Electronic Supplementary Information

Ancistrocyclinones A and B, unprecedented pentacyclic *N,C*-coupled naphthylisoquinoline alkaloids, from the Chinese liana *Ancistrocladus tectorius*

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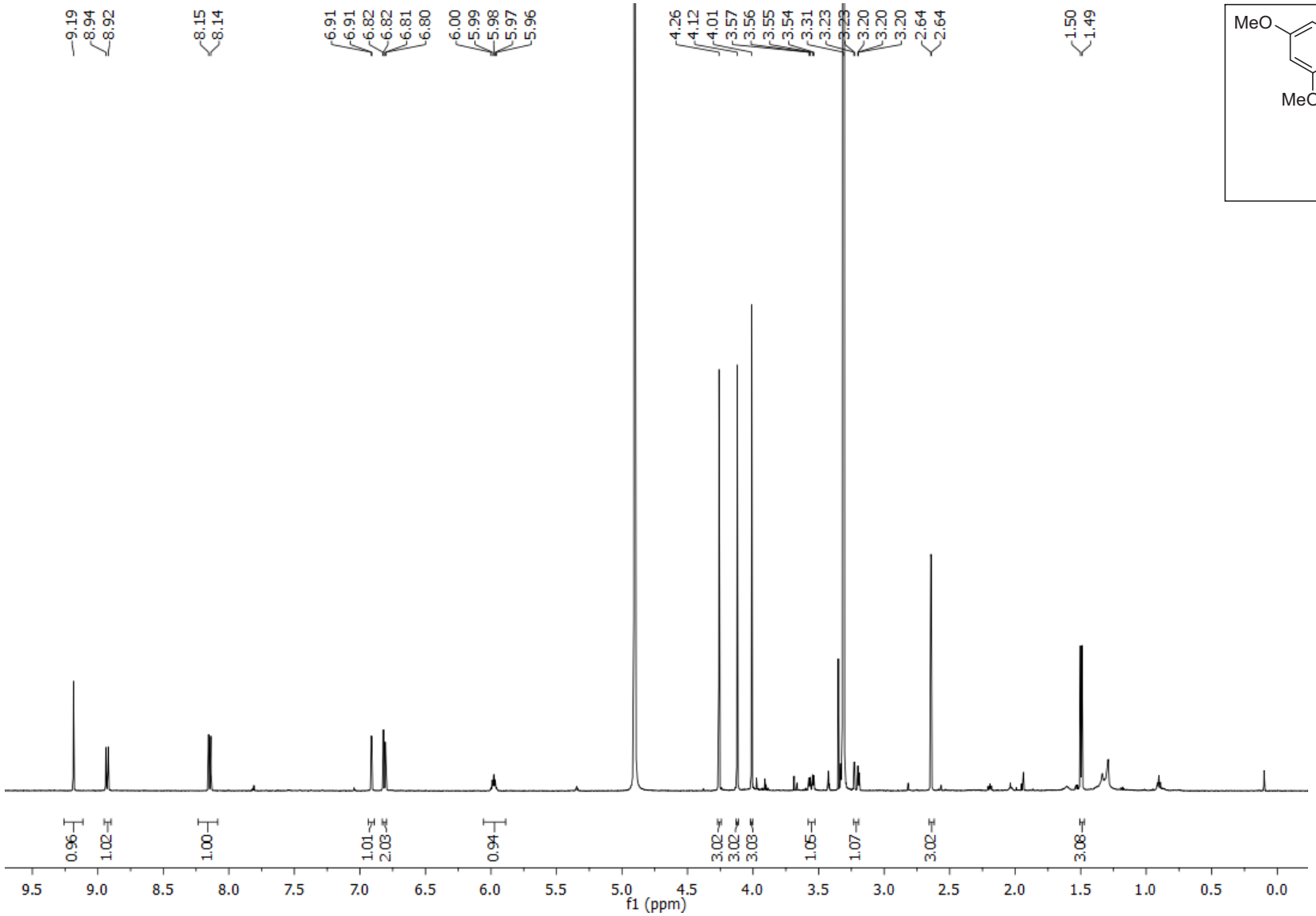
Table 1: ^{1}H and ^{13}C NMR data of ancistrocyclinone A (**5**) and B (**6**) in MeOD (400 MHz and 150 MHz).[a]

	5		**6**	
Position	δ_H	δ_C	δ_H	δ_C
1		148.6		148.8
3	5.98 (m)	55.3	5.94 (m)	55.1
4	3.21 (dd, 16.9,1.7)	34.3	3.13 (dd, 16.7,1.7)	34.2
	3.56 (dd, 16.6, 5.6)		3.51 (dd, 15.6, 5.1)	
5	6.80 (d, 2.2)	108.4	6.60 (s)	108.5
6		168.2		167.2
7	6.82 (d, 2.2)	99.5	6.68 (d, 2.2)	100.2
8		162.9		162.9
9		109.7		110.3
10		139.4		139.5
1'		141.0		141.1
2'		146.0		146.0
3'	6.91 (d, 1.3)	136.7	6.90 (d, 1.4)	136.6
4'		184.2		184.3
5'		163.9		163.7
6'	8.15 (d, 10.0)	122.5	8.12 (d, 10.0)	122.2
7'	8.93 (d, 10.0)	127.4	8.90 (d, 10.1)	127.3
8'		132.8		132.8
9'		126.4		126.2
10'		115.1		115.2
11'	9.19 (s)	125.0	9.17 (s)	125.0
3-CH_3	1.50 (d, 6.9)	16.7	1.49 (d, 6.9)	16.6
6-OCH_3	4.01 (s)	56.7		
8-OCH_3	4.12 (s)	57.2	4.08 (s)	57.0
2'-CH_3	2.64 (d, 1.4)	18.7	2.63 (d, 1.4)	18.7
5'-OCH_3	4.26 (s)	57.9	4.25 (s)	57.9

[a] Multiplicities and coupling constants J (Hz) are shown in parentheses, δ values are given in ppm.



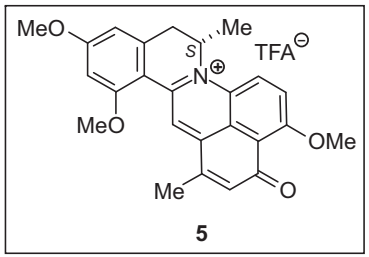


Figure 1: ^{1}H NMR spectrum of ancistrocyclinone A (**5**) in MeOD.

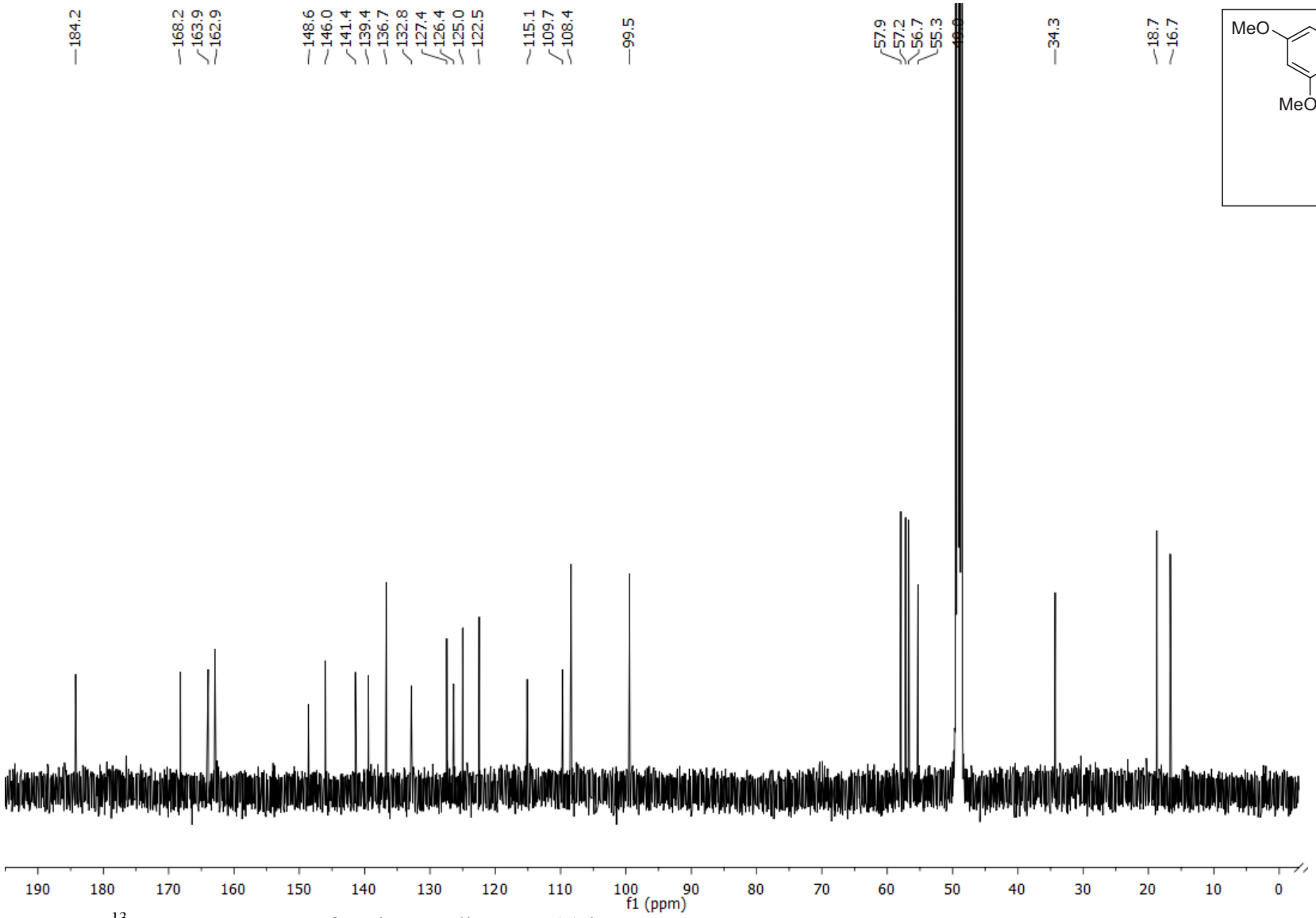


Figure 2: ^{13}C NMR spectrum of ancistrocyclinone A (**5**) in MeOD.

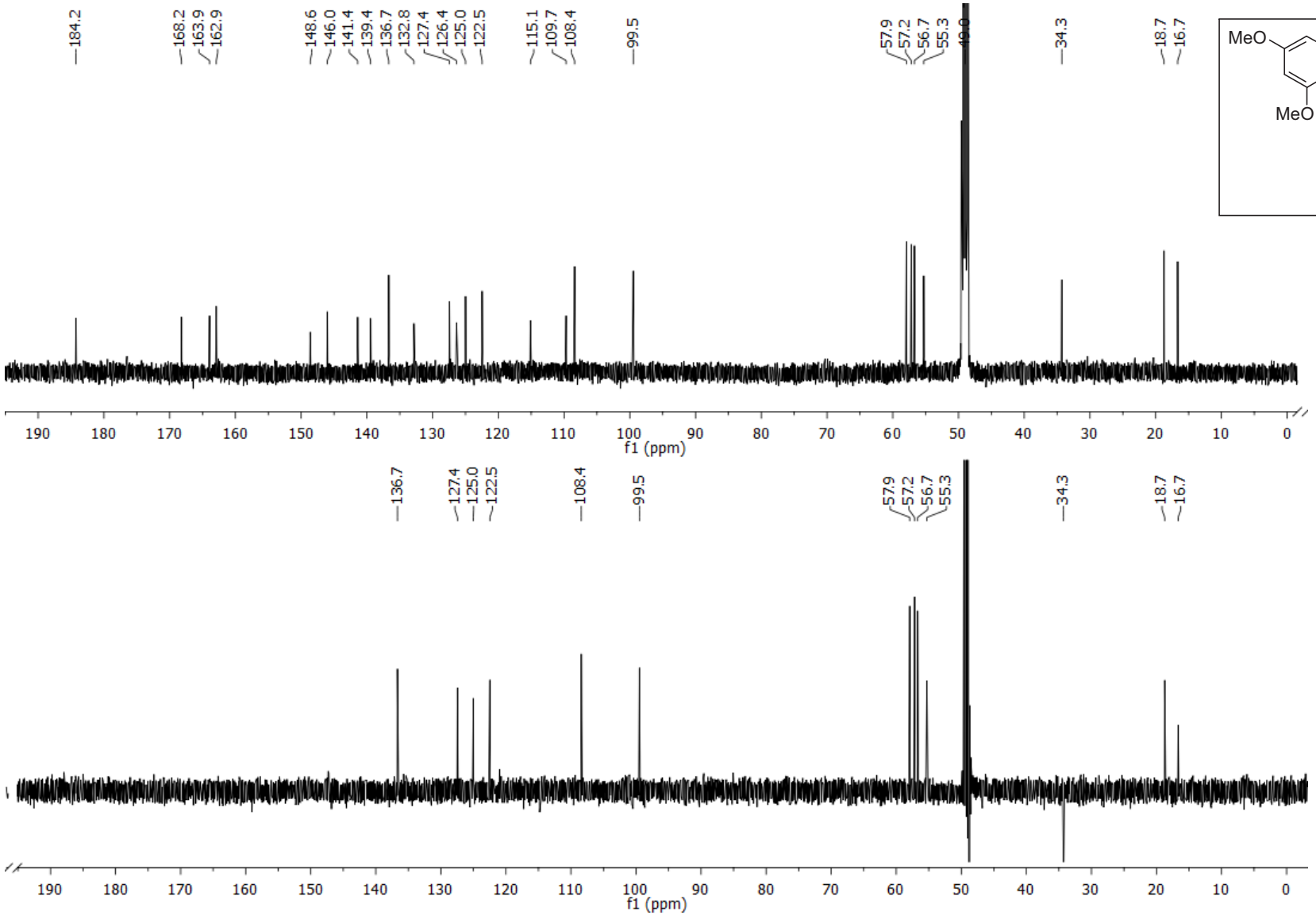


Figure 3: DEPT NMR spectrum of ancistrocyclinone A (**5**) in MeOD.

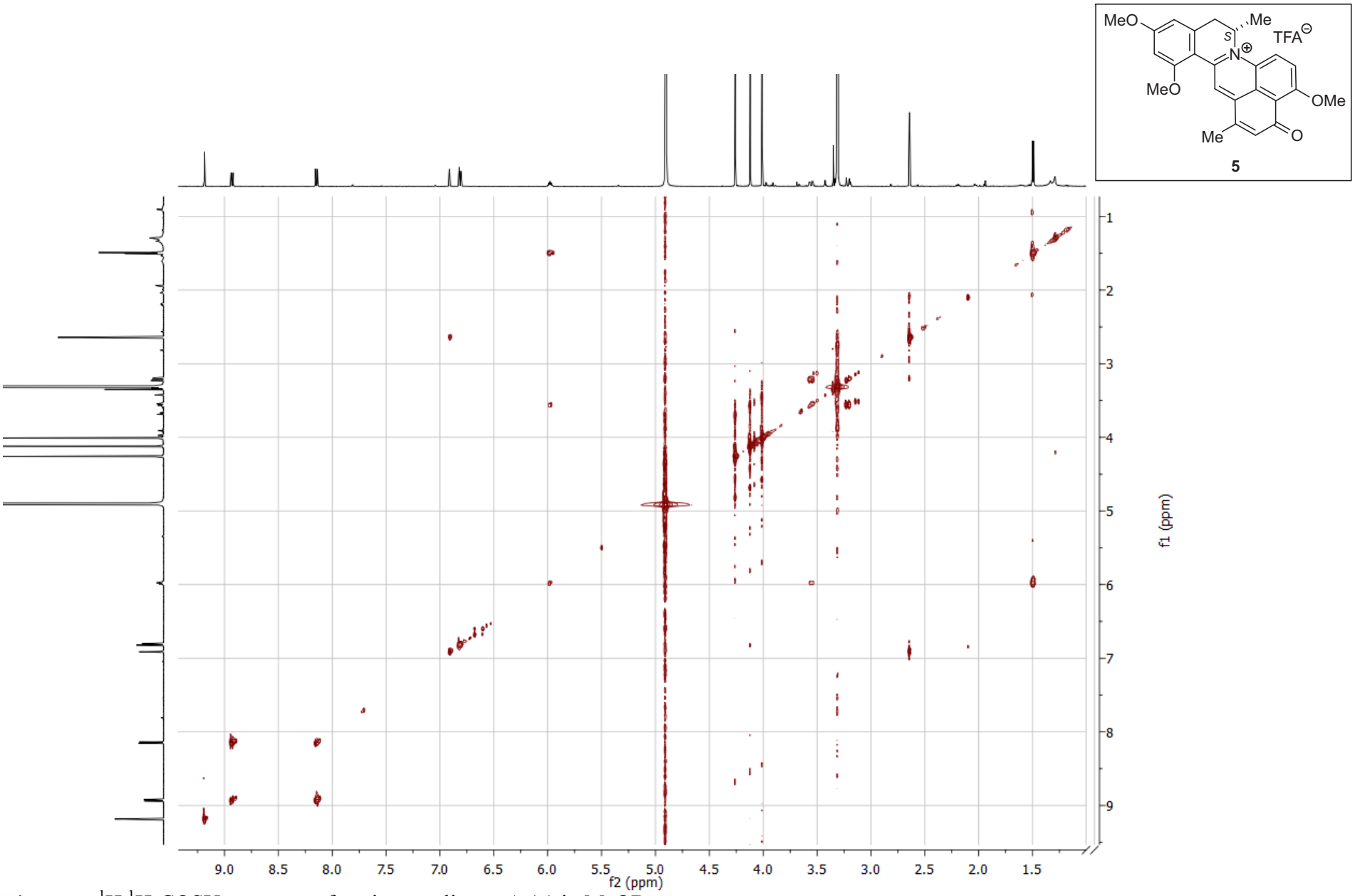


Figure 4: ^{1}H,^{1}H-COSY spectrum of ancistrocyclinone A (**5**) in MeOD.

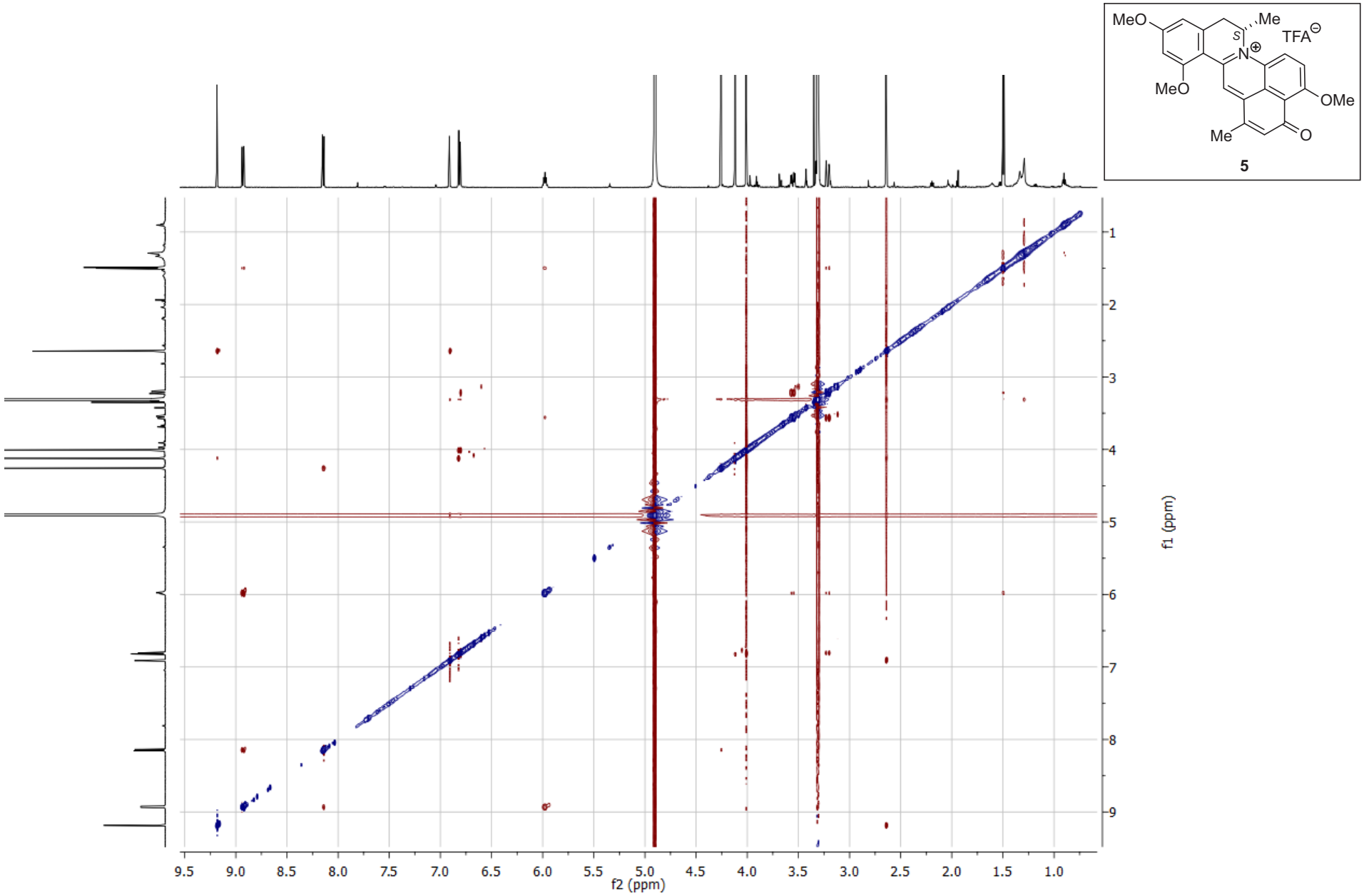


Figure 5: NOESY spectrum of ancistrocyclinone A (**5**) in MeOD.

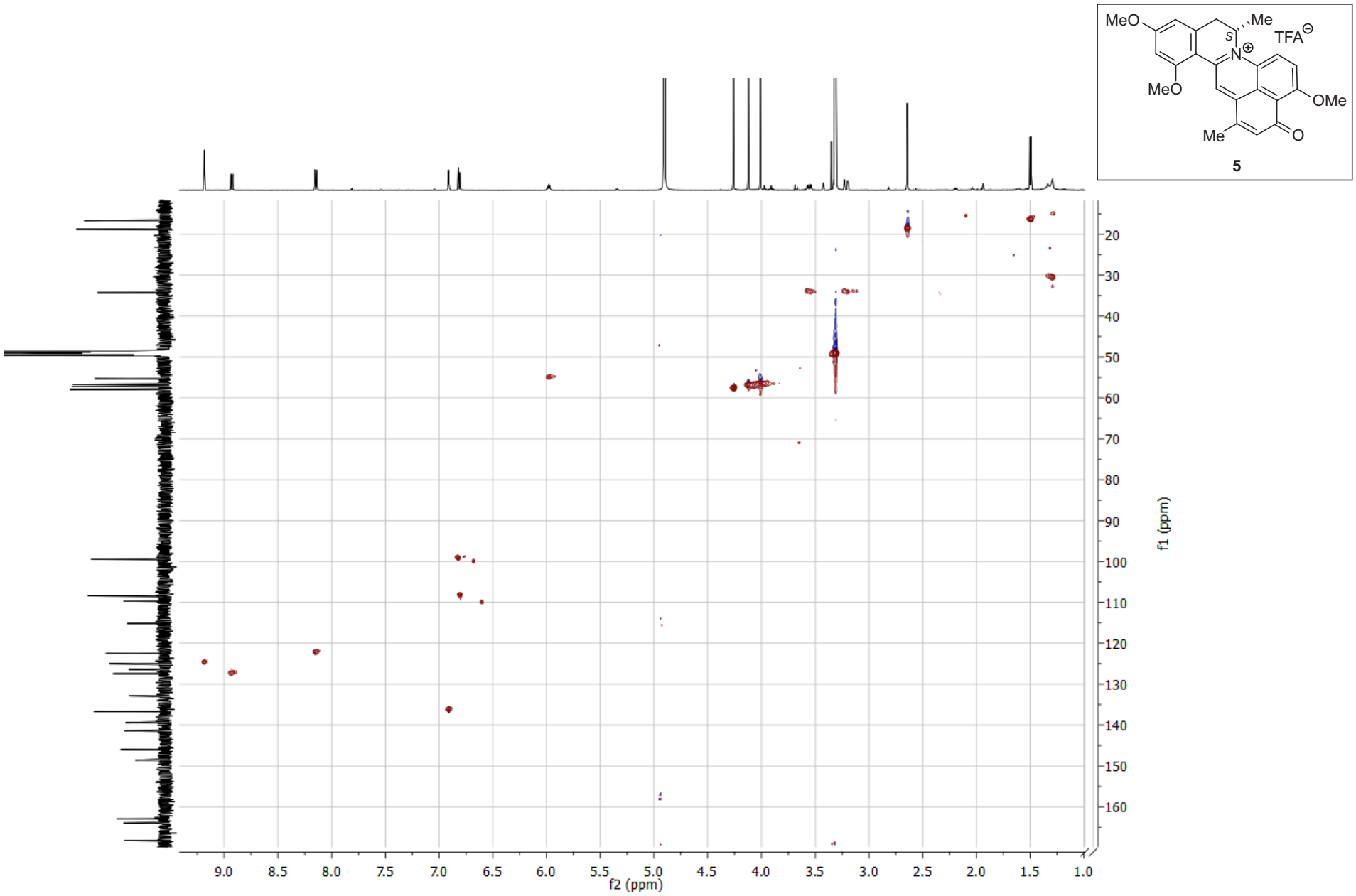


Figure 6: HSQC spectrum of ancistrocyclinone A (**5**) in MeOD.

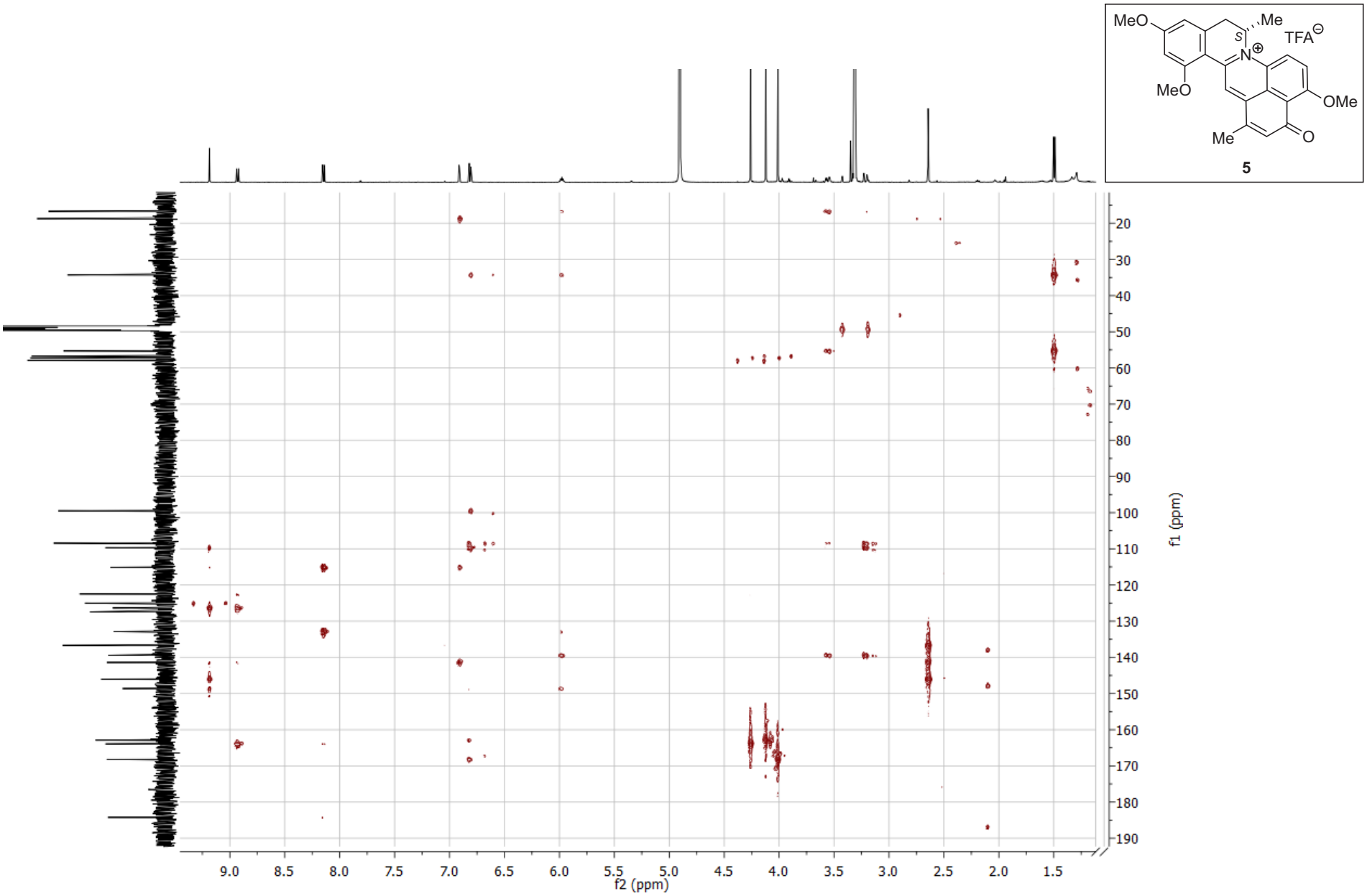


Figure 7: HMBC spectrum of ancistrocyclinone A (**5**) in MeOD.

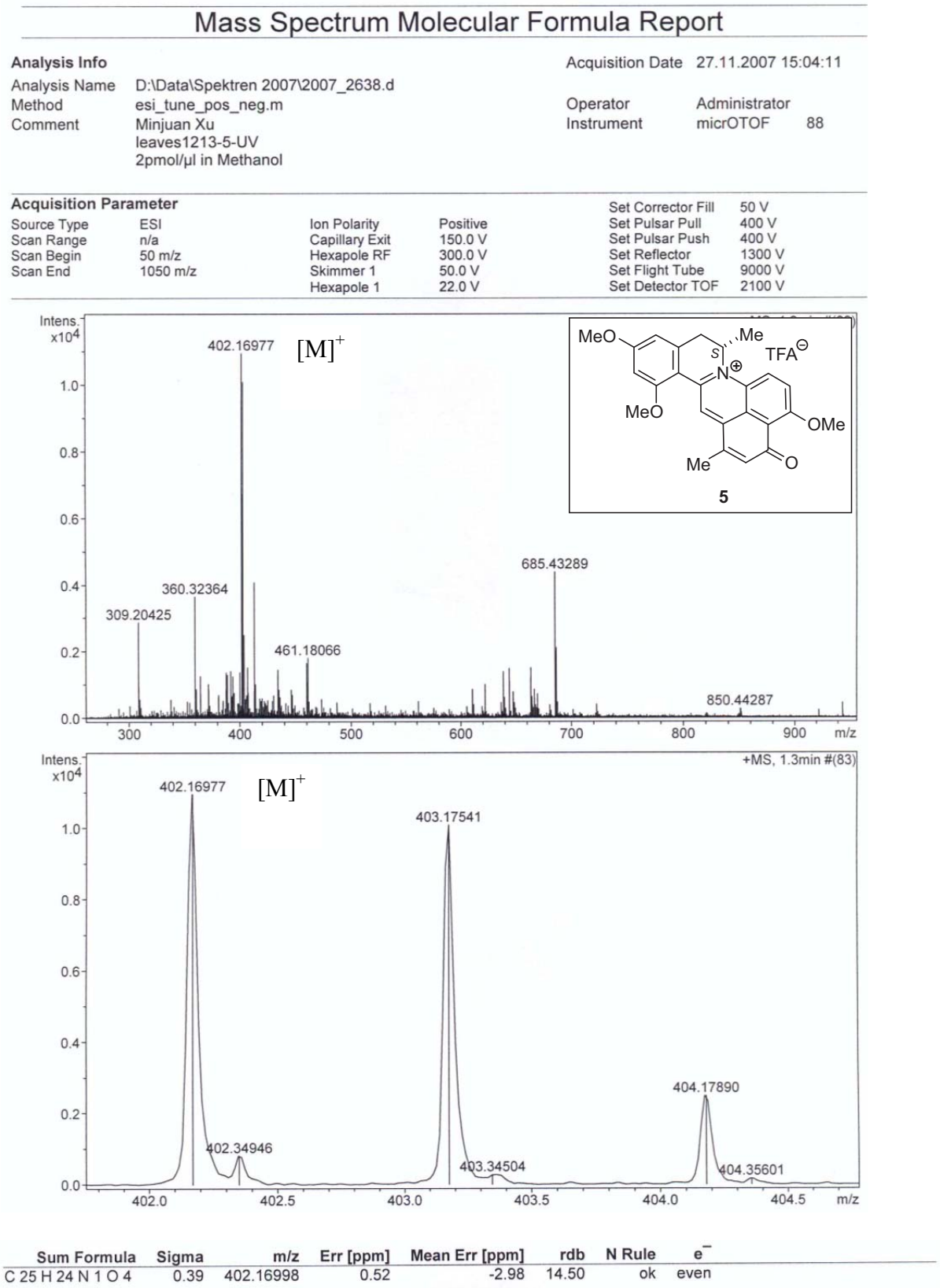


Figure 8: HRESI mass spectrum of ancistrocyclinone A (**5**).

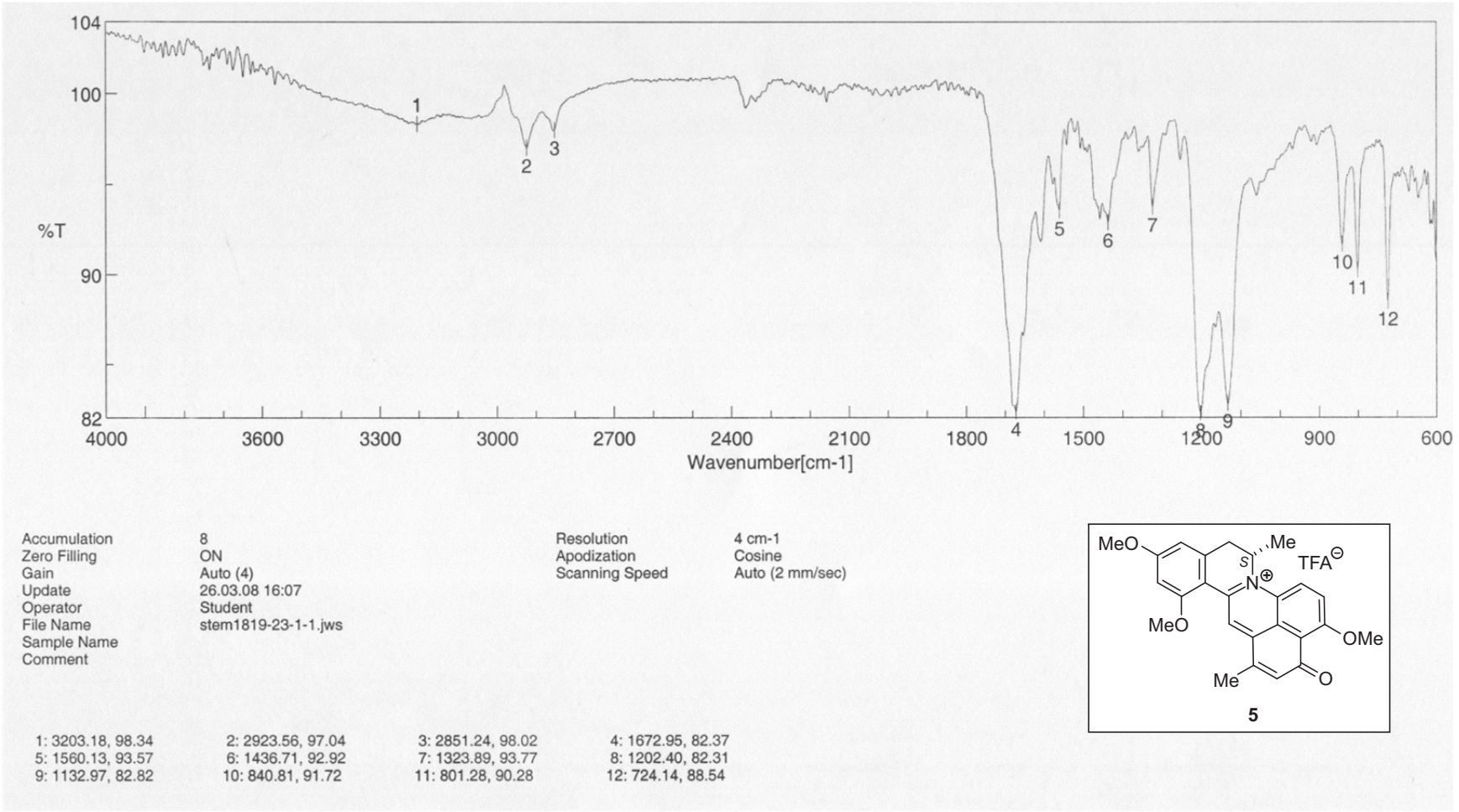
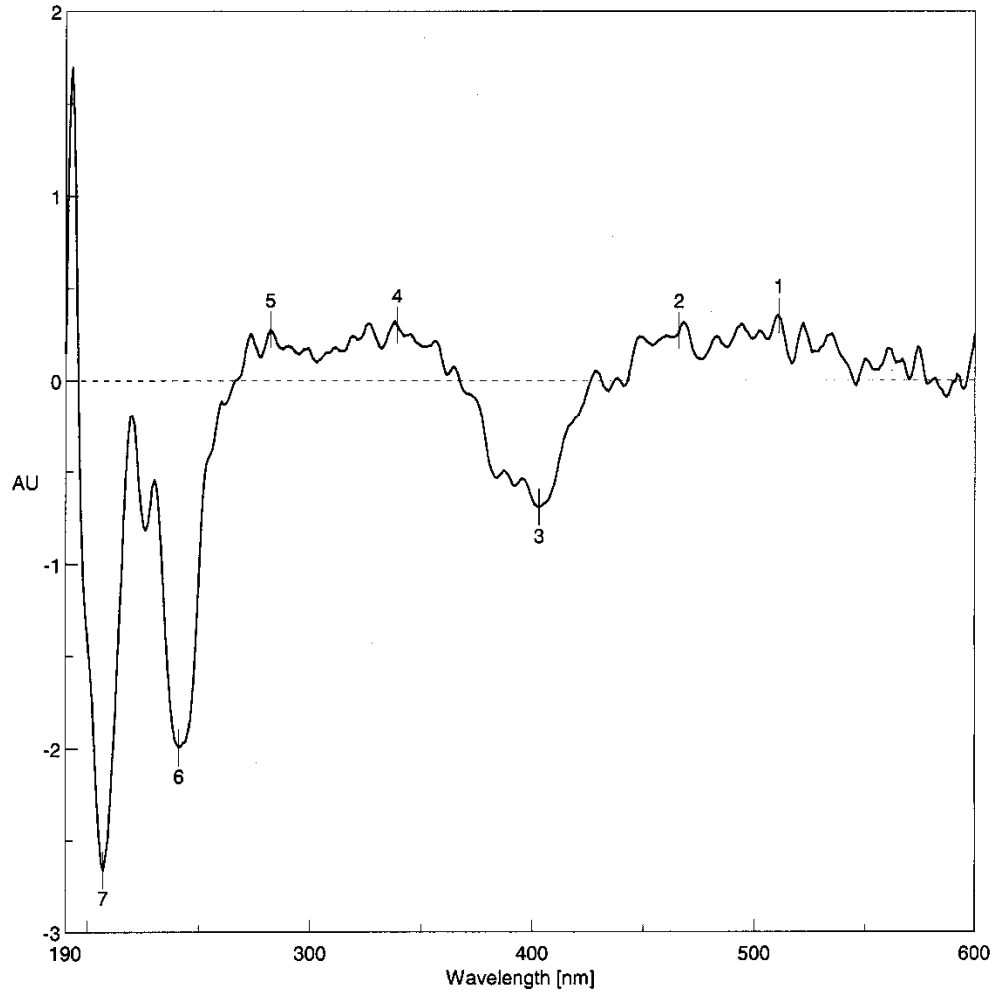
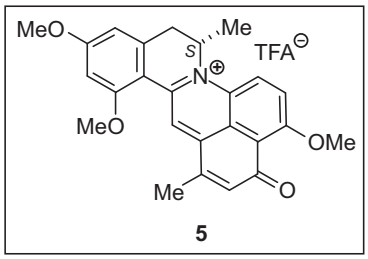


Figure 9: IR spectrum of ancistrocyclinone A (**5**).





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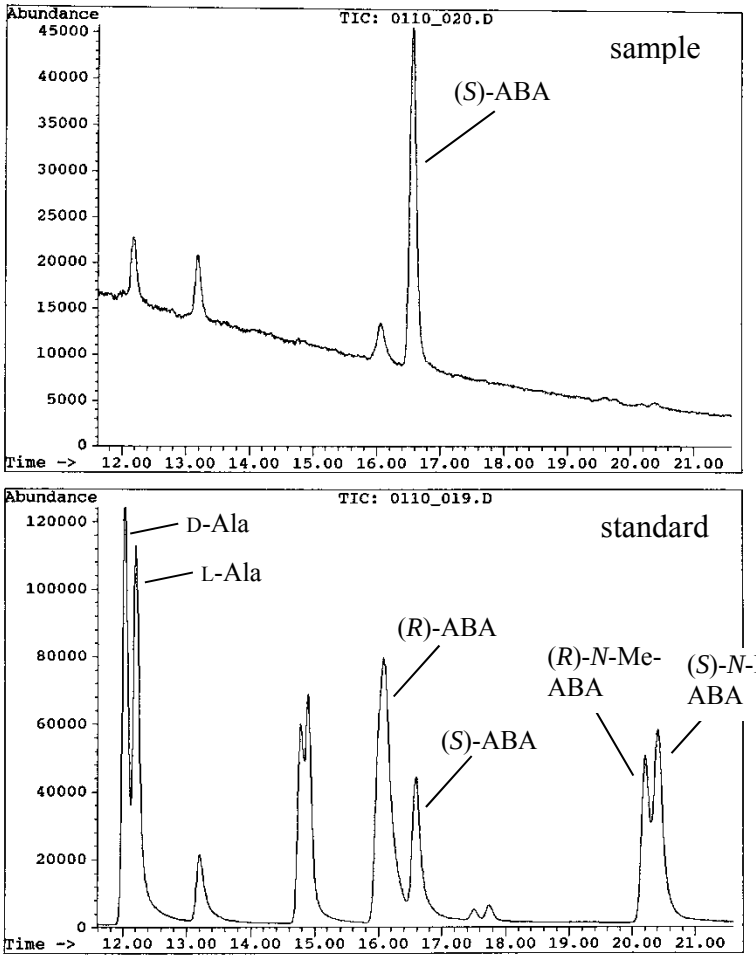
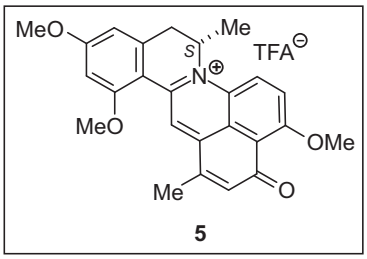
4	339.0	0.300018	5	282.0	0.27616	6	241.0	-1.99195
7	207.0	-2.65625						

Figure 10: ECD spectrum of ancistrocyclinone A (**5**).





5

Ala = Alanine

N-Me-Ala = *N*-Methylalanine

ABA = 3-Aminobutyric acid

N-Me-ABA = *N*-Methyl-3-aminobutyric acid

Figure 11: Oxidative degradation products of ancistrocyclinone A (**5**).

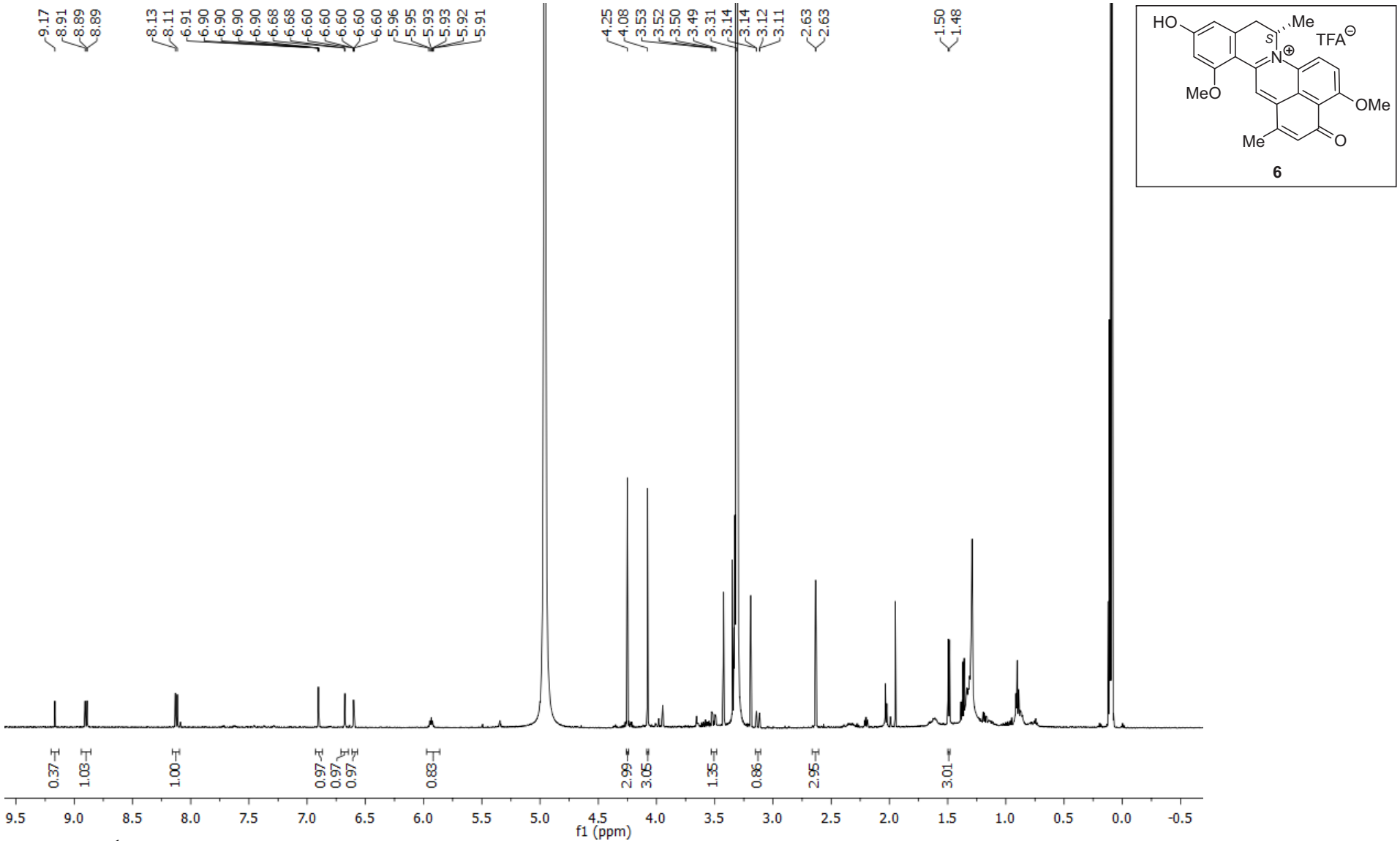


Figure 12: ^{1}H NMR spectrum of ancistrocyclinone B (**6**) in MeOD.

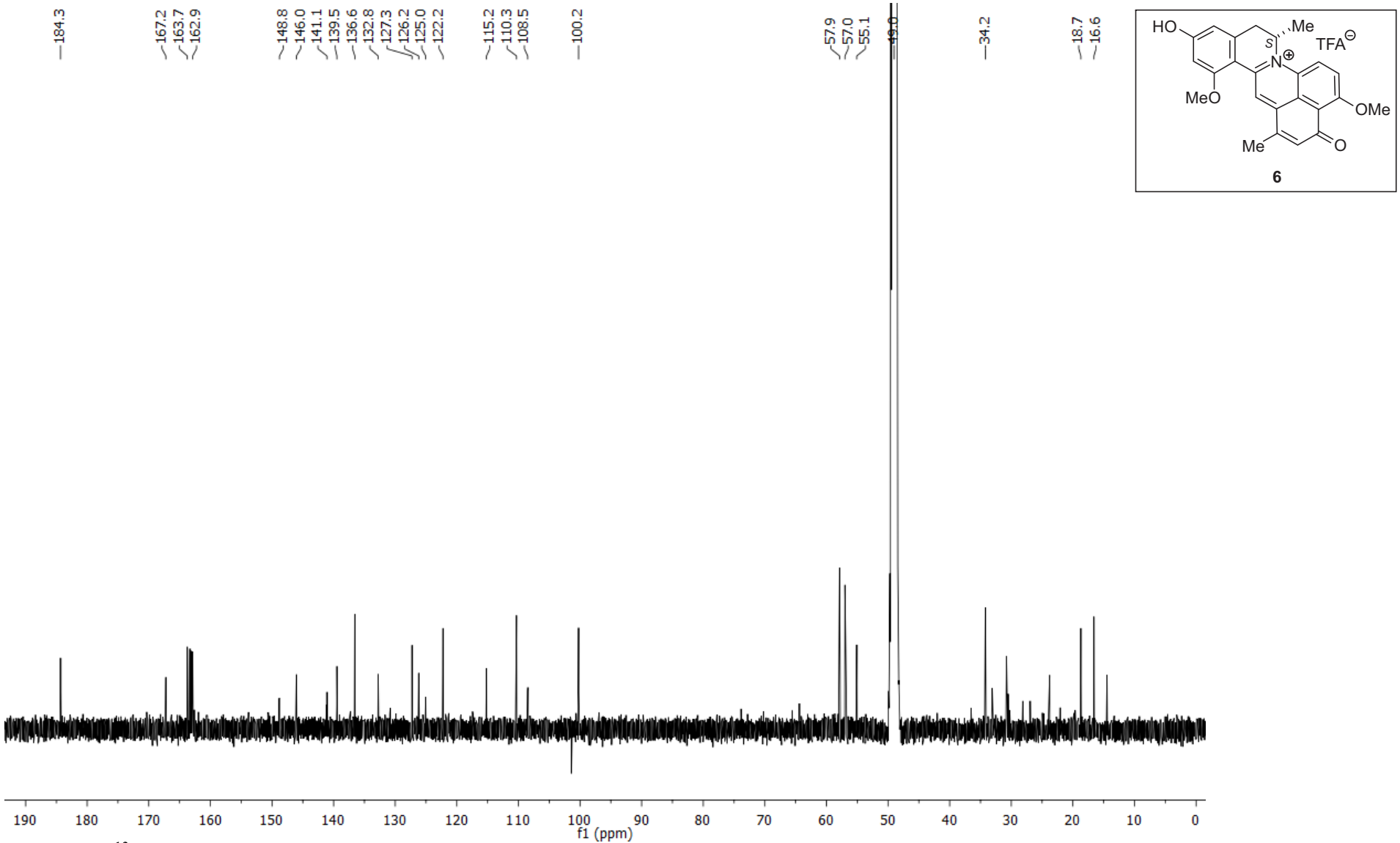


Figure 13: ^{13}C NMR spectrum of ancistrocyclinone B (**6**) in MeOD.

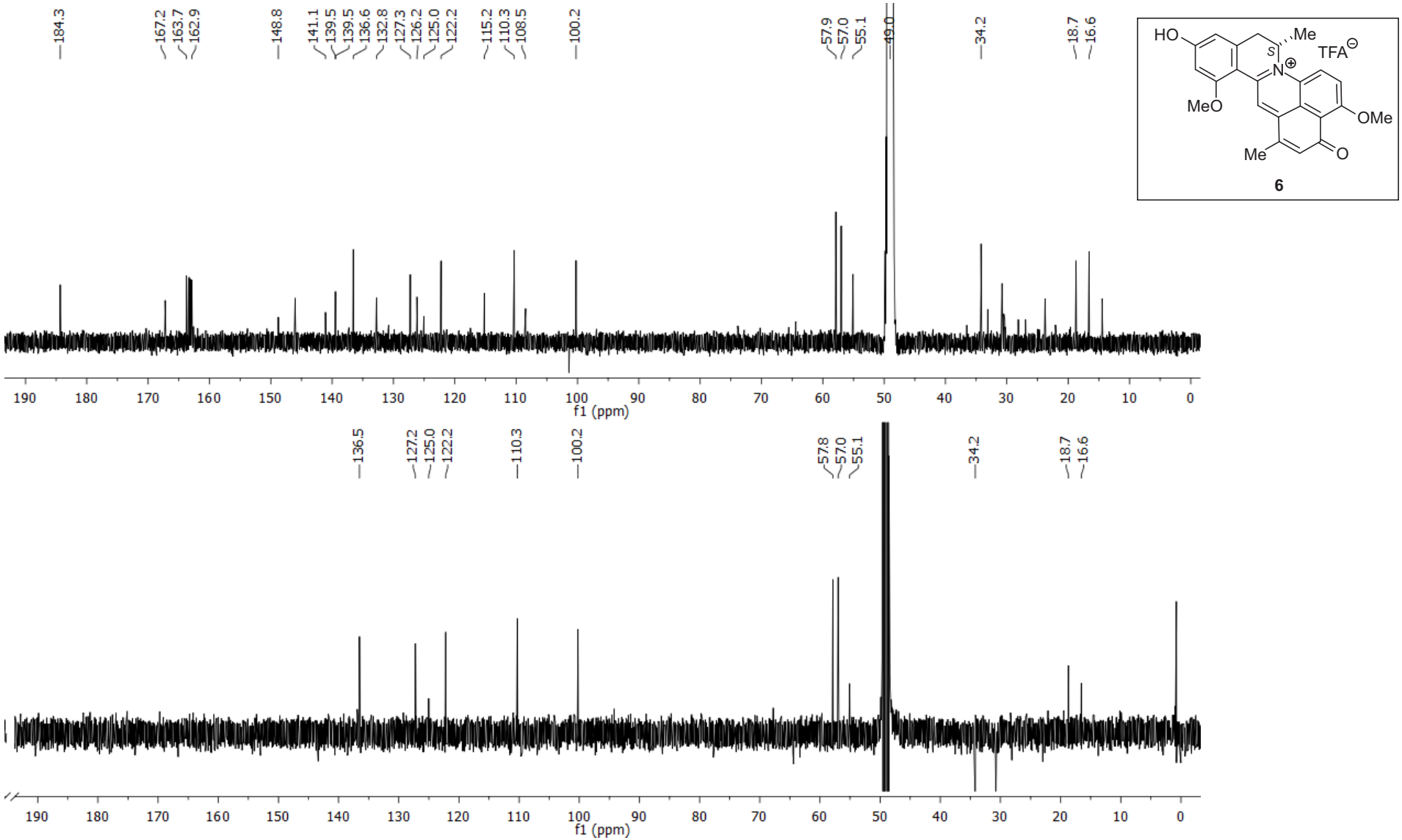


Figure 124: DEPT NMR spectrum of ancistrocyclinone B (**6**) in MeOD.

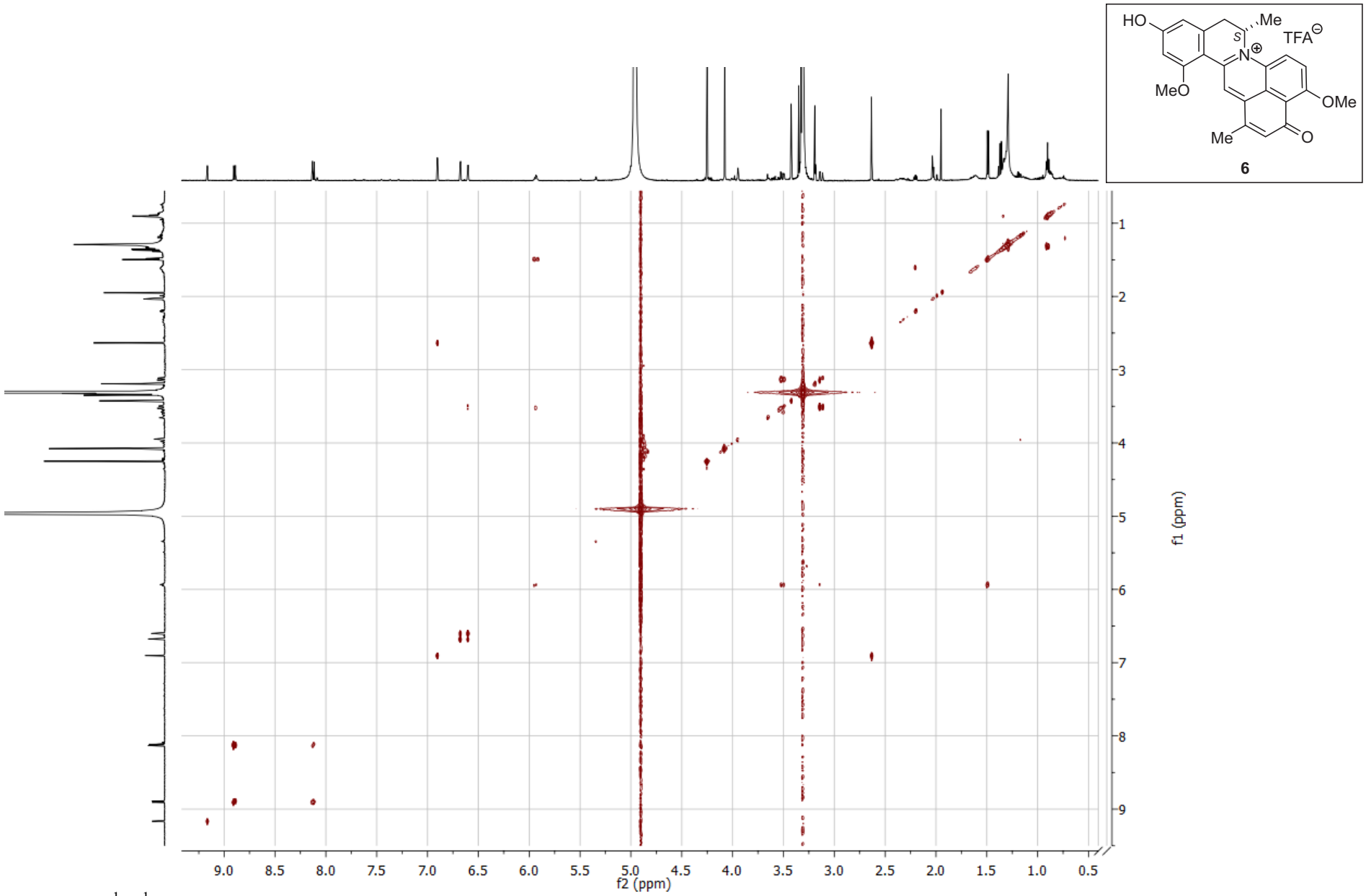


Figure 15: ^{1}H,^{1}H-COSY spectrum of ancistrocyclinone B (**6**) in MeOD.

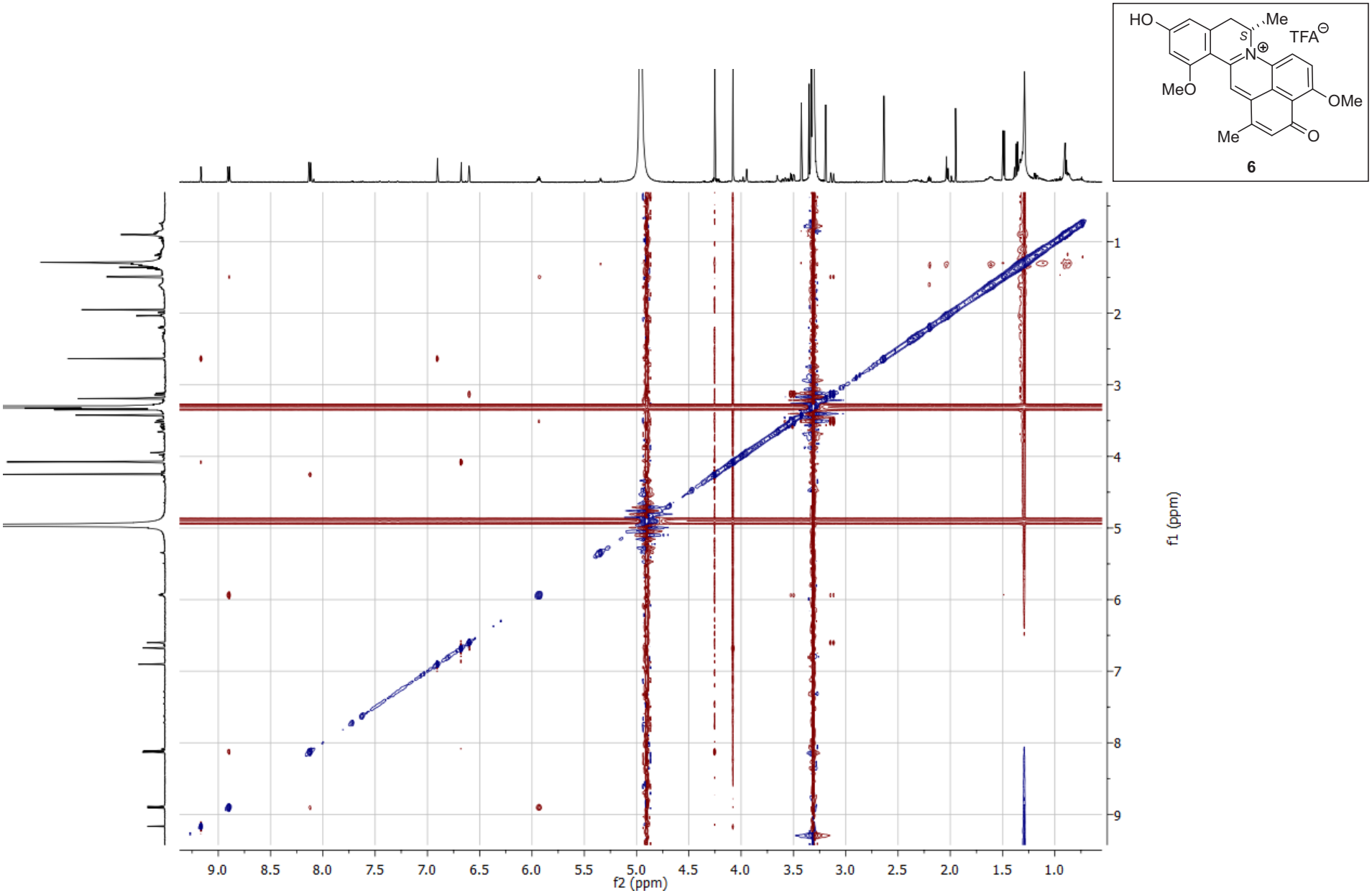


Figure 16: NOESY spectrum of ancistrocyclinone B (**6**) in MeOD.

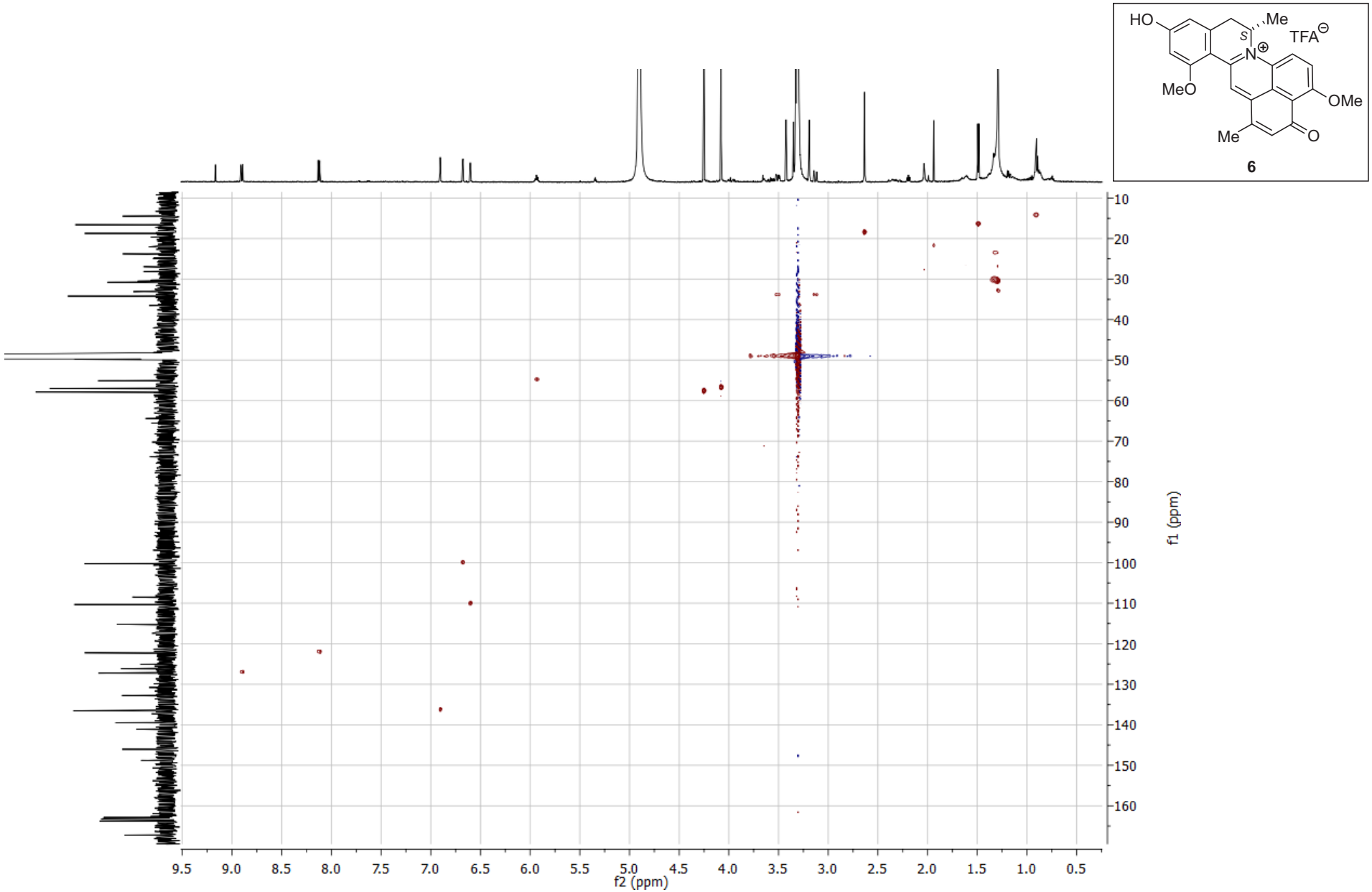


Figure 17: HSQC spectrum of ancistrocyclinone B (**6**) in MeOD.

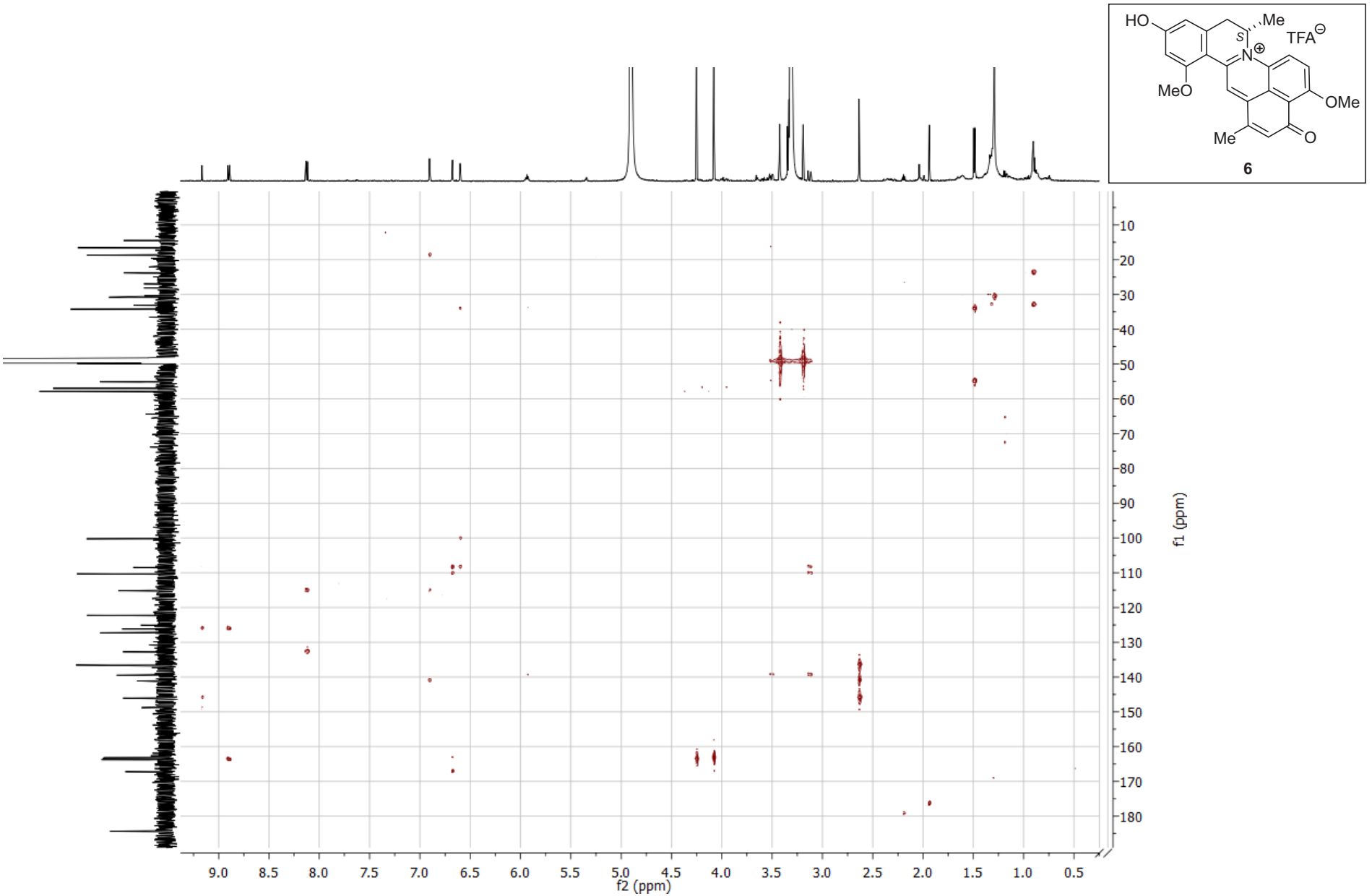


Figure 18: HMBC spectrum of ancistrocyclinone B (**6**) in MeOD.

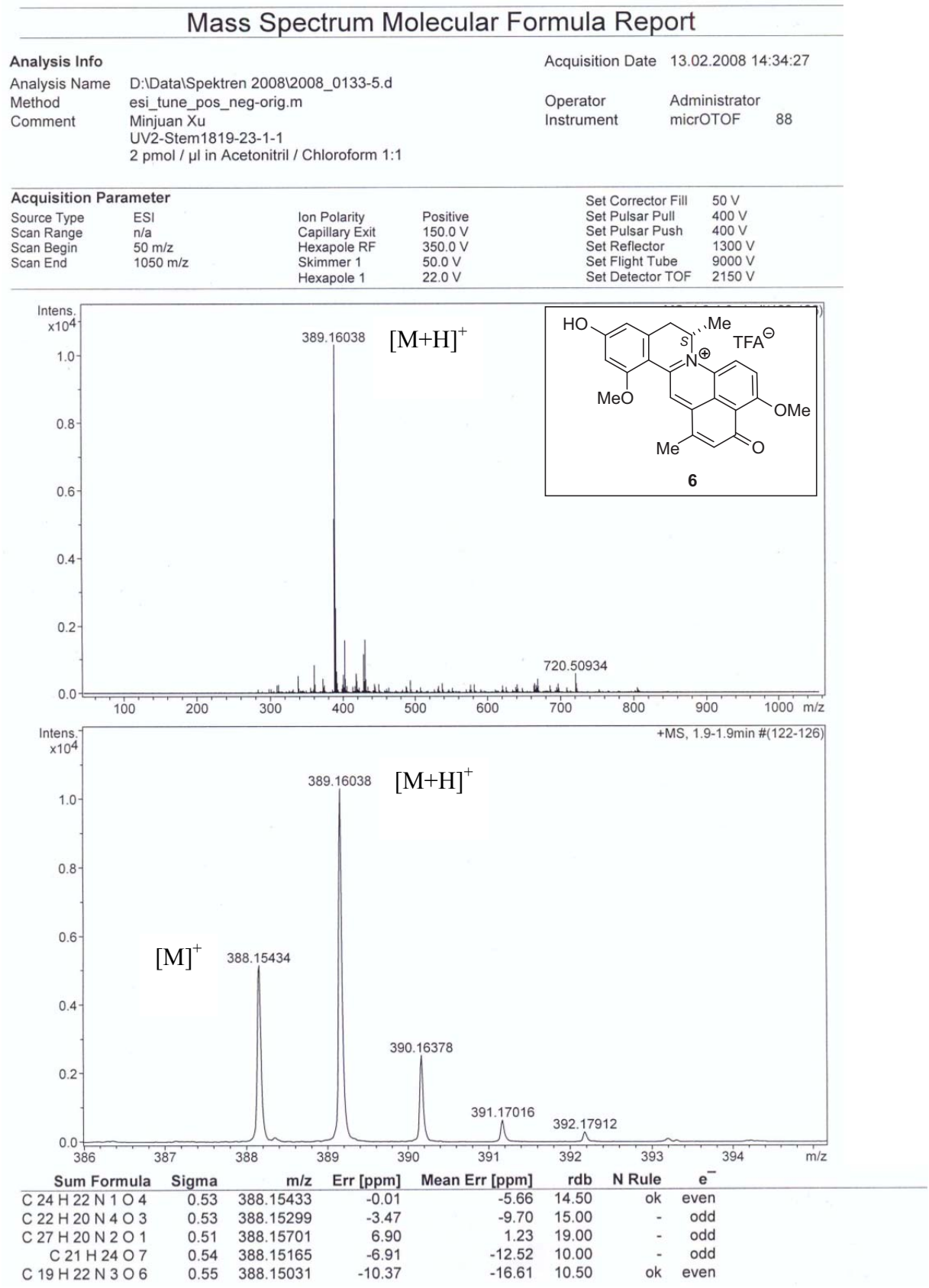


Figure 19: HRESI mass spectrum of ancistrocyclinone B (**6**).

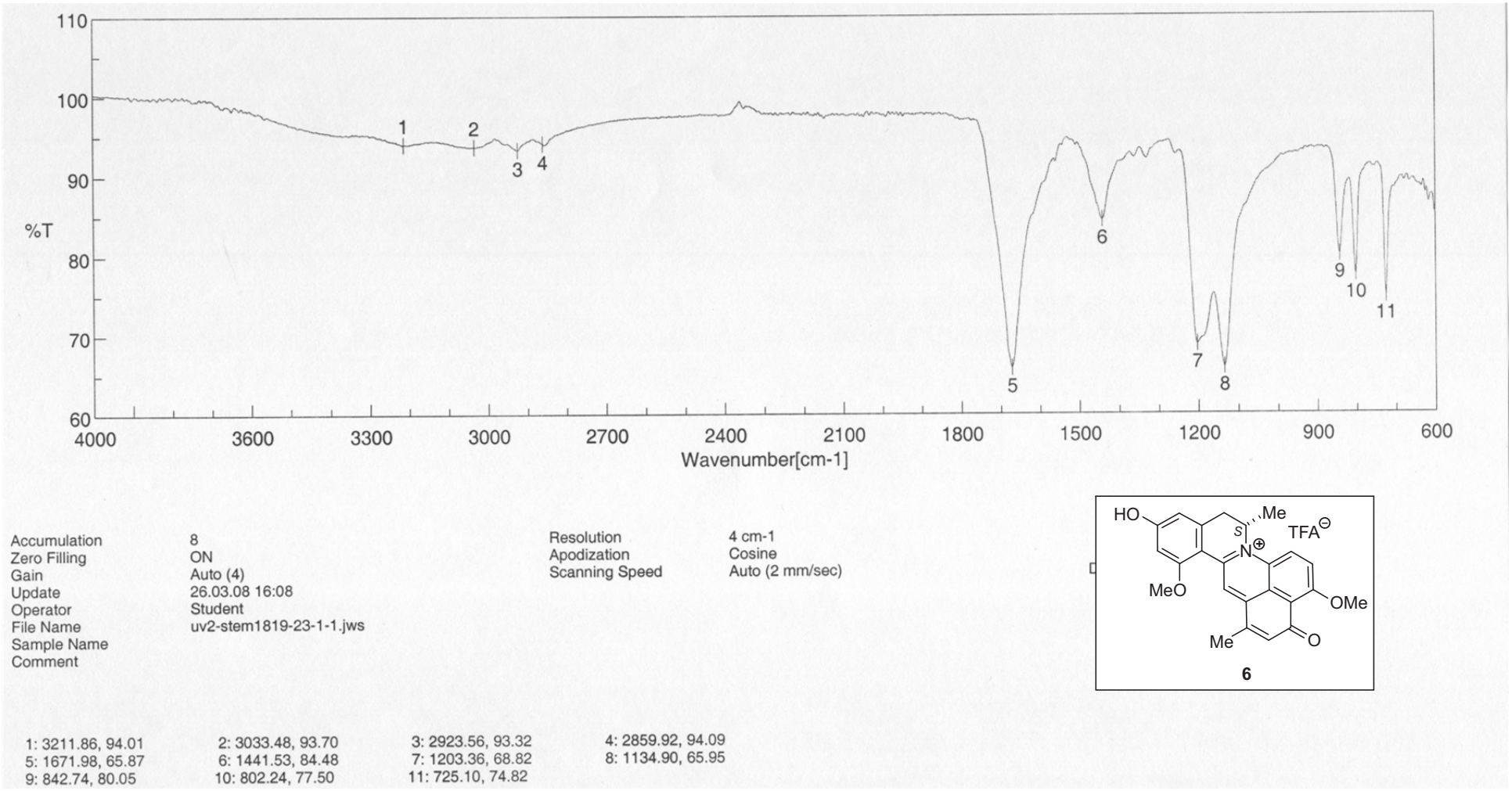
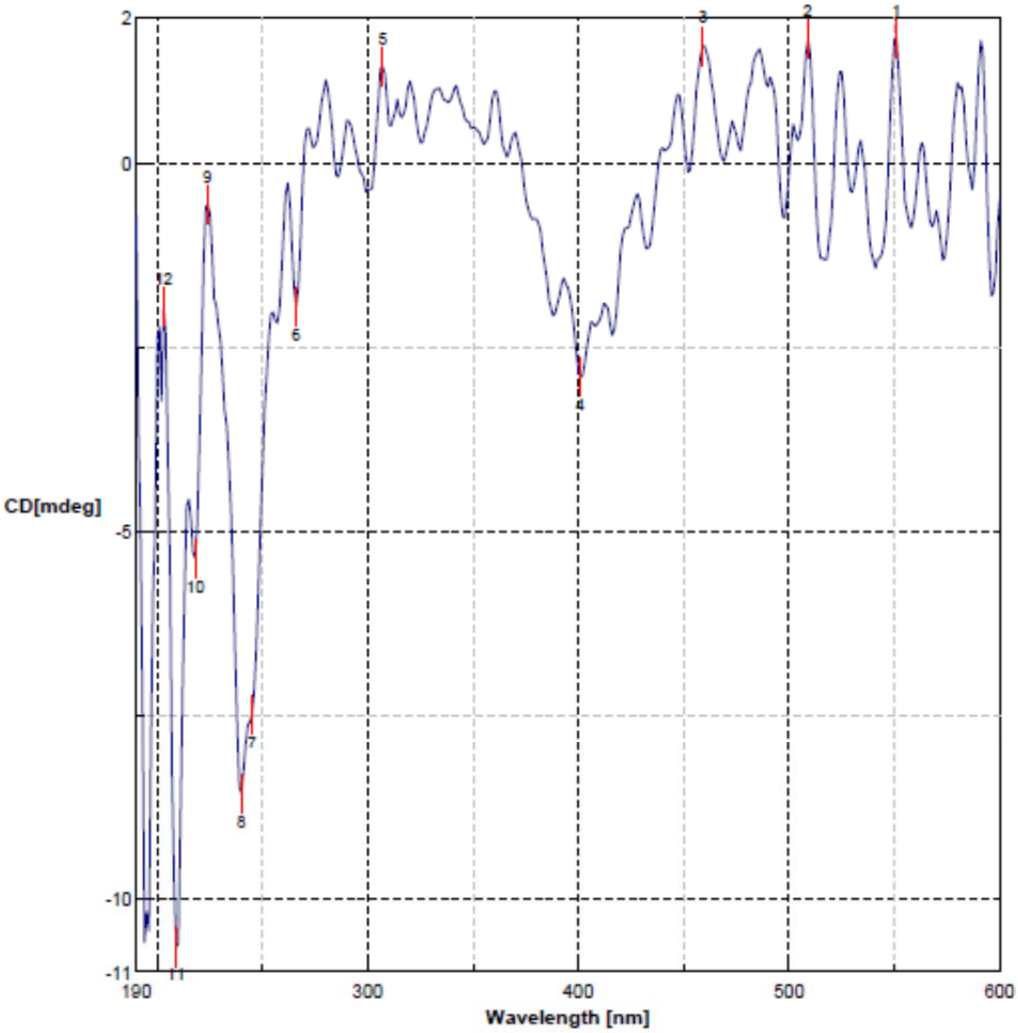


Figure 20: IR spectrum of ancistrocyclinone B (**6**).



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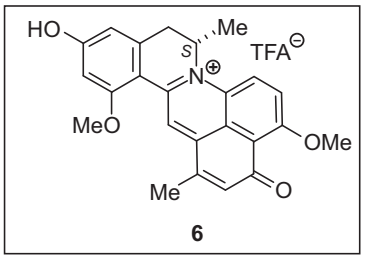
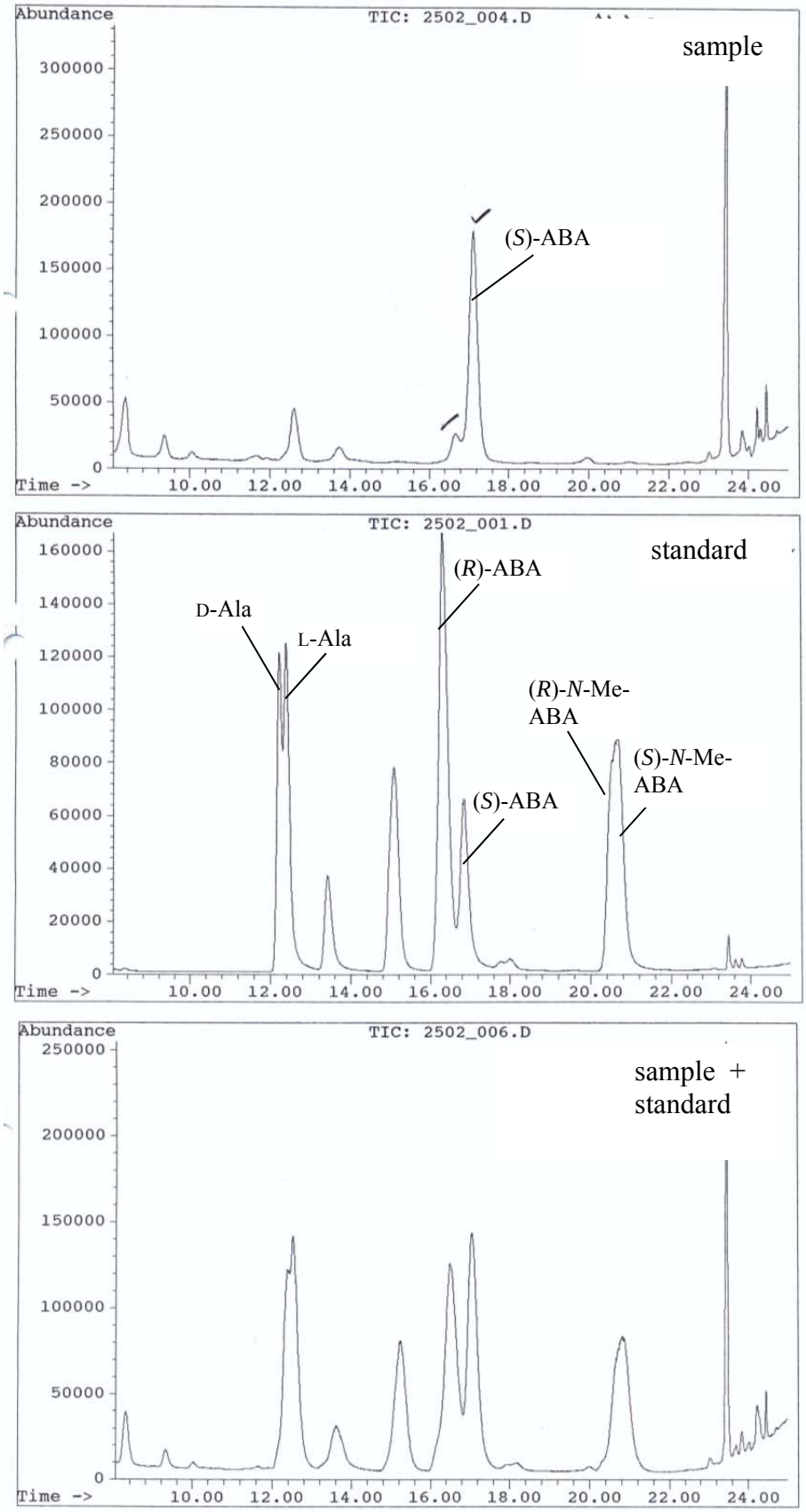


6

No.	nm	CD[mdeg]	No.	nm	CD[mdeg]	No.	nm	CD[mdeg]
1	551	1.70496	2	509	1.69526	3	459	1.6025
4	401	-2.90238	5	307	1.31756	6	266	-1.93574
7	245	-7.48303	8	240	-8.56929	9	224	-0.546478
10	218	-5.36389	11	209	-10.6614	12	203	-1.9435

Figure 21: ECD spectrum of ancistrocyclinone B (**6**).

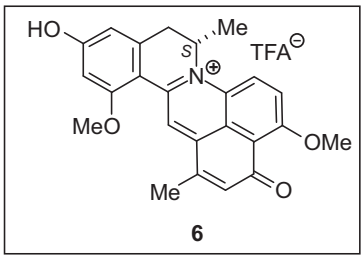


Ala = Alanine

N-Me-Ala = *N*-Methylalanine

ABA = 3-Aminobutyric acid

N-Me-ABA = *N*-Methyl-3-aminobutyric acid



6

Figure 22: Oxidative degradation products of ancistrocyclinone B (**6**).

Table 2: Oxidation of 4′-*O*-demethylancistrocladinium A (**8**) to **5**.

Entry	**Oxidizing agent**	**Yield 11 [%]**	**Yield 5 [%]**
1	Fremy salt	-	-
2	O_2	-	-
3	$Pb(OAc)_4$	23	36
4	Ag_2O	-	-
5	MnO_2	-	-
6	H_2O_2	-	-
7	$K_2Cr_2O_4$	-	-
8	$K_3[Fe(CN)_6]$	-	-
9	$KClO_4$	-	-

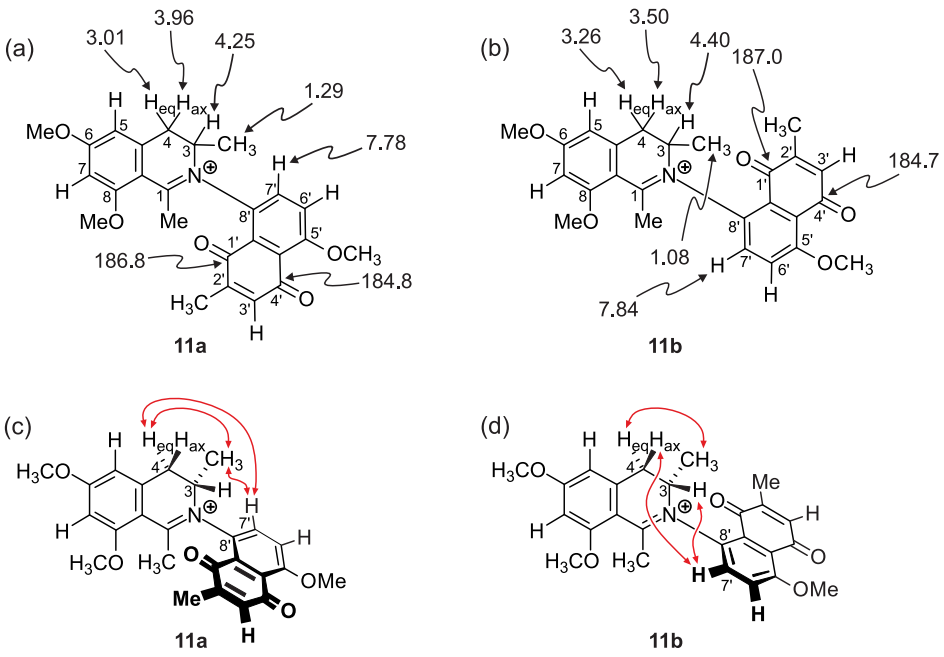


Figure 23: Selected NMR data of chinones **11a** and **11b**: (A) ^{1}H and ^{13}C NMR data (δ in ppm) of **11a**, and (b) of **11b**, (c) NOESY (double red arrows) correlations indicative of the relative configurations at the biaryl axes in **11a**, and (d) in **11b**.

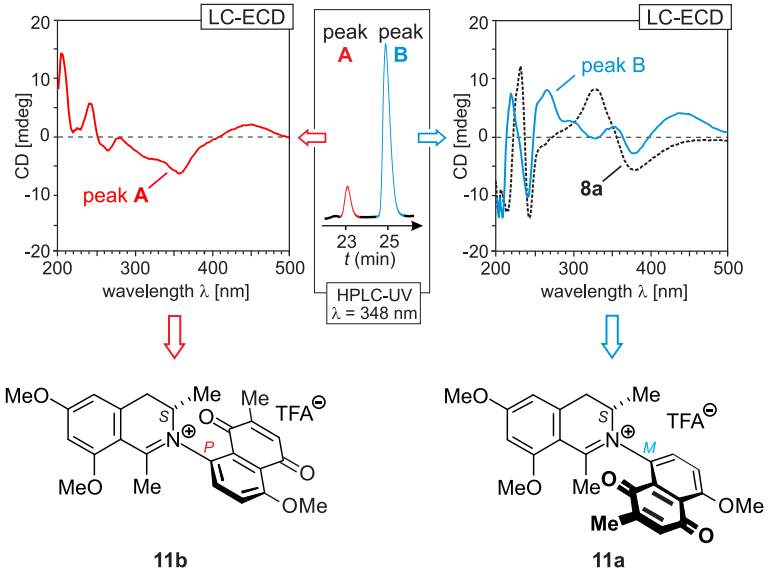


Figure 24: Assignment of the absolute axial configuration of the two atropo-diastereomers of **11** by LC-ECD coupling and by comparison of the LC-ECD spectra of peak **A** (left) and peak **B** (right) with the ECD curve of 4'-*O*-demethylancistrocladinium A (**8a**).

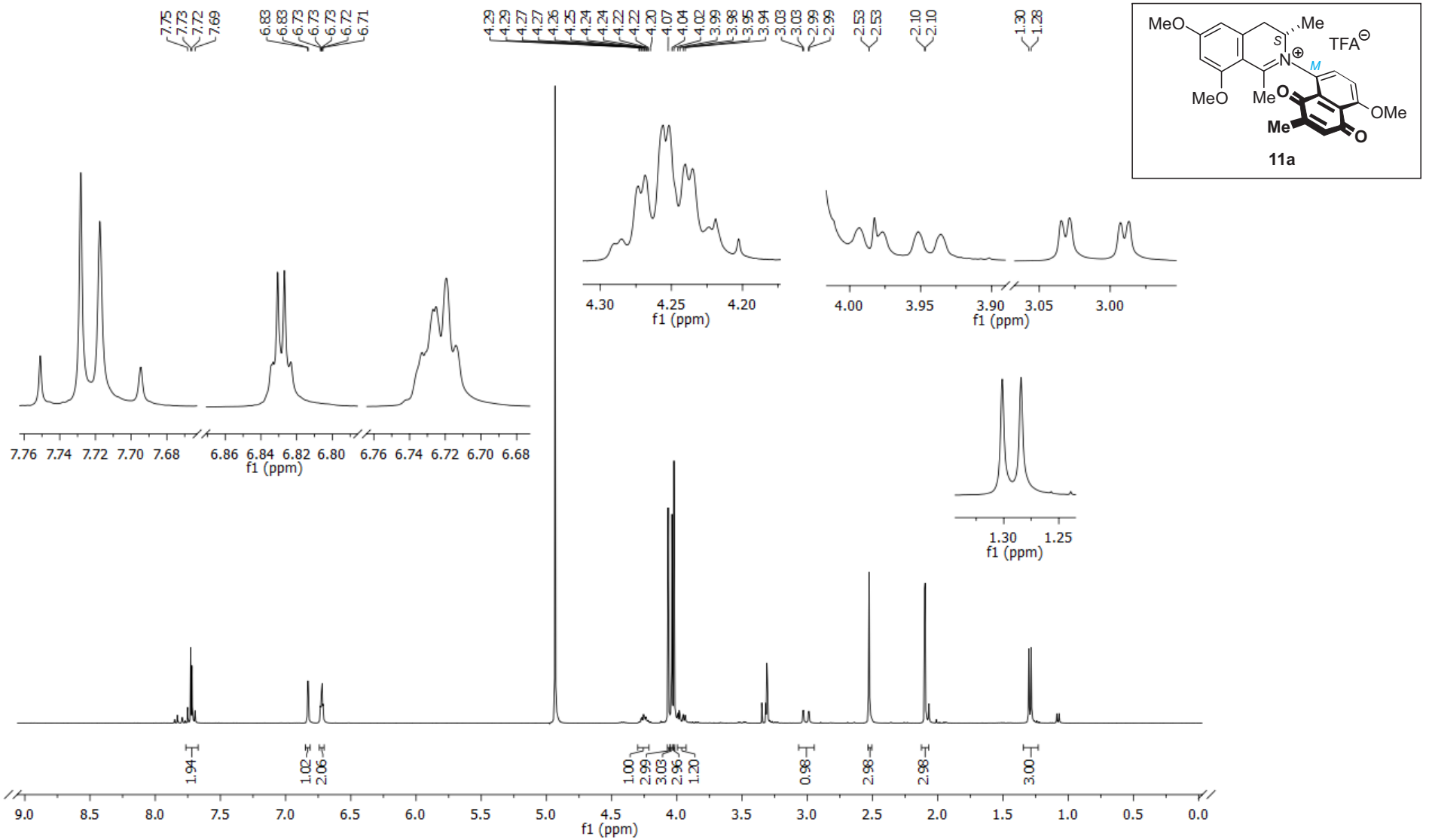


Figure 25: [1]H NMR spectrum of chinone **11a** (major compound) in MeOD.

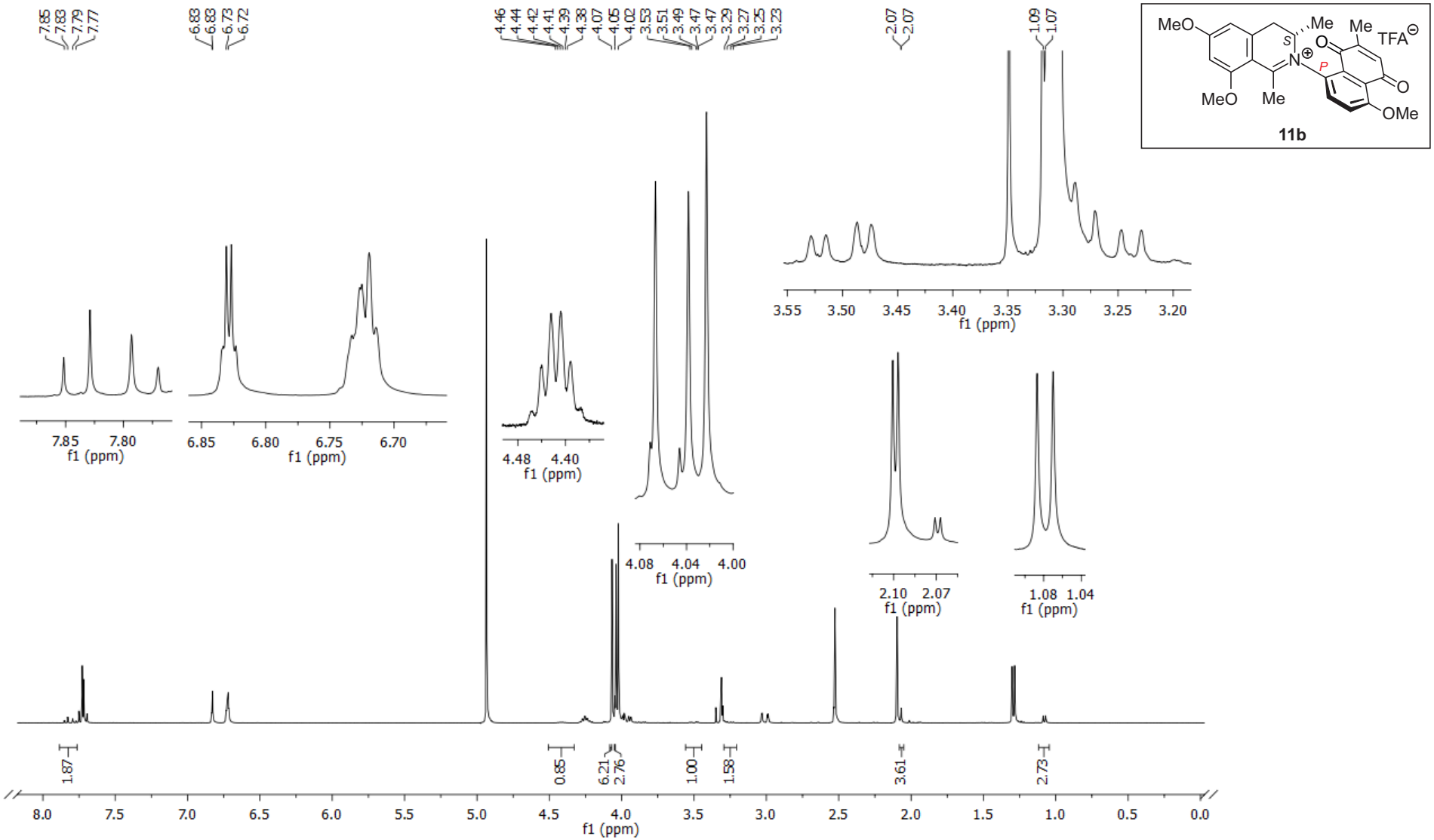


Figure 26: ^{1}H NMR spectrum of chinone **11b** (minor compound) in MeOD.

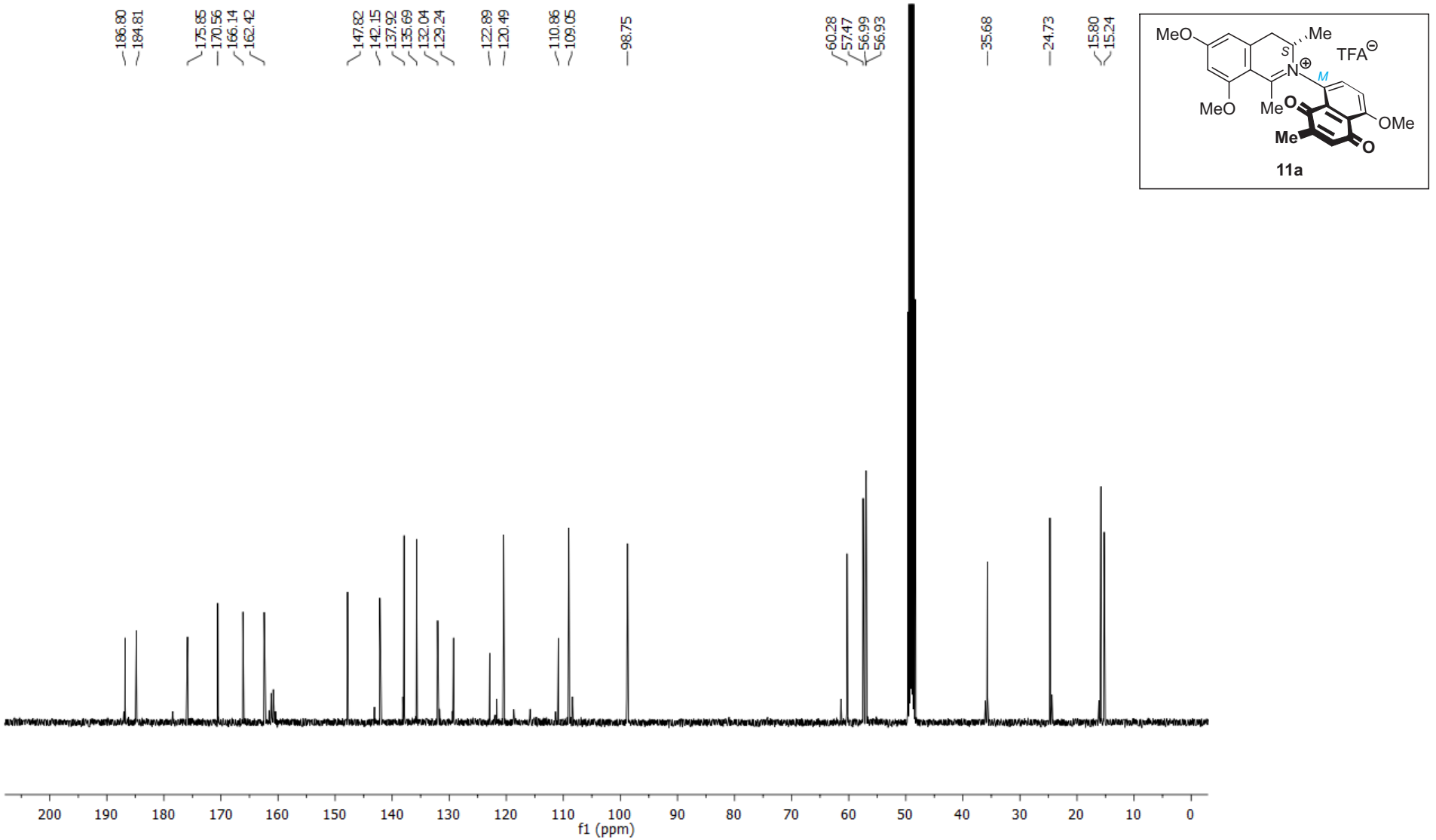


Figure 27: ^{13}C NMR spectrum of chinone **11a** (major compound) in MeOD.

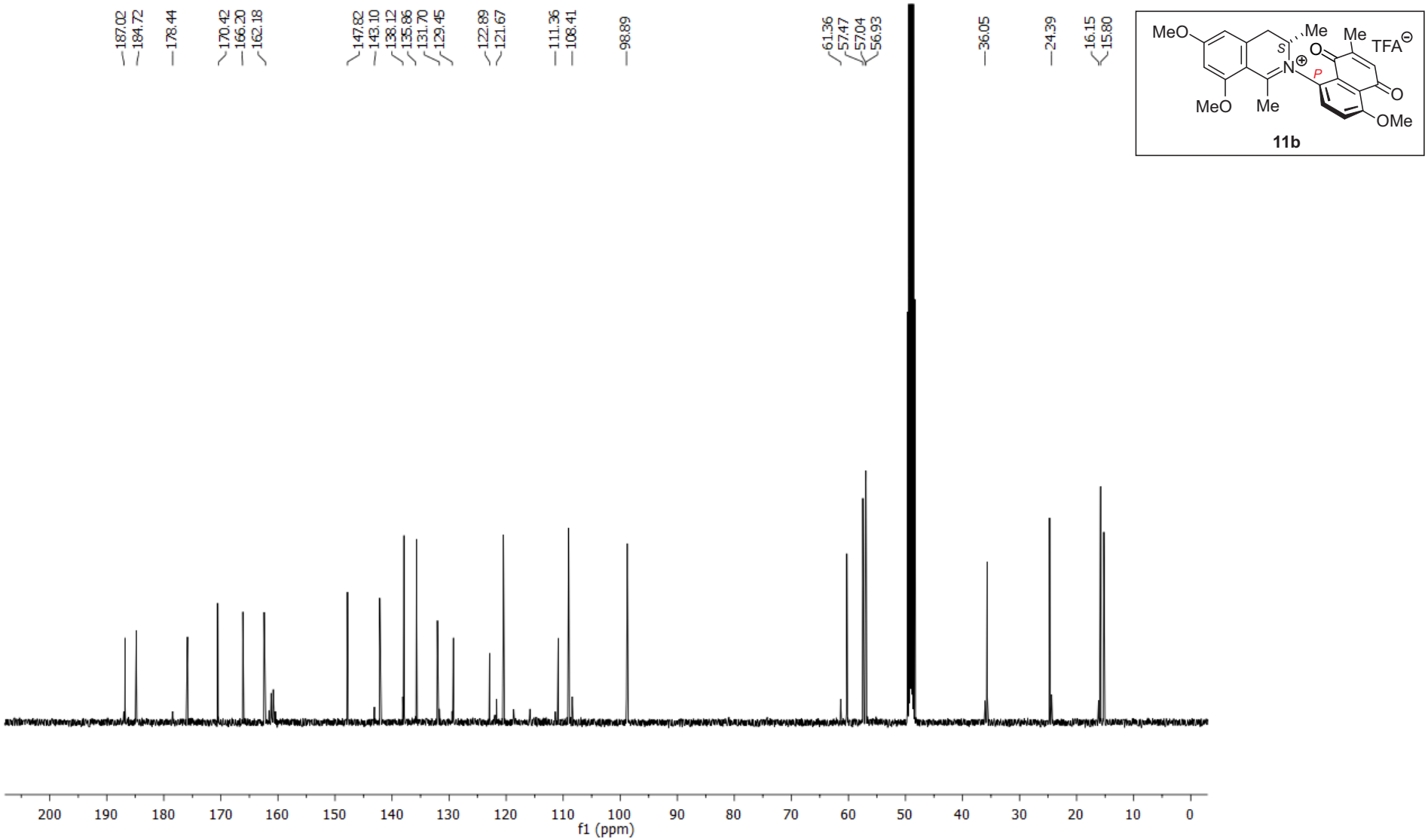


Figure 28: ^{13}C NMR spectrum of chinone **11b** (minor compound) in MeOD.

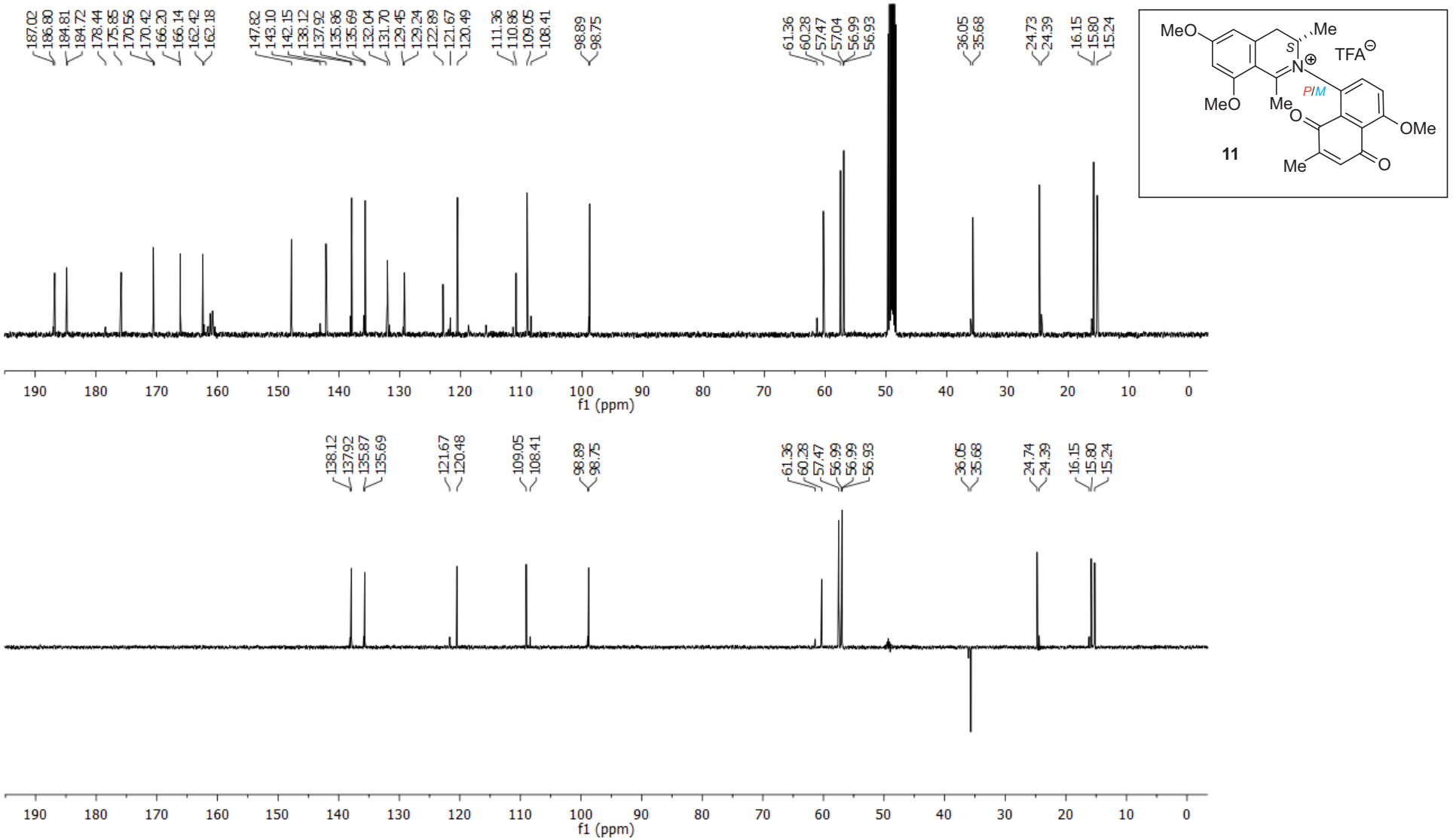


Figure 29: DEPT NMR spectrum of chinone **11** in MeOD.

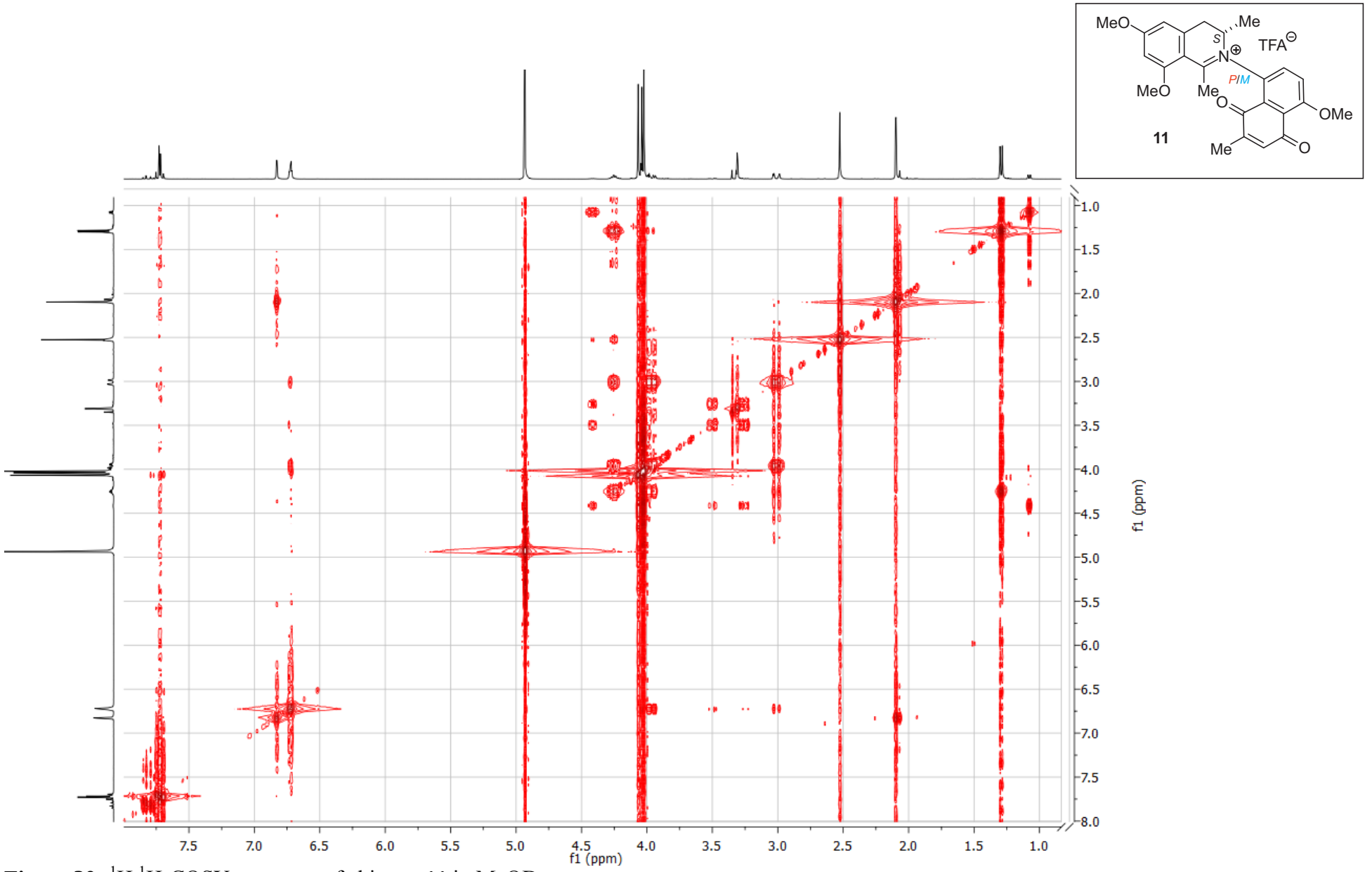


Figure 30: ^{1}H,^{1}H-COSY spectrum of chinone **11** in MeOD.

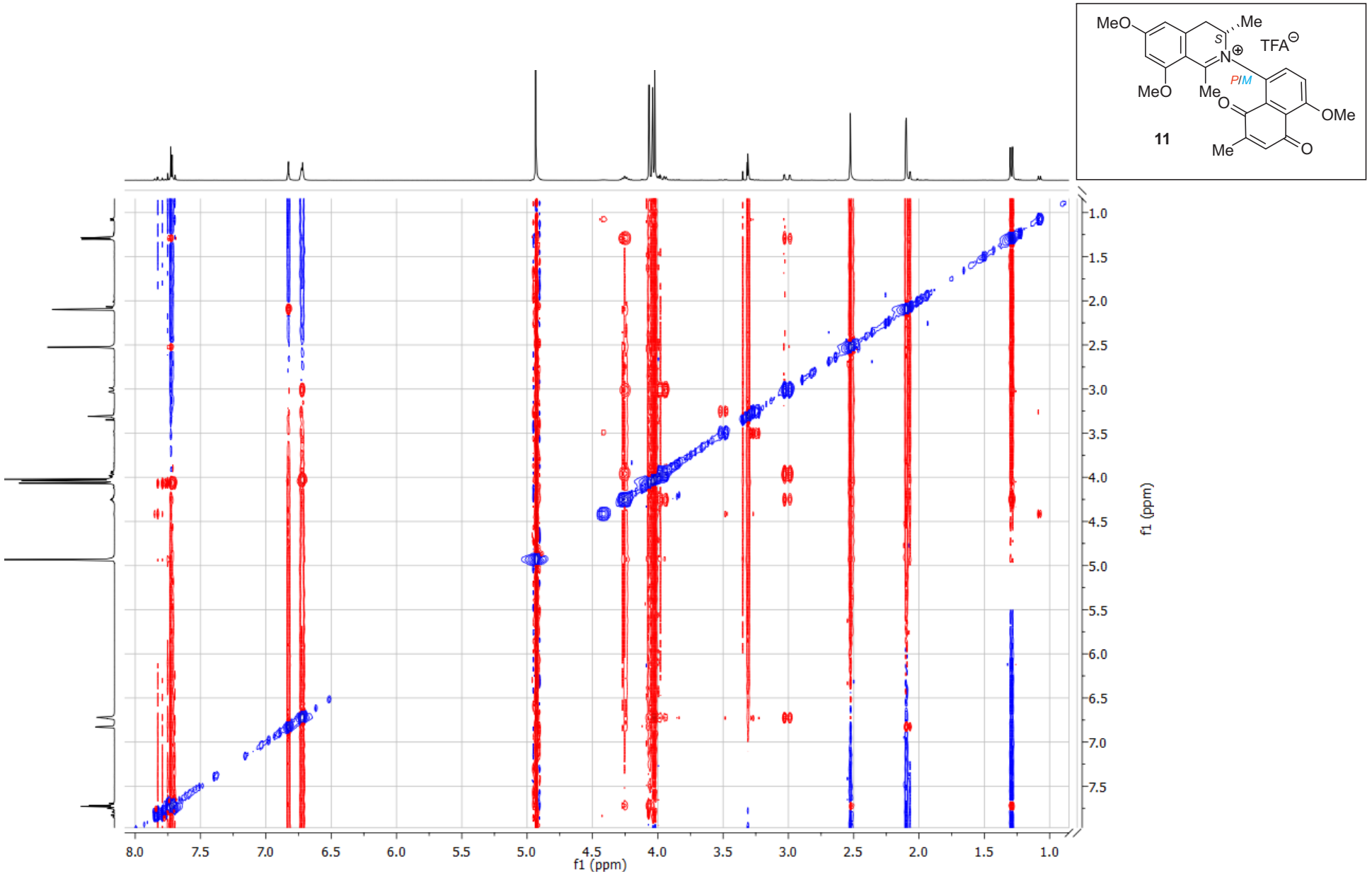


Figure 31: NOESY spectrum of chinone **11** in MeOD.

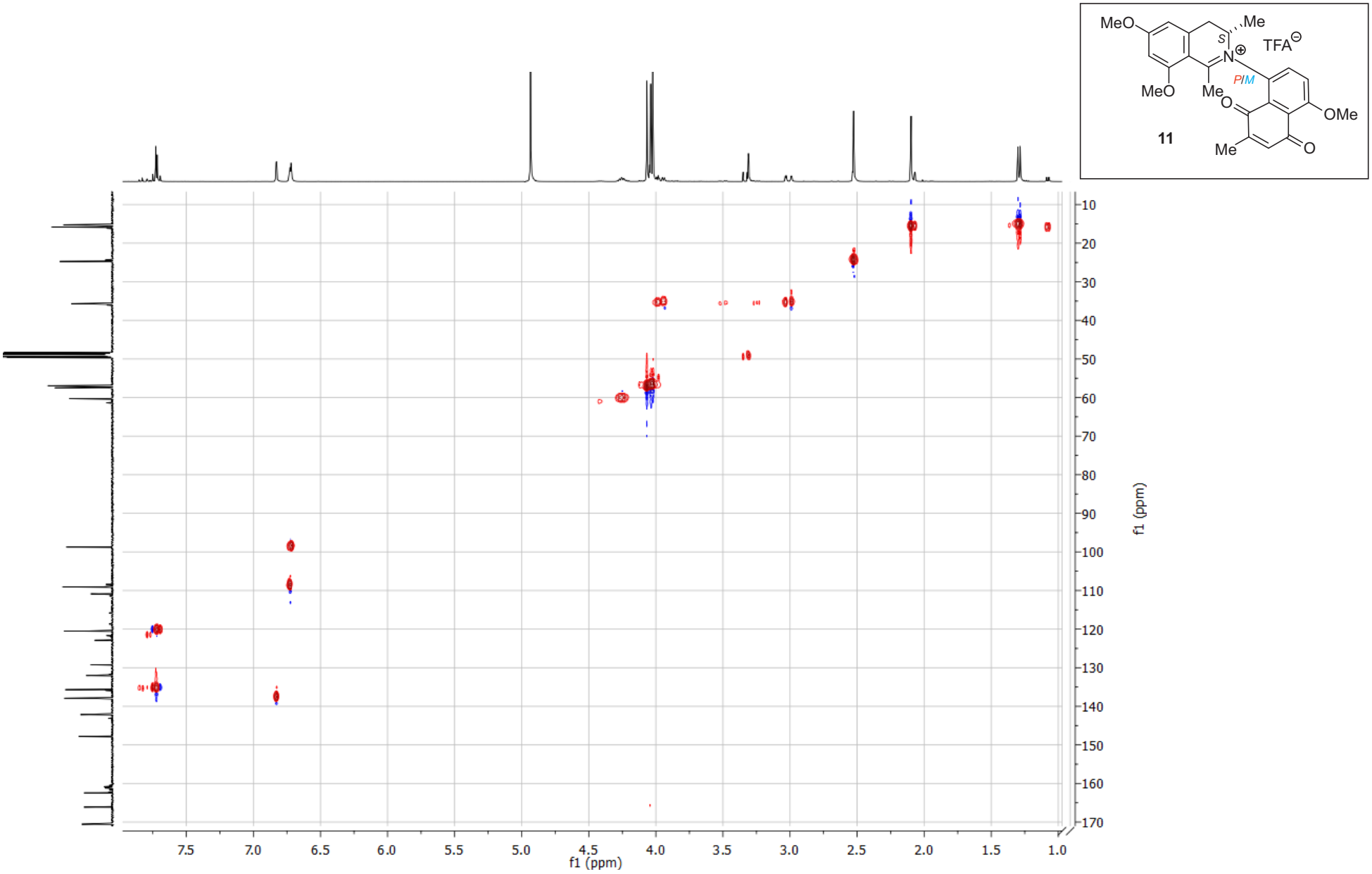


Figure 32: HSQC spectrum of chinone **11** in MeOD.

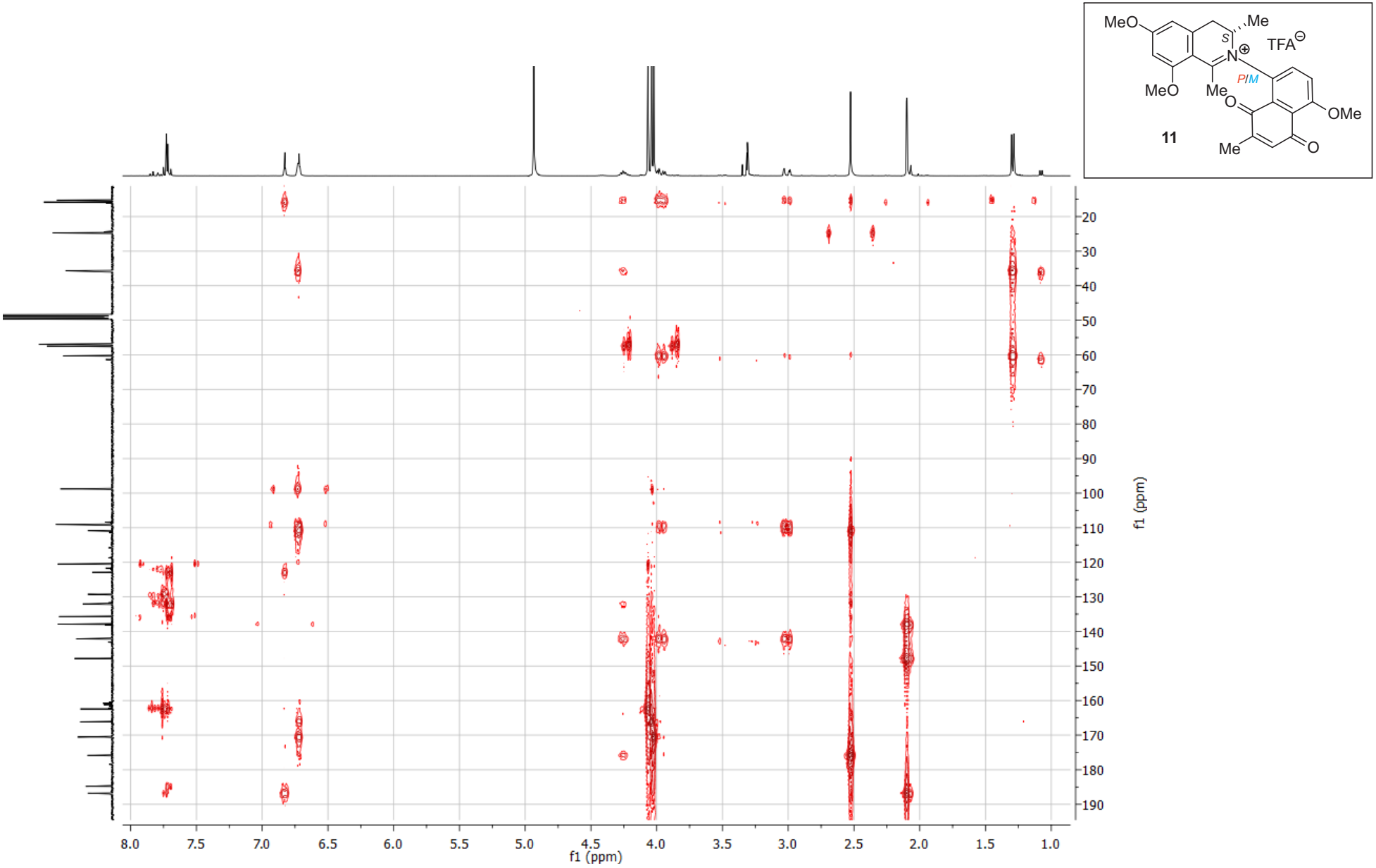


Figure 33: HMBC spectrum of chinone **11** in MeOD.

Mass Spectrum SmartFormula Report

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Comment	Seupel Raina A-Chinon 4 pmol/ul in MeOH		

Acquisition Parameter

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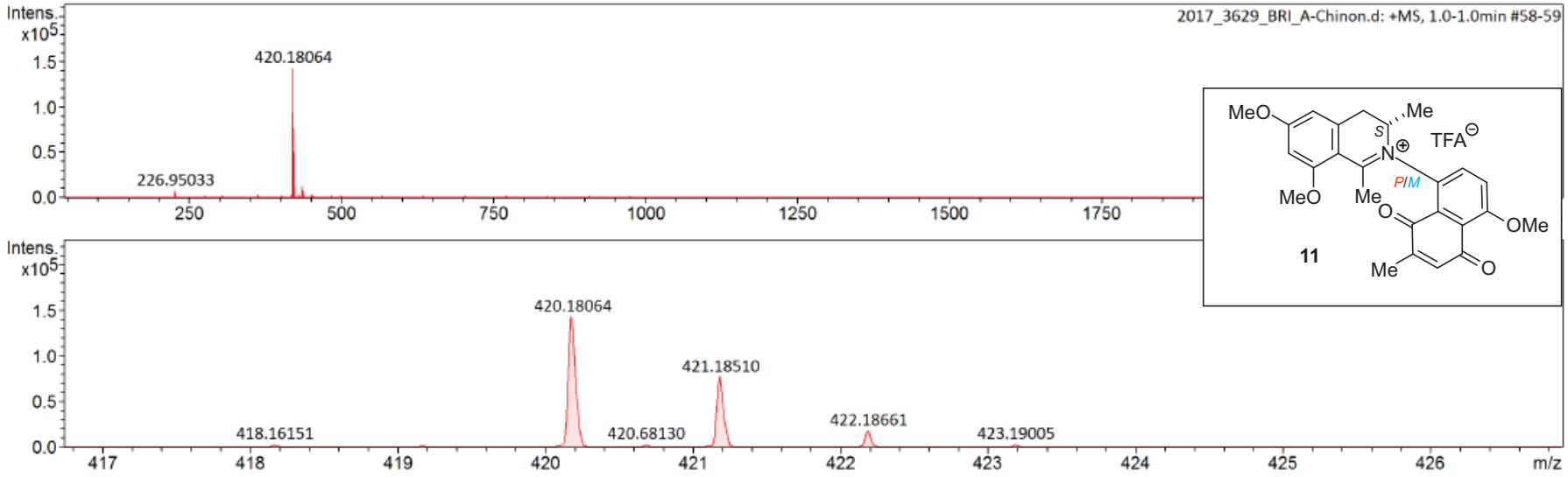

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420.18064	1	C25H26NO5	420.18055	-0.22	154.5	1	100.00	13.5	even	ok

Figure 34: HRESI mass spectrum of chinone **11**.

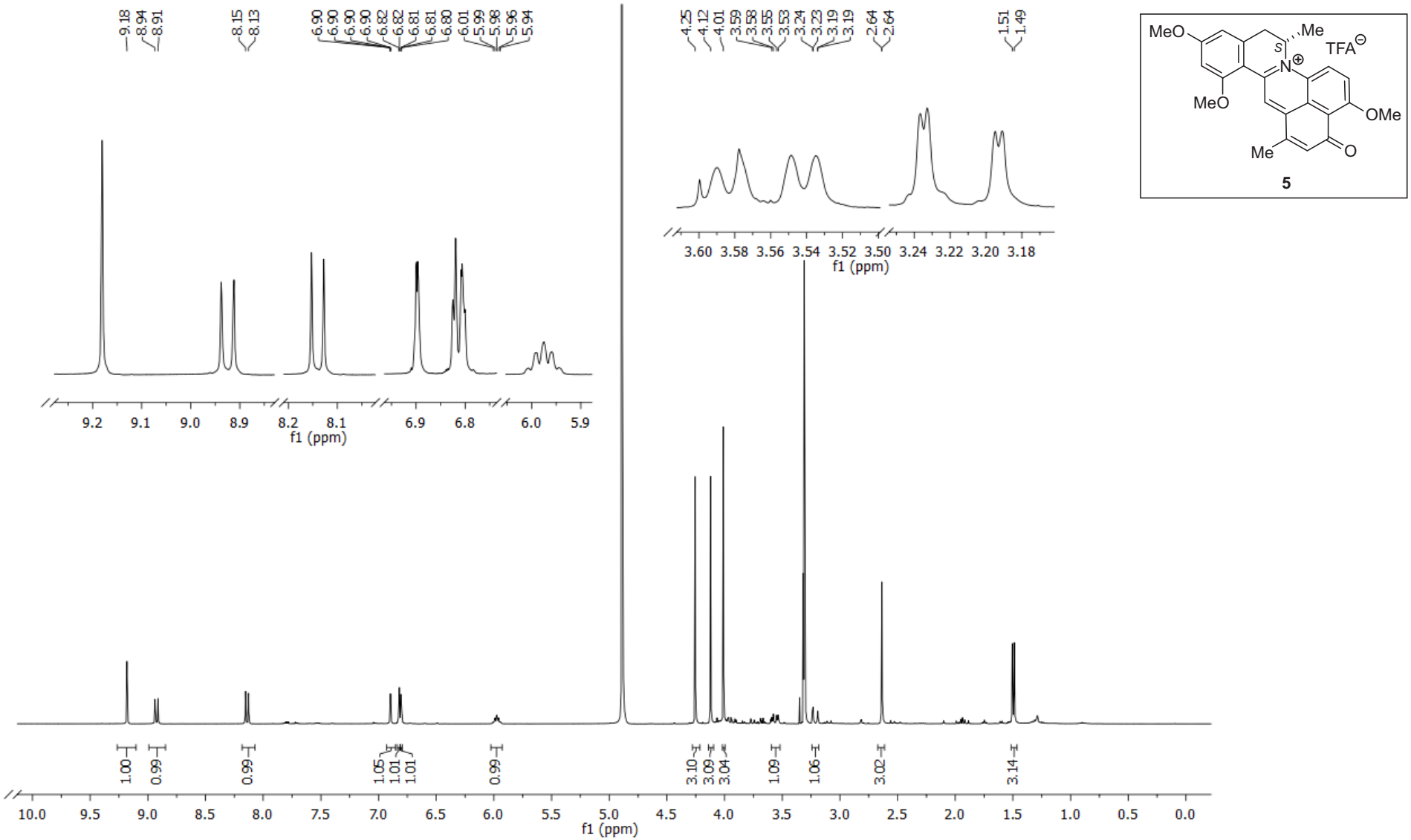

Figure 35: [1]H NMR spectrum of synthetic ancistrocyclinone A (**5**) in MeOD.

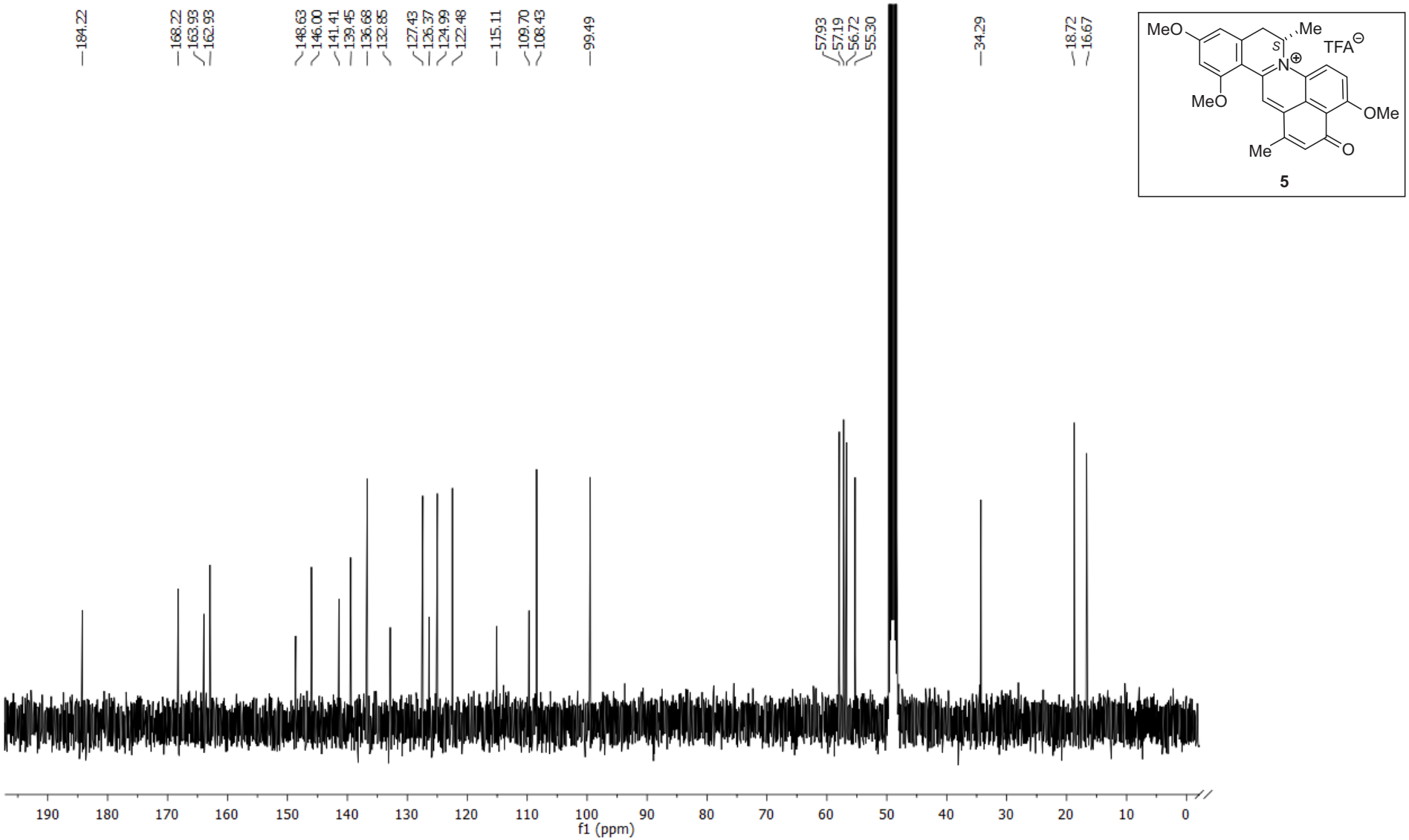

Figure 36: ^{13}C NMR spectrum of synthetic ancistrocyclinone A (**5**) in MeOD.

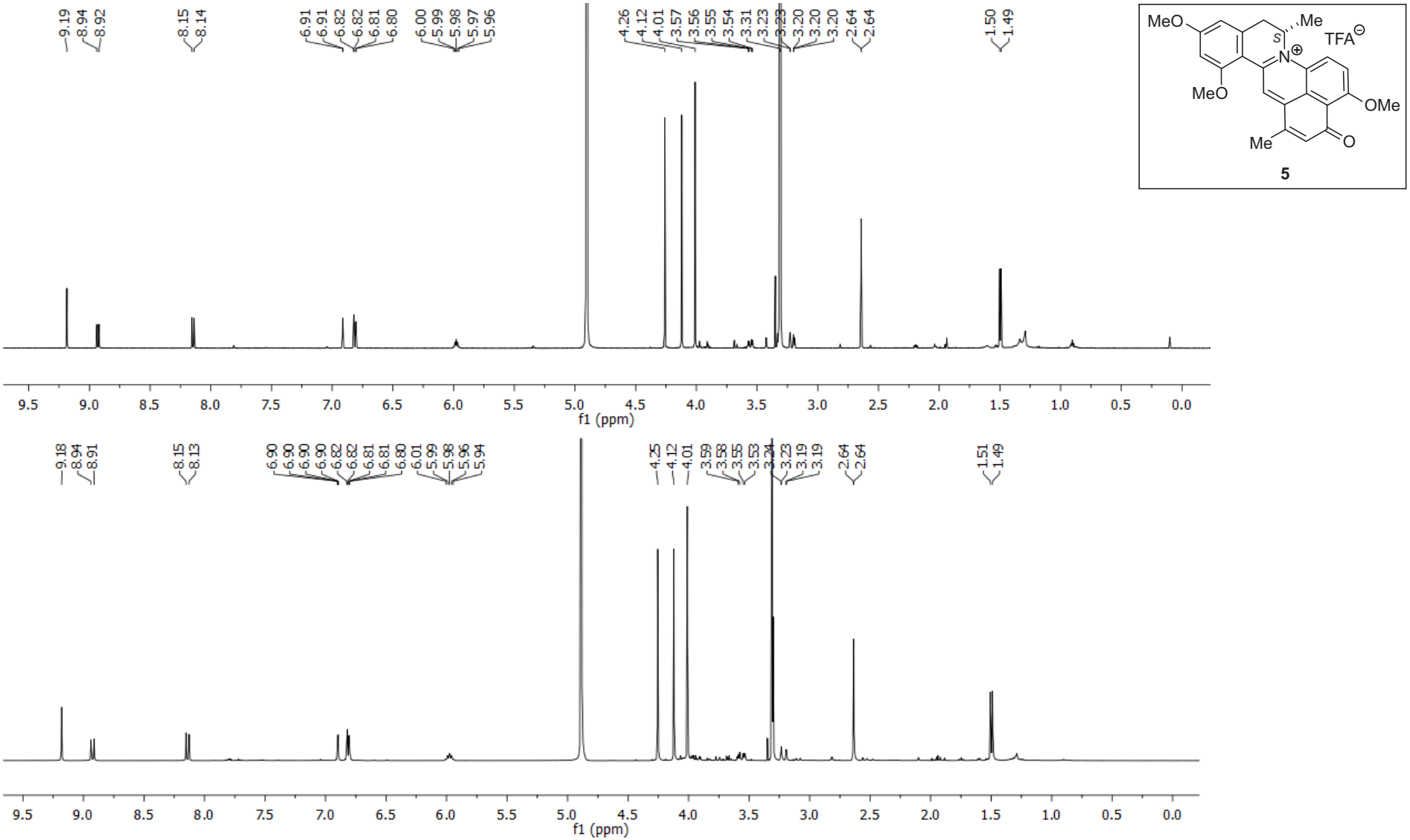

Figure 37: Comparison of the ^{1}H NMR spectra of isolated (top) and synthetic (bottom) ancistrocyclinone A (**5**).

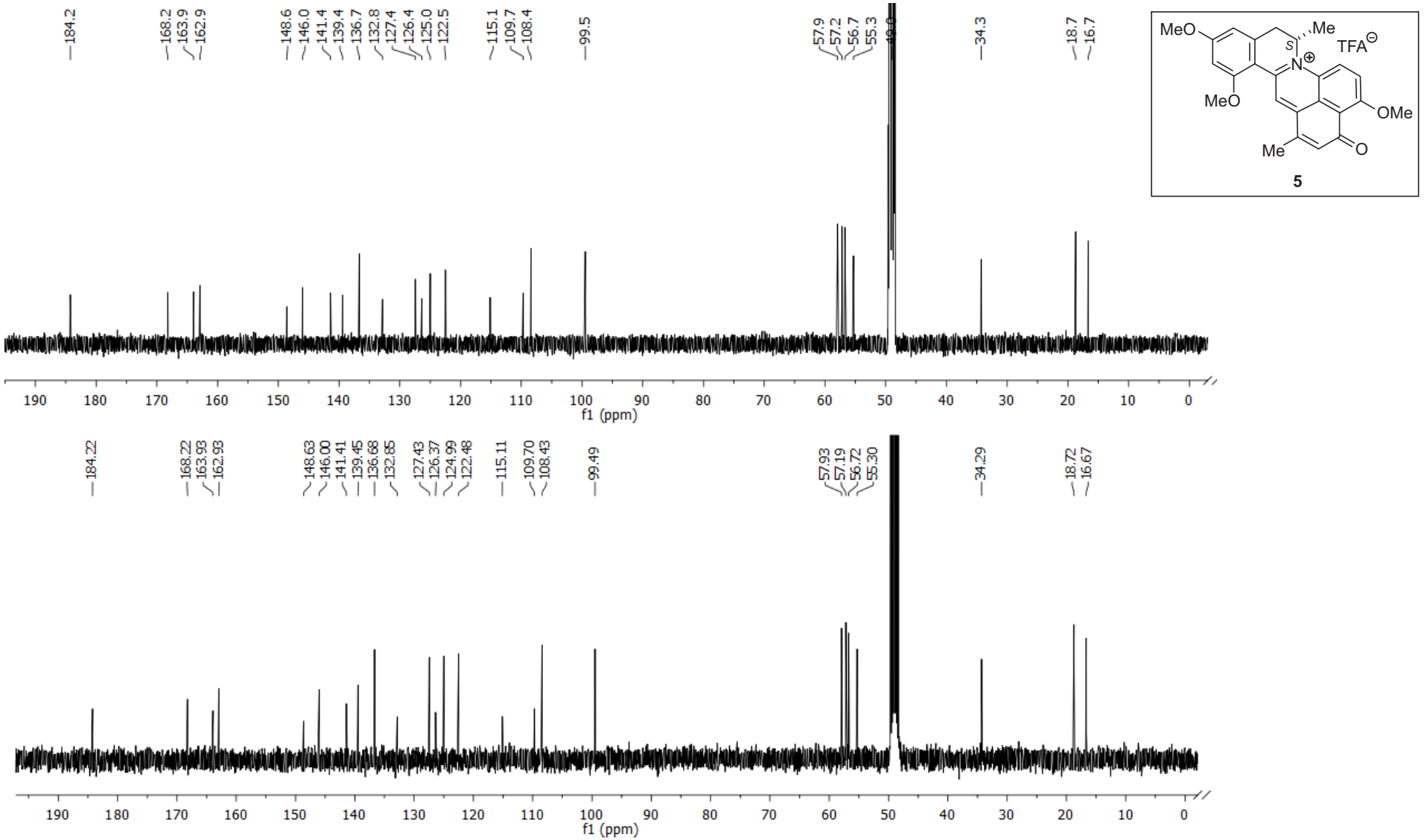

Figure 38: Comparison of the ^{13}C NMR spectra of isolated (top) and synthetic (bottom) ancistrocyclinone A (**5**).

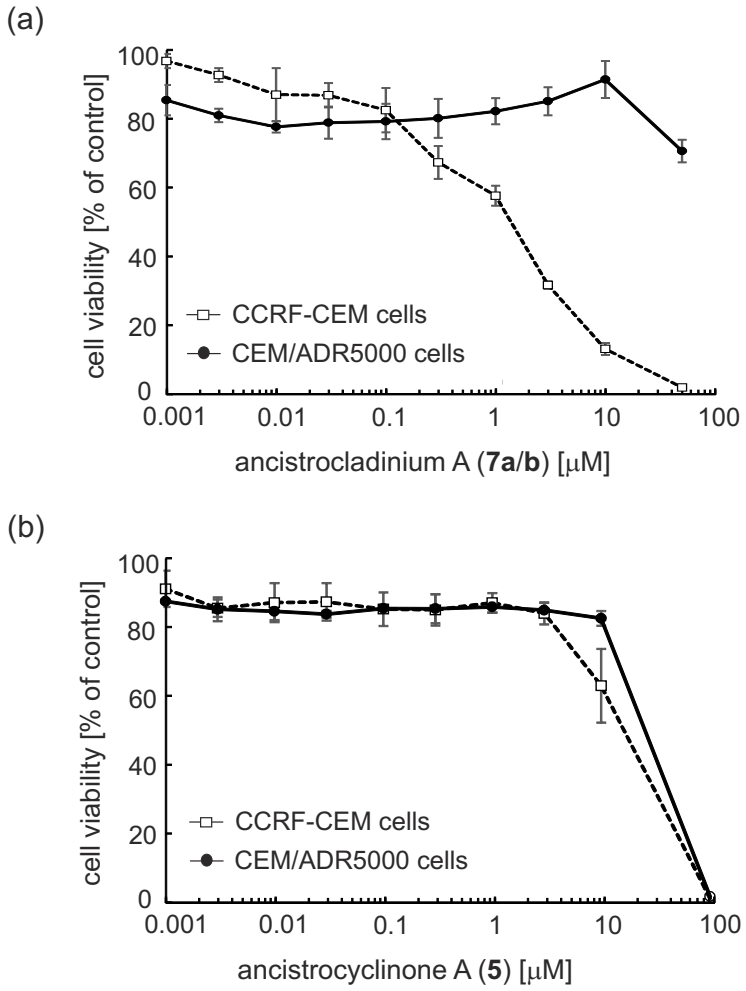

Figure 39: Cytotoxic activities of ancistrocladinium A (**7a**/**b**) and ancistrocyclinone A (**5**) against parental drug-sensitive CCRF-CEM leukemia cells and their multi-drug resistant subline, CEM/ADR5000. The compounds were dissolved in DMSO (< 1%) and cell culture medium at concentrations of 0.001, 0.003, 0.01, 0.03, 0.1, 0.3, 1, 3, 10, and 100 μM. Cell viability was assessed by the resazurin assay. Mean values and standard deviation of three independent experiments with each six parallel measurements are shown.