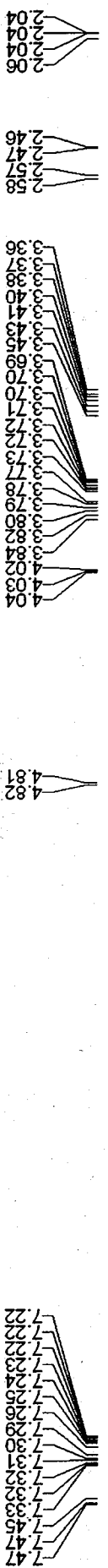
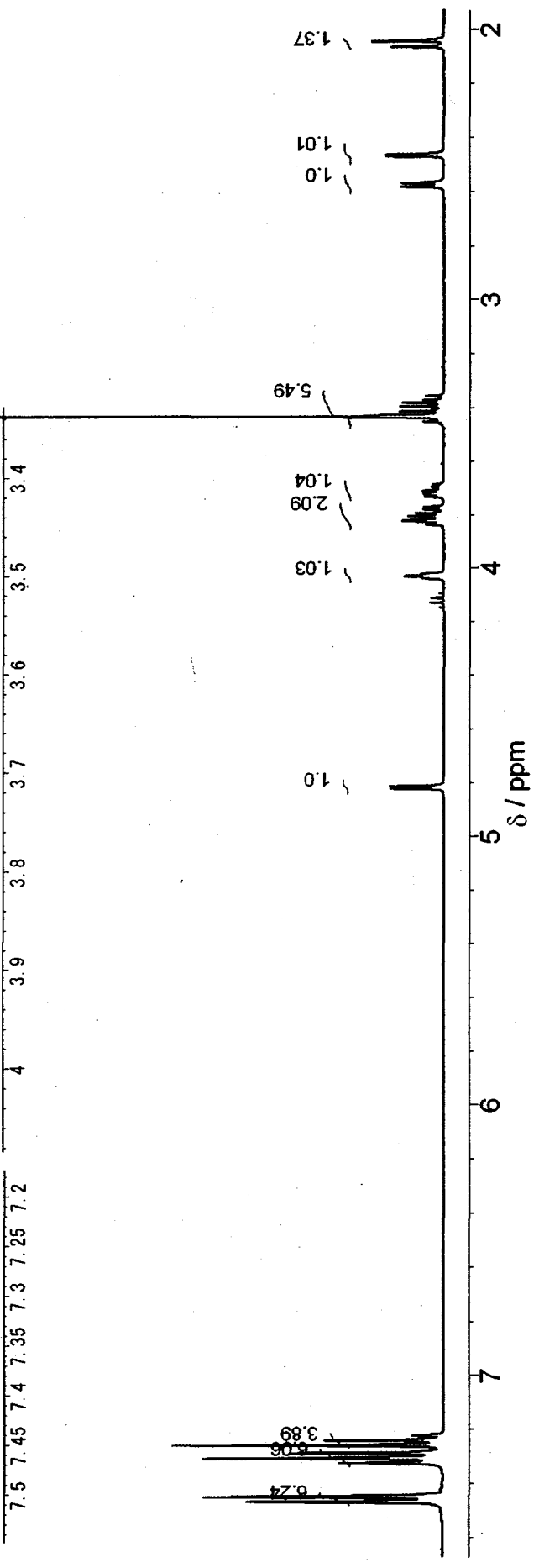
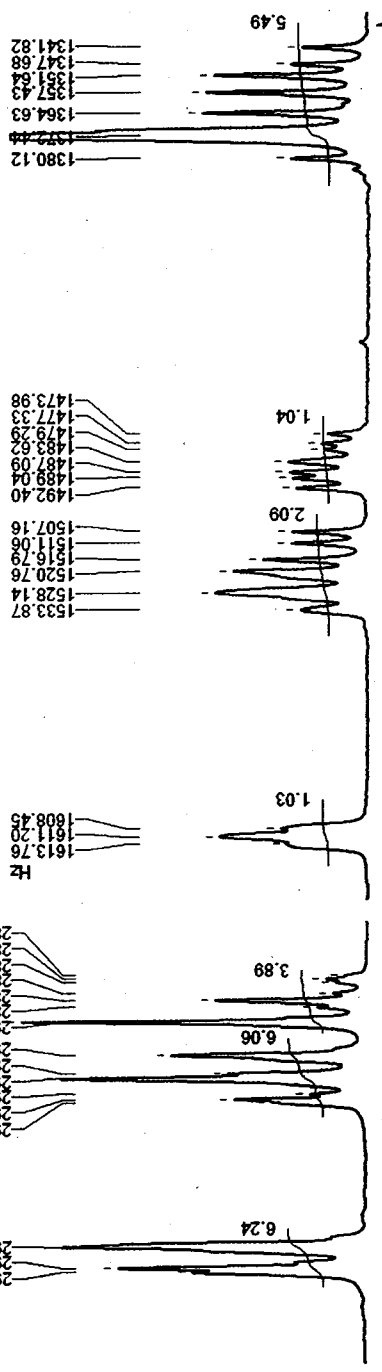
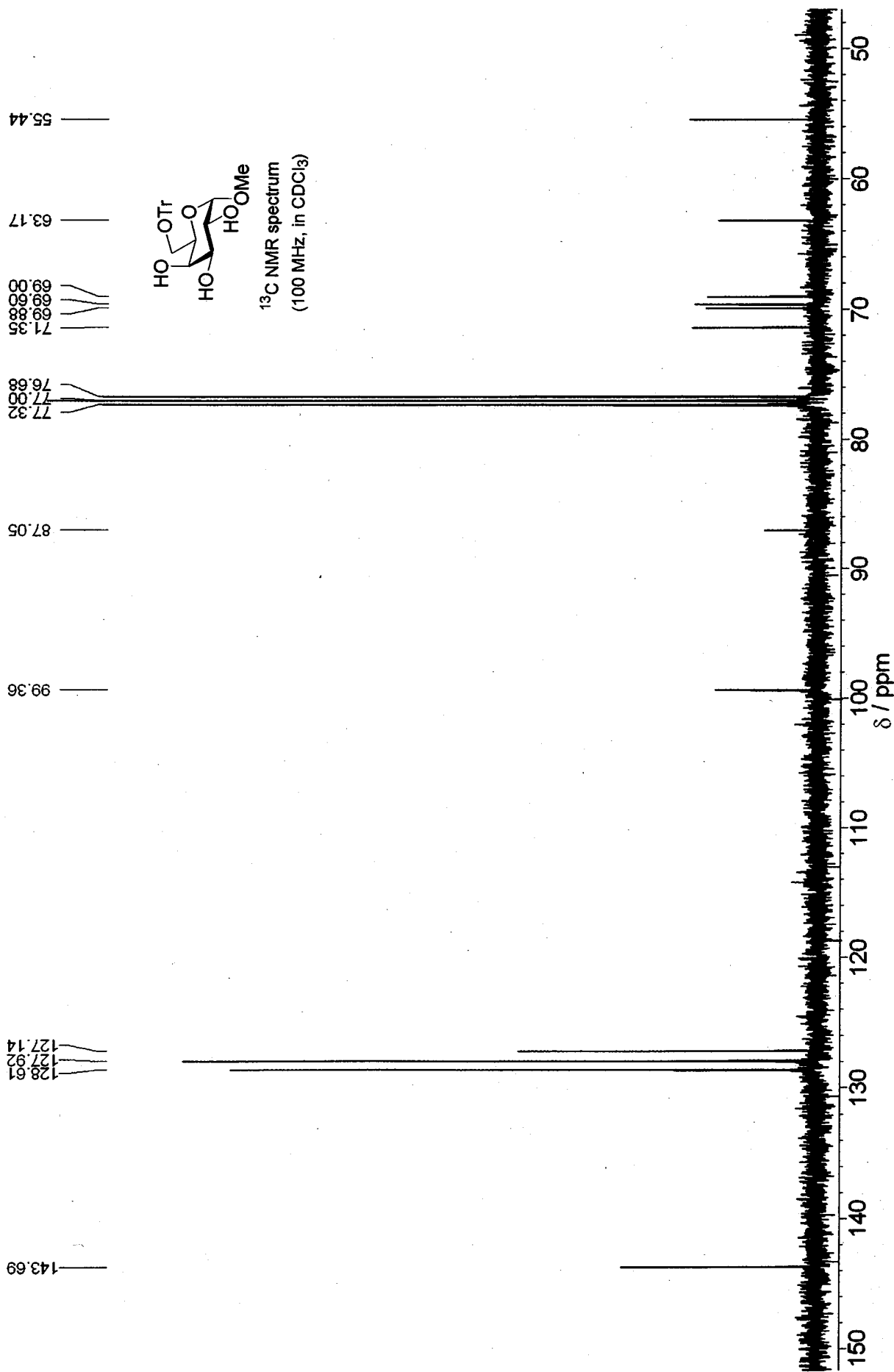


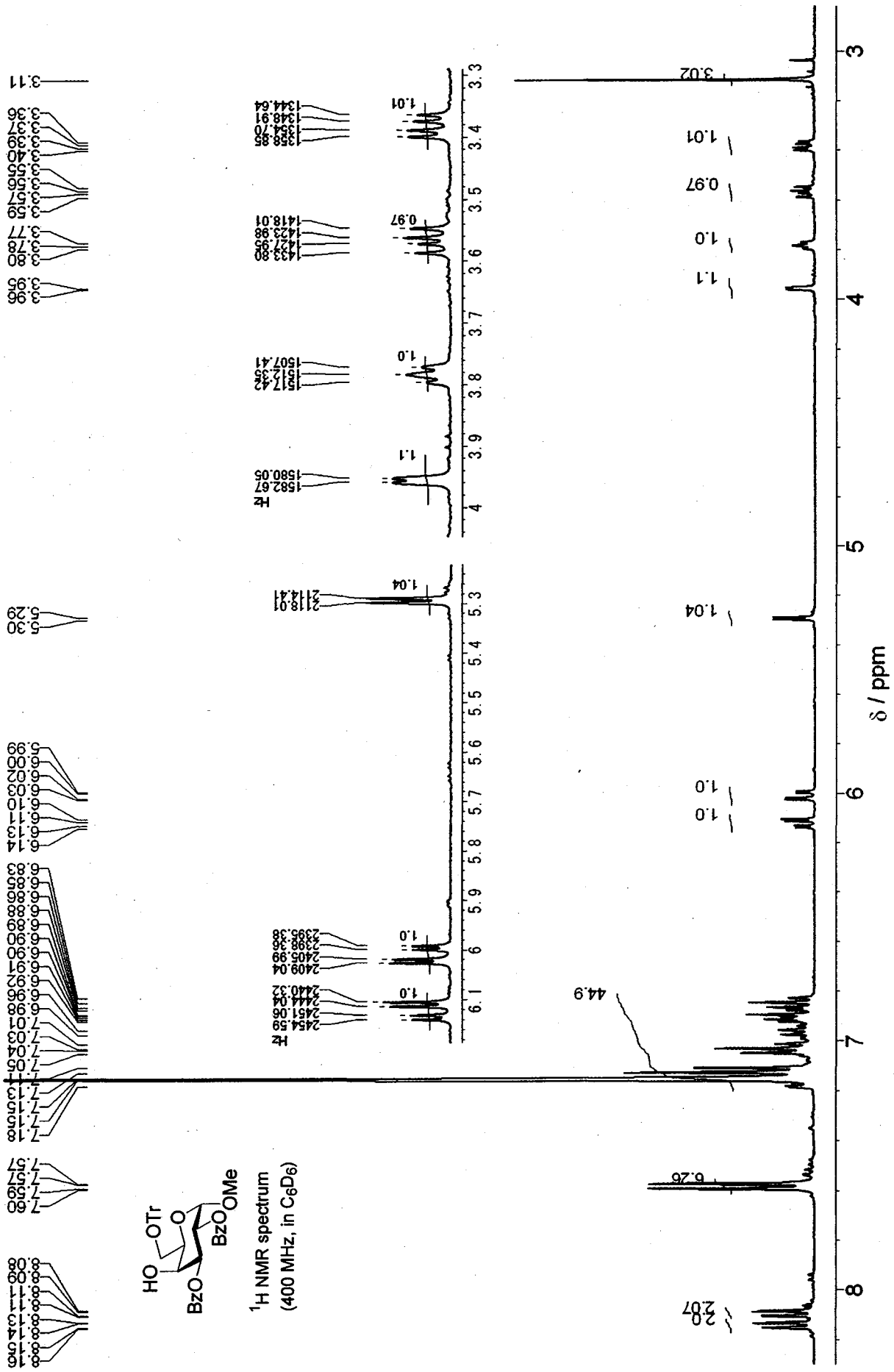
**Chapter 6**  
 **$^1\text{H}$  and  $^{13}\text{C}$  NMR spectra for novel compounds appeared in this thesis**

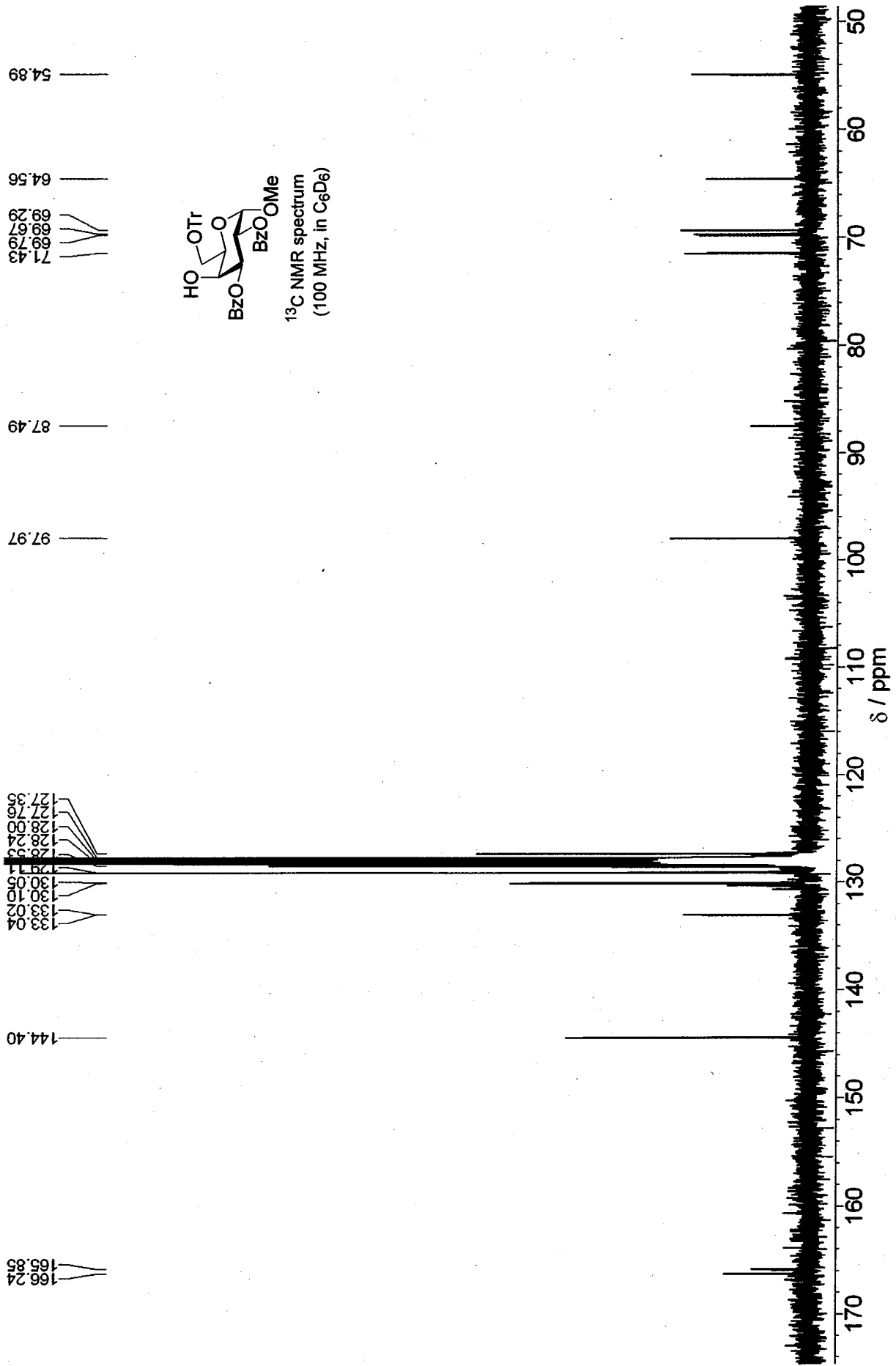


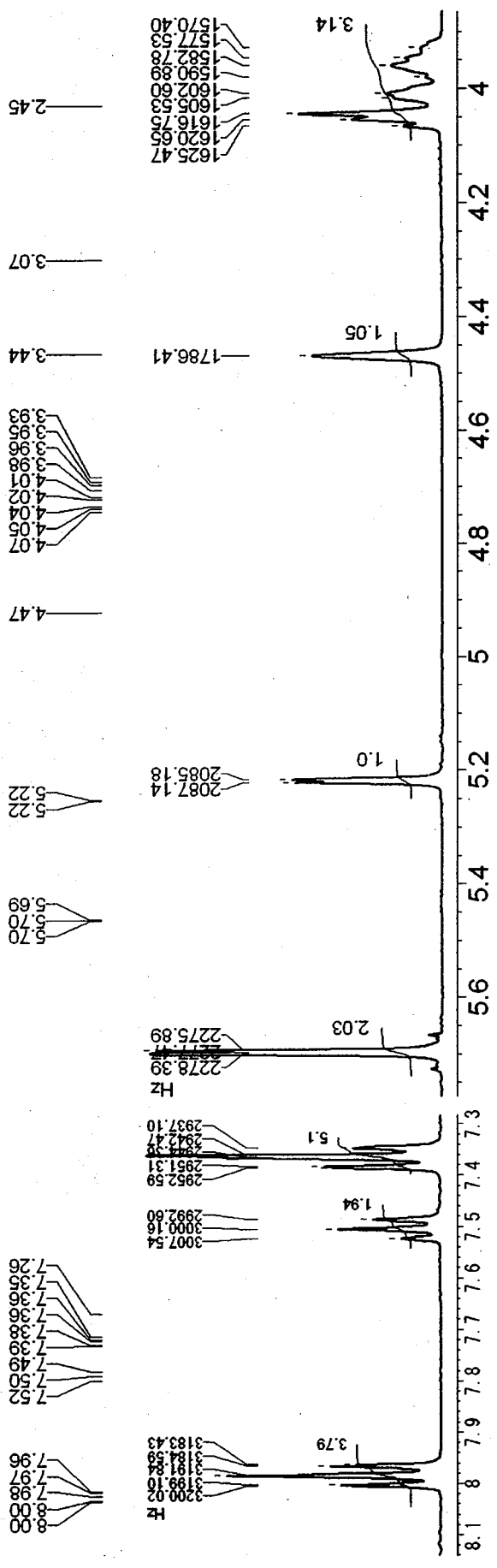
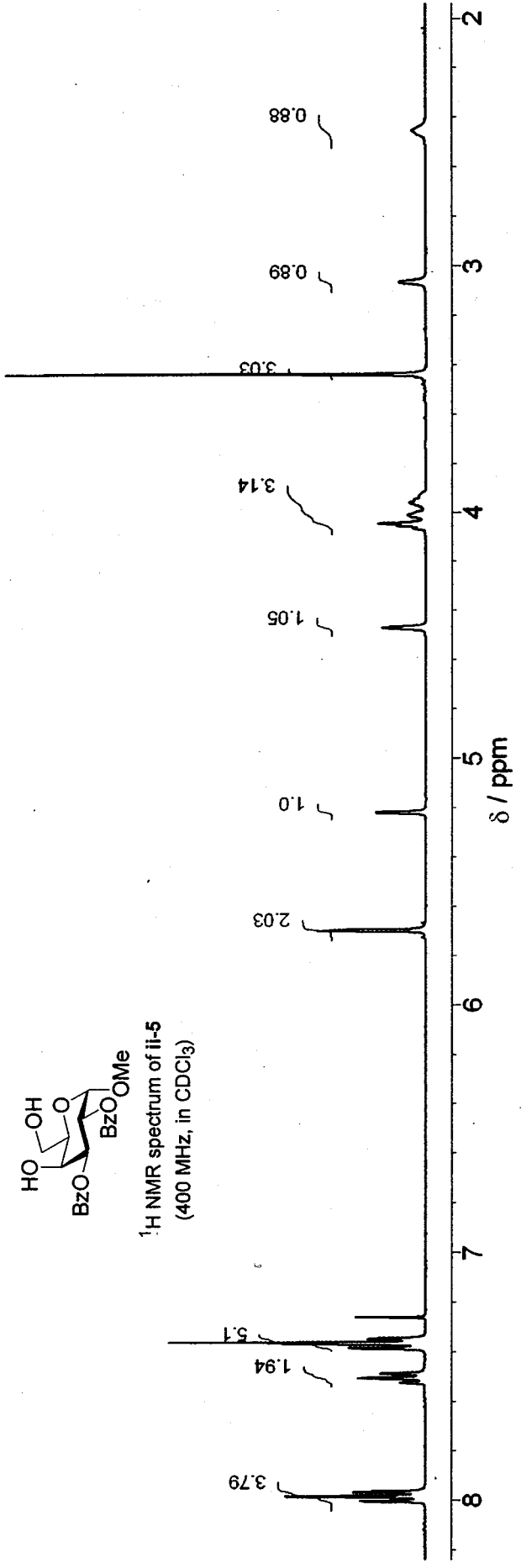
COC1OC(O)C(O)C(O)O1  
 $^1\text{H}$  NMR spectrum  
 (400 MHz, in  $\text{CDCl}_3$ )

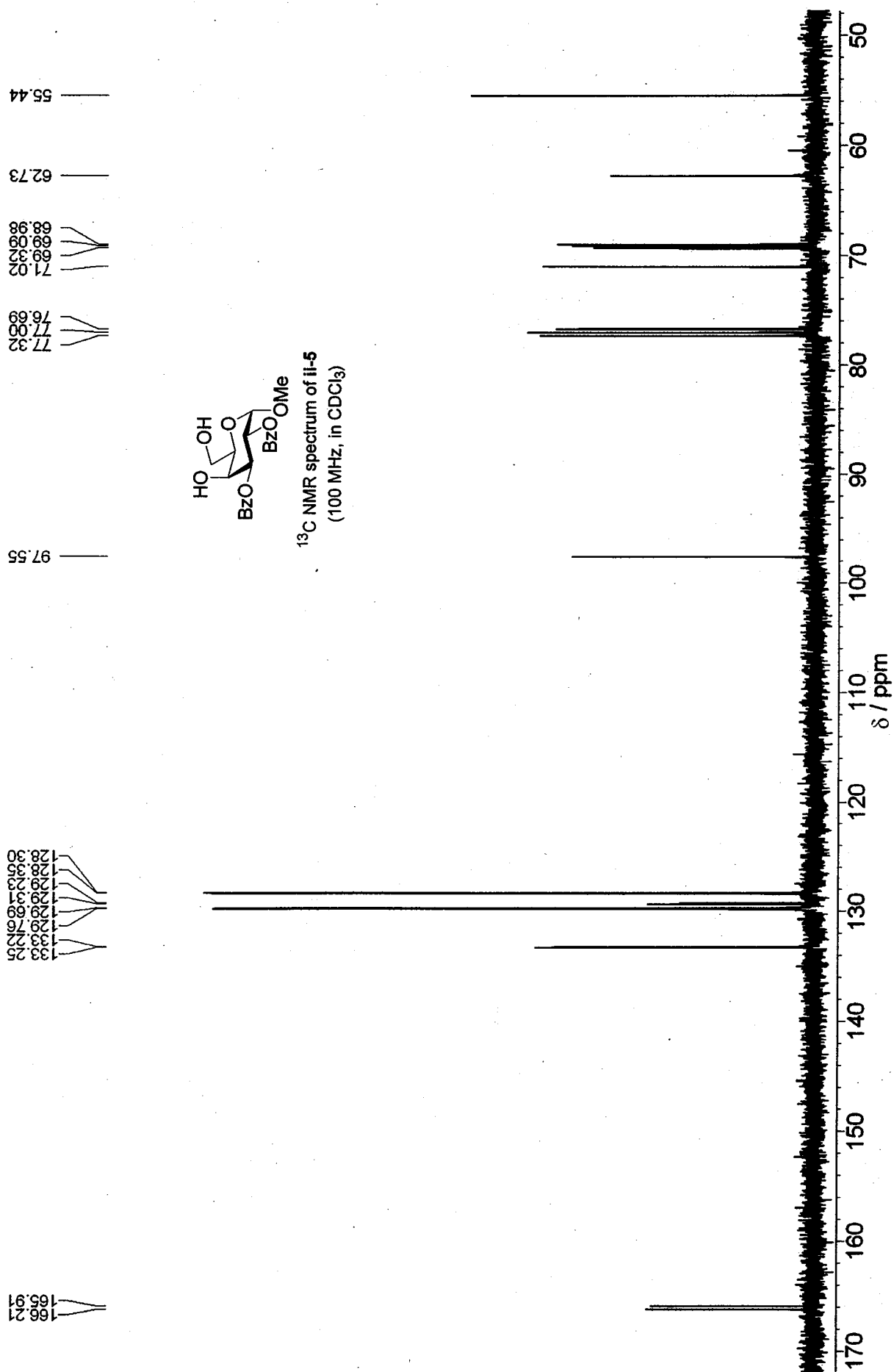


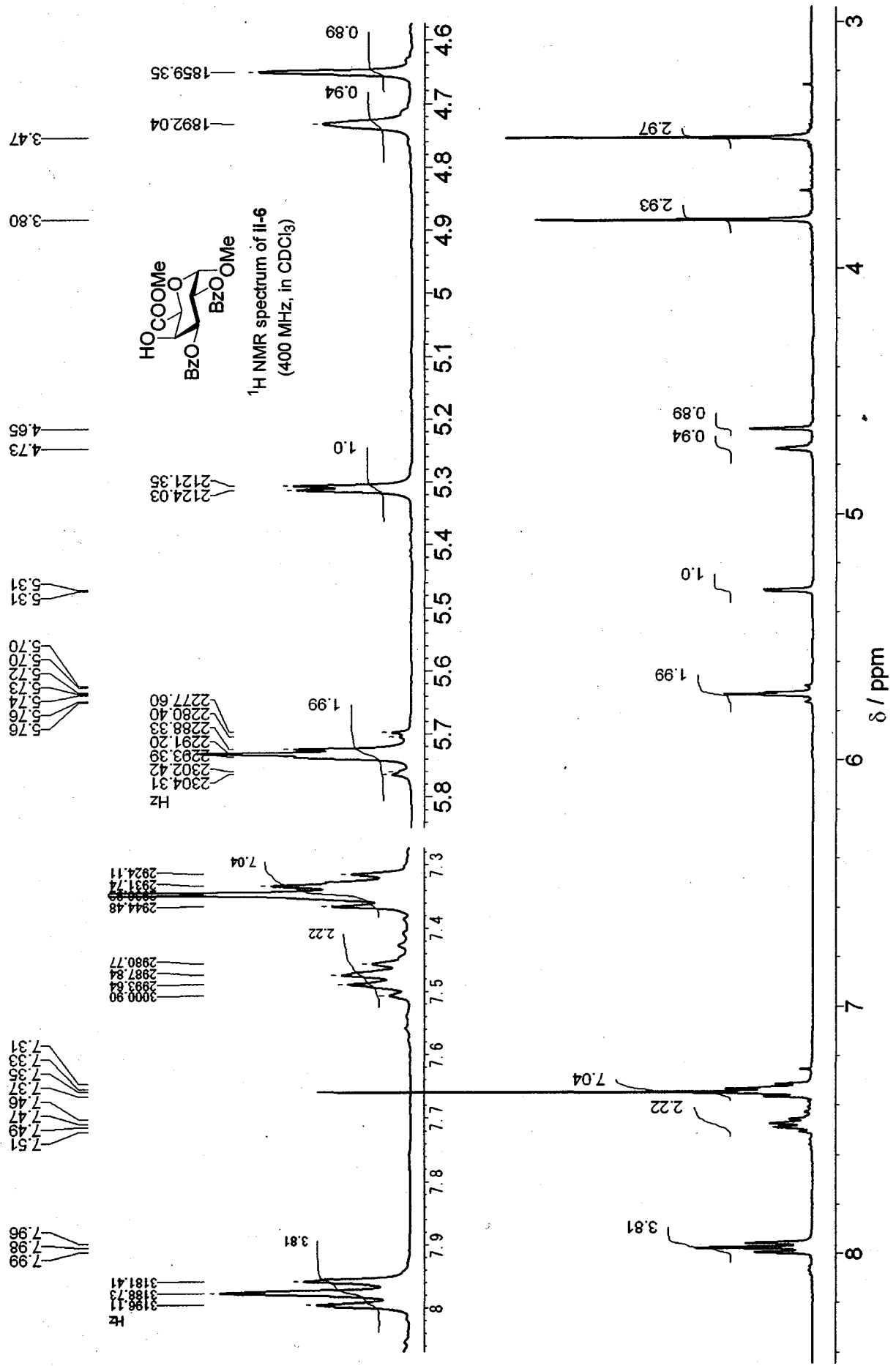




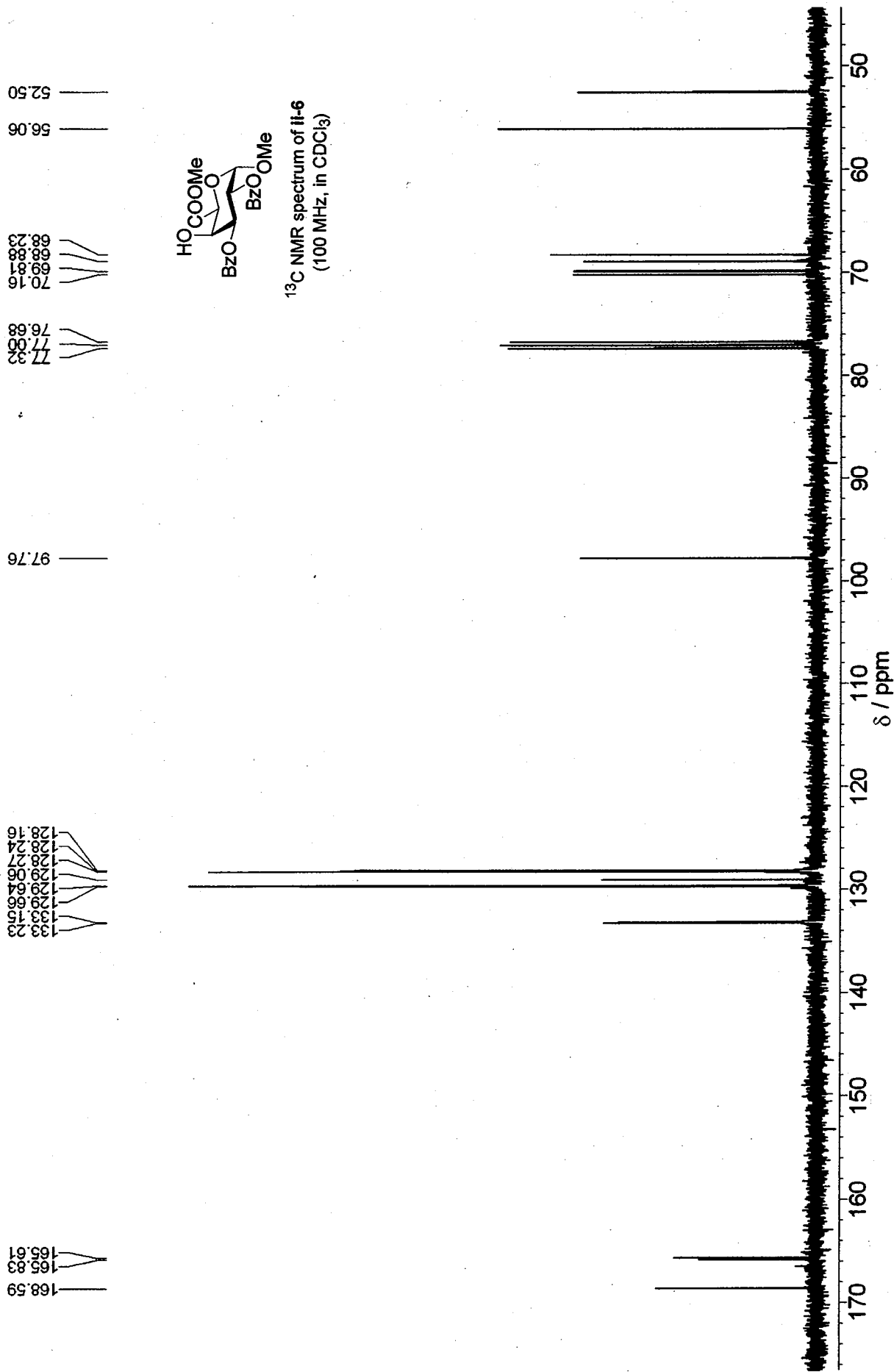


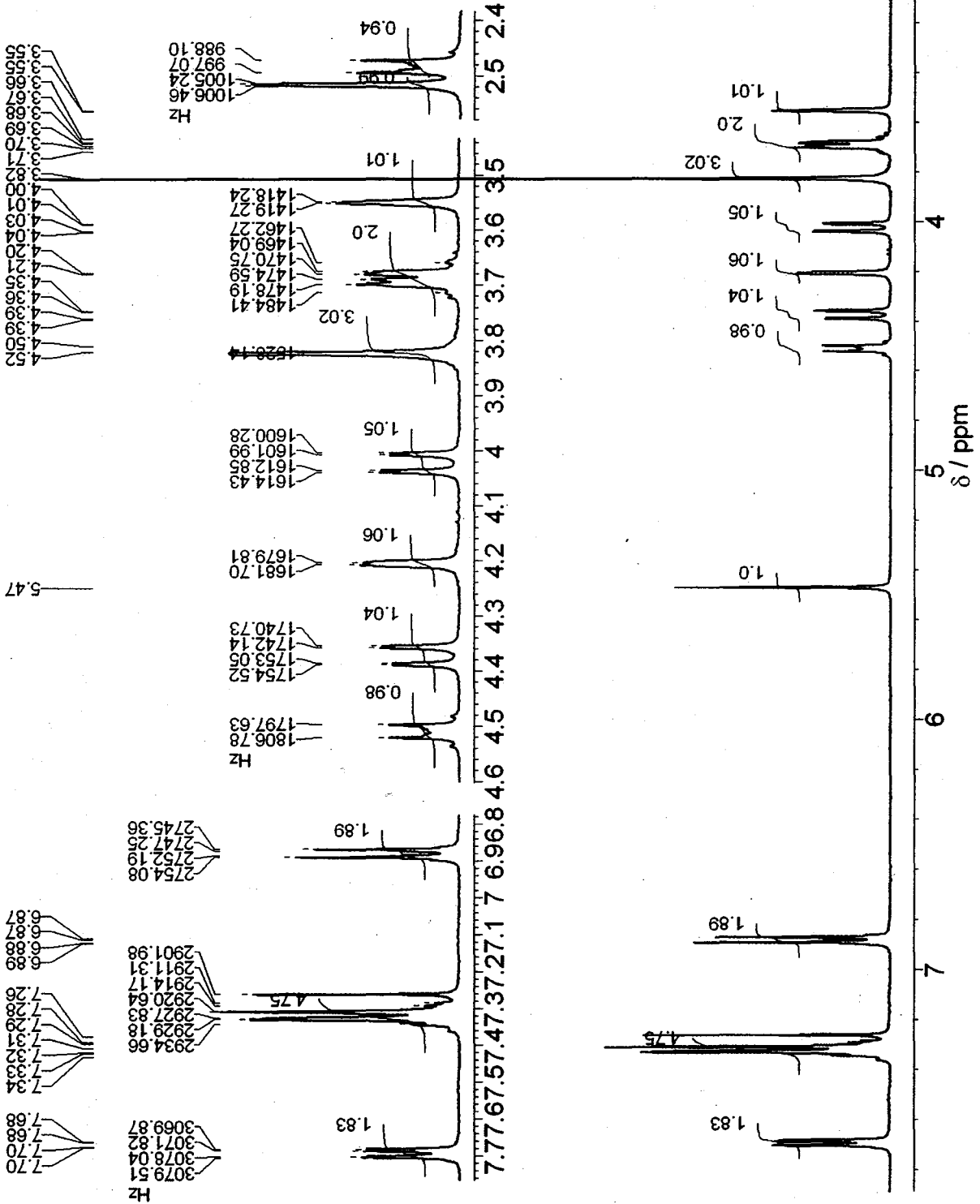
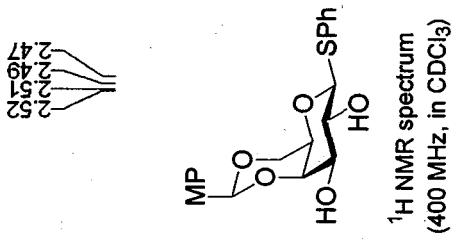


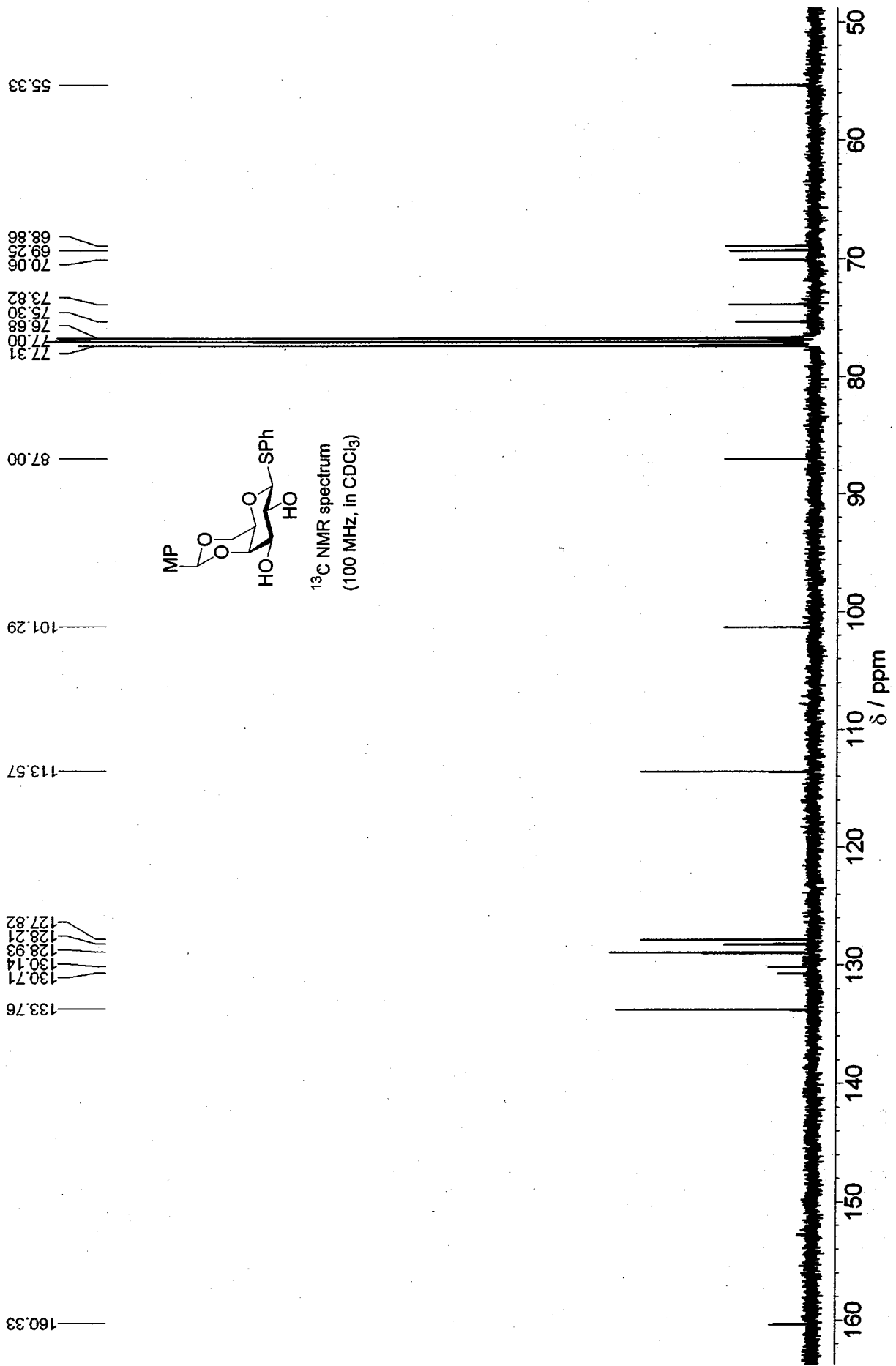


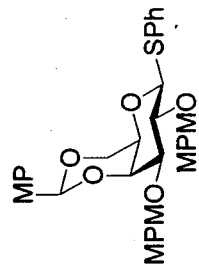
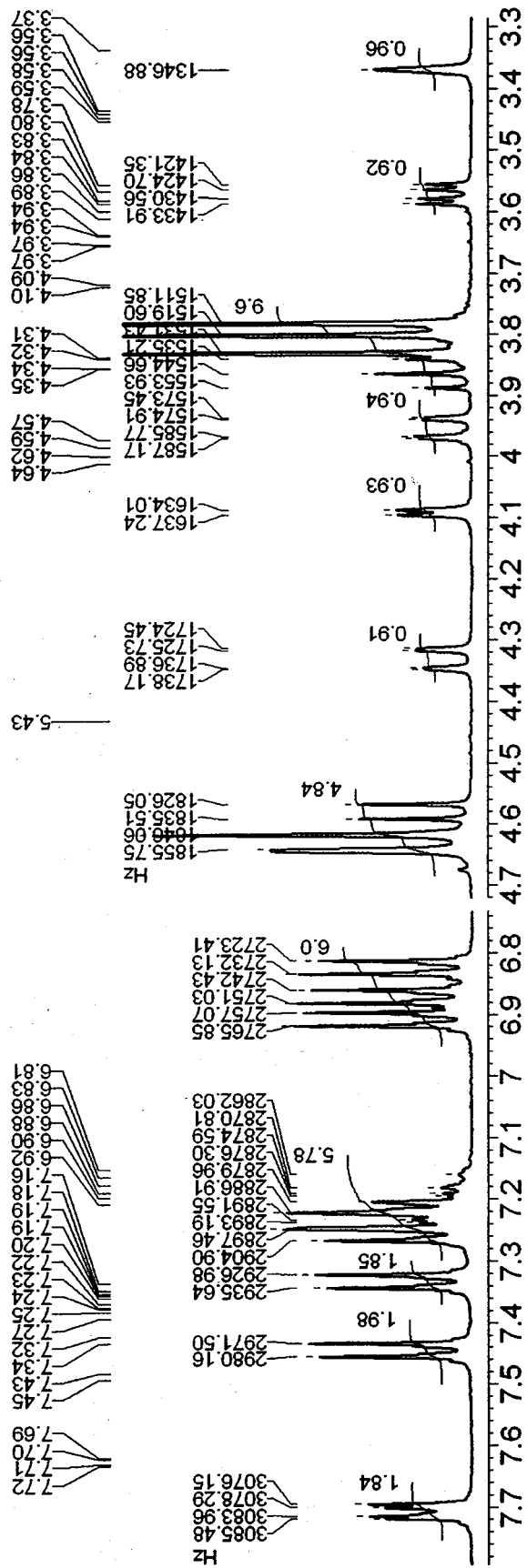




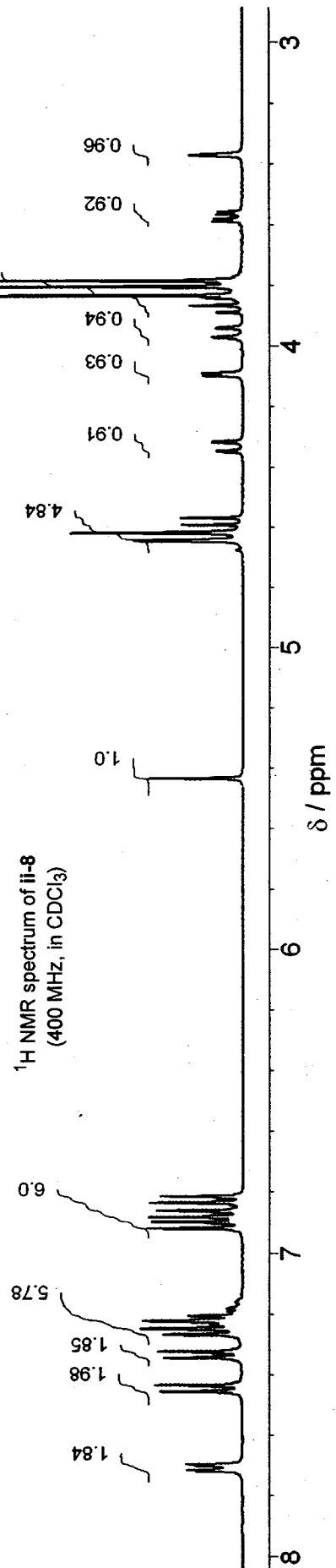


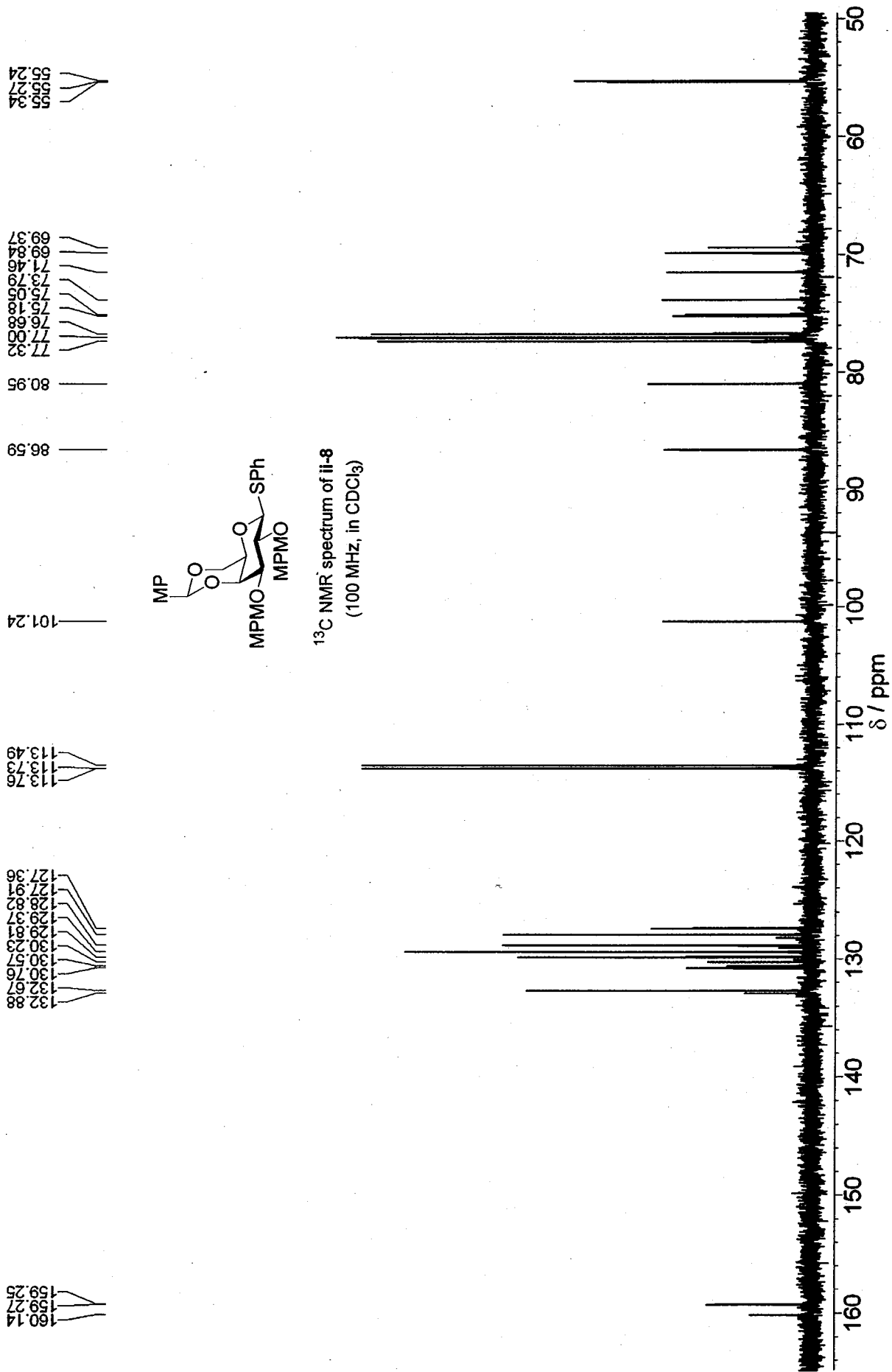


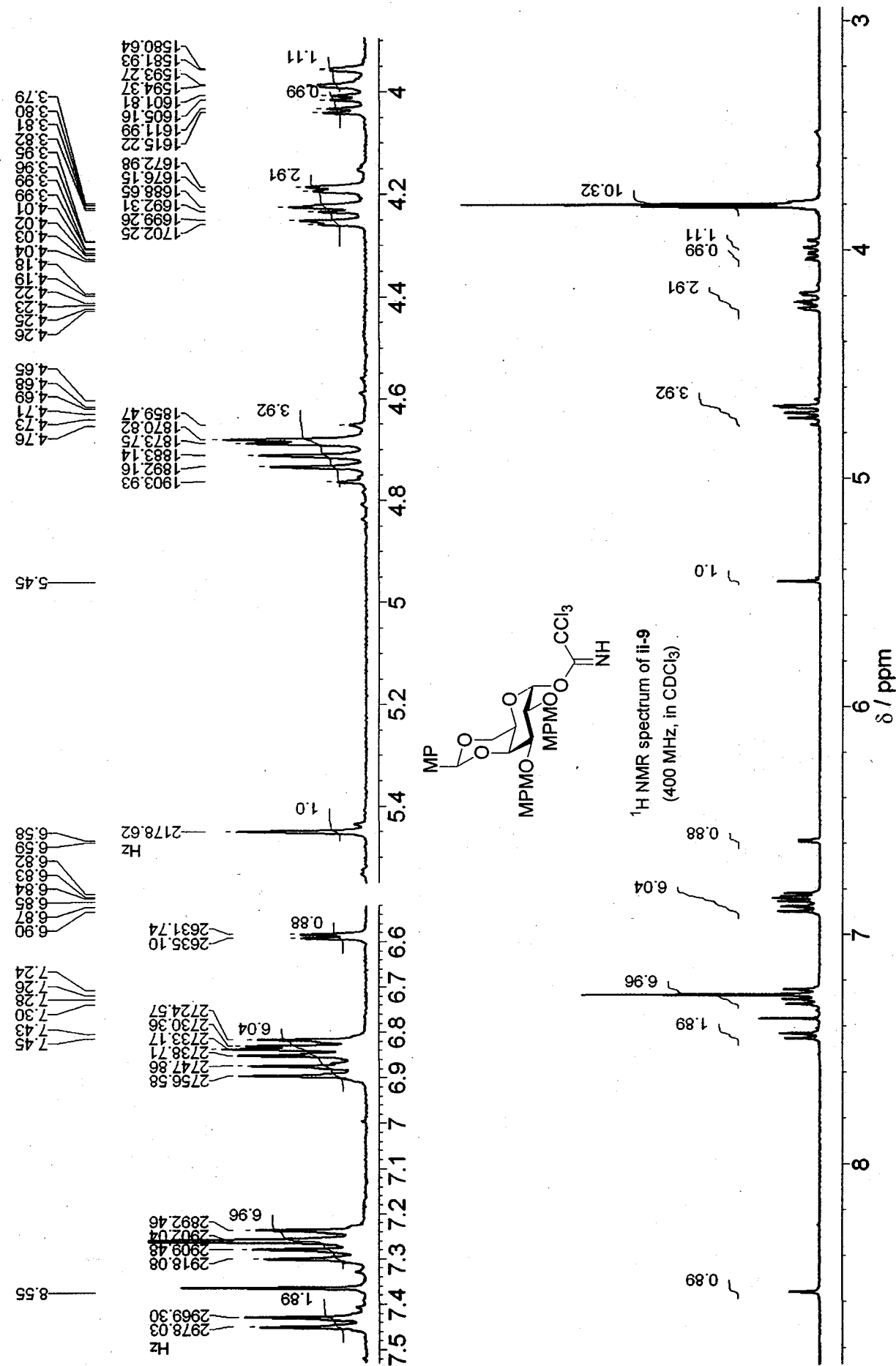


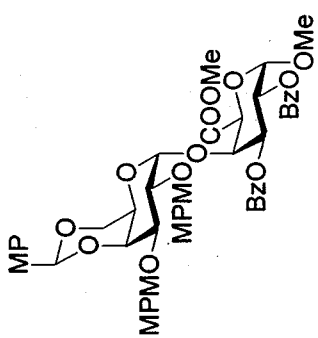
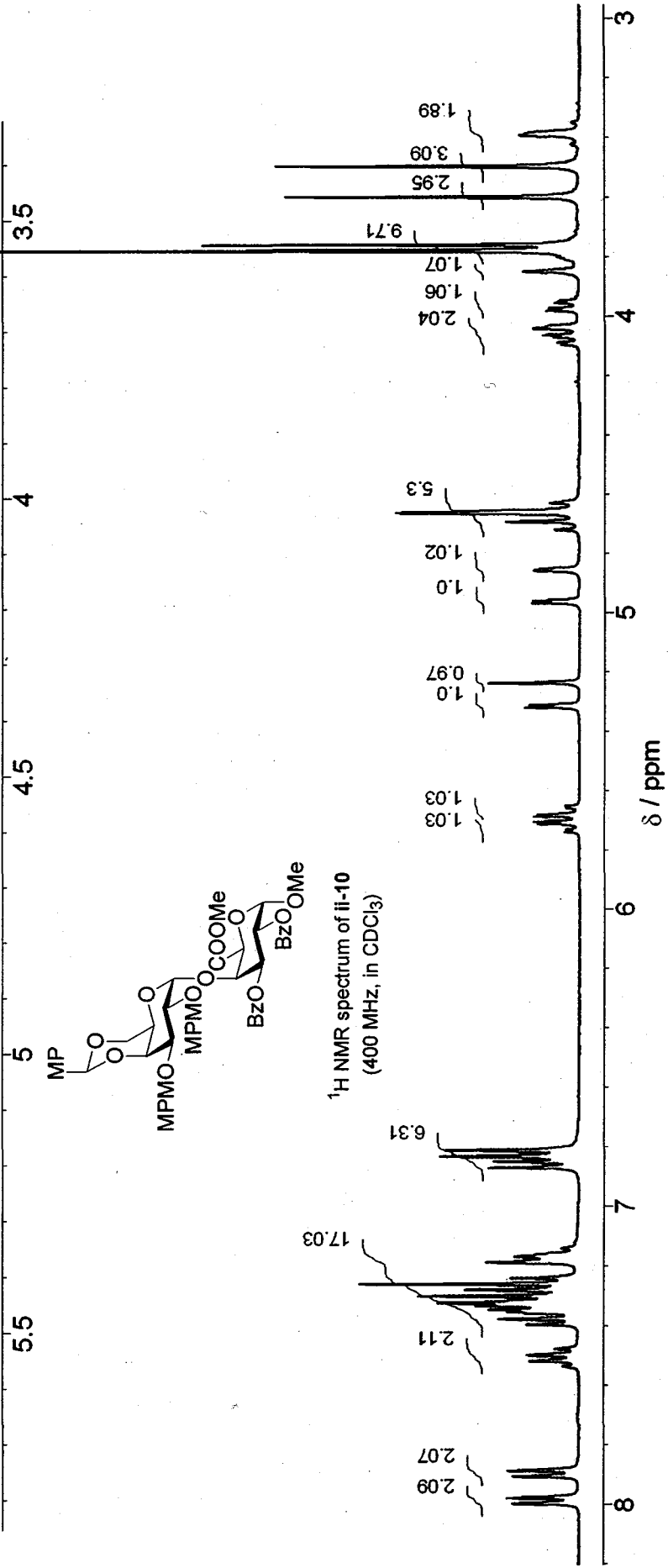
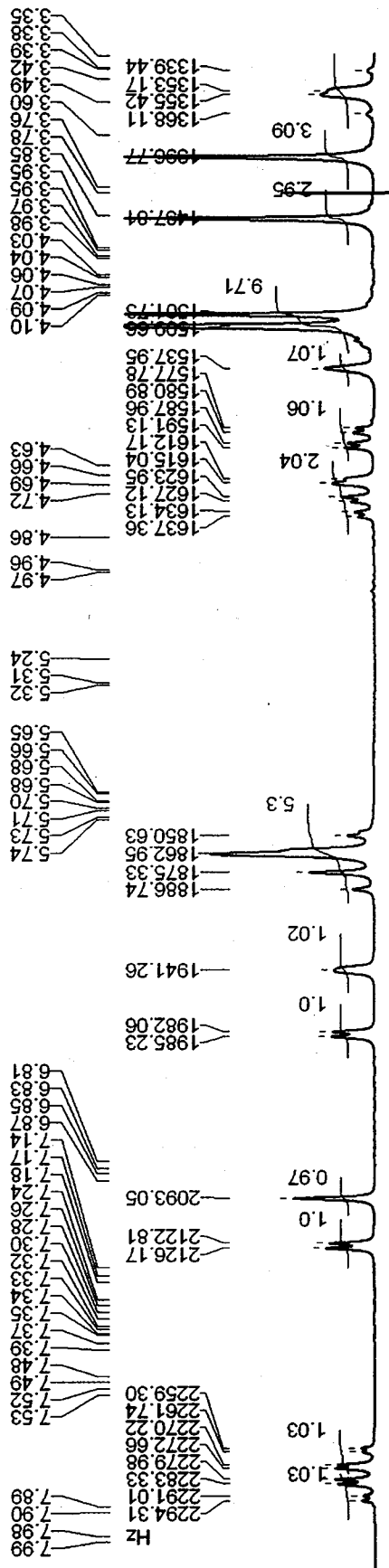


<sup>1</sup>H NMR spectrum of ii-8  
(400 MHz, in CDCl<sub>3</sub>)

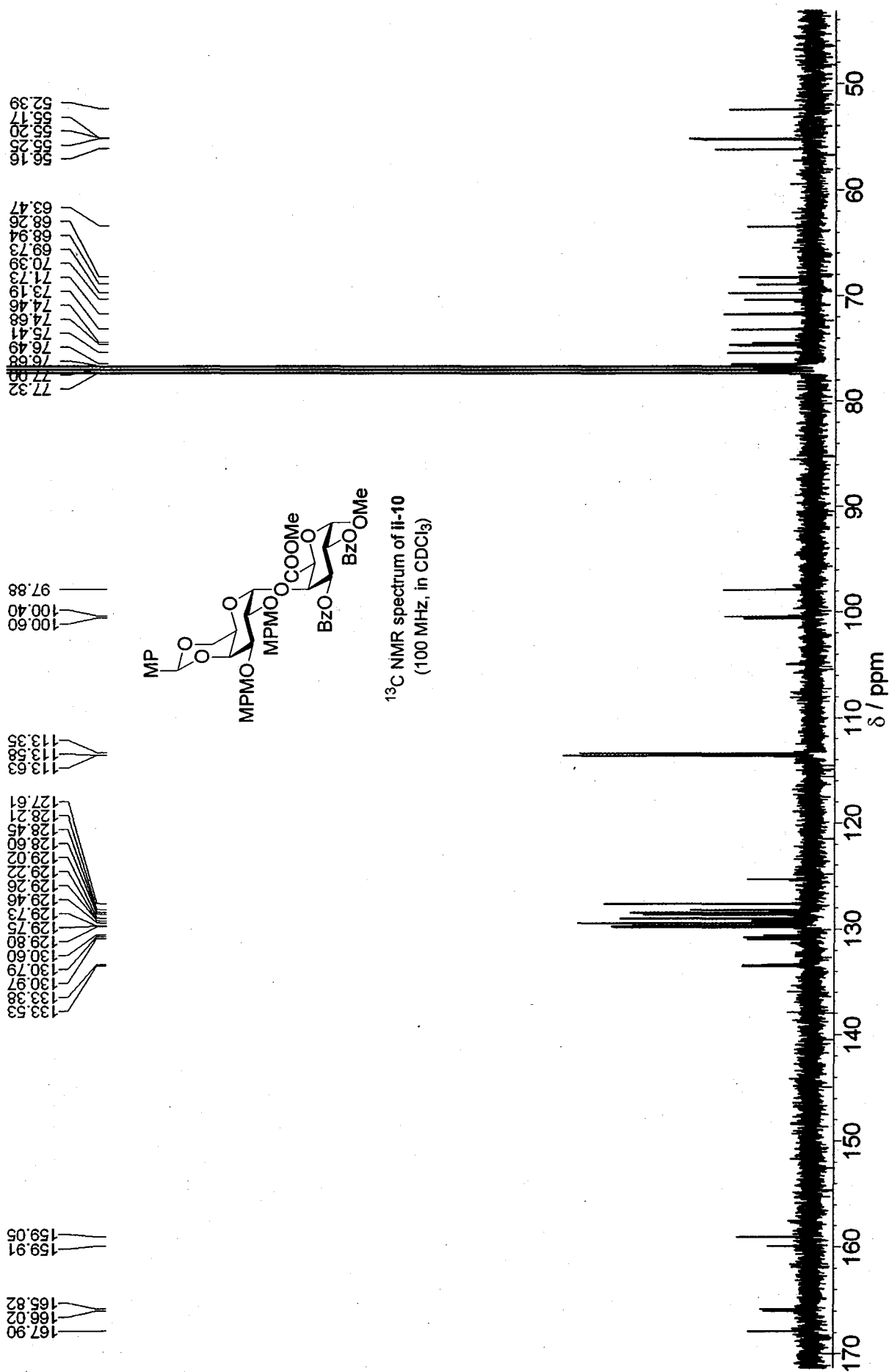




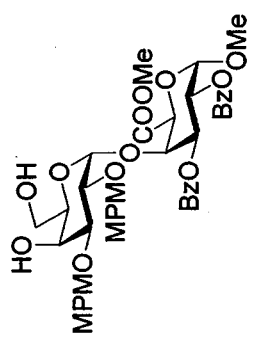
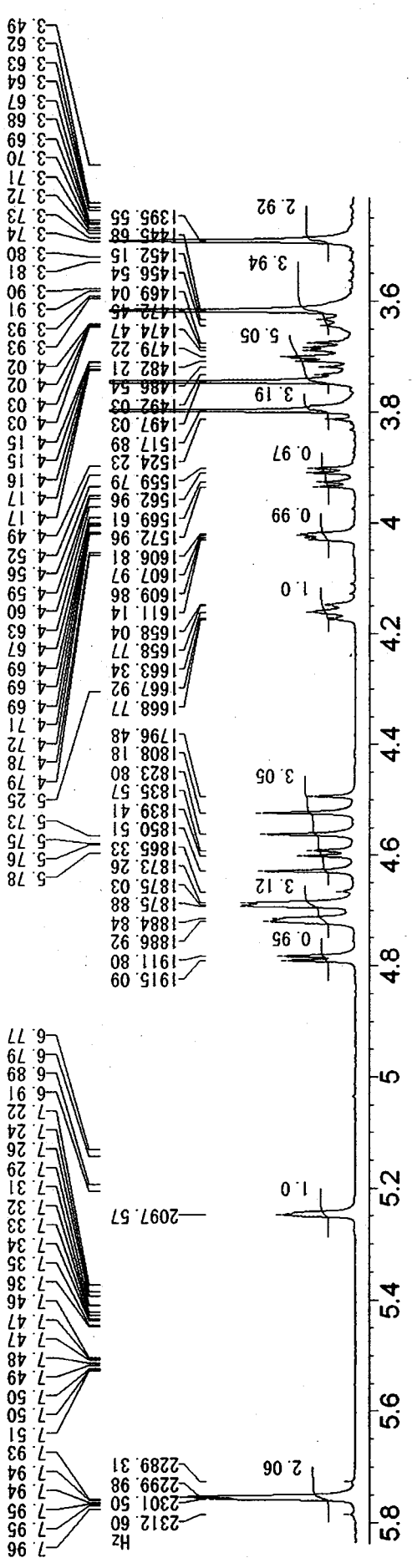




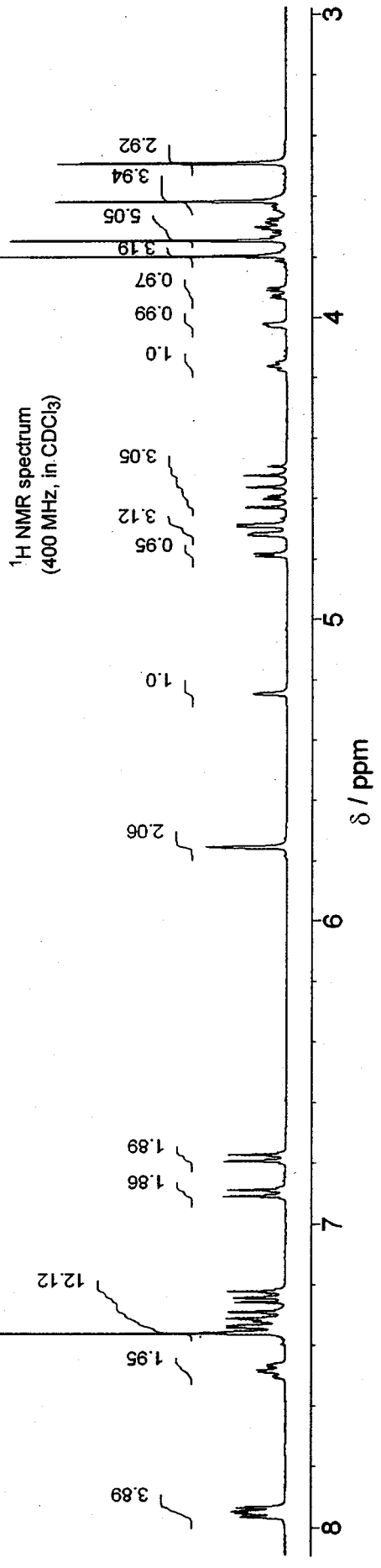
<sup>1</sup>H NMR spectrum of ii-10 (400 MHz, in CDCl<sub>3</sub>)

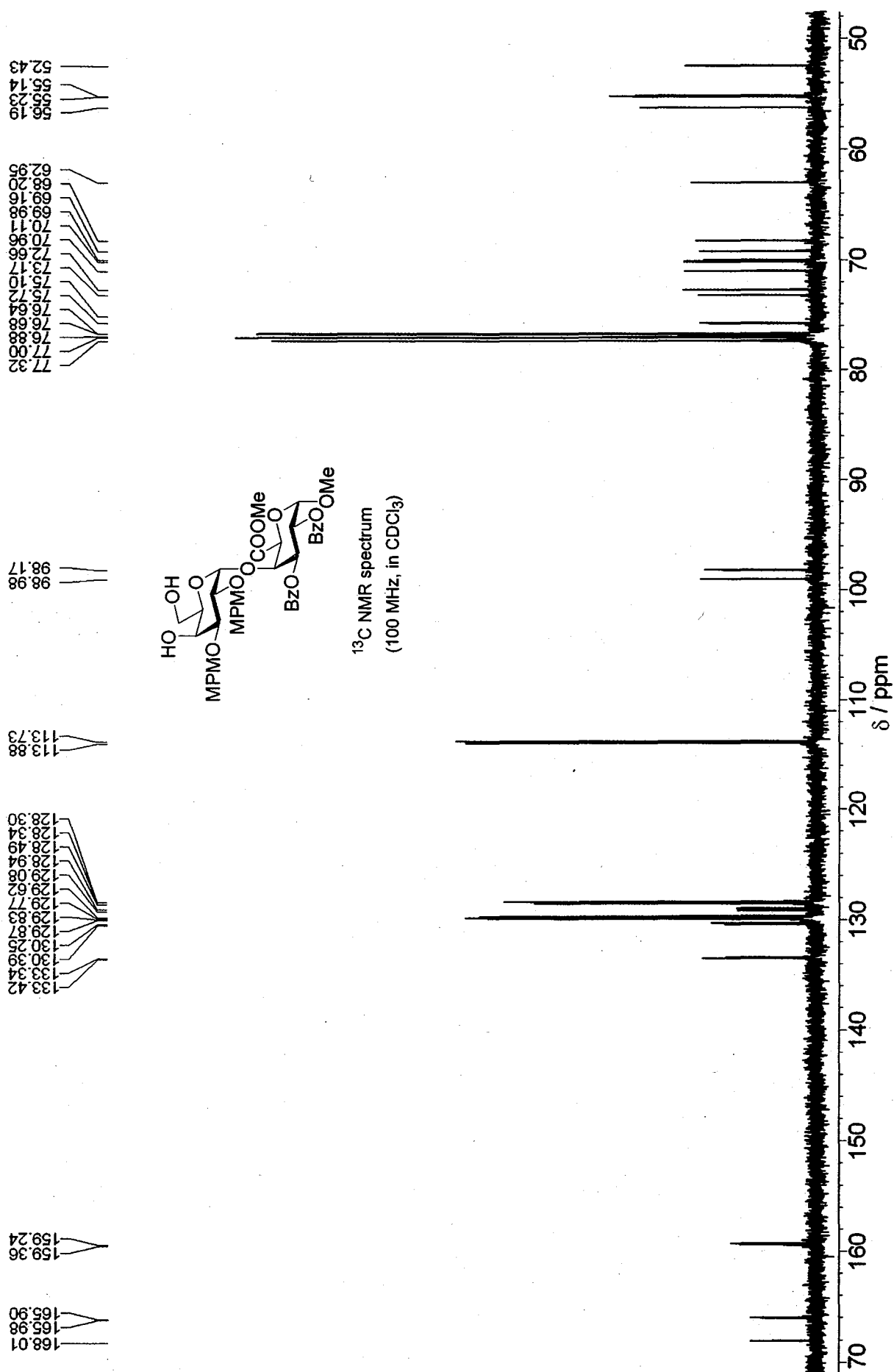


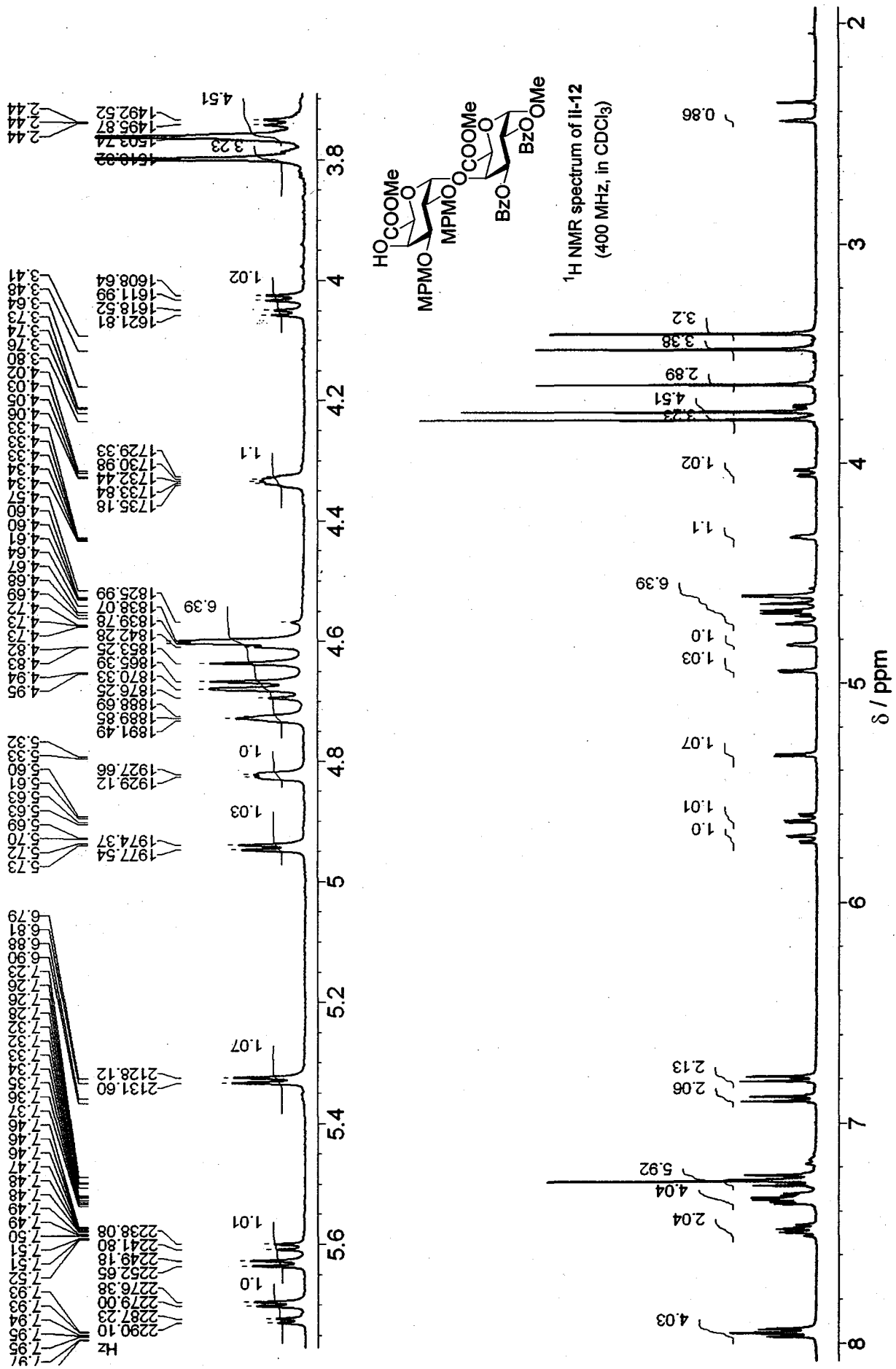


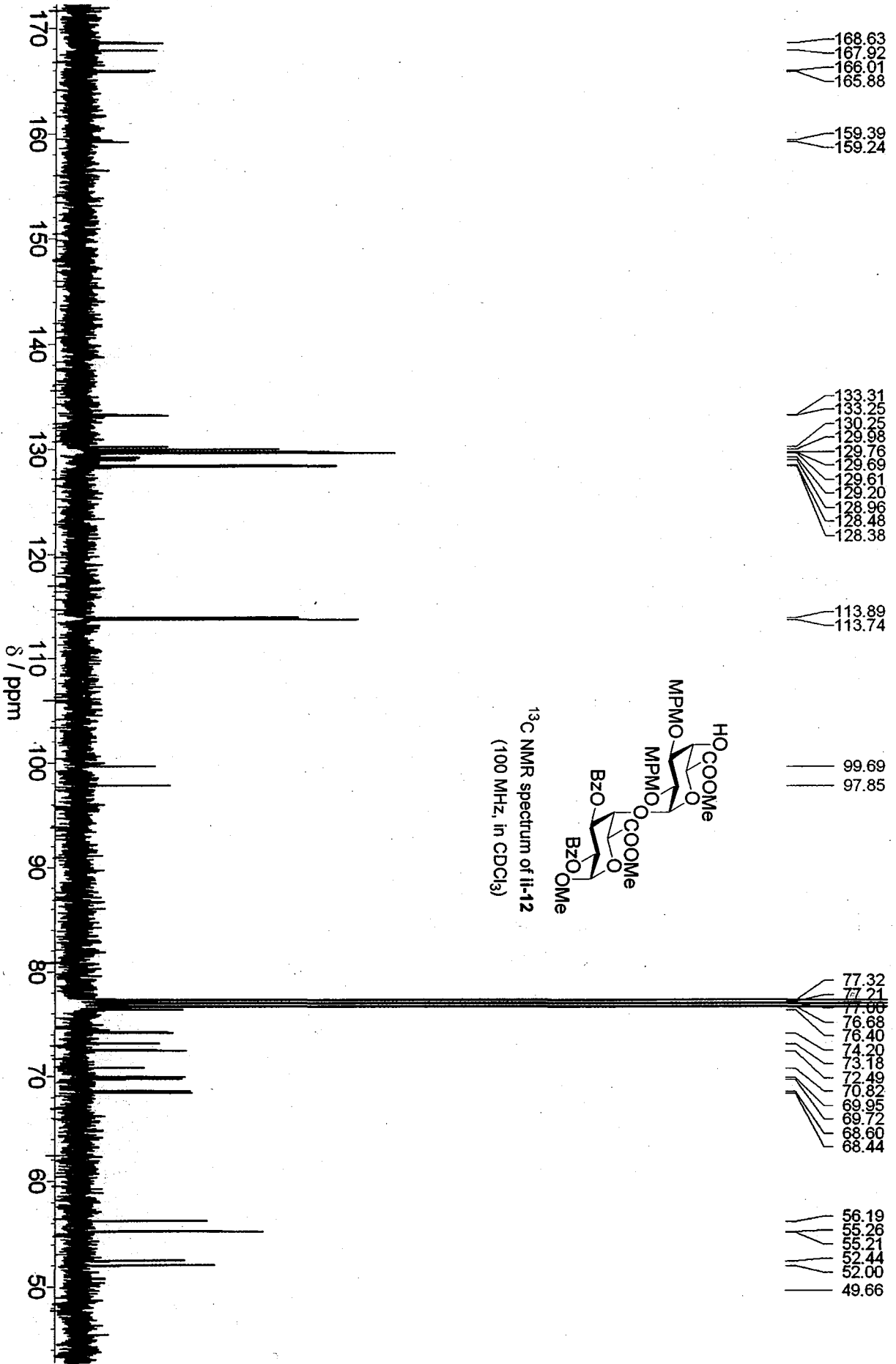


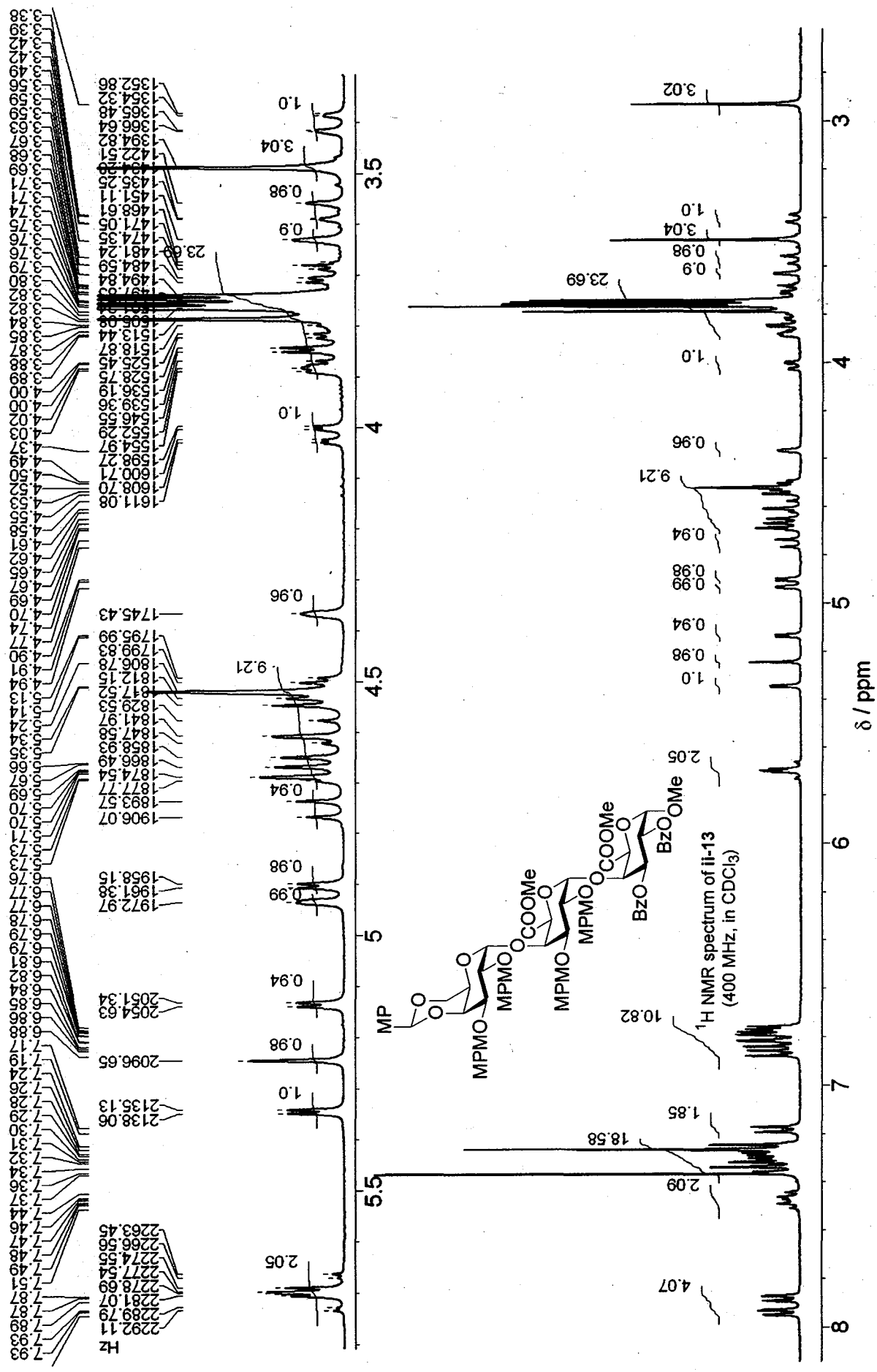
<sup>1</sup>H NMR spectrum (400 MHz, in CDCl<sub>3</sub>)



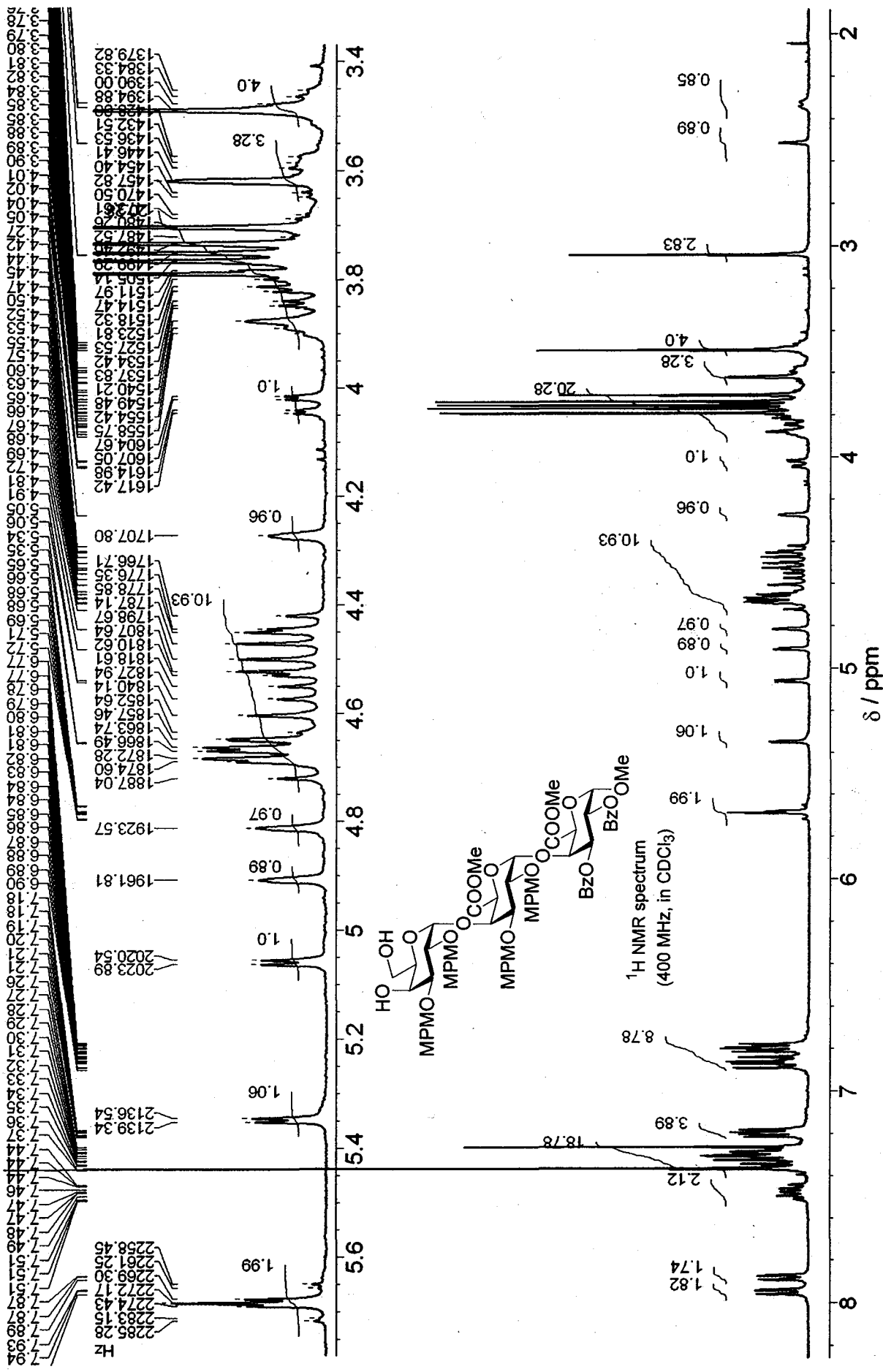


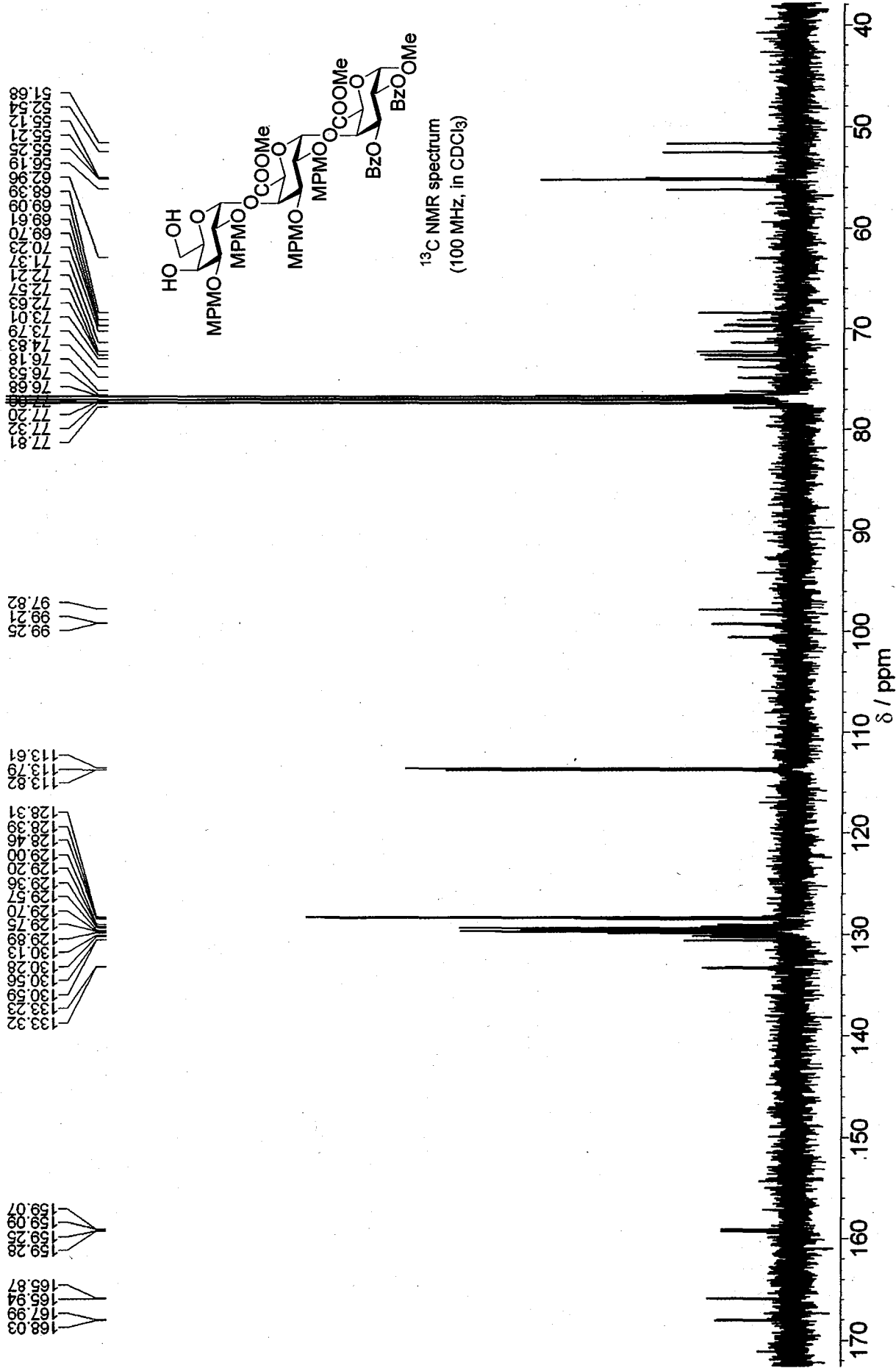






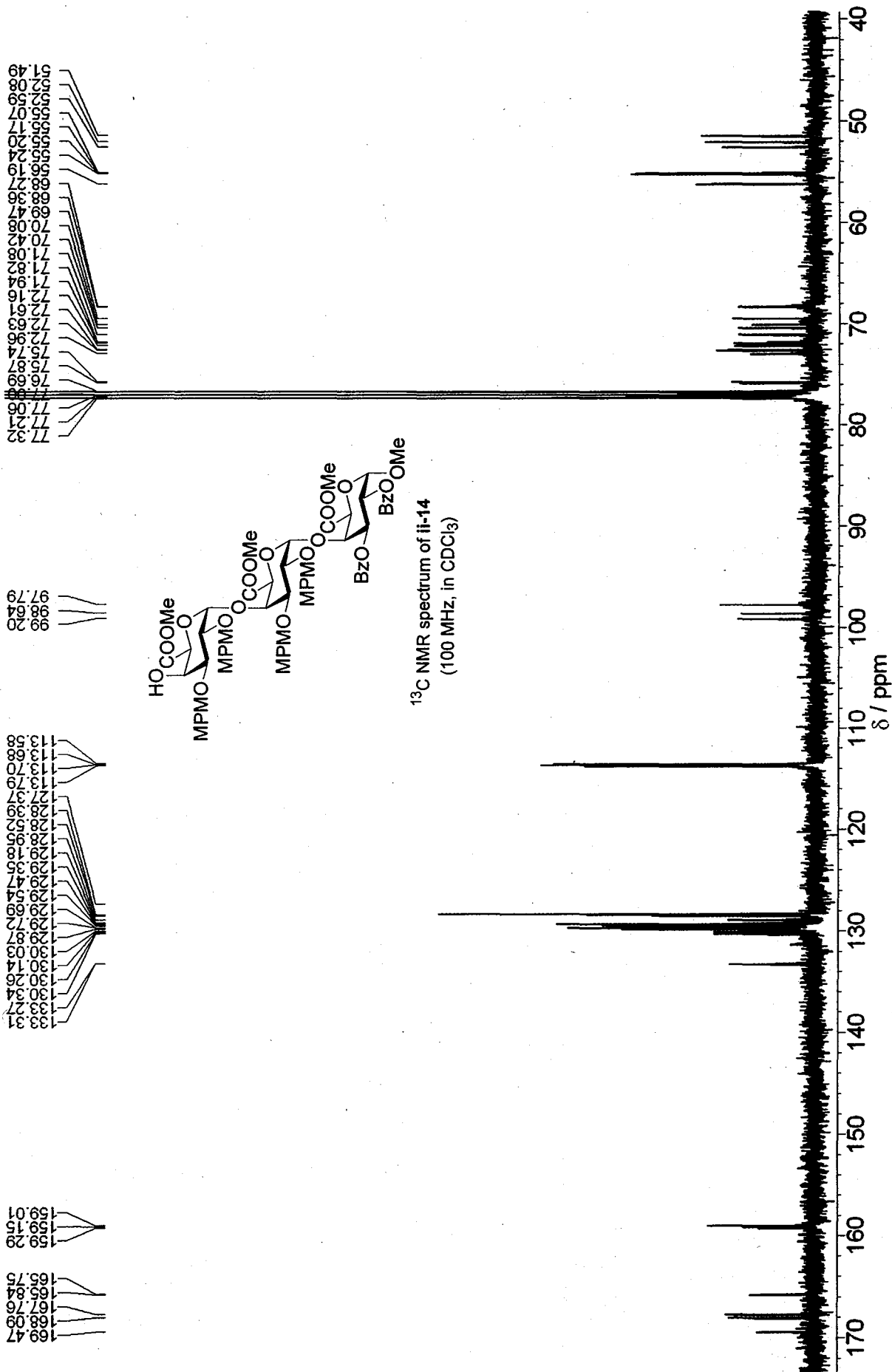


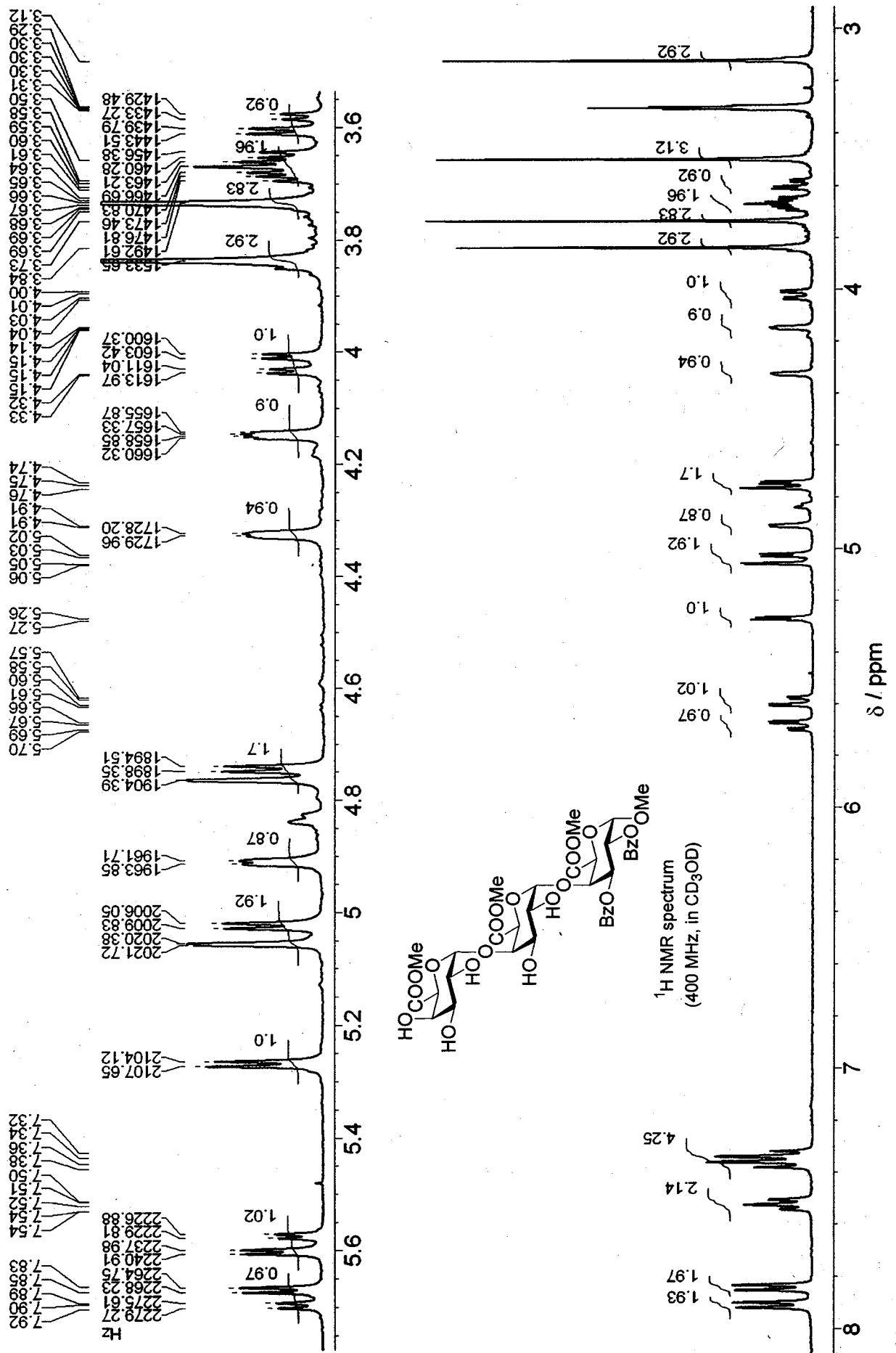


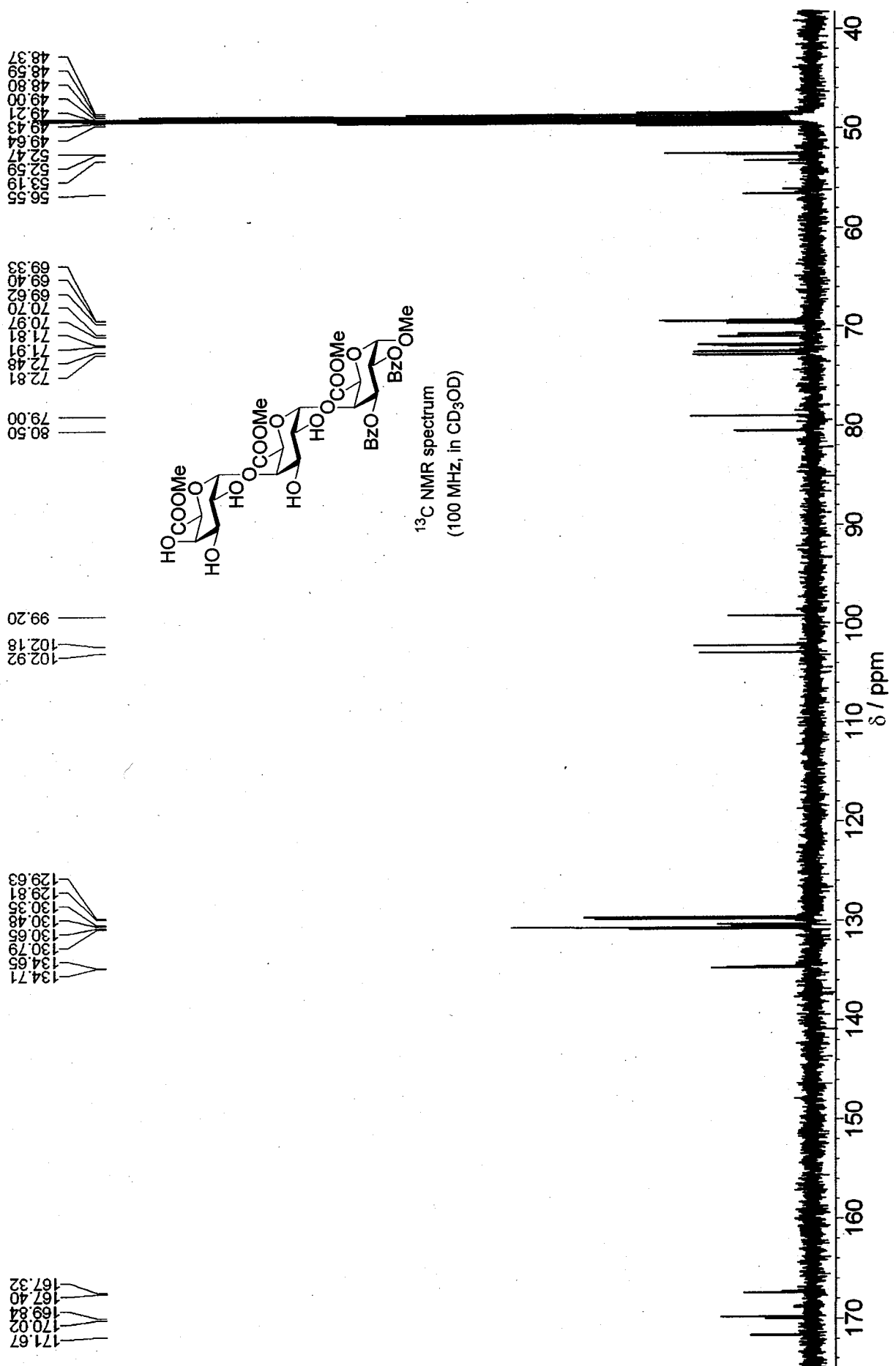


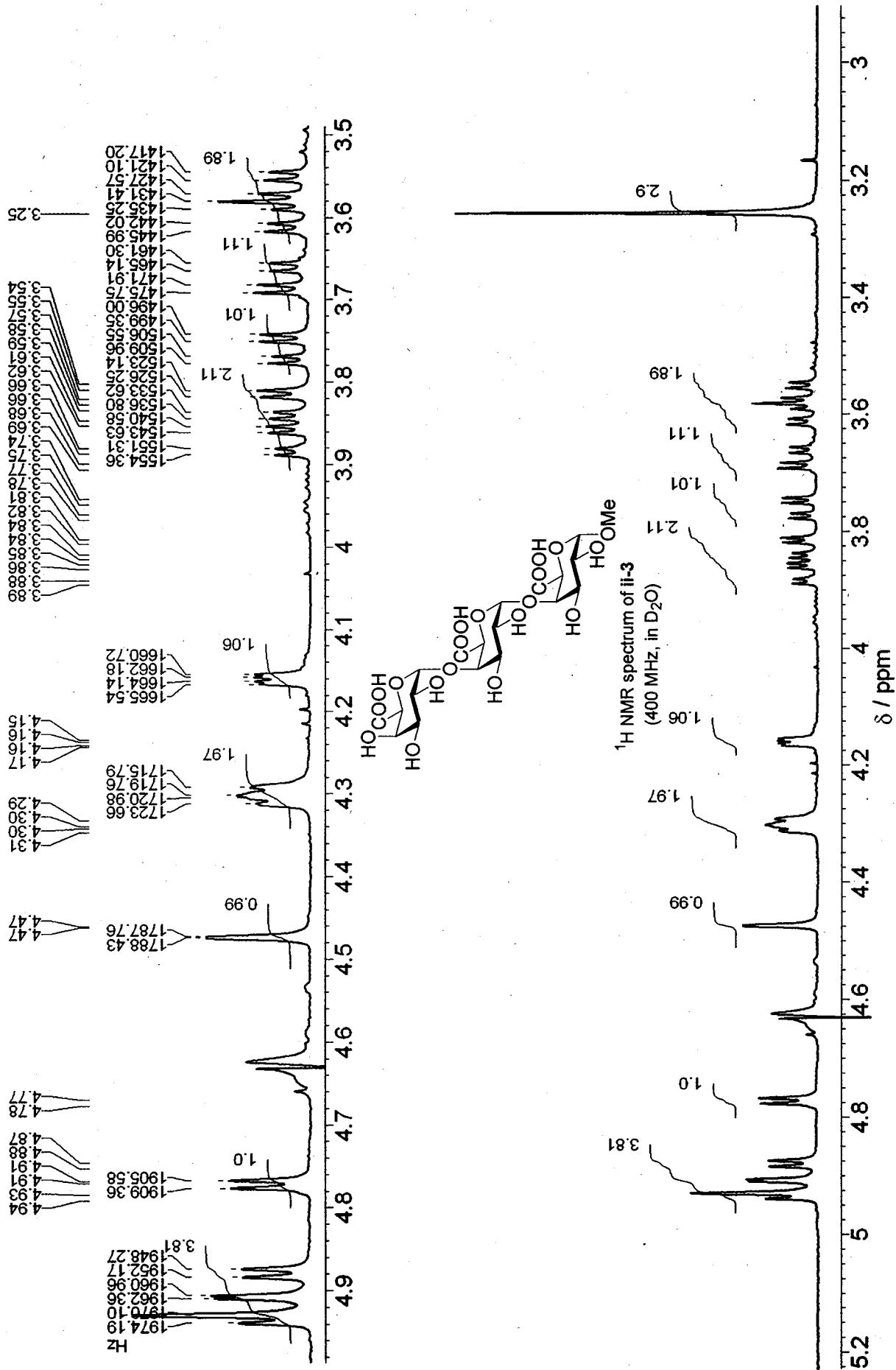


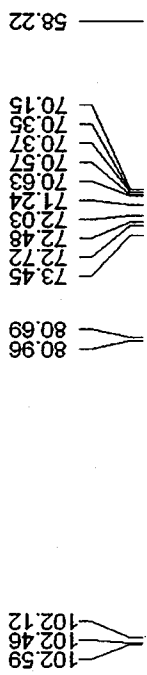




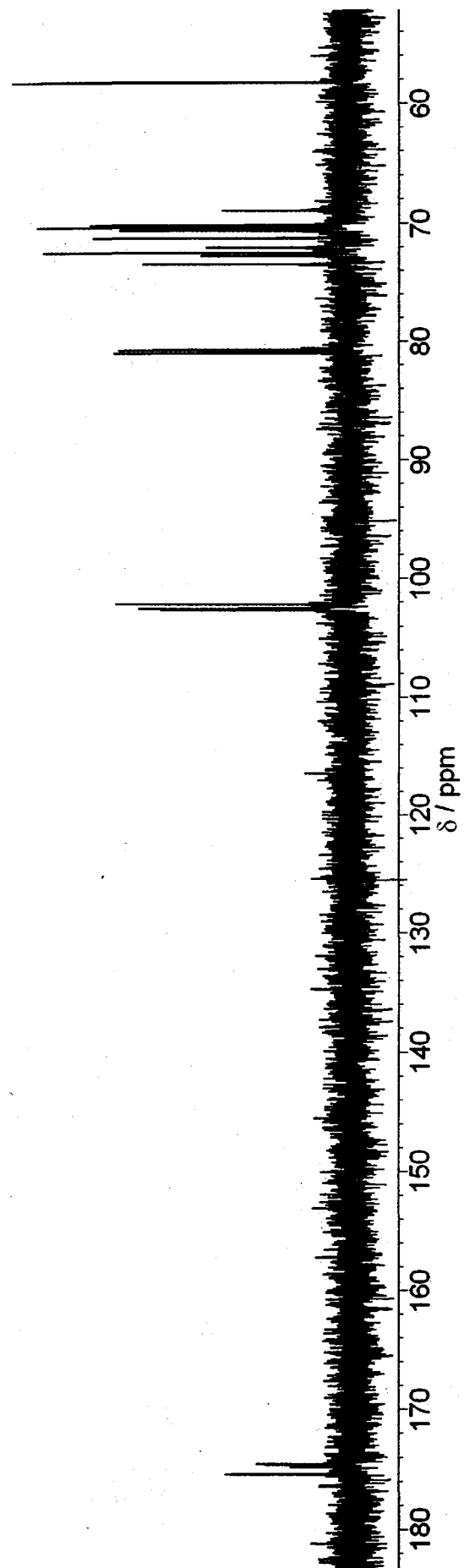








$^{13}\text{C}$  NMR spectrum of ii-3  
(100 MHz, in  $\text{D}_2\text{O}$ )



2.09  
2.05

3.94  
3.93  
3.92  
3.91  
3.90  
3.89  
3.80  
3.77  
3.75  
3.73  
3.65  
3.63  
3.61  
3.41

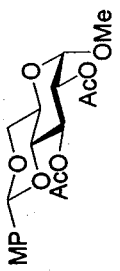
4.27  
4.28  
4.29  
4.30

4.89  
4.90  
4.91  
4.92  
4.93  
4.94

5.46  
5.55  
5.57  
5.59

6.88  
6.88

7.38  
7.36  
7.36  
7.26



<sup>1</sup>H NMR spectrum  
(500 MHz, in CDCl<sub>3</sub>)

1825.44  
1815.84  
1806.25

1866.97  
1877.28  
1887.59  
1898.90  
1969.85  
1959.06  
1955.10  
1950.09  
1945.22

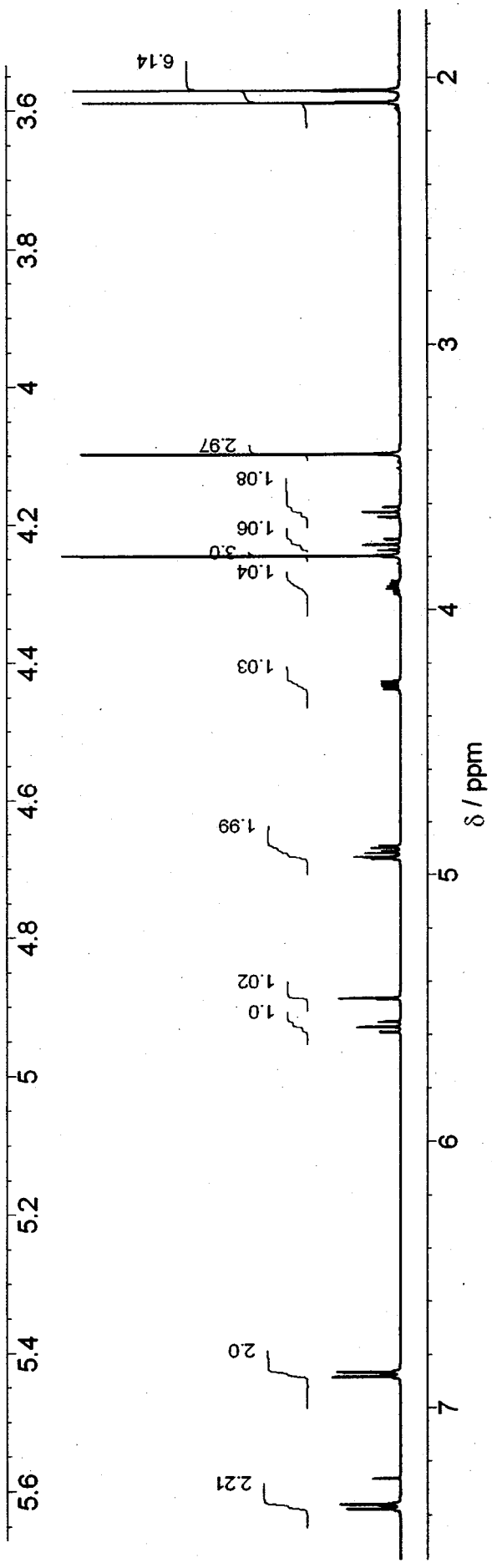
2148.99  
2144.19  
2138.75  
2133.88

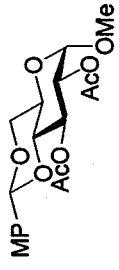
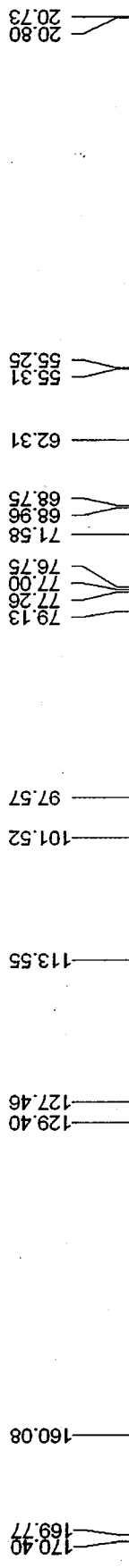
2470.32  
2466.59  
2458.86  
2455.14  
2446.05  
2445.33

2731.86

2795.30  
2785.56  
2775.82

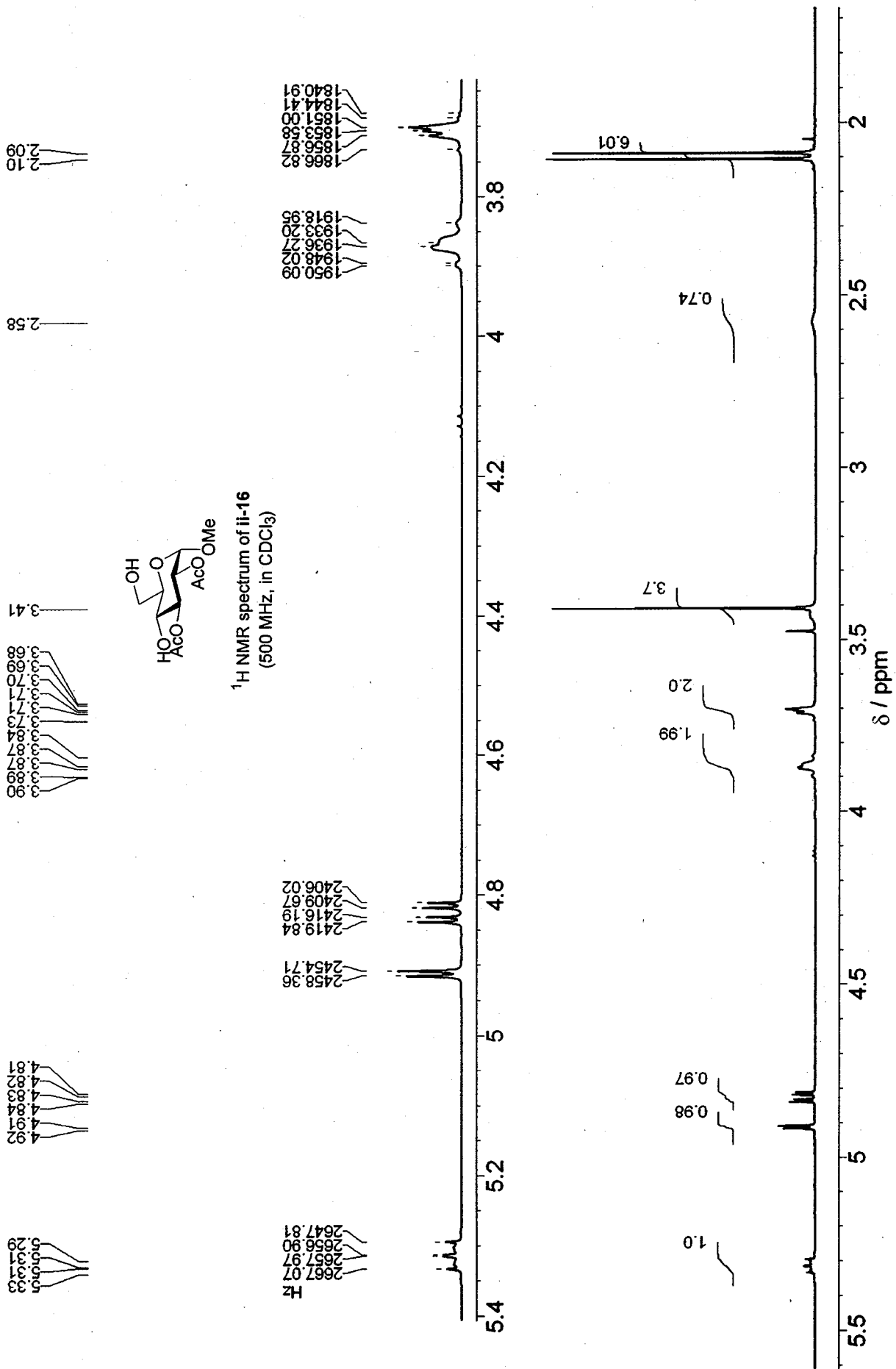
Hz

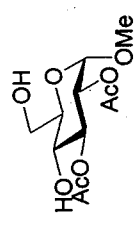
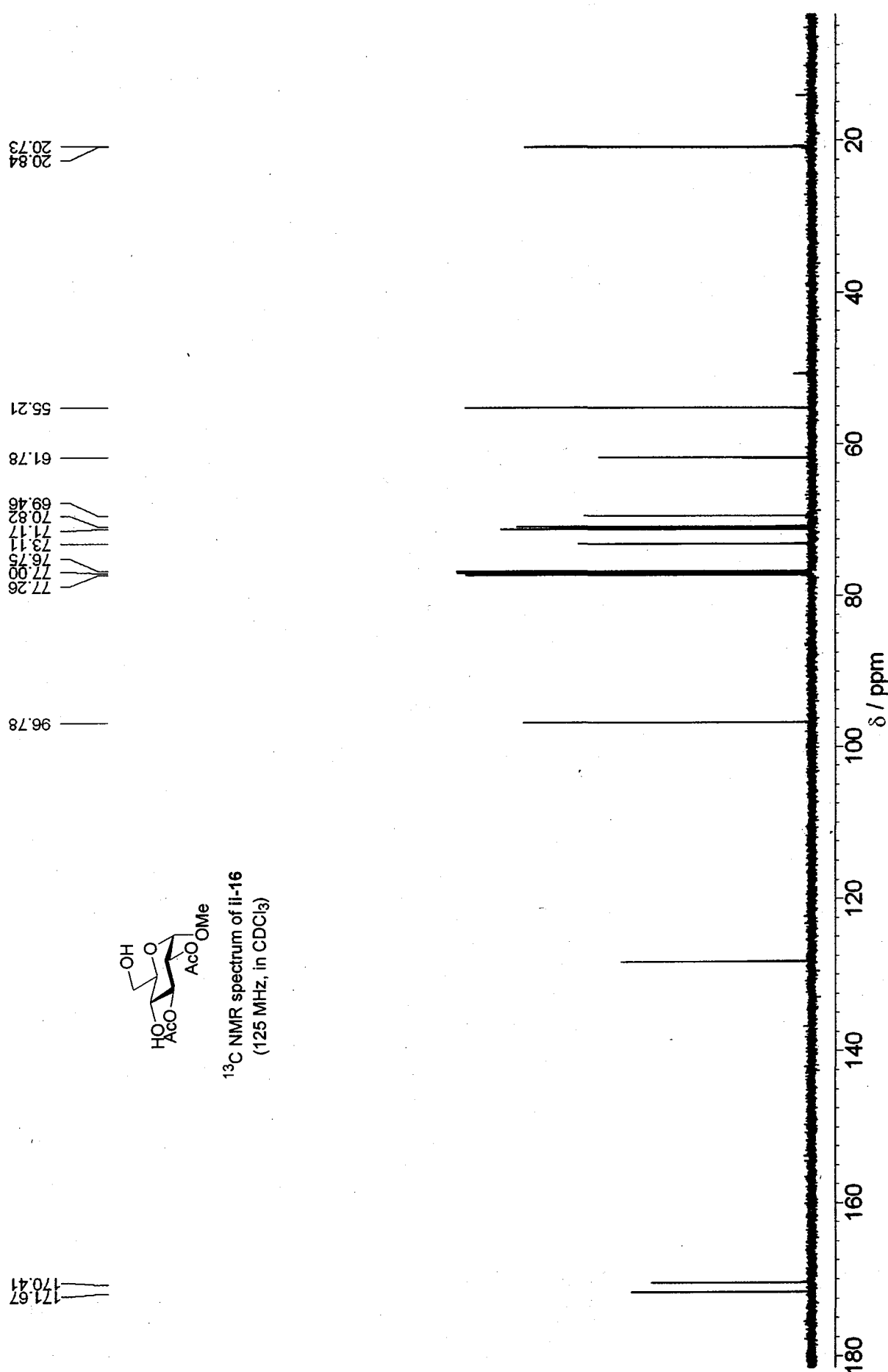




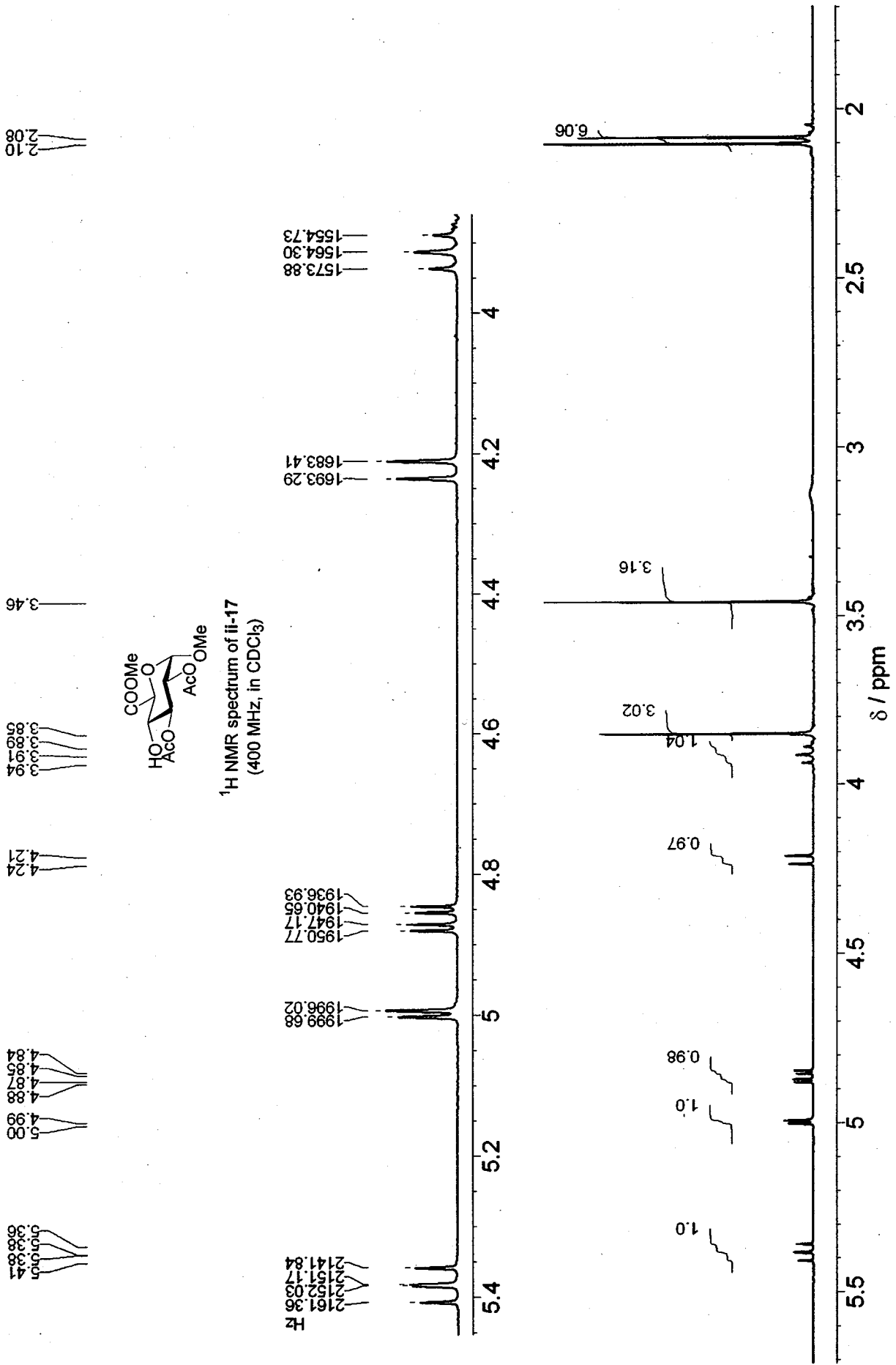
<sup>13</sup>C NMR spectrum.  
(125 MHz, in CDCl<sub>3</sub>)

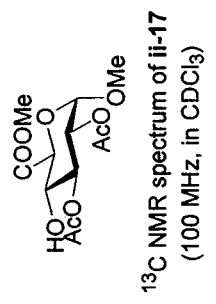
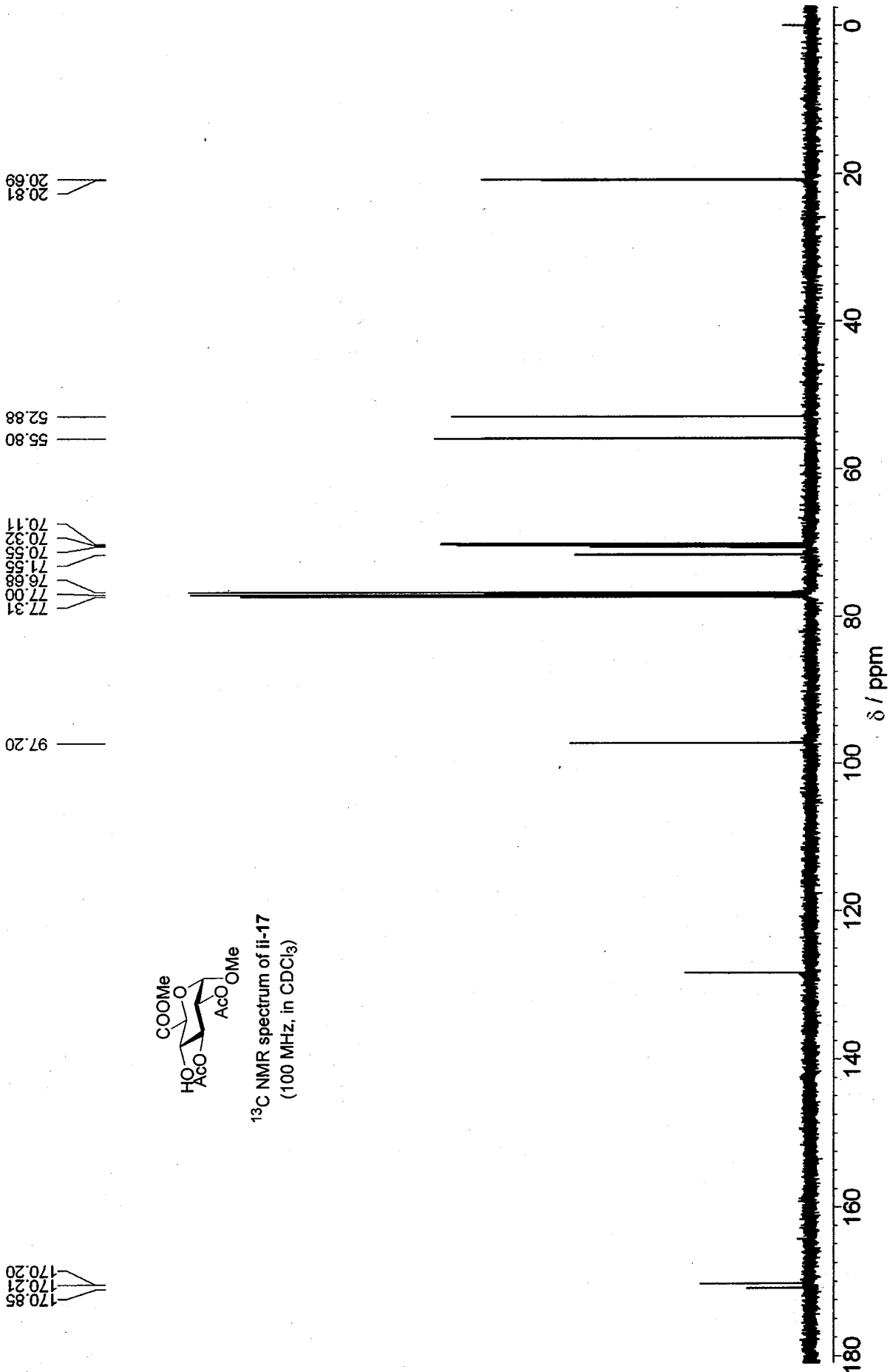


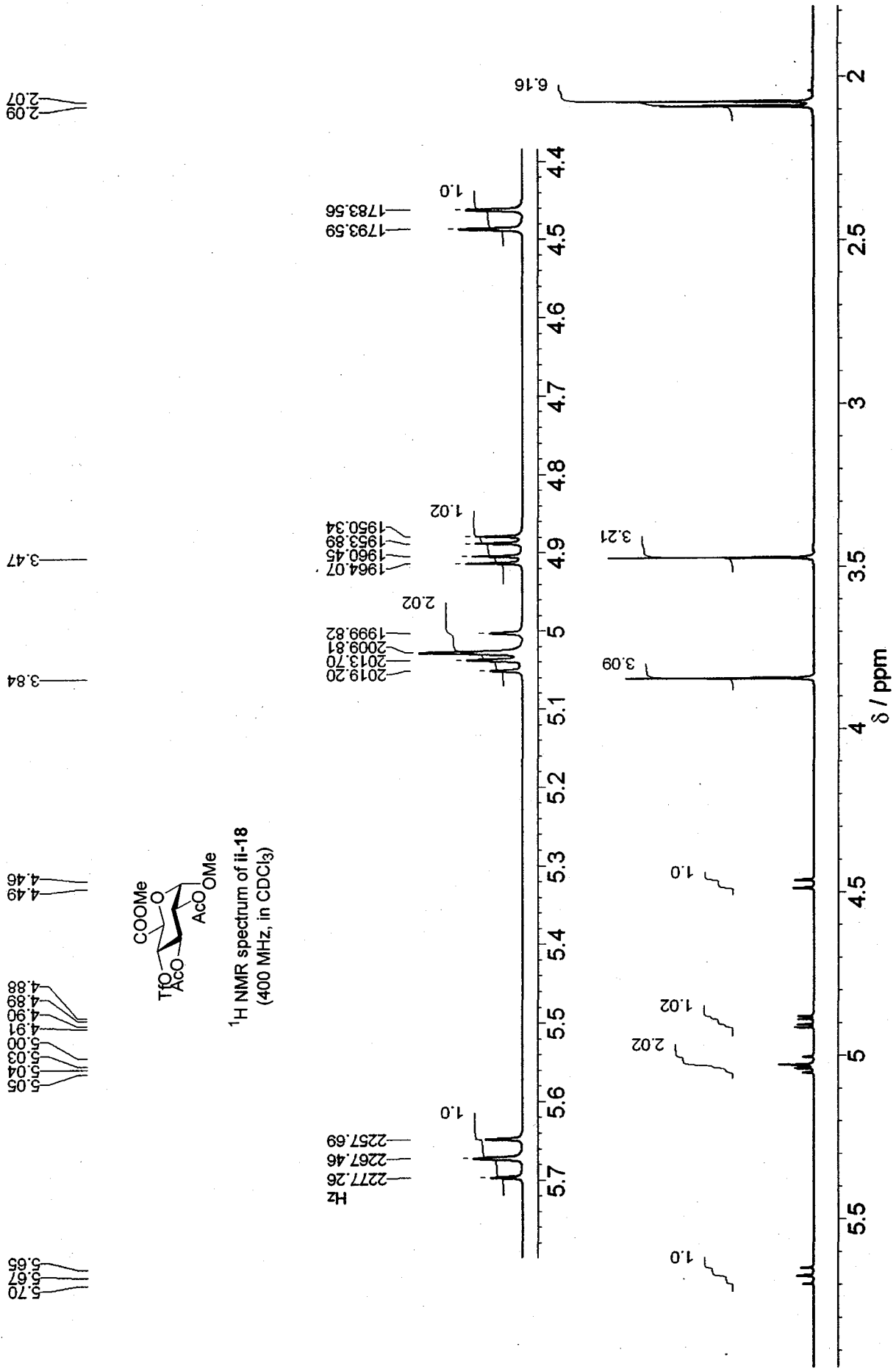


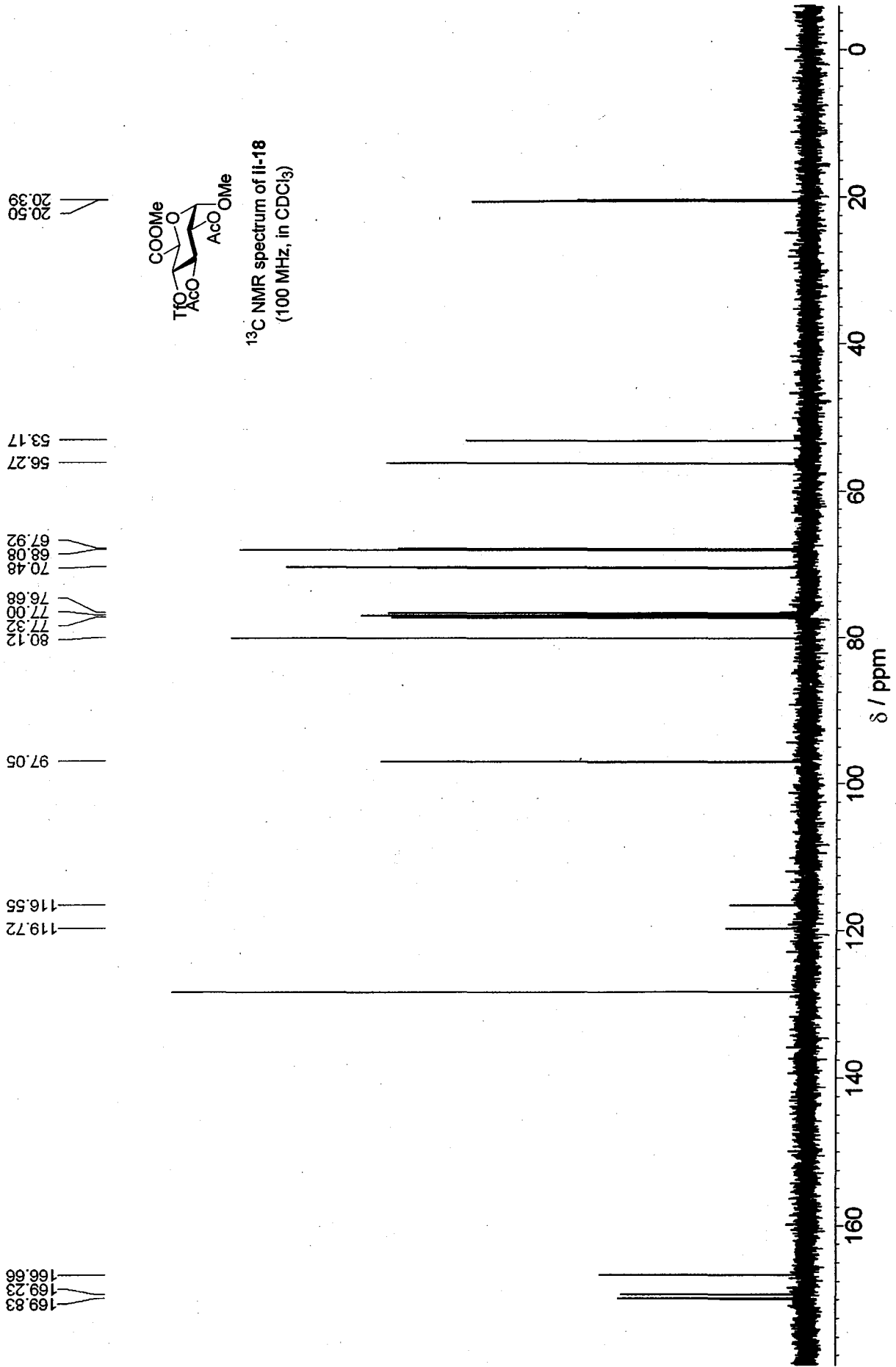


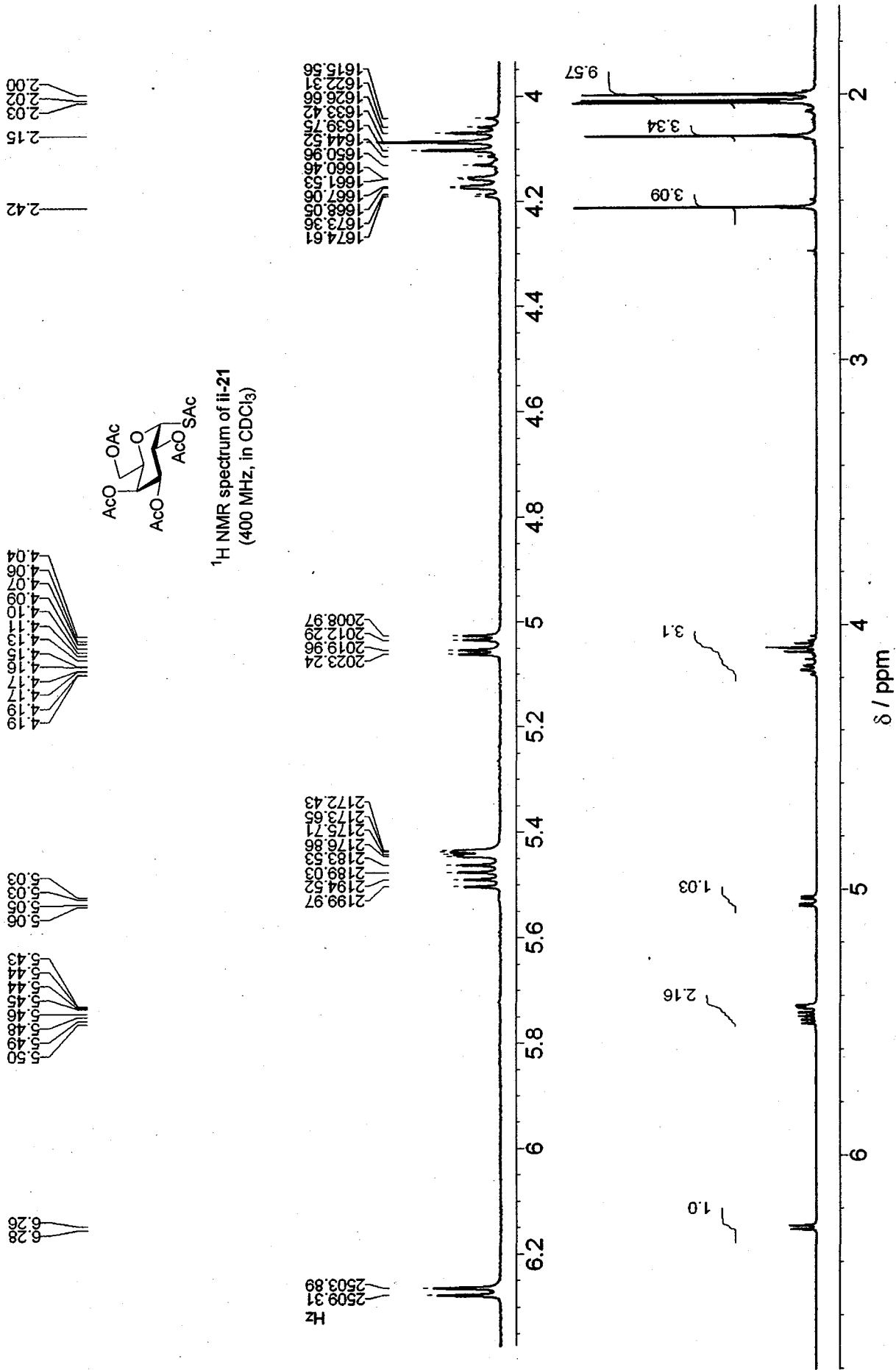
$^{13}\text{C}$  NMR spectrum of ii-16  
(125 MHz, in  $\text{CDCl}_3$ )

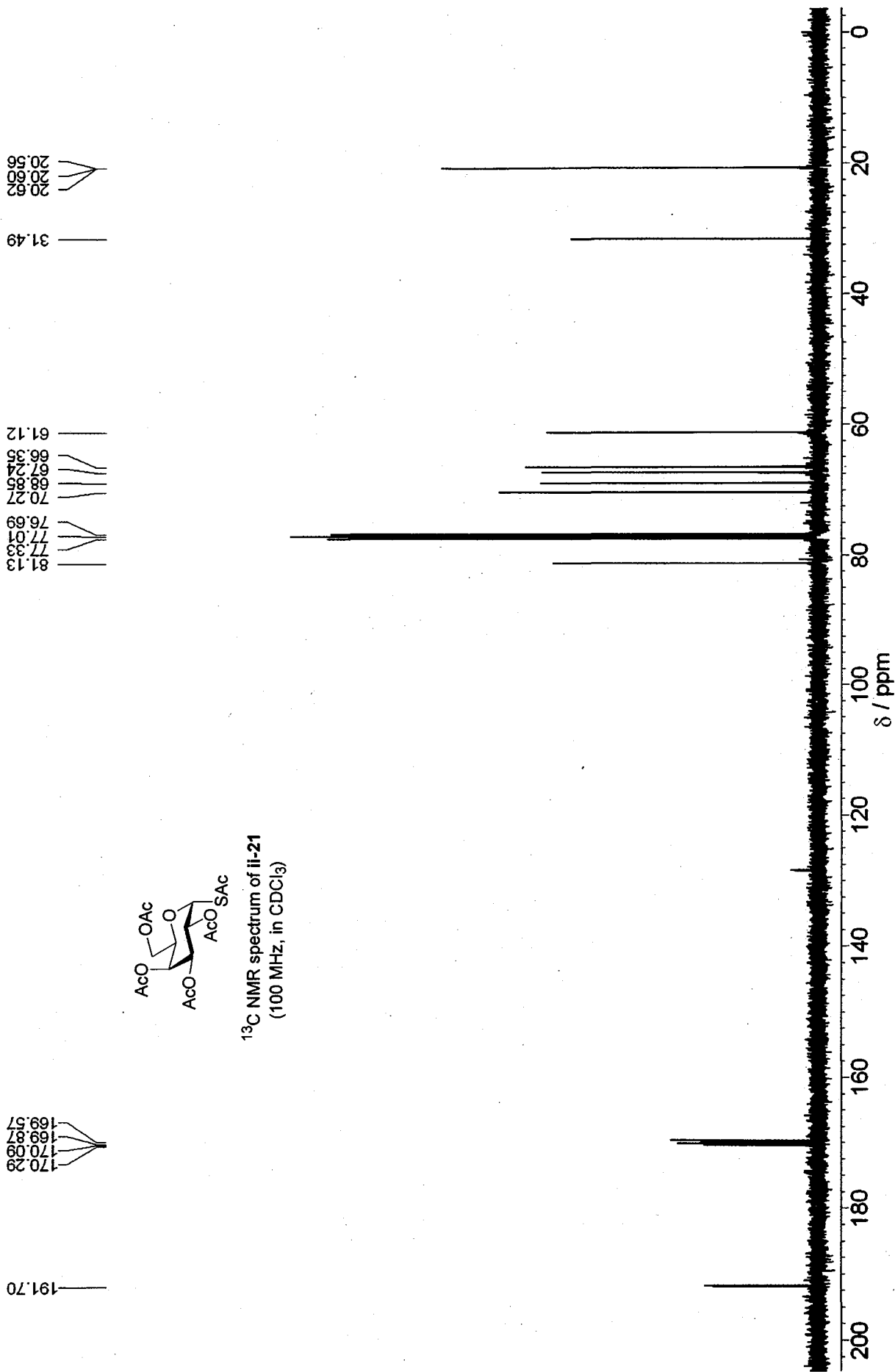




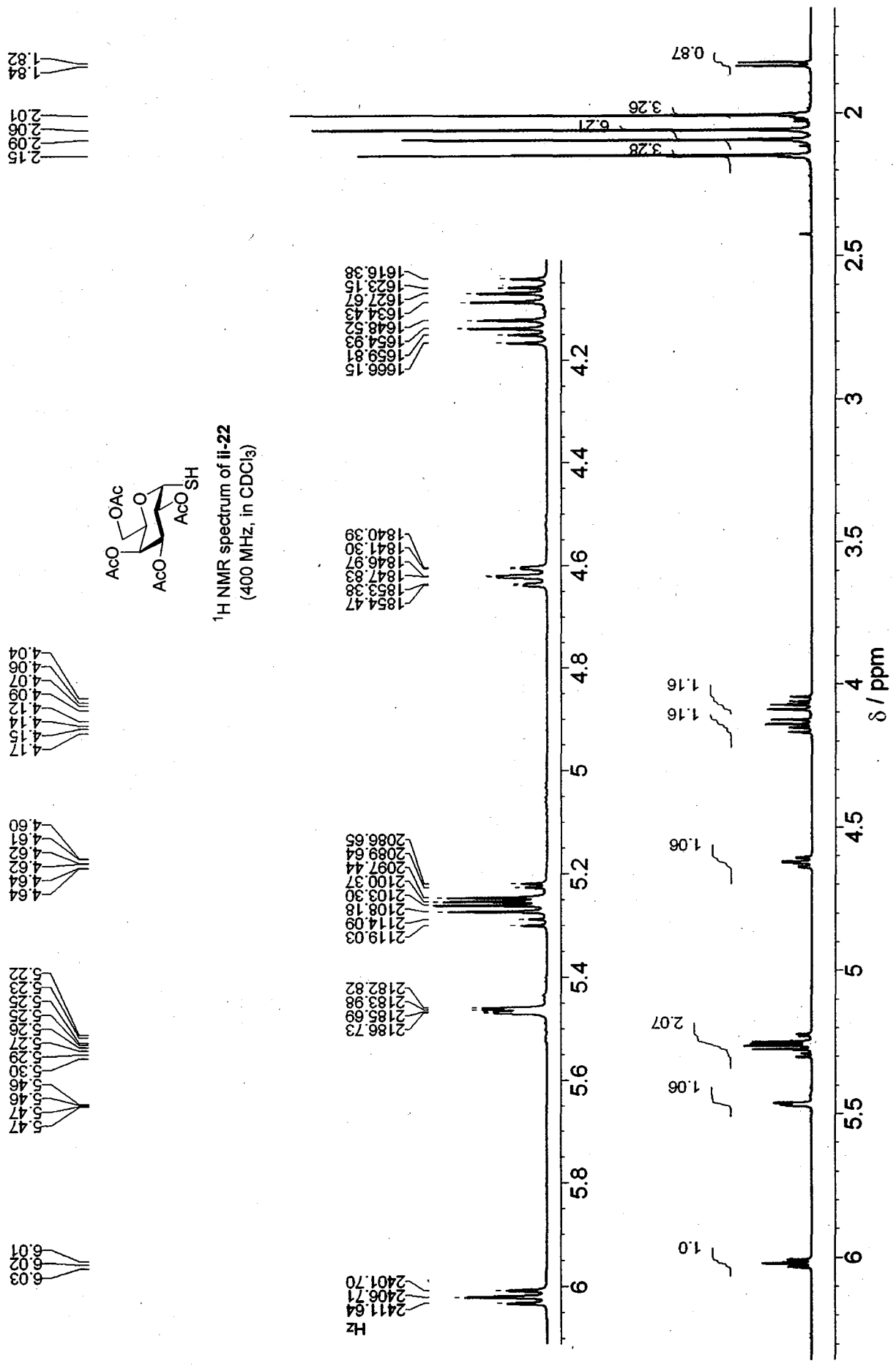




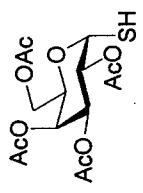








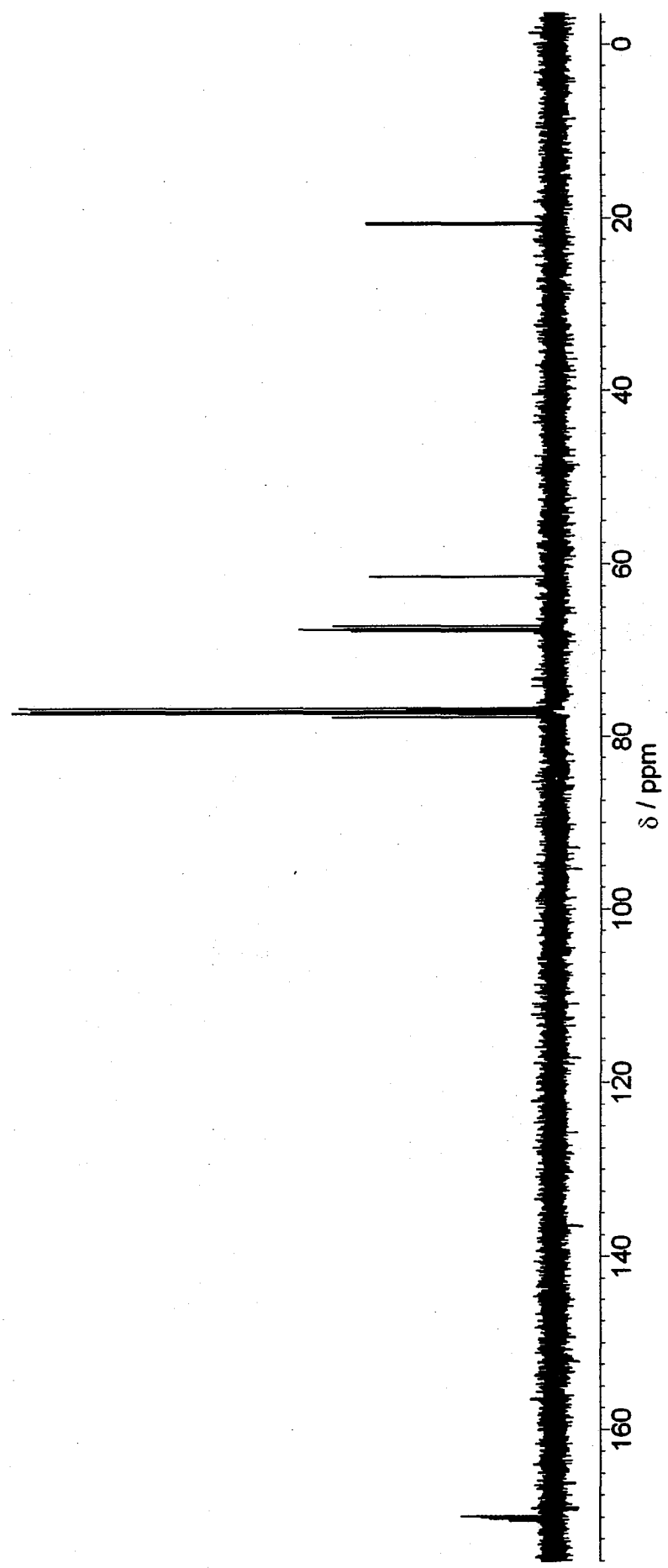
170.38  
170.08  
169.93  
169.87



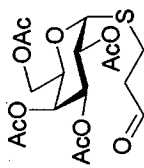
<sup>13</sup>C NMR spectrum of II-22  
(100 MHz, in CDCl<sub>3</sub>)

77.76  
77.32  
77.00  
76.69  
67.70  
67.52  
67.45  
67.13  
61.42

20.75  
20.67  
20.60  
20.58



9.77



<sup>1</sup>H NMR spectrum of II-23  
(400 MHz, in CDCl<sub>3</sub>)

2.15  
2.07  
2.06  
1.99

2.84  
2.84  
2.83  
2.82  
2.81  
2.80  
2.79

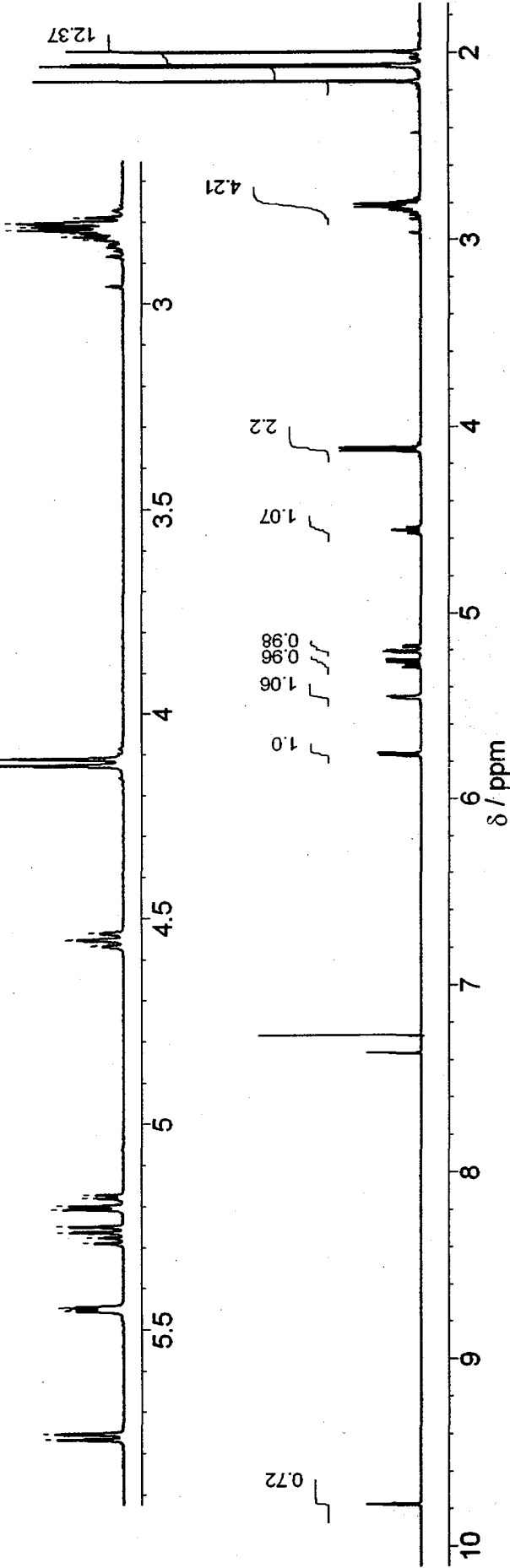
4.11  
4.13  
4.14  
4.54  
4.54  
4.55  
4.55  
4.57  
4.57  
4.17  
4.18  
4.20  
4.21  
4.25  
4.25  
4.26  
4.28  
4.28  
4.45  
4.45  
4.46  
4.46  
4.75  
4.77

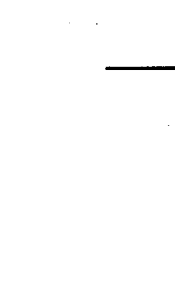
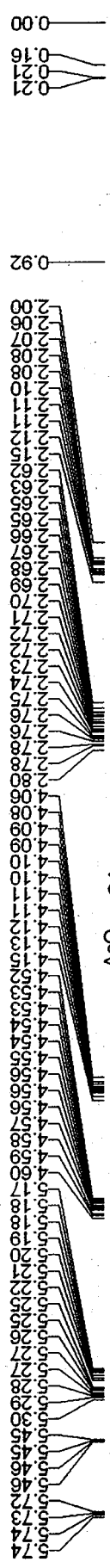
Hz  
2305.56  
2300.03

2181.21  
2180.14  
2178.04  
2176.93  
2114.98  
2109.41  
2104.15  
2098.62  
2081.76  
2078.55  
2070.92  
2067.60

1826.82  
1826.21  
1820.83  
1820.37  
1819.80  
1814.16  
1813.58

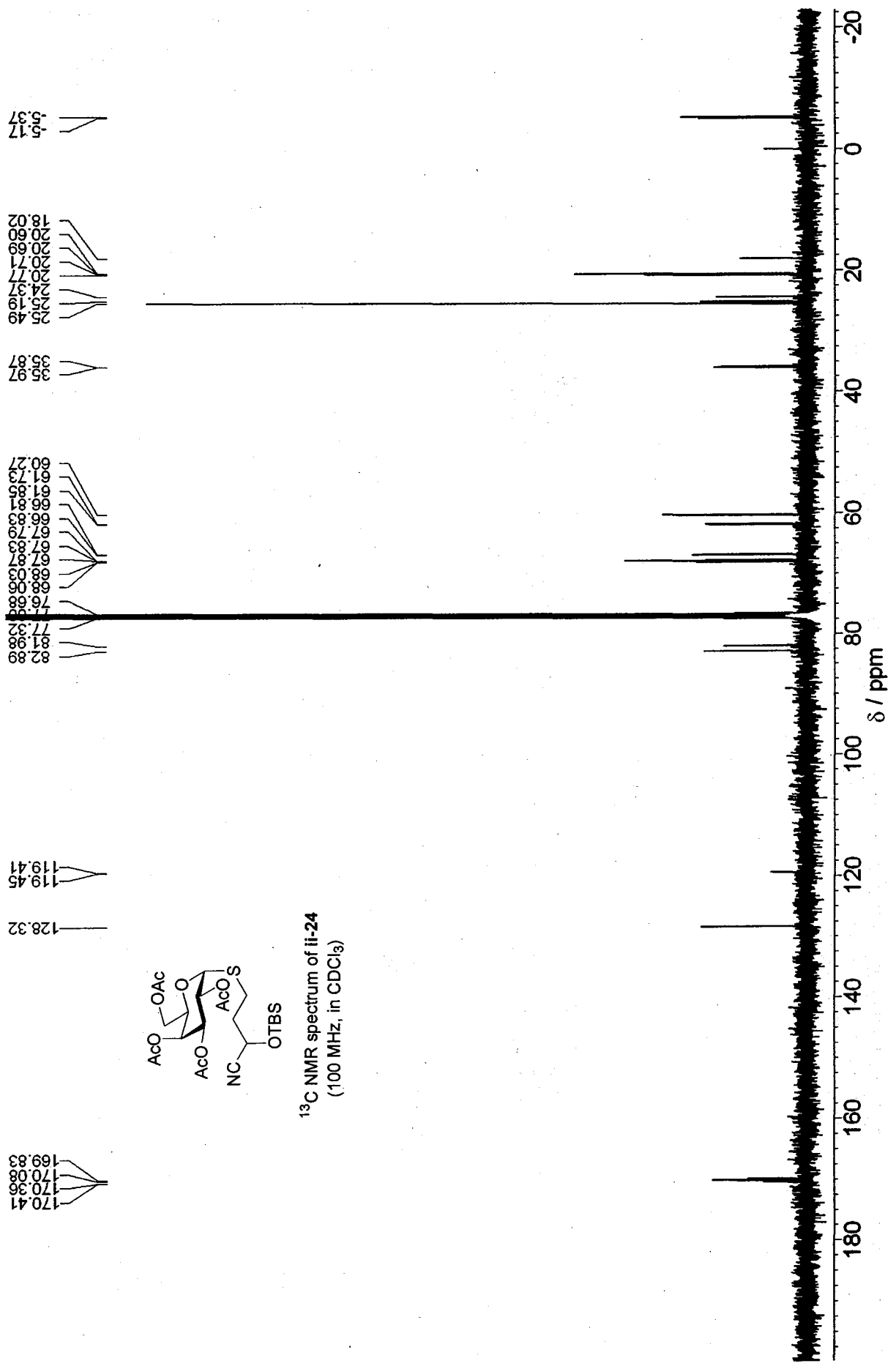
1137.01  
1134.34  
1131.02  
1129.11  
1127.62  
1124.69  
1121.18  
1115.42

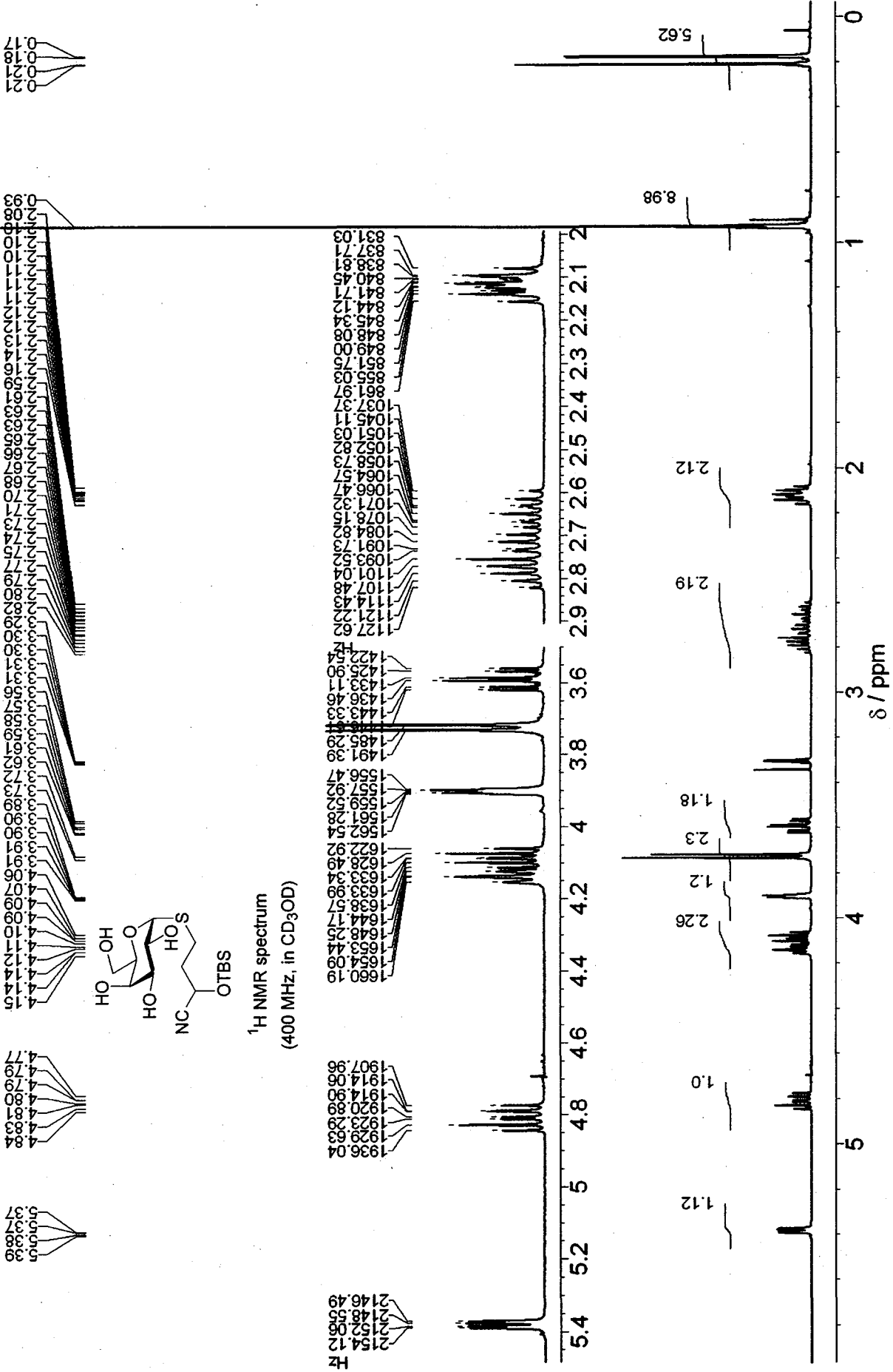


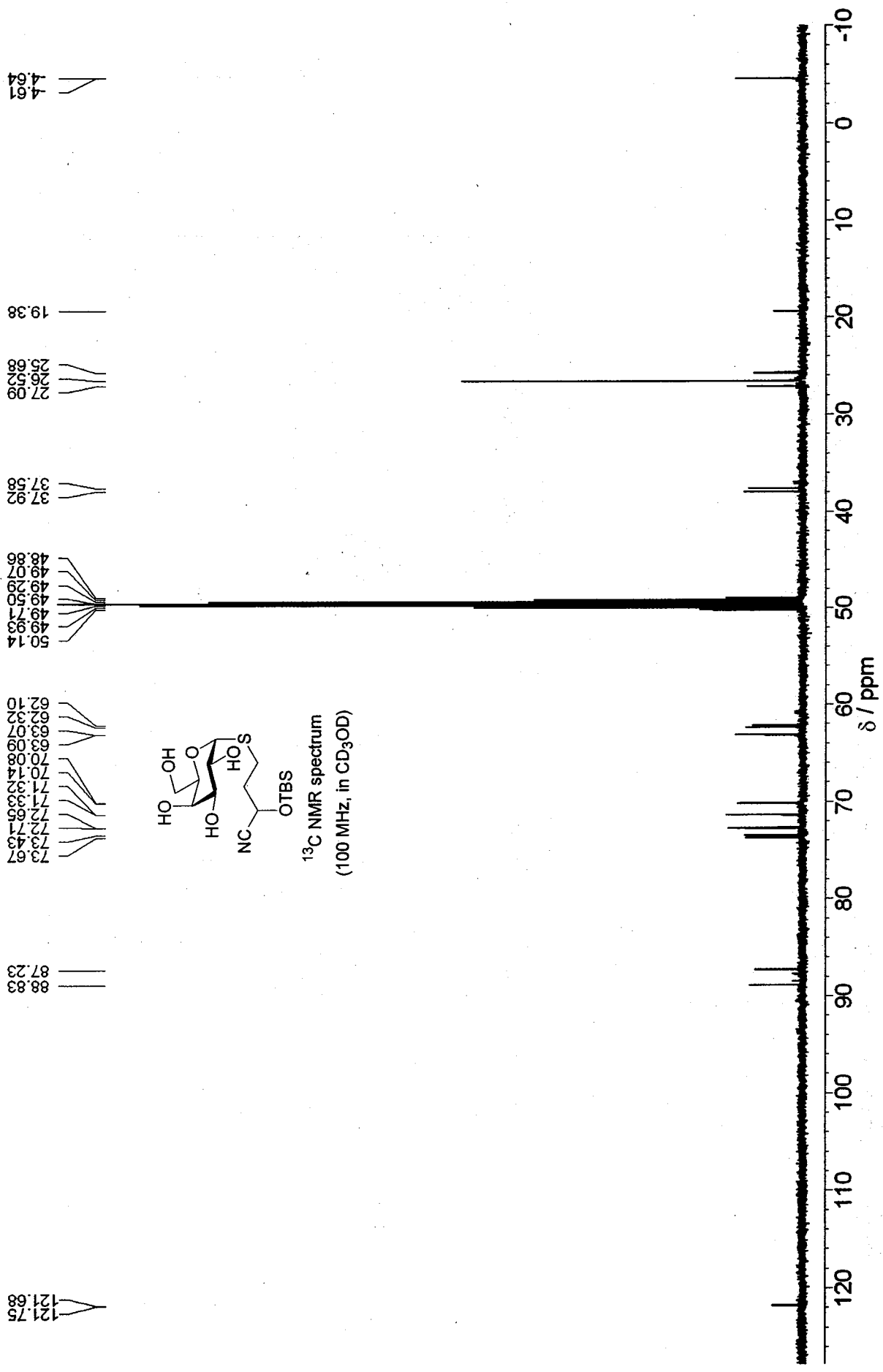


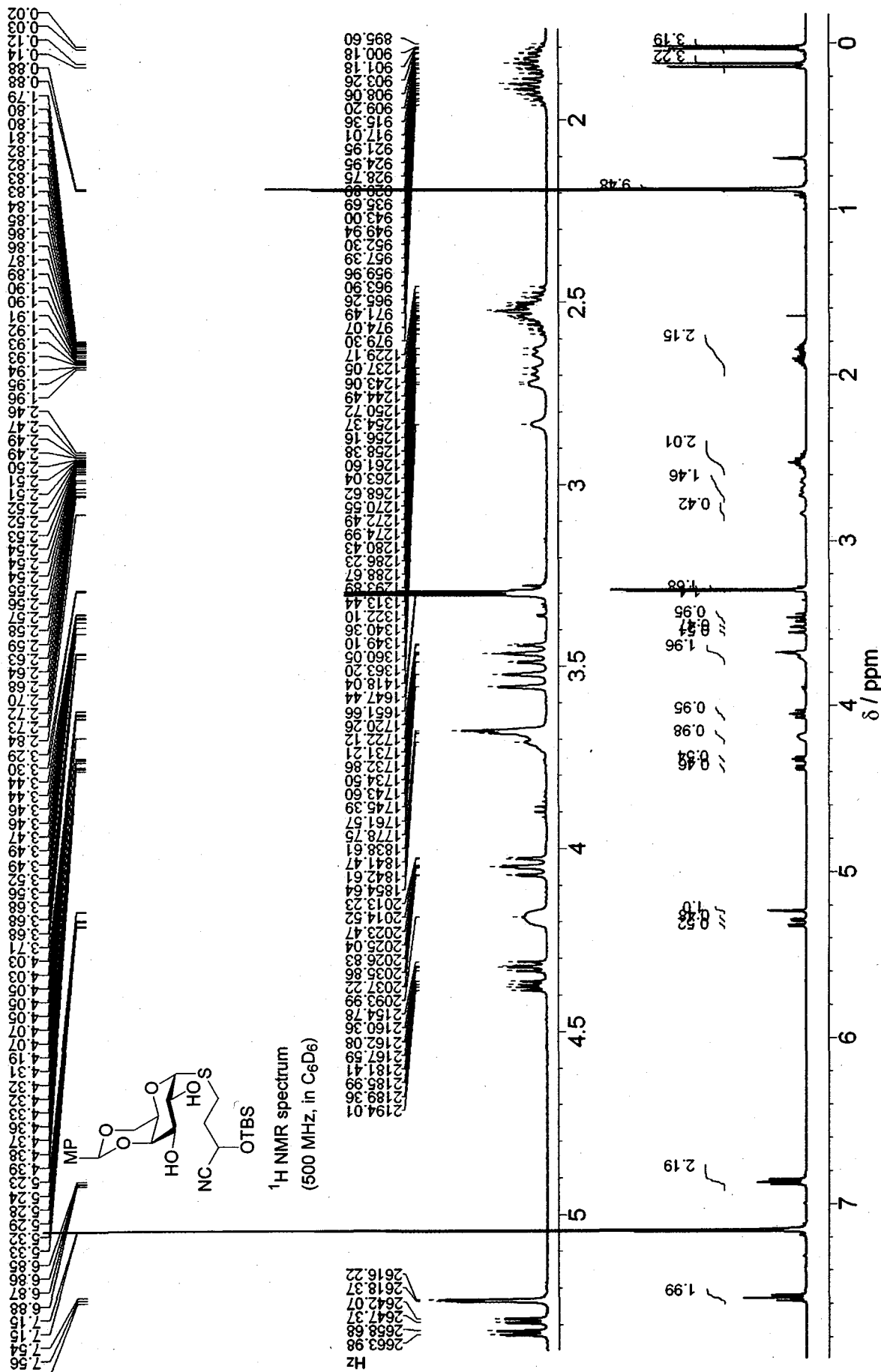
<sup>1</sup>H NMR spectrum of ii-24  
(400 MHz, in CDCl<sub>3</sub>)

Chemical Shift (ppm)	Integration
6.08	6.08
9.55	9.55
14.08	14.08
2.06	2.06
2.15	2.15
2.05	2.05
1.02	1.02
1.0	1.0
1.02	1.02
1.02	1.02

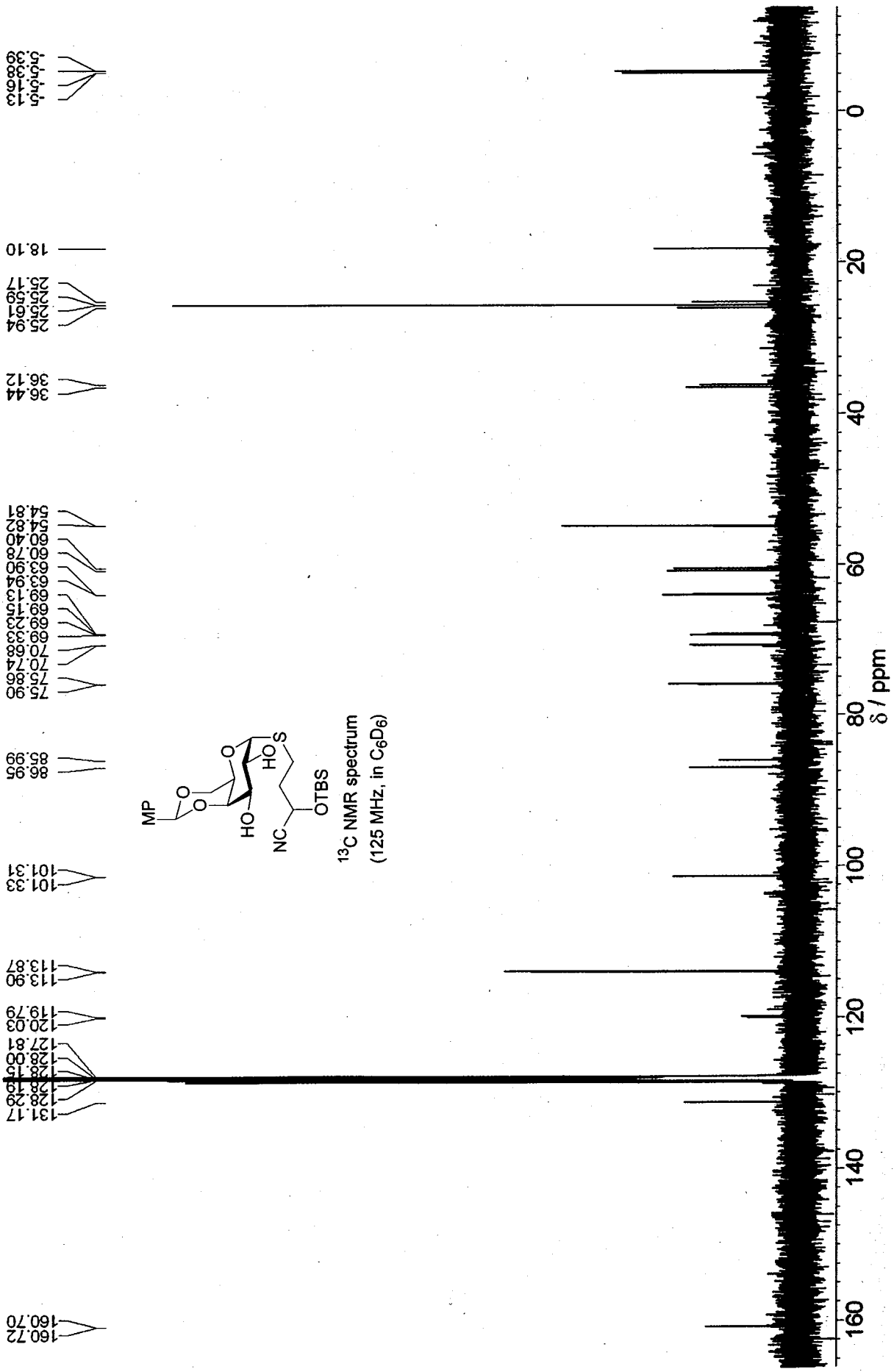


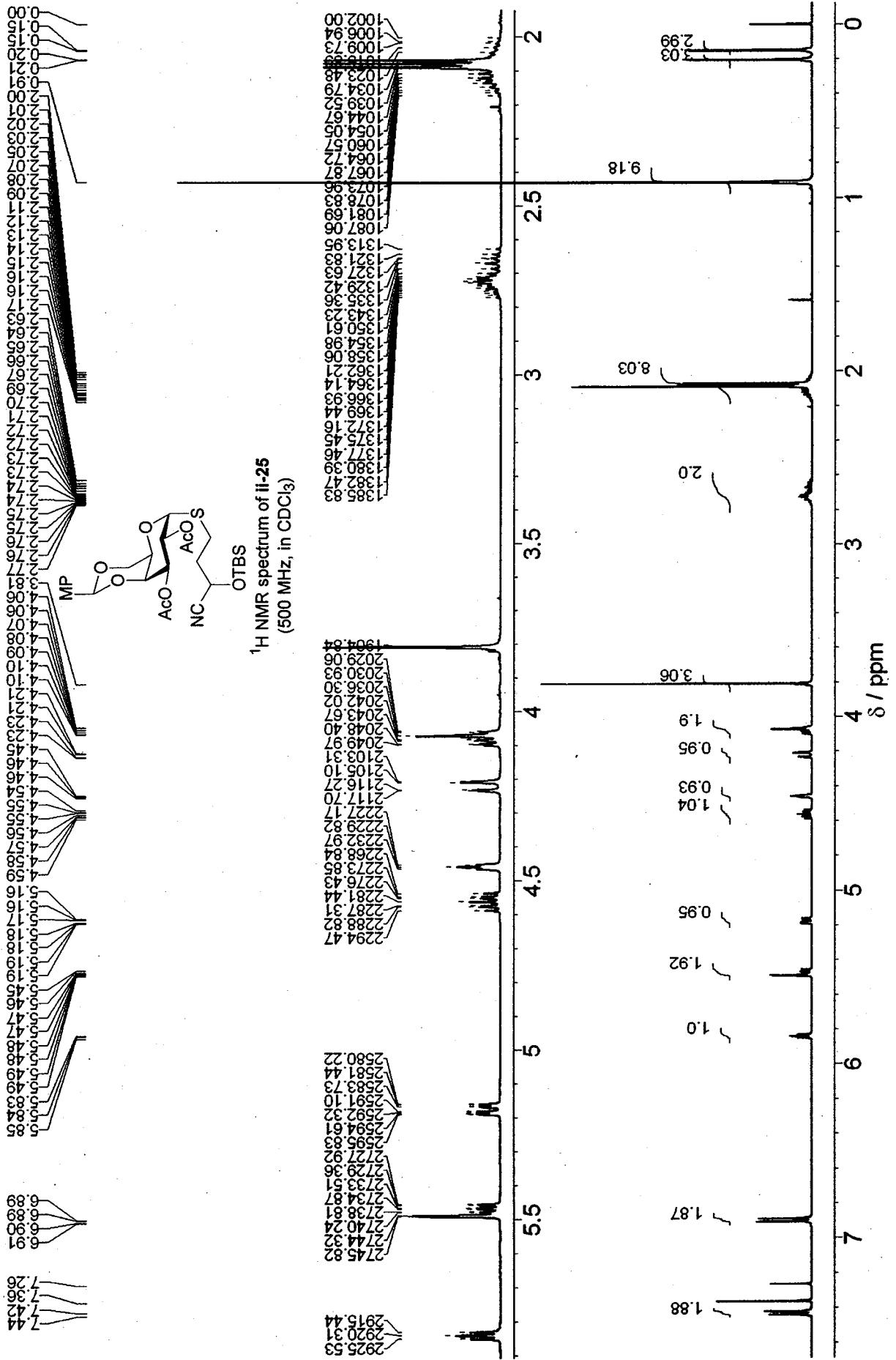


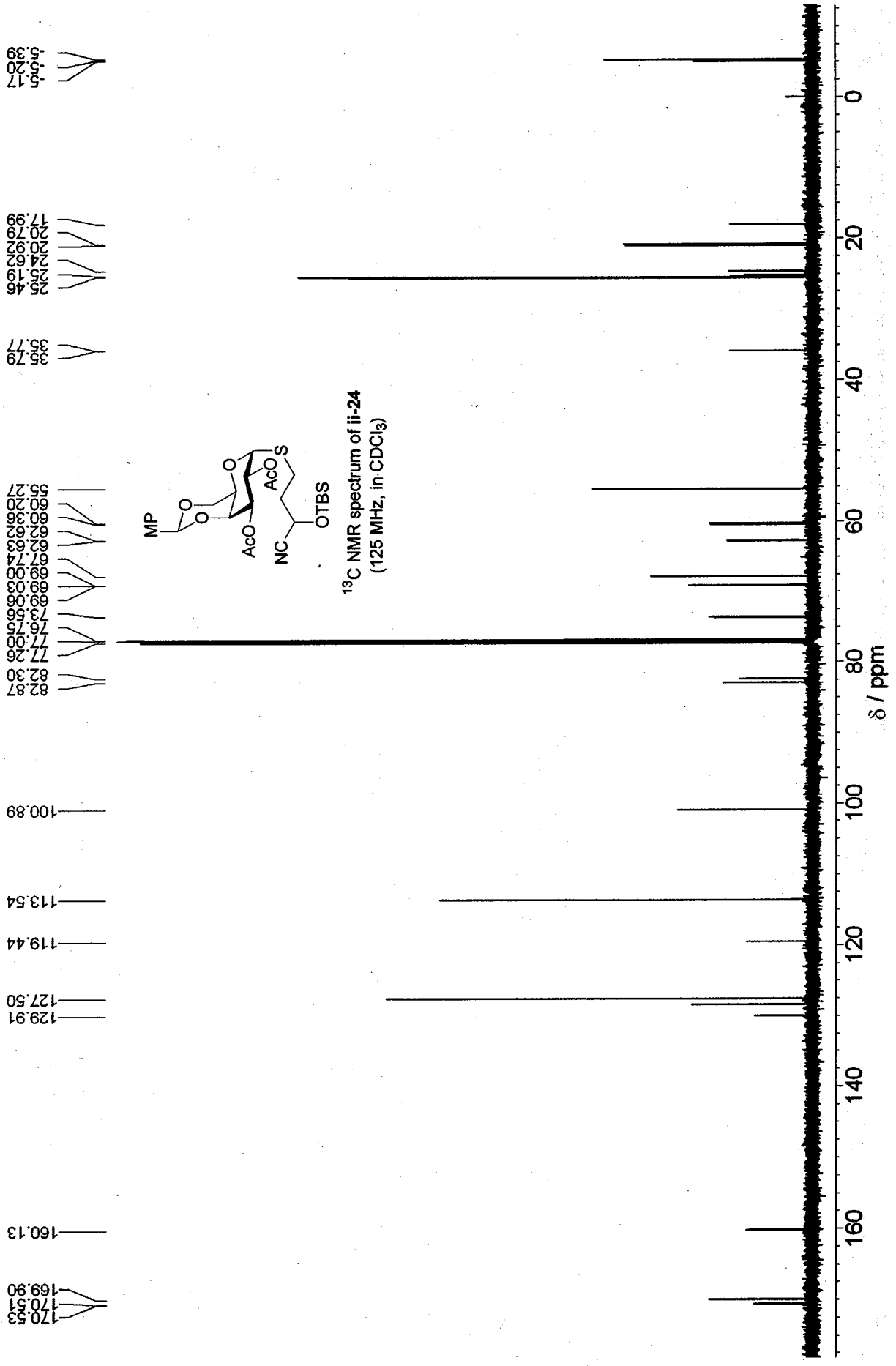


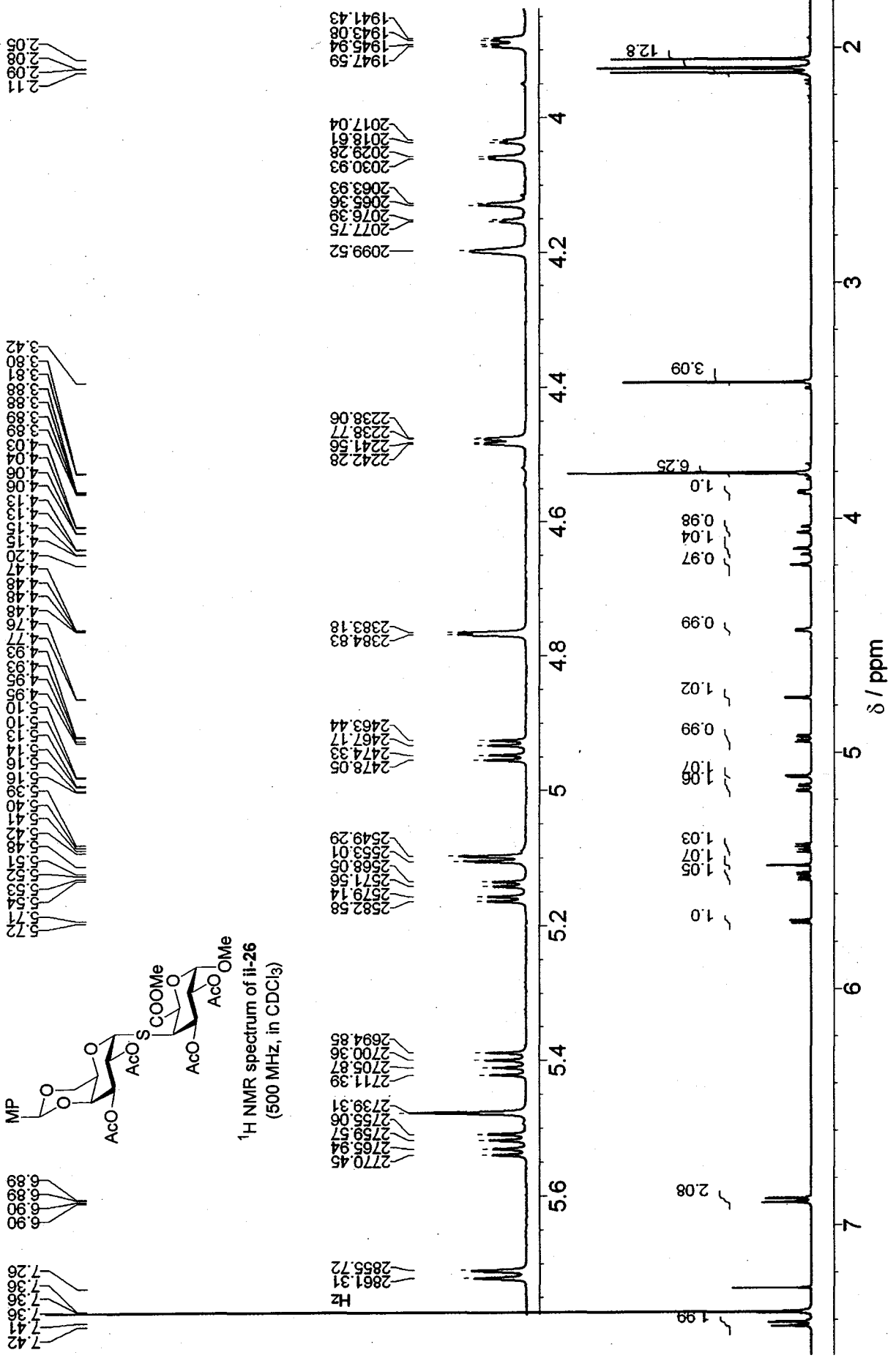


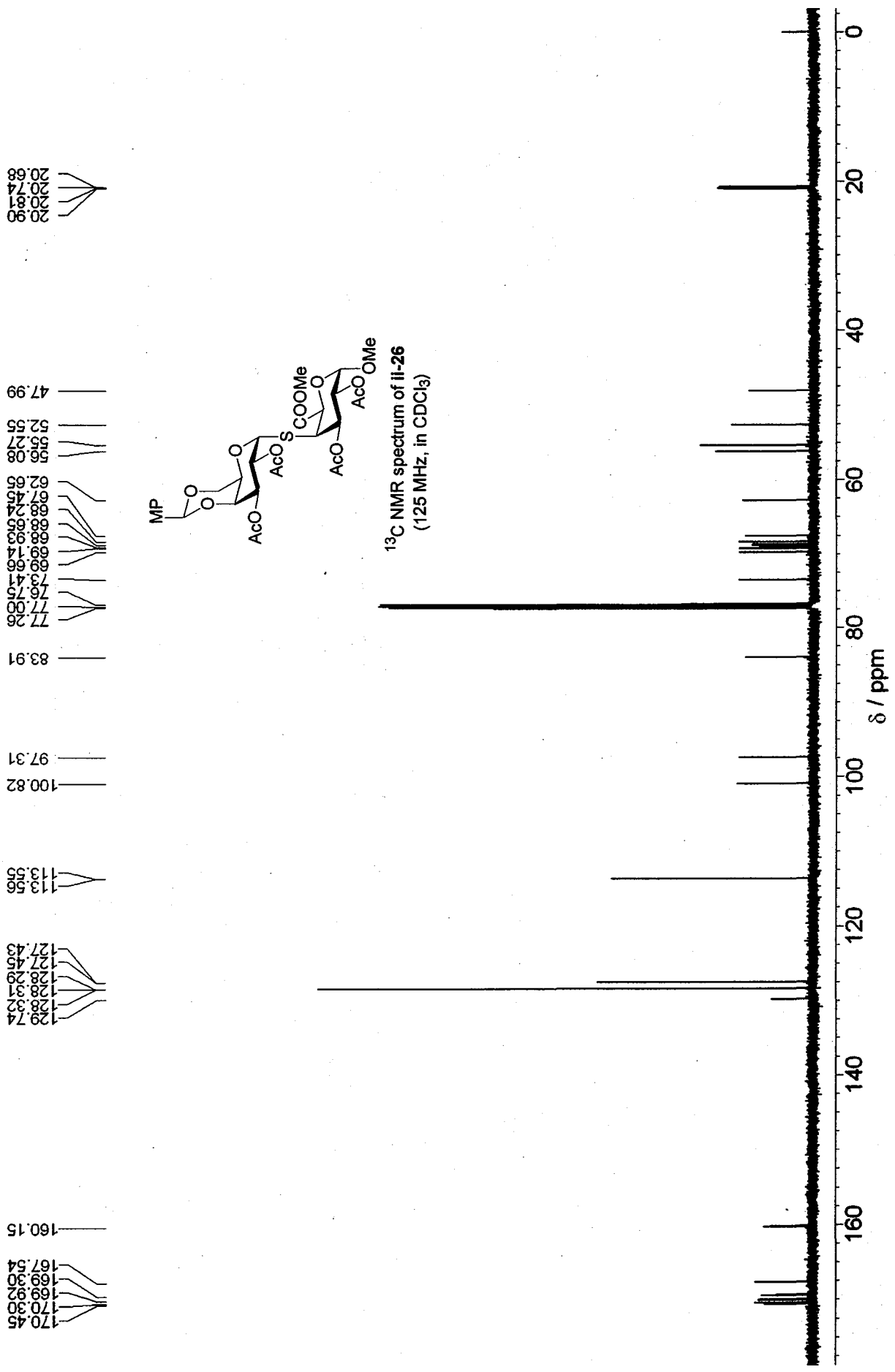




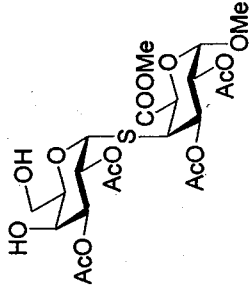








213  
211  
210  
208

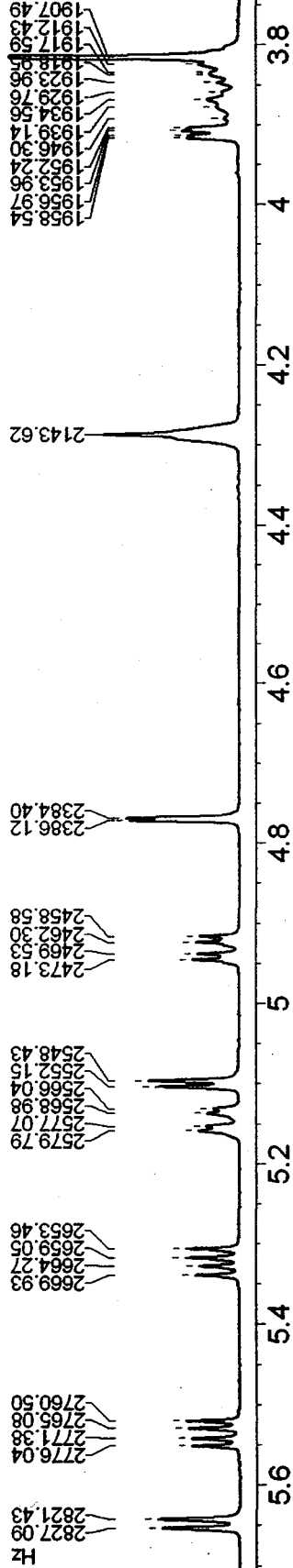


<sup>1</sup>H NMR spectrum of ii-29  
(500 MHz, in CDCl<sub>3</sub>)

3.42  
3.39  
3.38  
3.37  
3.36  
3.35  
3.34  
3.33  
3.32  
3.31  
3.30  
3.29  
3.28  
3.27  
3.26  
3.25  
3.24  
3.23  
3.22  
3.21  
3.20  
3.19  
3.18  
3.17  
3.16  
3.15  
3.14  
3.13  
3.12  
3.11  
3.10  
3.09  
3.08  
3.07  
3.06  
3.05  
3.04  
3.03  
3.02  
3.01  
3.00  
2.99  
2.98  
2.97  
2.96  
2.95  
2.94  
2.93  
2.92  
2.91  
2.90  
2.89  
2.88  
2.87  
2.86  
2.85  
2.84  
2.83  
2.82  
2.81  
2.80  
2.79  
2.78  
2.77  
2.76  
2.75  
2.74  
2.73  
2.72  
2.71  
2.70  
2.69  
2.68  
2.67  
2.66  
2.65  
2.64  
2.63  
2.62  
2.61  
2.60  
2.59  
2.58  
2.57  
2.56  
2.55  
2.54  
2.53  
2.52  
2.51  
2.50  
2.49  
2.48  
2.47  
2.46  
2.45  
2.44  
2.43  
2.42  
2.41  
2.40  
2.39  
2.38  
2.37  
2.36  
2.35  
2.34  
2.33  
2.32  
2.31  
2.30  
2.29  
2.28  
2.27  
2.26  
2.25  
2.24  
2.23  
2.22  
2.21  
2.20  
2.19  
2.18  
2.17  
2.16  
2.15  
2.14  
2.13  
2.12  
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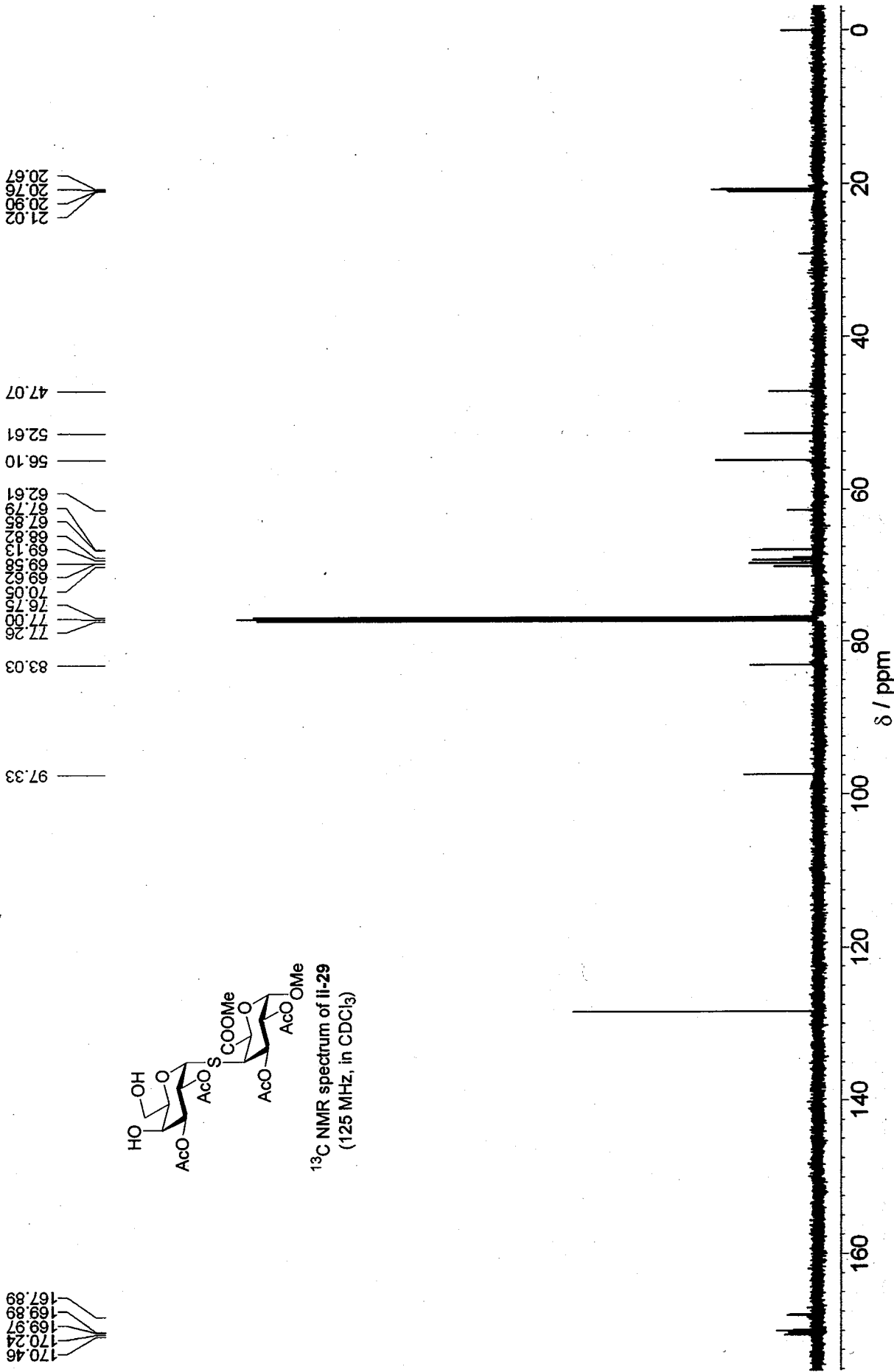
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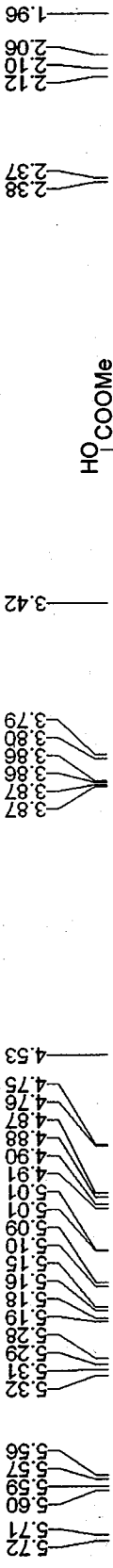
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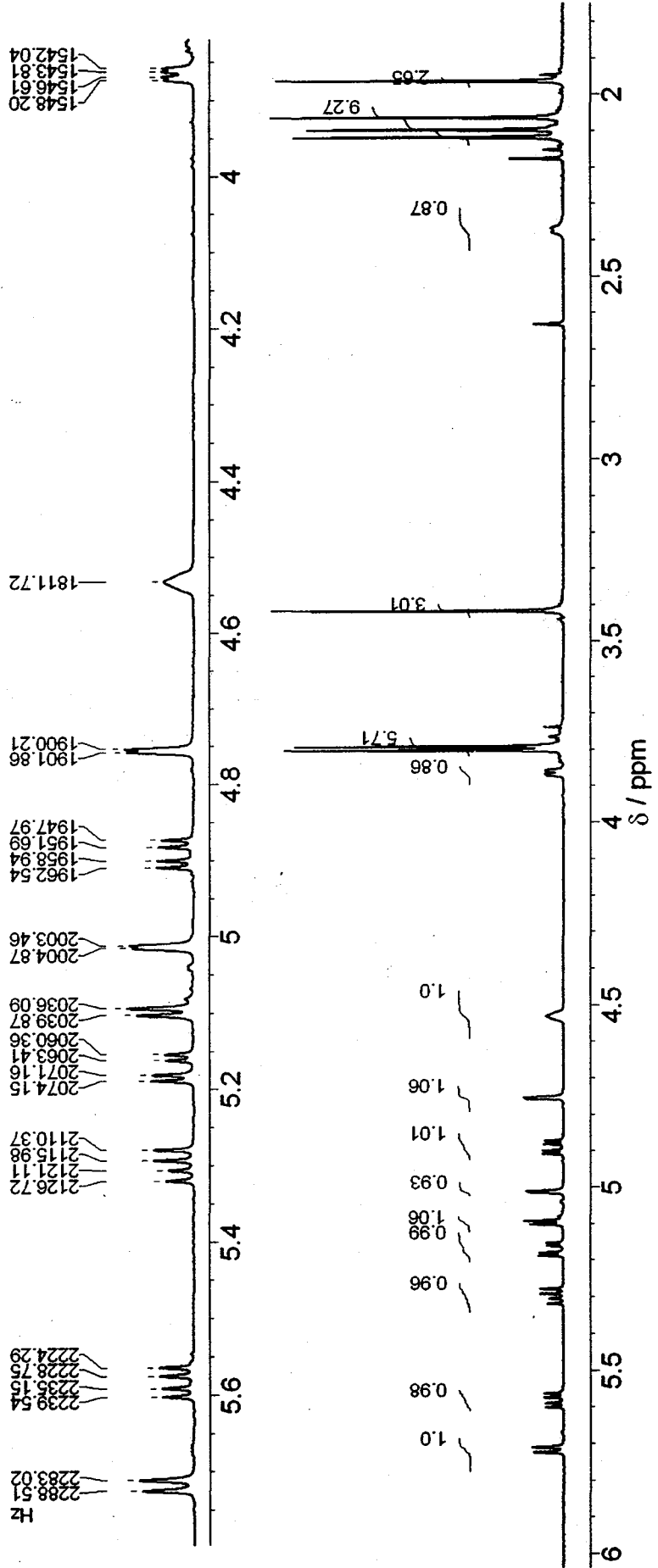
11.78

δ / ppm

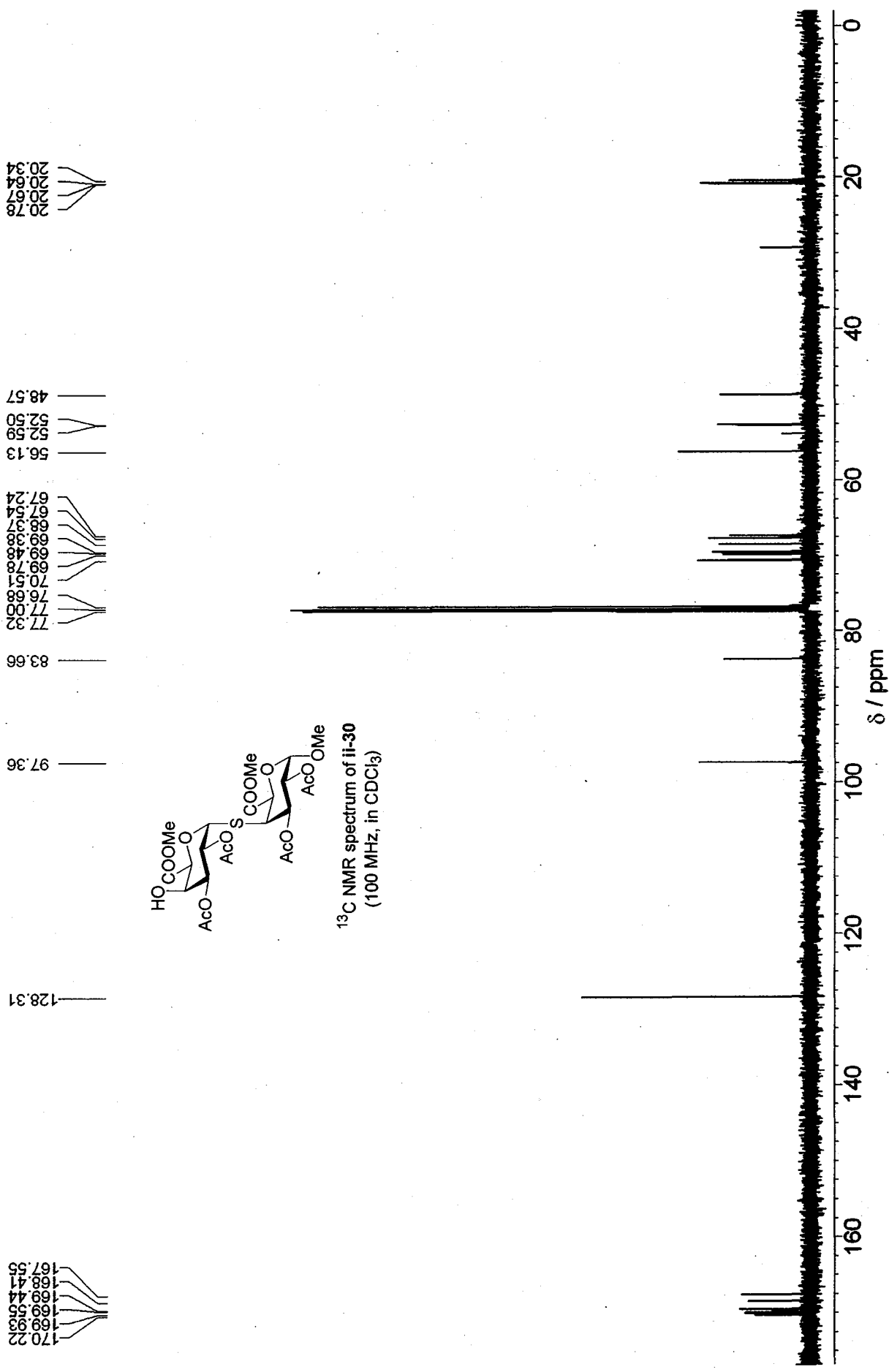


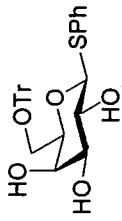
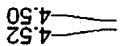
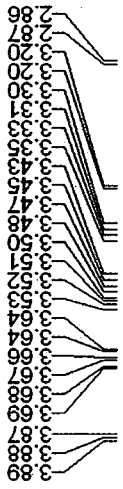


<sup>1</sup>H NMR spectrum of II-30  
(400 MHz, in CDCl<sub>3</sub>)









<sup>1</sup>H NMR spectrum  
(400 MHz, in CDCl<sub>3</sub>)

Hz  
1807.27  
1797.57

1.00  
1553.44  
1549.72  
1546.07

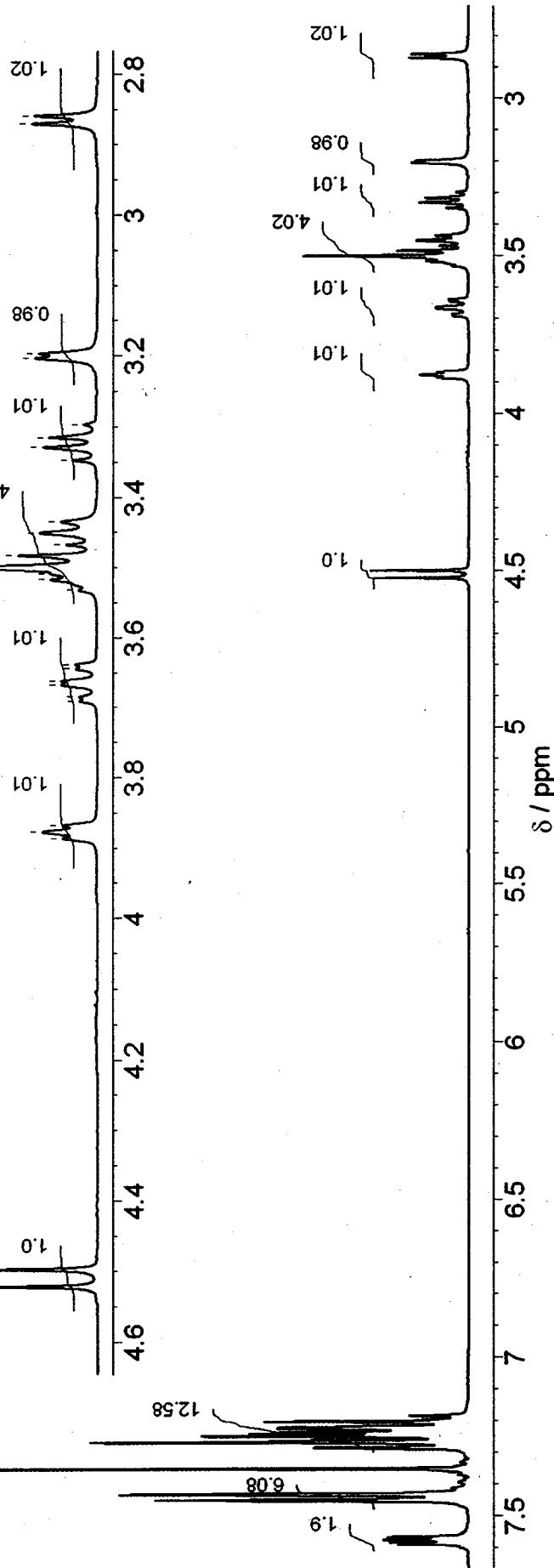
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1473.06  
1466.30  
1464.04  
1456.90  
1454.52

1.01  
1412.02  
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1402.56  
1398.84  
1392.07  
1386.04  
1379.33  
1373.05

4.02  
1337.98  
1330.66  
1325.23  
1317.65

0.98  
1280.47  
1277.91

1.02  
1147.40  
1142.88



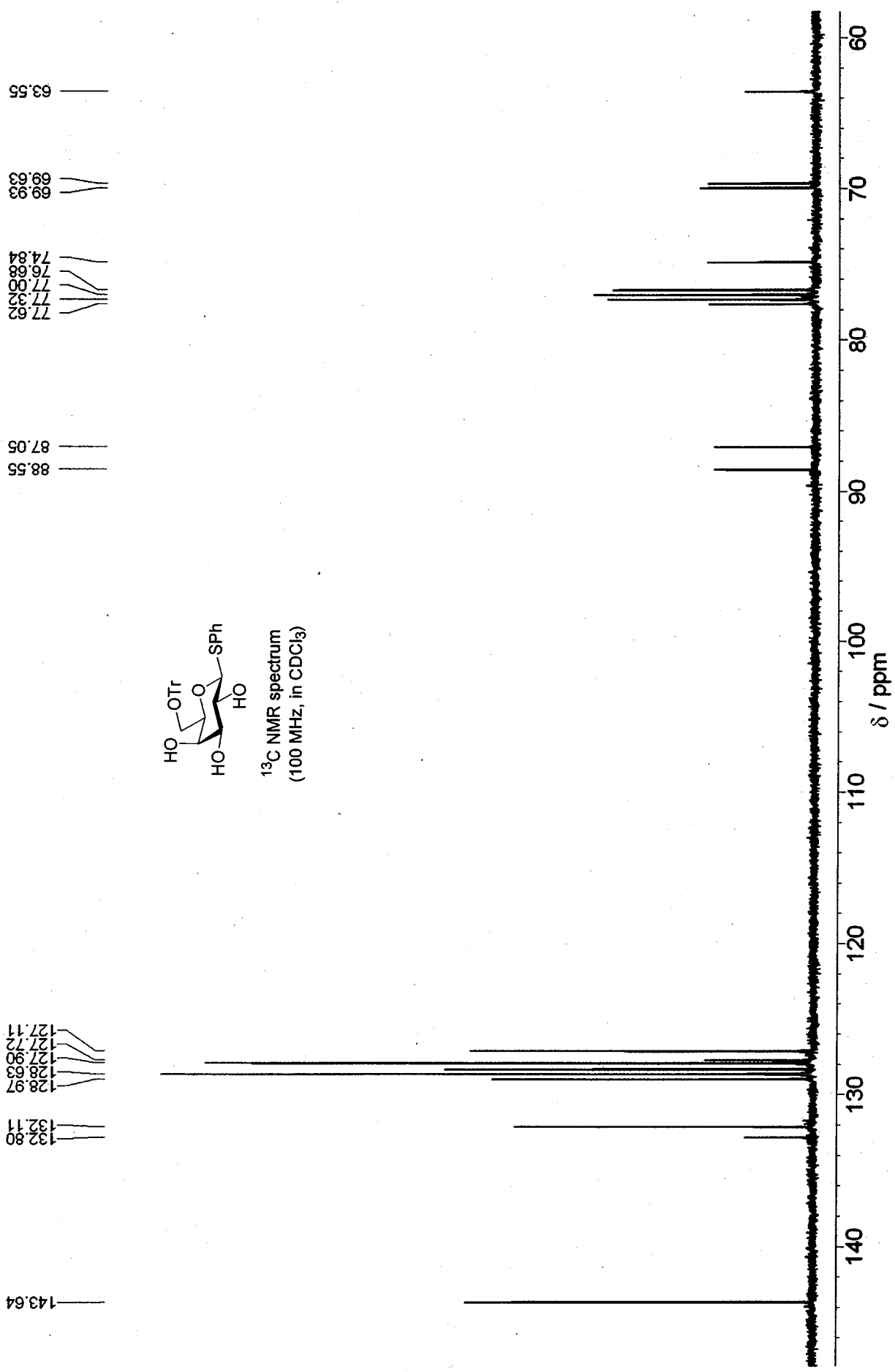
6.08

1.9

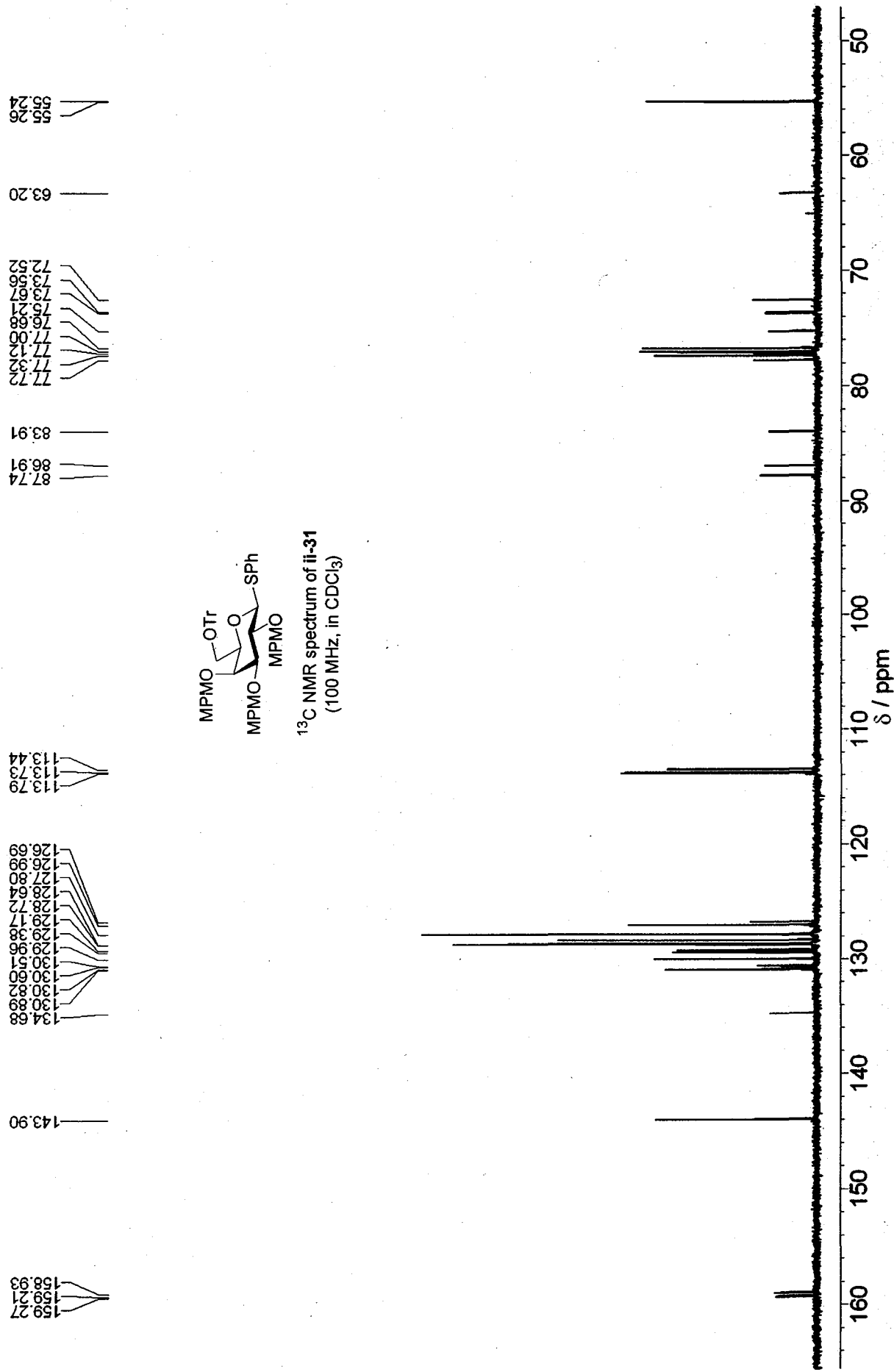
12.58

1.02  
0.98  
1.01  
4.02  
1.01  
1.01

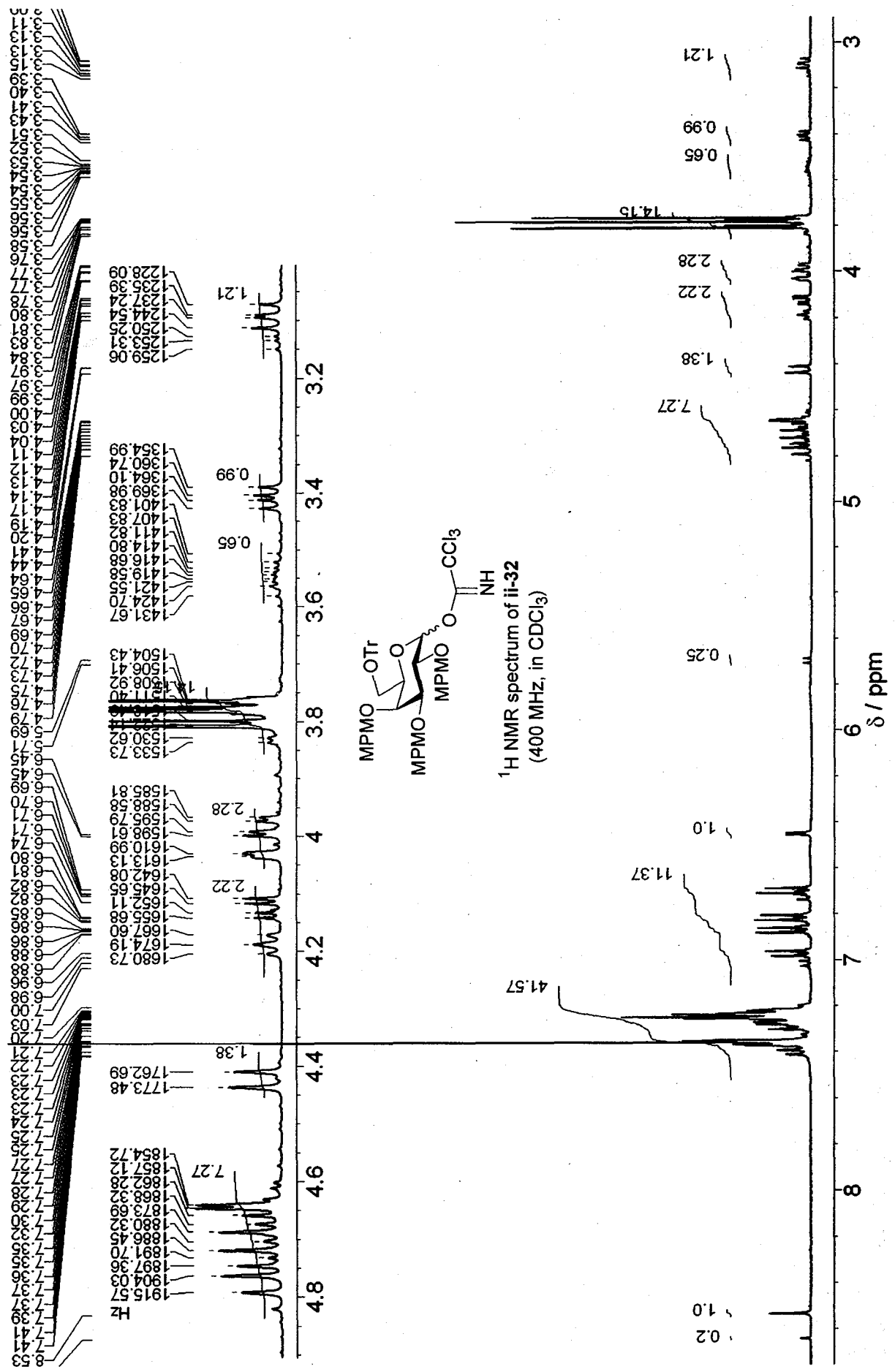
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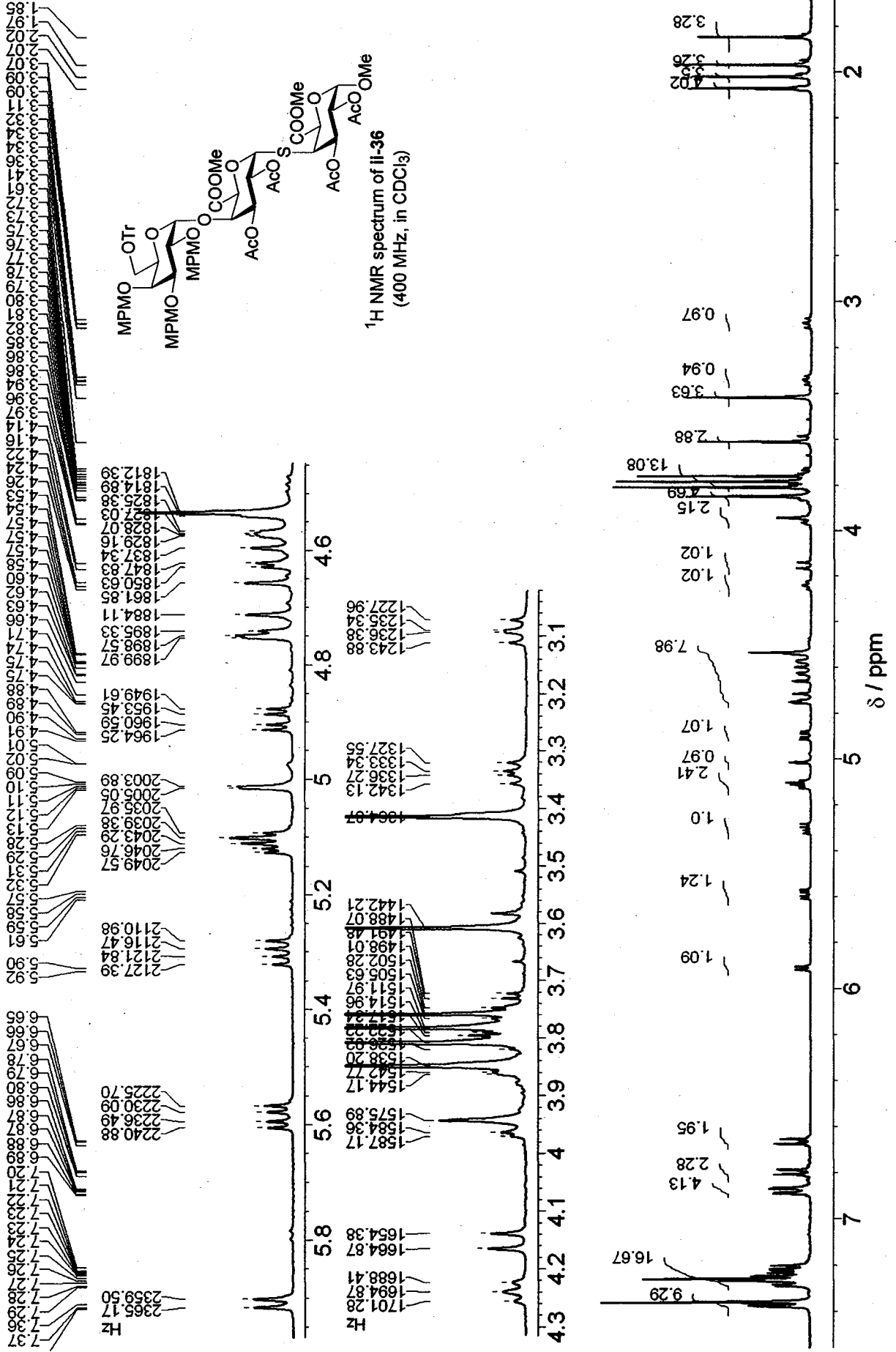




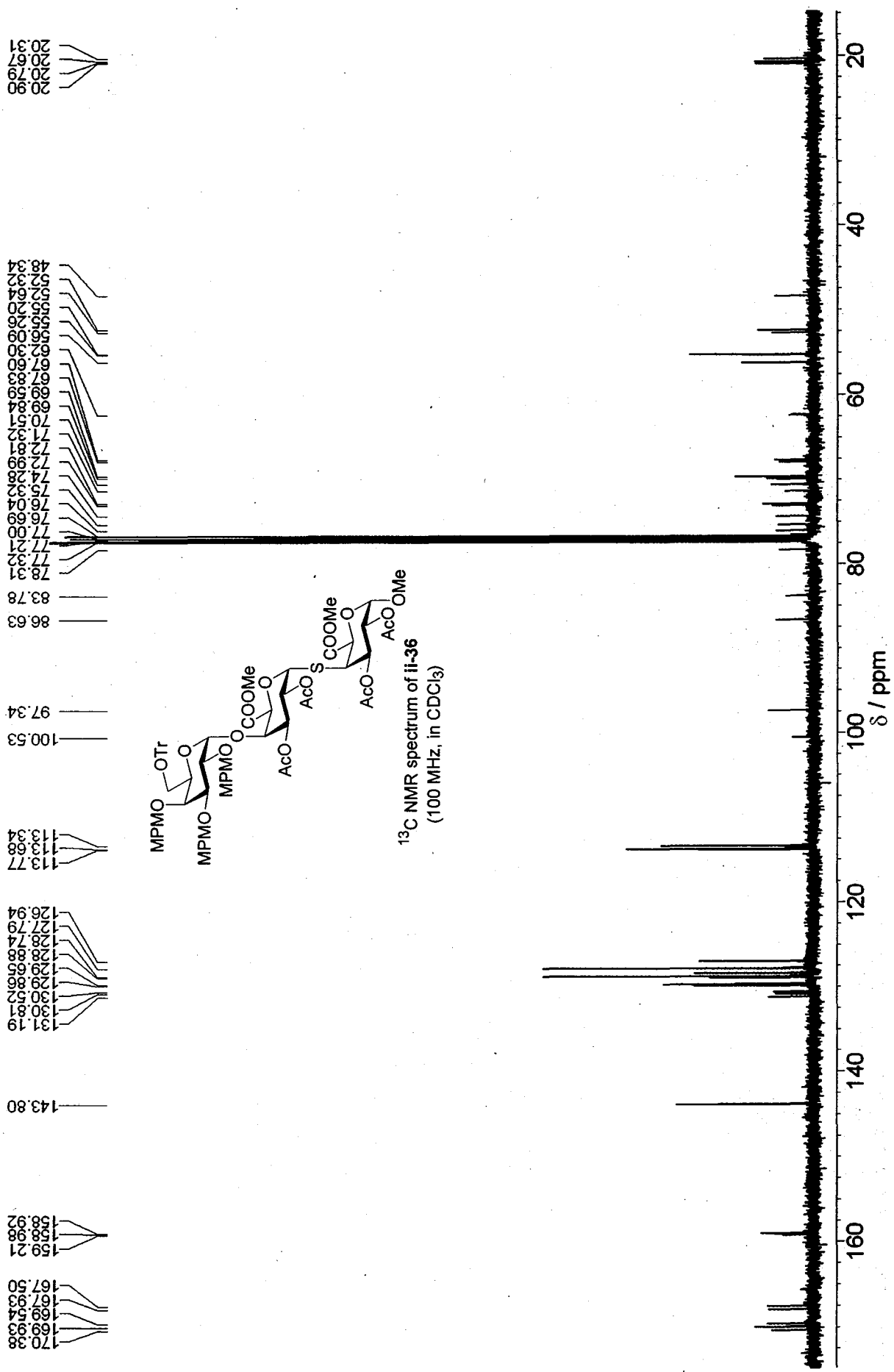


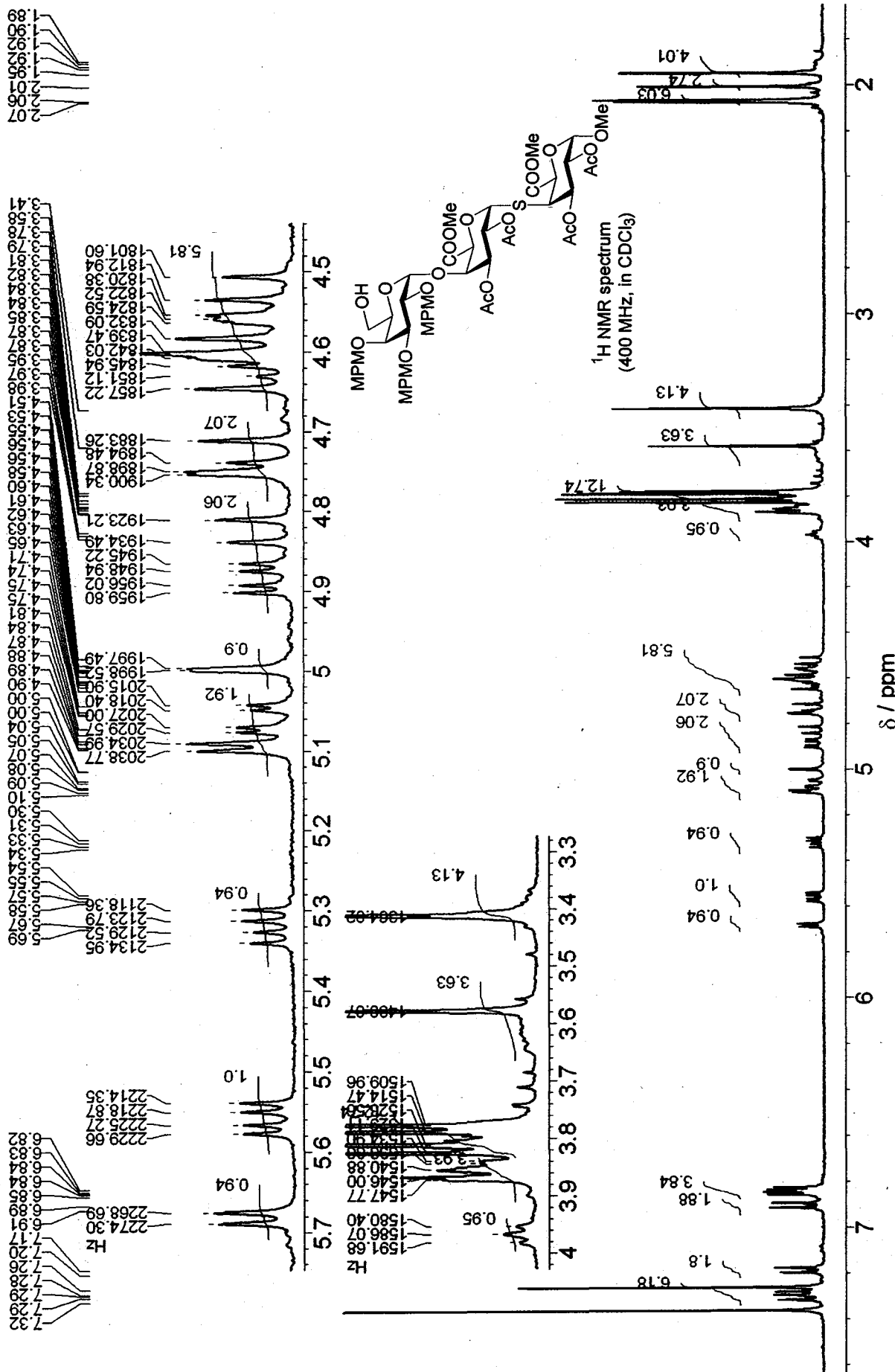


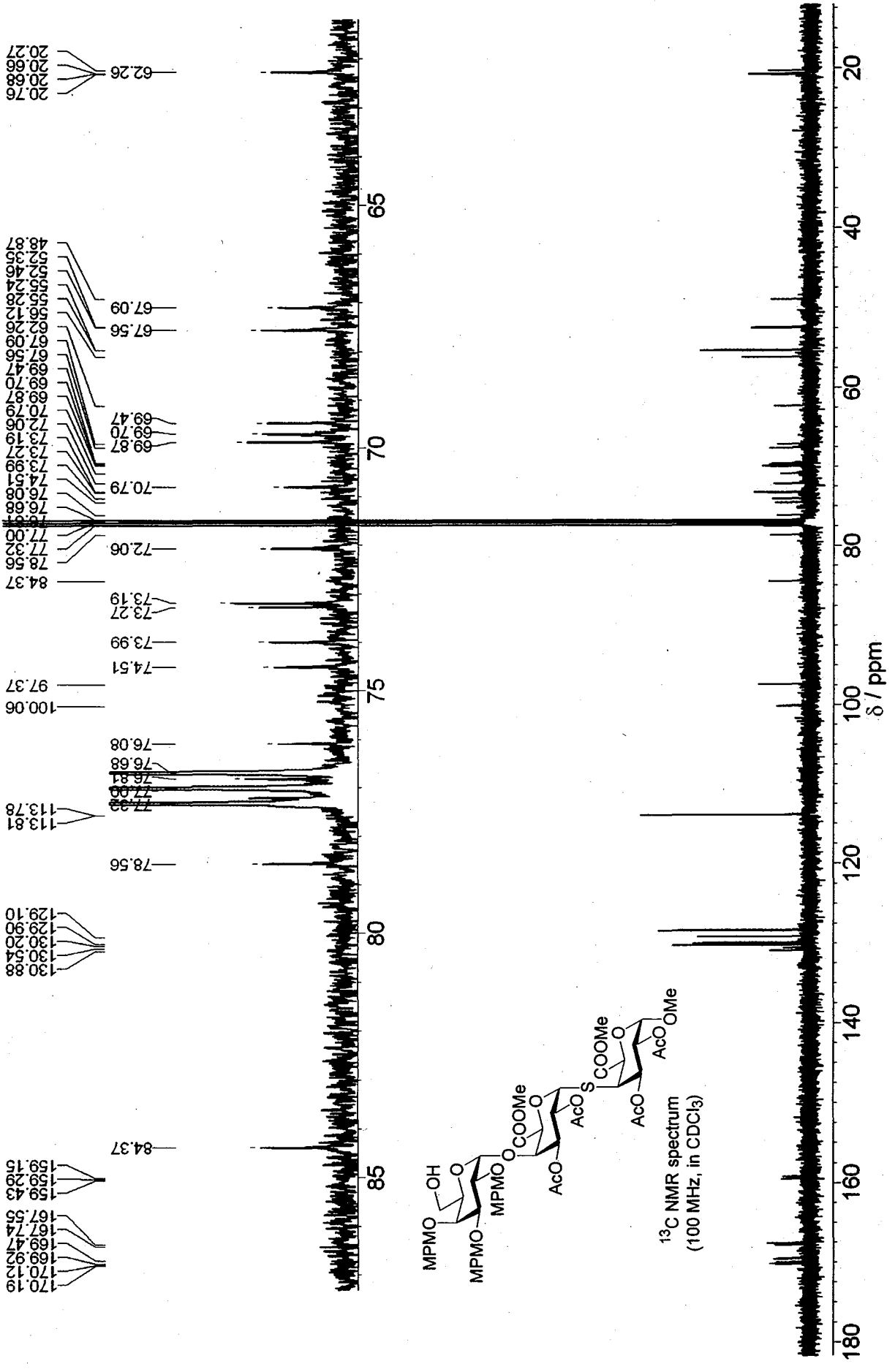


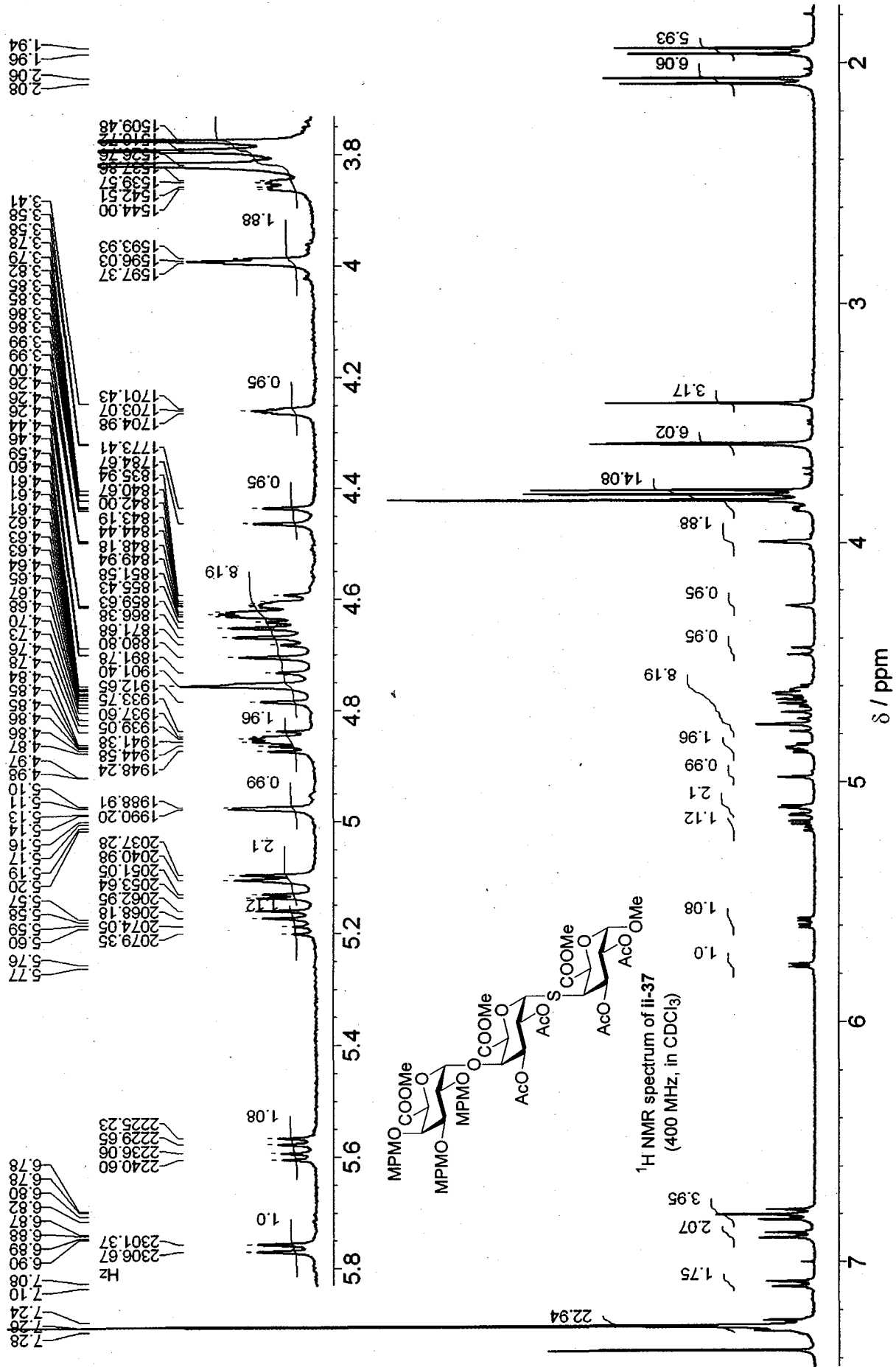


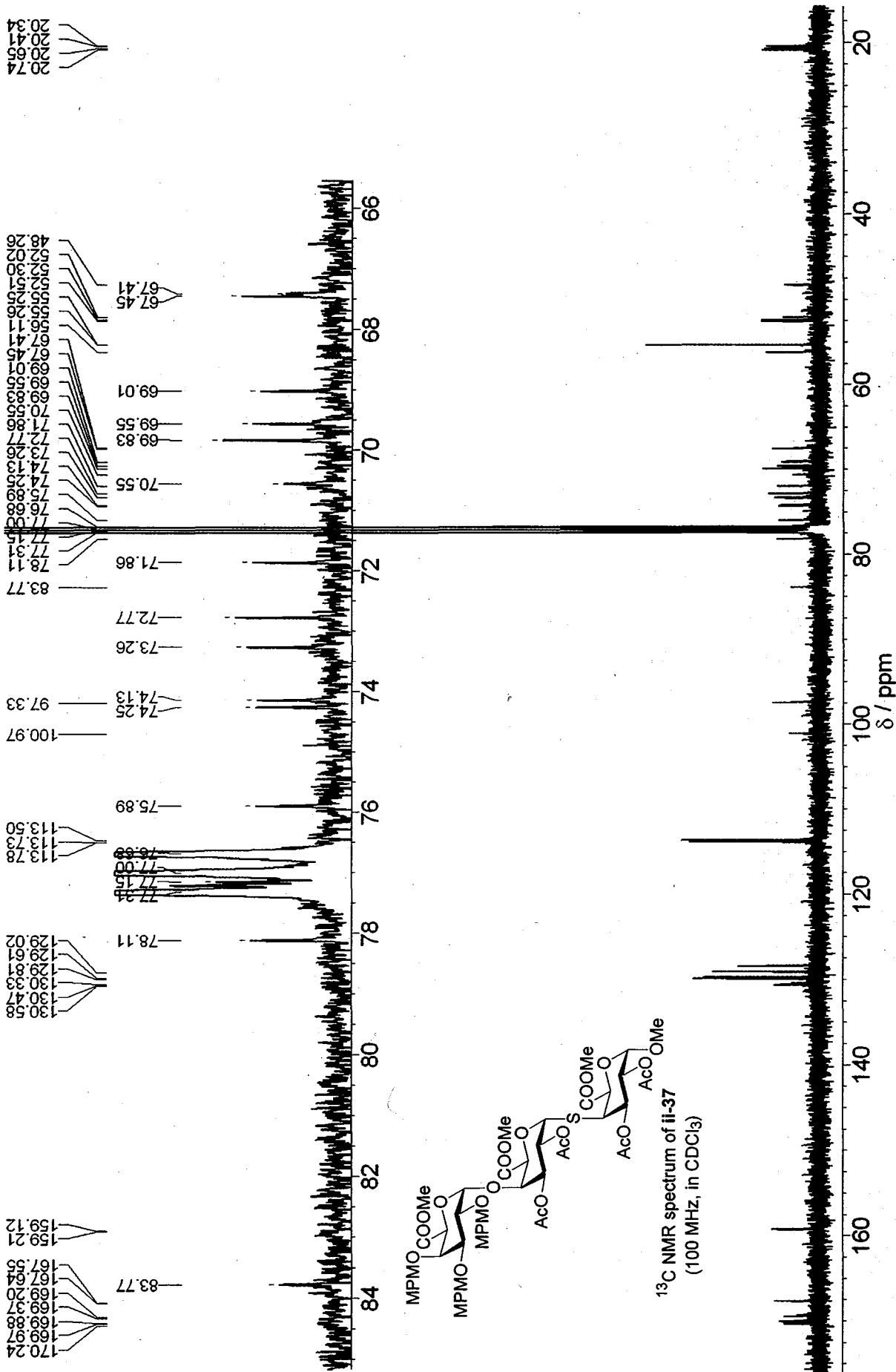


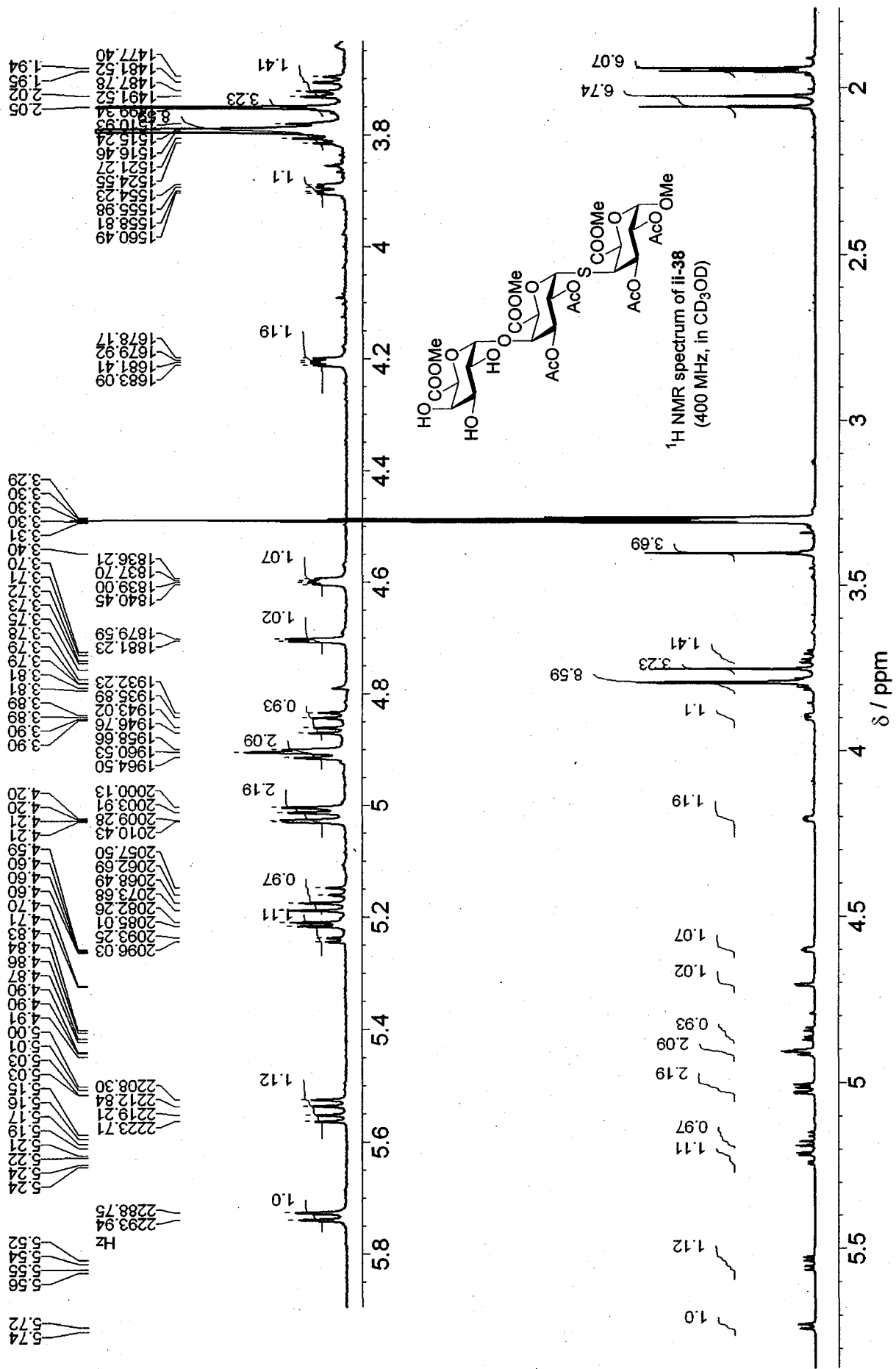


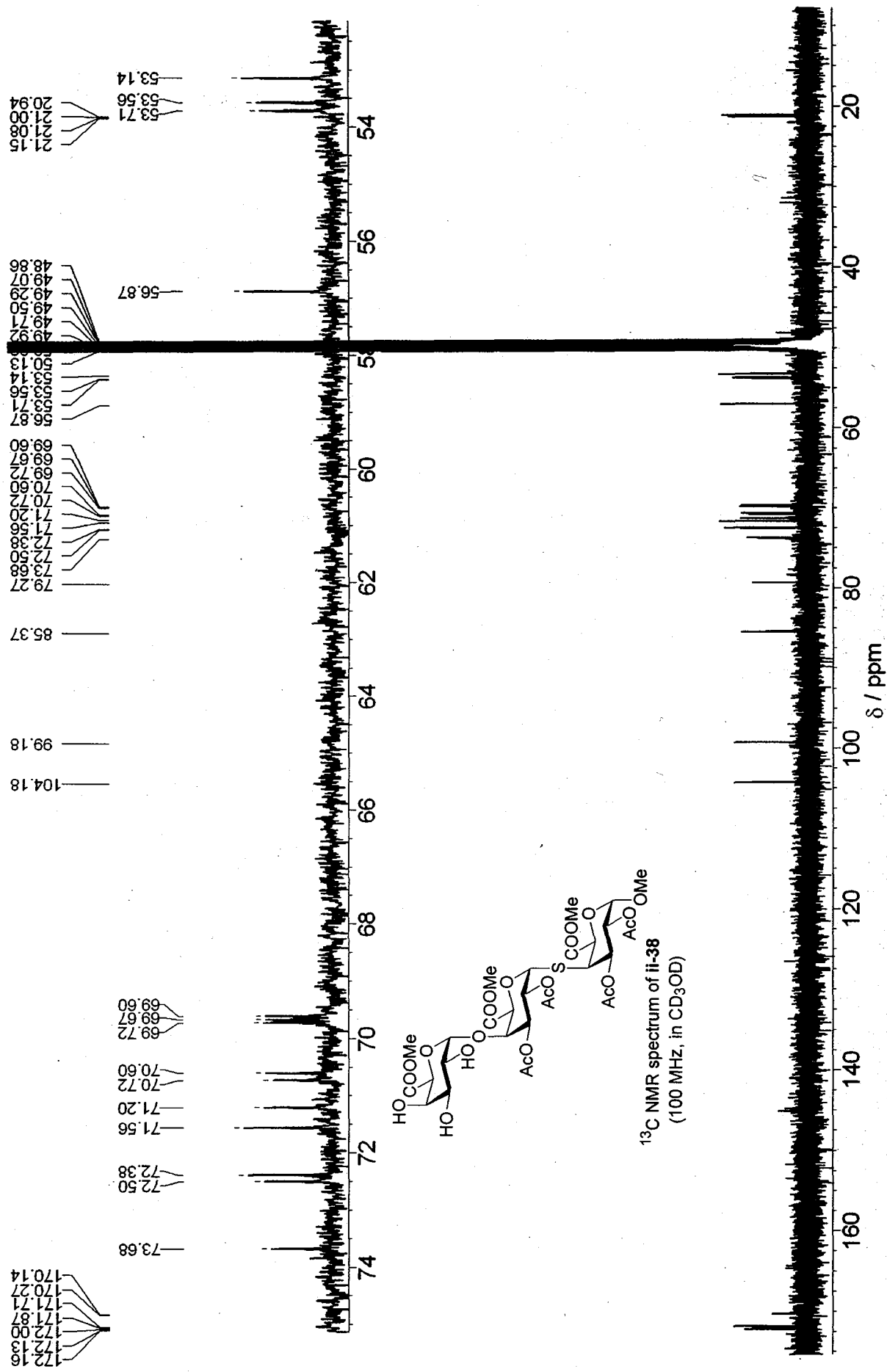


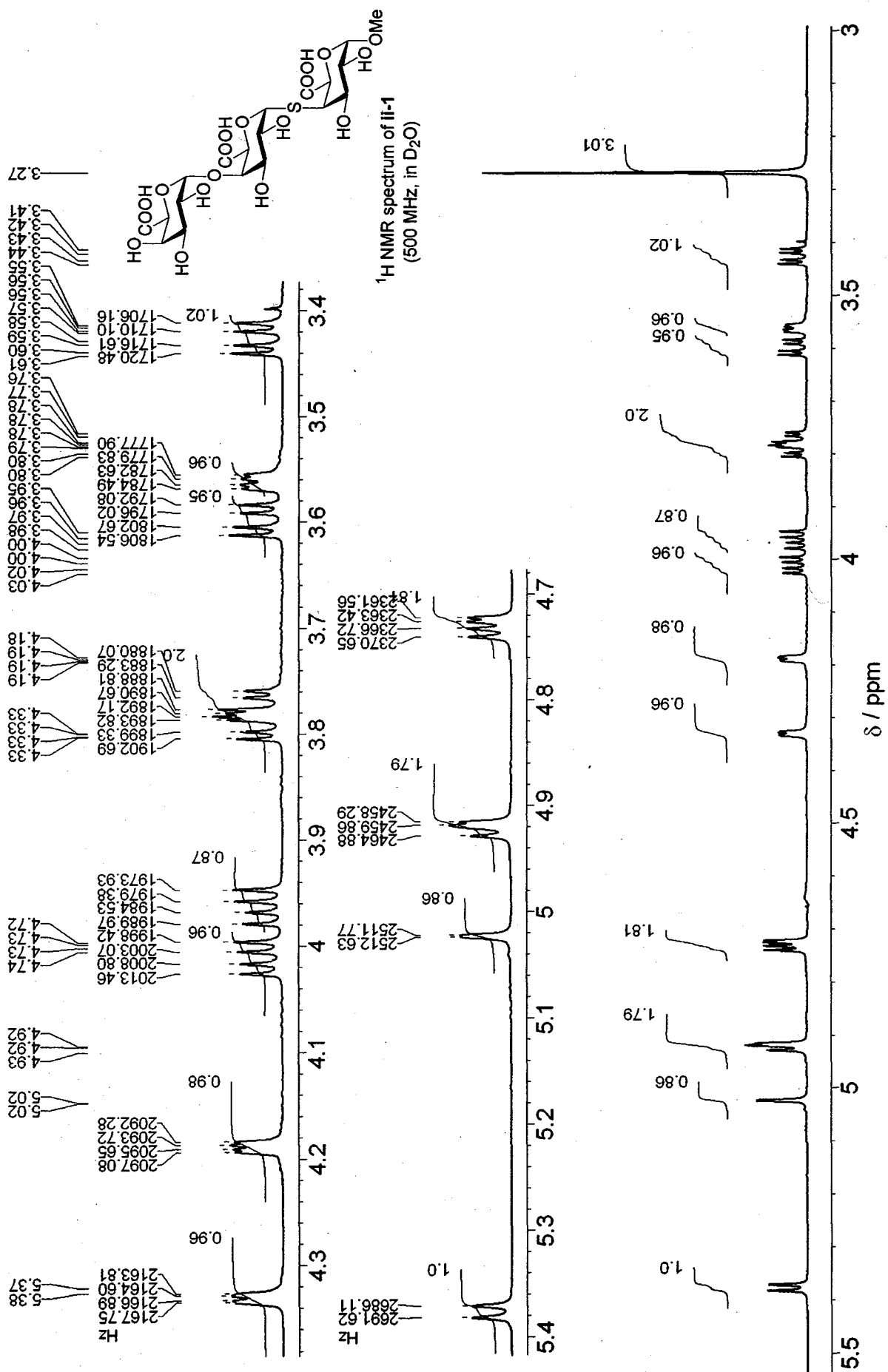




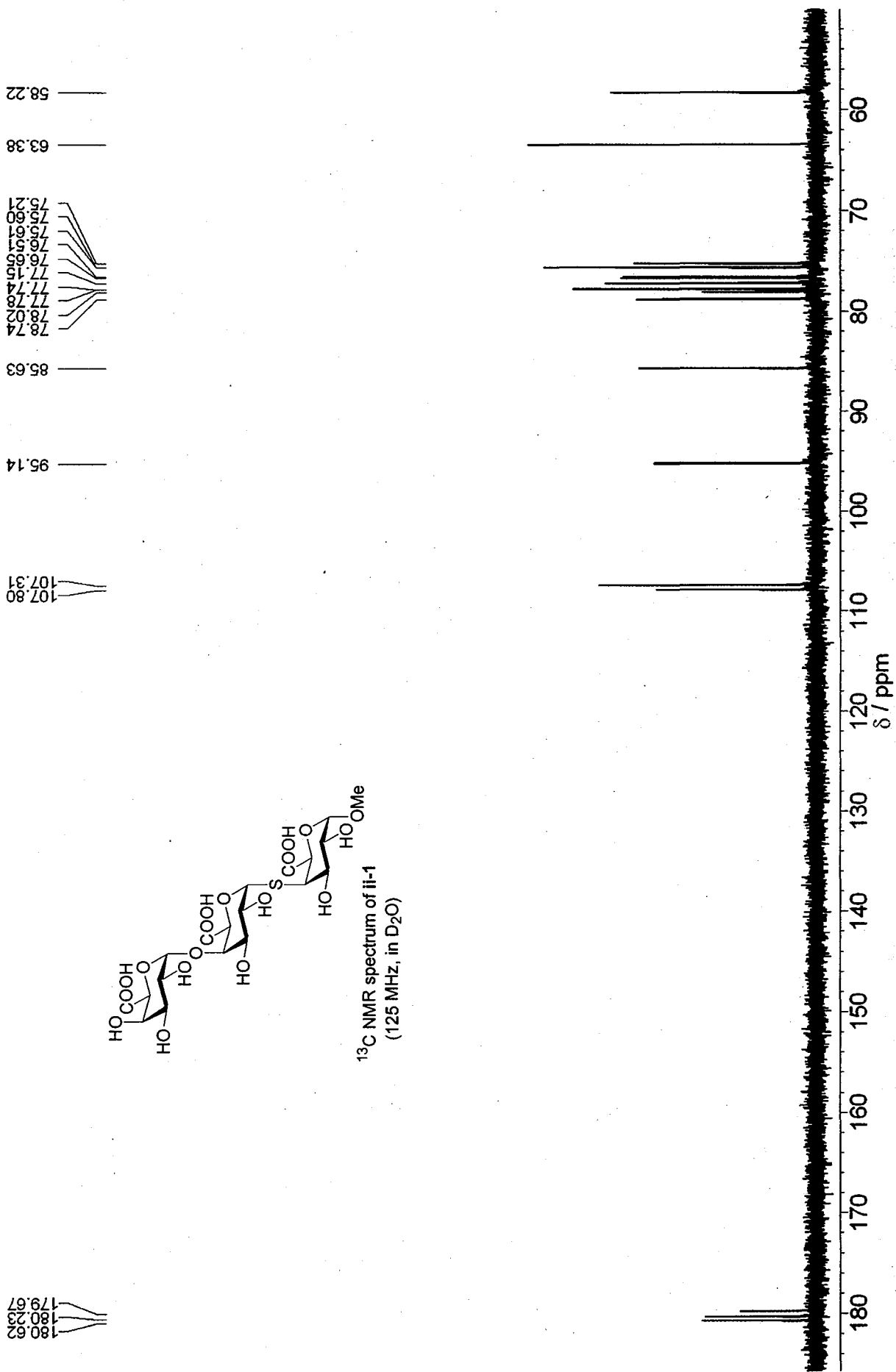




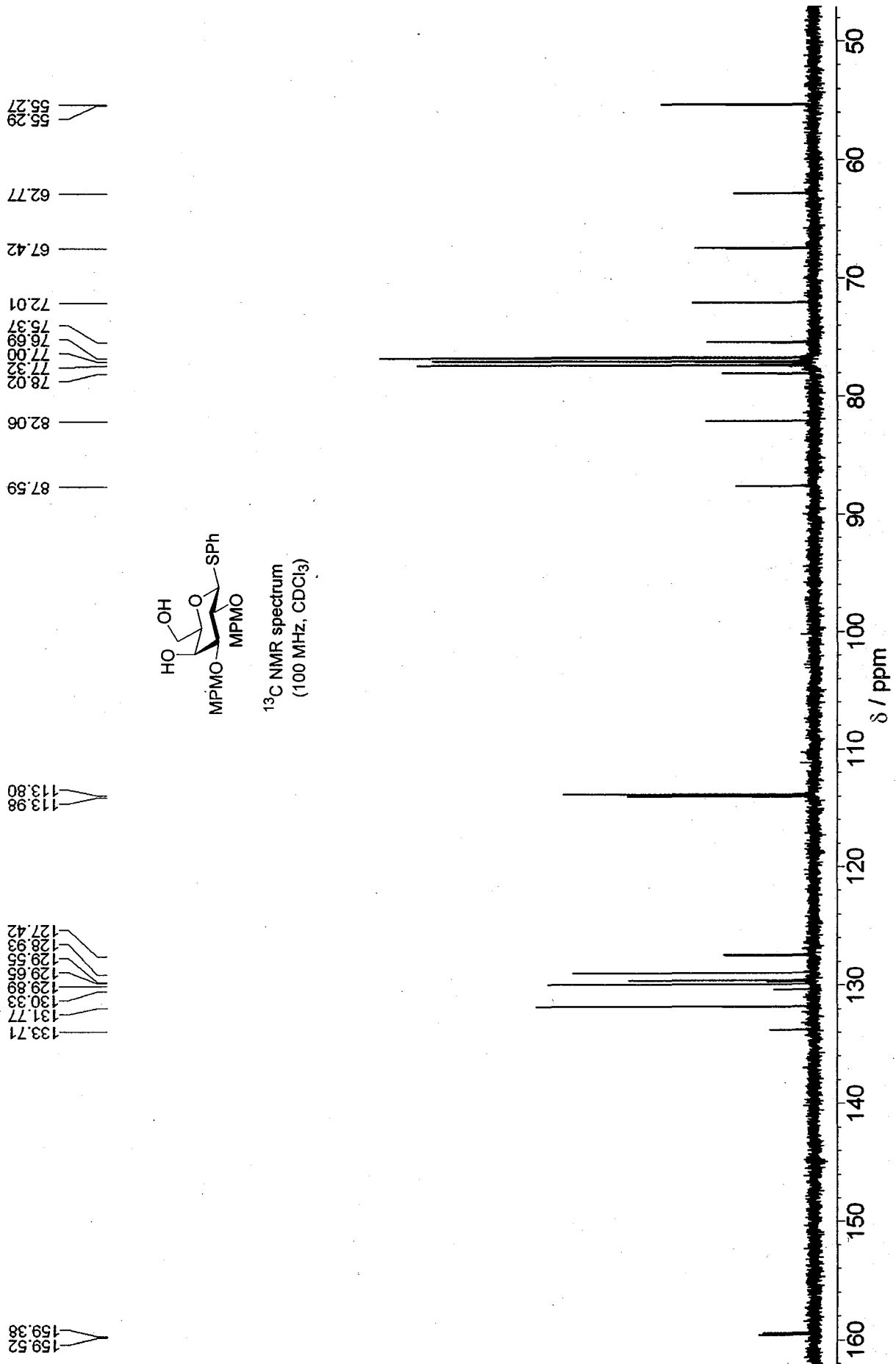


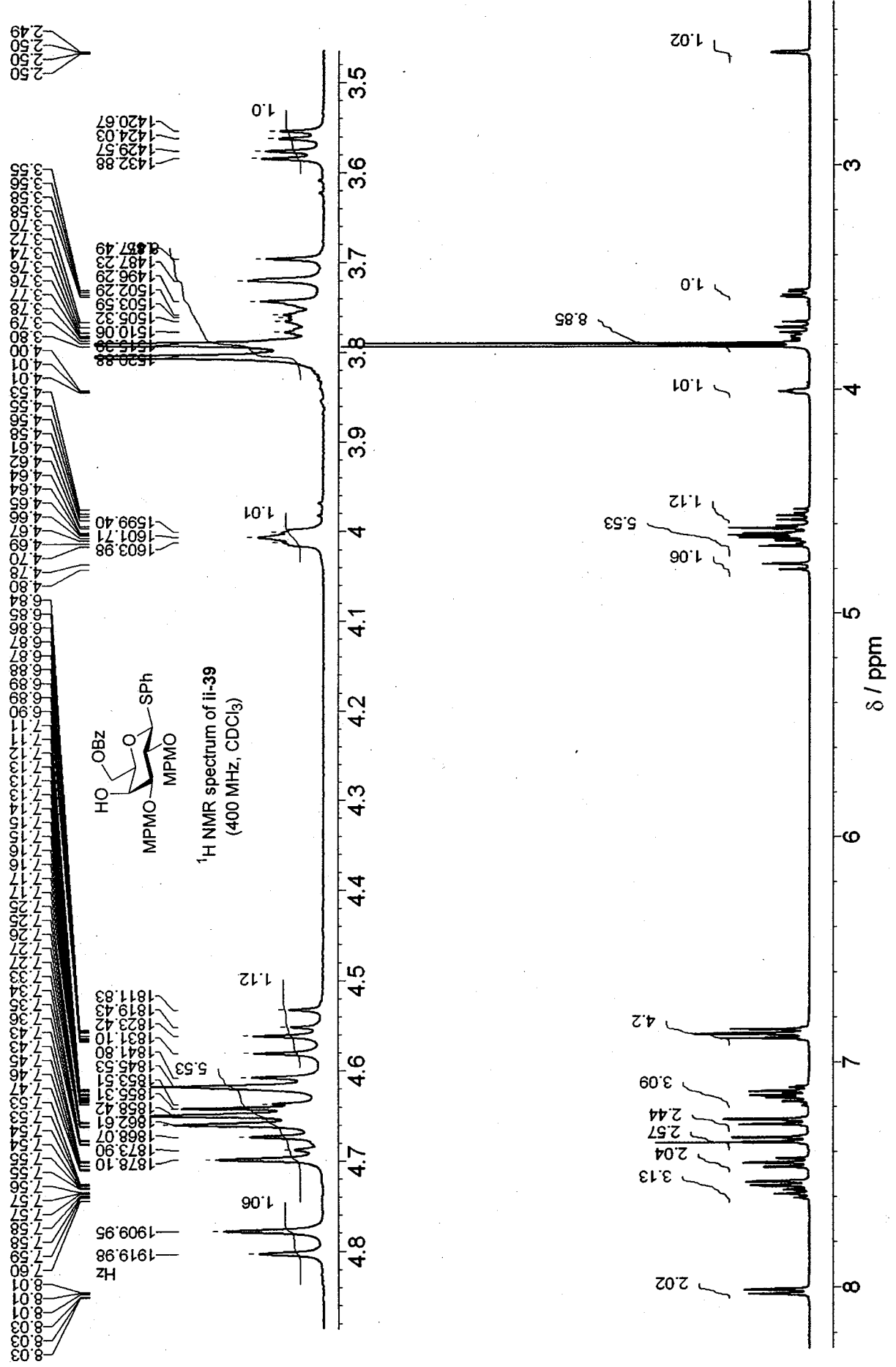


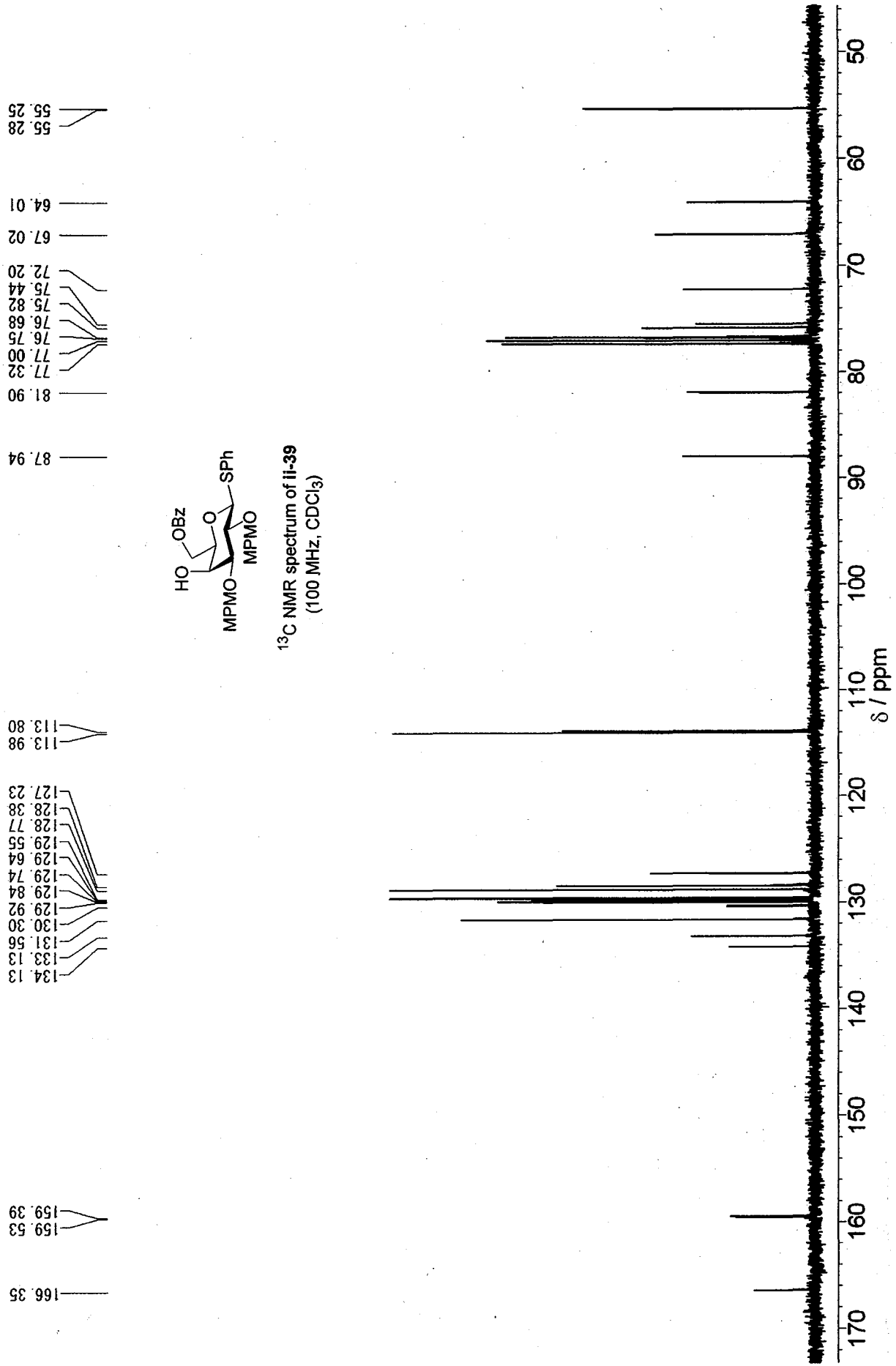




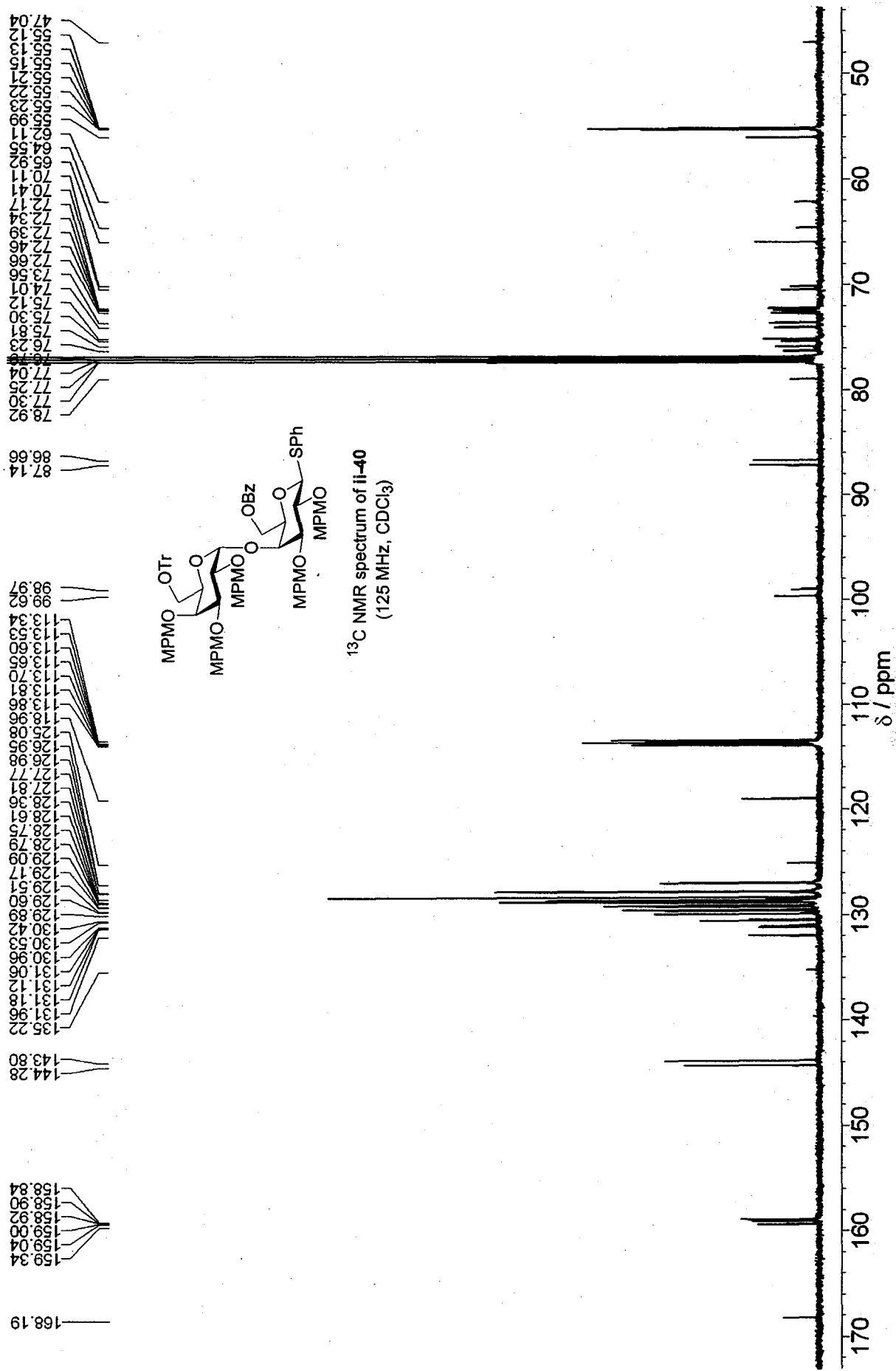


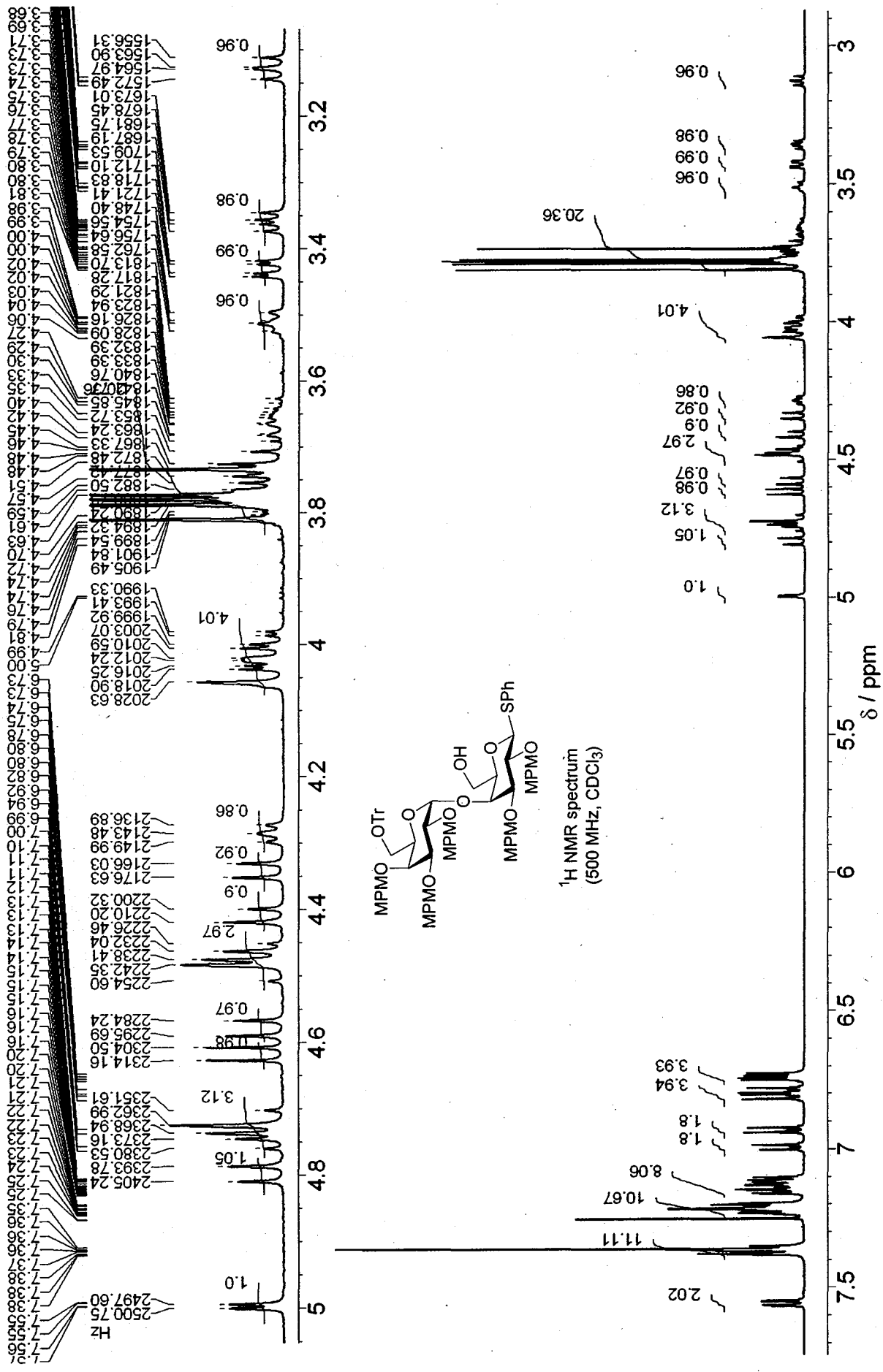




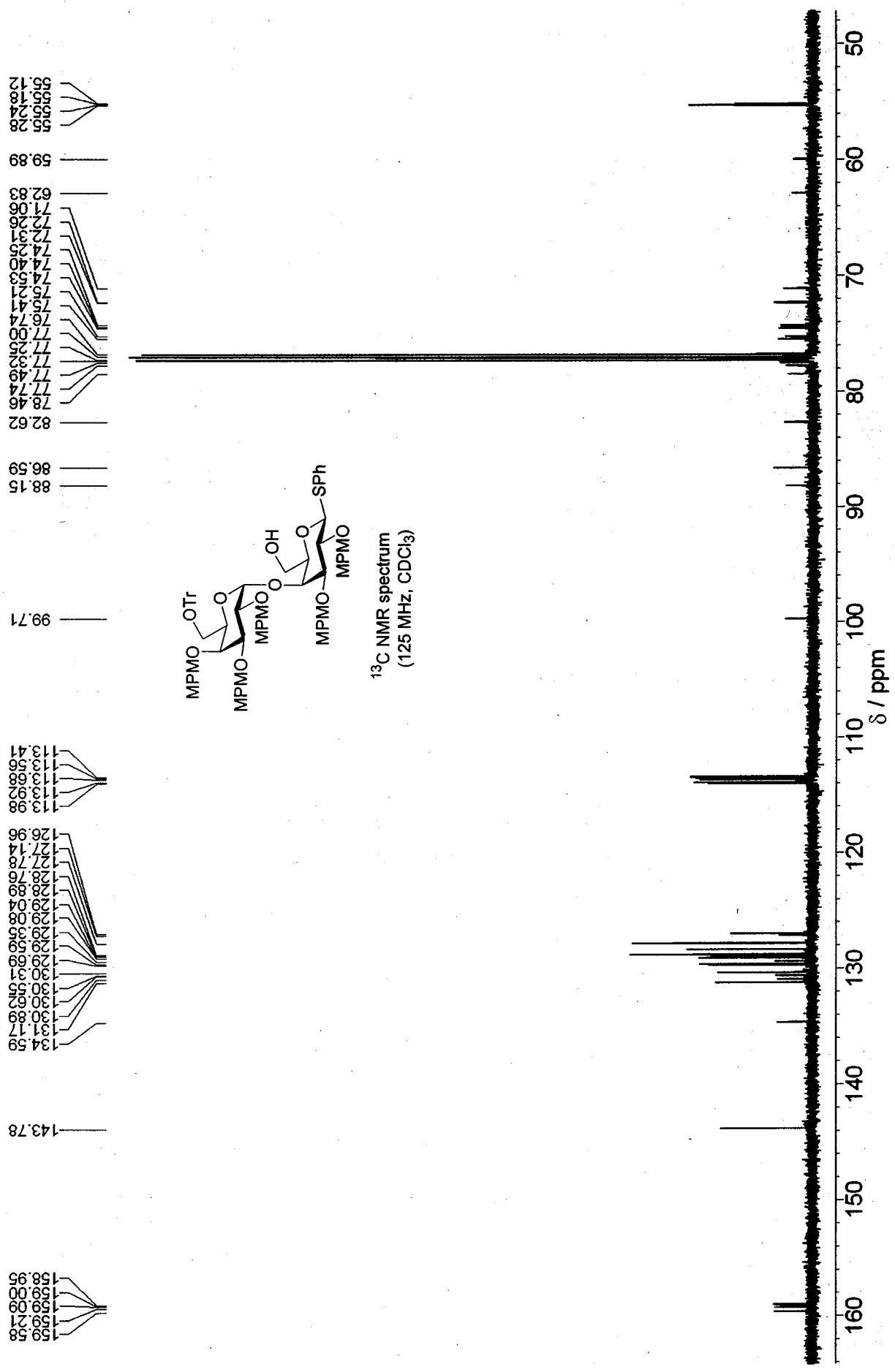


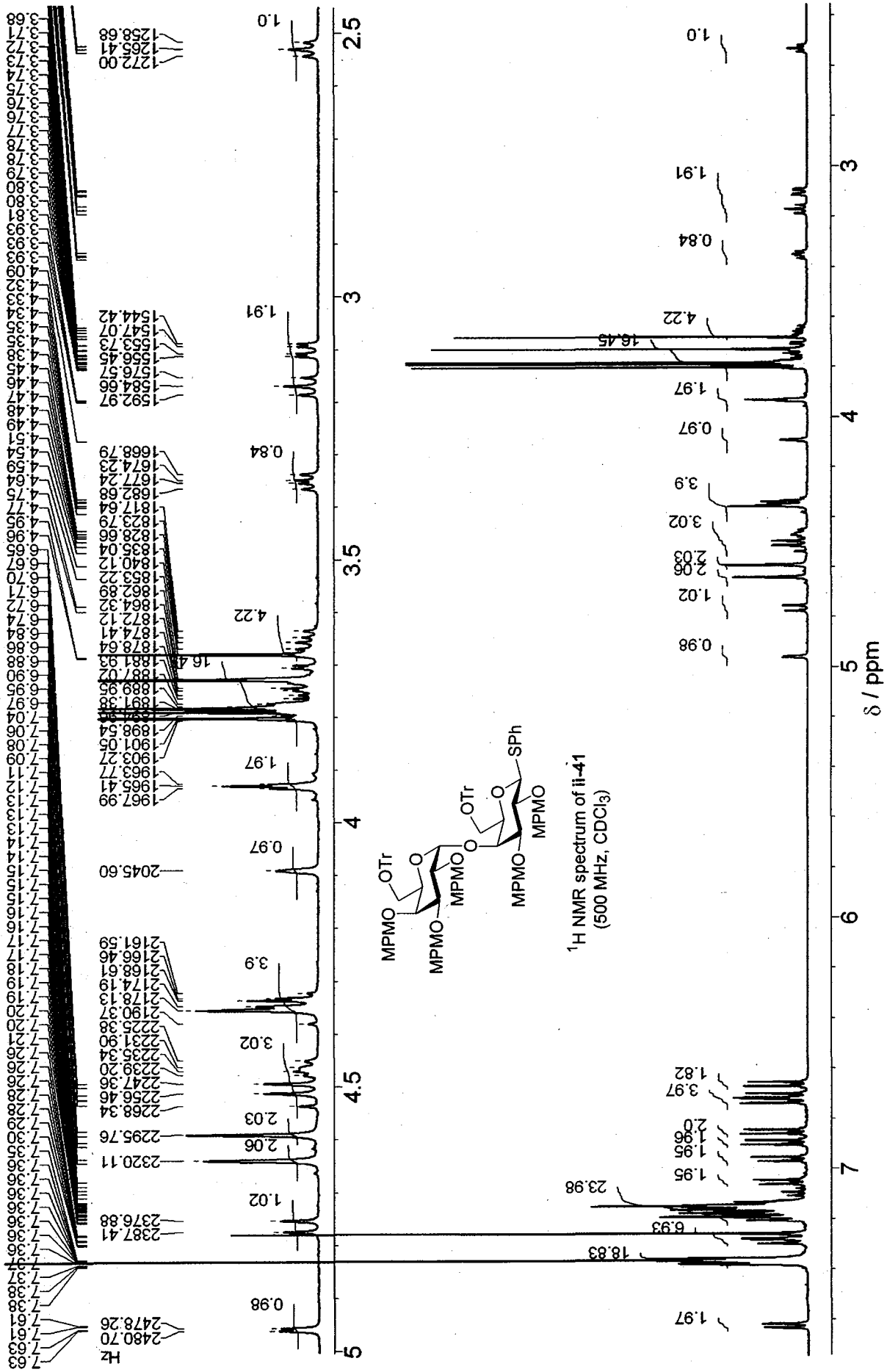


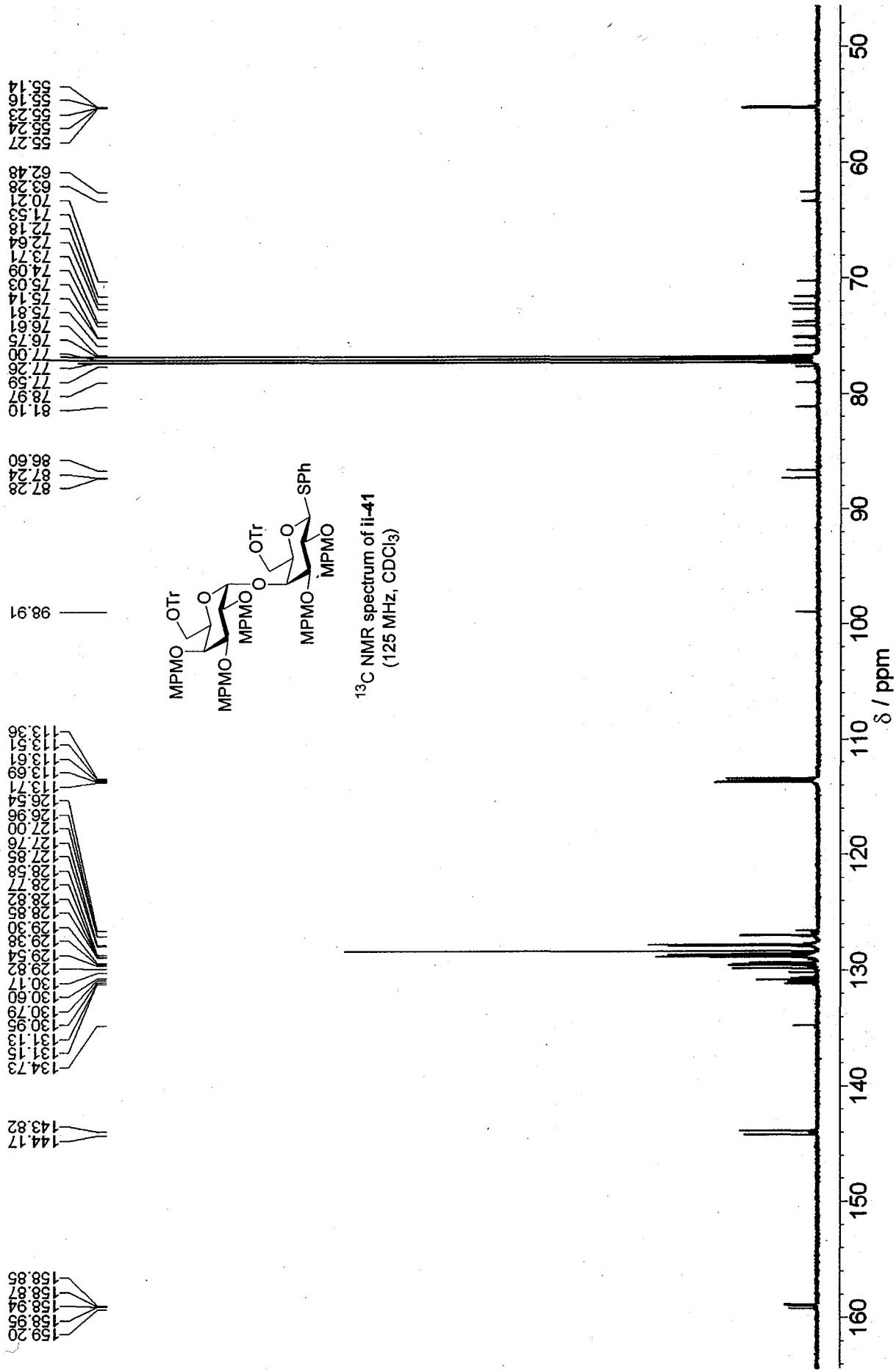




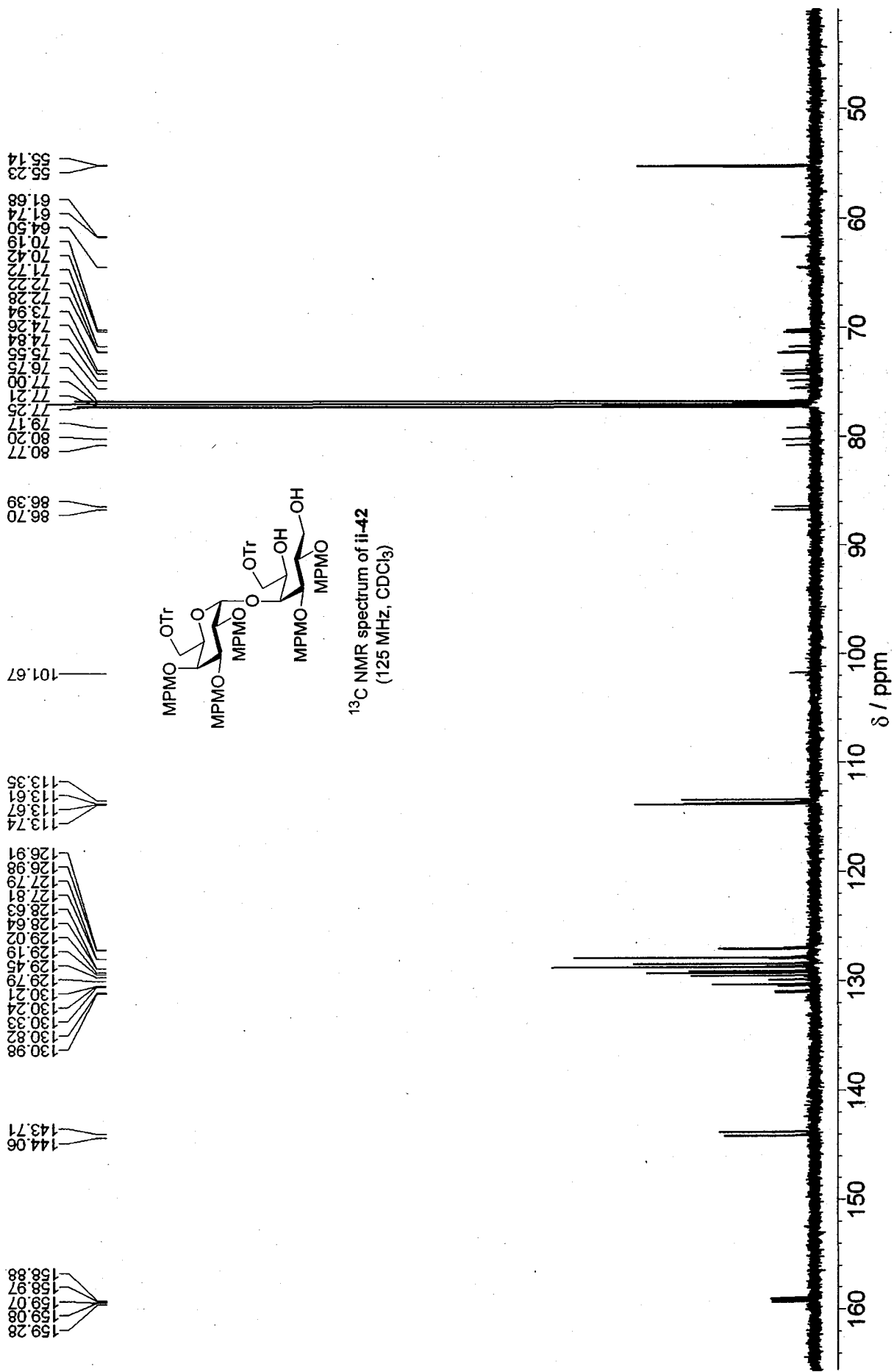


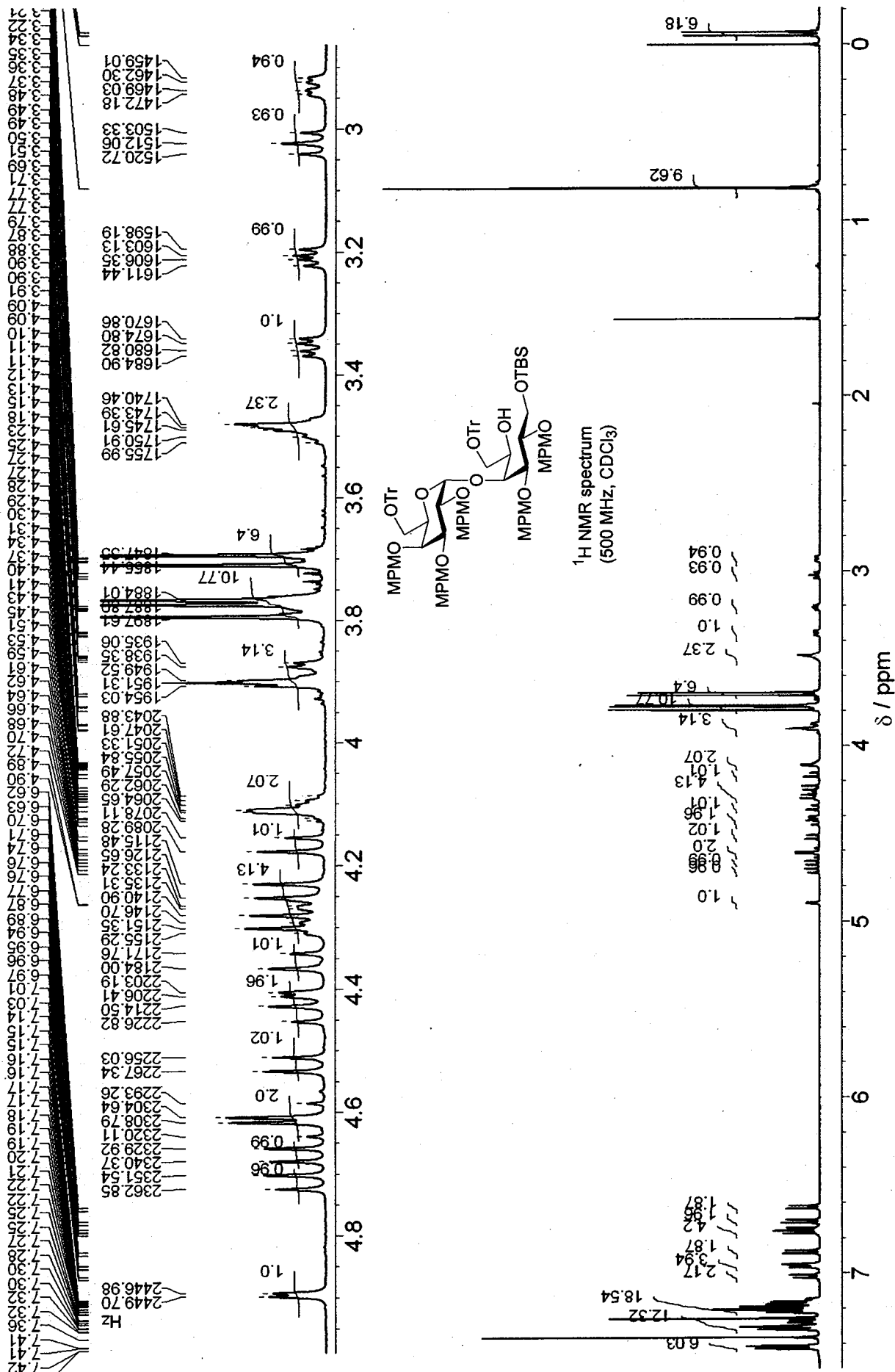


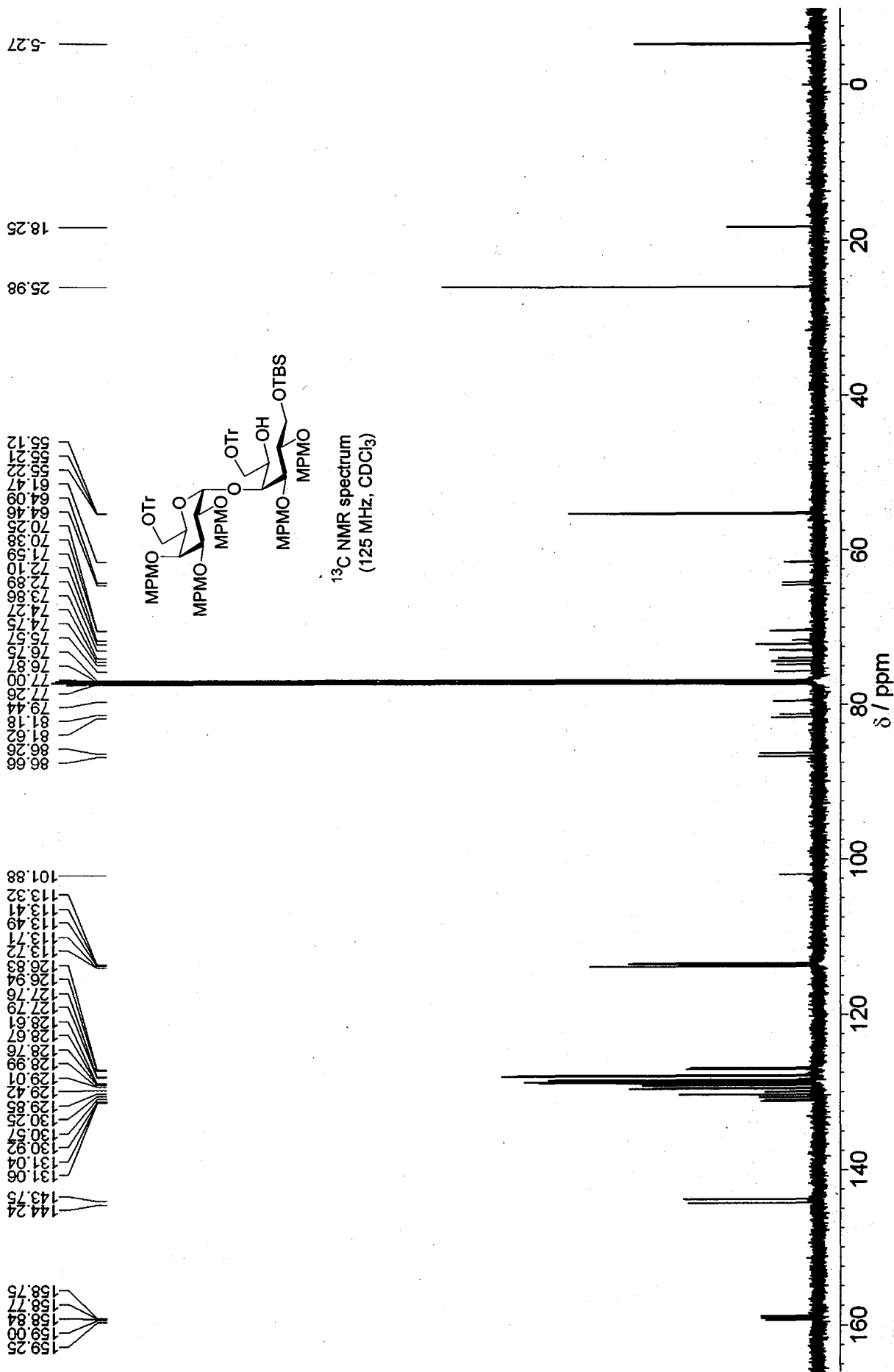


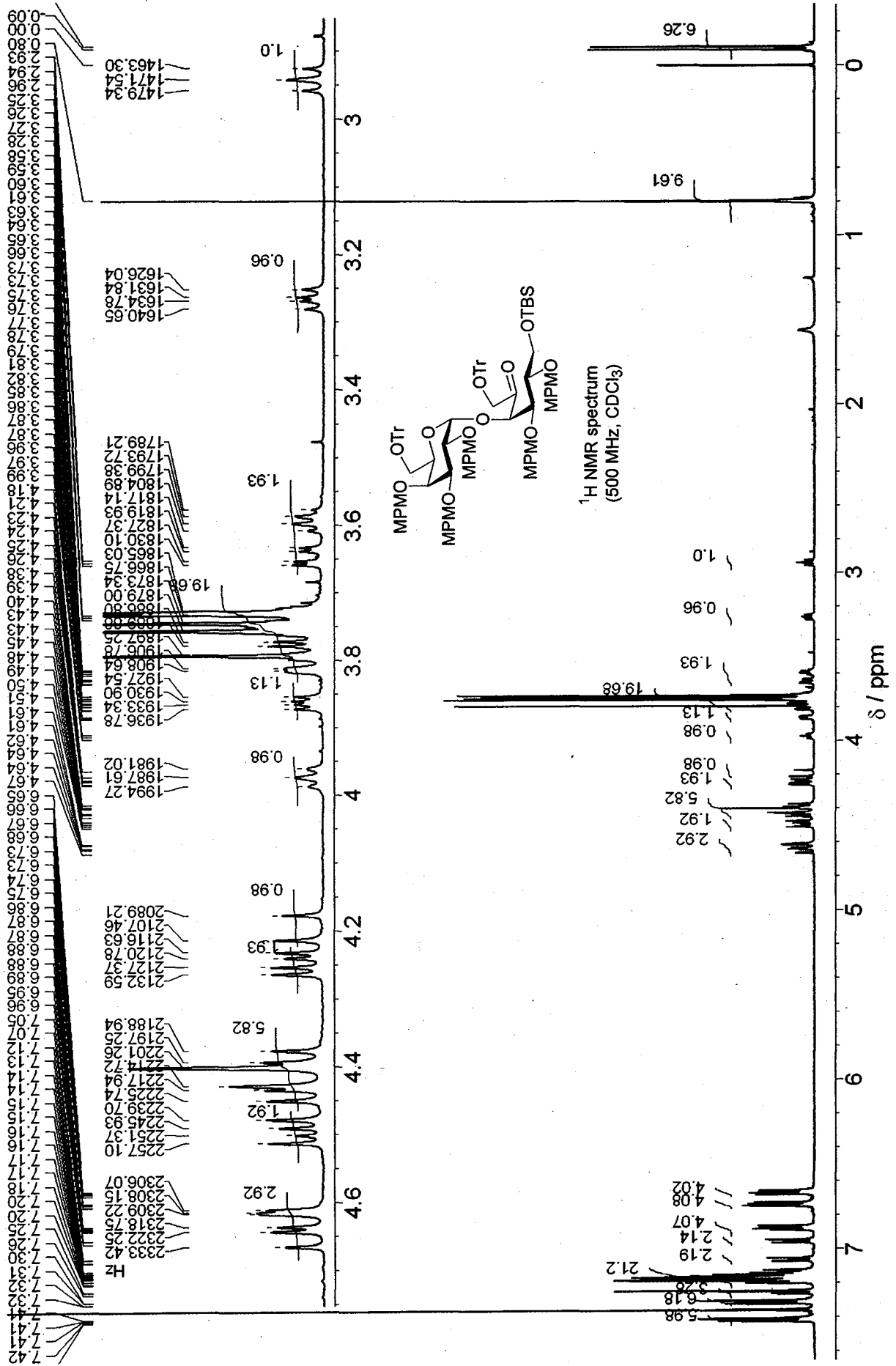




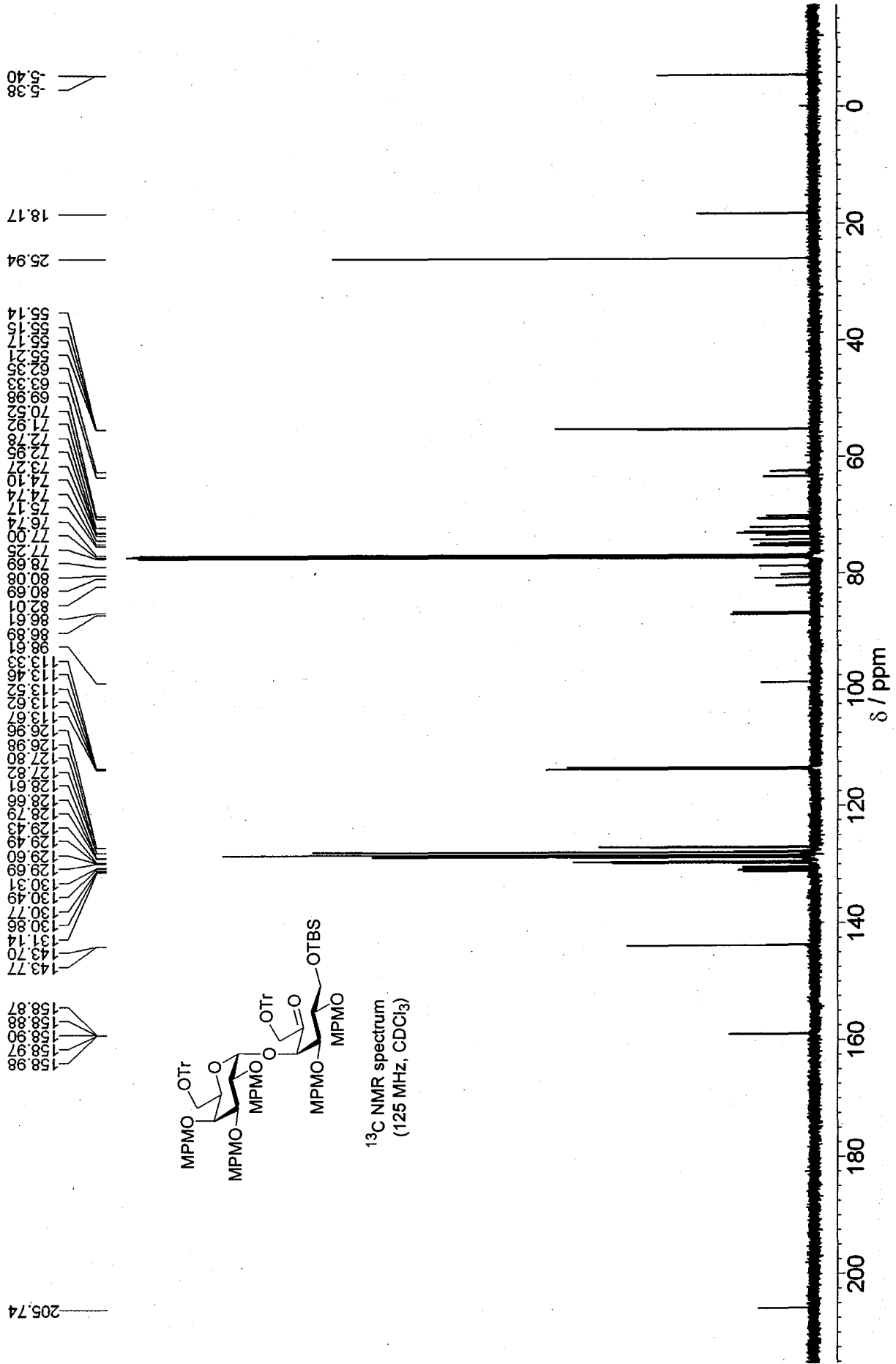


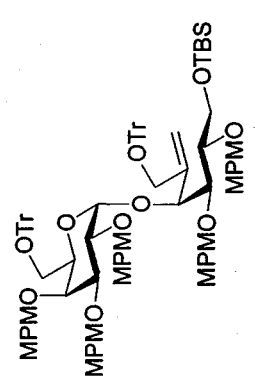
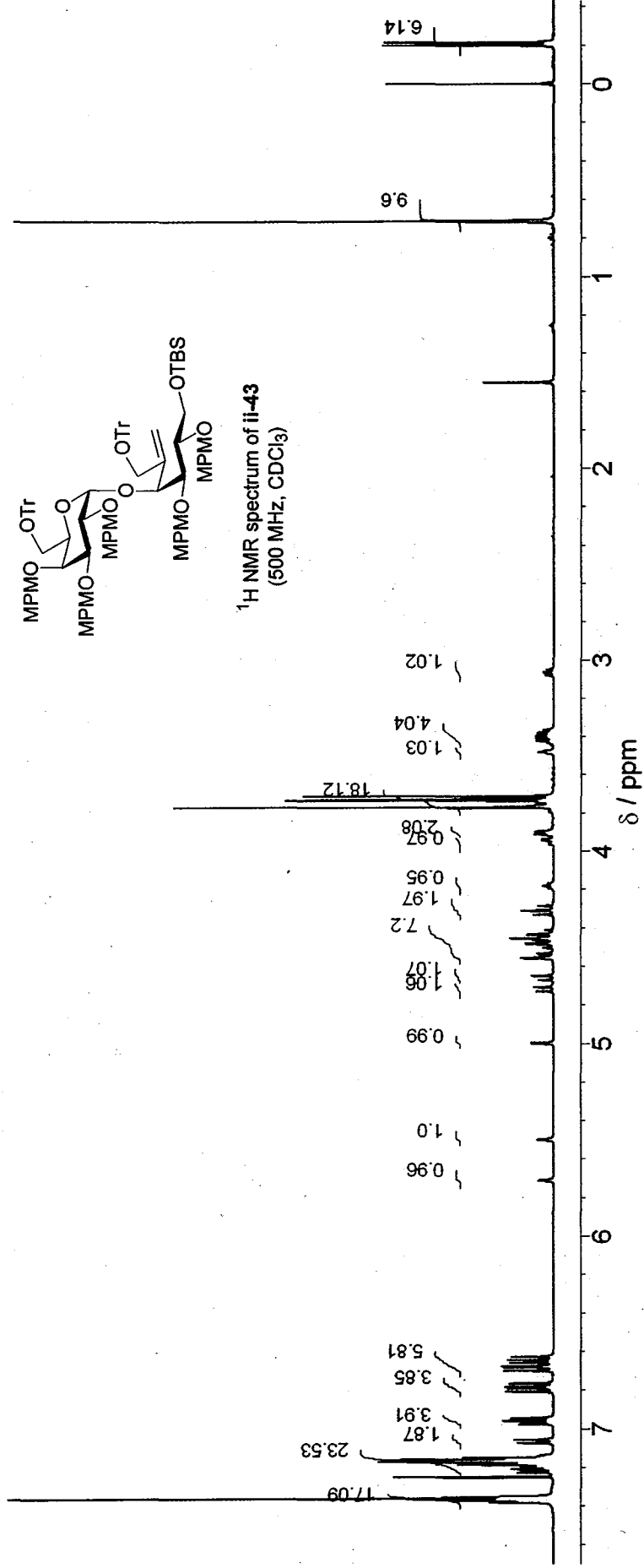
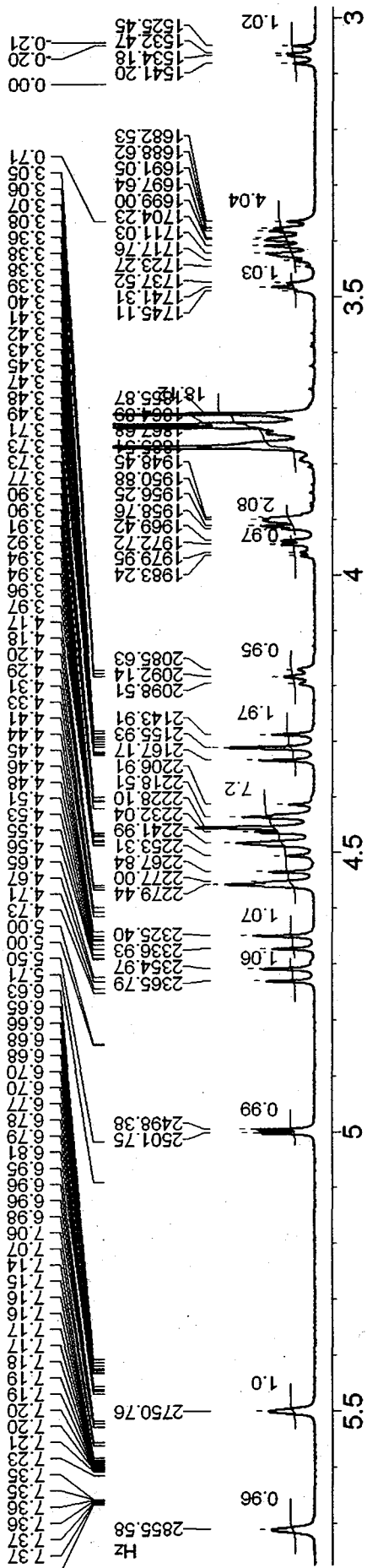


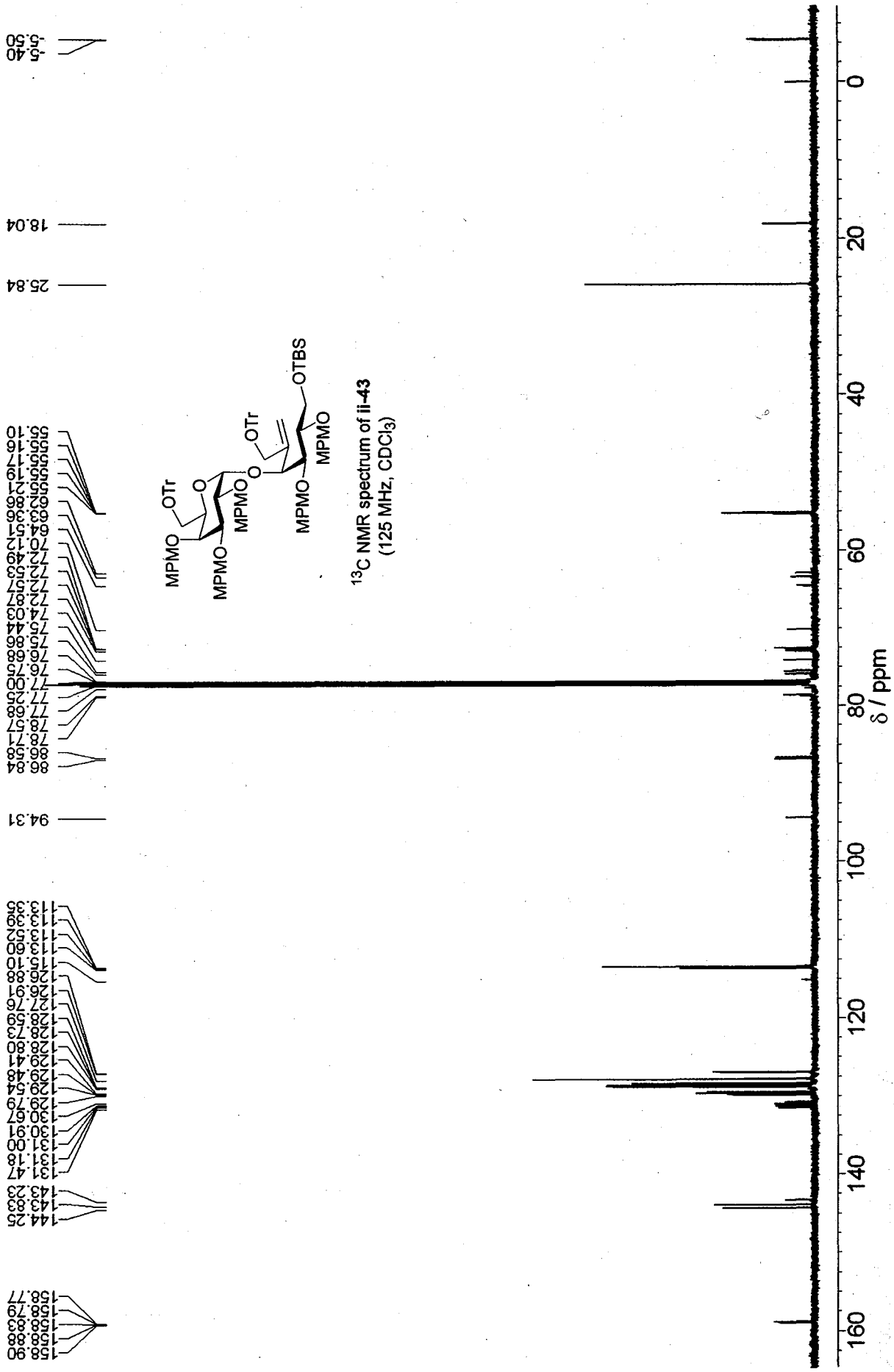


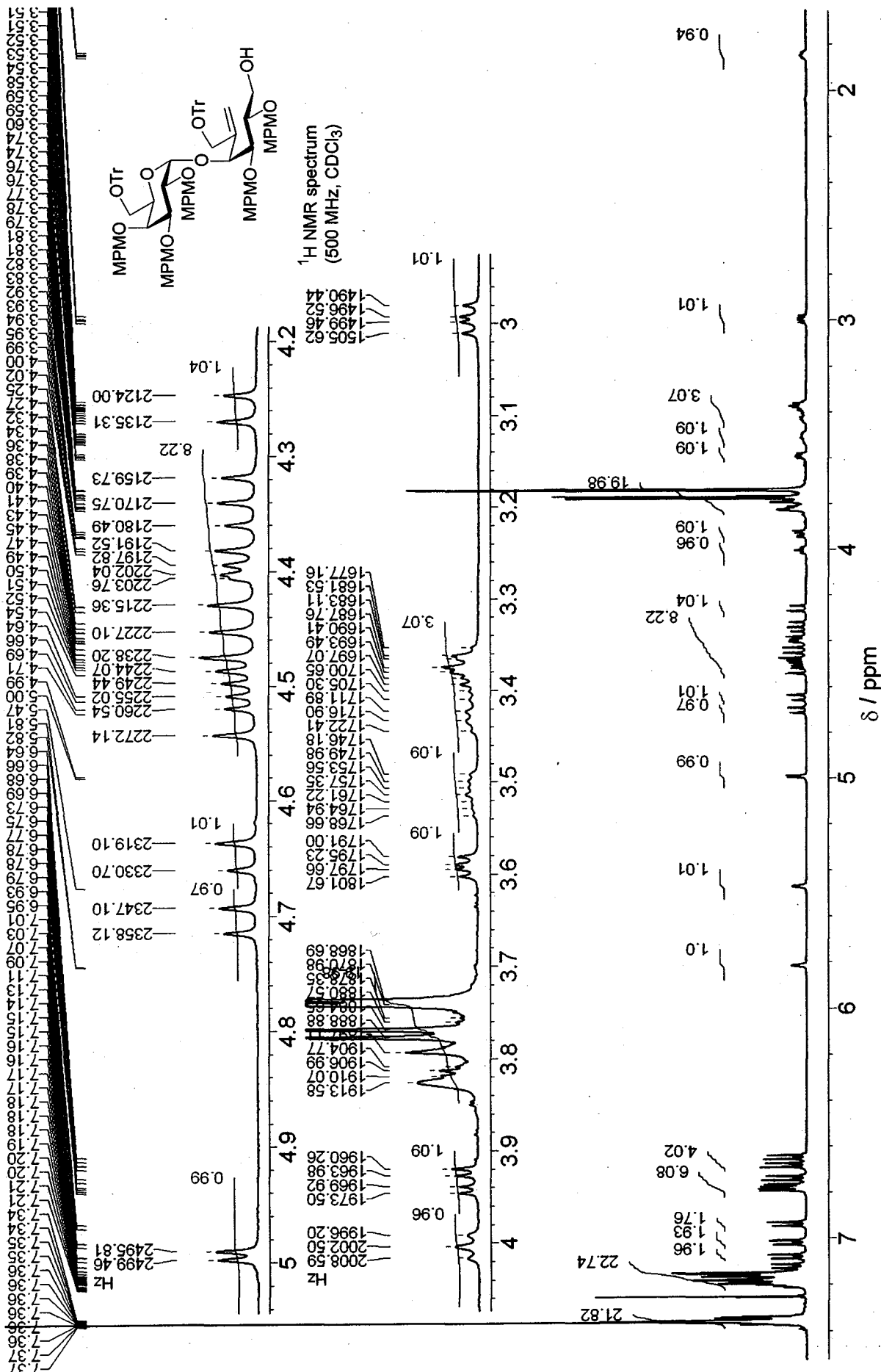


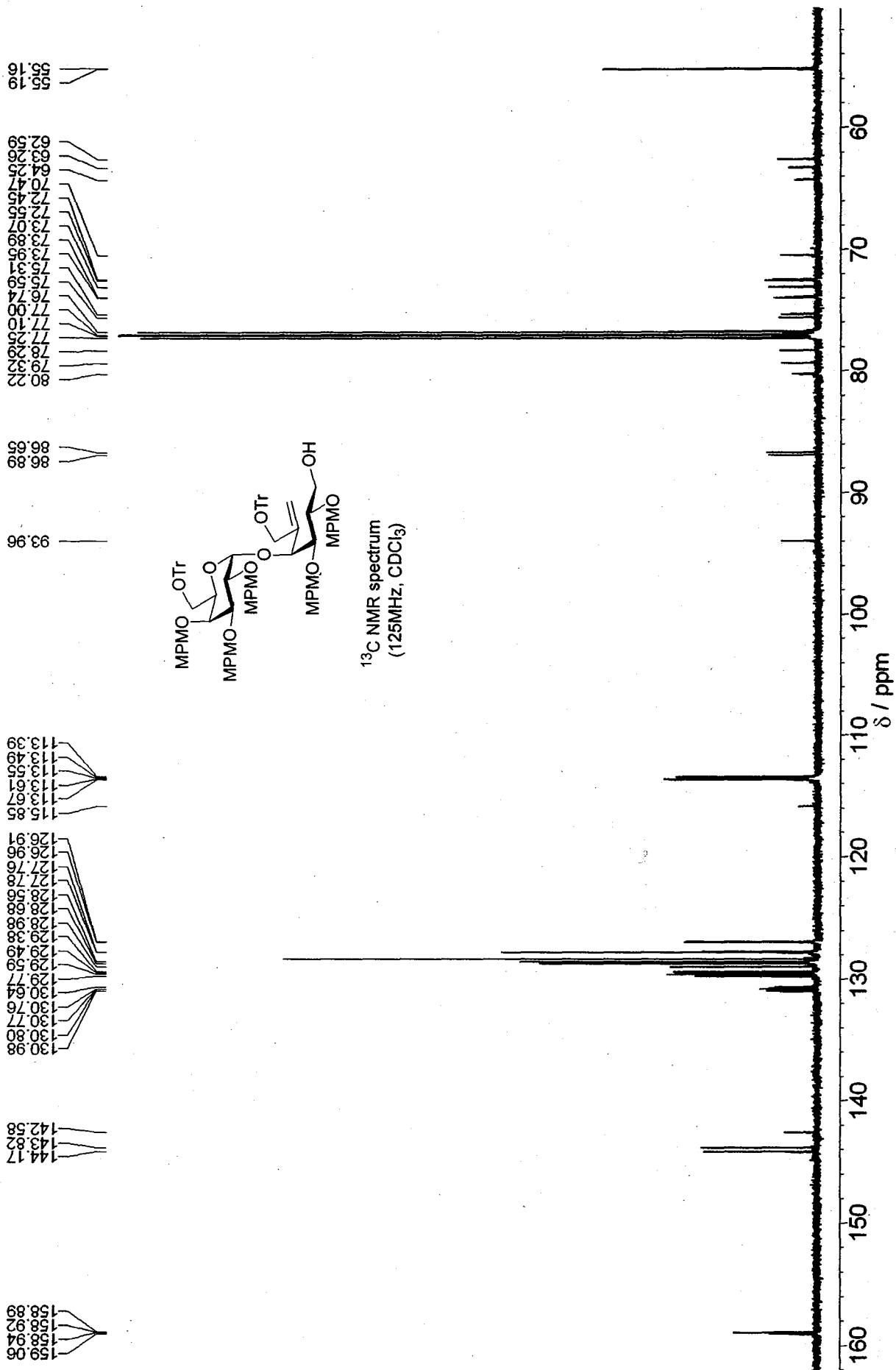


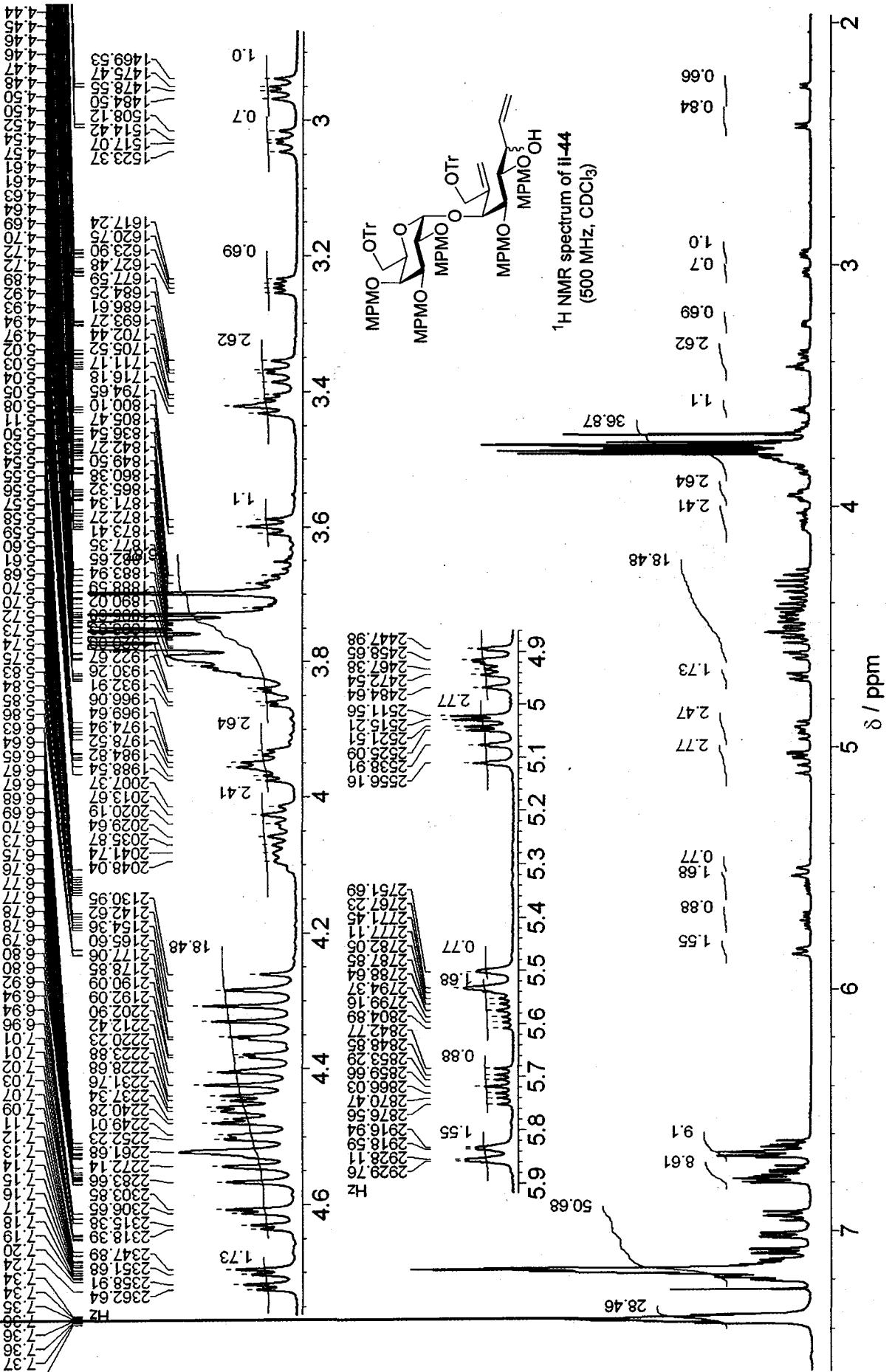


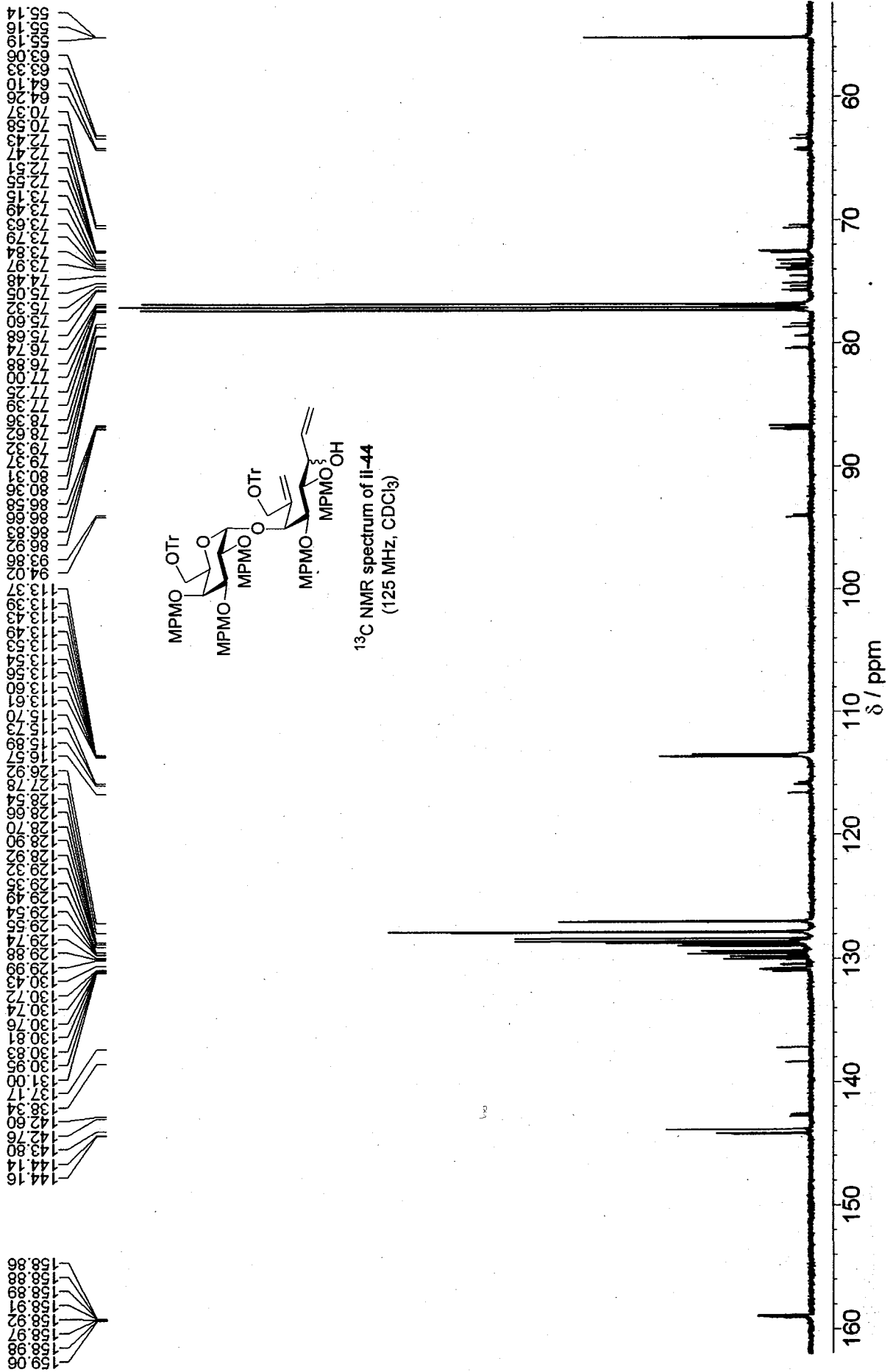










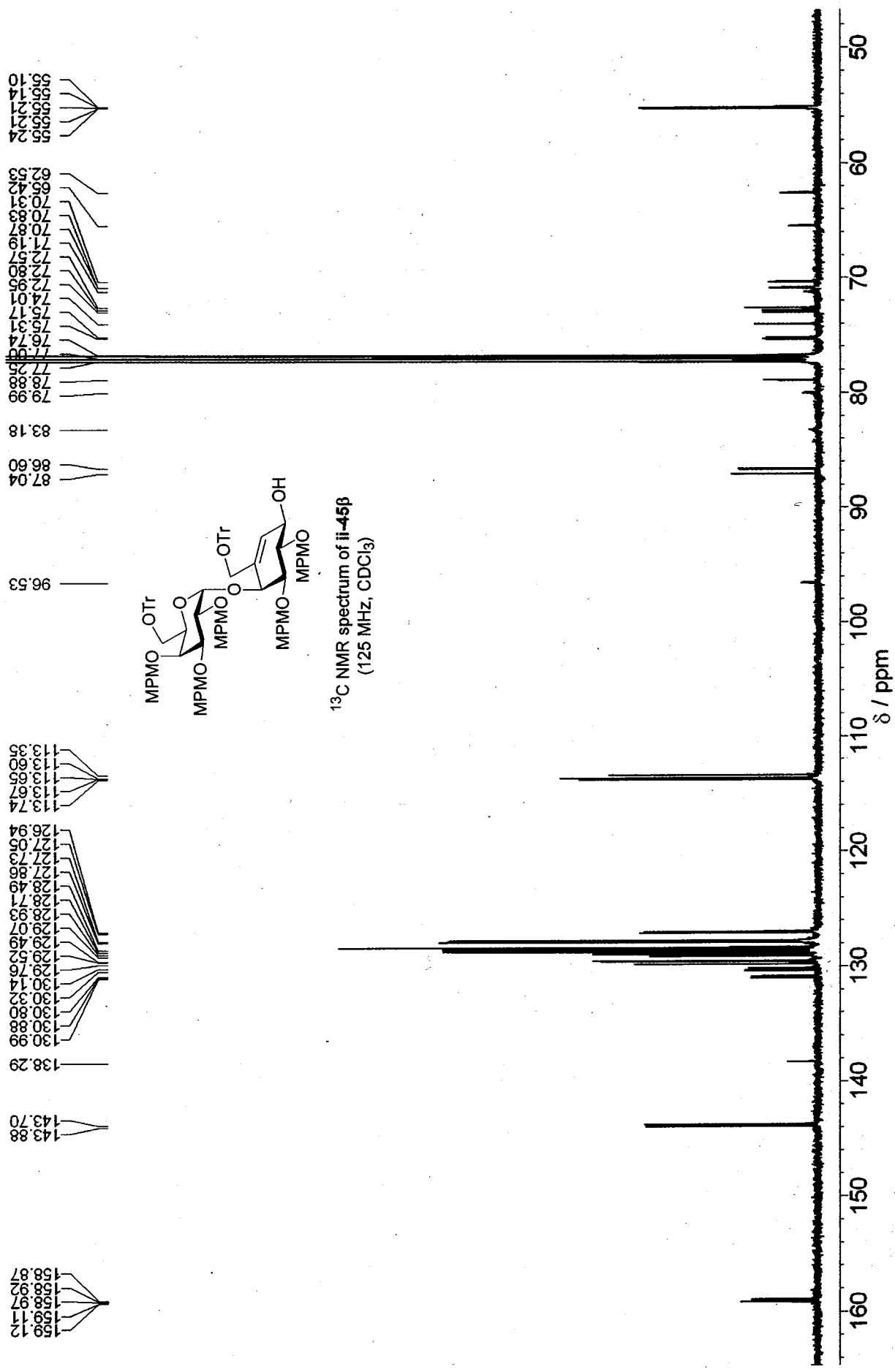


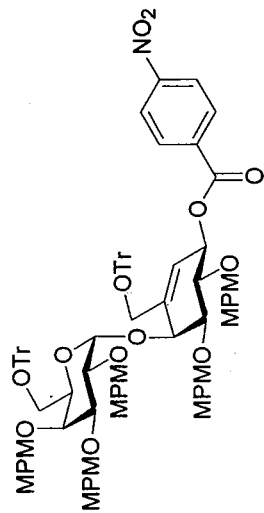
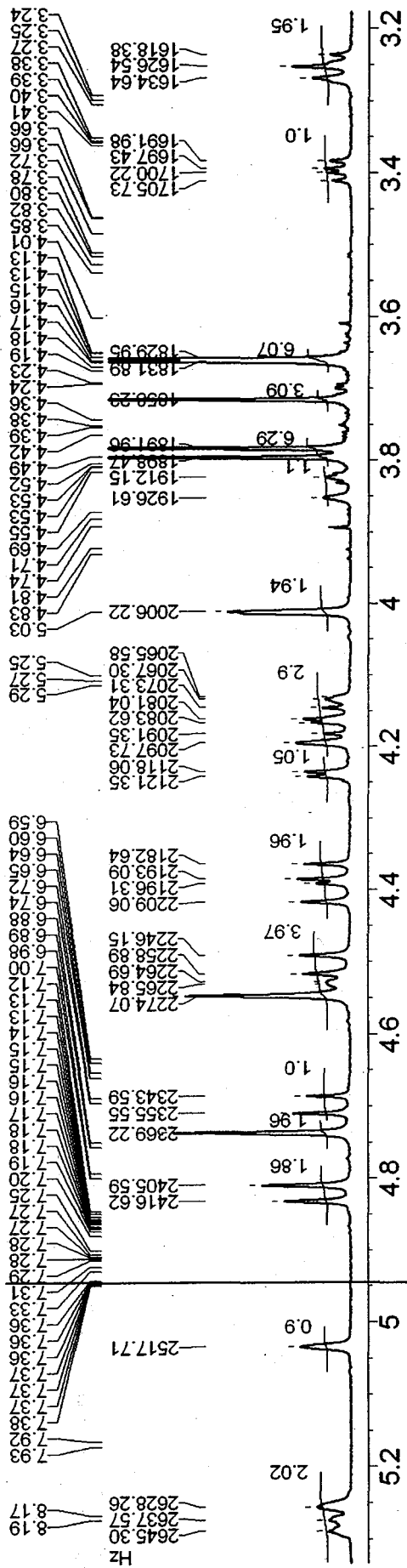




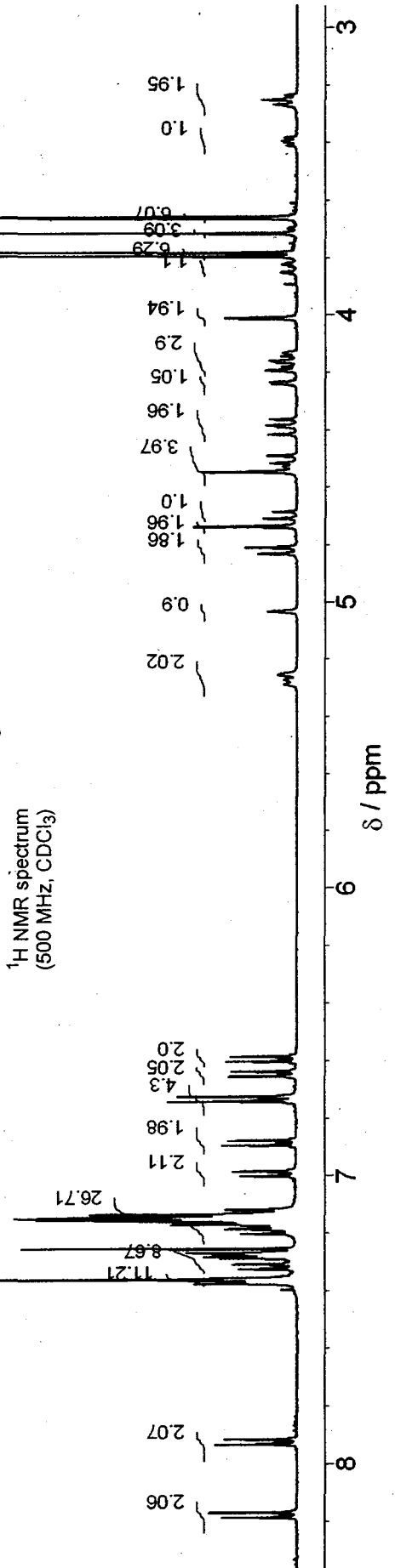




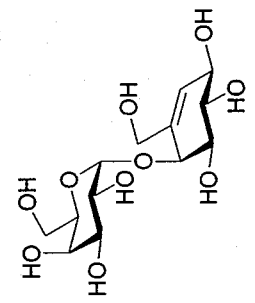
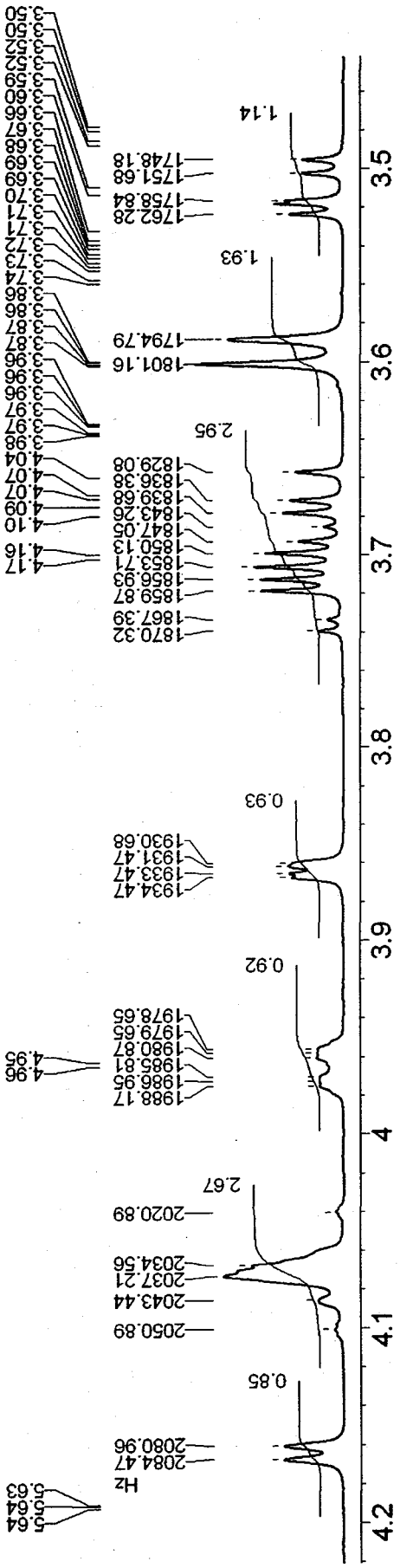




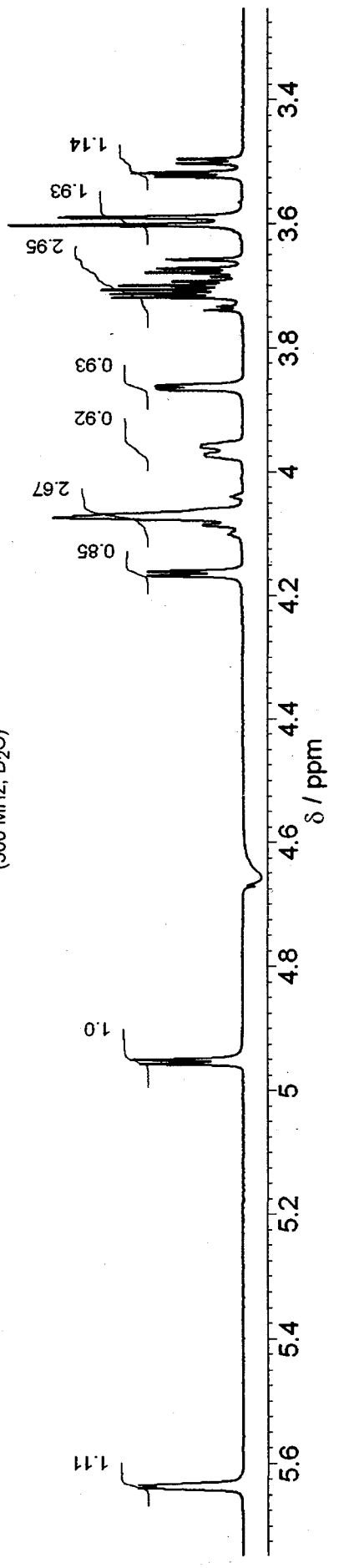
<sup>1</sup>H NMR spectrum  
(500 MHz, CDCl<sub>3</sub>)

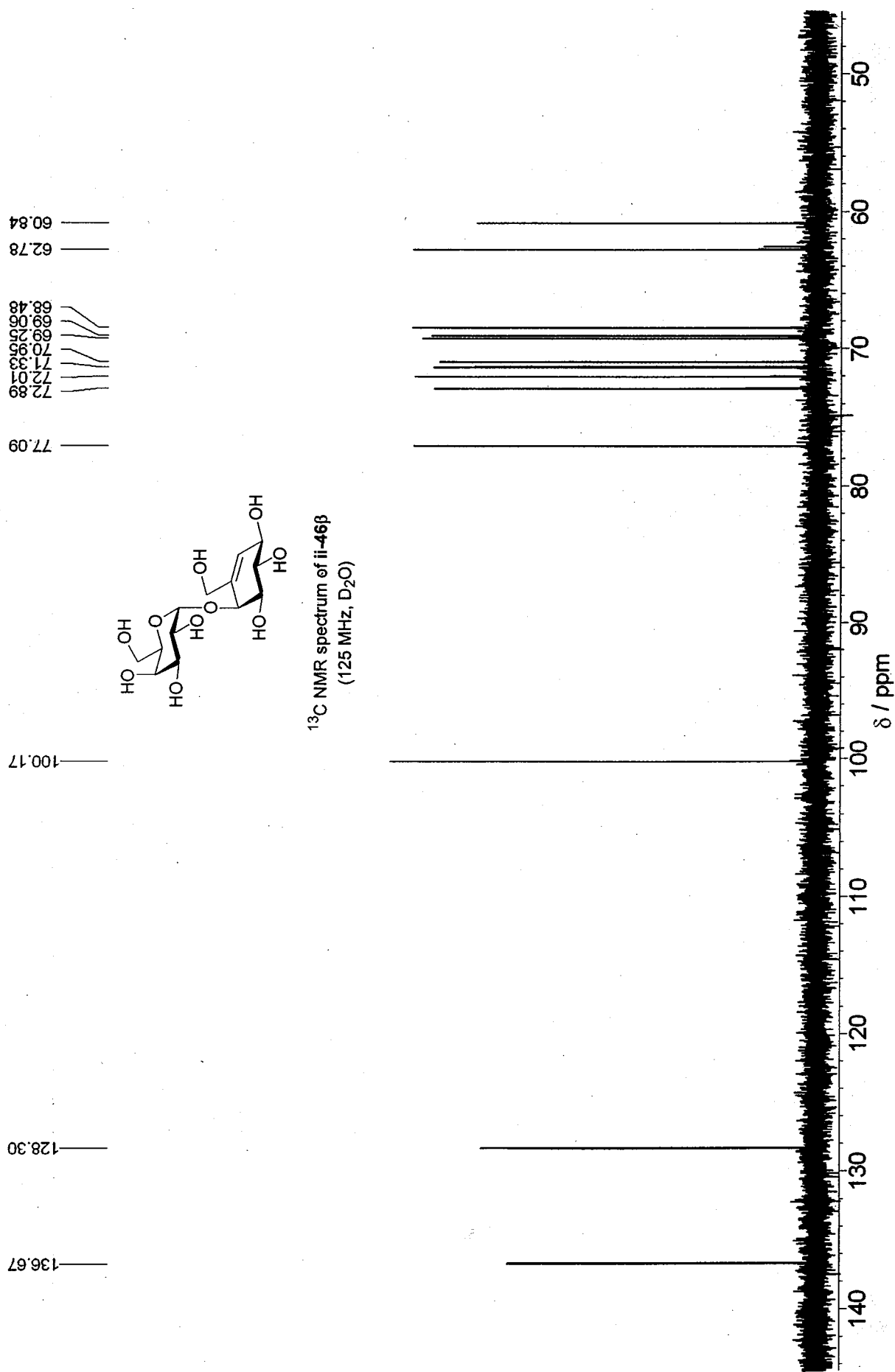




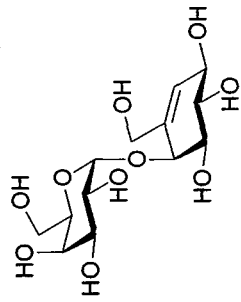


<sup>1</sup>H NMR spectrum of ii-46β  
(500 MHz, D<sub>2</sub>O)





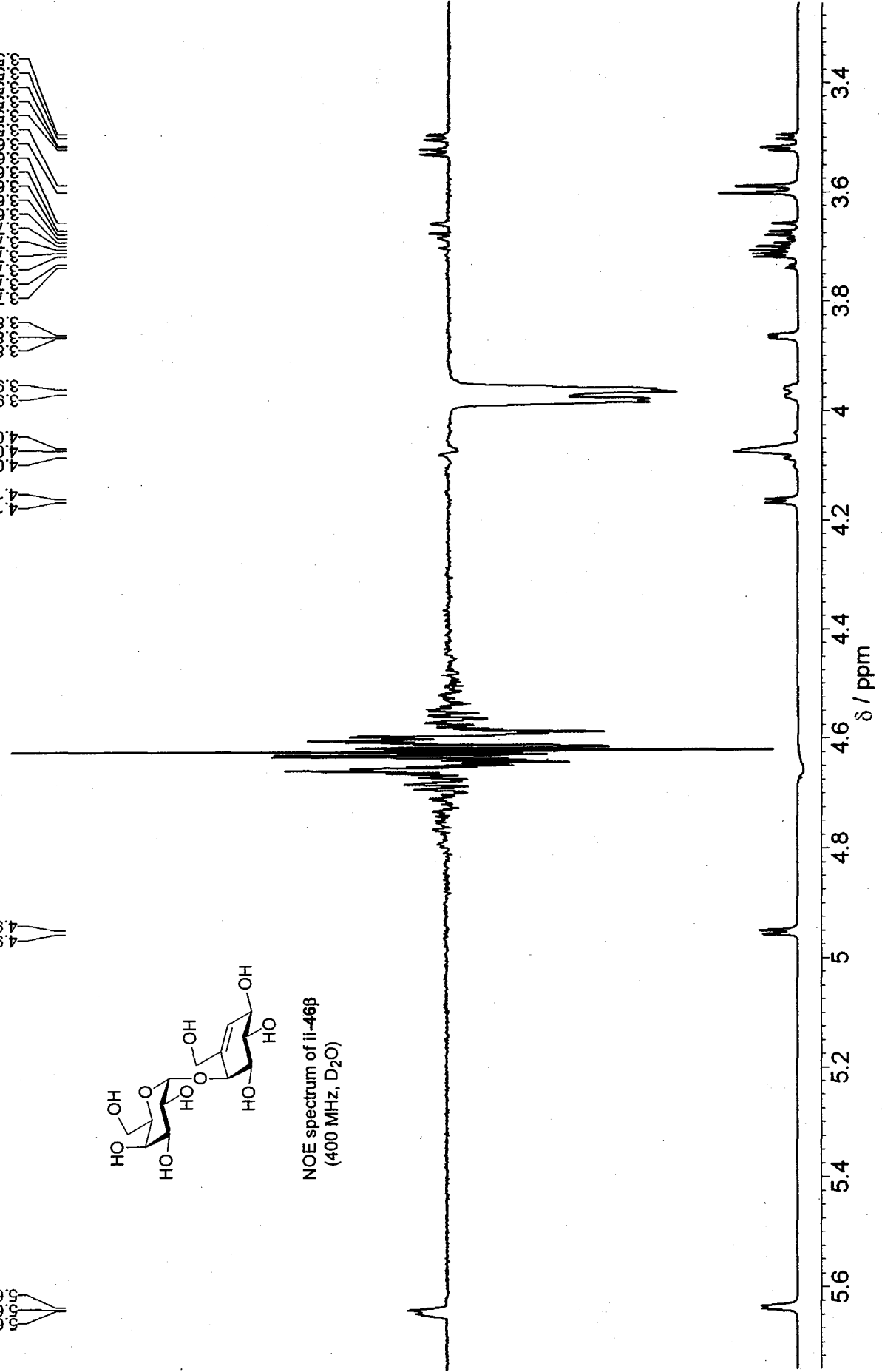
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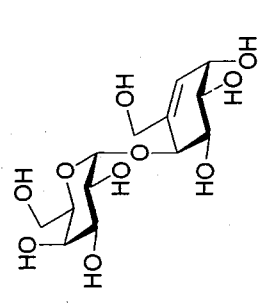
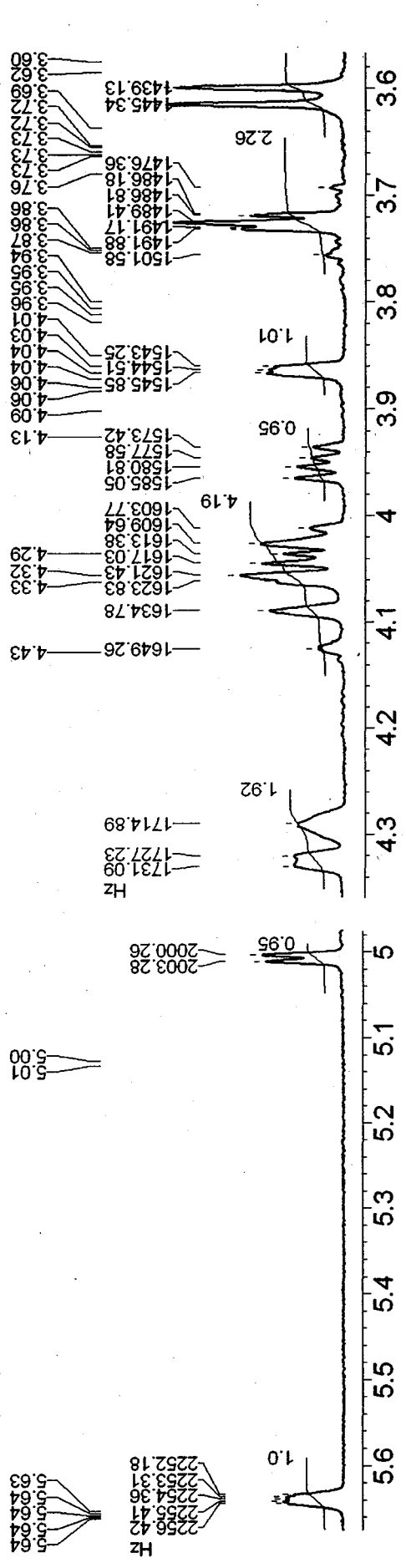
NOE spectrum of II-46 $\beta$   
(400 MHz, D<sub>2</sub>O)

4.95  
 4.96

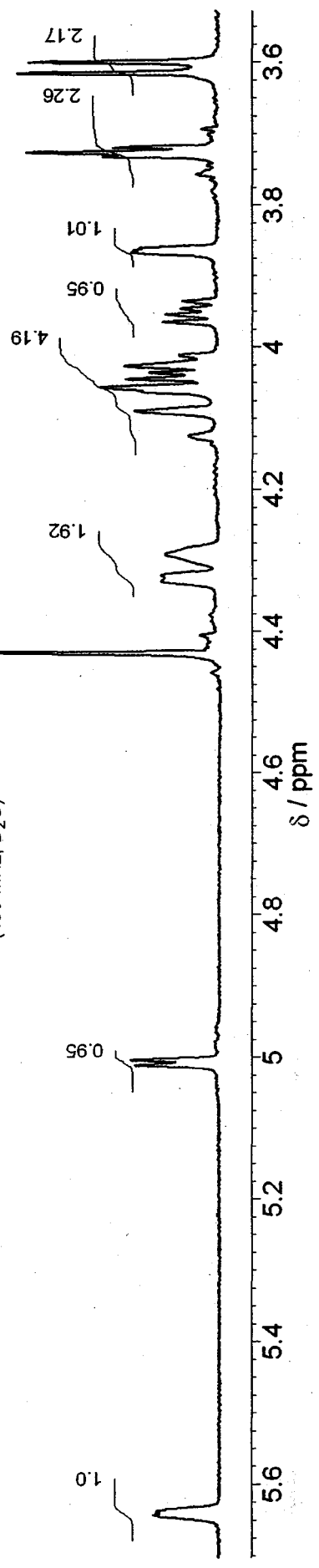
5.63  
 5.64  
 5.64

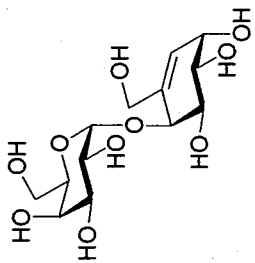




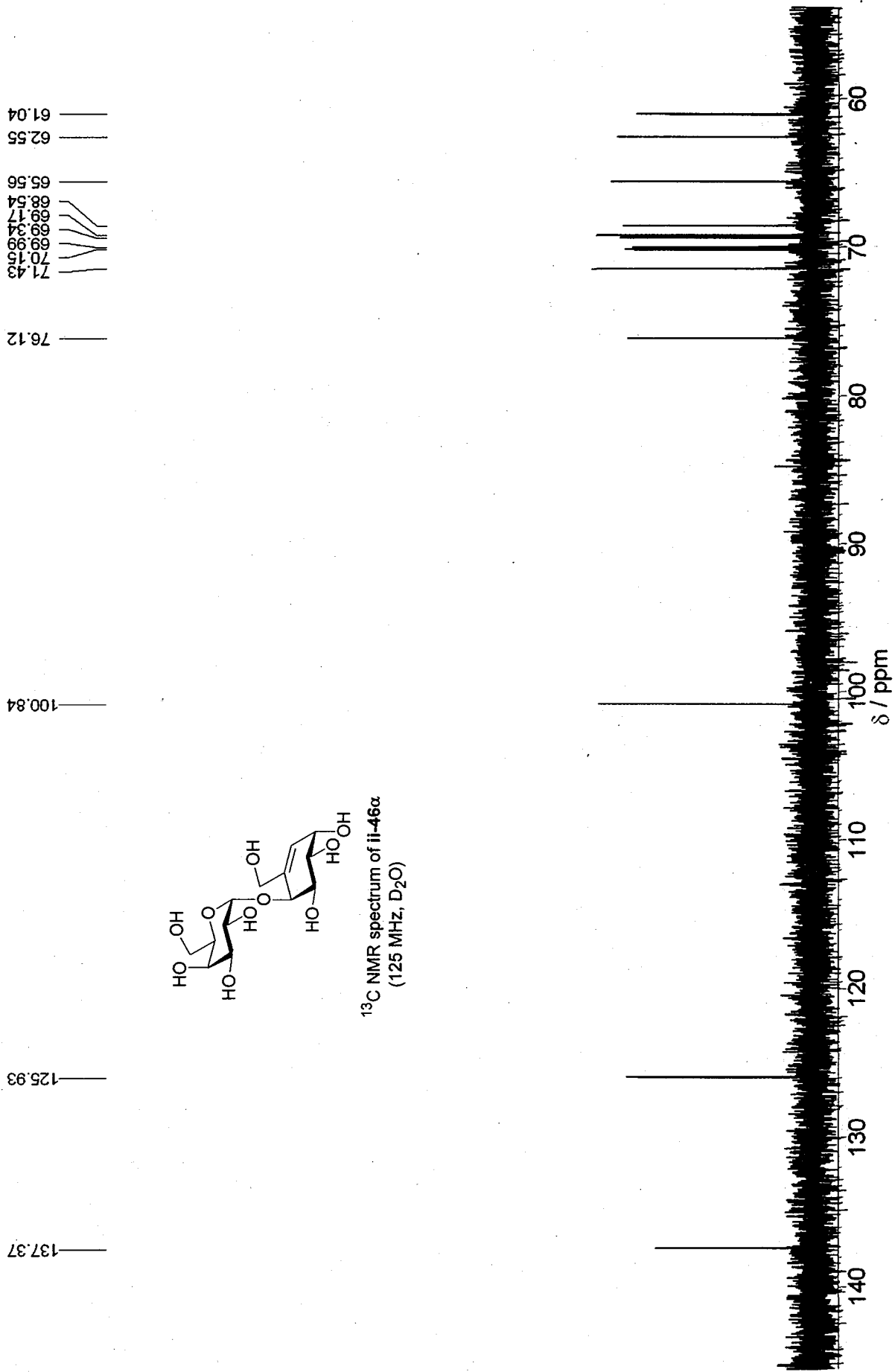


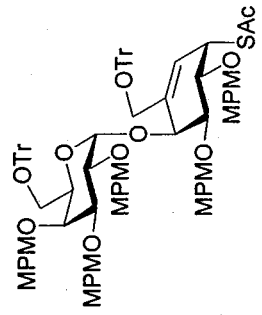
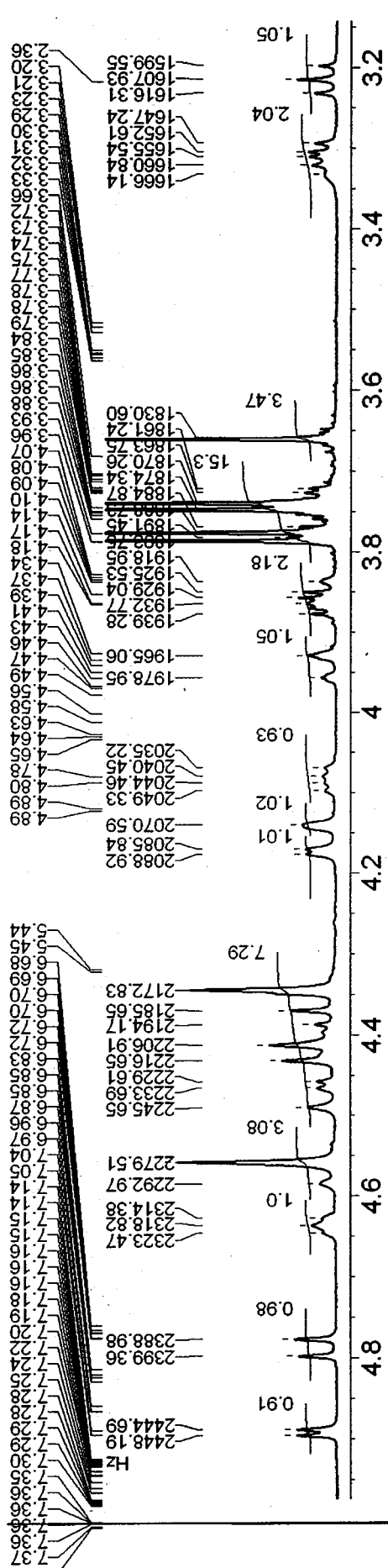
<sup>1</sup>H NMR spectrum of ii-46a (400 MHz, D<sub>2</sub>O)



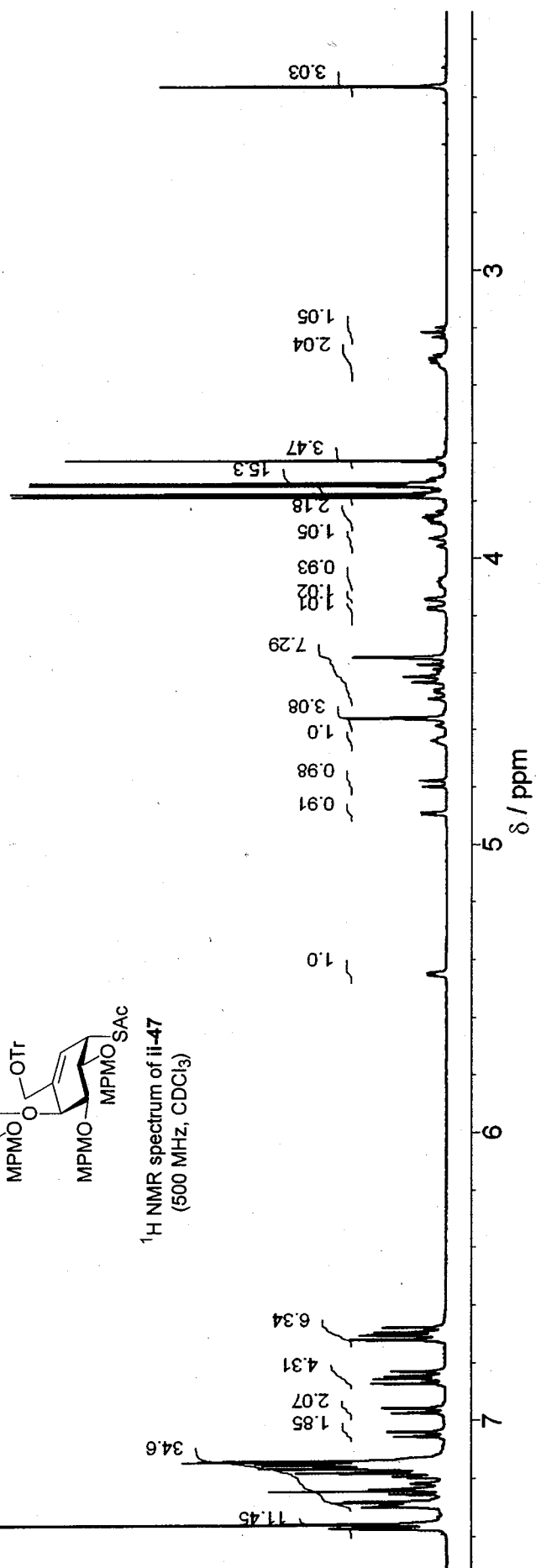


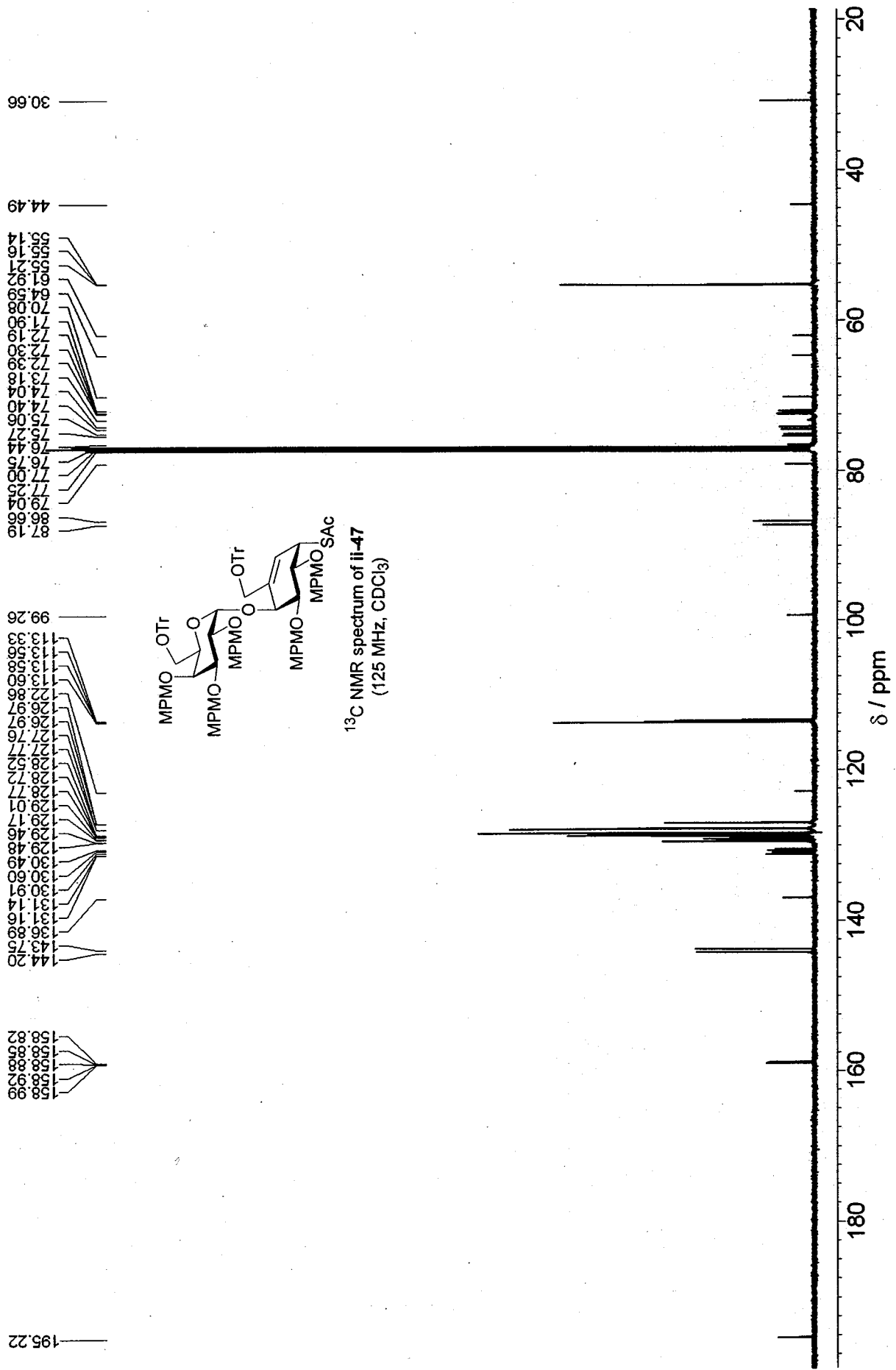
<sup>13</sup>C NMR spectrum of ii-46α  
(125 MHz, D<sub>2</sub>O)

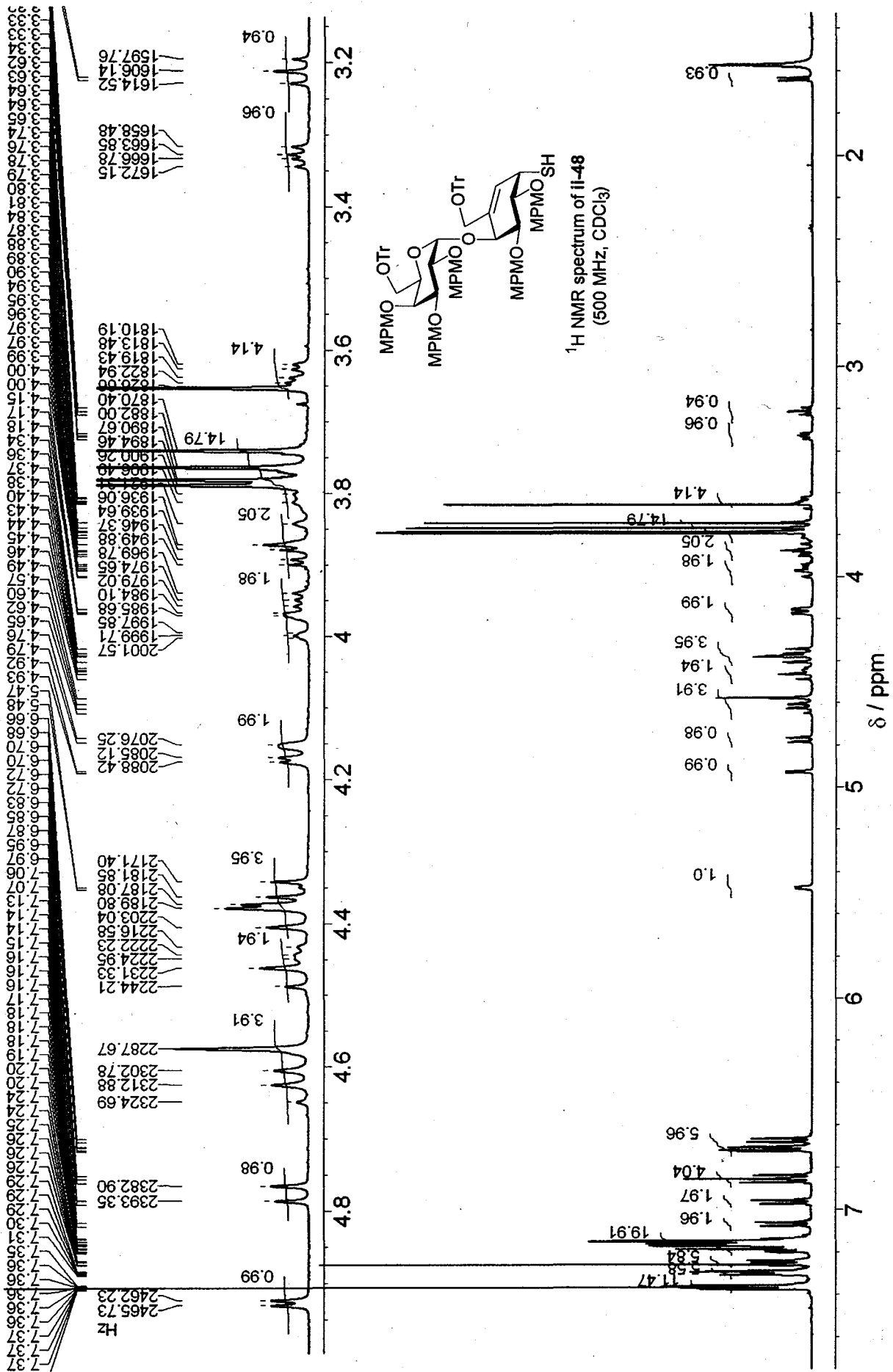


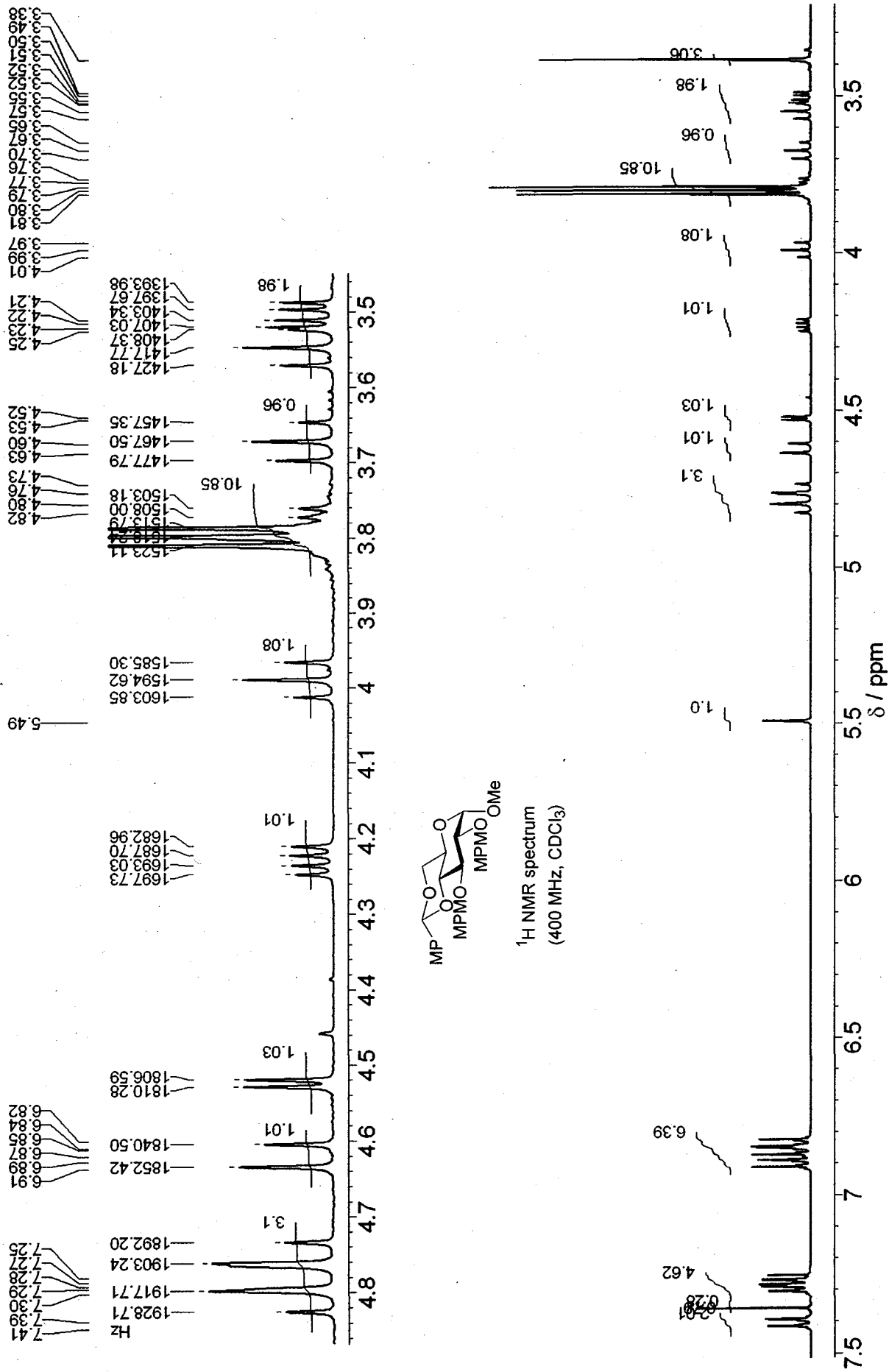


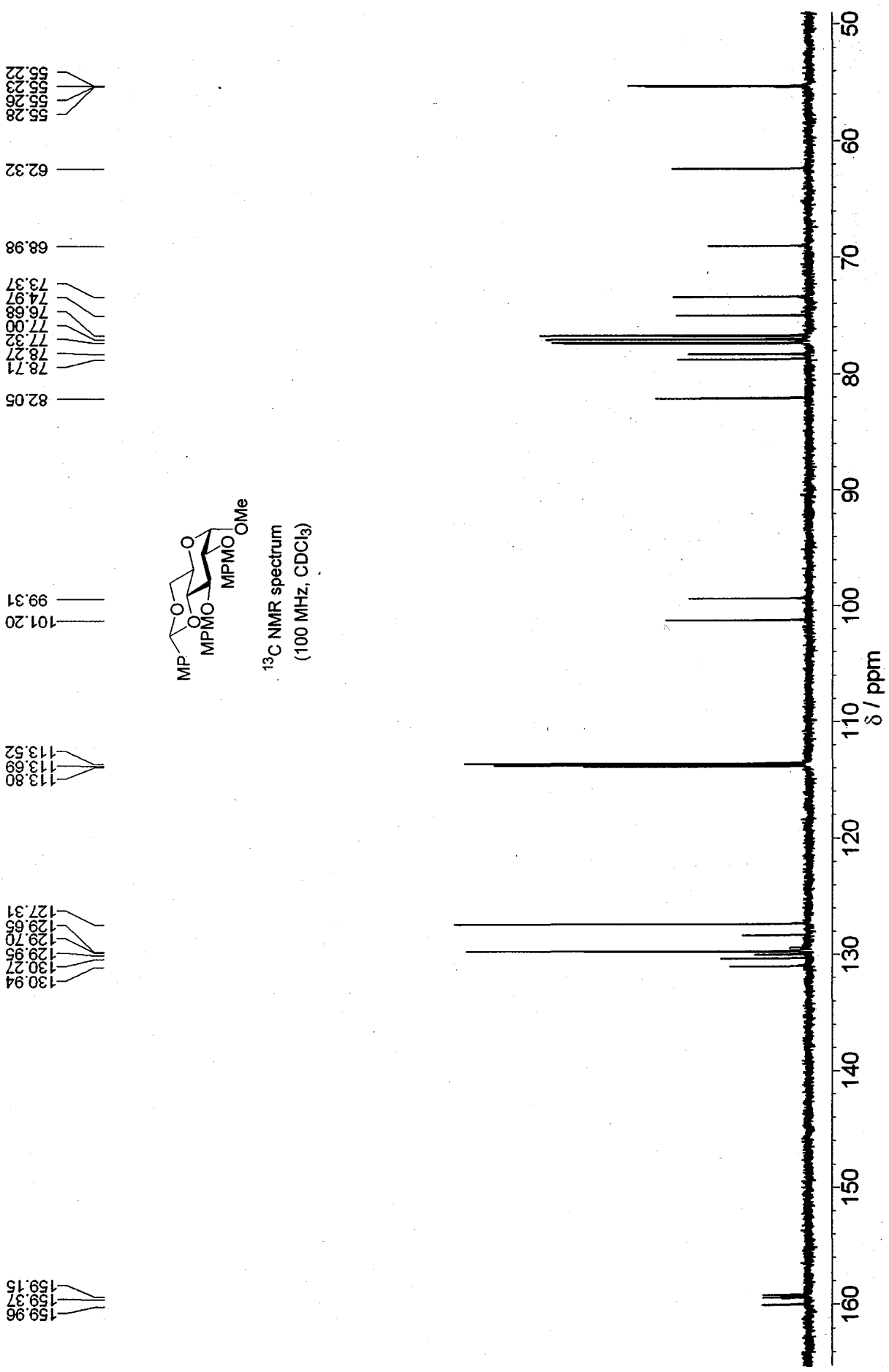
<sup>1</sup>H NMR spectrum of ii-47  
 (500 MHz, CDCl<sub>3</sub>)

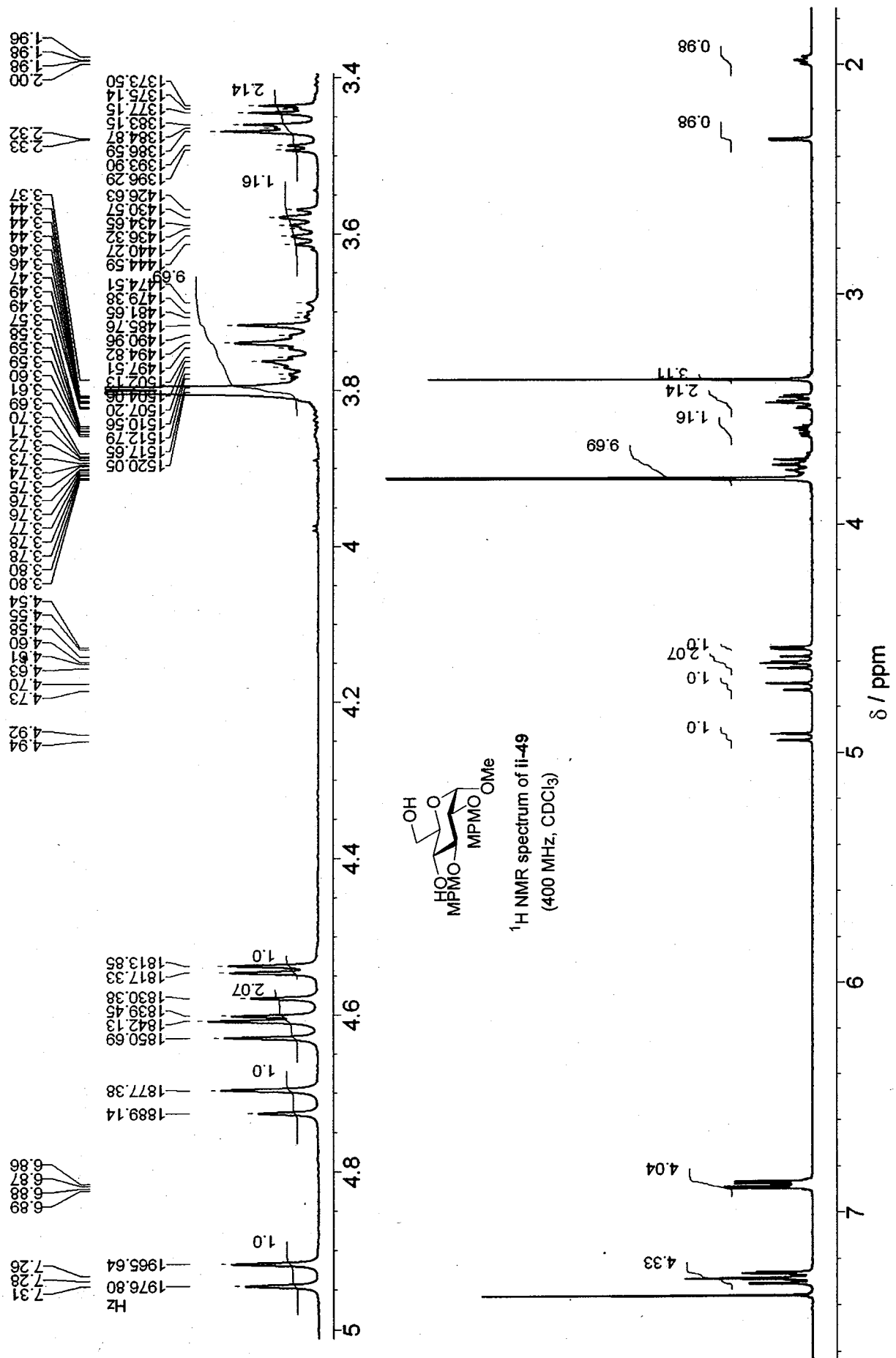




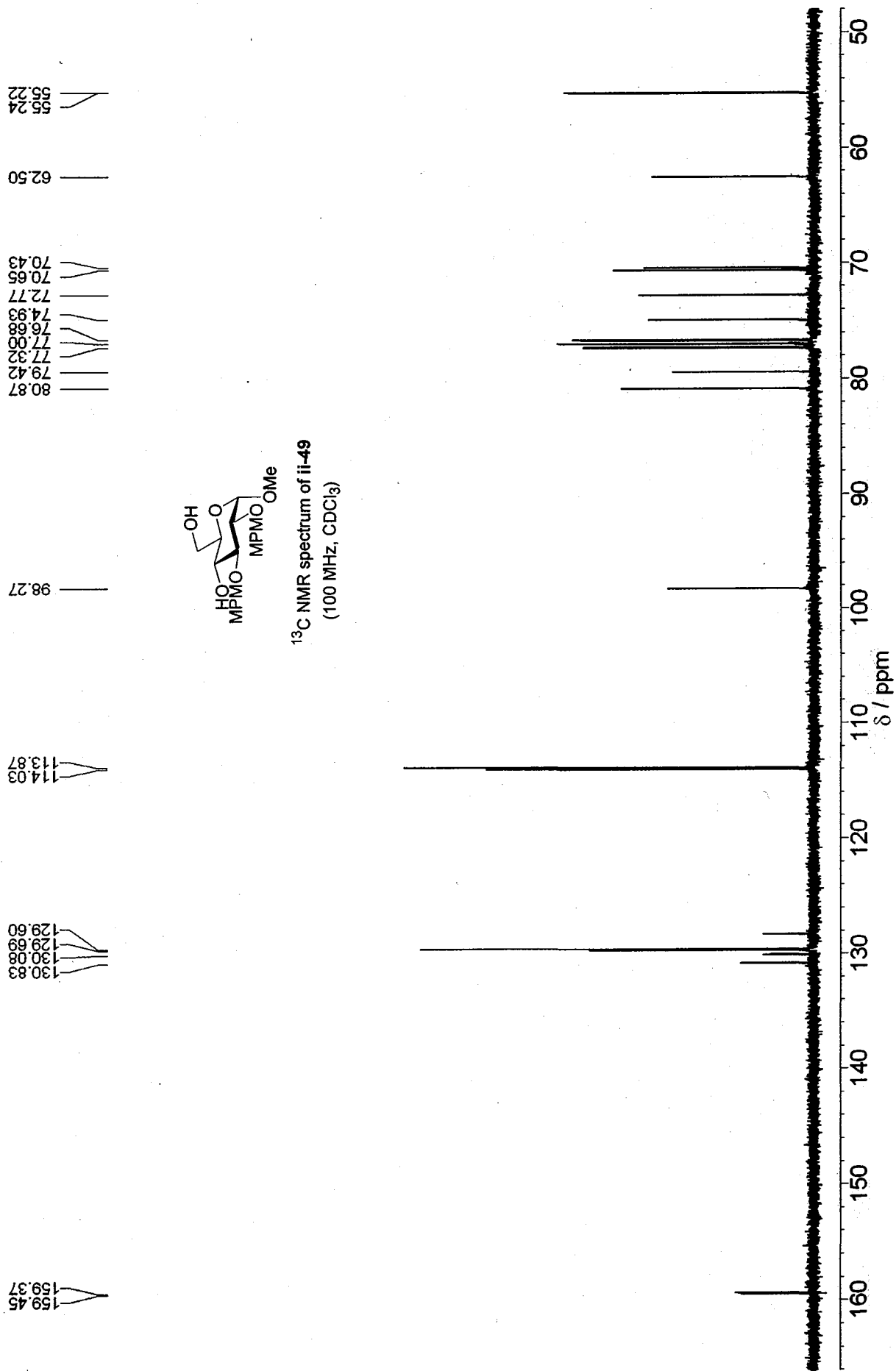


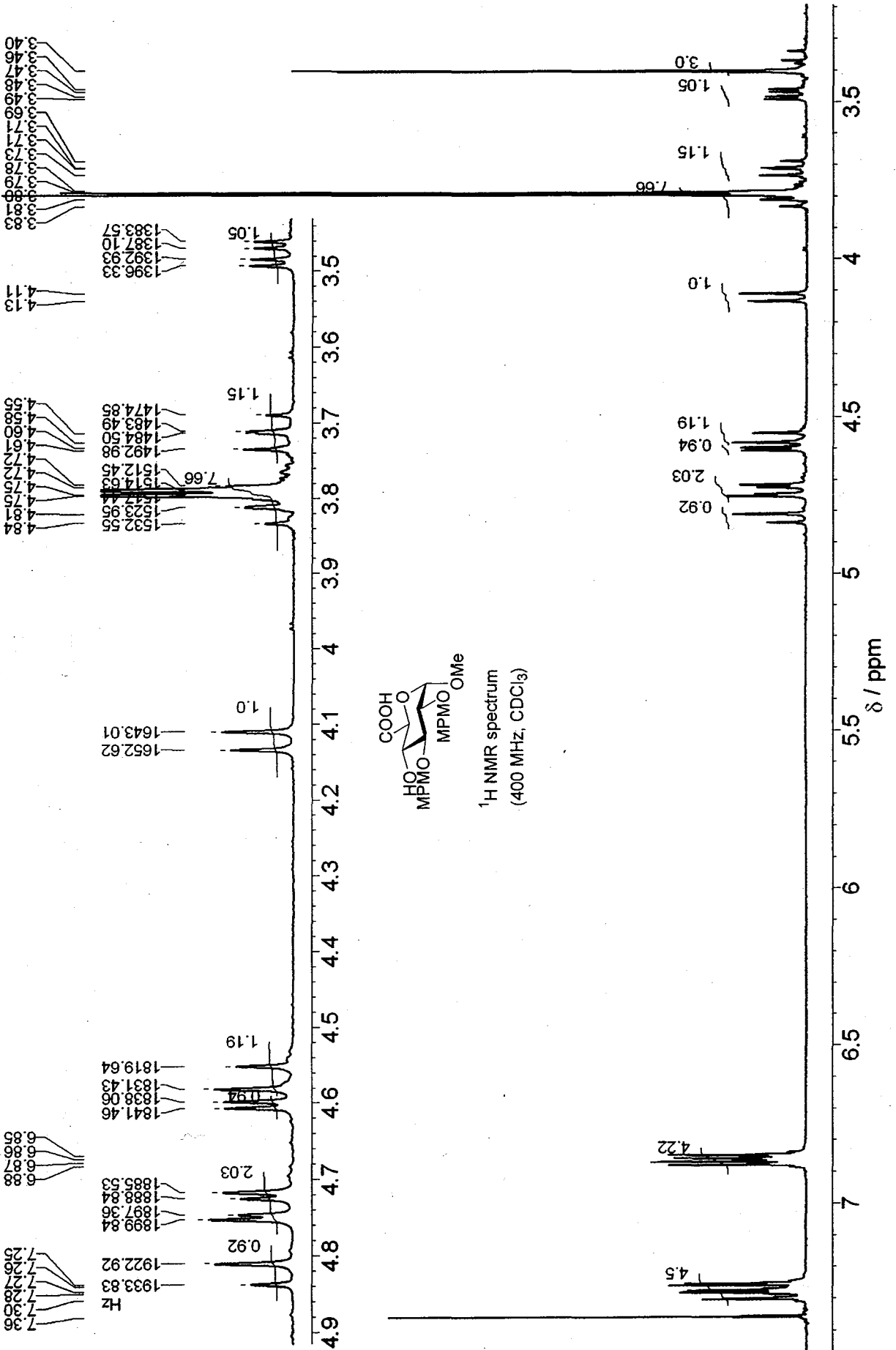


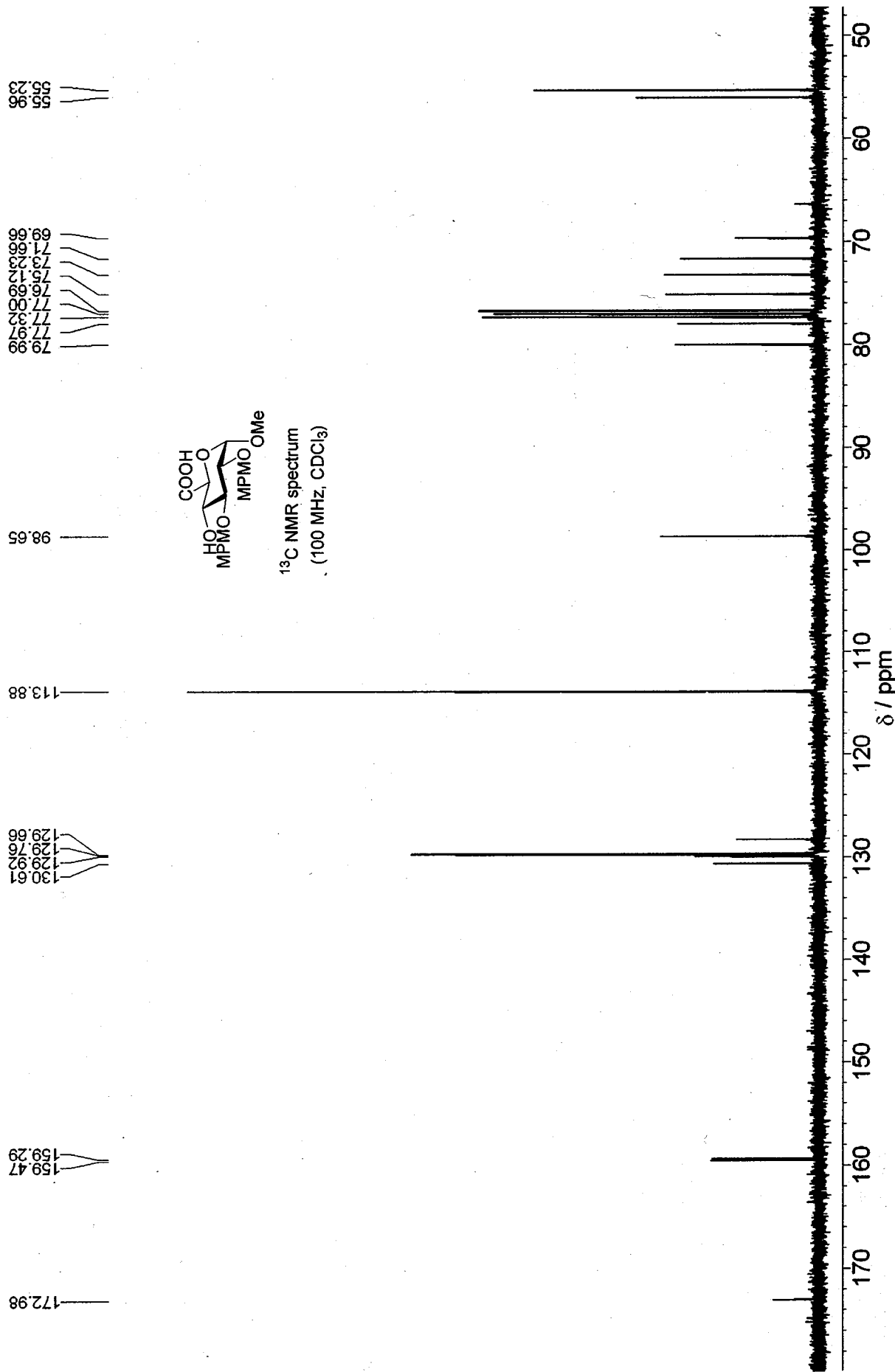




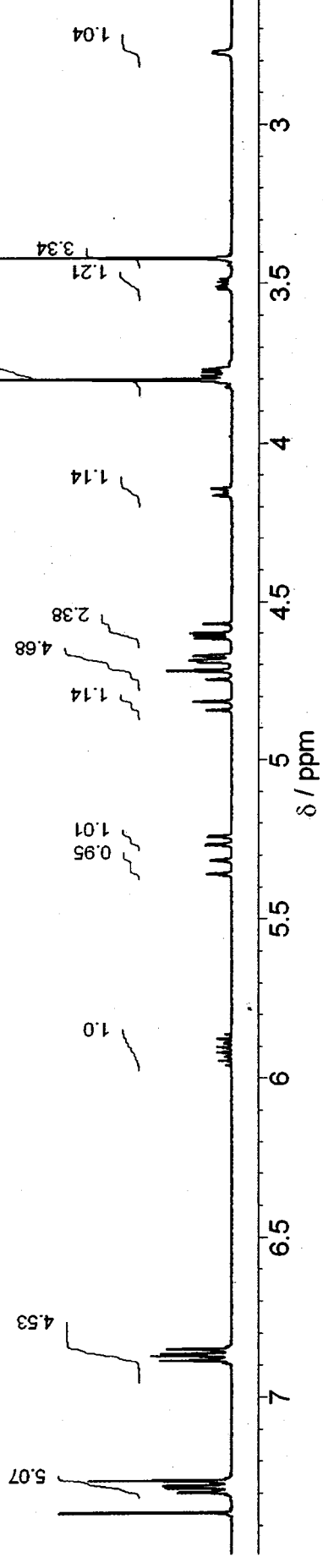
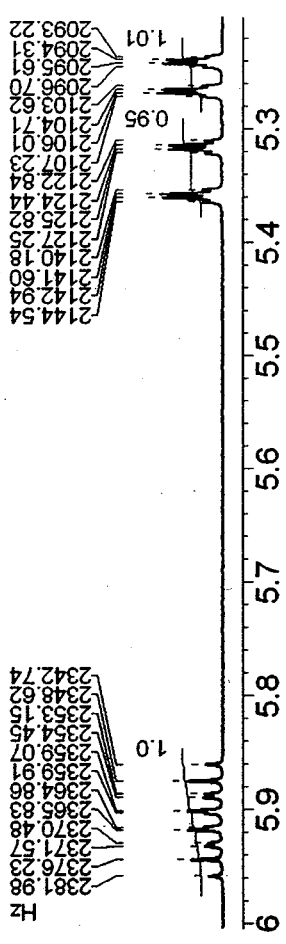
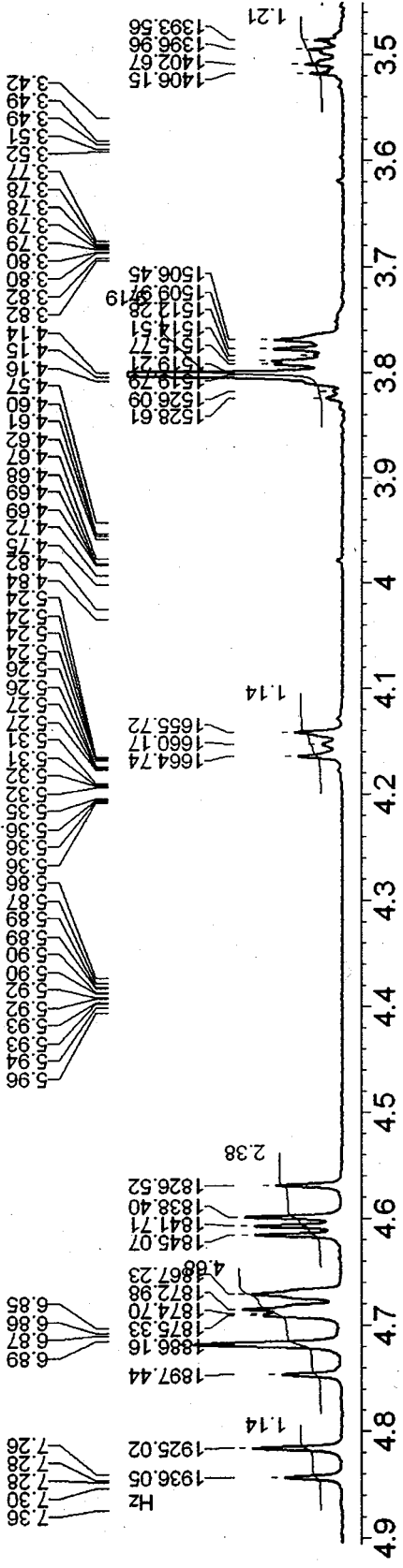


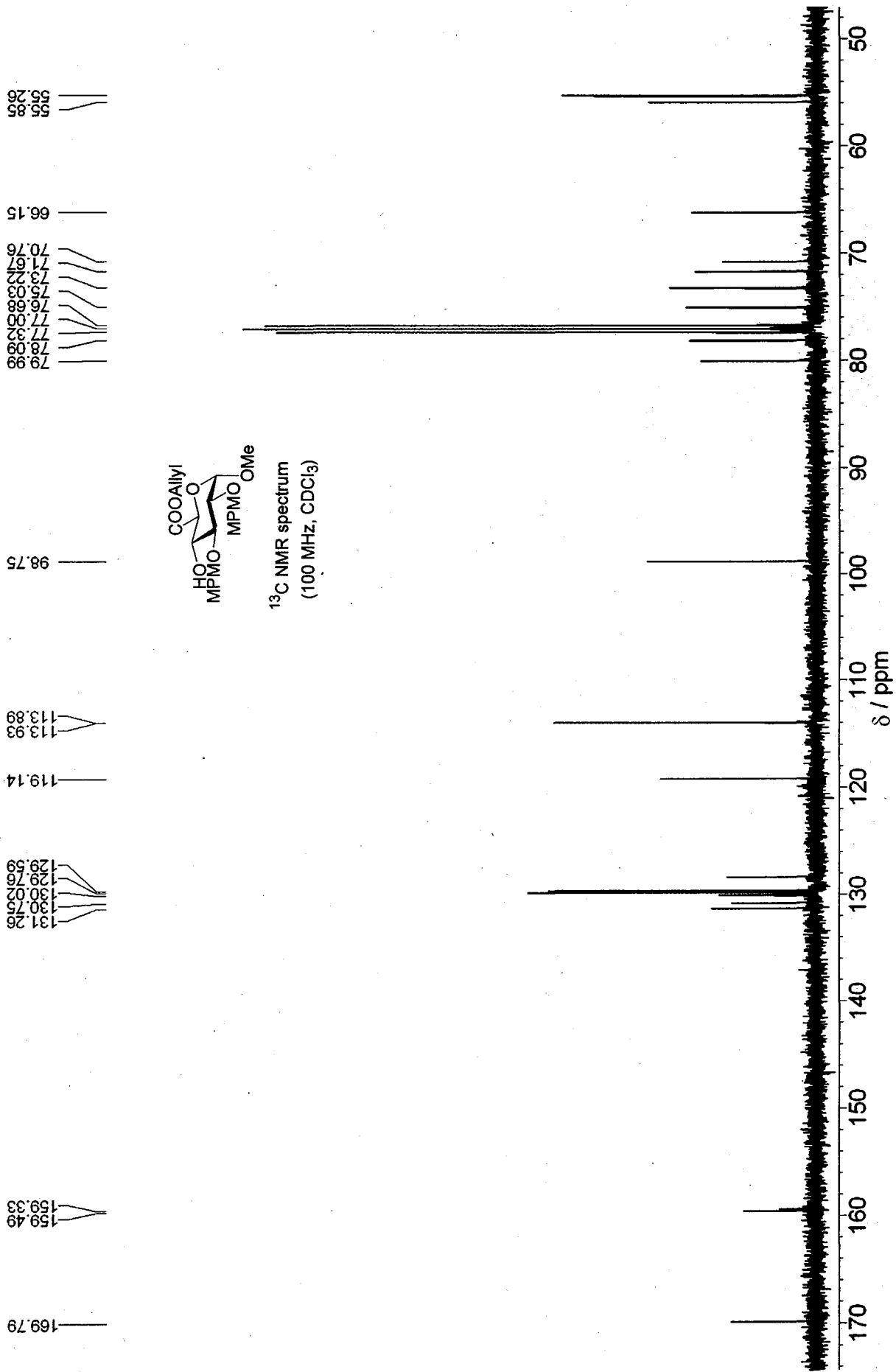


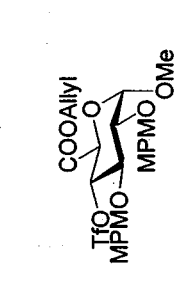
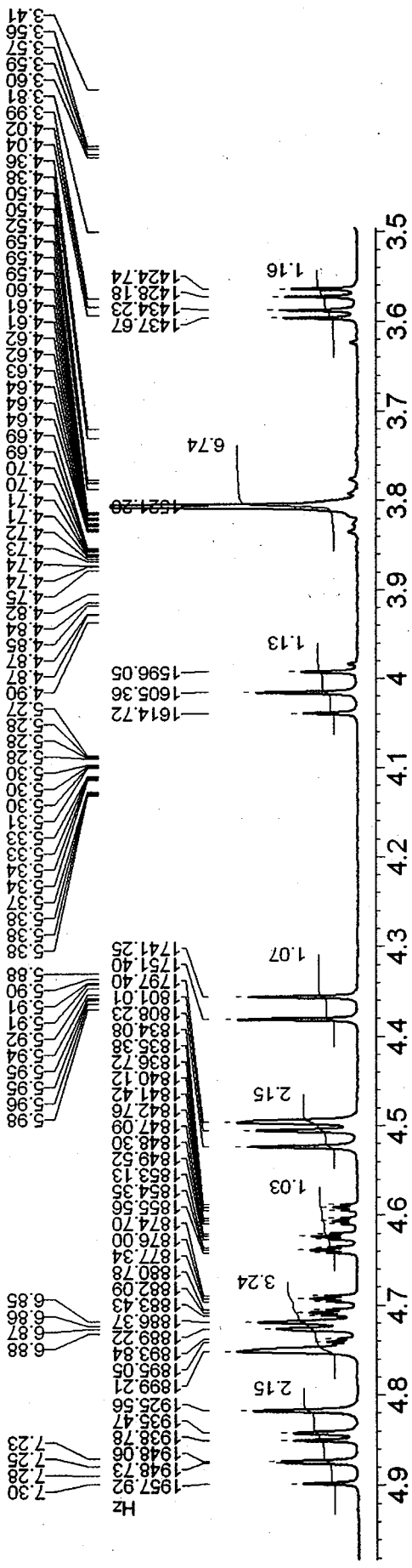




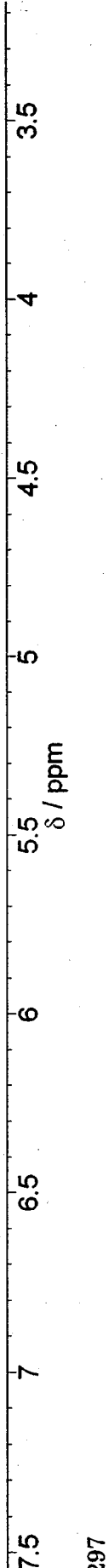
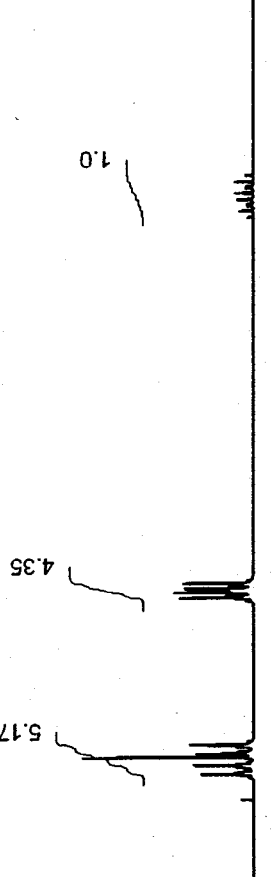
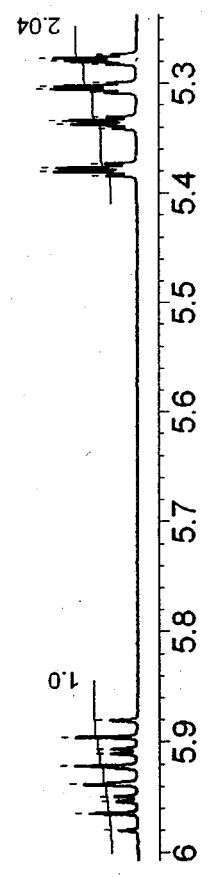
2.78  
2.77

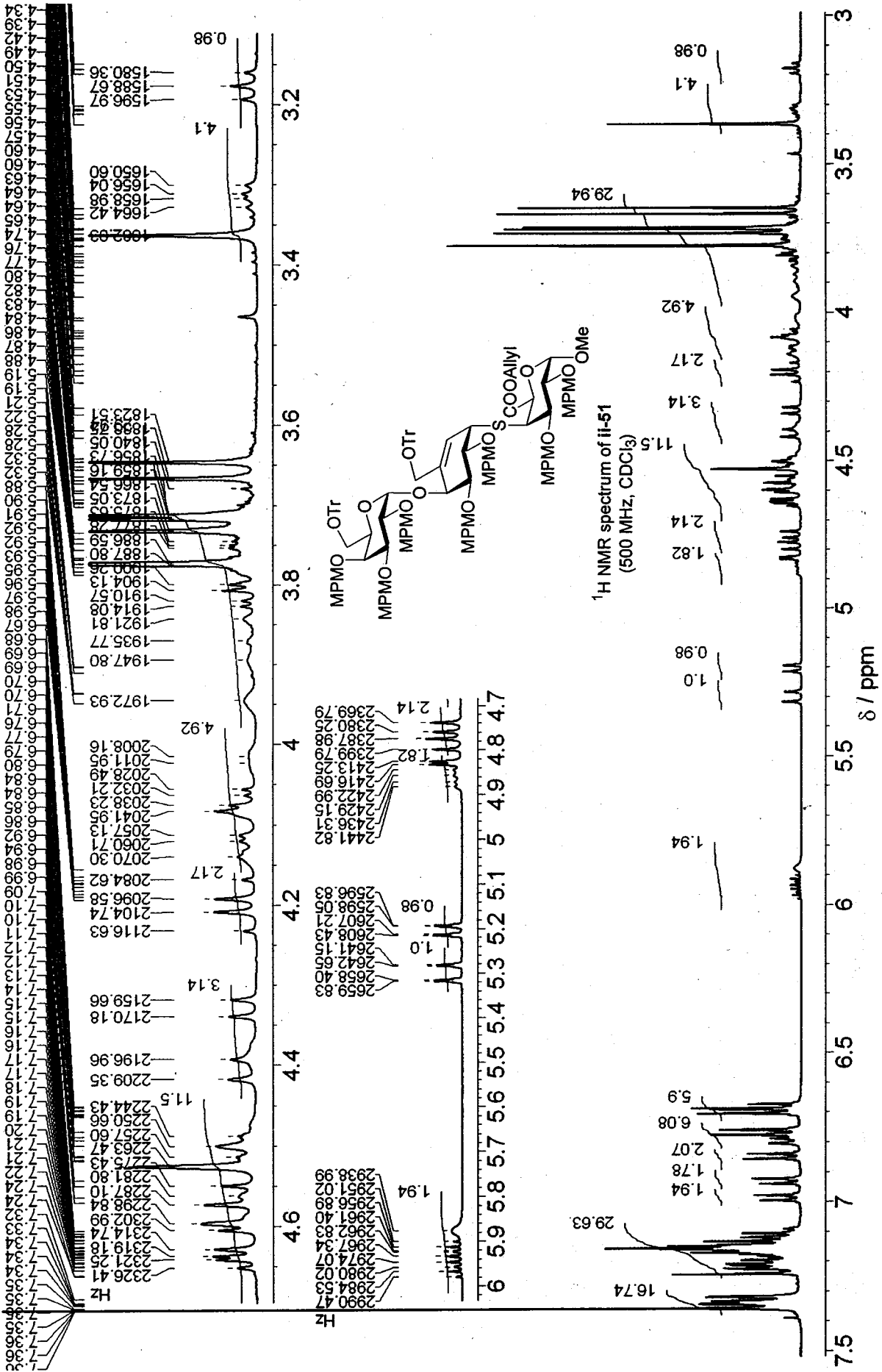


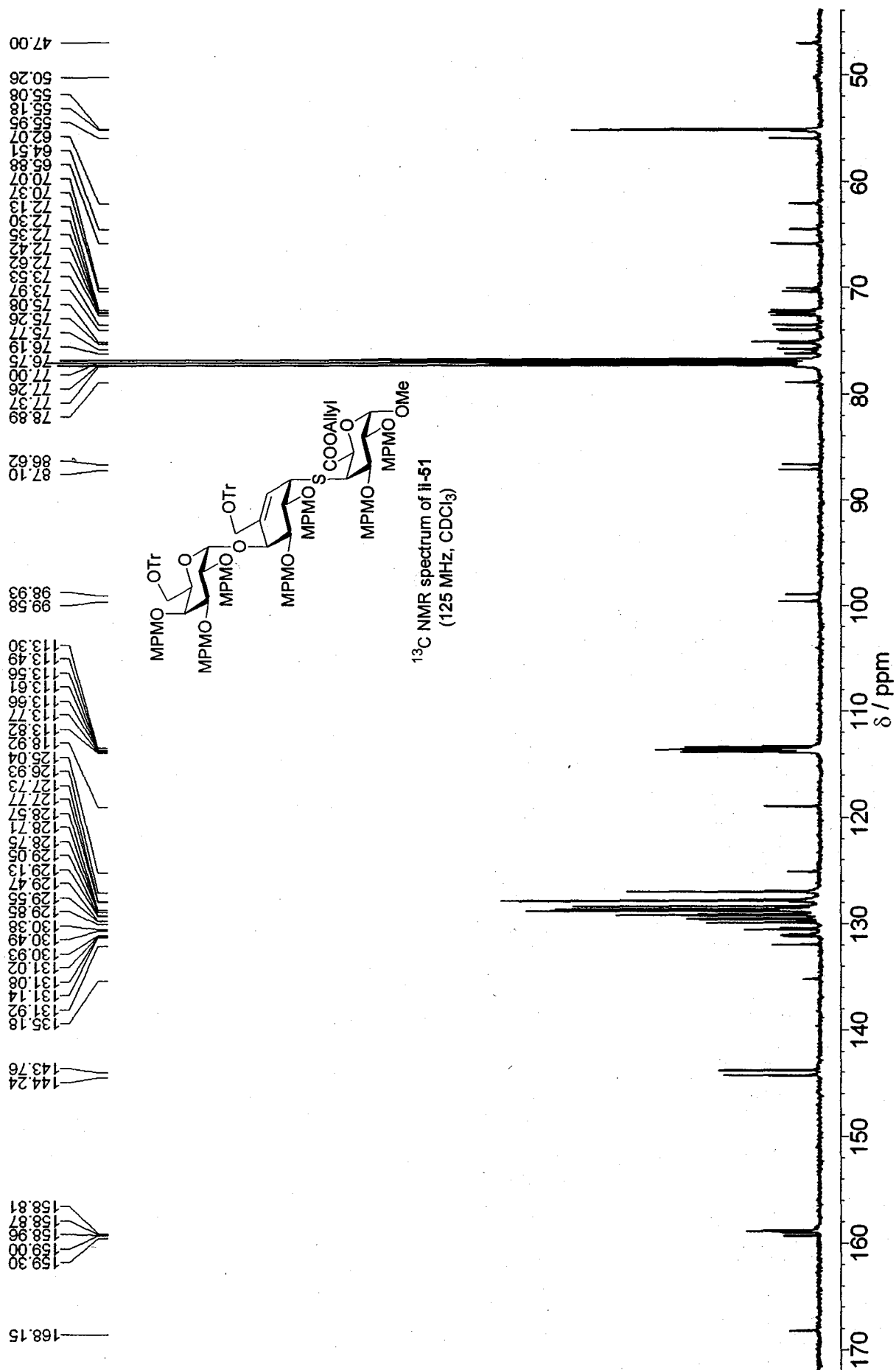




<sup>1</sup>H NMR spectrum of ii-50  
(400 MHz, CDCl<sub>3</sub>)

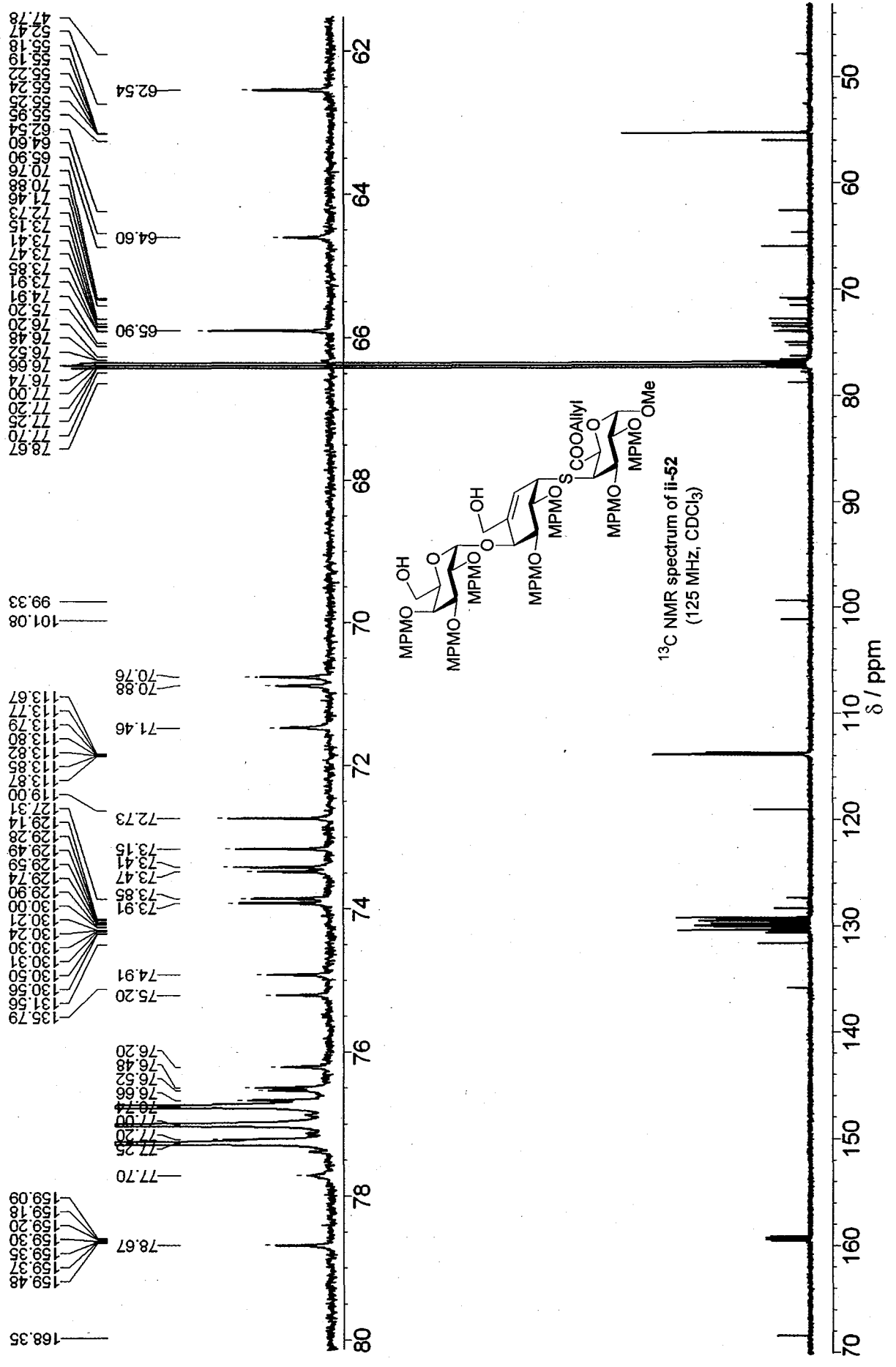


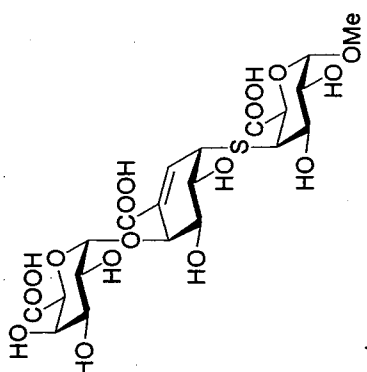




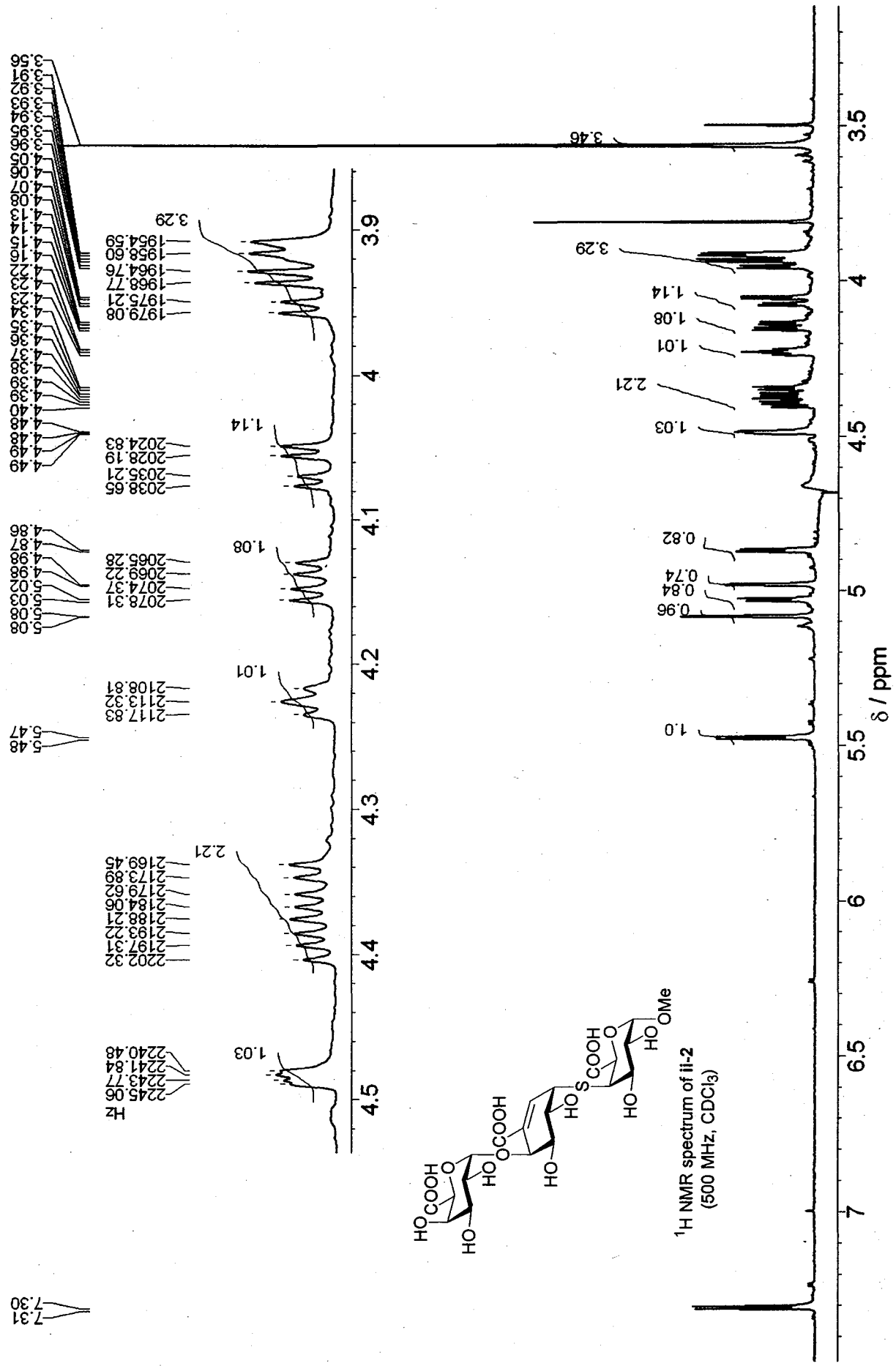


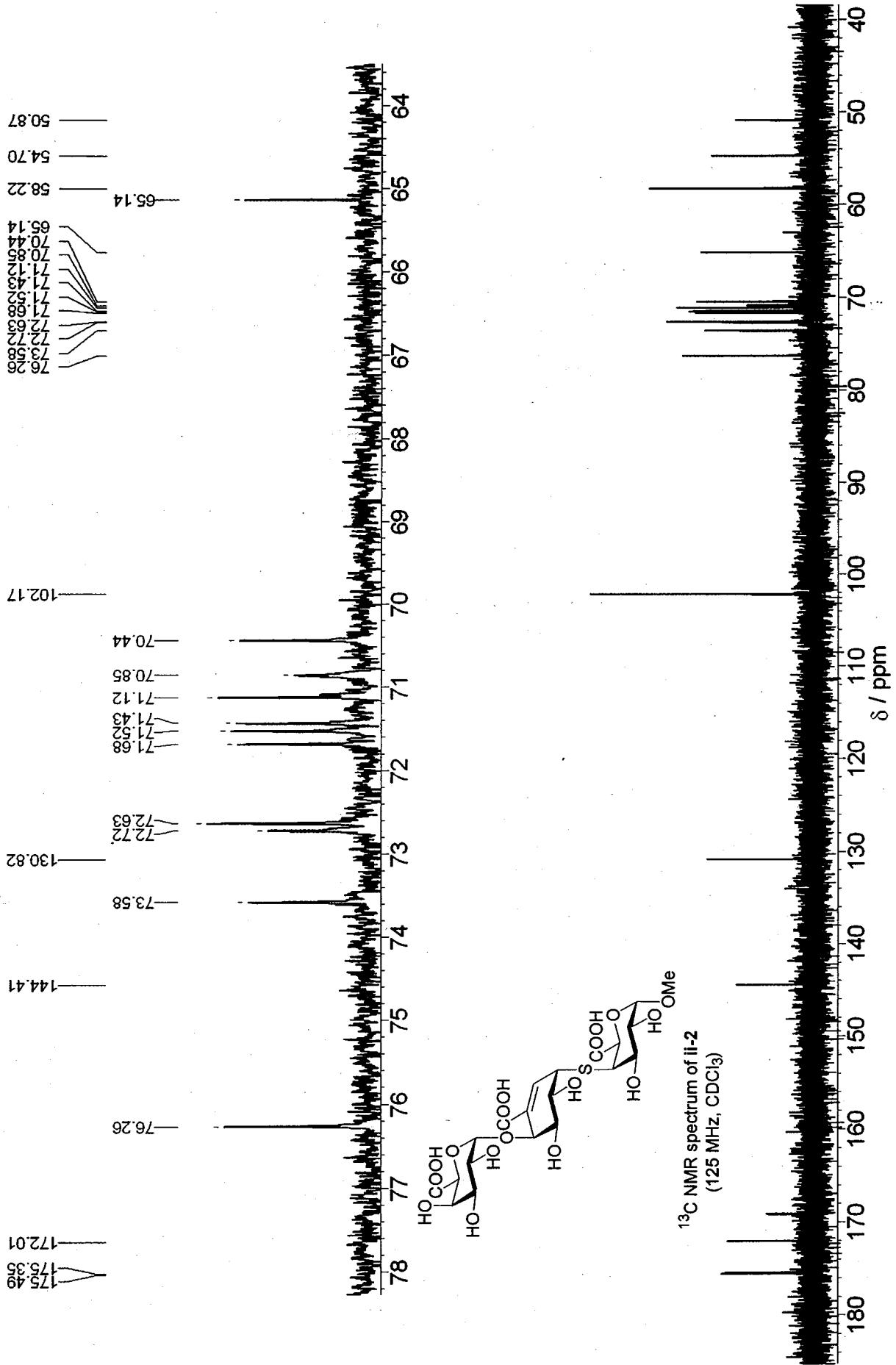


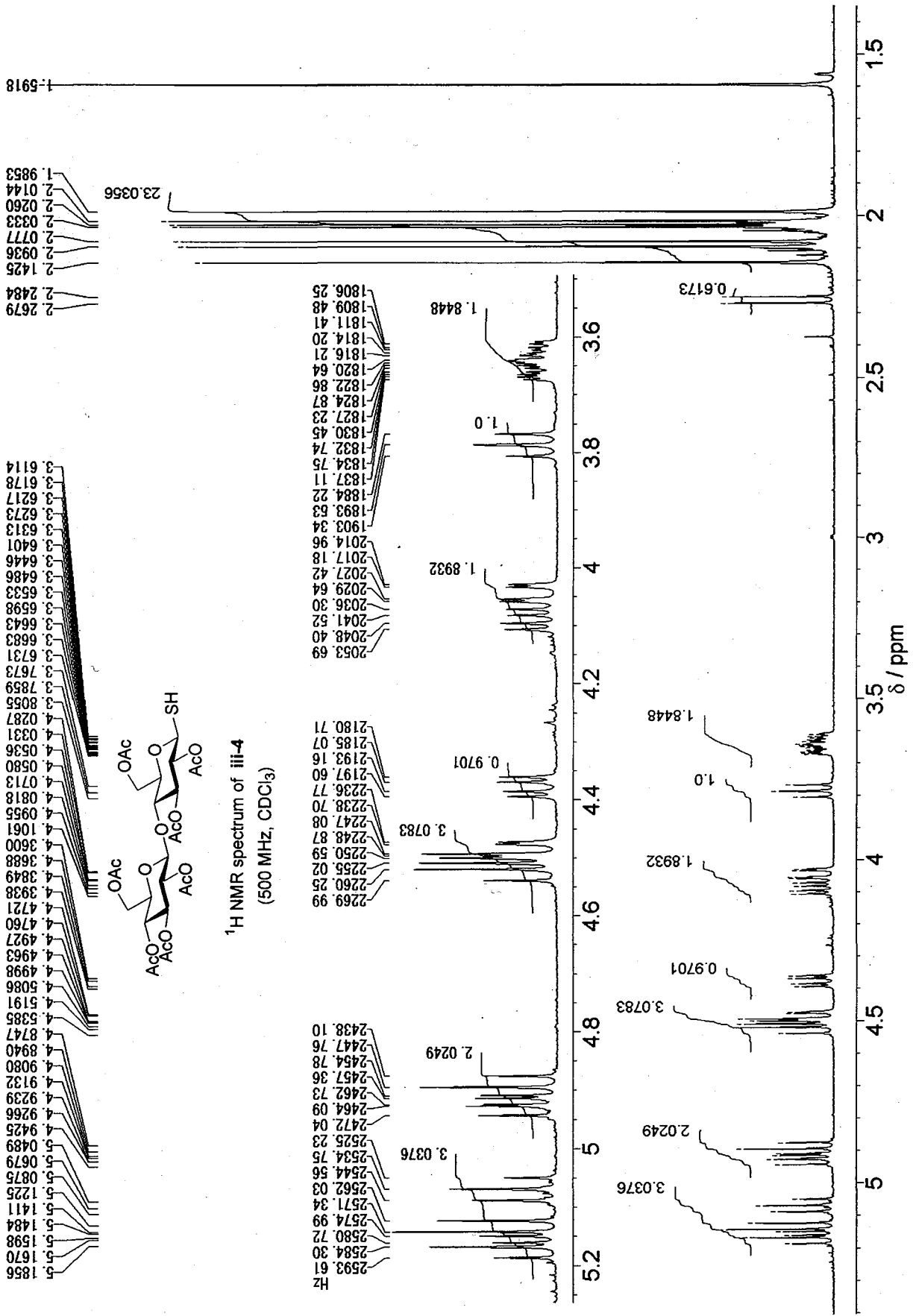




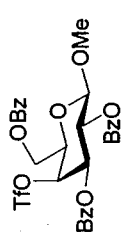
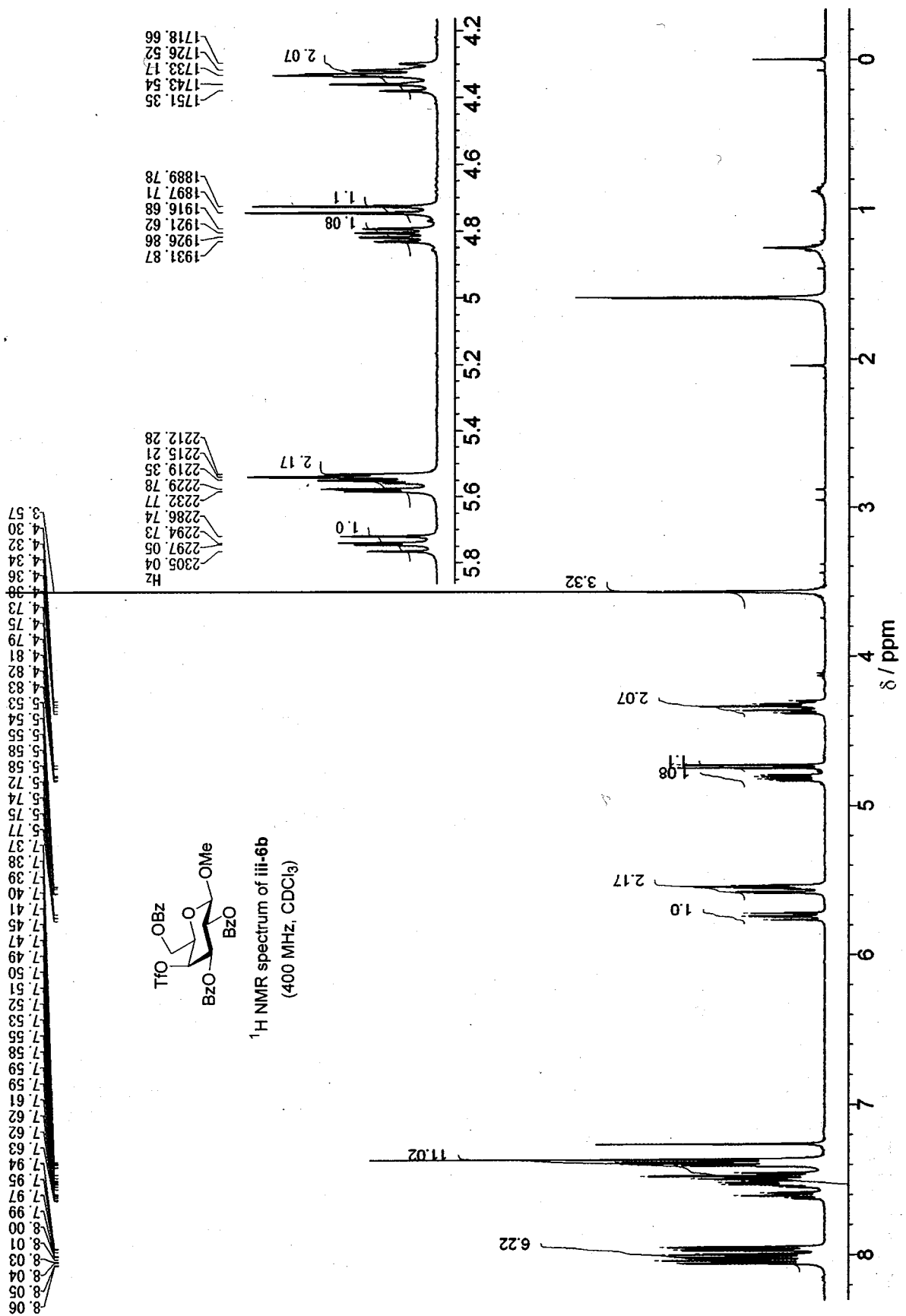
<sup>1</sup>H NMR spectrum of ii-2  
(500 MHz, CDCl<sub>3</sub>)



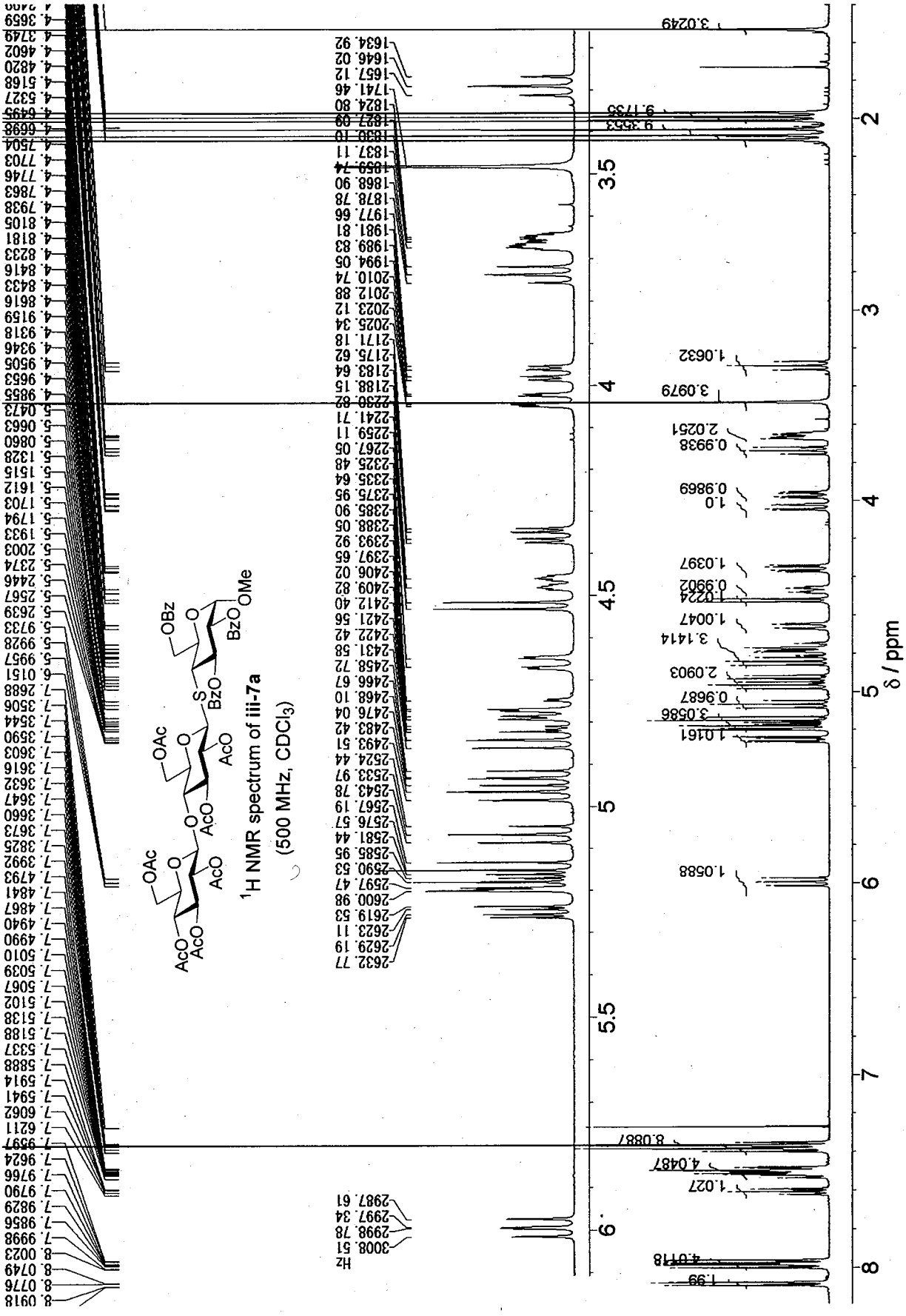




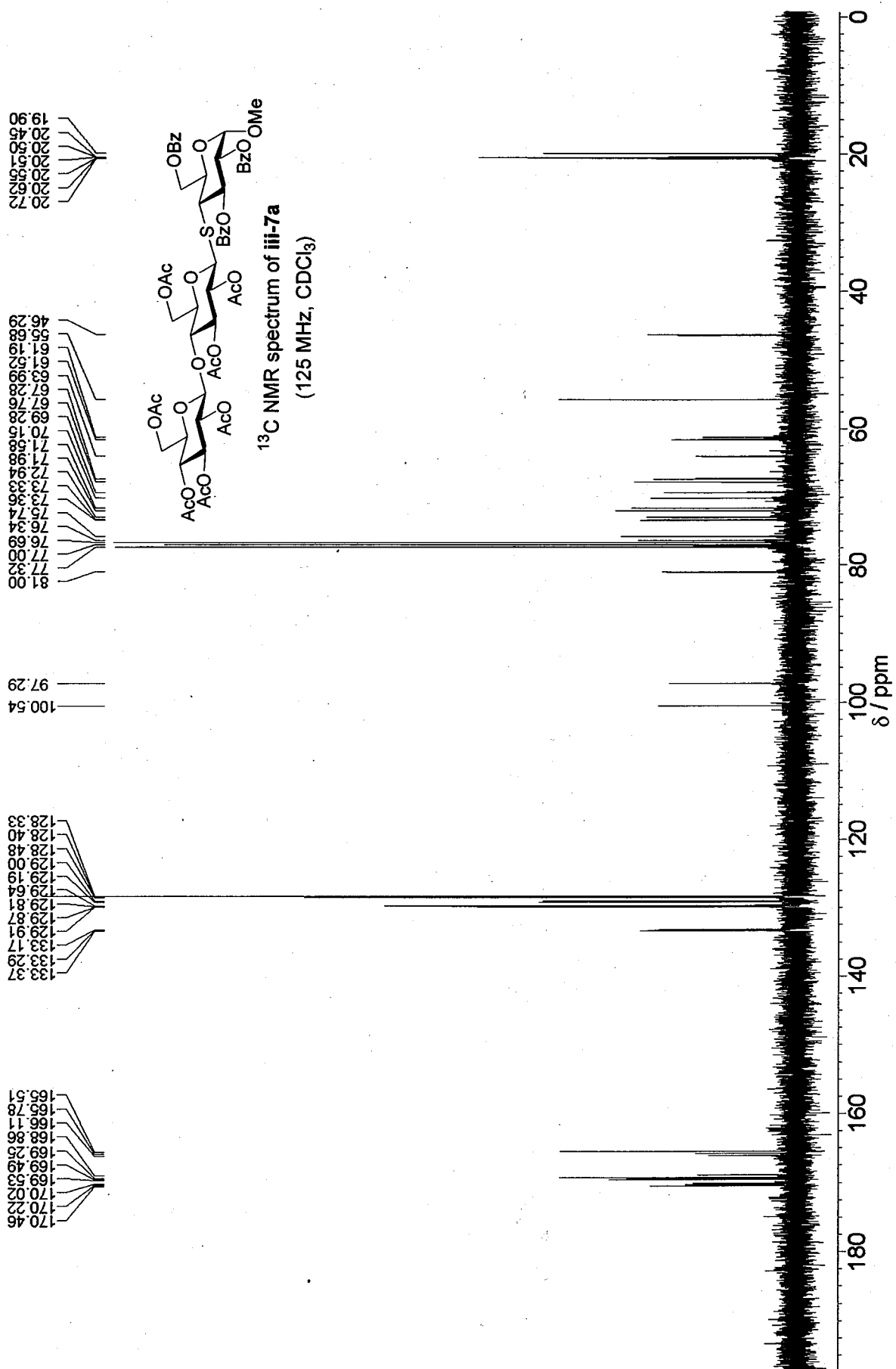




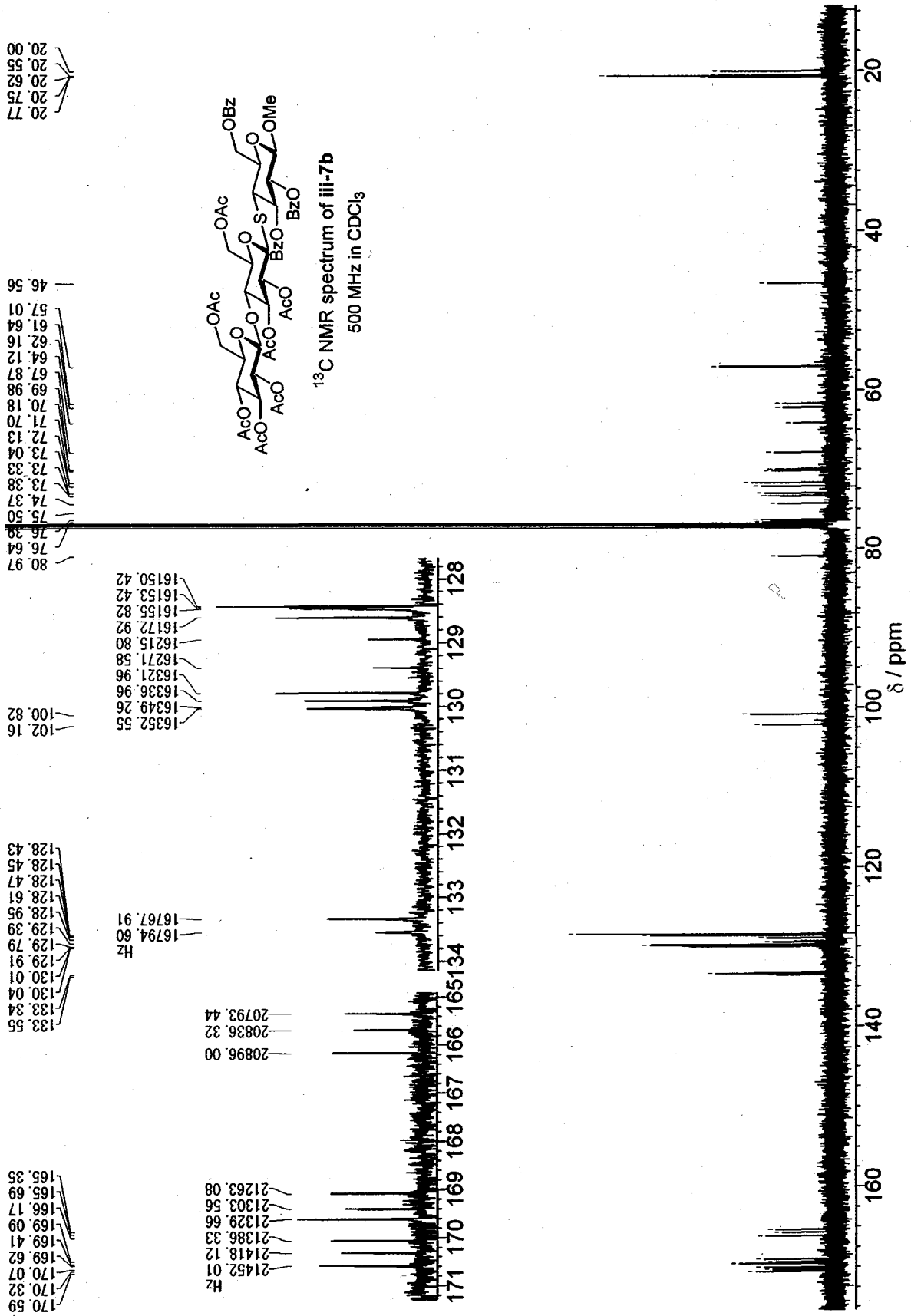
<sup>1</sup>H NMR spectrum of iii-6b  
(400 MHz, CDCl<sub>3</sub>)



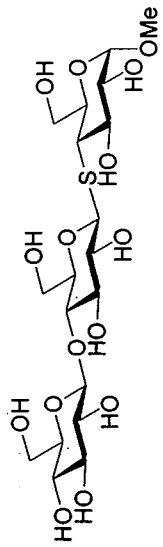




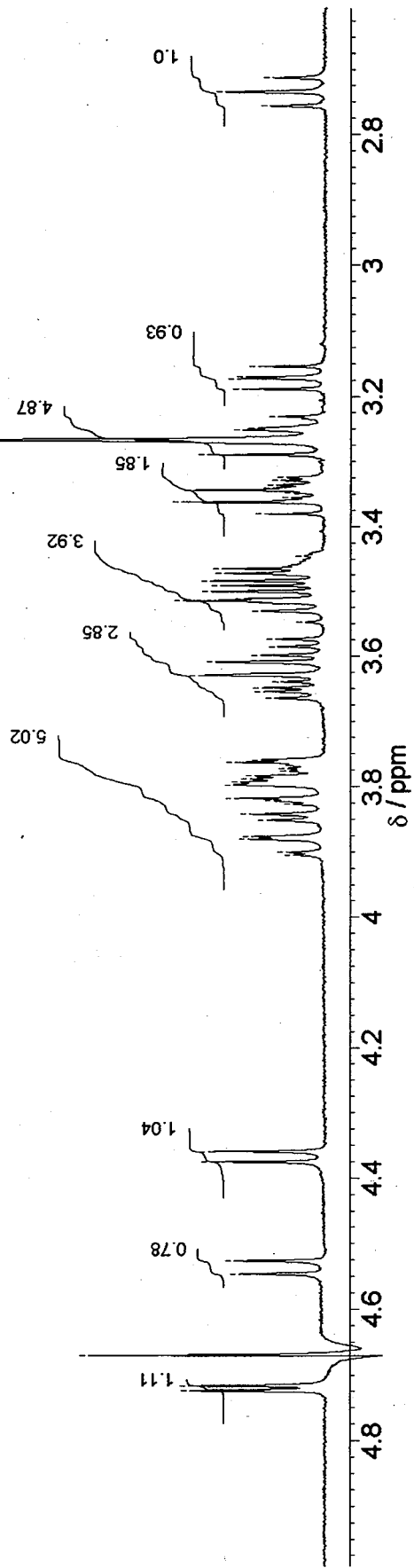


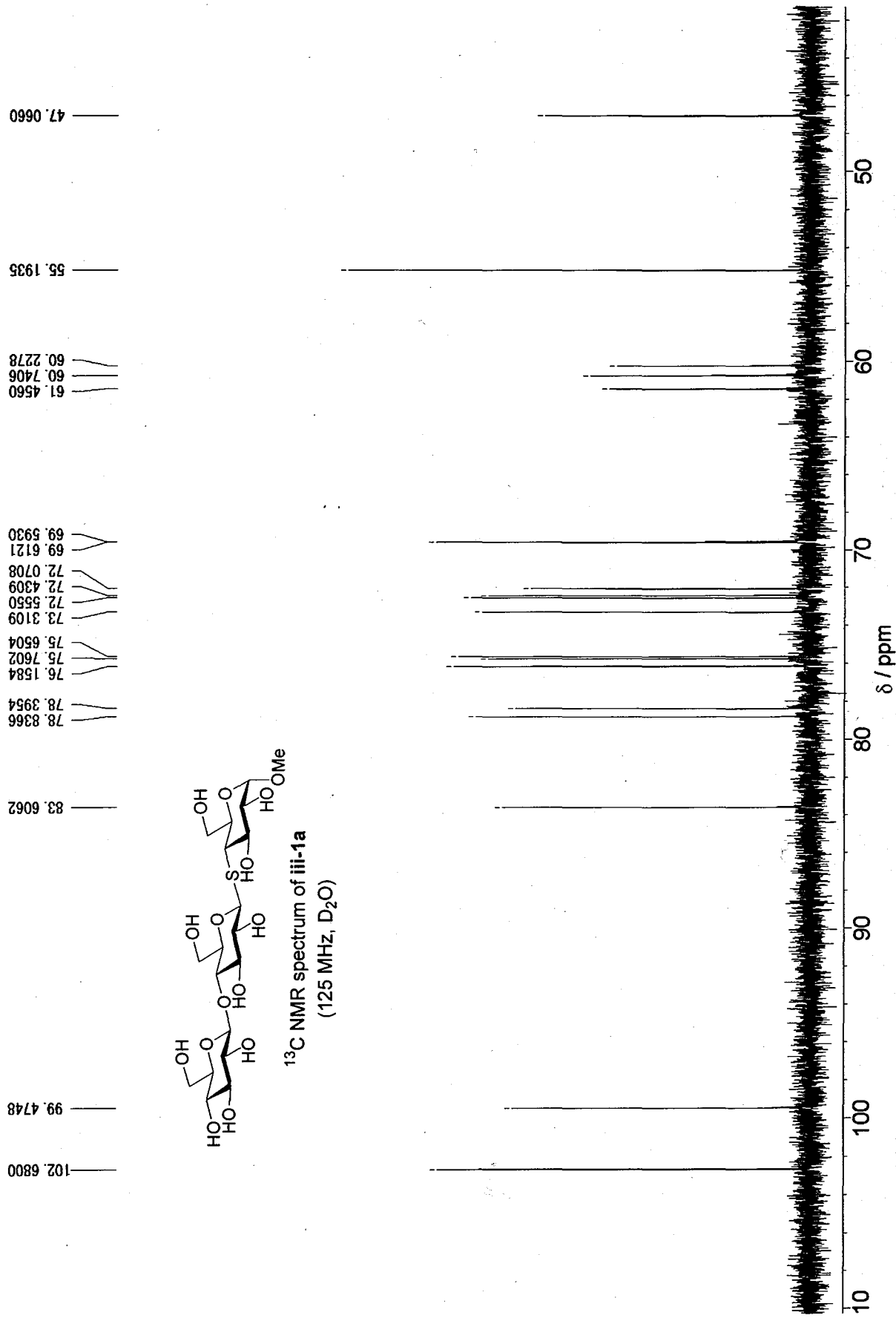


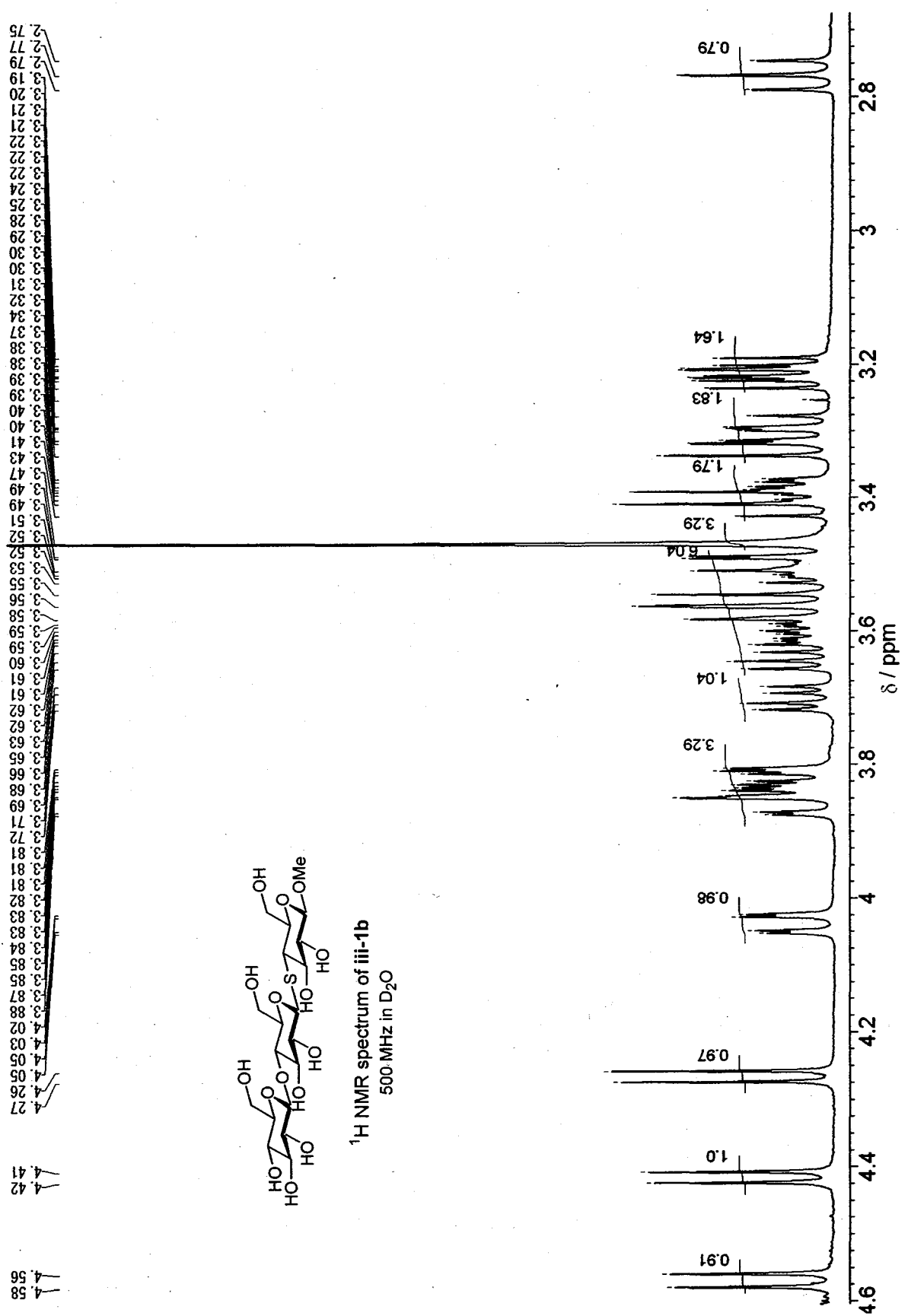
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 4.5259  
 4.3750  
 4.3592  
 3.9047  
 3.8802  
 3.8762  
 3.8511  
 3.8420  
 3.8266  
 3.8216  
 3.8175  
 3.7969  
 3.7930  
 3.7880  
 3.7833  
 3.7763  
 3.7721  
 3.7628  
 3.7586  
 3.6646  
 3.6546  
 3.6487  
 3.6397  
 3.6297  
 3.6089  
 3.5985  
 3.5852  
 3.5738  
 3.5476  
 3.5302  
 3.5143  
 3.5113  
 3.5001  
 3.4911  
 3.4837  
 3.4723  
 3.4649  
 3.4453  
 3.3802  
 3.3621  
 3.3553  
 3.3481  
 3.3435  
 3.3404  
 3.3358  
 3.3286  
 3.3242  
 3.2893  
 3.2659  
 3.2513  
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 3.1540  
 2.7562  
 2.7344  
 2.7128

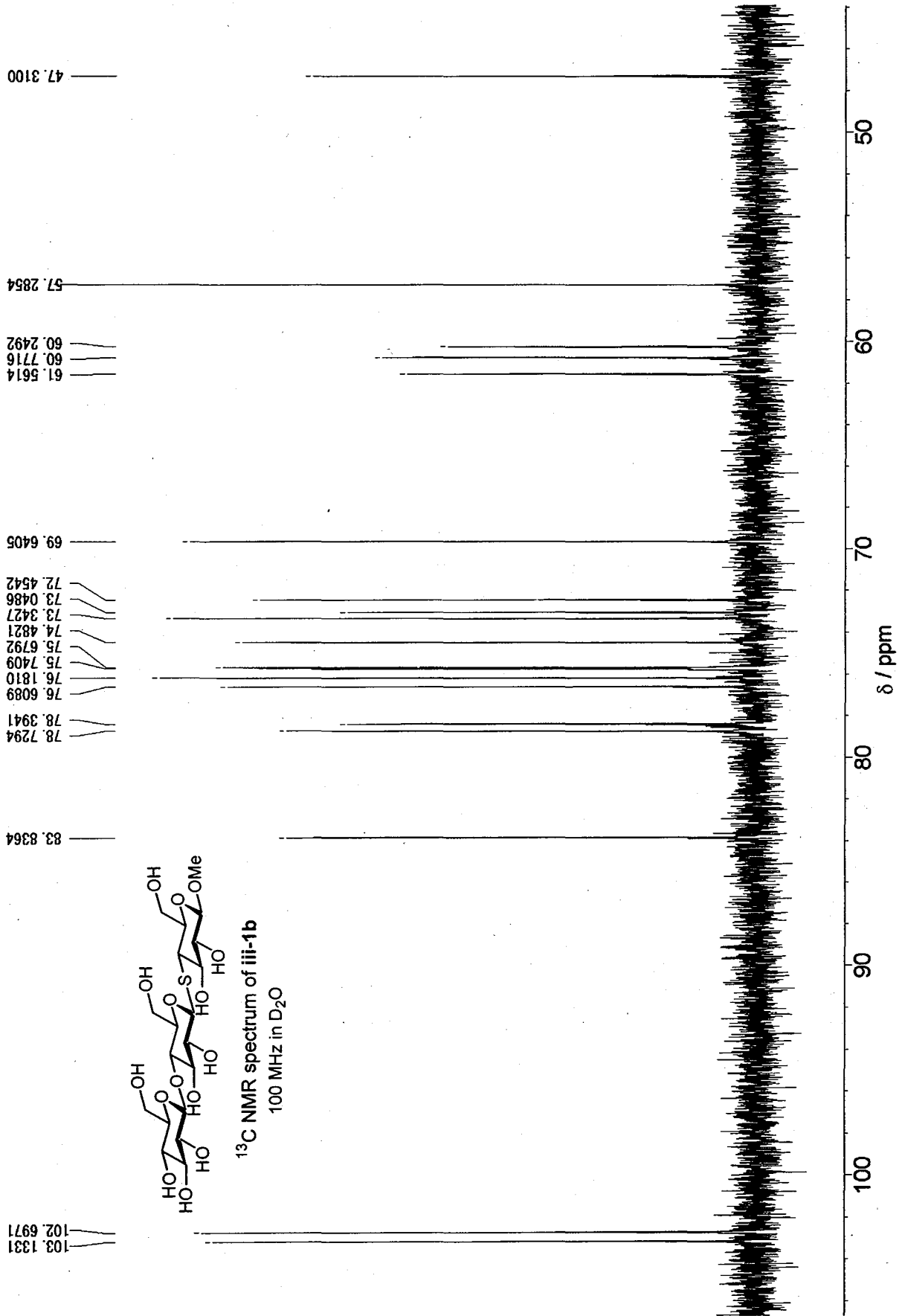


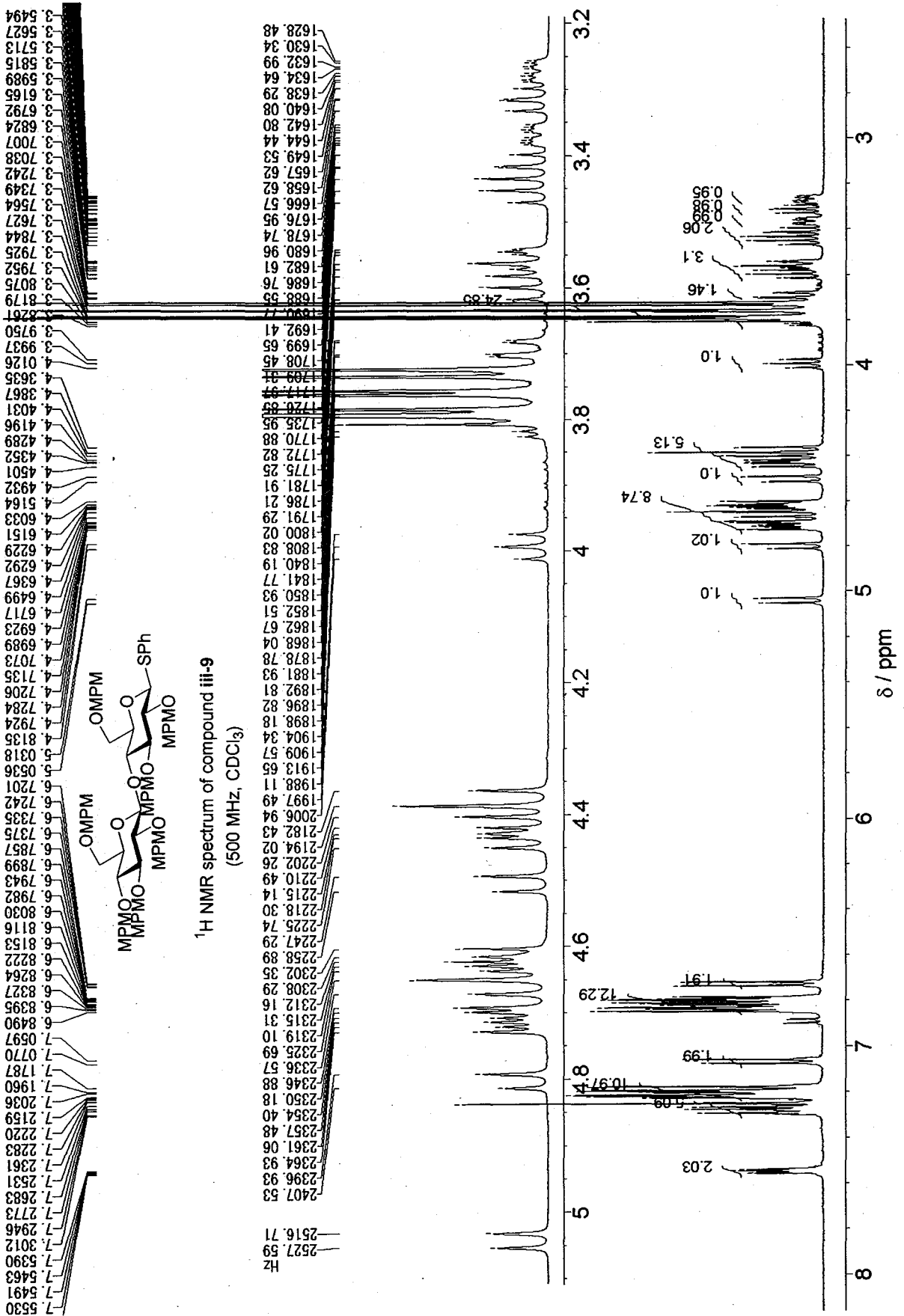
<sup>1</sup>H NMR spectrum of iii-1a  
 (500 MHz, D<sub>2</sub>O)



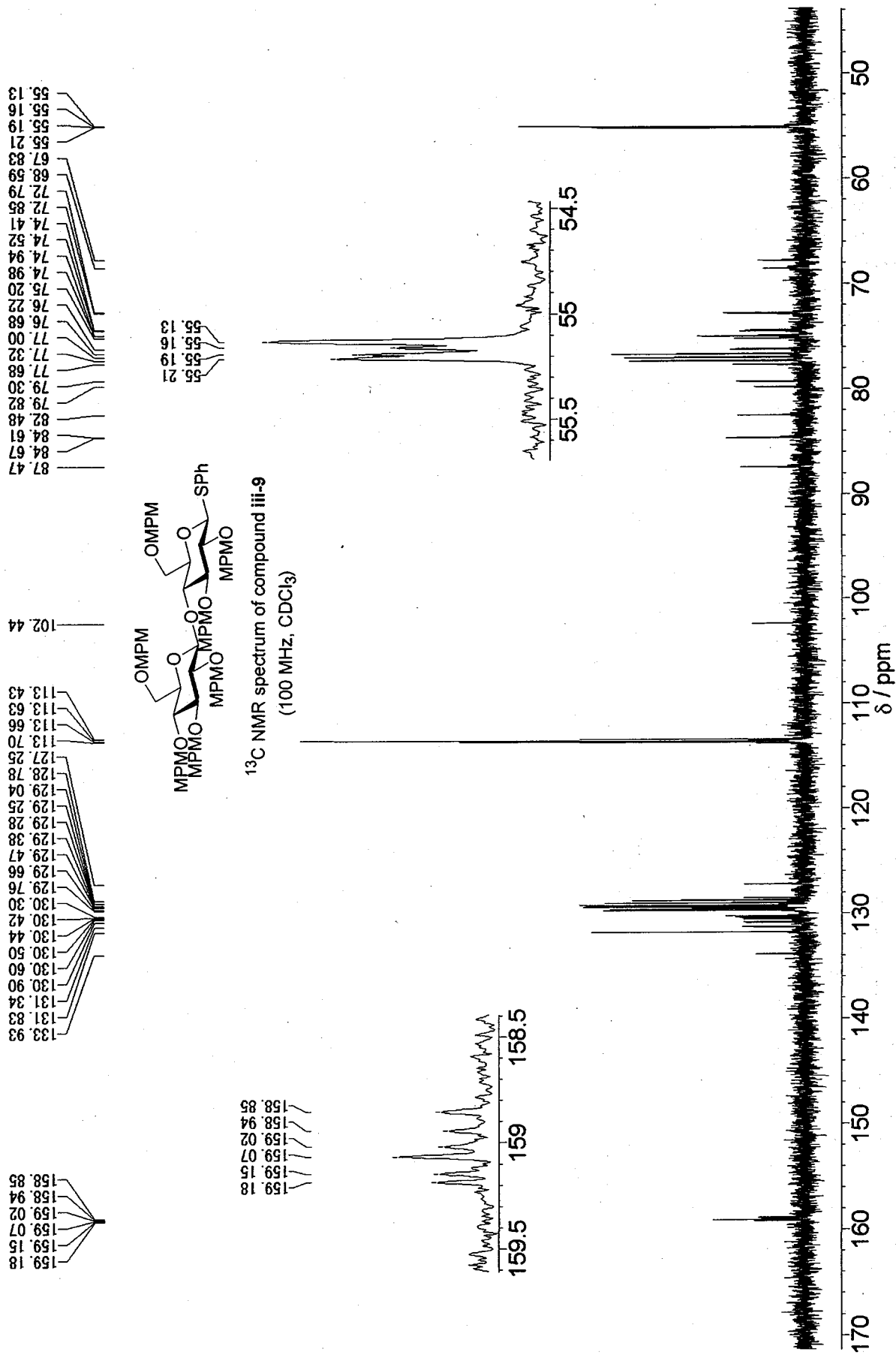




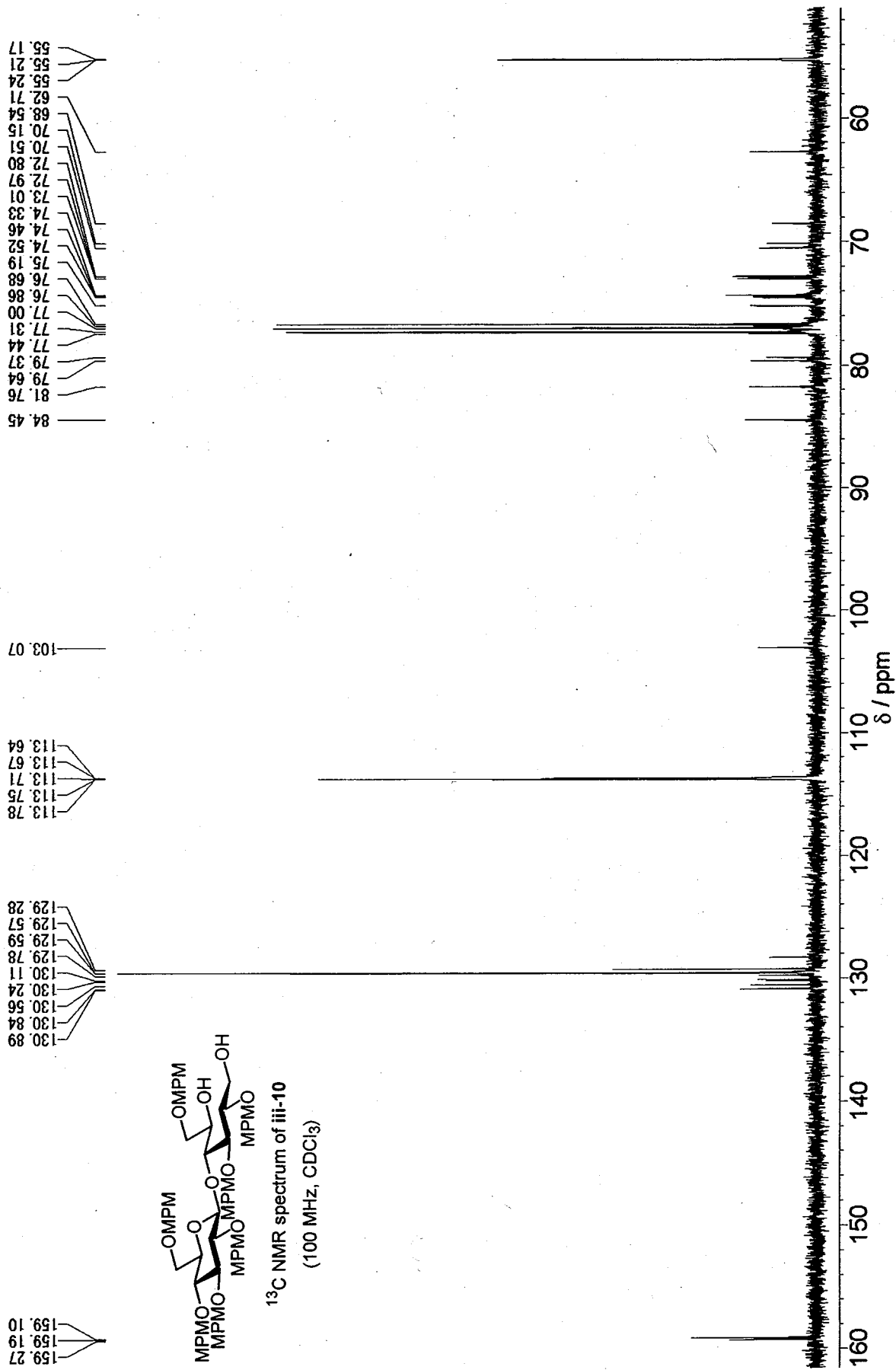


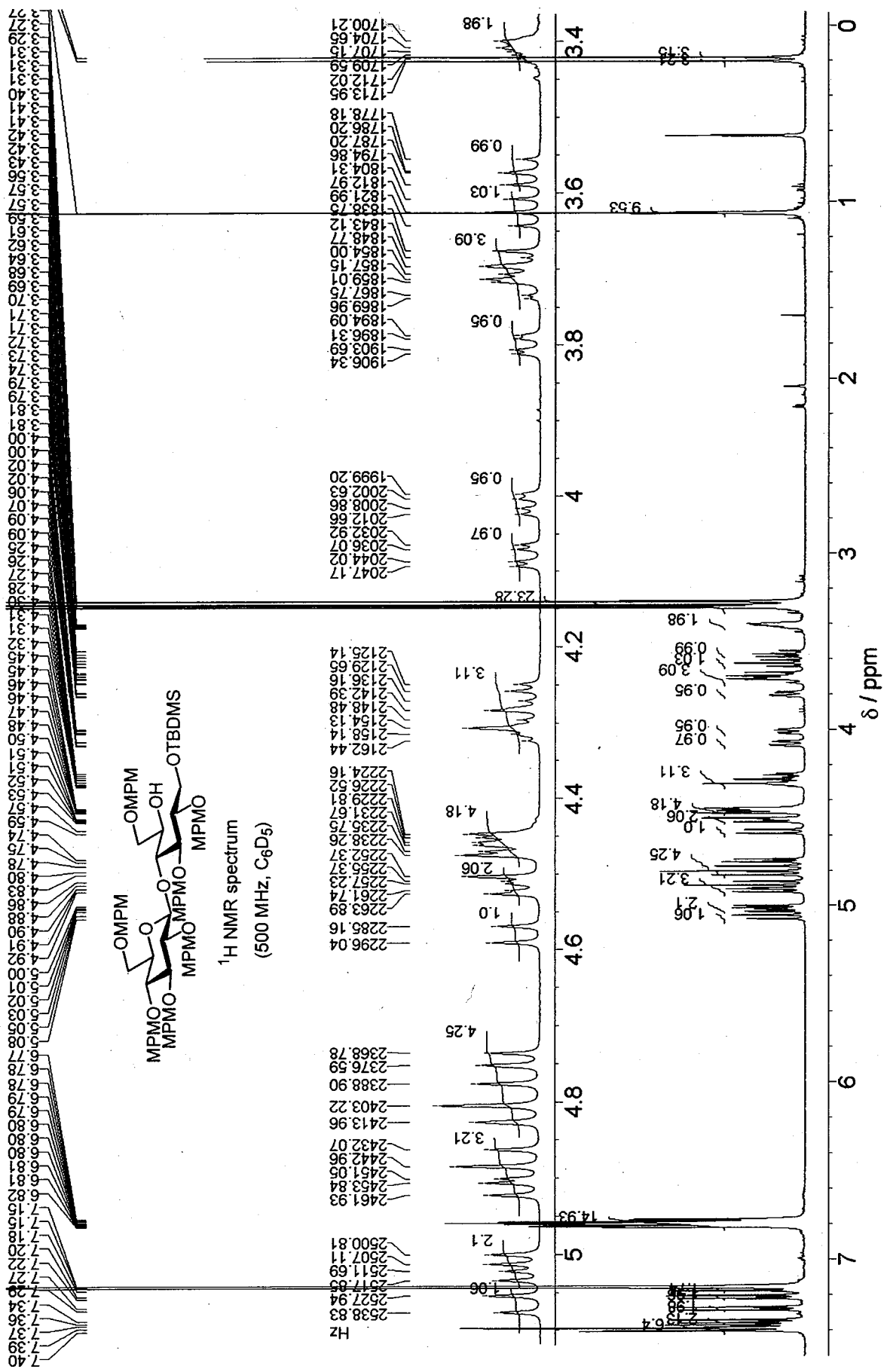


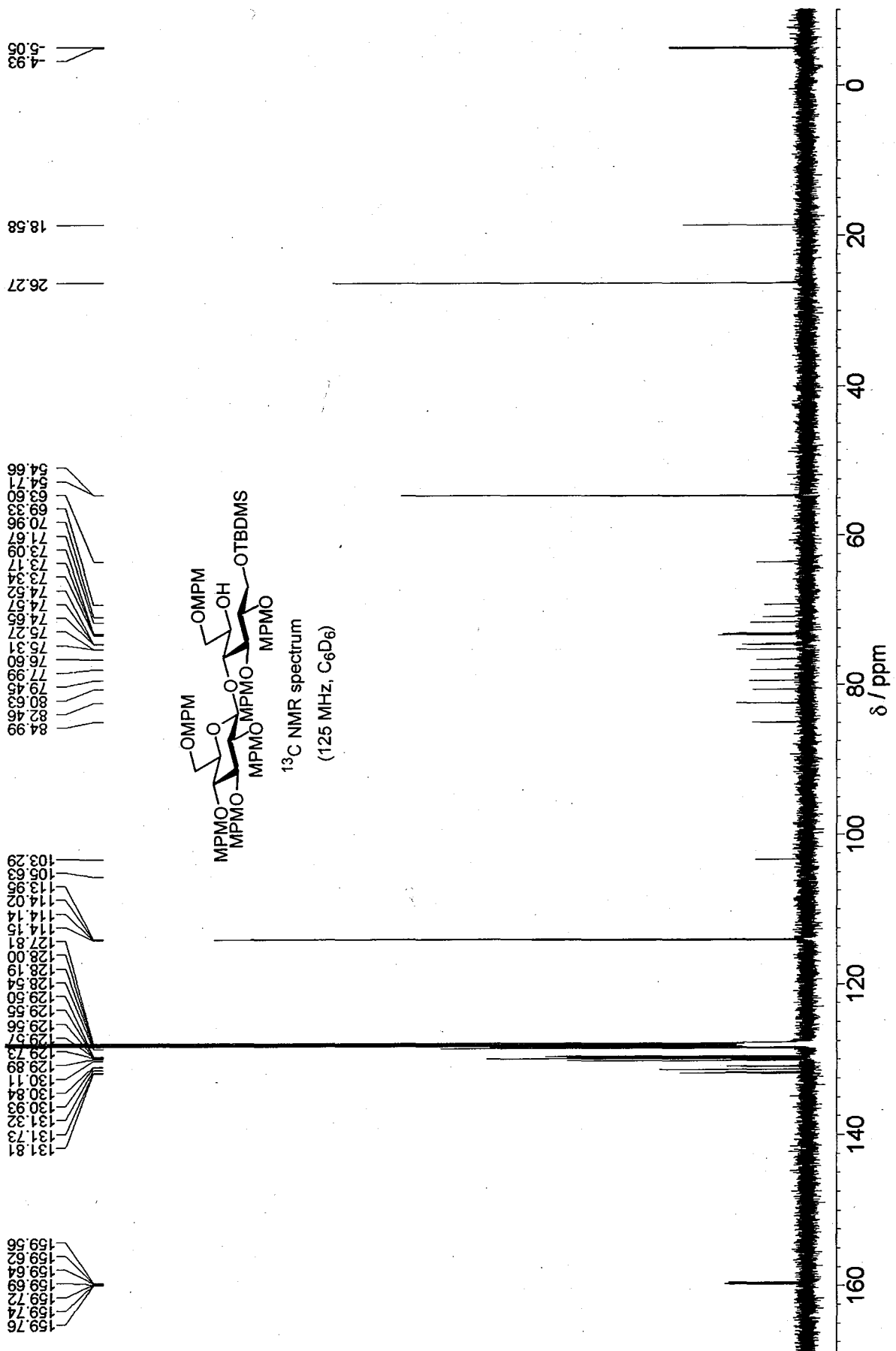


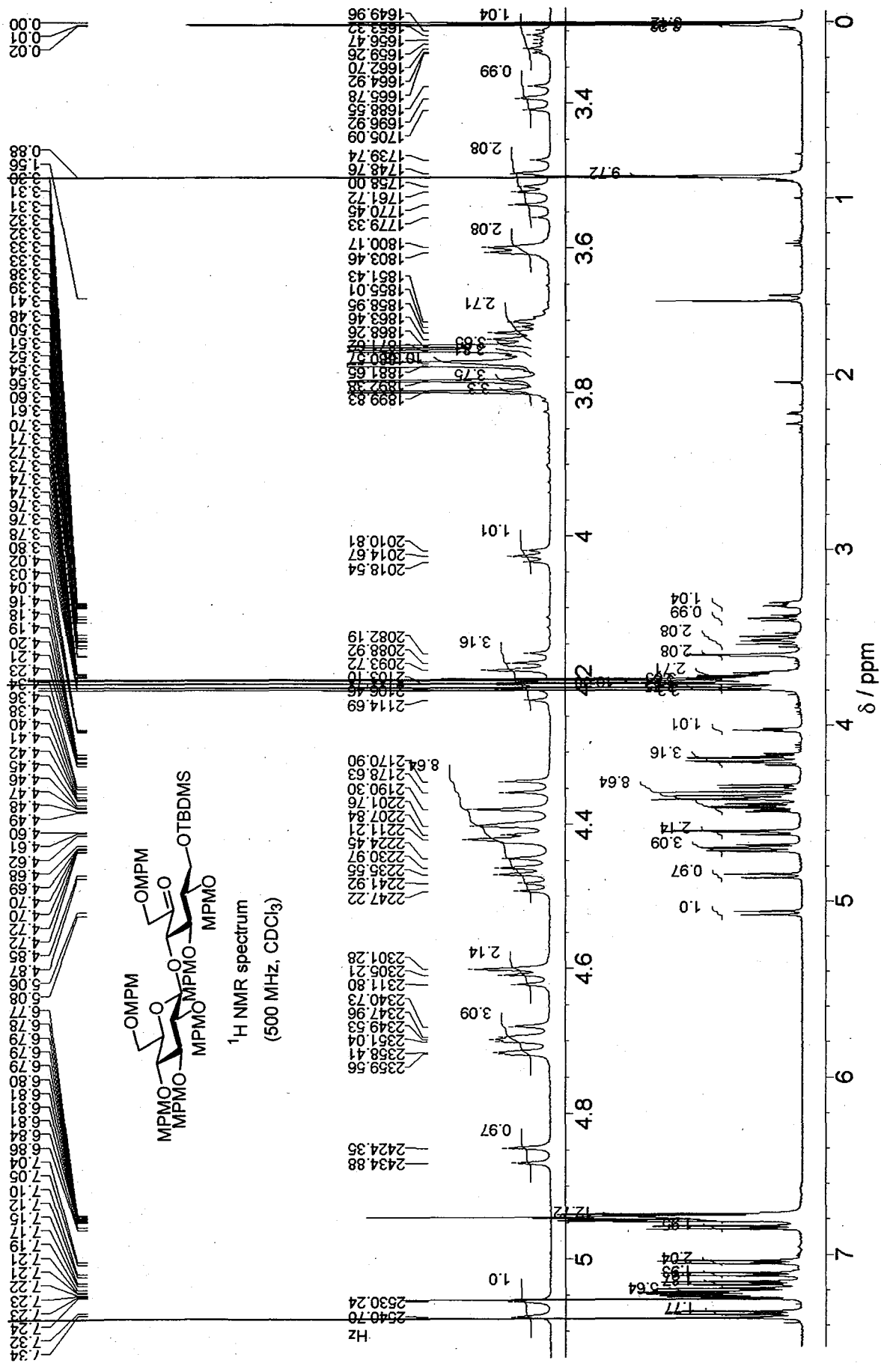






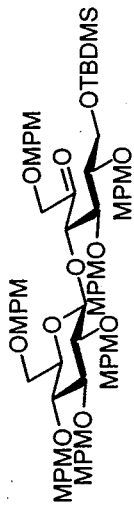






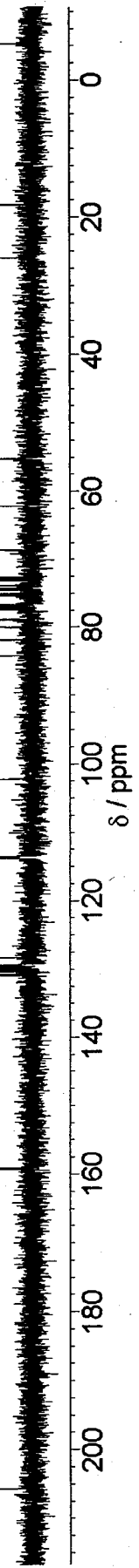
5.28  
5.31

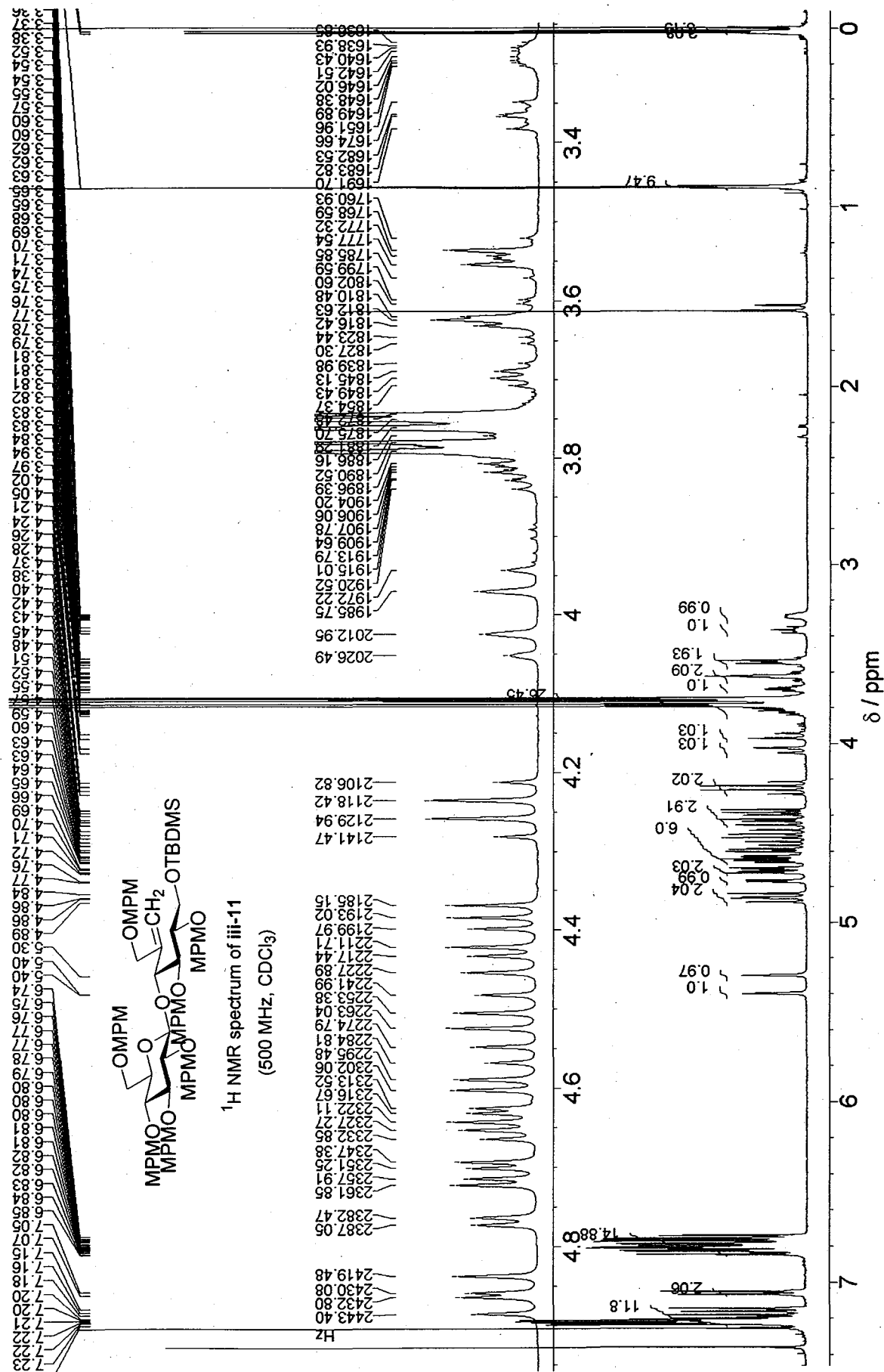
18.23  
25.95  
55.18  
55.20  
55.25  
55.26  
62.14  
68.63  
72.61  
72.78  
73.13  
73.90  
74.27  
74.32  
74.53  
74.98  
75.31  
76.68  
77.00  
77.32  
77.42  
78.86  
78.92  
80.00  
81.85  
84.23  
102.21  
113.55  
113.67  
113.68  
113.70  
113.77  
113.78  
129.34  
129.37  
129.46  
129.53  
129.55  
129.71  
129.79  
129.95  
129.95  
130.00  
130.17  
130.27  
130.36  
130.71  
130.78  
130.96  
159.06  
159.16  
159.21  
159.23  
159.27



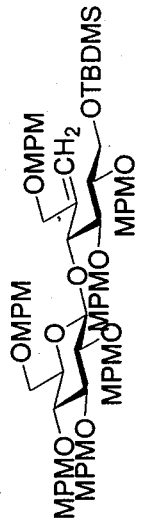
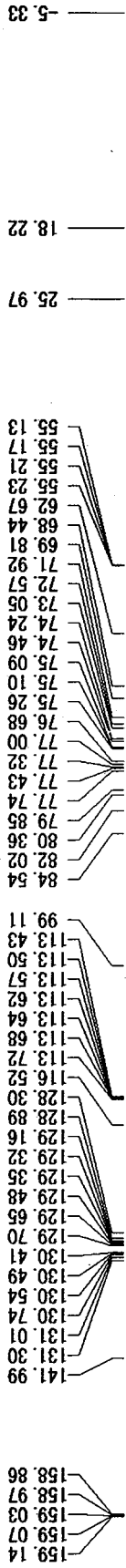
<sup>13</sup>C NMR spectrum  
(100 MHz, CDCl<sub>3</sub>)

205.74

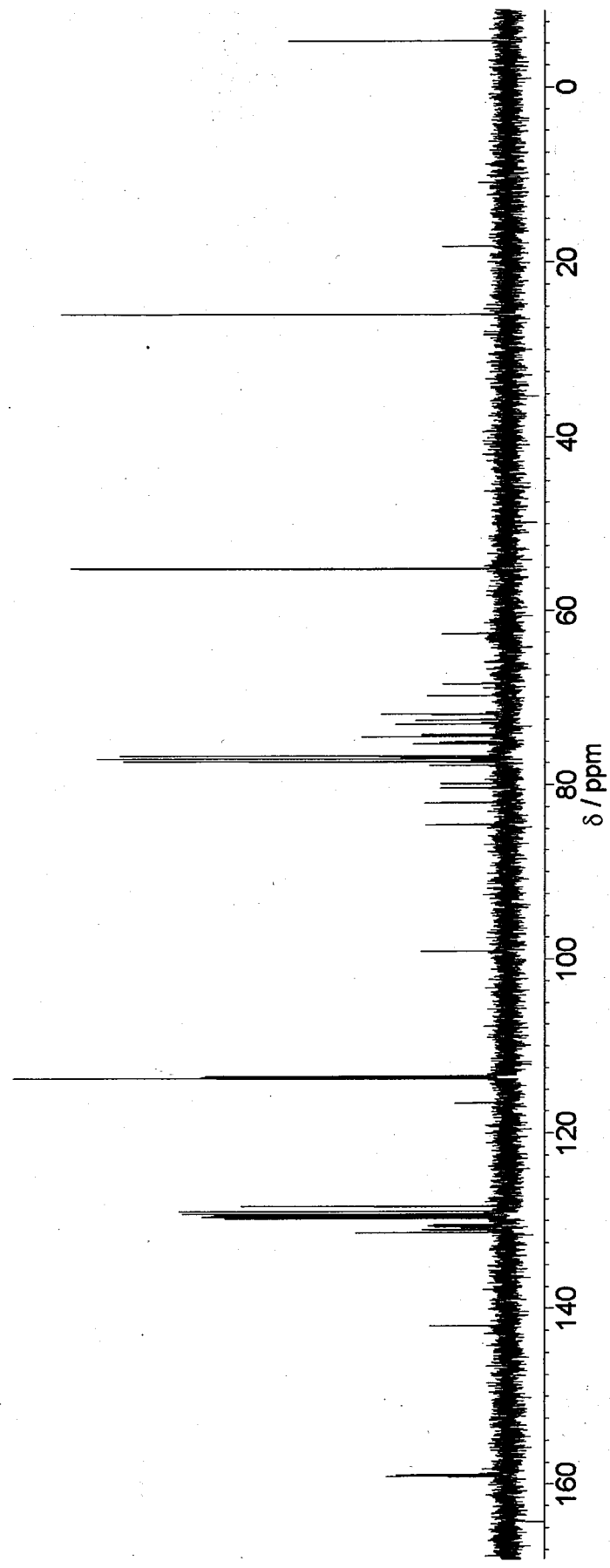


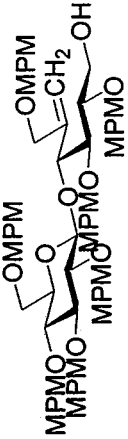
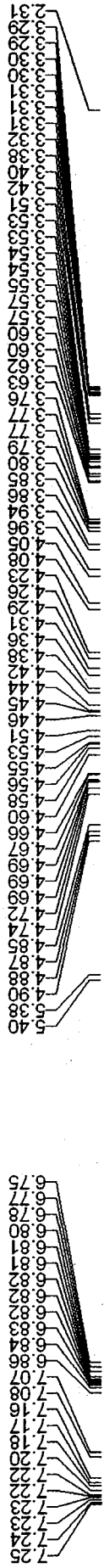




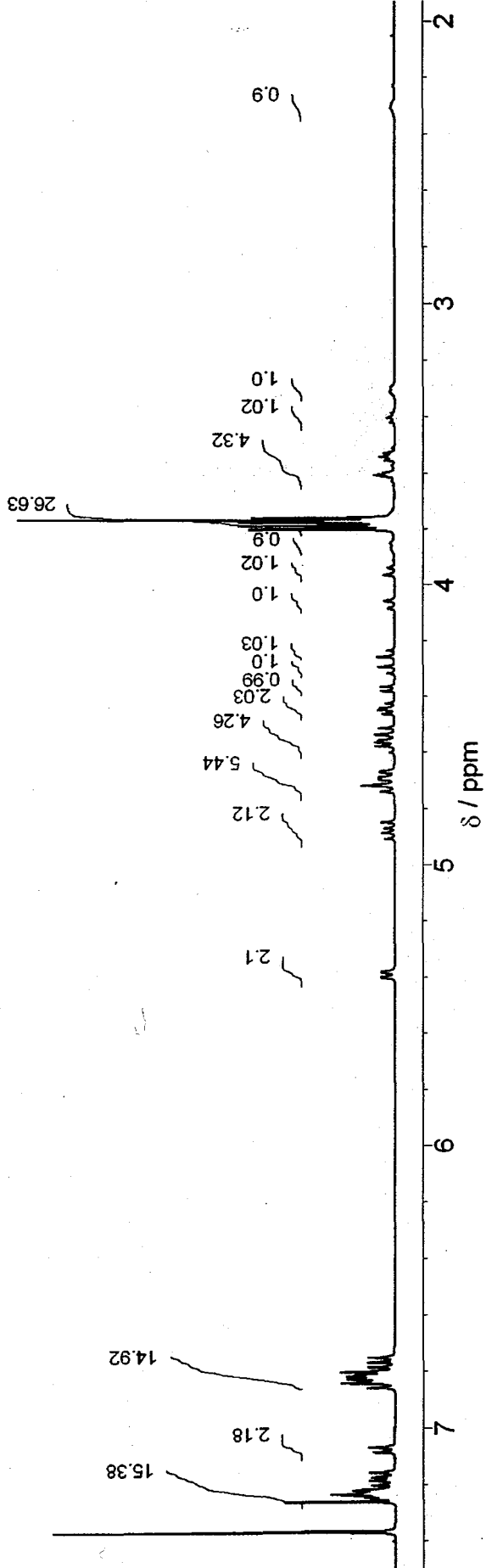
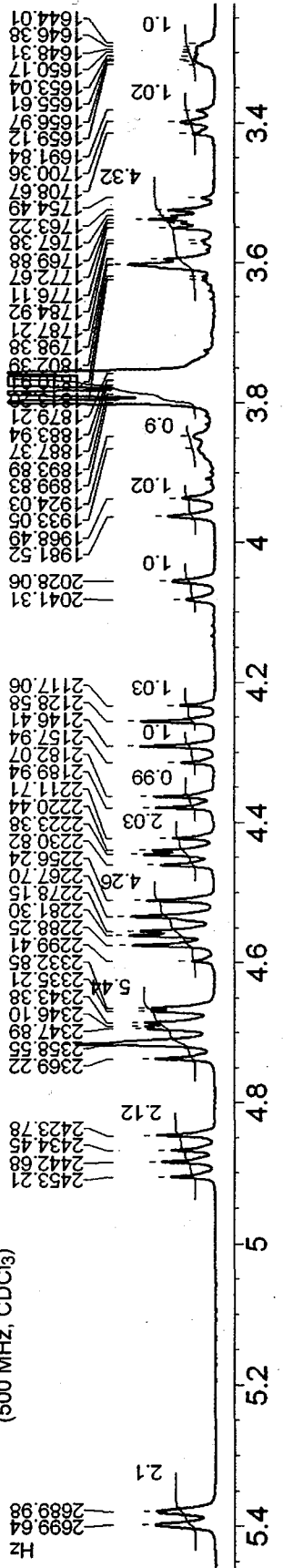


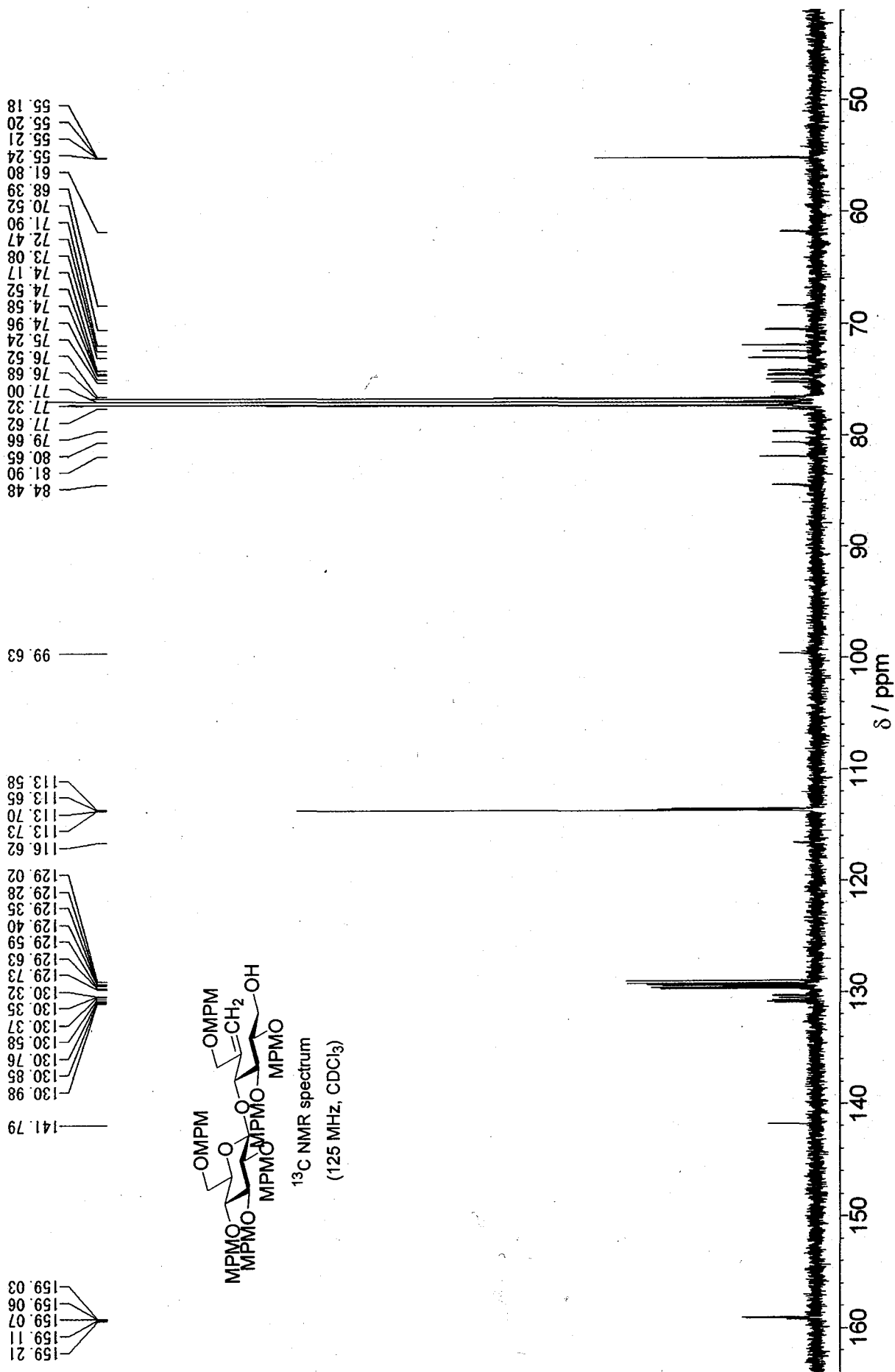
<sup>13</sup>C NMR spectrum of iii-11  
(125 MHz, CDCl<sub>3</sub>)





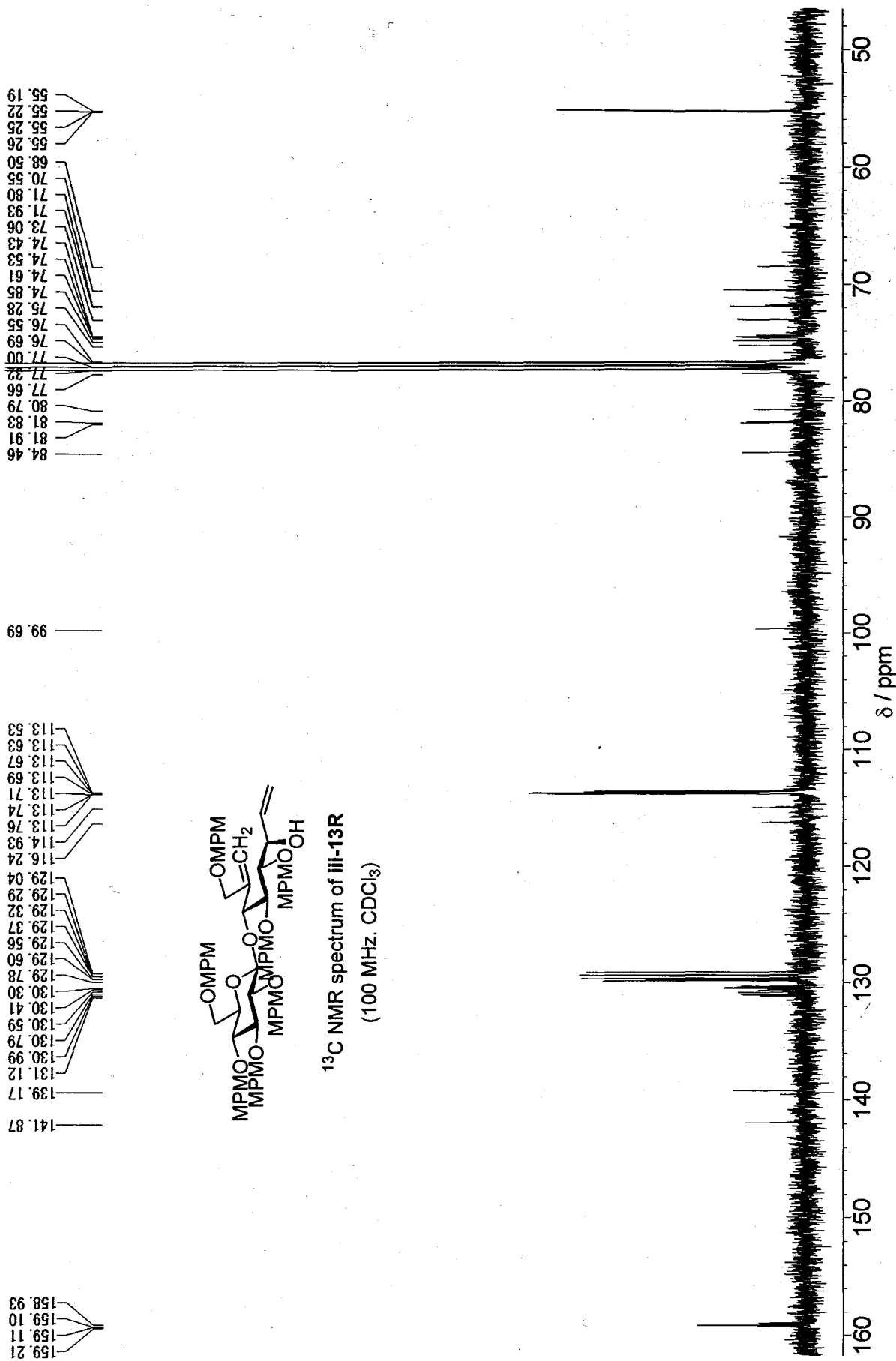
<sup>1</sup>H NMR spectrum  
(500 MHz, CDCl<sub>3</sub>)

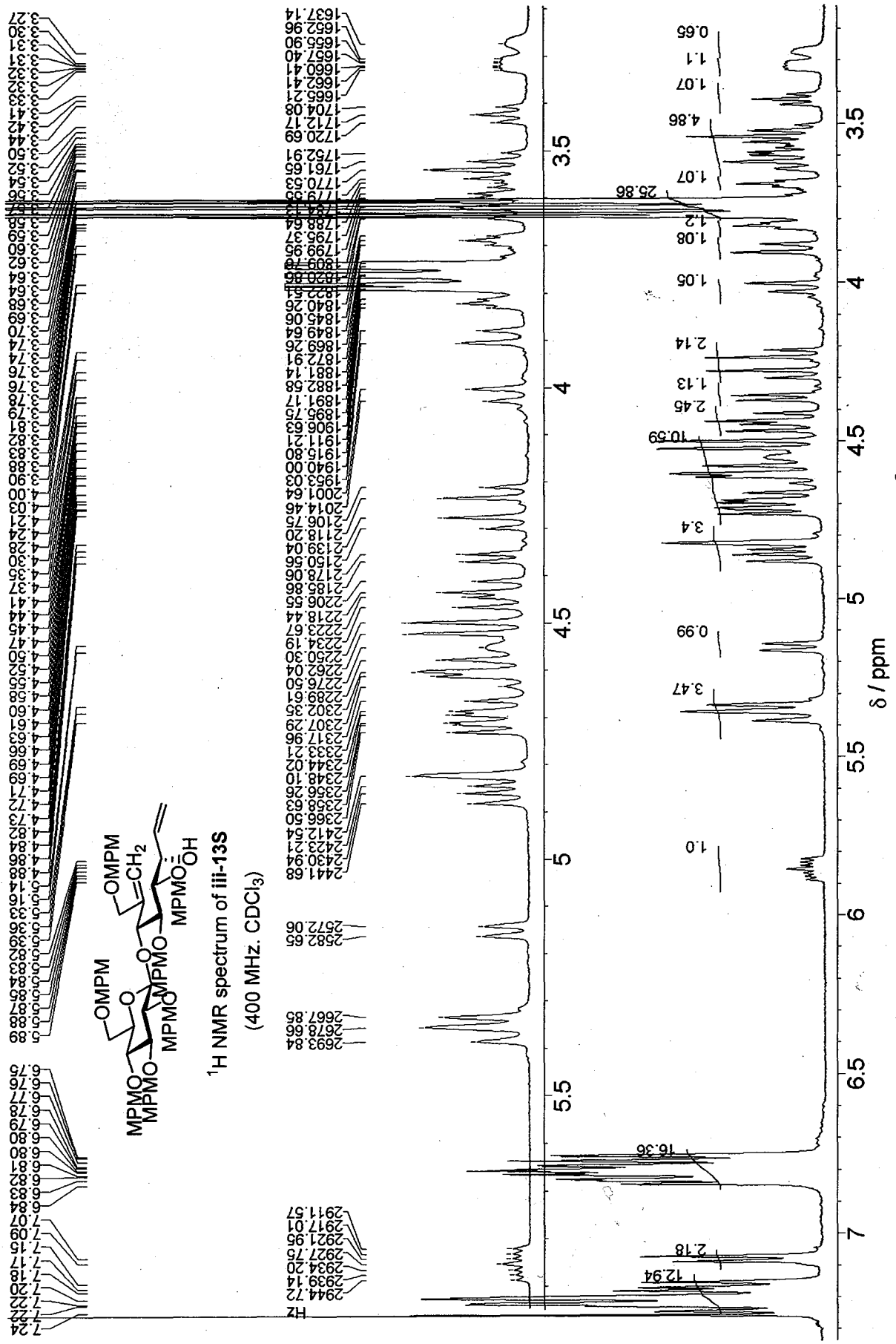


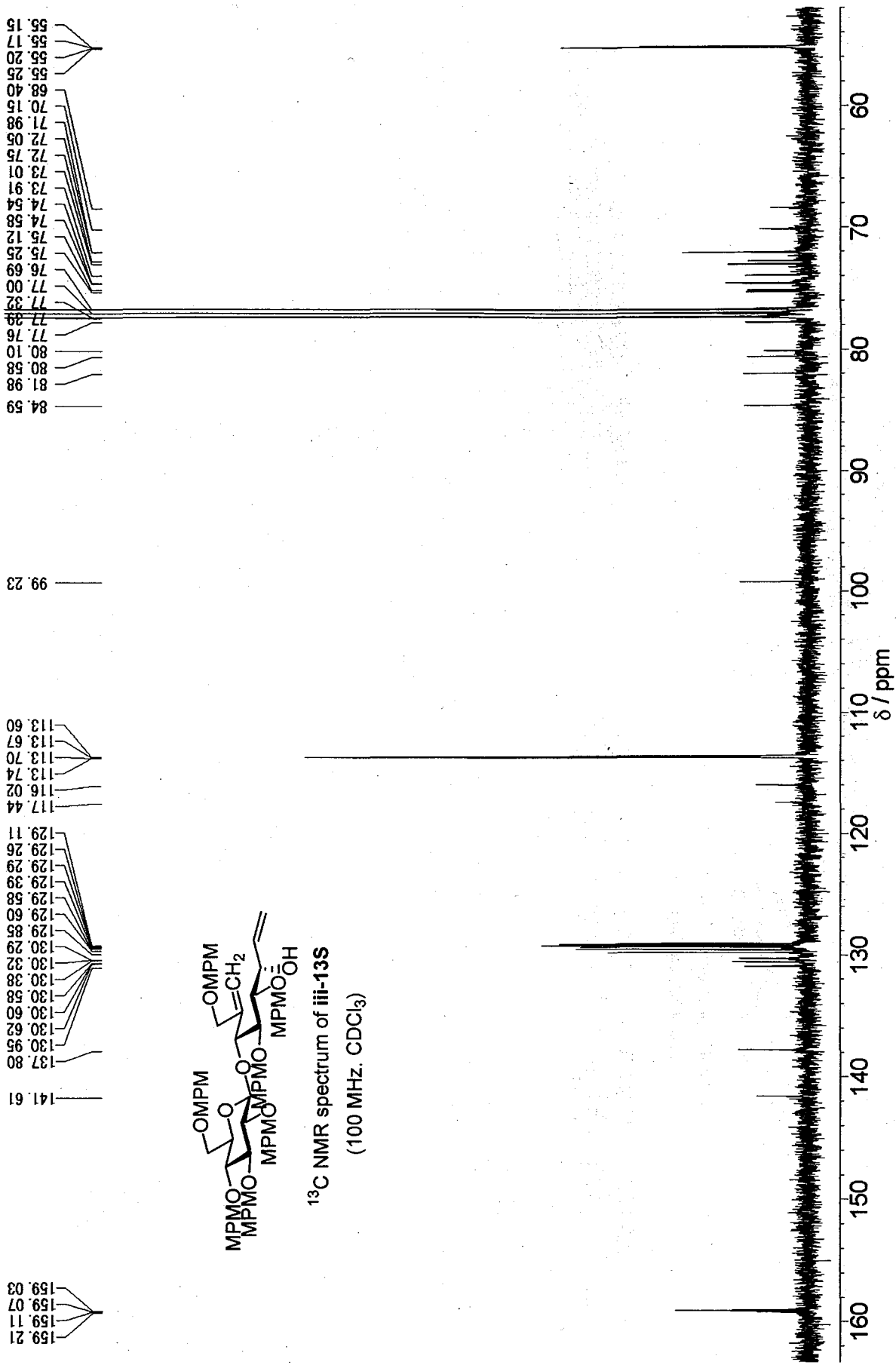




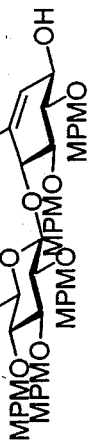
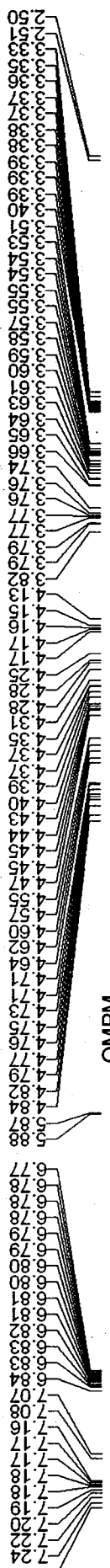




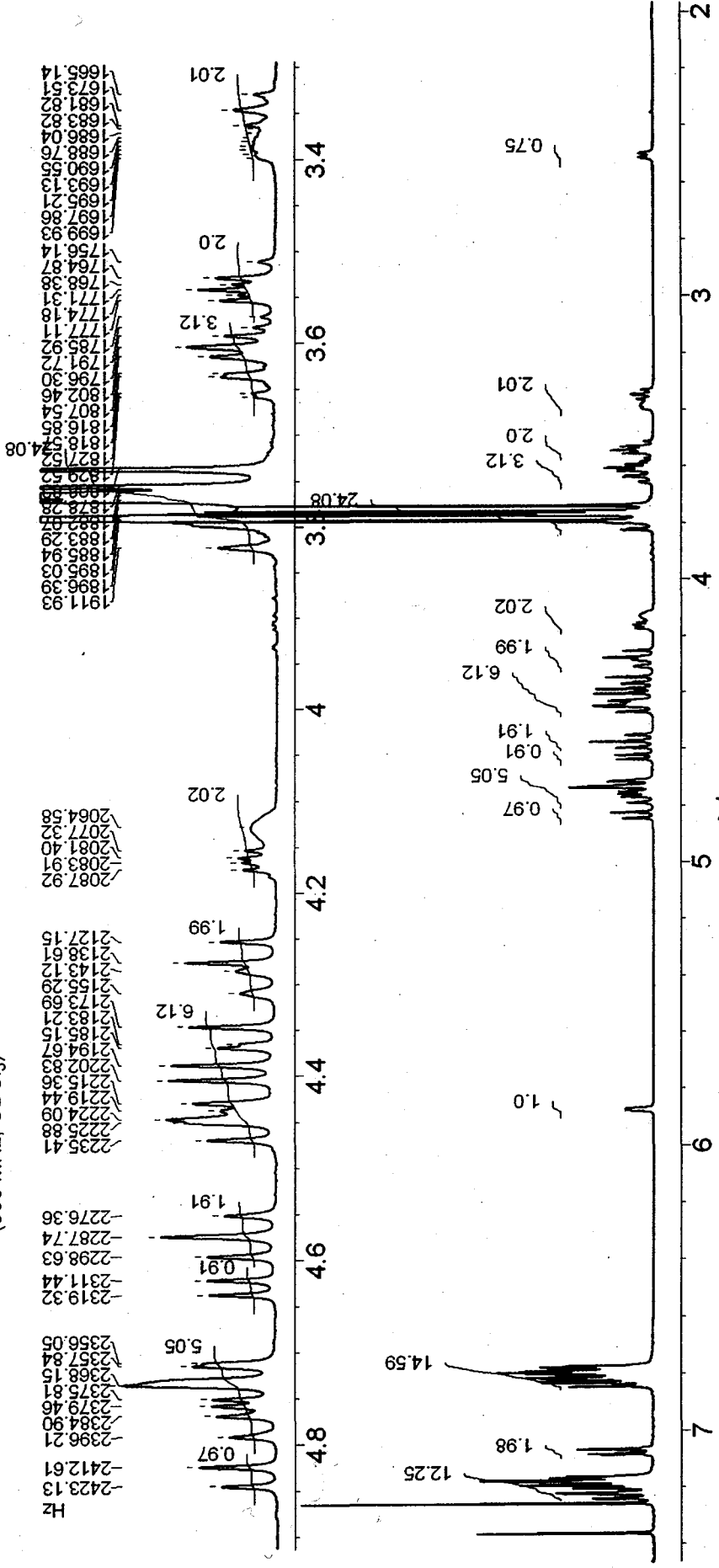


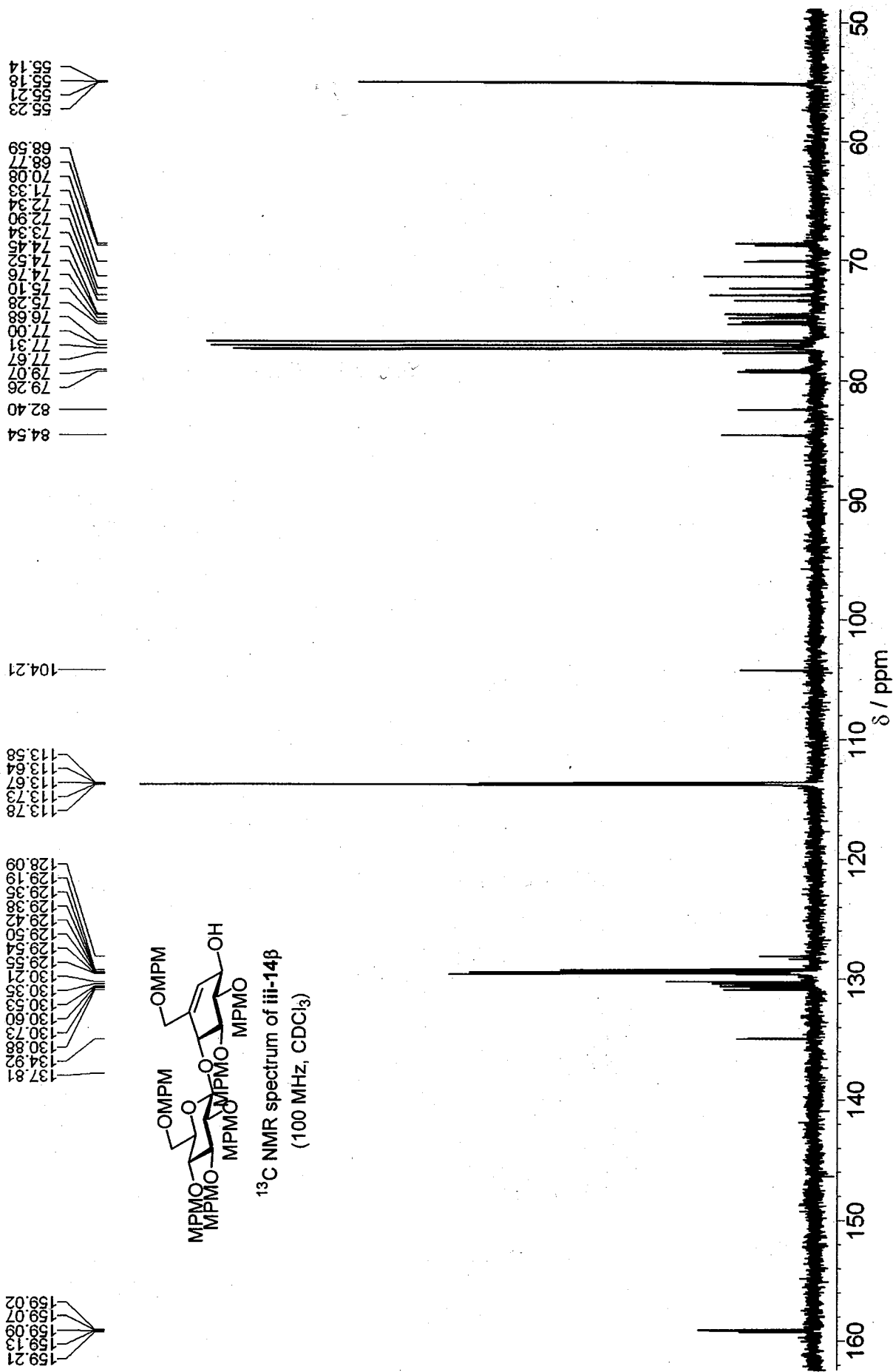


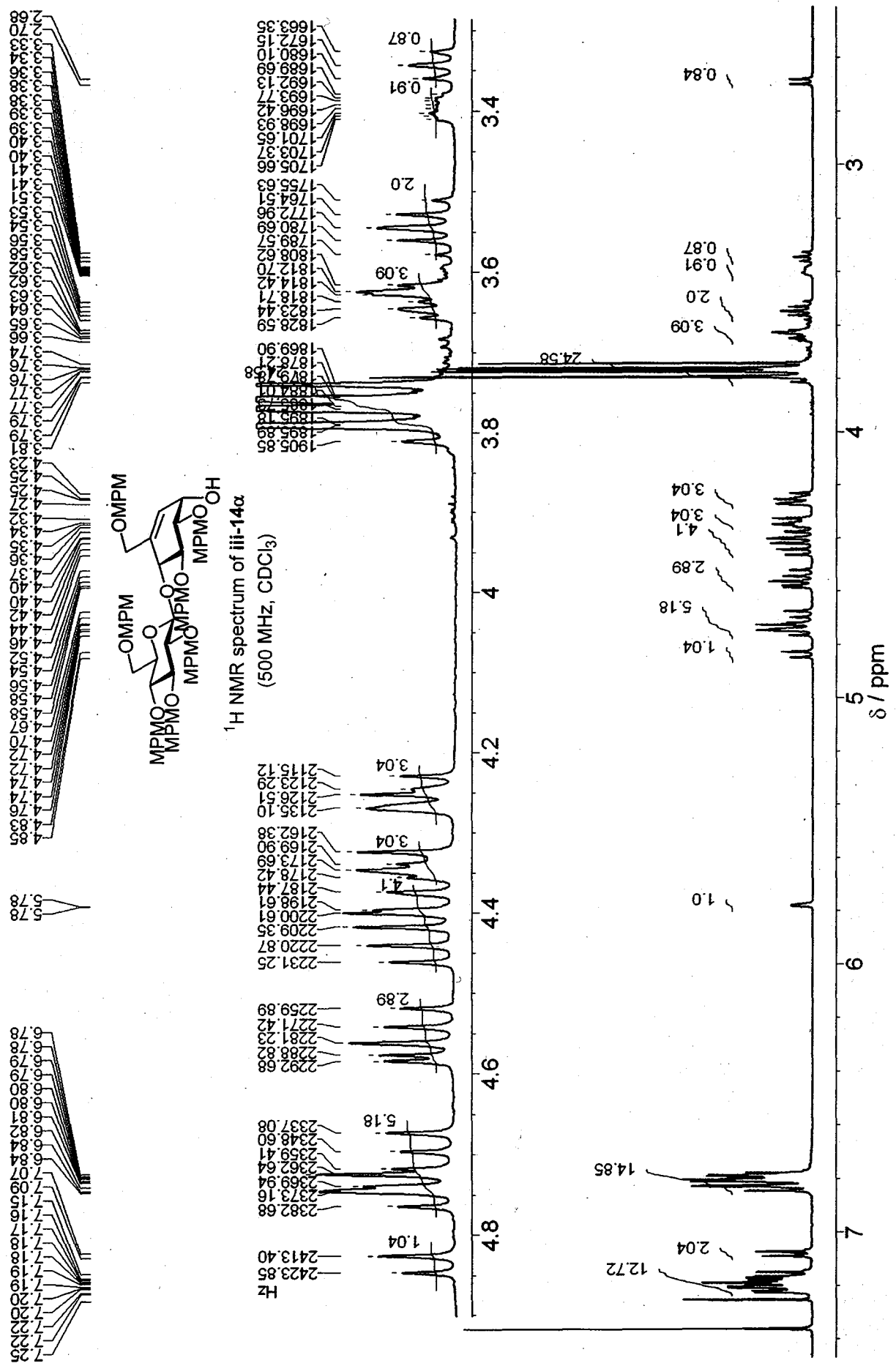


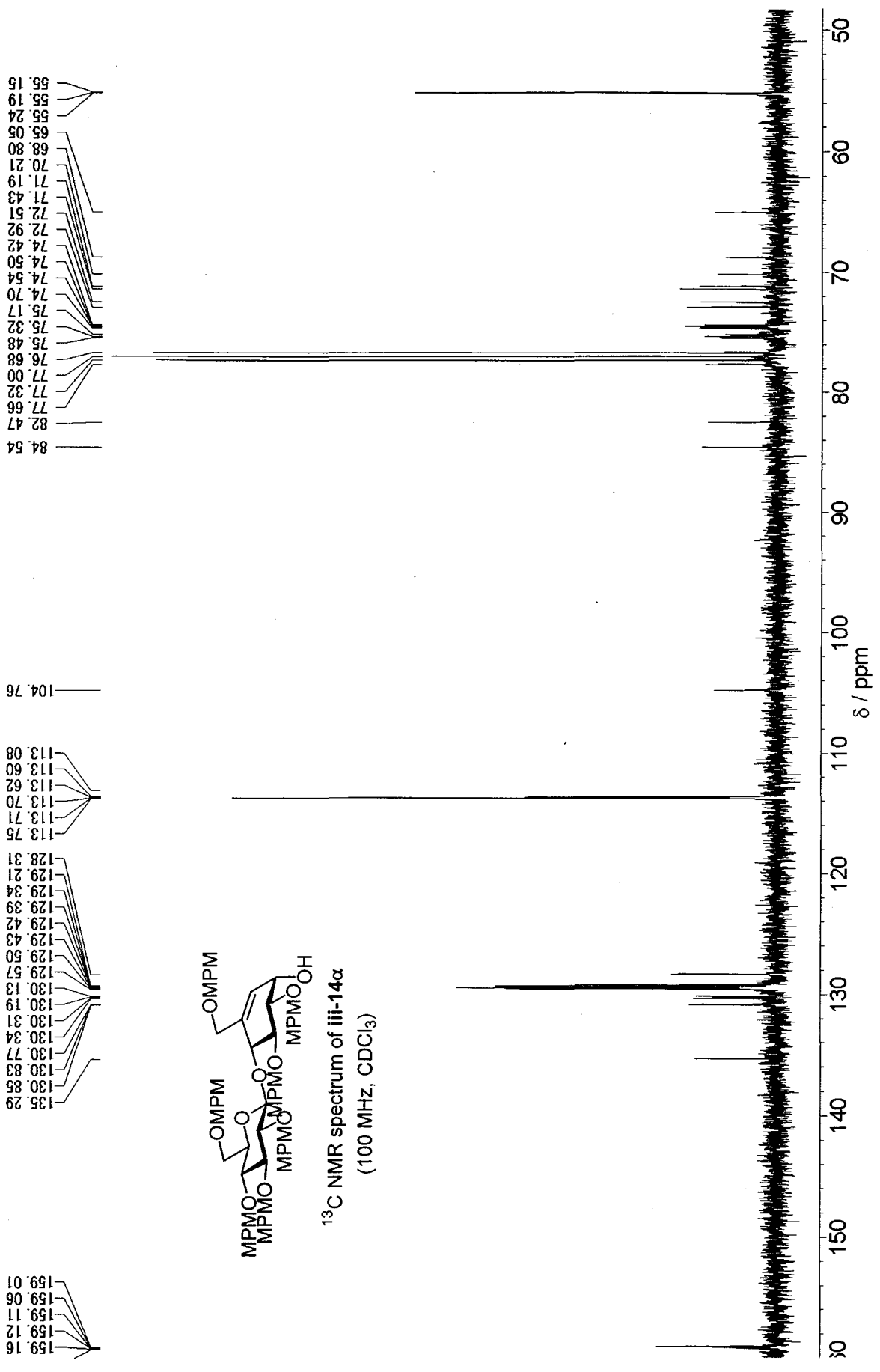


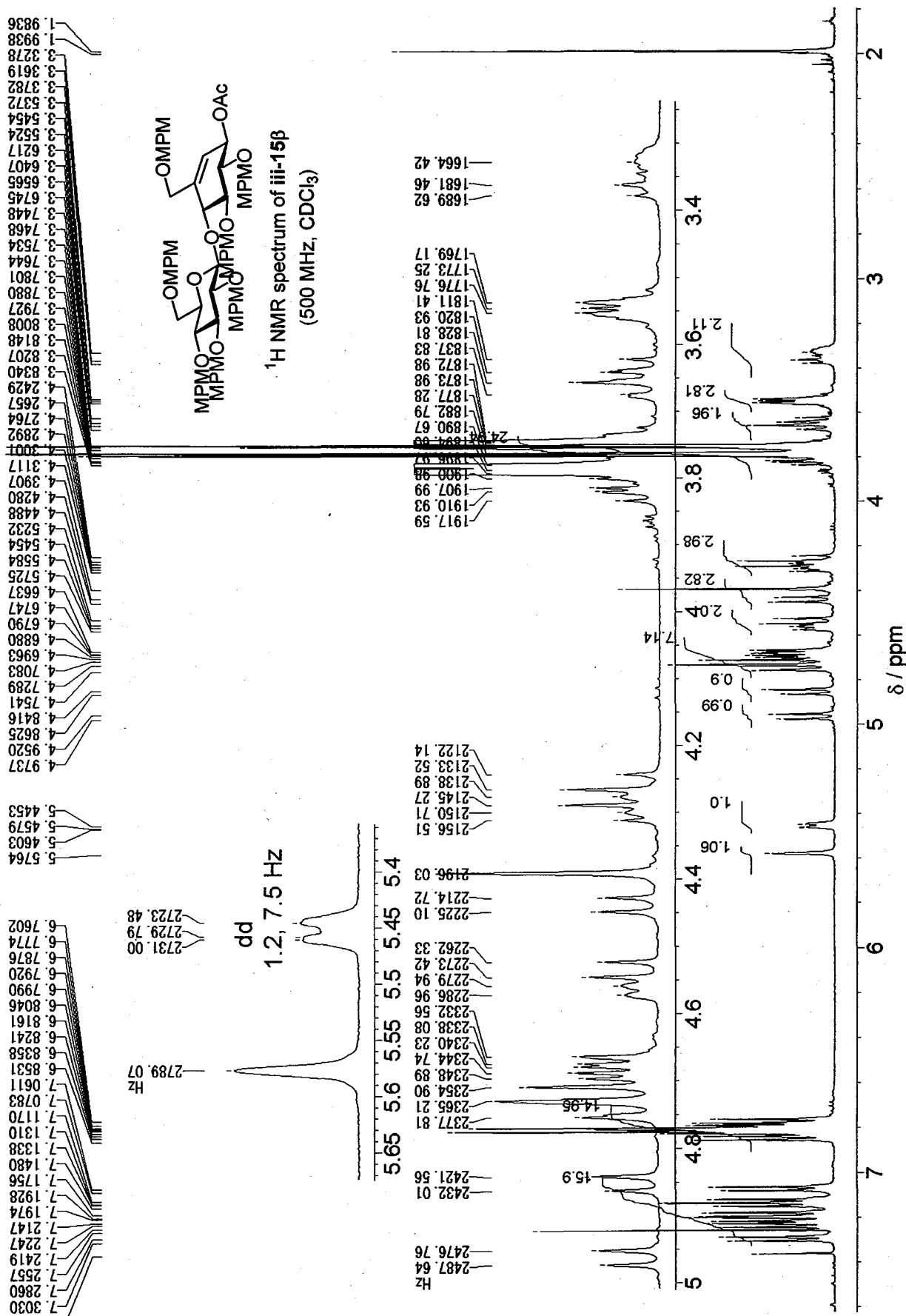
<sup>1</sup>H NMR spectrum of iii-14β  
(500 MHz, CDCl<sub>3</sub>)

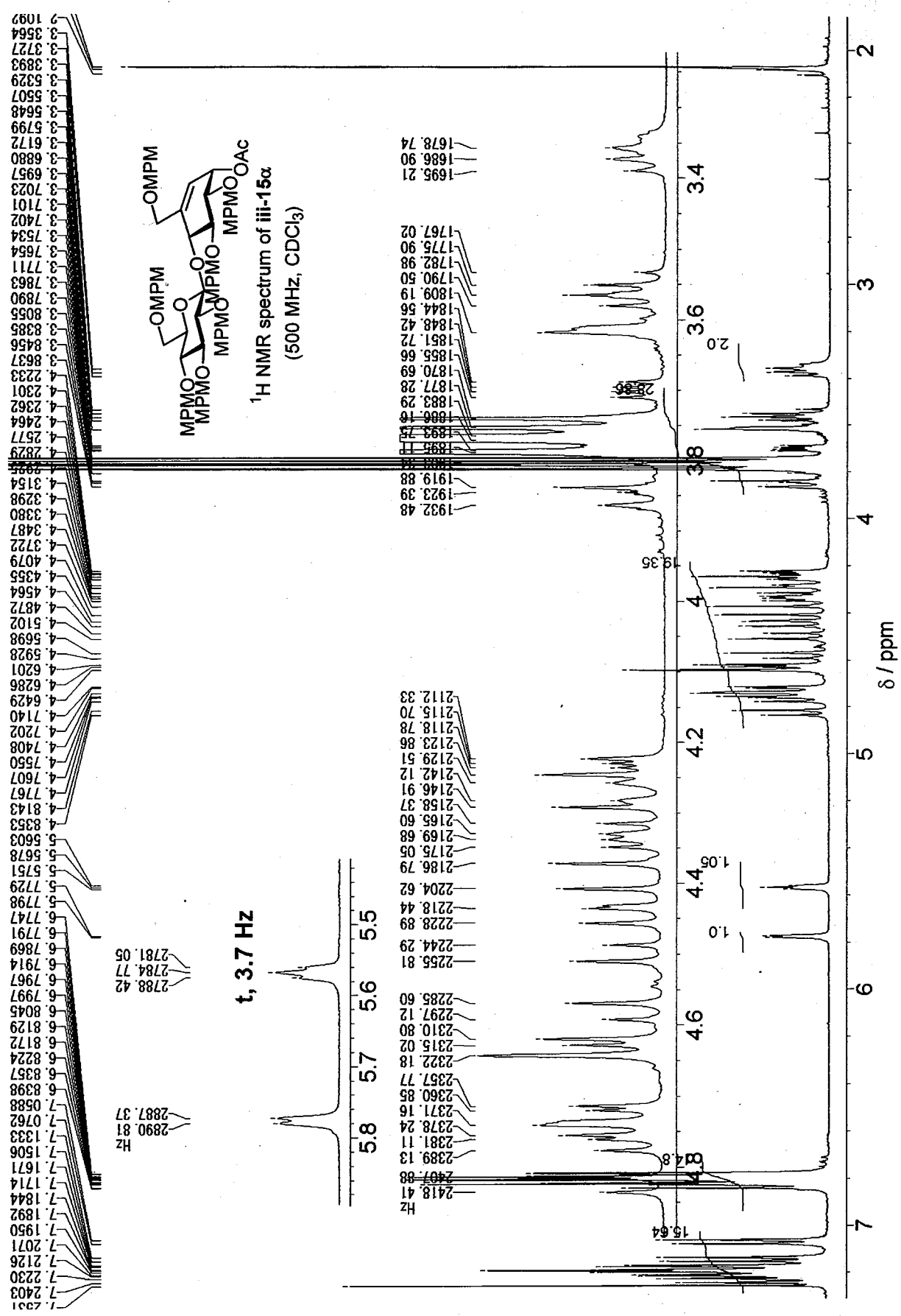


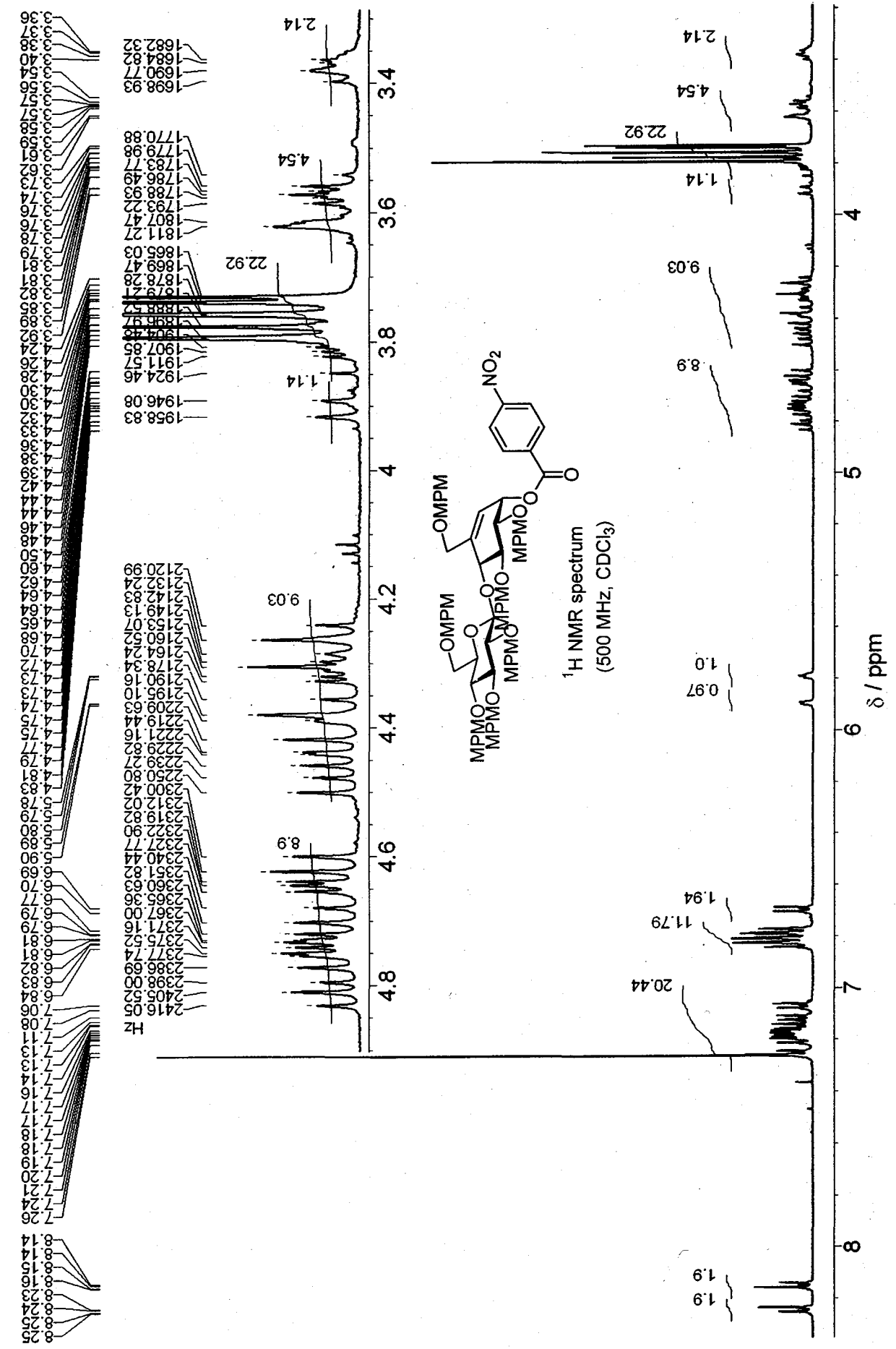


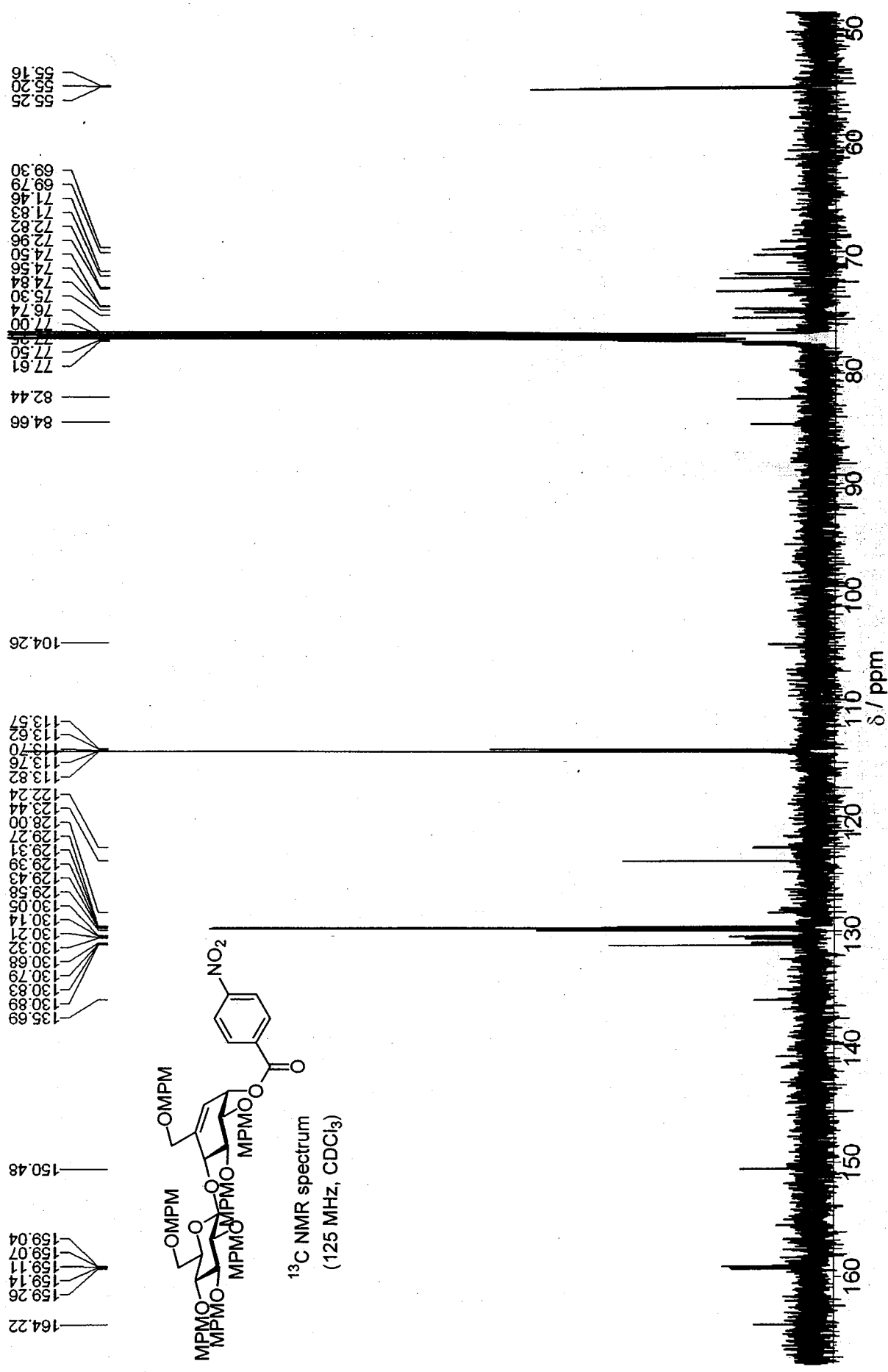






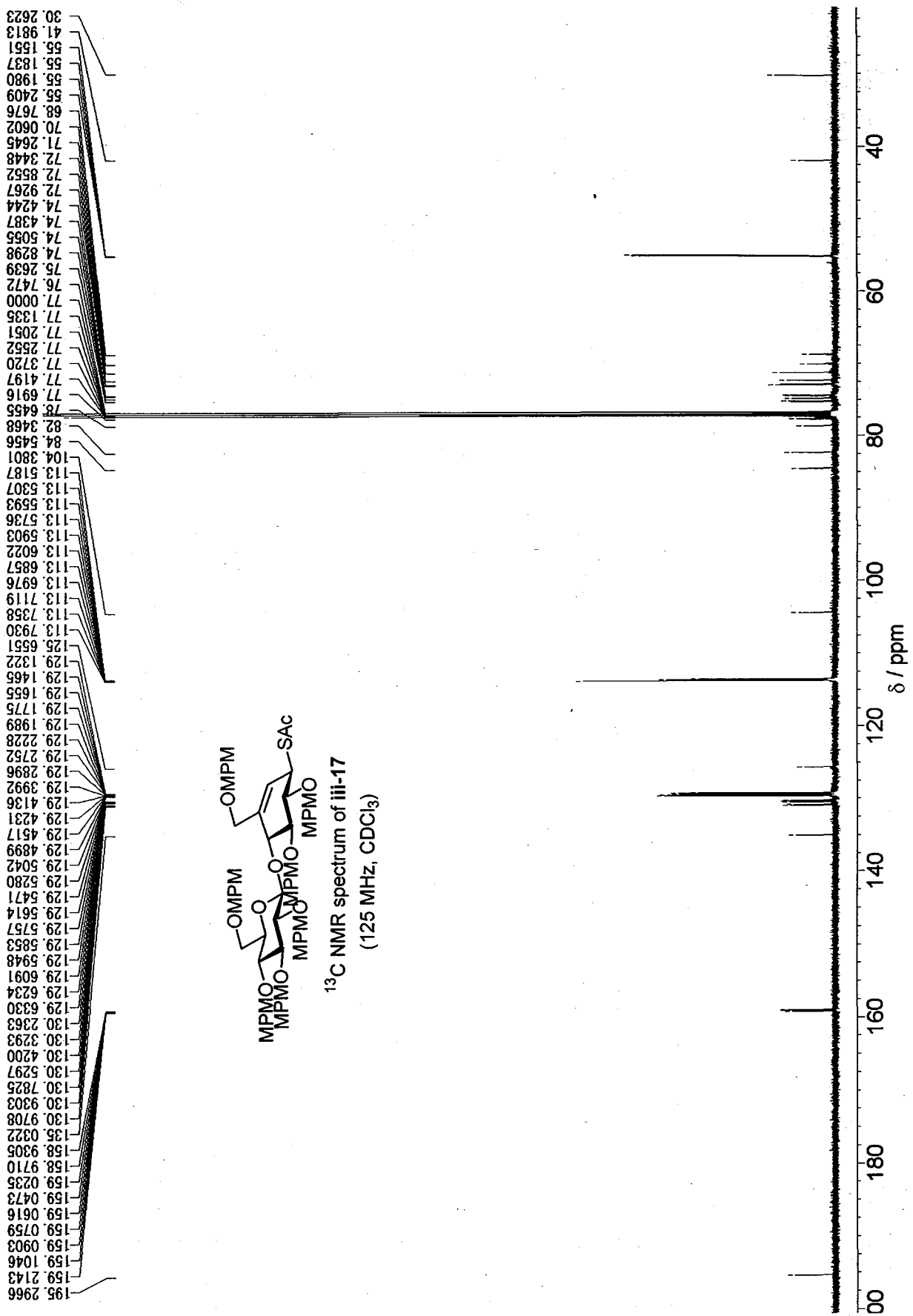


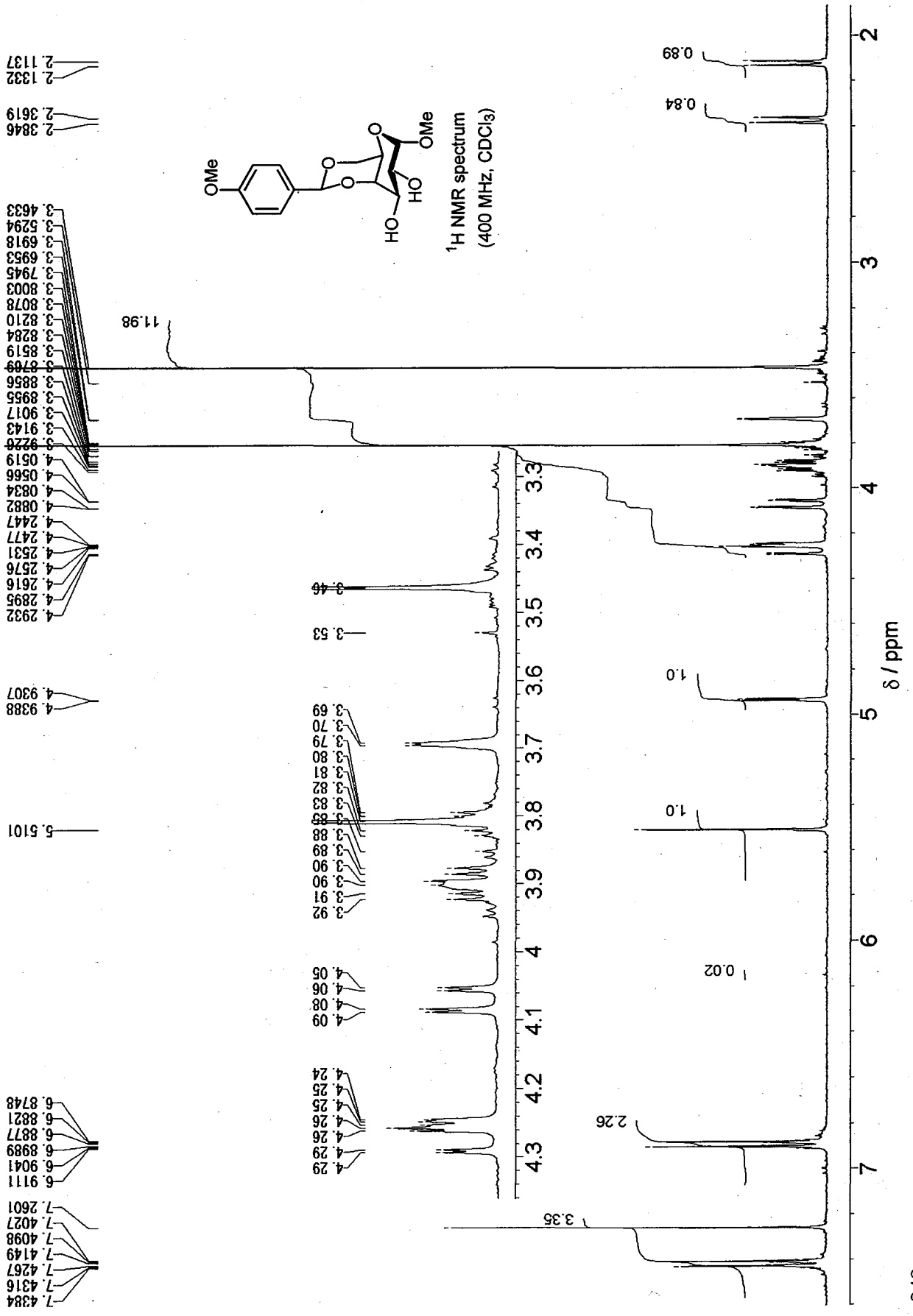


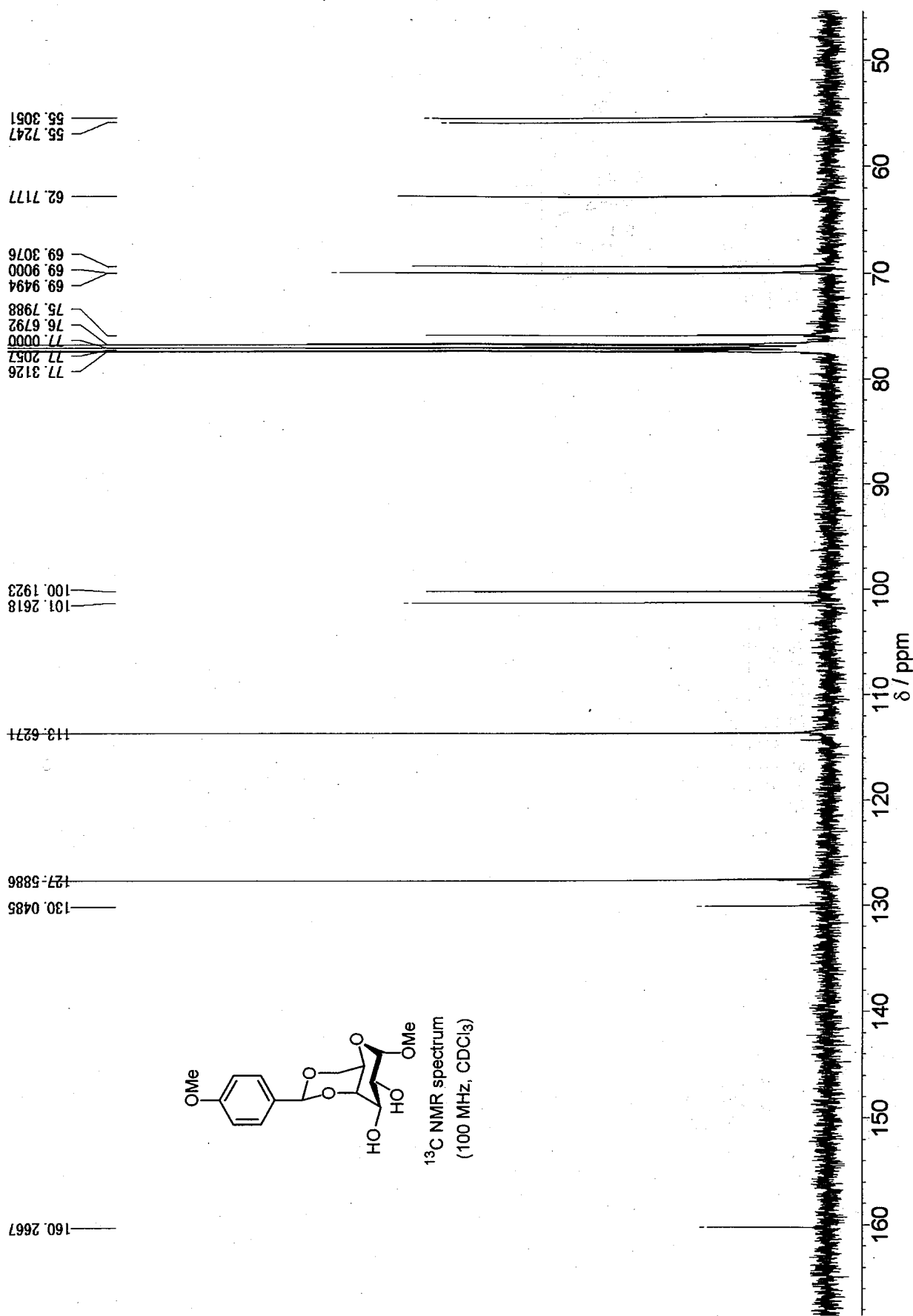






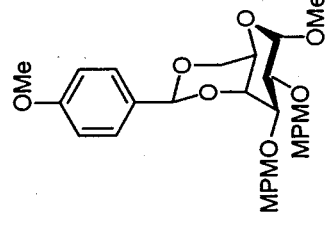






7.44  
7.42  
7.33  
7.31  
7.30  
7.28

6.89  
6.88  
6.87  
6.86  
6.85  
6.84



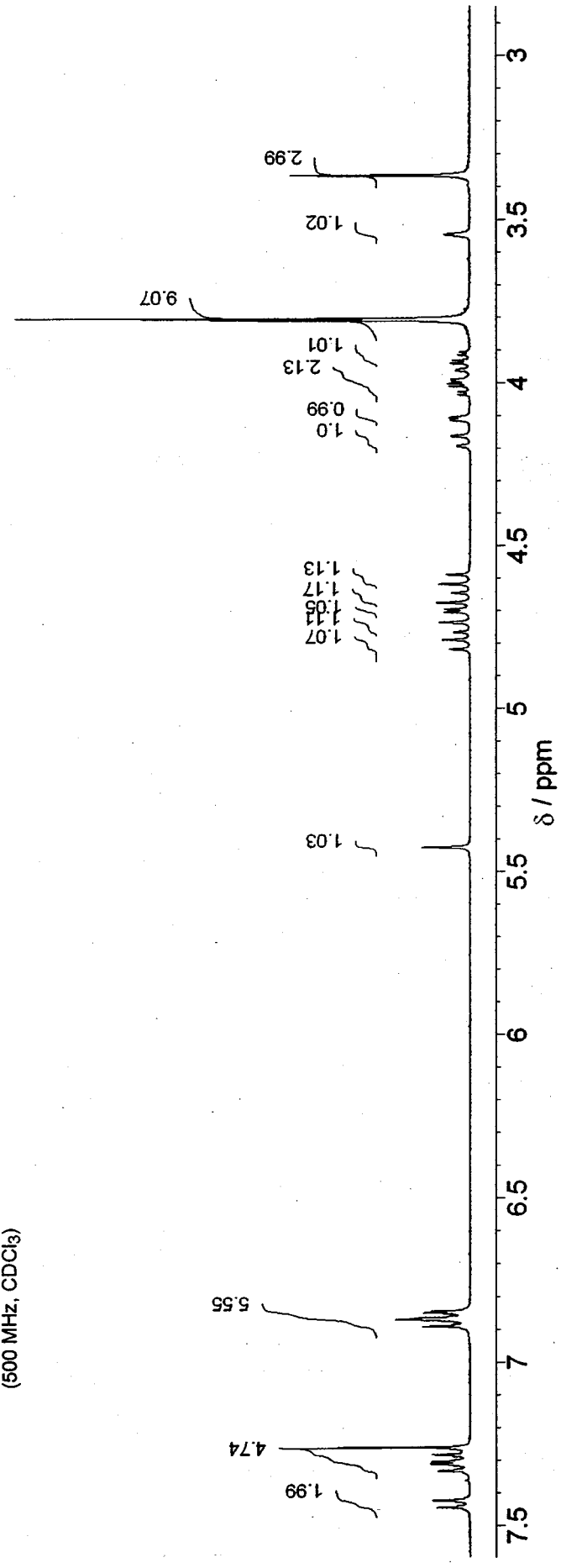
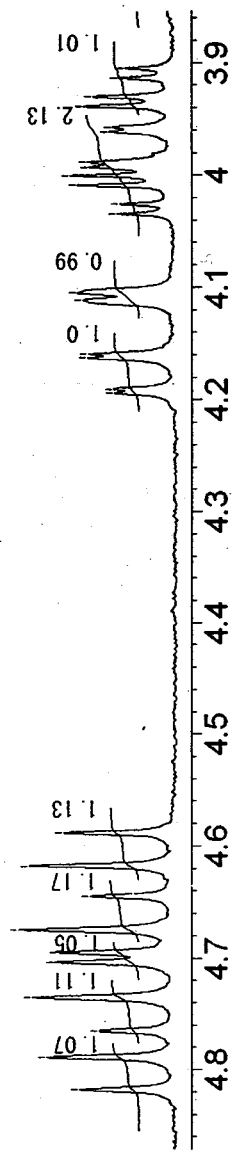
<sup>1</sup>H NMR spectrum of III-18a  
(500 MHz, CDCl<sub>3</sub>)

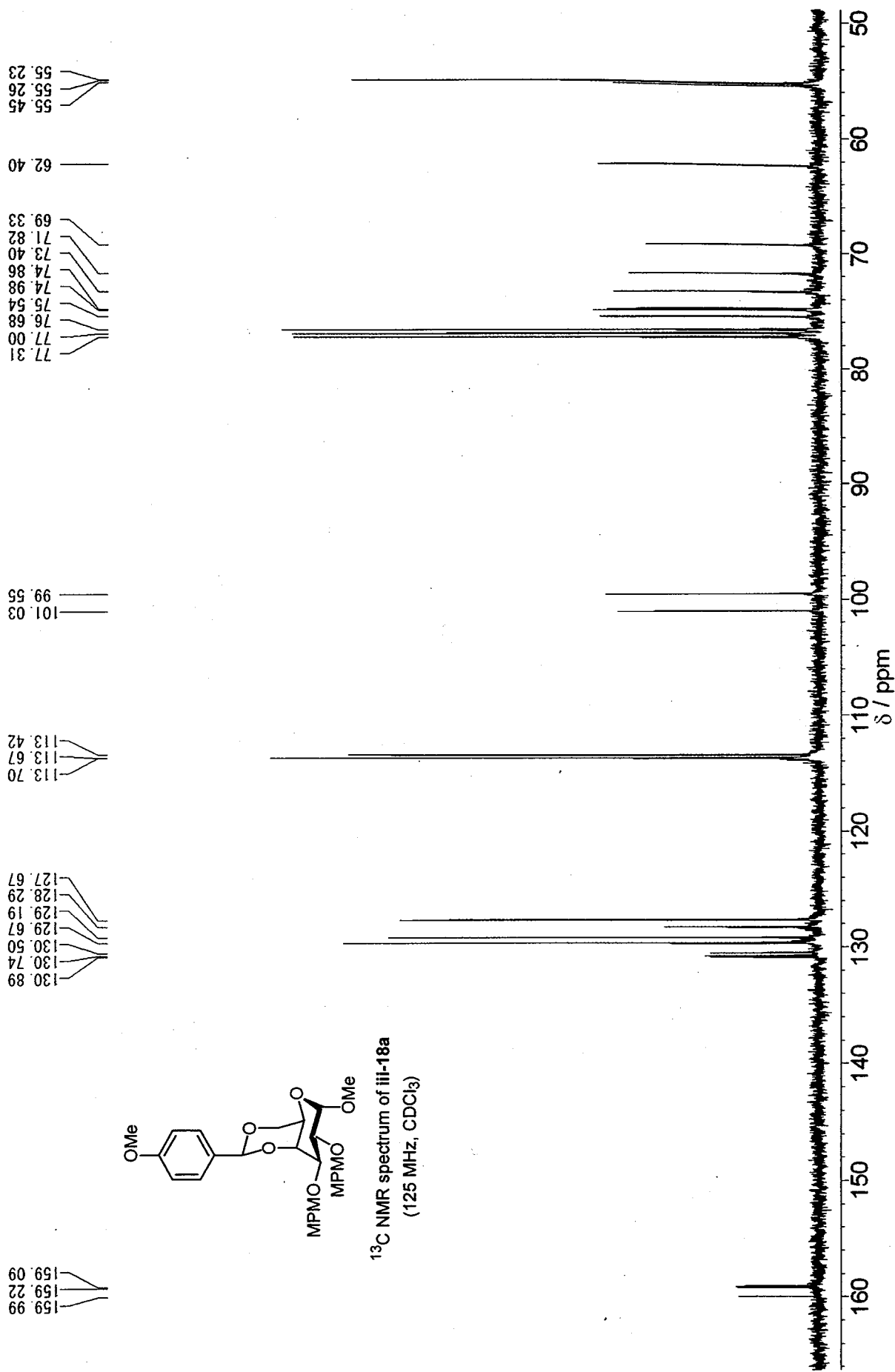
1926.13  
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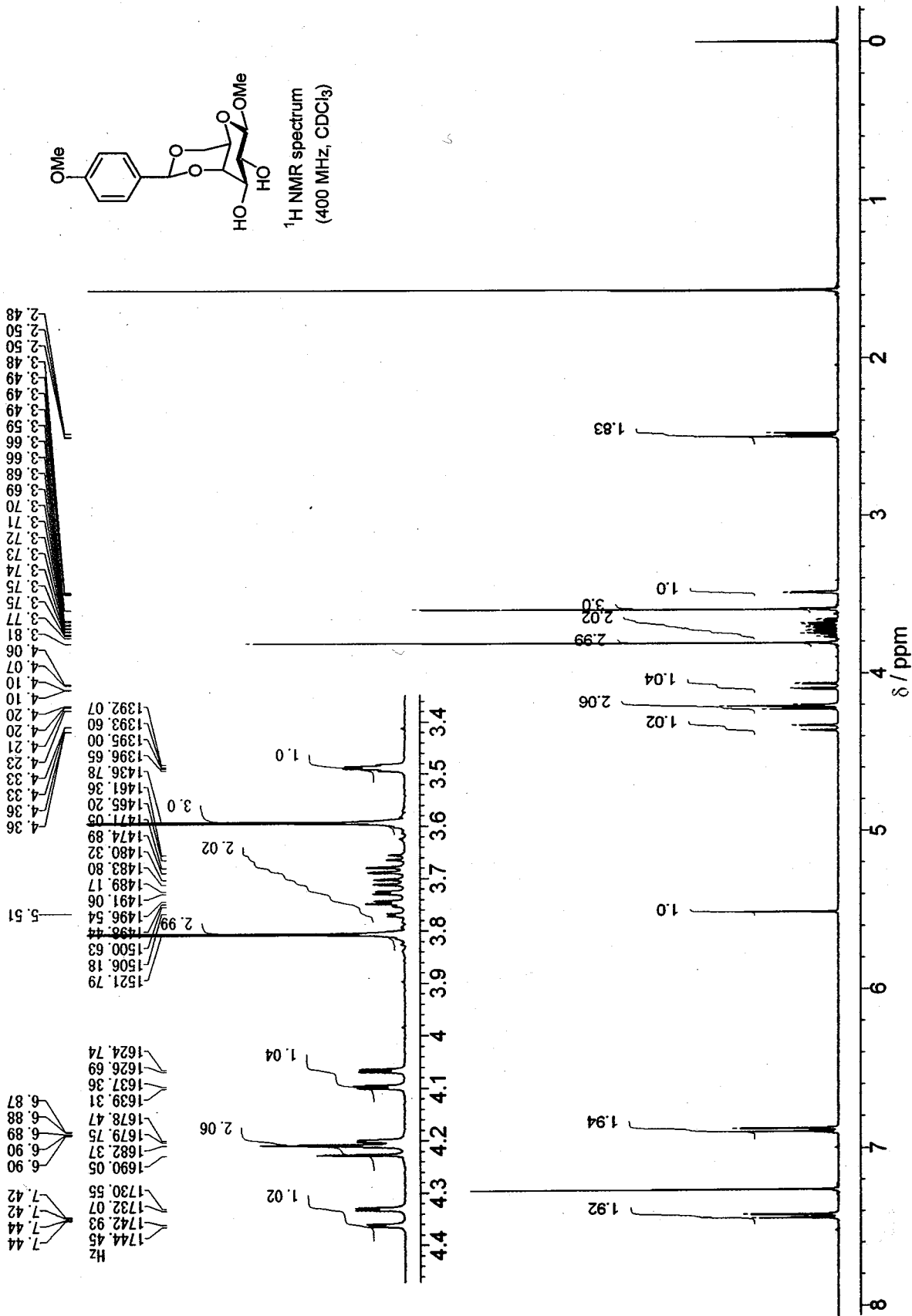
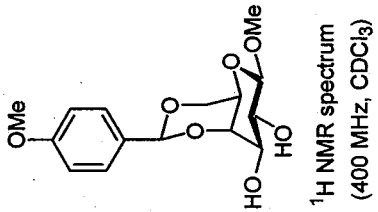
5.42

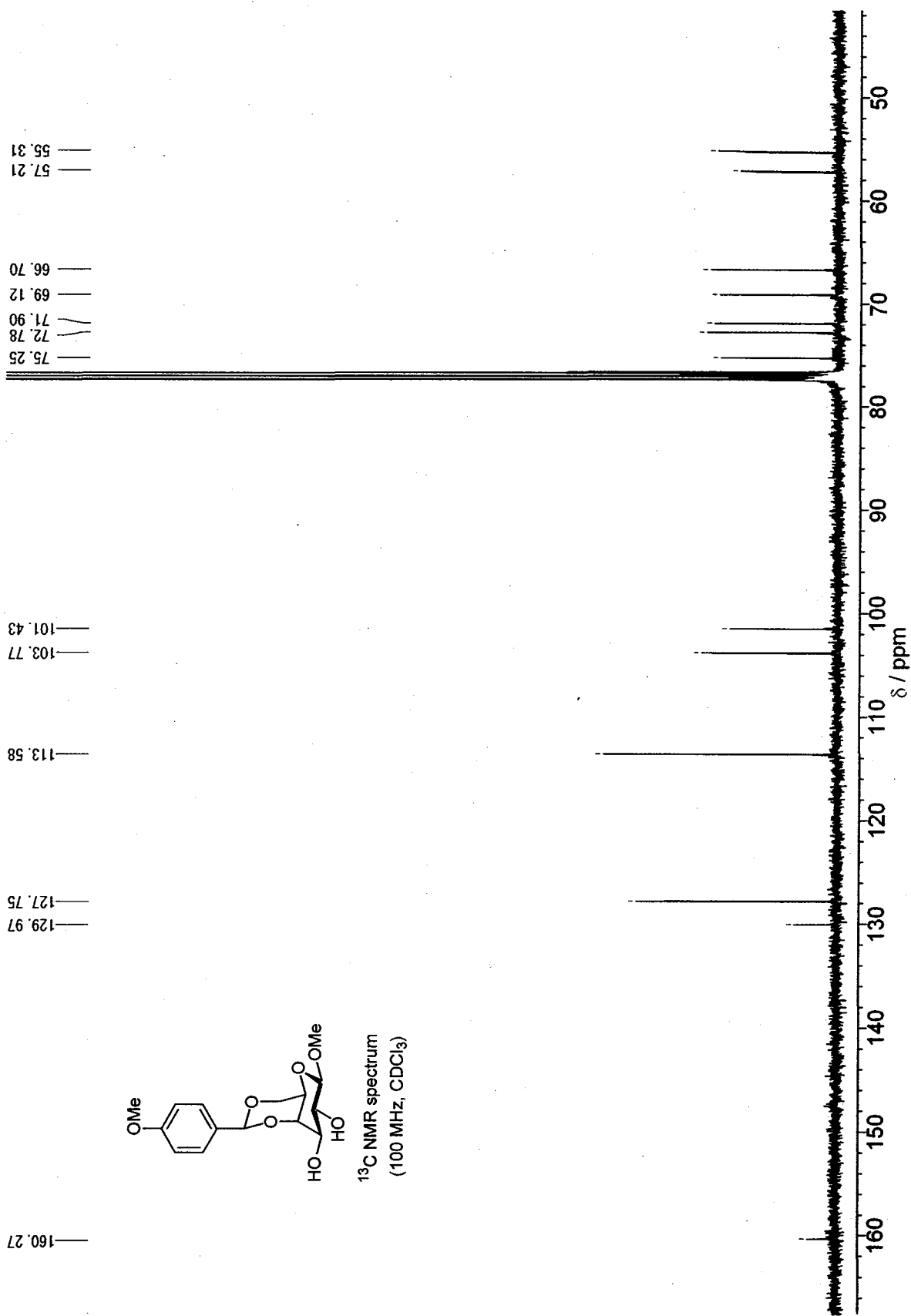
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1609.49  
1602.72  
1599.31  
1596.32  
1594.49  
1583.75  
1582.17  
1574.79  
1571.37  
1564.67  
1561.25

4.82  
4.79  
4.77  
4.74  
4.70  
4.69  
4.67  
4.64  
4.62  
4.59  
4.19  
4.19  
4.16  
4.16  
4.11  
4.11  
4.03  
4.03  
4.01  
4.00  
3.99  
3.99  
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3.55  
3.37

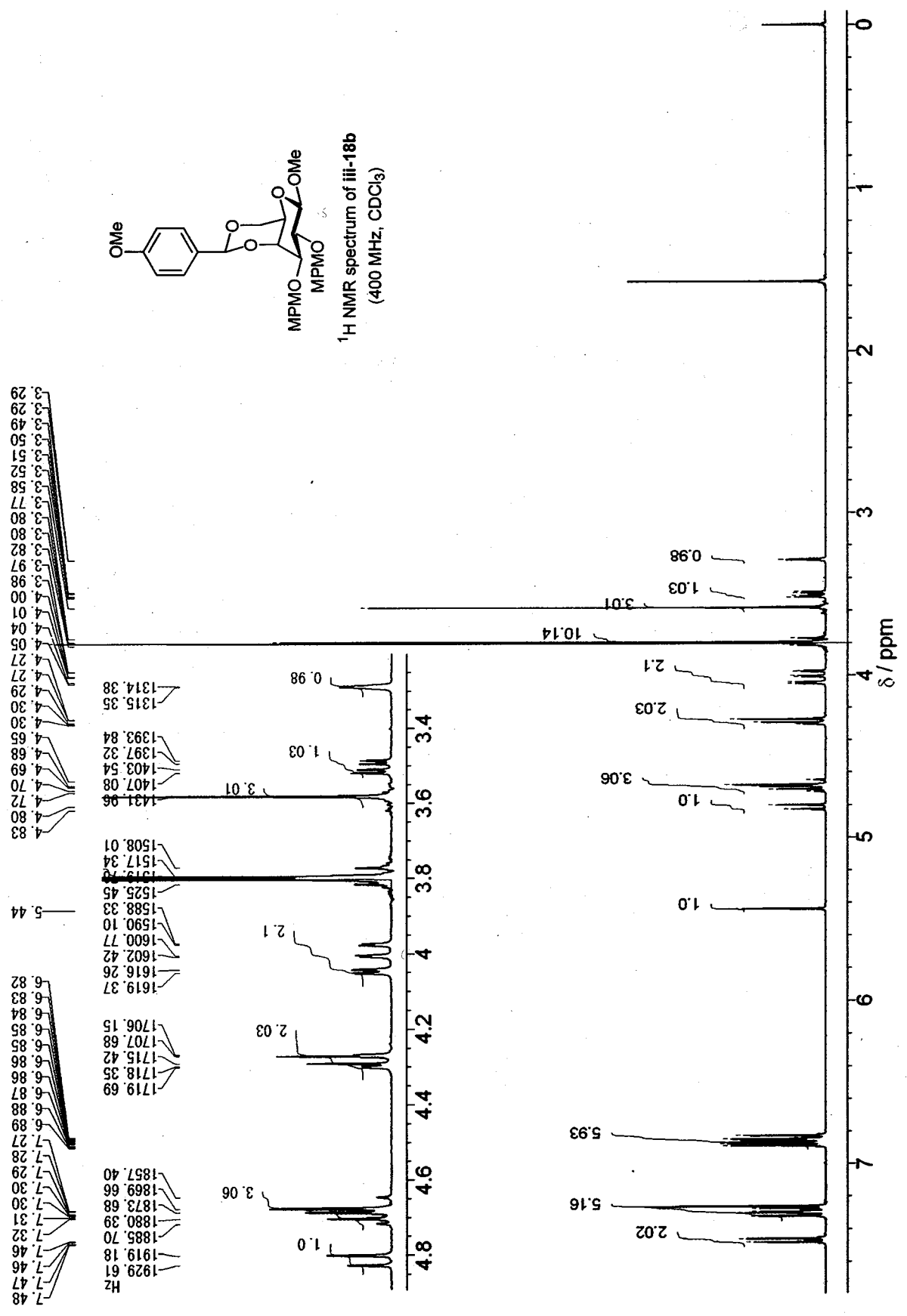
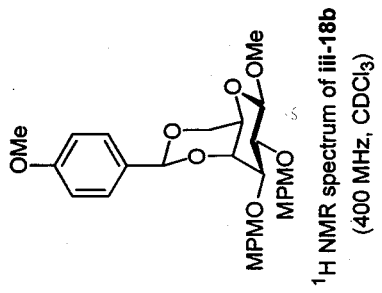


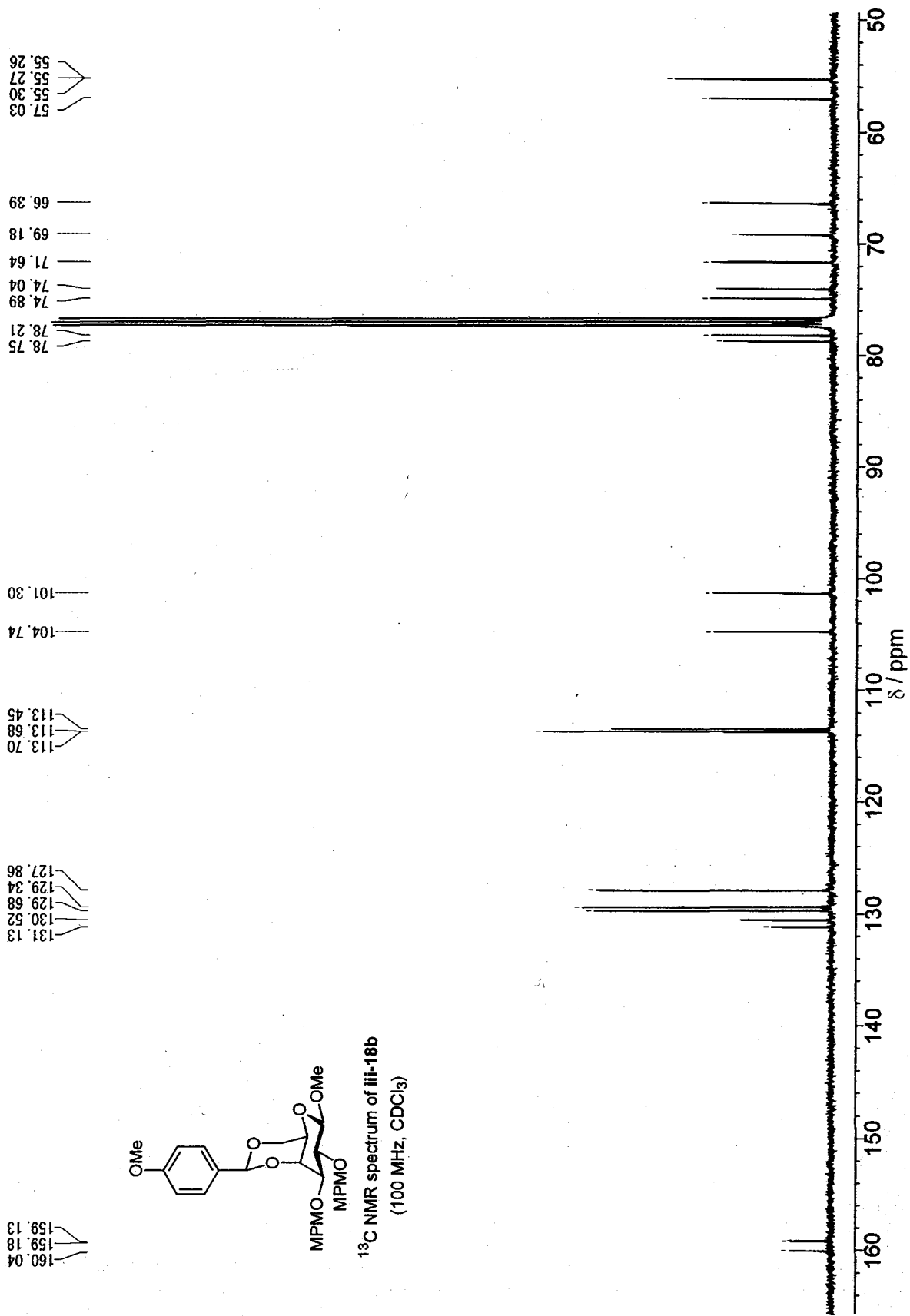




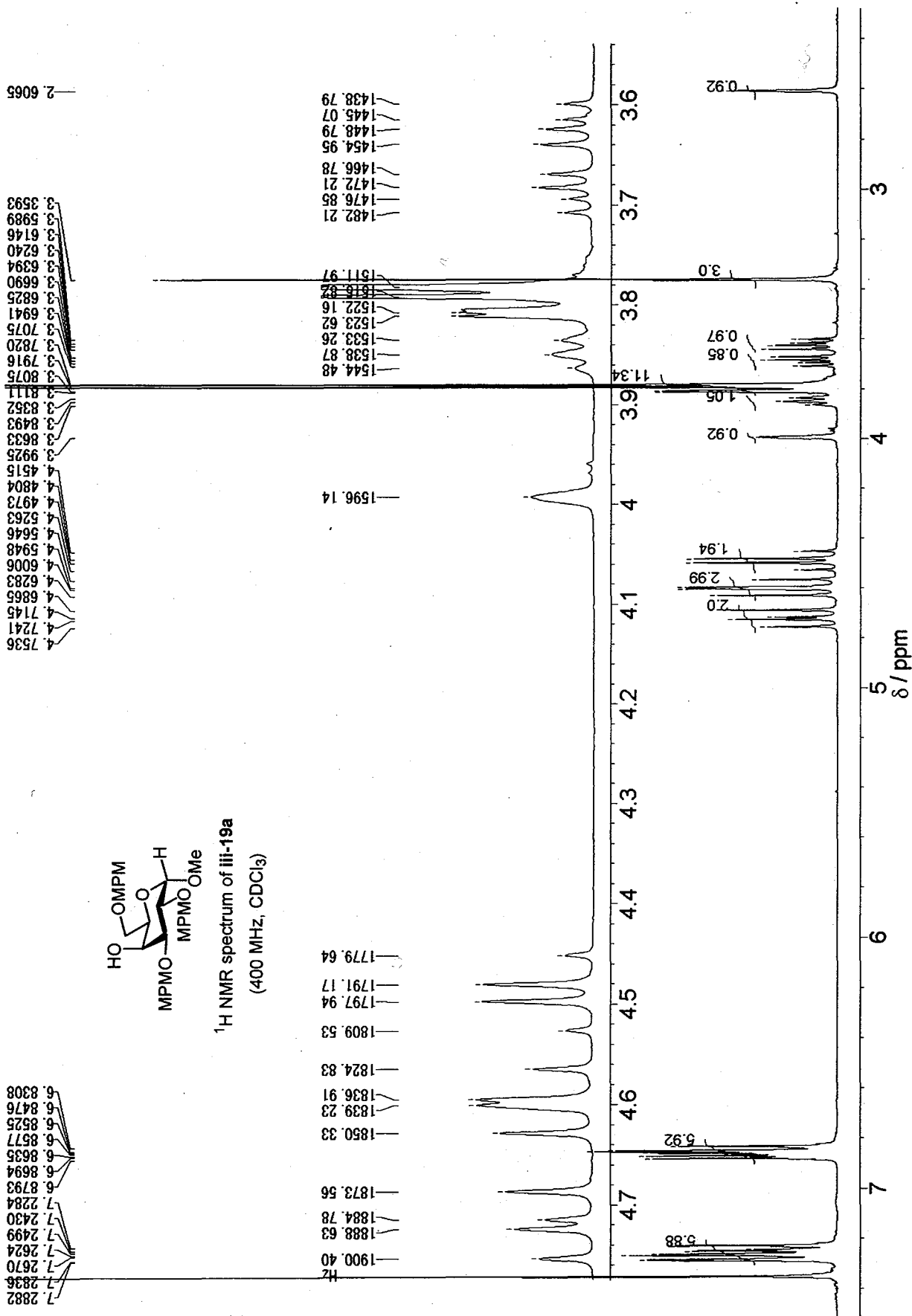
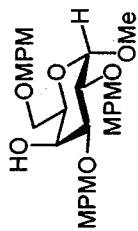


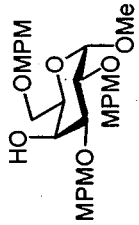
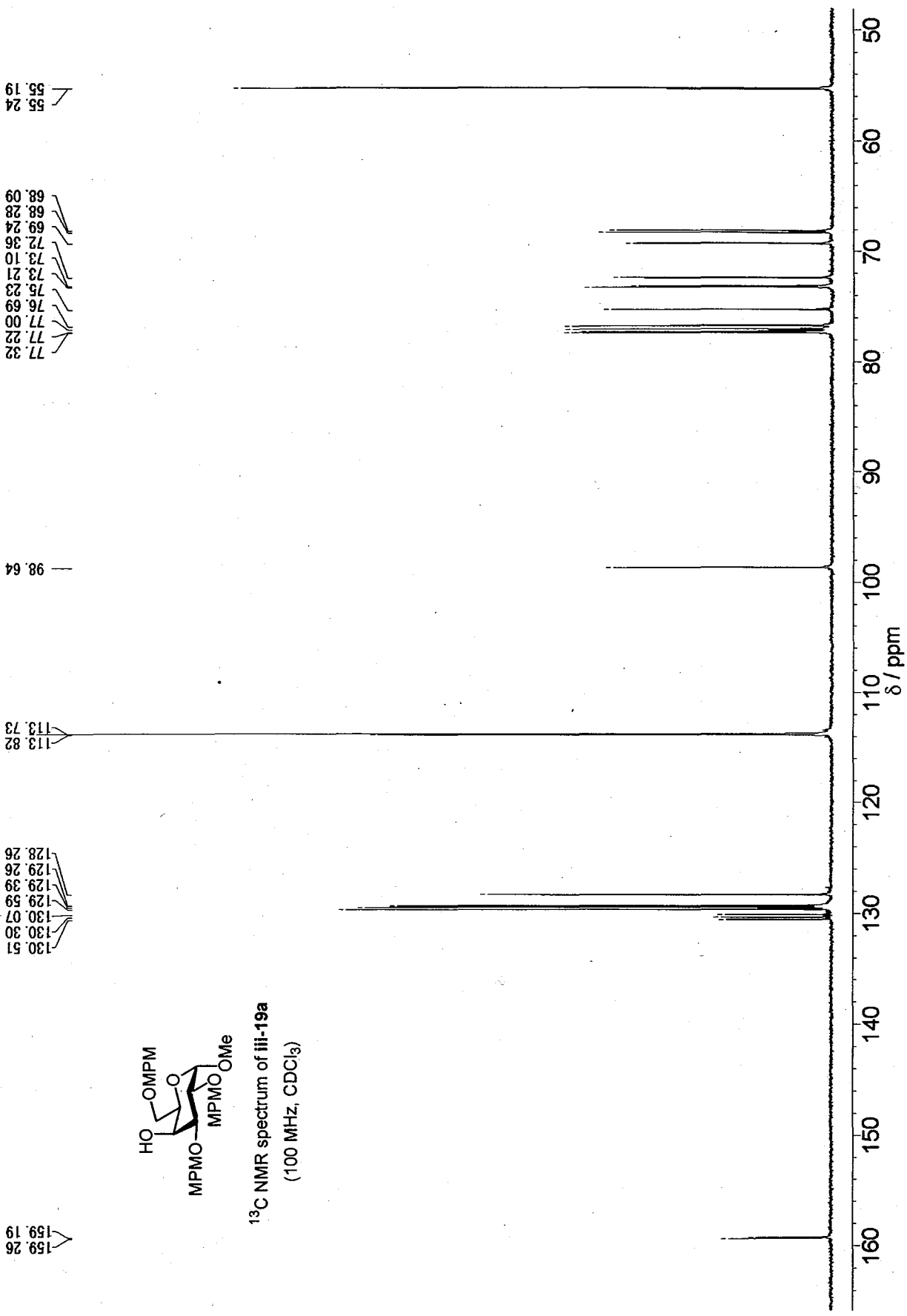




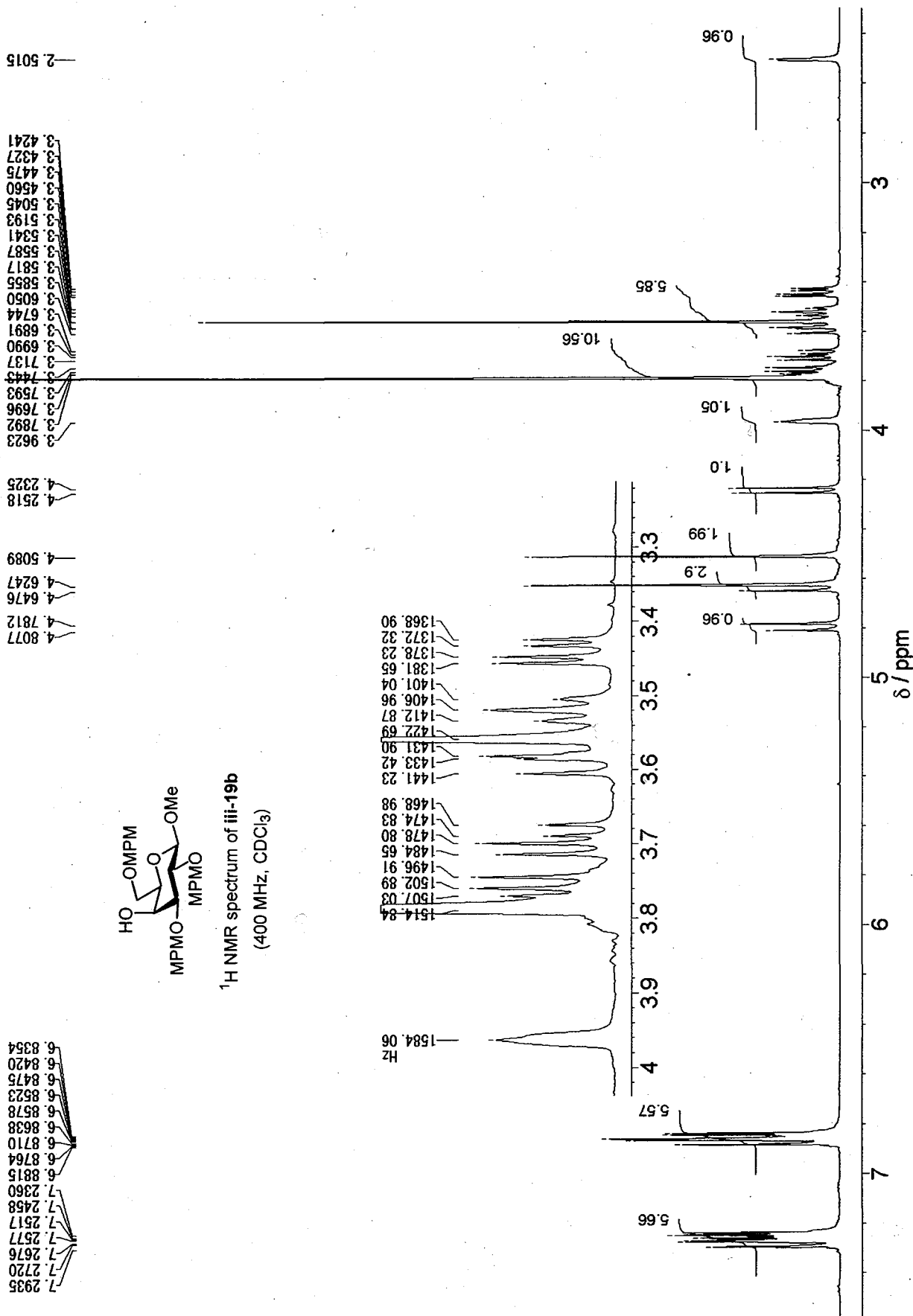


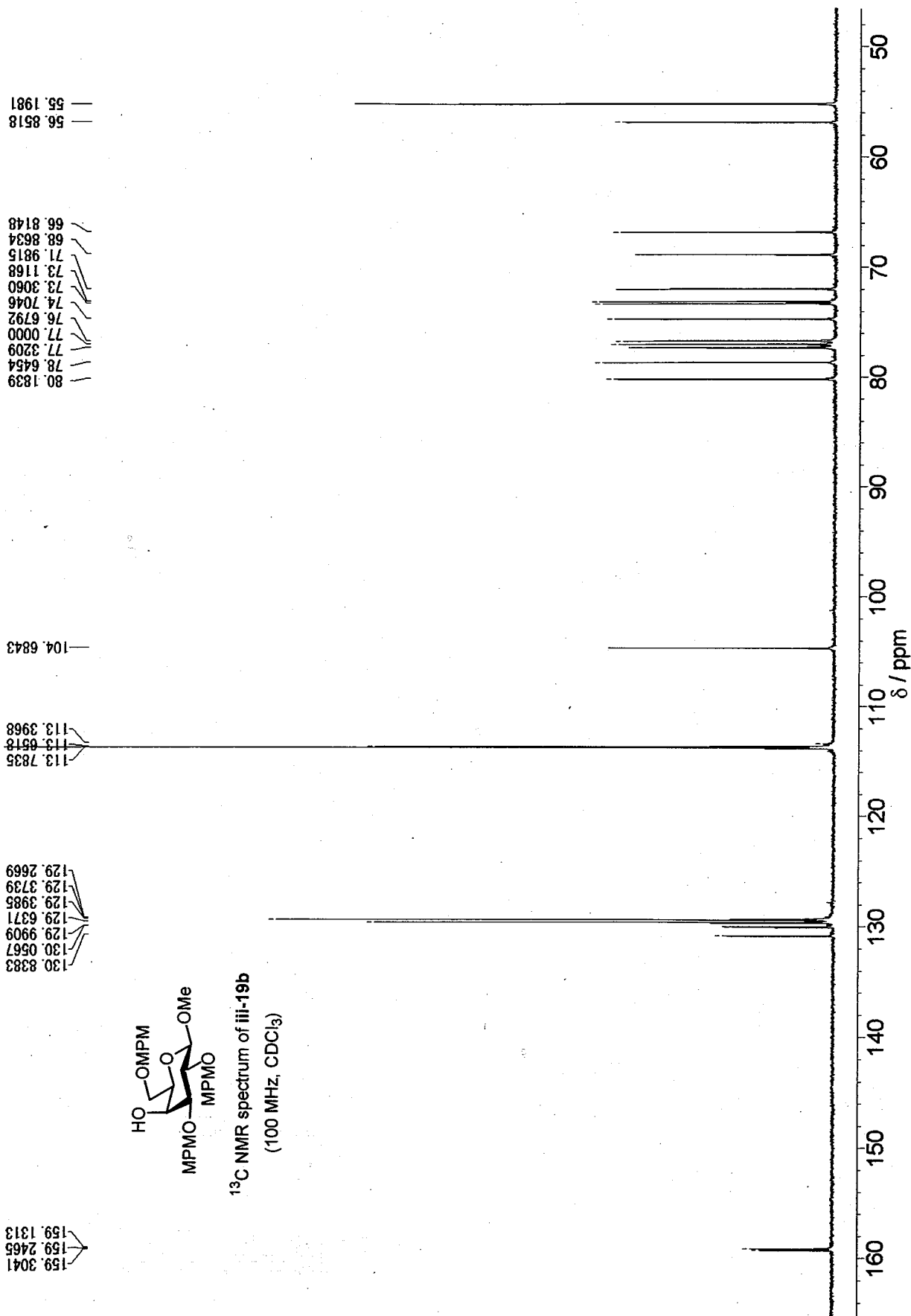
<sup>1</sup>H NMR spectrum of **iii-19a**  
(400 MHz, CDCl<sub>3</sub>)

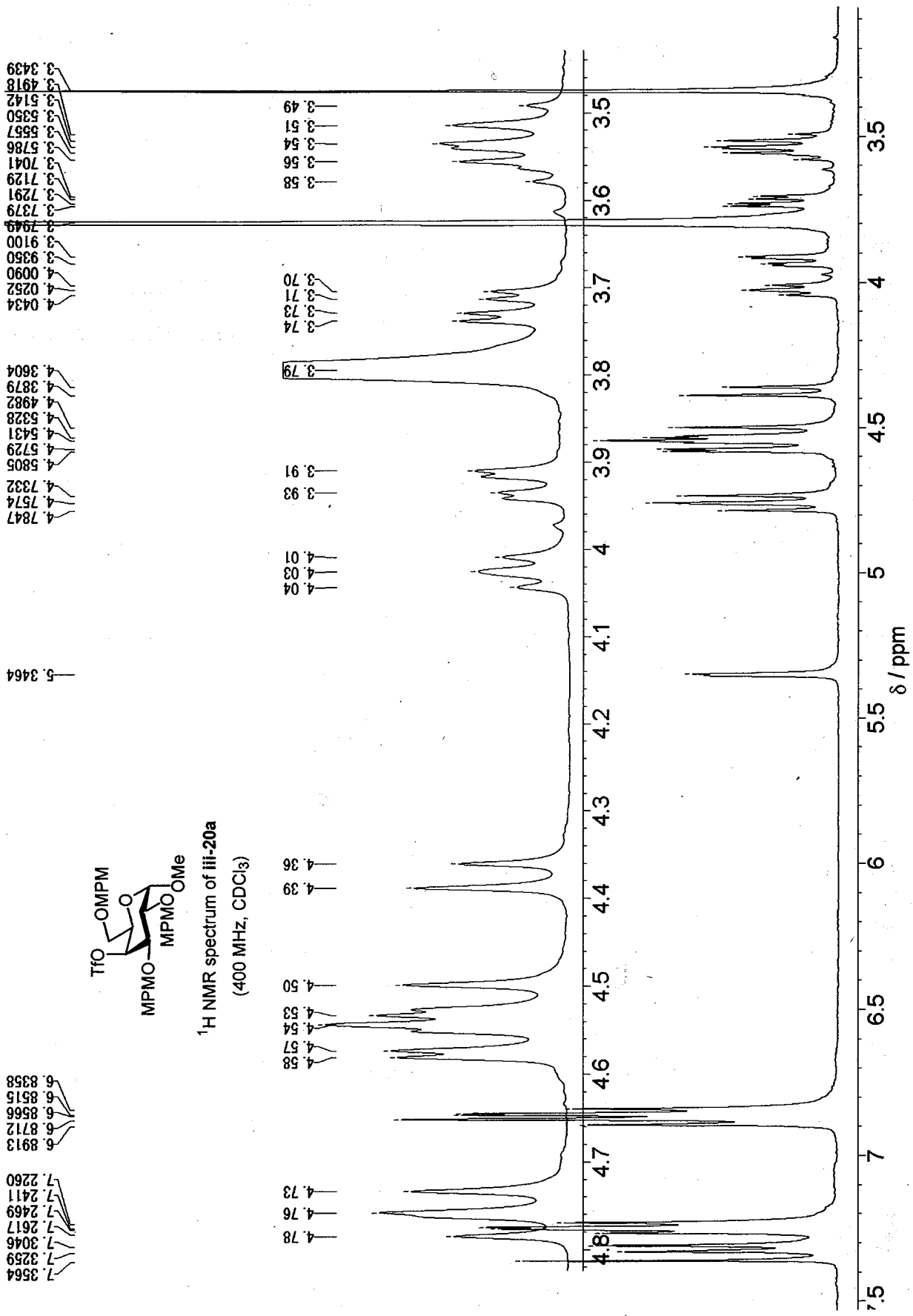




<sup>13</sup>C NMR spectrum of iii-19a  
(100 MHz, CDCl<sub>3</sub>)







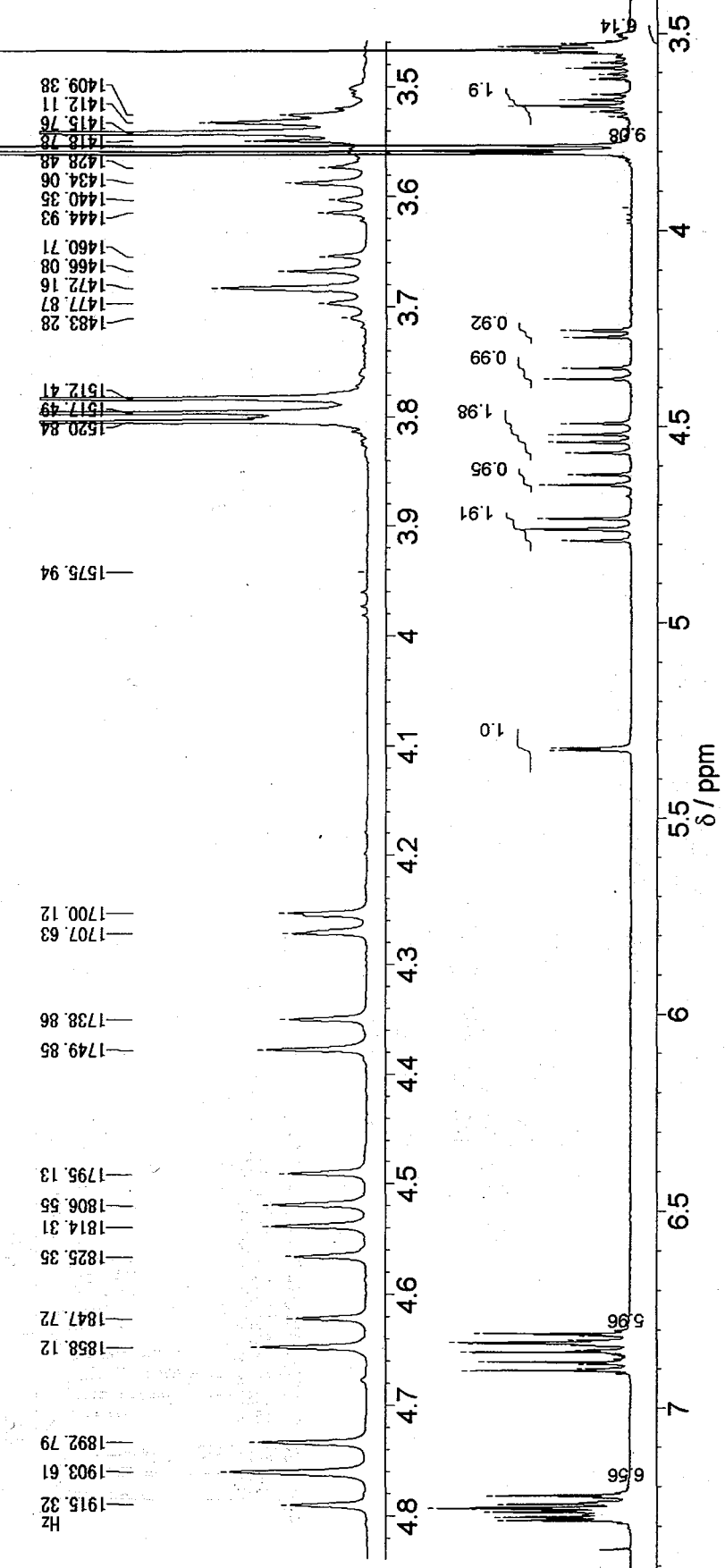
4.7909  
 4.7616  
 4.7345  
 4.6478  
 4.6218  
 4.5659  
 4.5382  
 4.5188  
 4.4903  
 4.3770  
 4.3495  
 4.2714  
 4.2526  
 3.9420  
 3.8042  
 3.7958  
 3.7831  
 3.7102  
 3.6967  
 3.6824  
 3.6538  
 3.6143  
 3.6028  
 3.5871  
 3.5731  
 3.5489  
 3.5413  
 3.5322  
 3.5254

5.3251  
 5.3191

7.2841  
 7.2758  
 7.2624  
 7.2540  
 7.2514  
 7.2431  
 7.2212  
 6.9028  
 6.8975  
 6.8861  
 6.8810  
 6.8558  
 6.8505  
 6.8390  
 6.8340  
 6.8307  
 6.8257  
 6.8140  
 6.8089

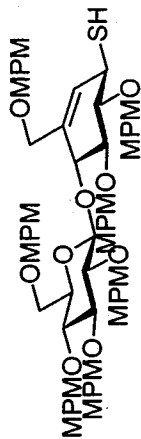


<sup>1</sup>H NMR spectrum of iii-20b  
 (400 MHz, CDCl<sub>3</sub>)





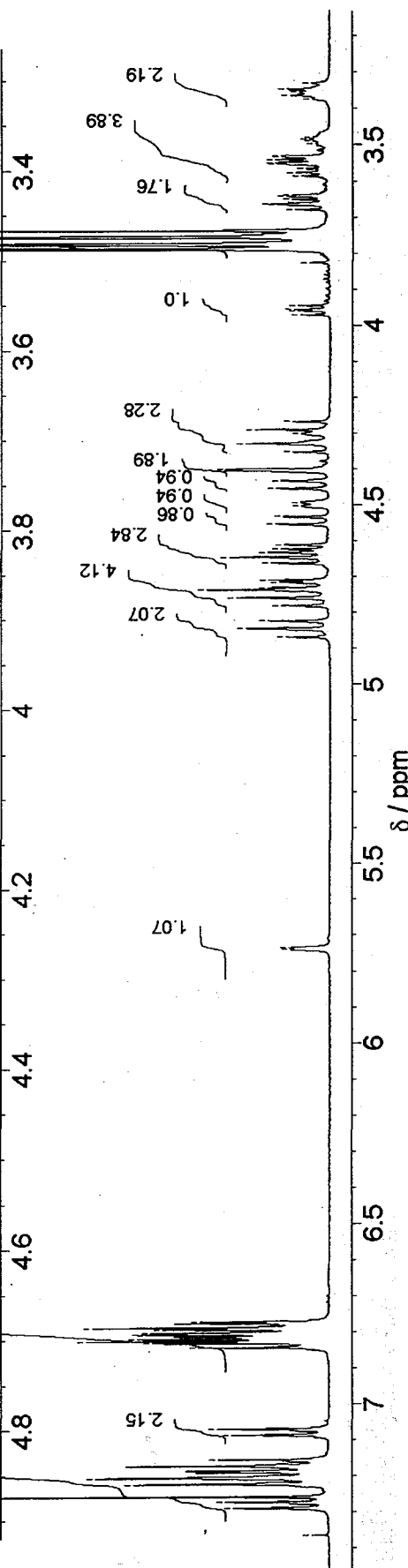
1.2090  
 1.2717  
 1.2577  
 1.2229  
 1.2054  
 1.1550  
 1.0867  
 1.0694  
 6.8438  
 6.8311  
 6.8259  
 6.8202  
 6.8078  
 6.8057  
 6.8026  
 6.7937  
 6.7891  
 6.7720  
 5.7401  
 5.7360  
 4.8692  
 4.8462  
 4.8244  
 4.8188  
 4.7601  
 4.7380  
 4.7319  
 4.7109  
 4.6635  
 4.6635  
 4.6475  
 4.6337  
 4.6242  
 4.6121  
 4.5550  
 4.5338  
 4.5033  
 4.4929  
 4.4549  
 4.4340  
 4.4058  
 4.4021  
 4.3533  
 4.3014  
 4.2912  
 4.2683  
 3.9707  
 3.9522  
 3.9443  
 3.8264  
 3.7906  
 3.7893  
 3.7783  
 3.7747  
 3.7581  
 3.7554  
 3.7389  
 3.6795  
 3.6663  
 3.6643  
 3.6608  
 3.6513  
 3.6427  
 3.6391  
 3.5860  
 3.5763  
 3.5687  
 3.5644  
 3.5527  
 3.5508  
 3.5421  
 3.5324  
 3.4969  
 3.4881  
 3.4838  
 3.4791  
 3.3720  
 3.3636  
 3.3544  
 3.3475  
 3.3298

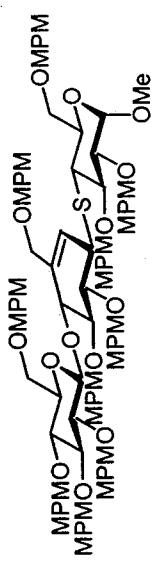
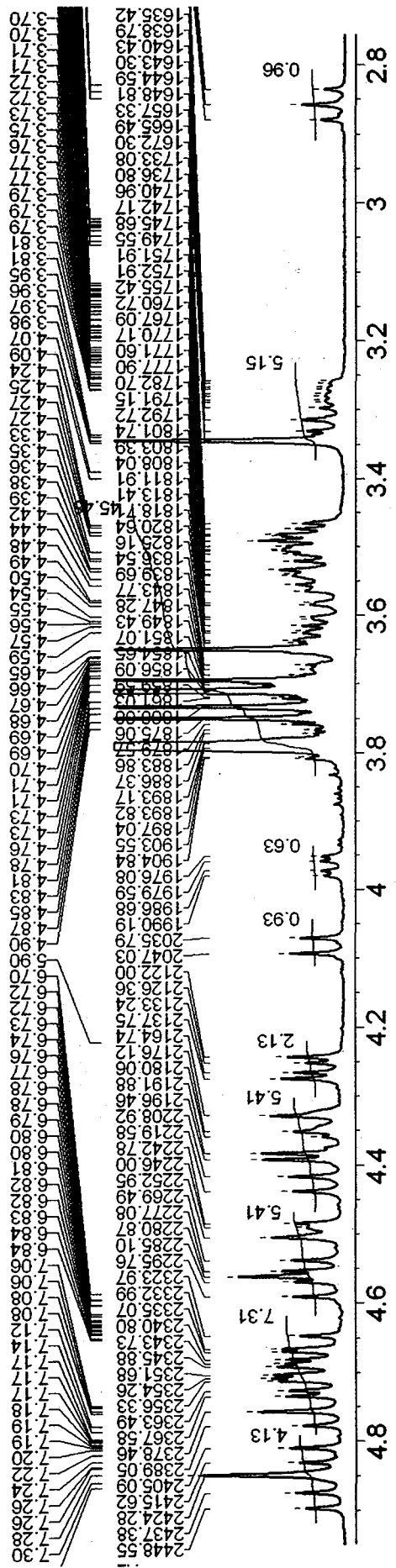


<sup>1</sup>H NMR spectrum of iii-21  
 (500 MHz, CDCl<sub>3</sub>)

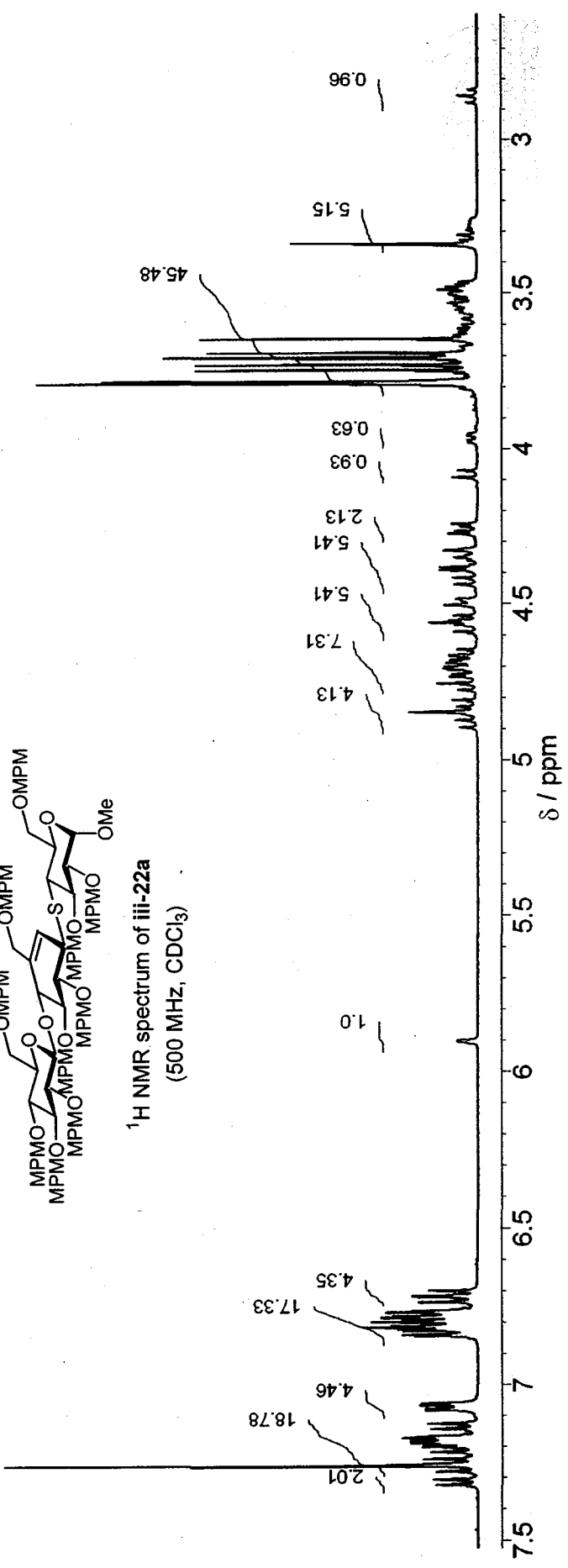
1985.96  
 1980.45  
 1978.23  
 1972.79  
 1913.79  
 1895.89  
 1895.25  
 1889.74  
 1887.95  
 1879.64  
 1878.28  
 1870.05  
 1840.33  
 1833.75  
 1832.74  
 1830.95  
 1826.23  
 1821.93  
 1820.14  
 1793.58  
 1788.71  
 1784.92  
 1782.77  
 1776.90  
 1775.97  
 1771.60  
 1767.66  
 1766.79  
 1748.98  
 1744.61  
 1742.46  
 1740.10  
 1686.54  
 1682.32  
 1677.74  
 1674.30  
 1665.42

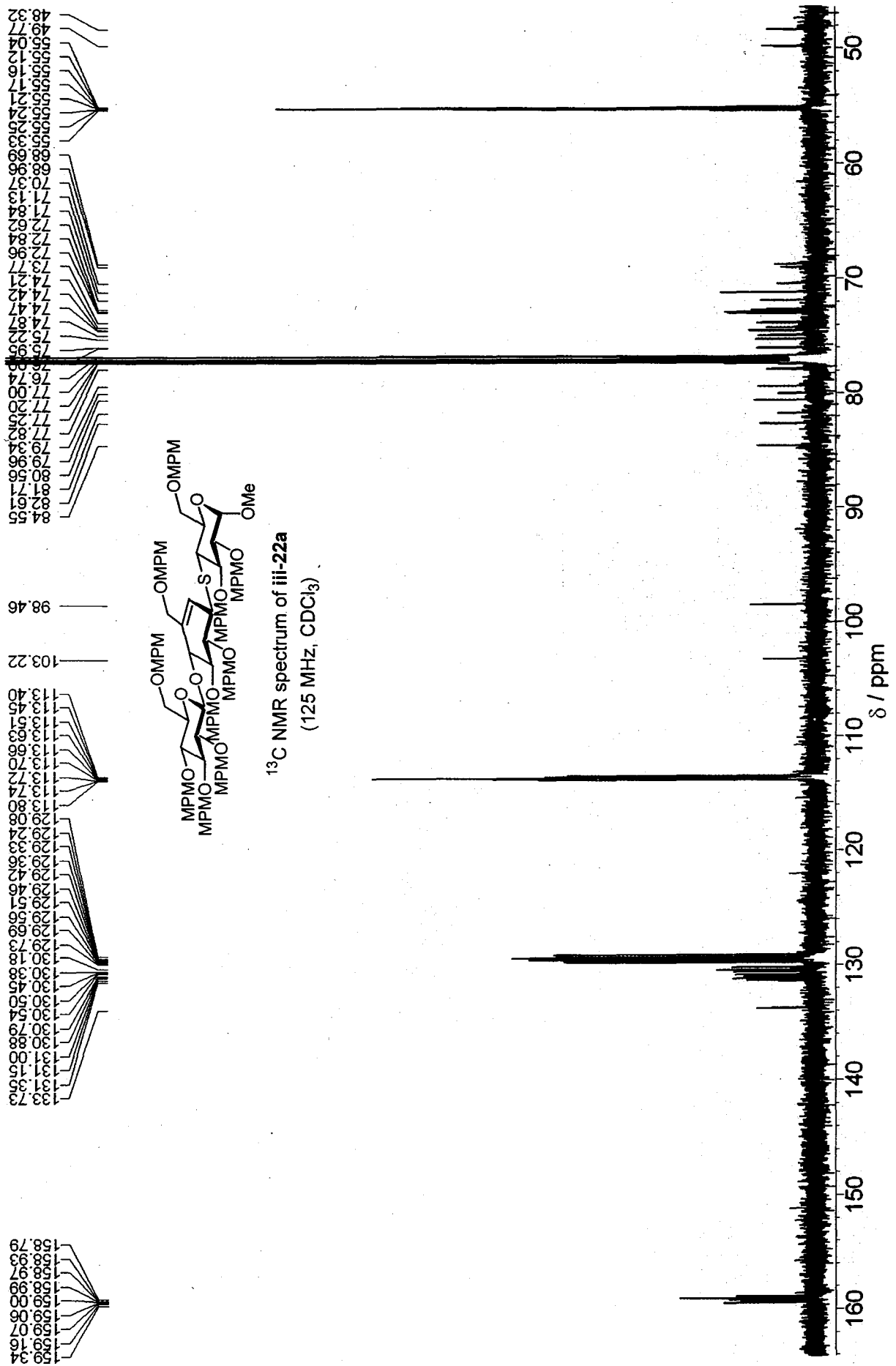
2435.38  
 2423.85  
 15.422412.97  
 2391.63  
 2380.82  
 2366.72  
 2359.20  
 2356.19  
 15.692332.49  
 2324.47  
 2317.60  
 2312.80  
 2306.79  
 2278.22  
 2267.63  
 2252.38  
 2247.15  
 2228.18  
 2217.72  
 2203.62  
 2201.76  
 2177.34  
 2165.89  
 2151.35  
 2146.27  
 2134.81

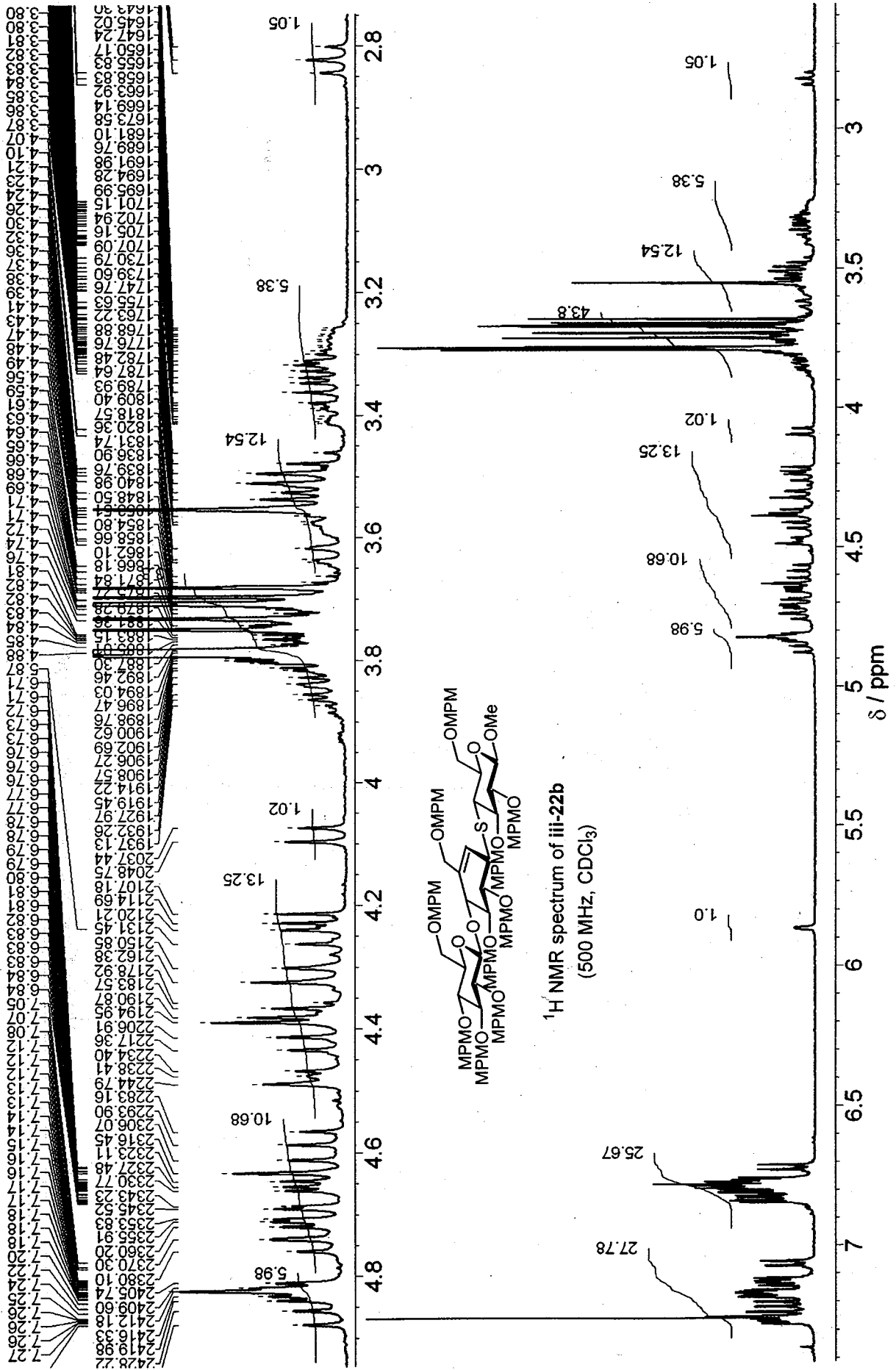




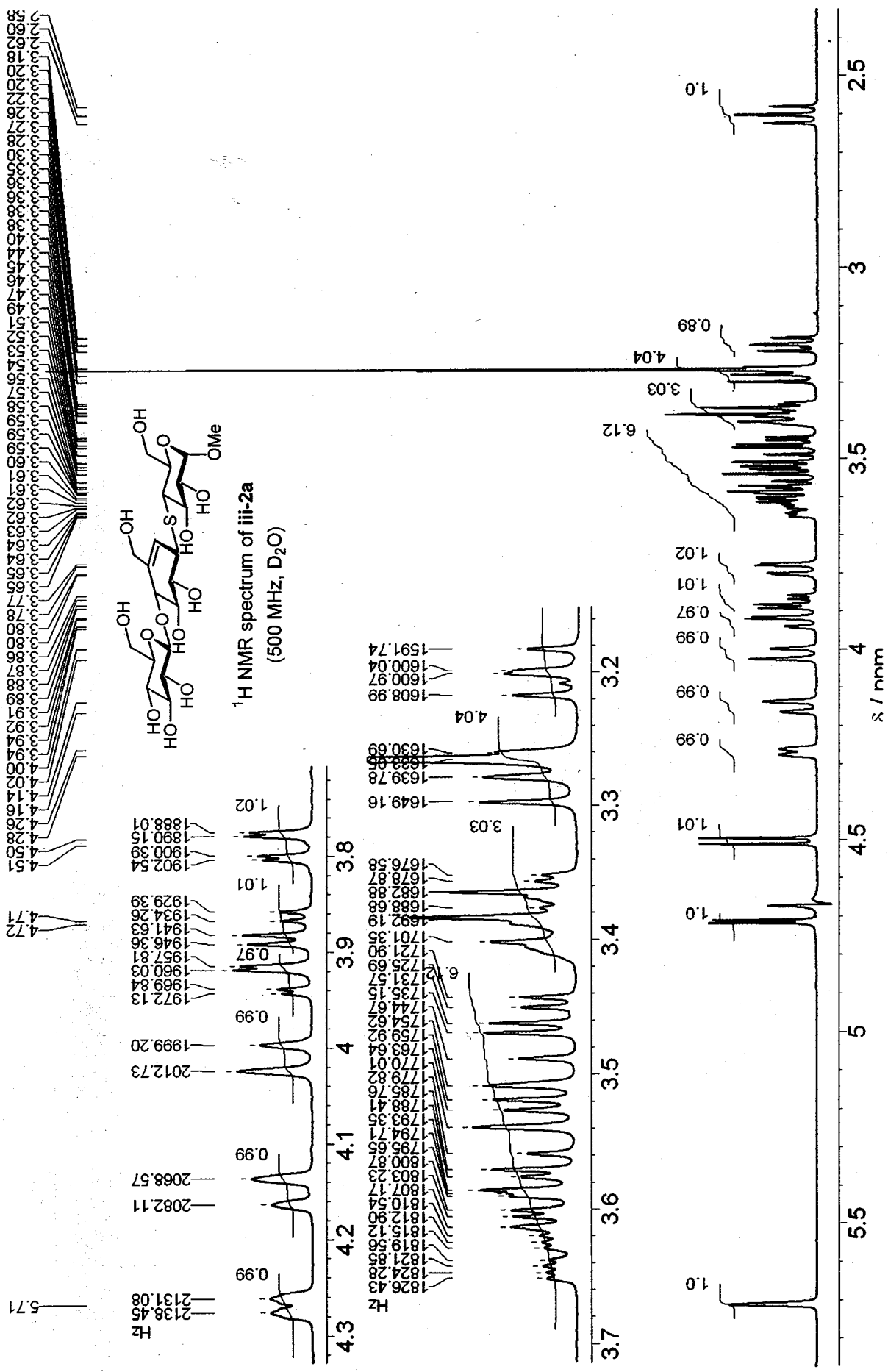
<sup>1</sup>H NMR spectrum of iii-22a  
 (500 MHz, CDCl<sub>3</sub>)

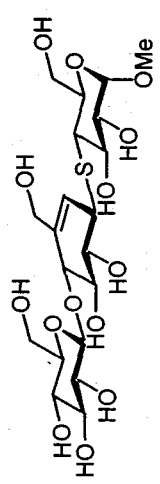




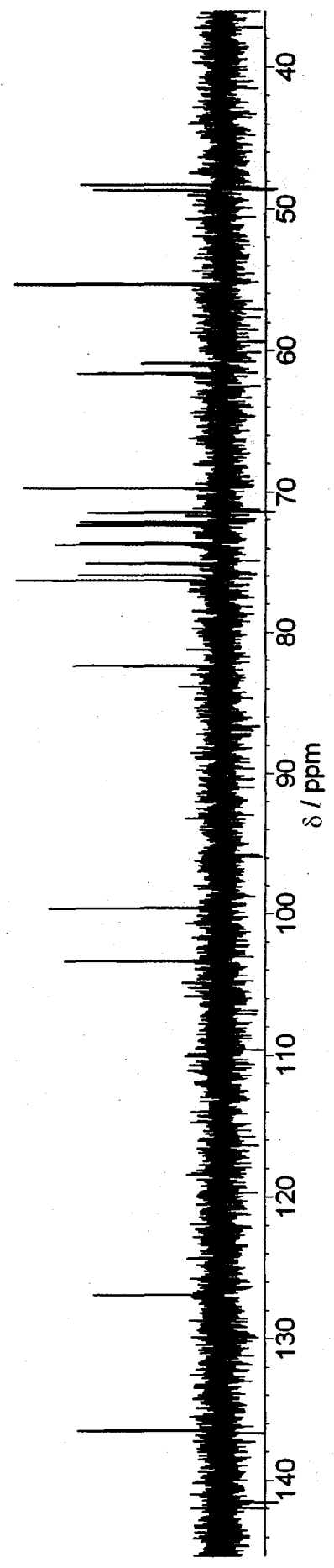


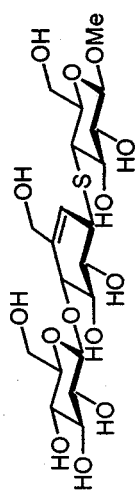
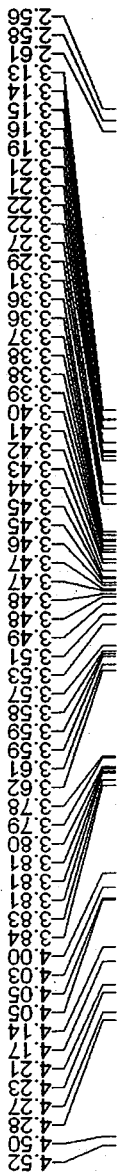




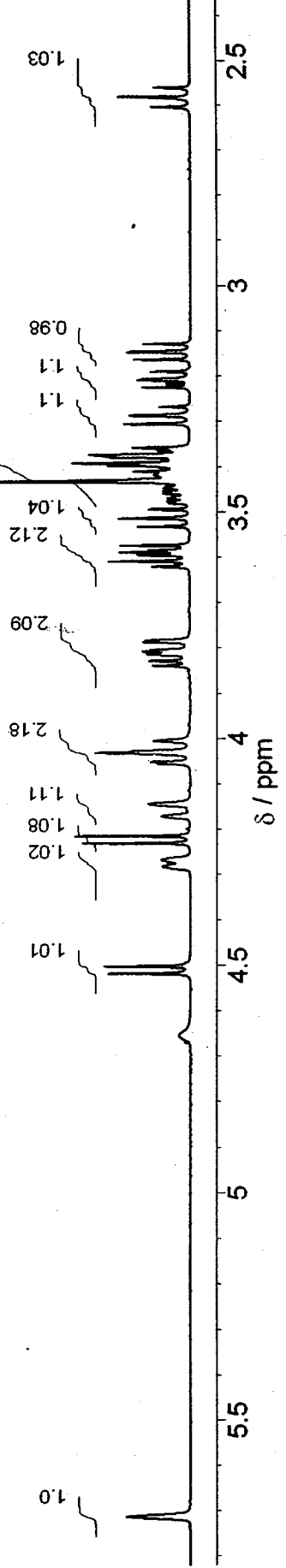
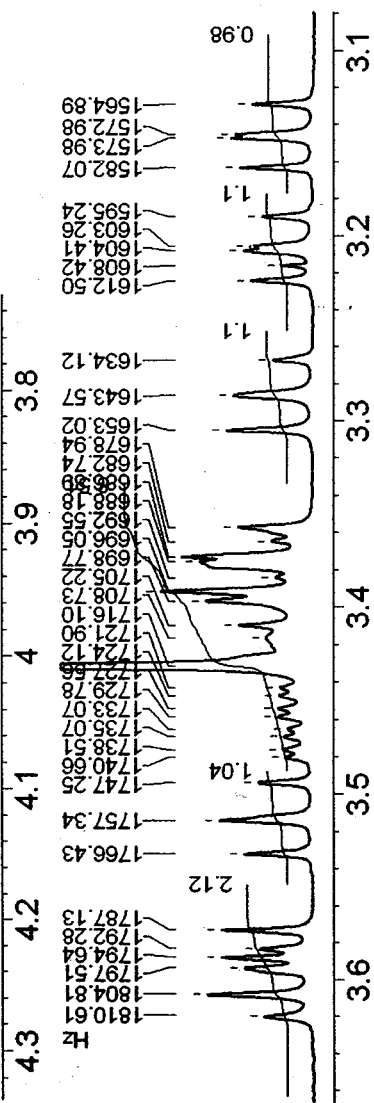
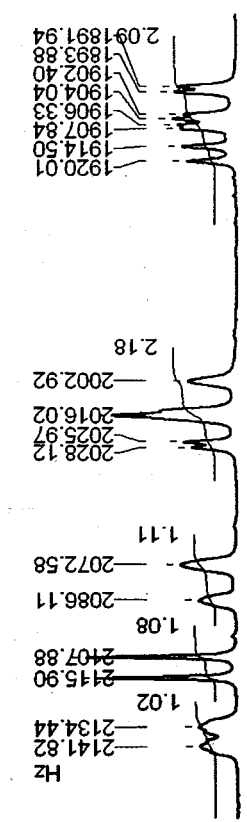


<sup>13</sup>C NMR spectrum of iii-2a  
(125 MHz, D<sub>2</sub>O)

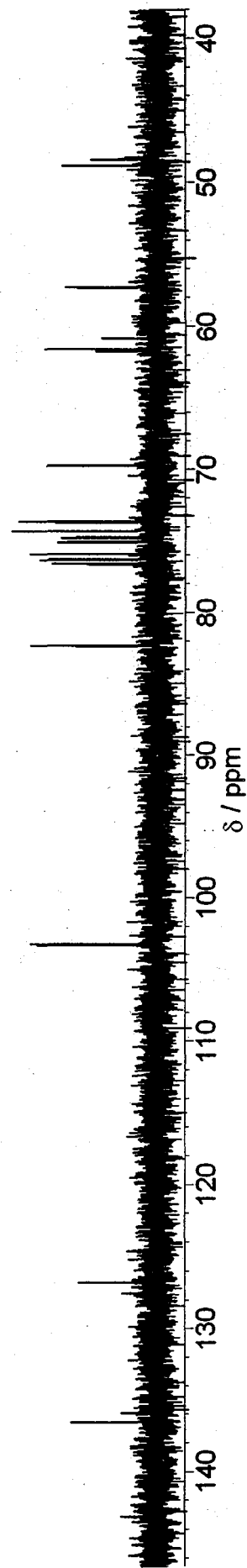
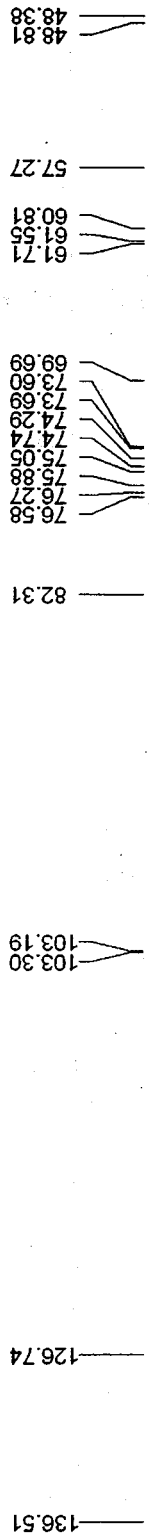




<sup>1</sup>H NMR spectrum of iii-2b  
(500 MHz, D<sub>2</sub>O)









20.54  
20.44  
20.41  
20.36  
20.32  
20.28  
20.13  
20.08

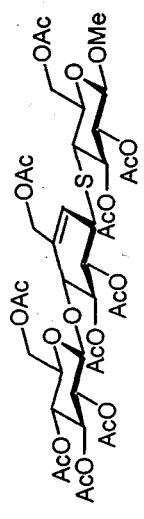
48.64  
45.25

56.21  
61.59  
63.66  
63.96  
68.29  
69.99  
70.61  
72.14  
72.48  
73.13  
73.53  
73.60  
74.33  
76.70

102.35  
101.55

131.50  
128.19  
129.09  
127.81  
127.10

169.11  
169.91  
169.76  
169.56  
169.53  
169.18  
169.12  
169.07



<sup>13</sup>C NMR spectrum of iii-23b  
(125 MHz, C<sub>6</sub>D<sub>6</sub>)

