

Supplementary Information for:

Synthesis of Novel C/D Ring Modified Bile Acids

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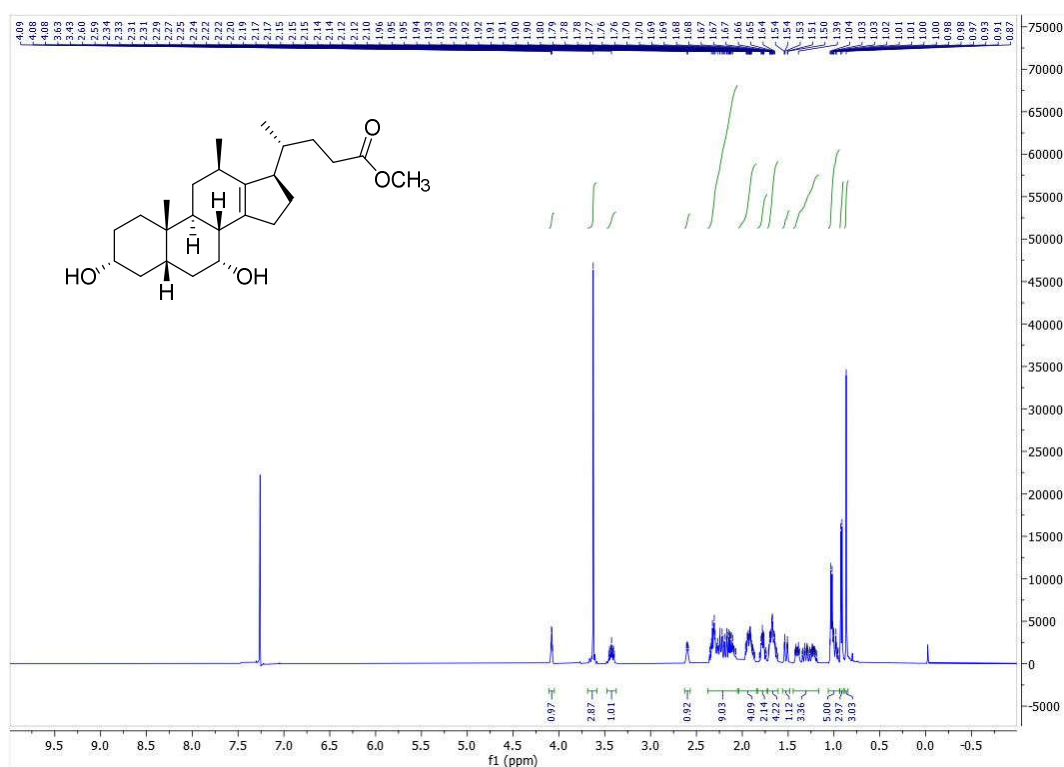
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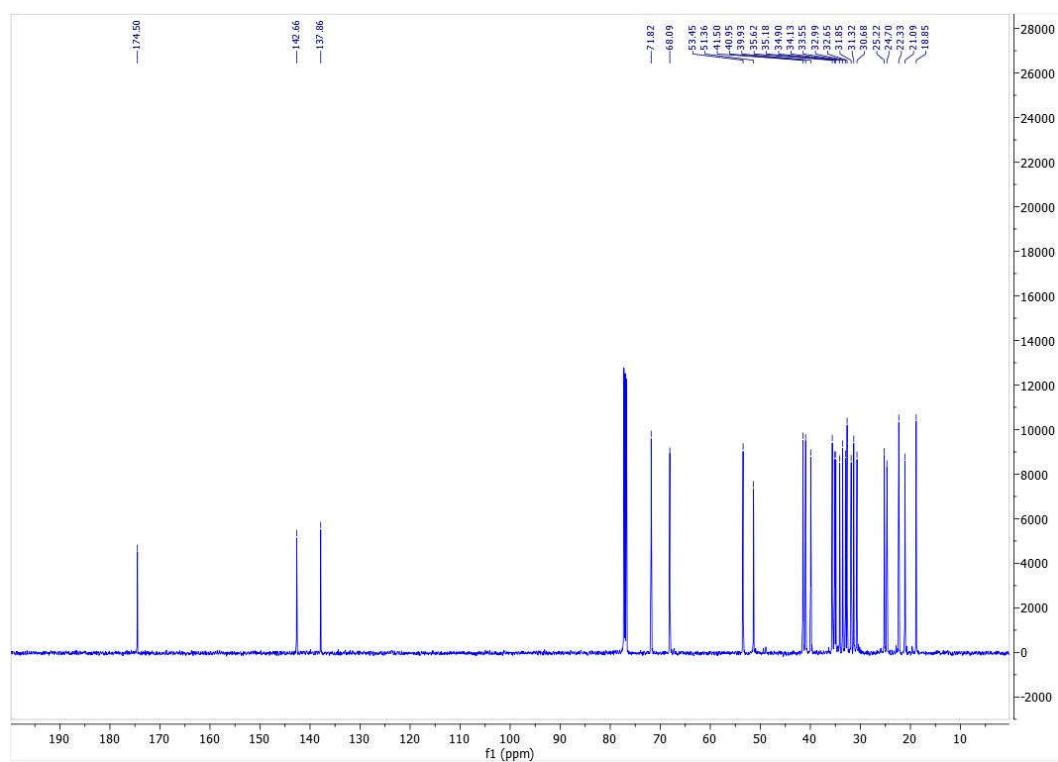
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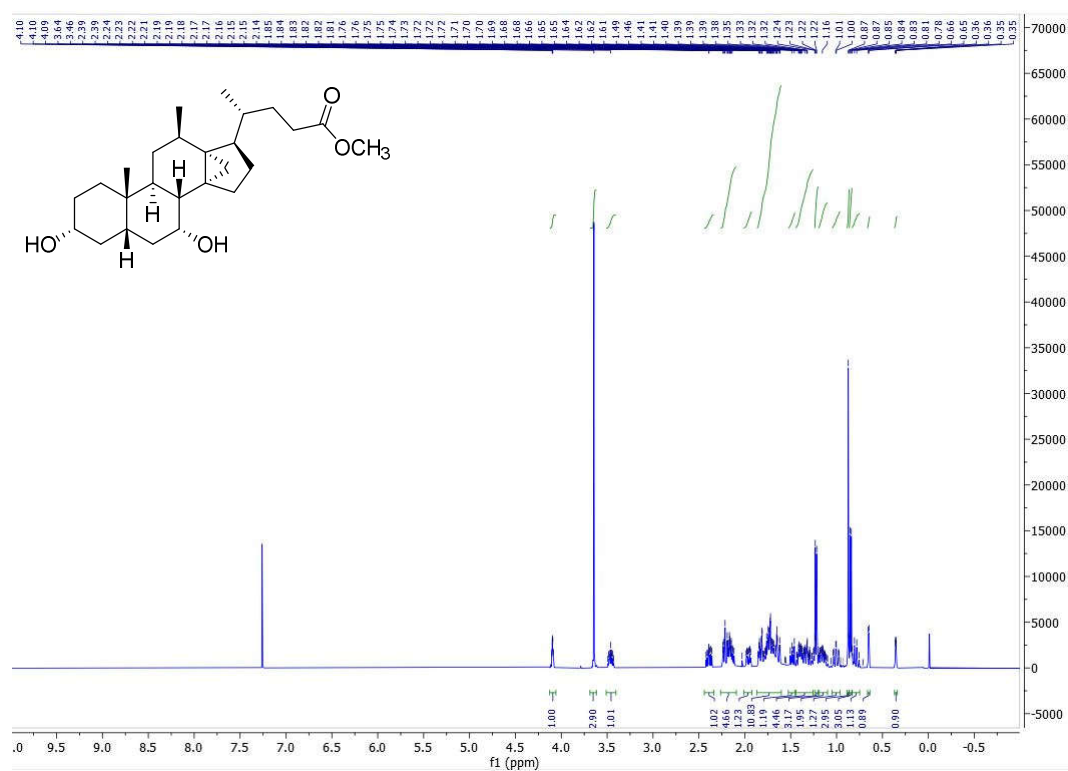
^1H NMR spectrum of compound **16** (500 MHz, CDCl_3)



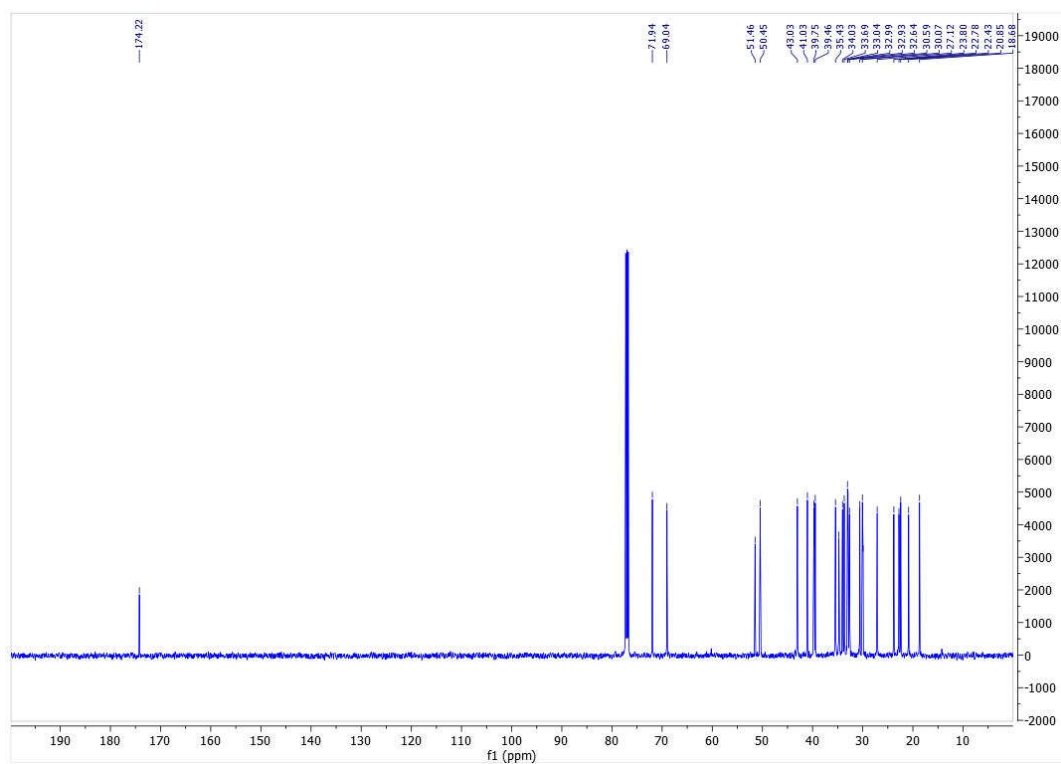
^{13}C NMR spectrum of compound **16** (126 MHz, CDCl_3)



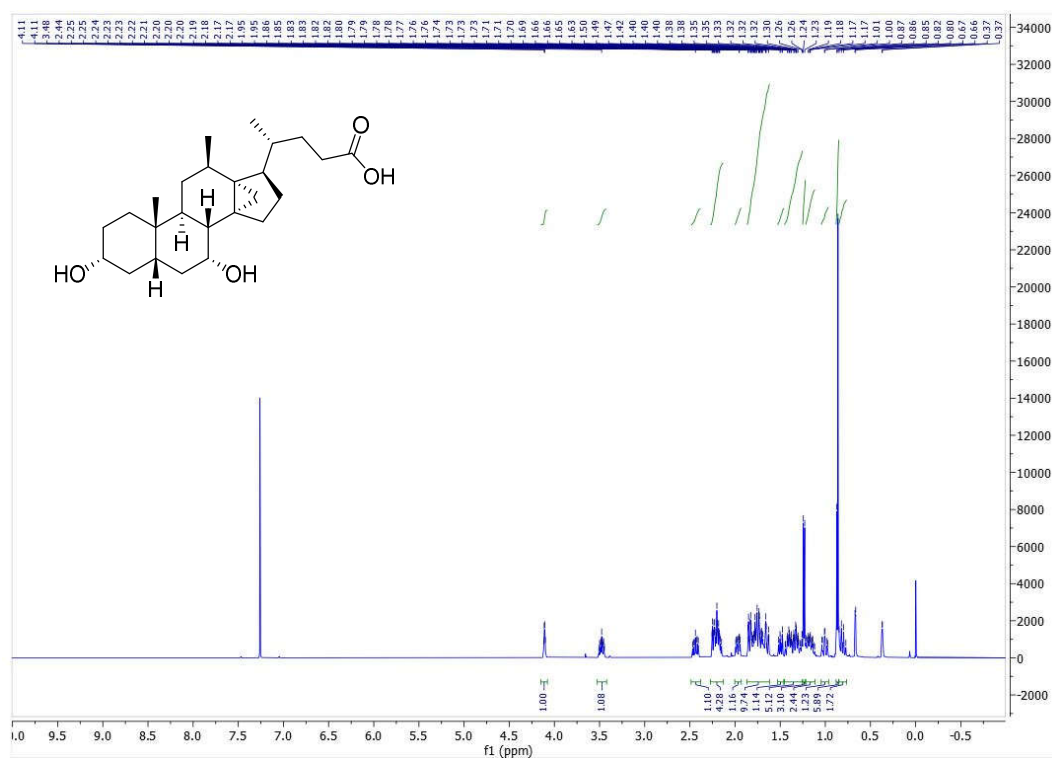
^1H NMR spectrum of compound **17** (500 MHz, CDCl_3)



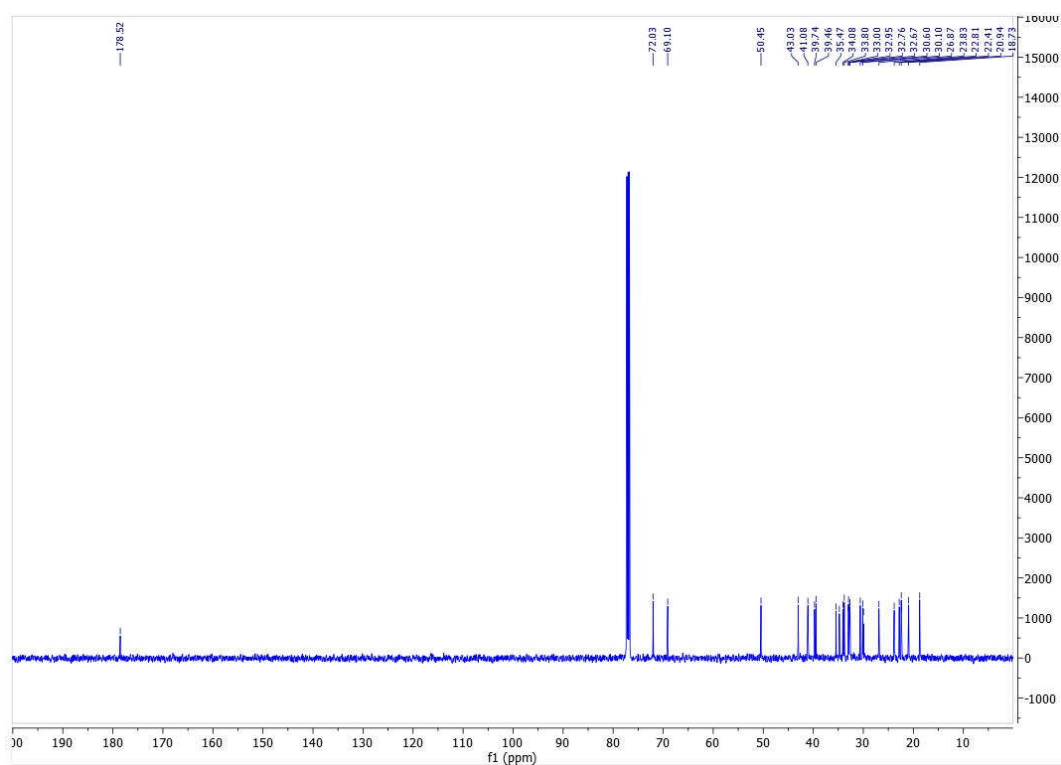
^{13}C NMR spectrum of compound **17** (126 MHz, CDCl_3)



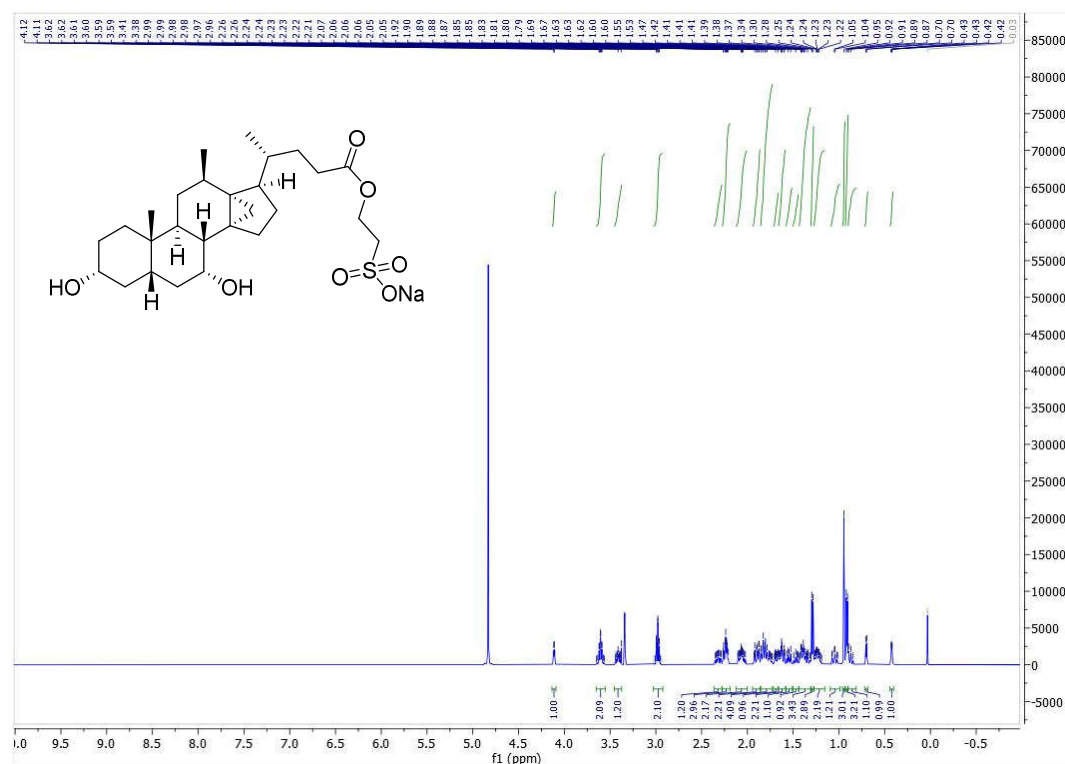
^1H NMR spectrum of compound **18** (500 MHz, CDCl_3)



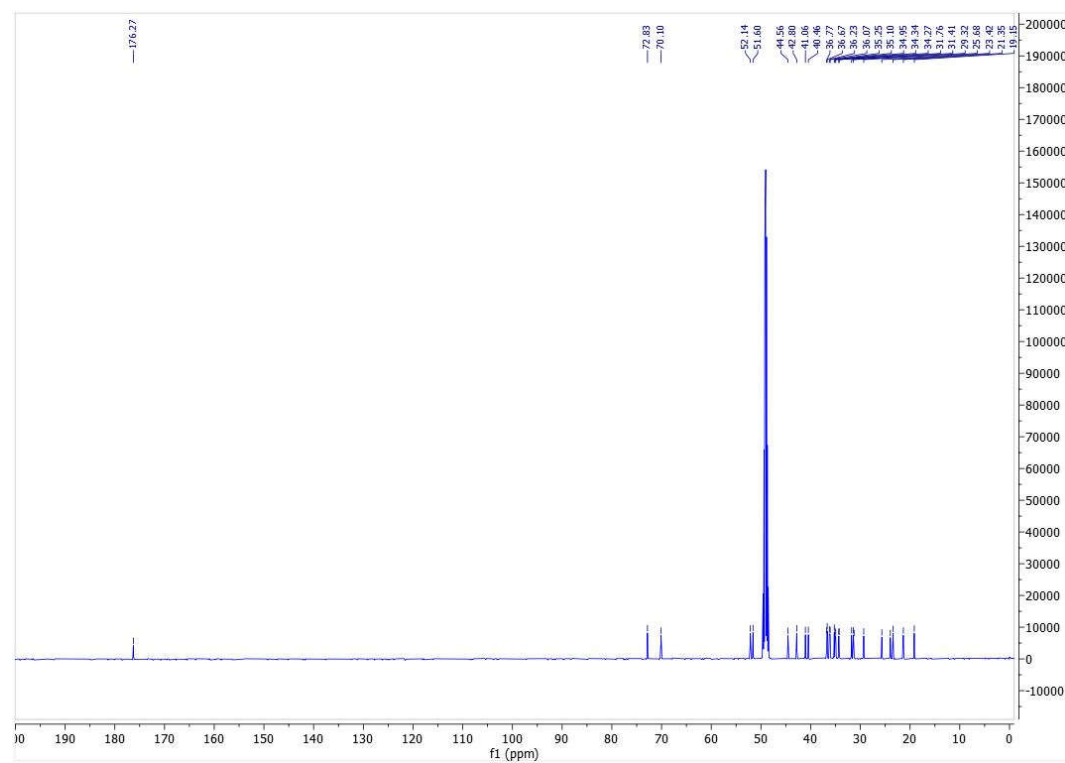
^{13}C NMR spectrum of compound **18** (126 MHz, CDCl_3)



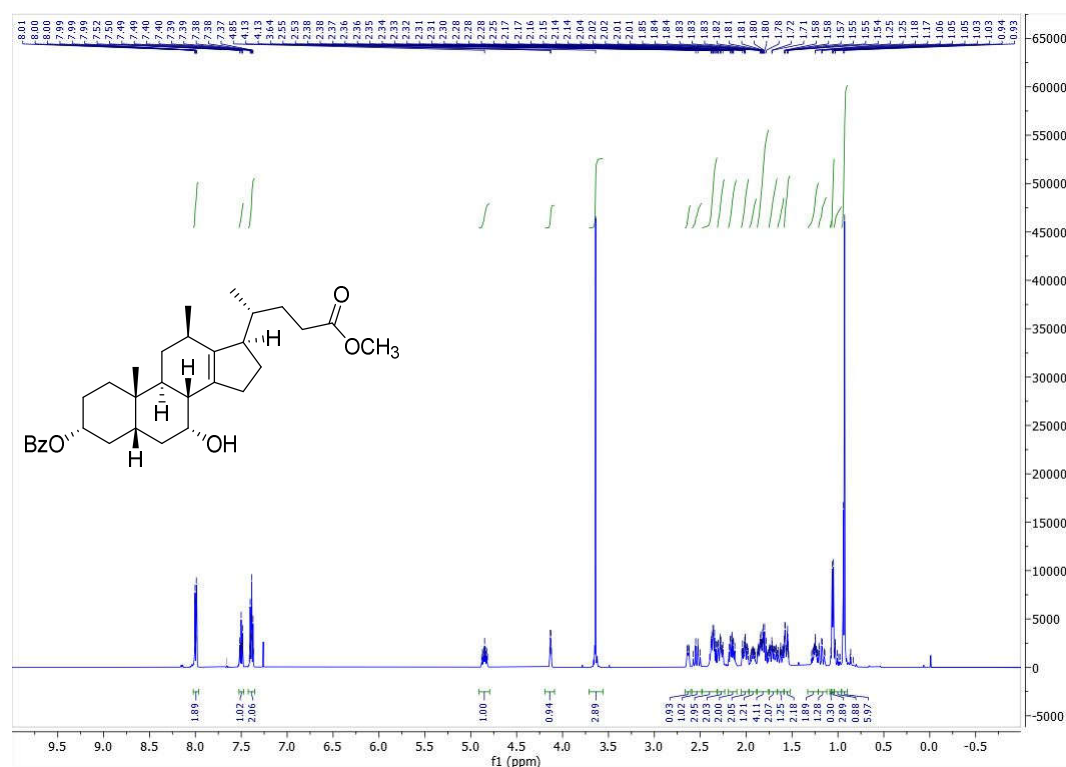
^1H NMR spectrum of compound **19** (500 MHz, CD_3OD)



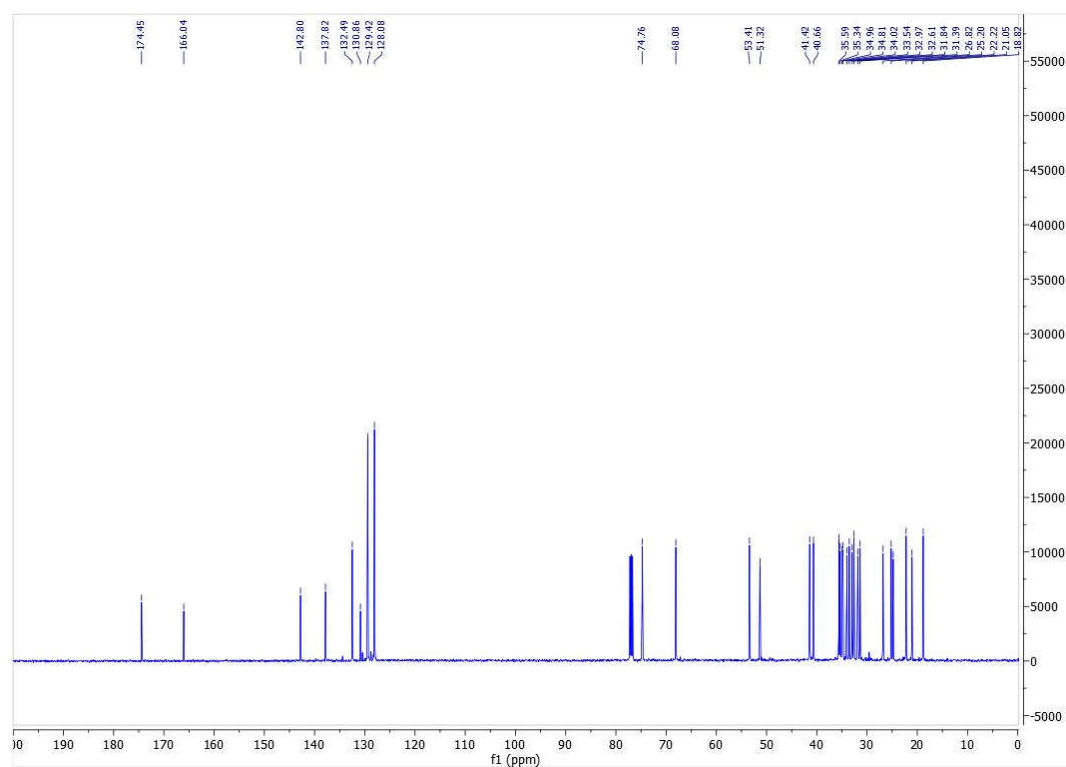
^{13}C NMR spectrum of compound **19** (126 MHz, CD_3OD)



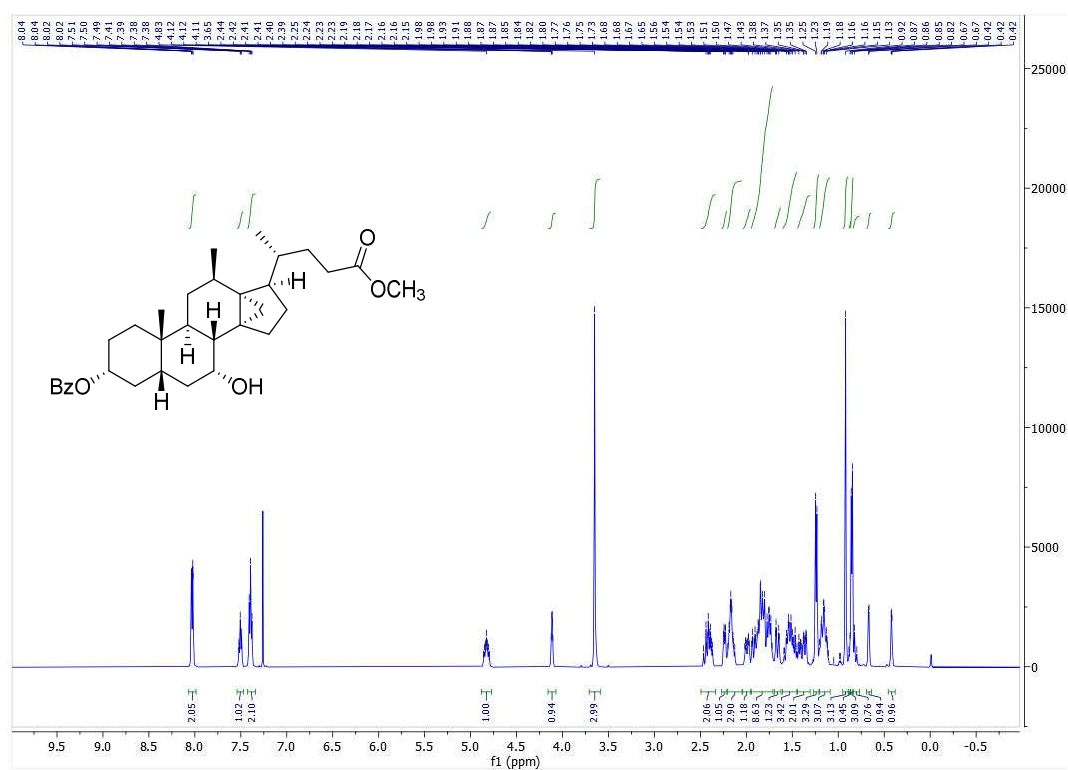
^1H NMR spectrum of compound **20** (500 MHz, CDCl_3)



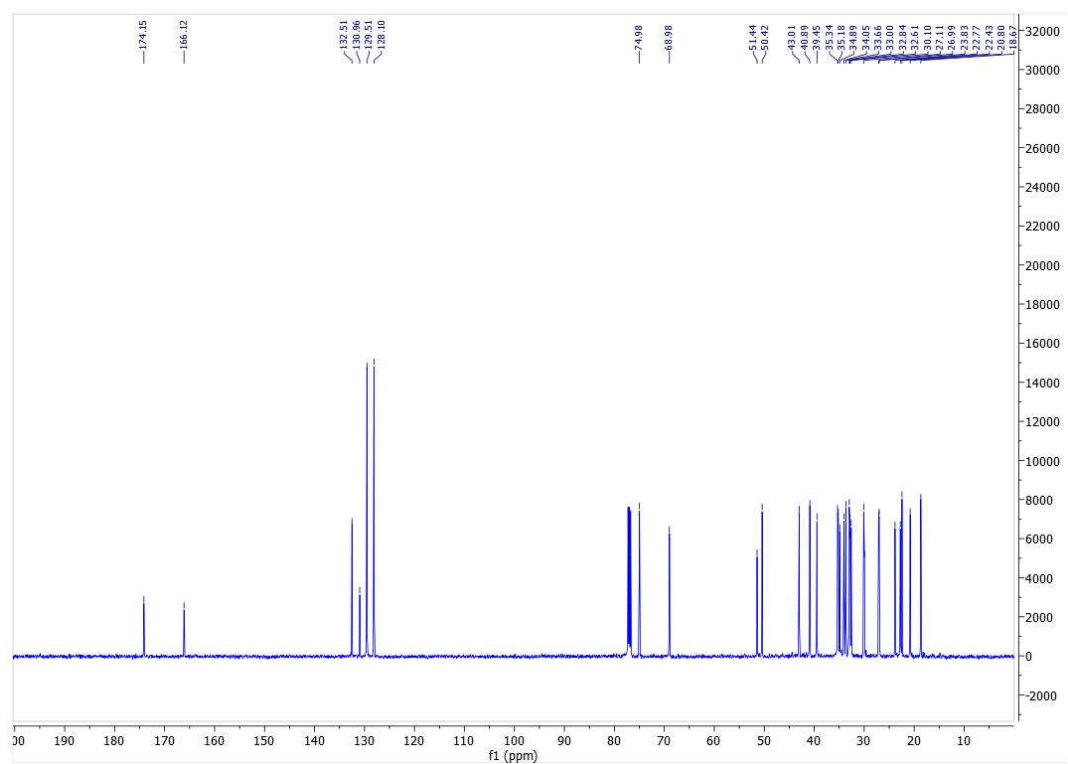
^{13}C NMR spectrum of compound **20** (126 MHz, CDCl_3)



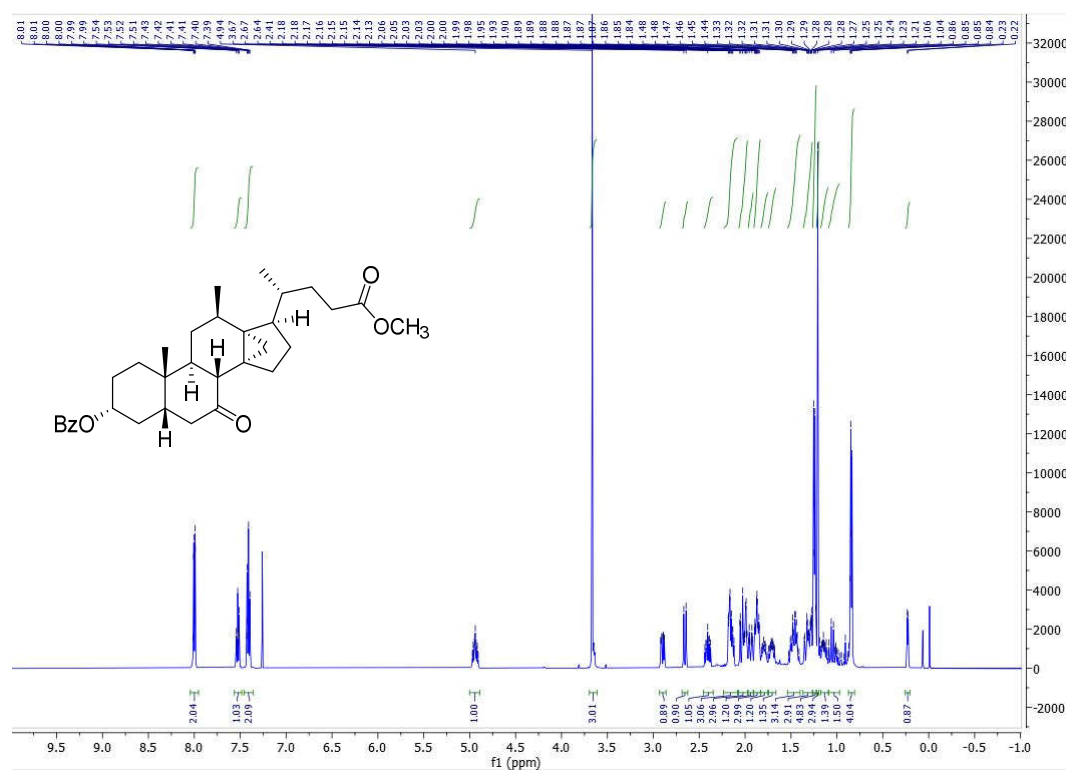
^1H NMR spectrum of compound **21** (500 MHz, CDCl_3)



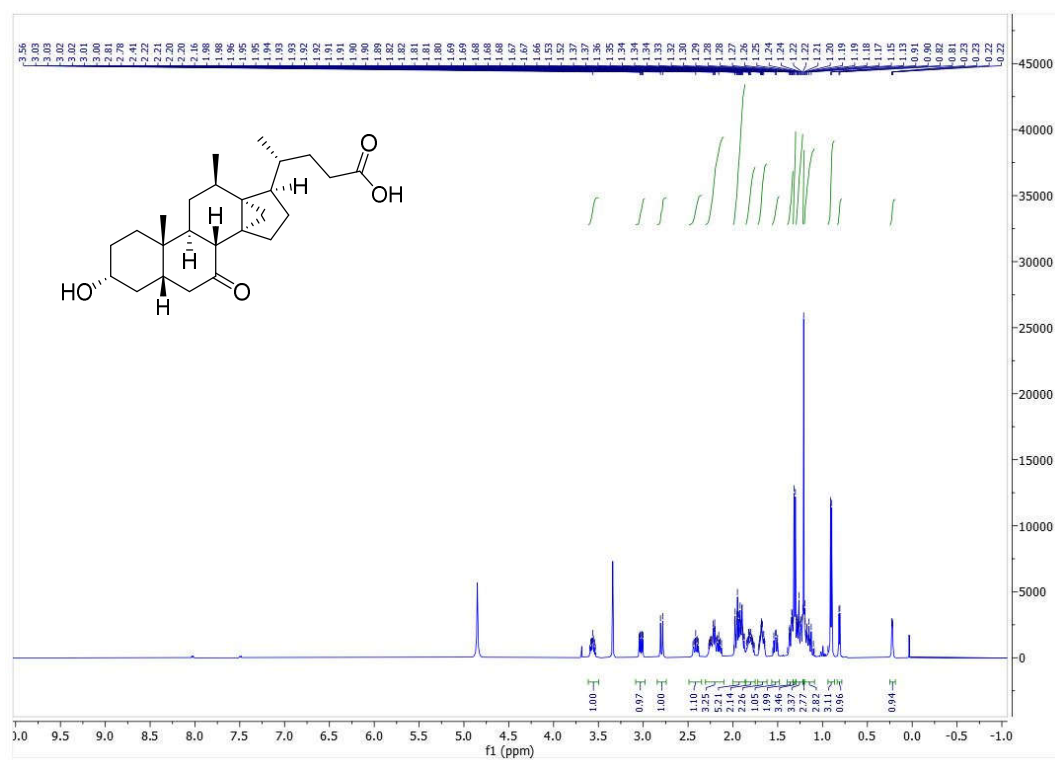
^{13}C NMR spectrum of compound **21** (126 MHz, CDCl_3)



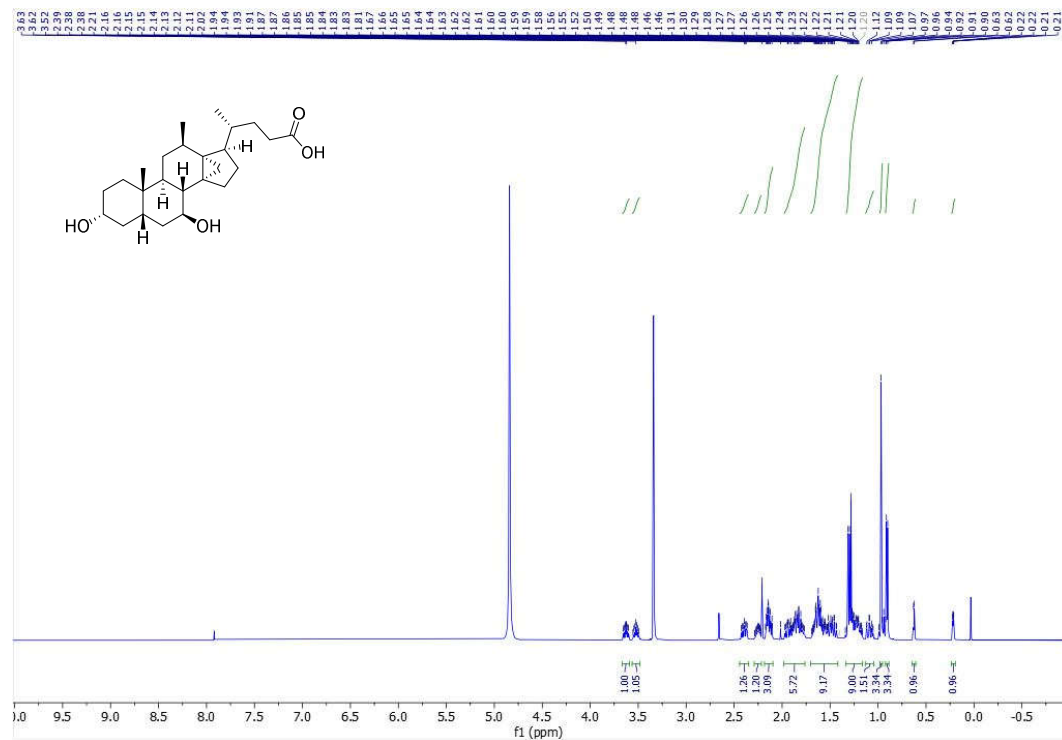
^1H NMR spectrum of compound **22** (500 MHz, CDCl_3)



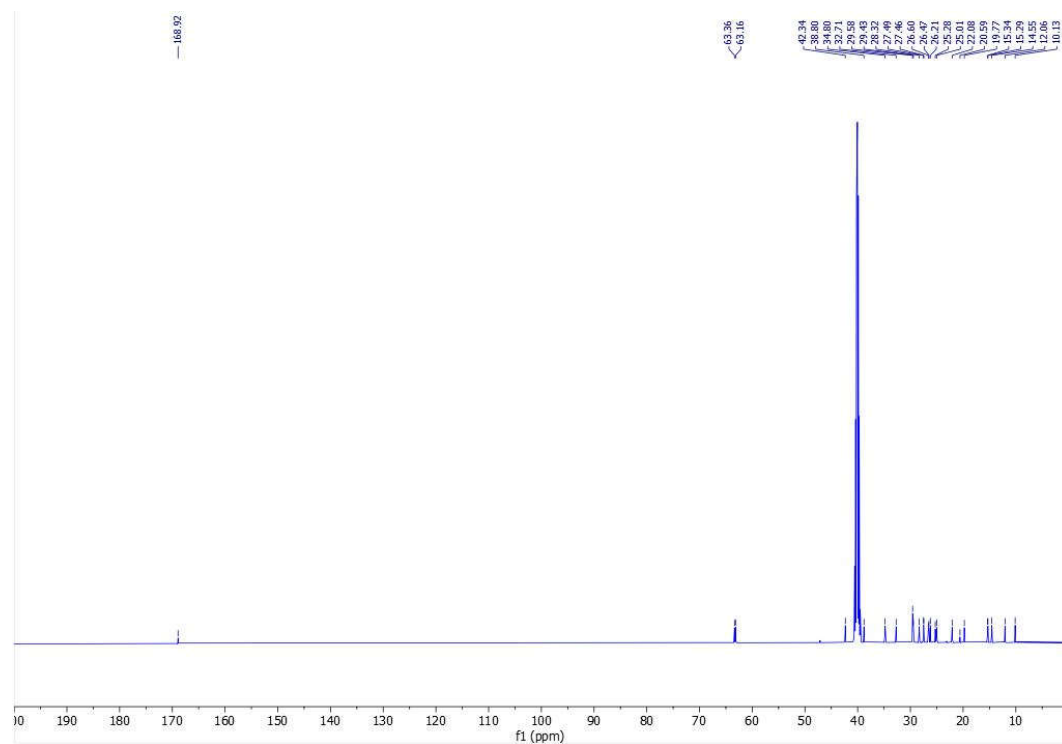
^1H NMR spectrum of compound **23** (500 MHz, CD_3OD)



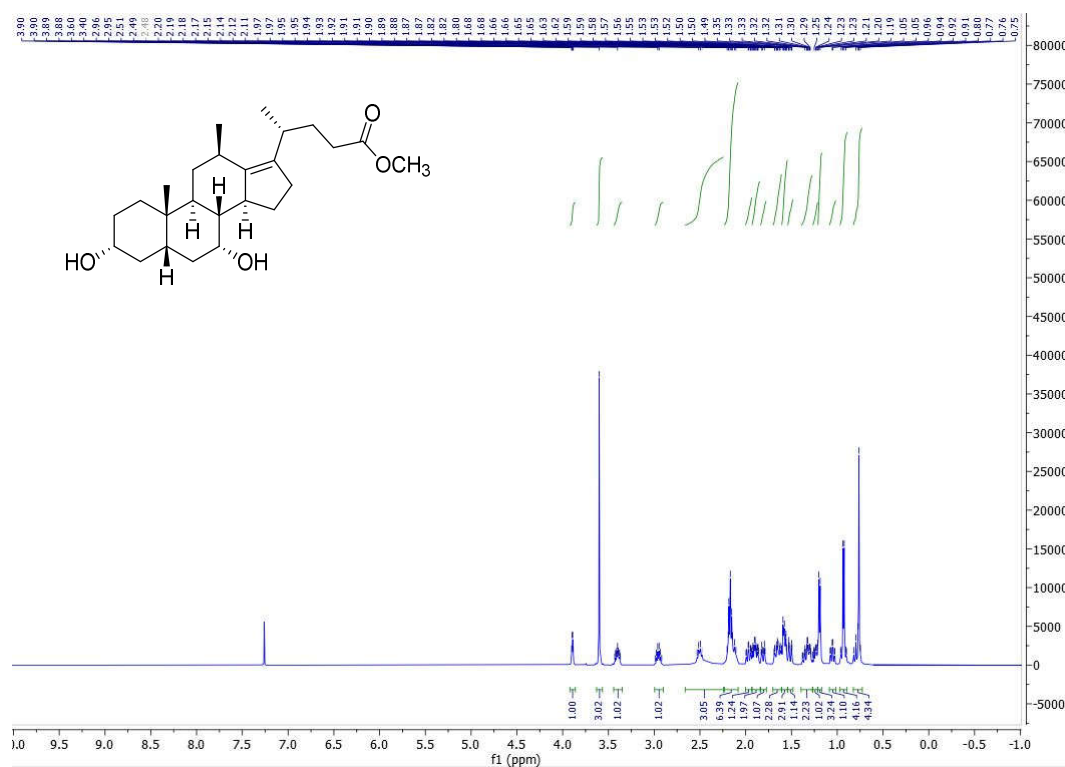
^1H NMR spectrum of compound **24** (500 MHz, CD_3OD)



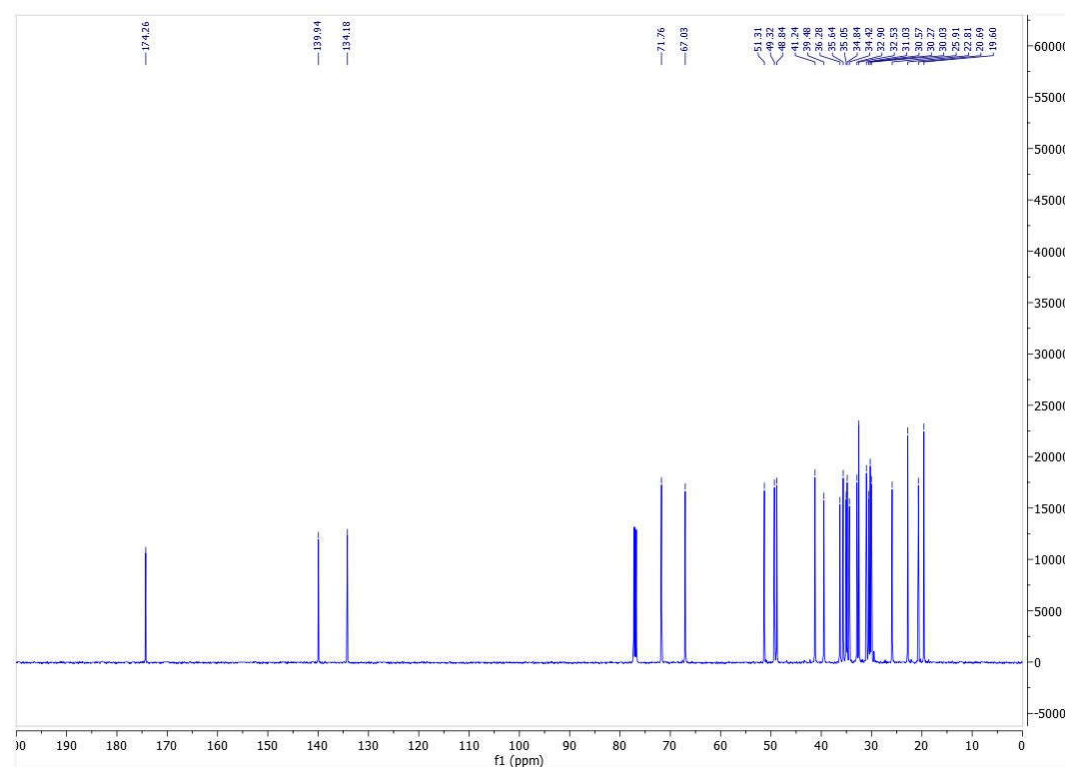
^{13}C NMR spectrum of compound **24** (126 MHz, CD_3OD)



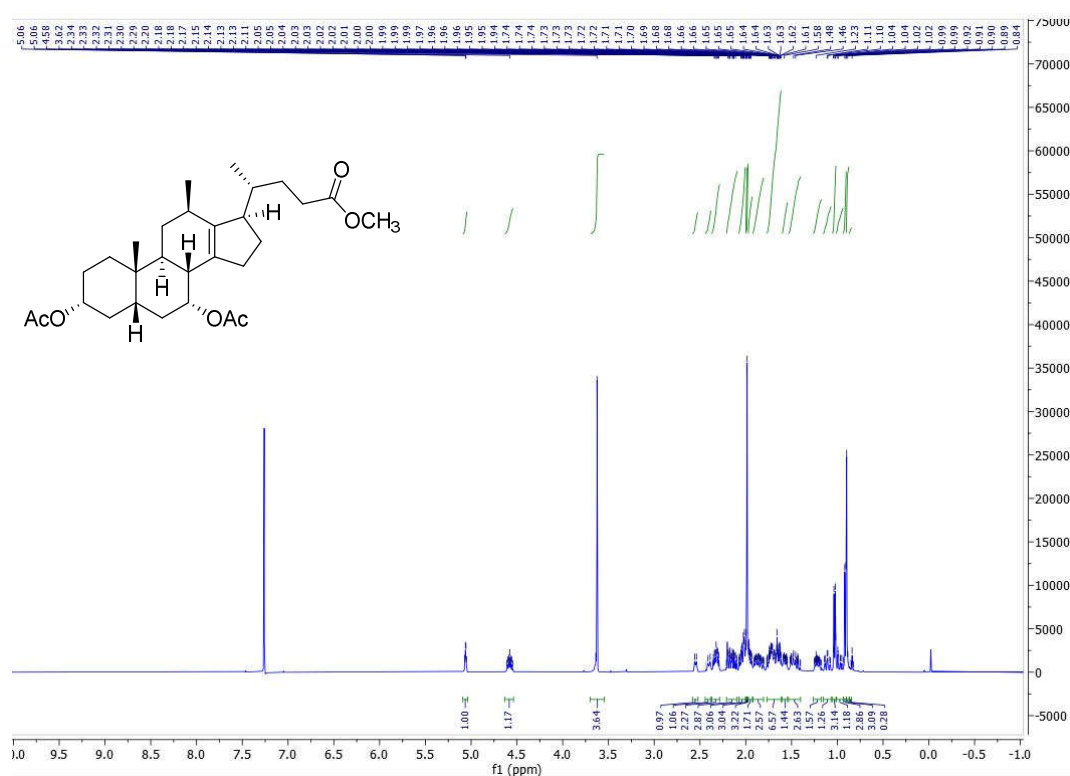
^1H NMR spectrum of compound **25** (500 MHz, CDCl_3)



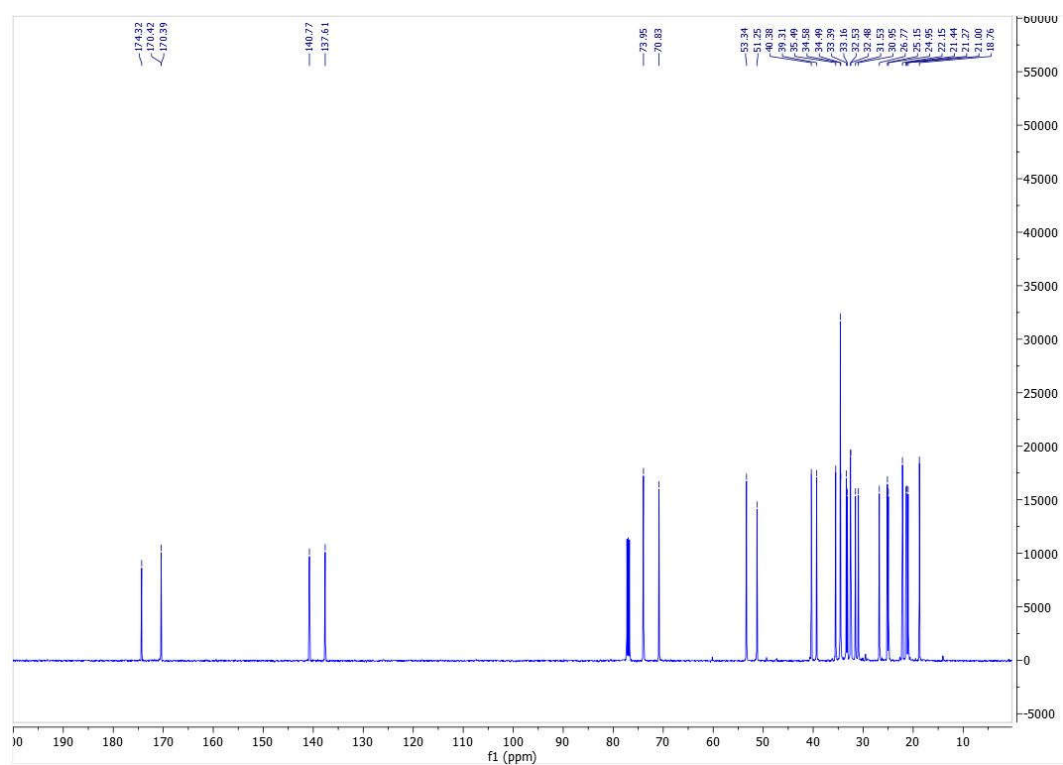
^{13}C NMR spectrum of compound **25** (126 MHz, CDCl_3)

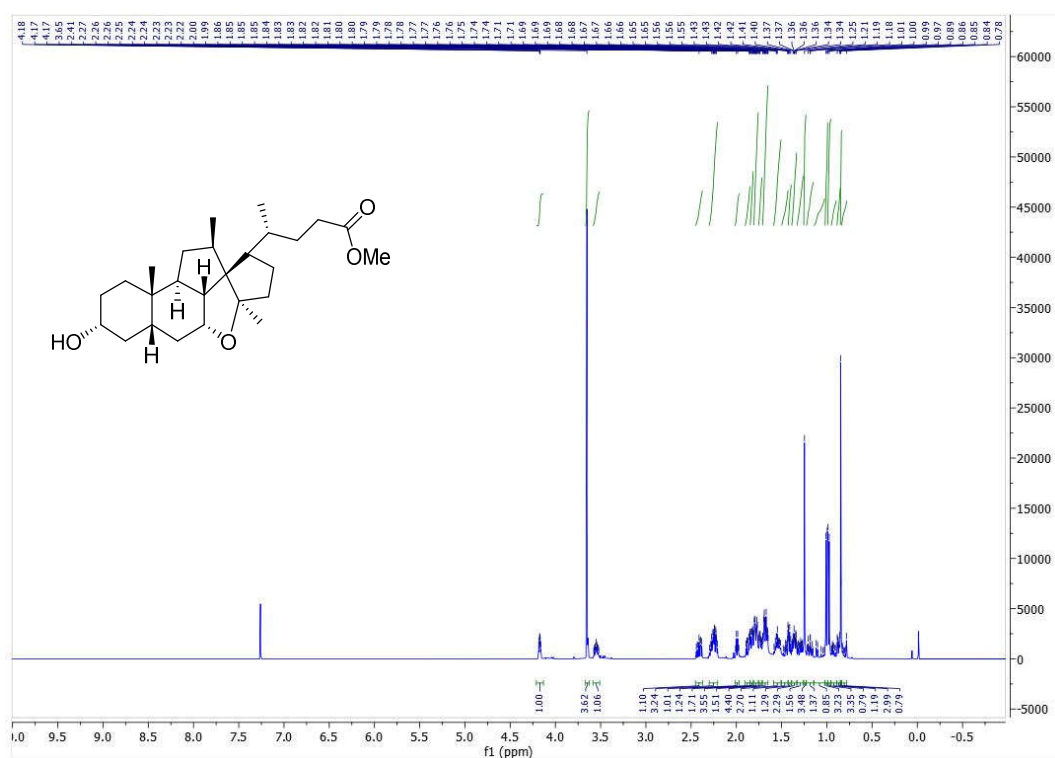


¹H NMR spectrum of compound **27** (500 MHz, CDCl₃)

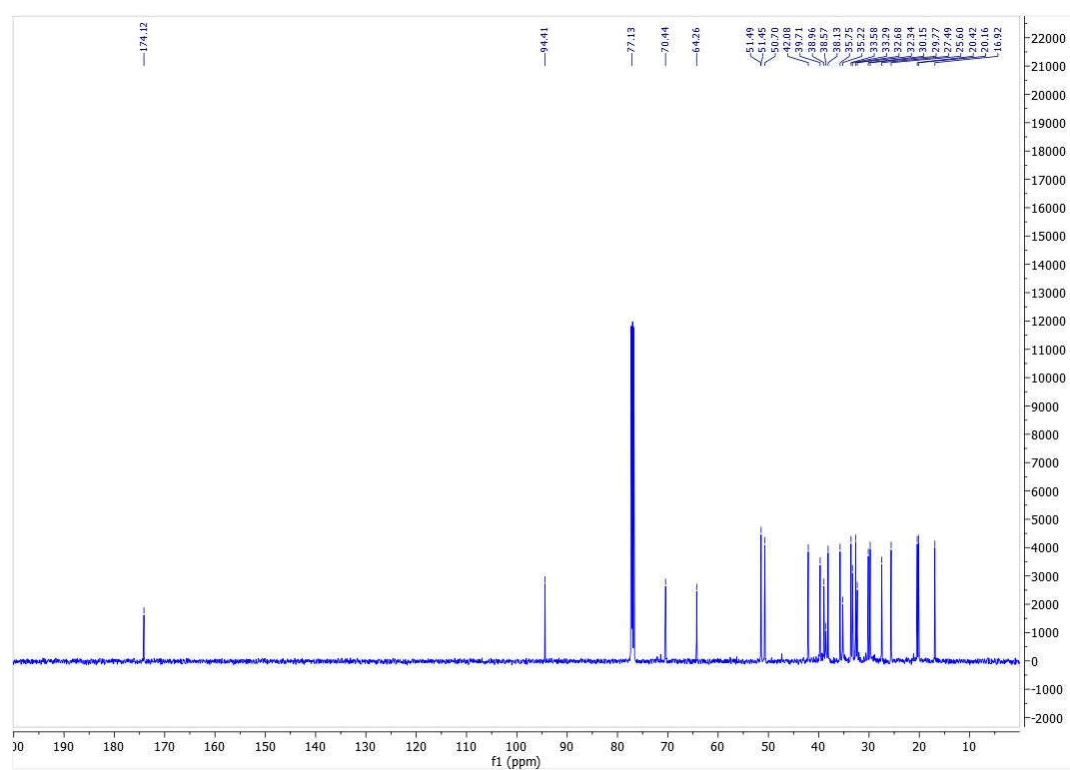


¹³C NMR spectrum of compound **27** (126 MHz, CDCl₃)

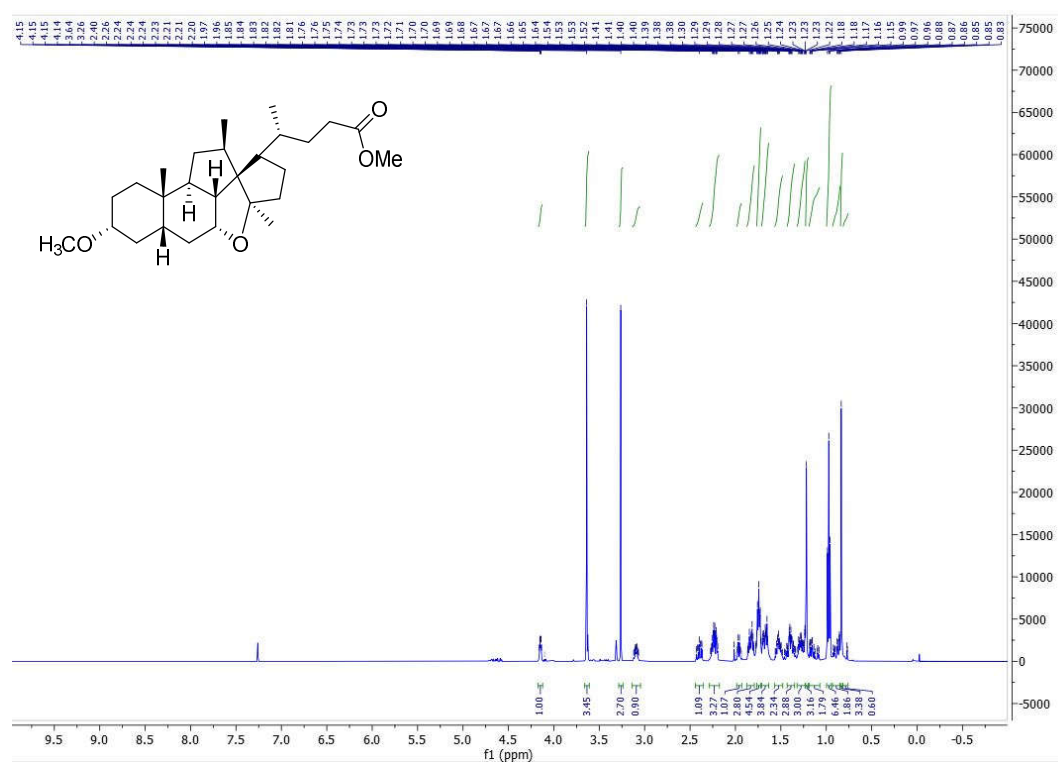


¹H NMR spectrum of compound **29** (500 MHz, CDCl₃)

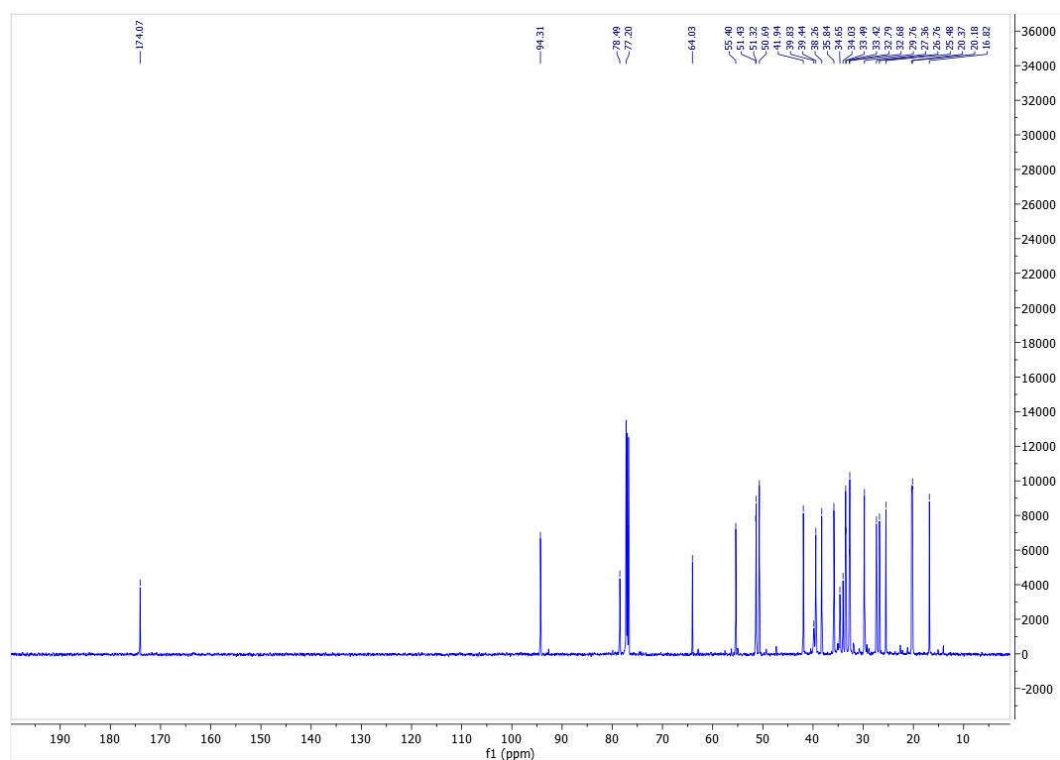
¹³C NMR spectrum of compound **29** (126 MHz, CDCl₃)



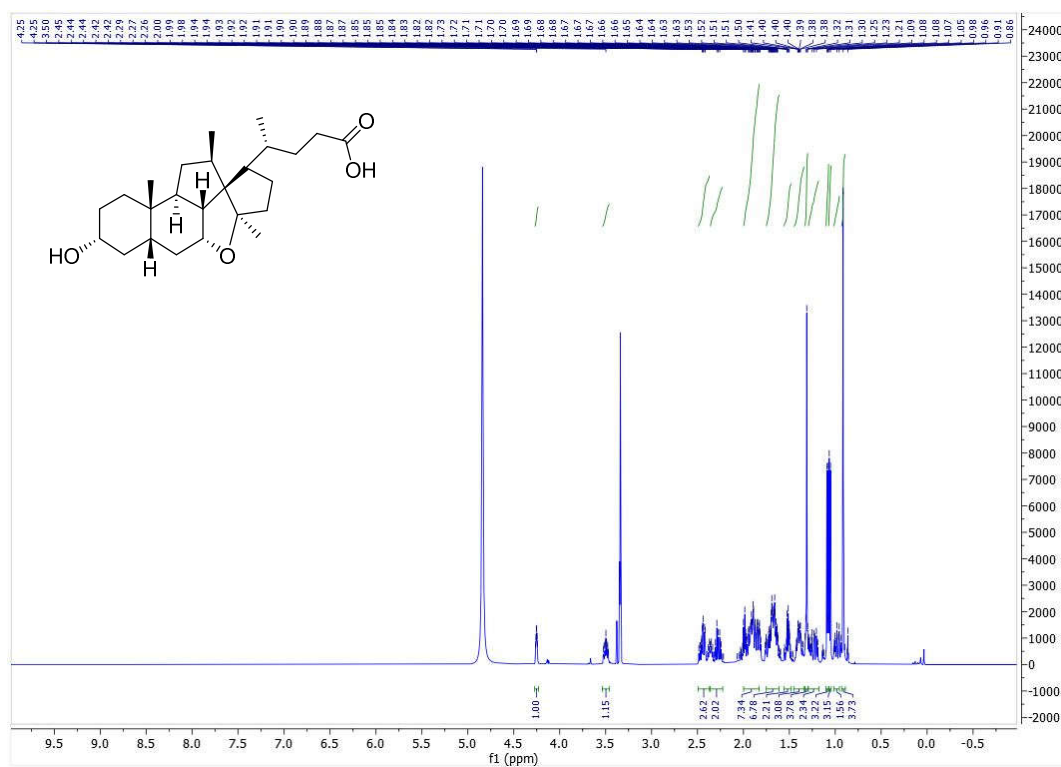
^1H NMR spectrum of compound **30** (500 MHz, CDCl_3)



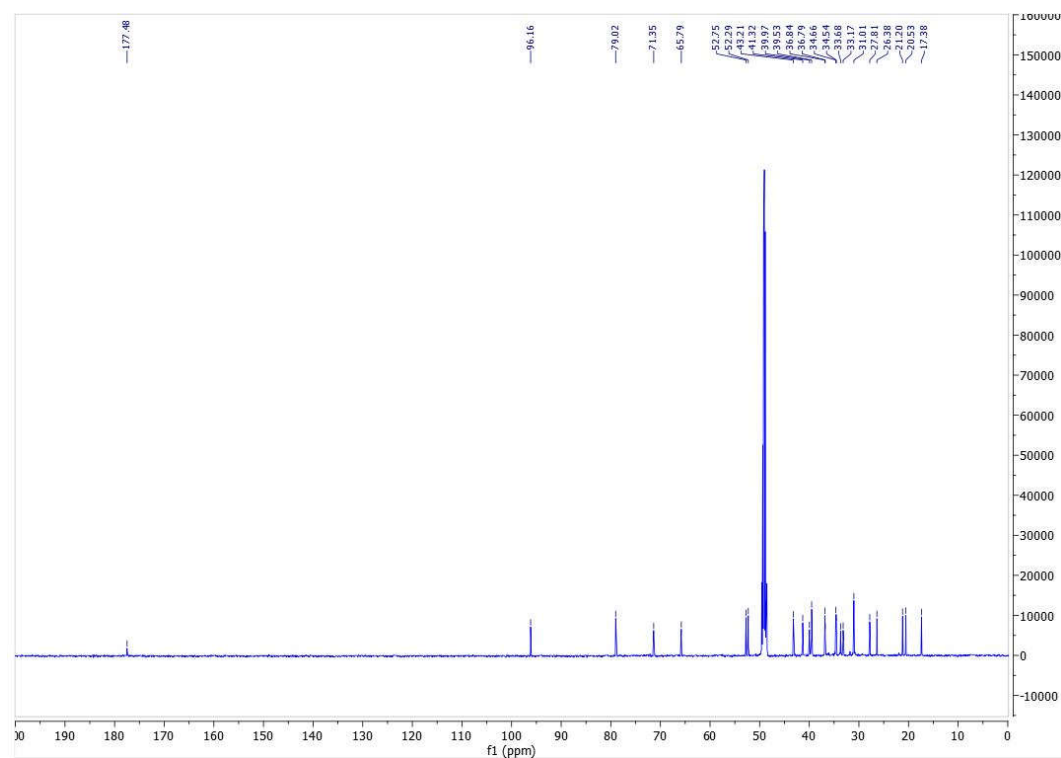
^{13}C NMR spectrum of compound **30** (126 MHz, CDCl_3)

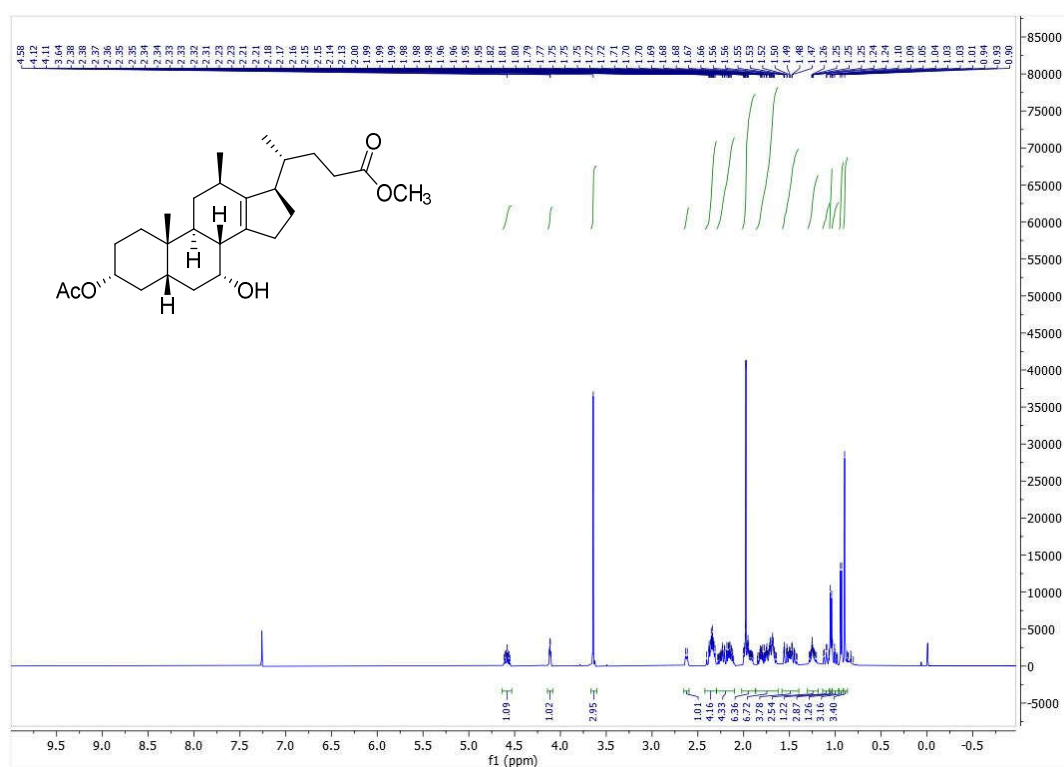


^1H NMR spectrum of compound **31** (500 MHz, CD_3OD)

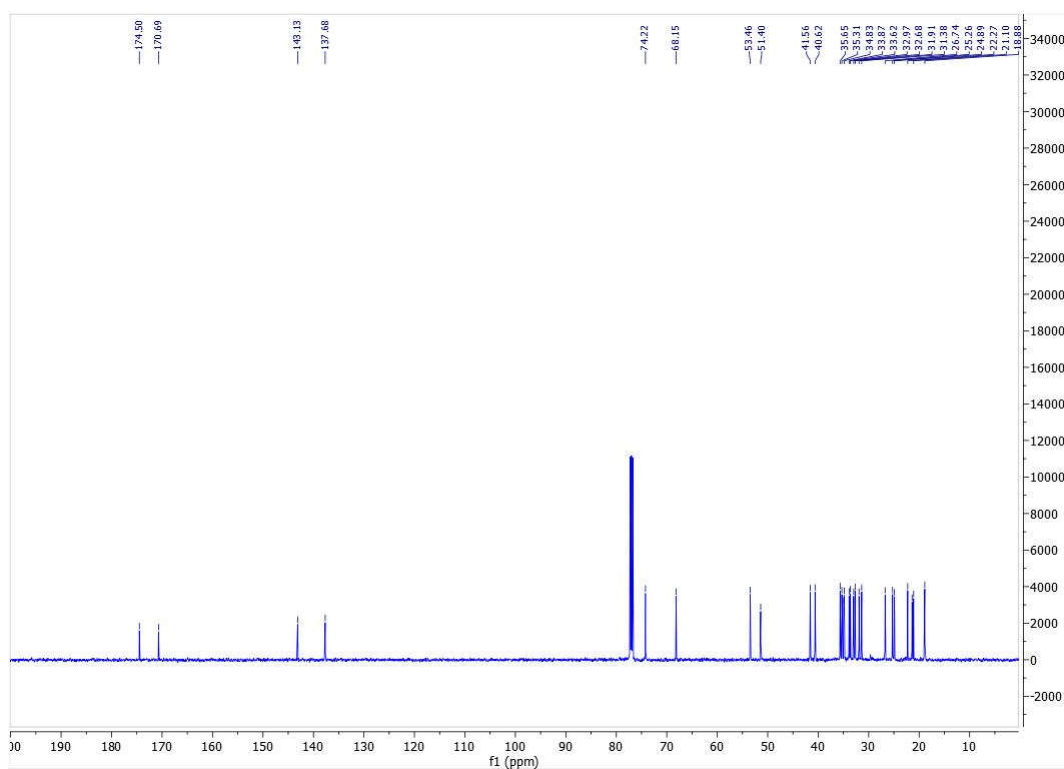


^{13}C NMR spectrum of compound **31** (126 MHz, CD_3OD)



¹H NMR spectrum of compound **32** (500 MHz, CDCl₃)

¹³C NMR spectrum of compound **32** (126 MHz, CDCl₃)



The figure displays the ^1H NMR spectrum of compound 10, which is a pentacyclic steroid derivative. The chemical structure of compound 10 is shown in the upper left corner, featuring an acetoxy group (AcO) and a methyl ester group (COOCH_3). The spectrum is plotted with the chemical shift in ppm on the x-axis (ranging from 10.0 to -1.0) and the intensity in arbitrary units on the y-axis (ranging from 0 to 70,000). The spectrum shows several peaks, with the most prominent ones in the aliphatic region (1.0 to 2.5 ppm). The peaks are assigned to specific protons in the molecule, with the following chemical shifts (ppm) and integrations (area) listed below:

Chemical Shift (ppm)	Integration (Area)
1.12	1.12
1.27	1.27
1.38	1.38
1.41	1.41
1.42	1.42
1.43	1.43
1.44	1.44
1.45	1.45
1.46	1.46
1.47	1.47
1.48	1.48
1.49	1.49
1.50	1.50
1.51	1.51
1.52	1.52
1.53	1.53
1.54	1.54
1.55	1.55
1.56	1.56
1.57	1.57
1.58	1.58
1.59	1.59
1.60	1.60
1.61	1.61
1.62	1.62
1.63	1.63
1.64	1.64
1.65	1.65
1.66	1.66
1.67	1.67
1.68	1.68
1.69	1.69
1.70	1.70
1.71	1.71
1.72	1.72
1.73	1.73
1.74	1.74
1.75	1.75
1.76	1.76
1.77	1.77
1.78	1.78
1.79	1.79
1.80	1.80
1.81	1.81
1.82	1.82
1.83	1.83
1.84	1.84
1.85	1.85
1.86	1.86
1.87	1.87
1.88	1.88
1.89	1.89
1.90	1.90
1.91	1.91
1.92	1.92
1.93	1.93
1.94	1.94
1.95	1.95
1.96	1.96
1.97	1.97
1.98	1.98
1.99	1.99
2.00	2.00
2.01	2.01
2.02	2.02
2.03	2.03
2.04	2.04
2.05	2.05
2.06	2.06
2.07	2.07
2.08	2.08
2.09	2.09
2.10	2.10
2.11	2.11
2.12	2.12
2.13	2.13
2.14	2.14
2.15	2.15
2.16	2.16
2.17	2.17
2.18	2.18
2.19	2.19
2.20	2.20
2.21	2.21
2.22	2.22
2.23	2.23
2.24	2.24
2.25	2.25
2.26	2.26
2.27	2.27
2.28	2.28
2.29	2.29
2.30	2.30
2.31	2.31
2.32	2.32
2.33	2.33
2.34	2.34
2.35	2.35
2.36	2.36
2.37	2.37
2.38	2.38
2.39	2.39
2.40	2.40
2.41	2.41
2.42	2.42
2.43	2.43
2.44	2.44
2.45	2.45
2.46	2.46
2.47	2.47
2.48	2.48
2.49	2.49
2.50	2.50
2.51	2.51
2.52	2.52
2.53	2.53
2.54	2.54
2.55	2.55
2.56	2.56
2.57	2.57
2.58	2.58
2.59	2.59
2.60	2.60
2.61	2.61
2.62	2.62
2.63	2.63
2.64	2.64
2.65	2.65
2.66	2.66
2.67	2.67
2.68	2.68
2.69	2.69
2.70	2.70
2.71	2.71
2.72	2.72
2.73	2.73
2.74	2.74
2.75	2.75
2.76	2.76
2.77	2.77
2.78	2.78
2.79	2.79
2.80	2.80
2.81	2.81
2.82	2.82
2.83	2.83
2.84	2.84
2.85	2.85
2.86	2.86
2.87	2.87
2.88	2.88
2.89	2.89
2.90	2.90
2.91	2.91
2.92	2.92
2.93	2.93
2.94	2.94
2.95	2.95
2.96	2.96
2.97	2.97
2.98	2.98
2.99	2.99
3.00	3.00
3.01	3.01
3.02	3.02
3.03	3.03
3.04	3.04
3.05	3.05
3.06	3.06
3.07	3.07
3.08	3.08
3.09	3.09
3.10	3.10
3.11	3.11
3.12	

17.406
17.067

94.37

72.02

63.90

51.47
50.74
50.74
41.86
40.86
39.86
38.87
35.90
33.93
33.93
33.63
33.12
32.96
32.96
32.97
27.30
26.30
25.44
25.44
20.24
20.10
16.77

f1 (ppm)