instrument	spect
Solvent	CDCl <sub>3</sub>
Temperature	297.1
Pulse Sequence	hsqcetgp
Experiment	HSQC
Number of Scans	2
Receiver Gain	196.4
Relaxation Delay	1.4592
Pulse Width	9.2600
Presaturation Frequency	
Acquisition Time	0.1393
Acquisition Date	2024-06-28T12:33:32
Modification Date	2024-06-28T13:53:56
Spectrometer Frequency	(400.13, 100.62)
Spectral Width	(3676.5, 16666.7)
Lowest Frequency	(-332.5, -829.1)
Nucleus	( <sup>1</sup> H, <sup>13</sup> C)
Acquired Size	(512, 256)
Spectral Size	(512, 512)



YM-20240626-1.4.ser  
CH2OMe+AOB



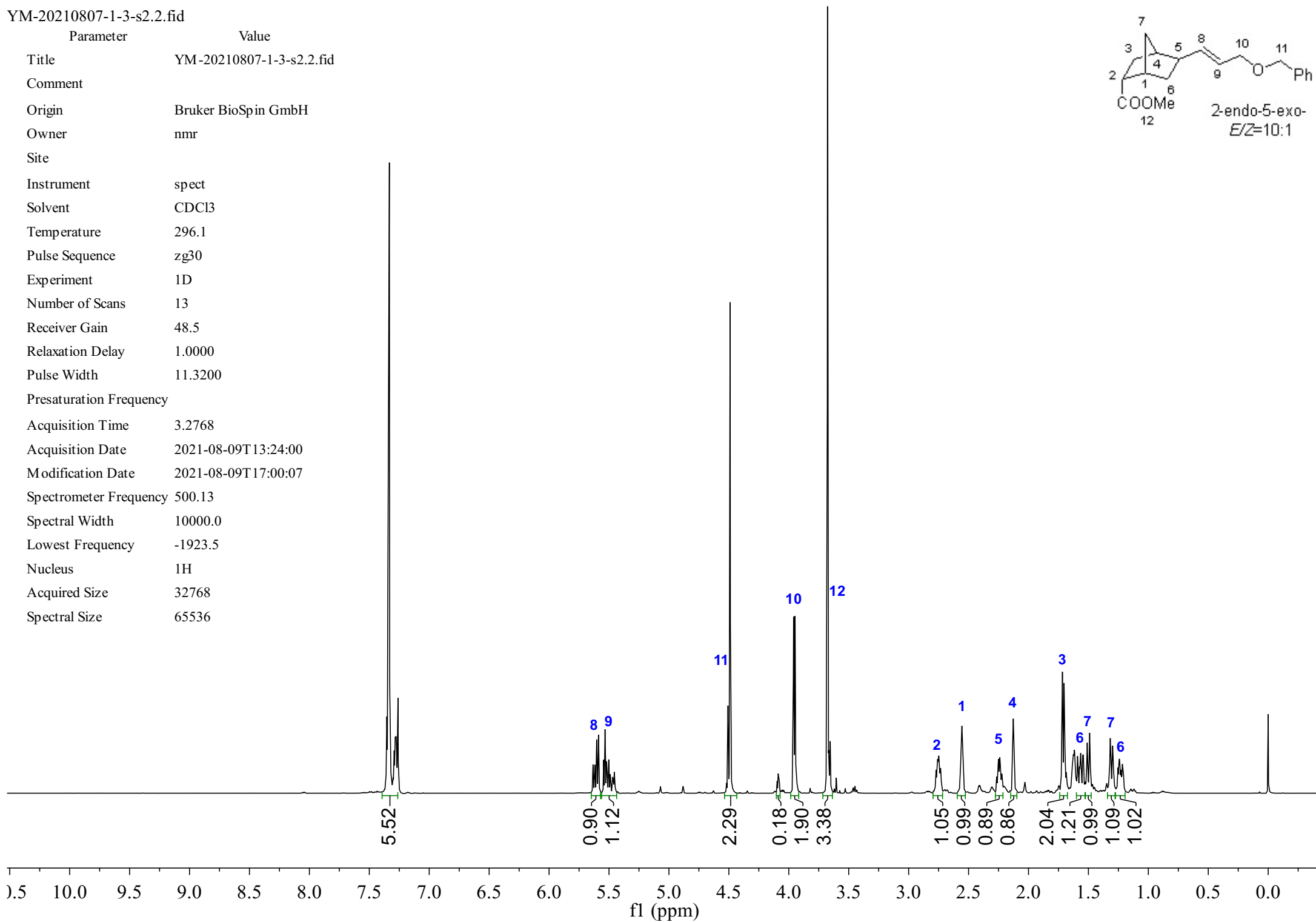
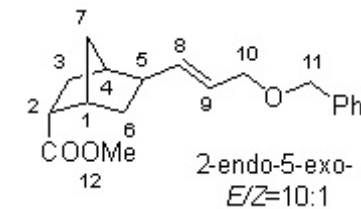
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Title	YM-20240626-1.4.ser
Comment	CH2OMe+AOB
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDCl3
Temperature	296.2
Pulse Sequence	cosygpppqf
Experiment	COSY
Number of Scans	1
Receiver Gain	48.5
Relaxation Delay	1.9115
Pulse Width	11.3200
Presaturation Frequency	
Acquisition Time	0.2417
Acquisition Date	2024-06-28T01:05:07
Modification Date	2024-06-28T05:05:12
Spectrometer Frequency	(500.13, 500.13)
Spectral Width	(4237.3, 4237.3)
Lowest Frequency	(-247.6, -247.6)
Nucleus	(1H, 1H)
Acquired Size	(1024, 128)
Spectral Size	(1024, 1024)



Parameter	Value
Title	YM-20240626-1.23.ser
Comment	
Origin	Bruker BioSpin GmbH
Owner	PC
Site	
Instrument	spect
Solvent	CDCl3
Temperature	296.8
Pulse Sequence	noesygp.php
Experiment	NOESY
Number of Scans	4
Receiver Gain	31.7
Relaxation Delay	1.9713
Pulse Width	9.2600
Presaturation Frequency	
Acquisition Time	0.2847
Acquisition Date	2024-06-29T18:59:32
Modification Date	2024-06-29T20:23:38
Spectrometer Frequency	(400.13, 400.13)
Spectral Width	(3597.1, 3597.1)
Lowest Frequency	(-279.4, -279.4)
Nucleus	(1H, 1H)
Acquired Size	(1024, 256)
Spectral Size	(1024, 1024)

YM-20210807-1-3-s2.2.fid

Parameter	Value
Title	YM-20210807-1-3-s2.2.fid
Comment	
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDC13
Temperature	296.1
Pulse Sequence	zg30
Experiment	1D
Number of Scans	13
Receiver Gain	48.5
Relaxation Delay	1.0000
Pulse Width	11.3200
Presaturation Frequency	
Acquisition Time	3.2768
Acquisition Date	2021-08-09T13:24:00
Modification Date	2021-08-09T17:00:07
Spectrometer Frequency	500.13
Spectral Width	10000.0
Lowest Frequency	-1923.5
Nucleus	1H
Acquired Size	32768
Spectral Size	65536





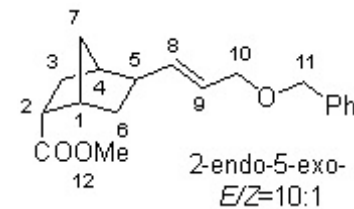
YM-210807-1-3.3.fid  
s2

—175.5

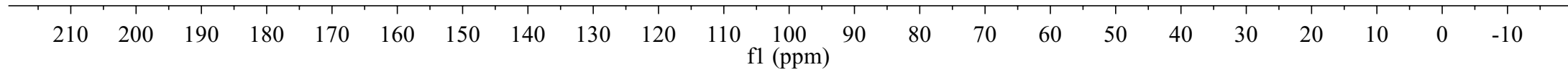
139.4  
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128.5  
127.9  
127.7  
124.3

72.0  
71.0

51.7  
45.3  
44.0  
43.0  
40.8  
37.6  
33.0  
32.2

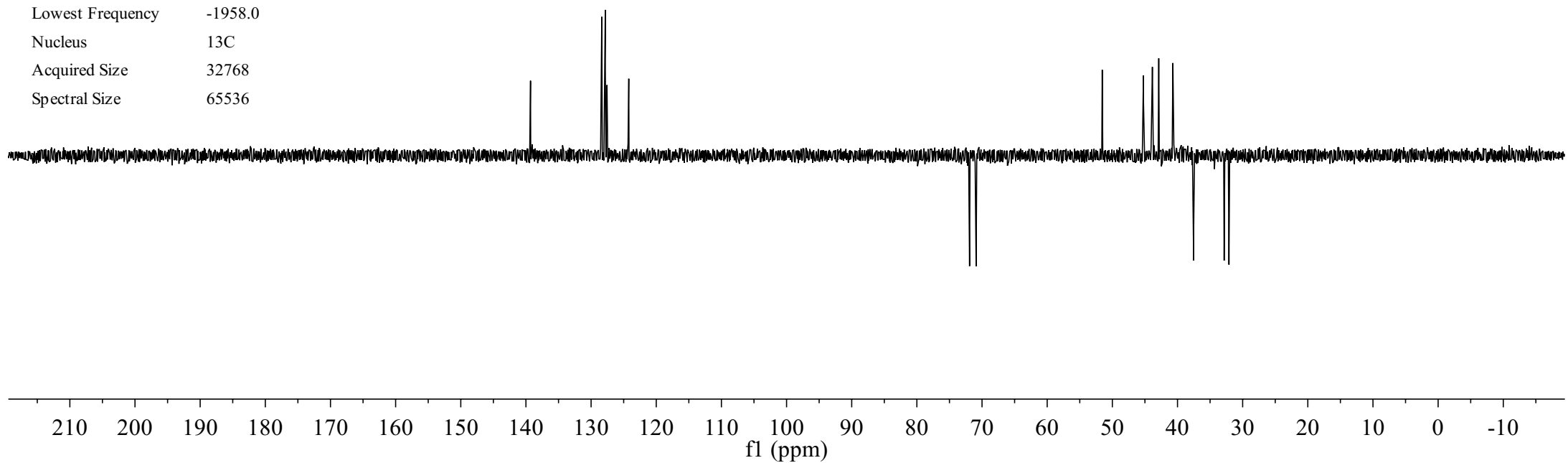
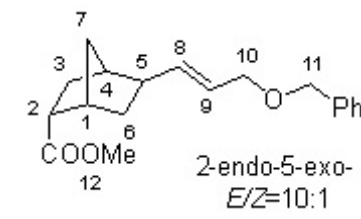


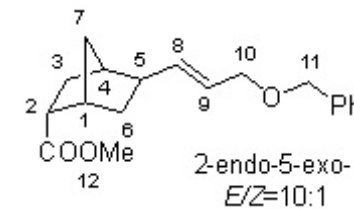
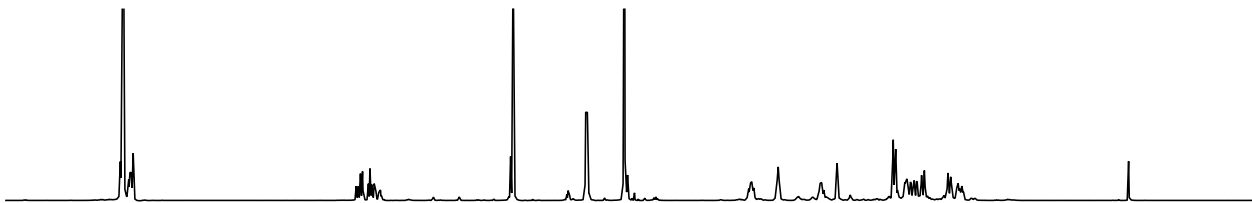
Parameter	Value
Title	YM-210807-1-3.3.fid
Comment	s2
Origin	Bruker BioSpin GmbH
Owner	PC
Site	
Instrument	spect
Solvent	CDC13
Temperature	296.8
Pulse Sequence	zgpg30
Experiment	1D
Number of Scans	108
Receiver Gain	196.4
Relaxation Delay	2.0000
Pulse Width	10.2200
Presaturation Frequency	
Acquisition Time	1.3631
Acquisition Date	2024-06-23T00:11:57
Modification Date	2024-06-23T12:52:20
Spectrometer Frequency	100.62
Spectral Width	24038.5
Lowest Frequency	-1946.0
Nucleus	<sup>13</sup> C
Acquired Size	32768
Spectral Size	65536



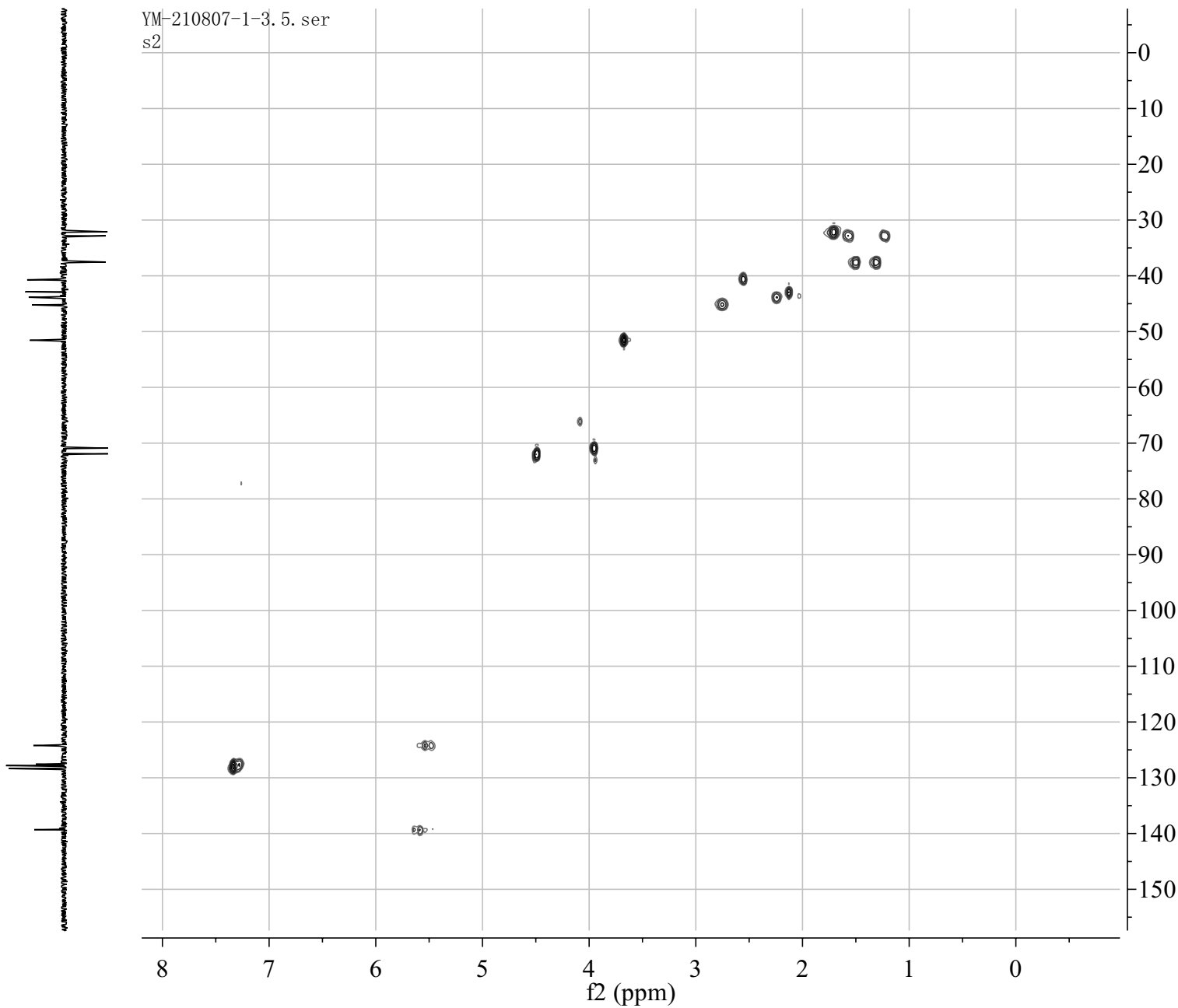
YM-210807-1-3.6.fid

s2	Parameter	Value
	Title	YM-210807-1-3.6.fid
	Comment	s2
	Origin	Bruker BioSpin GmbH
	Owner	PC
	Site	
	Instrument	spect
	Solvent	CDC13
	Temperature	296.9
	Pulse Sequence	depts135
	Experiment	DEPT-135
	Number of Scans	32
	Receiver Gain	196.4
	Relaxation Delay	2.0000
	Pulse Width	10.2200
	Presaturation Frequency	
	Acquisition Time	1.3631
	Acquisition Date	2024-06-23T12:09:04
	Modification Date	2024-06-23T12:52:23
	Spectrometer Frequency	100.62
	Spectral Width	24038.5
	Lowest Frequency	-1958.0
	Nucleus	13C
	Acquired Size	32768
	Spectral Size	65536

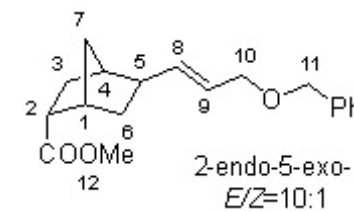
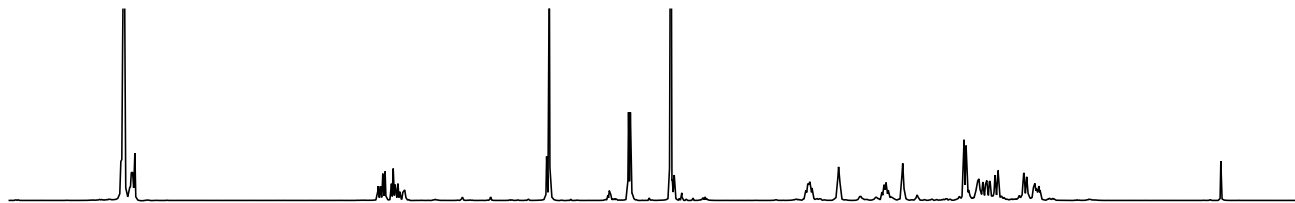




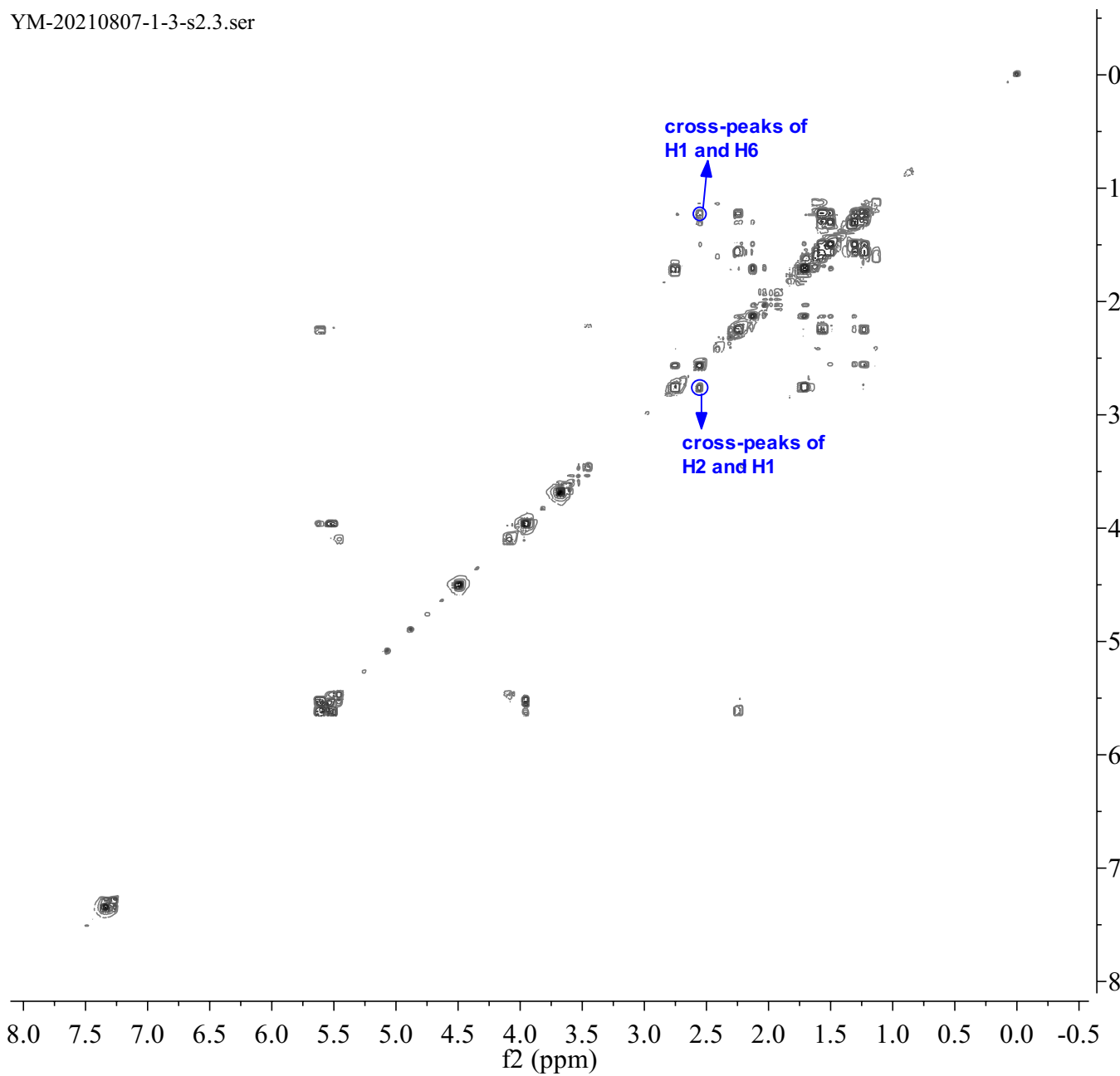
YM-210807-1-3.5.ser  
s2



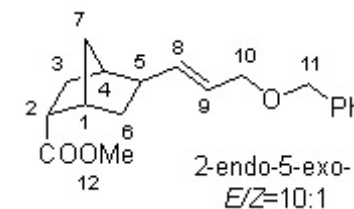
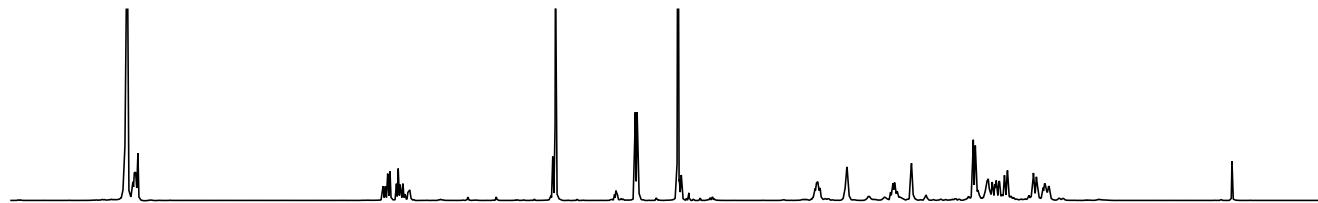
Parameter	Value
Title	YM-210807-1-3.5.ser
Comment	s2
Origin	Bruker BioSpin GmbH
Owner	PC
Site	
Instrument	spect
Solvent	CDCl3
Temperature	296.9
Pulse Sequence	hsqcetgp
Experiment	HSQC
Number of Scans	2
Receiver Gain	196.4
Relaxation Delay	1.4592
Pulse Width	9.2600
Presaturation Frequency	
Acquisition Time	0.1393
Acquisition Date	2024-06-23T00:19:12
Modification Date	2024-06-23T12:52:20
Spectrometer Frequency	(400.13, 100.62)
Spectral Width	(3676.5, 16666.7)
Lowest Frequency	(-397.7, -829.1)
Nucleus	(1H, 13C)
Acquired Size	(512, 256)
Spectral Size	(512, 512)



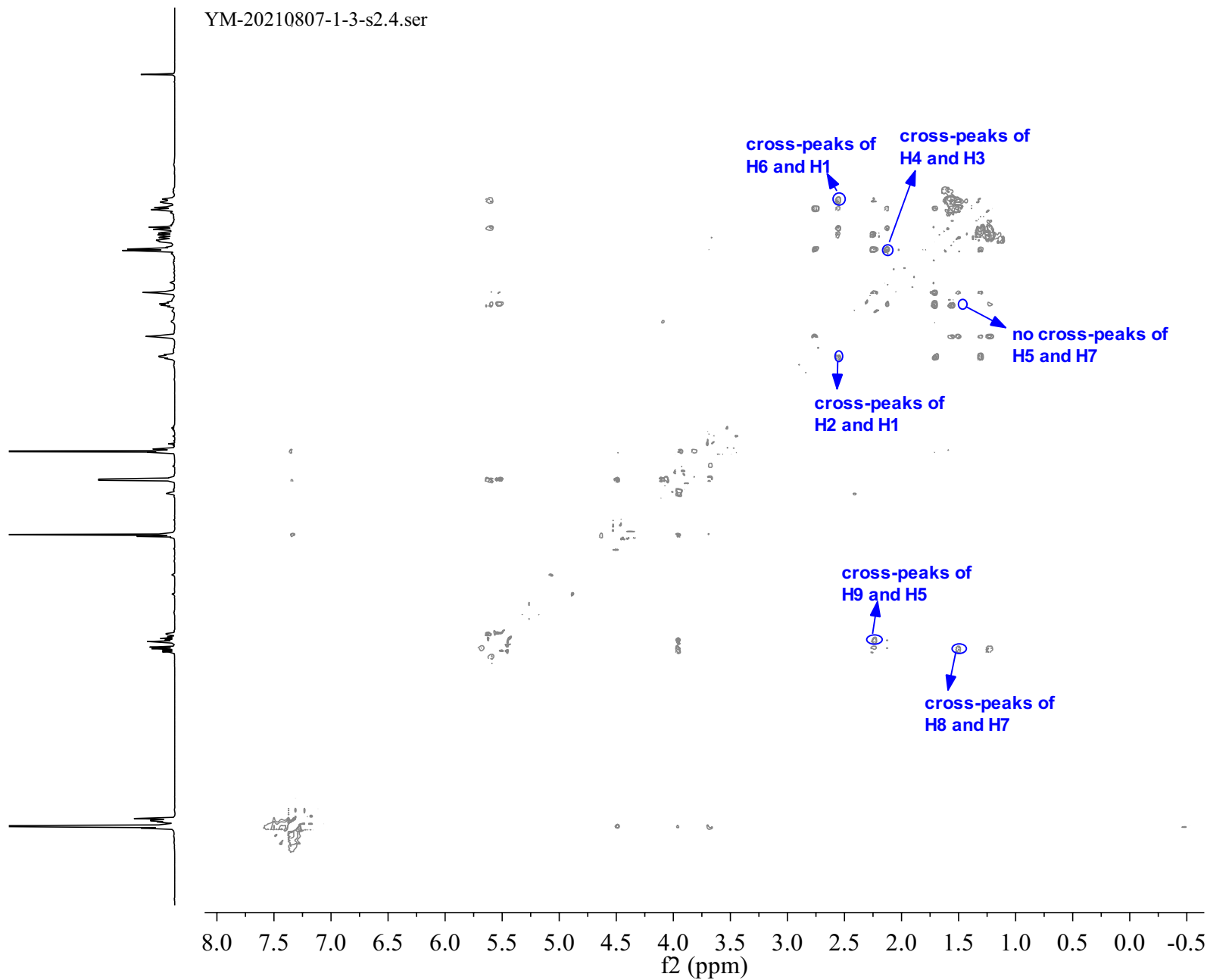
YM-20210807-1-3-s2.3.ser



Parameter	Value
Title	YM-20210807-1-3-s2.3.ser
Comment	
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDC13
Temperature	296.1
Pulse Sequence	cosy gpppqf
Experiment	COSY
Number of Scans	1
Receiver Gain	25.2
Relaxation Delay	1.9177
Pulse Width	11.3200
Presaturation	
Frequency	
Acquisition Time	0.2355
Acquisition Date	2021-08-09T13:25:00
Modification Date	2021-08-09T17:00:07
Spectrometer	(500.13, 500.13)
Frequency	
Spectral Width	(4347.8, 4347.8)
Lowest Frequency	(-294.2, -294.2)
Nucleus	(1H, 1H)
Acquired Size	(1024, 128)



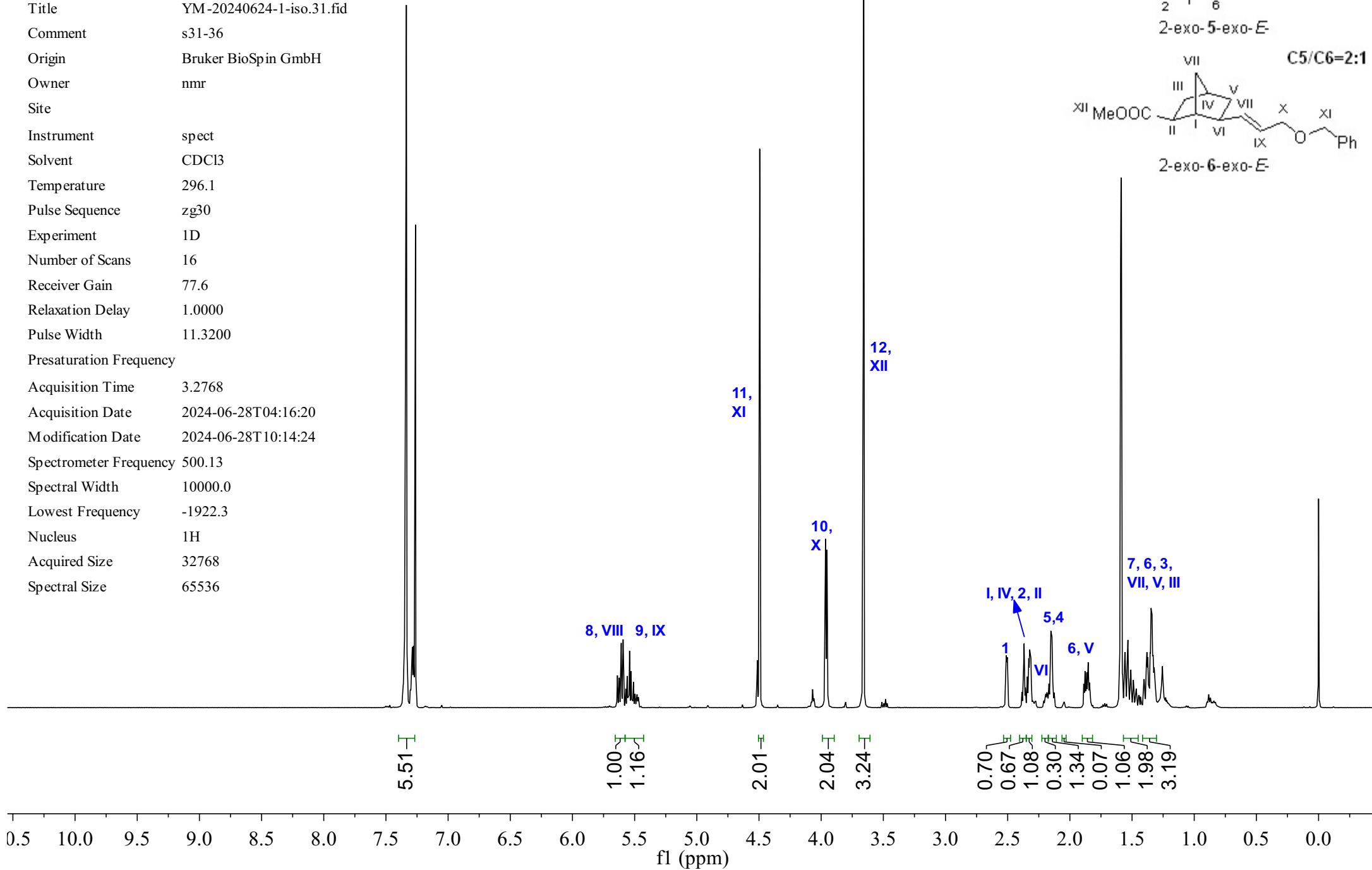
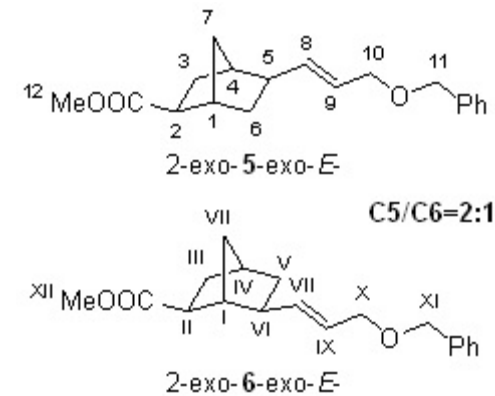
YM-20210807-1-3-s2.4.ser



Parameter	Value
Title	YM-20210807-1-3-s2.4.ser
Comment	
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDCl3
Temperature	296.1
Pulse Sequence	noesygp.php
Experiment	NOESY
Number of Scans	4
Receiver Gain	25.2
Relaxation Delay	1.9713
Pulse Width	11.3200
Presaturation Frequency	
Acquisition Time	0.2335
Acquisition Date	2021-08-09T13:32:00
Modification Date	2021-08-09T17:00:08
Spectrometer Frequency	(500.13, 500.13)
Spectral Width	(4386.0, 4386.0)
Lowest Frequency	(-331.1, -331.1)
Nucleus	(1H, 1H)
Acquired Size	(1024, 256)
Spectral Size	(1024, 1024)

YM-20240624-1-iso. 31. fid  
s31-36

Parameter	Value
Title	YM-20240624-1-iso.31.fid
Comment	s31-36
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDC13
Temperature	296.1
Pulse Sequence	zg30
Experiment	1D
Number of Scans	16
Receiver Gain	77.6
Relaxation Delay	1.0000
Pulse Width	11.3200
Presaturation Frequency	
Acquisition Time	3.2768
Acquisition Date	2024-06-28T04:16:20
Modification Date	2024-06-28T10:14:24
Spectrometer Frequency	500.13
Spectral Width	10000.0
Lowest Frequency	-1922.3
Nucleus	1H
Acquired Size	32768
Spectral Size	65536



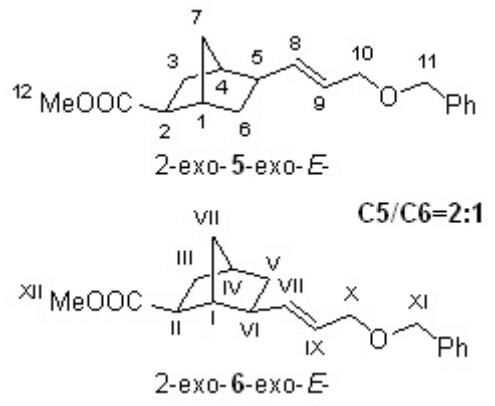
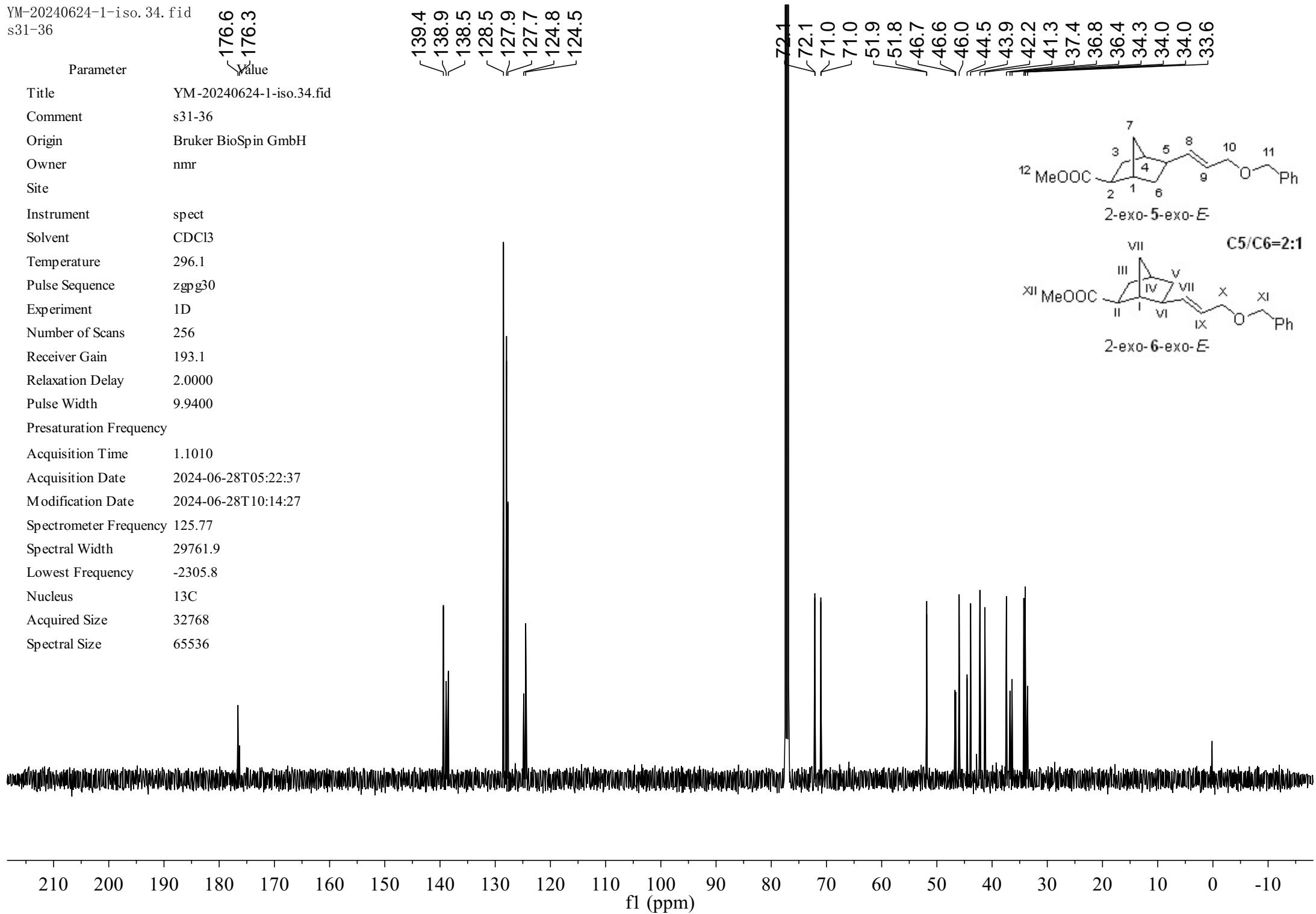
YM-20240624-1-iso. 34. fid  
s31-36

176.6  
176.3

139.4  
138.9  
138.5  
128.5  
127.9  
127.7  
124.8  
124.5

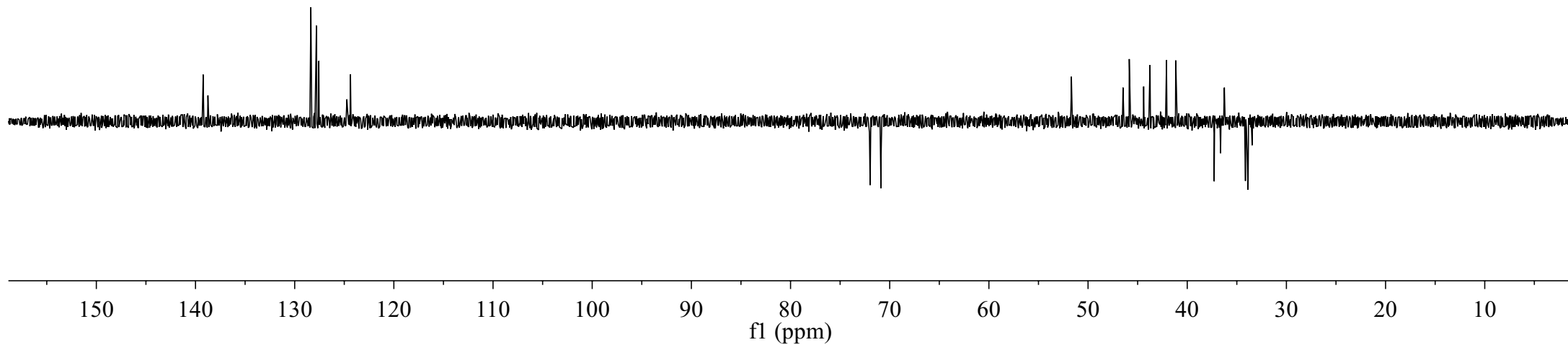
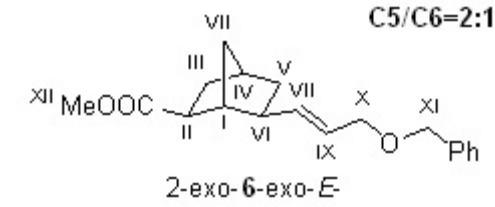
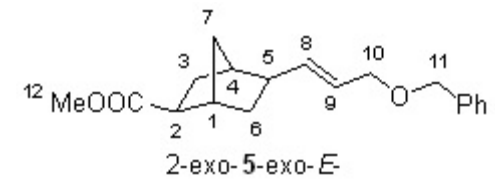
72.1  
72.1  
71.0  
71.0  
51.9  
51.8  
46.7  
46.6  
46.0  
44.5  
43.9  
42.2  
41.3  
37.4  
36.8  
36.4  
34.3  
34.0  
34.0  
33.6

Parameter	Value
Title	YM-20240624-1-iso.34.fid
Comment	s31-36
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDC13
Temperature	296.1
Pulse Sequence	zgpg30
Experiment	1D
Number of Scans	256
Receiver Gain	193.1
Relaxation Delay	2.0000
Pulse Width	9.9400
Presaturation Frequency	
Acquisition Time	1.1010
Acquisition Date	2024-06-28T05:22:37
Modification Date	2024-06-28T10:14:27
Spectrometer Frequency	125.77
Spectral Width	29761.9
Lowest Frequency	-2305.8
Nucleus	13C
Acquired Size	32768
Spectral Size	65536

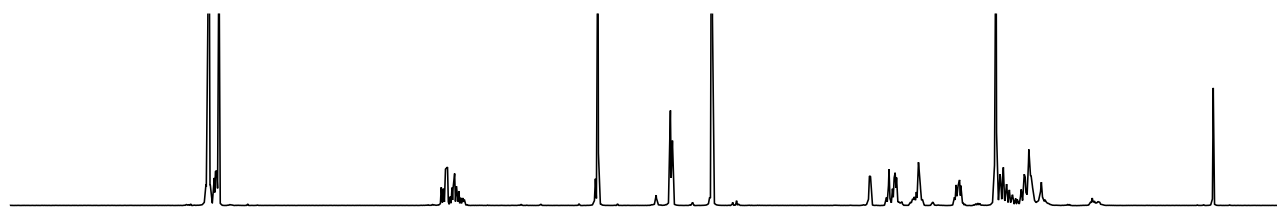


YM-20240624-1-iso.47.fid

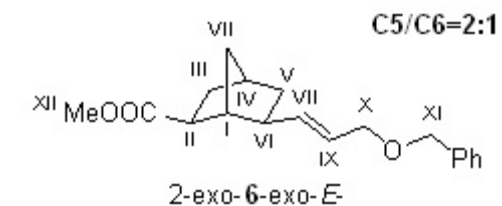
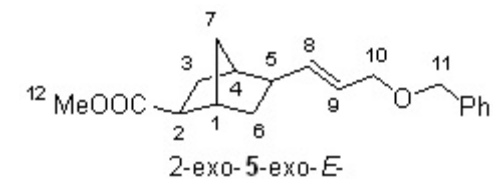
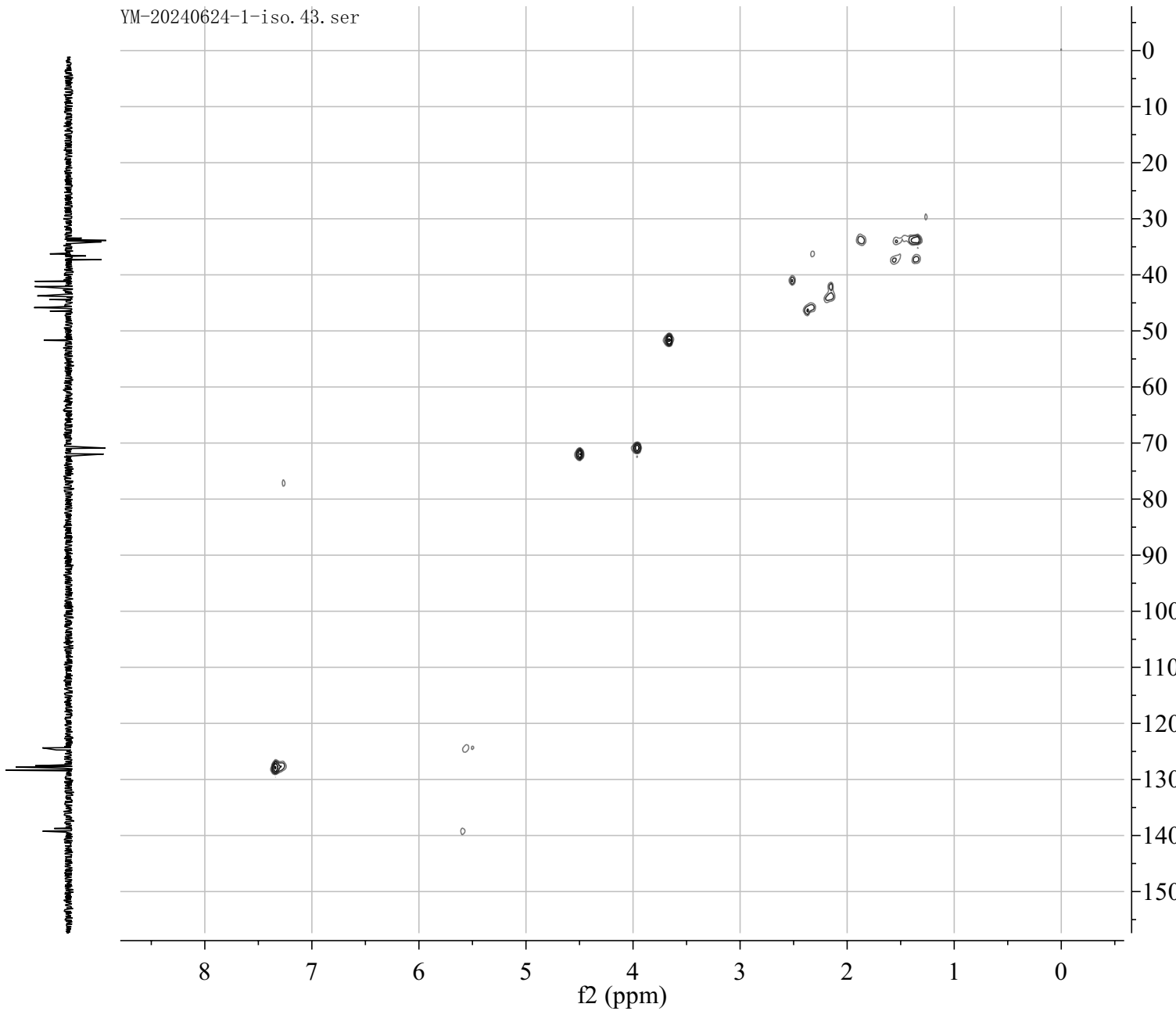
31-36	Parameter	Value
	Title	YM-20240624-1-iso.47.fid
	Comment	31-36
	Origin	Bruker BioSpin GmbH
	Owner	nmrsu
	Site	
	Instrument	Avance NEO 600
	Solvent	CDC13
	Temperature	295.4
	Pulse Sequence	deptsq 135
	Experiment	DEPT-135
	Number of Scans	61
	Receiver Gain	101.0
	Relaxation Delay	2.0000
	Pulse Width	11.7300
	Presaturation Frequency	
	Acquisition Time	1.3763
	Acquisition Date	2024-06-30T13:36:48
	Modification Date	2024-06-30T13:42:08
	Spectrometer Frequency	150.93
	Spectral Width	23809.5
	Lowest Frequency	168.9
	Nucleus	13C
	Acquired Size	32768
	Spectral Size	65536





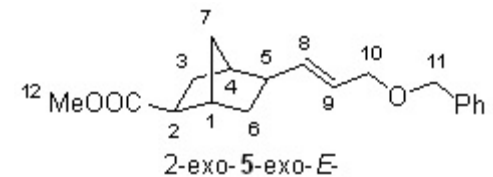
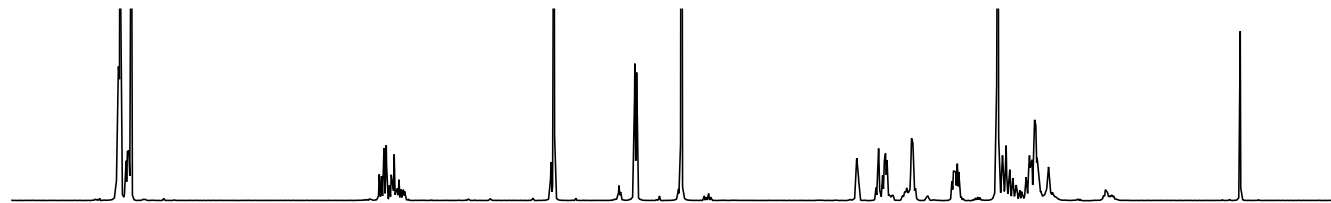


YM-20240624-1-iso.43.ser

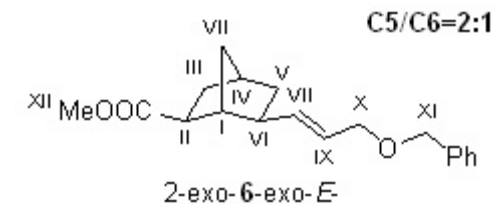
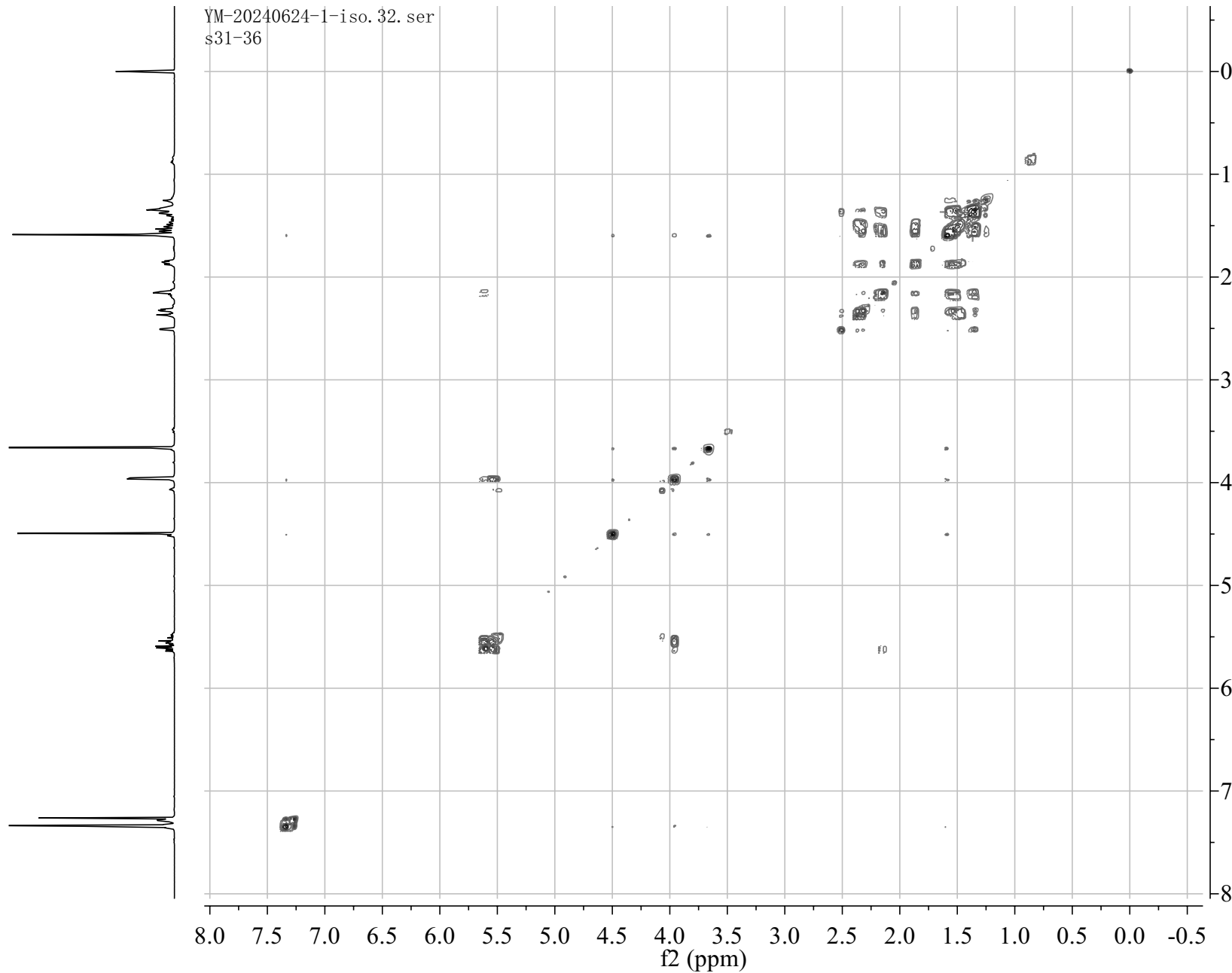


C5/C6=2:1

Parameter	Value
Title	YM-20240624-1-iso.43.ser
Comment	
Origin	Bruker BioSpin GmbH
Owner	PC
Site	
Instrument	spect
Solvent	CDCl3
Temperature	297.2
Pulse Sequence	hsqcetgp
Experiment	HSQC
Number of Scans	2
Receiver Gain	196.4
Relaxation Delay	1.4623
Pulse Width	9.2600
Presaturation Frequency	
Acquisition Time	0.1362
Acquisition Date	2024-06-28T12:58:40
Modification Date	2024-06-28T13:53:59
Spectrometer Frequency	(400.13, 100.62)
Spectral Width	(3759.4, 16666.7)
Lowest Frequency	(-242.4, -829.1)
Nucleus	(1H, 13C)
Acquired Size	(512, 256)
Spectral Size	(512, 512)

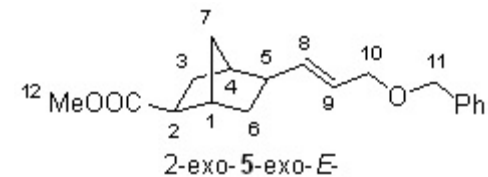
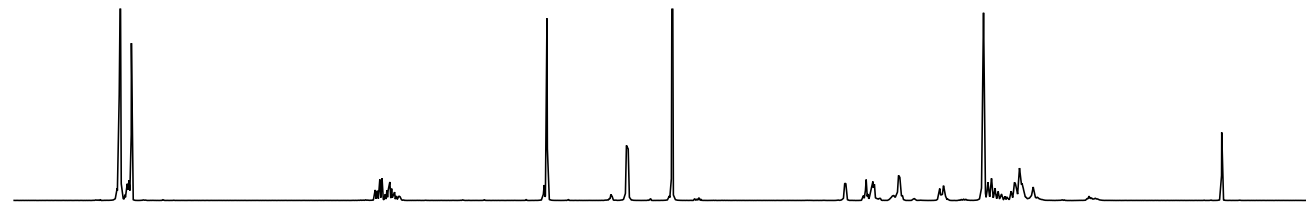


YM-20240624-1-iso.32.ser  
s31-36

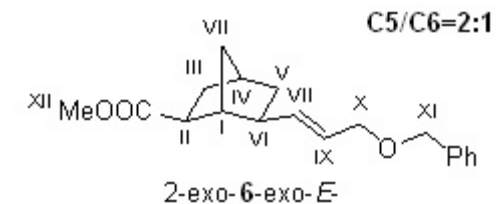
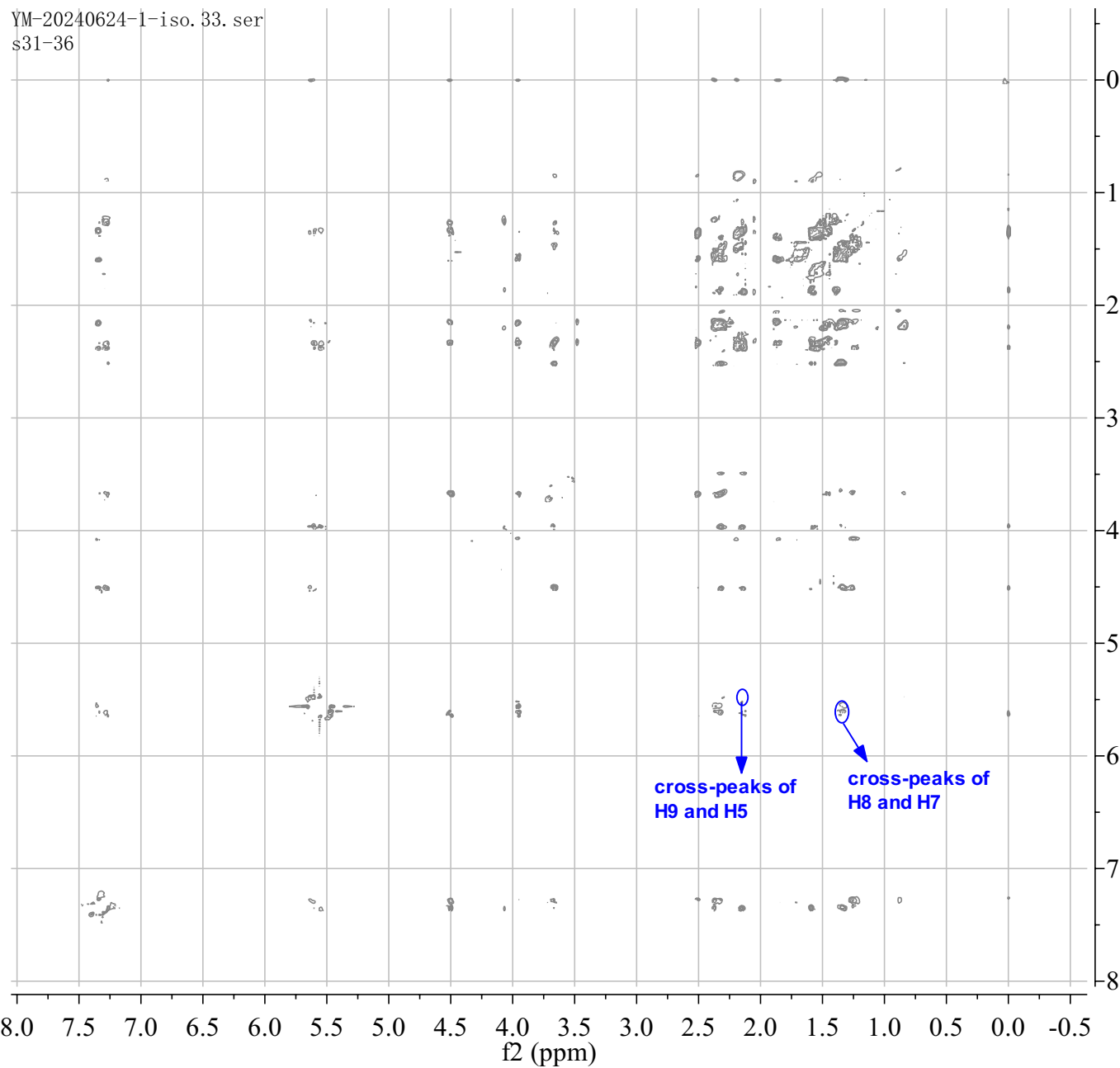


C5/C6=2:1

Parameter	Value
Title	YM-20240624-1-iso.32.ser
Comment	s31-36
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDCl3
Temperature	296.1
Pulse Sequence	cosygpppqf
Experiment	COSY
Number of Scans	1
Receiver Gain	34.4
Relaxation Delay	1.9177
Pulse Width	11.3200
Presaturation Frequency	
Acquisition Time	0.2355
Acquisition Date	2024-06-28T04:17:28
Modification Date	2024-06-28T10:14:24
Spectrometer Frequency	(500.13, 500.13)
Spectral Width	(4347.8, 4347.8)
Lowest Frequency	(-322.6, -322.6)
Nucleus	(1H, 1H)
Acquired Size	(1024, 128)
Spectral Size	(1024, 1024)

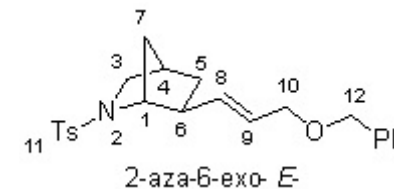


YM-20240624-1-iso.33.ser  
s31-36

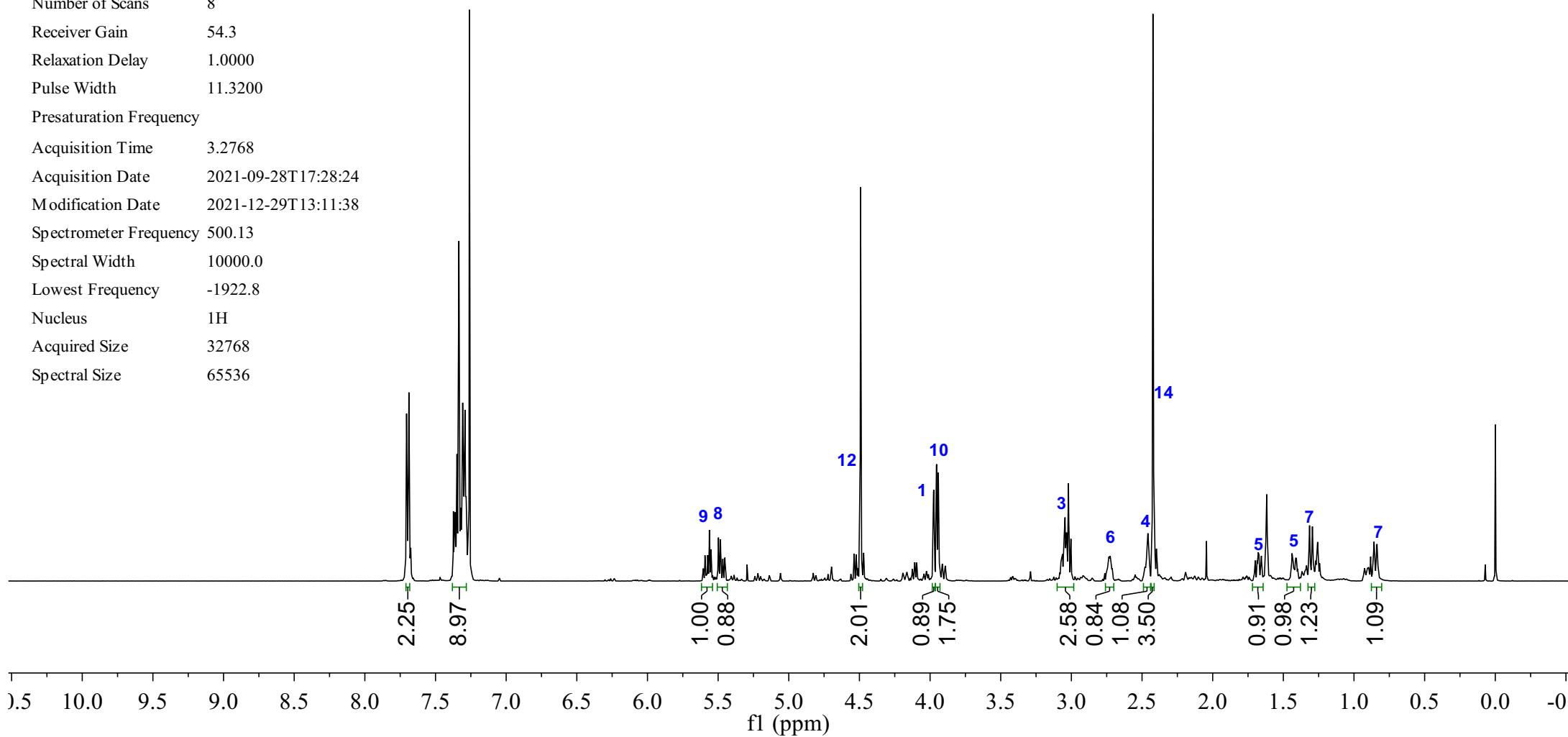


Parameter	Value
Title	YM-20240624-1-iso.33.ser
Comment	s31-36
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDCl3
Temperature	296.2
Pulse Sequence	noesygp phpp
Experiment	NOESY
Number of Scans	4
Receiver Gain	62.9
Relaxation Delay	1.9693
Pulse Width	11.3200
Presaturation Frequency	
Acquisition Time	0.2355
Acquisition Date	2024-06-28T04:24:24
Modification Date	2024-06-28T10:14:25
Spectrometer Frequency	(500.13, 500.13)
Spectral Width	(4347.8, 4347.8)
Lowest Frequency	(-322.6, -322.6)
Nucleus	(1H, 1H)
Acquired Size	(1024, 256)
Spectral Size	(1024, 1024)

Parameter	Value
Title	GX-21165-2-23-2.3.fid
Comment	
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDC13
Temperature	296.2
Pulse Sequence	zg30
Experiment	1D
Number of Scans	8
Receiver Gain	54.3
Relaxation Delay	1.0000
Pulse Width	11.3200
Presaturation Frequency	
Acquisition Time	3.2768
Acquisition Date	2021-09-28T17:28:24
Modification Date	2021-12-29T13:11:38
Spectrometer Frequency	500.13
Spectral Width	10000.0
Lowest Frequency	-1922.8
Nucleus	1H
Acquired Size	32768
Spectral Size	65536



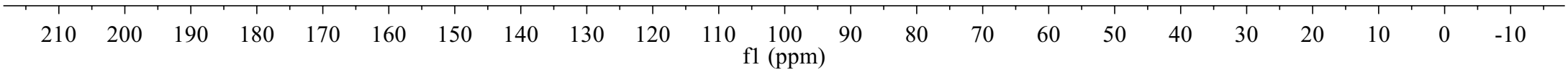
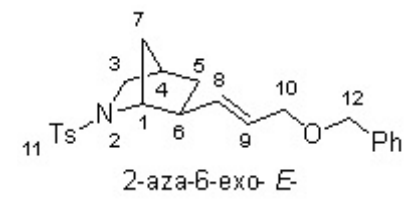
impurities cannot be separated well in this example



Parameter	Value
Title	GX-21165-2-23-2.4.fid
Comment	
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDCl3
Temperature	296.1
Pulse Sequence	zgpg30
Experiment	1D
Number of Scans	33
Receiver Gain	193.1
Relaxation Delay	2.0000
Pulse Width	9.9400
Presaturation Frequency	
Acquisition Time	1.1010
Acquisition Date	2021-09-28T17:30:17
Modification Date	2021-12-29T13:11:38
Spectrometer Frequency	125.77
Spectral Width	29761.9
Lowest Frequency	-2292.1
Nucleus	13C
Acquired Size	32768
Spectral Size	65536

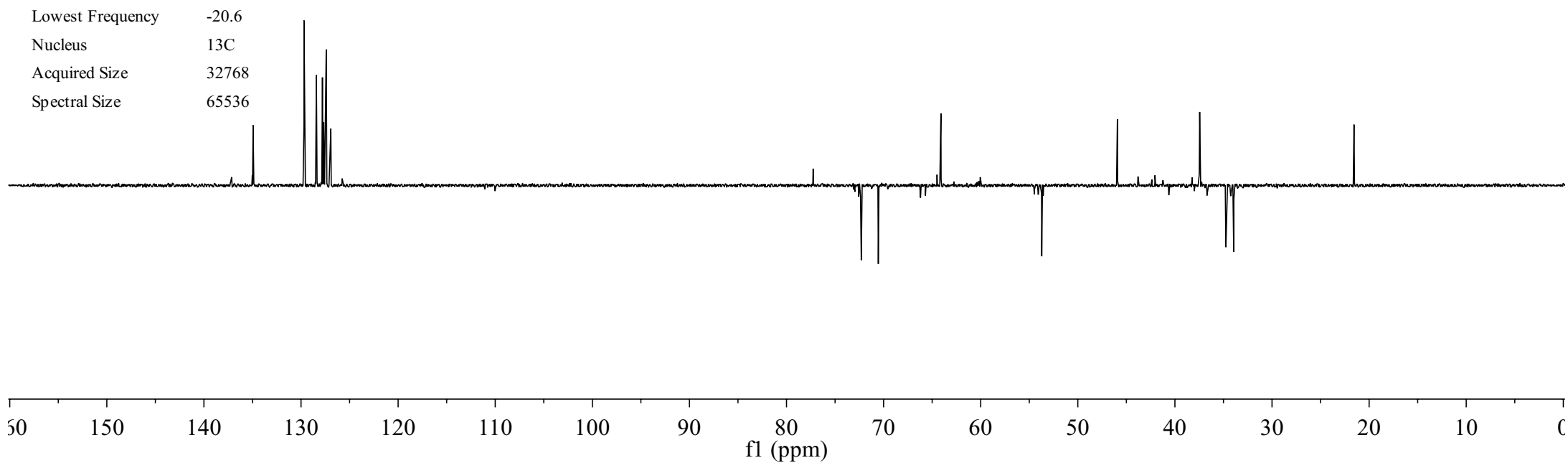
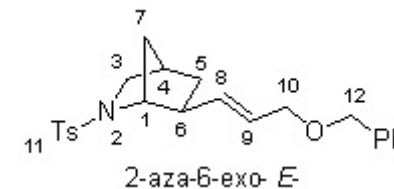
143.4  
138.3  
135.8  
135.0  
129.8  
128.5  
127.9  
127.8  
127.5  
127.0

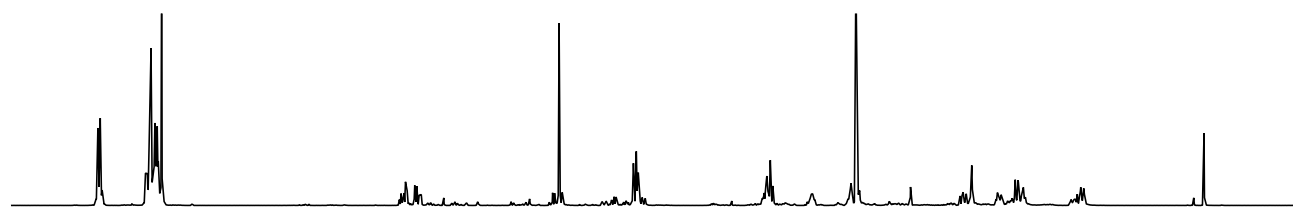
72.4  
70.7  
64.2  
53.8  
46.0  
37.6  
34.9  
34.1  
21.7



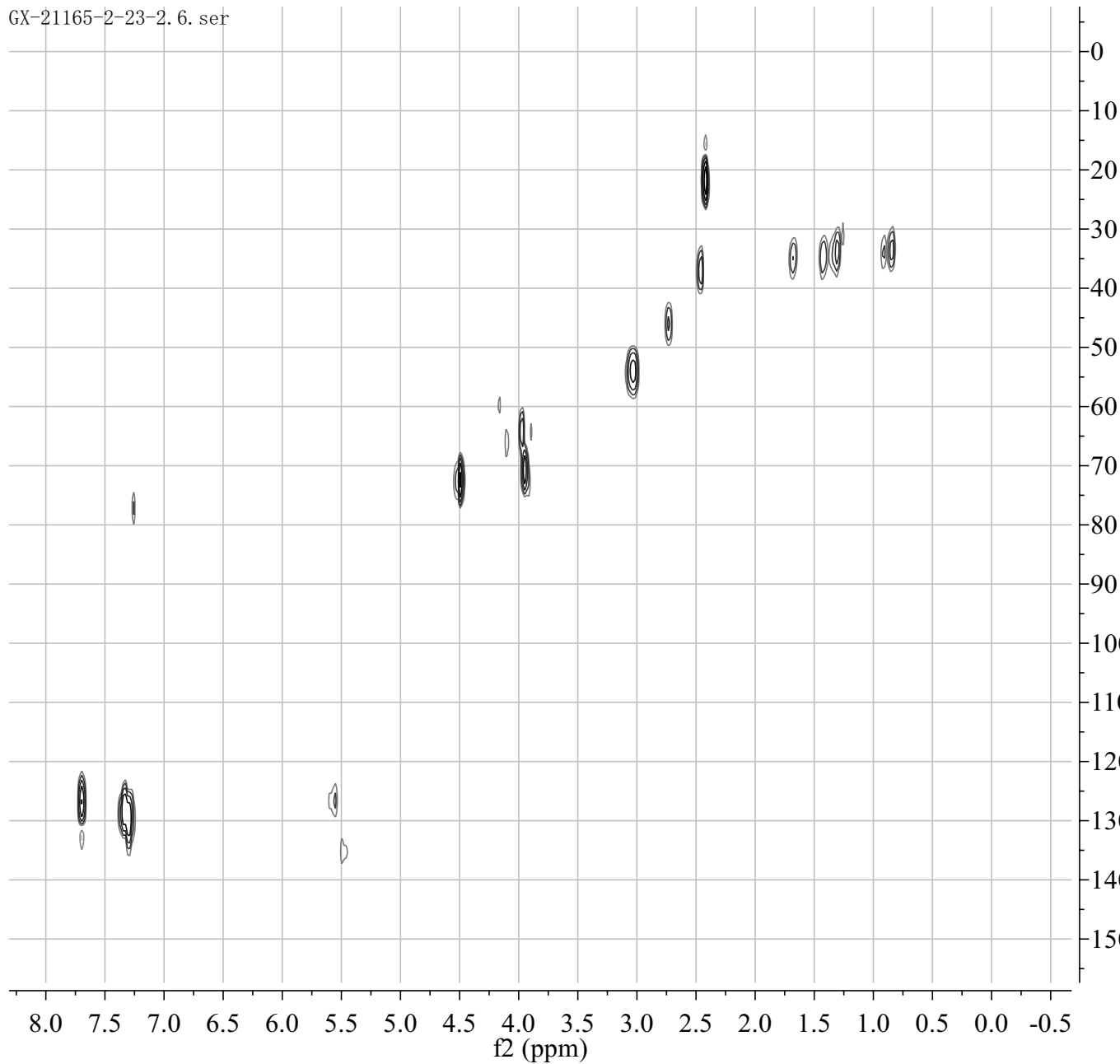
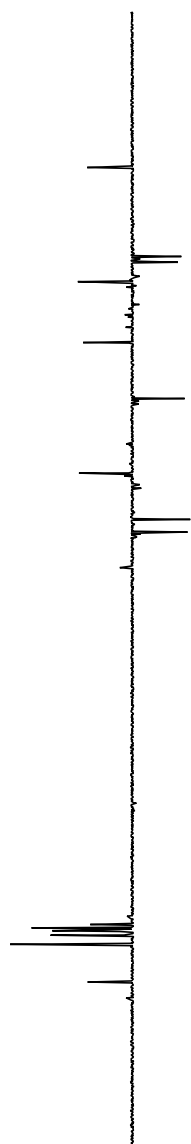
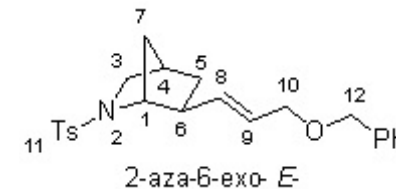
GX-21165-2-23-2.5.fid

Parameter	Value
Title	GX-21165-2-23-2.5.fid
Comment	
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDC13
Temperature	296.1
Pulse Sequence	deptsp135
Experiment	DEPT-135
Number of Scans	48
Receiver Gain	193.1
Relaxation Delay	2.0000
Pulse Width	9.9400
Presaturation Frequency	
Acquisition Time	1.6253
Acquisition Date	2021-09-28T17:33:51
Modification Date	2021-12-29T13:11:40
Spectrometer Frequency	125.77
Spectral Width	20161.3
Lowest Frequency	-20.6
Nucleus	13C
Acquired Size	32768
Spectral Size	65536

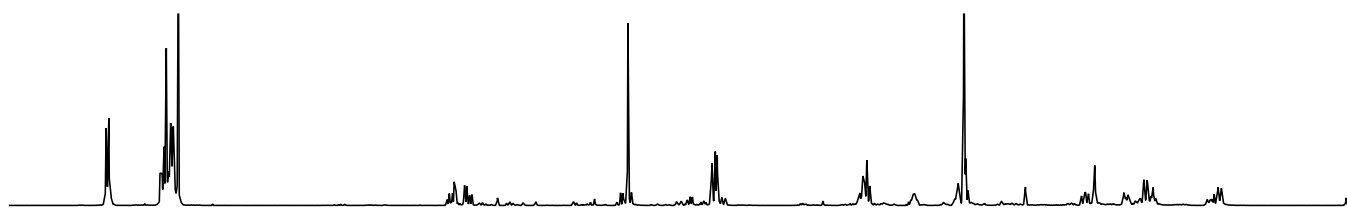




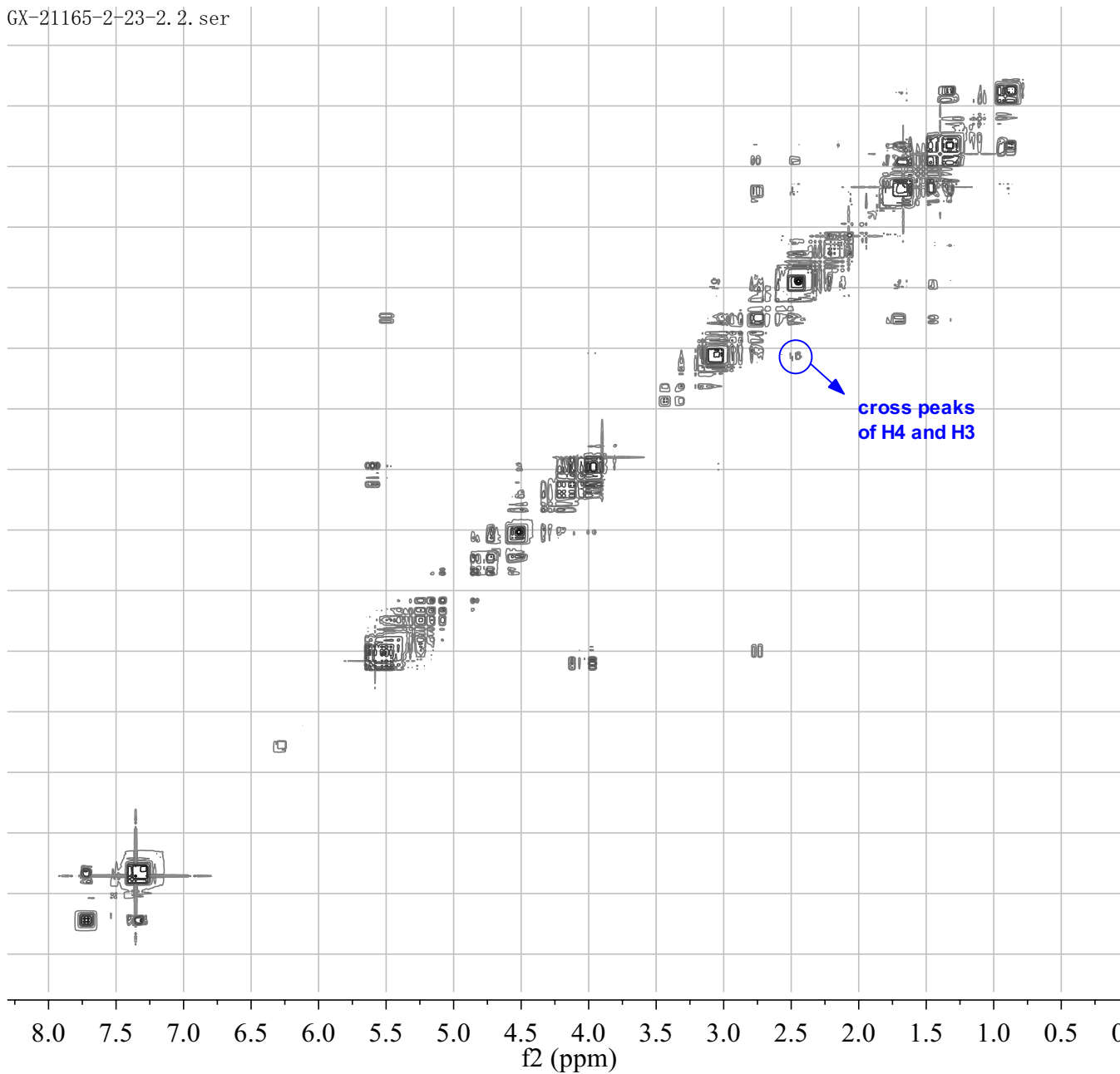
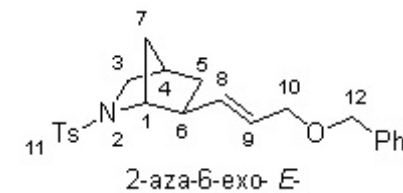
GX-21165-2-23-2. 6. ser



Parameter	Value
Title	GX-21165-2-23-2.6.ser
Comment	
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDCl3
Temperature	296.2
Pulse Sequence	hsqcetgp
Experiment	HSQC
Number of Scans	2
Receiver Gain	193.1
Relaxation Delay	1.4652
Pulse Width	11.3200
Presaturation Frequency	
Acquisition Time	0.1137
Acquisition Date	2021-09-28T17:37:27
Modification Date	2021-12-29T13:11:40
Spectrometer Frequency	(500.13, 125.77)
Spectral Width	(4504.5, 20833.3)
Lowest Frequency	(-347.8, -1037.0)
Nucleus	(1H, 13C)
Acquired Size	(512, 64)
Spectral Size	(512, 256)

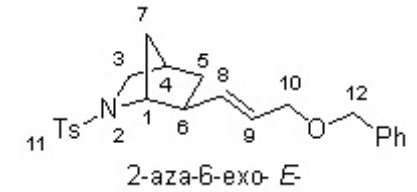
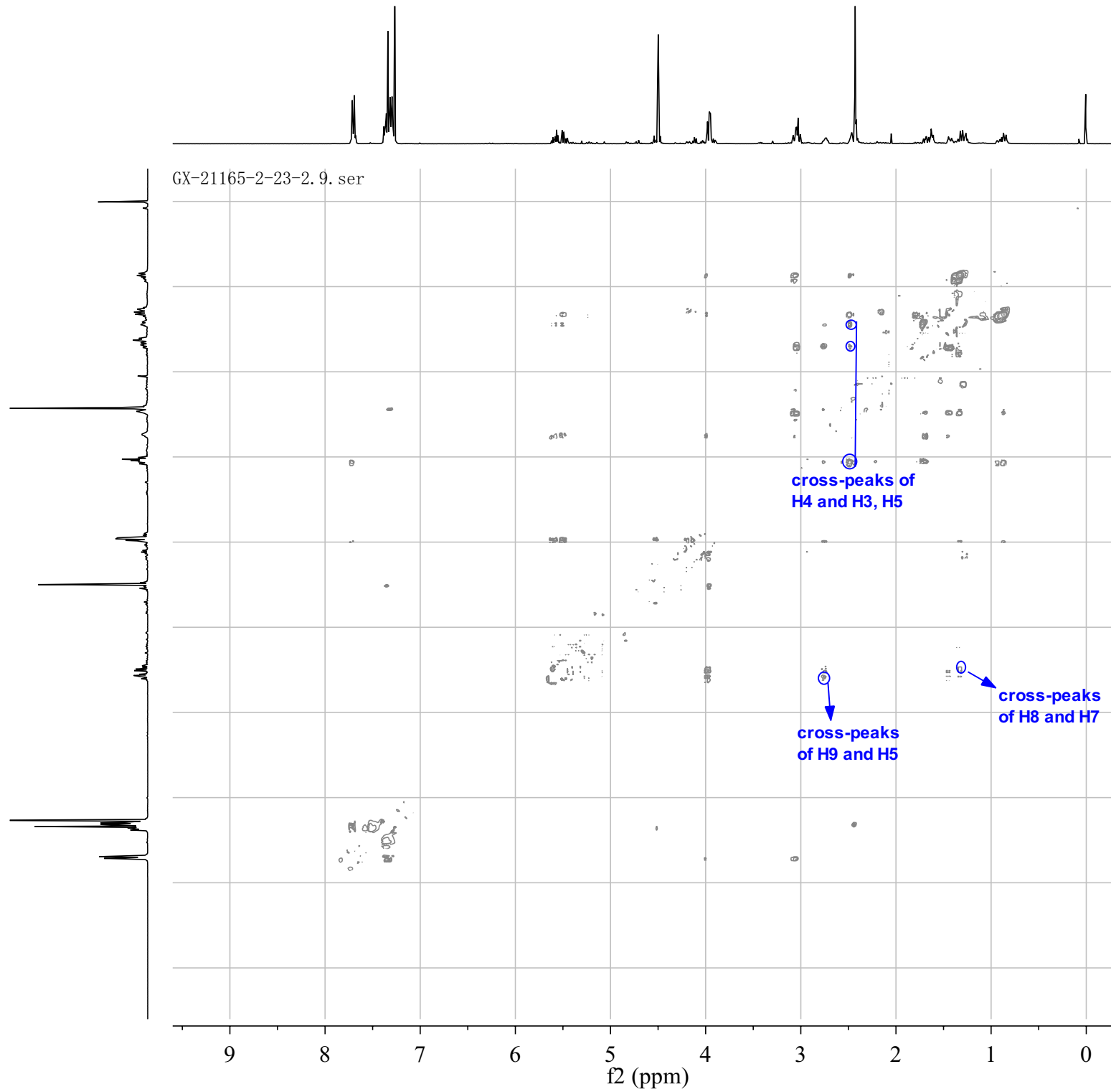


GX-21165-2+23-2. 2. ser



Parameter	Value
Title	GX-21165-2-23-2.2.ser
Comment	
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDCI3
Temperature	295.7
Pulse Sequence	cosygpppqf
Experiment	COSY
Number of Scans	1
Receiver Gain	154.6
Relaxation Delay	2.0000
Pulse Width	9.1500
Presaturation Frequency	
Acquisition Time	0.1917
Acquisition Date	2021-09-28T14:12:39
Modification Date	2021-12-29T13:11:36
Spectrometer Frequency (400.13, 400.13)	
Spectral Width	(5341.9, 5341.9)
Lowest Frequency	(-265.3, -265.3)
Nucleus	(1H, 1H)
Acquired Size	(1024, 64)
Spectral Size	(1024, 1024)

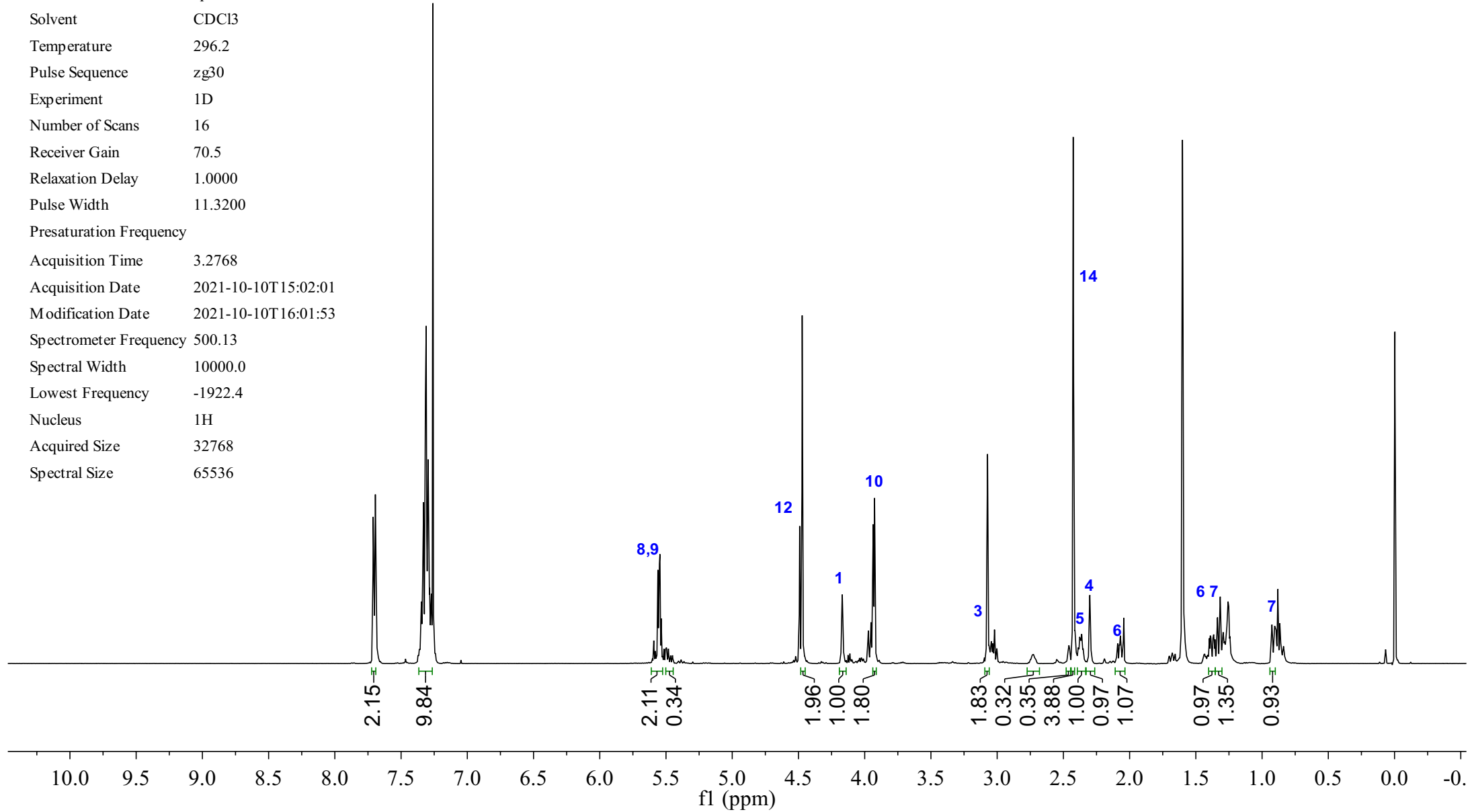
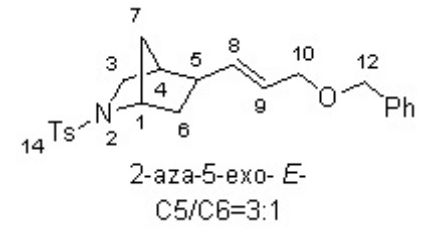




Parameter	Value
Title	GX-21165-2-23-2.9.ser
Comment	
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDCl3
Temperature	294.9
Pulse Sequence	noesygpphp
Experiment	NOESY
Number of Scans	4
Receiver Gain	62.3
Relaxation Delay	2.0000
Pulse Width	9.1500
Presaturation Frequency	
Acquisition Time	0.2560
Acquisition Date	2021-10-10T15:00:10
Modification Date	2021-12-29T13:11:46
Spectrometer Frequency	(400.13, 400.13)
Spectral Width	(4000.0, 4000.0)
Lowest Frequency	(-158.1, -158.1)
Nucleus	(1H, 1H)
Acquired Size	(1024, 200)
Spectral Size	(1024, 1024)

GX-21165-2-27-2.9.fid

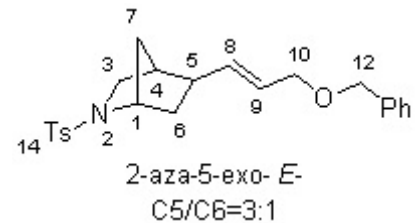
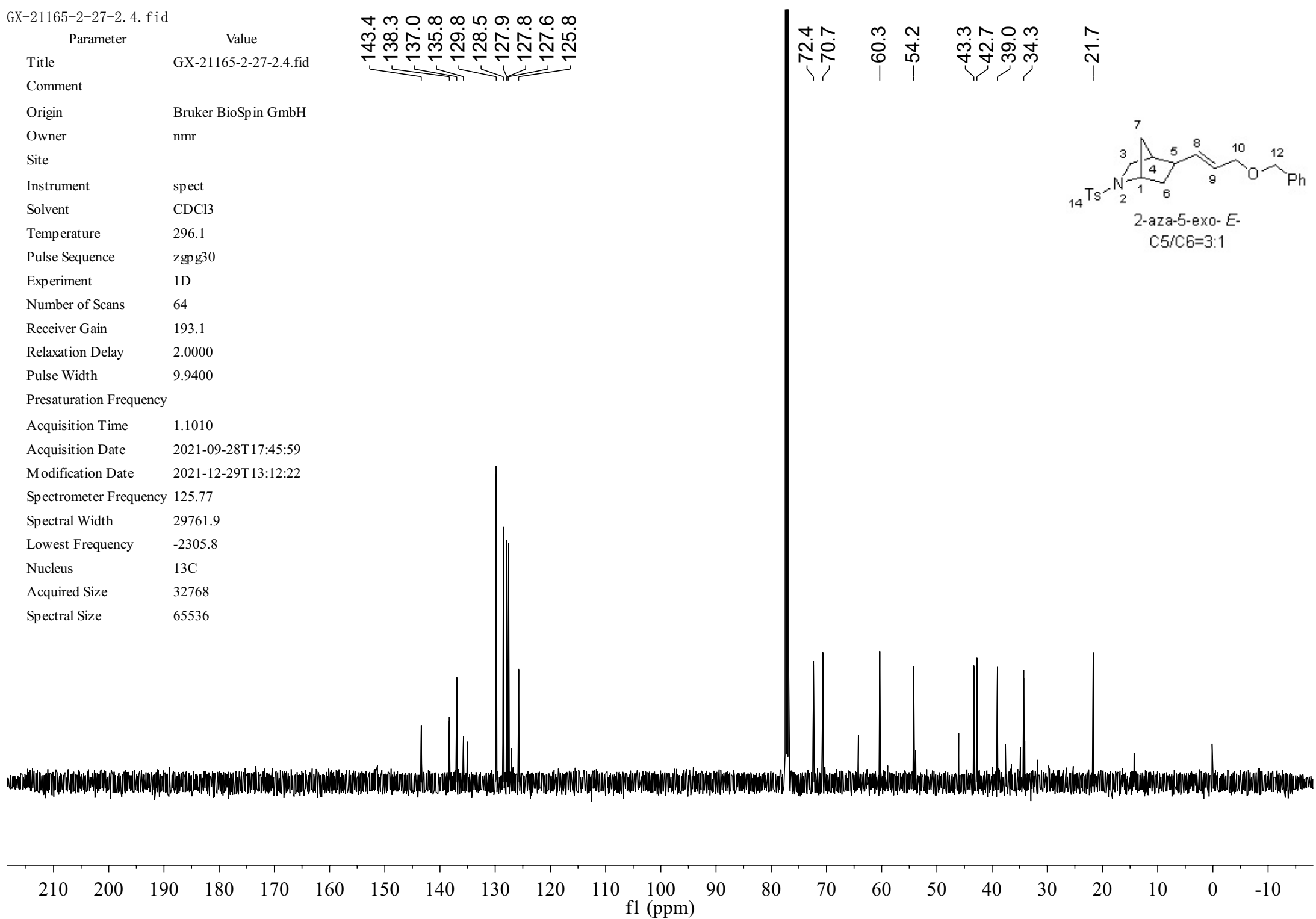
Parameter	Value
Title	GX-21165-2-27-2.9.fid
Comment	
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDC13
Temperature	296.2
Pulse Sequence	zg30
Experiment	1D
Number of Scans	16
Receiver Gain	70.5
Relaxation Delay	1.0000
Pulse Width	11.3200
Presaturation Frequency	
Acquisition Time	3.2768
Acquisition Date	2021-10-10T15:02:01
Modification Date	2021-10-10T16:01:53
Spectrometer Frequency	500.13
Spectral Width	10000.0
Lowest Frequency	-1922.4
Nucleus	1H
Acquired Size	32768
Spectral Size	65536



Parameter	Value
Title	GX-21165-2-27-2.4.fid
Comment	
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDC13
Temperature	296.1
Pulse Sequence	zpgg30
Experiment	1D
Number of Scans	64
Receiver Gain	193.1
Relaxation Delay	2.0000
Pulse Width	9.9400
Presaturation Frequency	
Acquisition Time	1.1010
Acquisition Date	2021-09-28T17:45:59
Modification Date	2021-12-29T13:12:22
Spectrometer Frequency	125.77
Spectral Width	29761.9
Lowest Frequency	-2305.8
Nucleus	13C
Acquired Size	32768
Spectral Size	65536

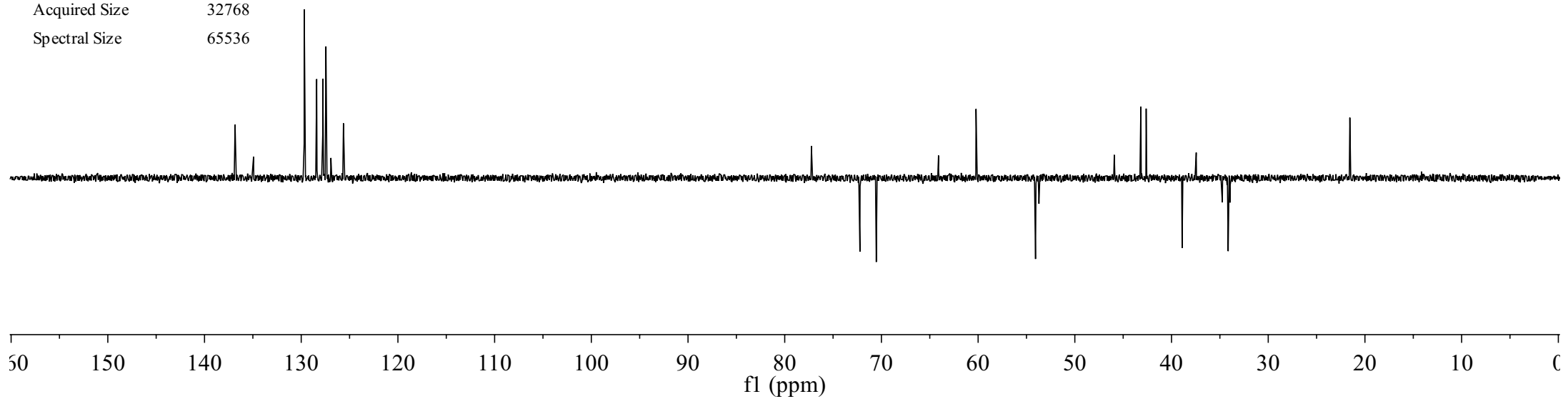
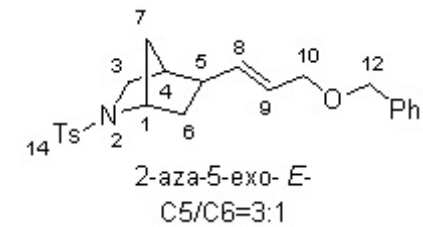
143.4  
138.3  
137.0  
135.8  
129.8  
128.5  
127.9  
127.8  
127.6  
125.8

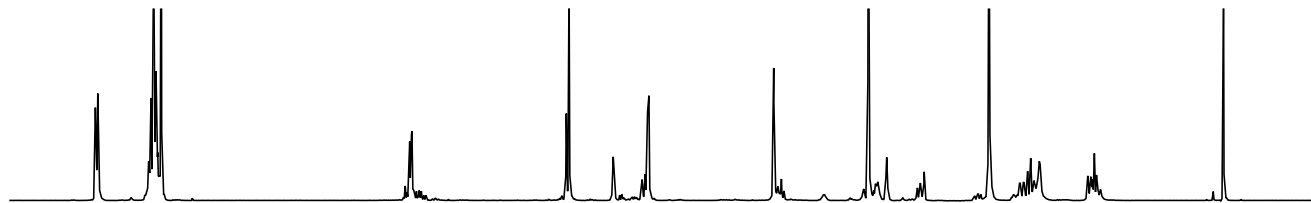
72.4  
70.7  
60.3  
54.2  
43.3  
42.7  
39.0  
34.3  
21.7



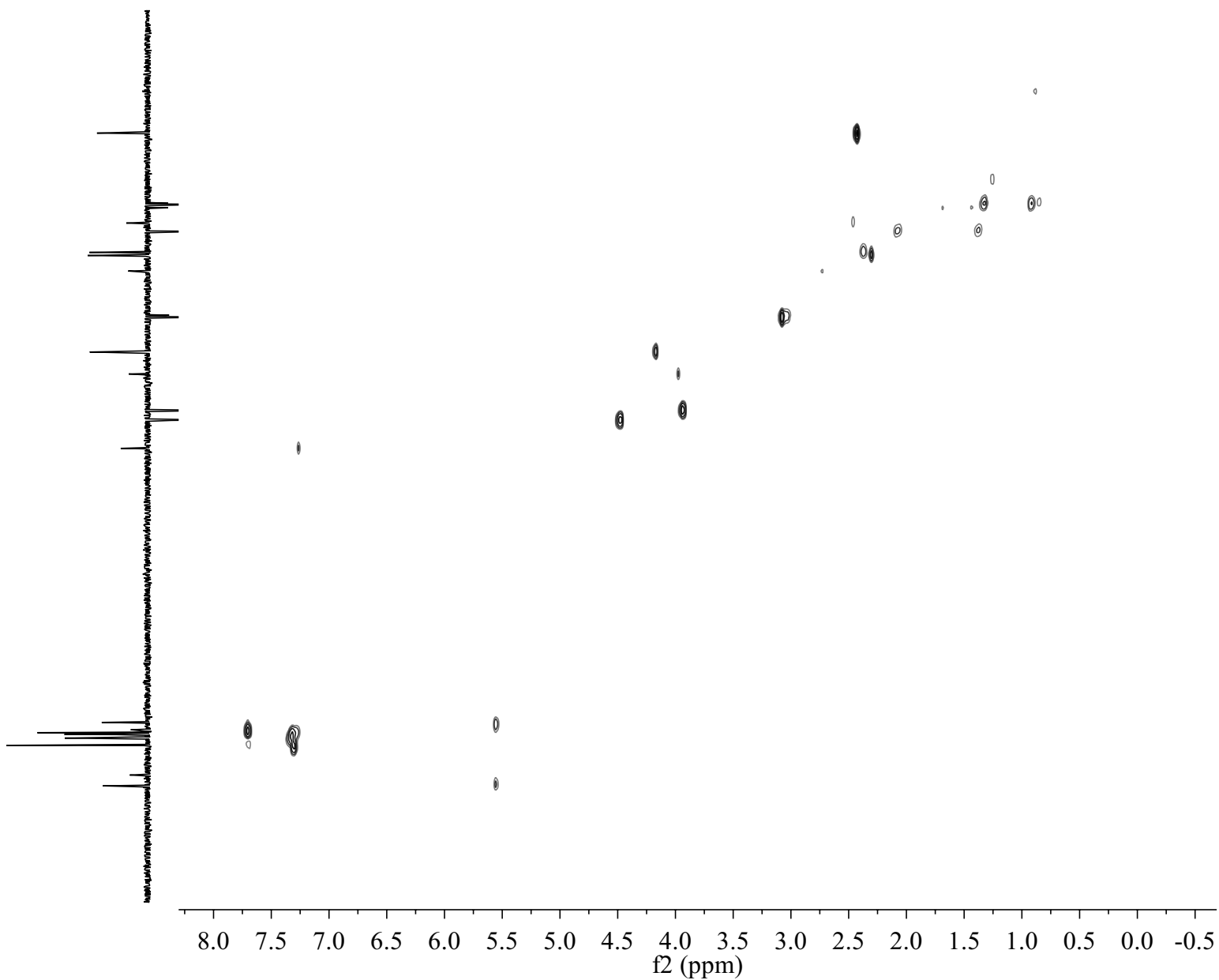
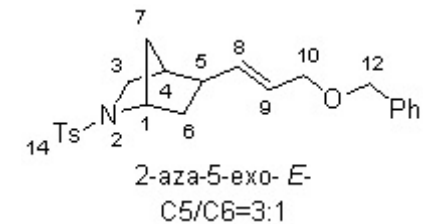
GX-21165-2-27-2.5.fid

Parameter	Value
Title	GX-21165-2-27-2.5.fid
Comment	
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDC13
Temperature	296.1
Pulse Sequence	deptsp135
Experiment	DEPT-135
Number of Scans	64
Receiver Gain	193.1
Relaxation Delay	2.0000
Pulse Width	9.9400
Presaturation Frequency	
Acquisition Time	1.6253
Acquisition Date	2021-09-28T17:51:07
Modification Date	2021-12-29T13:12:22
Spectrometer Frequency	125.77
Spectral Width	20161.3
Lowest Frequency	-20.6
Nucleus	13C
Acquired Size	32768
Spectral Size	65536

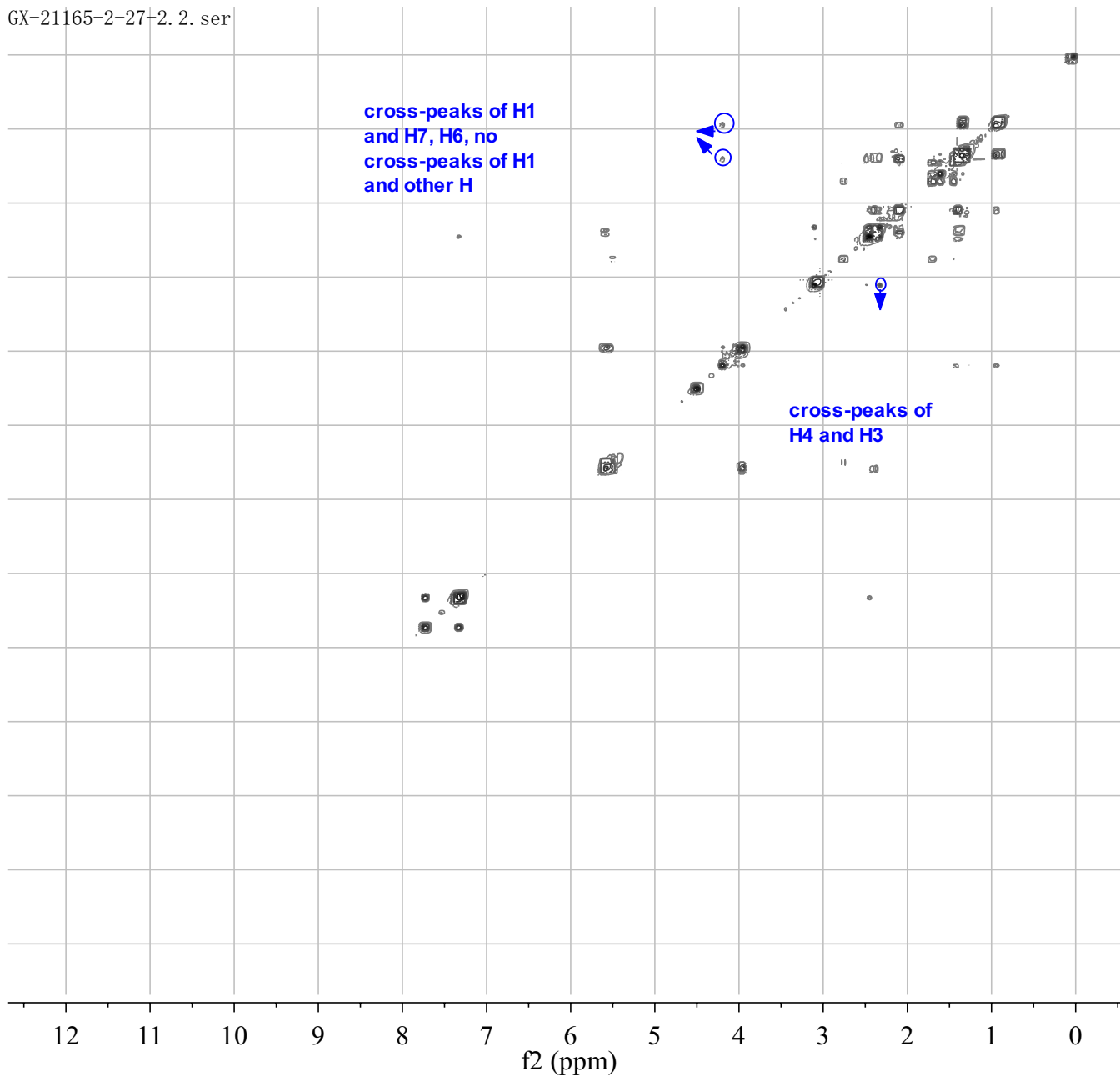
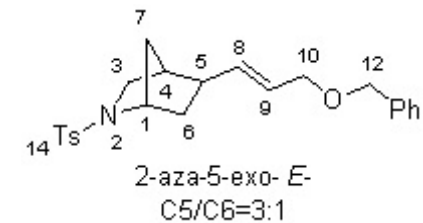
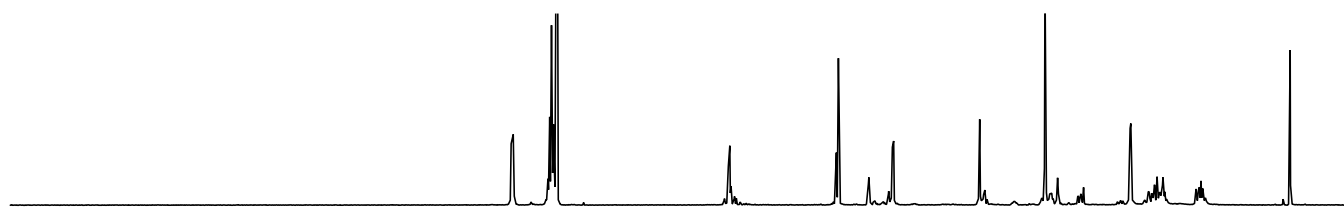




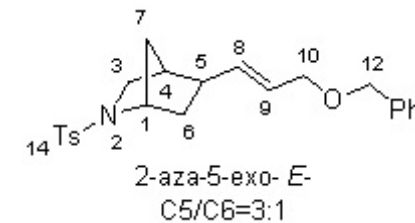
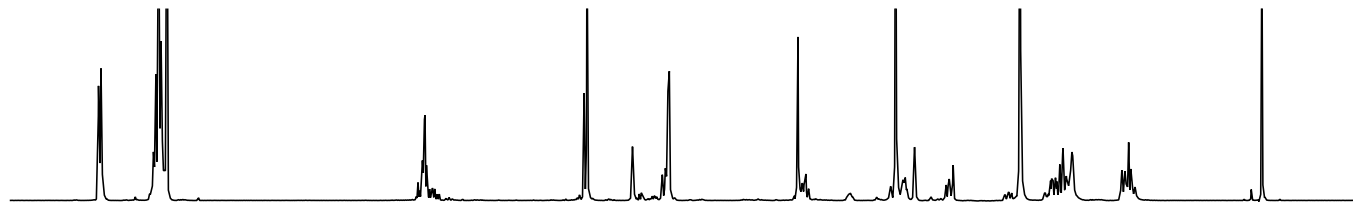
GX-21165-2-27-2.11.ser



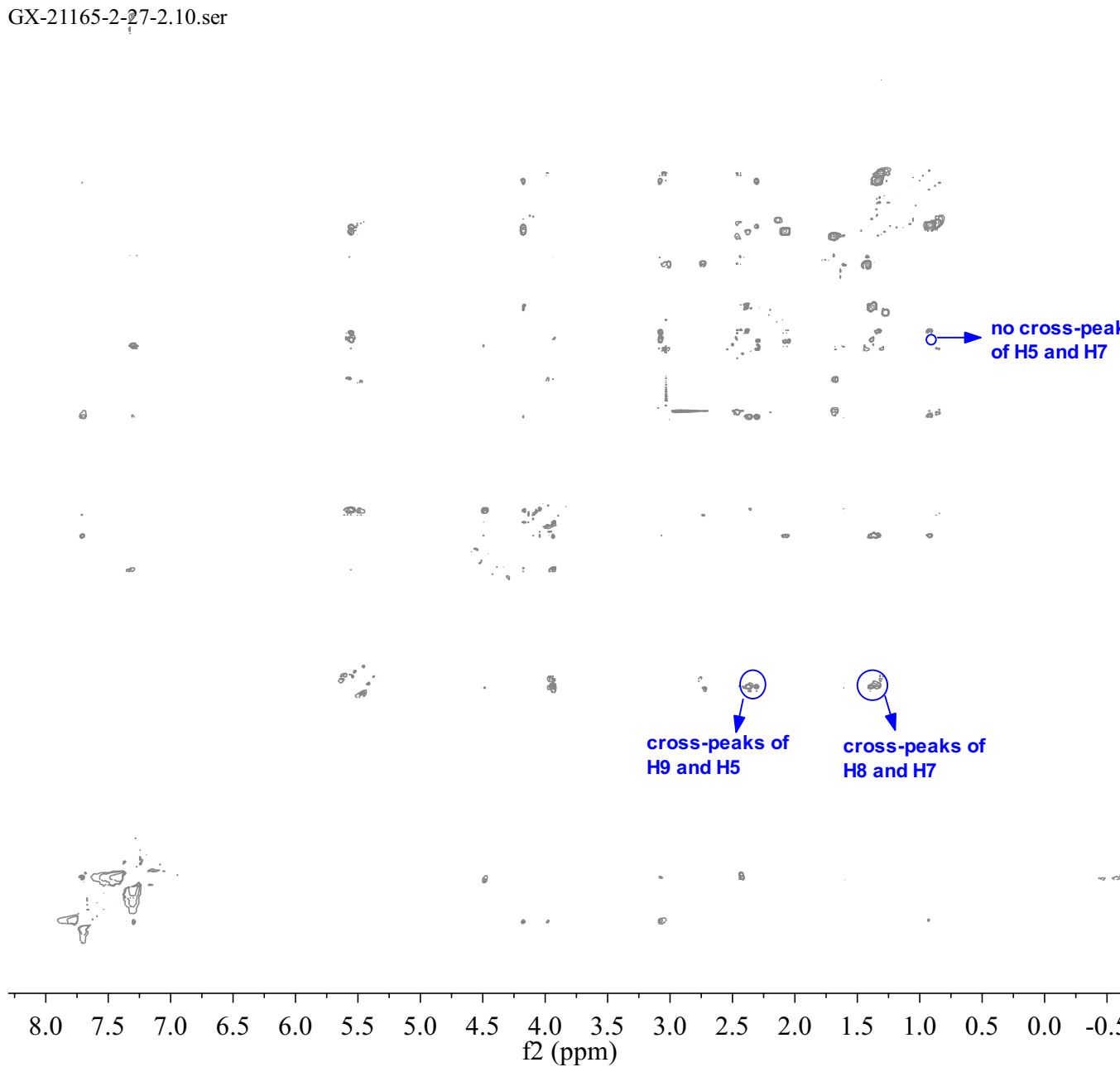
Parameter	Value
Title	GX-21165-2-27-2.11.ser
Comment	
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDCl3
Temperature	296.1
Pulse Sequence	hsqcetgp
Experiment	HSQC
Number of Scans	2
Receiver Gain	193.1
Relaxation Delay	1.4652
Pulse Width	11.3200
Presaturation Frequency	
Acquisition Time	0.1137
Acquisition Date	2021-10-10T15:49:34
Modification Date	2021-10-10T16:01:53
Spectrometer Frequency	(500.13, 125.77)
Spectral Width	(4504.5, 20833.3)
Lowest Frequency	(-352.3, -1039.8)
Nucleus	(1H, 13C)
Acquired Size	(512, 170)
Spectral Size	(512, 512)



Parameter	Value
Title	GX-21165-2-27-2.2.ser
Comment	
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDCl <sub>3</sub>
Temperature	295.5
Pulse Sequence	cosygpppqf
Experiment	COSY
Number of Scans	1
Receiver Gain	196.4
Relaxation Delay	2.0000
Pulse Width	9.1500
Presaturation Frequency	
Acquisition Time	0.1917
Acquisition Date	2021-09-28T14:02:28
Modification Date	2021-12-29T13:12:20
Spectrometer Frequency	(400.13, 400.13)
Spectral Width	(5341.9, 5341.9)
Lowest Frequency	(-265.3, -265.3)
Nucleus	(1H, 1H)
Acquired Size	(1024, 128)
Spectral Size	(1024, 1024)



GX-21165-2-27-2.10.ser

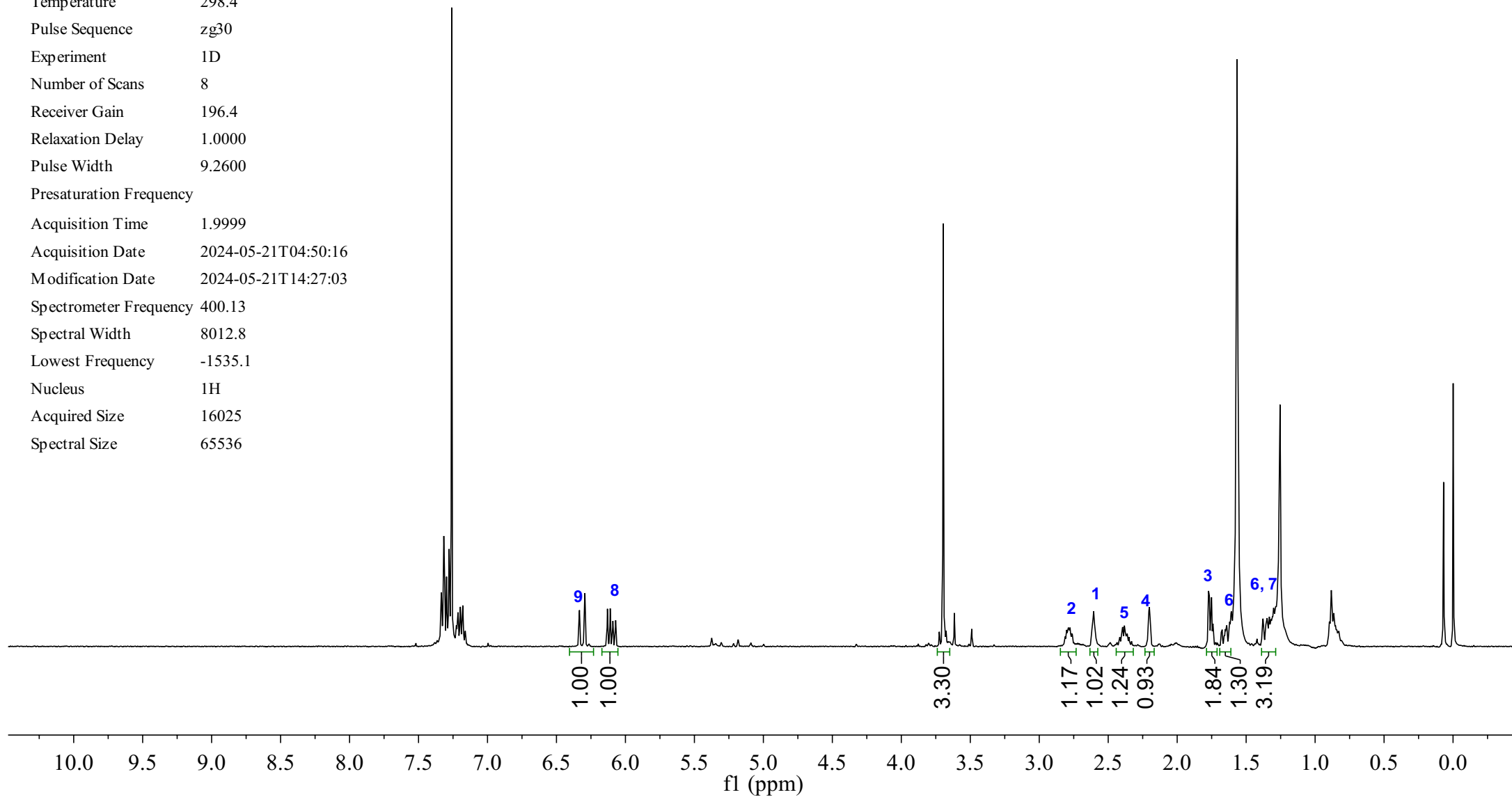
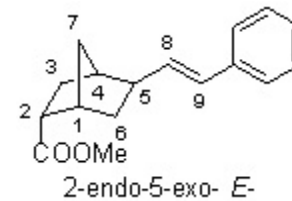


Parameter	Value
Title	GX-21165-2-27-2.10.ser
Comment	
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDCl <sub>3</sub>
Temperature	296.1
Pulse Sequence	noesygp ppp
Experiment	NOESY
Number of Scans	4
Receiver Gain	31.1
Relaxation Delay	1.9775
Pulse Width	11.3200
Presaturation Frequency	
Acquisition Time	0.2273
Acquisition Date	2021-10-10T15:04:26
Modification Date	2021-10-10T16:01:55
Spectrometer Frequency	(500.13, 500.13)
Spectral Width	(4504.5, 4504.5)
Lowest Frequency	(-352.3, -352.3)
Nucleus	( <sup>1</sup> H, <sup>1</sup> H)
Acquired Size	(1024, 256)
Spectral Size	(1024, 1024)

YM-20240429-9-iso-2.1.fid

s55-63

Parameter	Value
Title	YM-20240429-9-iso-2.1.fid
Comment	s55-63
Origin	Bruker BioSpin GmbH
Owner	PC
Site	
Instrument	spect
Solvent	CDC13
Temperature	298.4
Pulse Sequence	zg30
Experiment	1D
Number of Scans	8
Receiver Gain	196.4
Relaxation Delay	1.0000
Pulse Width	9.2600
Presaturation Frequency	
Acquisition Time	1.9999
Acquisition Date	2024-05-21T04:50:16
Modification Date	2024-05-21T14:27:03
Spectrometer Frequency	400.13
Spectral Width	8012.8
Lowest Frequency	-1535.1
Nucleus	1H
Acquired Size	16025
Spectral Size	65536

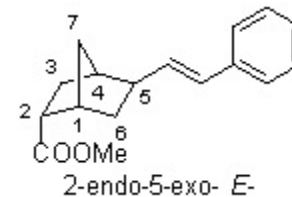




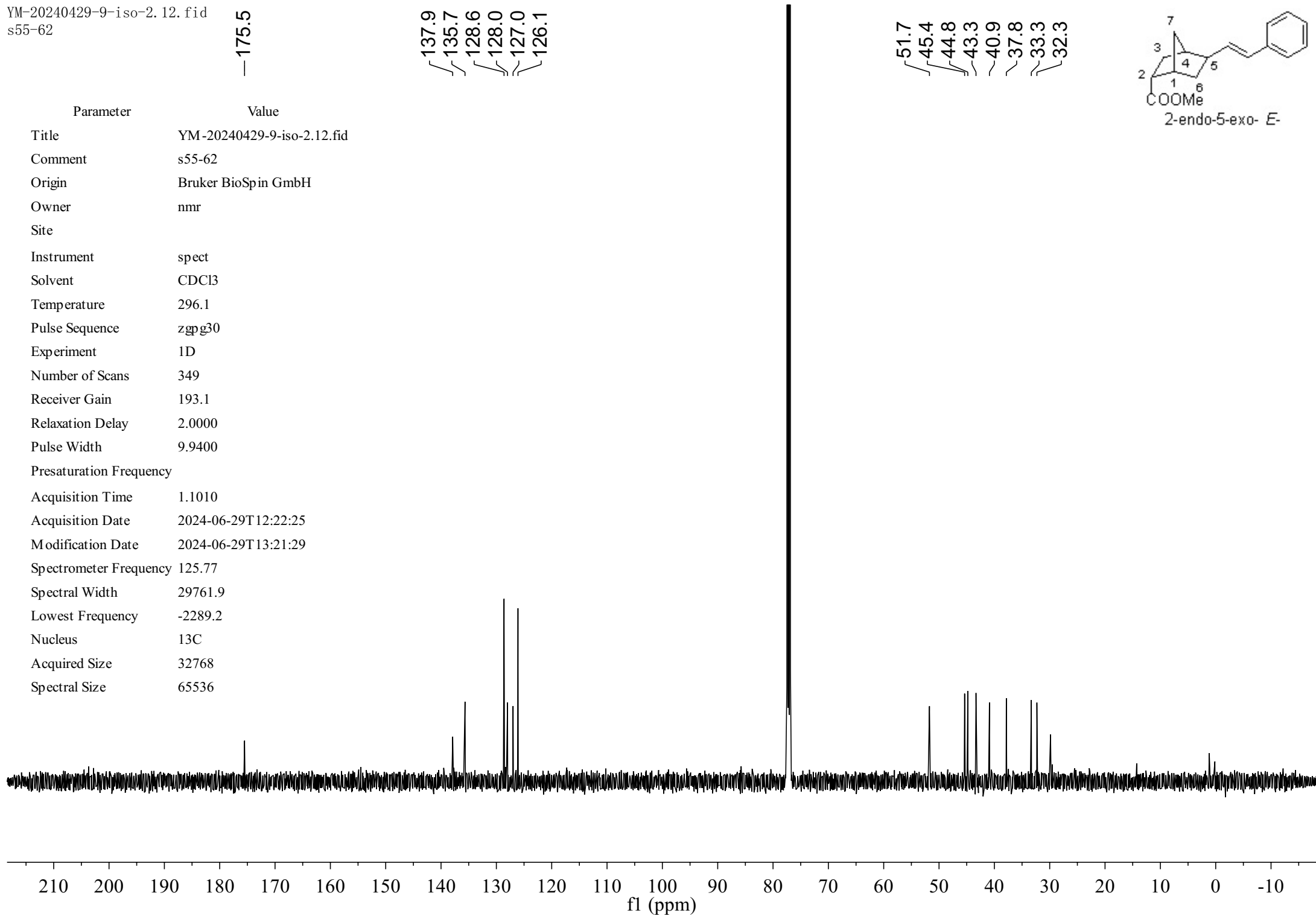
—175.5

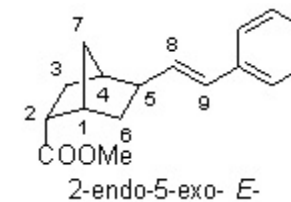
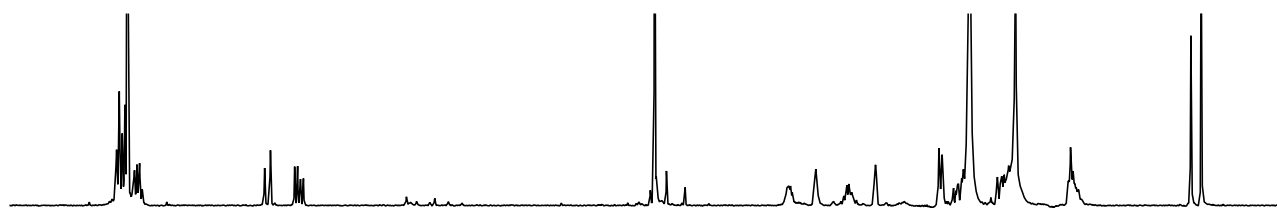
137.9  
135.7  
128.6  
128.0  
127.0  
126.1

51.7  
45.4  
44.8  
43.3  
40.9  
37.8  
33.3  
32.3

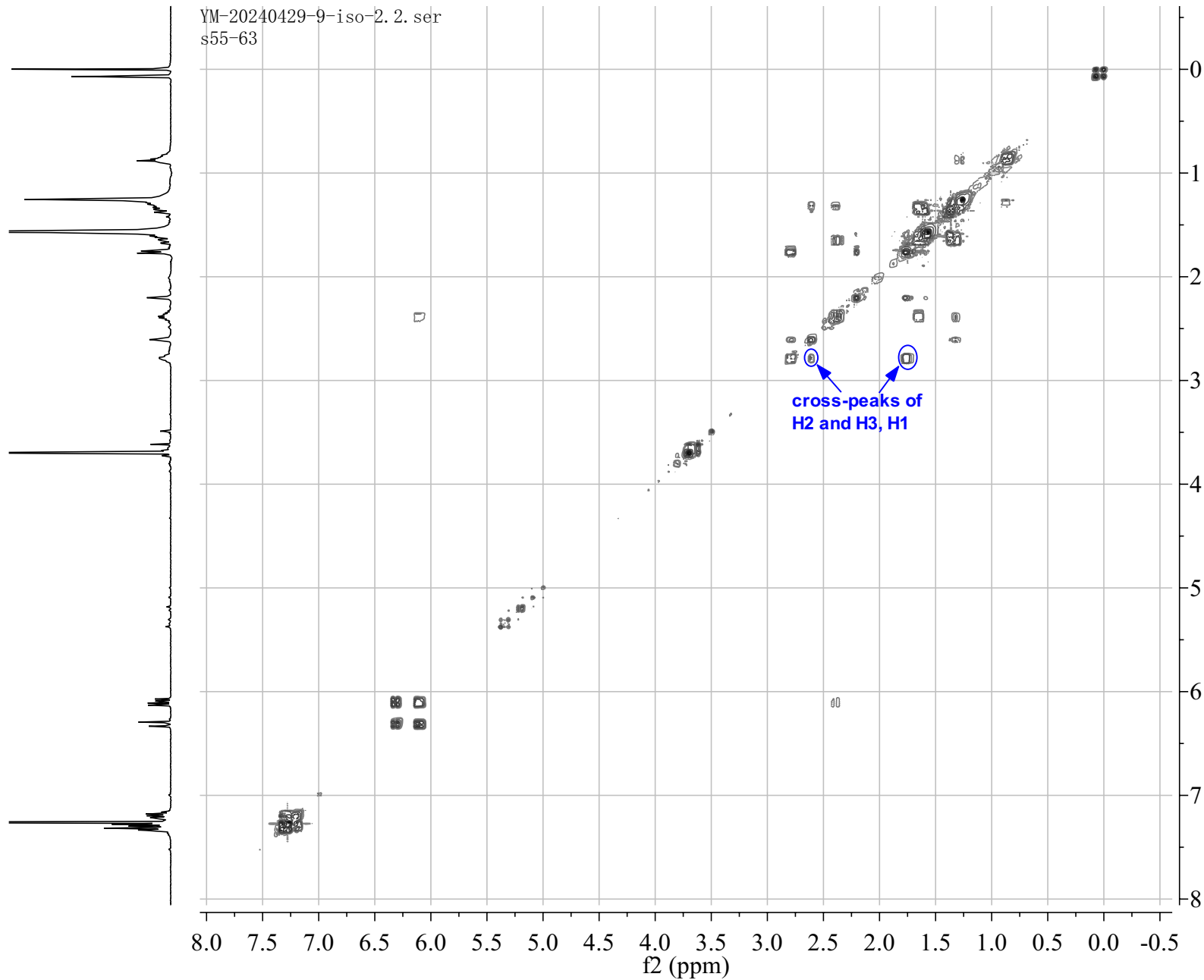


Parameter	Value
Title	YM-20240429-9-iso-2.12.fid
Comment	s55-62
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDCl3
Temperature	296.1
Pulse Sequence	zgpg30
Experiment	1D
Number of Scans	349
Receiver Gain	193.1
Relaxation Delay	2.0000
Pulse Width	9.9400
Presaturation Frequency	
Acquisition Time	1.1010
Acquisition Date	2024-06-29T12:22:25
Modification Date	2024-06-29T13:21:29
Spectrometer Frequency	125.77
Spectral Width	29761.9
Lowest Frequency	-2289.2
Nucleus	<sup>13</sup> C
Acquired Size	32768
Spectral Size	65536

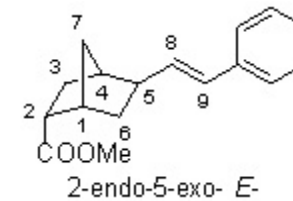
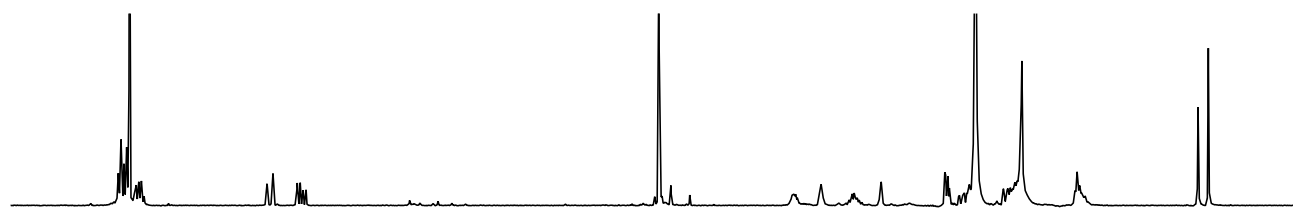




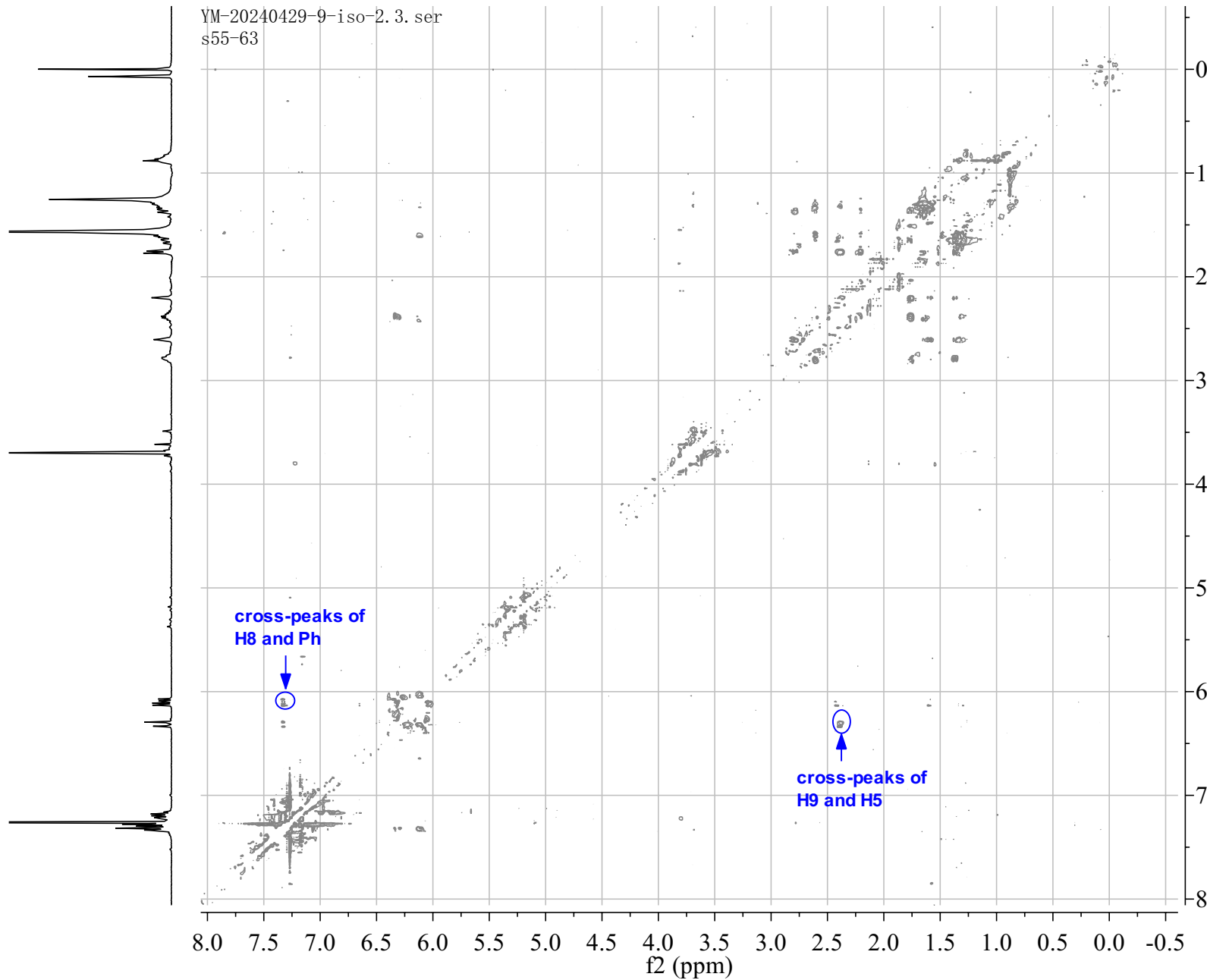
YM-20240429-9-iso-2.2.ser  
s55-63



Parameter	Value
Title	YM-20240429-9-iso-2.2.ser
Comment	s55-63
Origin	Bruker BioSpin GmbH
Owner	PC
Site	
Instrument	spect
Solvent	CDC13
Temperature	298.4
Pulse Sequence	cosygpqqf
Experiment	COSY
Number of Scans	1
Receiver Gain	62.3
Relaxation Delay	1.8968
Pulse Width	9.2600
Presaturation Frequency	
Acquisition Time	0.2949
Acquisition Date	2024-05-21T04:51:11
Modification Date	2024-05-21T14:27:03
Spectrometer Frequency	(400.13, 400.13)
Spectral Width	(3472.2, 3472.2)
Lowest Frequency	(-247.4, -247.4)
Nucleus	(1H, 1H)
Acquired Size	(1024, 128)
Spectral Size	(1024, 1024)



YM-20240429-9-iso-2.3.ser  
s55-63

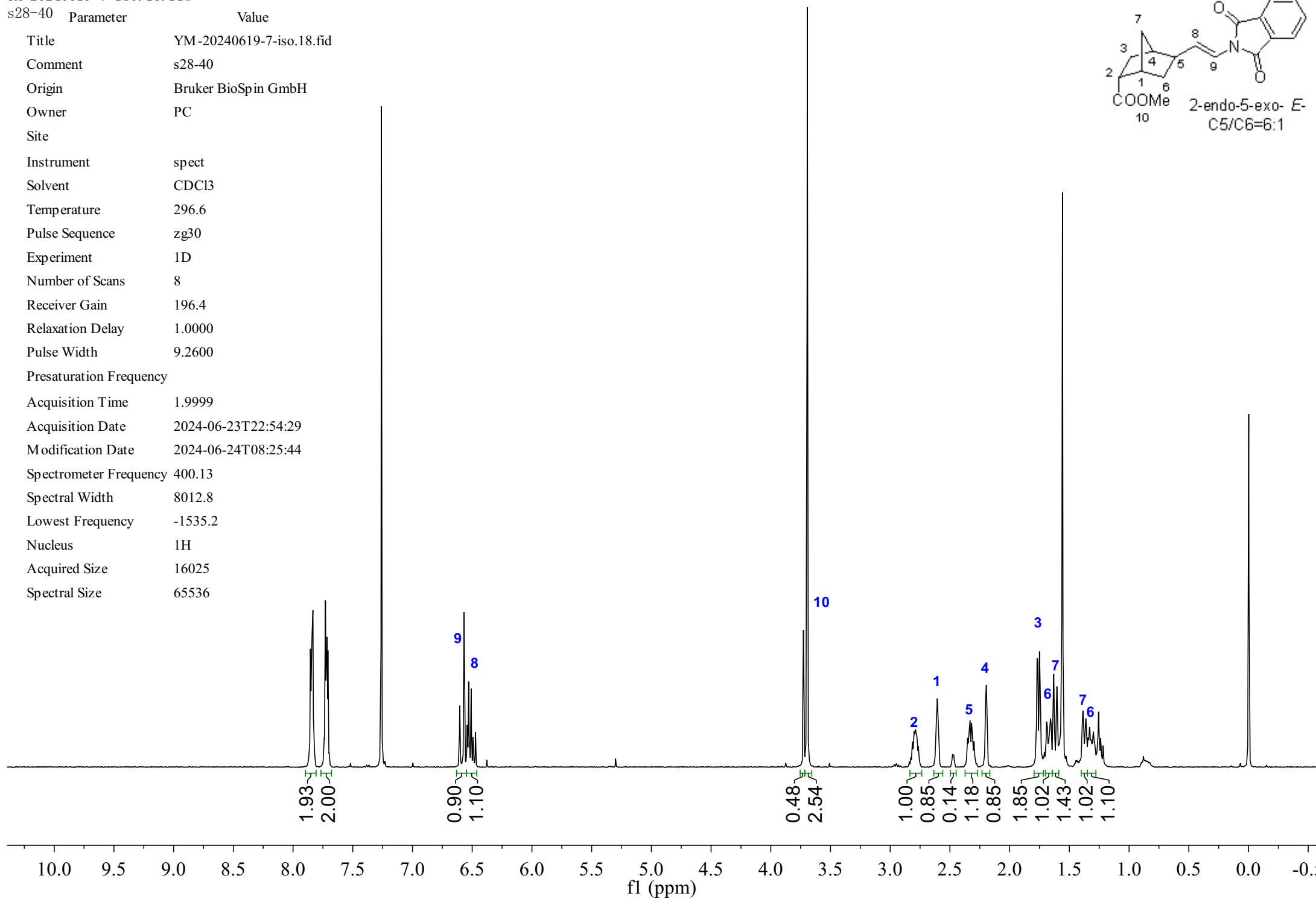
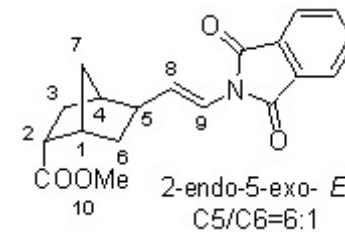


Parameter	Value
Title	YM-20240429-9-iso-2.3.ser
Comment	s55-63
Origin	Bruker BioSpin GmbH
Owner	PC
Site	
Instrument	spect
Solvent	CDCl3
Temperature	298.3
Pulse Sequence	noesygp phpp
Experiment	NOESY
Number of Scans	4
Receiver Gain	62.3
Relaxation Delay	1.9611
Pulse Width	9.2600
Presaturation Frequency	
Acquisition Time	0.2949
Acquisition Date	2024-05-21T04:58:07
Modification Date	2024-05-21T14:27:04
Spectrometer Frequency	(400.13, 400.13)
Spectral Width	(3472.2, 3472.2)
Lowest Frequency	(-247.4, -247.4)
Nucleus	(1H, 1H)
Acquired Size	(1024, 256)
Spectral Size	(1024, 1024)

YM-20240619-7-iso. 18. fid

s28-40 Parameter Value

Title YM-20240619-7-iso.18.fid  
Comment s28-40  
Origin Bruker BioSpin GmbH  
Owner PC  
Site  
Instrument spect  
Solvent CDCl3  
Temperature 296.6  
Pulse Sequence zg30  
Experiment 1D  
Number of Scans 8  
Receiver Gain 196.4  
Relaxation Delay 1.0000  
Pulse Width 9.2600  
Presaturation Frequency  
Acquisition Time 1.9999  
Acquisition Date 2024-06-23T22:54:29  
Modification Date 2024-06-24T08:25:44  
Spectrometer Frequency 400.13  
Spectral Width 8012.8  
Lowest Frequency -1535.2  
Nucleus 1H  
Acquired Size 16025  
Spectral Size 65536

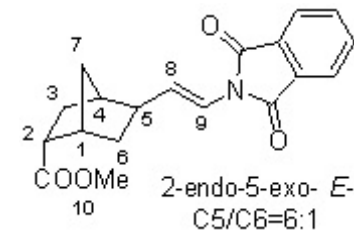


YM-20240619-7-iso.12.fid  
s28-40

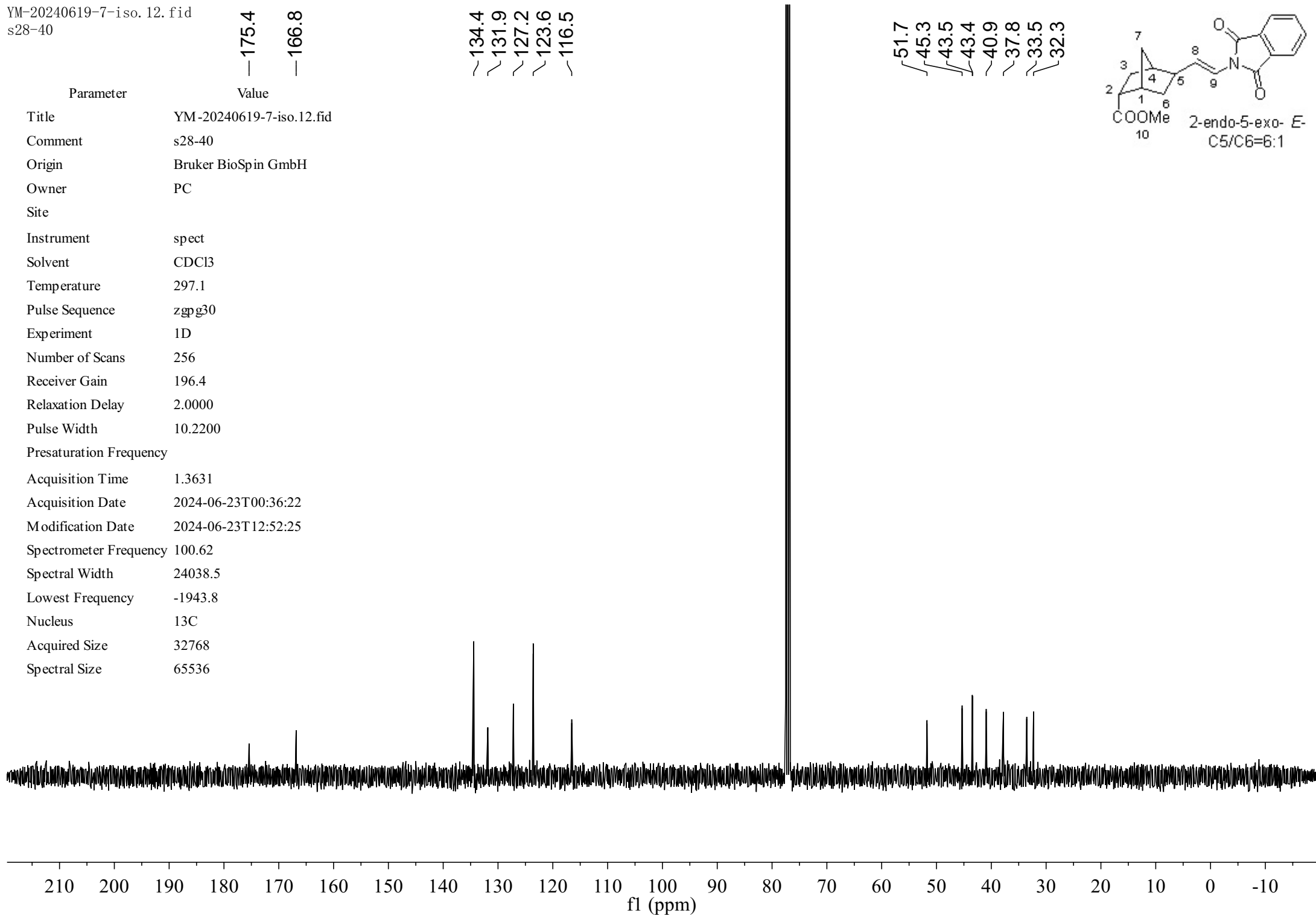
— 175.4  
— 166.8

~ 134.4  
~ 131.9  
~ 127.2  
~ 123.6  
~ 116.5

51.7  
45.3  
43.5  
43.4  
40.9  
37.8  
33.5  
32.3

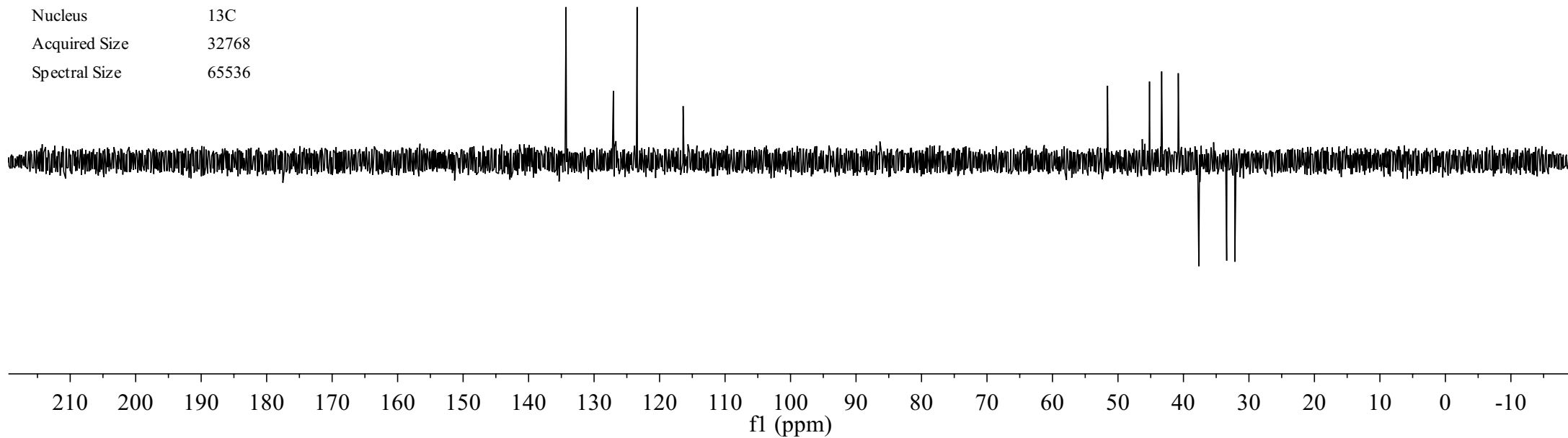
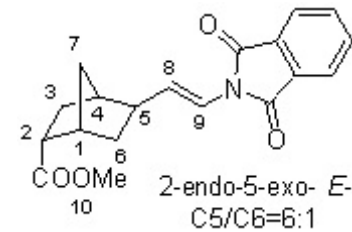


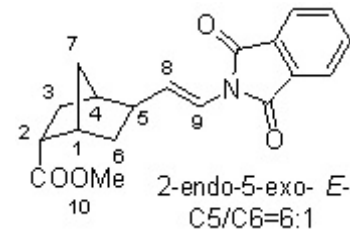
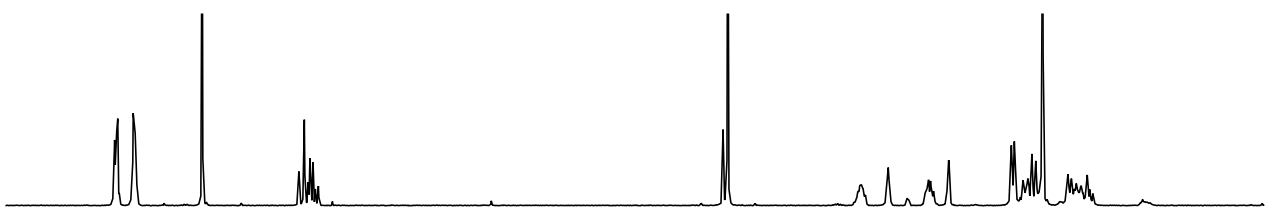
Parameter	Value
Title	YM-20240619-7-iso.12.fid
Comment	s28-40
Origin	Bruker BioSpin GmbH
Owner	PC
Site	
Instrument	spect
Solvent	CDC13
Temperature	297.1
Pulse Sequence	zgpg30
Experiment	1D
Number of Scans	256
Receiver Gain	196.4
Relaxation Delay	2.0000
Pulse Width	10.2200
Presaturation Frequency	
Acquisition Time	1.3631
Acquisition Date	2024-06-23T00:36:22
Modification Date	2024-06-23T12:52:25
Spectrometer Frequency	100.62
Spectral Width	24038.5
Lowest Frequency	-1943.8
Nucleus	13C
Acquired Size	32768
Spectral Size	65536



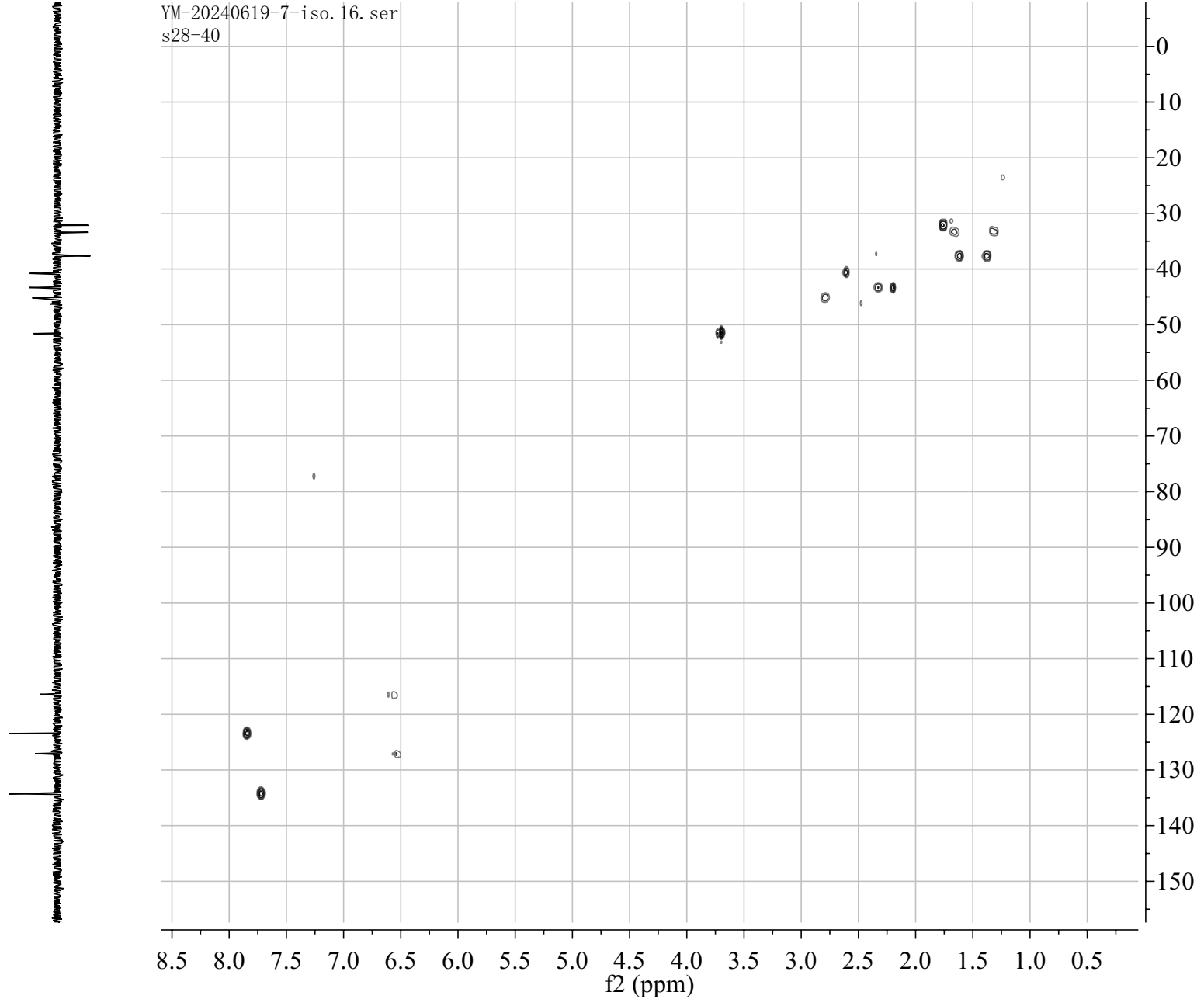
YM-20240619-7-iso.13.fid

Parameter	Value
Title	YM-20240619-7-iso.13.fid
Comment	s28-40
Origin	Bruker BioSpin GmbH
Owner	PC
Site	
Instrument	spect
Solvent	CDC13
Temperature	296.9
Pulse Sequence	depts135
Experiment	DEPT-135
Number of Scans	128
Receiver Gain	196.4
Relaxation Delay	2.0000
Pulse Width	10.2200
Presaturation Frequency	
Acquisition Time	1.3631
Acquisition Date	2024-06-23T00:51:27
Modification Date	2024-06-23T12:52:26
Spectrometer Frequency	100.62
Spectral Width	24038.5
Lowest Frequency	-1958.0
Nucleus	<sup>13</sup> C
Acquired Size	32768
Spectral Size	65536

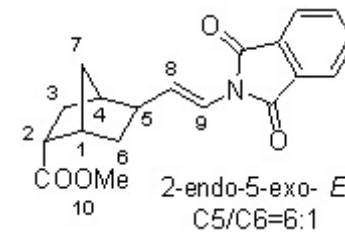
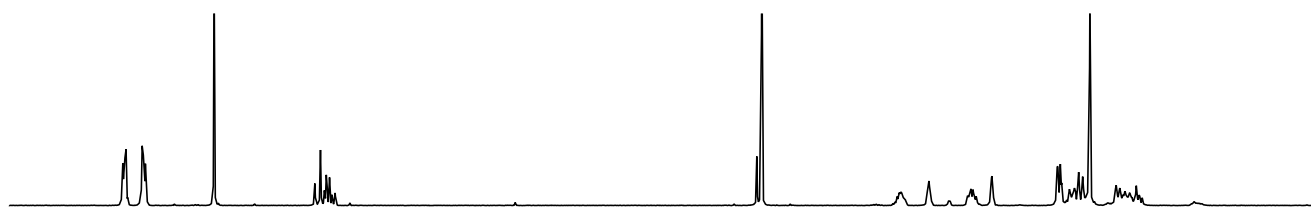




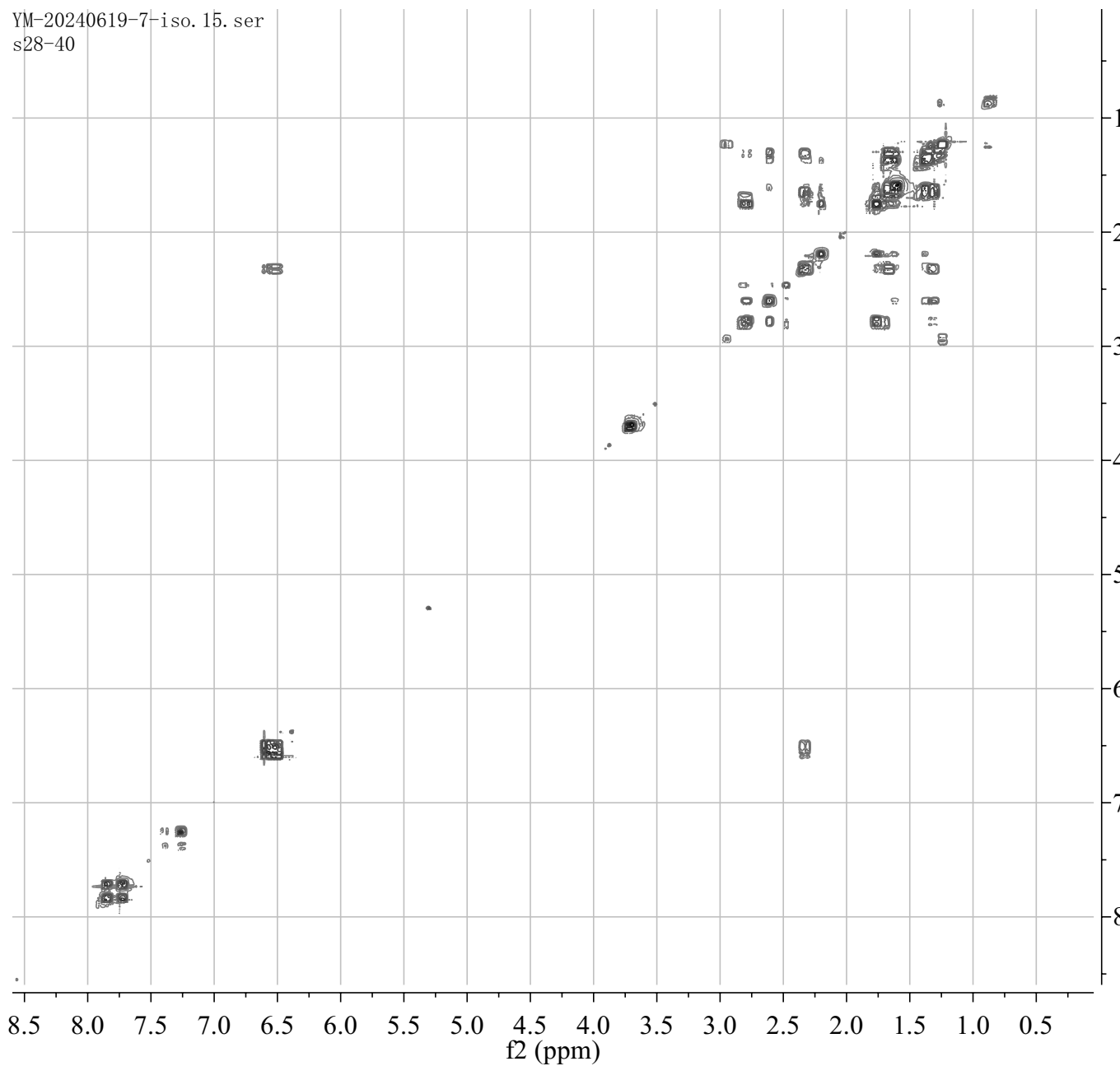
YM-20240619-7-iso.16.ser  
s28-40



Parameter	Value
Title	YM-20240619-7-iso.16.ser
Comment	s28-40
Origin	Bruker BioSpin GmbH
Owner	PC
Site	
Instrument	spect
Solvent	CDCl3
Temperature	296.8
Pulse Sequence	hsqcetgp
Experiment	HSQC
Number of Scans	2
Receiver Gain	196.4
Relaxation Delay	1.4490
Pulse Width	9.2600
Presaturation Frequency	
Acquisition Time	0.1495
Acquisition Date	2024-06-23T01:06:54
Modification Date	2024-06-23T12:52:27
Spectrometer Frequency	(400.13, 100.62)
Spectral Width	(3424.7, 16666.7)
Lowest Frequency	(14.8, -829.1)
Nucleus	(1H, 13C)
Acquired Size	(512, 256)
Spectral Size	(512, 512)

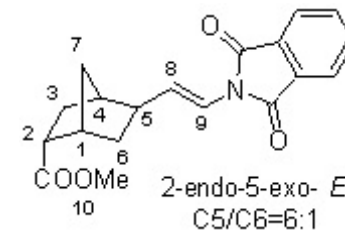
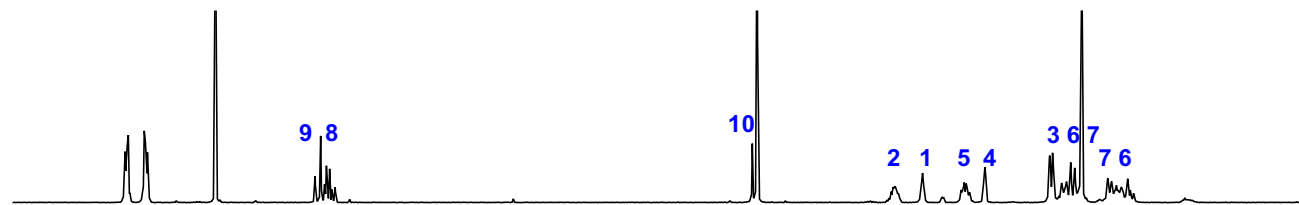


YM-20240619-7-iso. 15. ser  
s28-40

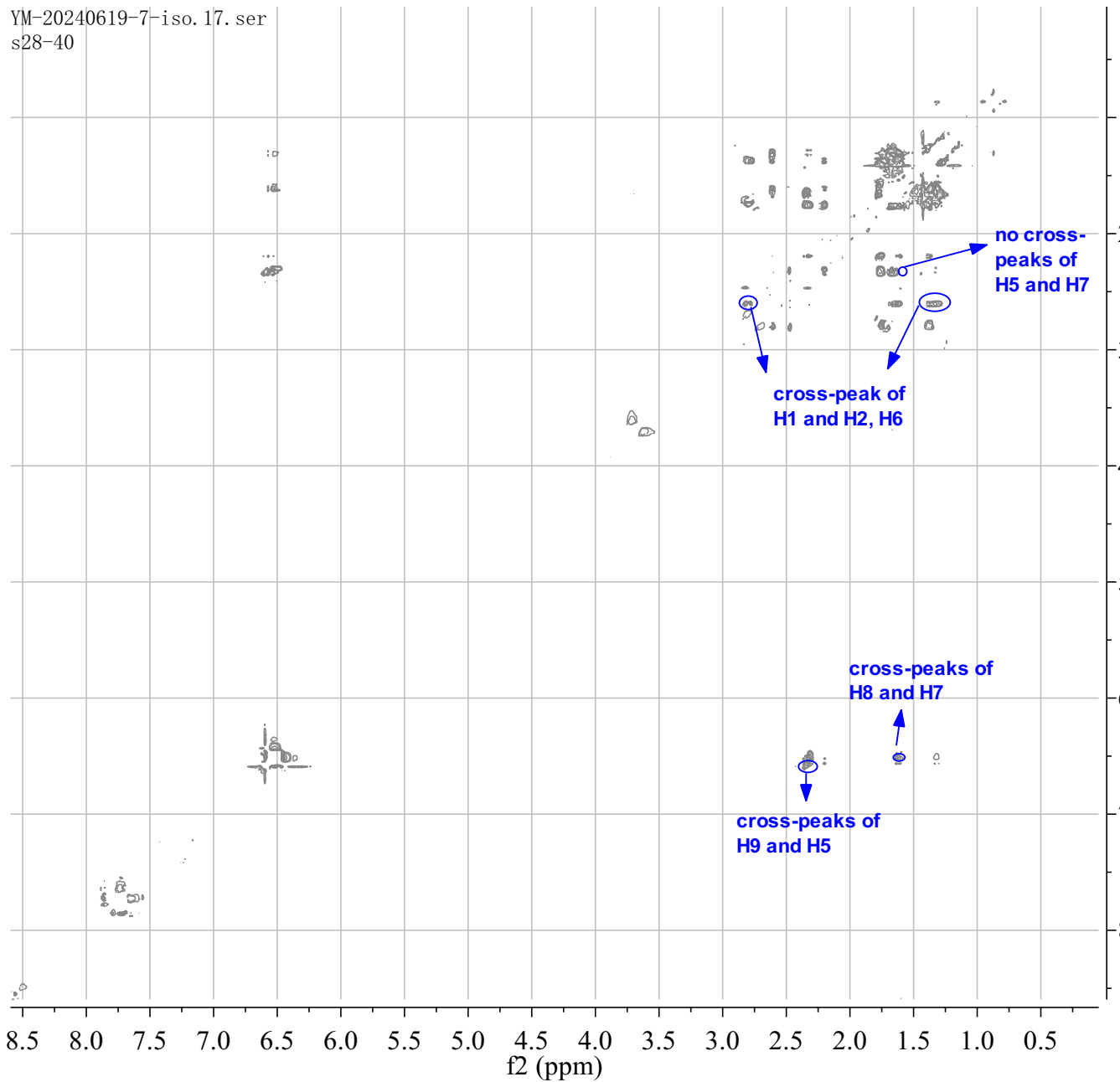


Parameter	Value
Title	YM-20240619-7-iso.15.ser
Comment	s28-40
Origin	Bruker BioSpin GmbH
Owner	PC
Site	
Instrument	spect
Solvent	CDCI3
Temperature	296.7
Pulse Sequence	cosygpppqf
Experiment	COSY
Number of Scans	1
Receiver Gain	62.3
Relaxation Delay	1.8927
Pulse Width	9.2600
Presaturation Frequency	
Acquisition Time	0.2990
Acquisition Date	2024-06-23T01:00:48
Modification Date	2024-06-23T12:52:26
Spectrometer Frequency	(400.13, 400.13)
Spectral Width	(3424.7, 3424.7)
Lowest Frequency	(14.8, 14.8)
Nucleus	(1H, 1H)
Acquired Size	(1024, 128)
Spectral Size	(1024, 1024)



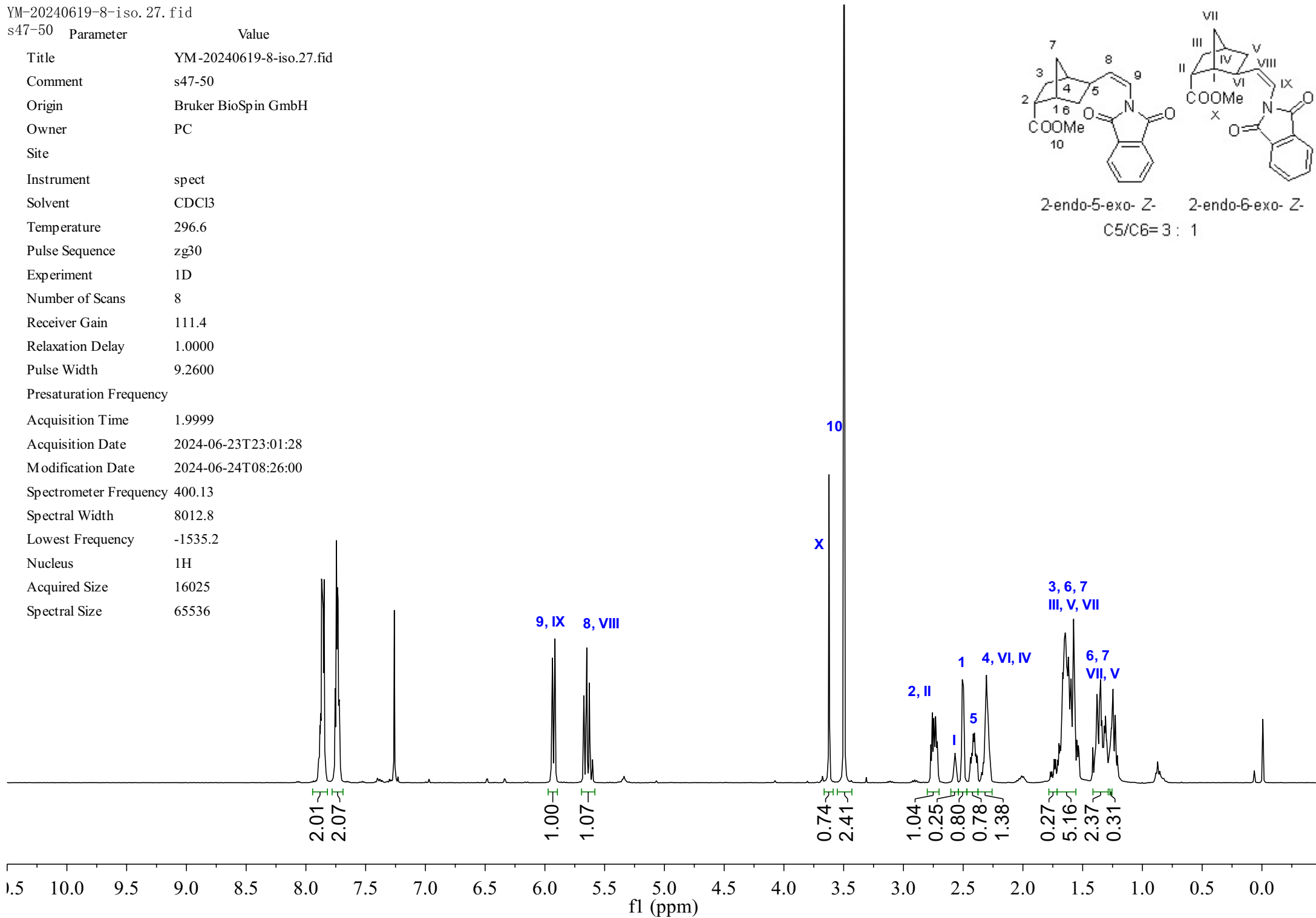
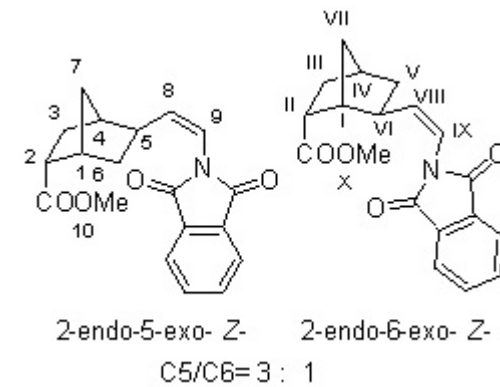


YM-20240619-7-iso.17.ser  
s28-40



Parameter	Value
Title	YM-20240619-7-iso.17.ser
Comment	s28-40
Origin	Bruker BioSpin GmbH
Owner	PC
Site	
Instrument	spect
Solvent	CDC13
Temperature	296.6
Pulse Sequence	noesygp.php
Experiment	NOESY
Number of Scans	4
Receiver Gain	62.3
Relaxation Delay	1.9570
Pulse Width	9.2600
Presaturation Frequency	
Acquisition Time	0.2990
Acquisition Date	2024-06-23T01:22:48
Modification Date	2024-06-23T12:52:27
Spectrometer Frequency	(400.13, 400.13)
Spectral Width	(3424.7, 3424.7)
Lowest Frequency	(14.9, 14.9)
Nucleus	(1H, 1H)
Acquired Size	(1024, 256)
Spectral Size	(1024, 1024)

Parameter	Value
Title	YM-20240619-8-iso.27.fid
Comment	s47-50
Origin	Bruker BioSpin GmbH
Owner	PC
Site	
Instrument	spect
Solvent	CDC13
Temperature	296.6
Pulse Sequence	zg30
Experiment	1D
Number of Scans	8
Receiver Gain	111.4
Relaxation Delay	1.0000
Pulse Width	9.2600
Presaturation Frequency	
Acquisition Time	1.9999
Acquisition Date	2024-06-23T23:01:28
Modification Date	2024-06-24T08:26:00
Spectrometer Frequency	400.13
Spectral Width	8012.8
Lowest Frequency	-1535.2
Nucleus	1H
Acquired Size	16025
Spectral Size	65536

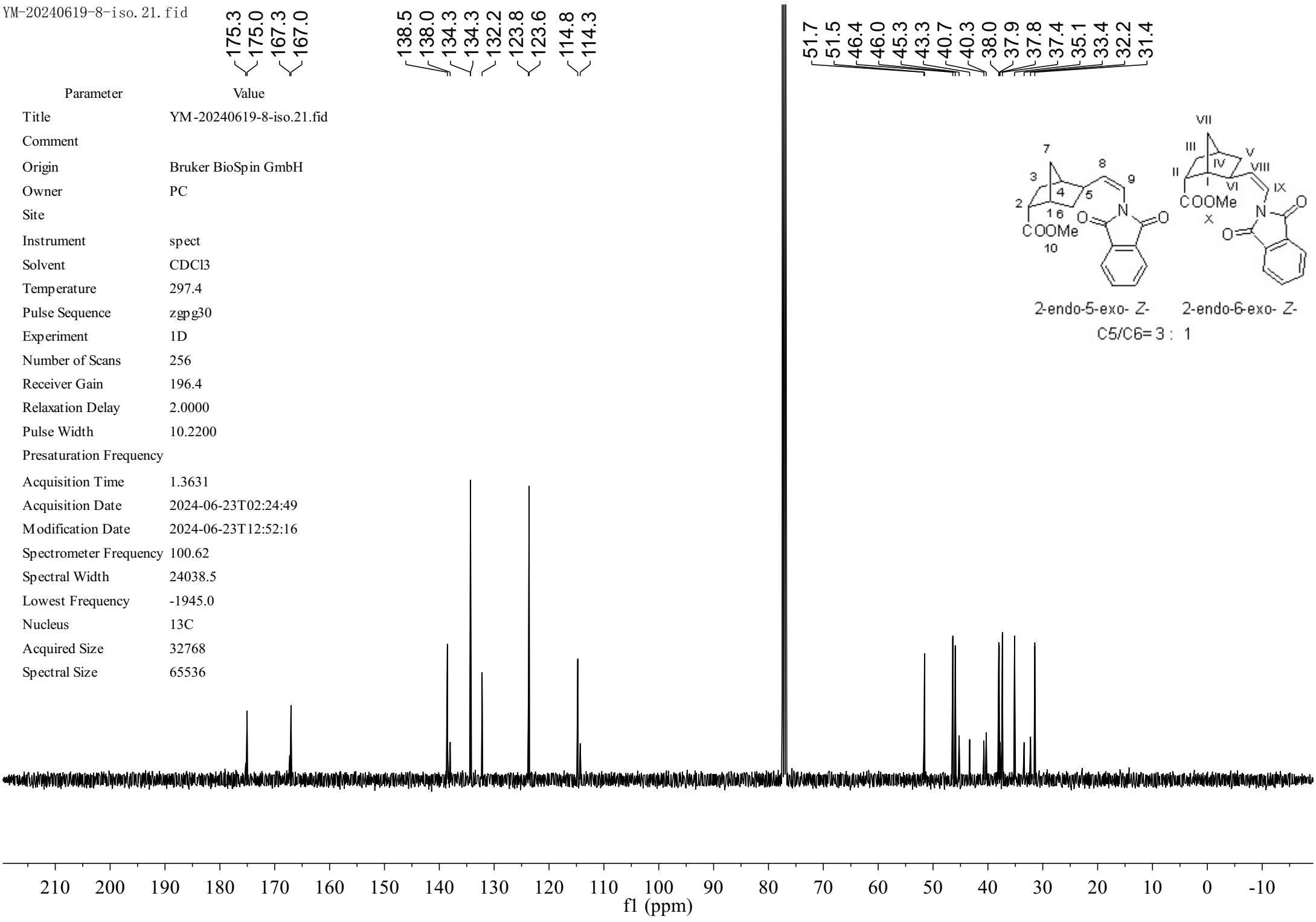
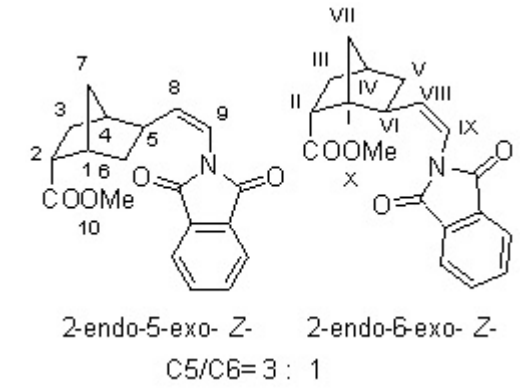


175.3  
175.0  
167.3  
167.0

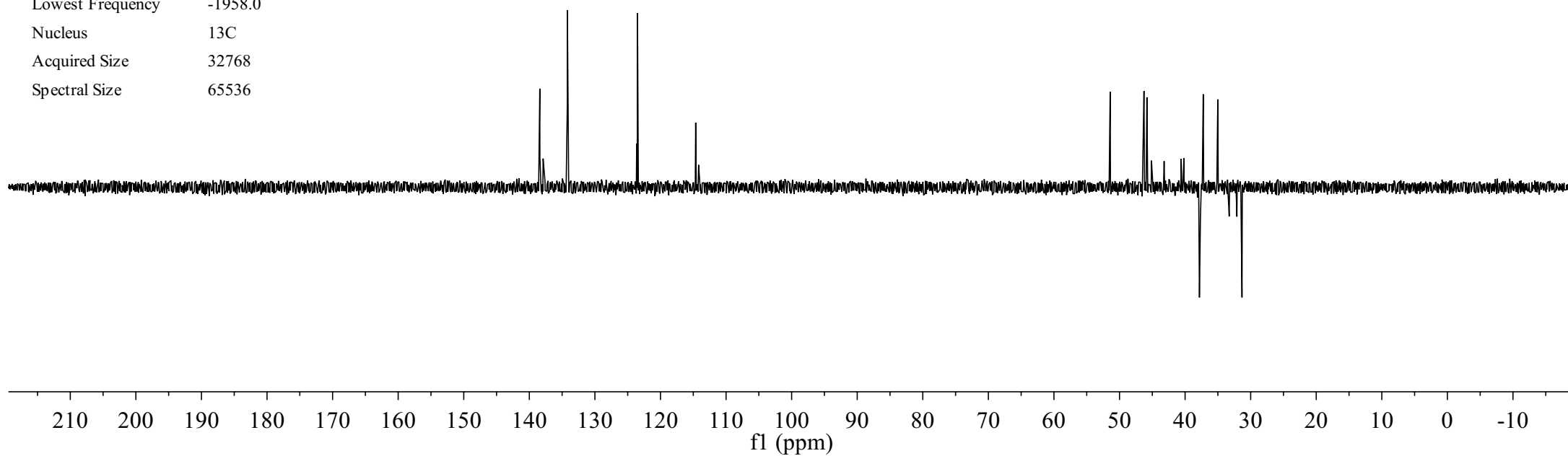
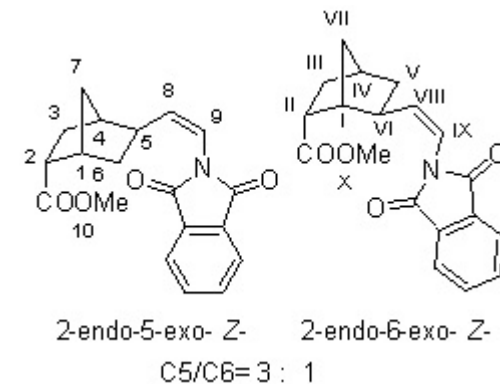
138.5  
138.0  
134.3  
134.3  
132.2  
123.8  
123.6  
114.8  
114.3

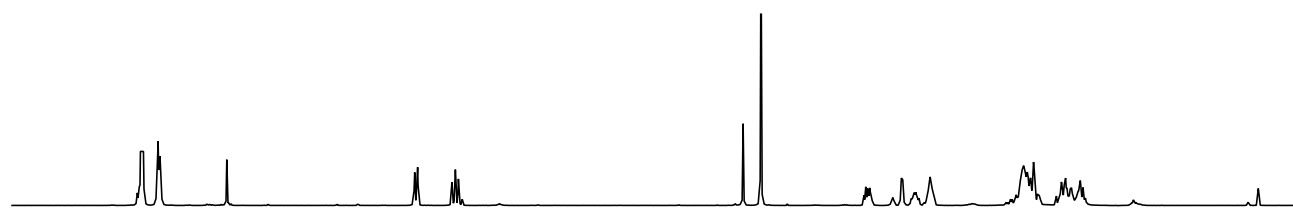
51.7  
51.5  
46.4  
46.0  
45.3  
43.3  
40.7  
40.3  
38.0  
37.9  
37.8  
37.4  
35.1  
33.4  
32.2  
31.4

Parameter	Value
Title	YM-20240619-8-iso.21.fid
Comment	
Origin	Bruker BioSpin GmbH
Owner	PC
Site	
Instrument	spect
Solvent	CDC13
Temperature	297.4
Pulse Sequence	zpgg30
Experiment	1D
Number of Scans	256
Receiver Gain	196.4
Relaxation Delay	2.0000
Pulse Width	10.2200
Presaturation Frequency	
Acquisition Time	1.3631
Acquisition Date	2024-06-23T02:24:49
Modification Date	2024-06-23T12:52:16
Spectrometer Frequency	100.62
Spectral Width	24038.5
Lowest Frequency	-1945.0
Nucleus	13C
Acquired Size	32768
Spectral Size	65536

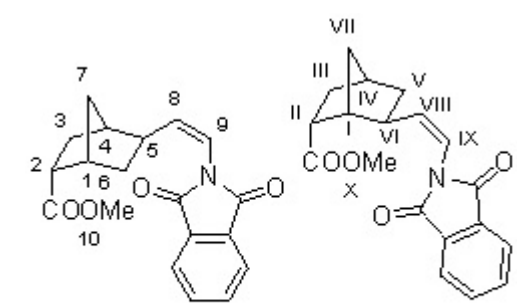
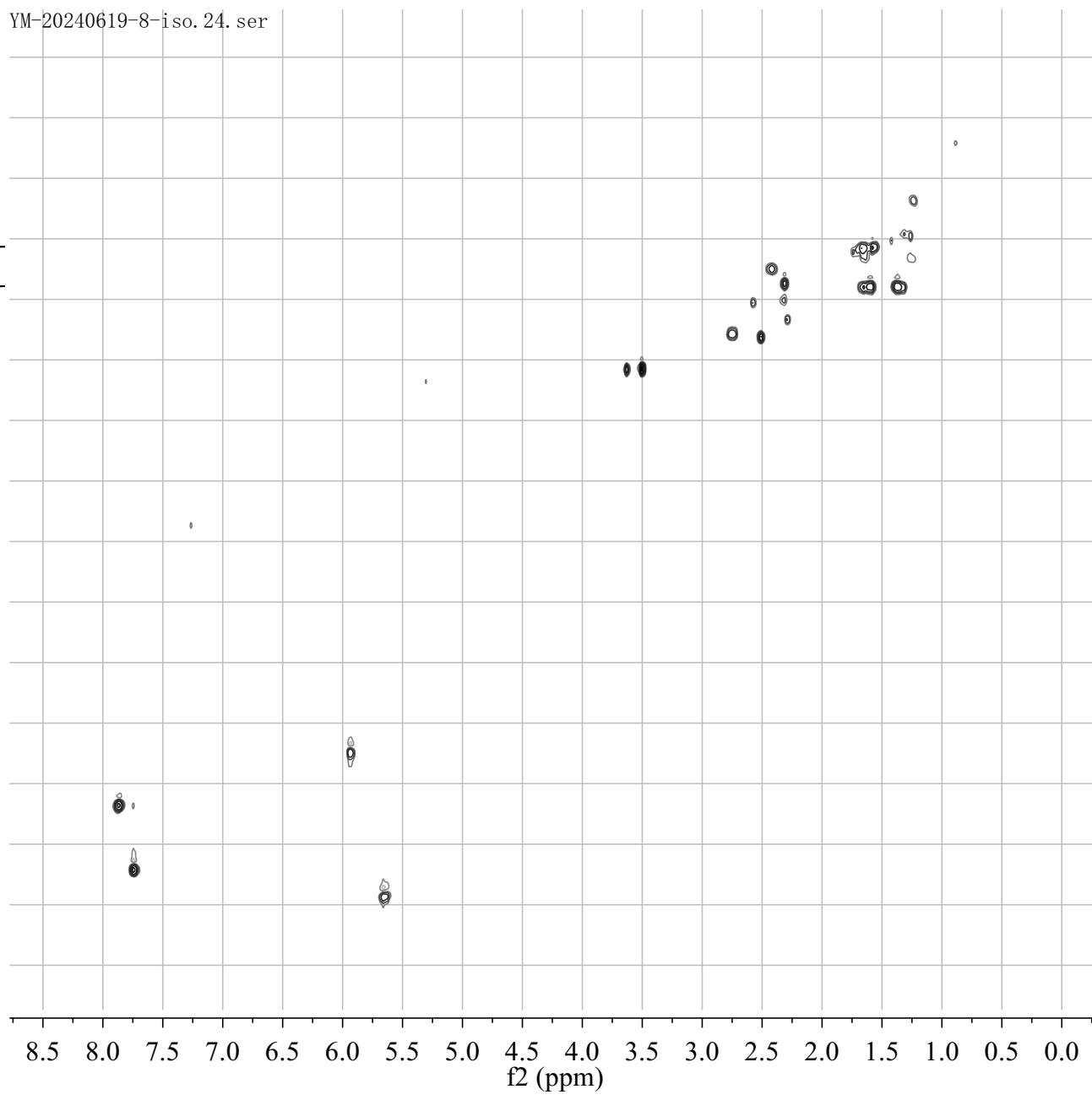


Parameter	Value
Title	YM-20240619-8-iso.26.fid
Comment	s47-50
Origin	Bruker BioSpin GmbH
Owner	PC
Site	
Instrument	spect
Solvent	CDC13
Temperature	296.7
Pulse Sequence	deptsq 135
Experiment	DEPT-135
Number of Scans	64
Receiver Gain	196.4
Relaxation Delay	2.0000
Pulse Width	10.2200
Presaturation Frequency	
Acquisition Time	1.3631
Acquisition Date	2024-06-23T12:13:38
Modification Date	2024-06-23T12:52:18
Spectrometer Frequency	100.62
Spectral Width	24038.5
Lowest Frequency	-1958.0
Nucleus	<sup>13</sup> C
Acquired Size	32768
Spectral Size	65536



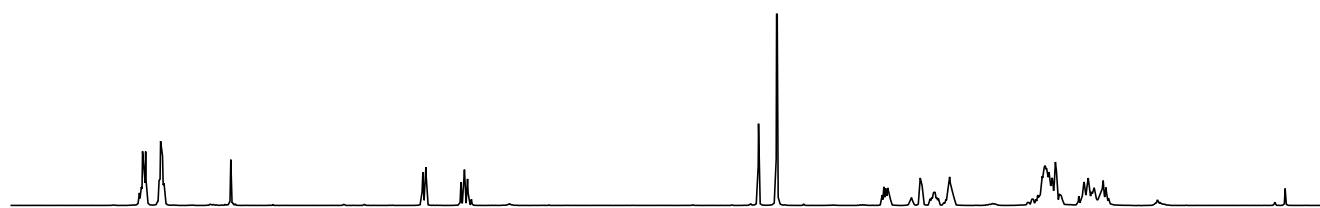


YM-20240619-8-iso.24.ser

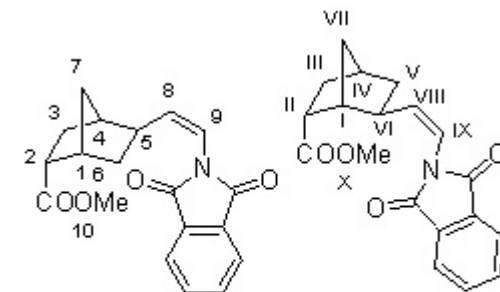
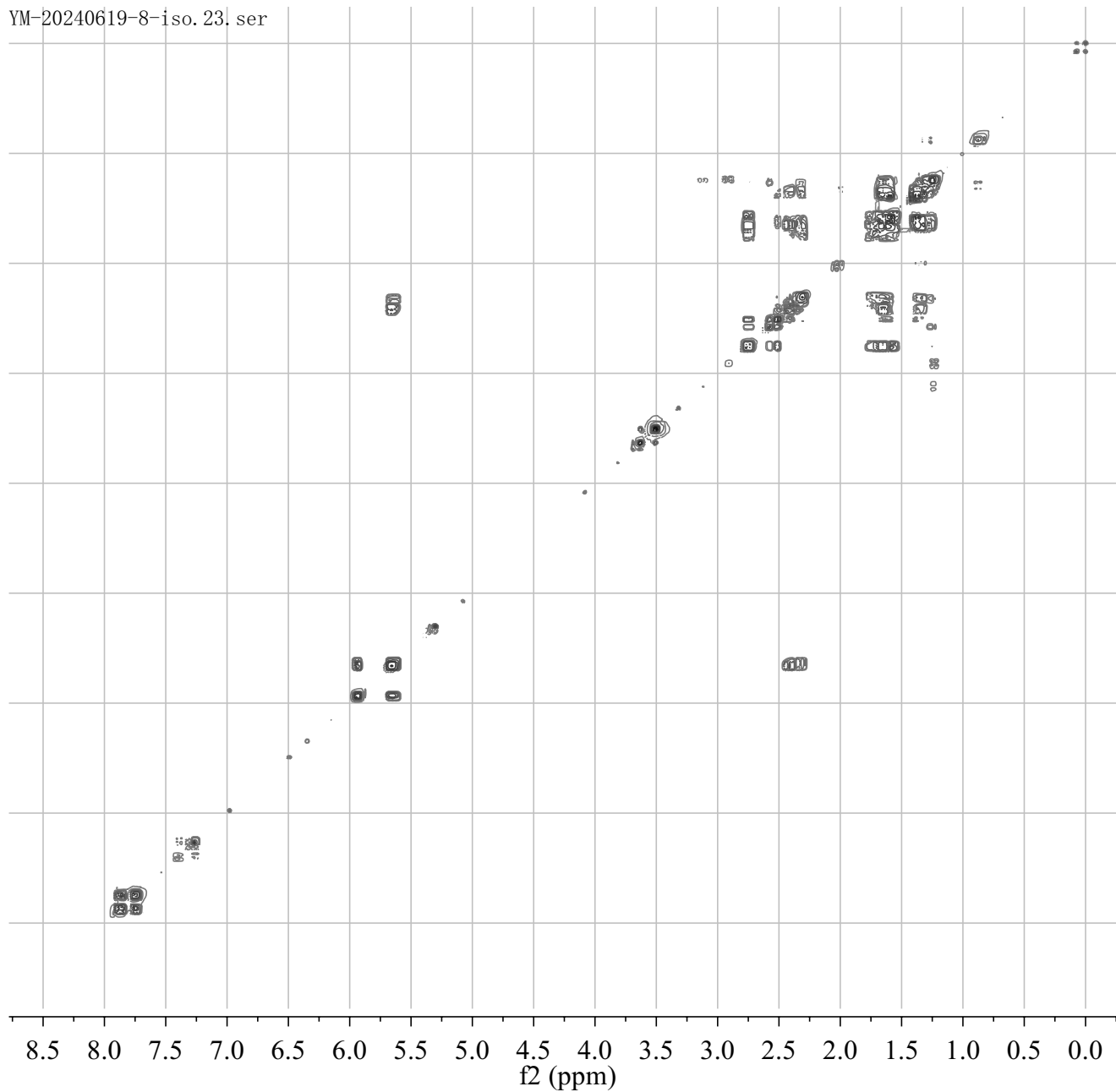


2-endo-5-exo-Z- 2-endo-6-exo-Z-  
C5/C6= 3 : 1

Parameter	Value
Title	YM-20240619-8-iso.24.ser
Comment	
Origin	Bruker BioSpin GmbH
Owner	PC
Site	
Instrument	spect
Solvent	CDC13
Temperature	297.2
Pulse Sequence	hsqcetgp
Experiment	HSQC
Number of Scans	2
Receiver Gain	196.4
Relaxation Delay	1.4582
Pulse Width	9.2600
Presaturation Frequency	
Acquisition Time	0.1403
Acquisition Date	2024-06-23T02:33:06
Modification Date	2024-06-23T12:52:17
Spectrometer Frequency	(400.13, 100.62)
Spectral Width	(3649.6, 16666.7)
Lowest Frequency	(-136.9, -829.1)
Nucleus	(1H, 13C)
Acquired Size	(512, 256)
Spectral Size	(512, 512)

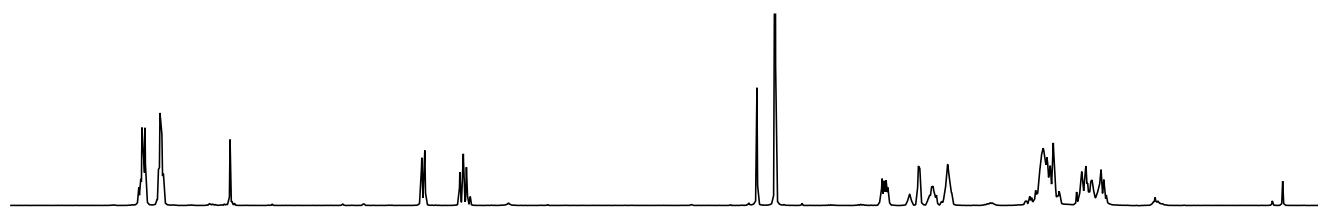


YM-20240619-8-iso. 23. ser

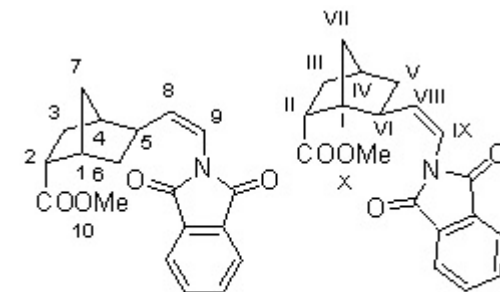


2-endo-5-exo- Z-    2-endo-6-exo- Z-  
C5/C6= 3 : 1

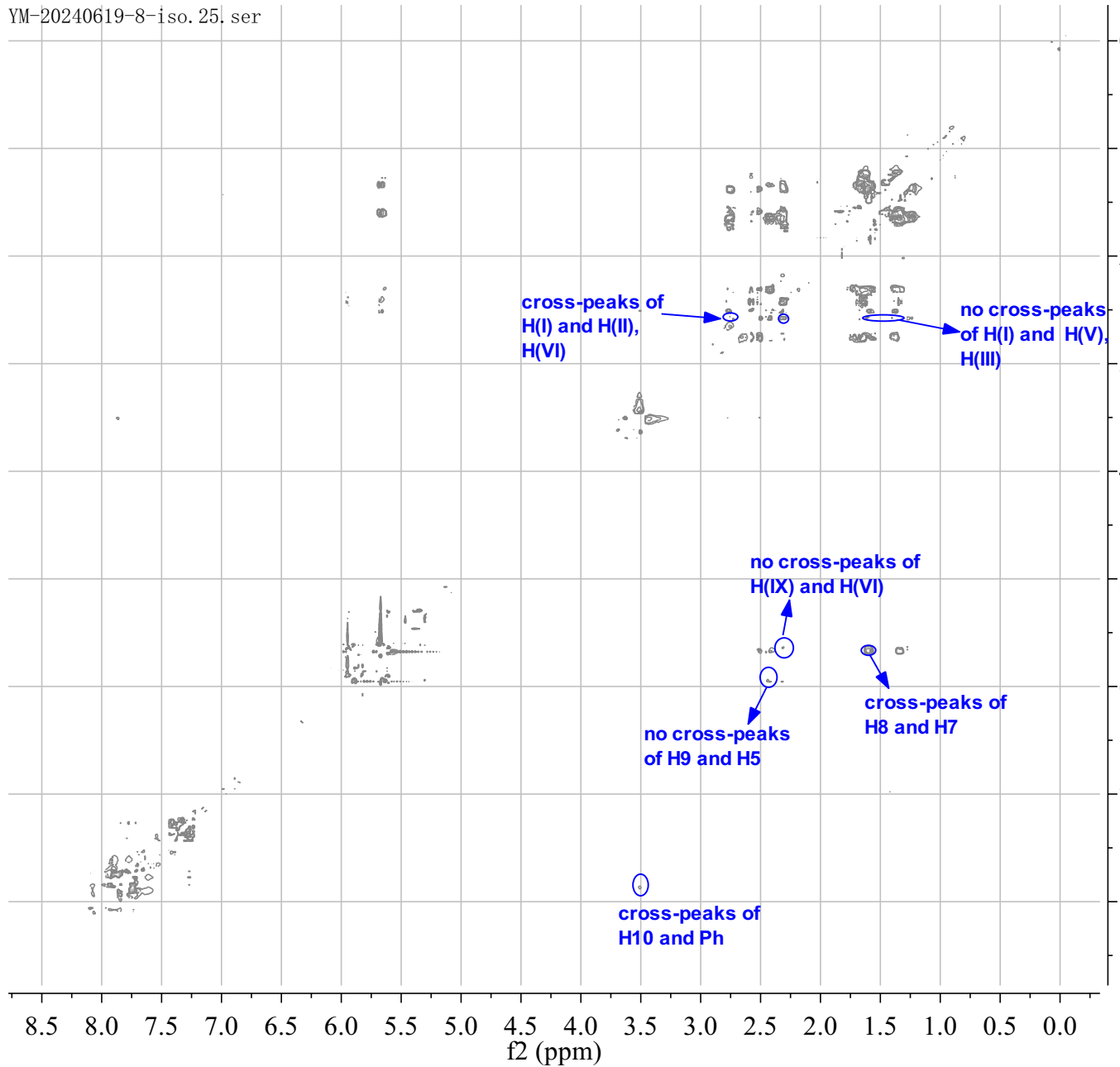
Parameter	Value
Title	YM-20240619-8-iso.23.ser
Comment	
Origin	Bruker BioSpin GmbH
Owner	PC
Site	
Instrument	spect
Solvent	CDCI3
Temperature	297.0
Pulse Sequence	cosygpppqf
Experiment	COSY
Number of Scans	1
Receiver Gain	31.7
Relaxation Delay	1.9111
Pulse Width	9.2600
Presaturation Frequency	
Acquisition Time	0.2806
Acquisition Date	2024-06-23T02:27:00
Modification Date	2024-06-23T12:52:17
Spectrometer Frequency	(400.13, 400.13)
Spectral Width	(3649.6, 3649.6)
Lowest Frequency	(-136.9, -136.9)
Nucleus	(1H, 1H)
Acquired Size	(1024, 128)
Spectral Size	(1024, 1024)



YM-20240619-8-iso. 25. ser

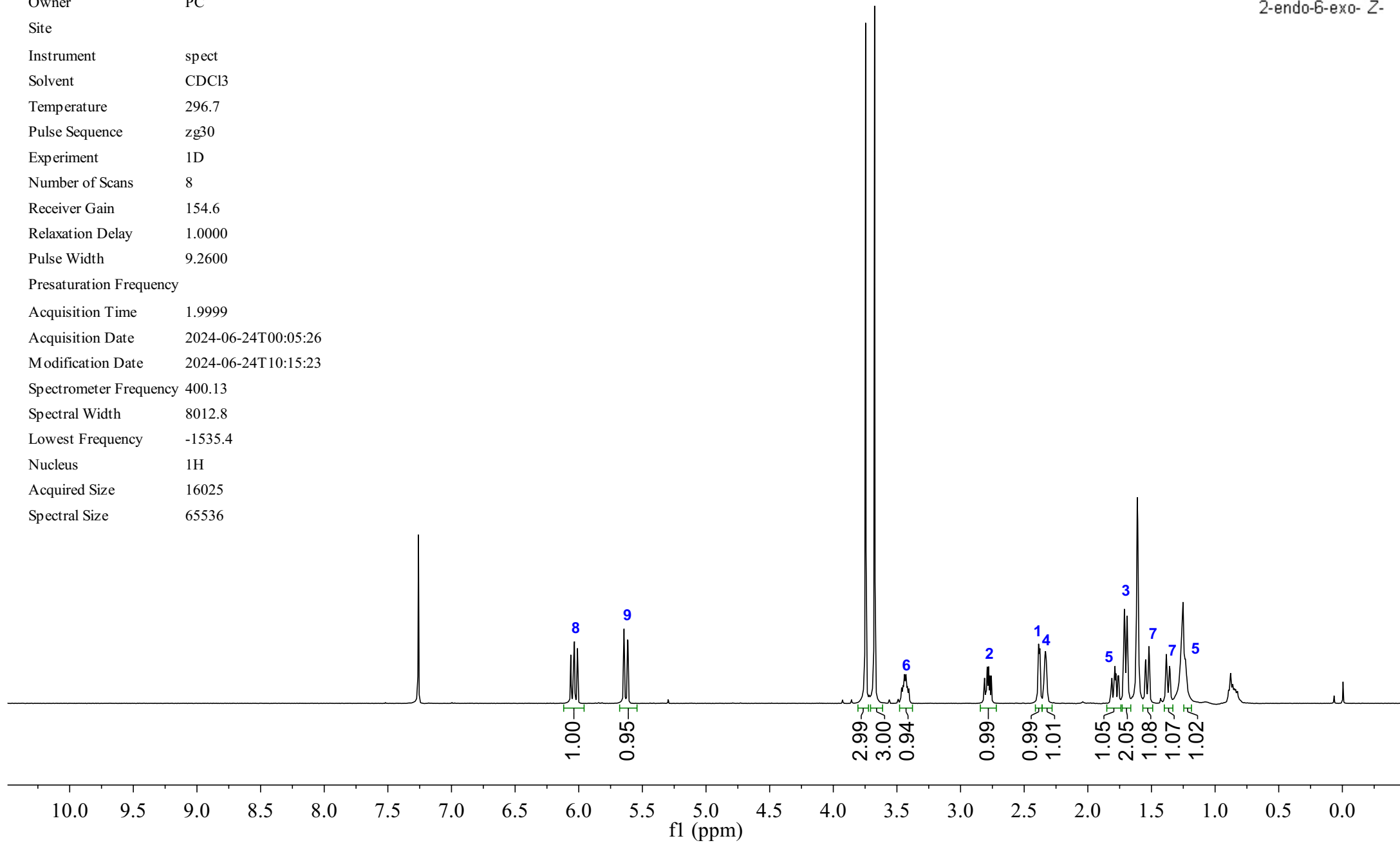
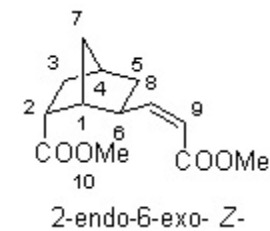


2-endo-5-exo- Z-    2-endo-6-exo- Z-  
C5/C6= 3 : 1



Parameter	Value
Title	YM-20240619-8-iso.25.ser
Comment	
Origin	Bruker BioSpin GmbH
Owner	PC
Site	
Instrument	spect
Solvent	CDC13
Temperature	296.7
Pulse Sequence	noesygpphp
Experiment	NOESY
Number of Scans	4
Receiver Gain	31.7
Relaxation Delay	1.9754
Pulse Width	9.2600
Presaturation Frequency	
Acquisition Time	0.2806
Acquisition Date	2024-06-23T02:49:08
Modification Date	2024-06-23T12:52:17
Spectrometer Frequency	(400.13, 400.13)
Spectral Width	(3649.6, 3649.6)
Lowest Frequency	(-136.9, -136.9)
Nucleus	(1H, 1H)
Acquired Size	(1024, 256)
Spectral Size	(1024, 1024)

Title	YM-20240619-5-iso.13.fid
Comment	24-26
Origin	Bruker BioSpin GmbH
Owner	PC
Site	
Instrument	spect
Solvent	CDC13
Temperature	296.7
Pulse Sequence	zg30
Experiment	1D
Number of Scans	8
Receiver Gain	154.6
Relaxation Delay	1.0000
Pulse Width	9.2600
Presaturation Frequency	
Acquisition Time	1.9999
Acquisition Date	2024-06-24T00:05:26
Modification Date	2024-06-24T10:15:23
Spectrometer Frequency	400.13
Spectral Width	8012.8
Lowest Frequency	-1535.4
Nucleus	1H
Acquired Size	16025
Spectral Size	65536





YM-20240619-5-iso.12.fid  
24-26

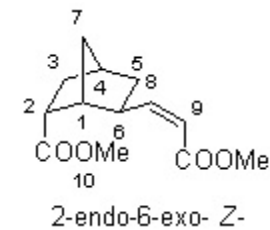
—175.0

—166.4

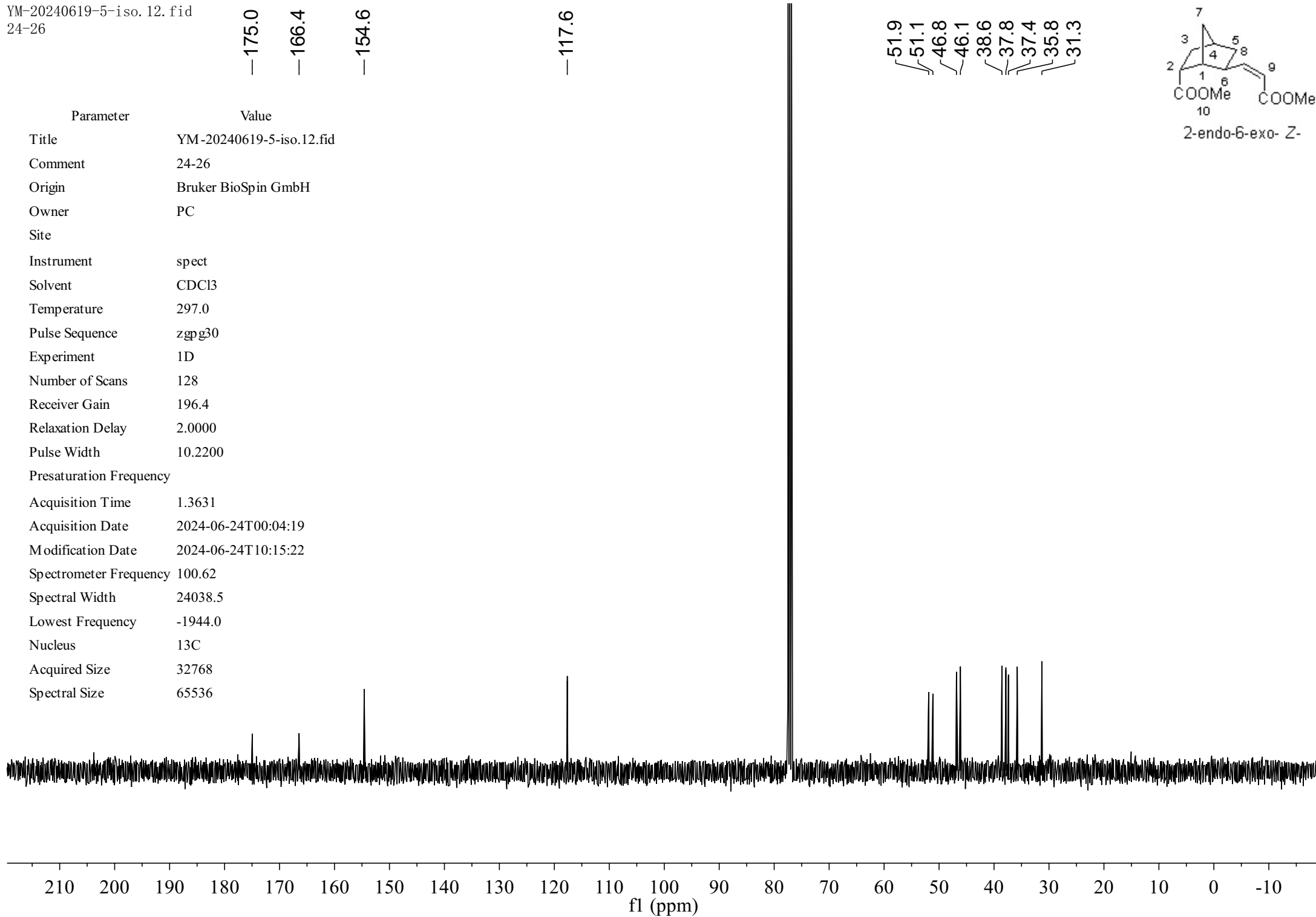
—154.6

—117.6

51.9  
51.1  
46.8  
46.1  
38.6  
37.8  
37.4  
35.8  
31.3

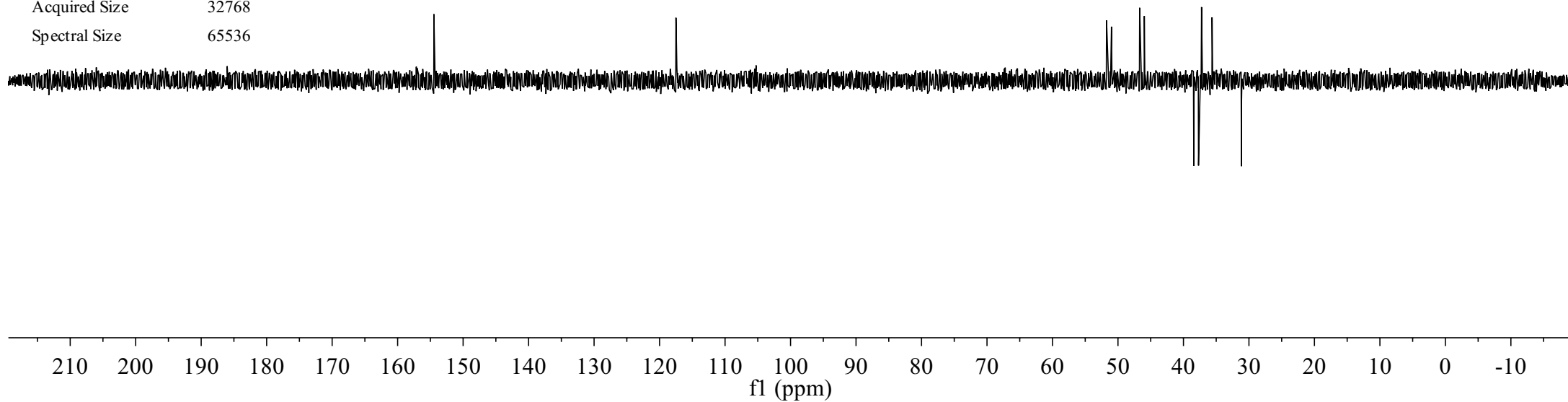
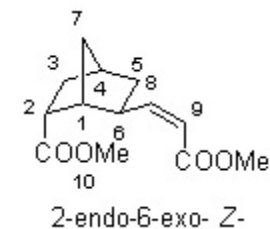


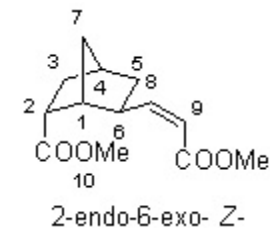
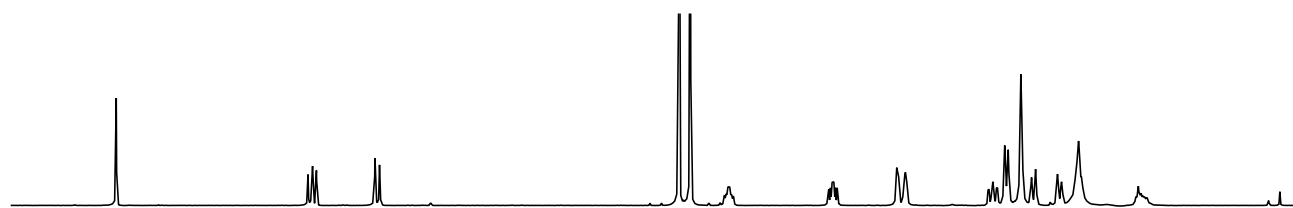
Parameter	Value
Title	YM-20240619-5-iso.12.fid
Comment	24-26
Origin	Bruker BioSpin GmbH
Owner	PC
Site	
Instrument	spect
Solvent	CDCI3
Temperature	297.0
Pulse Sequence	zgpg30
Experiment	1D
Number of Scans	128
Receiver Gain	196.4
Relaxation Delay	2.0000
Pulse Width	10.2200
Presaturation Frequency	
Acquisition Time	1.3631
Acquisition Date	2024-06-24T00:04:19
Modification Date	2024-06-24T10:15:22
Spectrometer Frequency	100.62
Spectral Width	24038.5
Lowest Frequency	-1944.0
Nucleus	13C
Acquired Size	32768
Spectral Size	65536



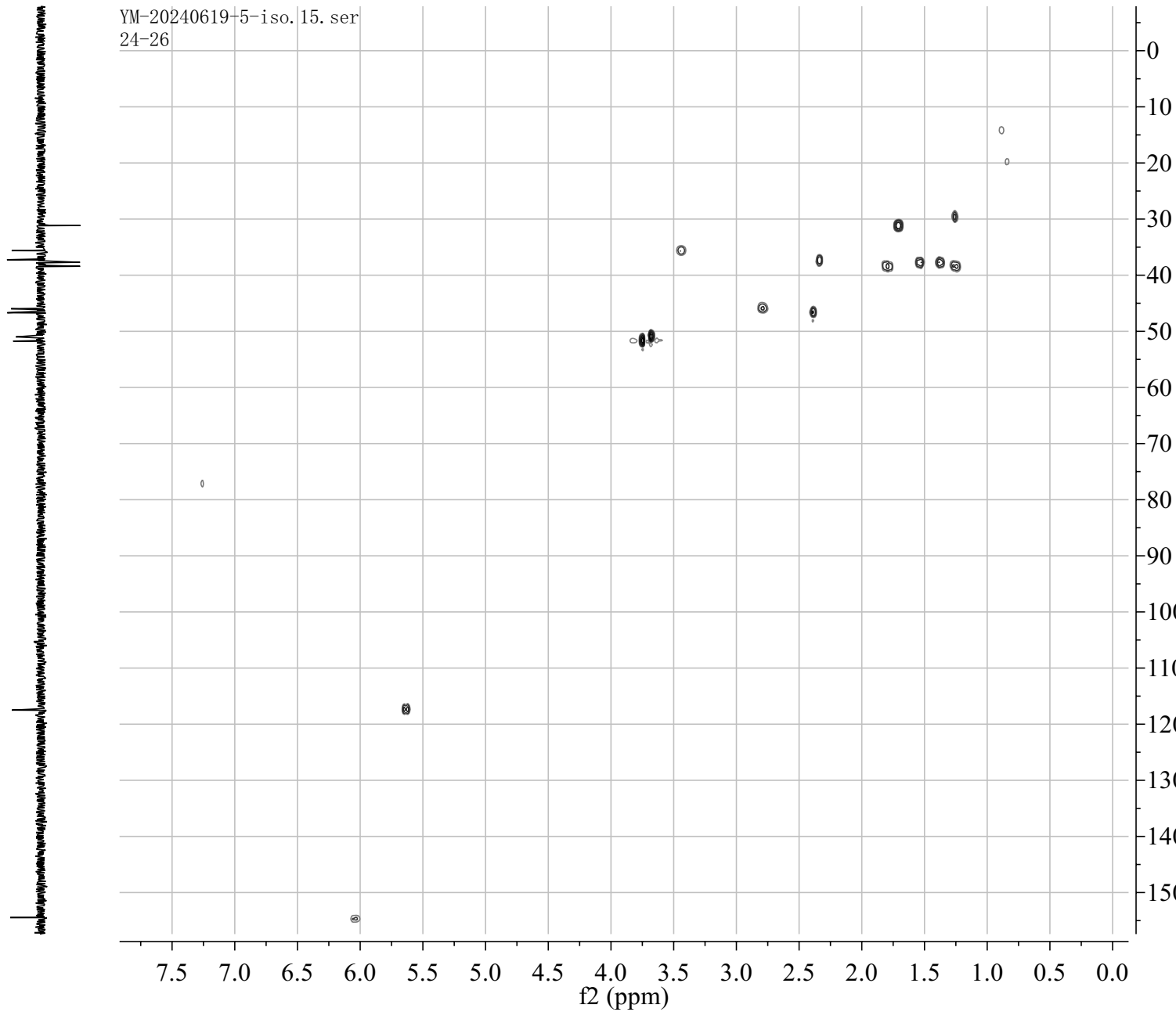
YM-20240619-5-iso.11.fid

Parameter	Value
Title	YM-20240619-5-iso.11.fid
Comment	24-26
Origin	Bruker BioSpin GmbH
Owner	PC
Site	
Instrument	spect
Solvent	CDC13
Temperature	296.6
Pulse Sequence	depts135
Experiment	DEPT-135
Number of Scans	48
Receiver Gain	196.4
Relaxation Delay	2.0000
Pulse Width	10.2200
Presaturation Frequency	
Acquisition Time	1.3631
Acquisition Date	2024-06-23T23:53:18
Modification Date	2024-06-24T10:15:22
Spectrometer Frequency	100.62
Spectral Width	24038.5
Lowest Frequency	-1958.0
Nucleus	<sup>13</sup> C
Acquired Size	32768
Spectral Size	65536

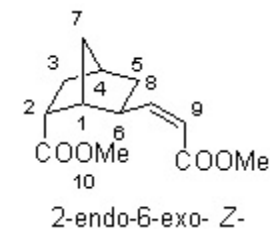
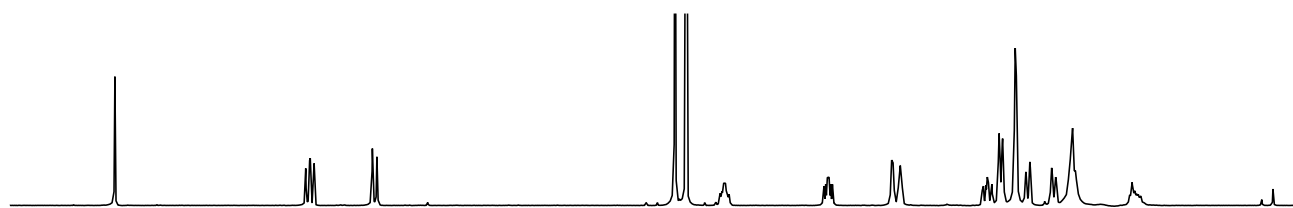




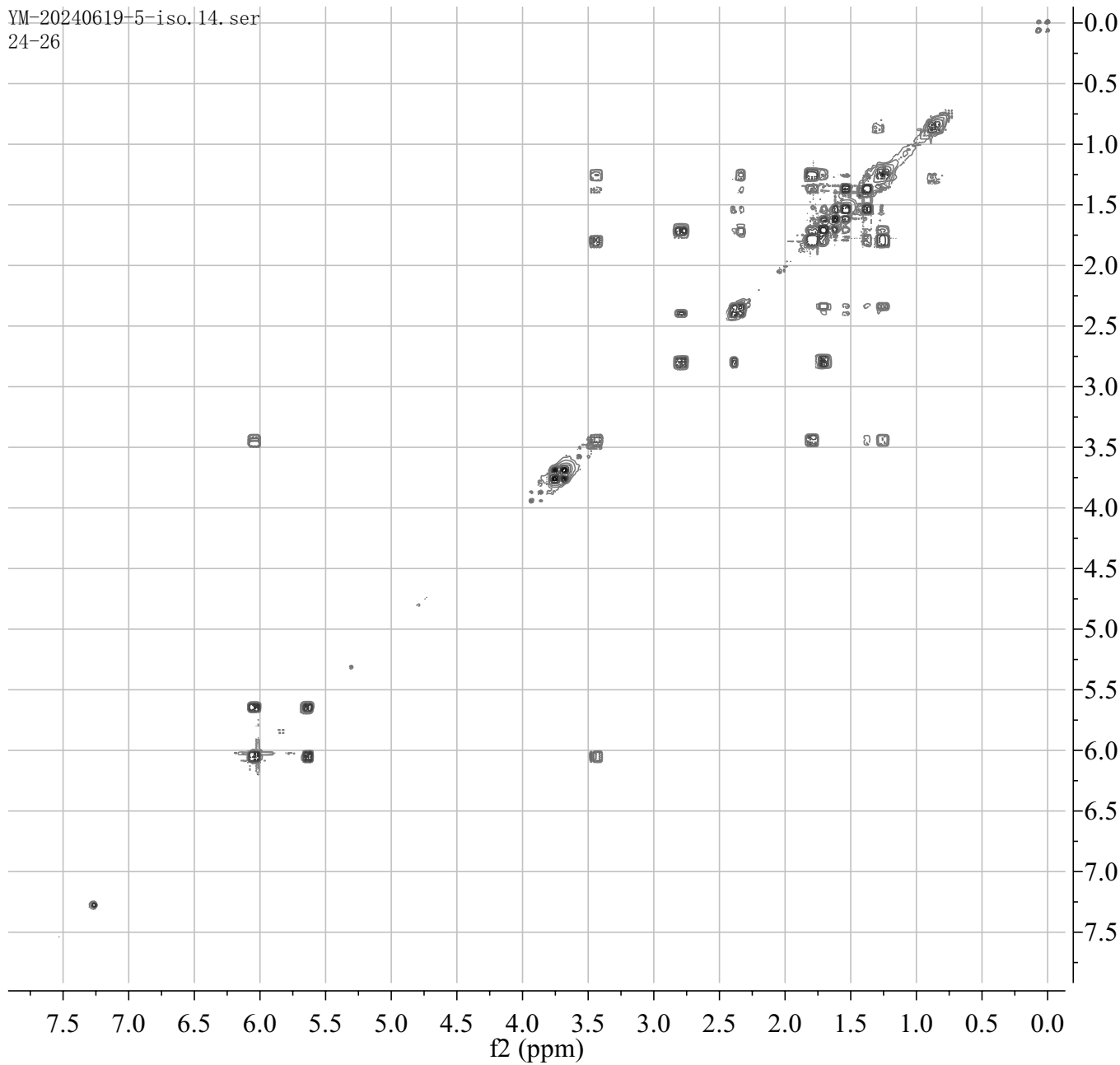
YM-20240619-5-iso.15.ser  
24-26



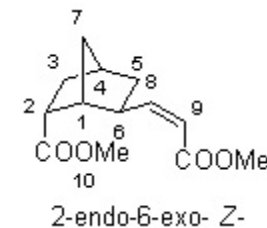
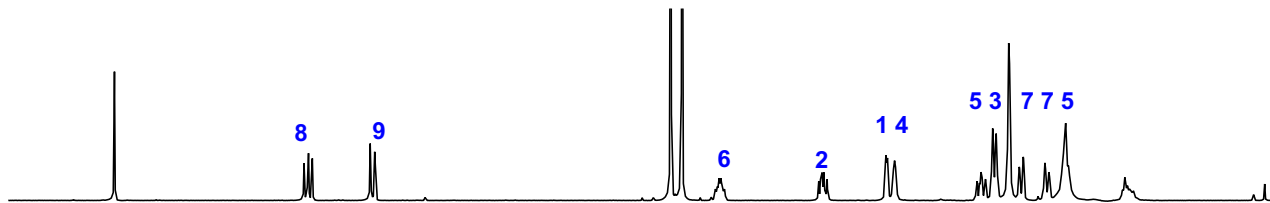
Parameter	Value
Title	YM-20240619-5-iso.15.ser
Comment	24-26
Origin	Bruker BioSpin GmbH
Owner	PC
Site	
Instrument	spect
Solvent	CDCl3
Temperature	296.7
Pulse Sequence	hsqcetgp
Experiment	HSQC
Number of Scans	2
Receiver Gain	196.4
Relaxation Delay	1.4398
Pulse Width	9.2600
Presaturation Frequency	
Acquisition Time	0.1587
Acquisition Date	2024-06-24T00:12:28
Modification Date	2024-06-24T10:15:24
Spectrometer Frequency	(400.13, 100.62)
Spectral Width	(3225.8, 16666.7)
Lowest Frequency	(-57.3, -829.1)
Nucleus	(1H, 13C)
Acquired Size	(512, 256)
Spectral Size	(512, 512)



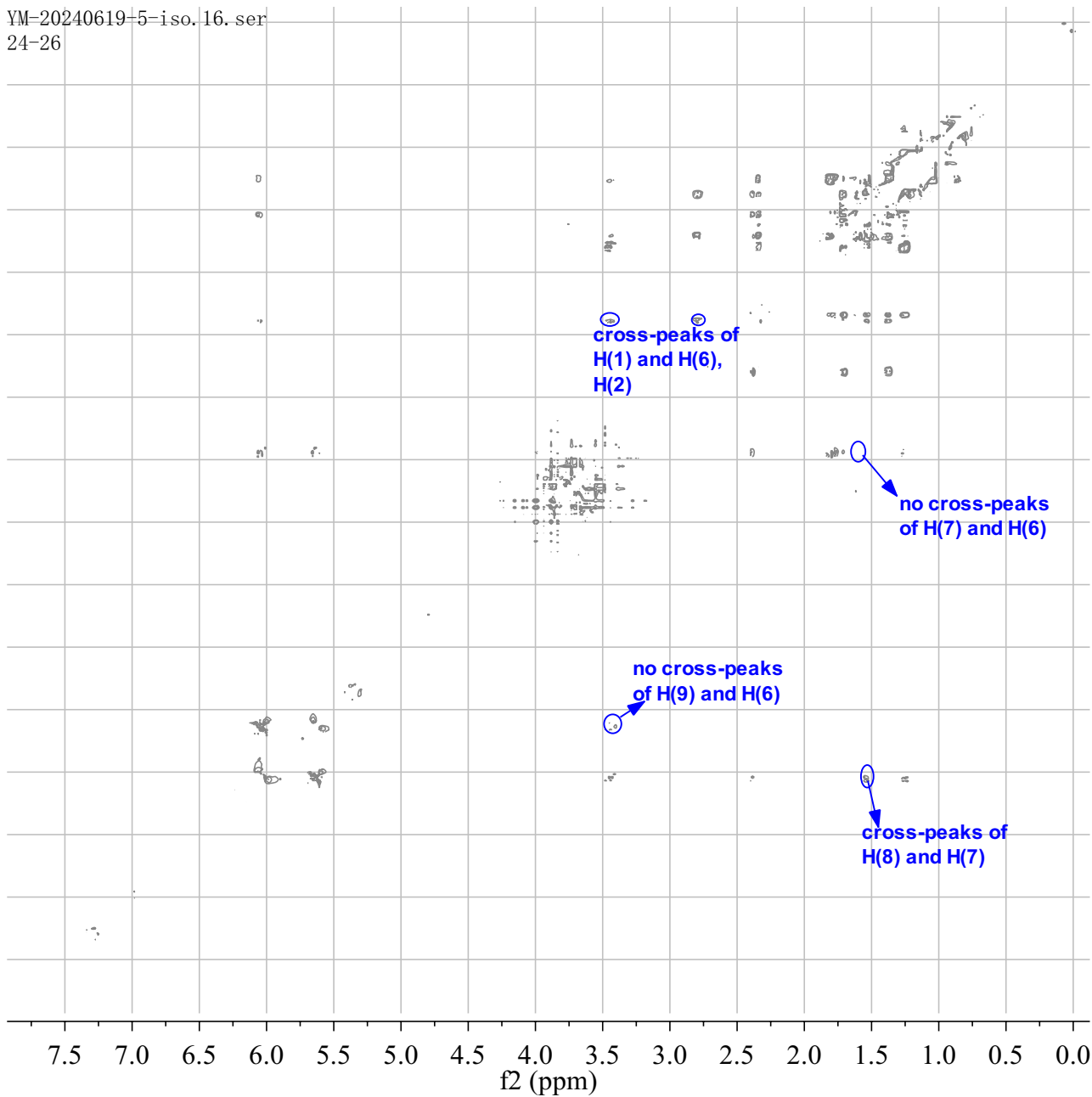
YM-20240619-5-iso.14.ser  
24-26



Parameter	Value
Title	YM-20240619-5-iso.14.ser
Comment	24-26
Origin	Bruker BioSpin GmbH
Owner	PC
Site	
Instrument	spect
Solvent	CDCl3
Temperature	296.6
Pulse Sequence	cosygpqqf
Experiment	COSY
Number of Scans	1
Receiver Gain	62.3
Relaxation Delay	1.8743
Pulse Width	9.2600
Presaturation Frequency	
Acquisition Time	0.3174
Acquisition Date	2024-06-24T00:06:20
Modification Date	2024-06-24T10:15:23
Spectrometer Frequency	(400.13, 400.13)
Spectral Width	(3225.8, 3225.8)
Lowest Frequency	(-57.3, -57.3)
Nucleus	(1H, 1H)
Acquired Size	(1024, 128)
Spectral Size	(1024, 1024)

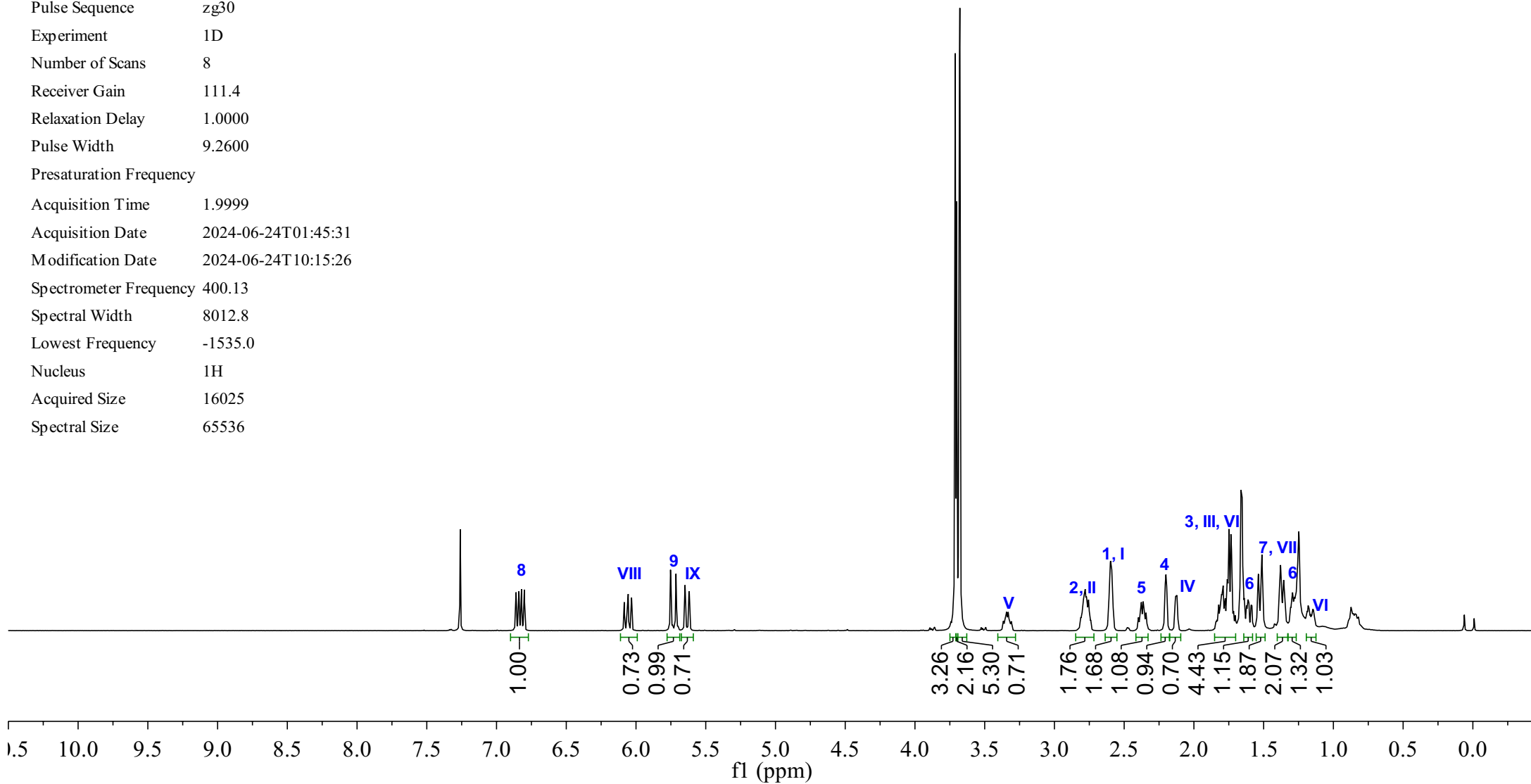
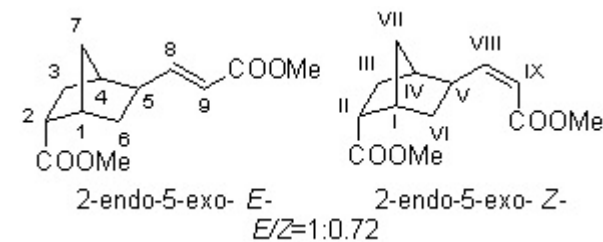


YM-20240619-5-iso.16.ser  
24-26



Parameter	Value
Title	YM-20240619-5-iso.16.ser
Comment	24-26
Origin	Bruker BioSpin GmbH
Owner	PC
Site	
Instrument	spect
Solvent	CDCI3
Temperature	297.0
Pulse Sequence	noesygp ppp
Experiment	NOESY
Number of Scans	4
Receiver Gain	62.3
Relaxation Delay	1.9386
Pulse Width	9.2600
Presaturation Frequency	
Acquisition Time	0.3174
Acquisition Date	2024-06-24T00:28:21
Modification Date	2024-06-24T10:15:25
Spectrometer Frequency	(400.13, 400.13)
Spectral Width	(3225.8, 3225.8)
Lowest Frequency	(-52.7, -52.7)
Nucleus	(1H, 1H)
Acquired Size	(1024, 256)
Spectral Size	(1024, 1024)

Parameter	Value
Title	YM-20240619-5-iso.22.fid
Comment	s32-37
Origin	Bruker BioSpin GmbH
Owner	PC
Site	
Instrument	spect
Solvent	CDC13
Temperature	296.7
Pulse Sequence	zg30
Experiment	1D
Number of Scans	8
Receiver Gain	111.4
Relaxation Delay	1.0000
Pulse Width	9.2600
Presaturation Frequency	
Acquisition Time	1.9999
Acquisition Date	2024-06-24T01:45:31
Modification Date	2024-06-24T10:15:26
Spectrometer Frequency	400.13
Spectral Width	8012.8
Lowest Frequency	-1535.0
Nucleus	1H
Acquired Size	16025
Spectral Size	65536



YM-20240619-5-iso. 21. fid  
s32-37

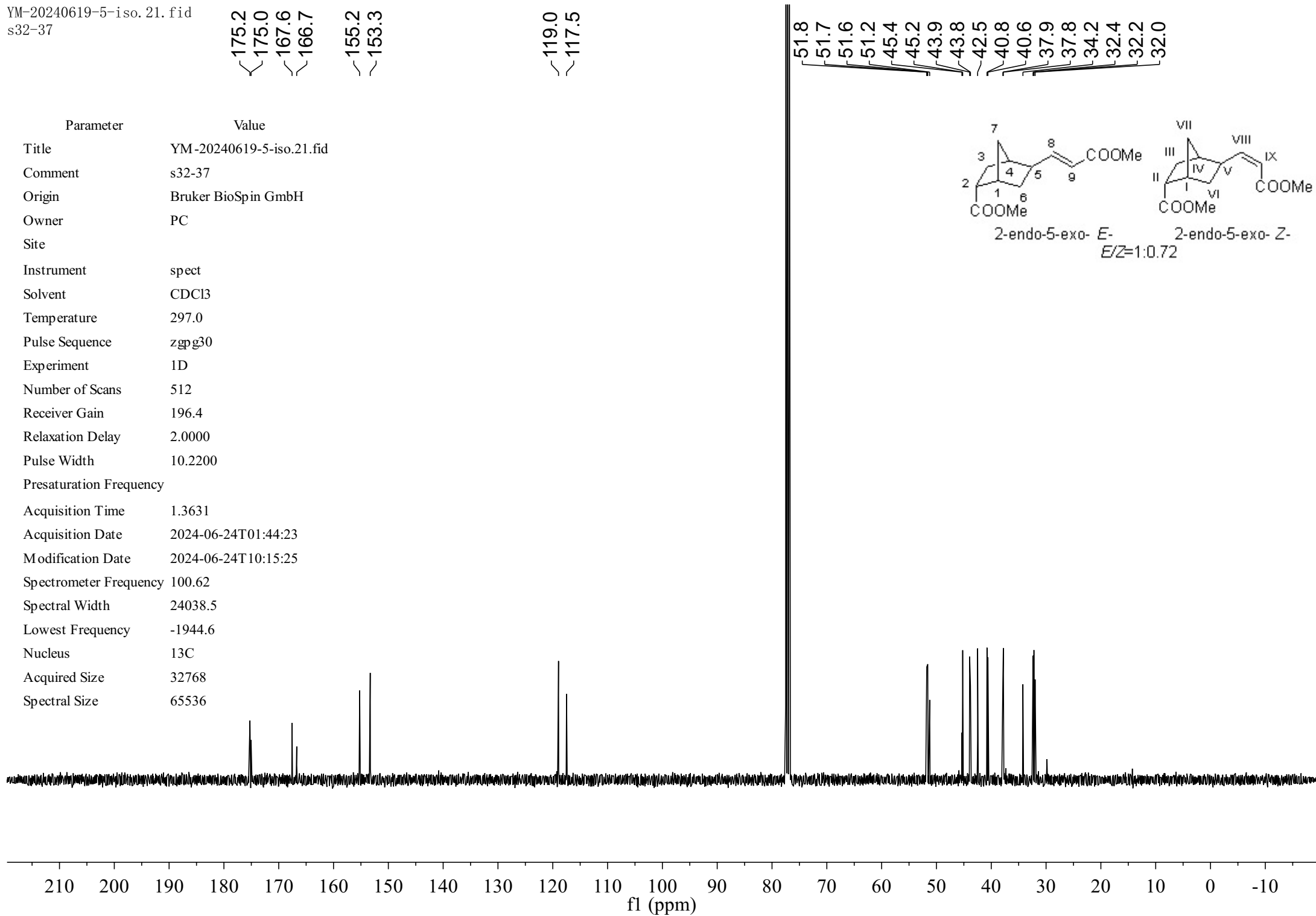
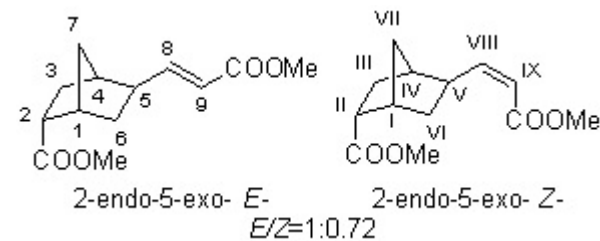
175.2  
175.0  
167.6  
166.7

155.2  
153.3

119.0  
117.5

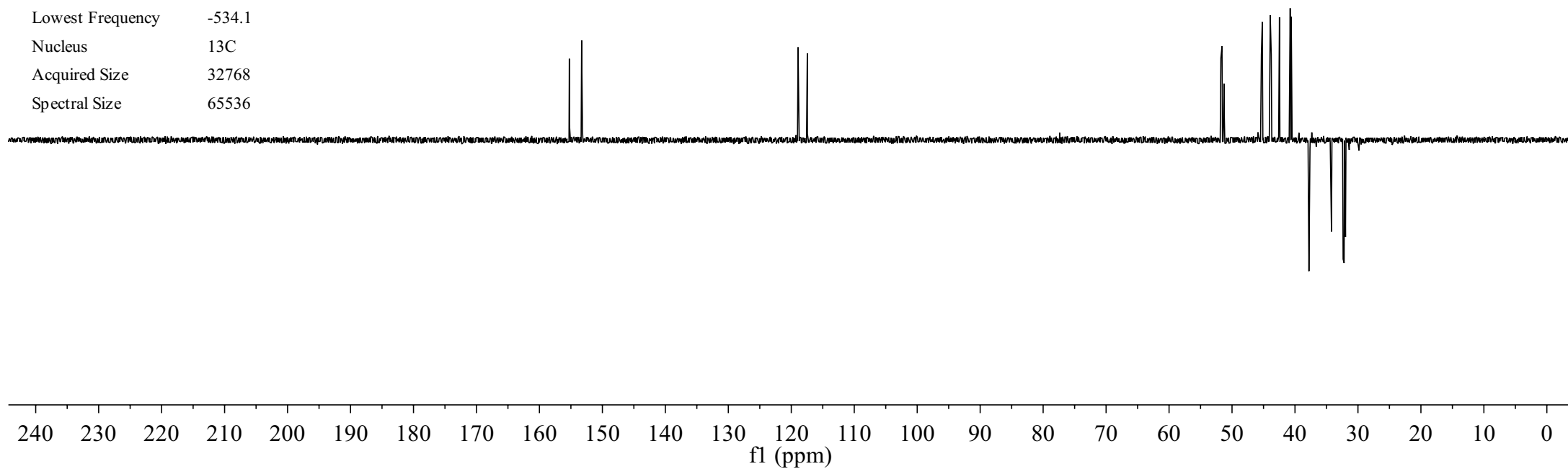
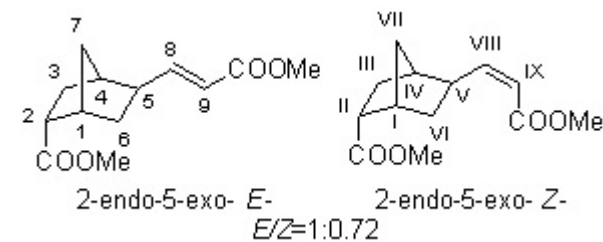
51.8  
51.7  
51.6  
51.2  
45.4  
45.2  
43.9  
43.8  
42.5  
40.8  
40.6  
37.9  
37.8  
34.2  
32.4  
32.2  
32.0

Parameter	Value
Title	YM-20240619-5-iso.21.fid
Comment	s32-37
Origin	Bruker BioSpin GmbH
Owner	PC
Site	
Instrument	spect
Solvent	CDCl3
Temperature	297.0
Pulse Sequence	zgpg30
Experiment	1D
Number of Scans	512
Receiver Gain	196.4
Relaxation Delay	2.0000
Pulse Width	10.2200
Presaturation Frequency	
Acquisition Time	1.3631
Acquisition Date	2024-06-24T01:44:23
Modification Date	2024-06-24T10:15:25
Spectrometer Frequency	100.62
Spectral Width	24038.5
Lowest Frequency	-1944.6
Nucleus	13C
Acquired Size	32768
Spectral Size	65536

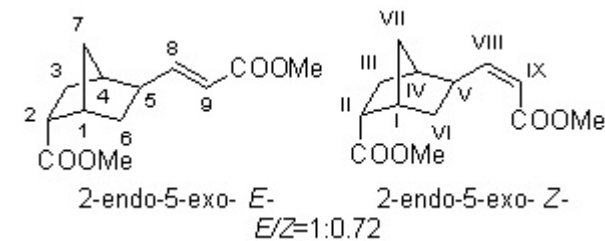
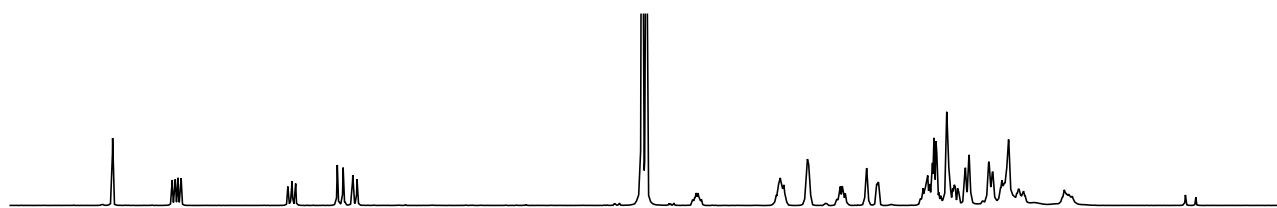


YM-20240619-5-iso. 26. fid

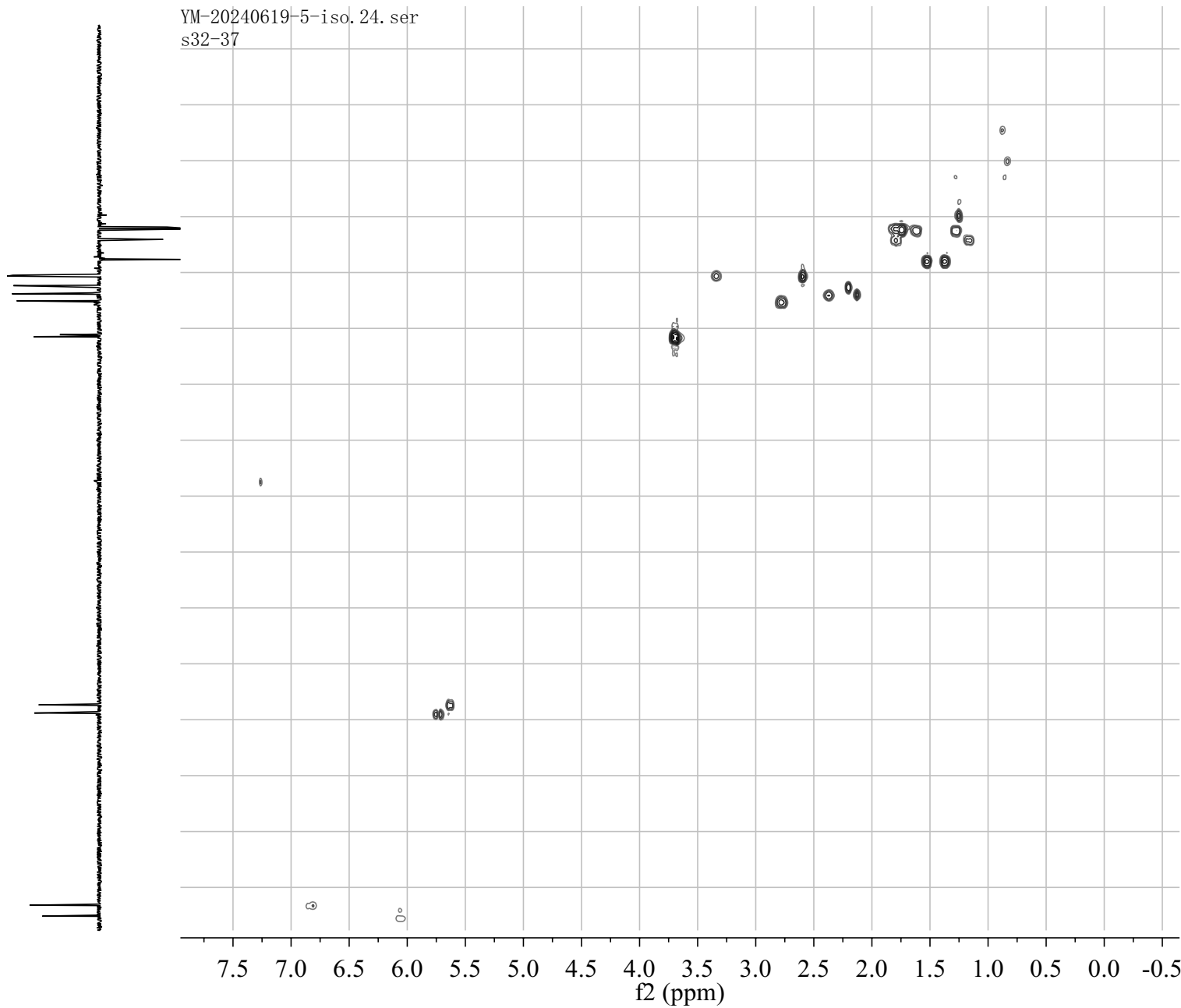
Parameter	Value
Title	YM-20240619-5-iso.26.fid
Comment	s32-37
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDCI3
Temperature	296.1
Pulse Sequence	depts135
Experiment	DEPT-135
Number of Scans	49
Receiver Gain	193.1
Relaxation Delay	2.0000
Pulse Width	9.9400
Presaturation Frequency	
Acquisition Time	1.0486
Acquisition Date	2024-06-24T09:42:46
Modification Date	2024-06-24T10:15:27
Spectrometer Frequency	125.77
Spectral Width	31250.0
Lowest Frequency	-534.1
Nucleus	13C
Acquired Size	32768
Spectral Size	65536



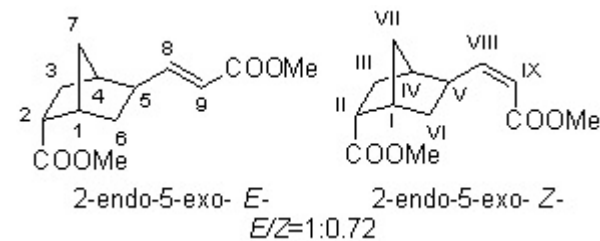
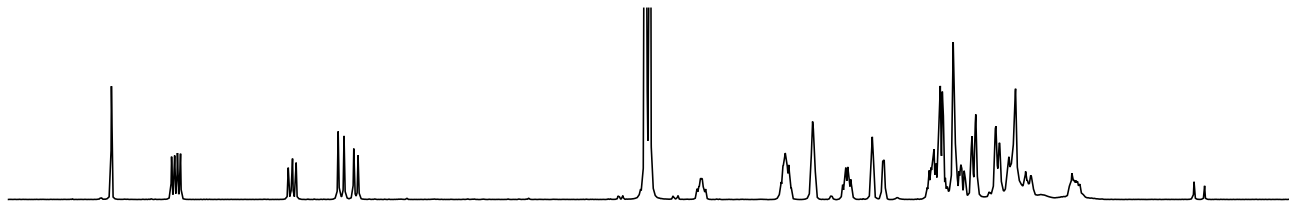




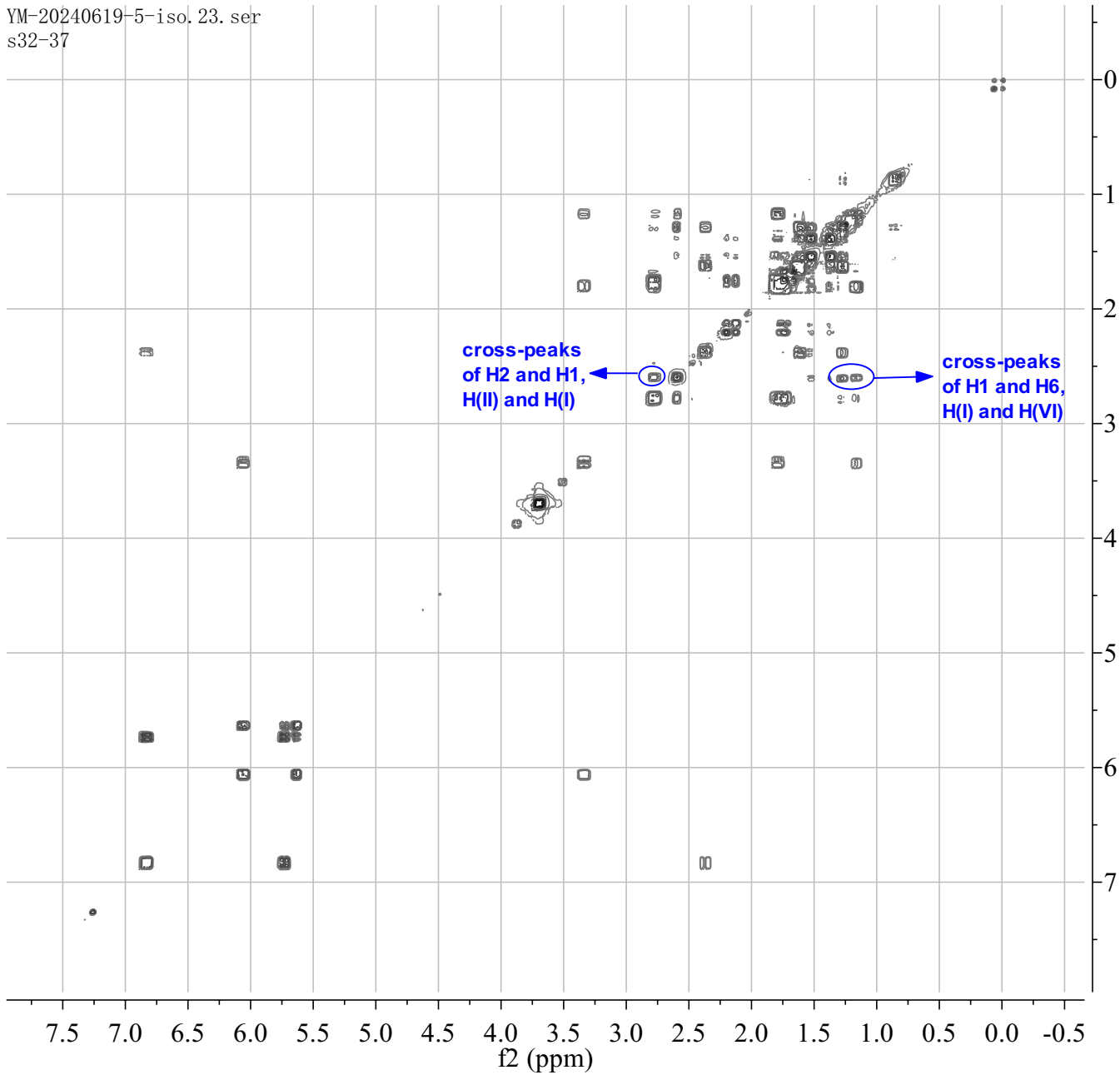
YM-20240619-5-iso.24.ser  
s32-37



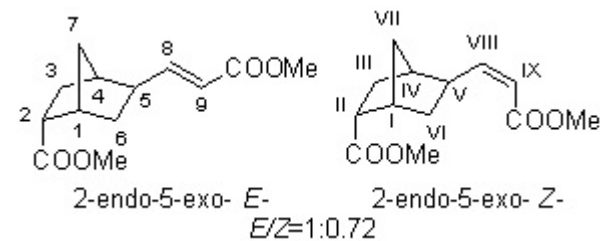
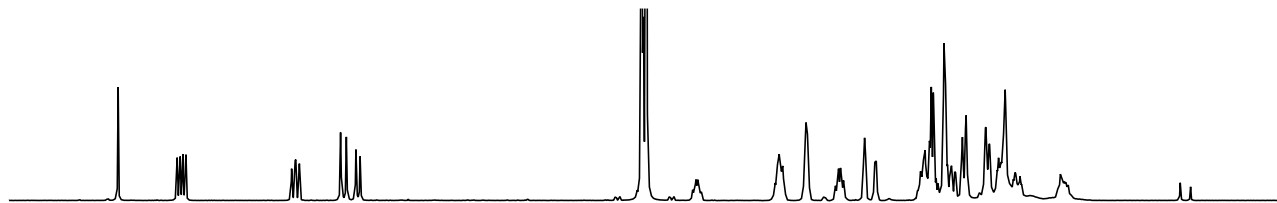
Parameter	Value
Title	YM-20240619-5-iso.24.ser
Comment	s32-37
Origin	Bruker BioSpin GmbH
Owner	PC
Site	
Instrument	spect
Solvent	CDCl3
Temperature	296.7
Pulse Sequence	hsqcetgp
Experiment	HSQC
Number of Scans	2
Receiver Gain	196.4
Relaxation Delay	1.4500
Pulse Width	9.2600
Presaturation Frequency	
Acquisition Time	0.1485
Acquisition Date	2024-06-24T01:57:29
Modification Date	2024-06-24T10:15:27
Spectrometer Frequency	(400.13, 100.62)
Spectral Width	(3448.3, 16666.7)
Lowest Frequency	(-291.8, -829.1)
Nucleus	(1H, 13C)
Acquired Size	(512, 256)
Spectral Size	(512, 512)



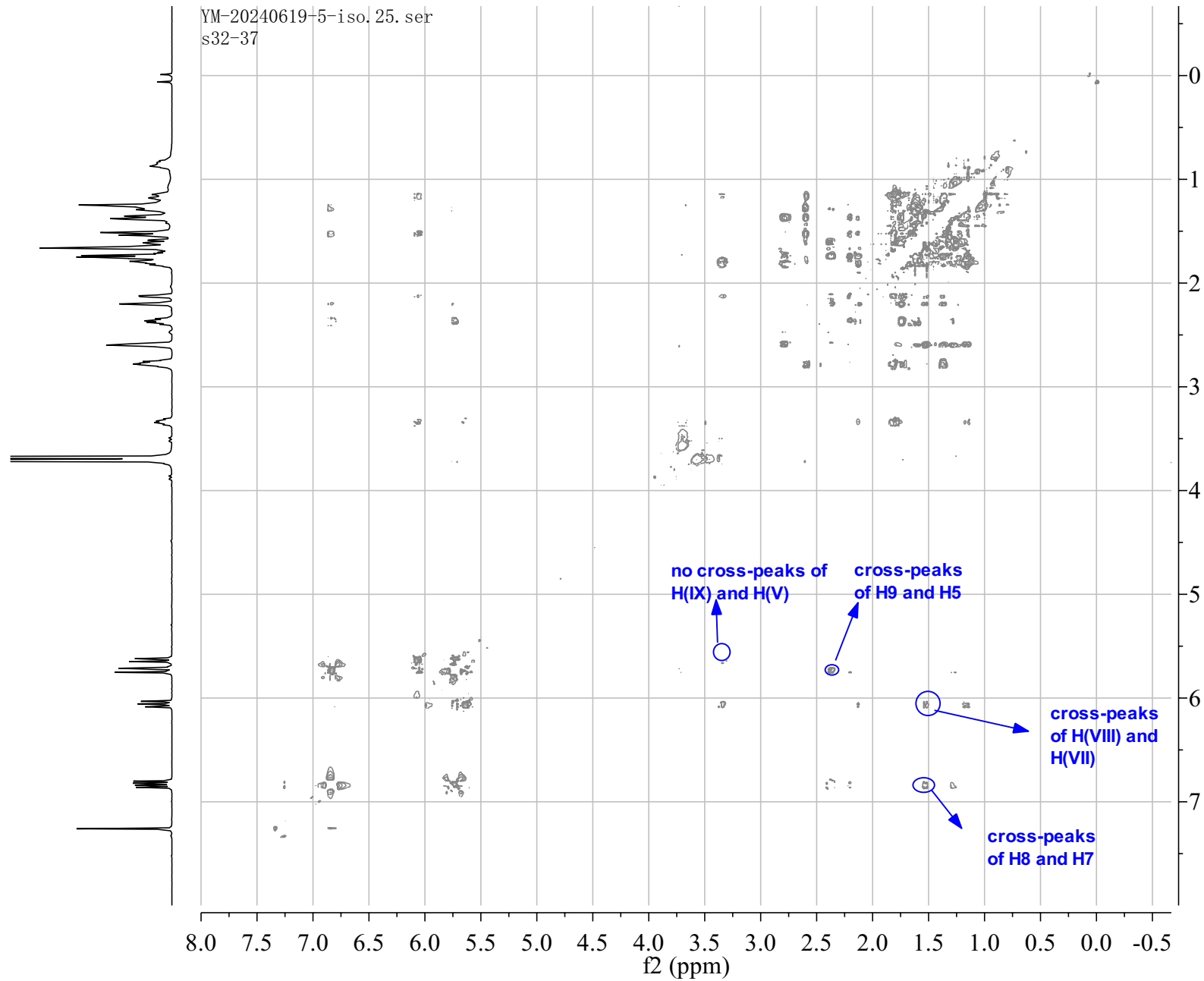
YM-20240619-5-iso.23.ser  
s32-37



Parameter	Value
Title	YM-20240619-5-iso.23.ser
Comment	s32-37
Origin	Bruker BioSpin GmbH
Owner	PC
Site	
Instrument	spect
Solvent	CDCl <sub>3</sub>
Temperature	296.6
Pulse Sequence	cosygpppqf
Experiment	COSY
Number of Scans	2
Receiver Gain	31.7
Relaxation Delay	1.8947
Pulse Width	9.2600
Presaturation Frequency	
Acquisition Time	0.2970
Acquisition Date	2024-06-24T01:46:36
Modification Date	2024-06-24T10:15:26
Spectrometer Frequency	(400.13, 400.13)
Spectral Width	(3448.3, 3448.3)
Lowest Frequency	(-291.8, -291.8)
Nucleus	( <sup>1</sup> H, <sup>1</sup> H)
Acquired Size	(1024, 128)
Spectral Size	(1024, 1024)

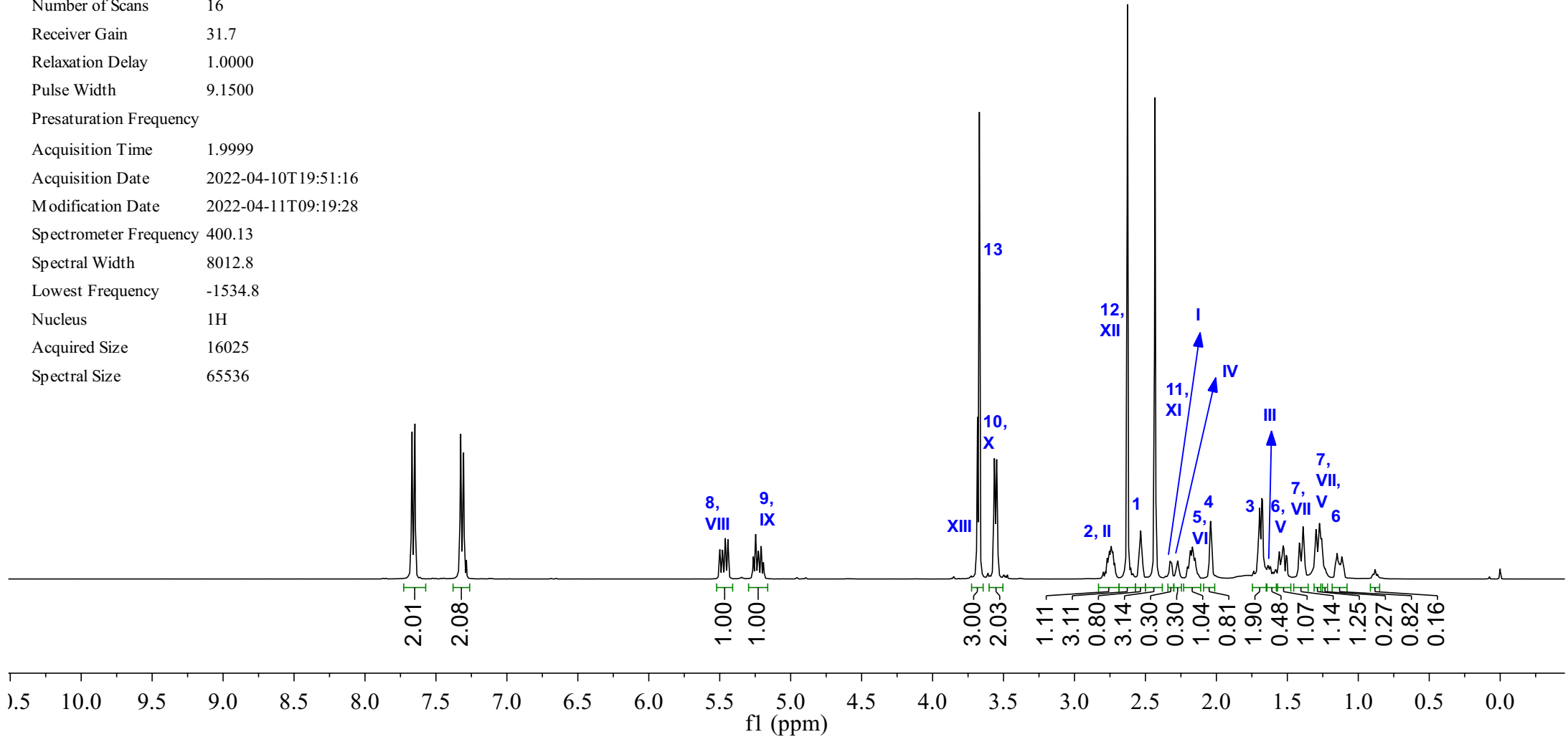
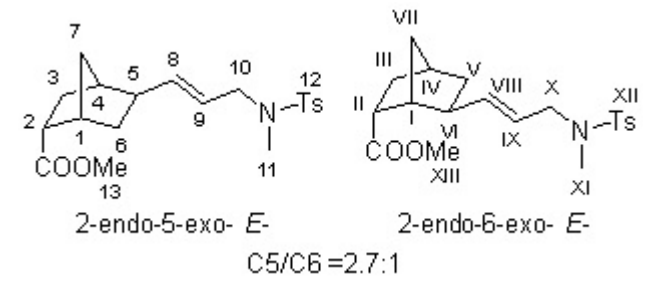


YM-20240619-5-iso.25.ser  
s32-37



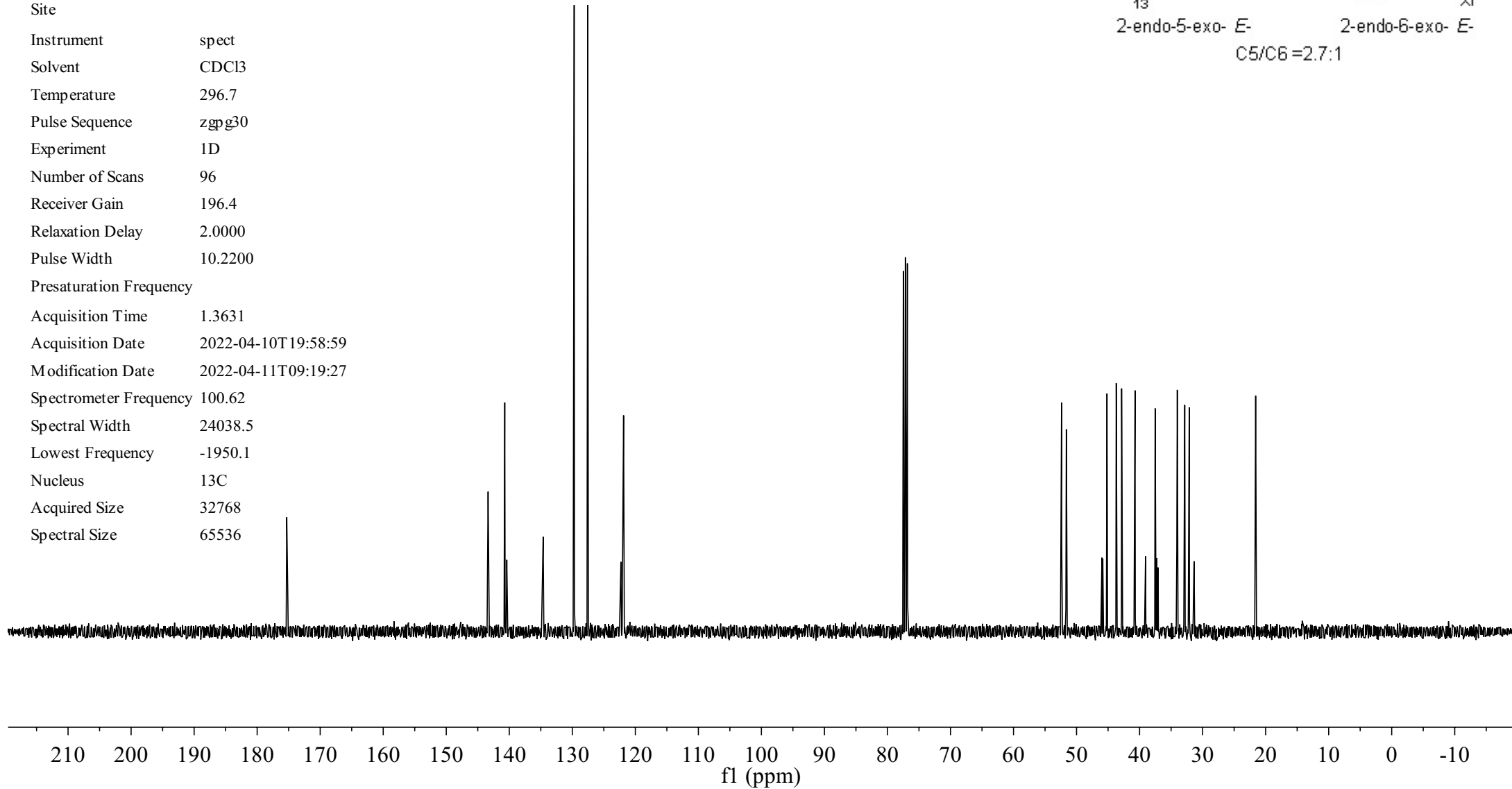
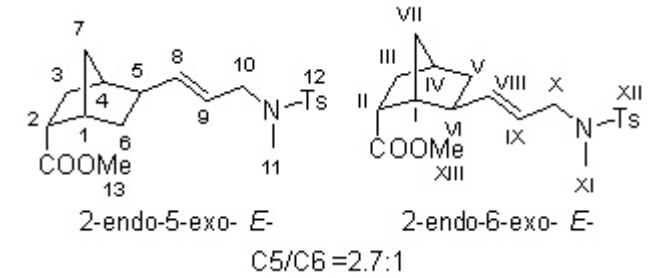
Parameter	Value
Title	YM-20240619-5-iso.25.ser
Comment	s32-37
Origin	Bruker BioSpin GmbH
Owner	PC
Site	
Instrument	spect
Solvent	CDCI3
Temperature	296.5
Pulse Sequence	noesygpphpp
Experiment	NOESY
Number of Scans	4
Receiver Gain	31.7
Relaxation Delay	1.9611
Pulse Width	9.2600
Presaturation Frequency	
Acquisition Time	0.2949
Acquisition Date	2024-06-24T02:13:32
Modification Date	2024-06-24T10:15:27
Spectrometer Frequency	(400.13, 400.13)
Spectral Width	(3472.2, 3472.2)
Lowest Frequency	(-271.1, -271.5)
Nucleus	(1H, 1H)
Acquired Size	(1024, 256)
Spectral Size	(1024, 1024)

Parameter	Value
Title	YM-20220406-2-4.11.fid
Comment	
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDC13
Temperature	296.4
Pulse Sequence	zg30
Experiment	1D
Number of Scans	16
Receiver Gain	31.7
Relaxation Delay	1.0000
Pulse Width	9.1500
Presaturation Frequency	
Acquisition Time	1.9999
Acquisition Date	2022-04-10T19:51:16
Modification Date	2022-04-11T09:19:28
Spectrometer Frequency	400.13
Spectral Width	8012.8
Lowest Frequency	-1534.8
Nucleus	1H
Acquired Size	16025
Spectral Size	65536



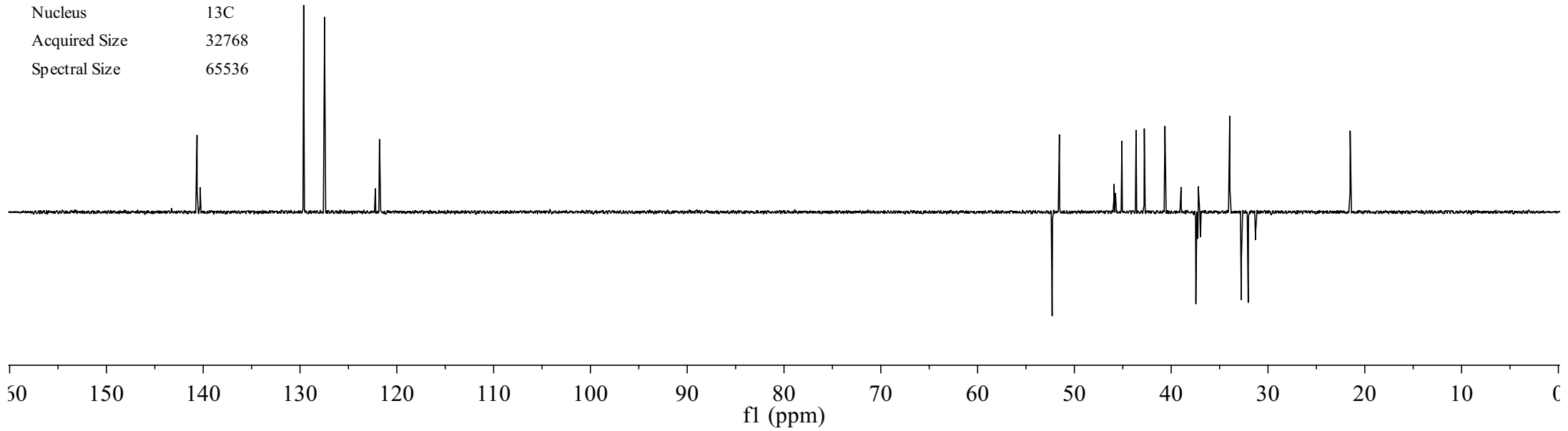
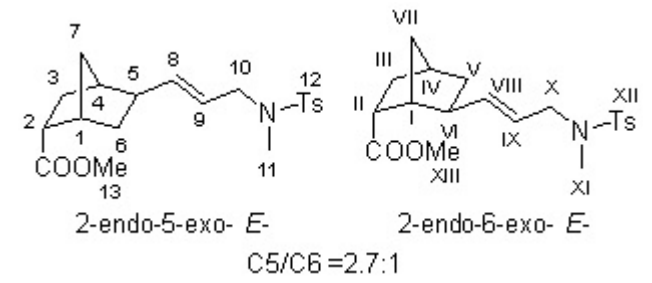
175.3  
175.1143.4  
140.7  
140.4  
134.6  
134.6  
129.7  
127.5  
122.3  
121.952.4  
52.4  
51.7  
51.6  
46.0  
45.8  
45.2  
43.7  
42.9  
40.7  
39.1  
37.5  
37.3  
37.3  
37.1  
34.1  
34.0  
32.8  
32.1  
31.4  
21.6

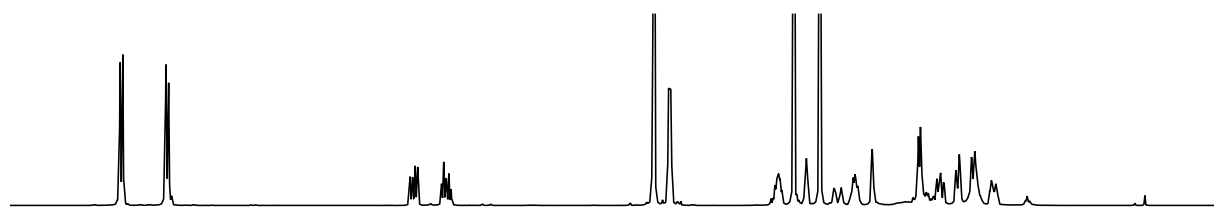
Parameter	Value
Title	YM-20220406-2-4.13.fid
Comment	
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDC13
Temperature	296.7
Pulse Sequence	zgpg30
Experiment	1D
Number of Scans	96
Receiver Gain	196.4
Relaxation Delay	2.0000
Pulse Width	10.2200
Presaturation Frequency	
Acquisition Time	1.3631
Acquisition Date	2022-04-10T19:58:59
Modification Date	2022-04-11T09:19:27
Spectrometer Frequency	100.62
Spectral Width	24038.5
Lowest Frequency	-1950.1
Nucleus	13C
Acquired Size	32768
Spectral Size	65536



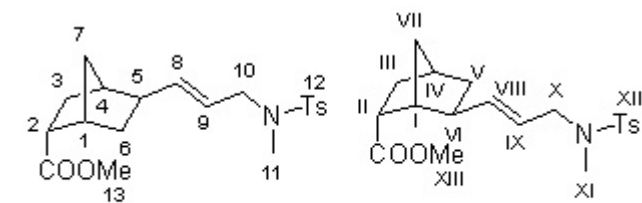
YM-20220406-2-4.14.fid

Parameter	Value
Title	YM-20220406-2-4.14.fid
Comment	
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDC13
Temperature	296.7
Pulse Sequence	deptsp 135
Experiment	DEPT-135
Number of Scans	64
Receiver Gain	196.4
Relaxation Delay	2.0000
Pulse Width	10.2200
Presaturation Frequency	
Acquisition Time	2.0316
Acquisition Date	2022-04-10T20:05:42
Modification Date	2022-04-11T09:19:26
Spectrometer Frequency	100.62
Spectral Width	16129.0
Lowest Frequency	-16.0
Nucleus	13C
Acquired Size	32768
Spectral Size	65536

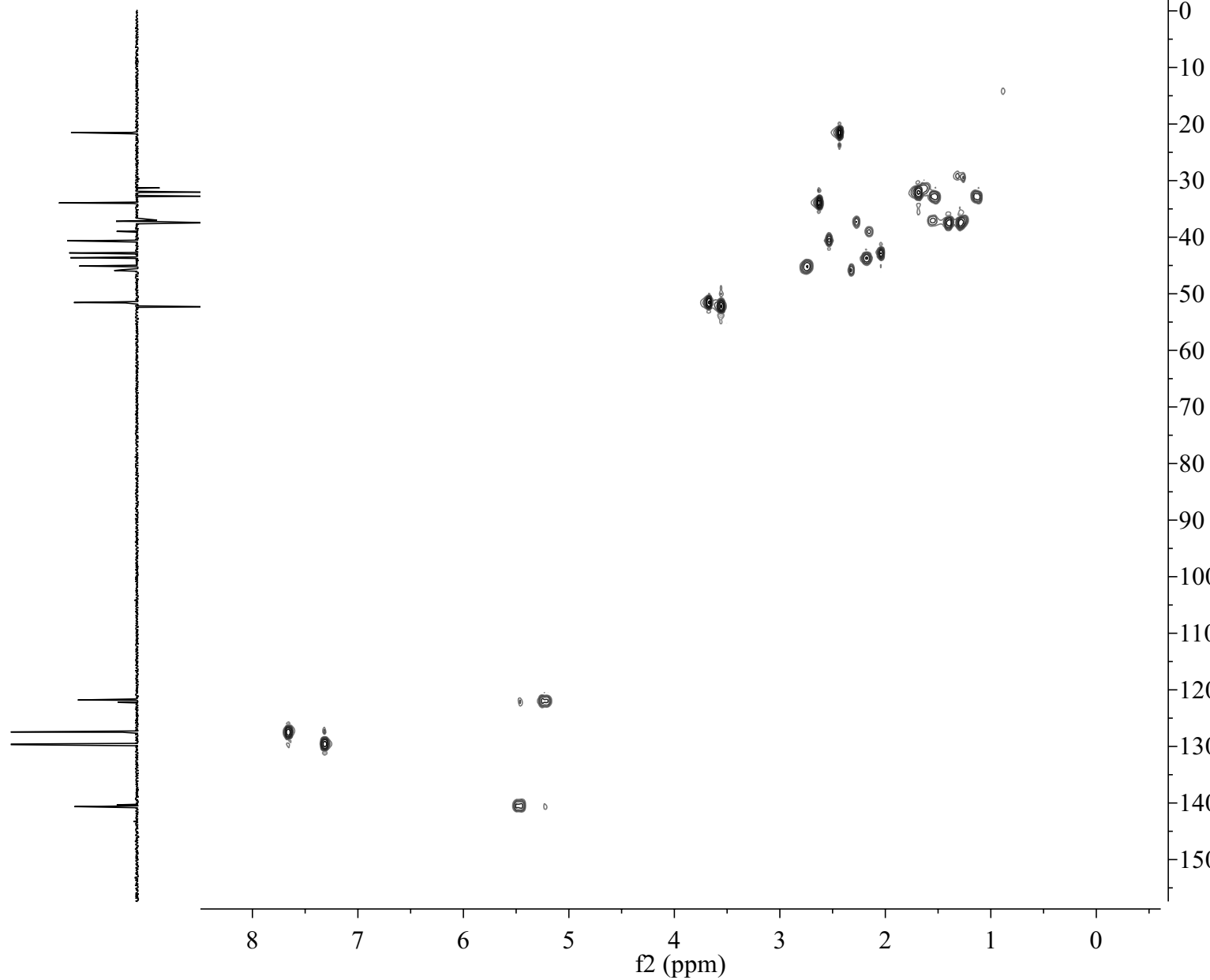




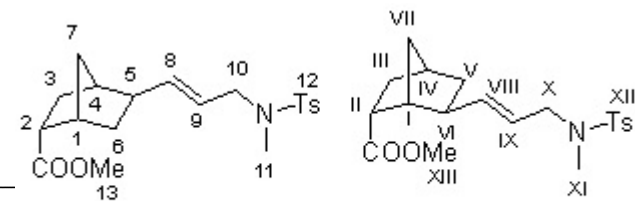
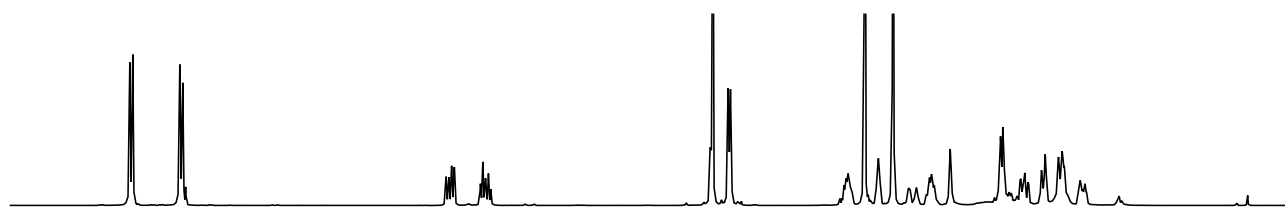
YM-20220406-2-4.15.ser



2-endo-5-exo- *E*-  
2-endo-6-exo- *E*-  
C5/C6 = 2.7:1

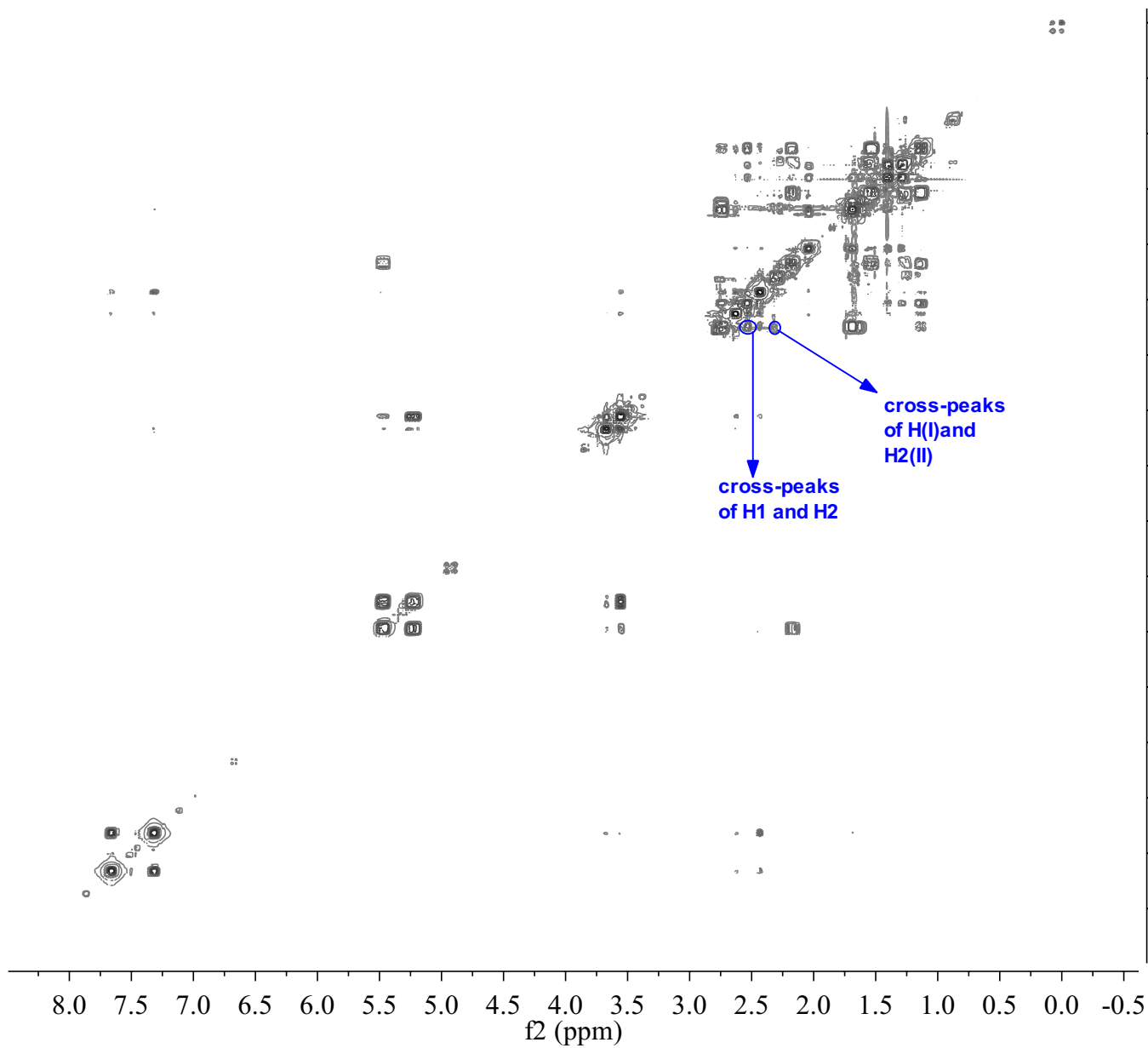
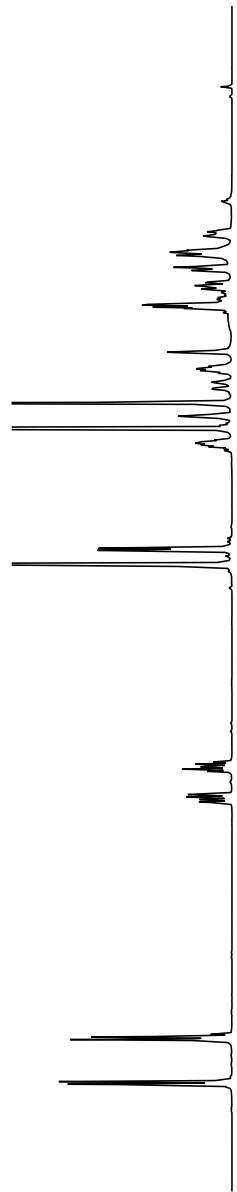


Parameter	Value
Title	YM-20220406-2-4.15.ser
Comment	
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDCl3
Temperature	296.8
Pulse Sequence	hsqcetgp
Experiment	HSQC
Number of Scans	2
Receiver Gain	196.4
Relaxation Delay	1.4582
Pulse Width	9.1500
Presaturation Frequency	
Acquisition Time	0.1403
Acquisition Date	2022-04-10T20:11:17
Modification Date	2022-04-11T09:19:29
Spectrometer Frequency	(400.13, 100.62)
Spectral Width	(3649.6, 16666.7)
Lowest Frequency	(-251.5, -829.1)
Nucleus	(1H, 13C)
Acquired Size	(512, 256)
Spectral Size	(512, 512)



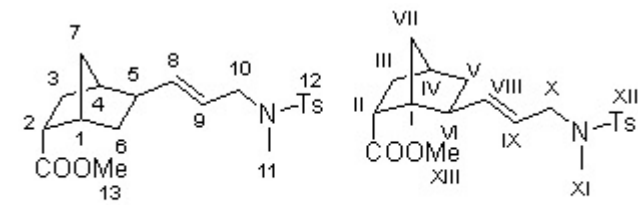
2-endo-5-exo- *E*-  
2-endo-6-exo- *E*-  
C5/C6 = 2.7:1

YM-20220406-2-4.12.ser

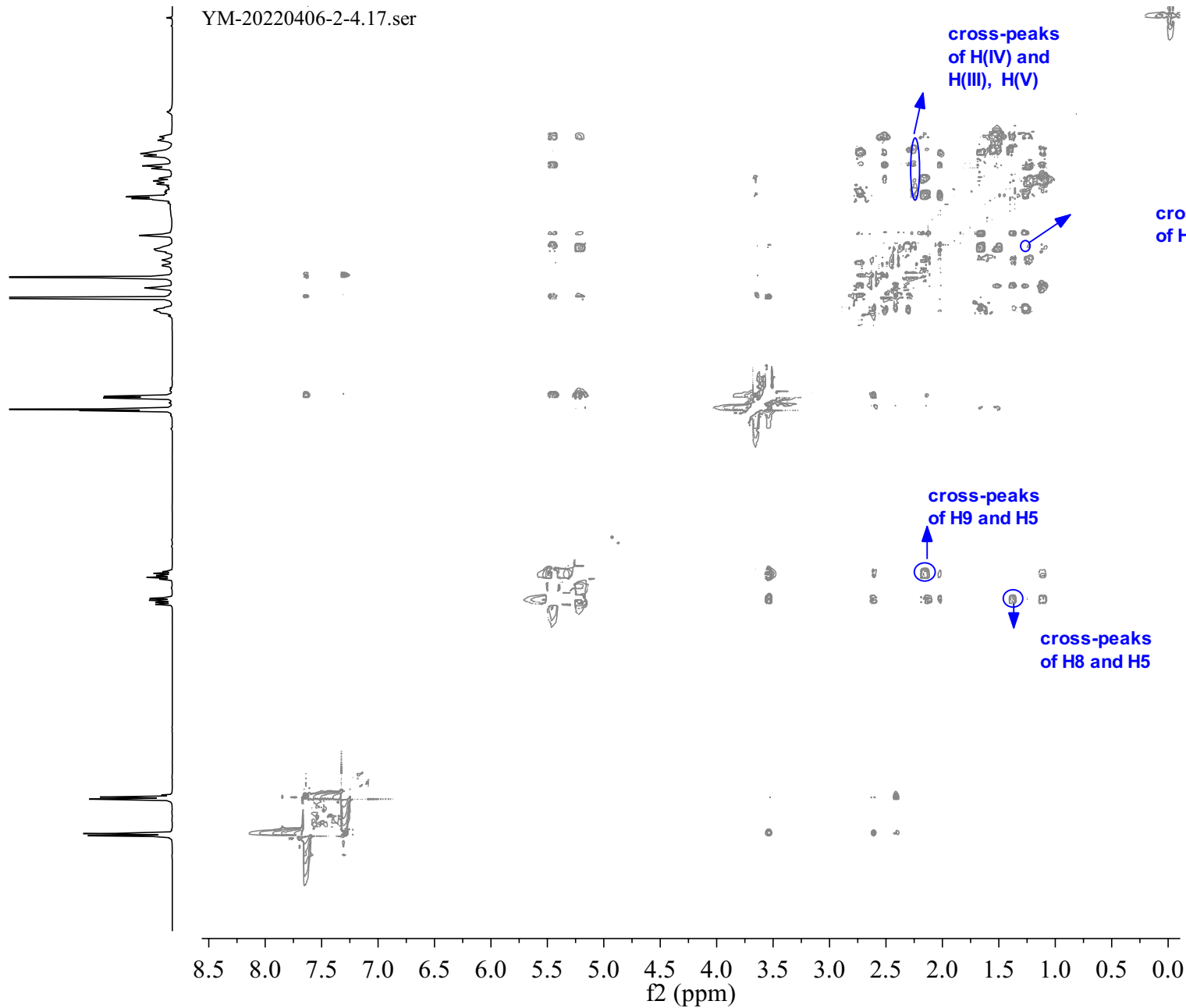


Parameter	Value
Title	YM-20220406-2-4.12.ser
Comment	
Origin	Bruker BioSpin GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDC13
Temperature	296.4
Pulse Sequence	cosypppqf
Experiment	COSY
Number of Scans	1
Receiver Gain	19.6
Relaxation Delay	1.9111
Pulse Width	9.1500
Presaturation Frequency	
Acquisition Time	0.2806
Acquisition Date	2022-04-10T19:52:28
Modification Date	2022-04-11T09:19:27
Spectrometer Frequency	(400.13, 400.13)
Spectral Width	(3649.6, 3649.6)
Lowest Frequency	(-251.5, -251.5)
Nucleus	(1H, 1H)
Acquired Size	(1024, 128)
Spectral Size	(1024, 1024)





YM-20220406-2-4.17.ser



0  
1  
2  
3  
4  
5  
6  
7  
8

C5/C6 = 2.7:1

cross-peaks of H5 and H7

cross-peaks of H(IV) and H(III), H(V)

cross-peaks of H9 and H5

cross-peaks of H8 and H5

Parameter	Value
Title	YM-20220406-2-4.17.ser
Comment	
Origin	Bruker BioSp in GmbH
Owner	nmr
Site	
Instrument	spect
Solvent	CDCI3
Temperature	298.1
Pulse Sequence	noesy gp ppp
Experiment	NOESY
Number of Scans	4
Receiver Gain	17.4
Relaxation Delay	1.9611
Pulse Width	9.3800
Presaturation Frequency	
Acquisition Time	0.2949
Acquisition Date	2022-04-12T23:10:18
Modification Date	2022-04-13T09:52:58
Spectrometer Frequency	(400.13, 400.13)
Spectral Width	(3472.2, 3472.2)
Lowest Frequency	(-46.2, -46.2)
Nucleus	(1H, 1H)
Acquired Size	(1024, 256)
Spectral Size	(1024, 1024)