Electronic Supplementary Material (ESI) for Organic & Biomolecular Chemistry.

Electronic Supporting Information

Metal-free synthesis of quinoline-2,4-dicarboxylate derivatives using aryl amines and acetylenedicarboxylates through pseudo three-component reaction

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Figure: S1. ORTEP Diagram of compound 3k with 40% ellipsoid probabilit

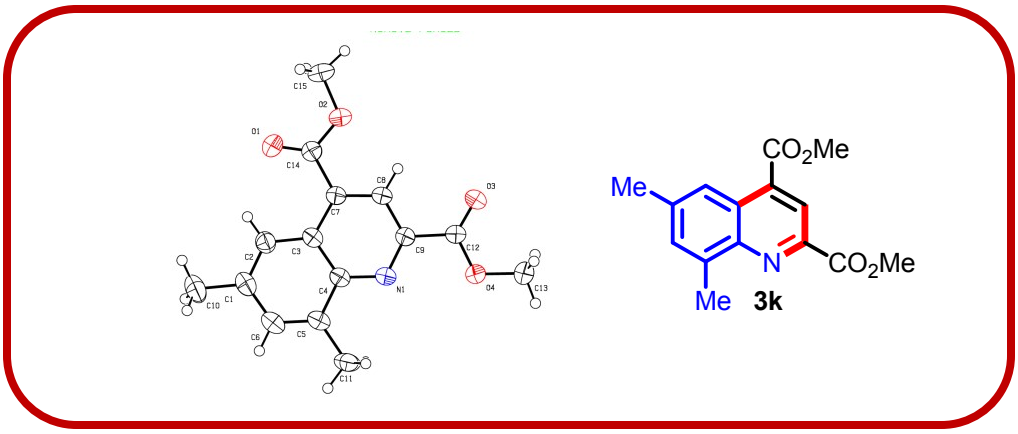
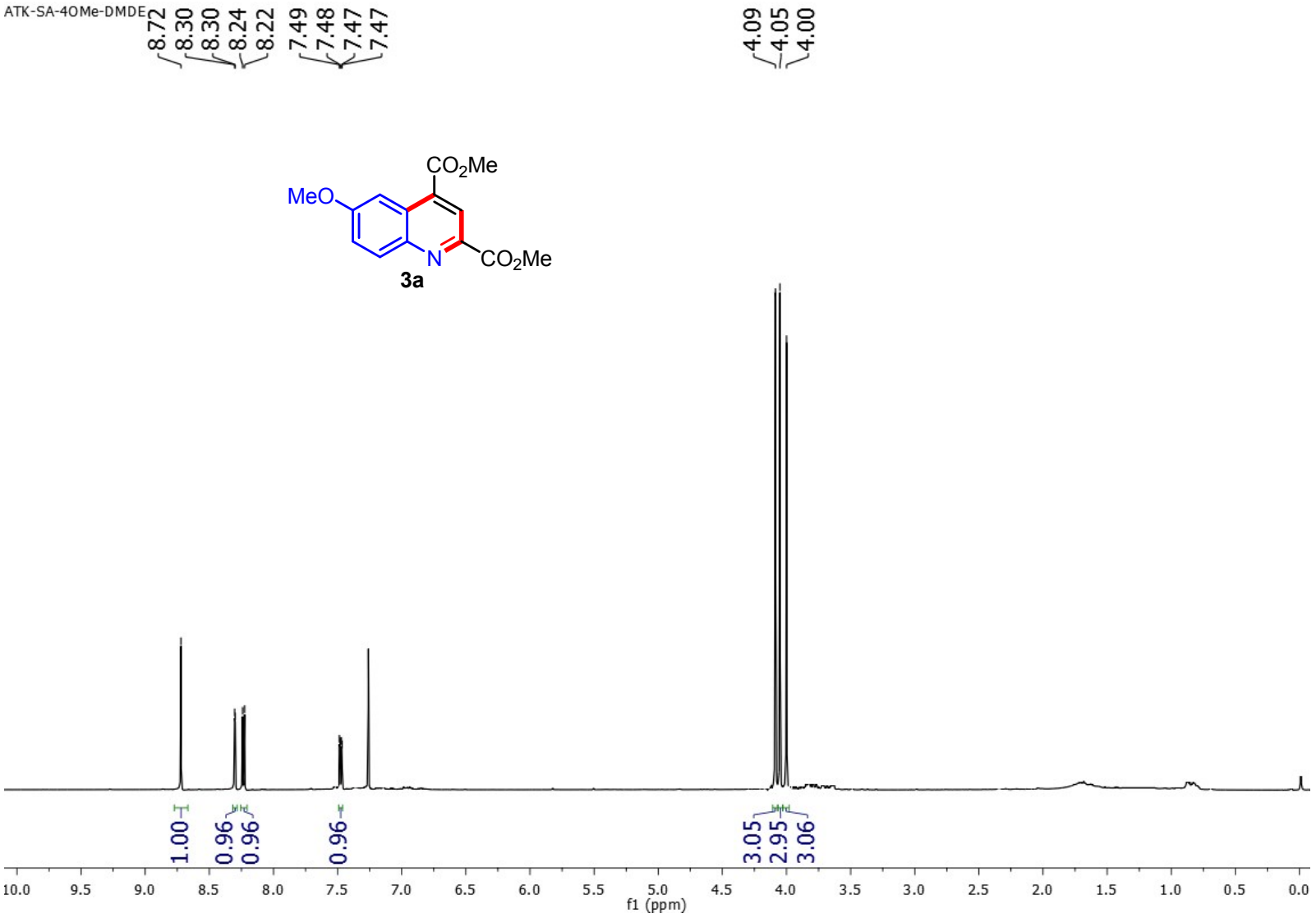


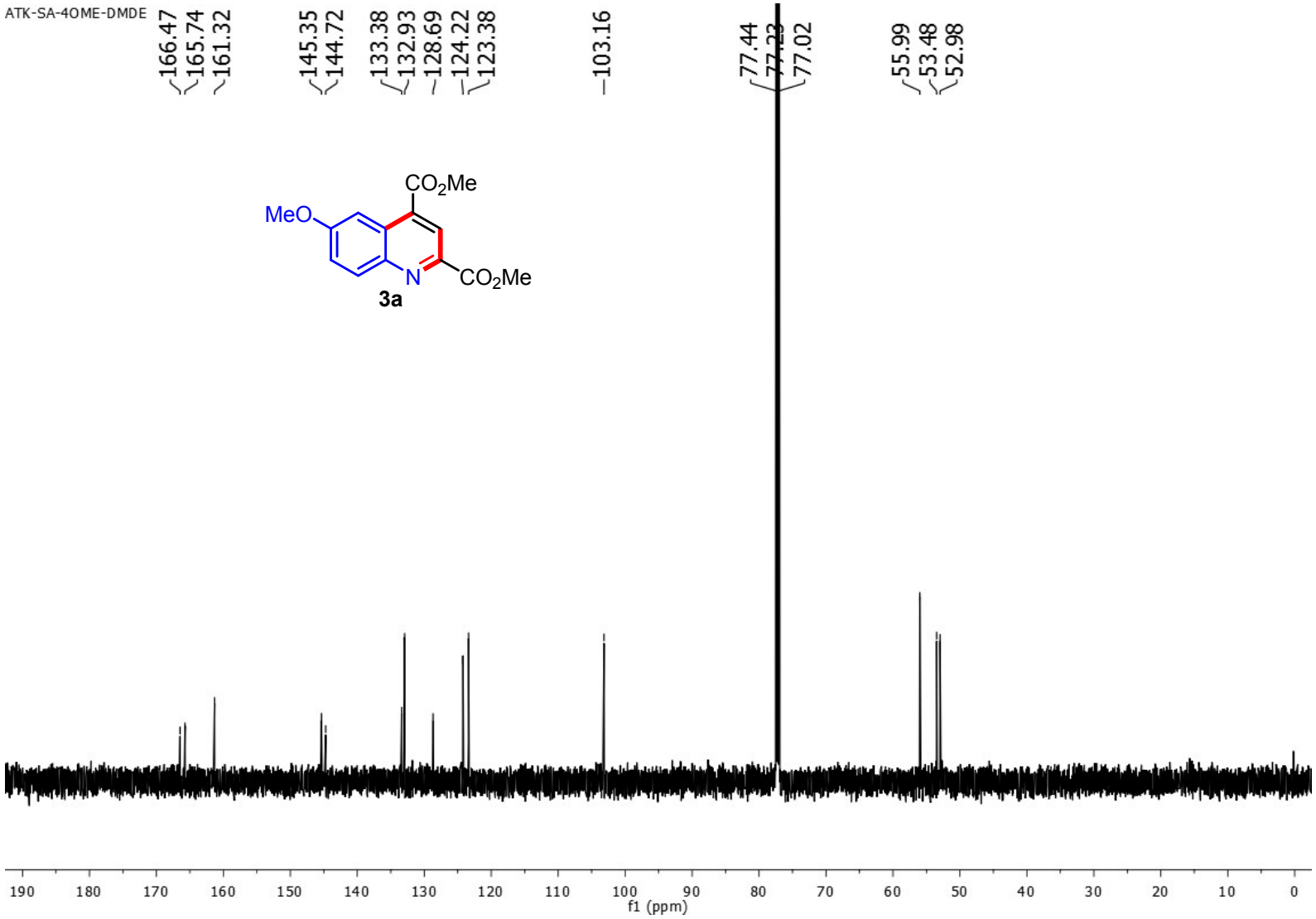
Table S1. Crystal data and structure refinement for compound 3k

Entry	Identification code	Compound 3k
01	Empirical formula	$C_{15}H_{15}NO_4$
02	Formula weight	273.1001
03	Temperature	296 (2)K
04	Wavelength	0.71073
05	Radiation type	MoK\a
06	Radiation source	'fine-focus sealed tube'
07	Crystal system	Monoclinic
08	Space group	P 21/n
09	Cell length	a=3.9964(3)b=38.647(3)c=8.7063(5)
10	Cell Angle	α 90(9)β 97.942(3)γ90
11	Cell Volume	1331.77(3)
12	Density	1.363
13	Completeness to theta	0.998-28.293
14	Absorption correction	multi-scan
15	Refinement method	Full
16	Index ranges	$-5 \le h \le 5$, $-55 \le k \le 55$, $-11 \le l \le 11$
17	Reflection number	3314
18	Theta range	2.108-28.293
19	Cell formula units Z	4
20	CCDC no	2053801

^{1}H NMR spectrum of compound: 3a



^{13}C NMR spectrum of compound: 3a



HRMS spectrum of compound: 3a

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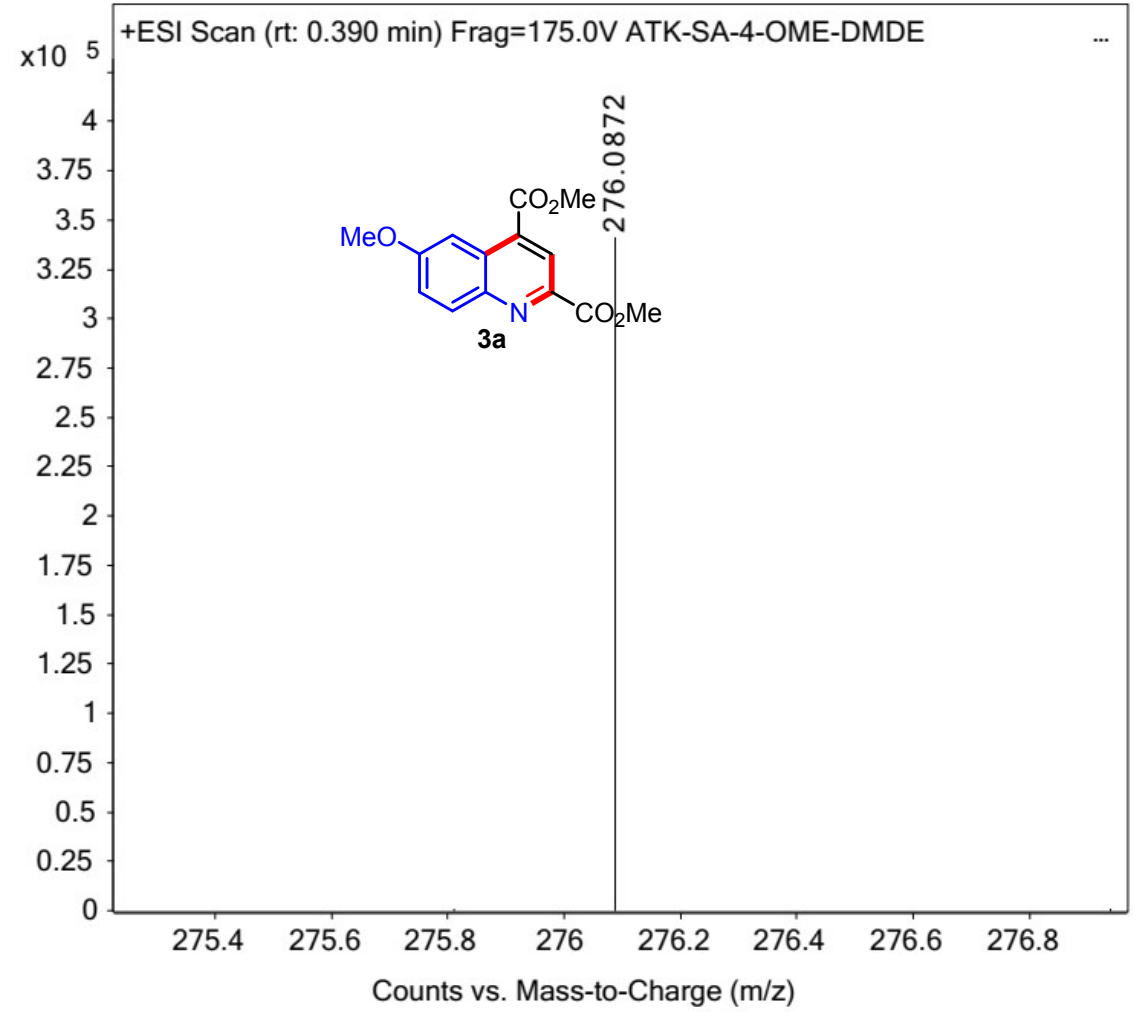
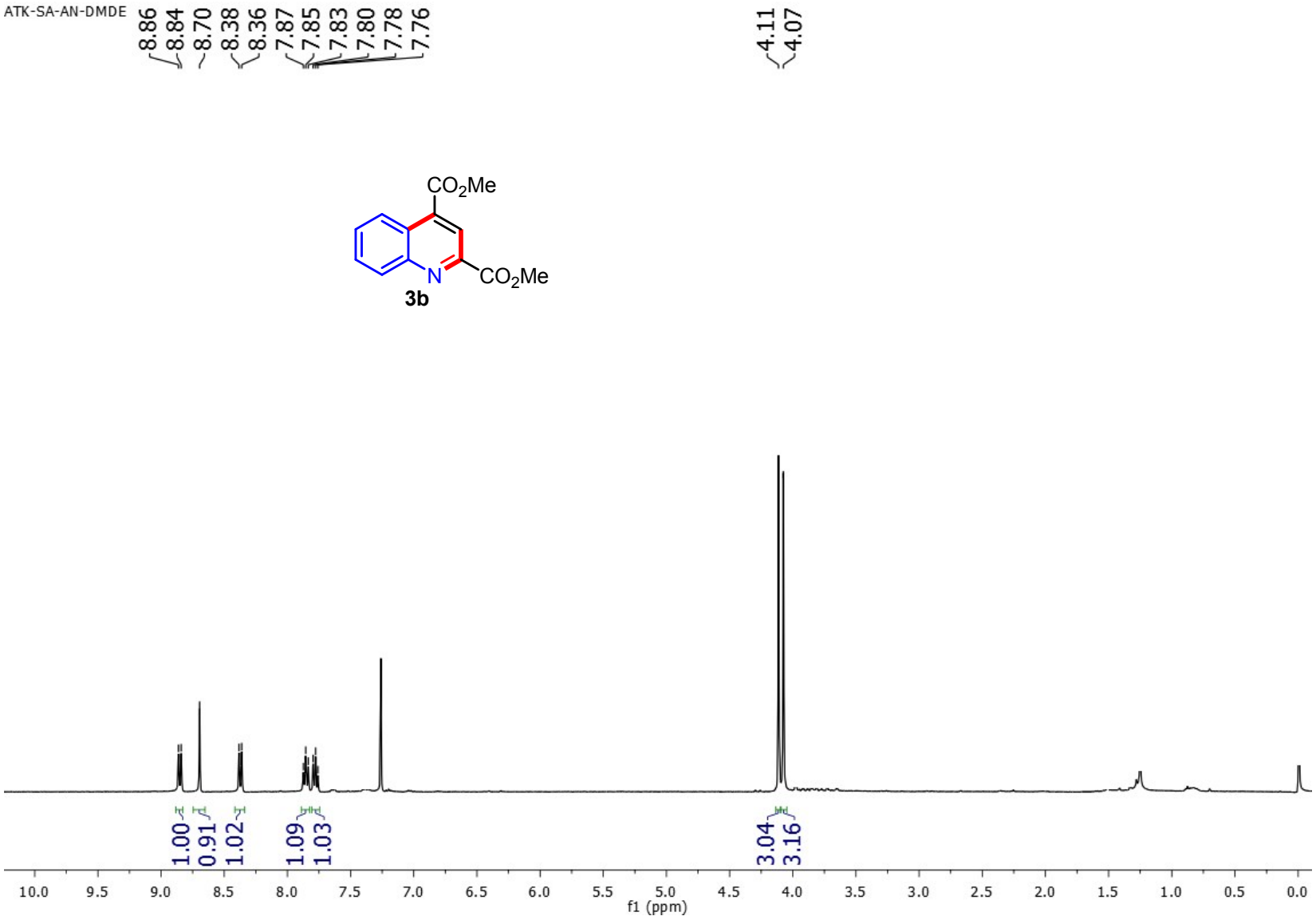
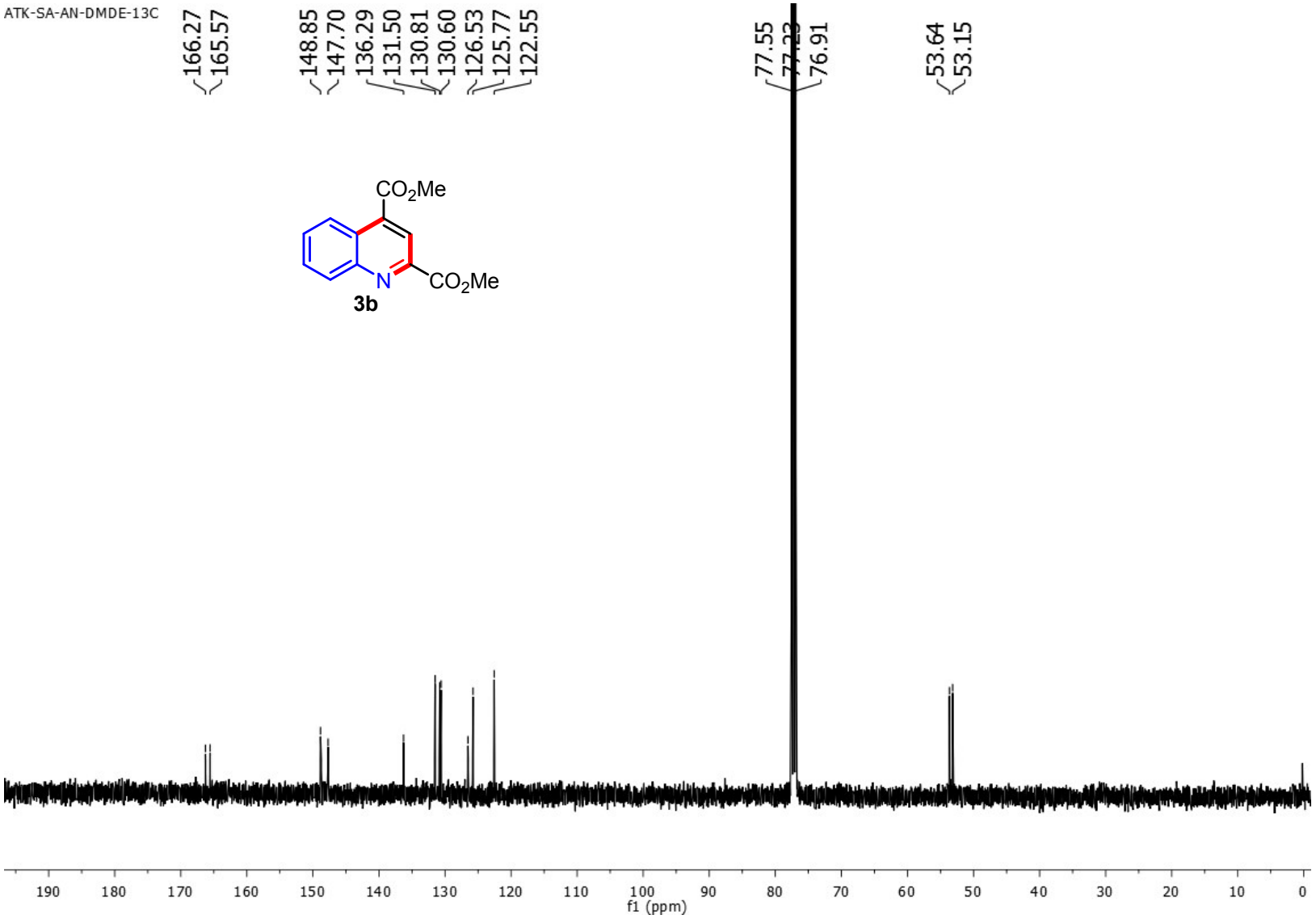
	Inj Vol	20	**InjPosition**	
Sample	**IRM Calibration Status**	Success	**Data Filename**	ATK-SA-4-OME-DMDE.d
ESI ALS 100-500.m	**Comment**		**Acquired Time**	21-12-2020 11:37:02 (UTC+05:30)



^{1}H NMR spectrum of compound: 3b

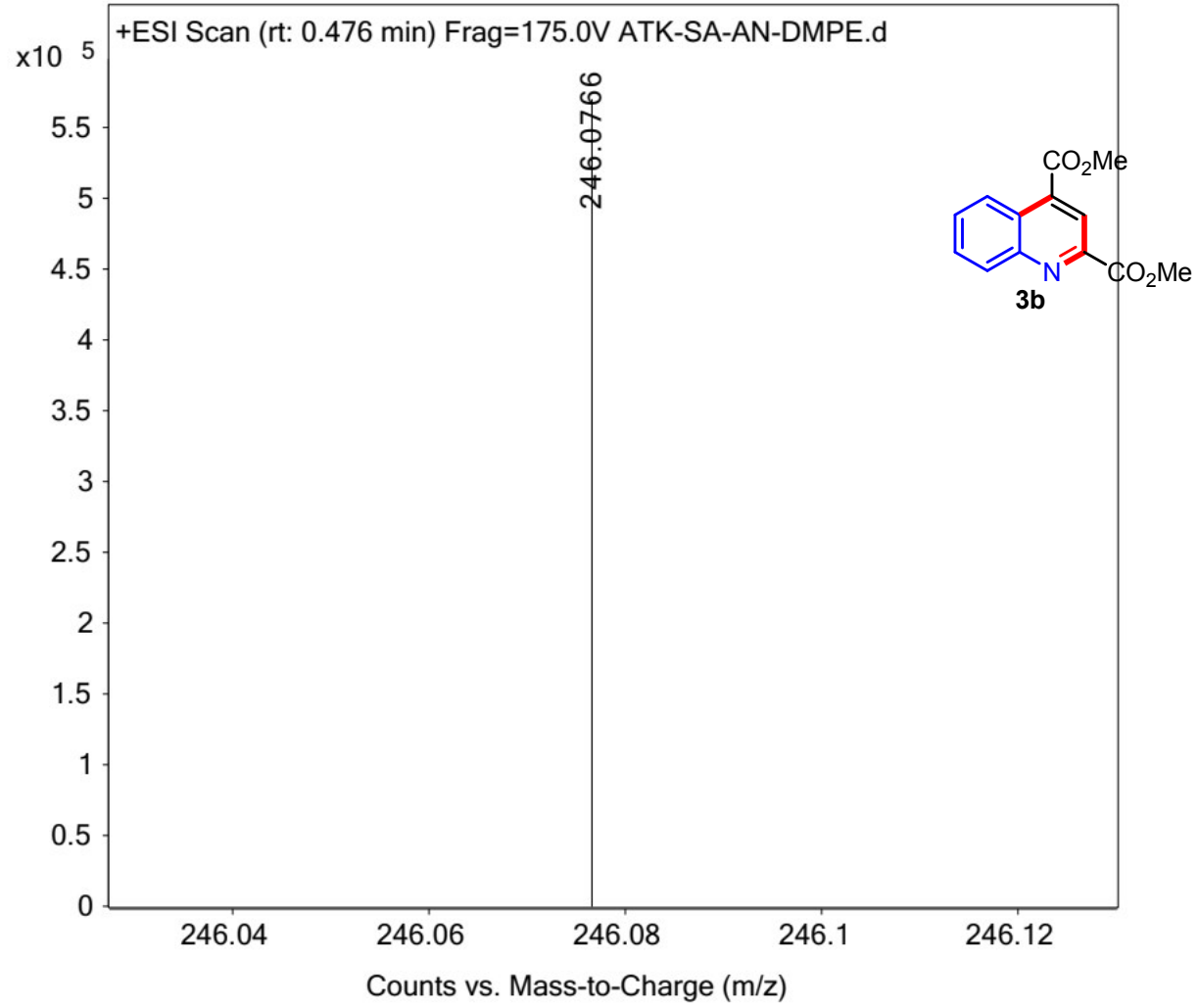


^{13}C NMR spectrum of compound: 3b

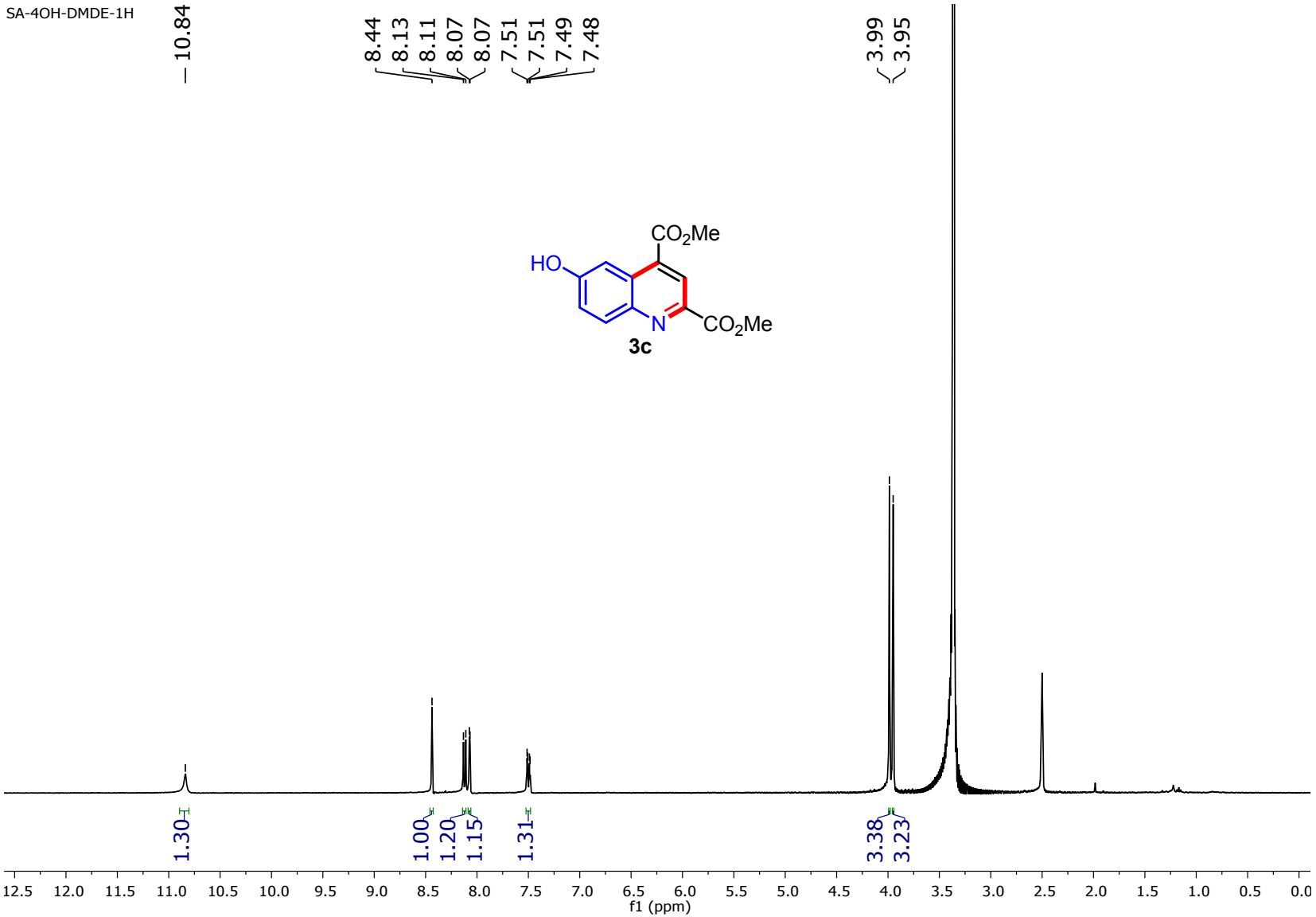


HRMS spectrum of compound: 3b

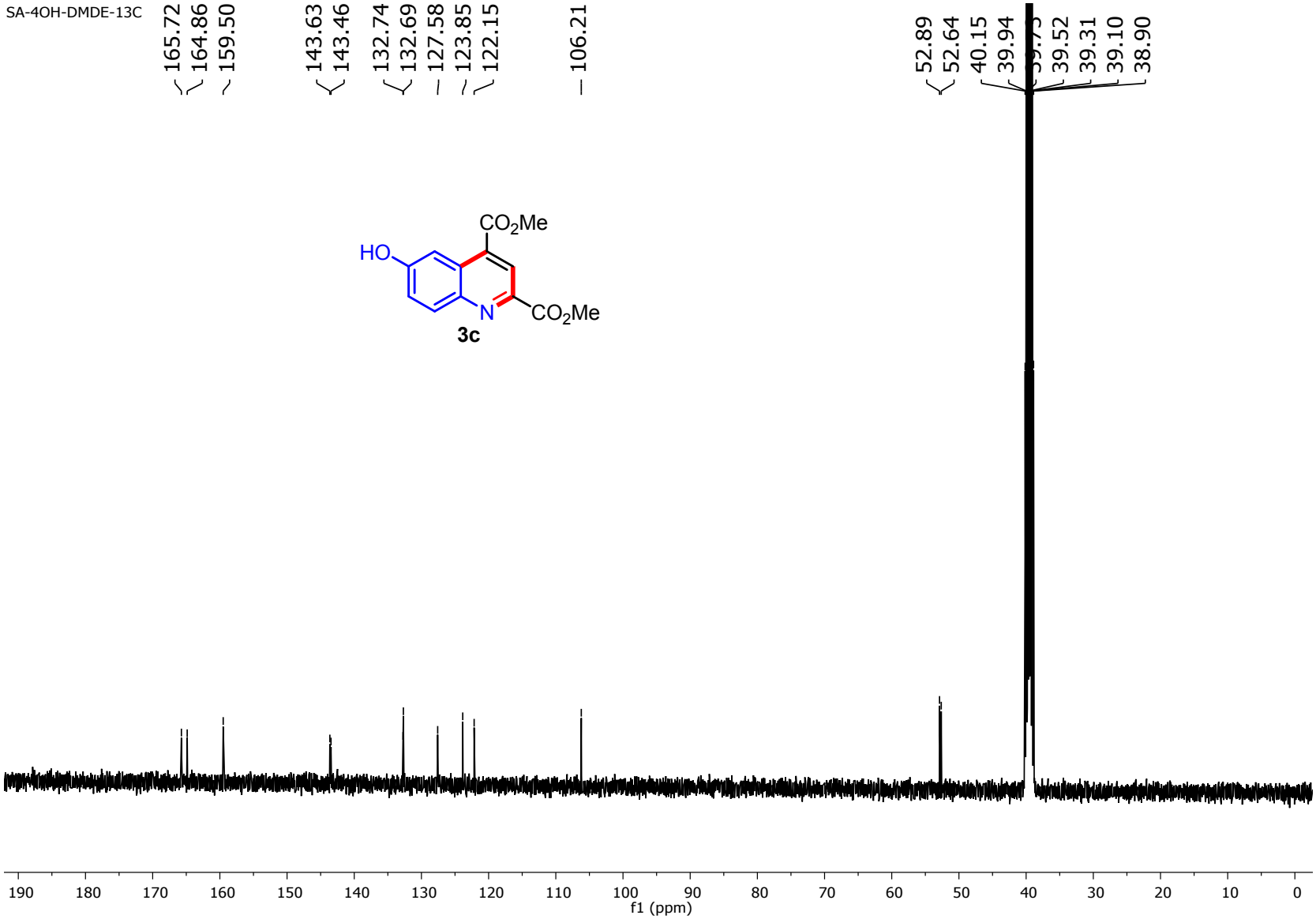
ATK-SA-AN-DMPE	**Position**	P2-B2	**Instrument Name**	Instrument 1
	Inj Vol	20	**InjPosition**	
Sample	**IRM Calibration Status**	Success	**Data Filename**	ATK-SA-AN-DMPE.d
ESI ALS 100-500.m	**Comment**		**Acquired Time**	12-01-2021 21:40:33 (UTC+05:30)



^{1}H NMR spectrum of compound: 3c

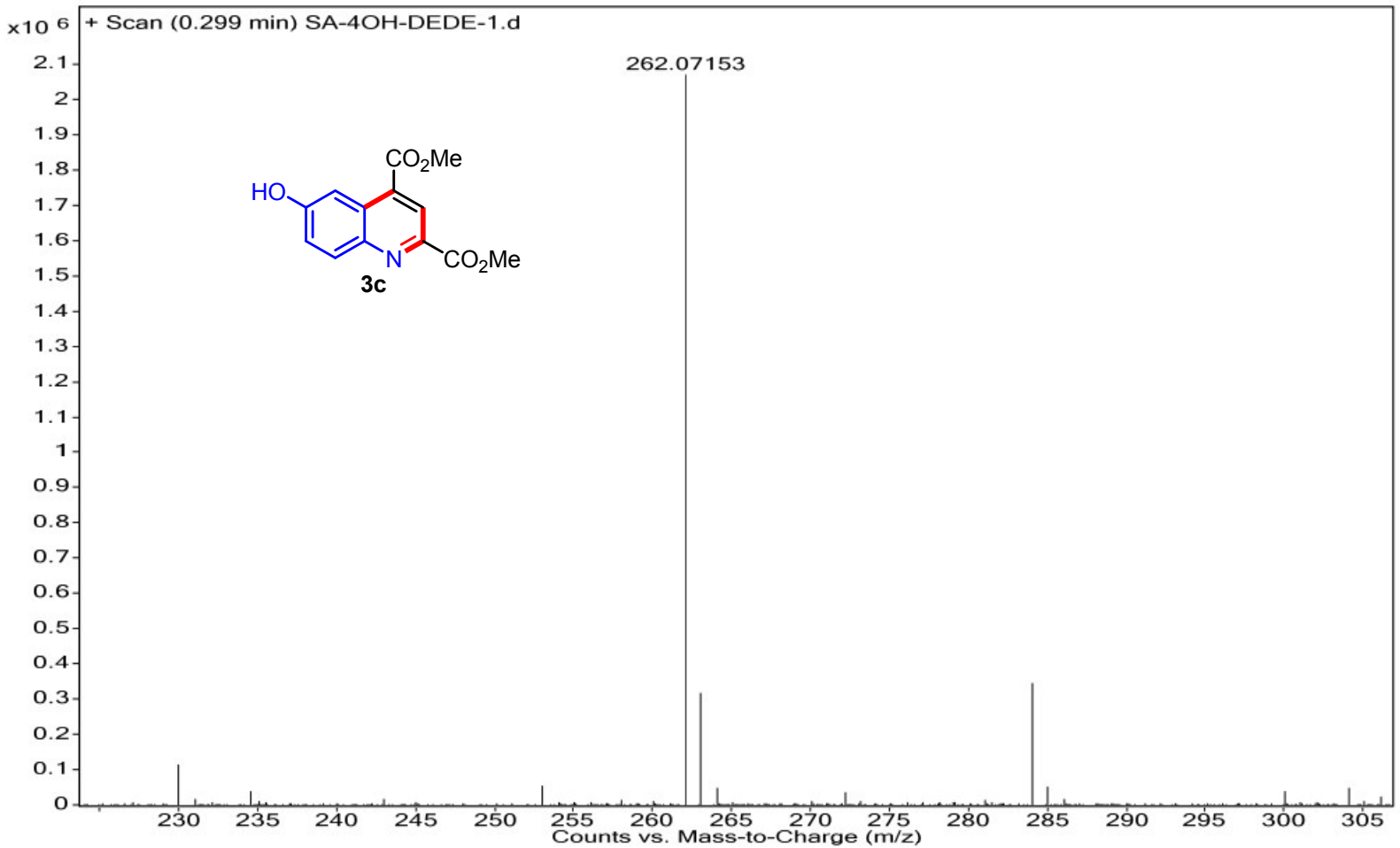


^{13}C NMR spectrum of compound: 3c

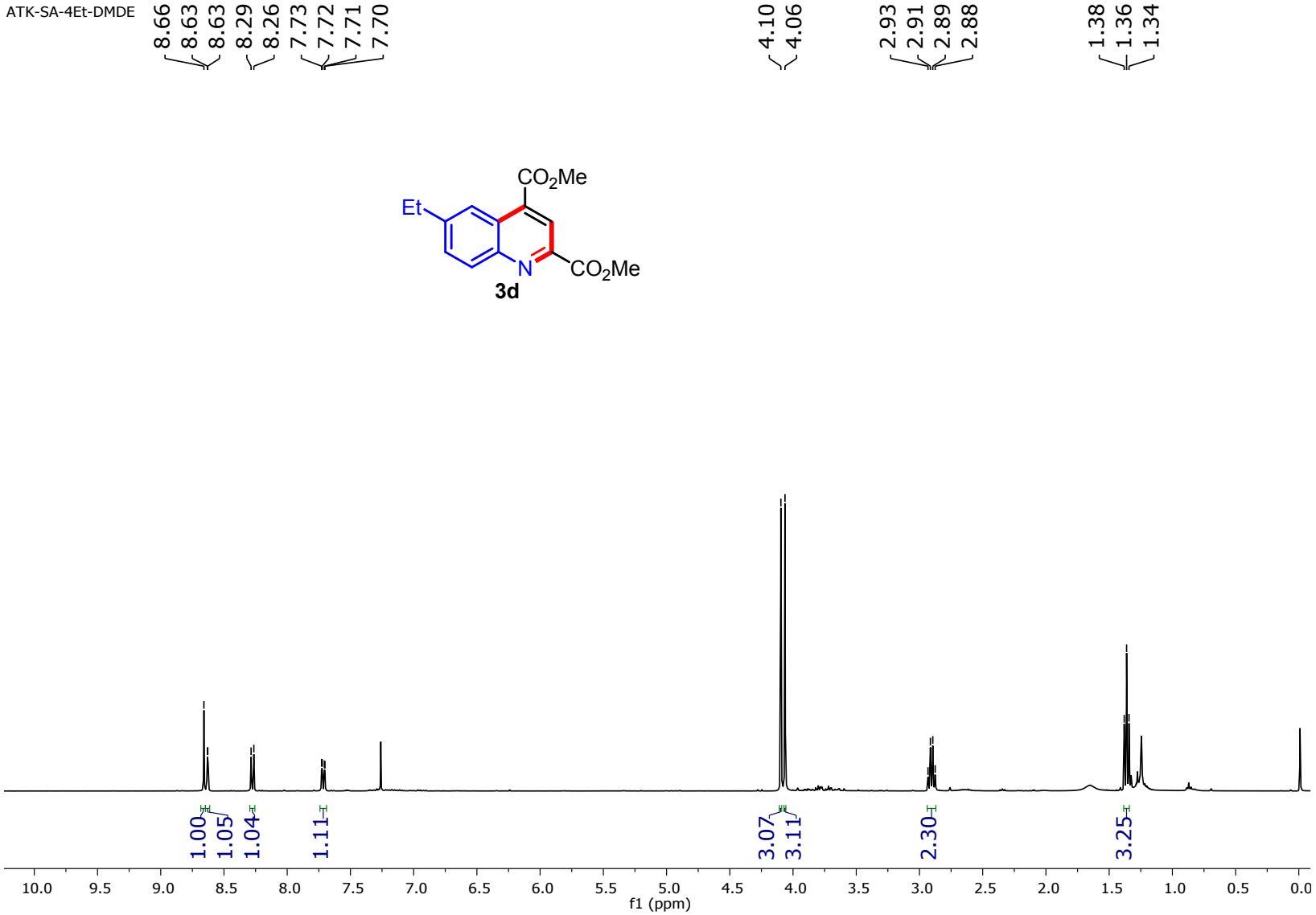


HRMS spectrum of compound: 3c

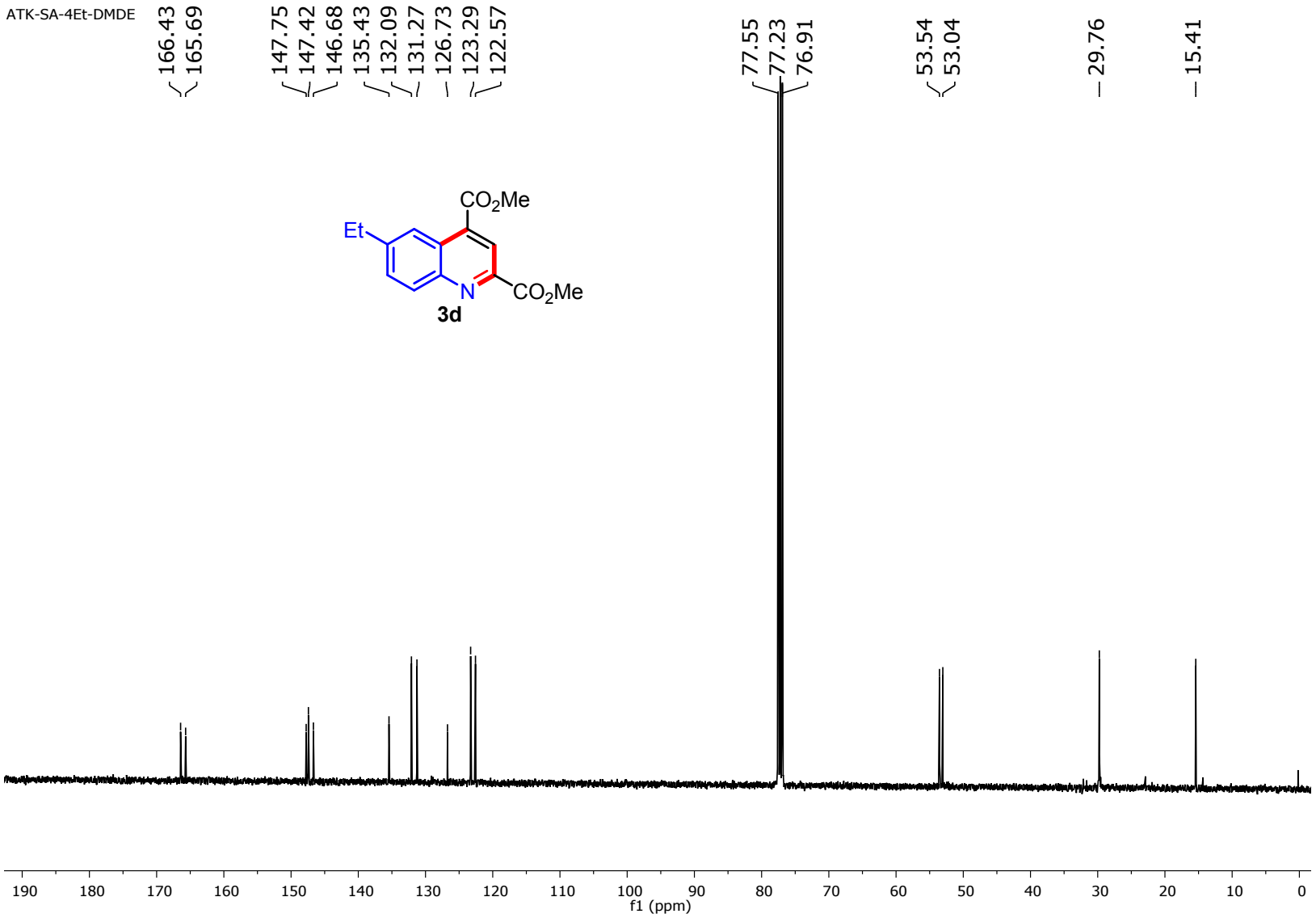
Sample Name	SAMPLE 8	**Position**	P1-A6	**Instrument Name**	Instrument 1	**User Name**	
Inj Vol	20	**InjPosition**		**SampleType**	Sample	**IRM Calibration Status**	Success
Data Filename	SA-4OH-DEDE-1.d	**ACQ Method**	ESI ALS 100-500.m	**Comment**		**Acquired Time**	2/18/2021 1:41:46 PM



^{1}H NMR spectrum of compound: 3d

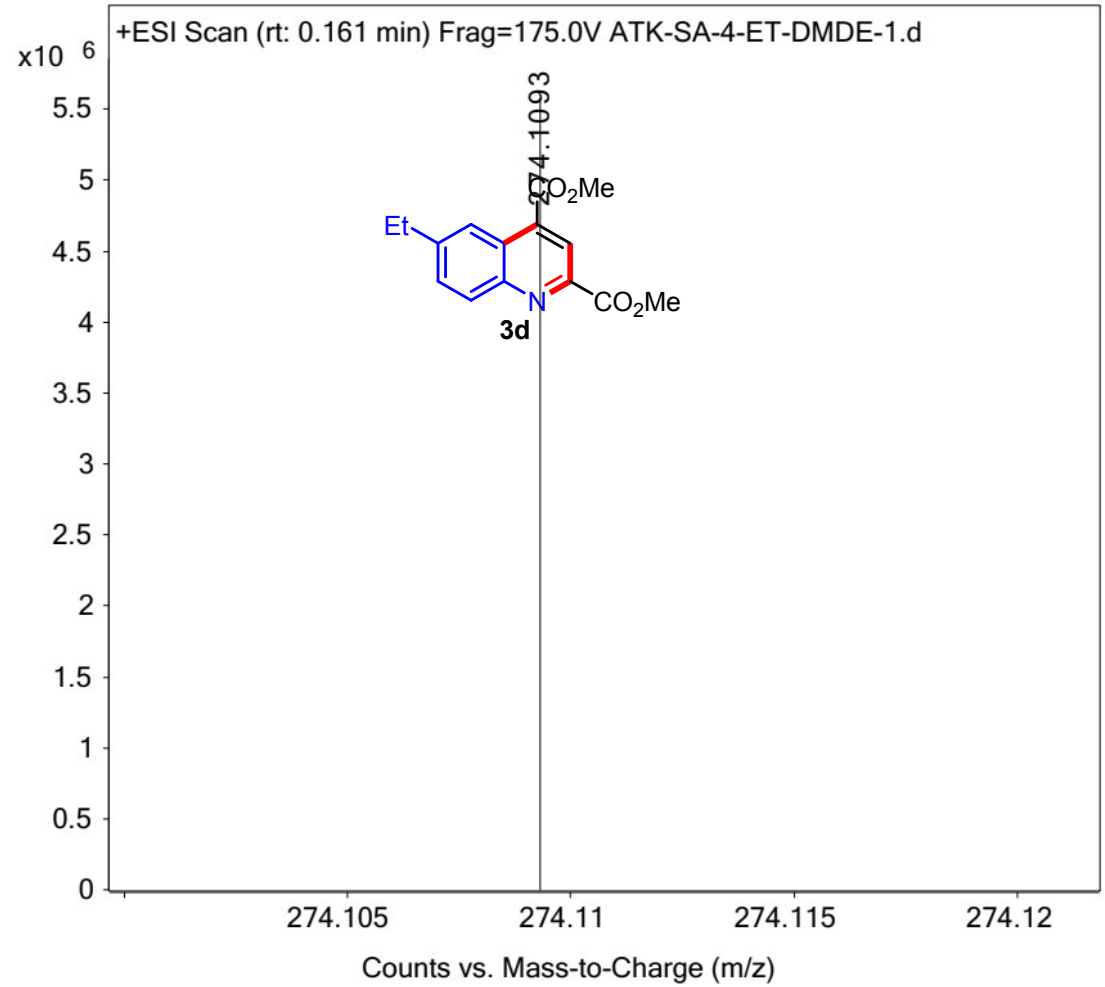


^{13}C NMR spectrum of compound: 3d

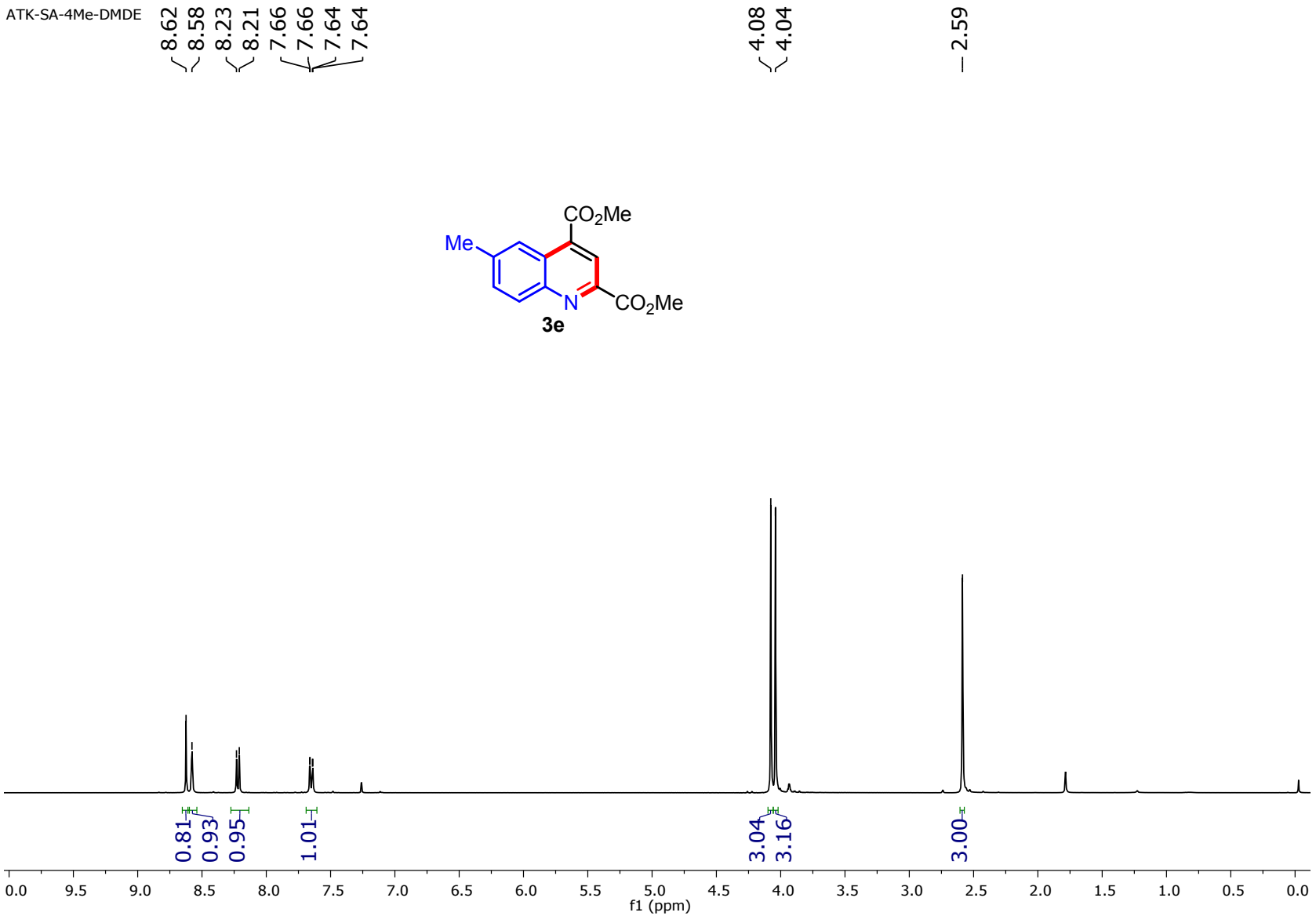


HRMS spectrum of compound: 3d

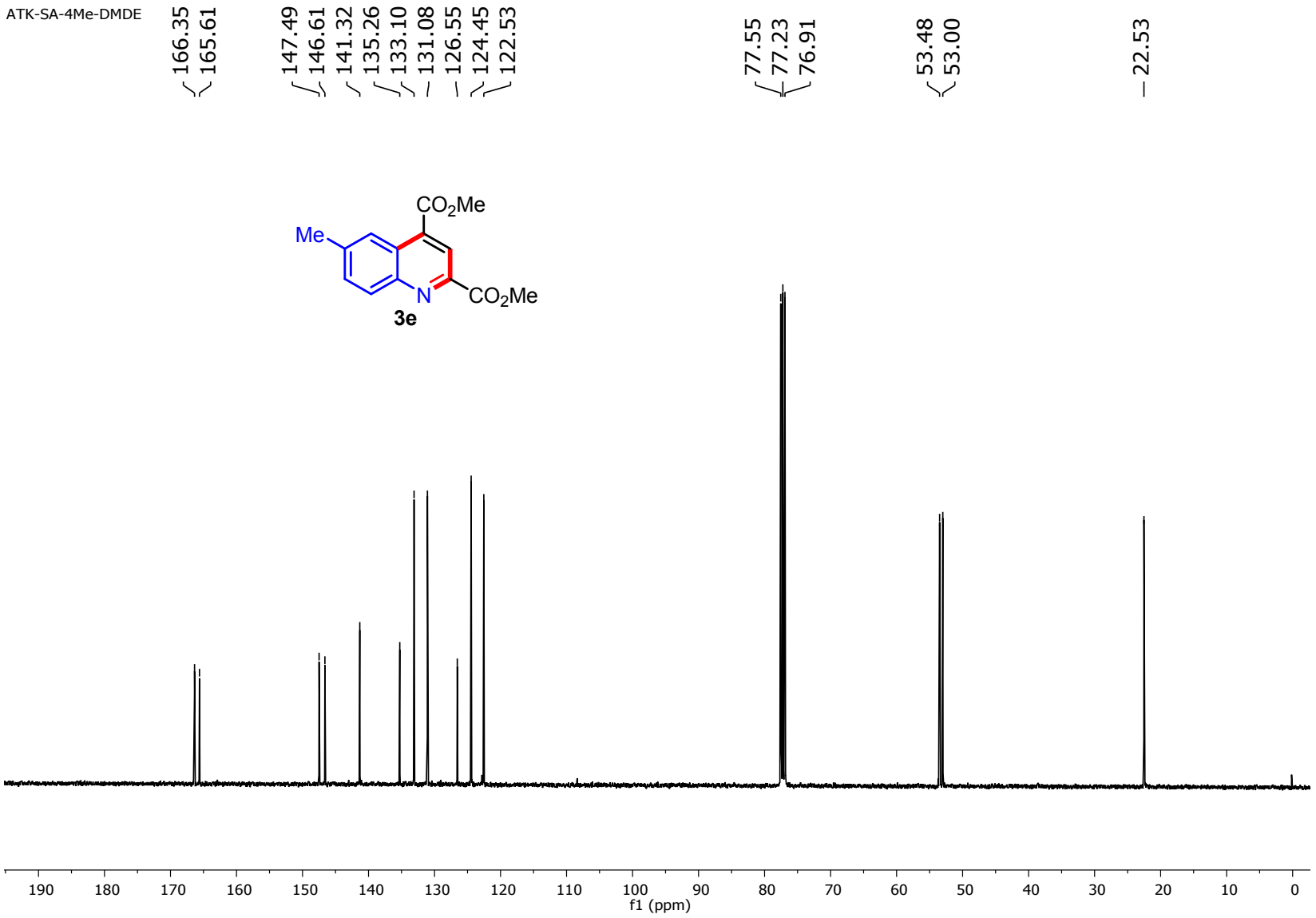
WASH	**Position**	P1-D3	**Instrument Name**	Instrument 1
	Inj Vol	20	**InjPosition**	
Sample	**IRM Calibration Status**	Success	**Data Filename**	ATK-SA-4-ET-DMDE-1.d
ESI ALS 100-500.m	**Comment**		**Acquired Time**	04-01-2021 14:22:44 (UTC+05:30)



^{1}H NMR spectrum of compound: 3e

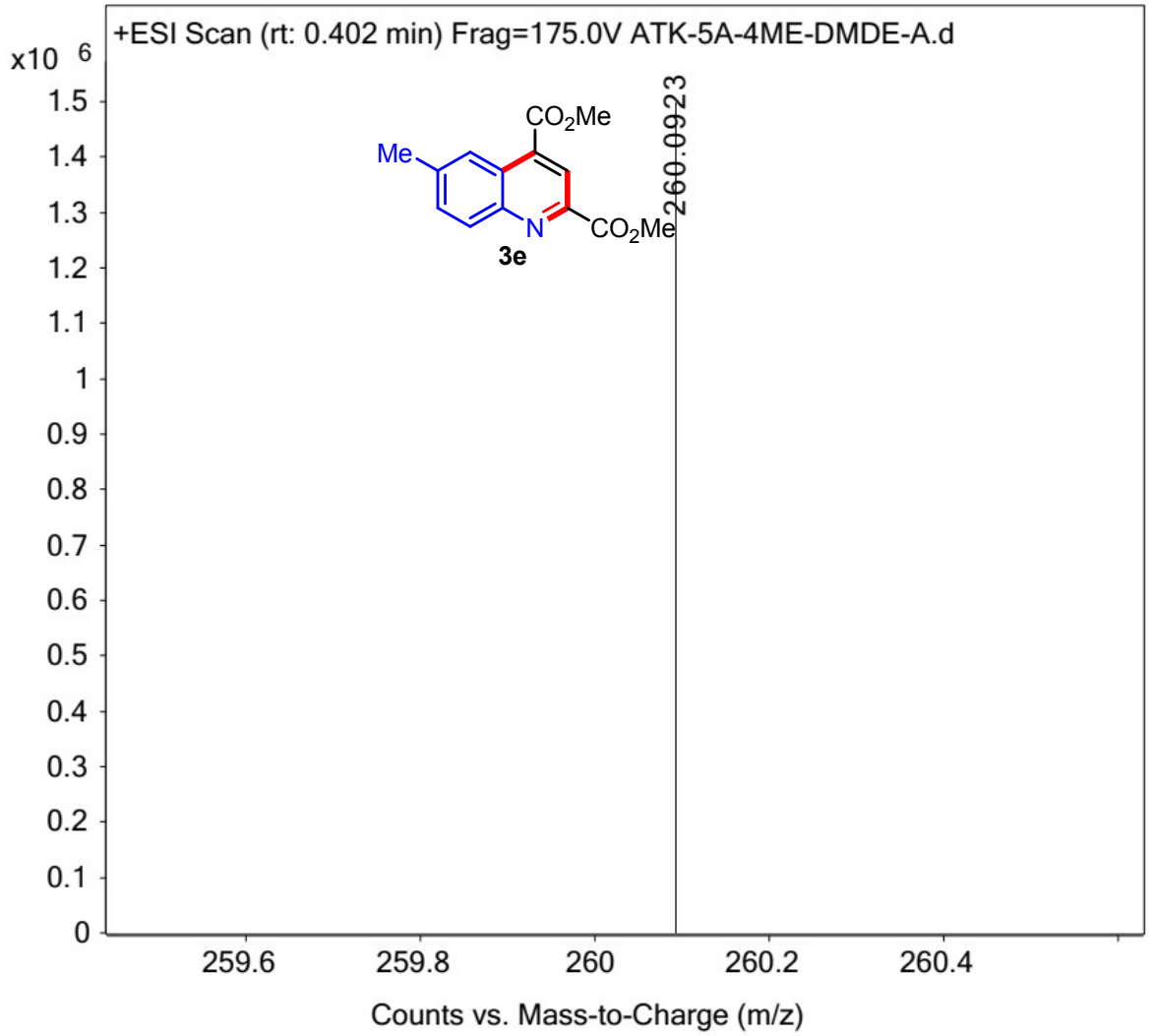


^{13}C NMR spectrum of compound: 3e

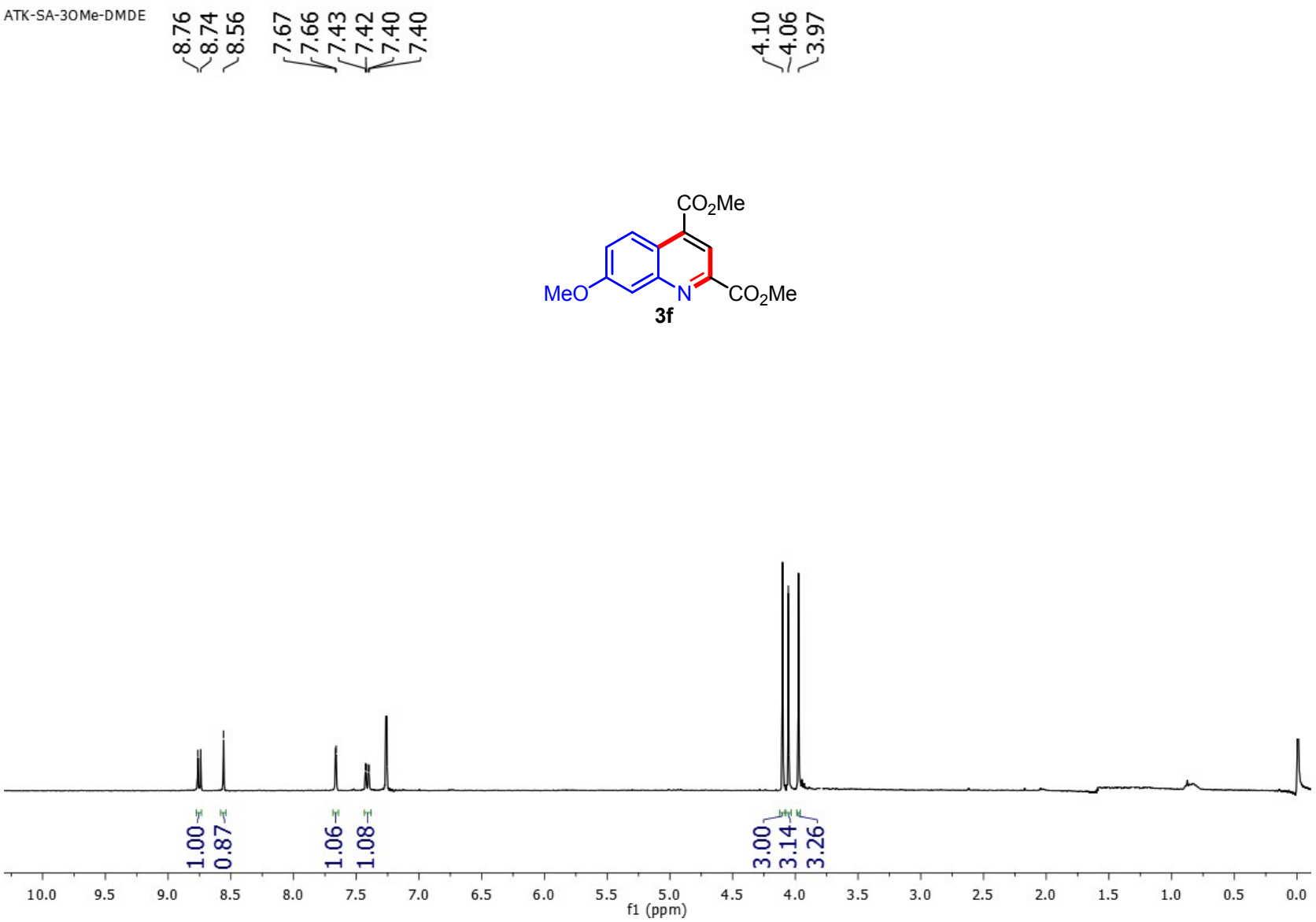


HRMS spectrum of compound: 3e

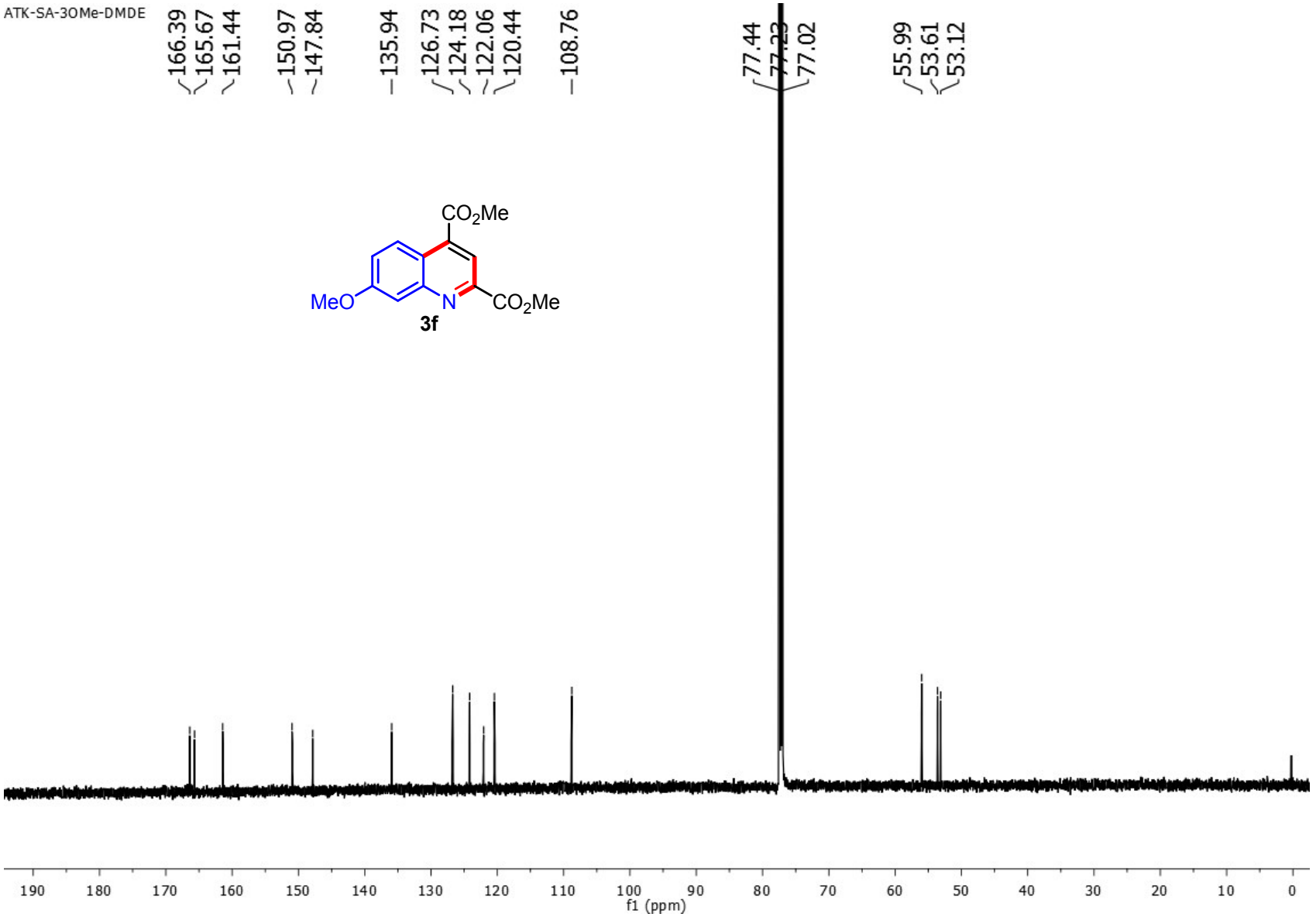
WASH	**Position**	P1-C7	**Instrument Name**	Instrument 1
	Inj Vol	20	**InjPosition**	
Sample	**IRM Calibration Status**	Success	**Data Filename**	ATK-5A-4ME-DMDE-A.d
ESI ALS 100-500.m	**Comment**		**Acquired Time**	24-12-2020 19:53:23 (UTC+05:30)



^{1}H NMR spectrum of compound: 3f

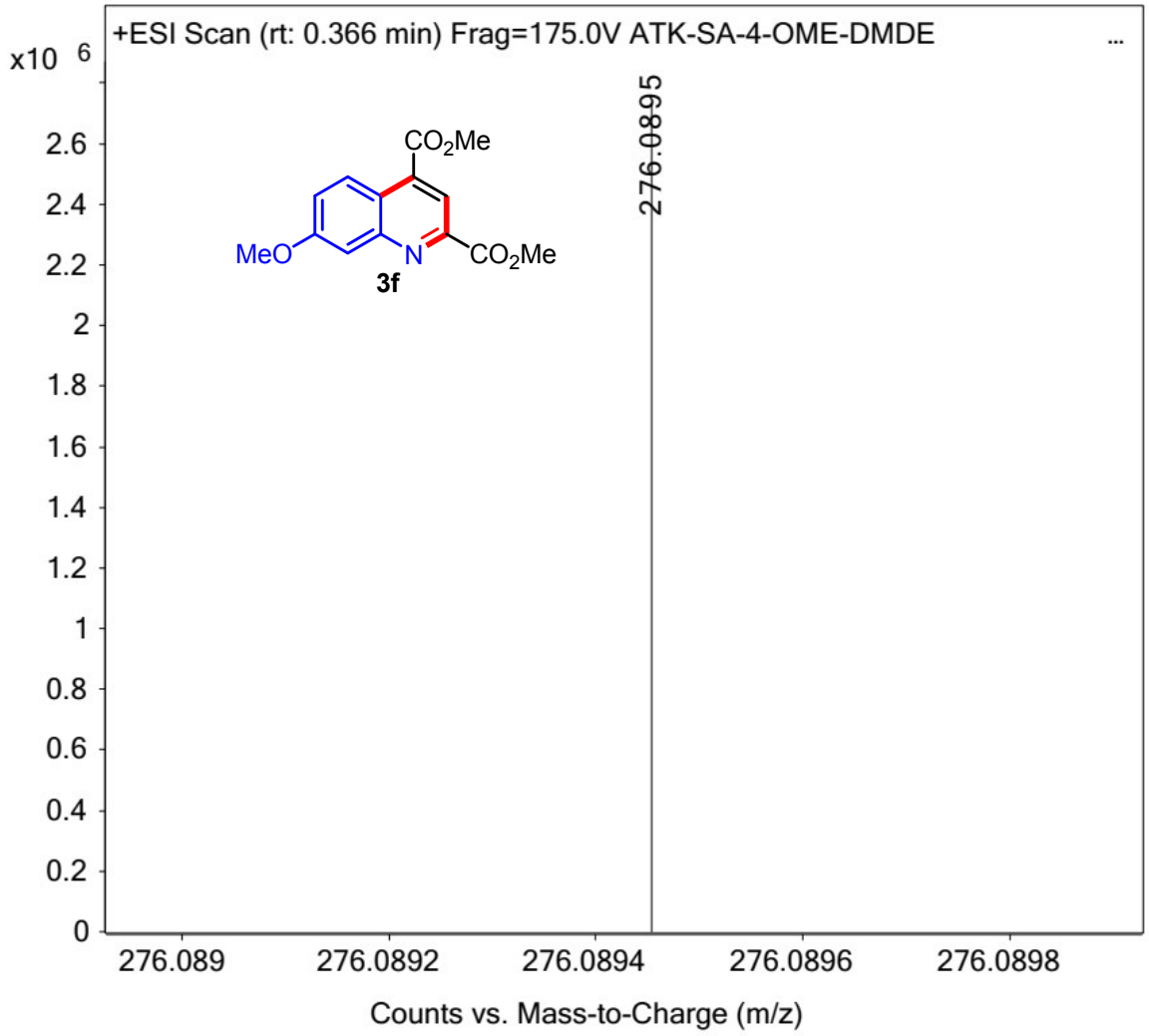


^{13}C NMR spectrum of compound: 3f

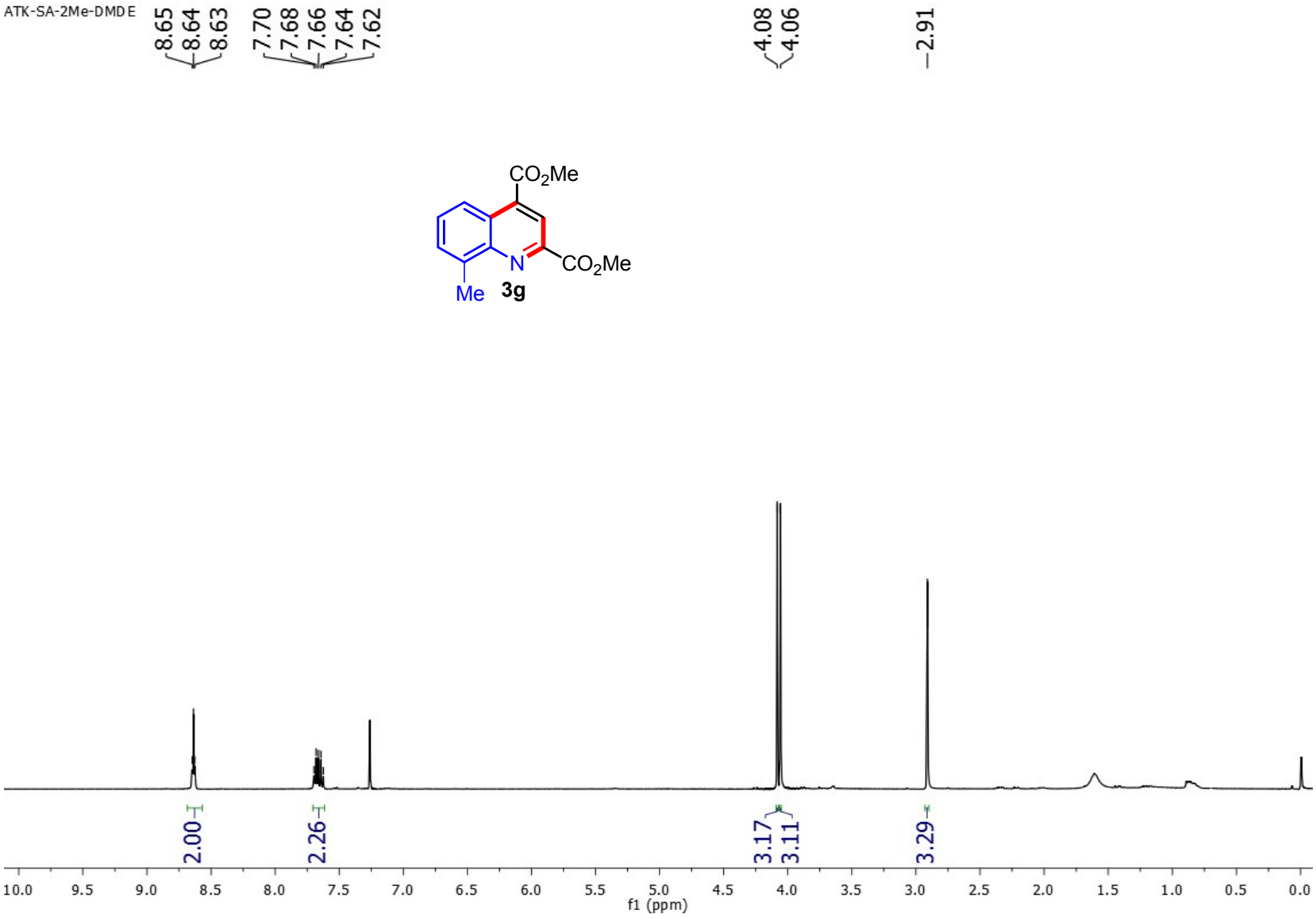


HRMS spectrum of compound: 3f

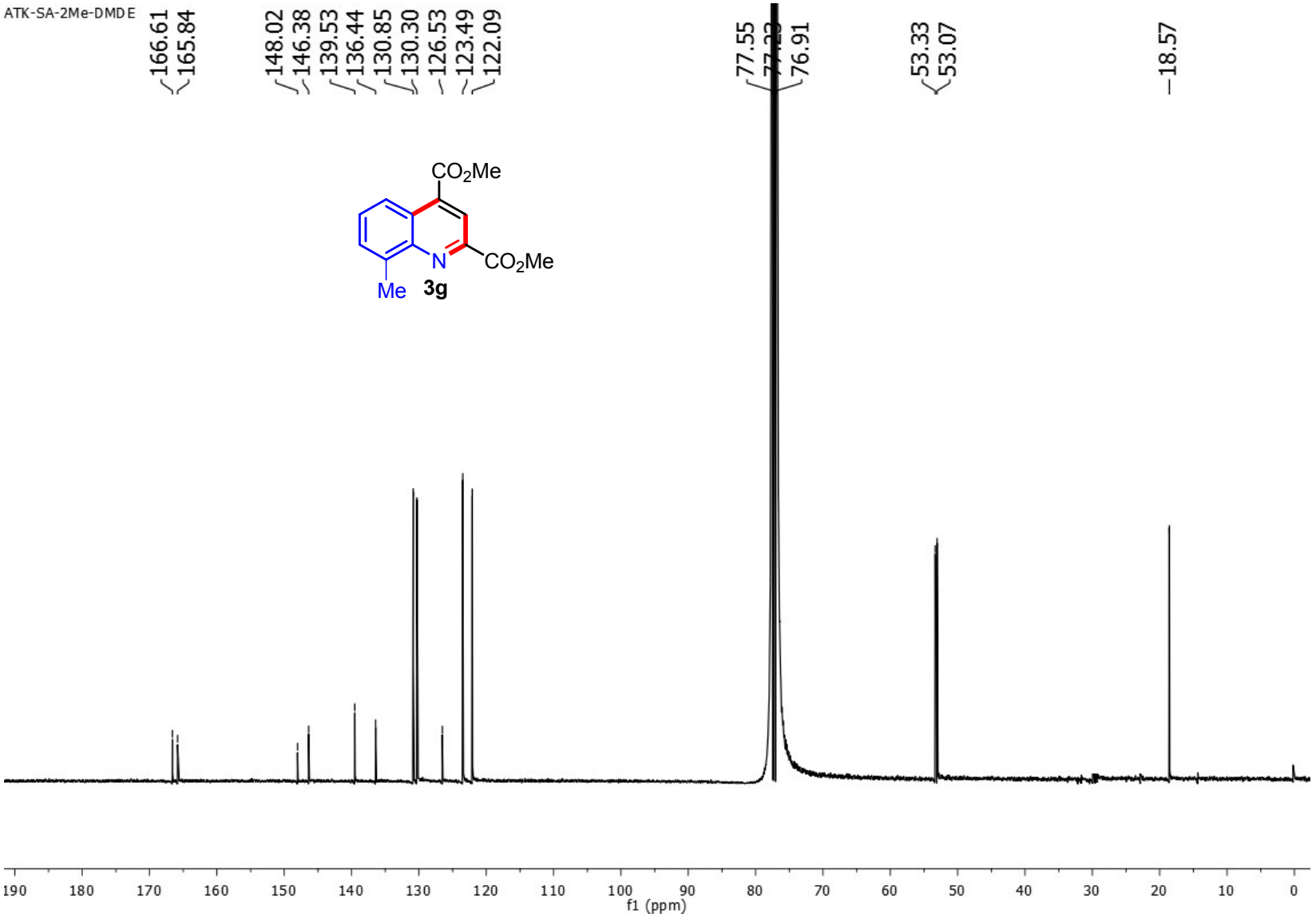
ATK-SA-4-OME-DMDE	**Position**	P1-B4	**Instrument Name**	Instrument 1
	Inj Vol	20	**InjPosition**	
Sample	**IRM Calibration Status**	Success	**Data Filename**	ATK-SA-4-OME-DMDE.d
ESI ALS 100-1000.m	**Comment**		**Acquired Time**	20-01-2021 13:49:09 (UTC+05:30)



^{1}H NMR spectrum of compound: 3g

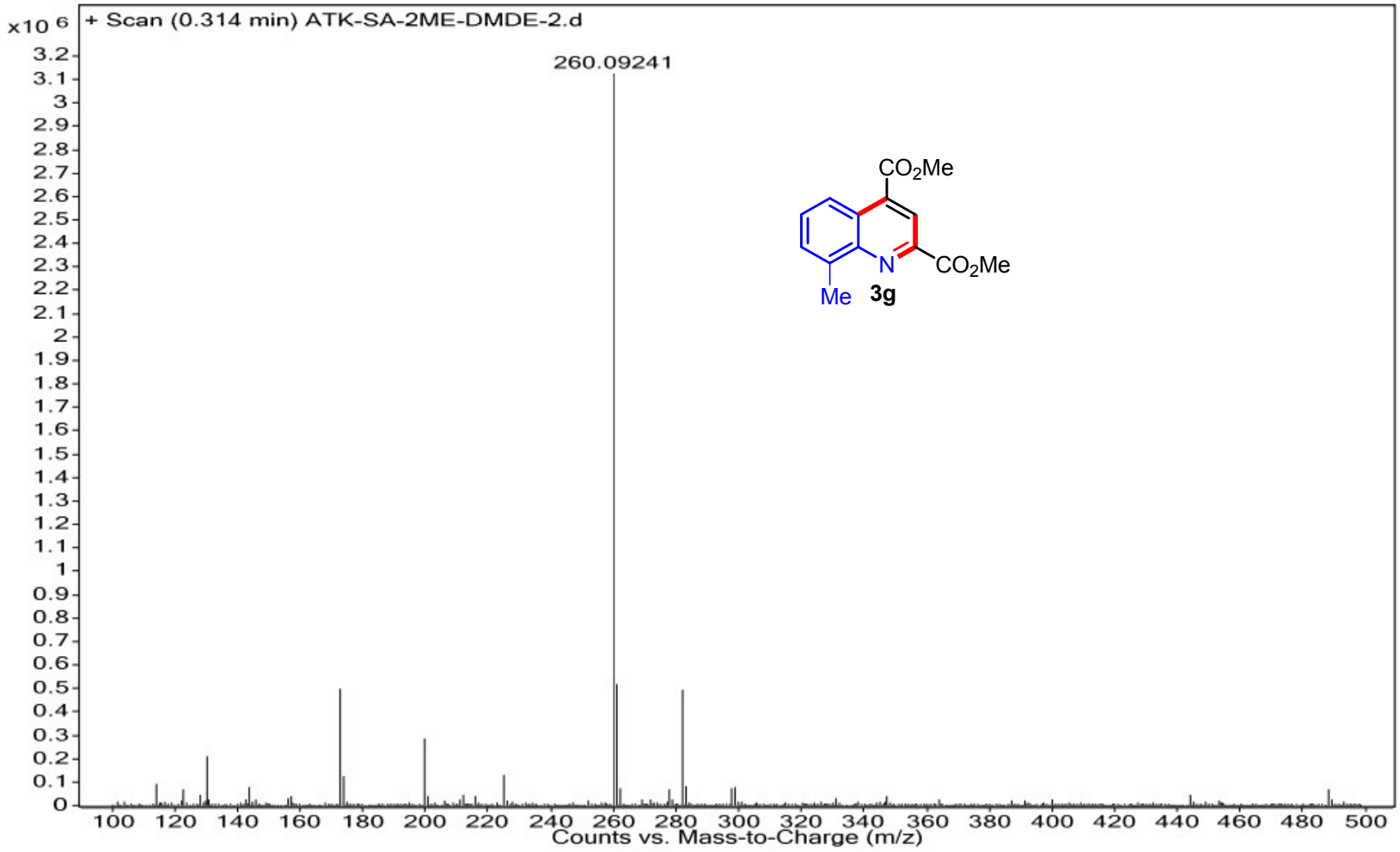


^{13}C NMR spectrum of compound: 3g

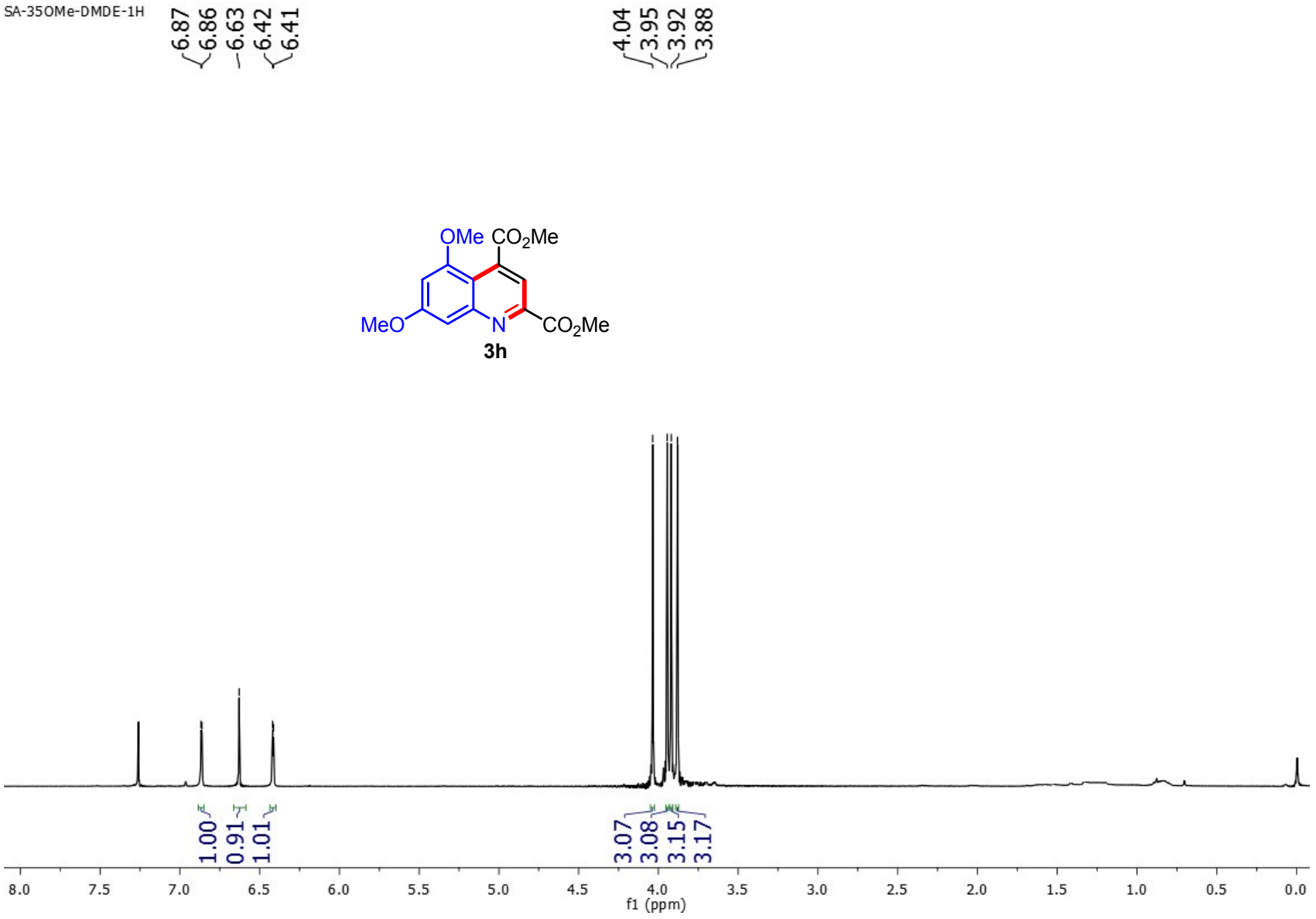


HRMS spectrum of compound: 3g

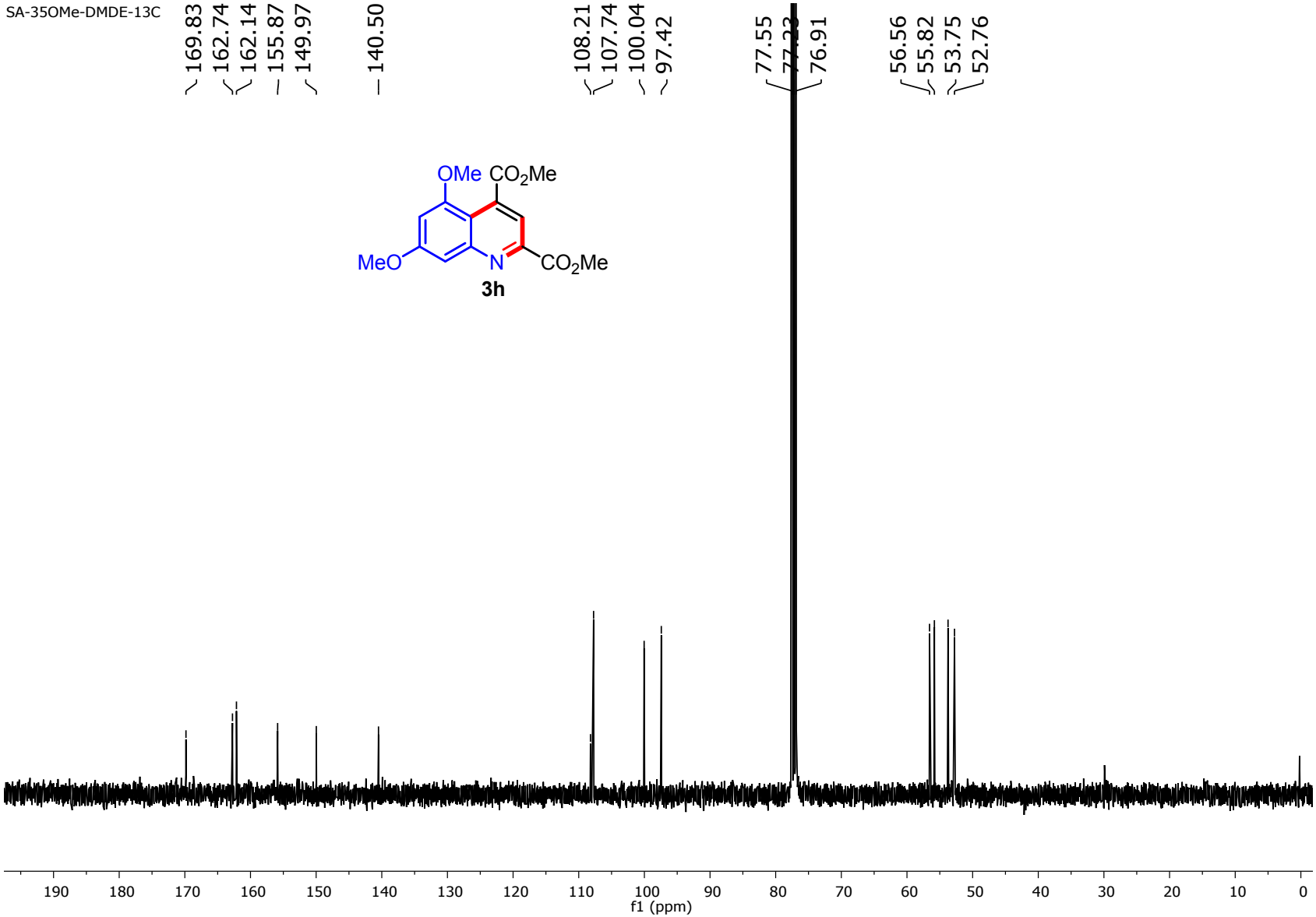
Sample Name	SAMPLE	**Position**	P1-C4	**Instrument Name**	Instrument 1	**User Name**	
Inj Vol	20	**InjPosition**		**SampleType**	Sample	**IRM Calibration Status**	Success
Data Filename	ATK-SA-2ME-DMDE-2.d	**ACQ Method**	ESI ALS 100-500.m	**Comment**		**Acquired Time**	1/11/2021 2:39:28 PM



^{1}H NMR spectrum of compound: 3h

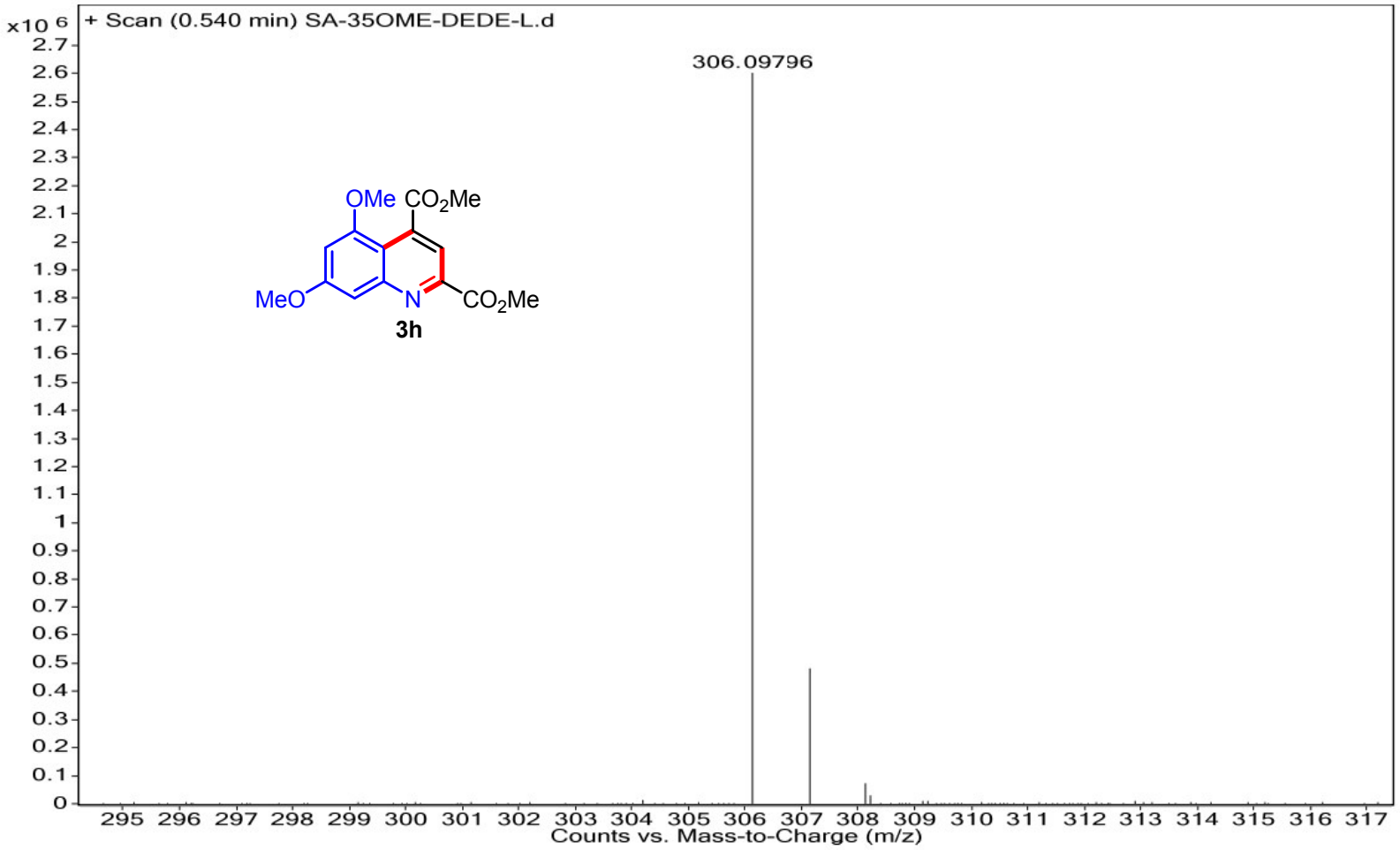


^{13}C NMR spectrum of compound: 3h

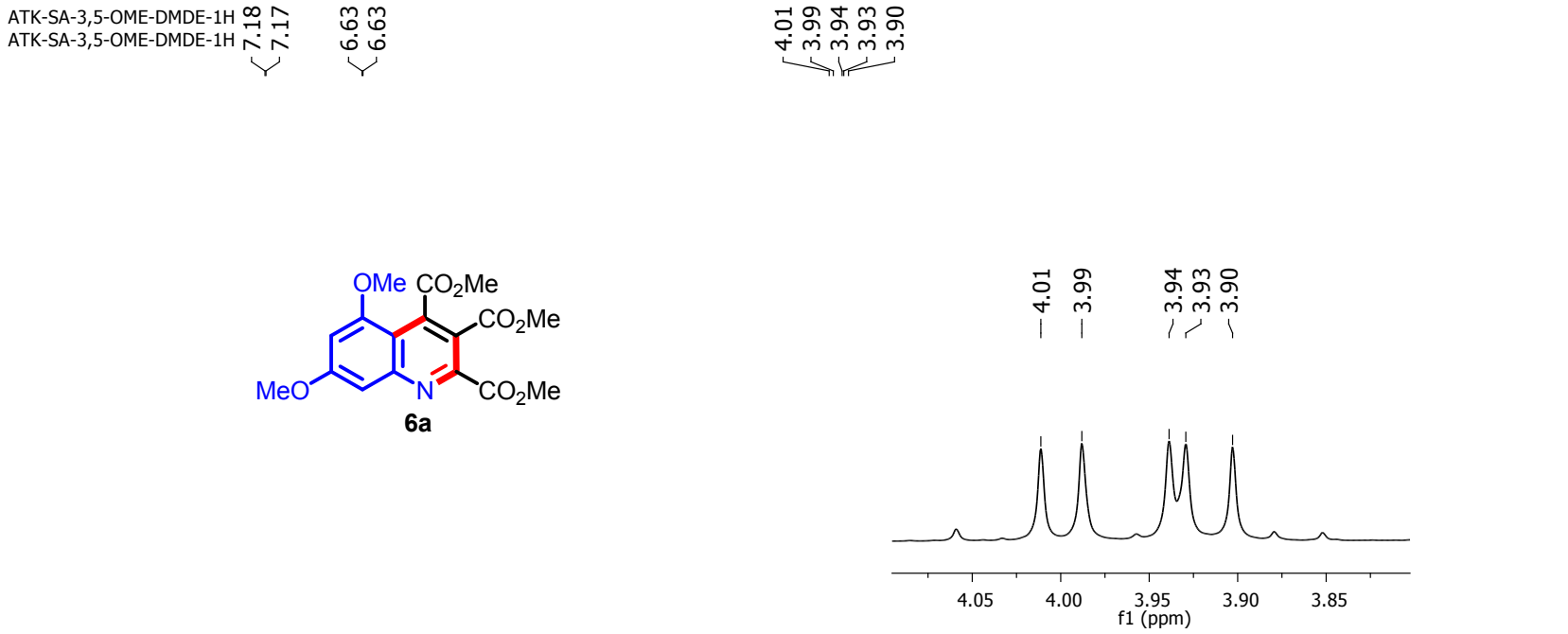


HRMS spectrum of compound: 3h

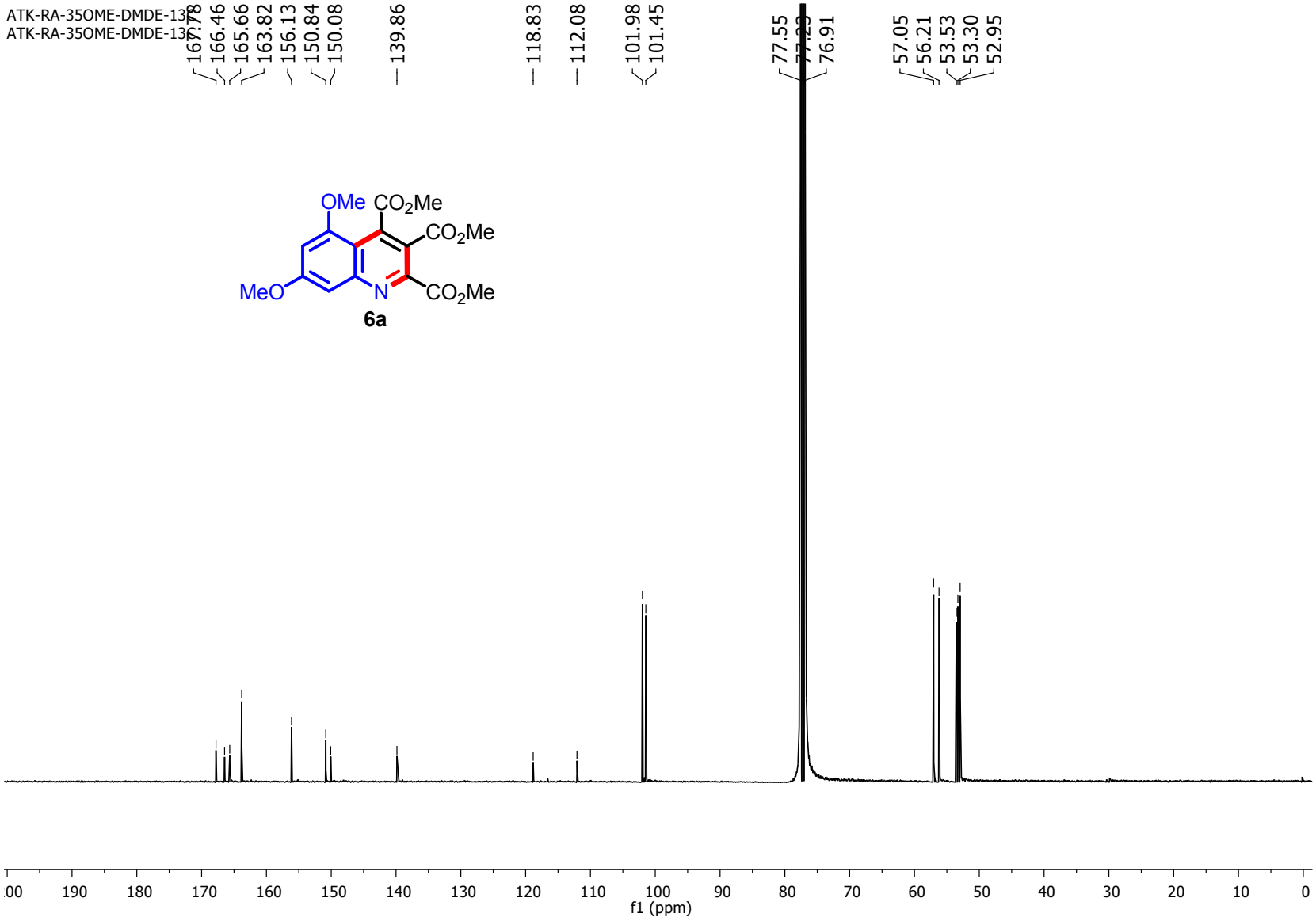
Sample Name	SAMPLE 6	**Position**	P1-A4	**Instrument Name**	Instrument 1	**User Name**	
Inj Vol	20	**InjPosition**		**SampleType**	Sample	**IRM Calibration Status**	Success
Data Filename	SA-35OME-DEDE-L.d	**ACQ Method**	ESI ALS 100-500.m	**Comment**		**Acquired Time**	2/18/2021 1:23:10 PM



^{1}H NMR spectrum of compound: 3h'

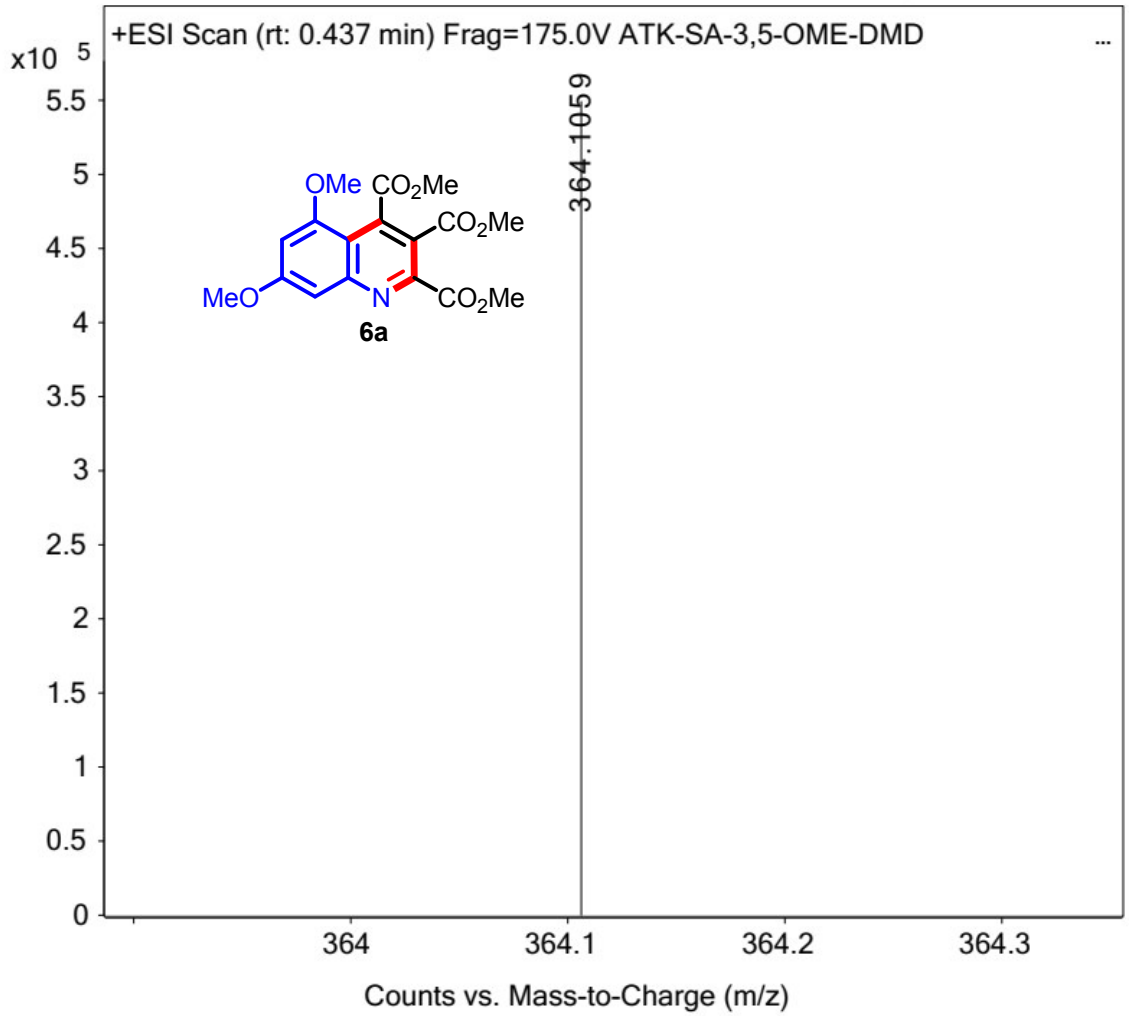


^{13}C NMR spectrum of compound: 3h'

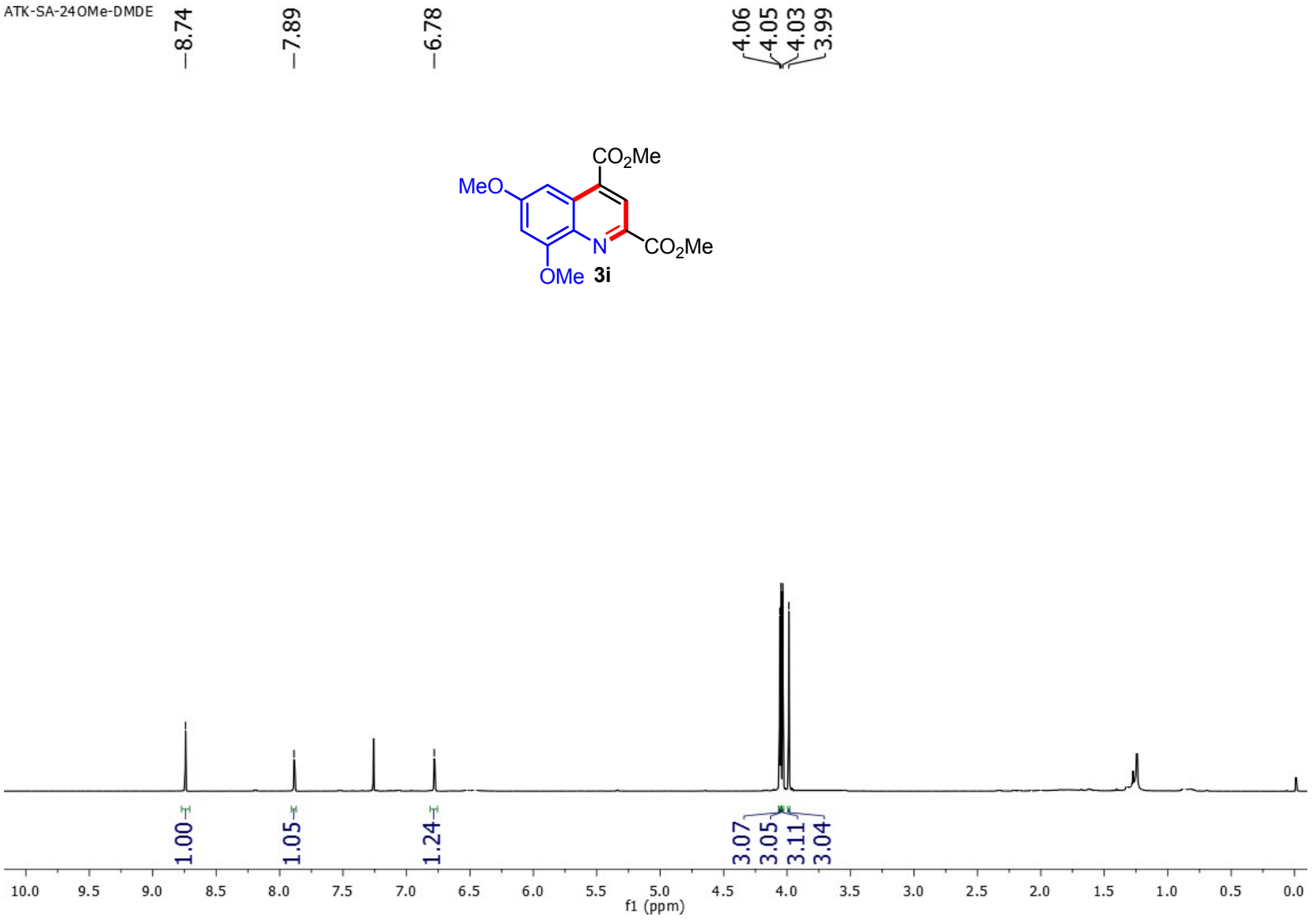


HRMS spectrum of compound: 3h’

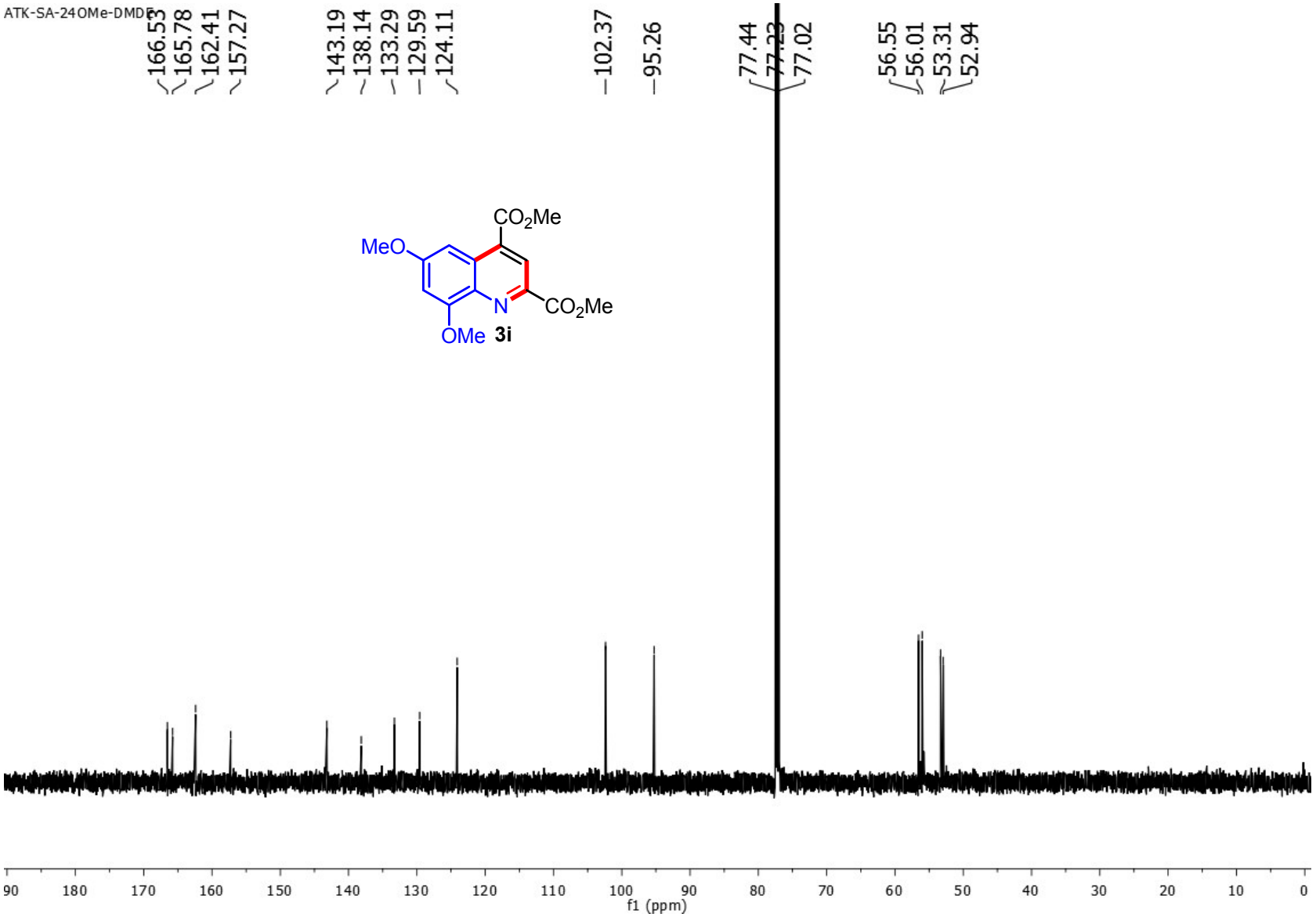
Sample Name	WASH	**Position**	P1-D2	**Instrument Name**	Instrument 1
User Name		**Inj Vol**	20	**InjPosition**	
Sample Type	Sample	**IRM Calibration Status**	Success	**Data Filename**	ATK-SA-3,5-OME-DMDE-L1.d
ACQ Method	ESI ALS 100-500.m	**Comment**		**Acquired Time**	04-01-2021 14:17:07 (UTC+05:30)



^{1}H NMR spectrum of compound: 3i



^{1}H NMR spectrum of compound: 3i



HRMS spectrum of compound: 3i

SAMPLE	**Position**	P1-B6	**Instrument Name**	Instrument 1
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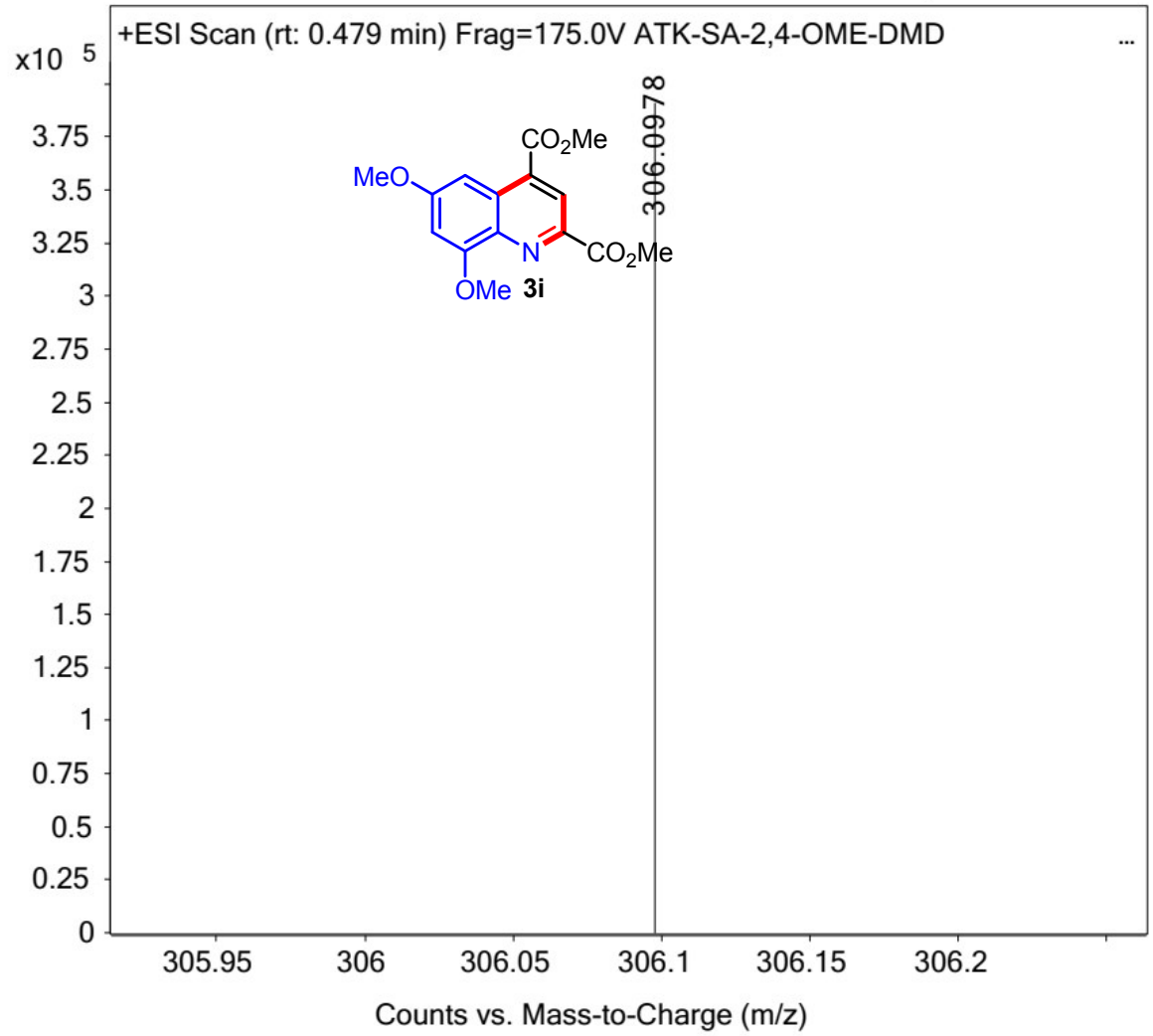
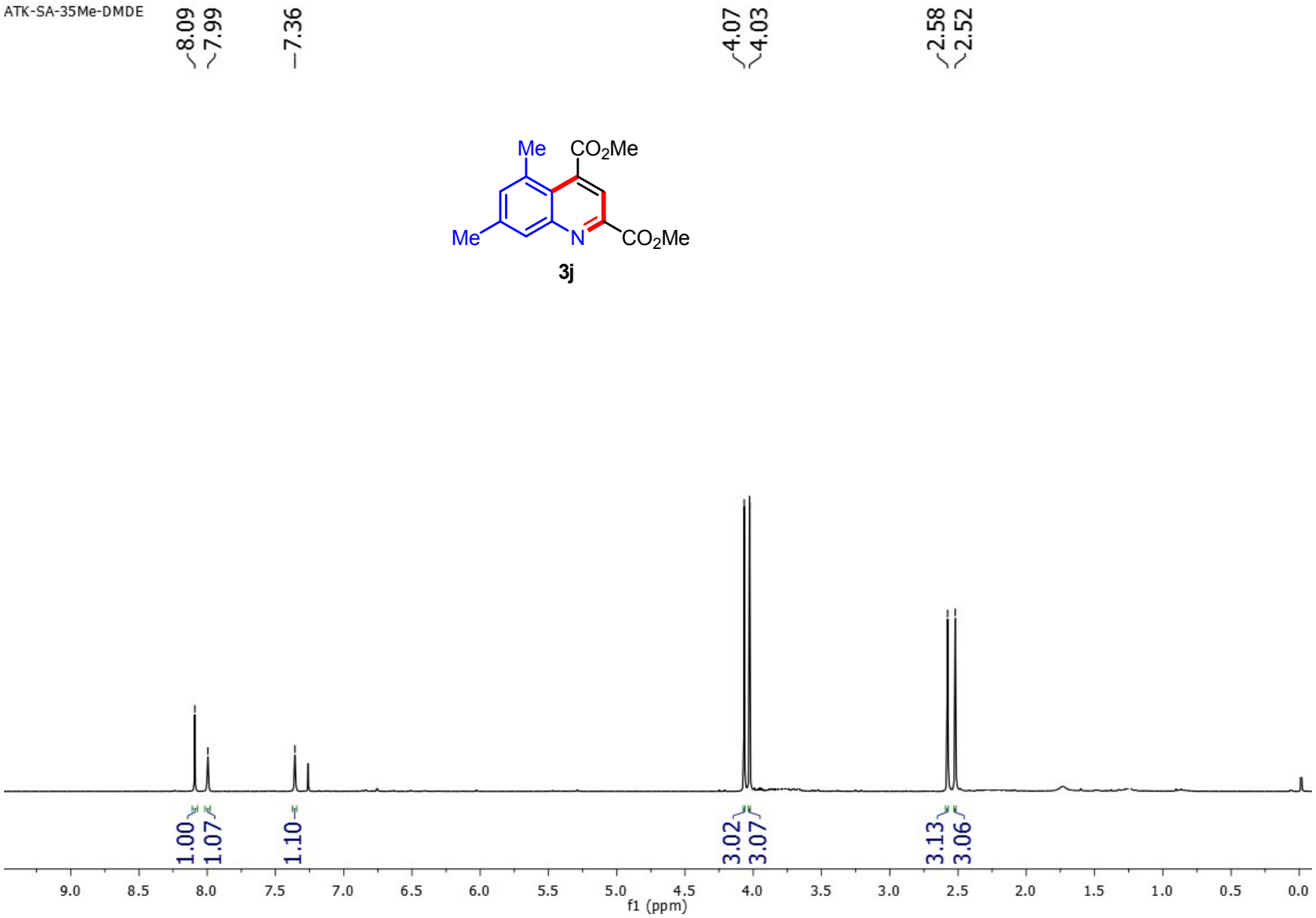
Sample	**IRM Calibration Status**	Success	**Data Filename**	ATK-SA-2,4-OME-DMDE.d
ESI ALS 100-500.m	**Comment**		**Acquired Time**	21-12-2020 11:48:28 (UTC+05:30)

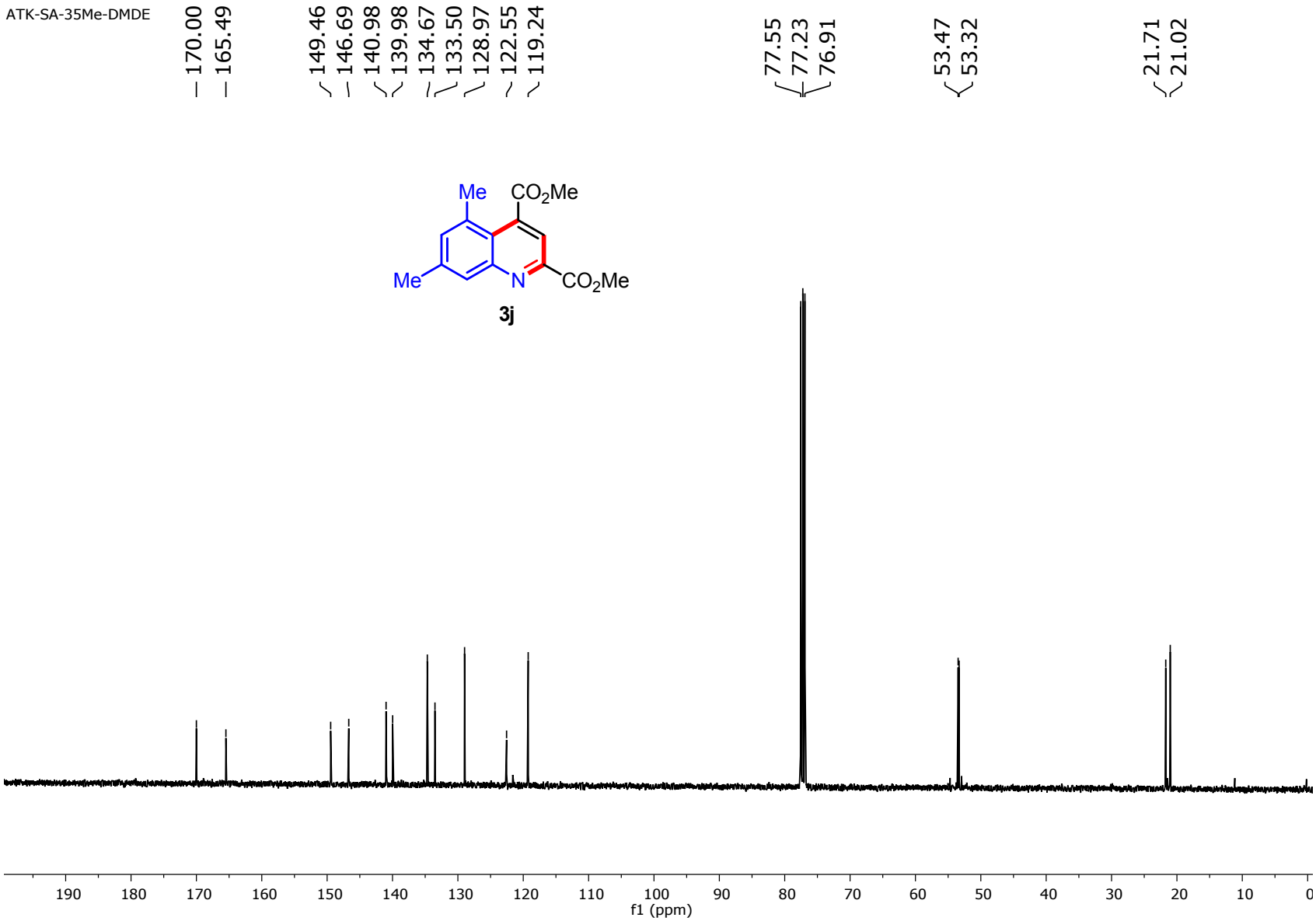


^{1}H NMR spectrum of compound: 3j



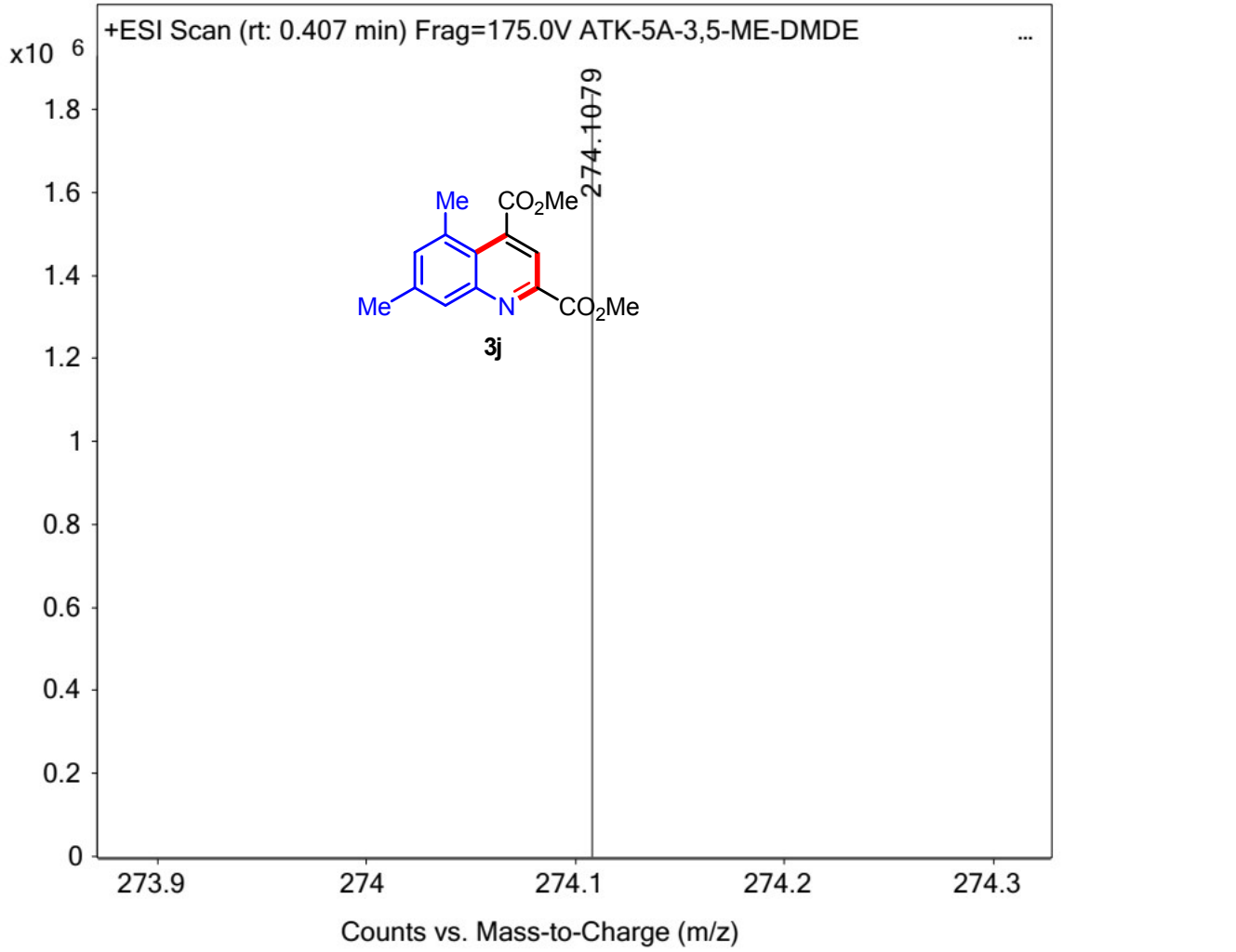
3j

^{13}C NMR spectrum of compound: 3j

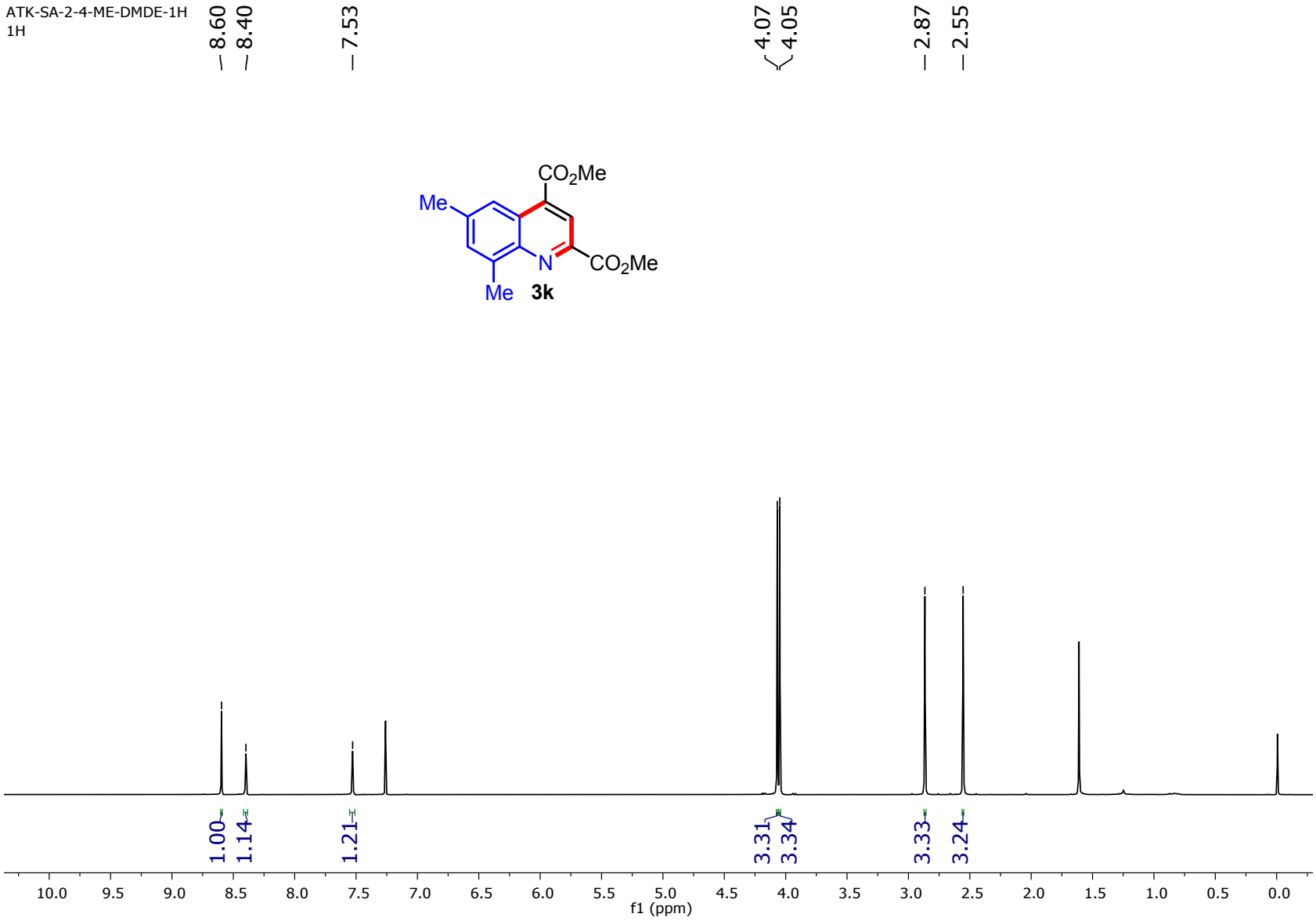


HRMS spectrum of compound: 3j

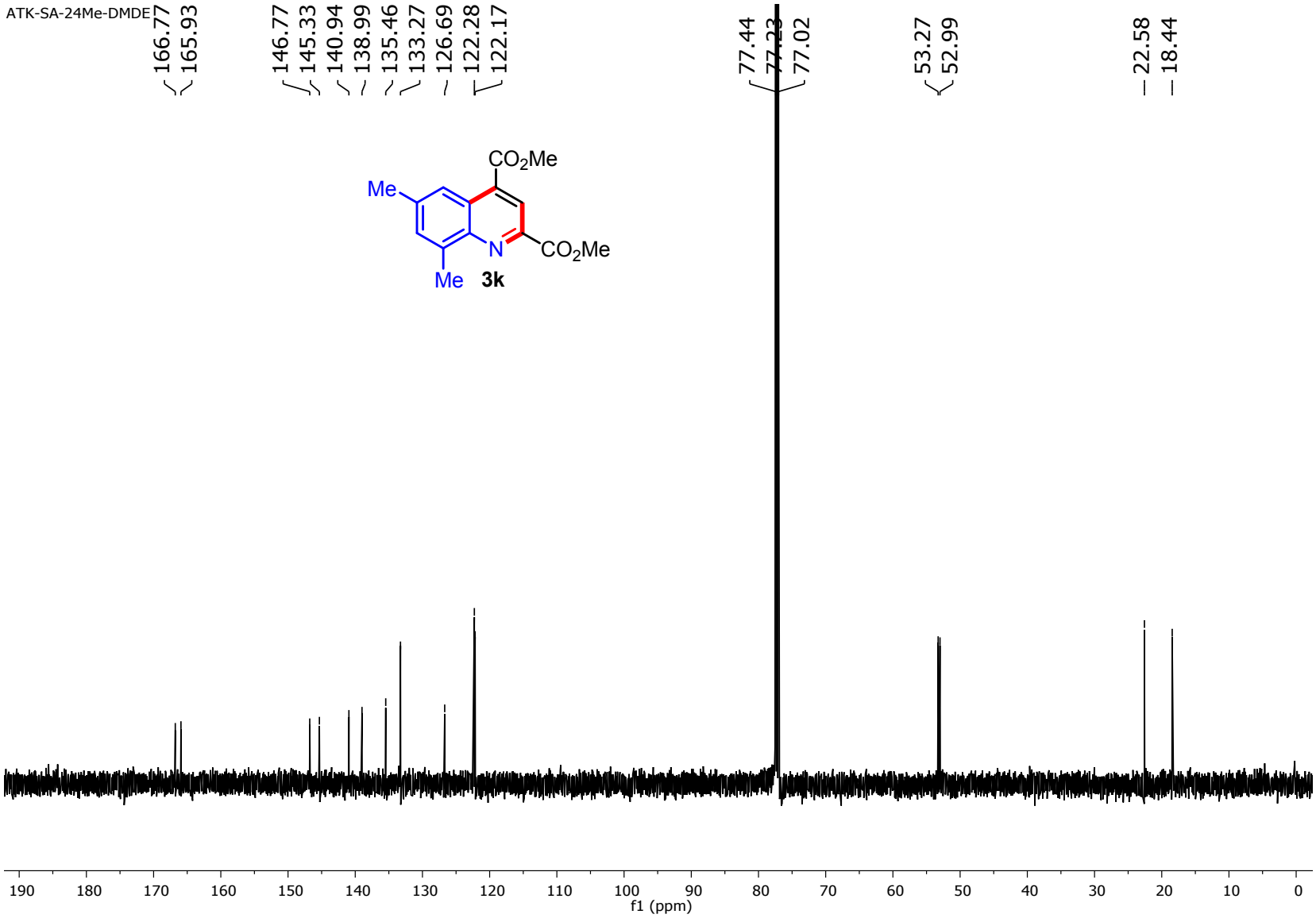
WASH	**Position**	P1-C8	**Instrument Name**	Instrument 1
	Inj Vol	20	**InjPosition**	
Sample	**IRM Calibration Status**	Success	**Data Filename**	ATK-5A-3,5-ME-DMDE-A.d
ESI ALS 100-500.m	**Comment**		**Acquired Time**	24-12-2020 20:04:54 (UTC+05:30)



^{1}H NMR spectrum of compound: 3k

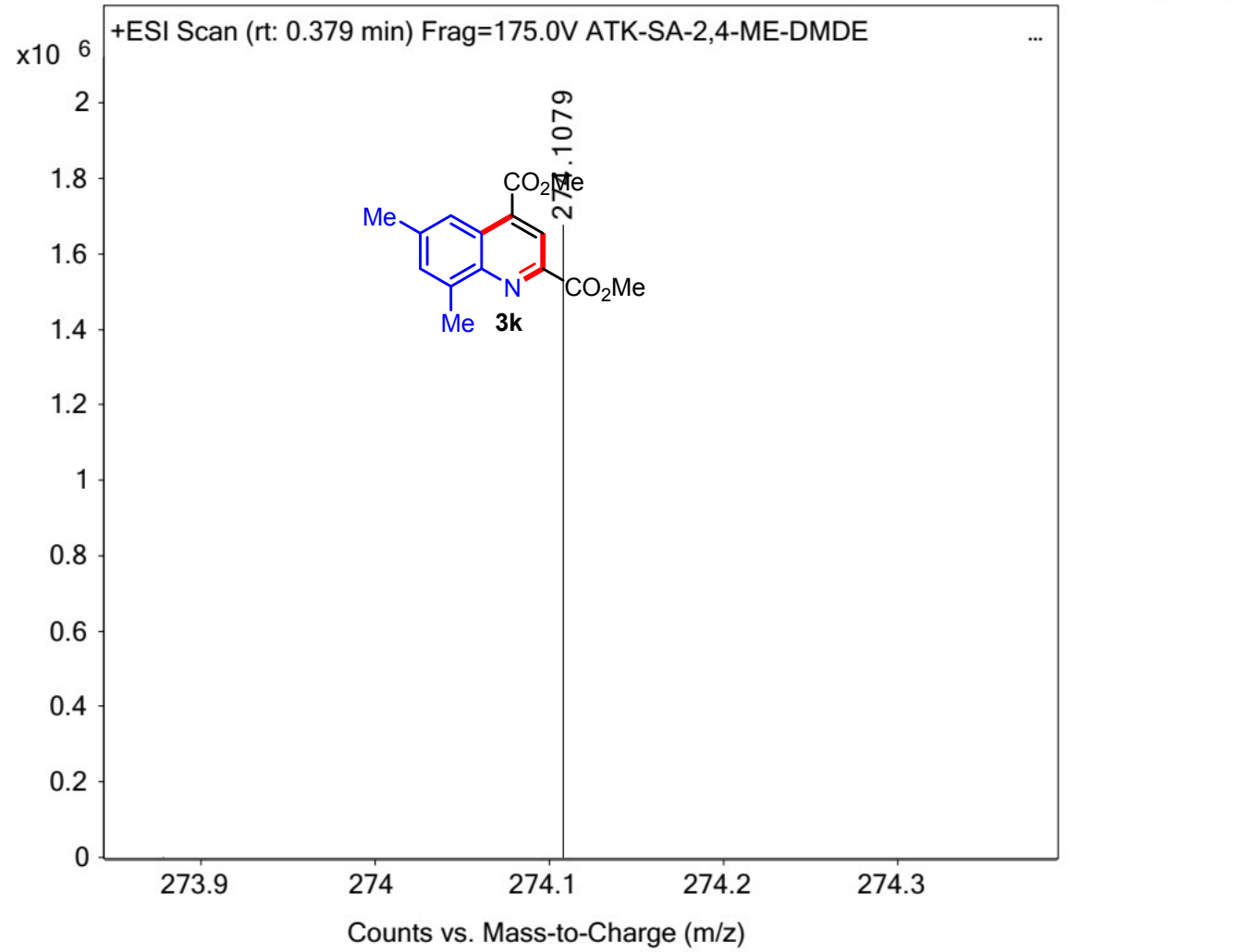


^{13}C NMR spectrum of compound: 3k

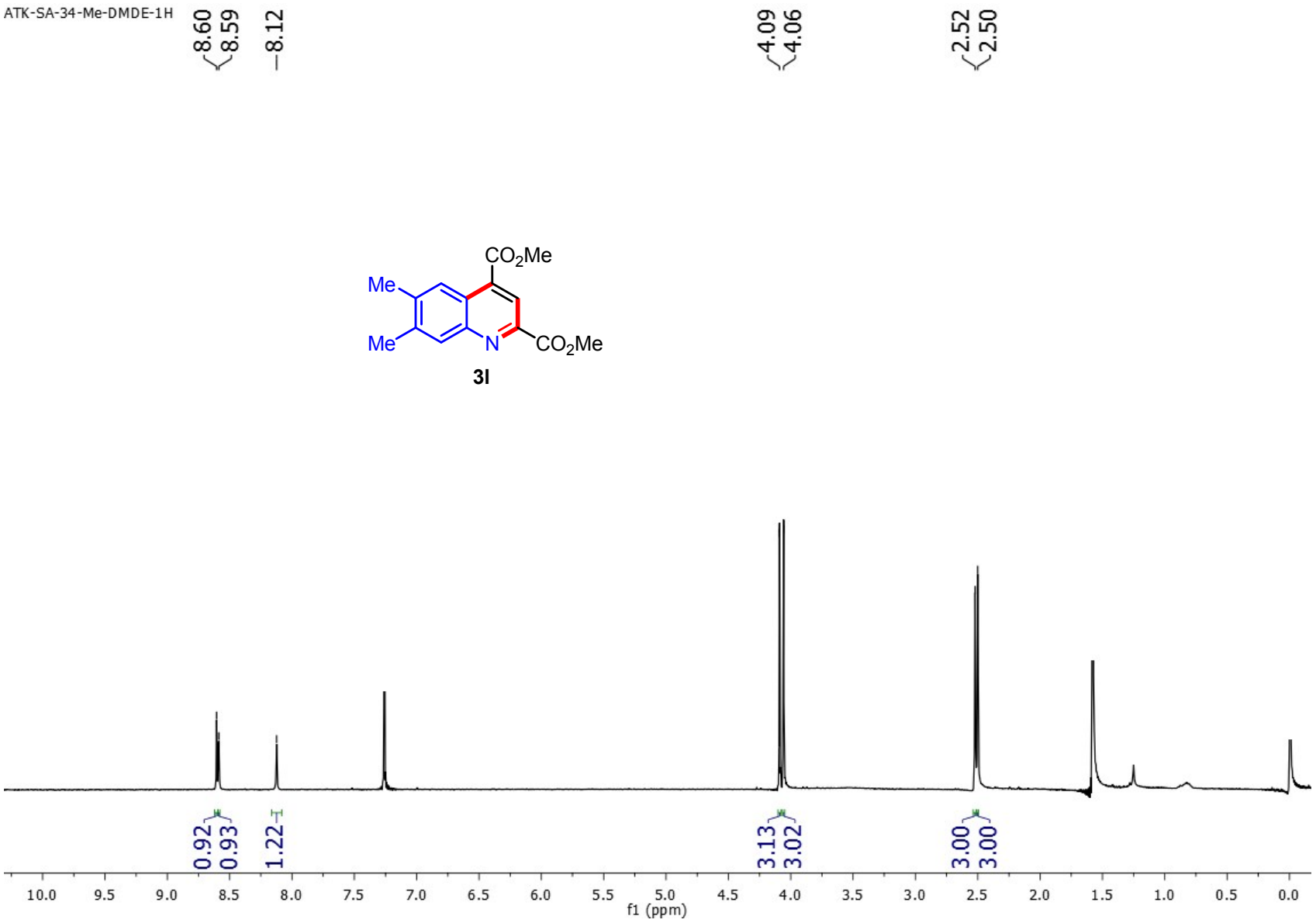


HRMS spectrum of compound: 3k

SAMPLE	**Position**	P1-B7	**Instrument Name**	Instrument 1
	Inj Vol	20	**InjPosition**	
Sample	**IRM Calibration Status**	Success	**Data Filename**	ATK-SA-2,4-ME-DMDE.d
ESI ALS 100-500.m	**Comment**		**Acquired Time**	21-12-2020 11:54:08 (UTC+05:30)

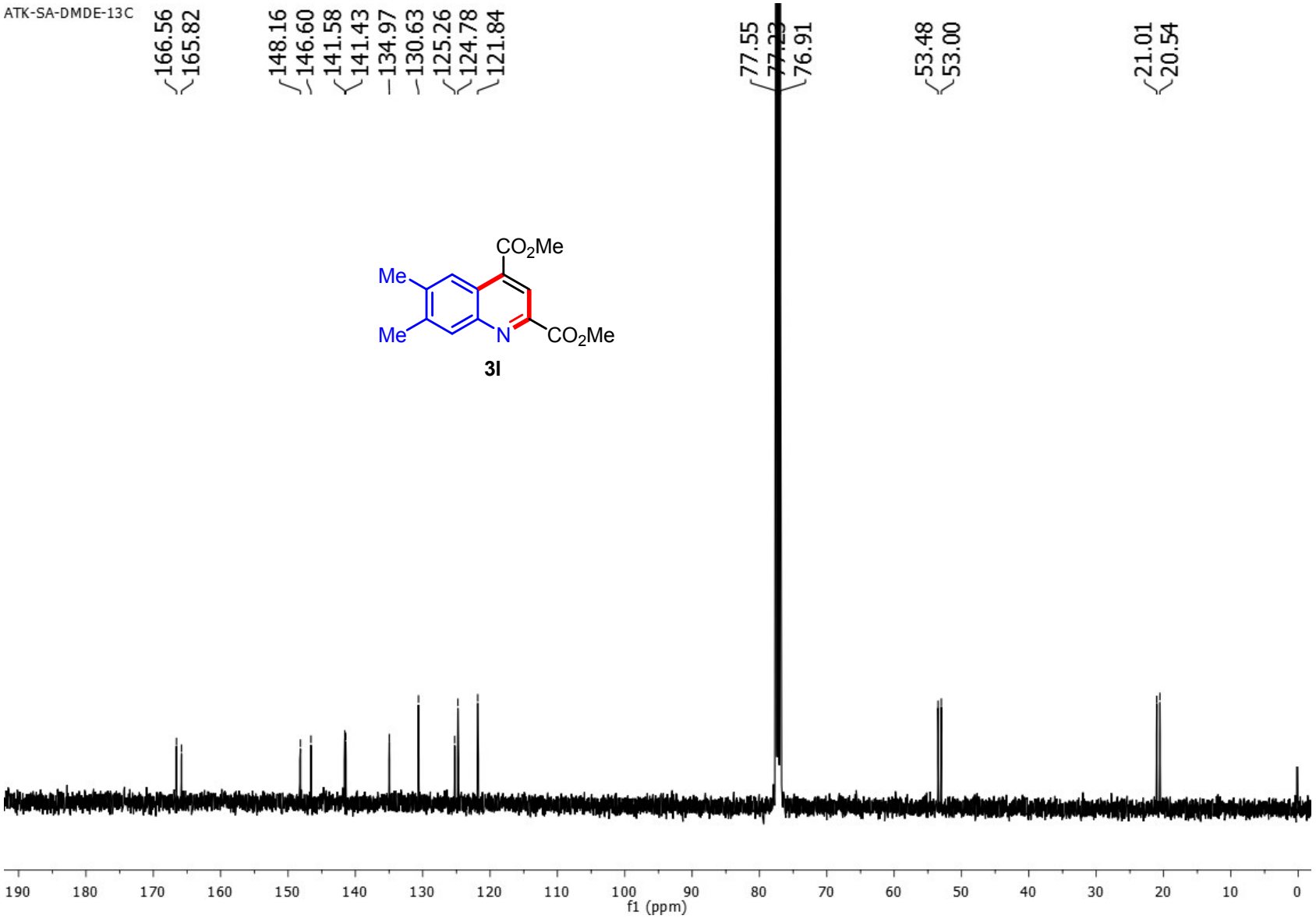


^{1}H NMR spectrum of compound: 3l



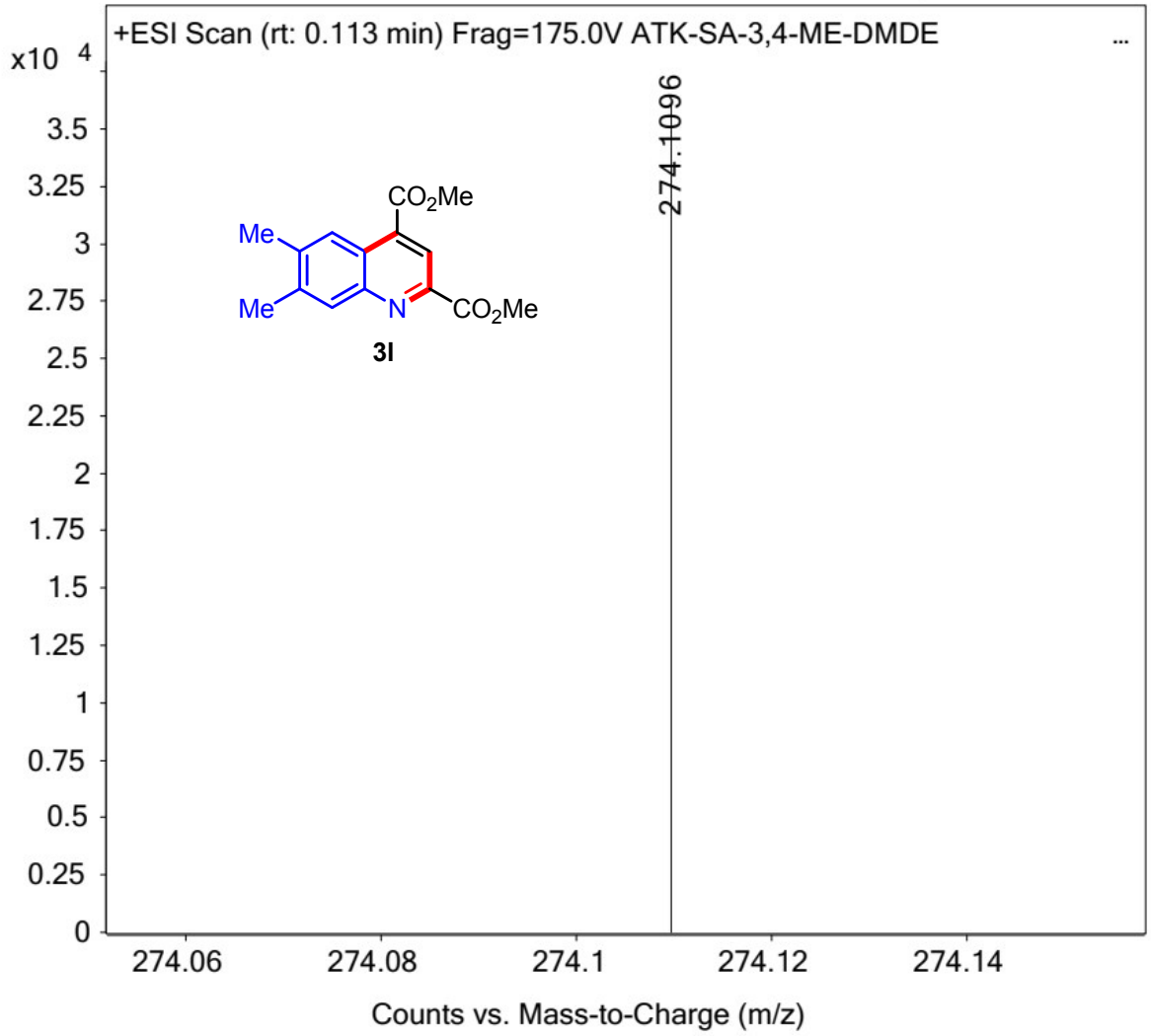
3l

^{13}C NMR spectrum of compound: 3l

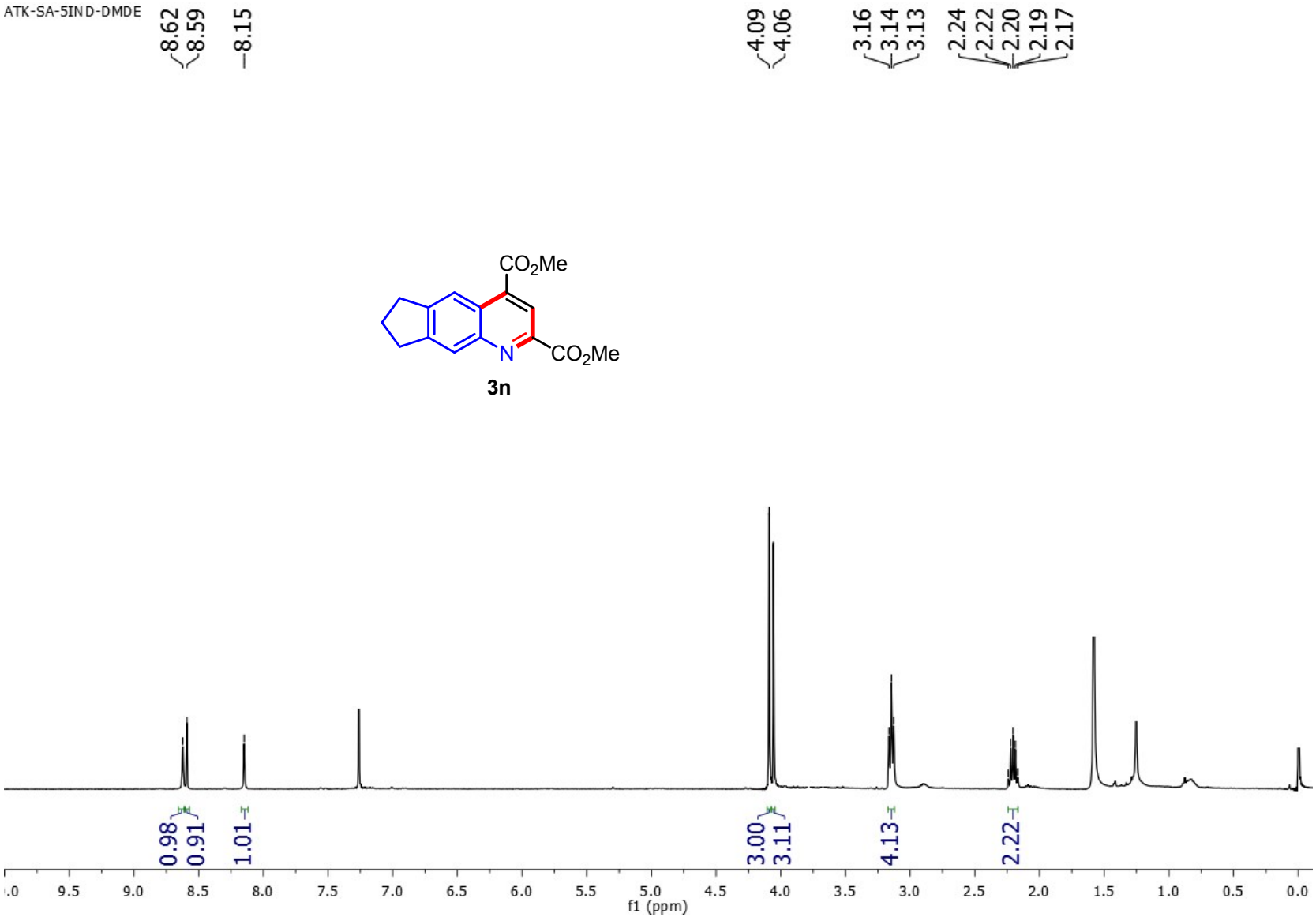


HRMS spectrum of compound: 3l

ATK-SA-3,4-ME-DMDE	**Position**	P1-B2	**Instrument Name**	Instrument 1
	Inj Vol	20	**InjPosition**	
Sample	**IRM Calibration Status**	Success	**Data Filename**	ATK-SA-3,4-ME-DMDE.d
ESI ALS 100-1000.m	**Comment**		**Acquired Time**	20-01-2021 13:25:15 (UTC+05:30)

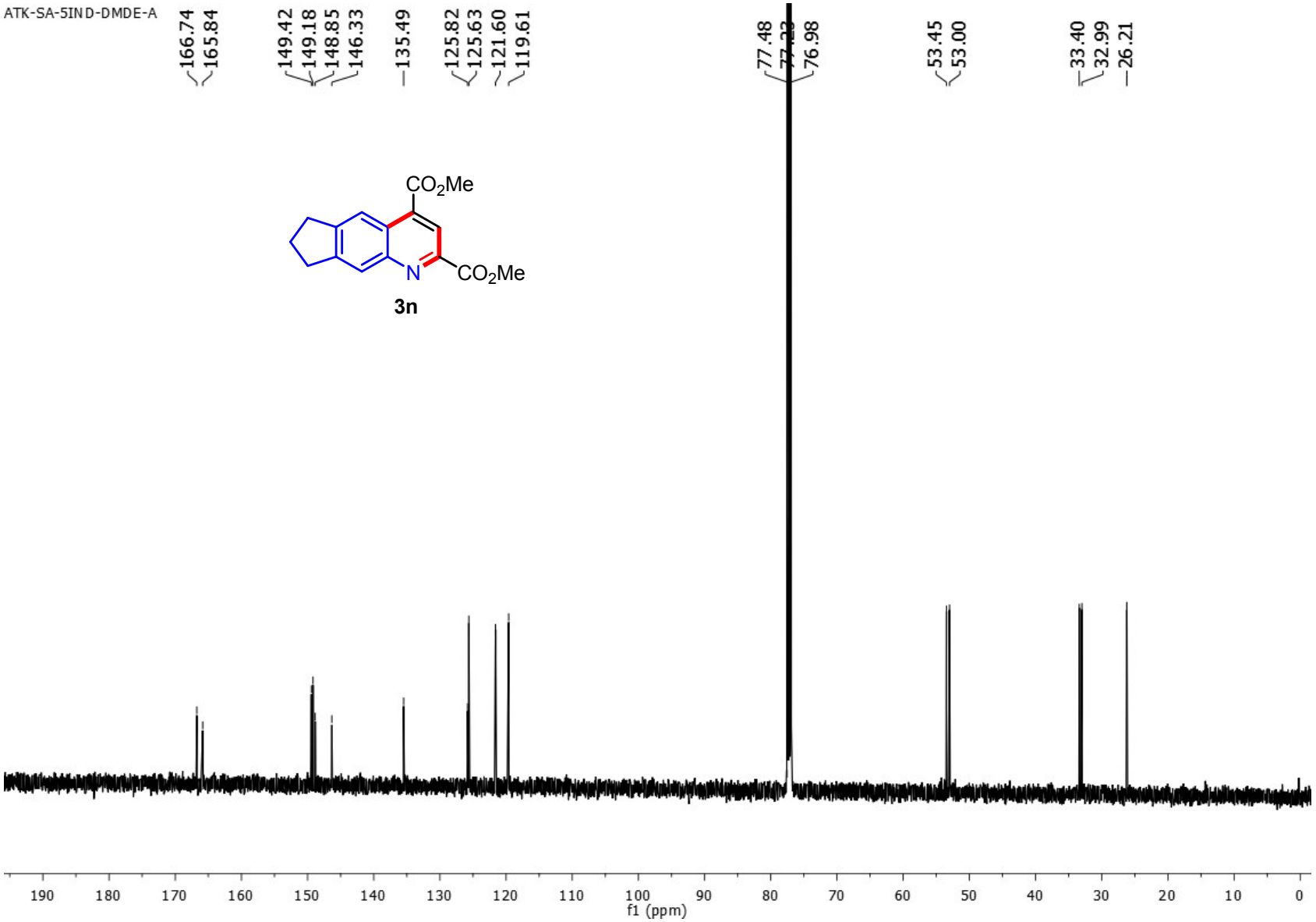


^{1}H NMR spectrum of compound: 3m



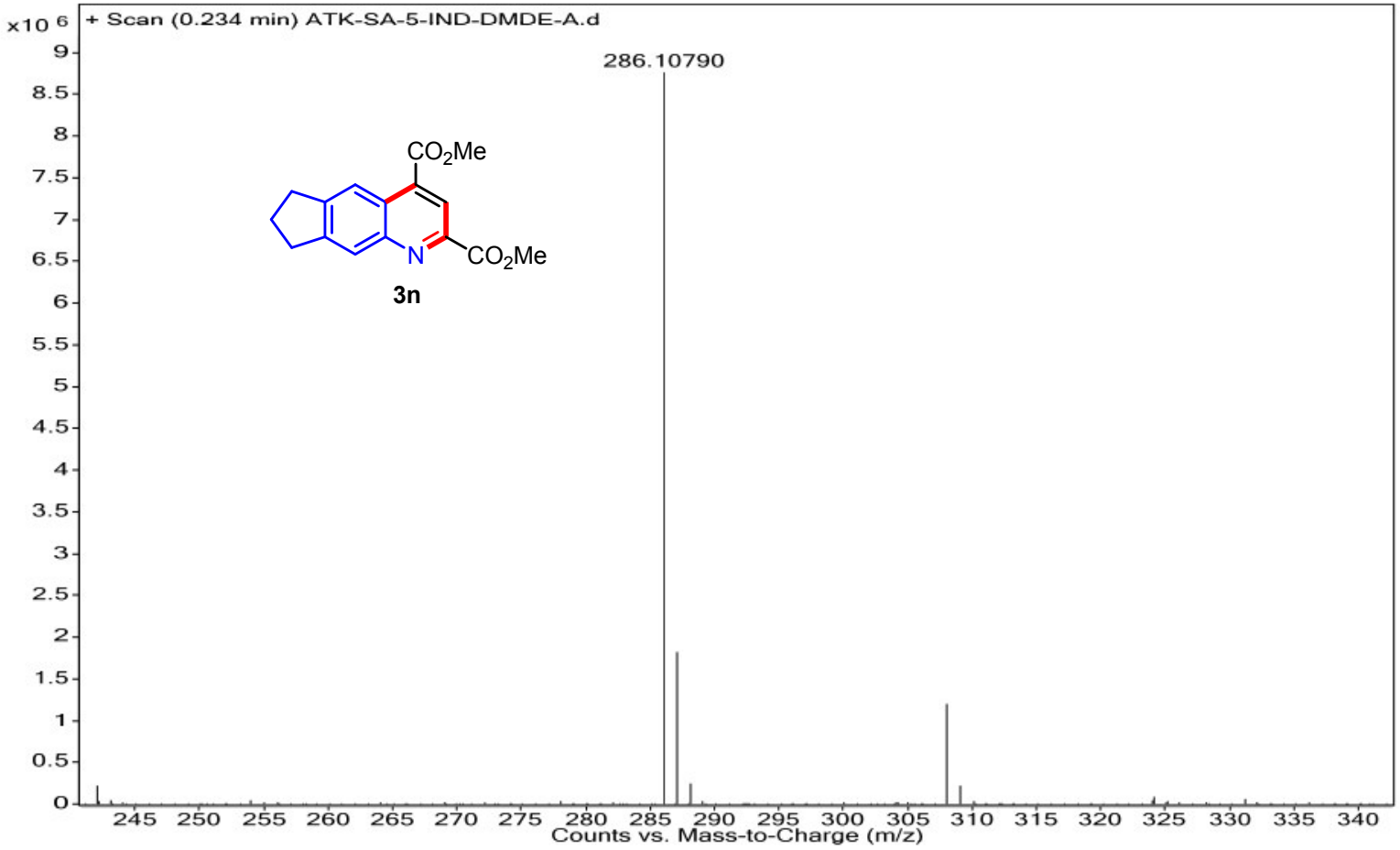
3n

^{13}C NMR spectrum of compound: 3m

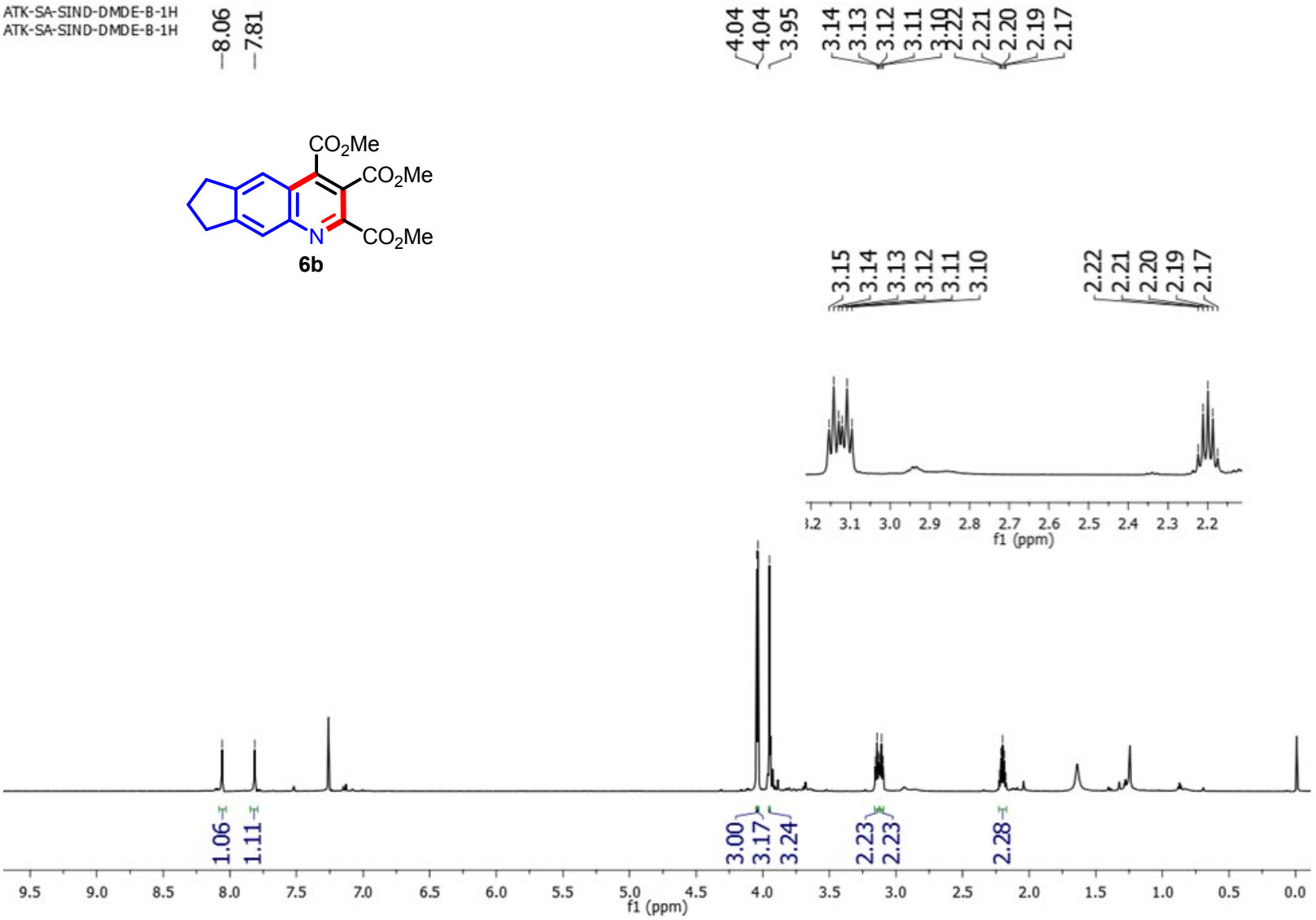


HRMS spectrum of compound: 3m

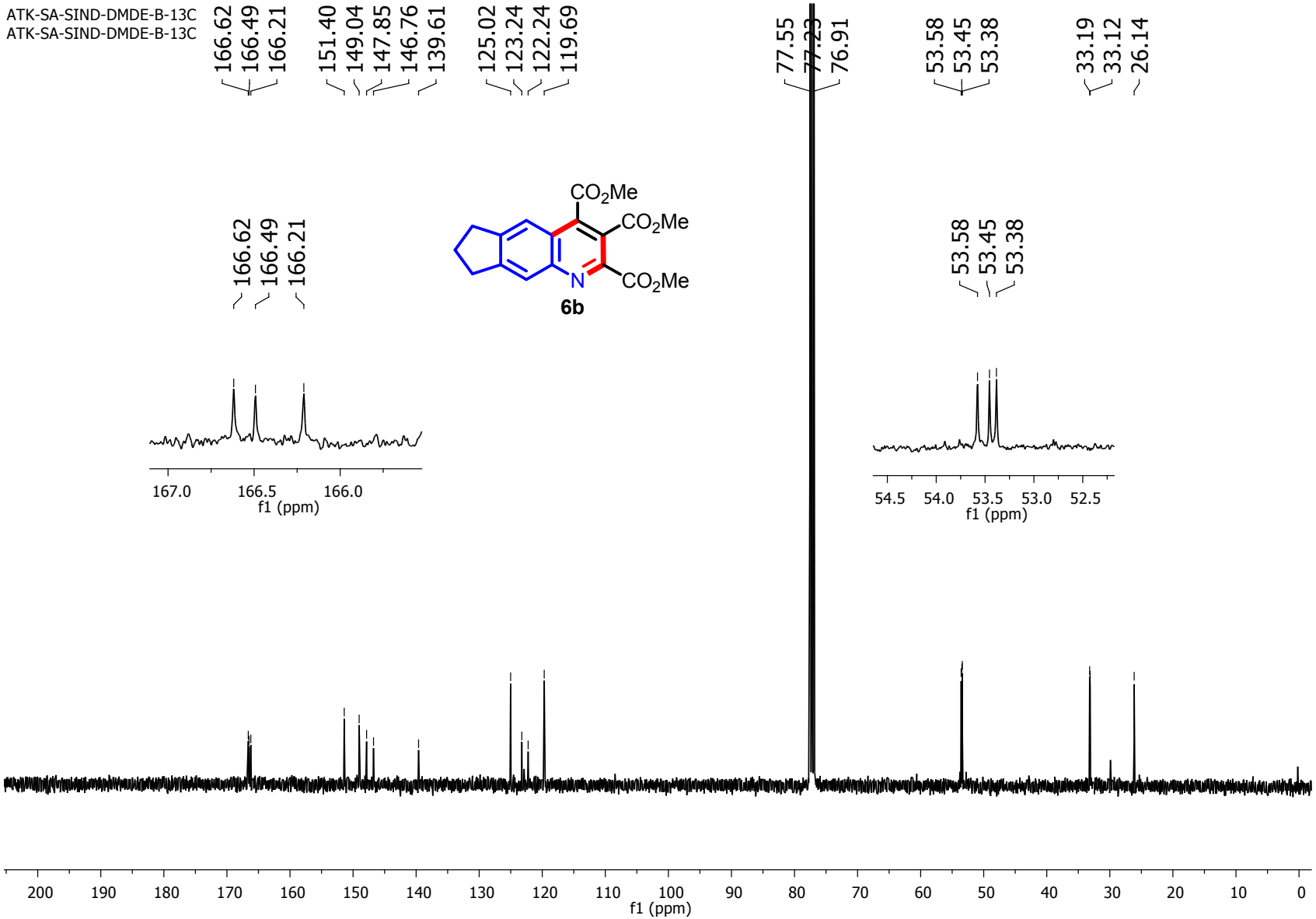
Sample Name	ATK-SA-5-IND-DMDE-A	**Position**	P1-A6	**Instrument Name**	Instrument 1	**User Name**	
Inj Vol	20	**InjPosition**		**SampleType**	Sample	**IRM Calibration Status**	Success
Data Filename	ATK-SA-5-IND-DMDE-A.	**ACQ Method**	ESI ALS 100-1000.m	**Comment**		**Acquired Time**	2/3/2021 11:43:18 AM



^{1}H NMR spectrum of compound: 3m'

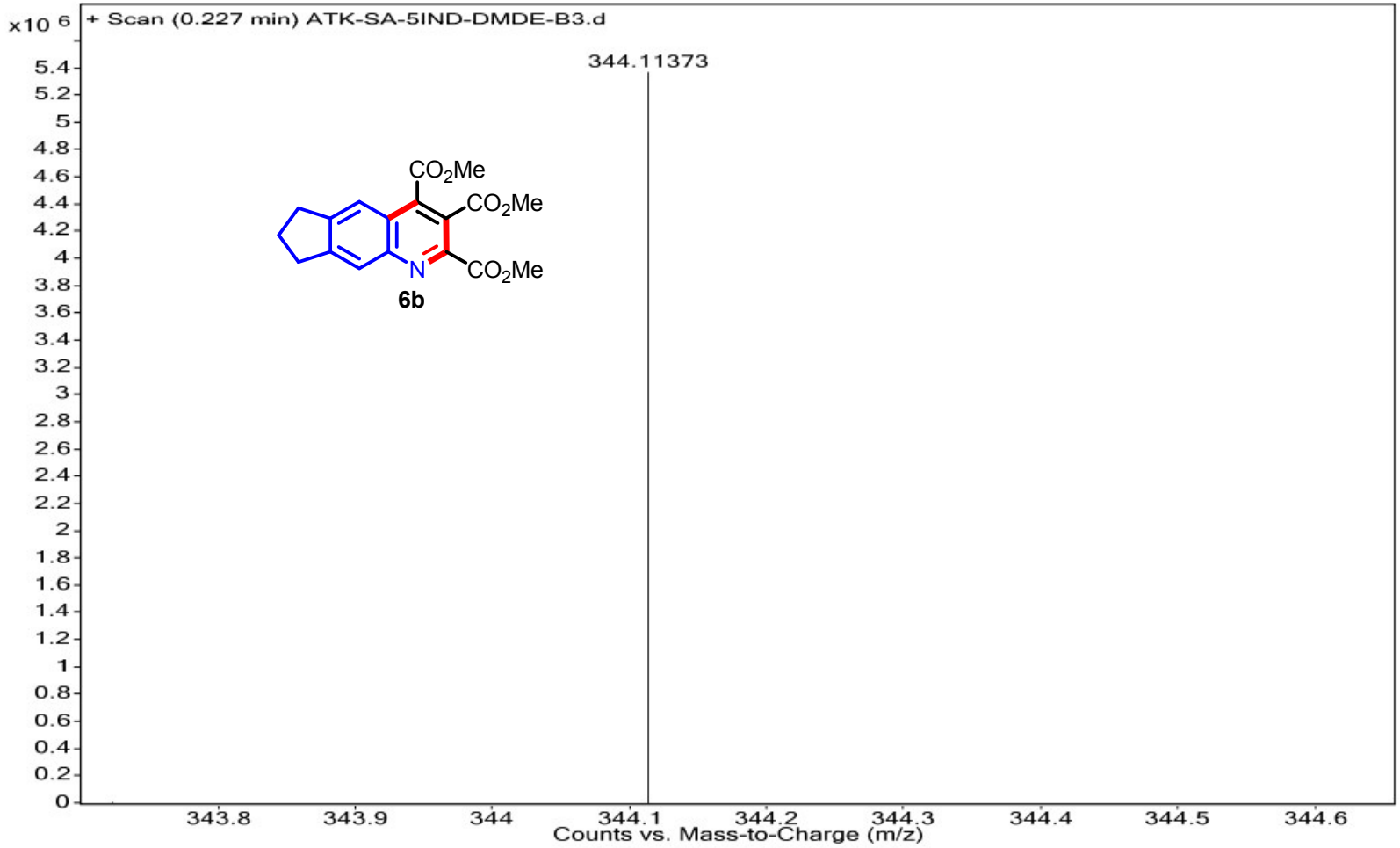


^{13}C NMR spectrum of compound: 3m'

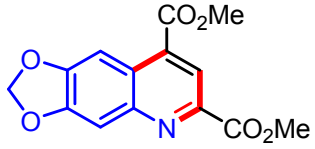


HRMS spectrum of compound: 3m’

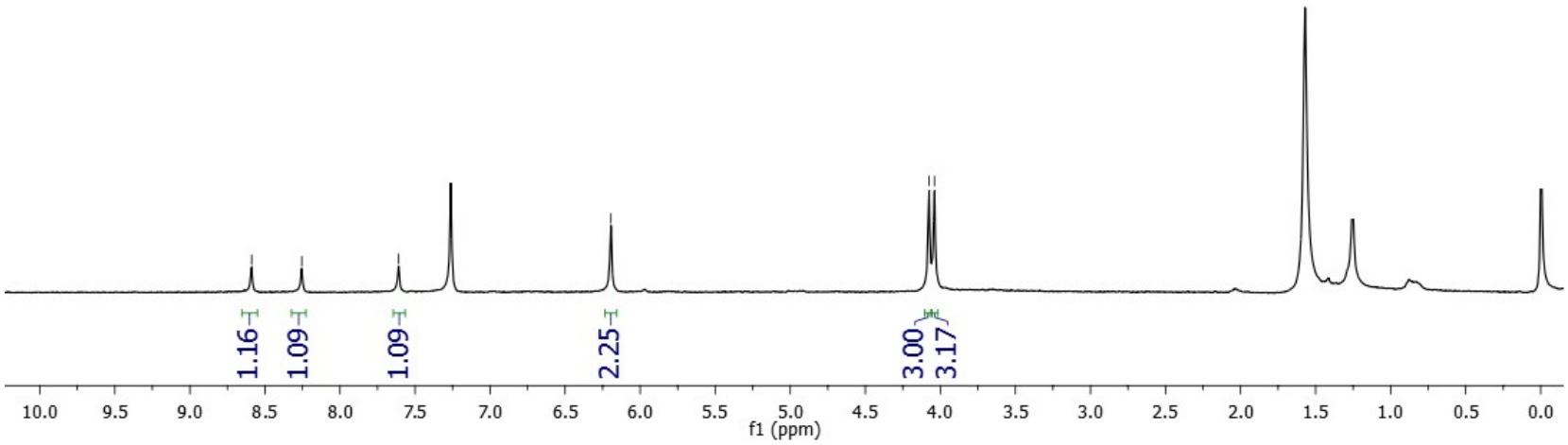
Sample Name	ATK-SA-5IND-DMDE-B3	**Position**	P1-A3	**Instrument Name**	Instrument 1	**User Name**	
Inj Vol	20	**InjPosition**		**SampleType**	Sample	**IRM Calibration Status**	Success
Data Filename	ATK-SA-5IND-DMDE-B3.	**ACQ Method**	ESI ALS 100-1000.m	**Comment**		**Acquired Time**	2/3/2021 11:11:55 AM



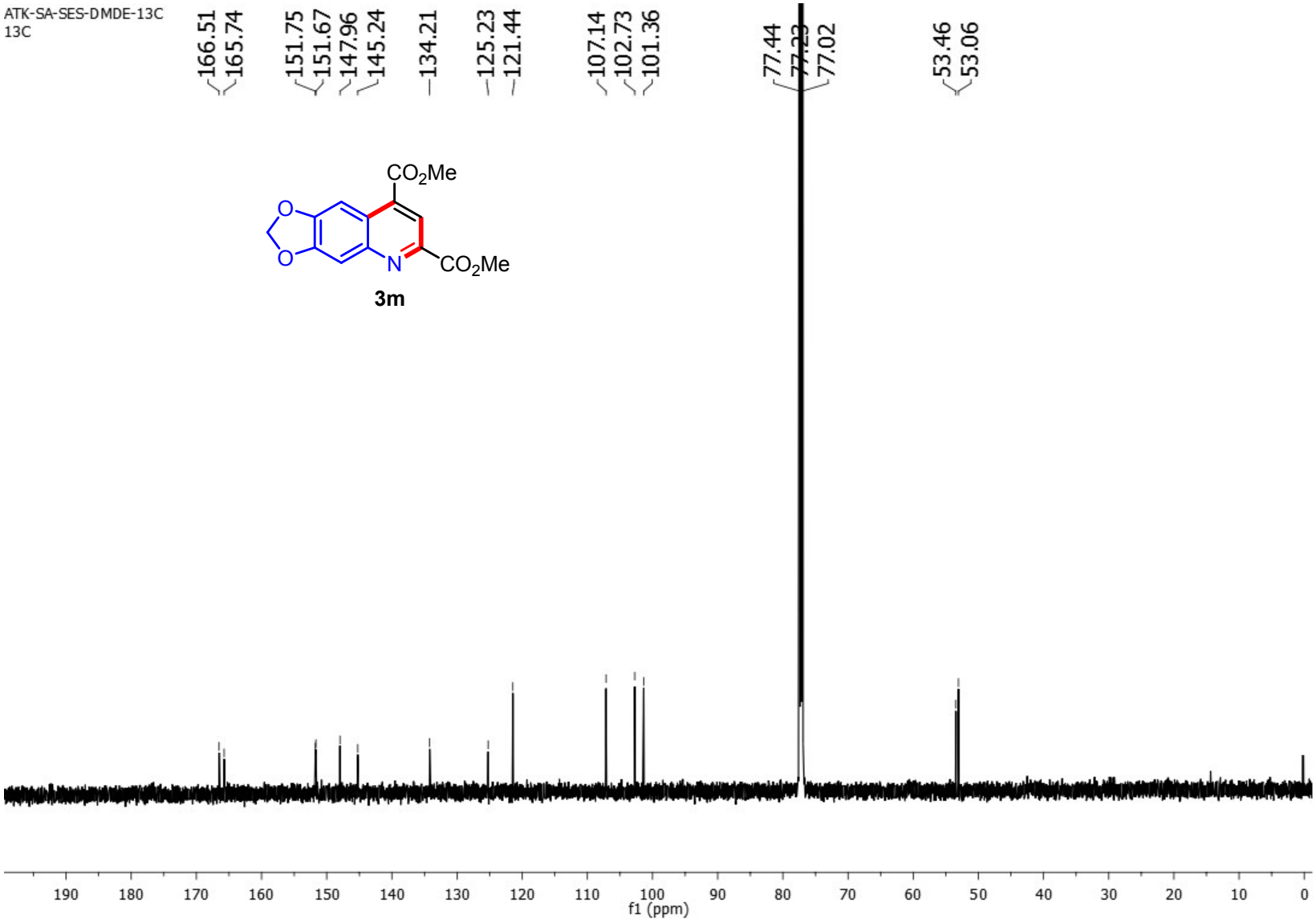
^{1}H NMR spectrum of compound: 3n



3m

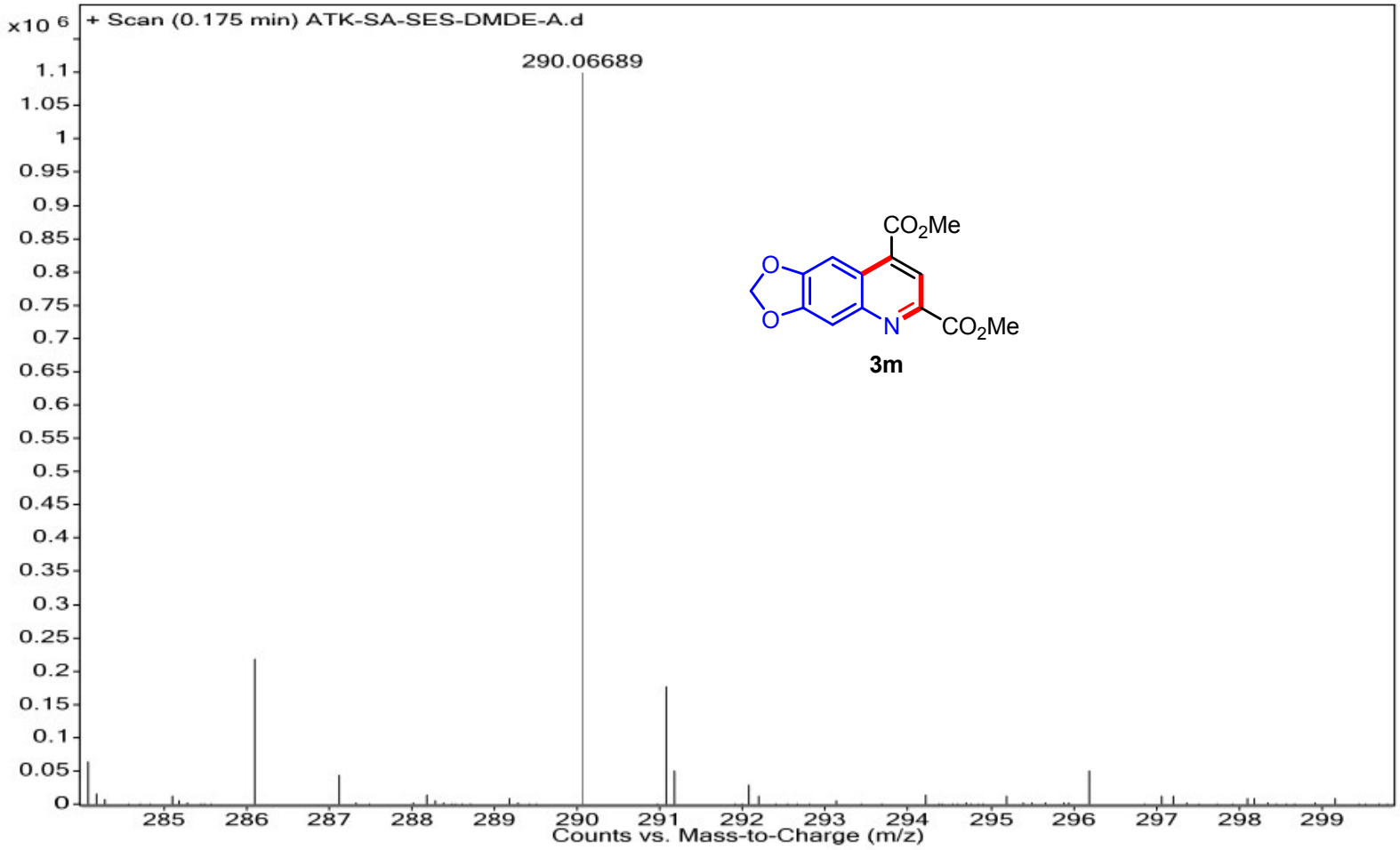


^{13}C NMR spectrum of compound: 3n



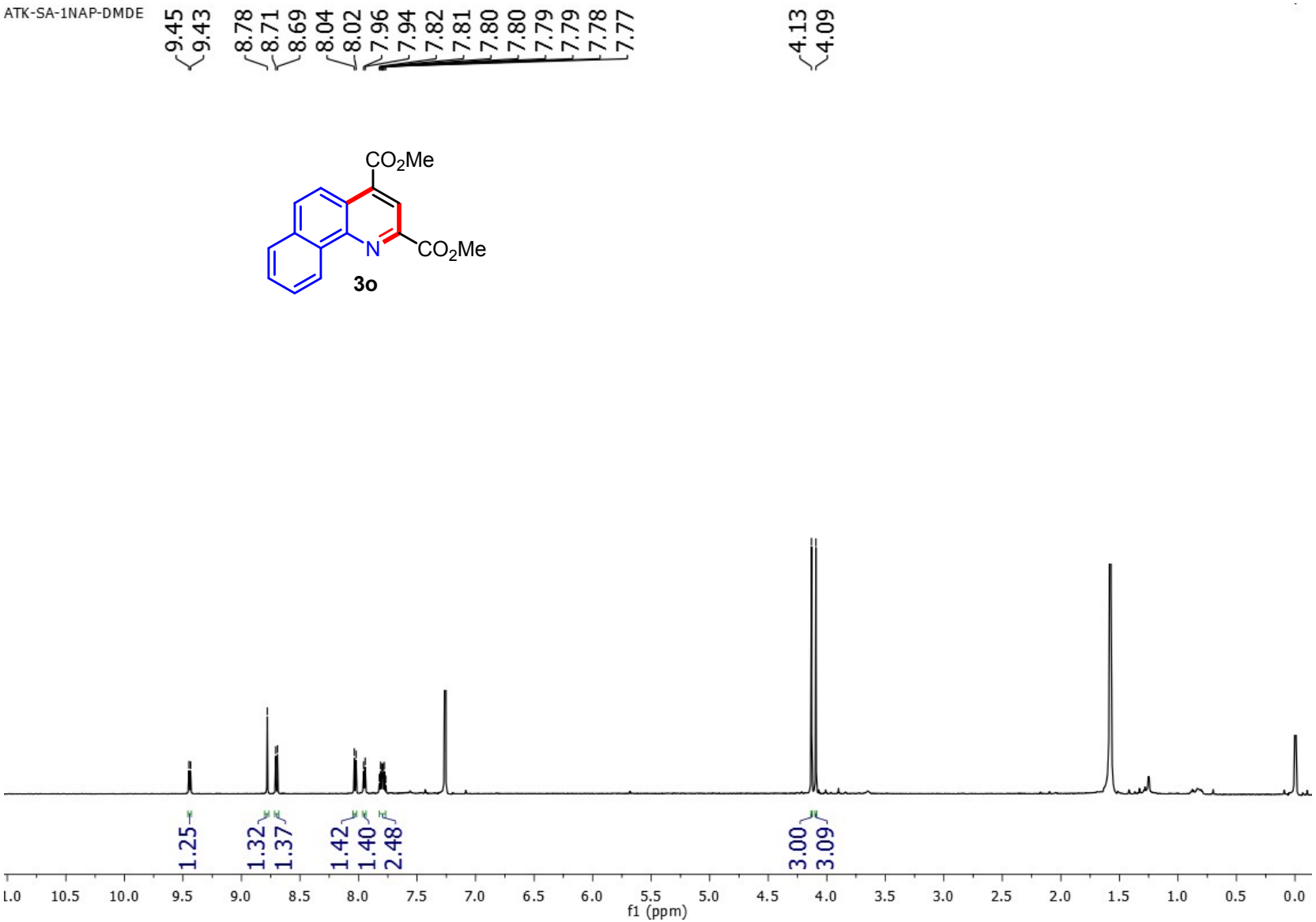
HRMS spectrum of compound: 3n

Sample Name	ATK-SA-SES-DMDE-A	**Position**	P1-A5	**Instrument Name**	Instrument 1	**User Name**	
Inj Vol	20	**InjPosition**		**SampleType**	Sample	**IRM Calibration Status**	Success
Data Filename	ATK-SA-SES-DMDE-A.d	**ACQ Method**	ESI ALS 100-1000.m	**Comment**		**Acquired Time**	2/3/2021 11:32:03 AM

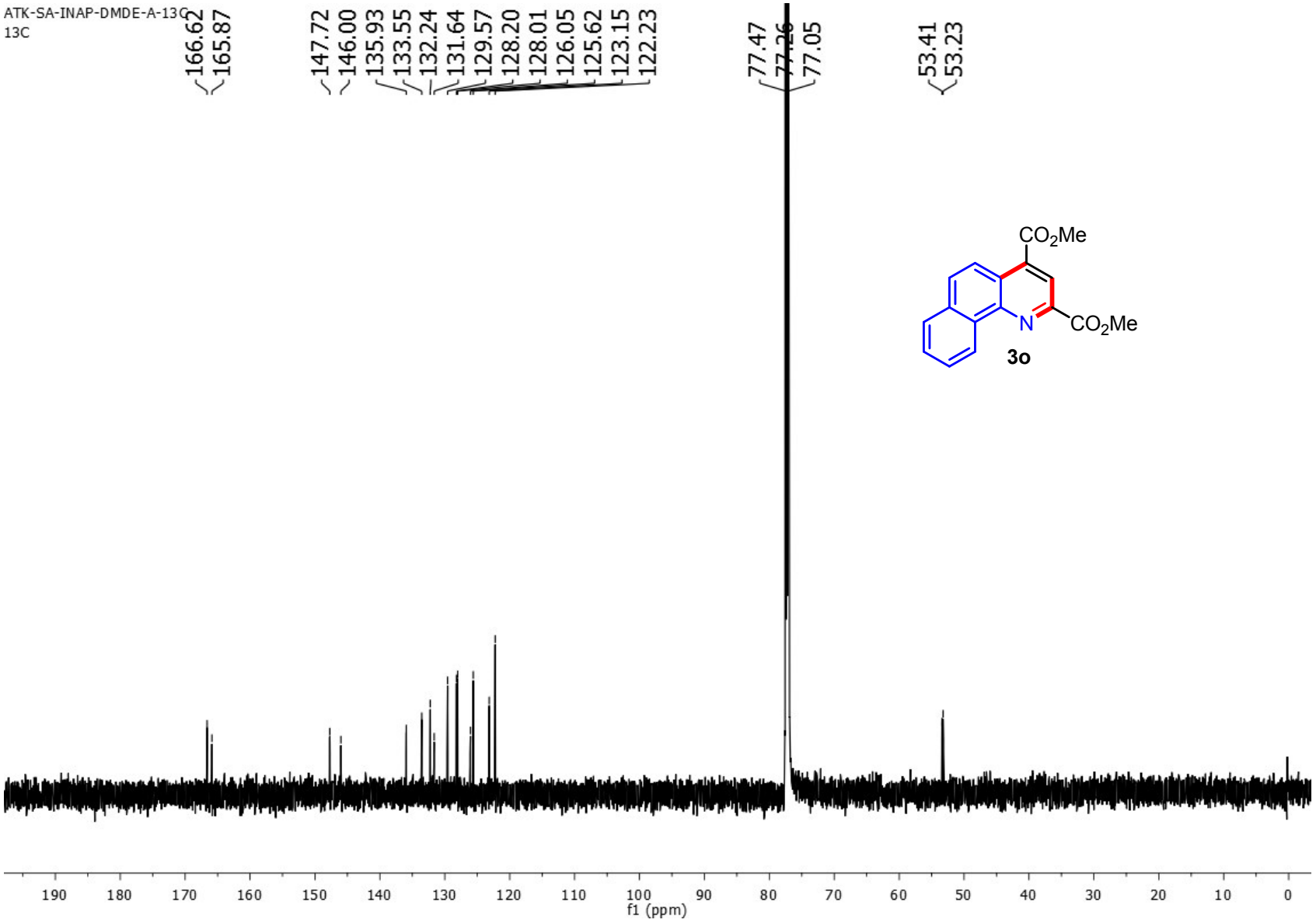


3m

^{1}H NMR spectrum of compound: 3o

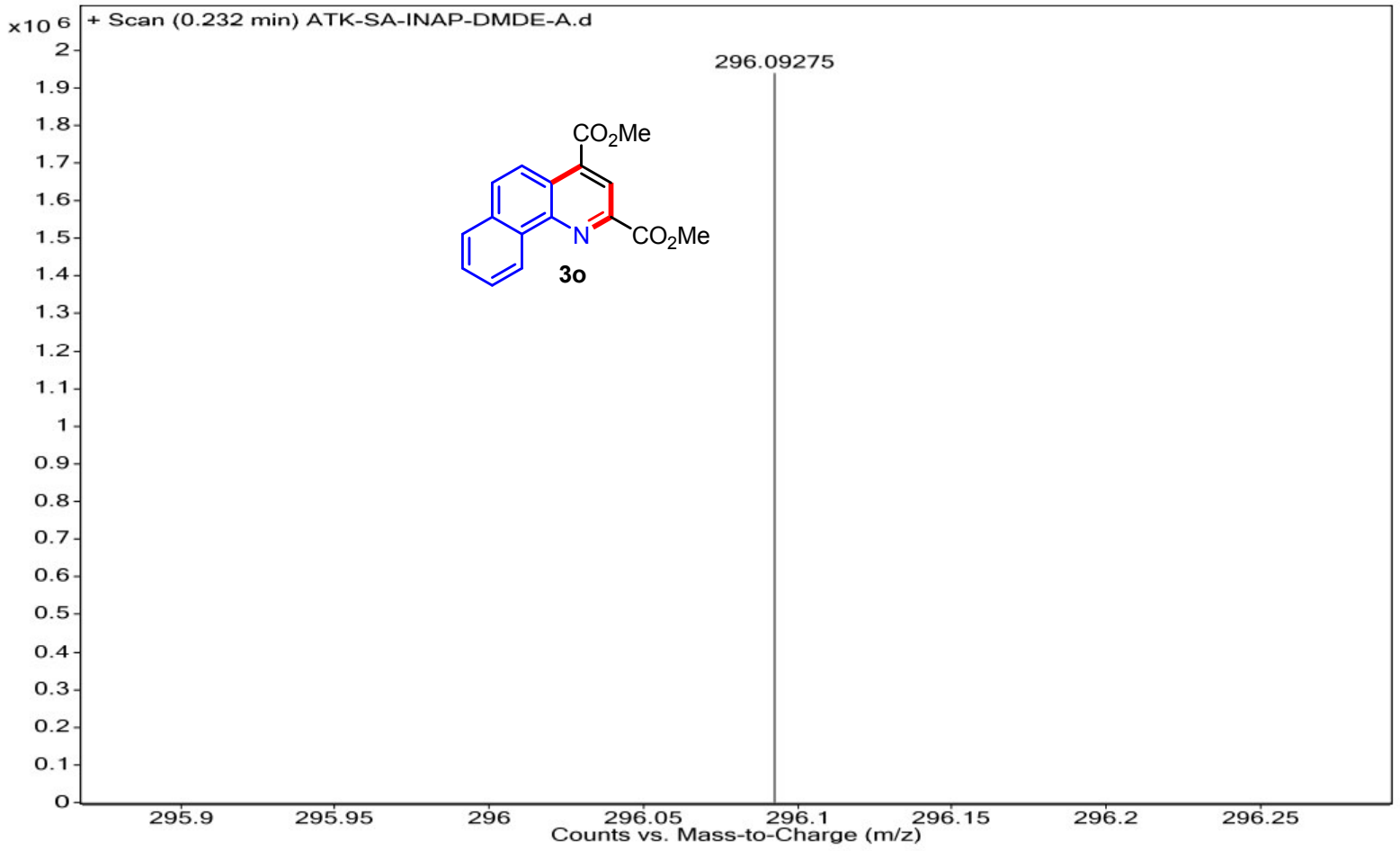


^{13}C NMR spectrum of compound: 3o

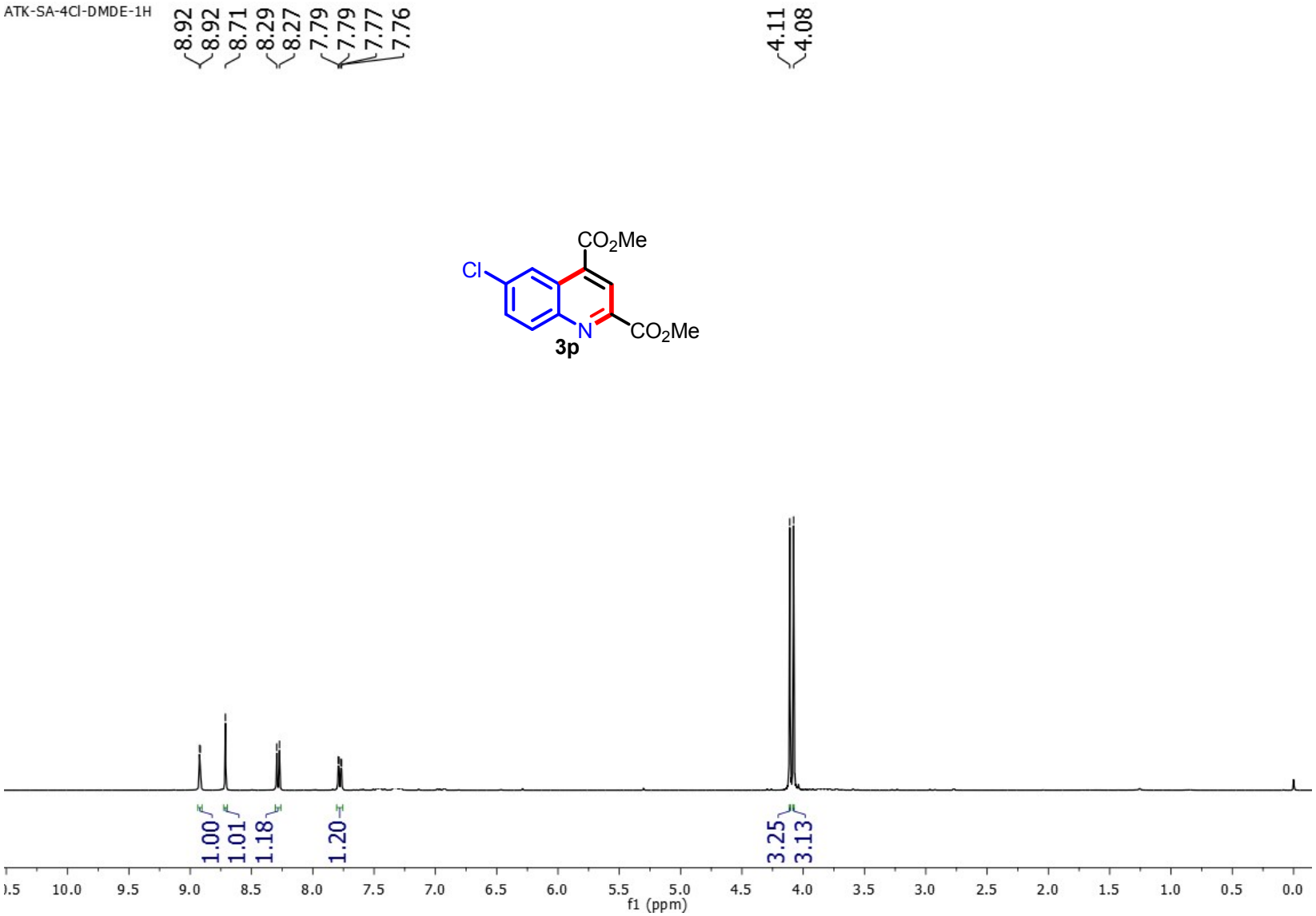


HRMS spectrum of compound: 3o

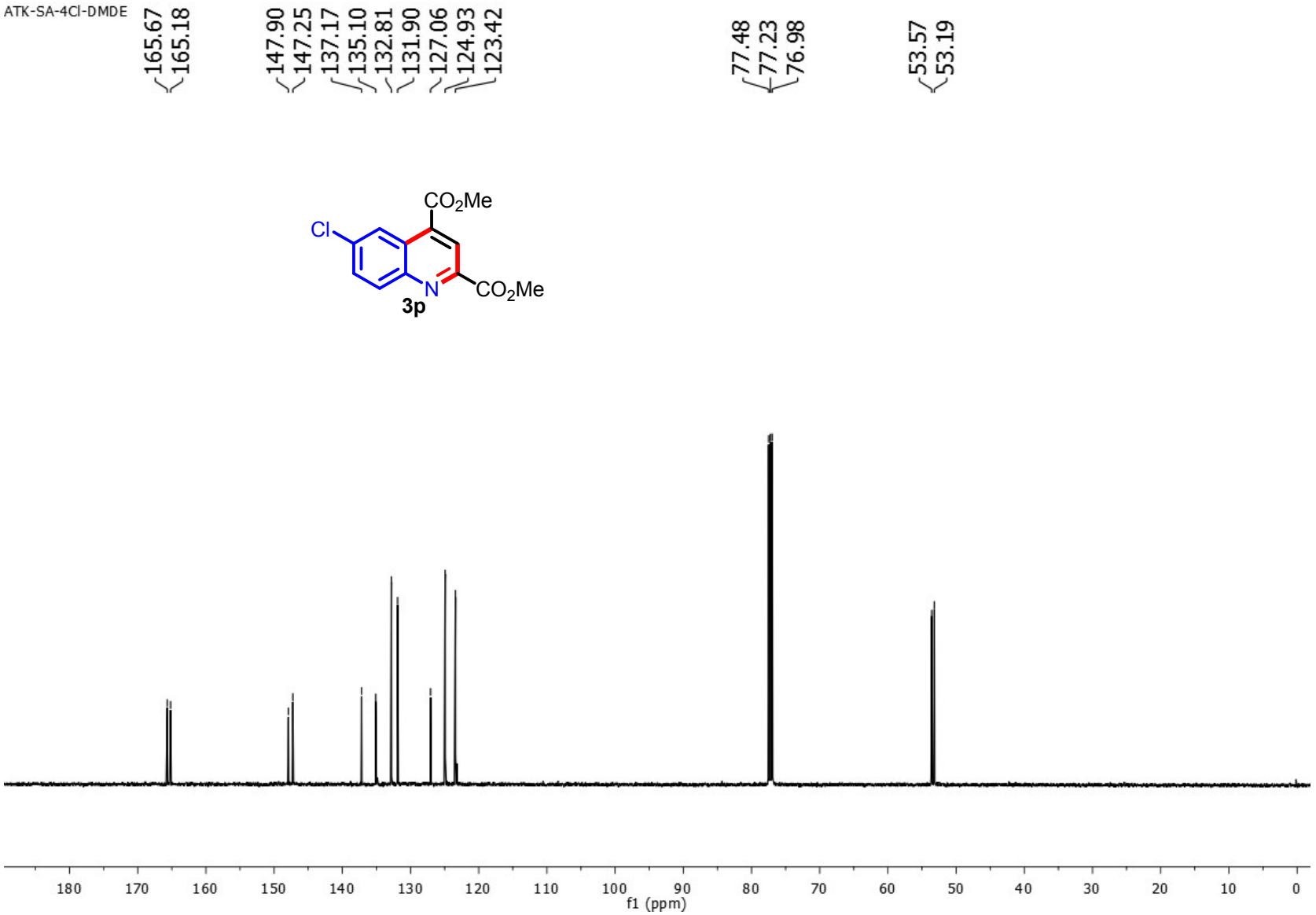
Sample Name	SAMPLE 21	**Position**	P2-C3	**Instrument Name**	Instrument 1	**User Name**	
Inj Vol	20	**InjPosition**		**SampleType**	Sample	**IRM Calibration Status**	Success
Data Filename	ATK-SA-INAP-DMDE-A.d	**ACQ Method**	ESI ALS 100-1000.m	**Comment**		**Acquired Time**	1/27/2021 11:51:29 PM



^{1}H NMR spectrum of compound: 3p

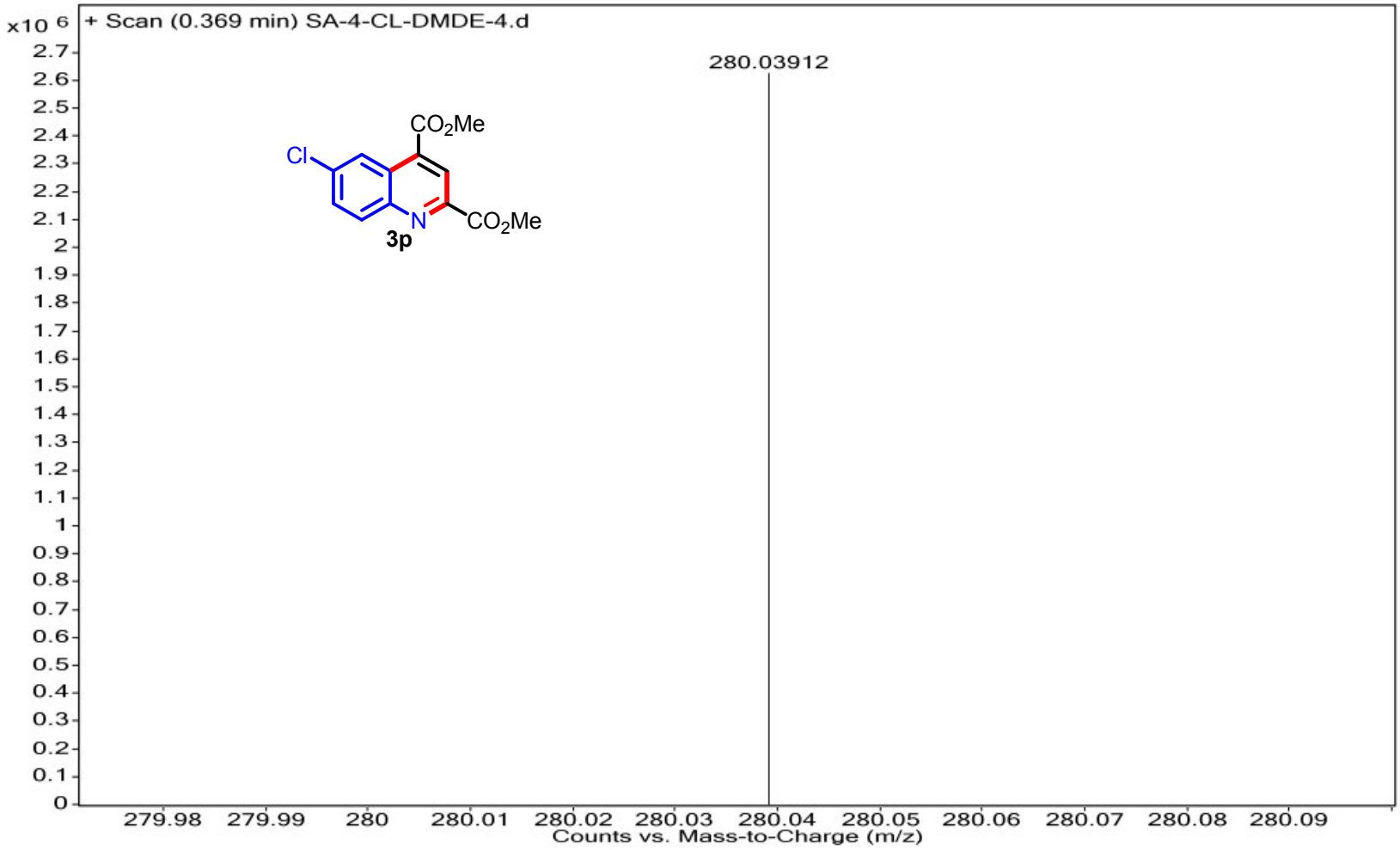


^{13}C NMR spectrum of compound: 3p

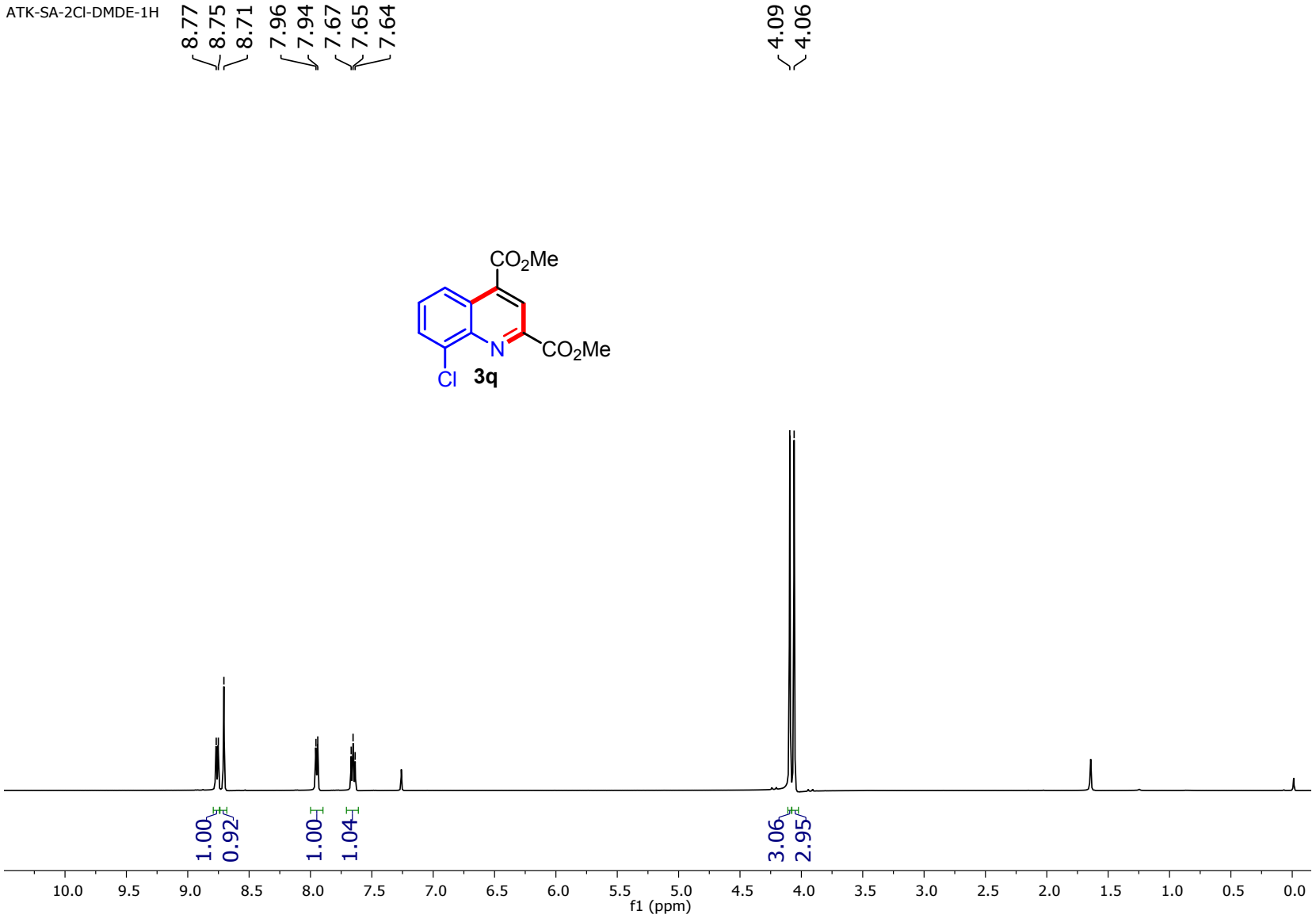


HRMS spectrum of compound: 3p

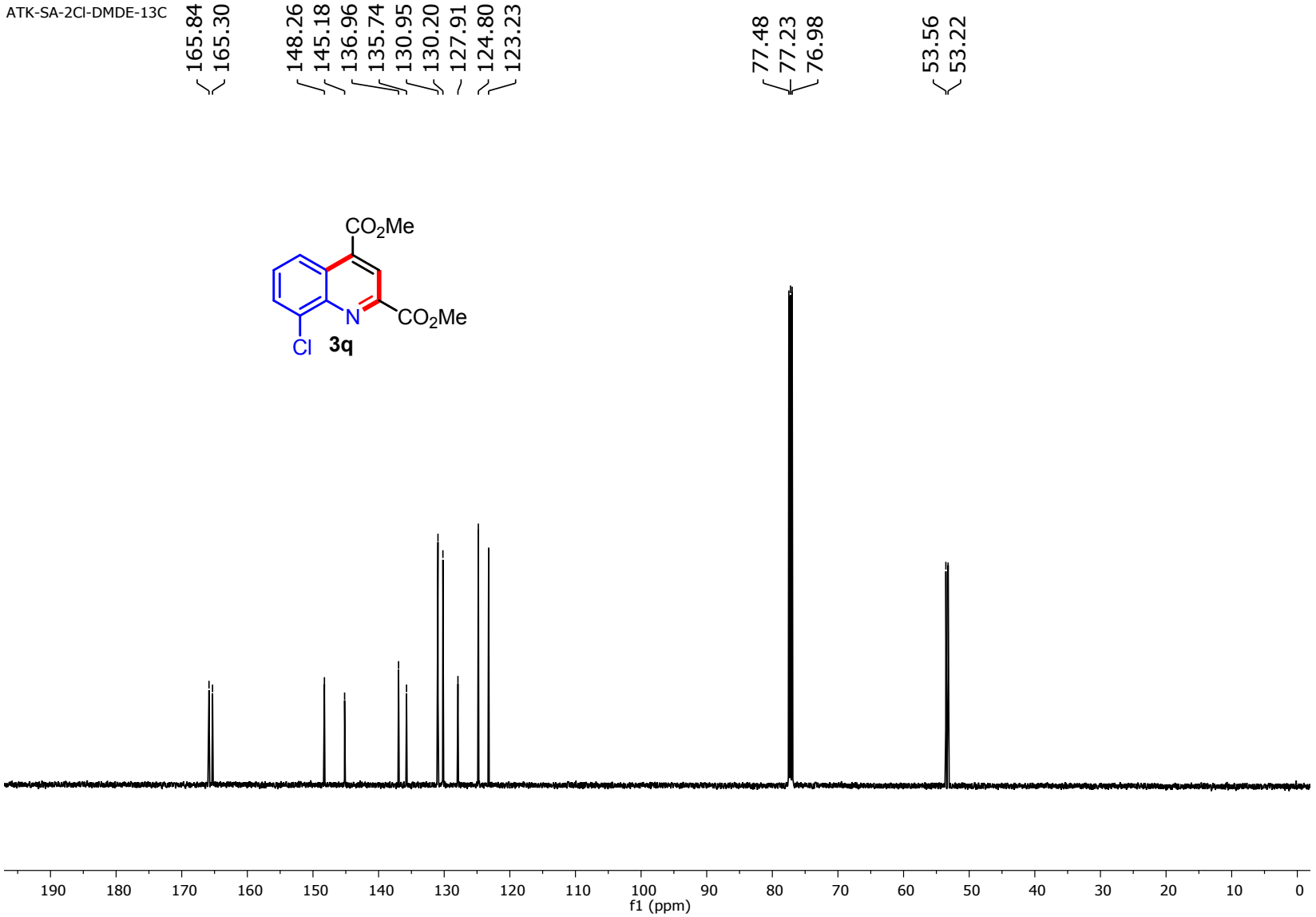
Sample Name	SAMPLE 32	**Position**	P1-C9	**Instrument Name**	Instrument 1	**User Name**	
Inj Vol	20	**InjPosition**		**SampleType**	Sample	**IRM Calibration Status**	Success
Data Filename	SA-4-CL-DMDE-4.d	**ACQ Method**	ESI ALS 100-500.m	**Comment**		**Acquired Time**	3/19/2021 4:37:15 PM



^{1}H NMR spectrum of compound: 3q

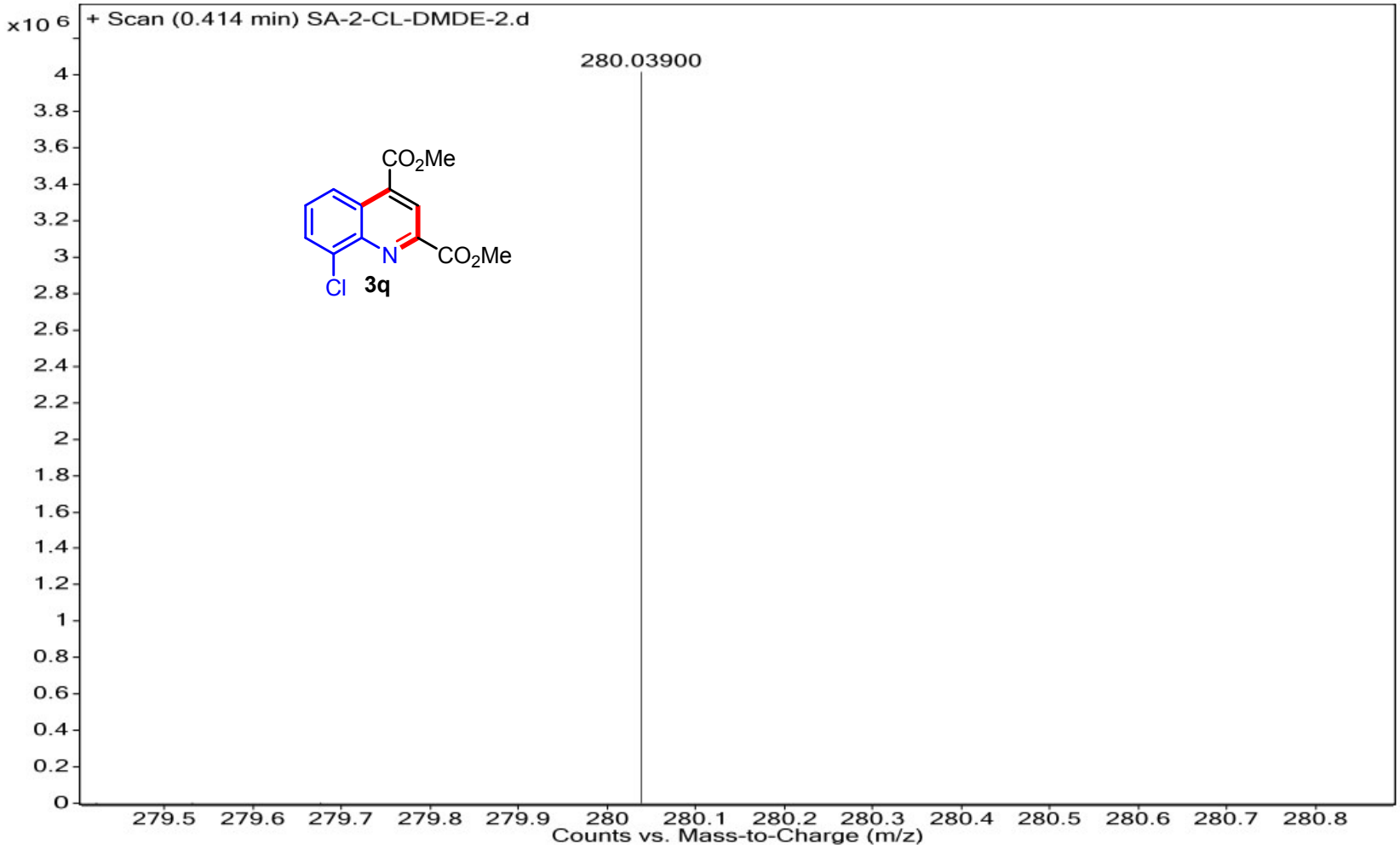


^{13}C NMR spectrum of compound: 3q

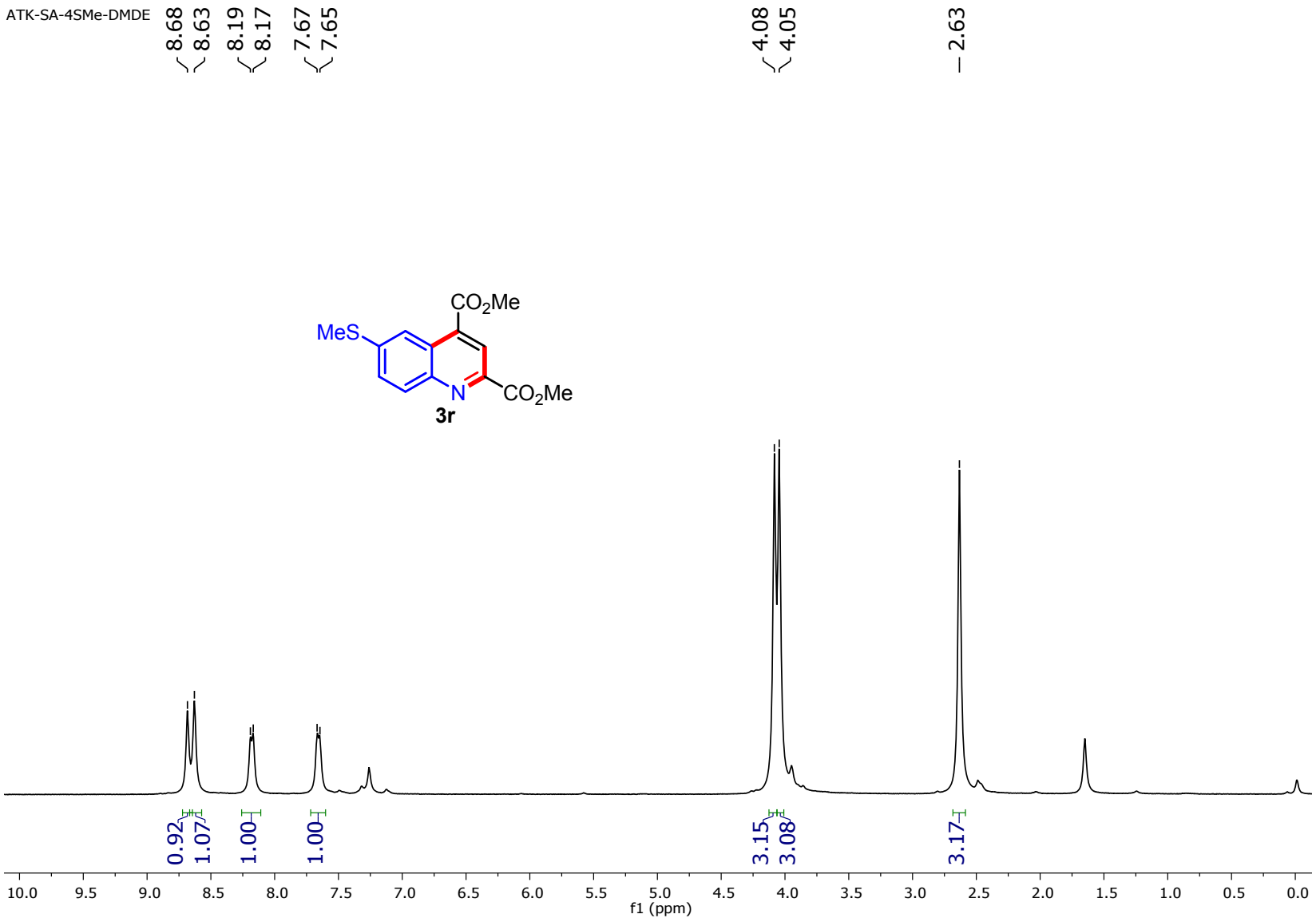


HRMS spectrum of compound: 3q

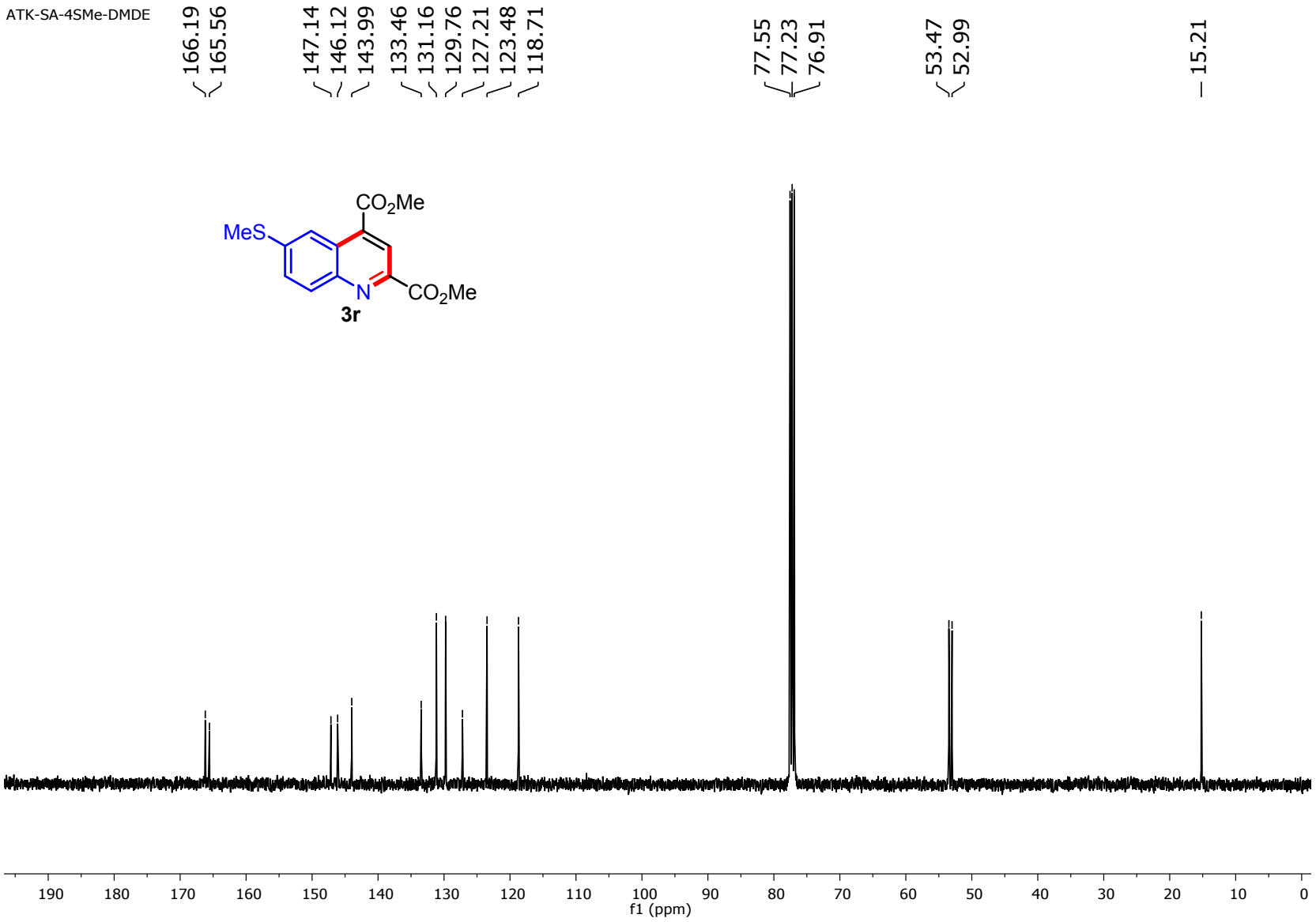
Sample Name	SAMPLE 33	**Position**	P1-C10	**Instrument Name**	Instrument 1	**User Name**	
Inj Vol	20	**InjPosition**		**SampleType**	Sample	**IRM Calibration Status**	Success
Data Filename	SA-2-CL-DMDE-2.d	**ACQ Method**	ESI ALS 100-500.m	**Comment**		**Acquired Time**	3/19/2021 4:48:47 PM



^{1}H NMR spectrum of compound: 3r

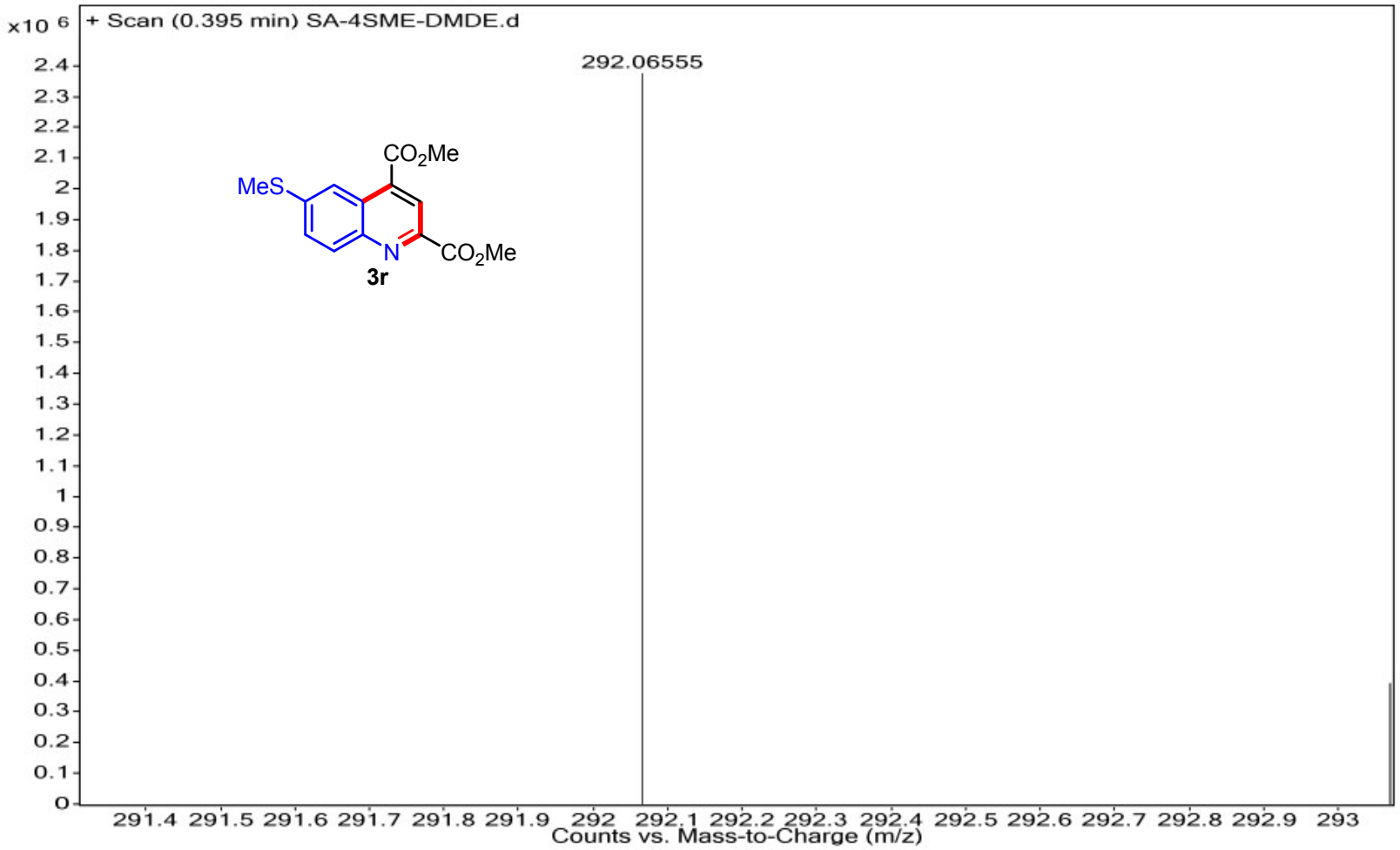


^{13}C NMR spectrum of compound: 3r

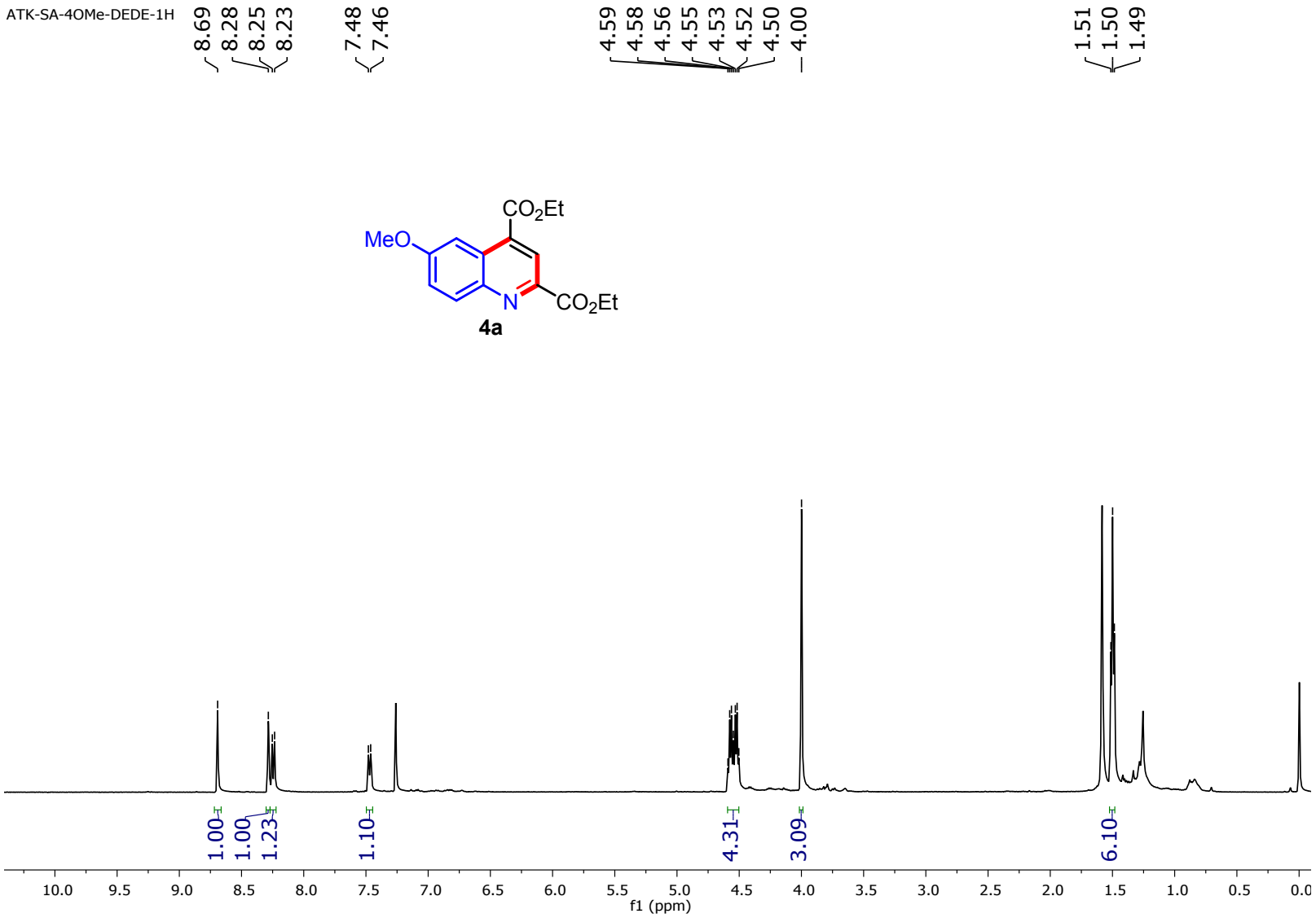


HRMS spectrum of compound: 3r

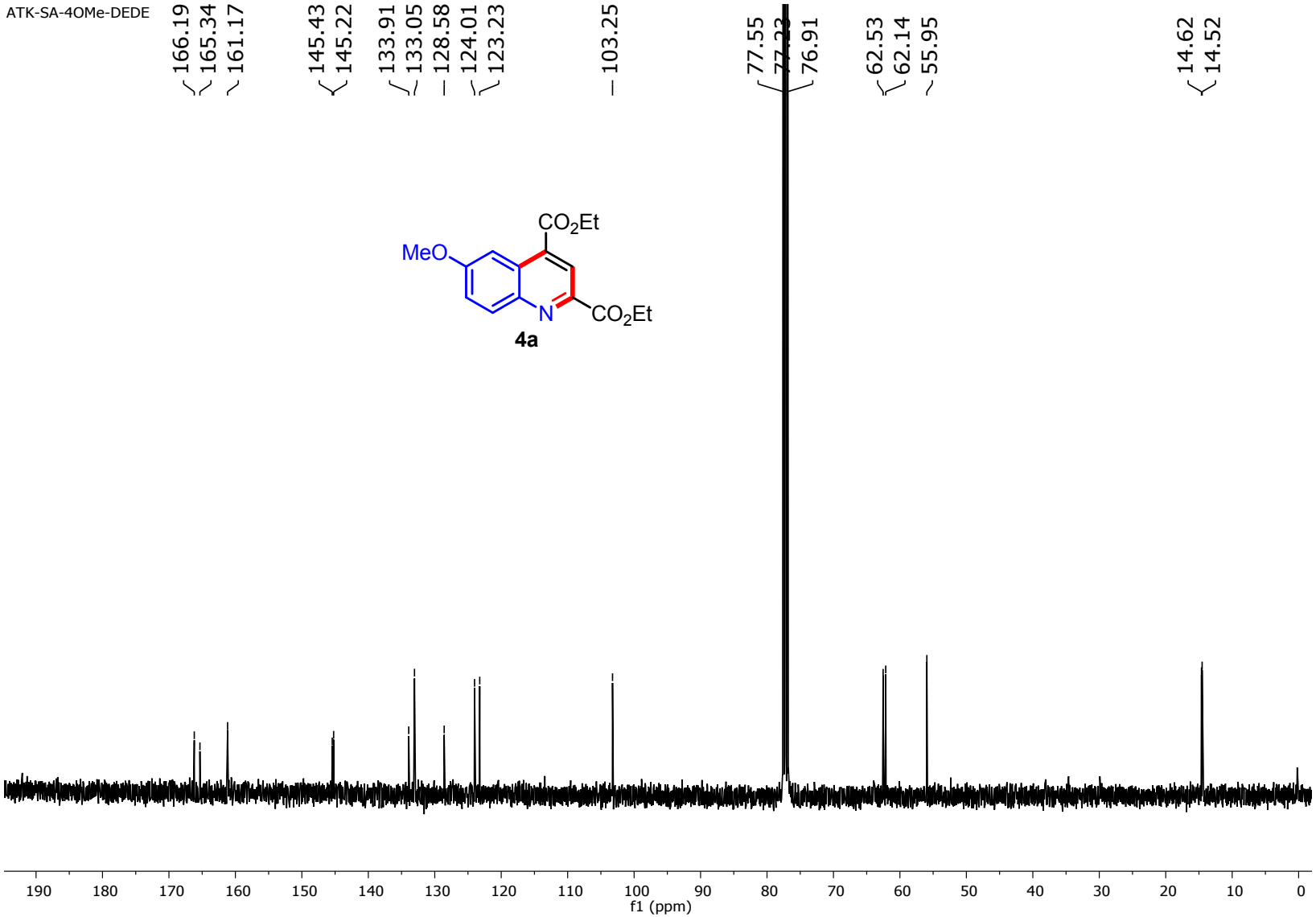
Sample Name	SA-4SME-DMDE	**Position**	P1-A5	**Instrument Name**	Instrument 1	**User Name**	
Inj Vol	20	**InjPosition**		**SampleType**	Sample	**IRM Calibration Status**	Success
Data Filename	SA-4SME-DMDE.d	**ACQ Method**	ESI ALS 100-550.m	**Comment**		**Acquired Time**	3/31/2021 12:12:22 PM



^{1}H NMR spectrum of compound: 4a

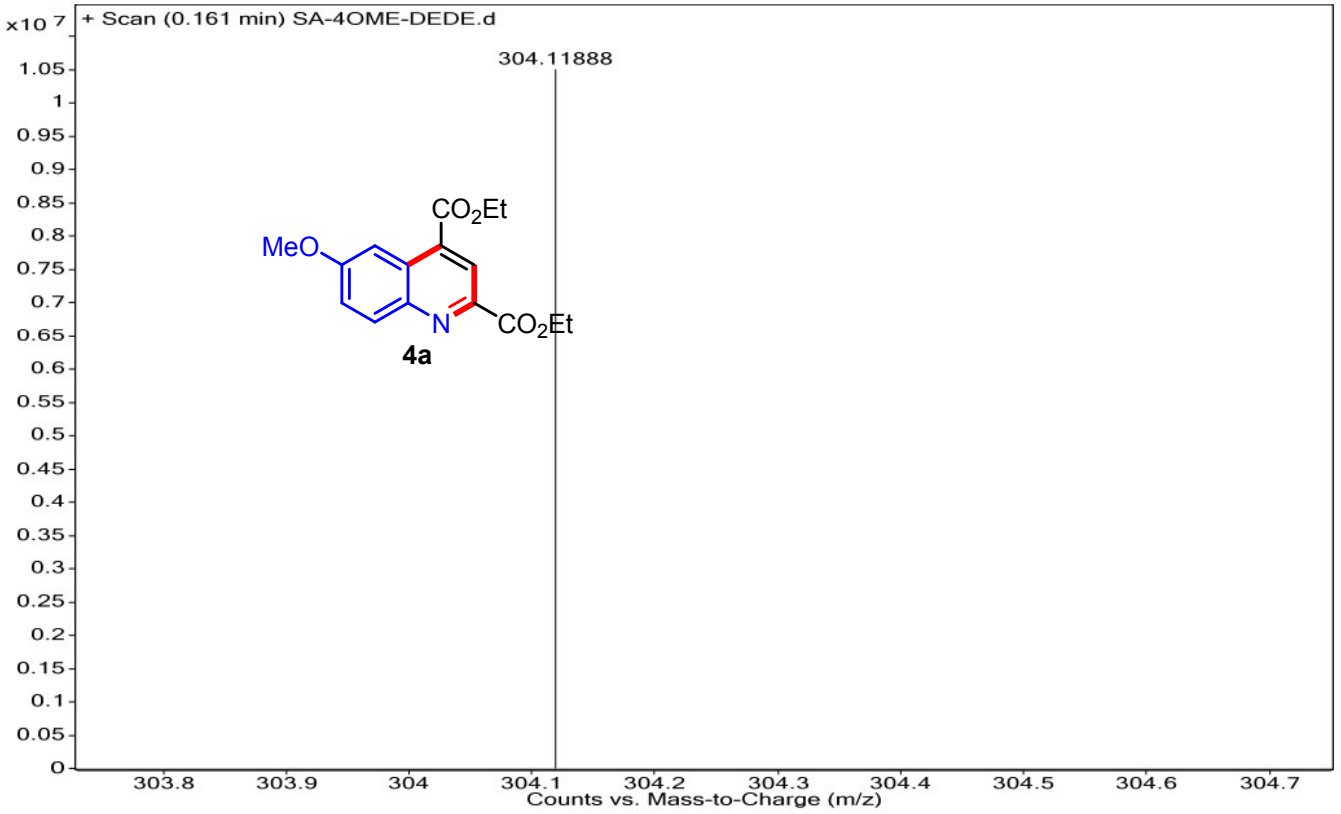


^{13}C NMR spectrum of compound: 4a

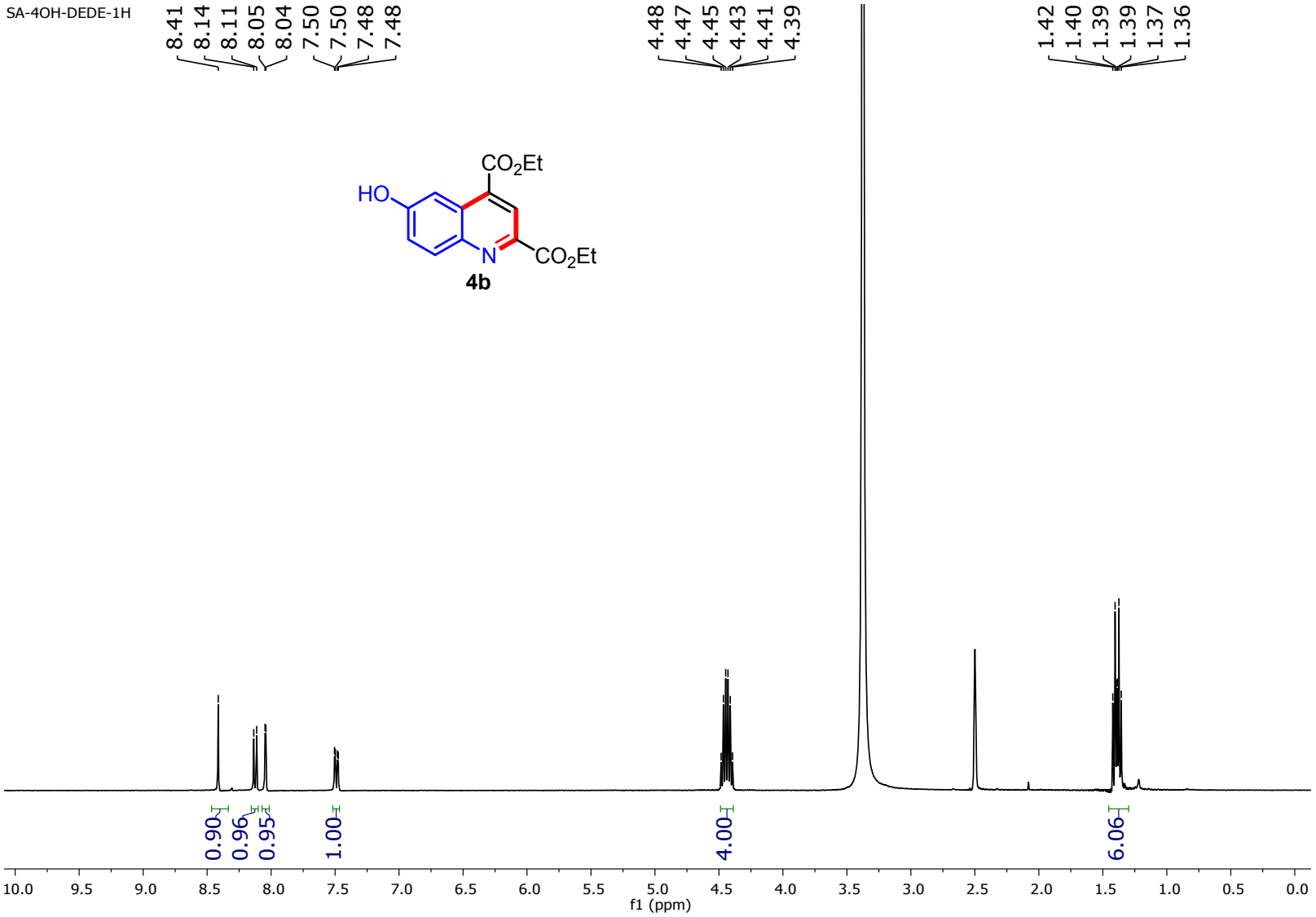


HRMS spectrum of compound: 4a

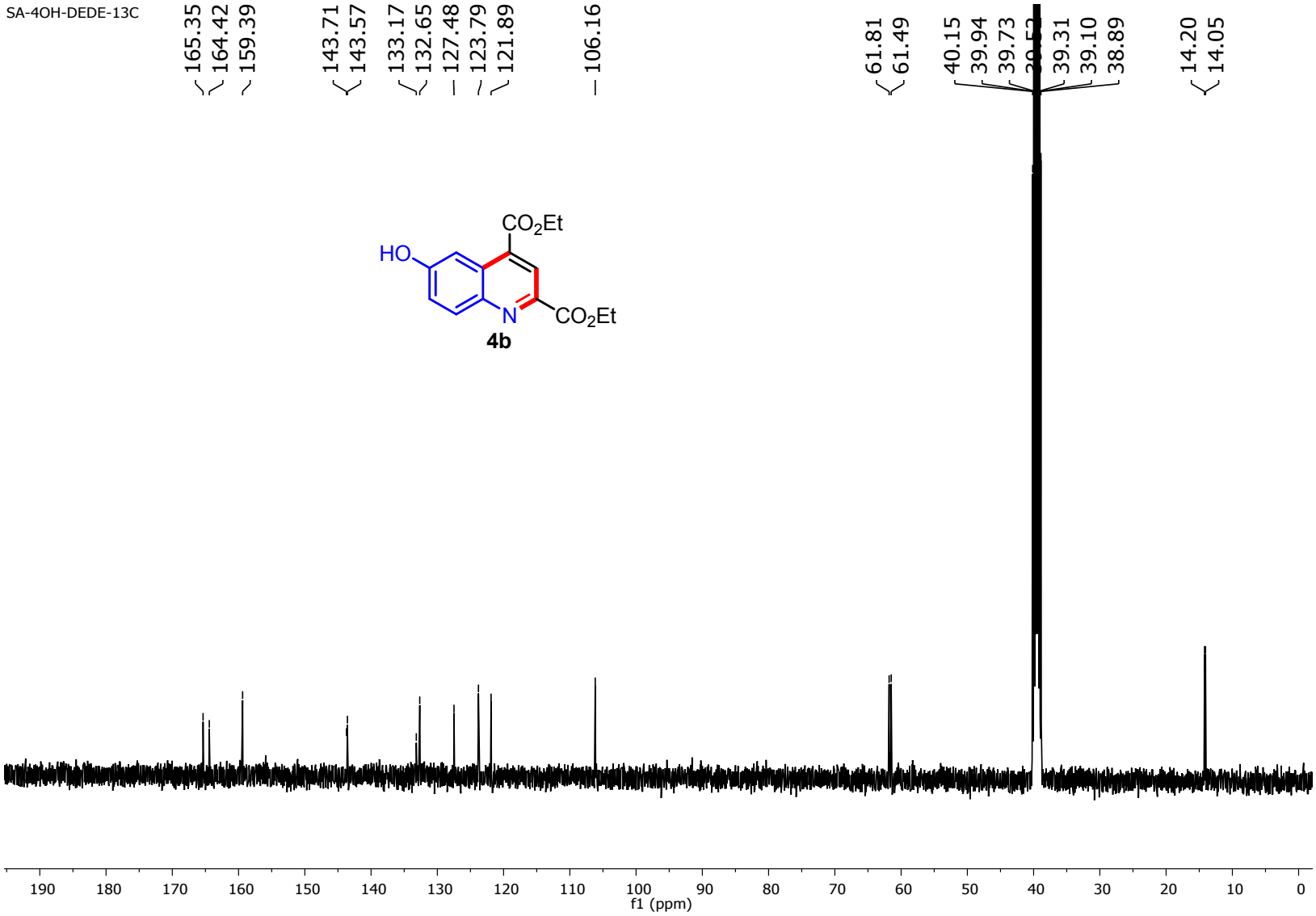
Sample Name	SAMPLE 12	**Position**	P1-A9	**Instrument Name**	Instrument 1	**User Name**	
Inj Vol	20	**InjPosition**		**SampleType**	Sample	**IRM Calibration Status**	Success
Data Filename	SA-4OME-DEDE.d	**ACQ Method**	ESI ALS 100-500.m	**Comment**		**Acquired Time**	2/11/2021 12:41:38 PM



^{1}H NMR spectrum of compound: 4b

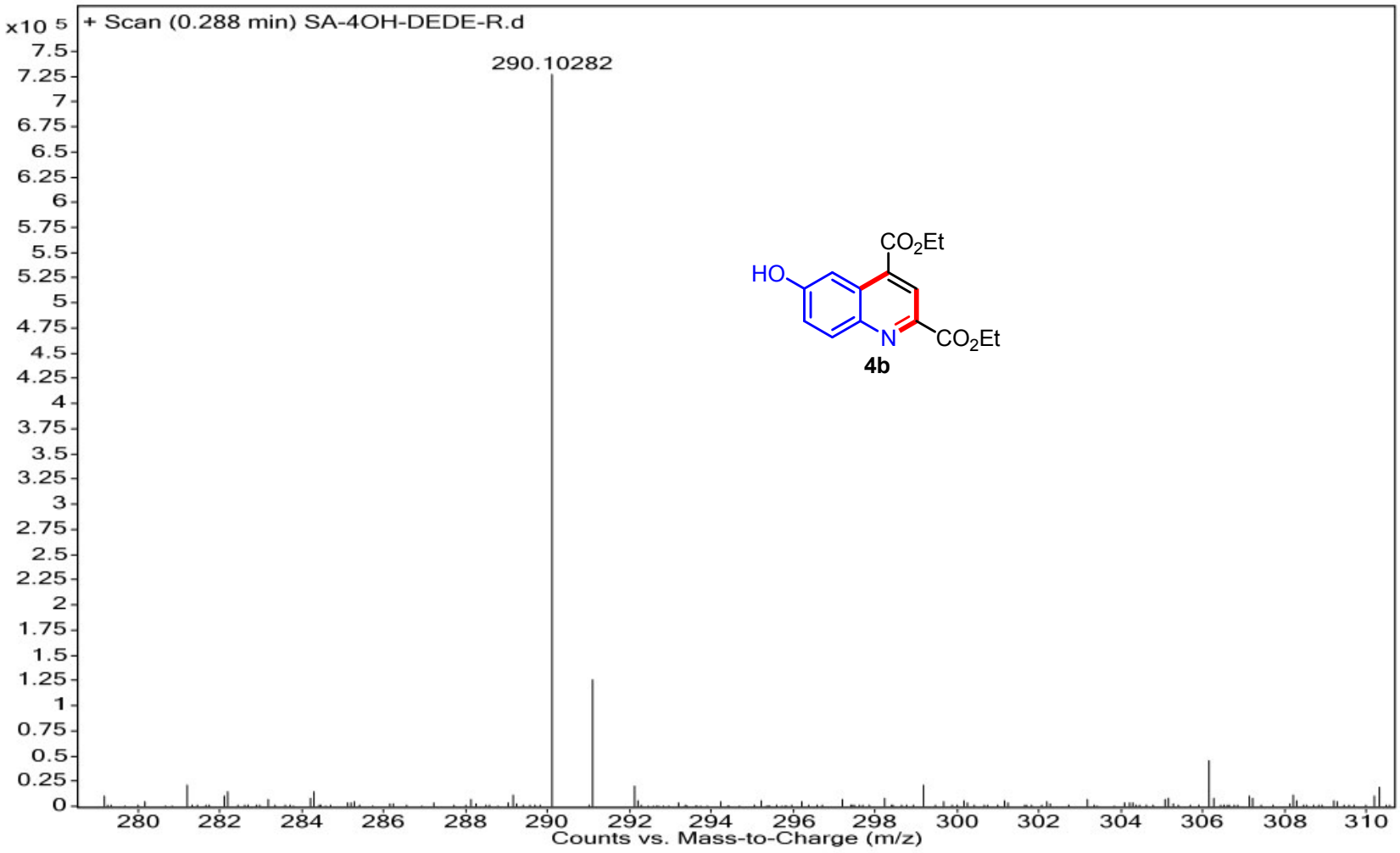


^{13}C NMR spectrum of compound: 4b

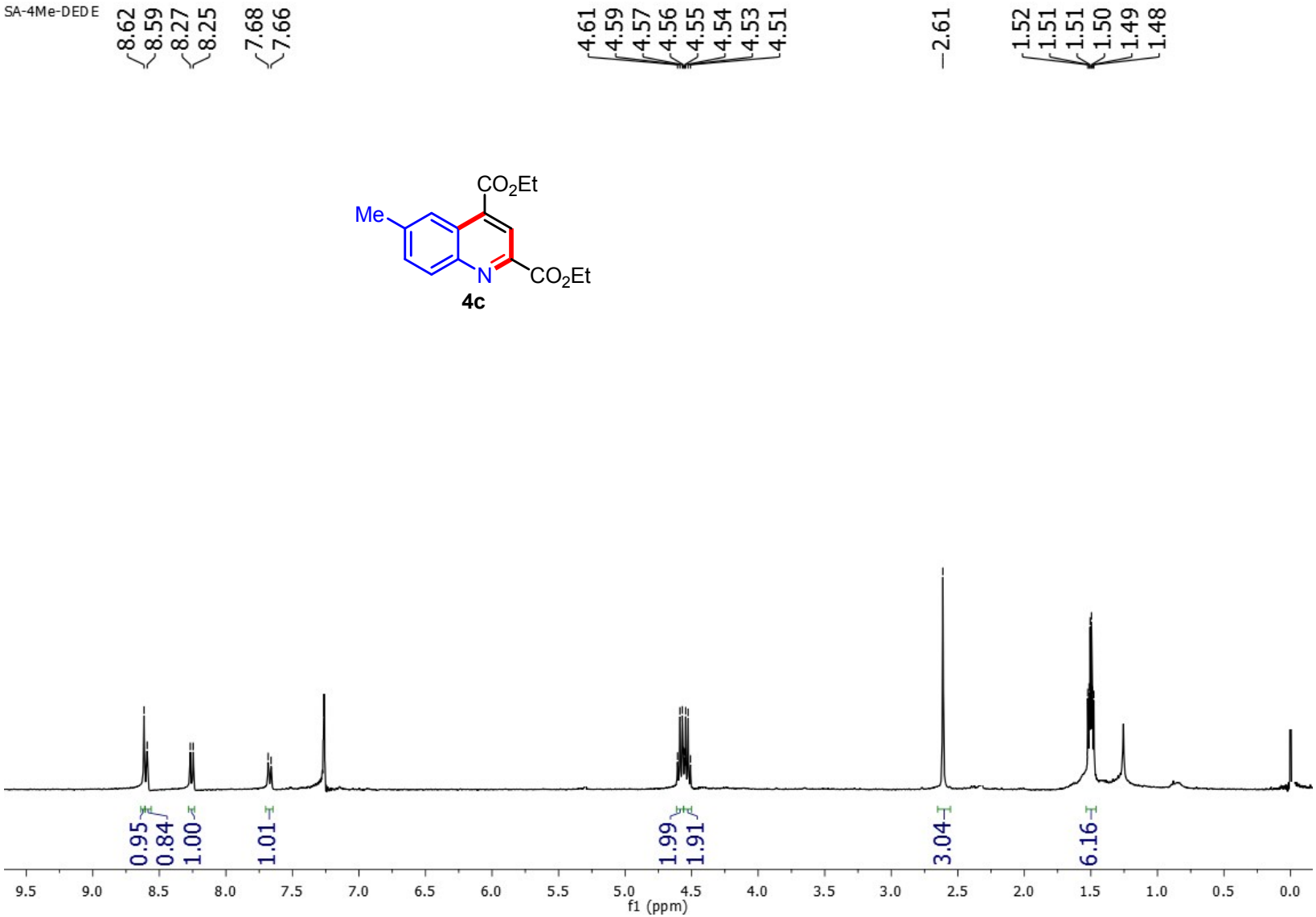


HRMS spectrum of compound: 4b

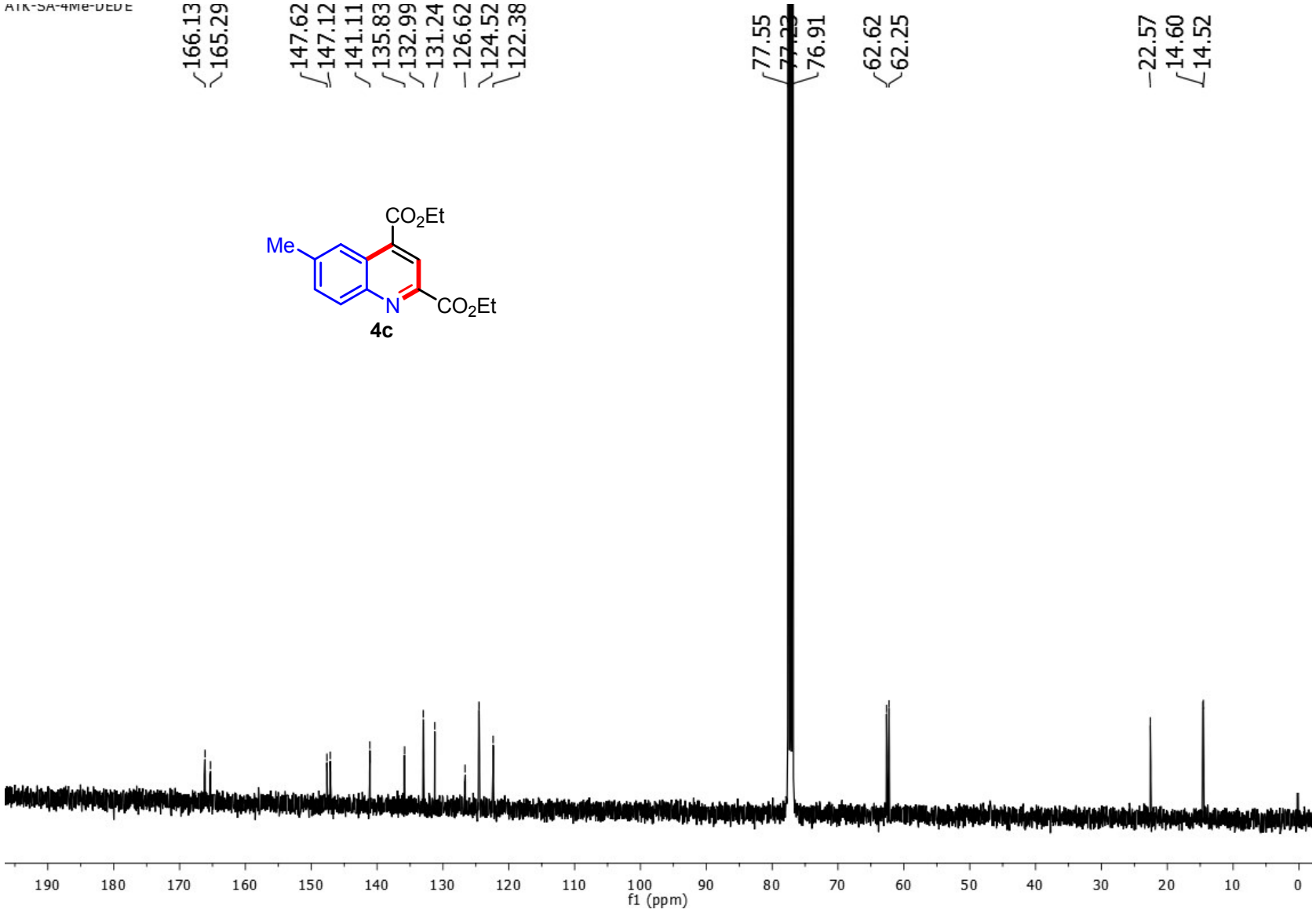
Sample Name	WASH	**Position**	P1-D4	**Instrument Name**	Instrument 1	**User Name**	
Inj Vol	20	**InjPosition**		**SampleType**	Sample	**IRM Calibration Status**	Success
Data Filename	SA-4OH-DEDE-R.d	**ACQ Method**	ESI ALS 100-1000.m	**Comment**		**Acquired Time**	2/19/2021 5:03:43 PM



^{1}H NMR spectrum of compound: 4c

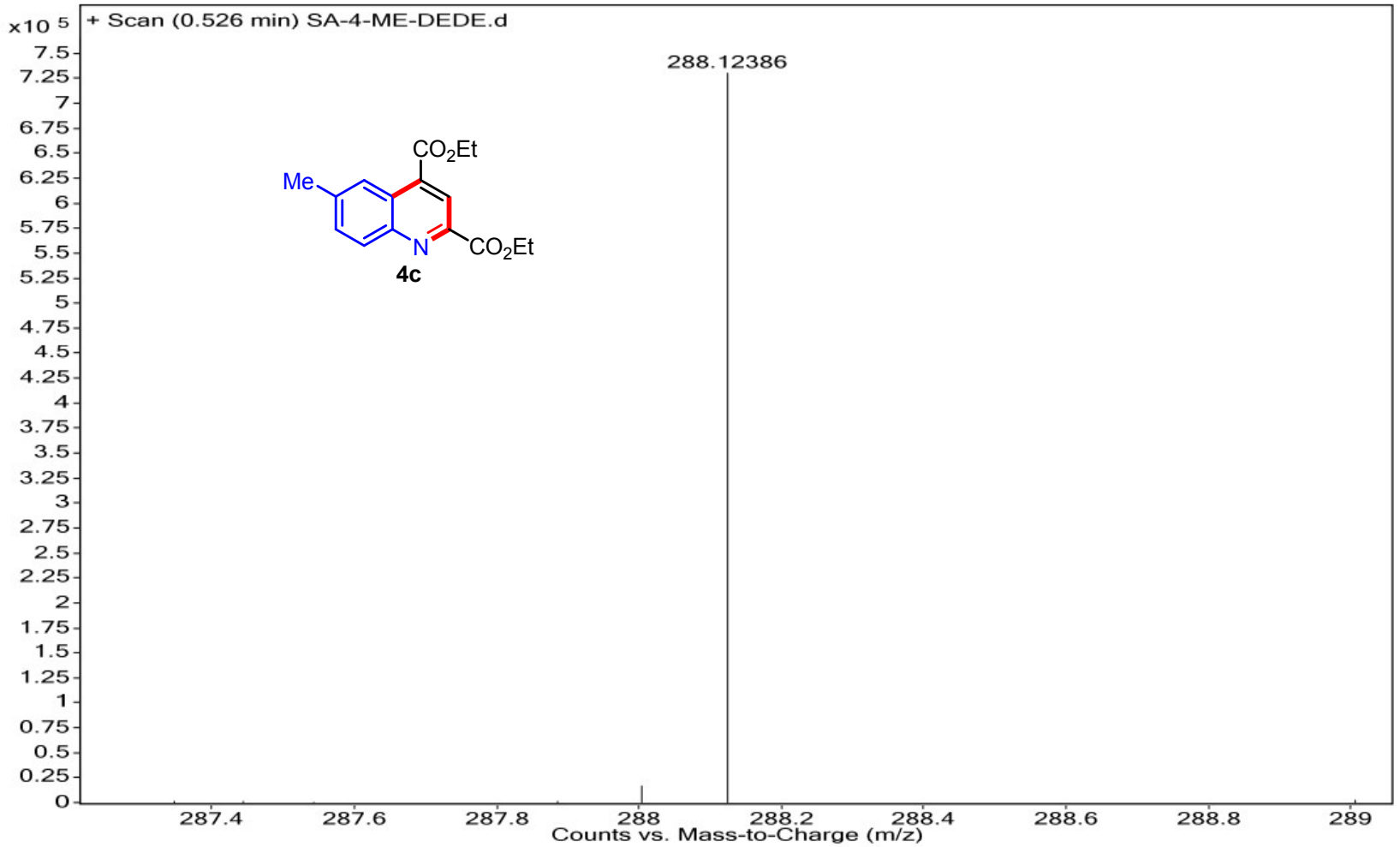


^{13}C NMR spectrum of compound: 4c

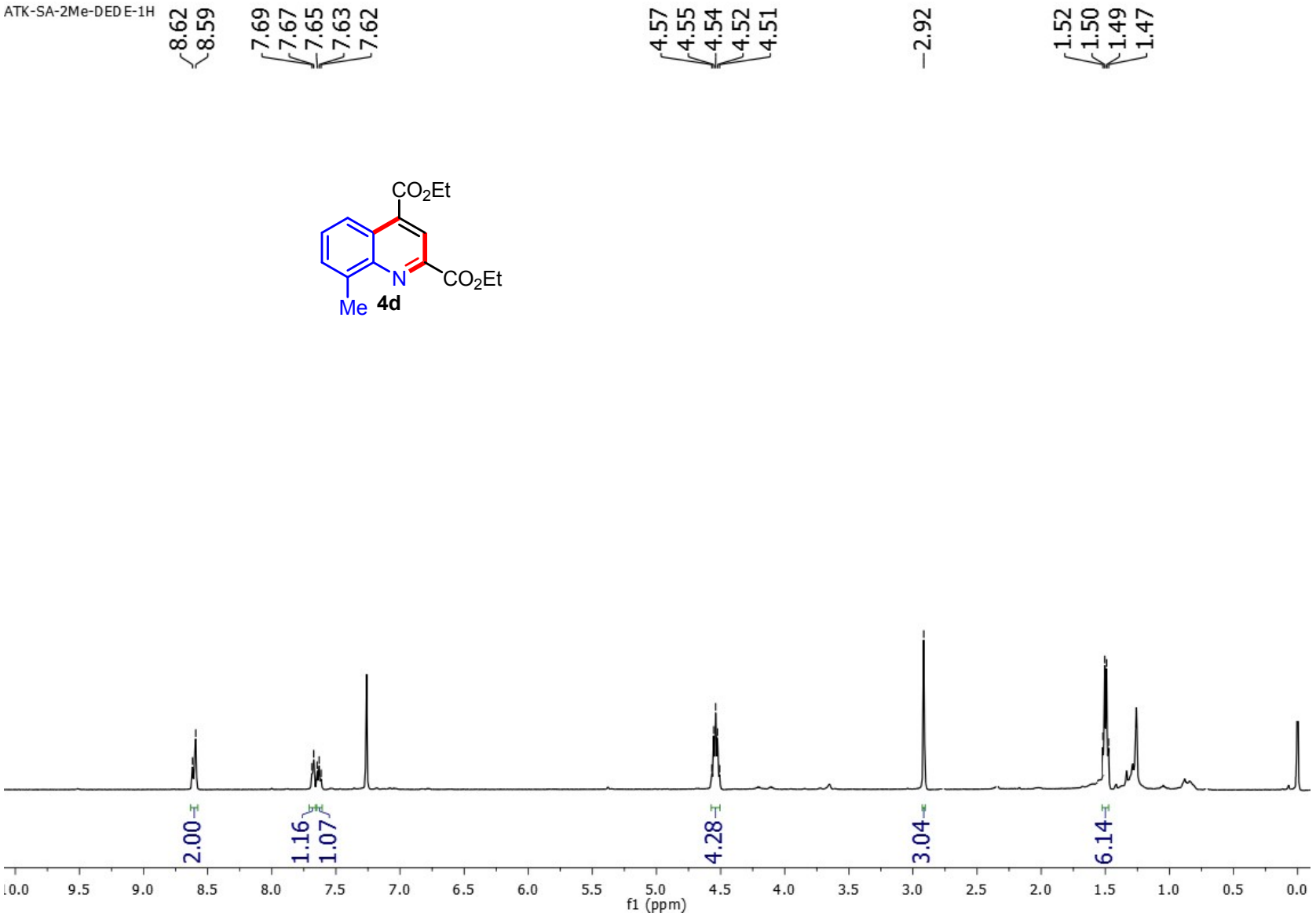


HRMS spectrum of compound: 4c

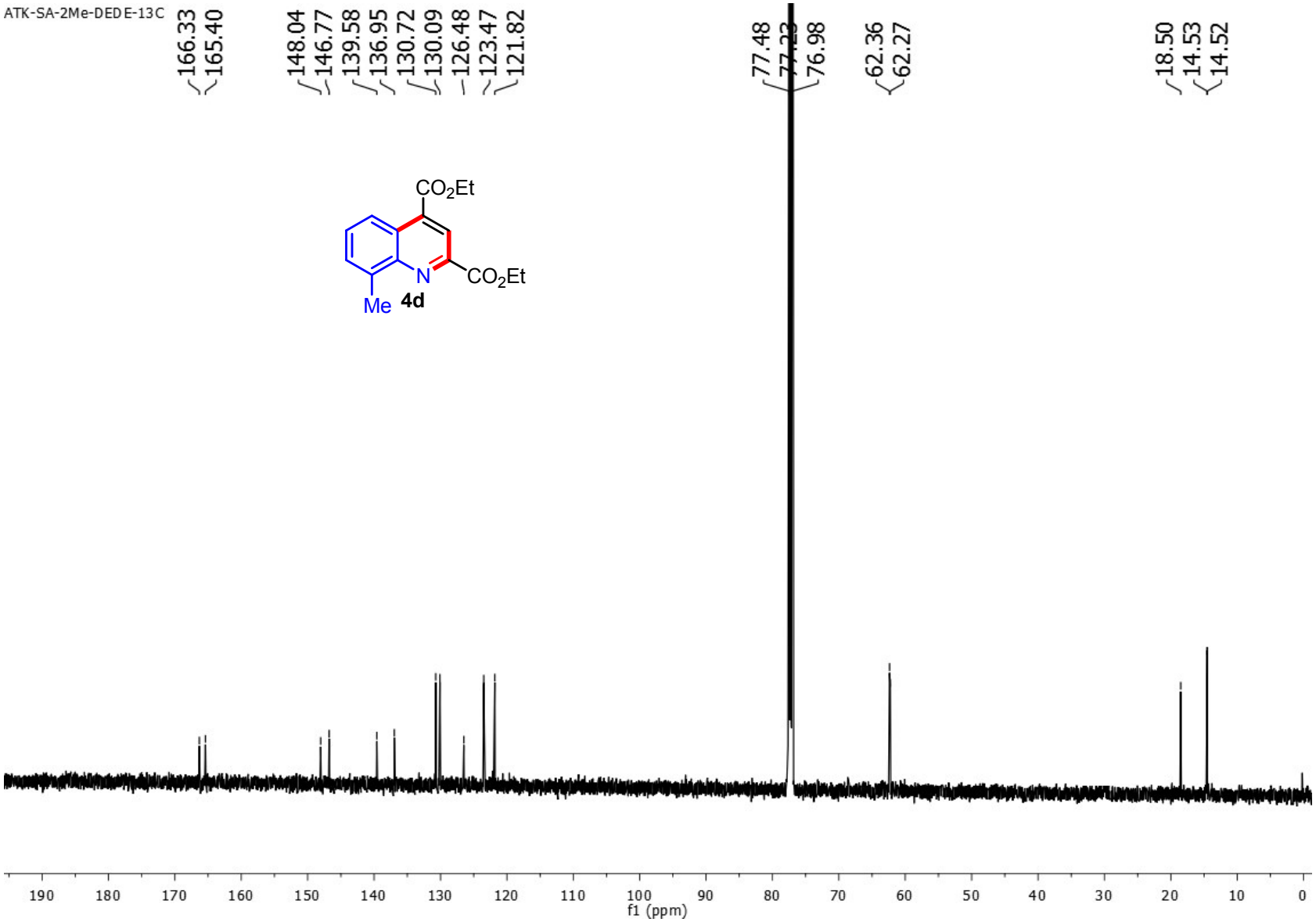
Sample Name	WASH	**Position**	P1-B3	**Instrument Name**	Instrument 1	**User Name**	
Inj Vol	20	**InjPosition**		**SampleType**	Sample	**IRM Calibration Status**	Success
Data Filename	SA-4-ME-DEDE.d	**ACQ Method**	ESI ALS 100-1000.m	**Comment**		**Acquired Time**	3/1/2021 1:00:17 PM



^{1}H NMR spectrum of compound: 4d

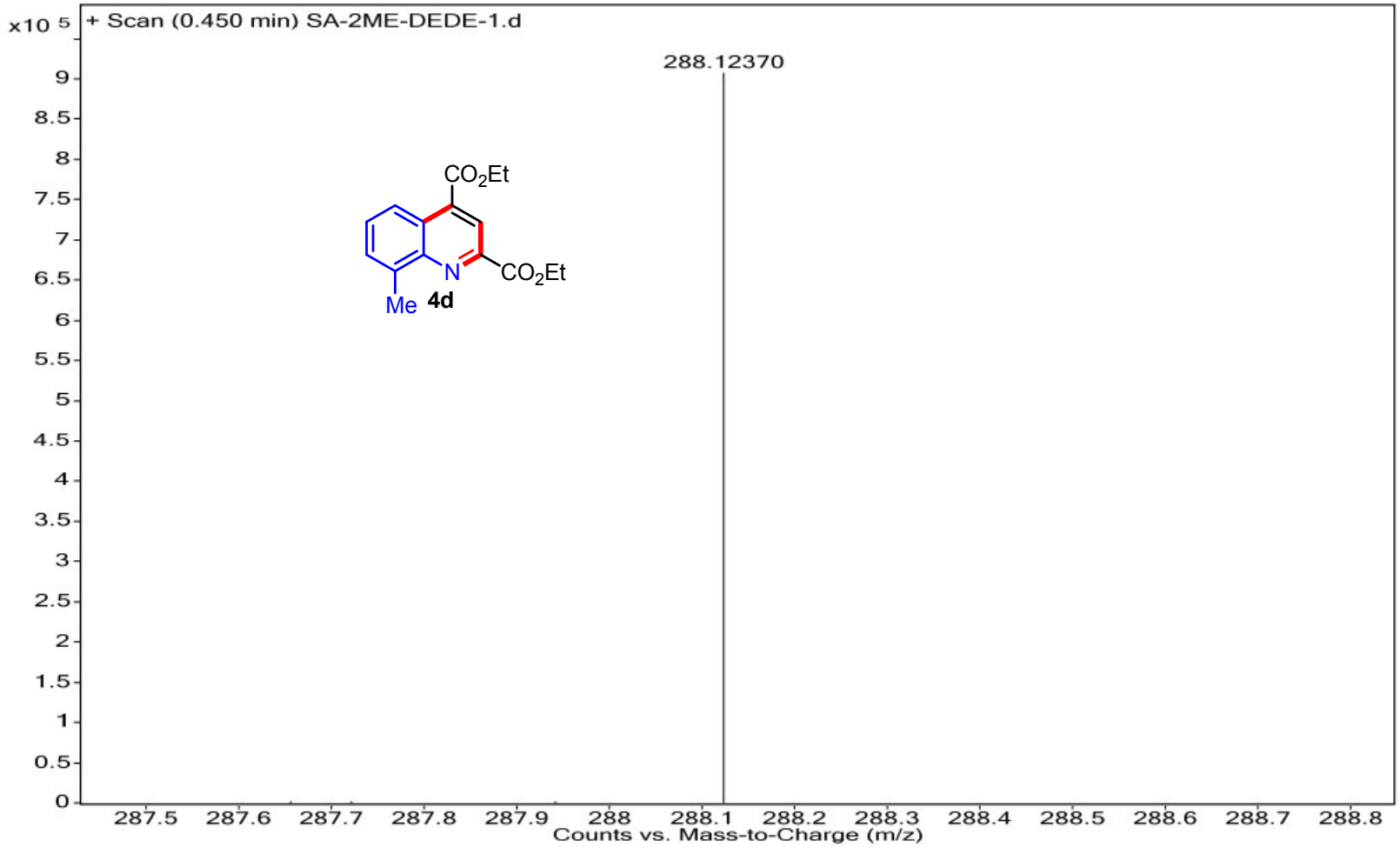


^{13}C NMR spectrum of compound: 5d

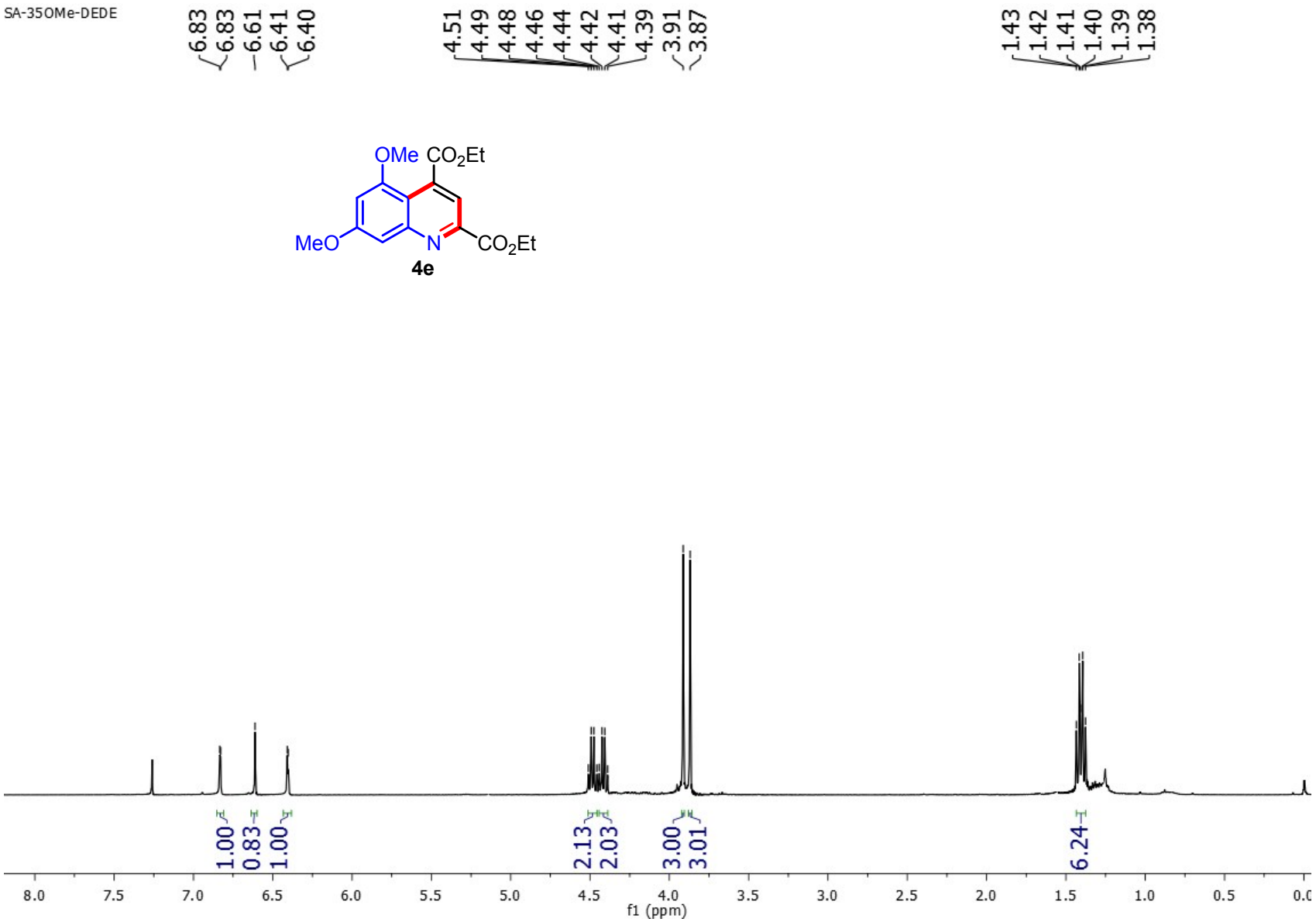


HRMS spectrum of compound: 4d

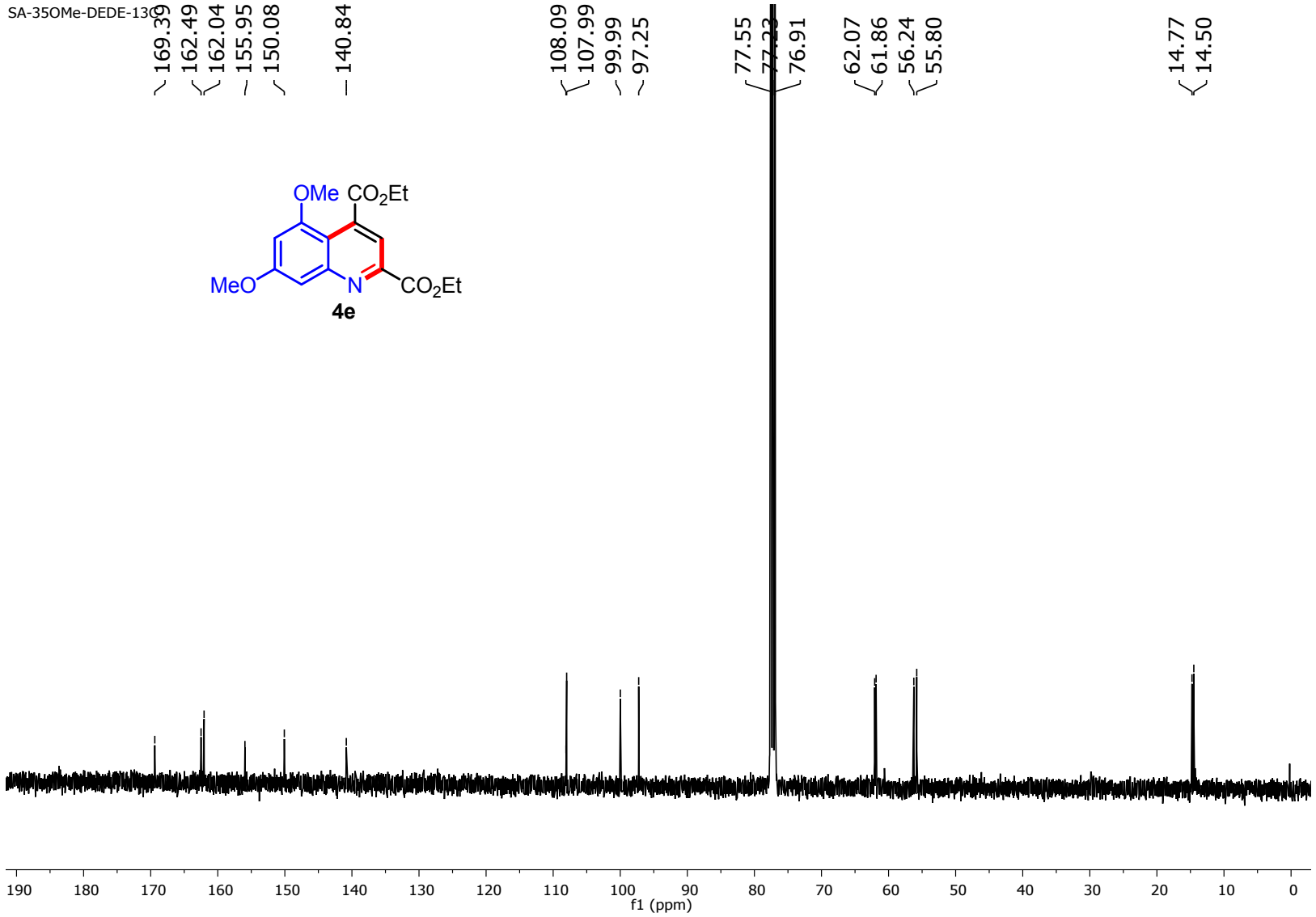
Sample Name	SAMPLE	**Position**	P1-A6	**Instrument Name**	Instrument 1	**User Name**	
Inj Vol	20	**InjPosition**		**SampleType**	Sample	**IRM Calibration Status**	Success
Data Filename	SA-2ME-DEDE-1.d	**ACQ Method**	ESI ALS 100-500.m	**Comment**		**Acquired Time**	2/11/2021 12:27:36 PM



^{1}H NMR spectrum of compound: 4e

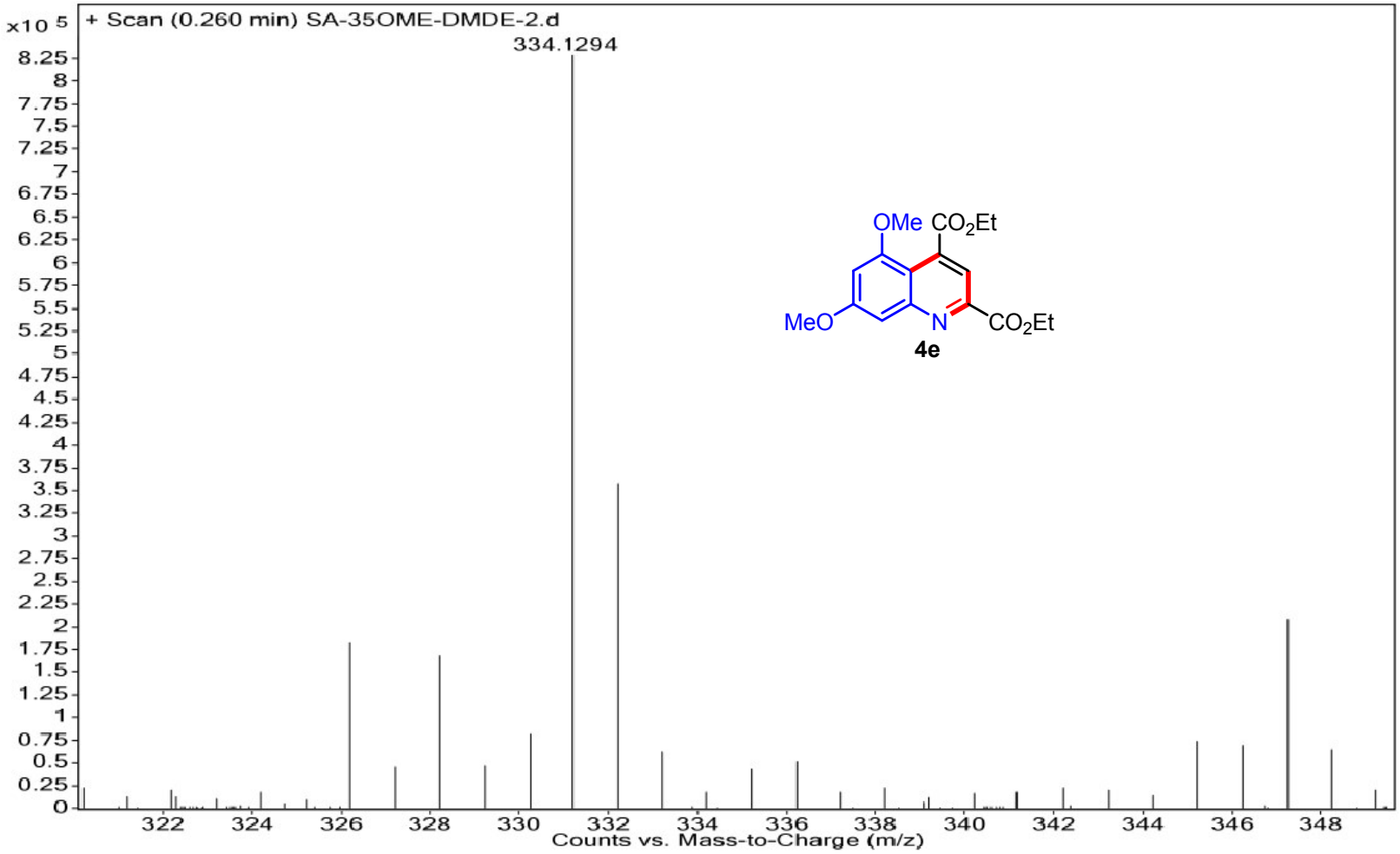


^{13}C NMR spectrum of compound: 4e

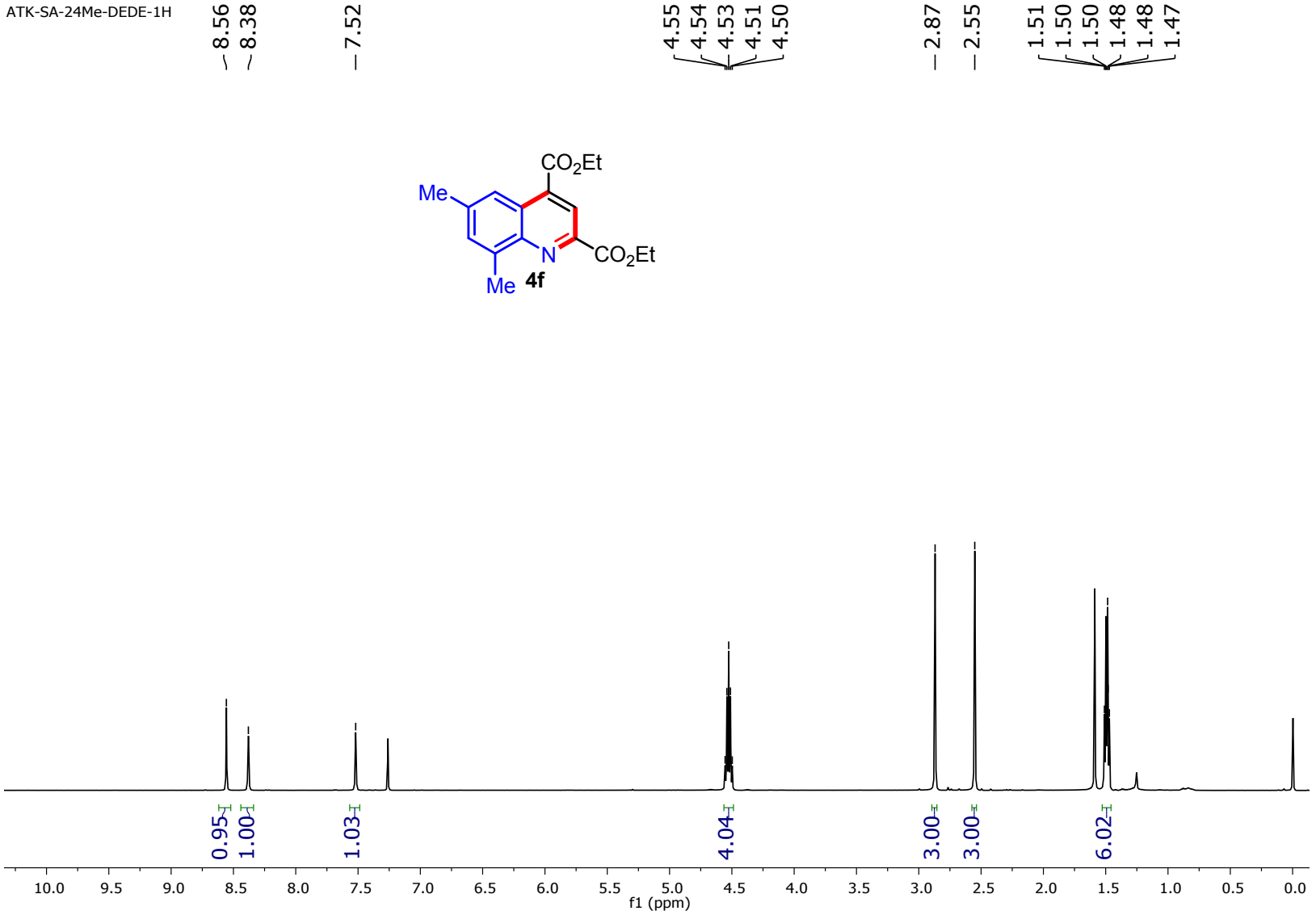


HRMS spectrum of compound: 4e

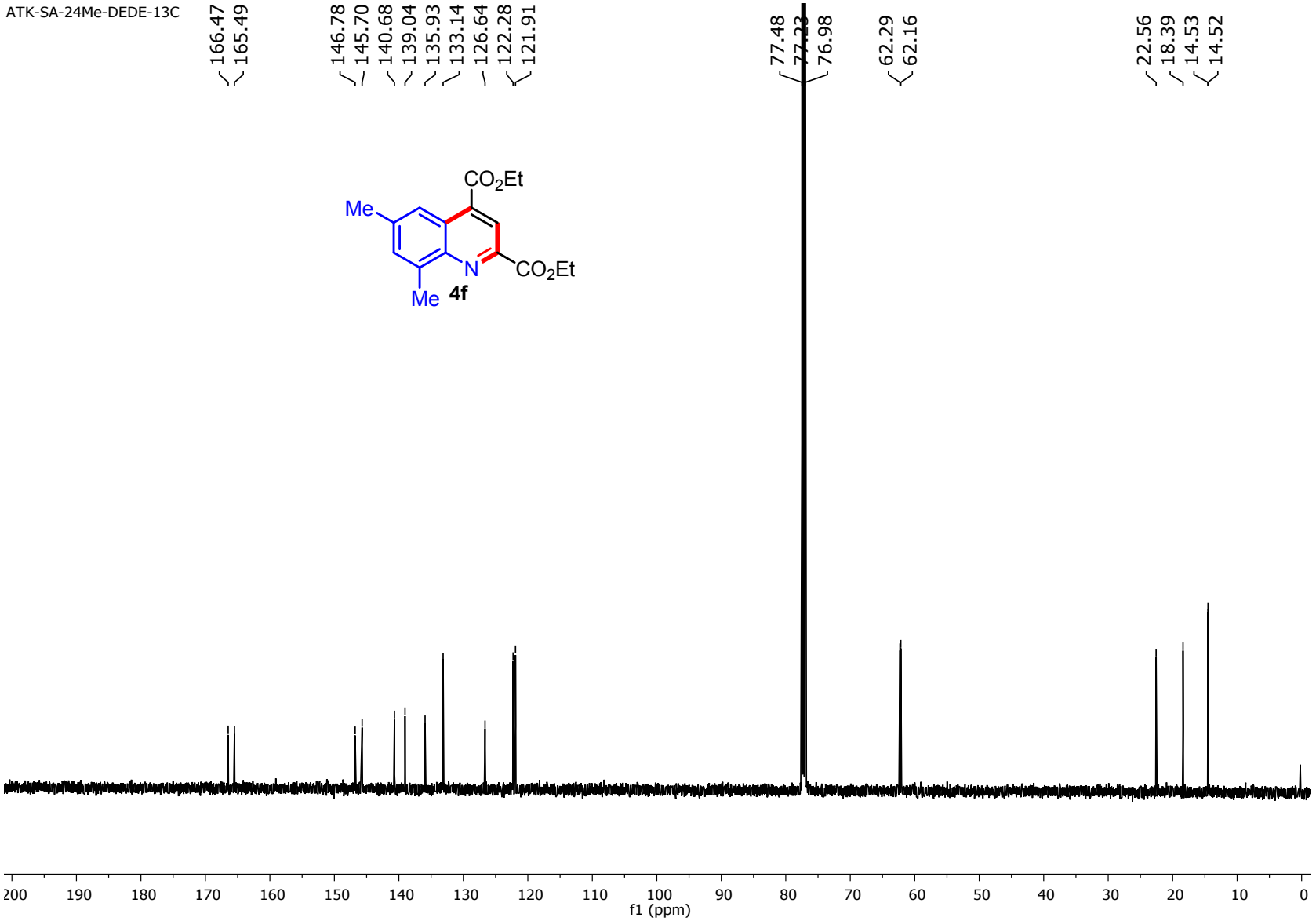
Sample Name	WASH	**Position**	P1-A2	**Instrument Name**	Instrument 1	**User Name**	
Inj Vol	20	**InjPosition**		**SampleType**	Sample	**IRM Calibration Status**	Success
Data Filename	SA-35OME-DMDE-2.d	**ACQ Method**	ESI ALS 100-500.m	**Comment**		**Acquired Time**	2/19/2021 12:29:10 PM



^{1}H NMR spectrum of compound: 4f

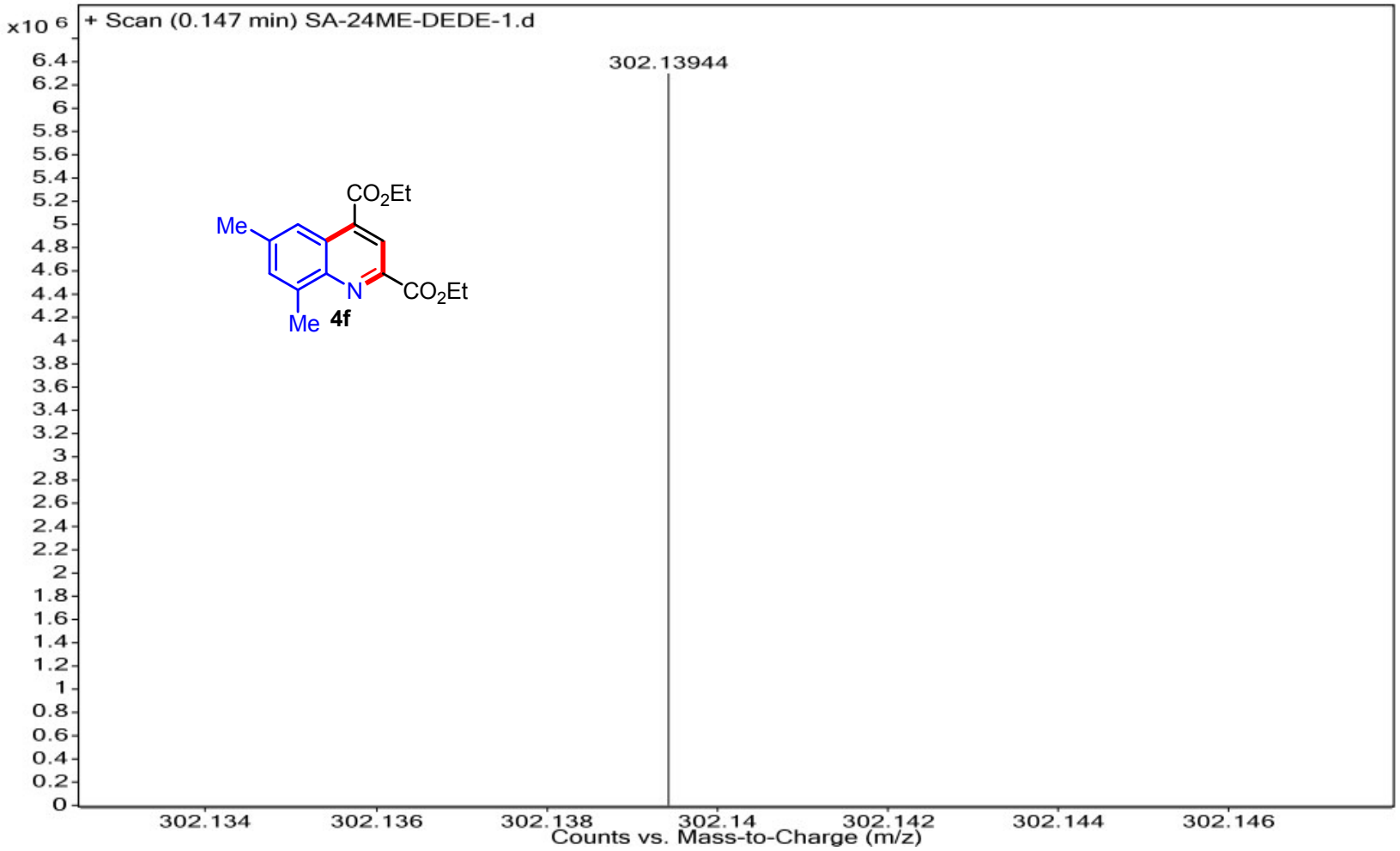


^{13}C NMR spectrum of compound: 4f

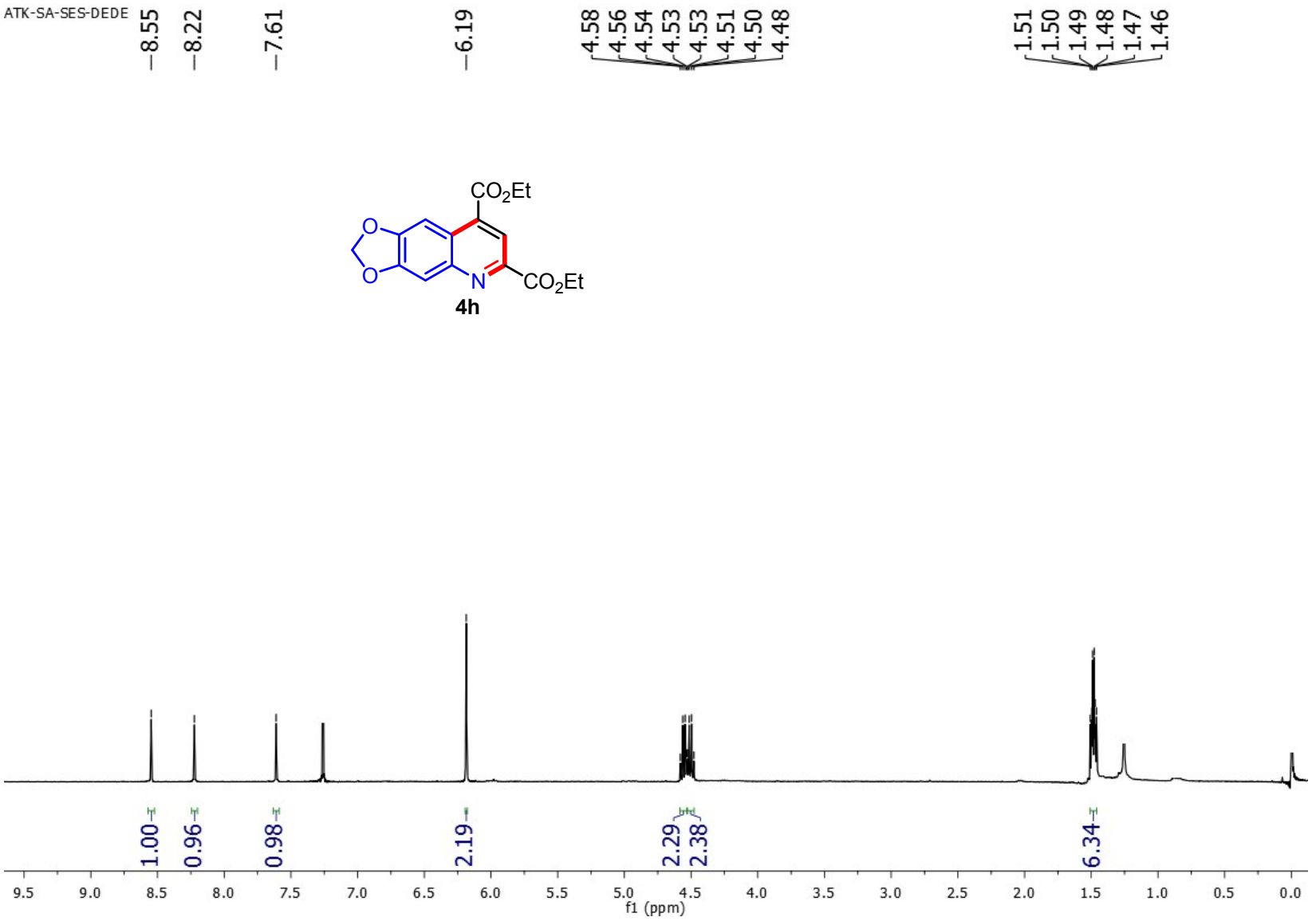


HRMS spectrum of compound: 4f

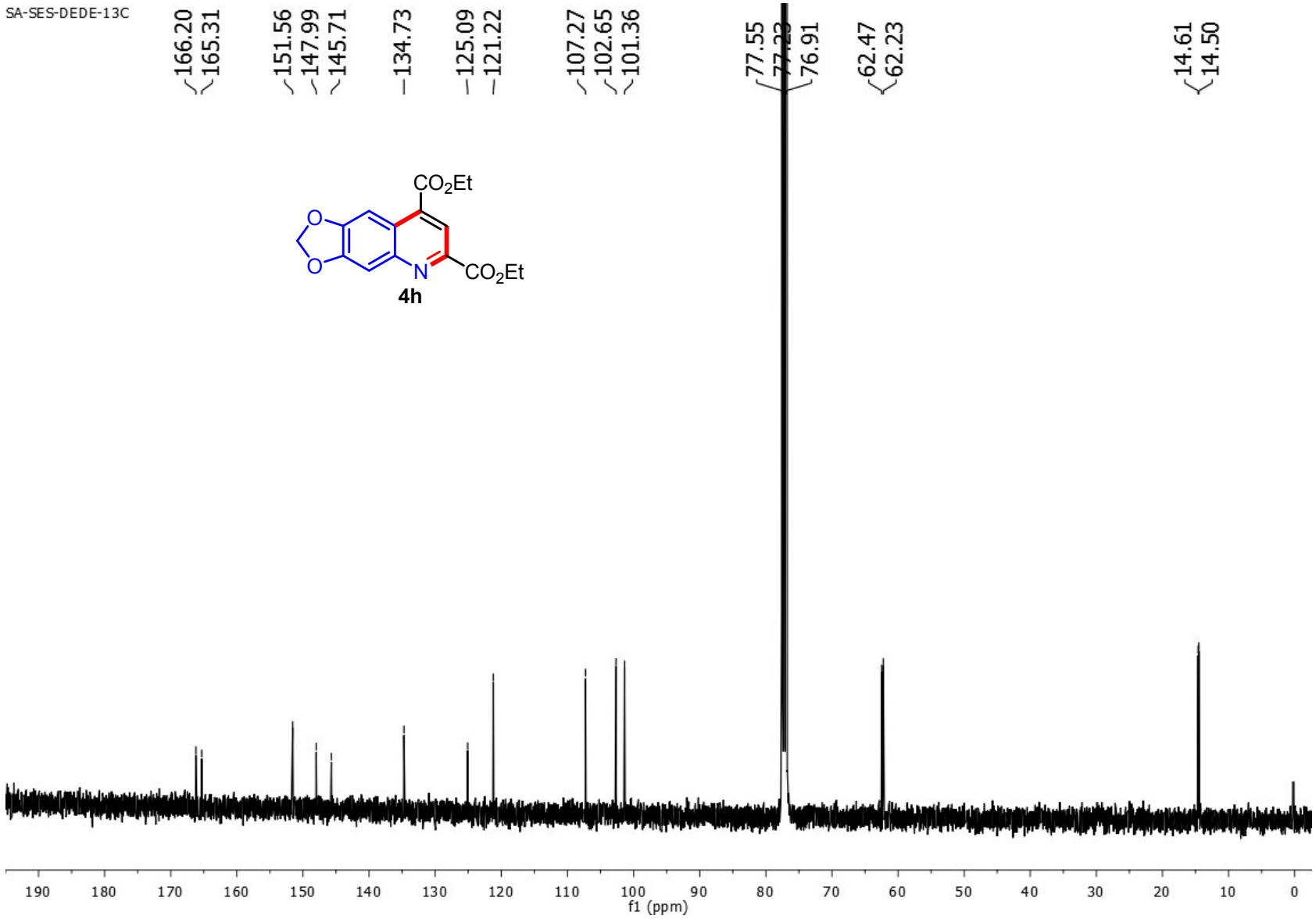
Sample Name	SAMPLE	**Position**	P1-A7	**Instrument Name**	Instrument 1	**User Name**	
Inj Vol	20	**InjPosition**		**SampleType**	Sample	**IRM Calibration Status**	Success
Data Filename	SA-24ME-DEDE-1.d	**ACQ Method**	ESI ALS 100-500.m	**Comment**		**Acquired Time**	2/11/2021 12:29:51 PM



^{1}H NMR spectrum of compound: 4h

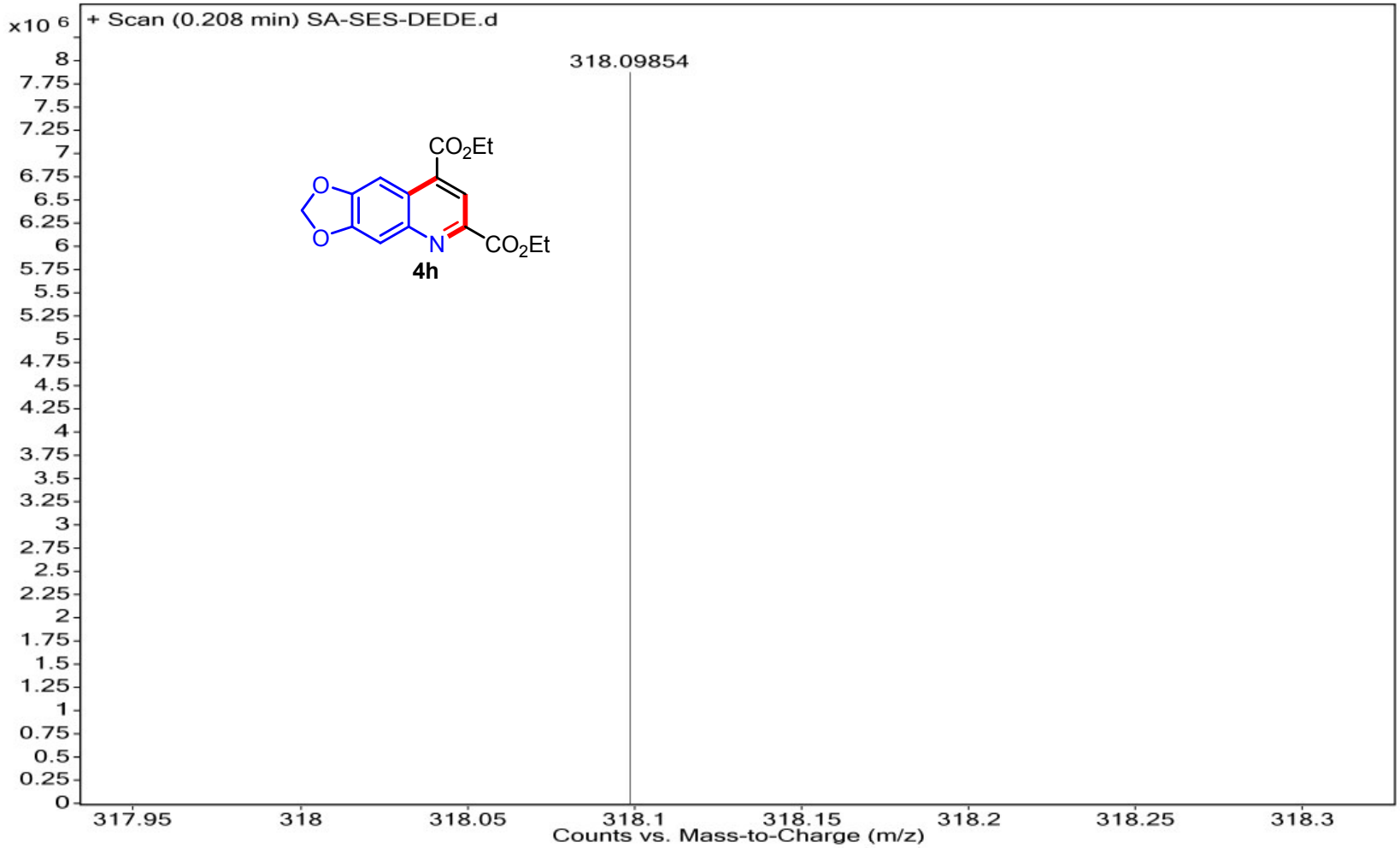


^{13}C NMR spectrum of compound: 4h

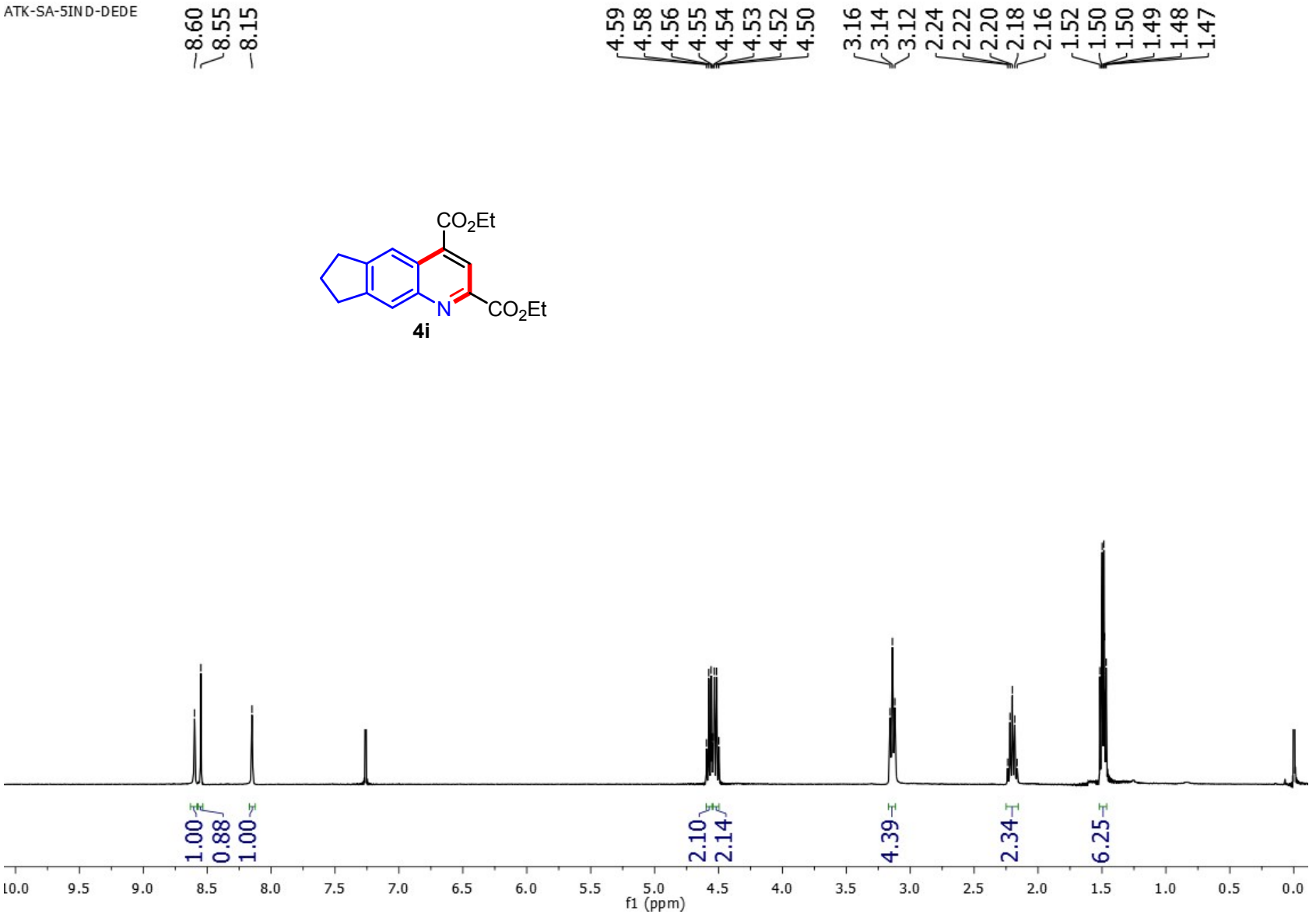


HRMS spectrum of compound: 4h

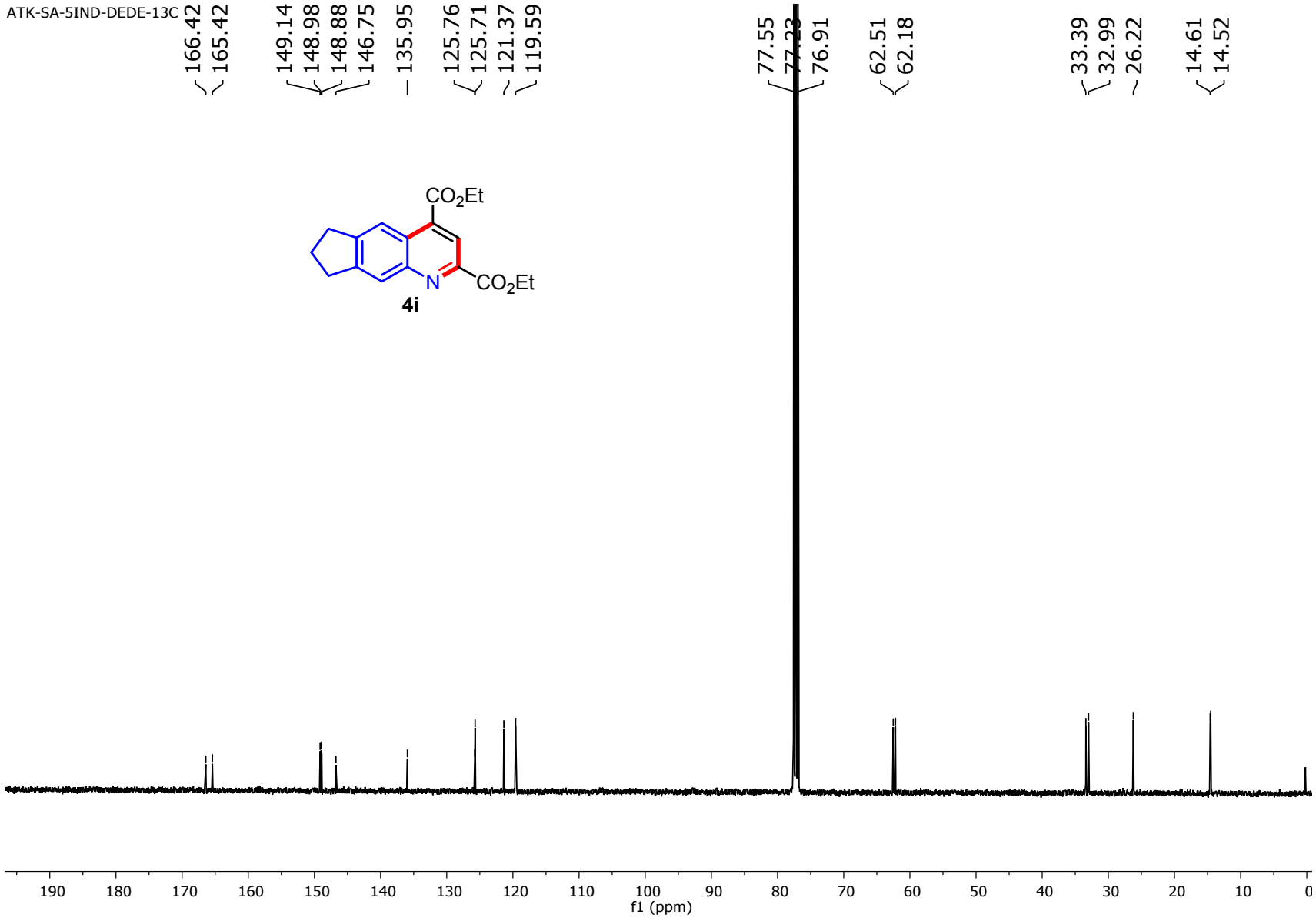
Sample Name	WASH	**Position**	P1-B6	**Instrument Name**	Instrument 1	**User Name**	
Inj Vol	20	**InjPosition**		**SampleType**	Sample	**IRM Calibration Status**	Success
Data Filename	SA-SES-DEDE.d	**ACQ Method**	ESI ALS 100-1000.m	**Comment**		**Acquired Time**	3/1/2021 1:05:56 PM



^{1}H NMR spectrum of compound: 4i

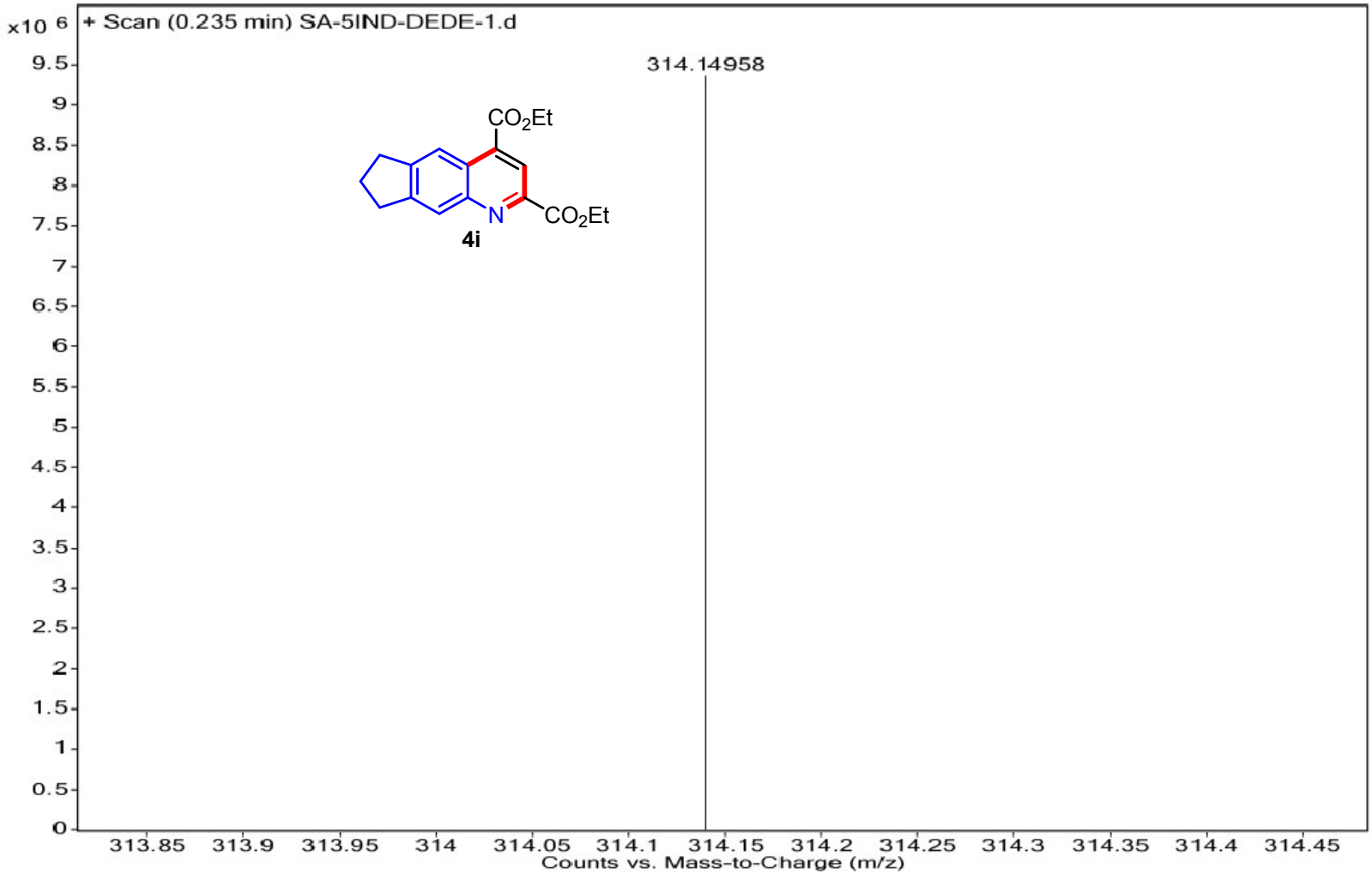


^{13}C NMR spectrum of compound: 4i

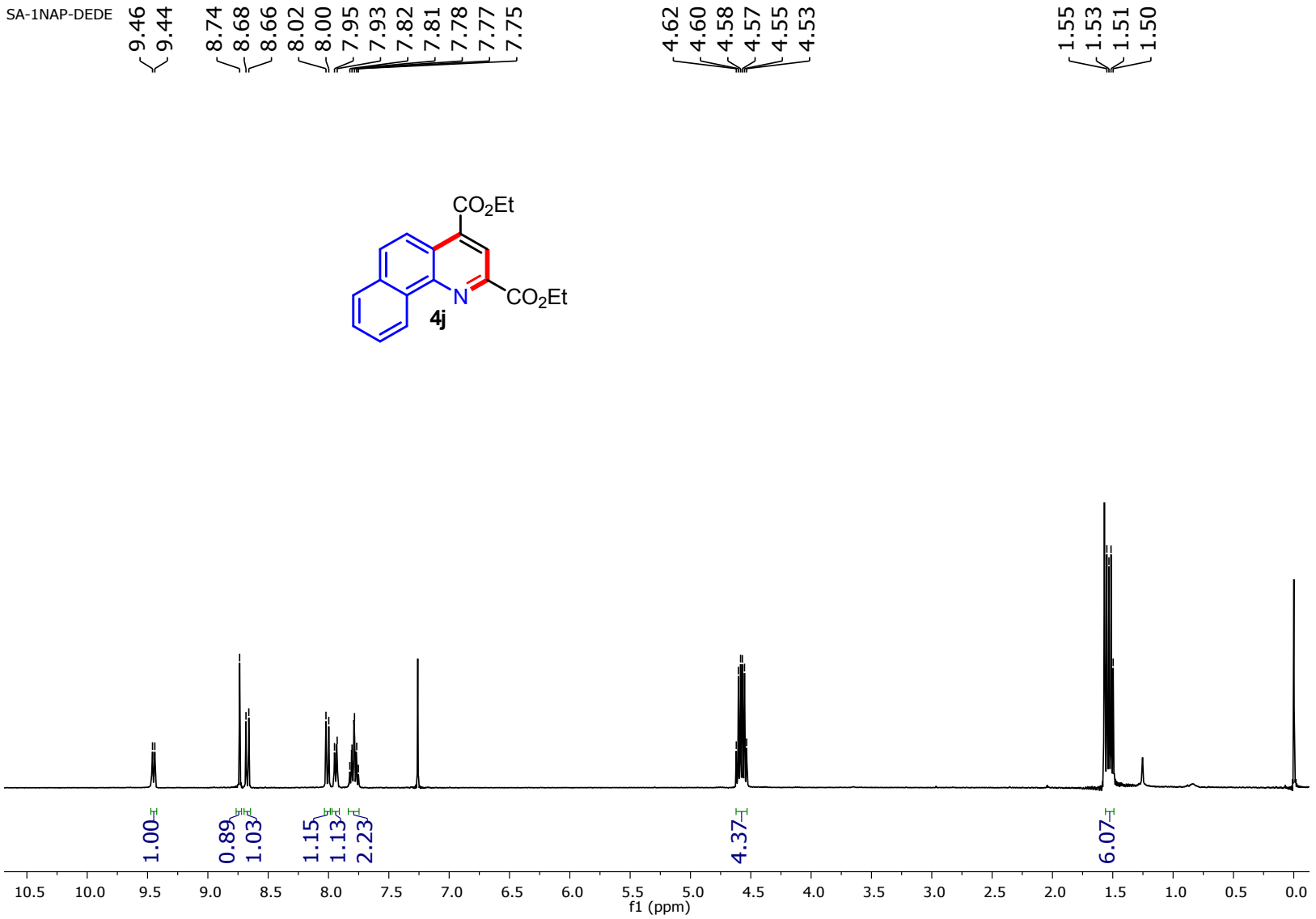


HRMS spectrum of compound: 4i

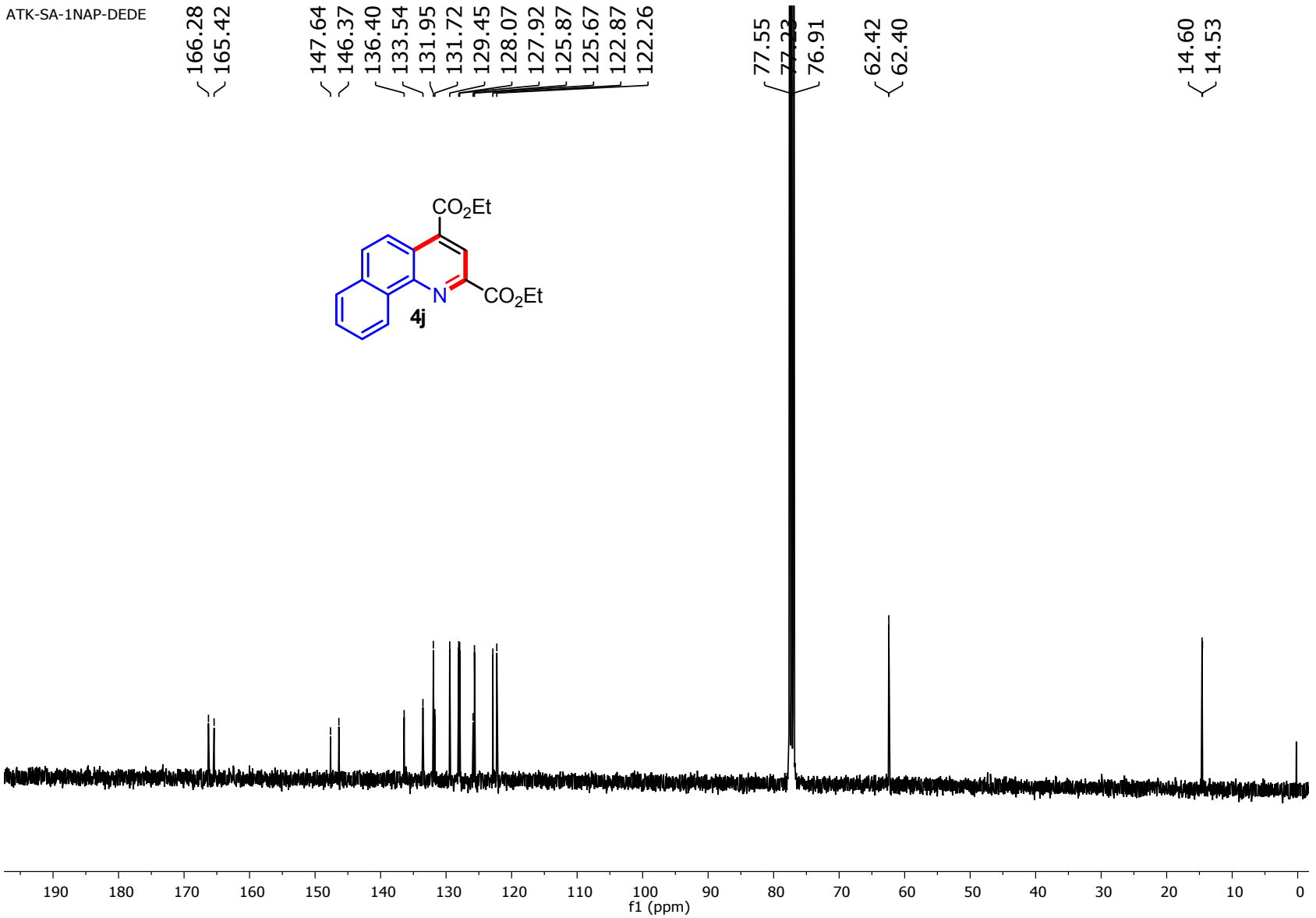
Sample Name	WASH	**Position**	P1-A10	**Instrument Name**	Instrument 1	**User Name**	
Inj Vol	20	**InjPosition**		**SampleType**	Sample	**IRM Calibration Status**	Success
Data Filename	SA-5IND-DEDE-1.d	**ACQ Method**	ESI ALS 100-1000.m	**Comment**		**Acquired Time**	3/11/2021 1:17:28 PM



^{1}H NMR spectrum of compound: 4j

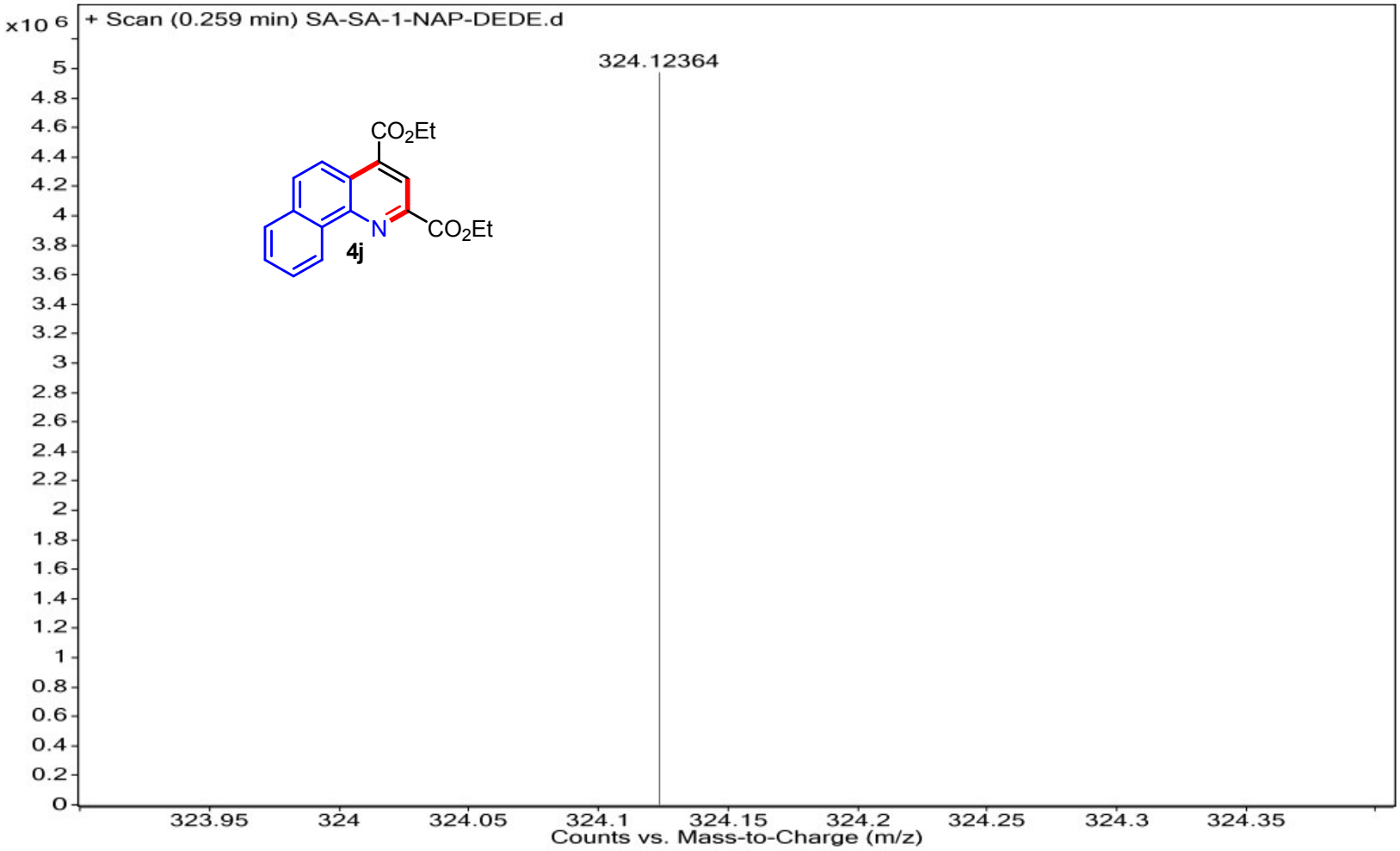


^{13}C NMR spectrum of compound: 4j

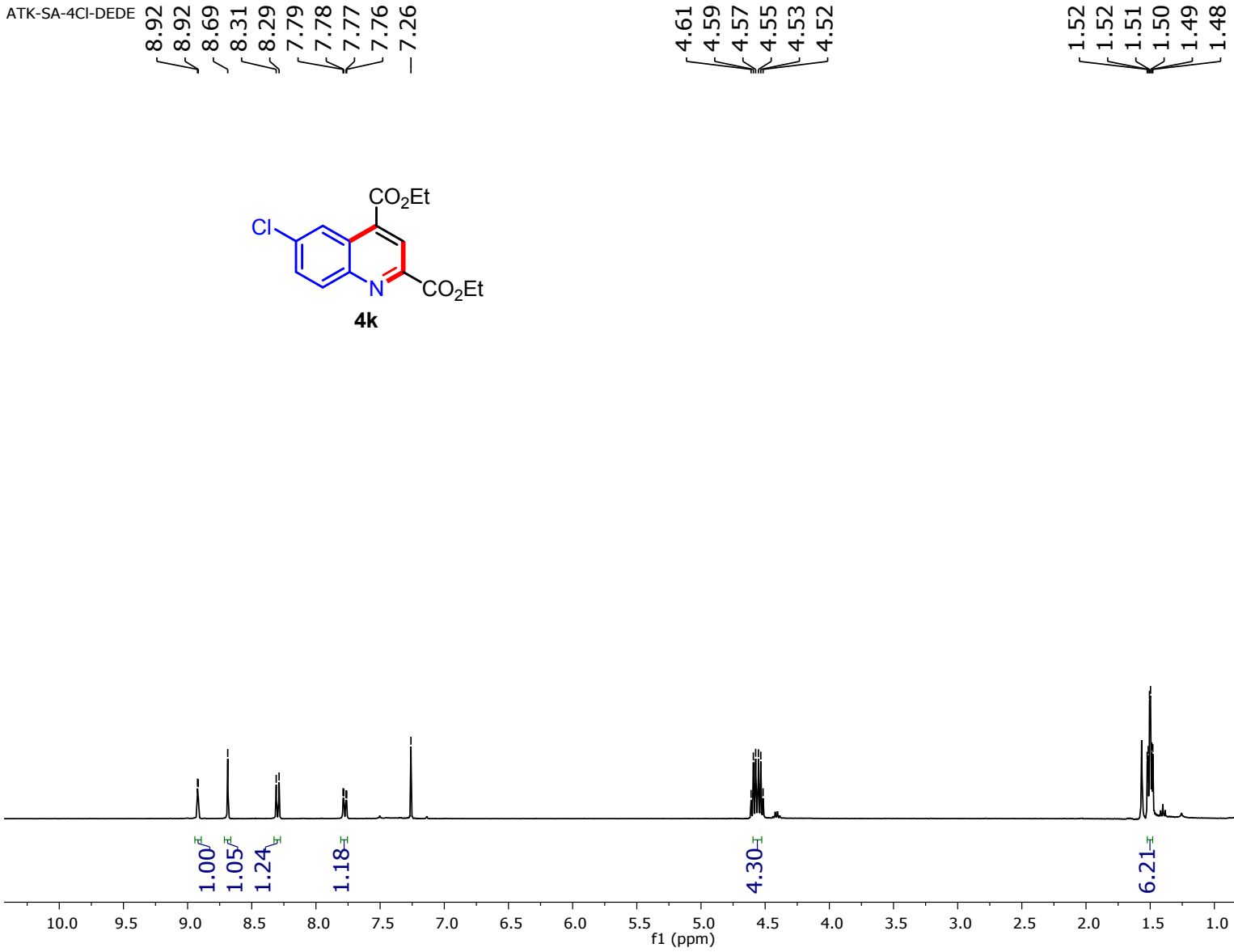


HRMS spectrum of compound: 4j

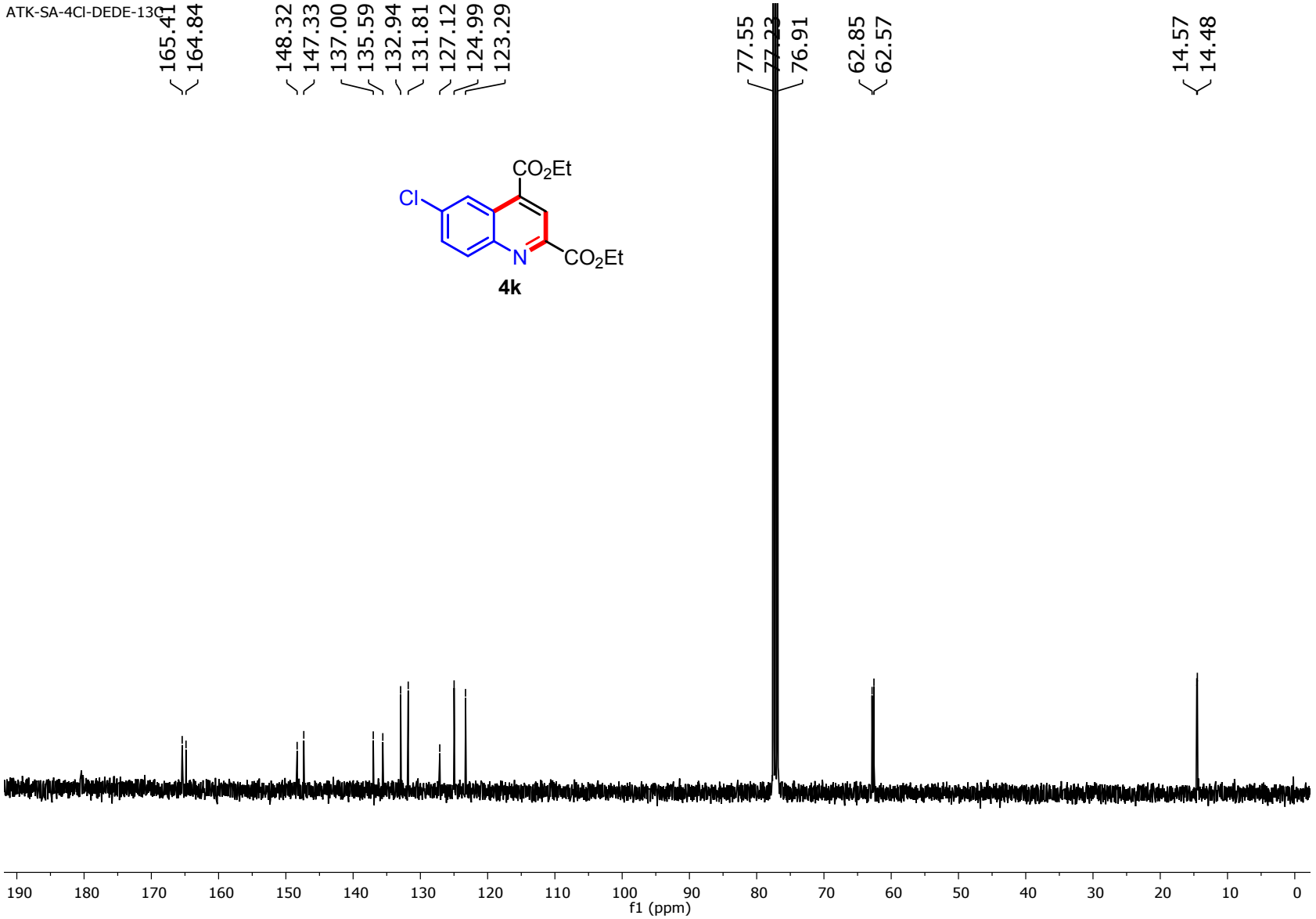
Sample Name	WASH	**Position**	P1-B5	**Instrument Name**	Instrument 1	**User Name**	
Inj Vol	20	**InjPosition**		**SampleType**	Sample	**IRM Calibration Status**	Success
Data Filename	SA-SA-1-NAP-DEDE.d	**ACQ Method**	ESI ALS 100-1000.m	**Comment**		**Acquired Time**	3/1/2021 1:04:02 PM



^{1}H NMR spectrum of compound: 4k

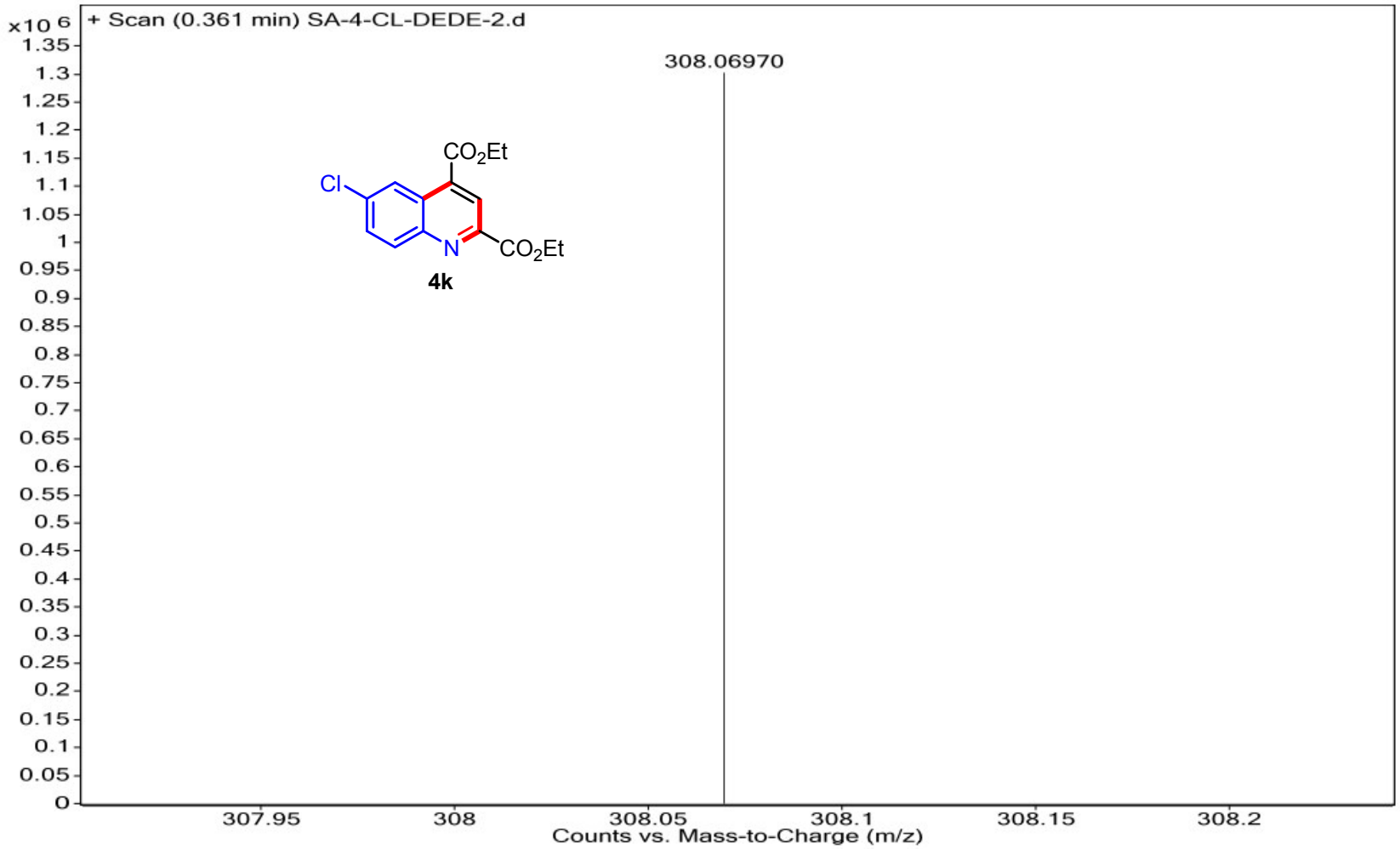


^{13}C NMR spectrum of compound: 4k

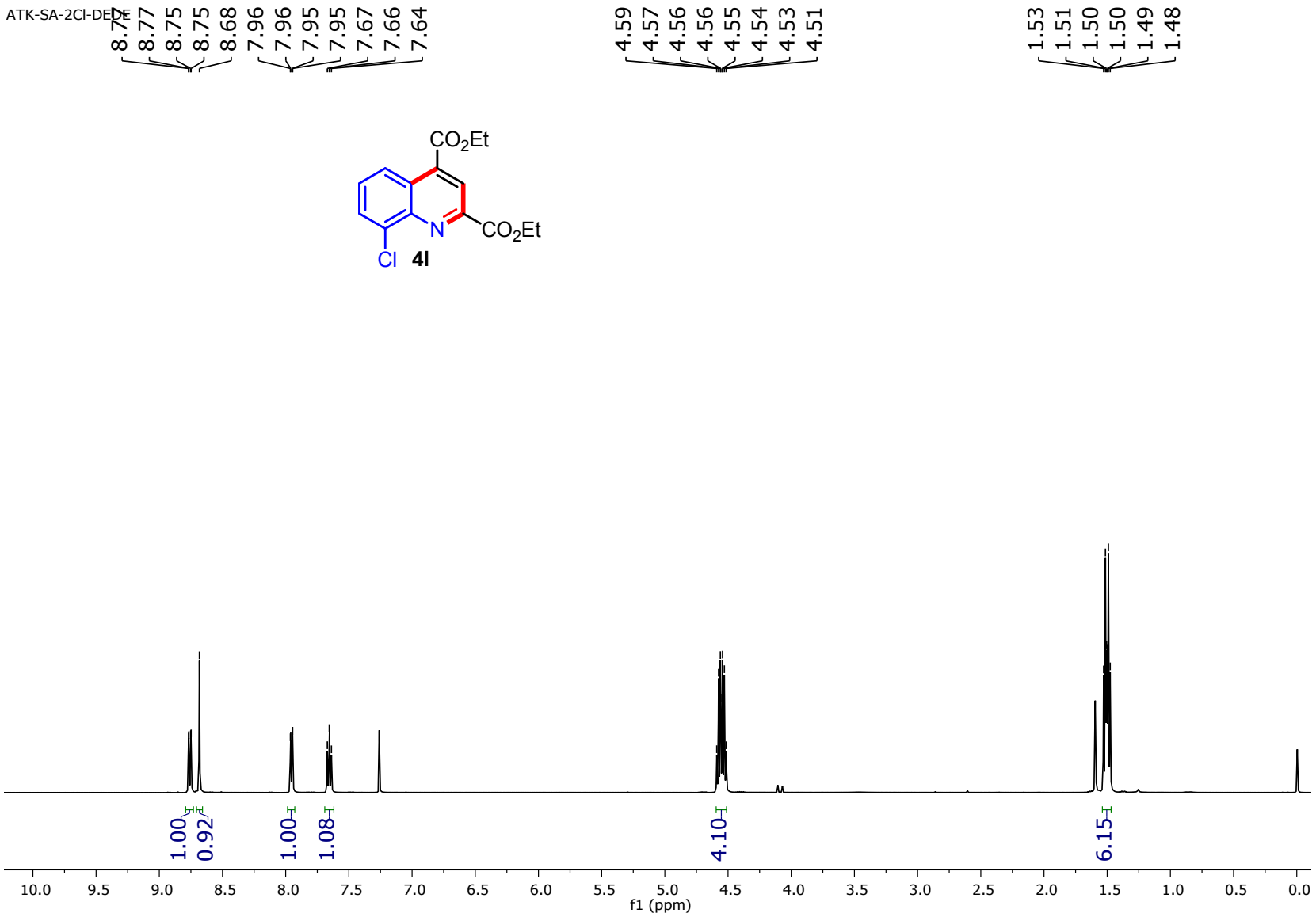


HRMS spectrum of compound: 4k

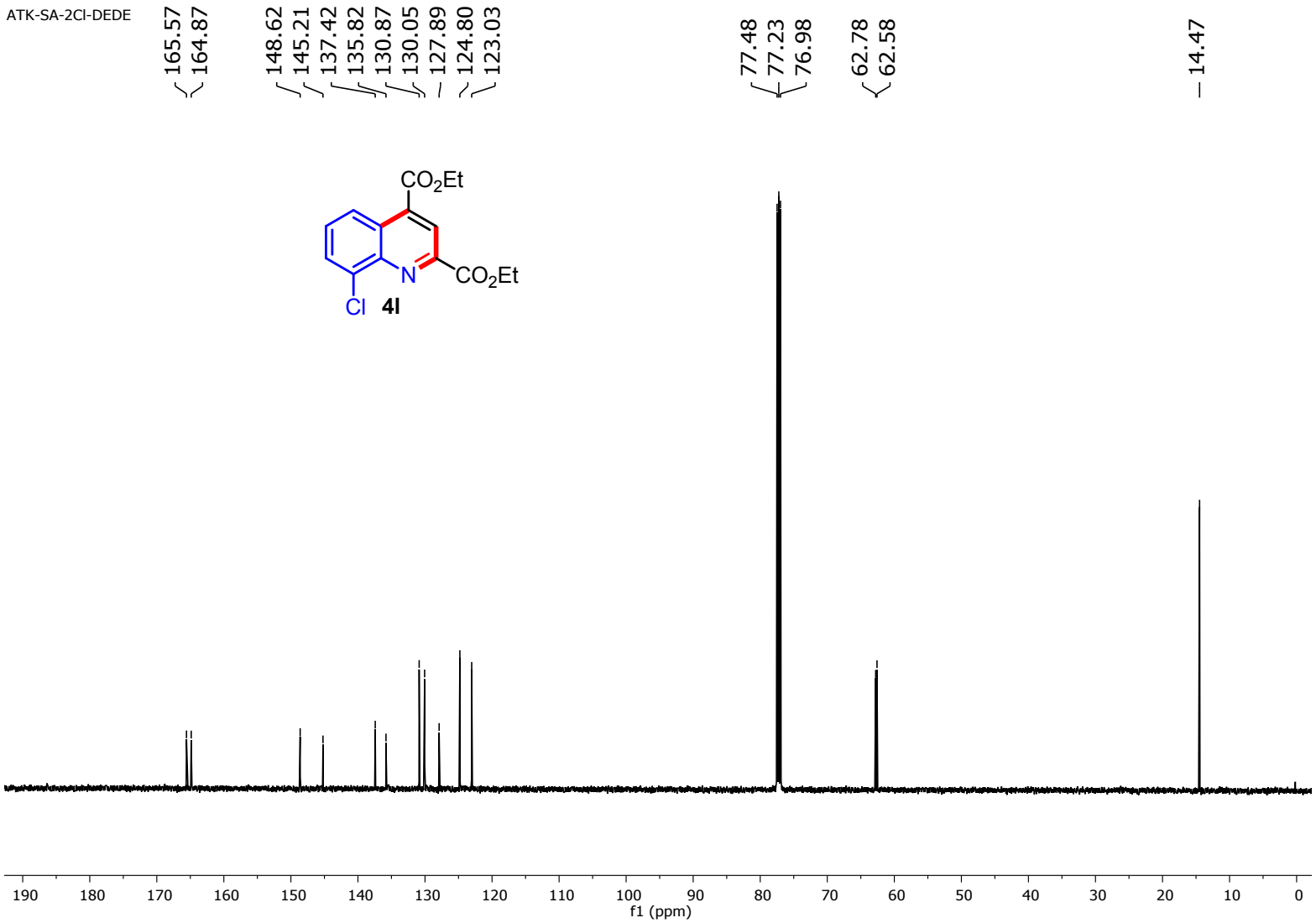
Sample Name	SAMPLE 34	**Position**	P1-C11	**Instrument Name**	Instrument 1	**User Name**	
Inj Vol	20	**InjPosition**		**SampleType**	Sample	**IRM Calibration Status**	Success
Data Filename	SA-4-CL-DEDE-2.d	**ACQ Method**	ESI ALS 100-500.m	**Comment**		**Acquired Time**	3/19/2021 5:00:14 PM



^{1}H NMR spectrum of compound: 4l

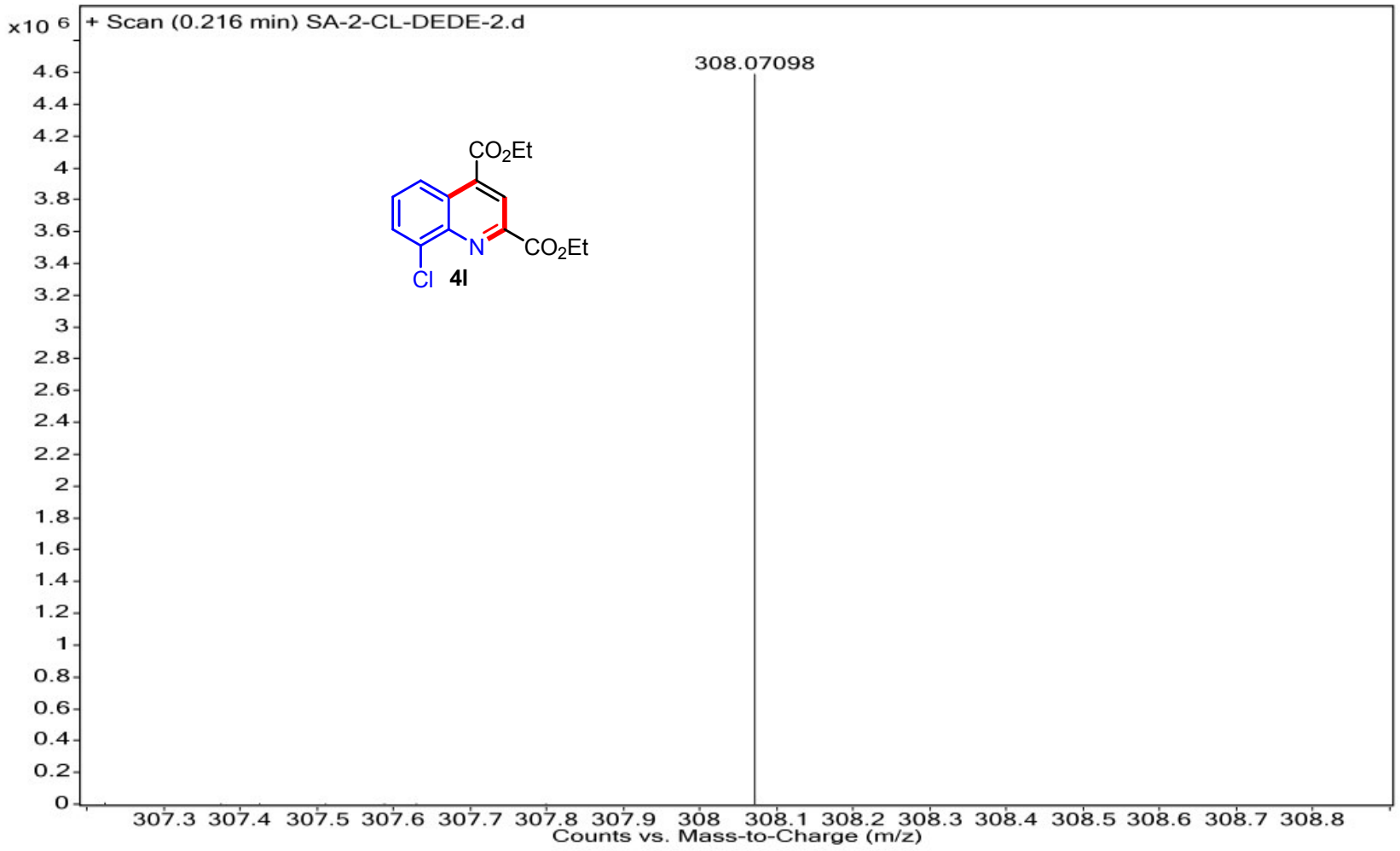


^{13}C NMR spectrum of compound: 4l

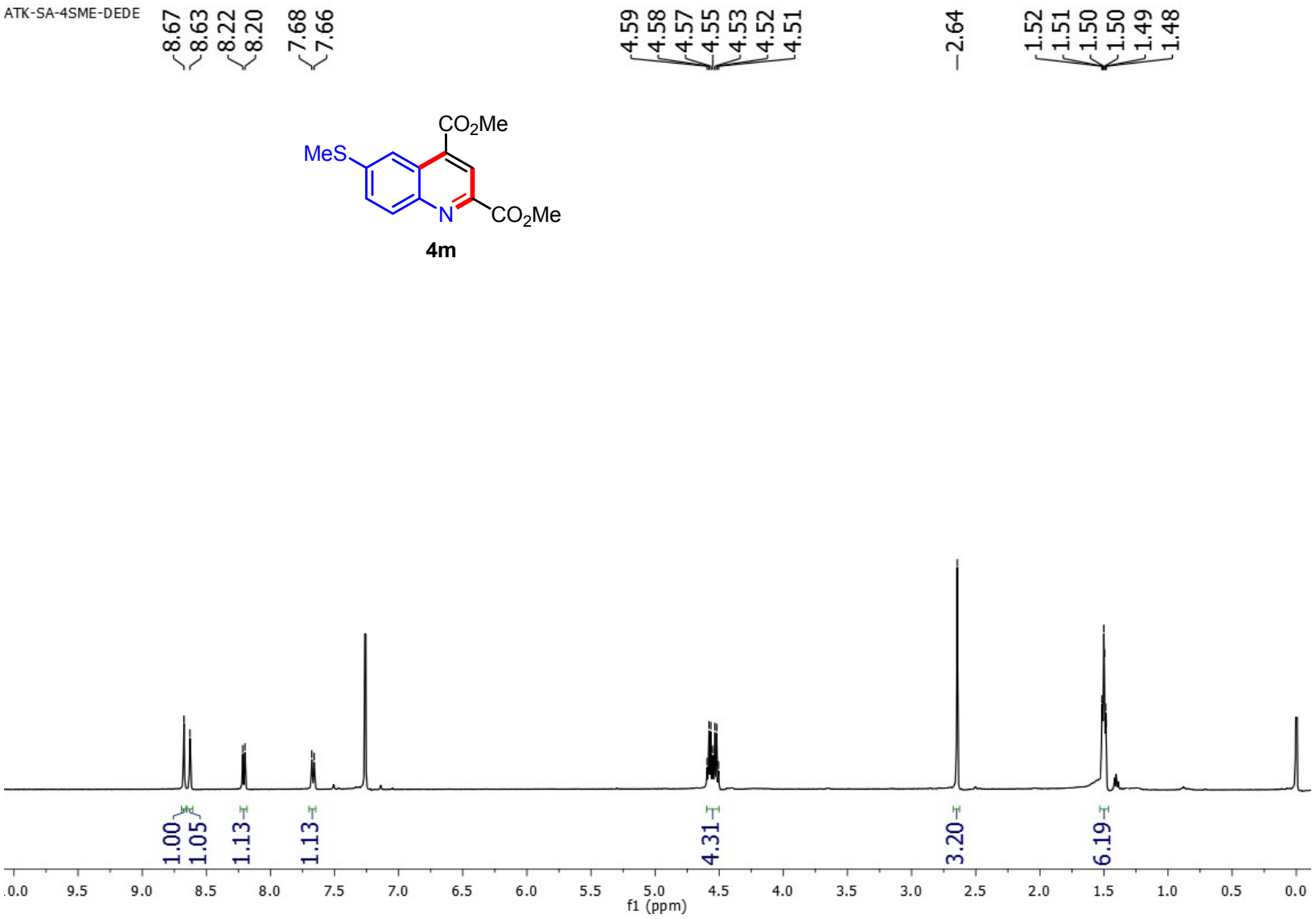


HRMS spectrum of compound: 4l

Sample Name	SAMPLE 35	**Position**	P1-D2	**Instrument Name**	Instrument 1	**User Name**	
Inj Vol	20	**InjPosition**		**SampleType**	Sample	**IRM Calibration Status**	Success
Data Filename	SA-2-CL-DEDE-2.d	**ACQ Method**	ESI ALS 100-500.m	**Comment**		**Acquired Time**	3/19/2021 5:11:46 PM

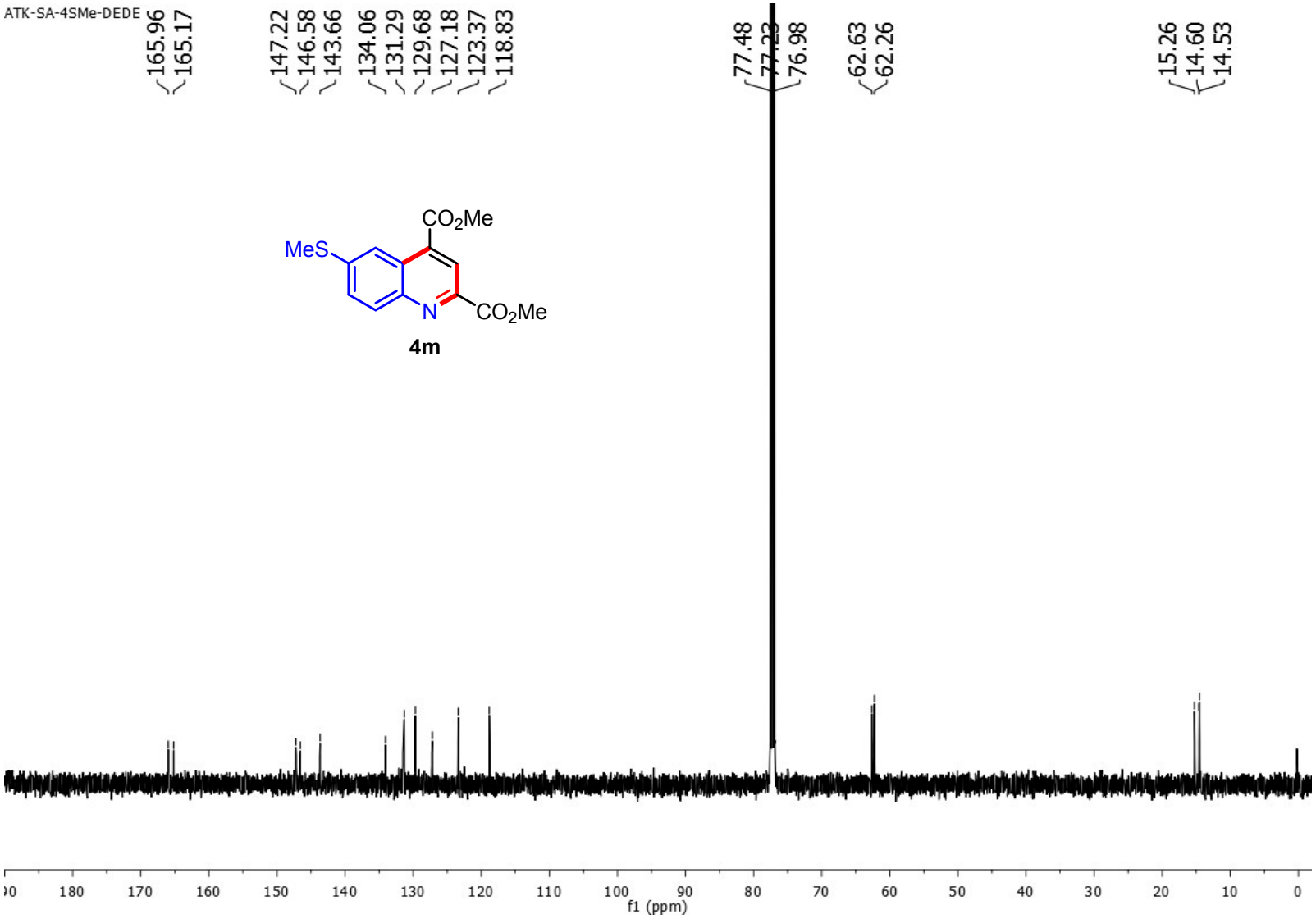


^{1}H NMR spectrum of compound: 4m



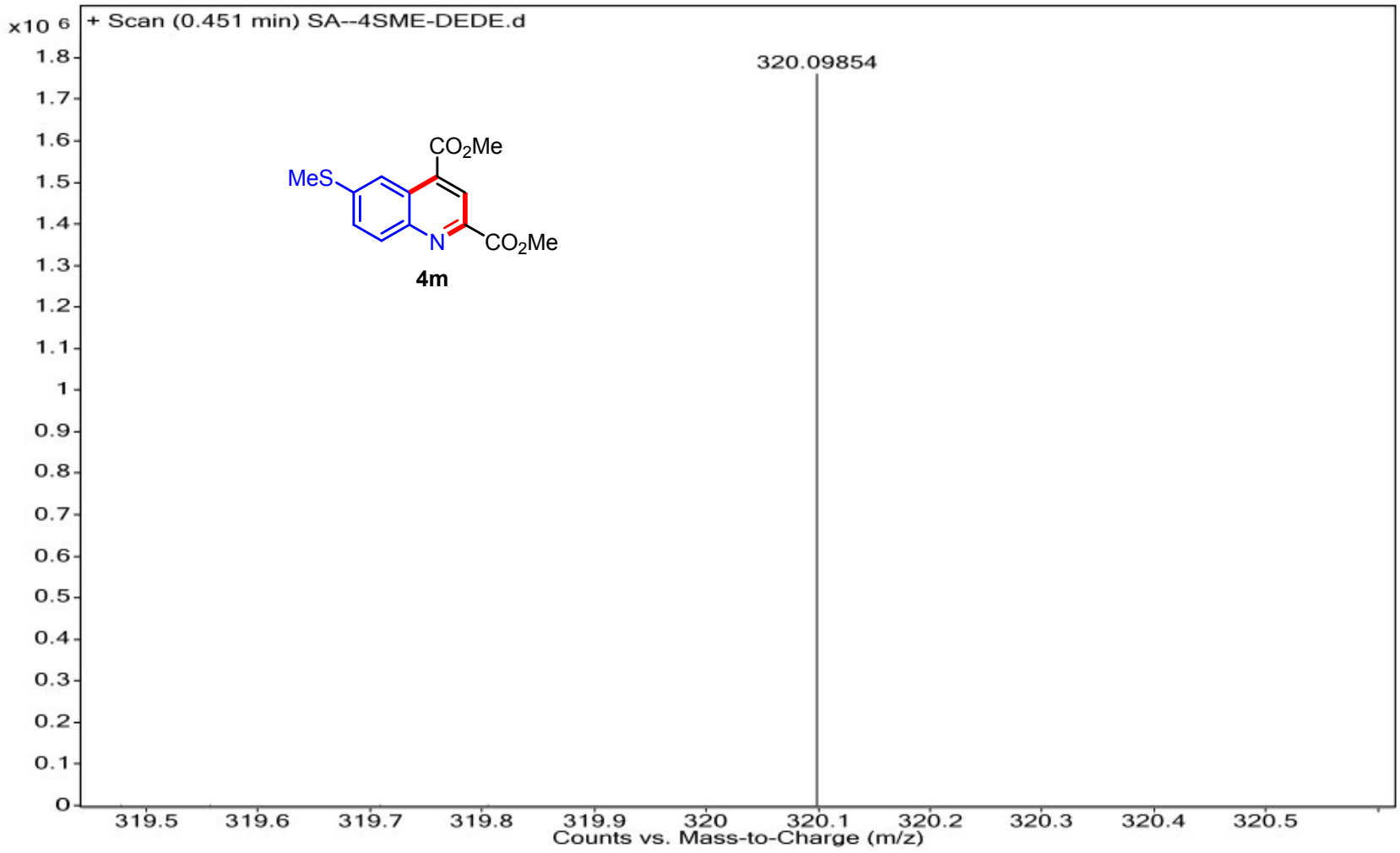
4m

^{13}C spectrum of compound: 4m

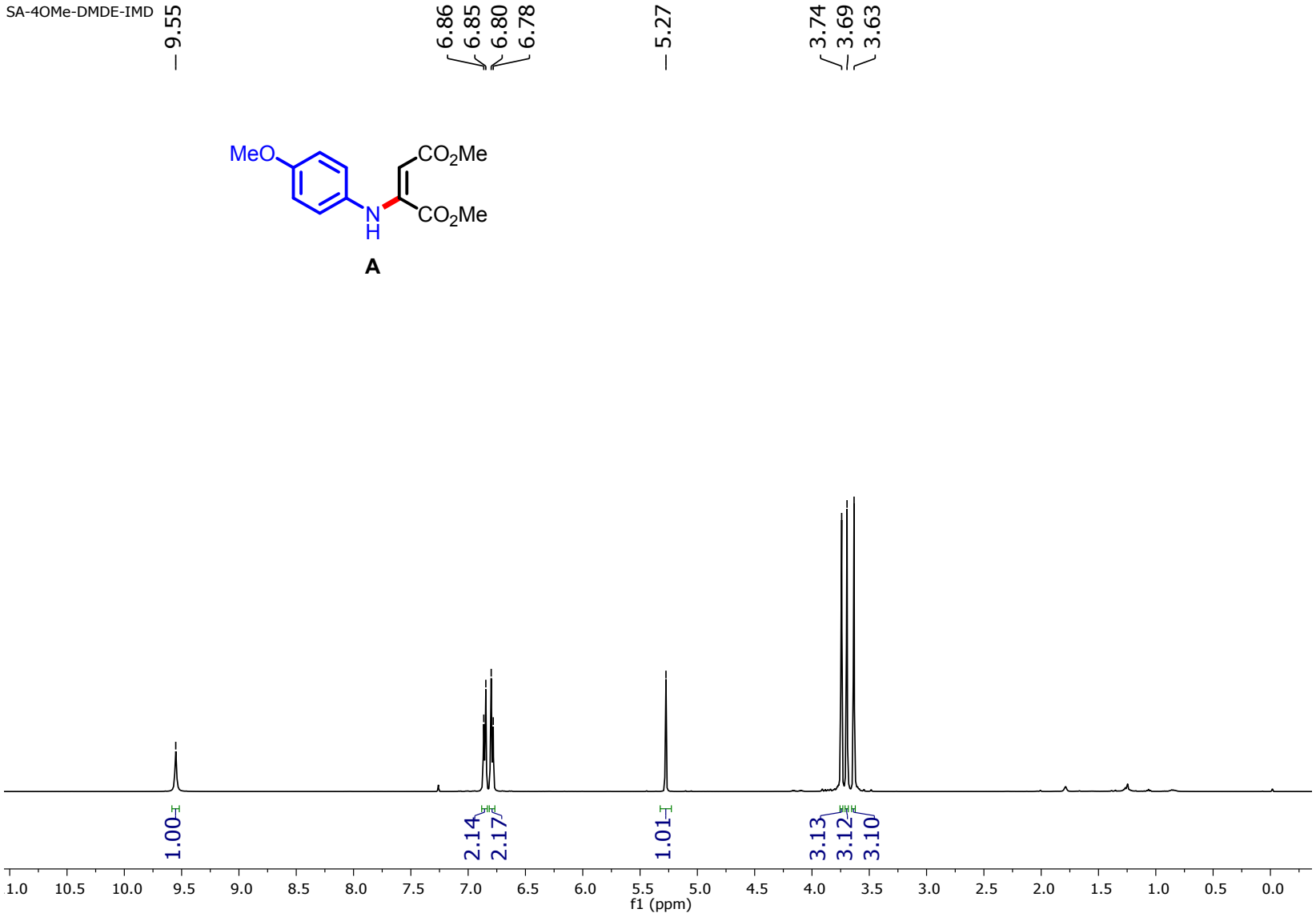


HRMS spectrum of compound: 4m

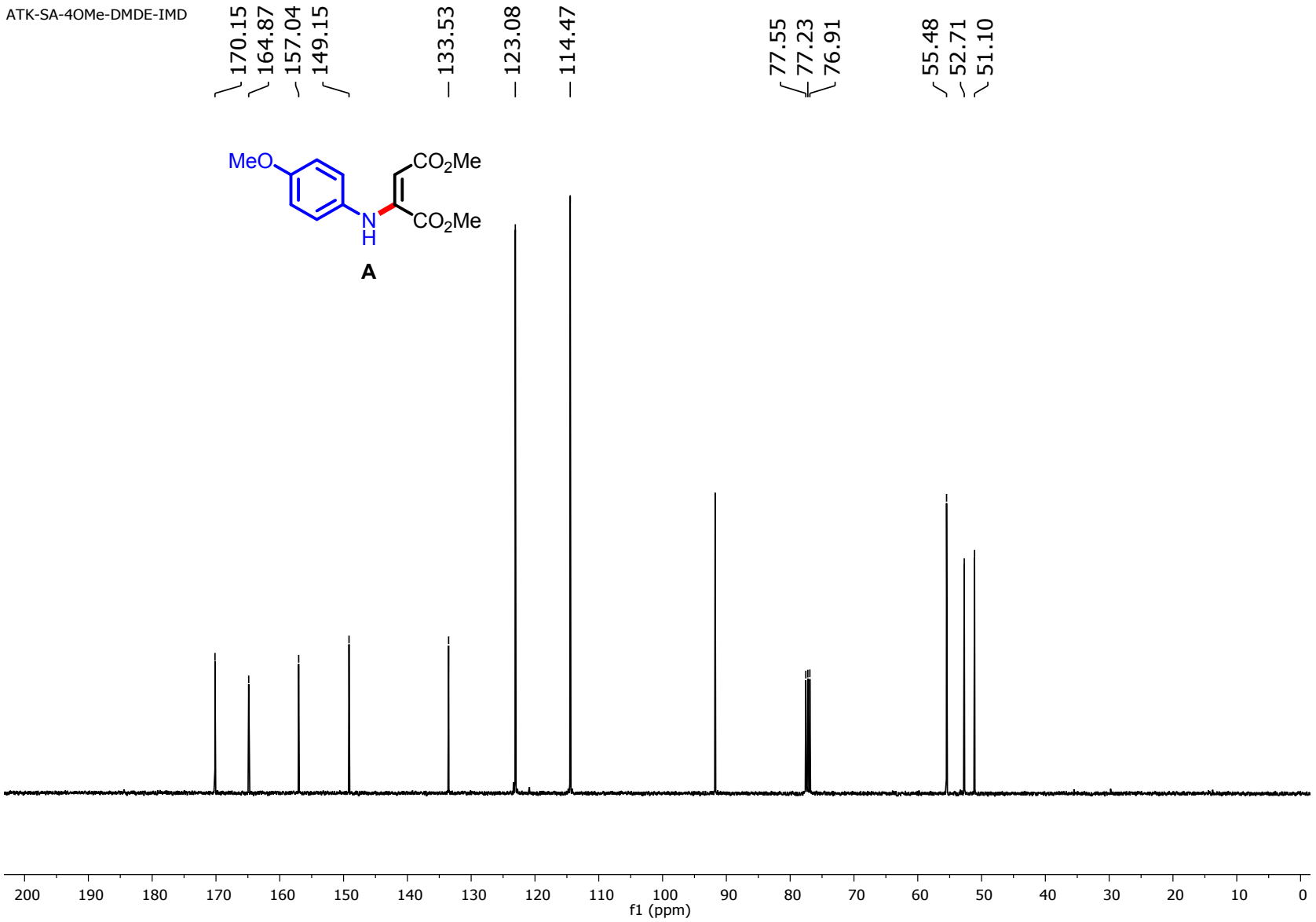
Sample Name	**Position**	**Instrument Name**	**User Name**
Inj Vol	**InjPosition**	**SampleType**	**IRM Calibration Status**
Data Filename	**ACQ Method**	**Comment**	**Acquired Time**



^{1}H NMR spectrum of compound: A

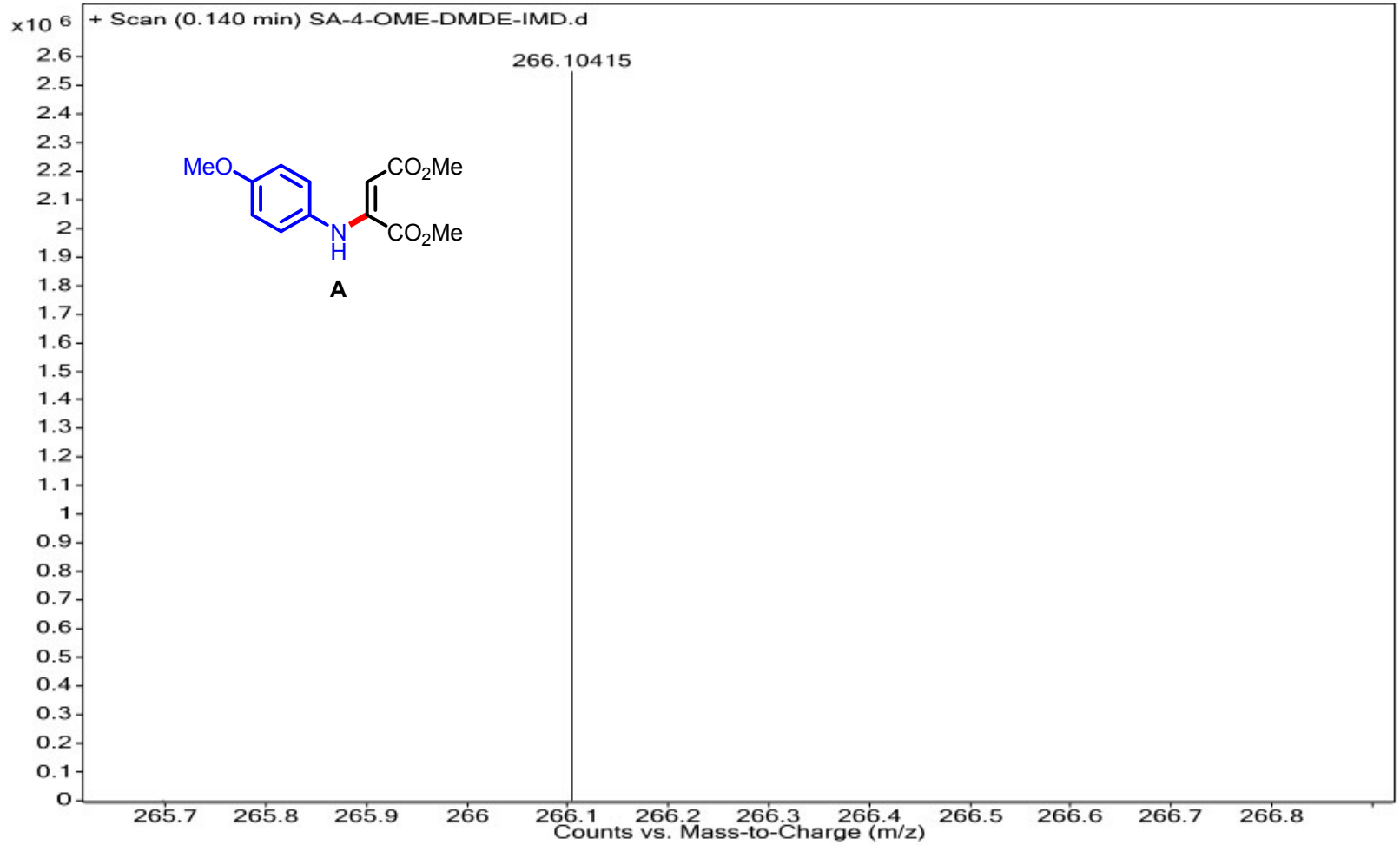


^{13}C NMR spectrum of compound: A

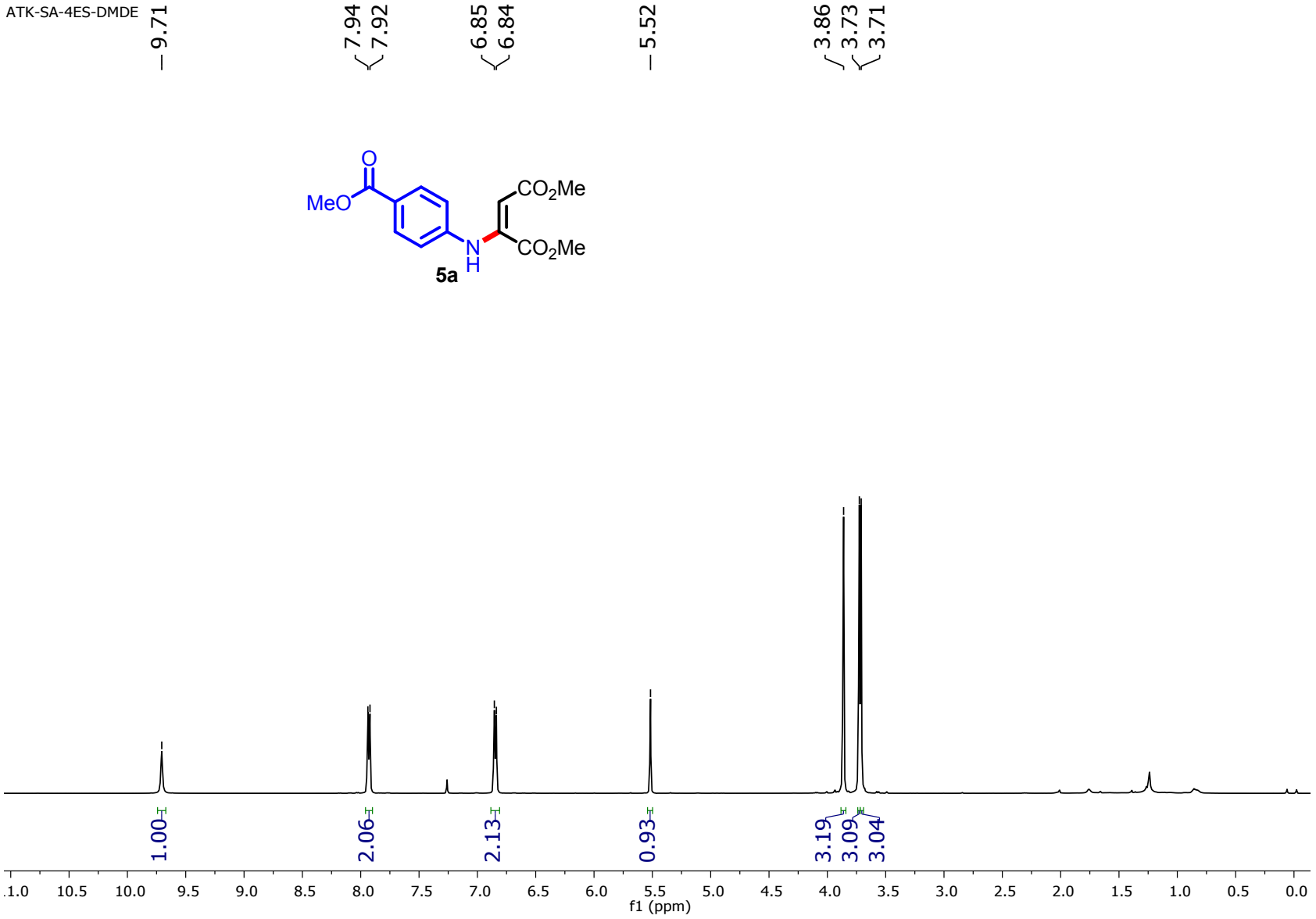


HRMS spectrum of compound: A

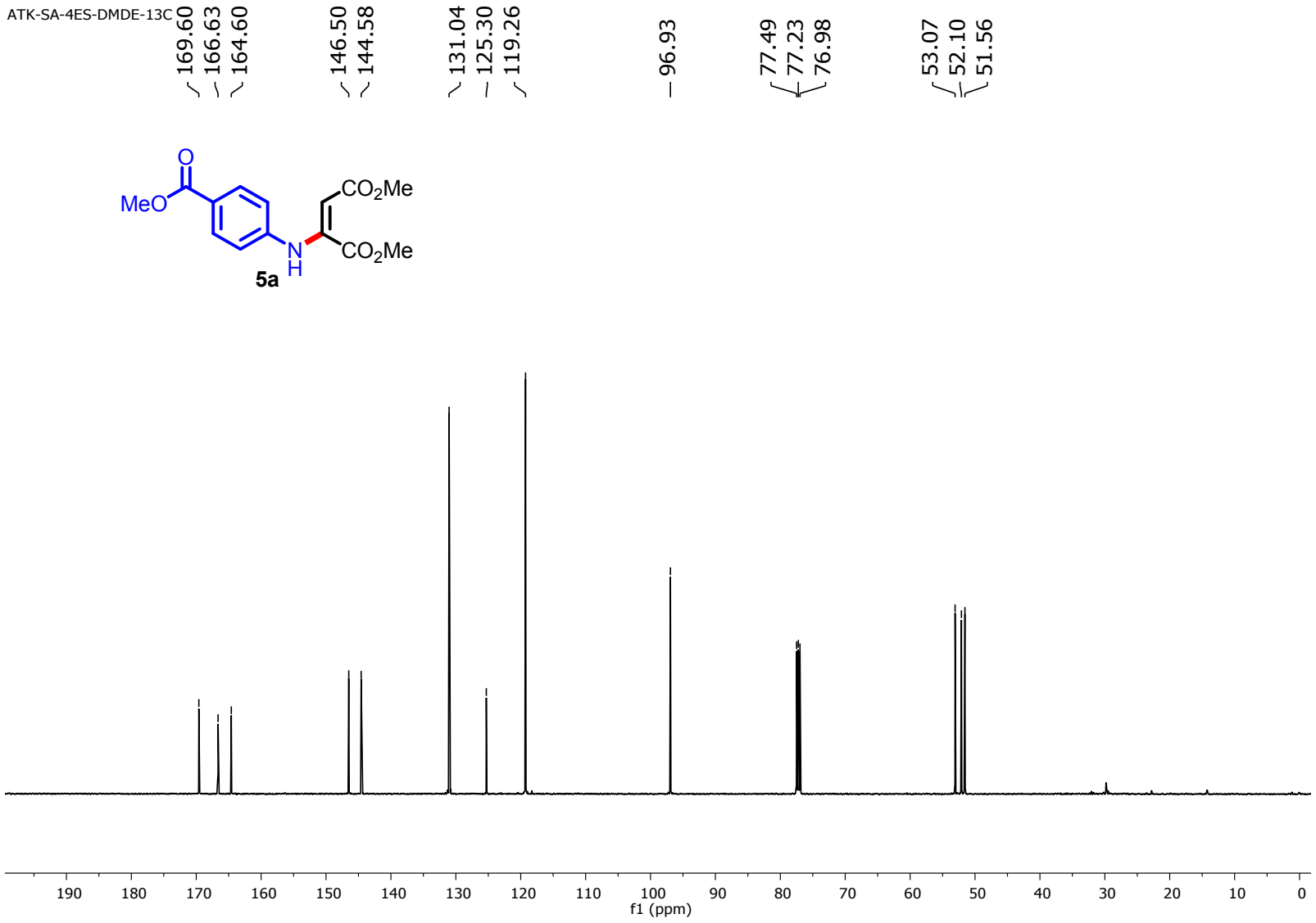
Sample Name	SAMPLE 36	**Position**	P1-D3	**Instrument Name**	Instrument 1	**User Name**	
Inj Vol	20	**InjPosition**		**SampleType**	Sample	**IRM Calibration Status**	Success
Data Filename	SA-4-OME-DMDE-IMD.d	**ACQ Method**	ESI ALS 100-500.m	**Comment**		**Acquired Time**	3/19/2021 5:23:23 PM



^{1}H NMR spectrum of compound: 5a

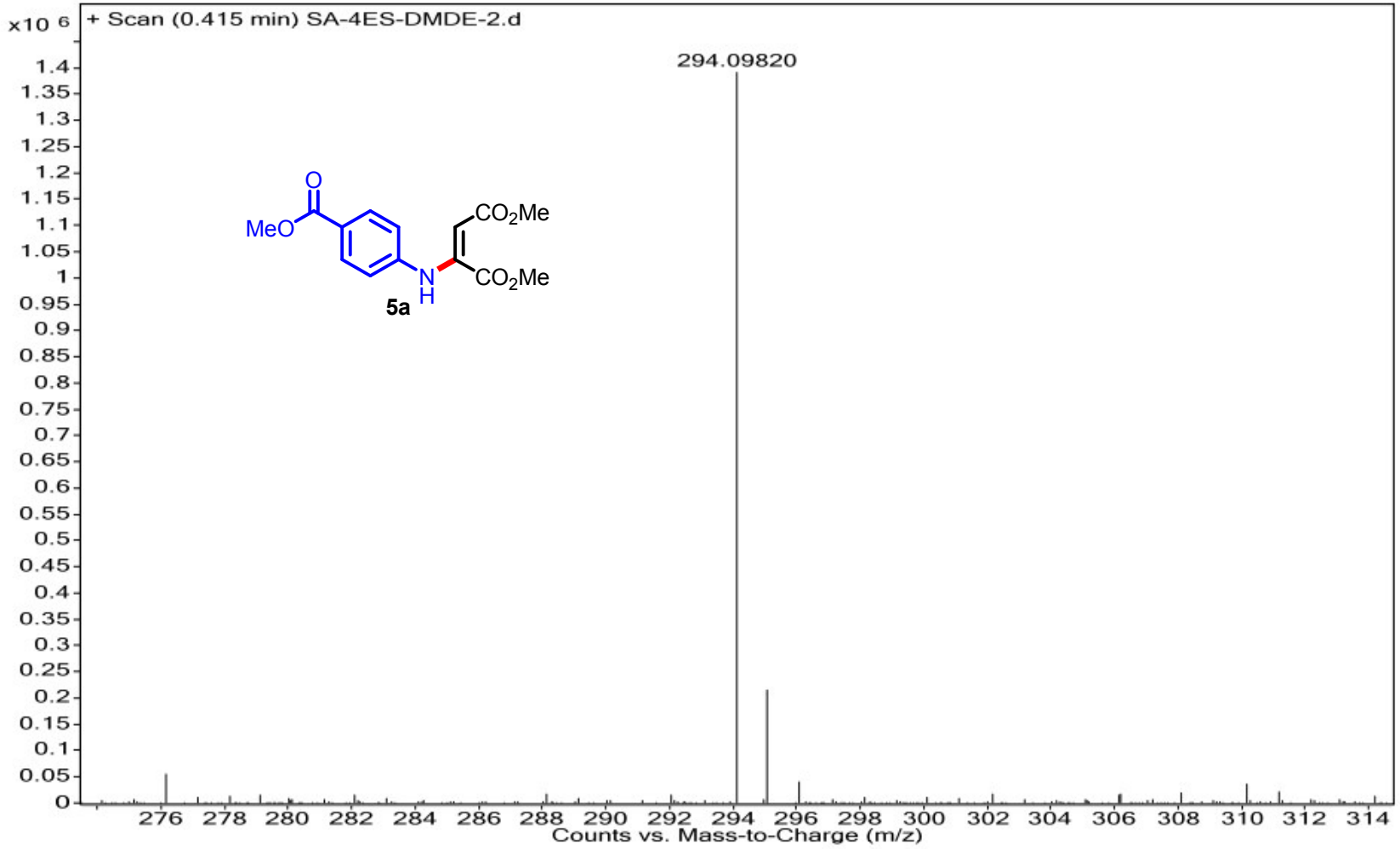


^{13}C NMR spectrum of compound: 5a

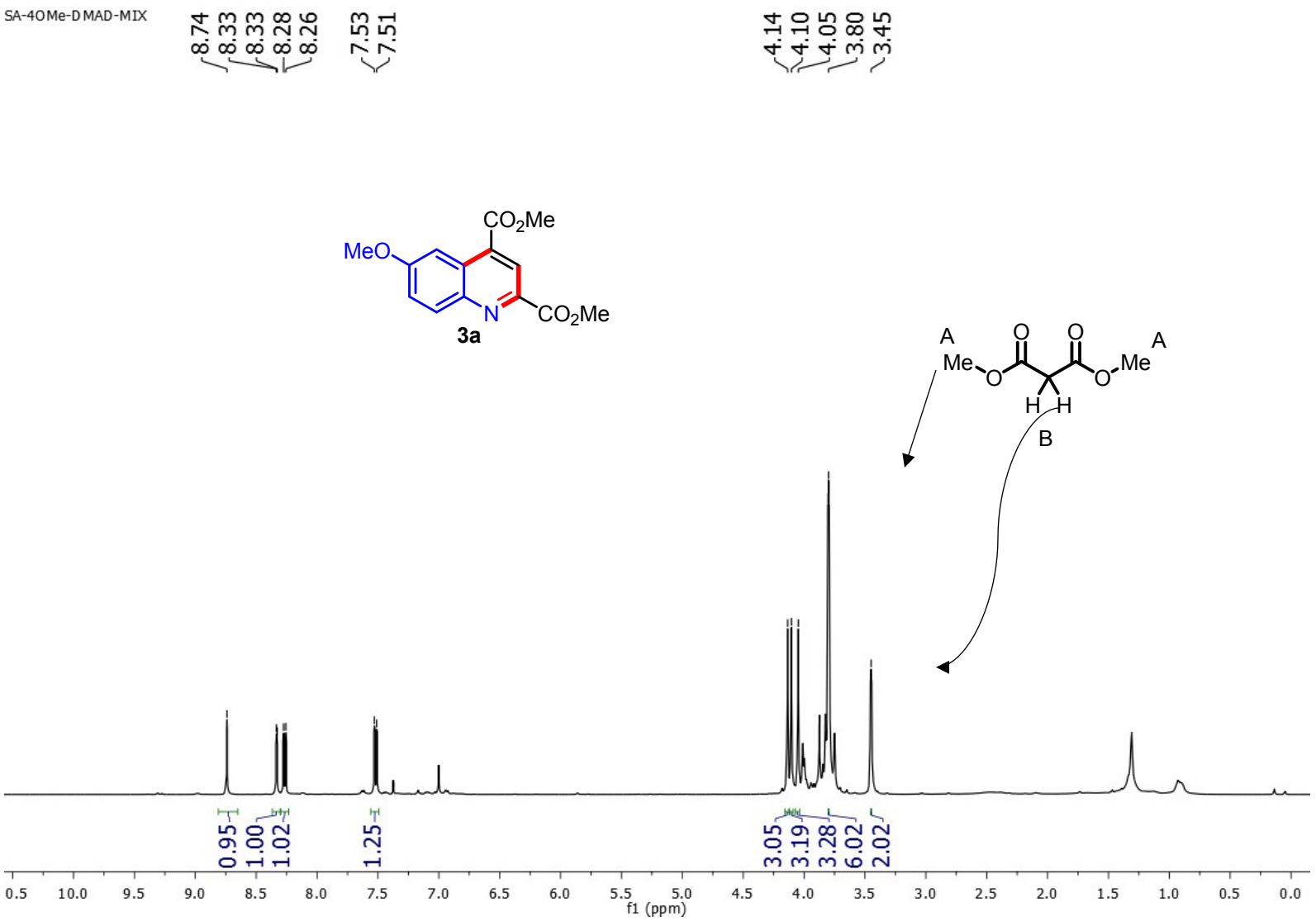


HRMS spectrum of compound: 5a

Sample Name	**Position**	**Instrument Name**	**User Name**
Inj Vol	**InjPosition**	**SampleType**	**IRM Calibration Status**
Data Filename	**ACQ Method**	**Comment**	**Acquired Time**



^{1}H NMR spectrum of crude mixture of compound: 3a



HRMS spectrum of mixture

Sample Name	SA-MIX	**Position**	P1-C3	**Instrument Name**	Instrument 1
User Name		**Inj Vol**	20	**InjPosition**	
Sample Type	Sample	**IRM Calibration Status**	Success	**Data Filename**	SA-MIX.d
ACQ Method	ESI ALS 100-300.m	**Comment**		**Acquired Time**	05-07-21 11:52:08 AM (UTC+05:30)