Development of an Orthogonal Protection Strategy for the Synthesis of Mycobacterial Arabinomannan Fragments

Kamar Sahloul and Todd L. Lowary*

Supporting Information

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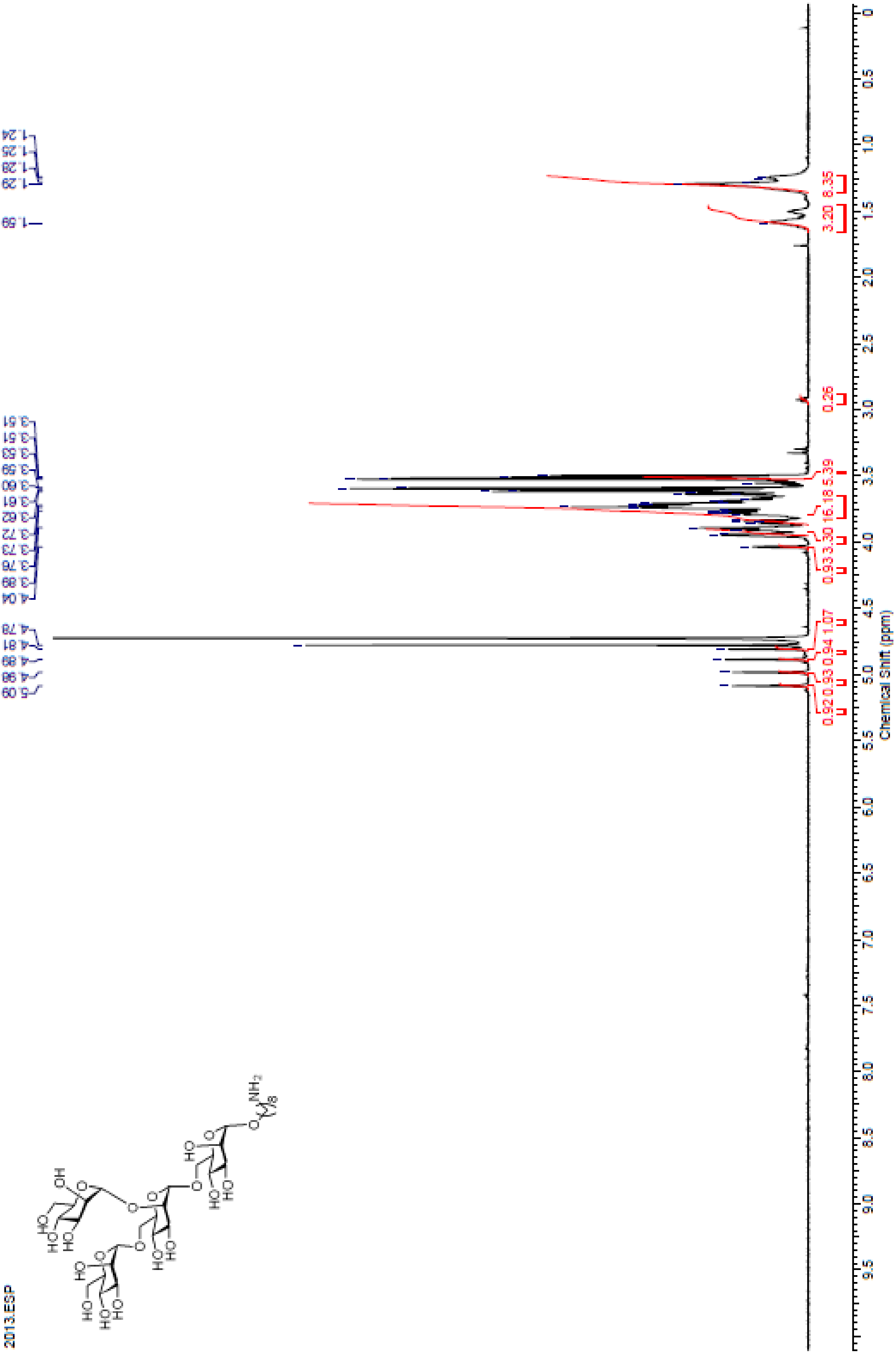
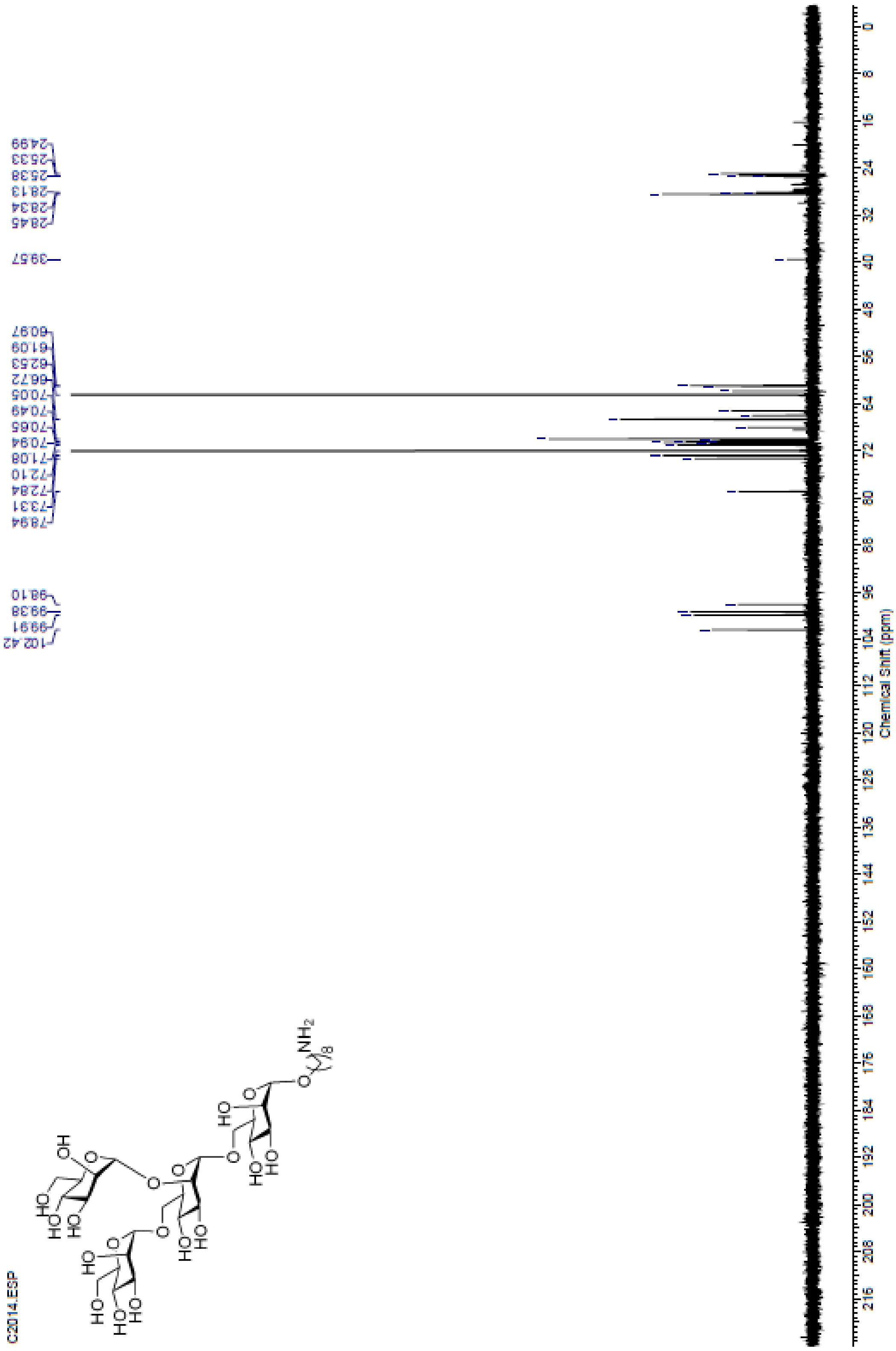
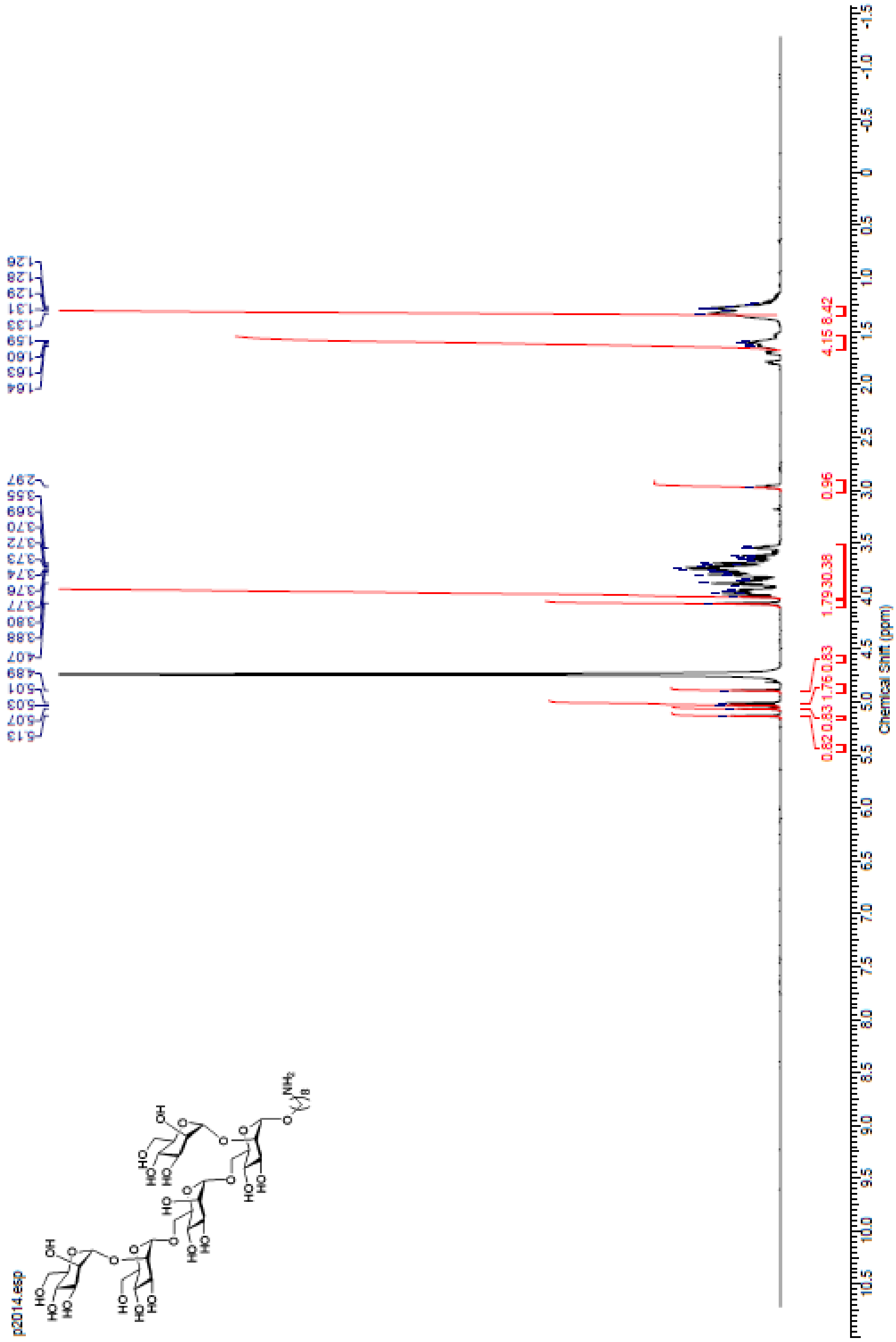
^{1}H NMR for compound **1** (600 MHz, D_2O)



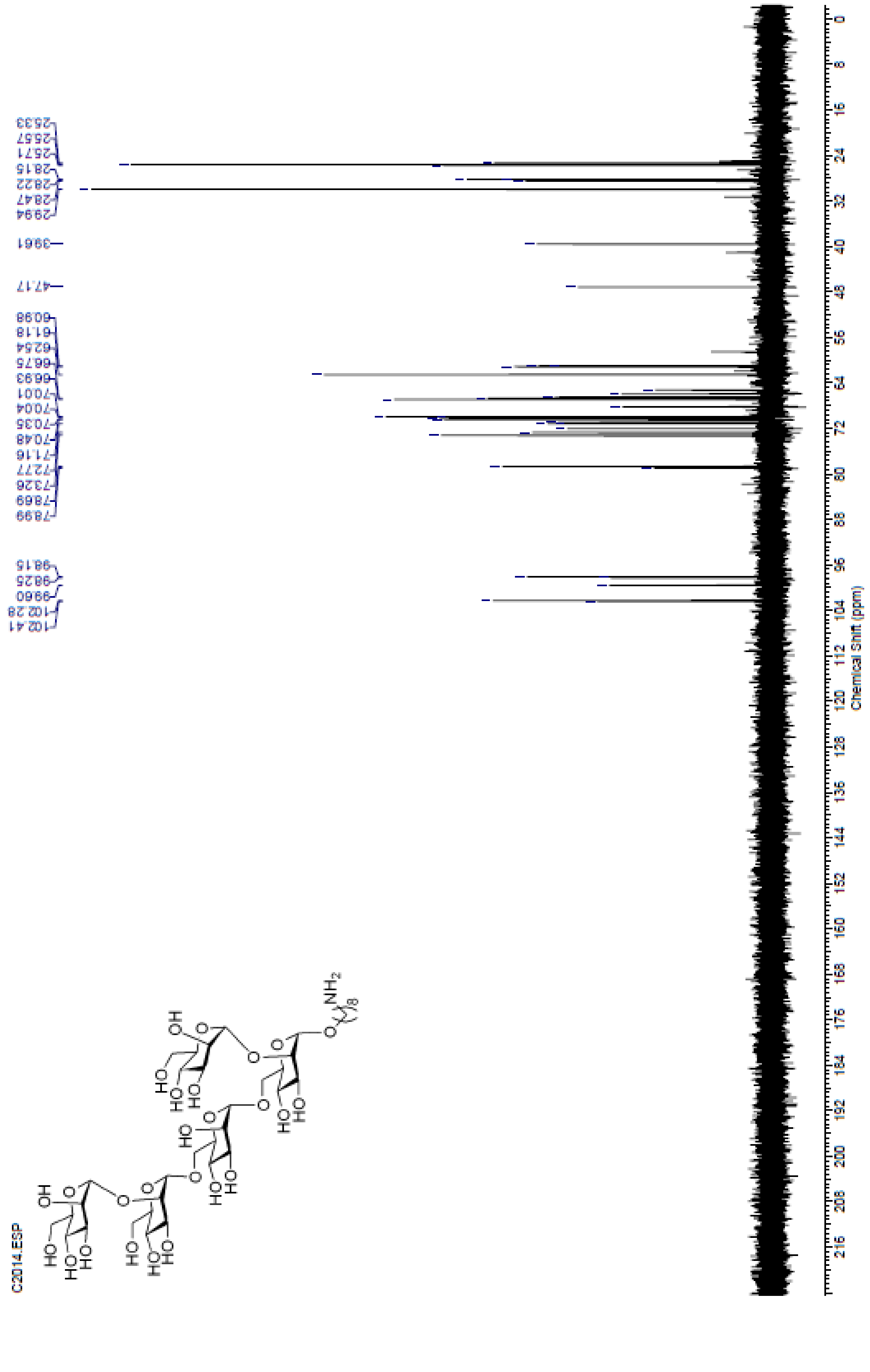
^{13}C NMR for compound **1** (126 MHz, D_2O)



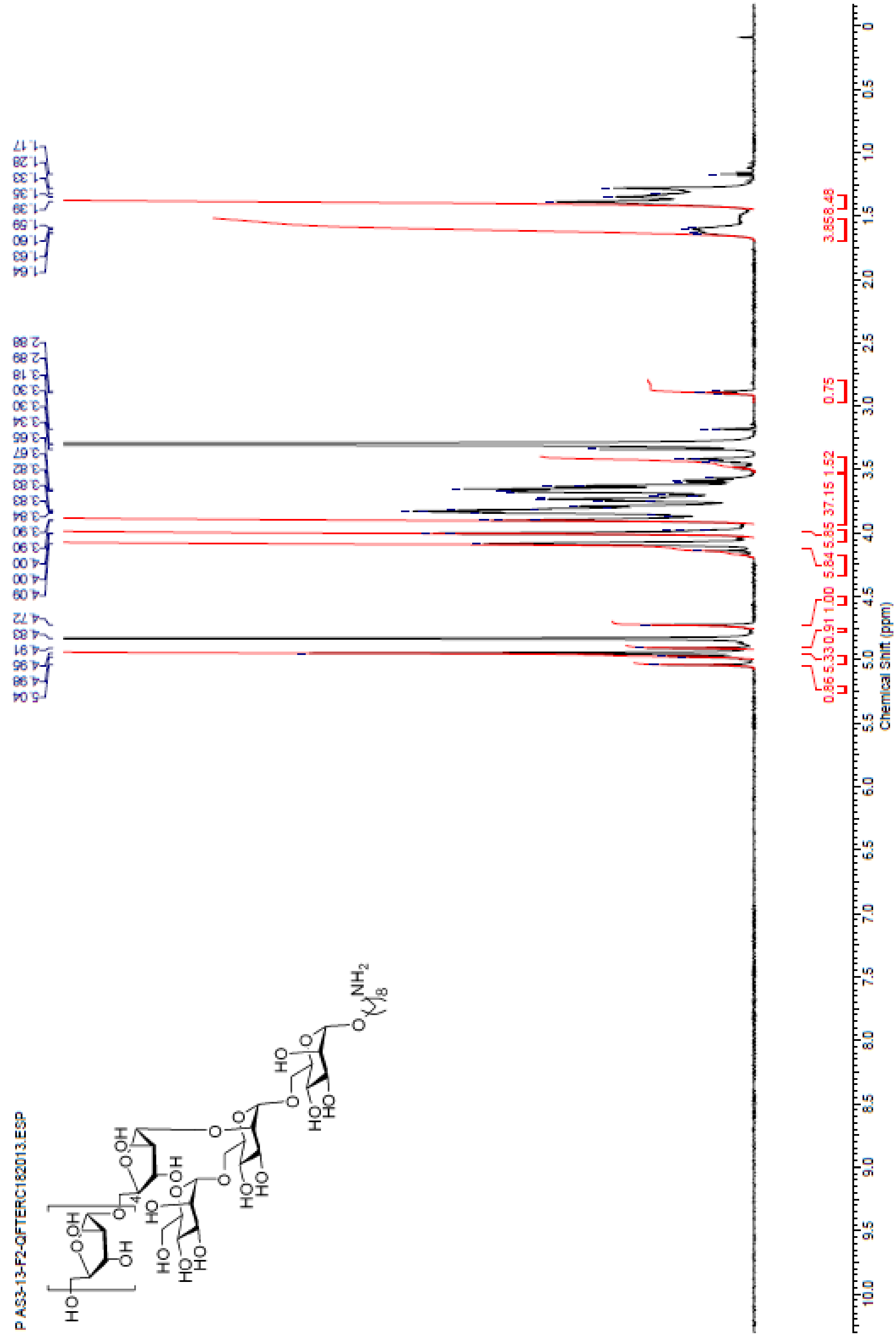
^{1}H NMR for compound **2** (700 MHz, D_2O)



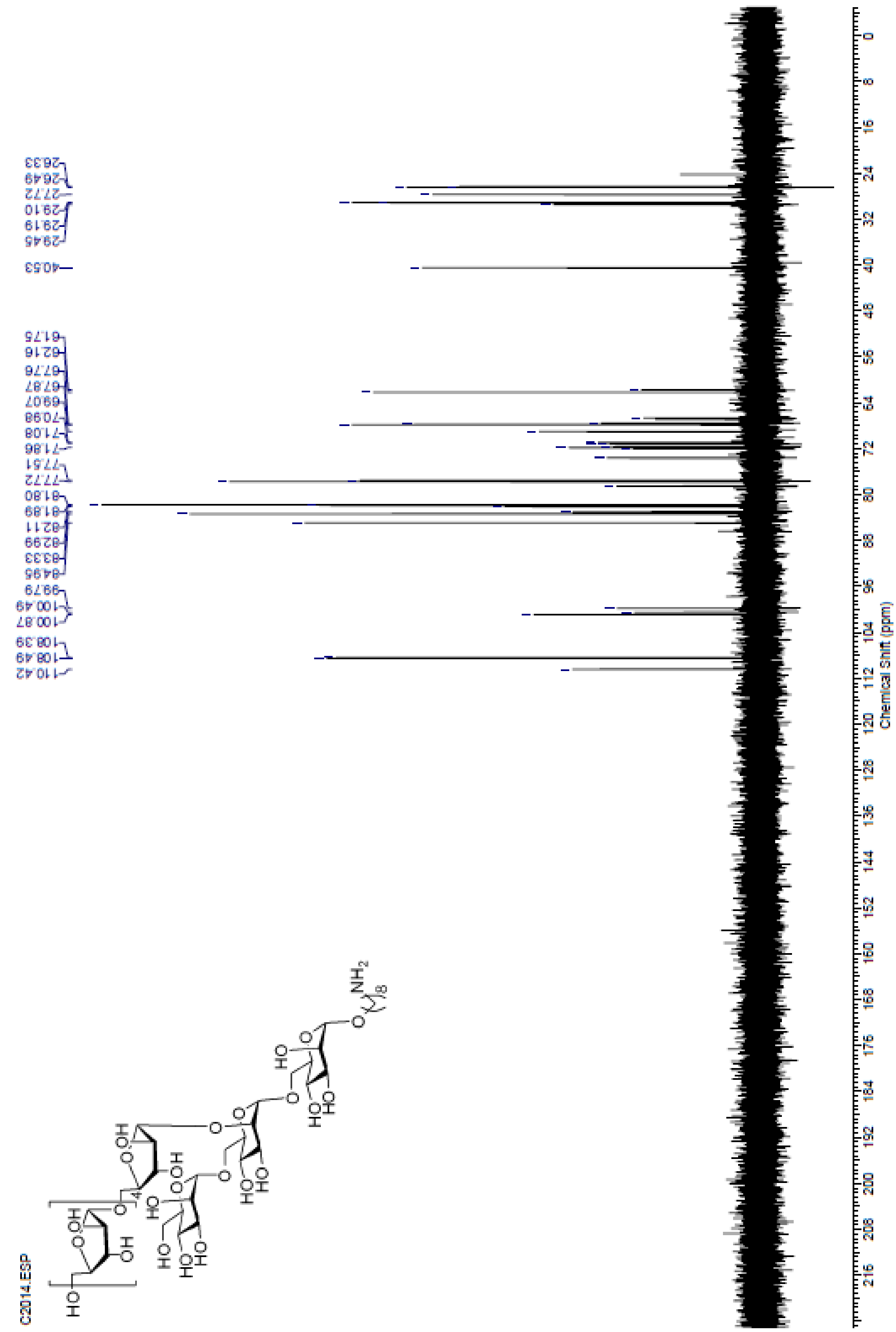
^{13}C NMR for compound **2** (151 MHz, D_2O)



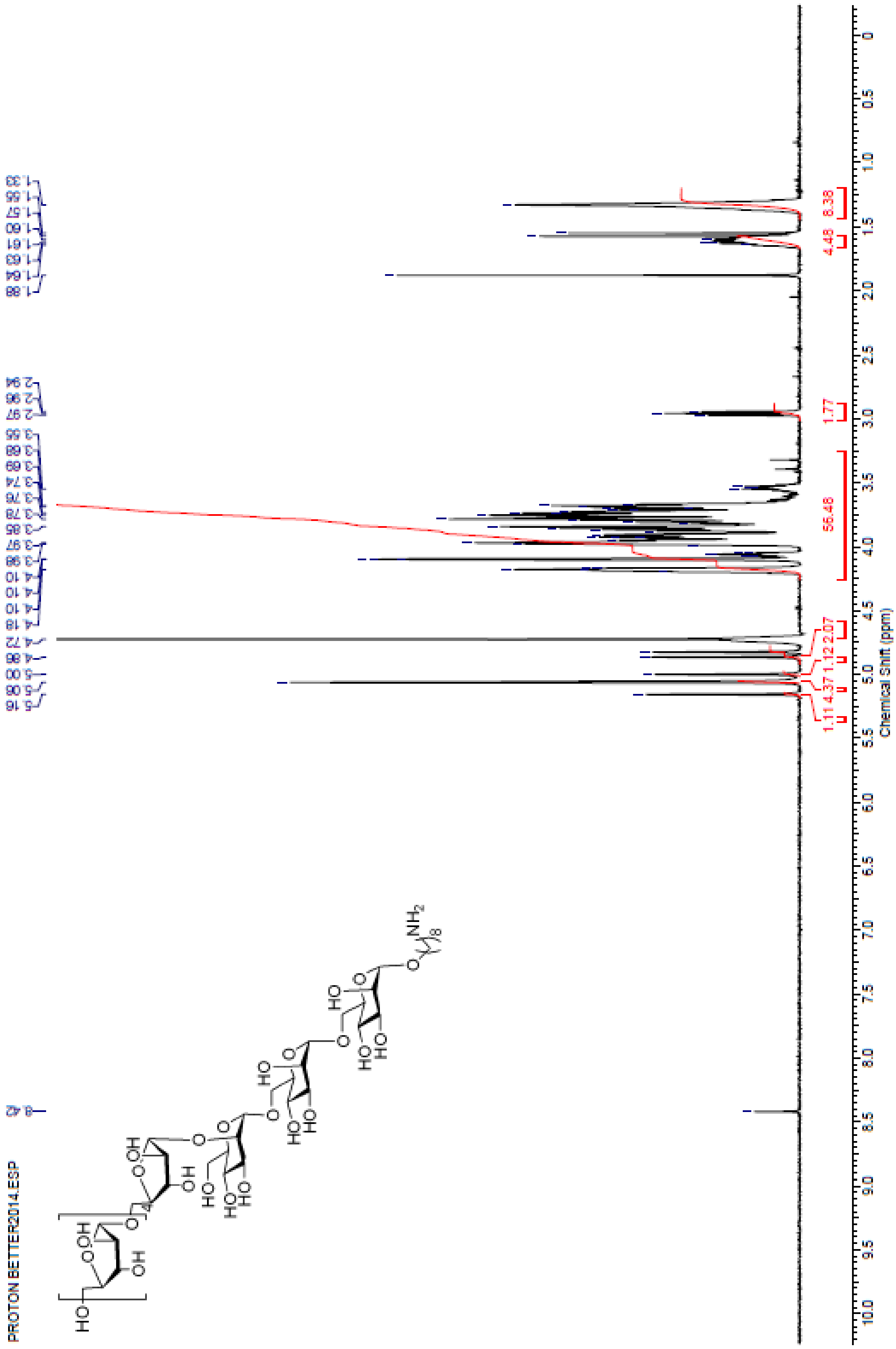
[1]H NMR for compound **3** (600 MHz, CD_3OD)



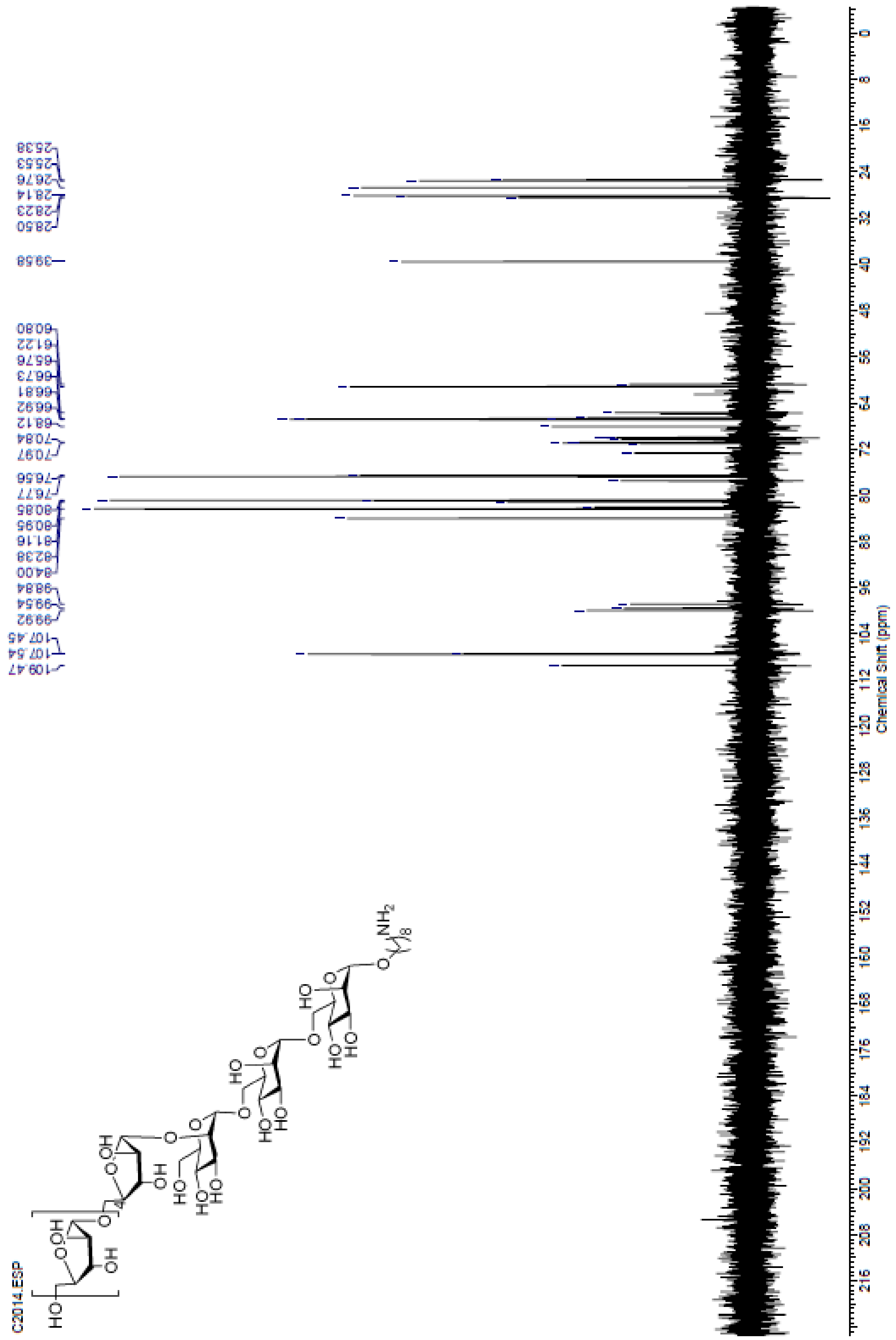
^{13}C NMR for compound **3** (126 MHz, D_2O)



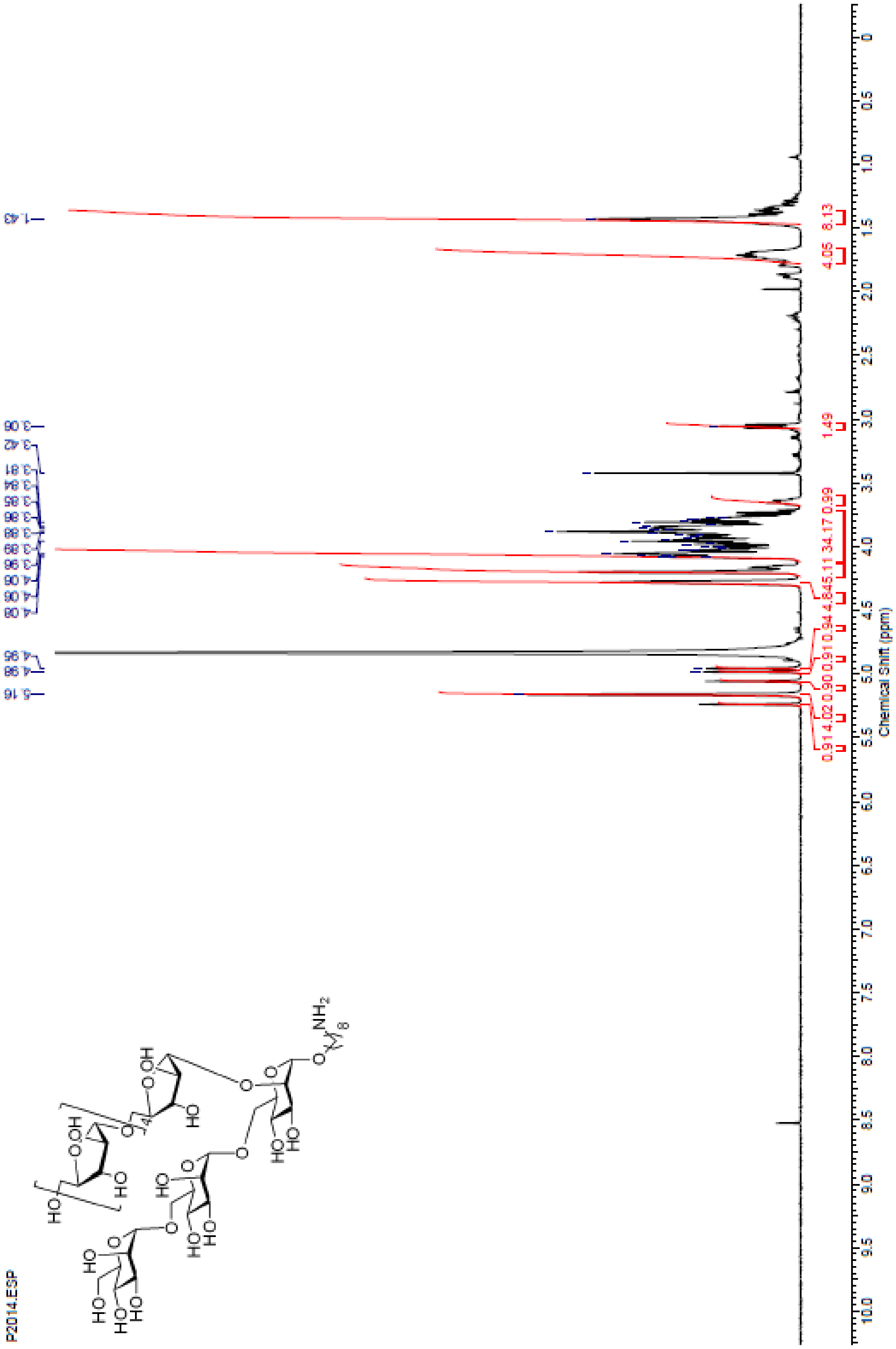
^{1}H NMR for compound **4** (500 MHz, D_2O)



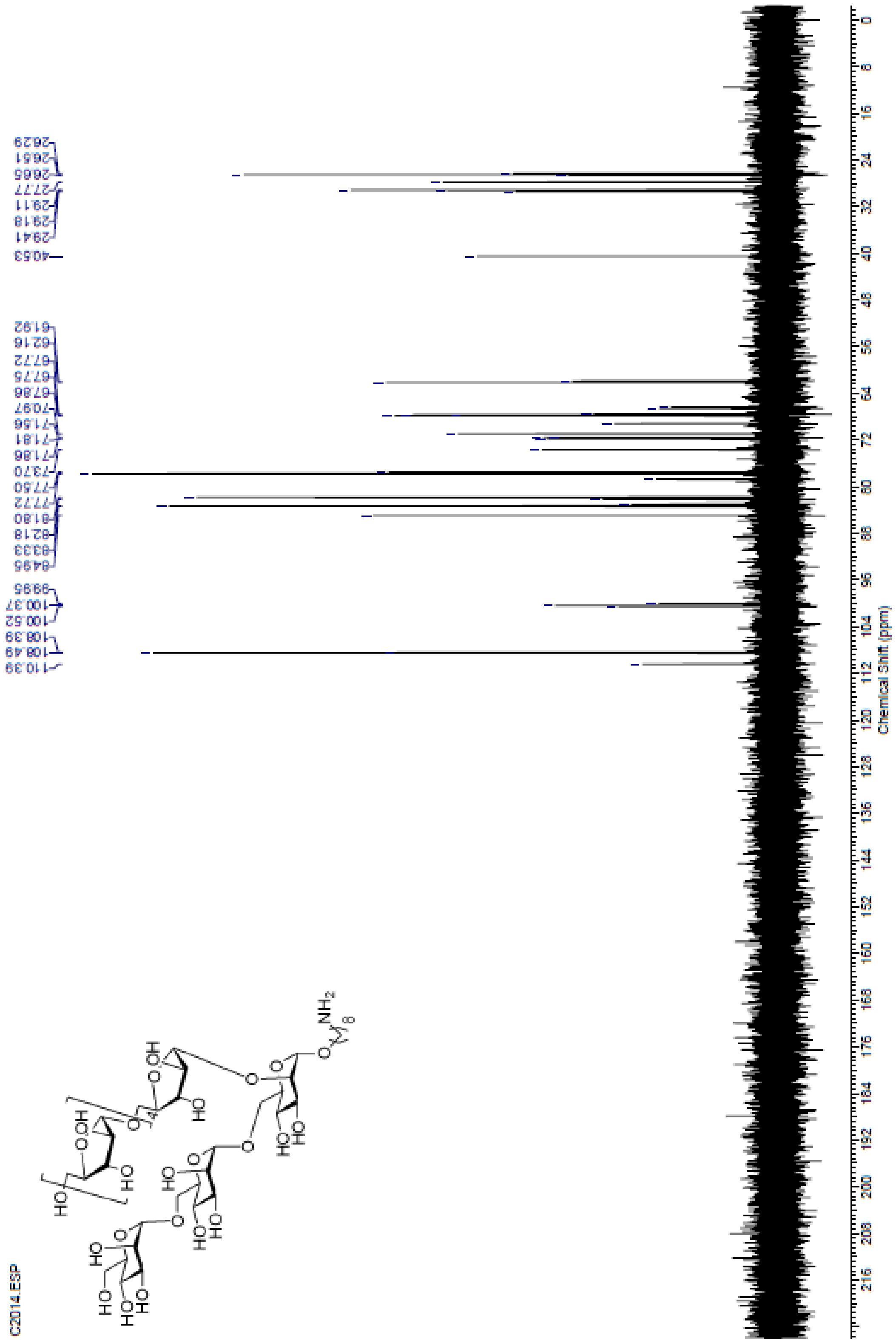
^{13}C NMR for compound **4** (126 MHz, D_2O)



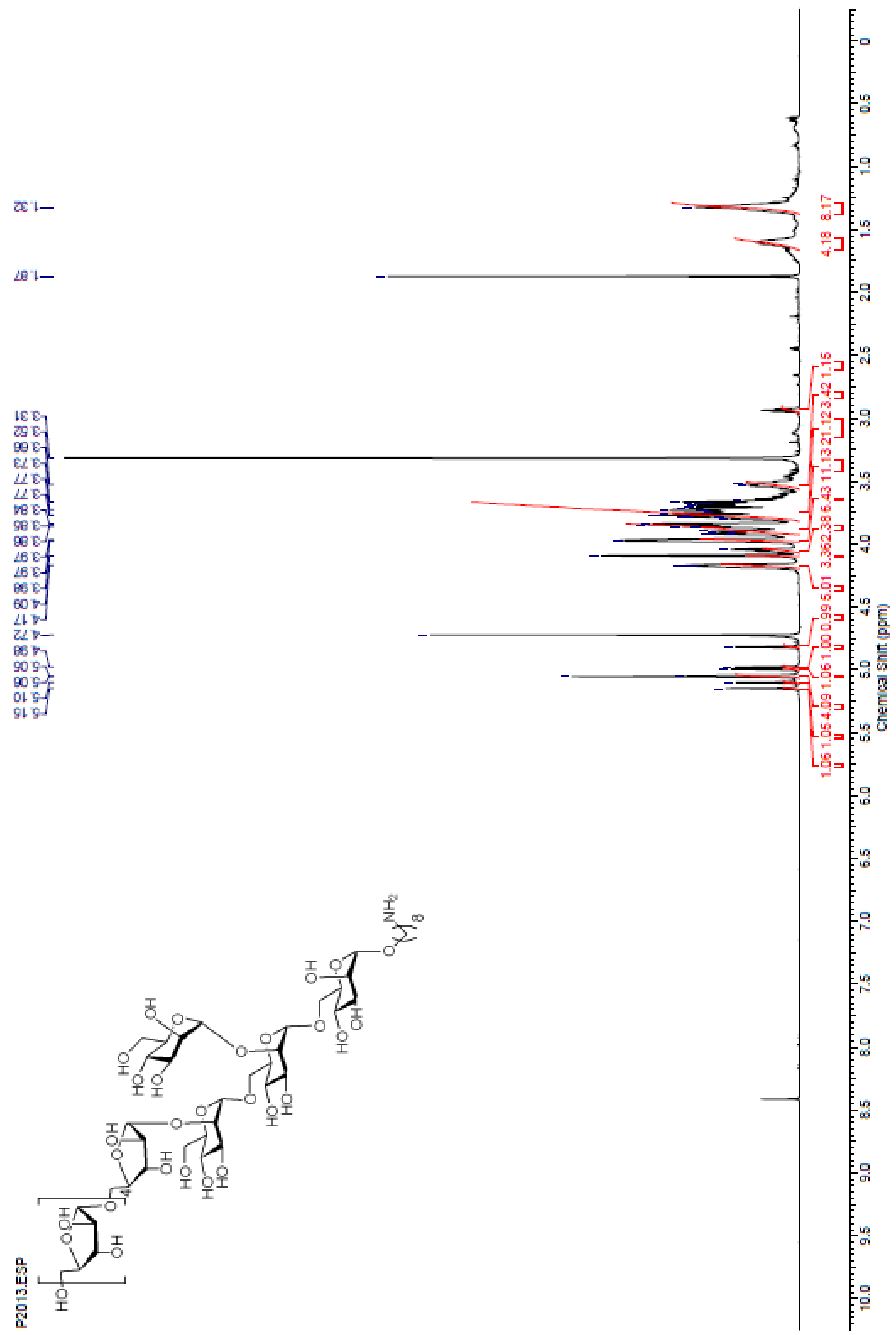
[1]H NMR for compound **5** (700 MHz, D_2O)



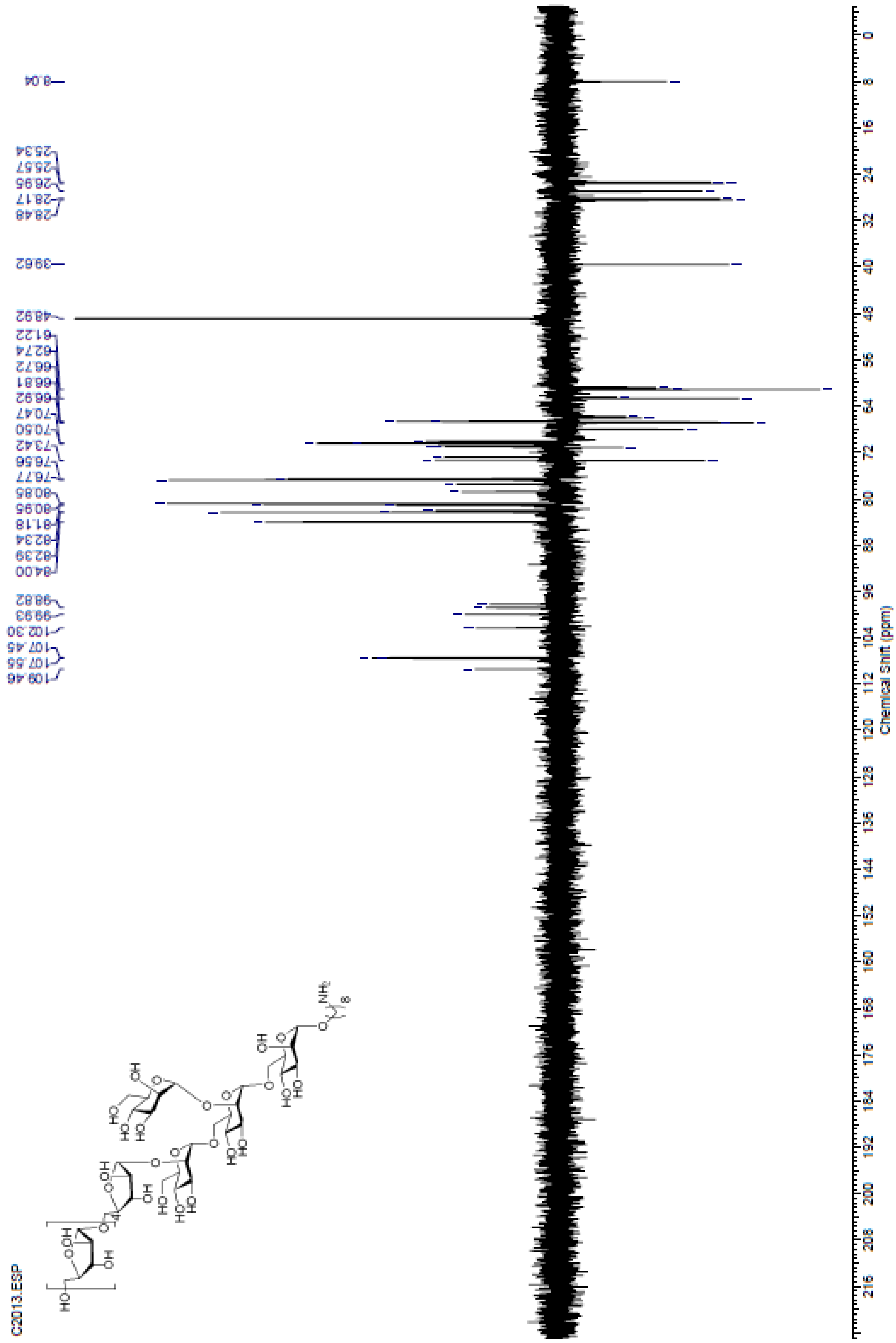
^{13}C NMR for compound **5** (126 MHz, D_2O)



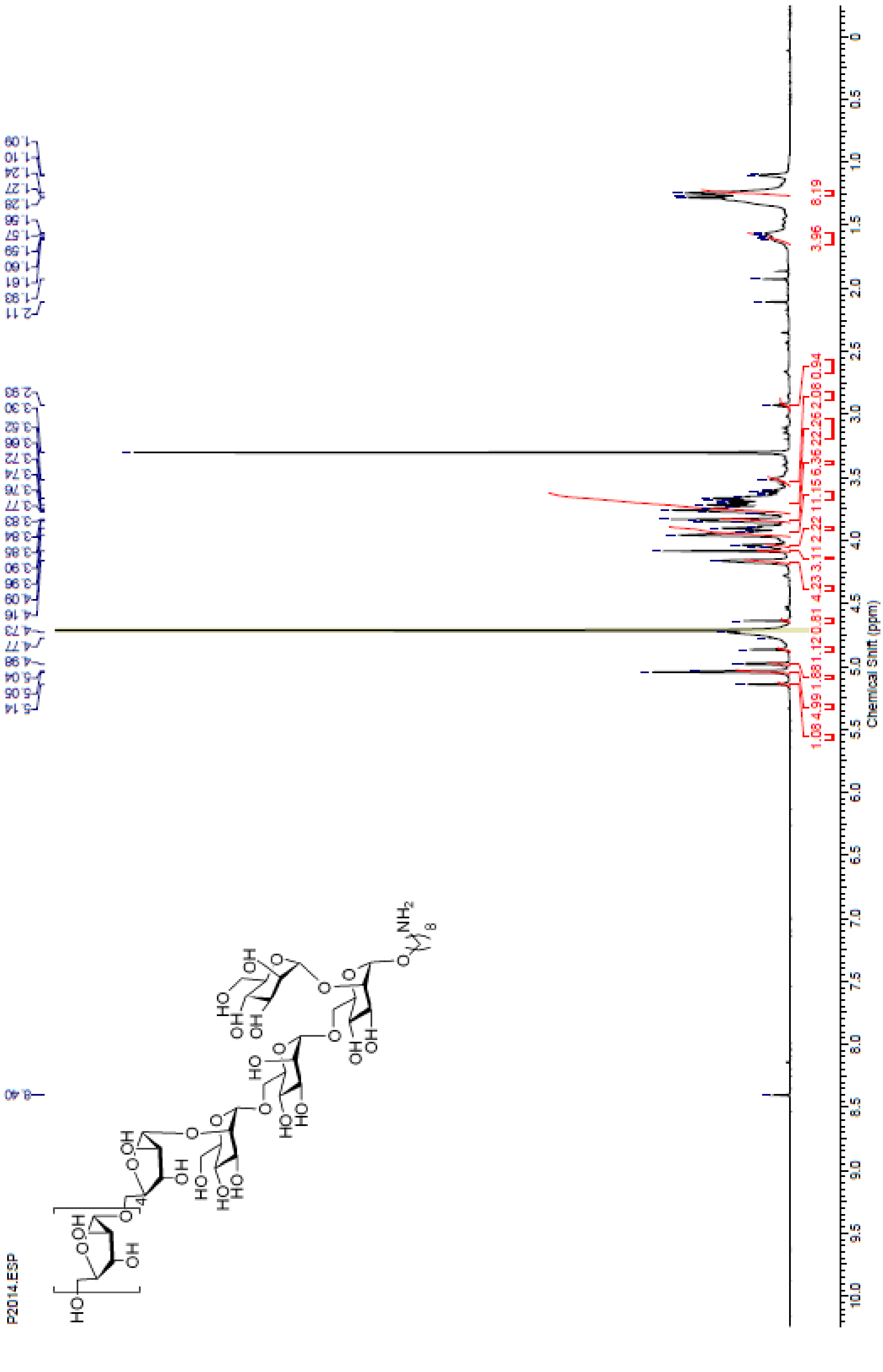
^{1}H NMR for compound **6** (600 MHz, D_2O)



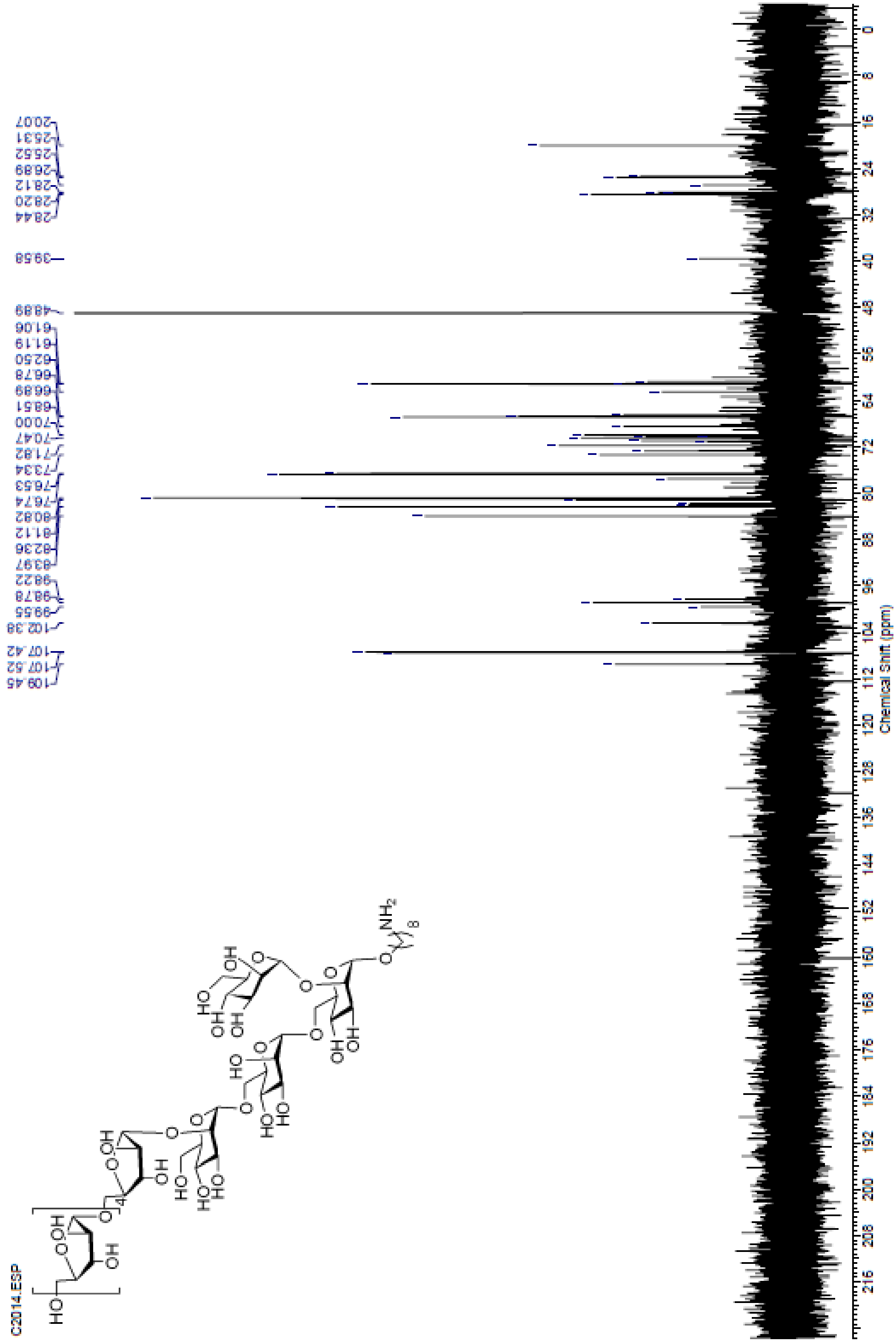
^{13}C NMR for compound **6** (126 MHz, D_2O)



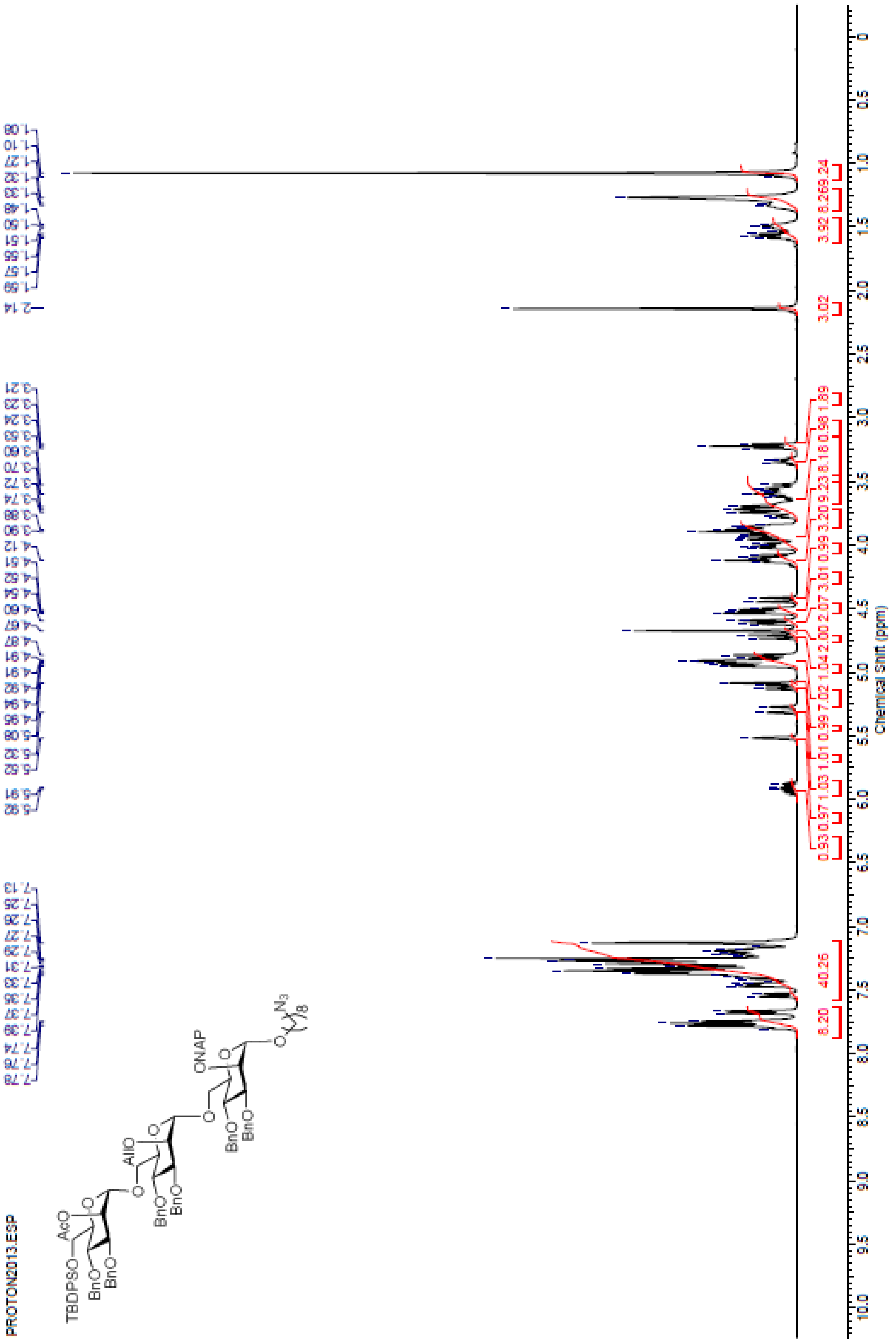
^{1}H NMR for compound **7** (700 MHz, D_2O)



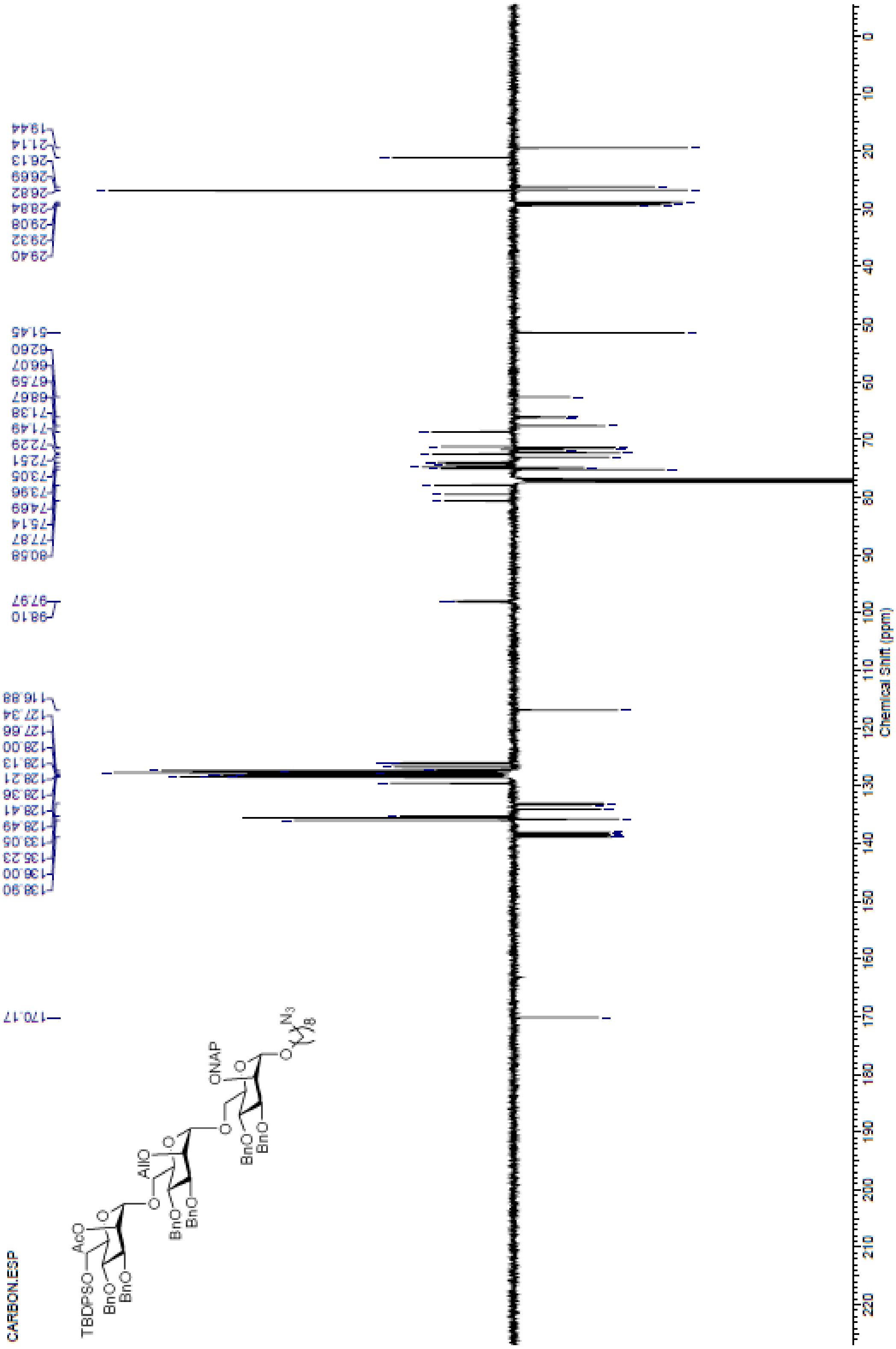
^{13}C NMR for compound **7** (176 MHz, D_2O)



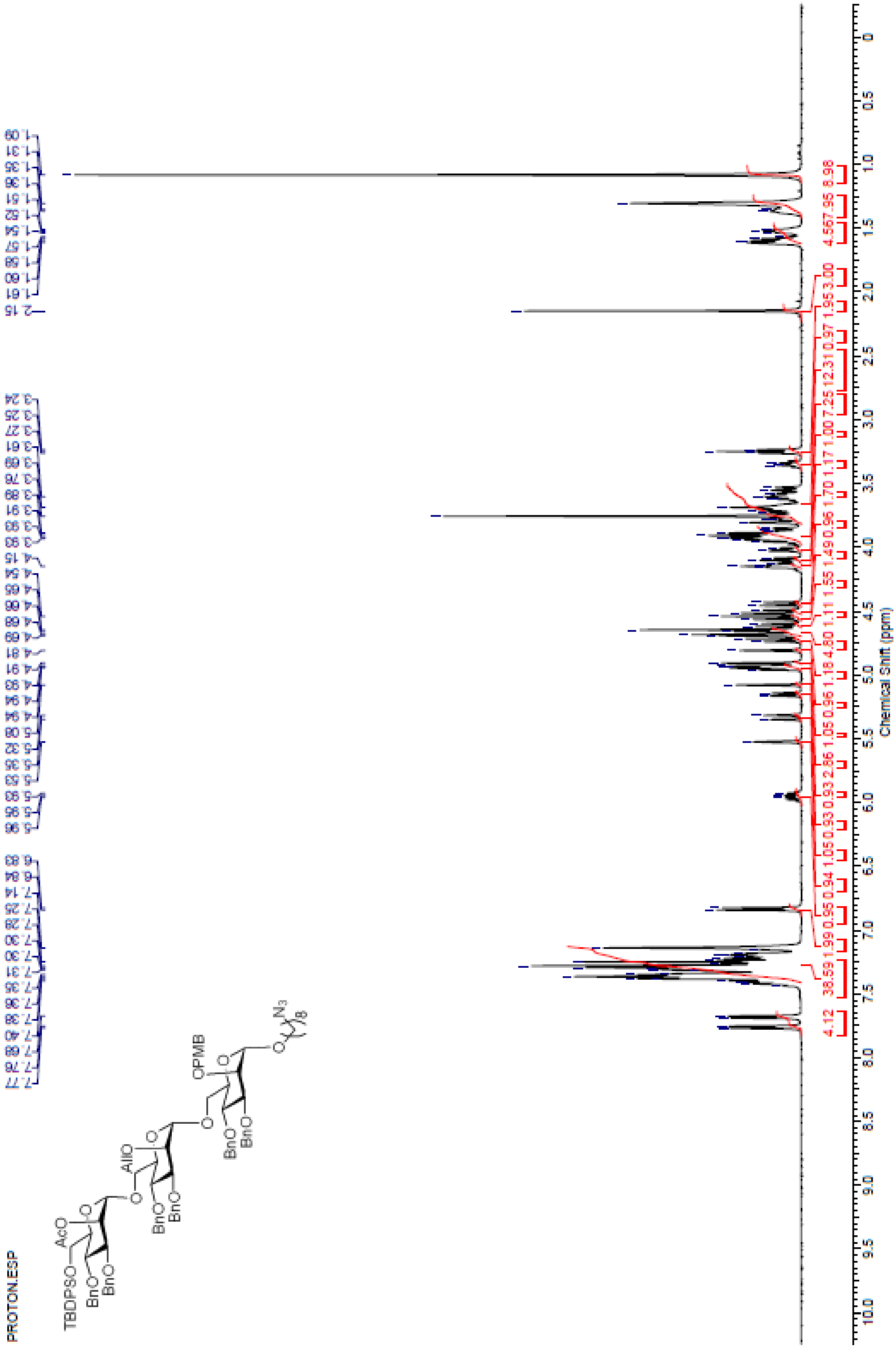
^{1}H NMR for compound **8** (400 MHz, $CDCl_3$)



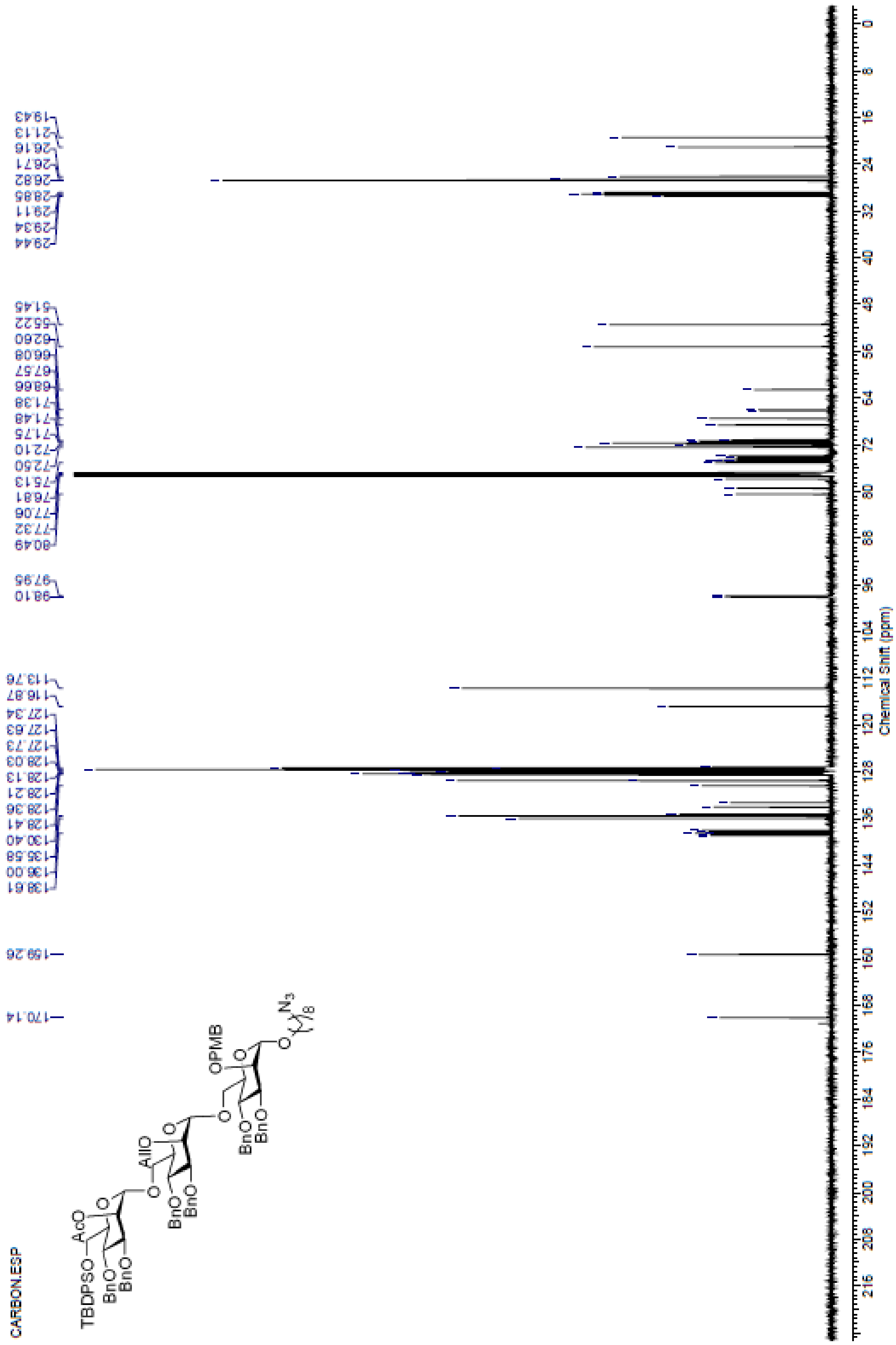
^{13}C NMR for compound **8** (126 MHz, $CDCl_3$)



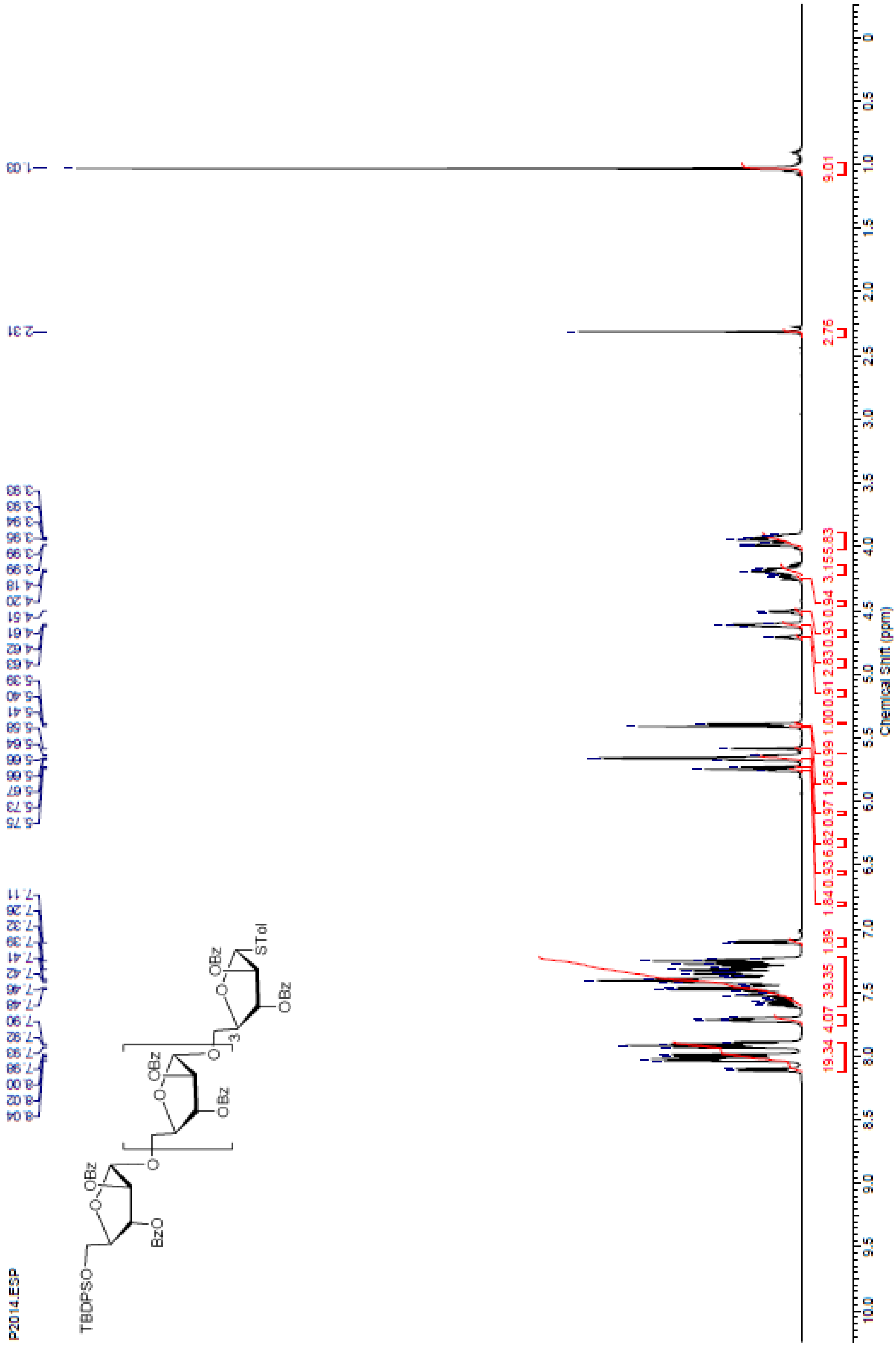
^{1}H NMR for compound **9** (500 MHz, $CDCl_3$)



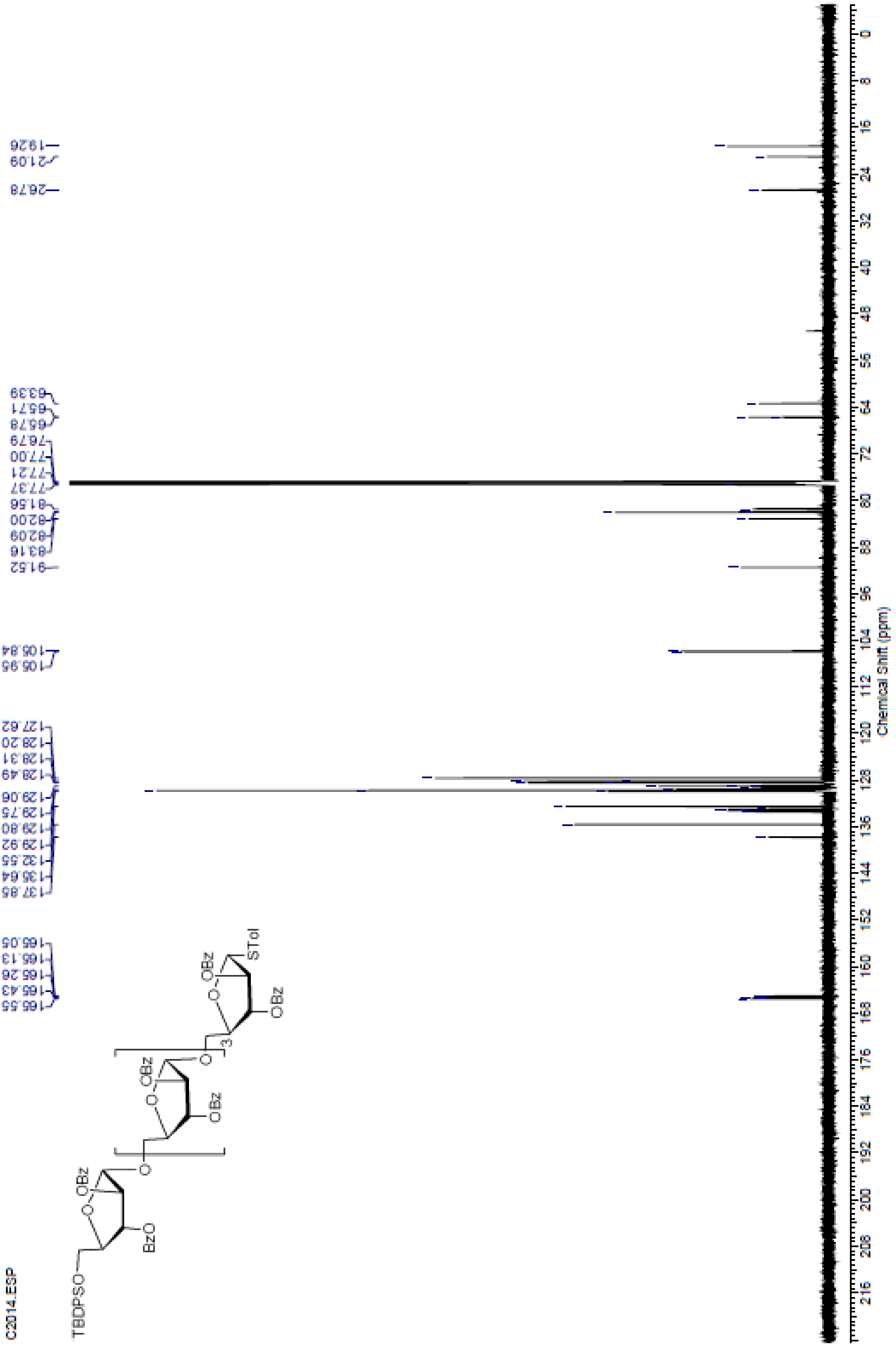
^{13}C NMR for compound **9** (126 MHz, $CDCl_3$)



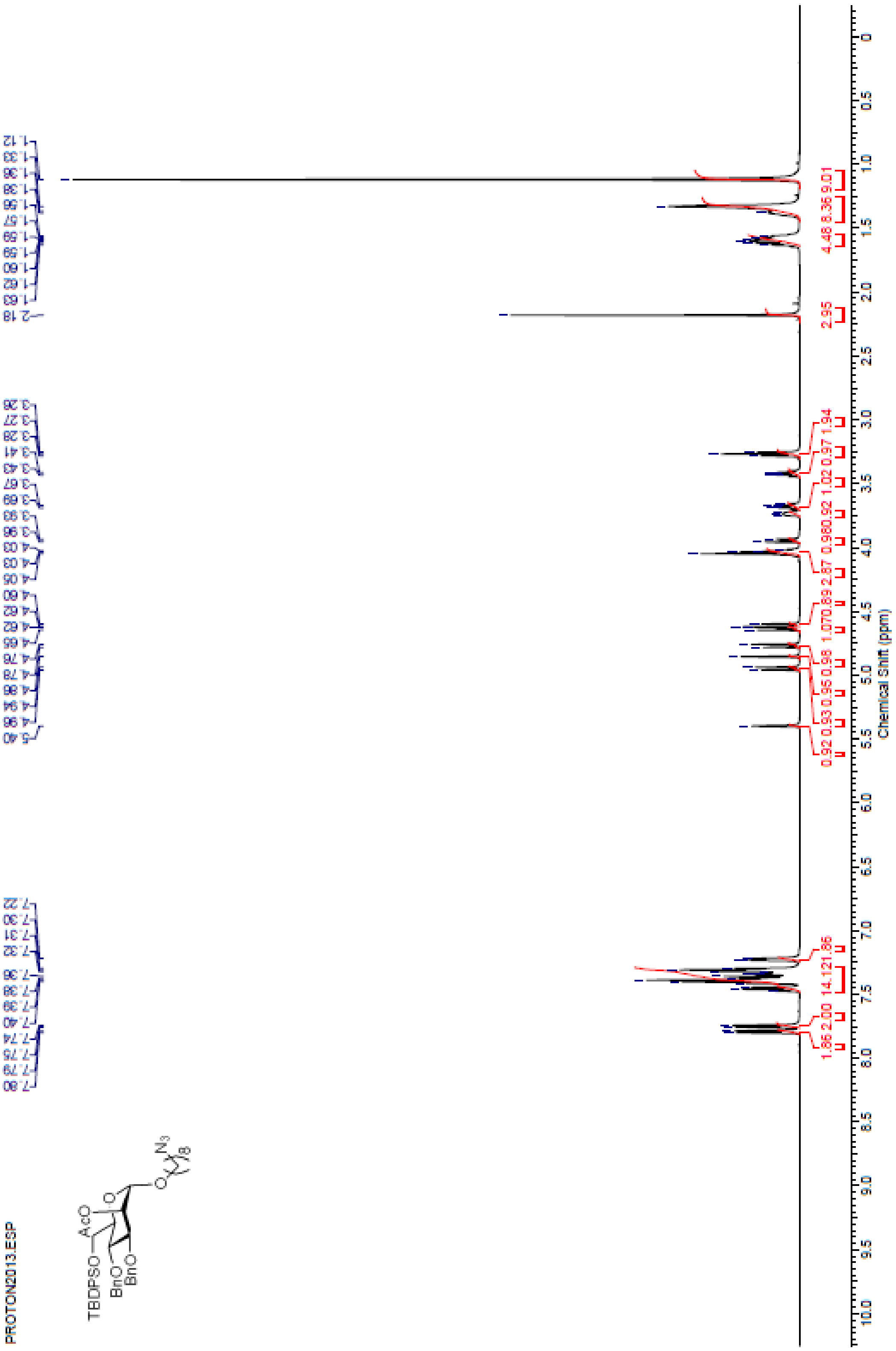
^{1}H NMR for compound **12** (600 MHz, $CDCl_3$)



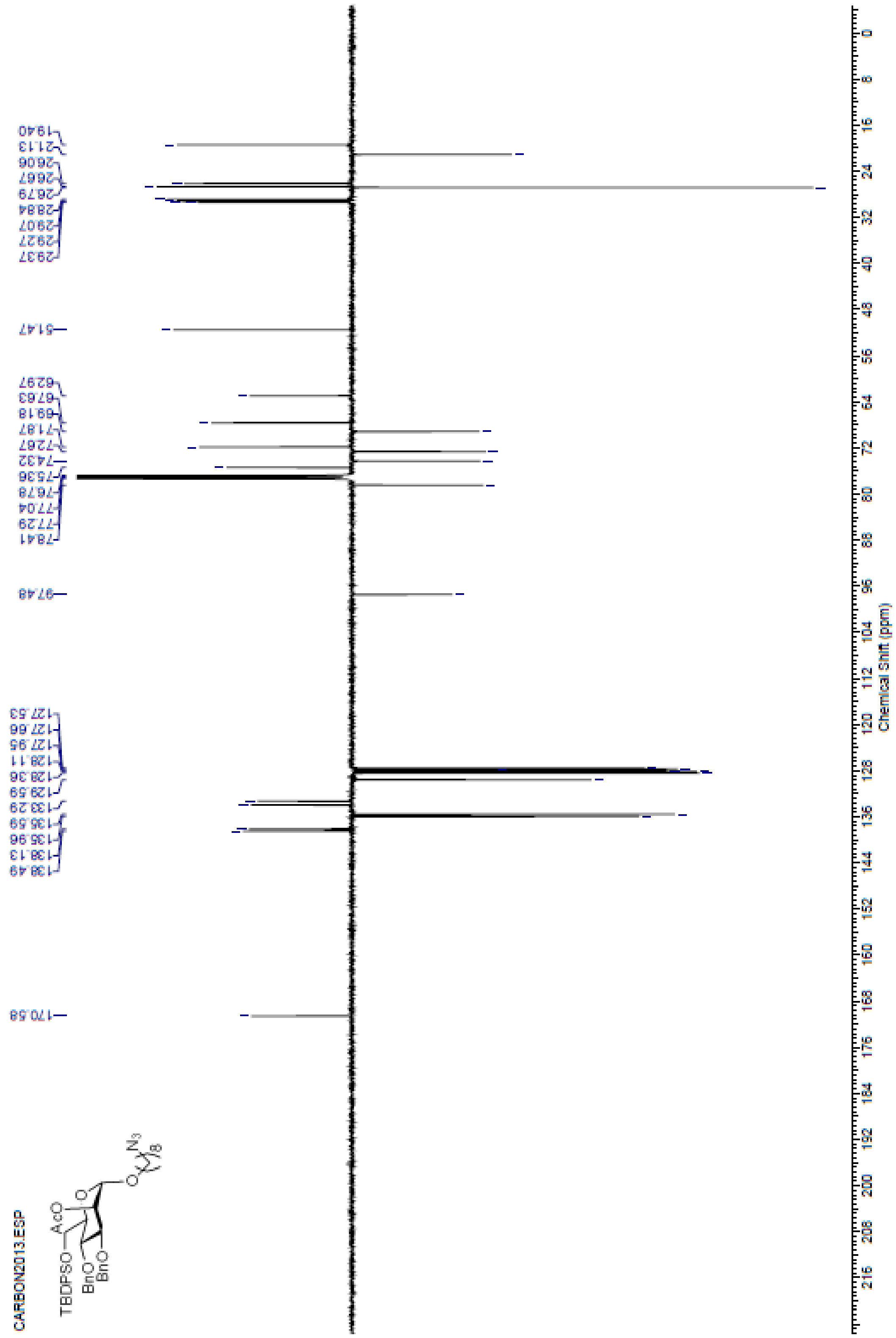
^{13}C NMR for compound **12** (151 MHz, $CDCl_3$)



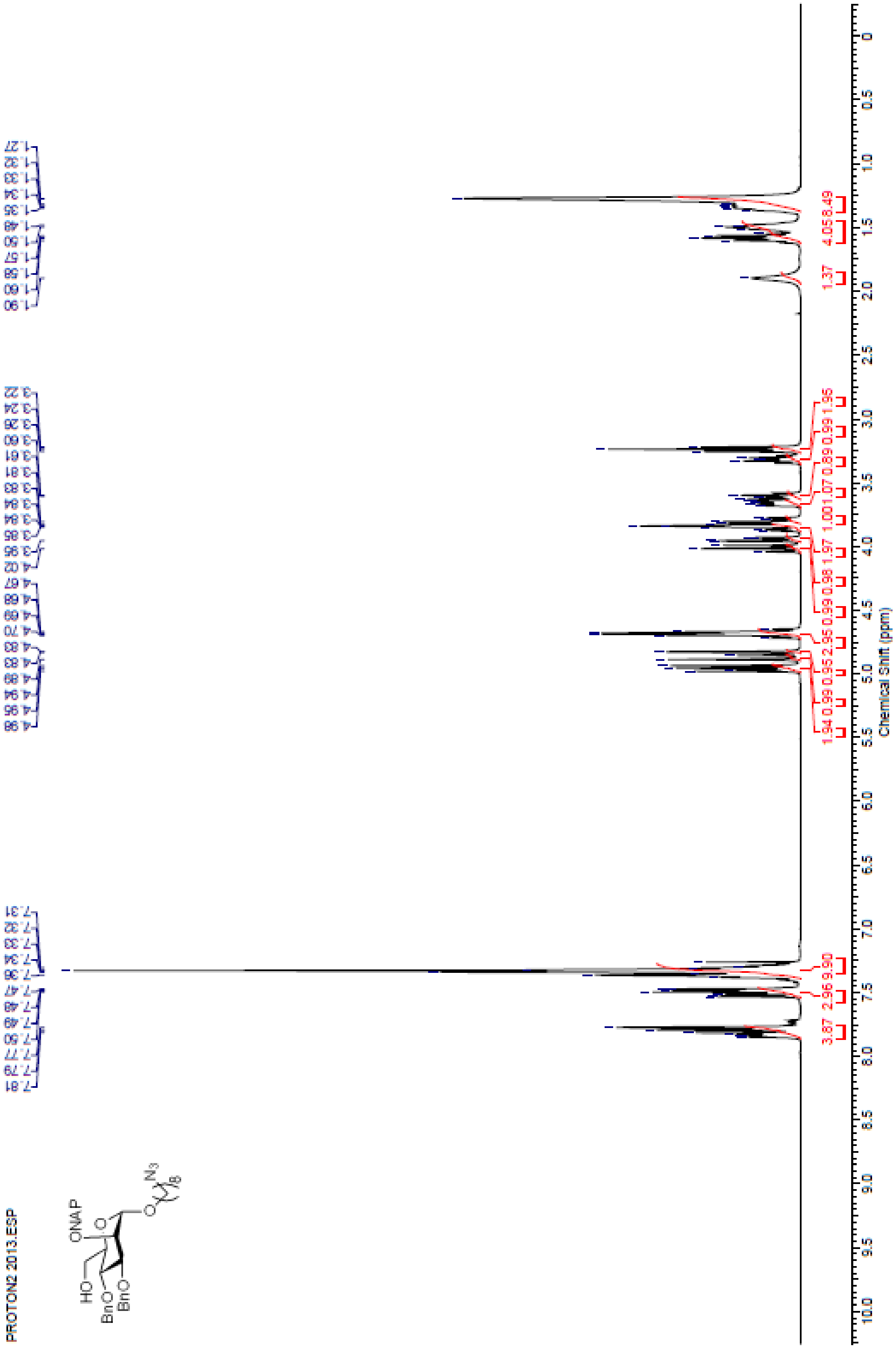
^{1}H NMR for compound **13** (500 MHz, $CDCl_3$)



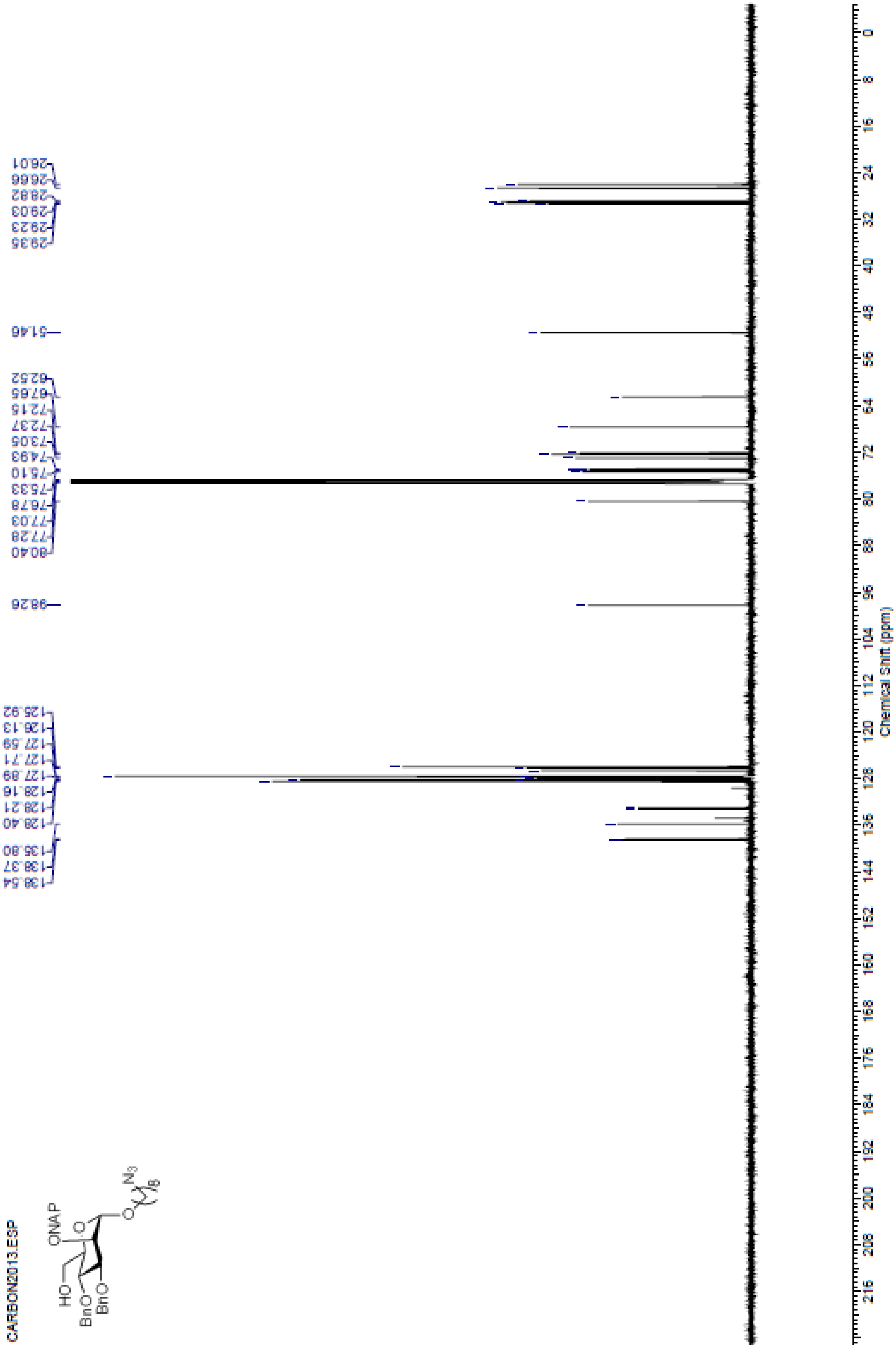
^{13}C NMR for compound **13** (126 MHz, $CDCl_3$)



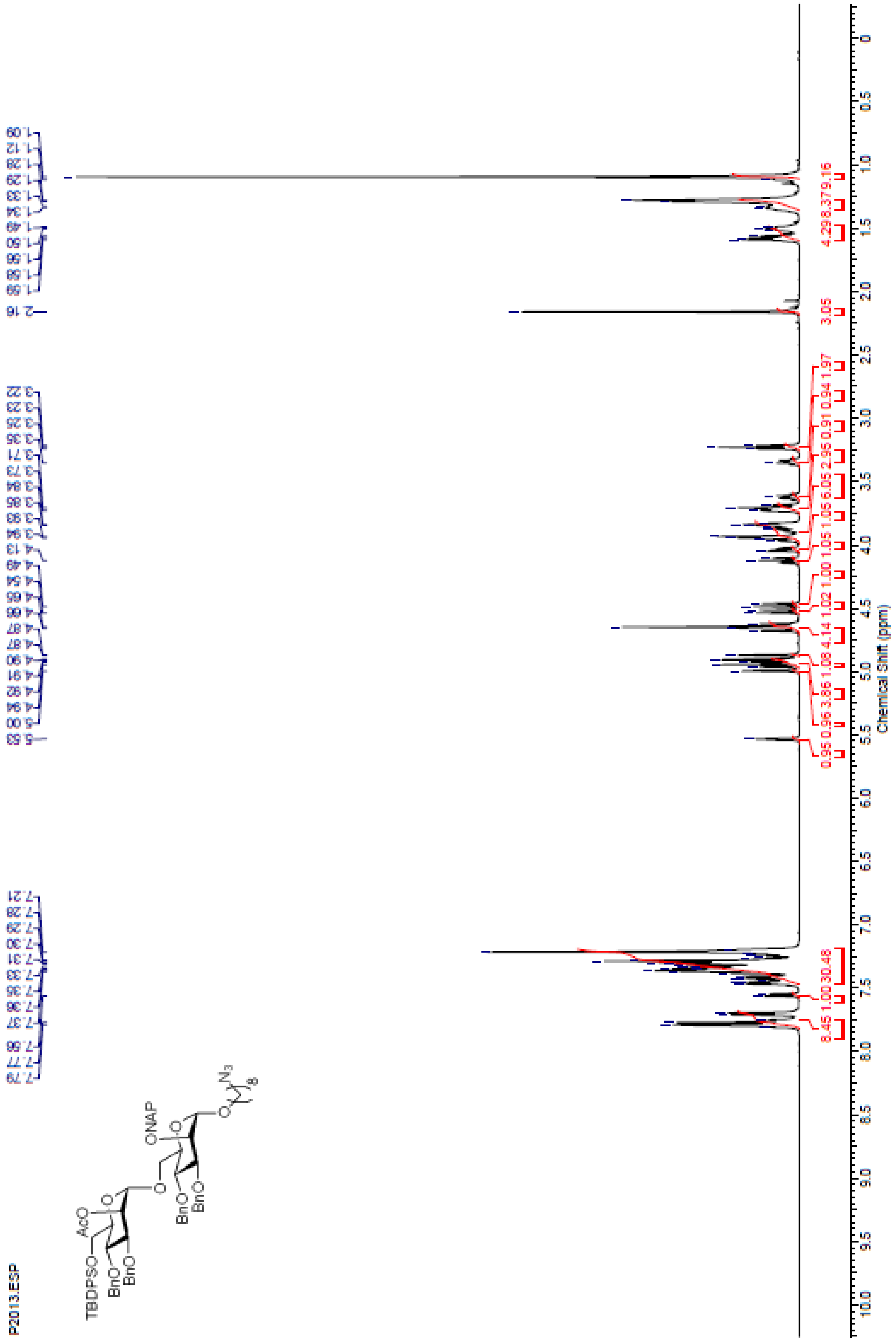
^{1}H NMR for compound **14** (500 MHz, $CDCl_3$)



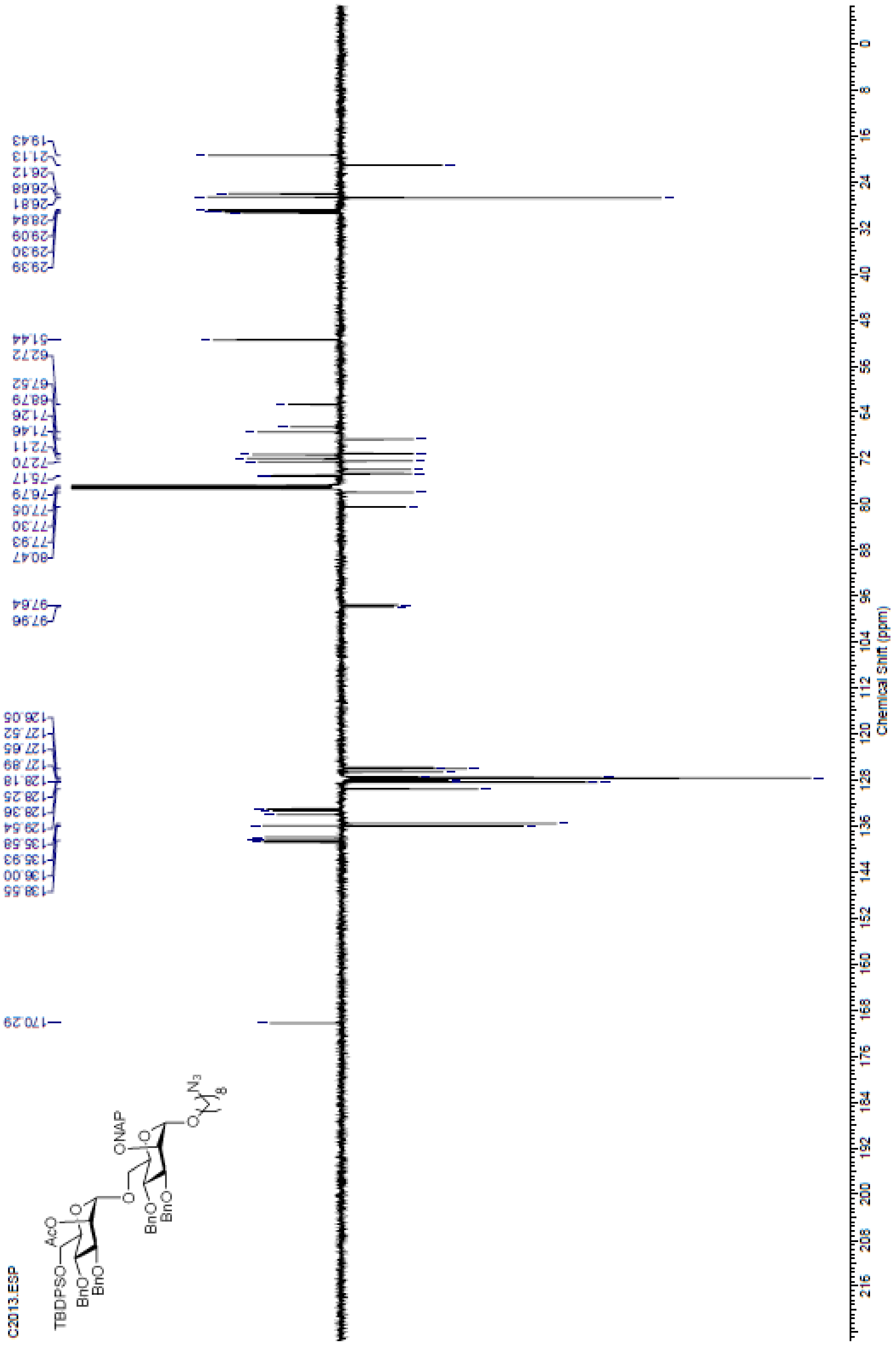
^{13}C NMR for compound **14** (126 MHz, $CDCl_3$)



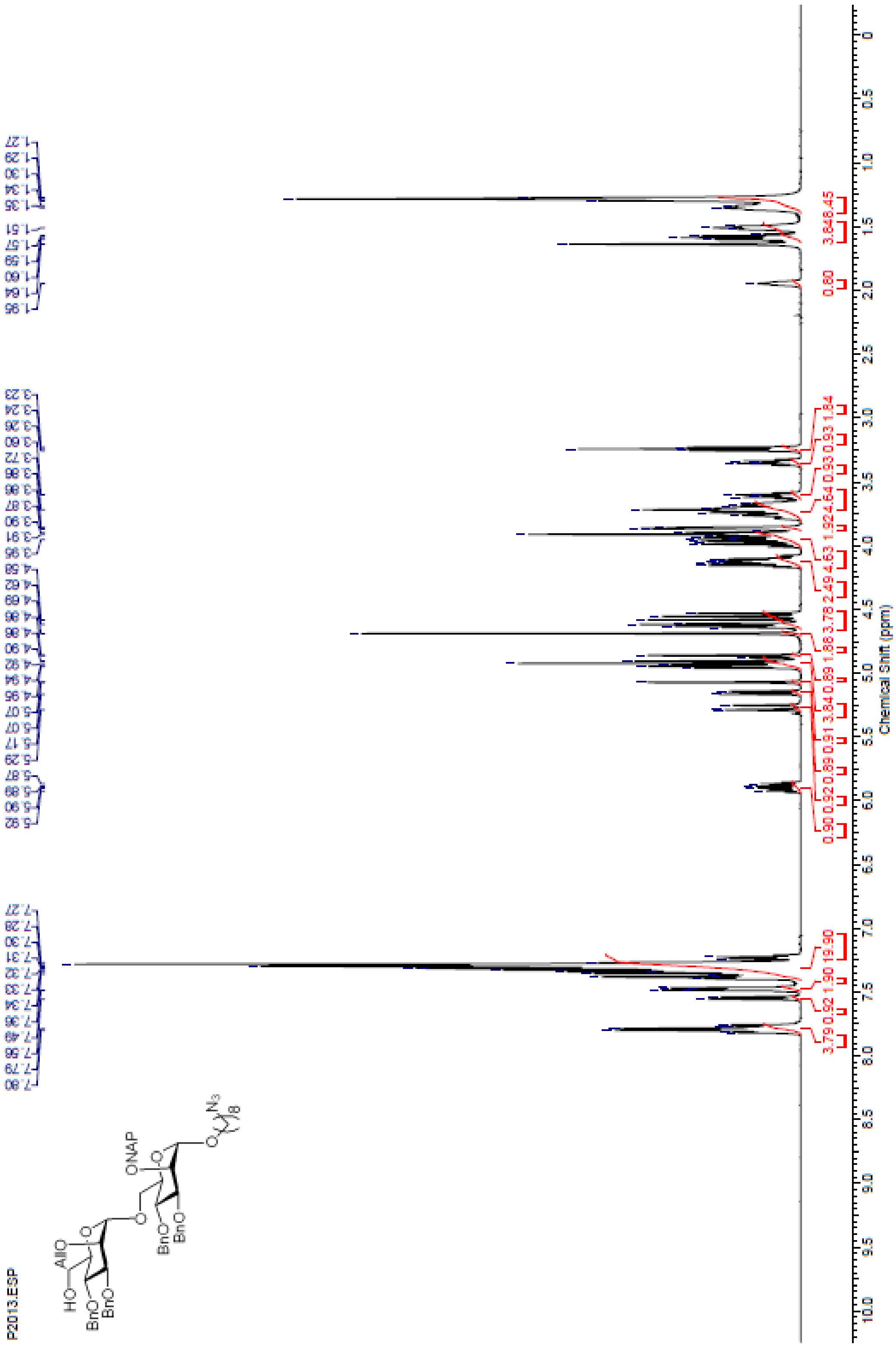
^{1}H NMR for compound **15** (500 MHz, $CDCl_3$)



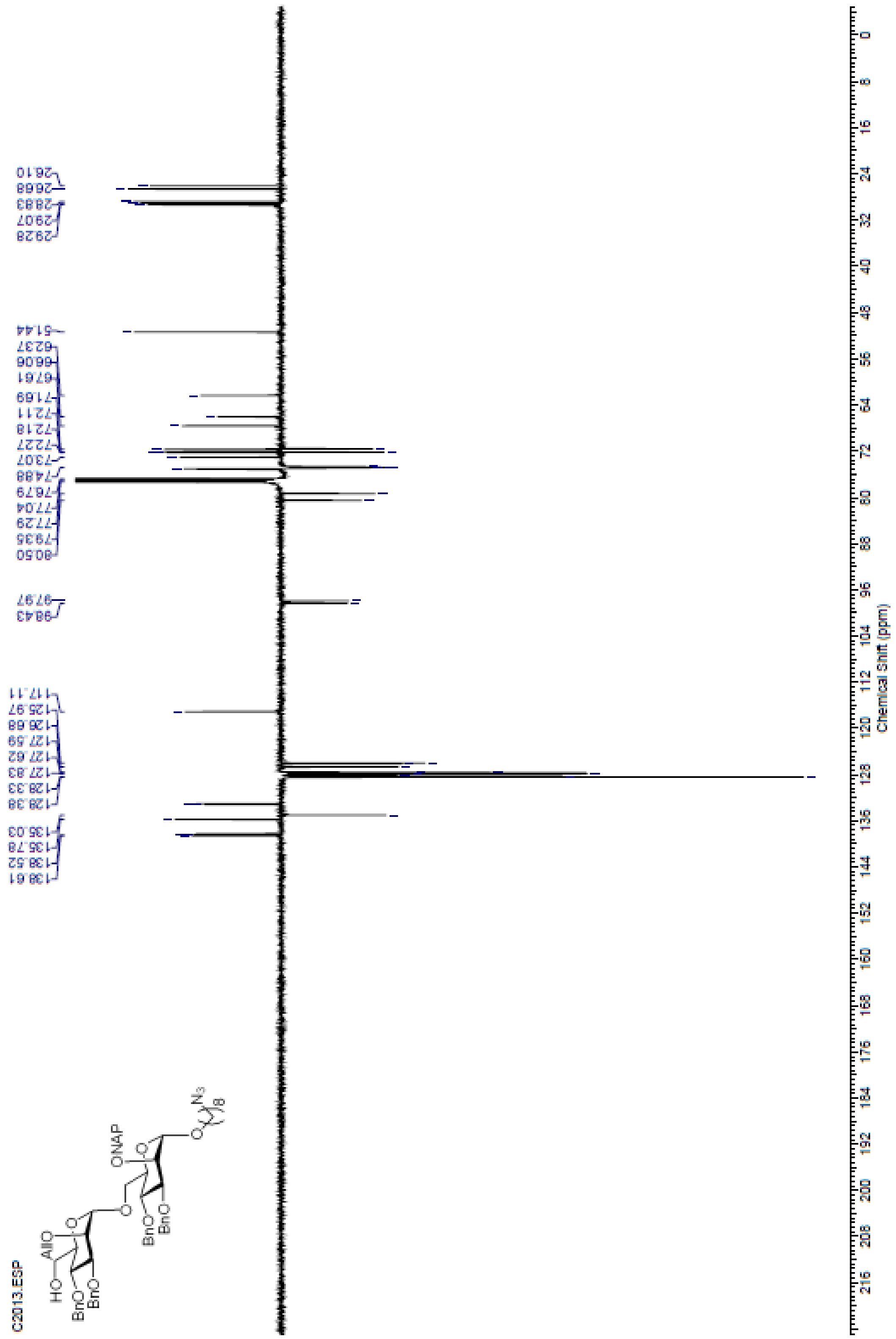
^{13}C NMR for compound **15** (126 MHz, $CDCl_3$)



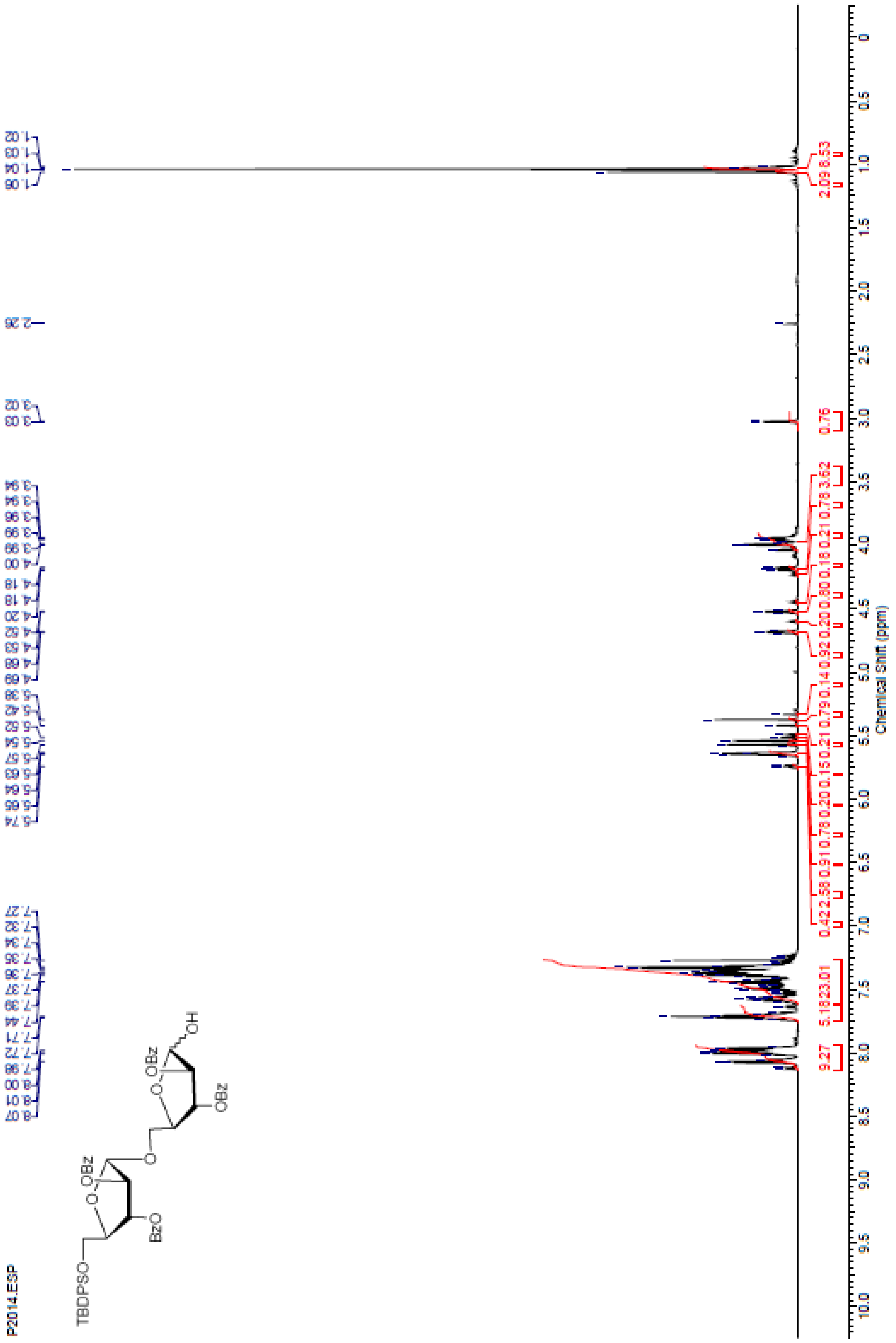
^{1}H NMR for compound **16** (400 MHz, $CDCl_3$)



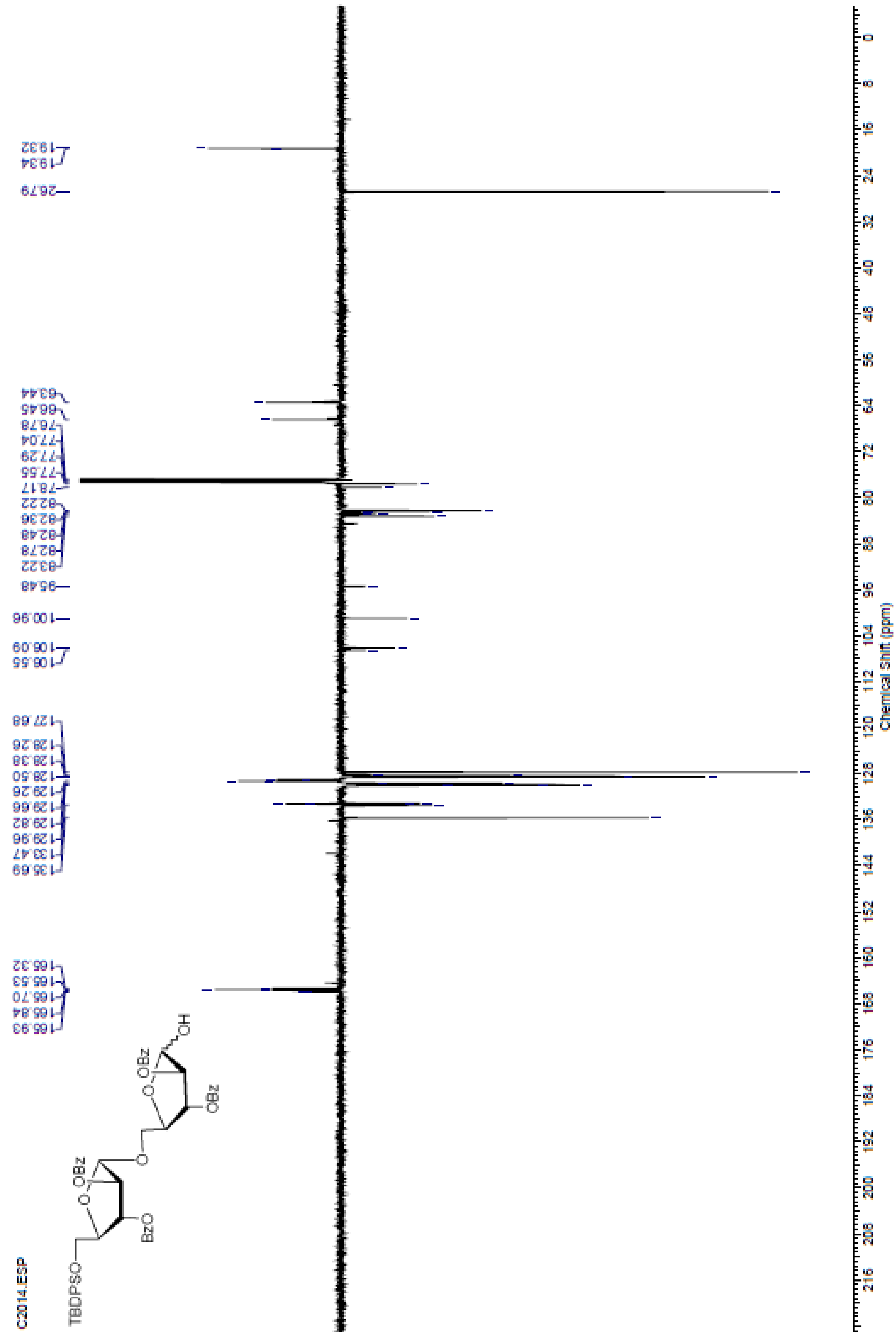
^{13}C NMR for compound **16** (126 MHz, $CDCl_3$)



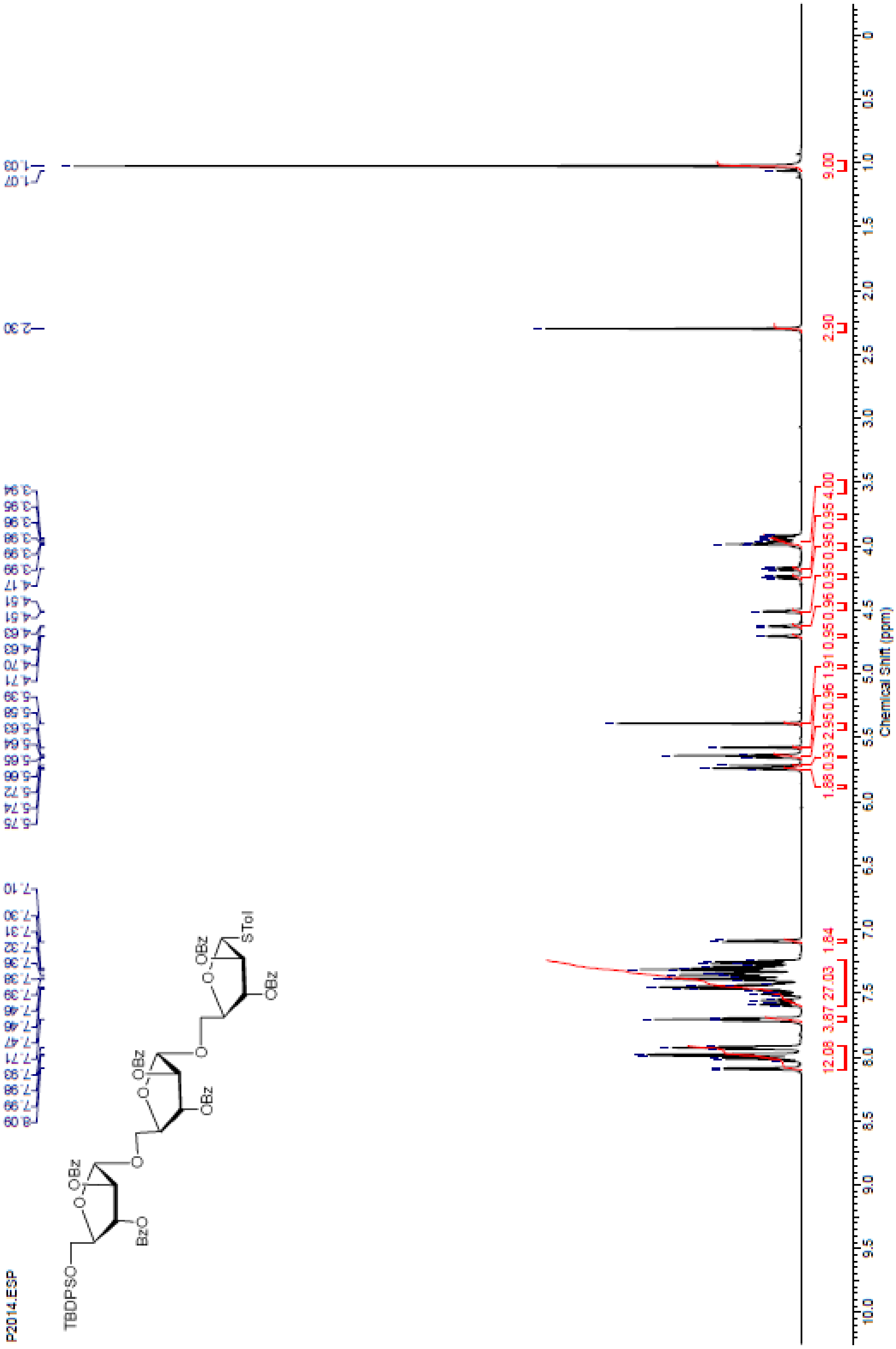
^{1}H NMR for compound **18** (700 MHz, $CDCl_3$)



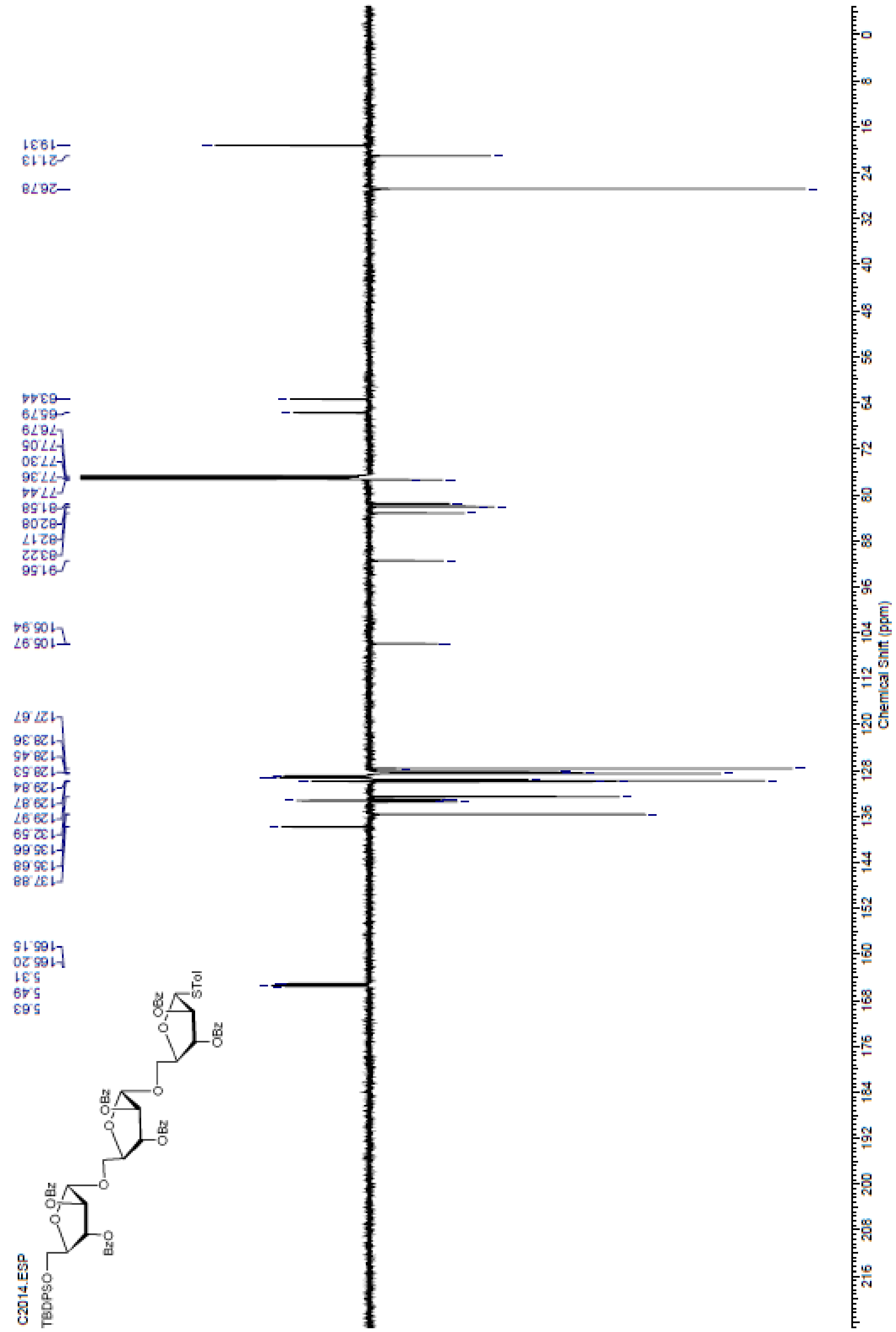
^{13}C NMR for compound **18** (126 MHz, $CDCl_3$)



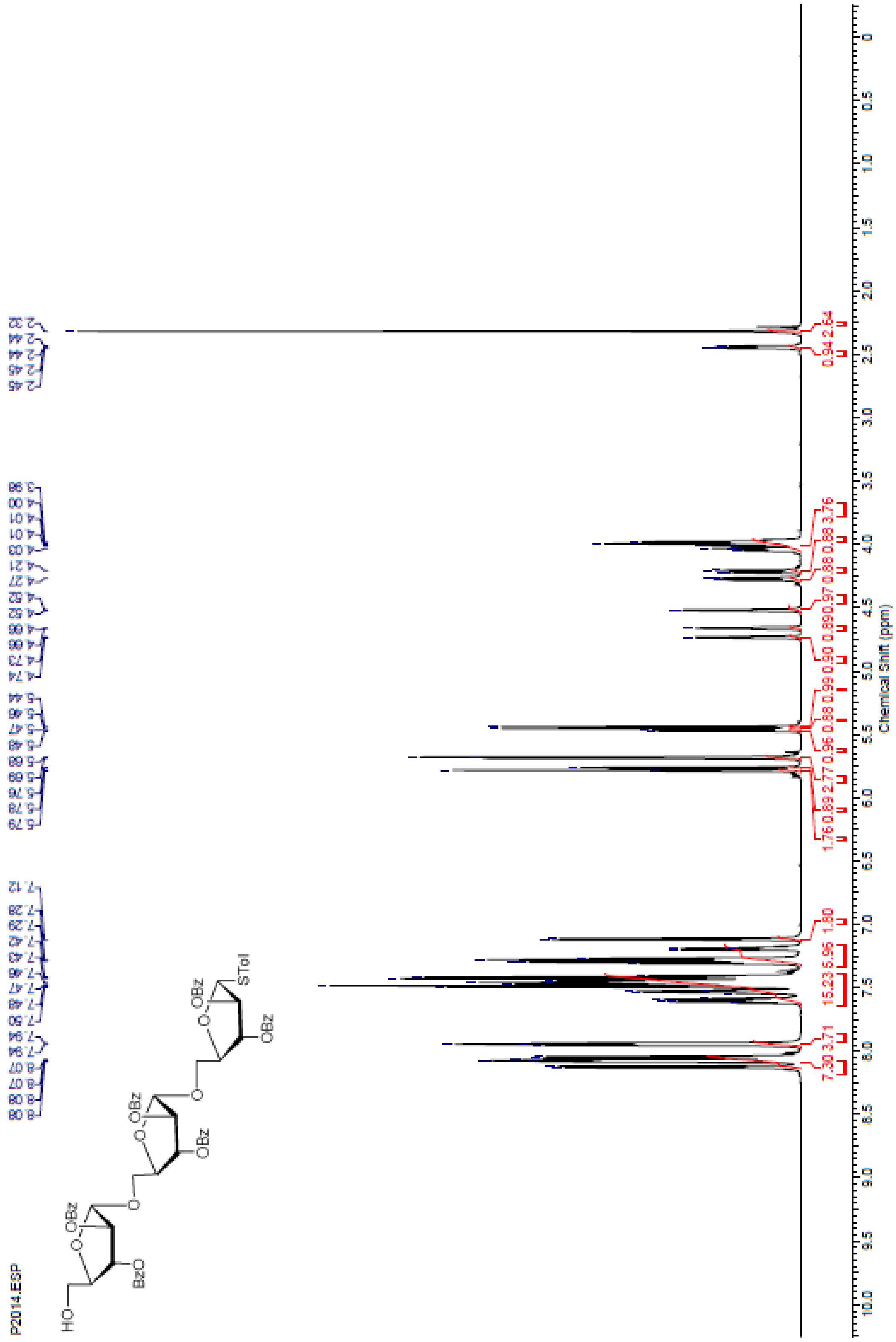
^{1}H NMR for compound **22** (700 MHz, $CDCl_3$)



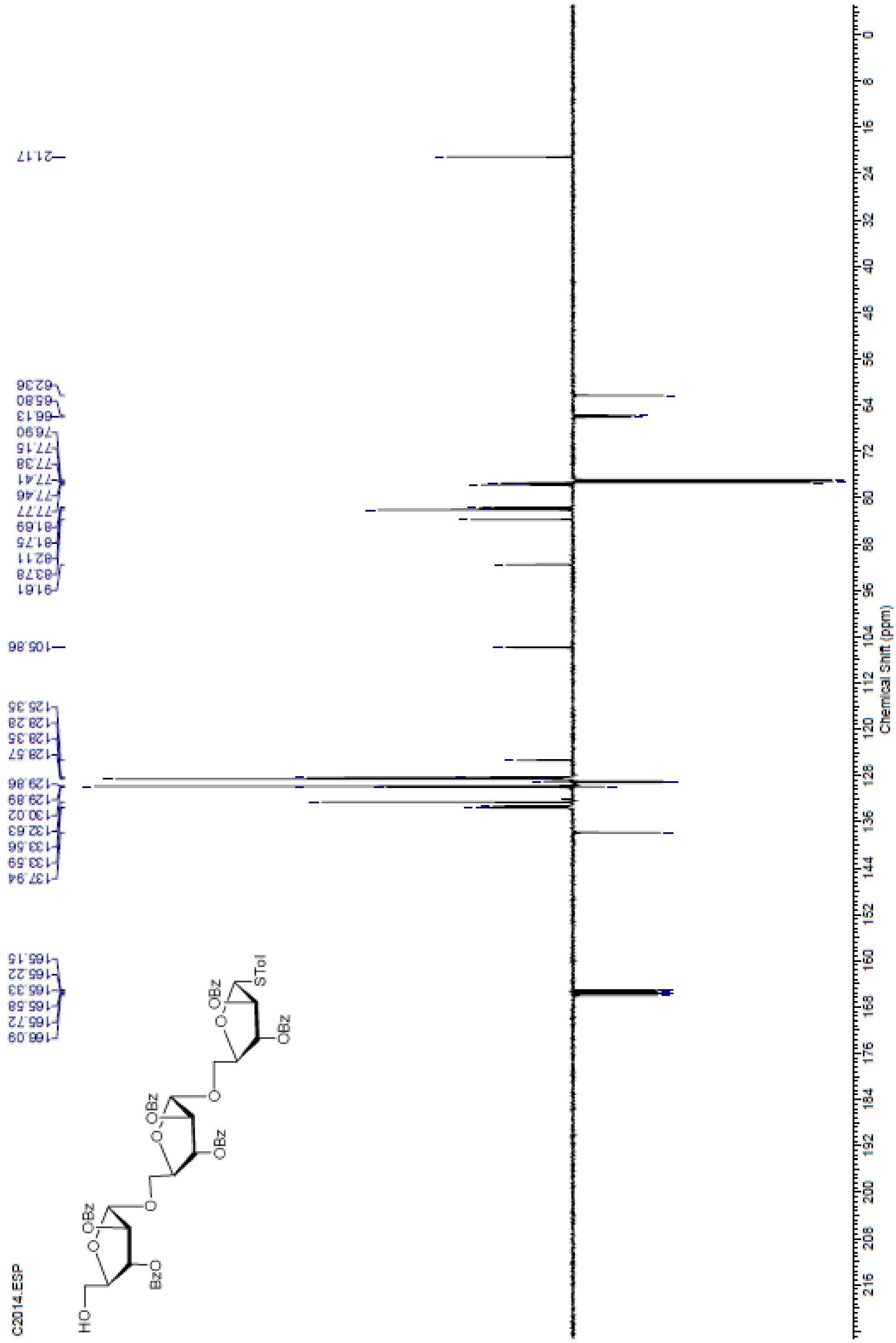
^{13}C NMR for compound **22** (126 MHz, $CDCl_3$)



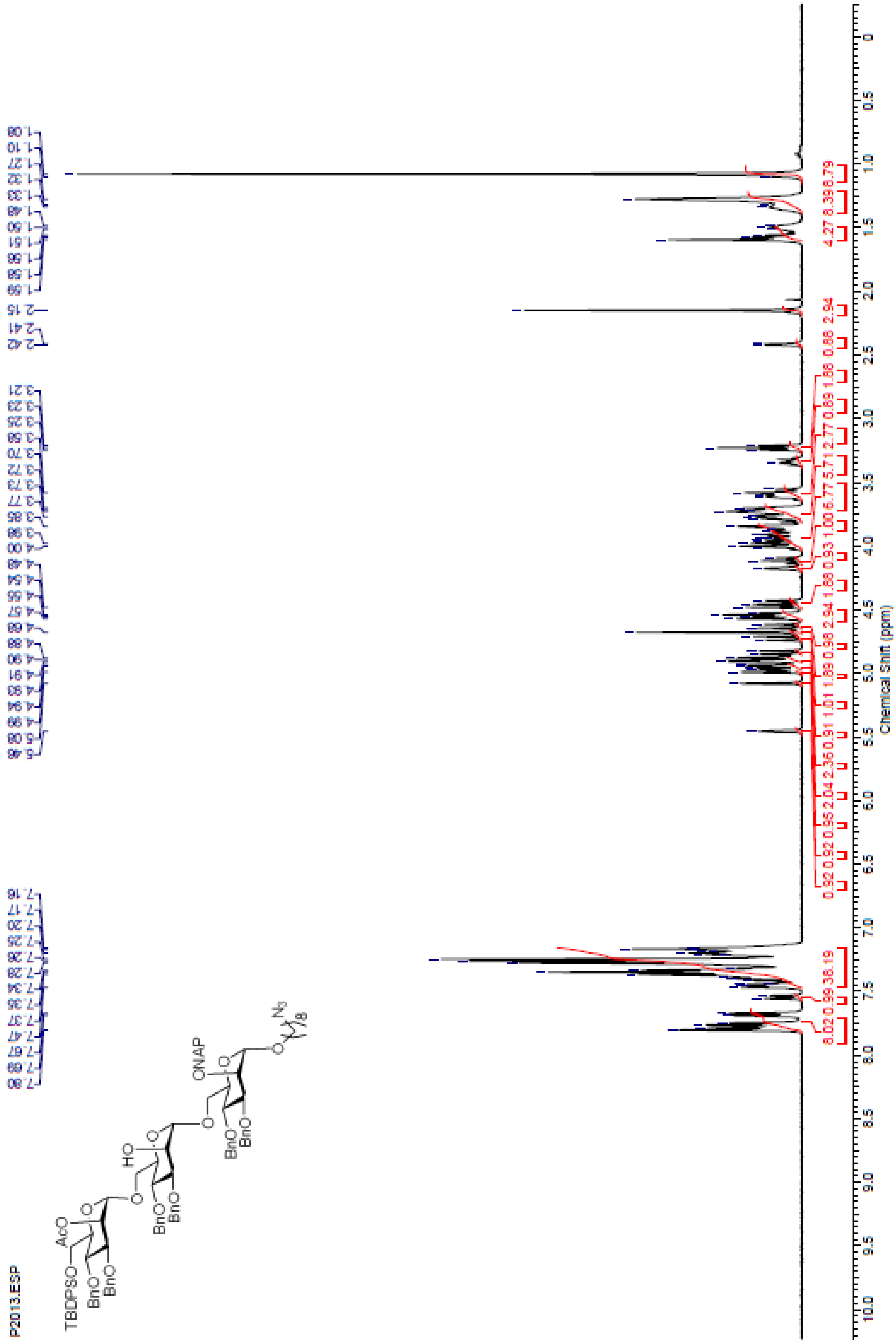
^{1}H NMR for compound **23** (700 MHz, $CDCl_3$)



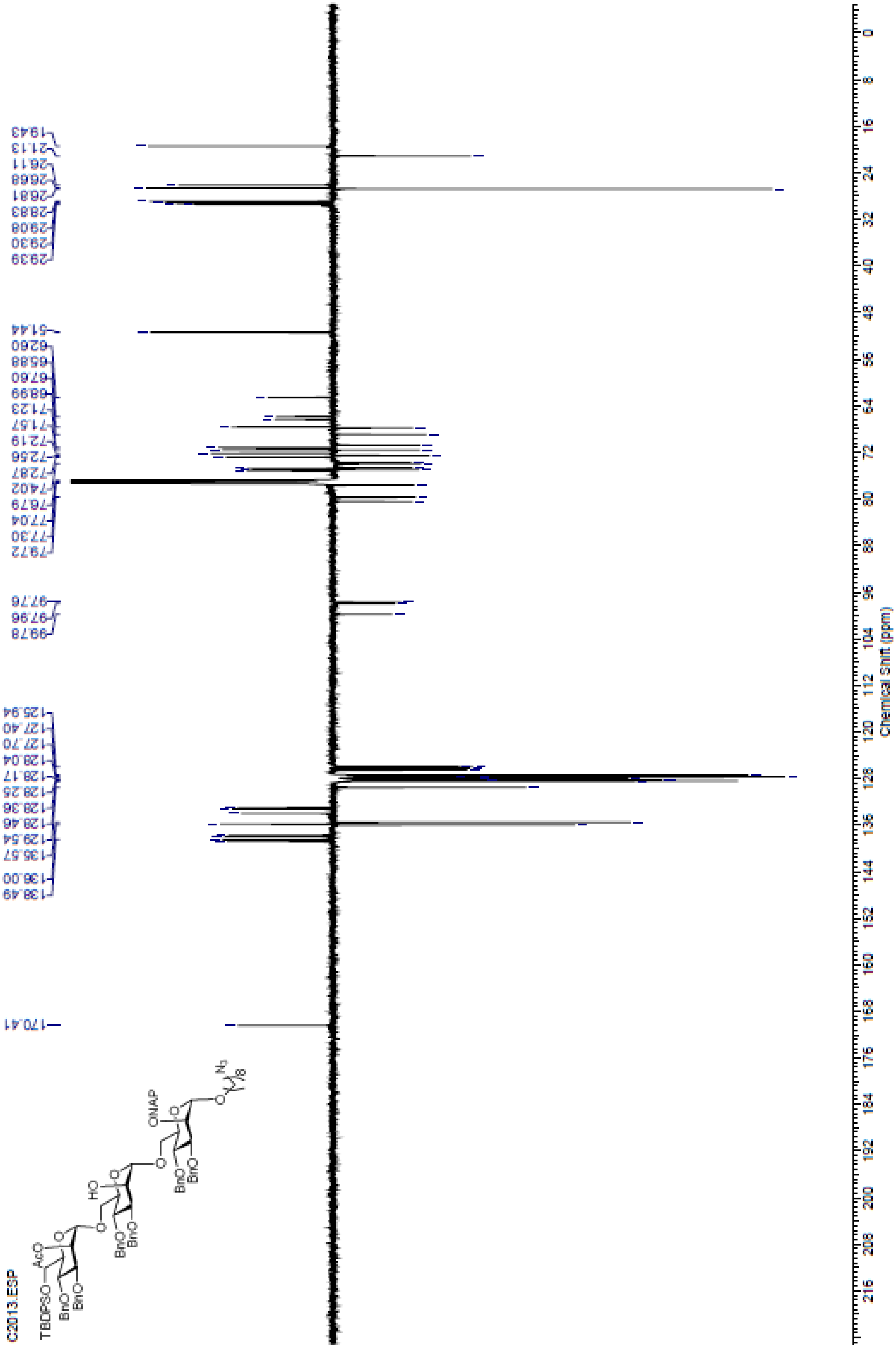
^{13}C NMR for compound **23** (126 MHz, $CDCl_3$)



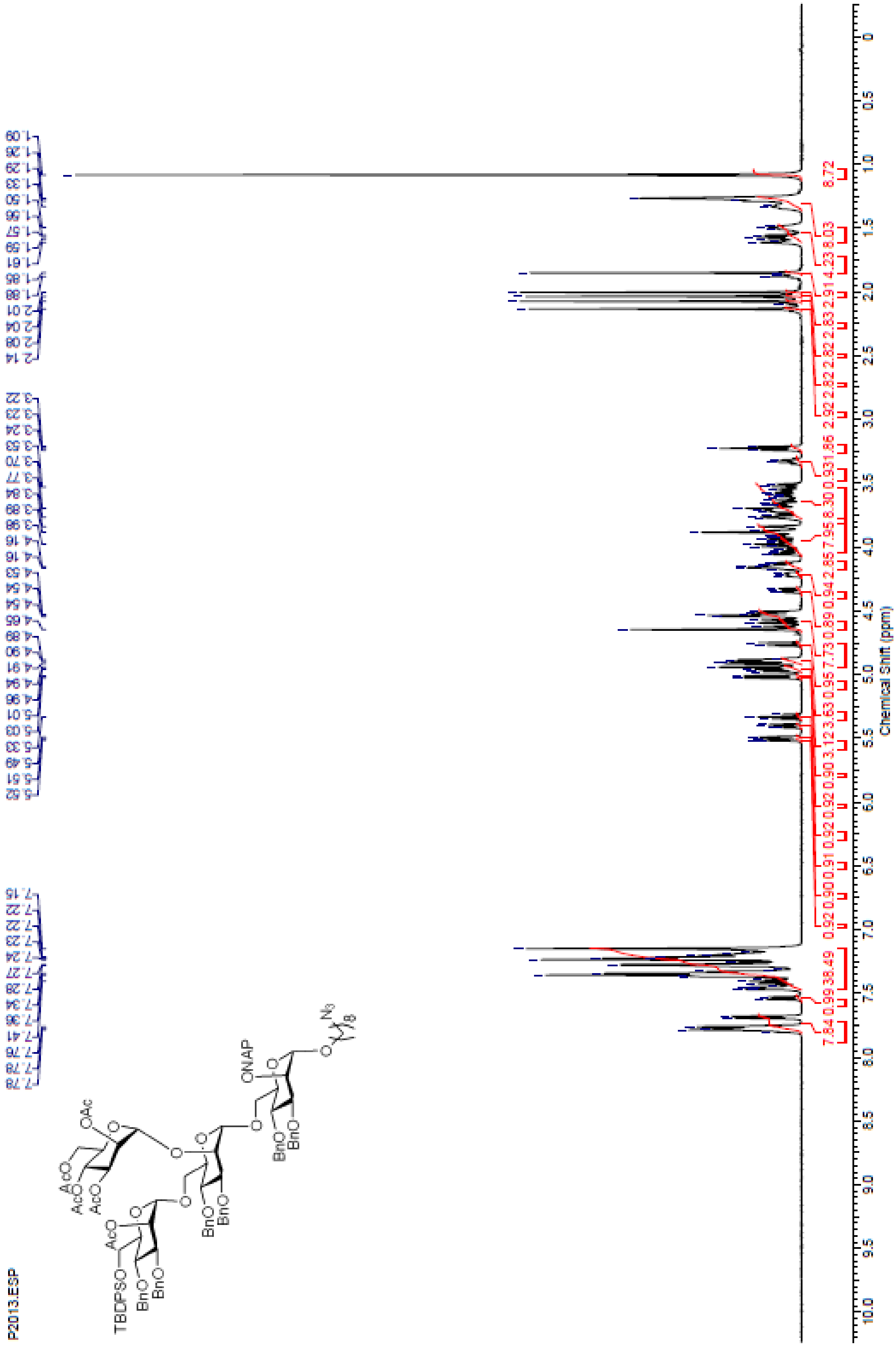
^{1}H NMR for compound **24** (400 MHz, $CDCl_3$)



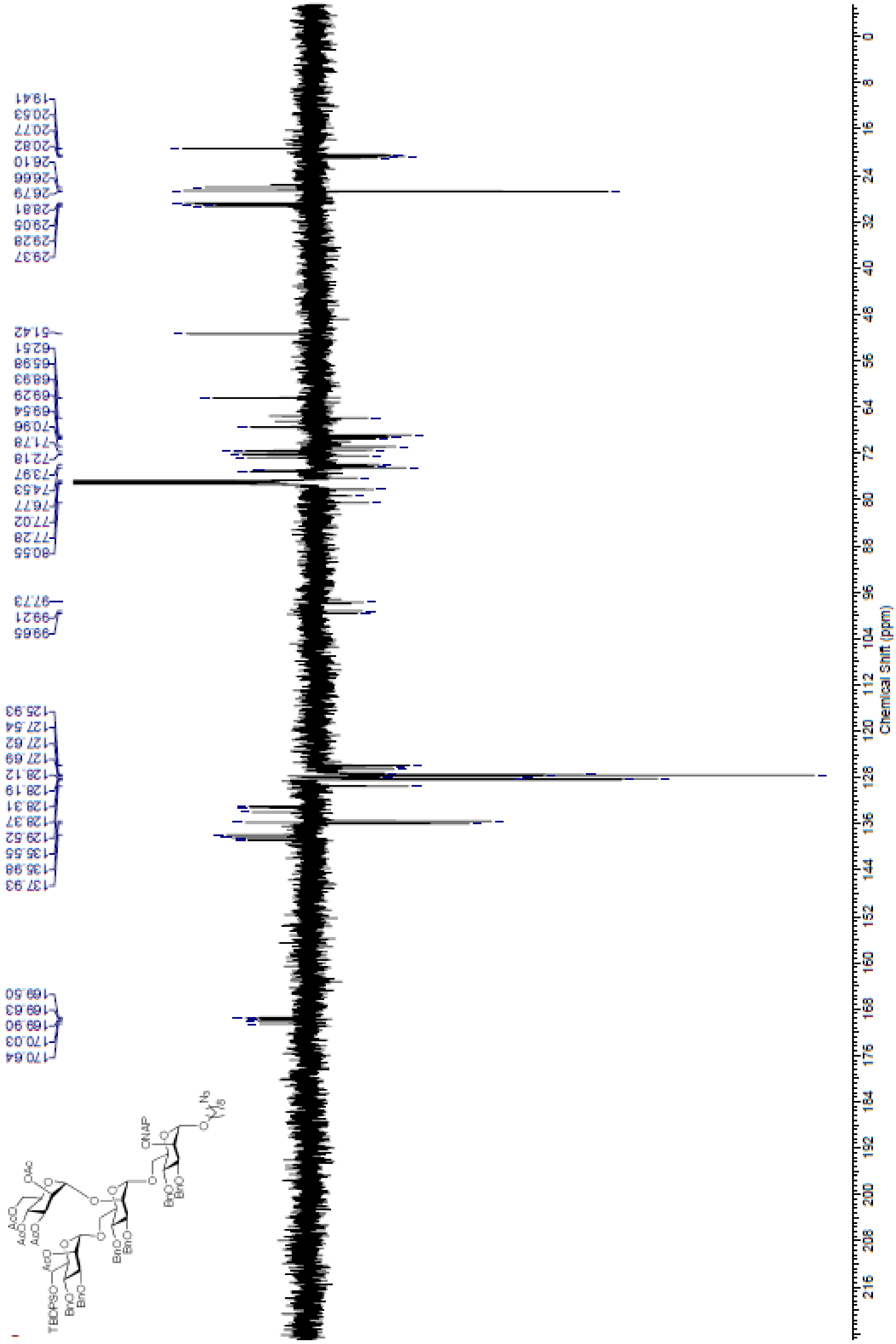
^{13}C NMR for compound **24** (126 MHz, $CDCl_3$)



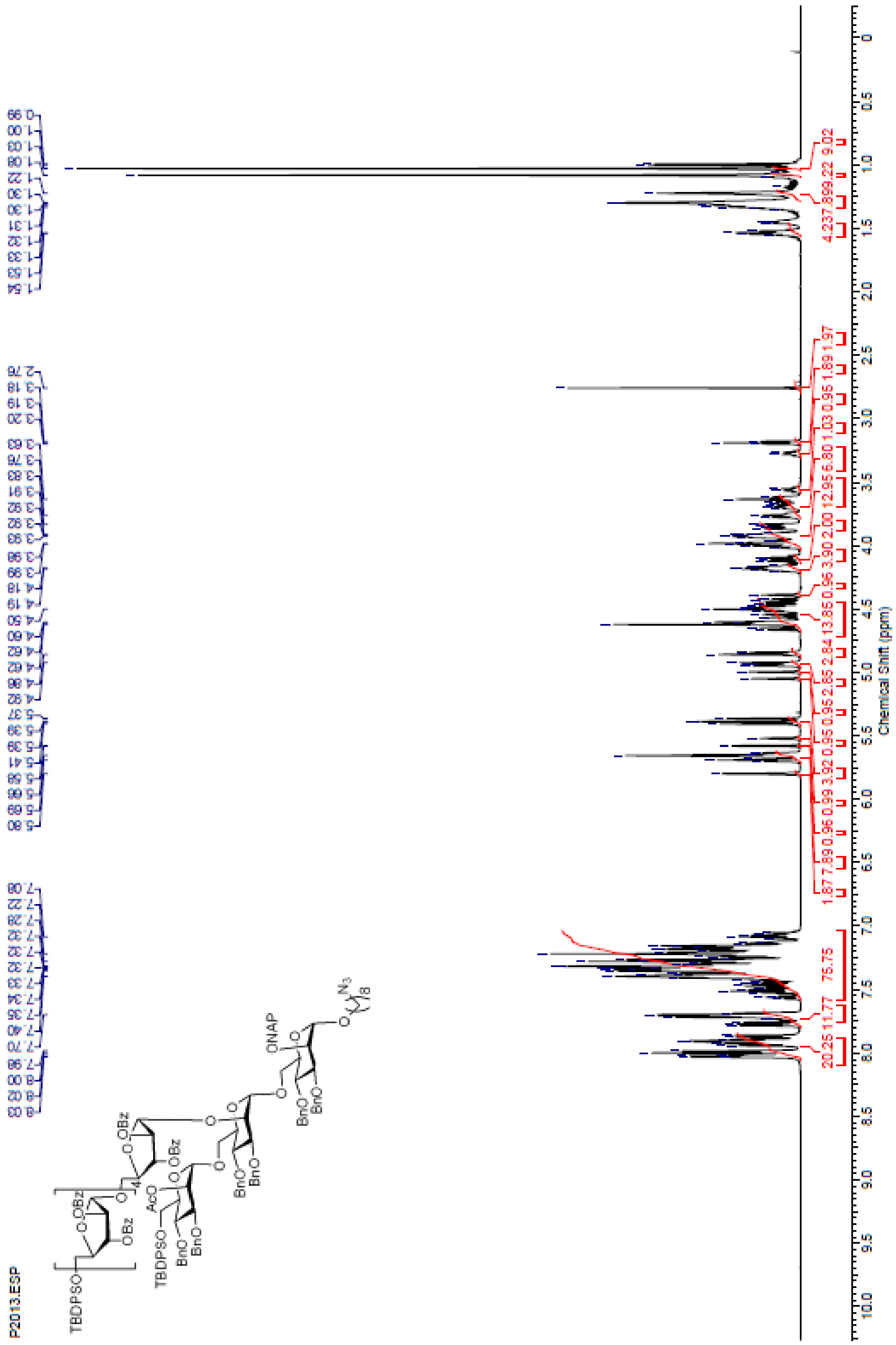
[1]H NMR for compound **25** (500 MHz, $CDCl_3$)



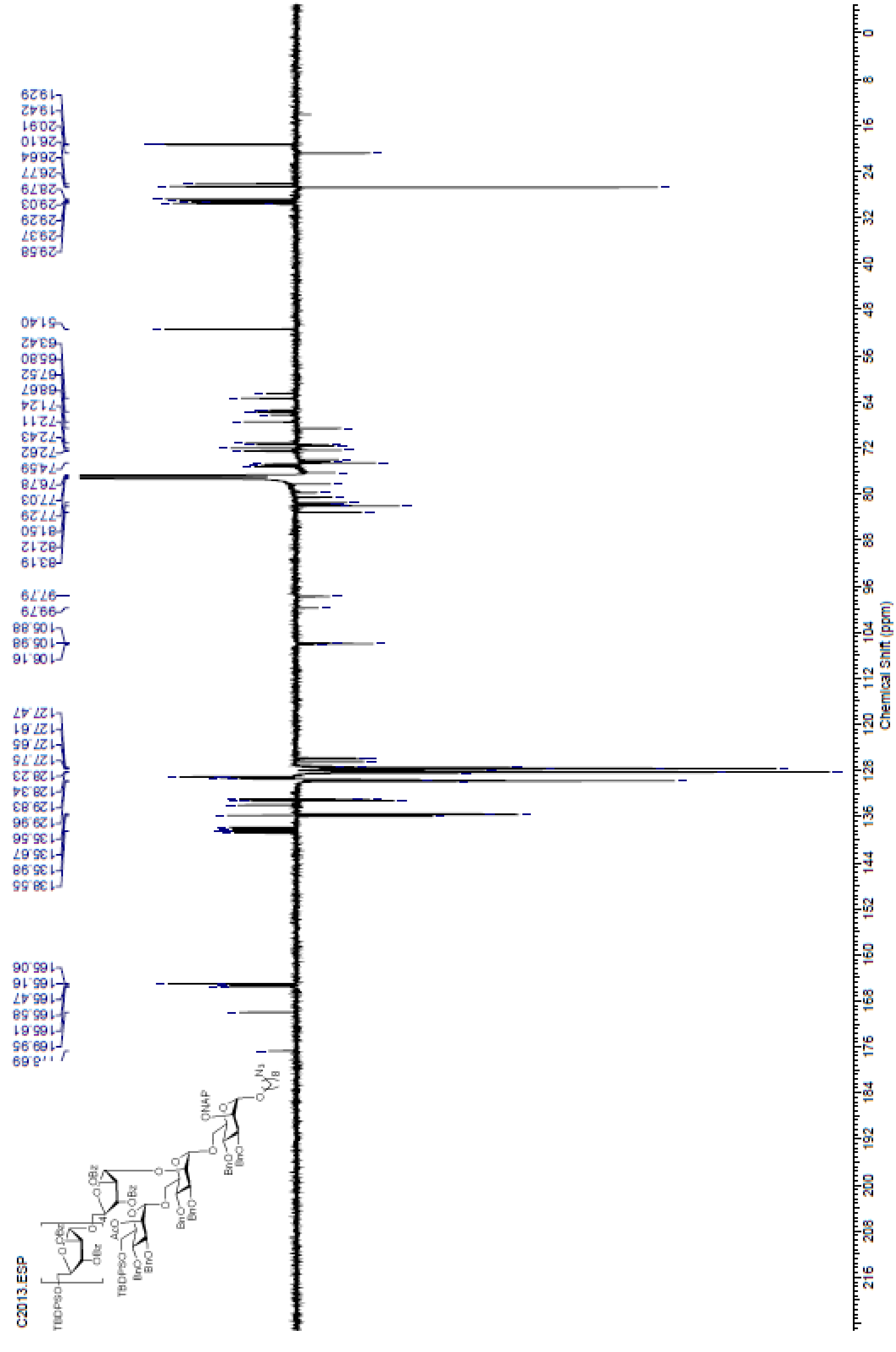
^{13}C NMR for compound **25** (126 MHz, $CDCl_3$)



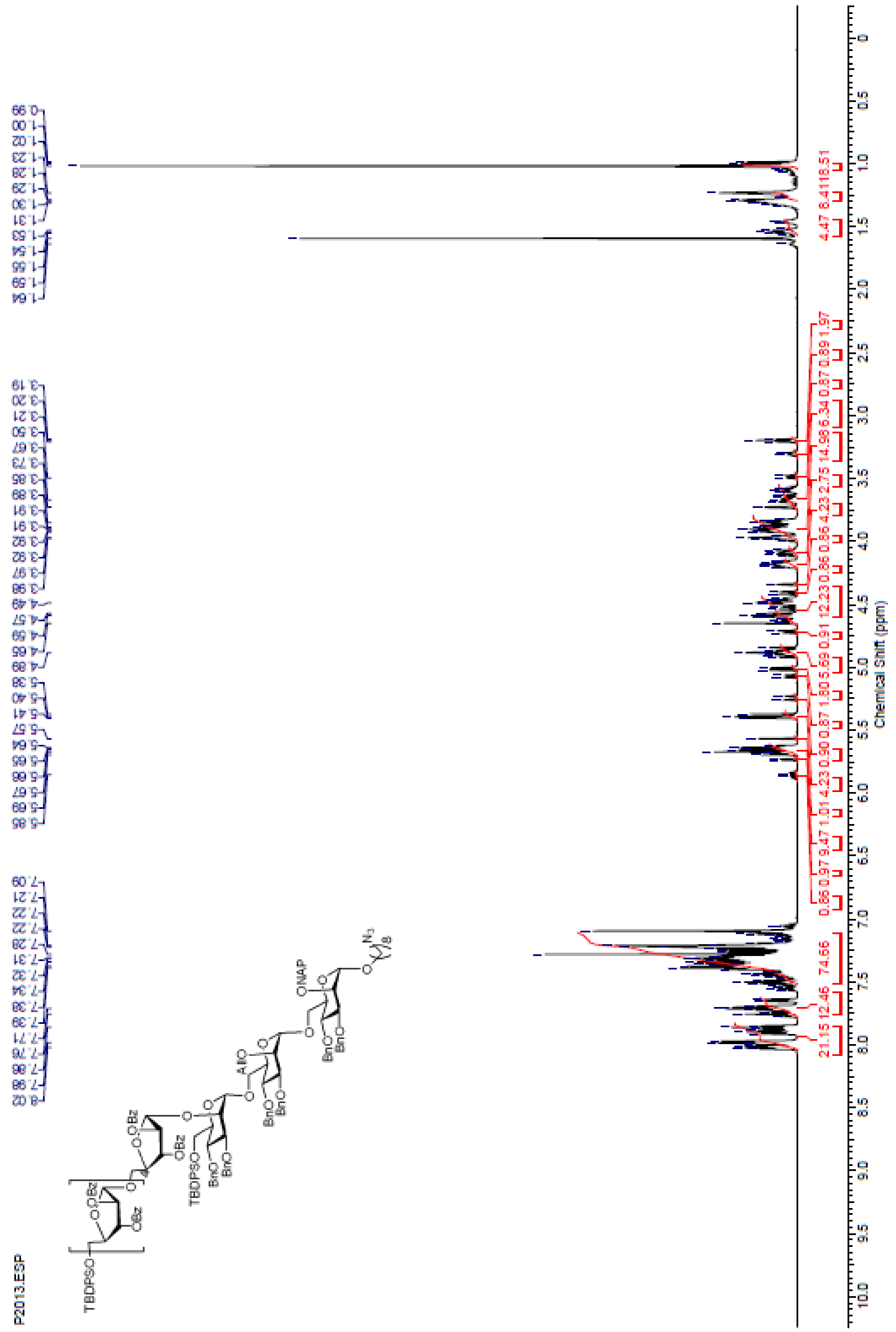
^{1}H NMR for compound **26** (600 MHz, $CDCl_3$)



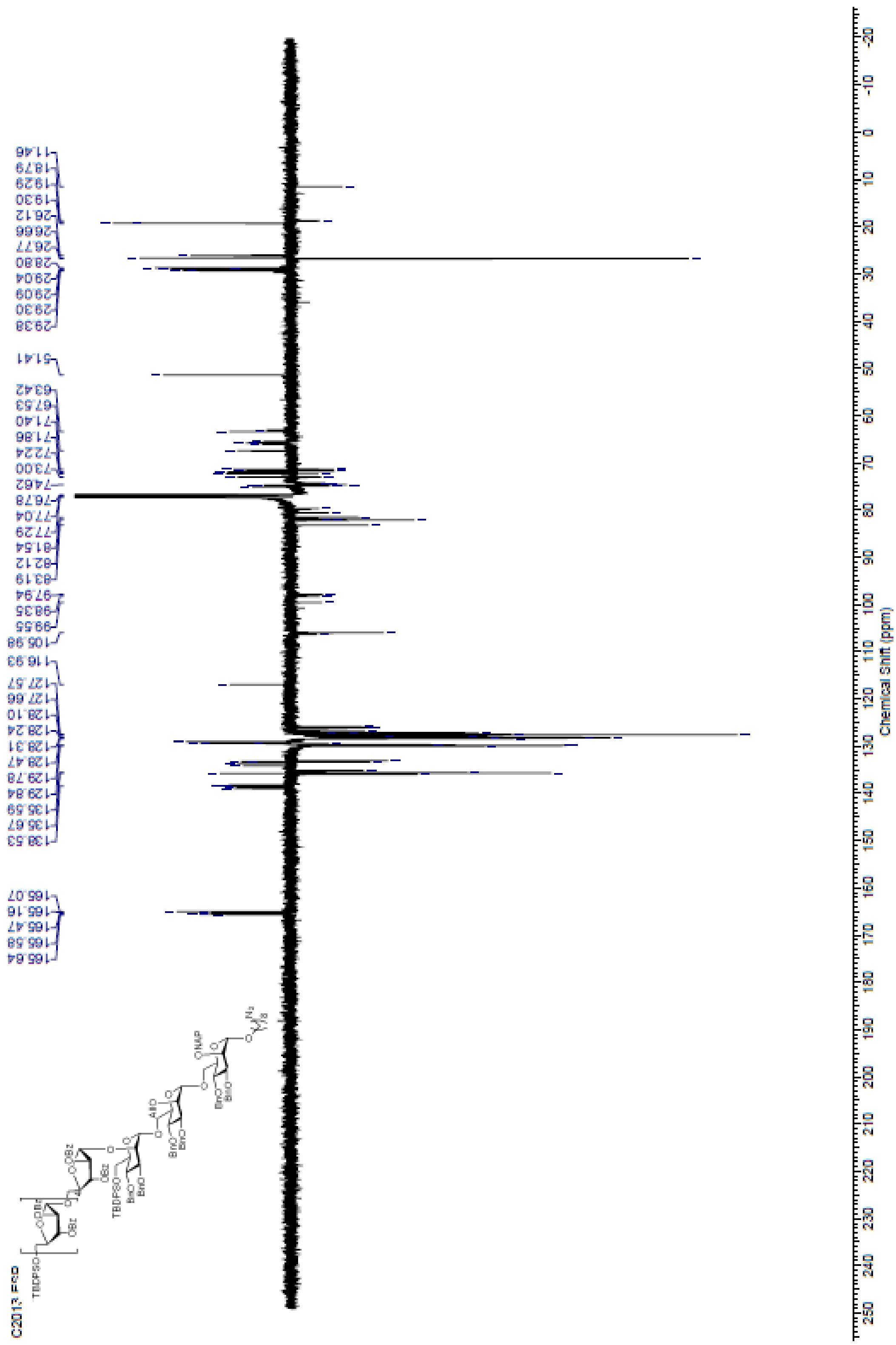
[13]C NMR for compound **26** (126 MHz, $CDCl_3$)



[1]H NMR for compound **28** (600 MHz, $CDCl_3$)



^{13}C NMR for compound **28** (126 MHz, $CDCl_3$)



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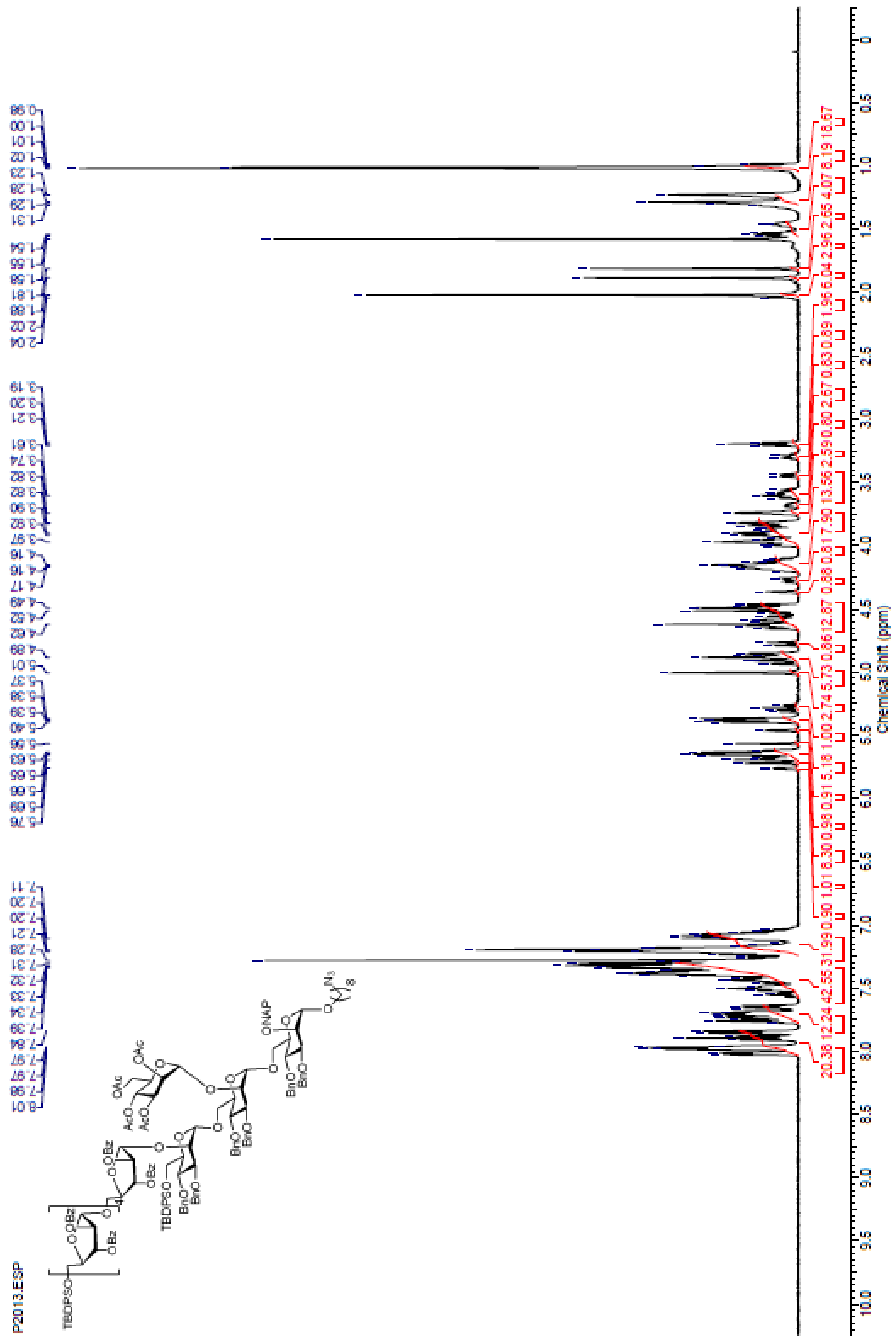
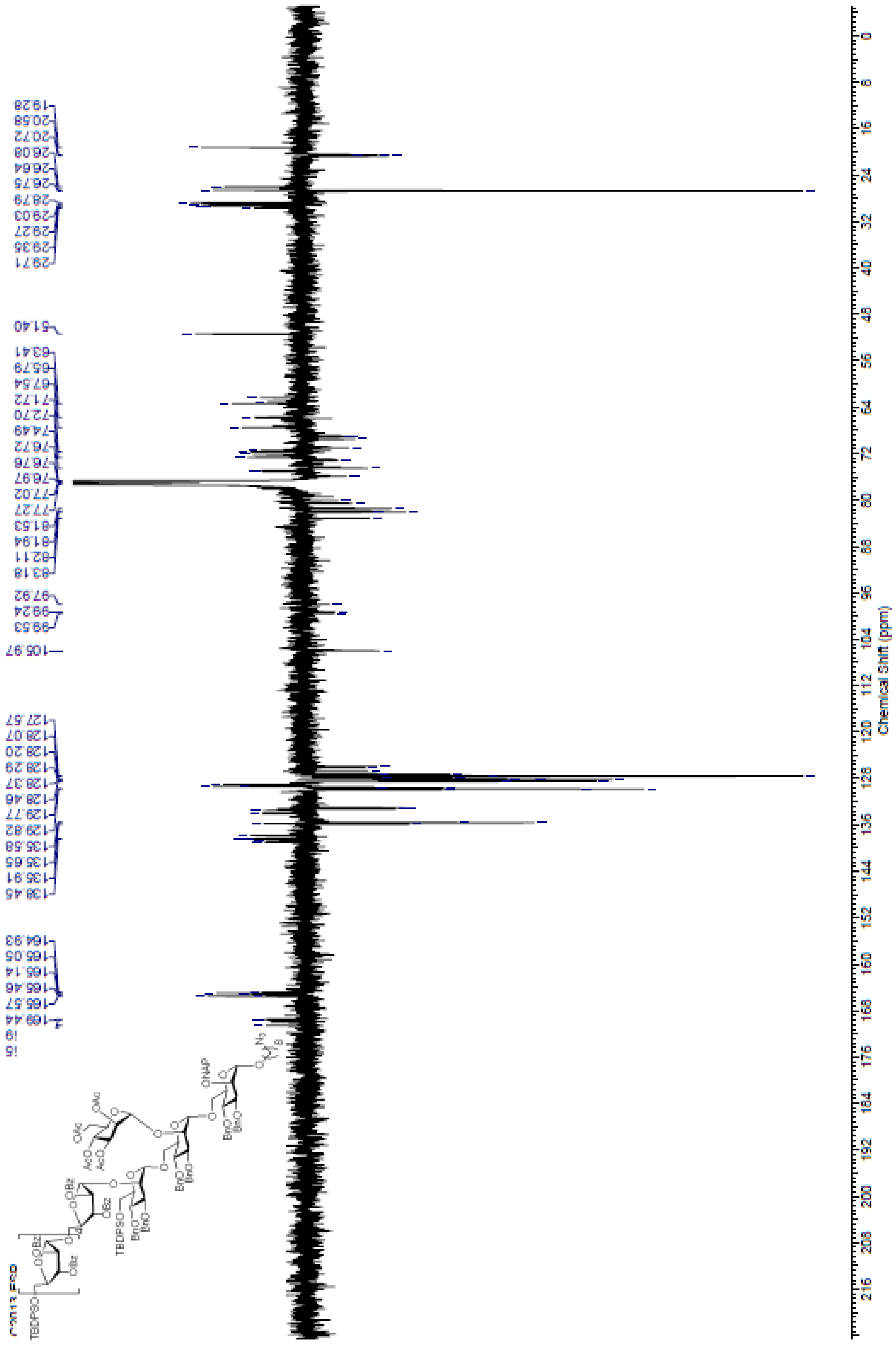
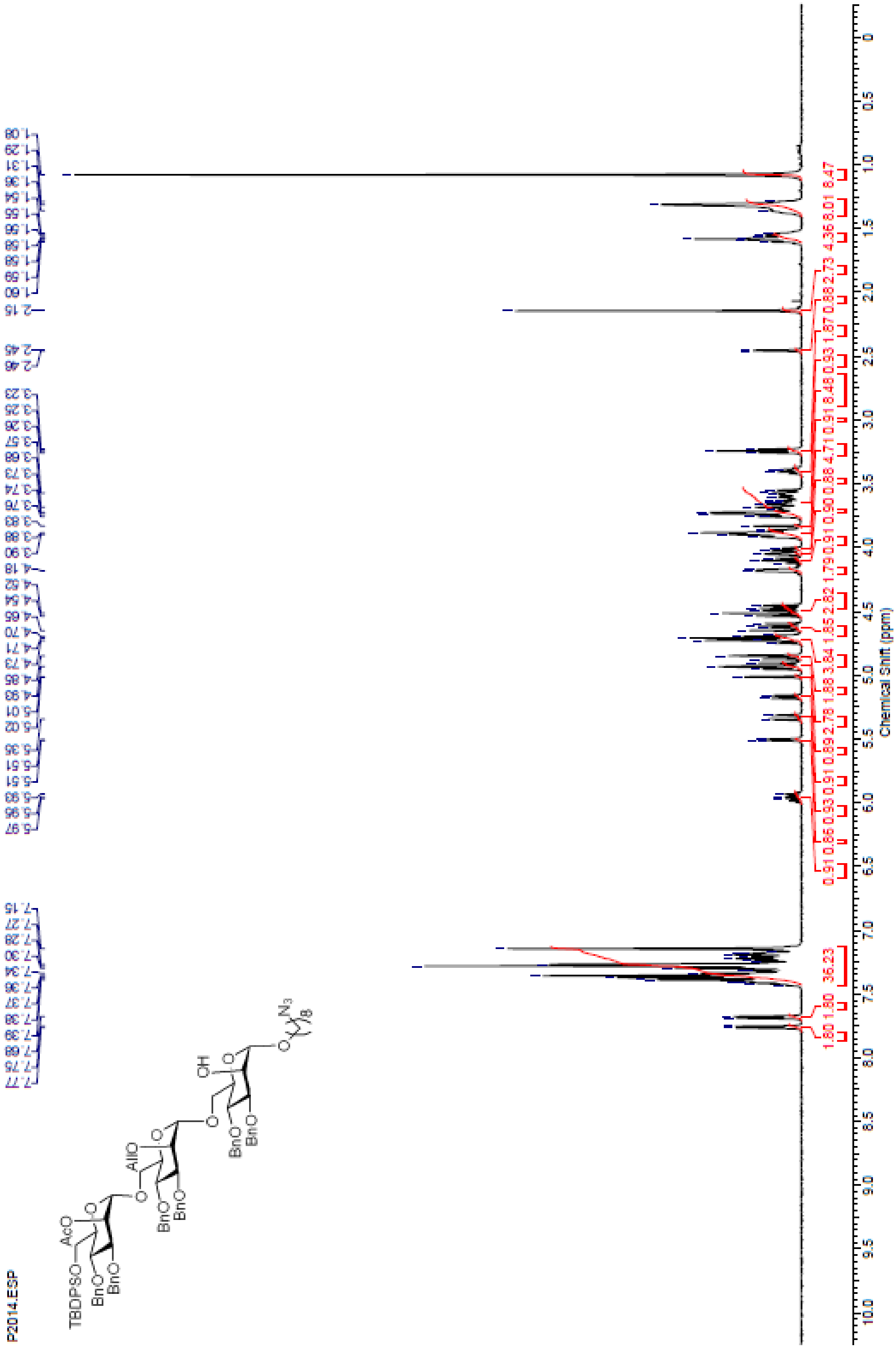


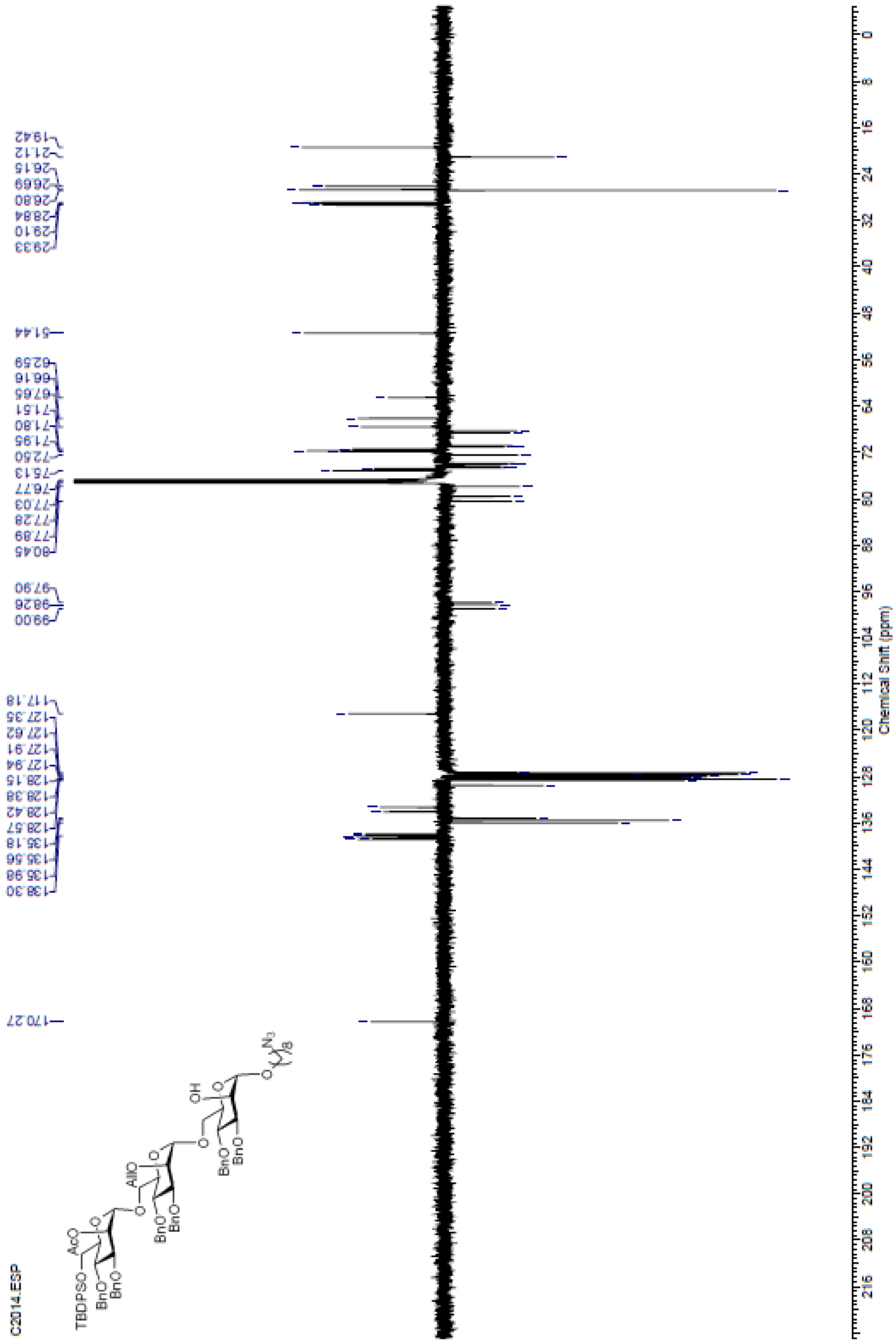
^{13}C NMR for compound **29** (126 MHz, $CDCl_3$)



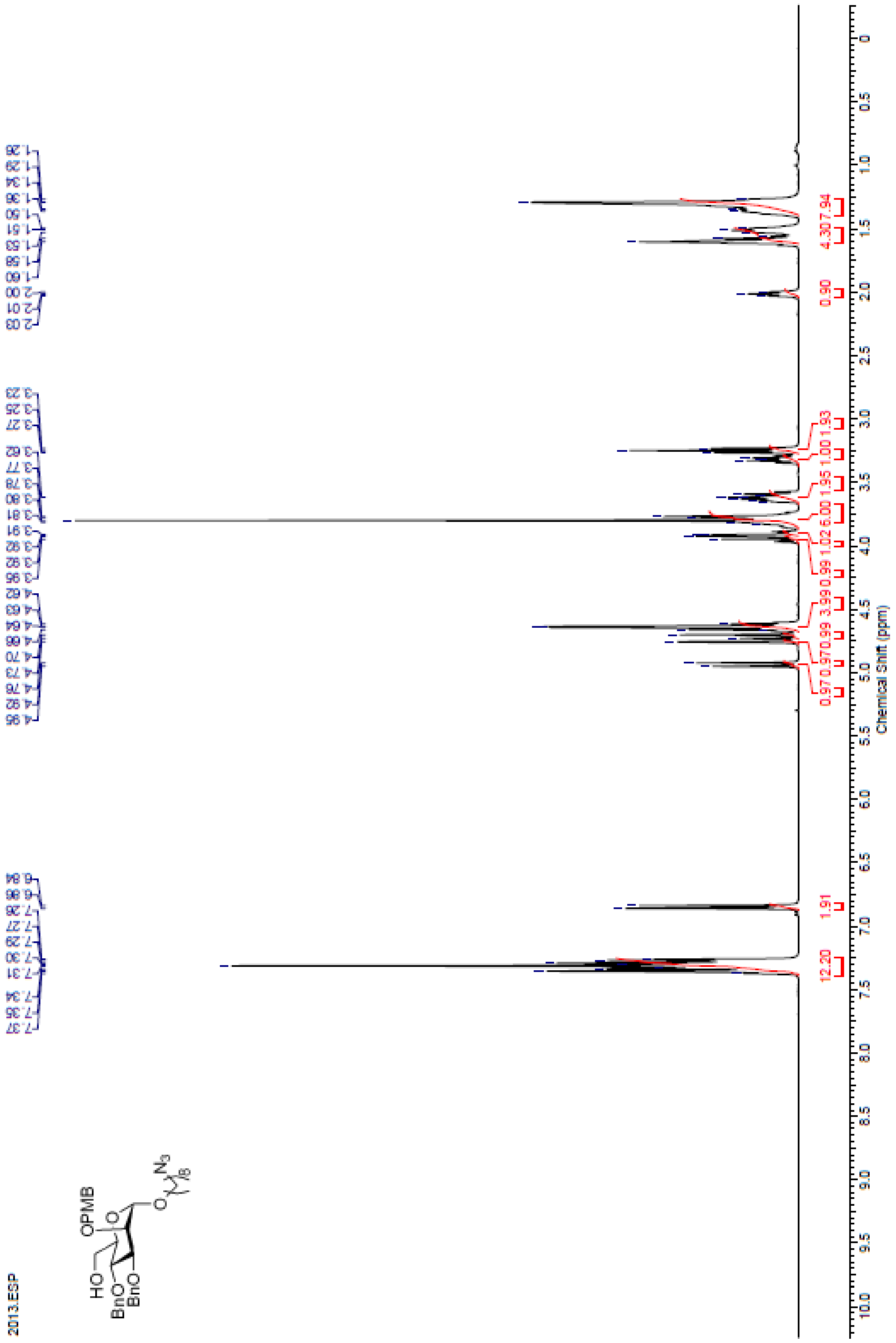
[1]H NMR for compound **30** (500 MHz, $CDCl_3$)



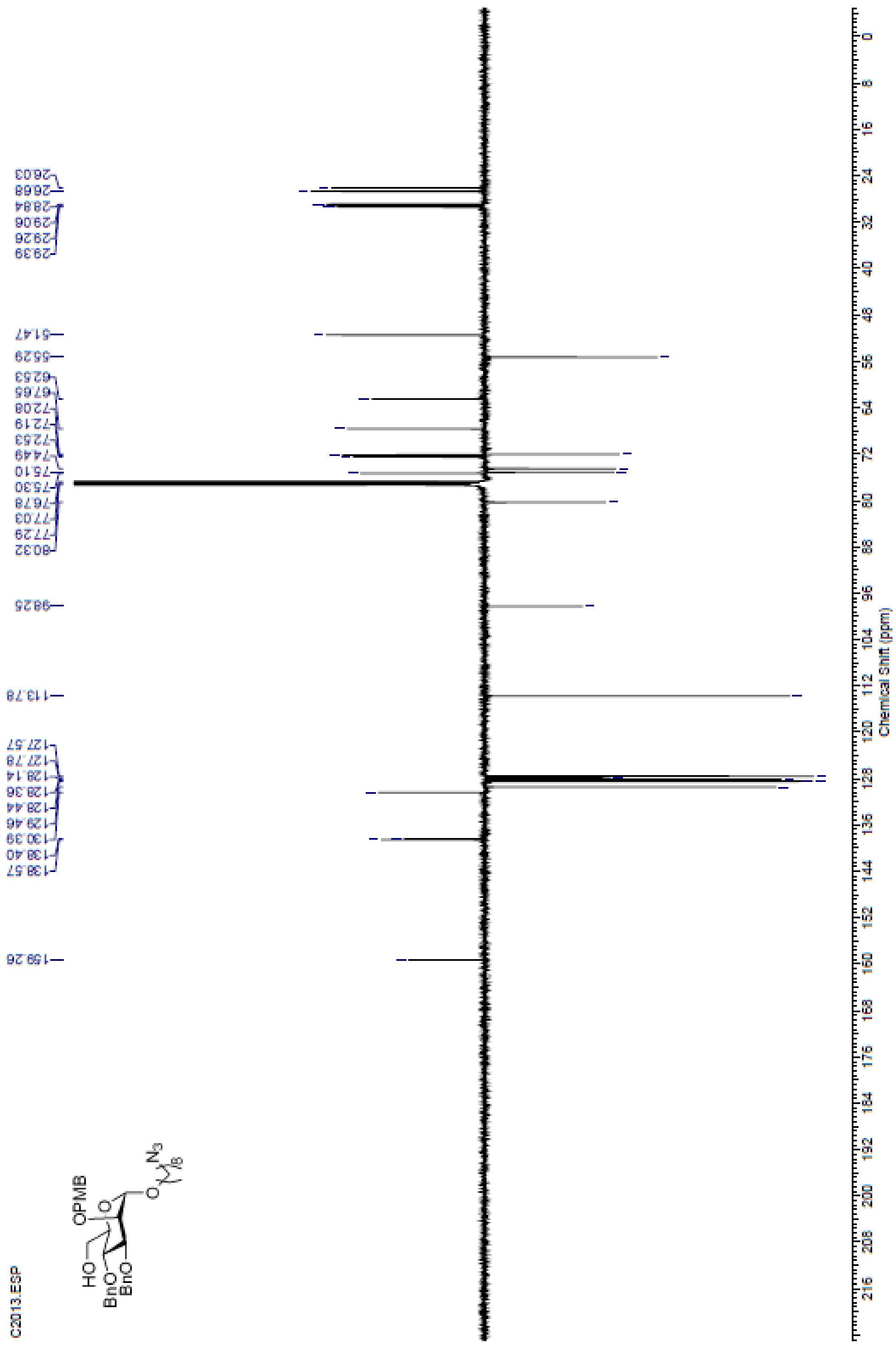
^{13}C NMR for compound **30** (126 MHz, $CDCl_3$)



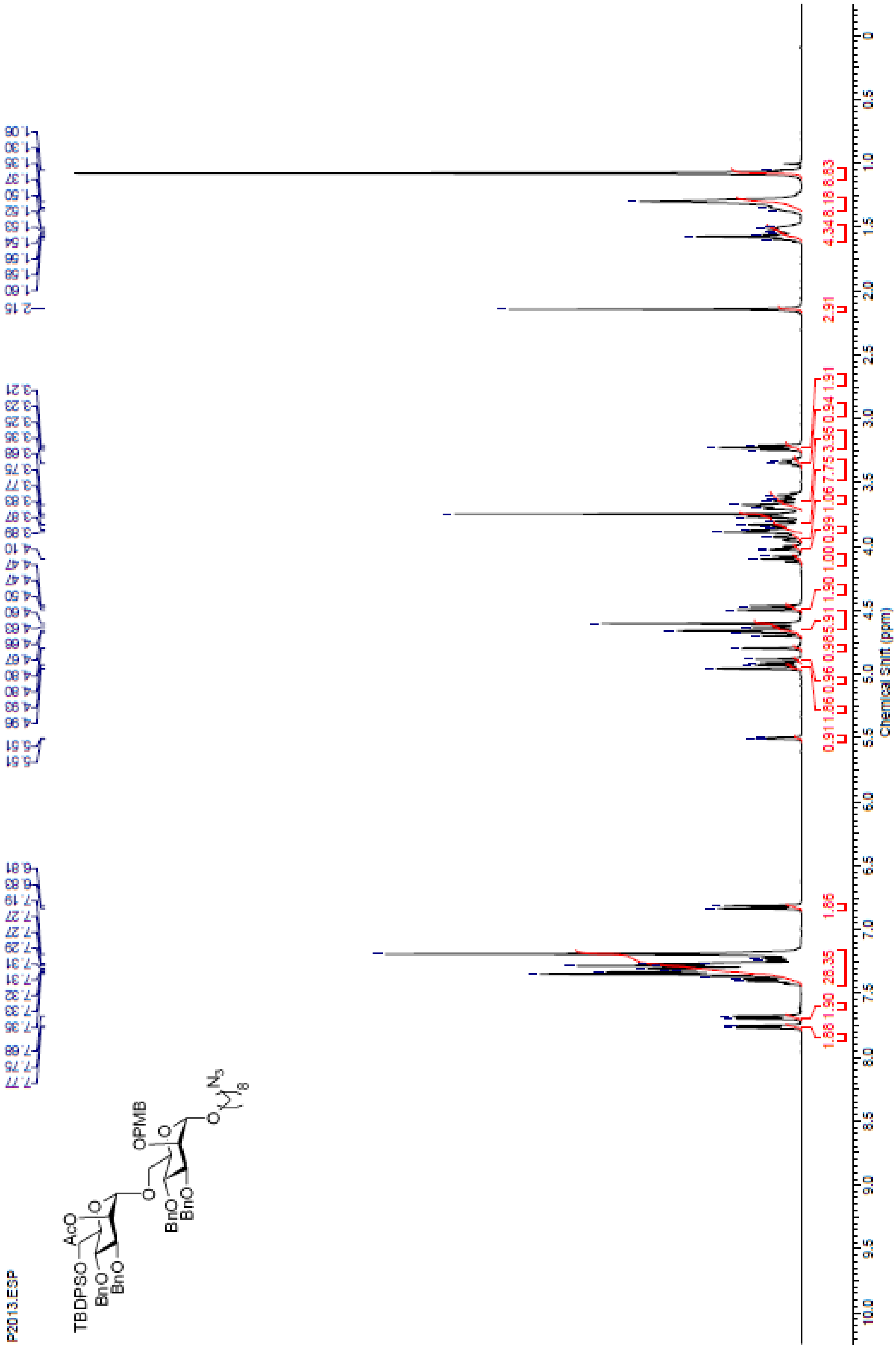
^{1}H NMR for compound **31** (400 MHz, $CDCl_3$)



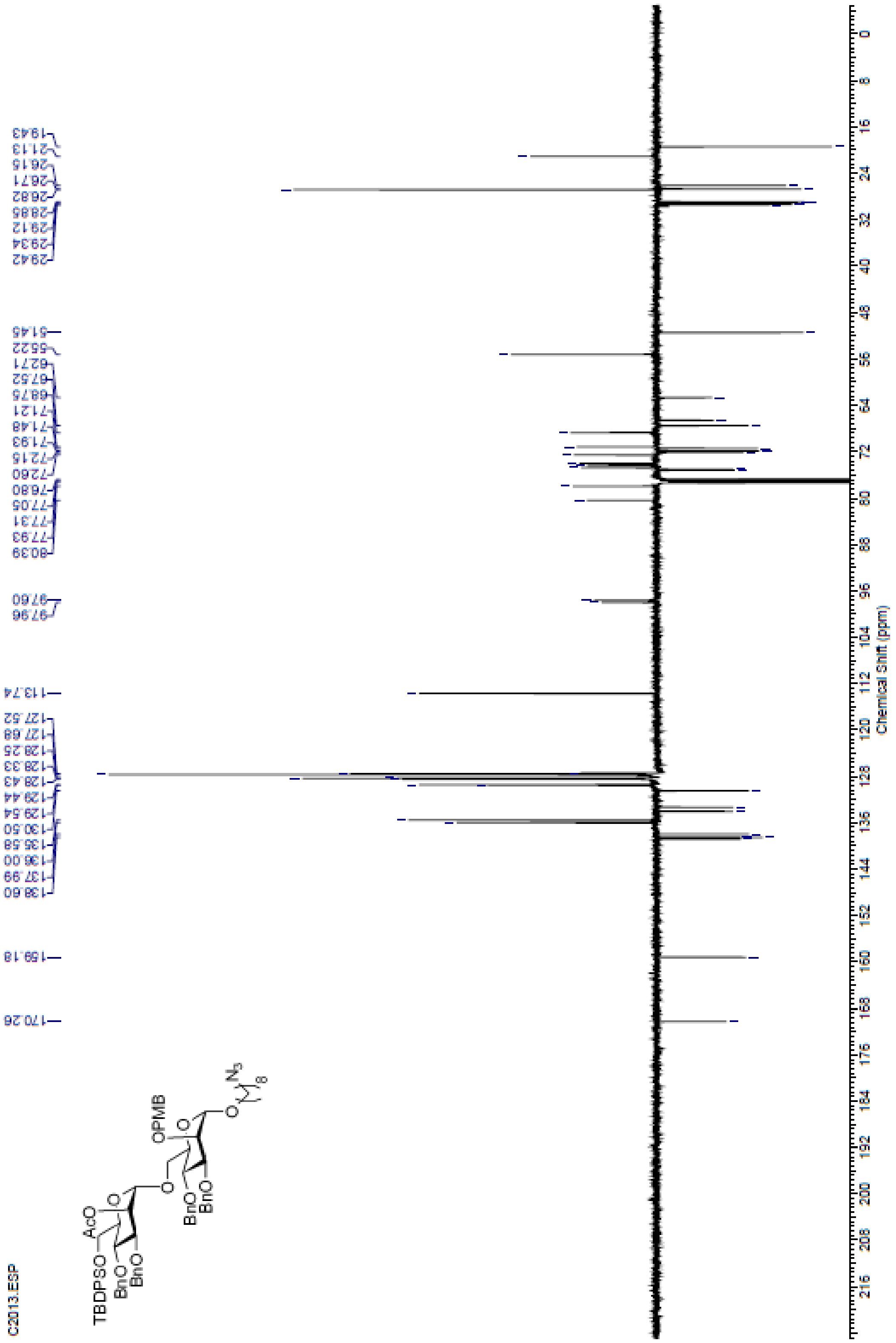
^{13}C NMR for compound **31** (126 MHz, $CDCl_3$)



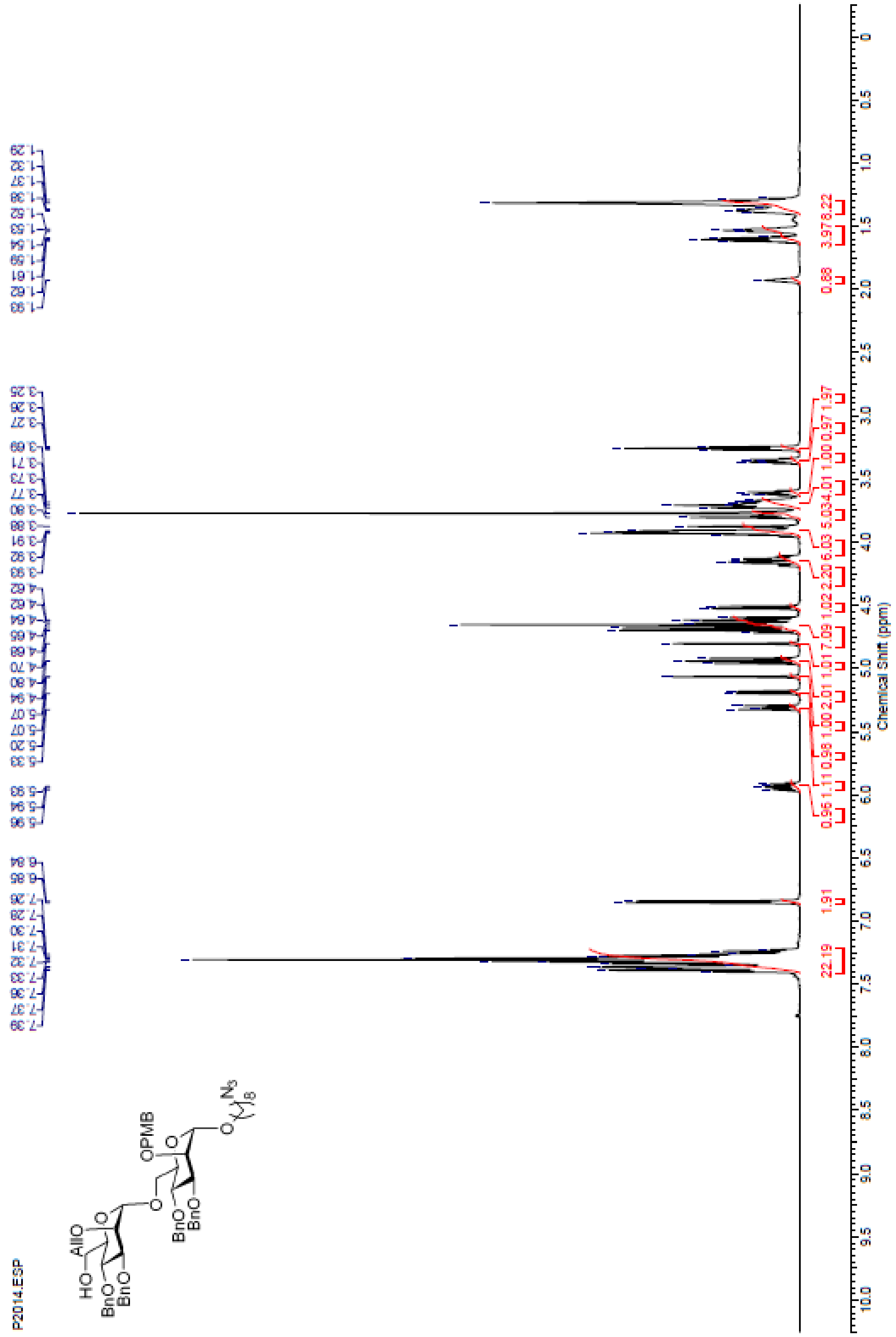
[1]H NMR for compound **32** (400 MHz, $CDCl_3$)



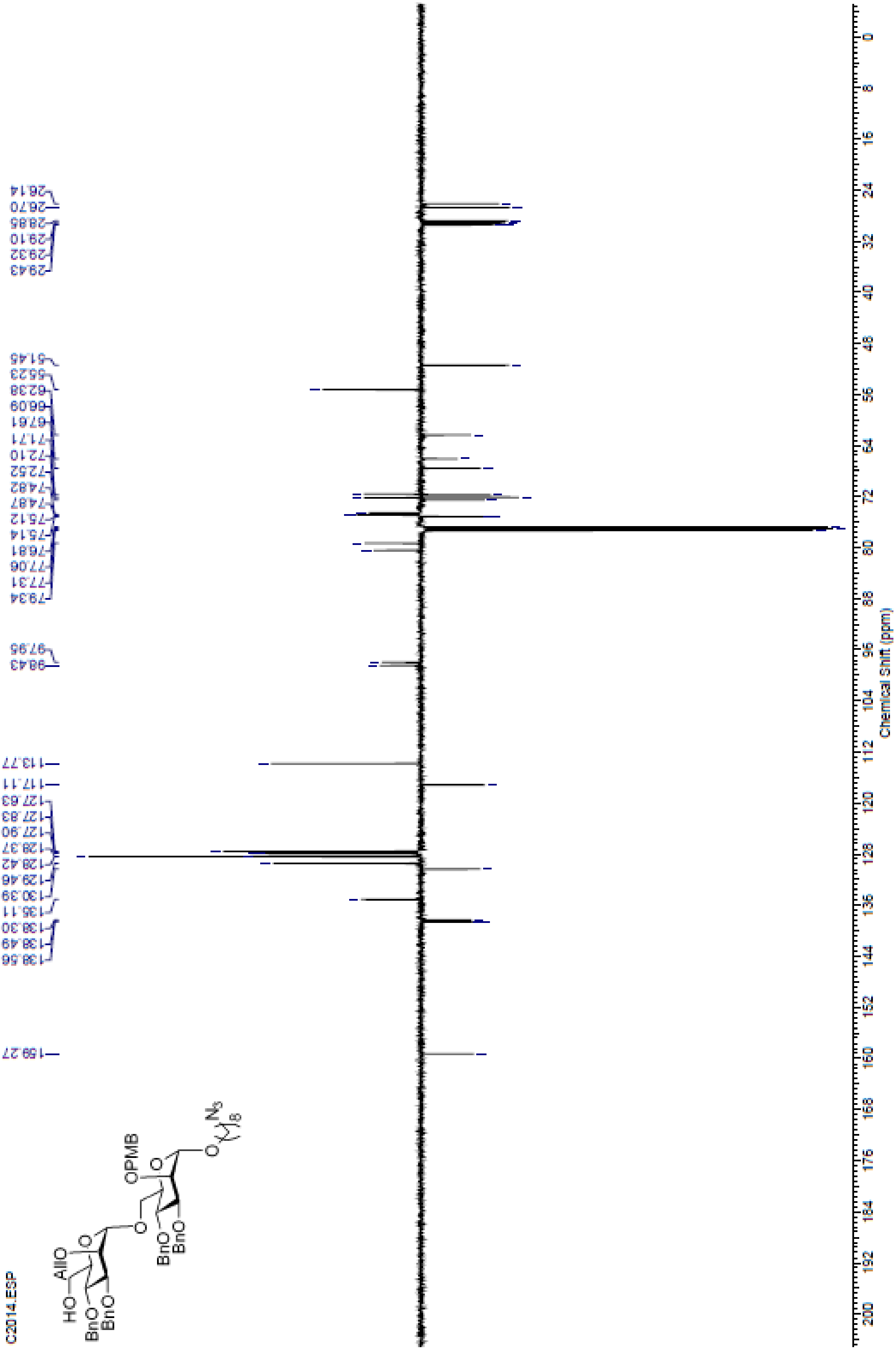
^{13}C NMR for compound **32** (126 MHz, $CDCl_3$)



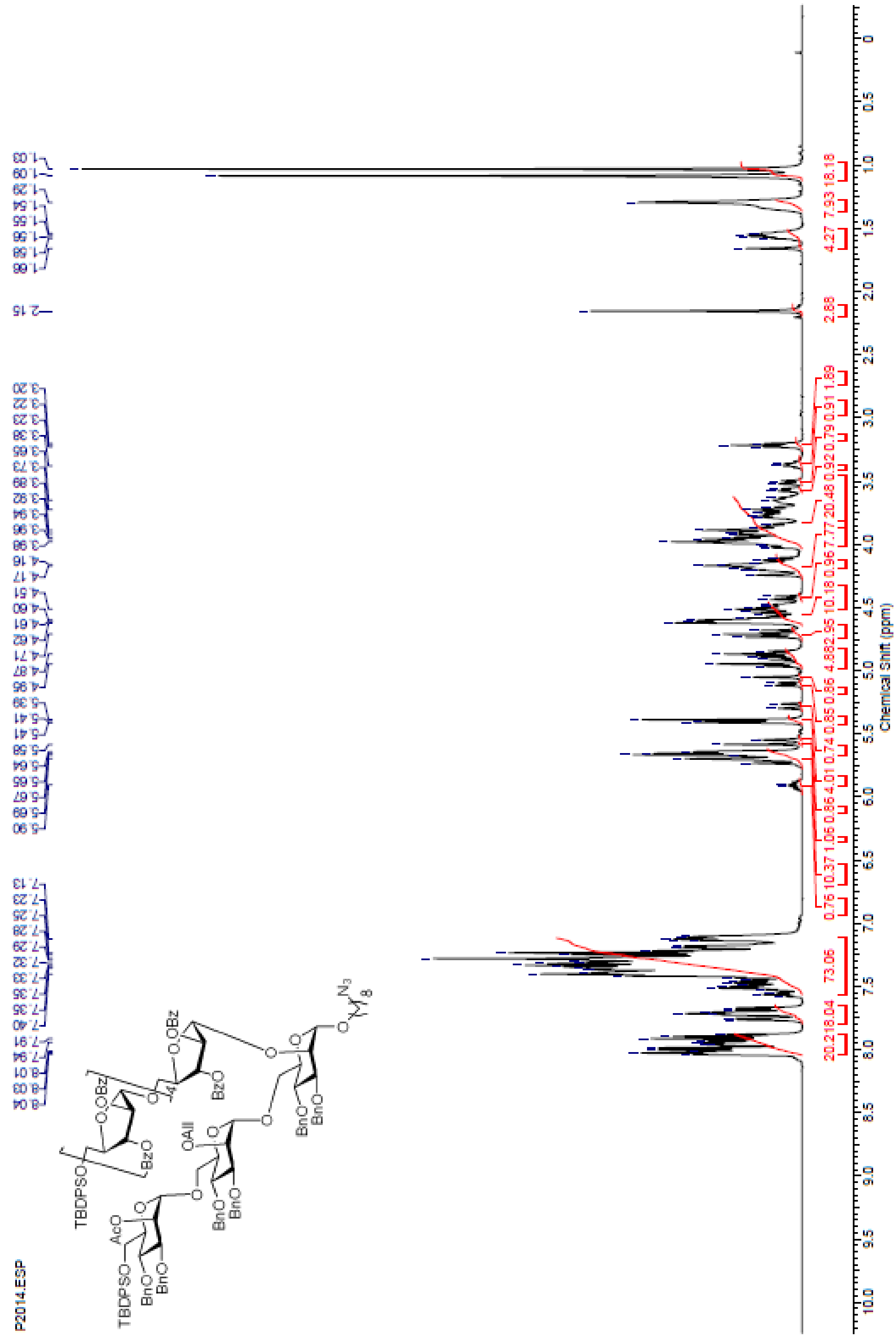
[1]H NMR for compound **33** (600 MHz, $CDCl_3$)



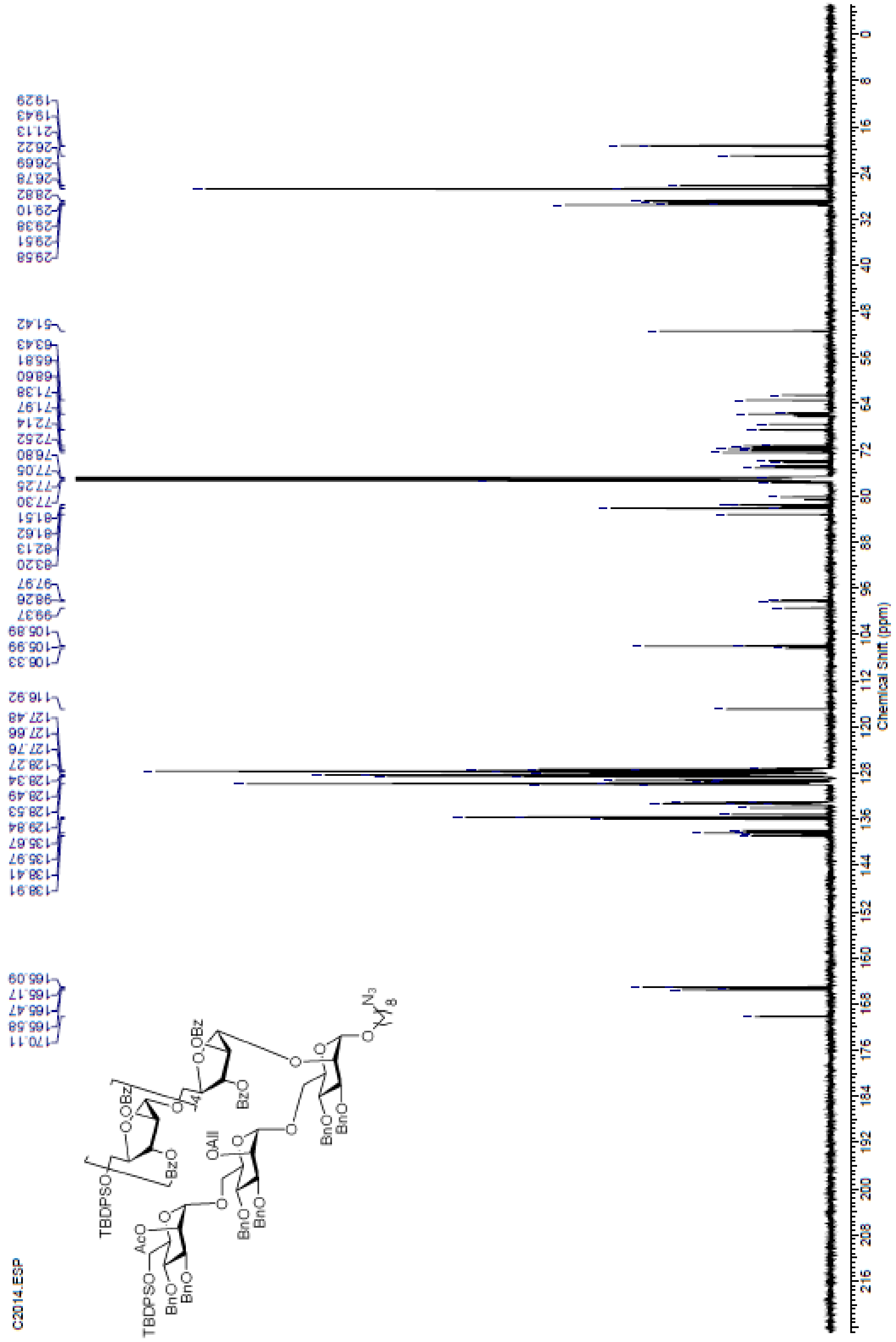
^{13}C NMR for compound **33** (126 MHz, $CDCl_3$)



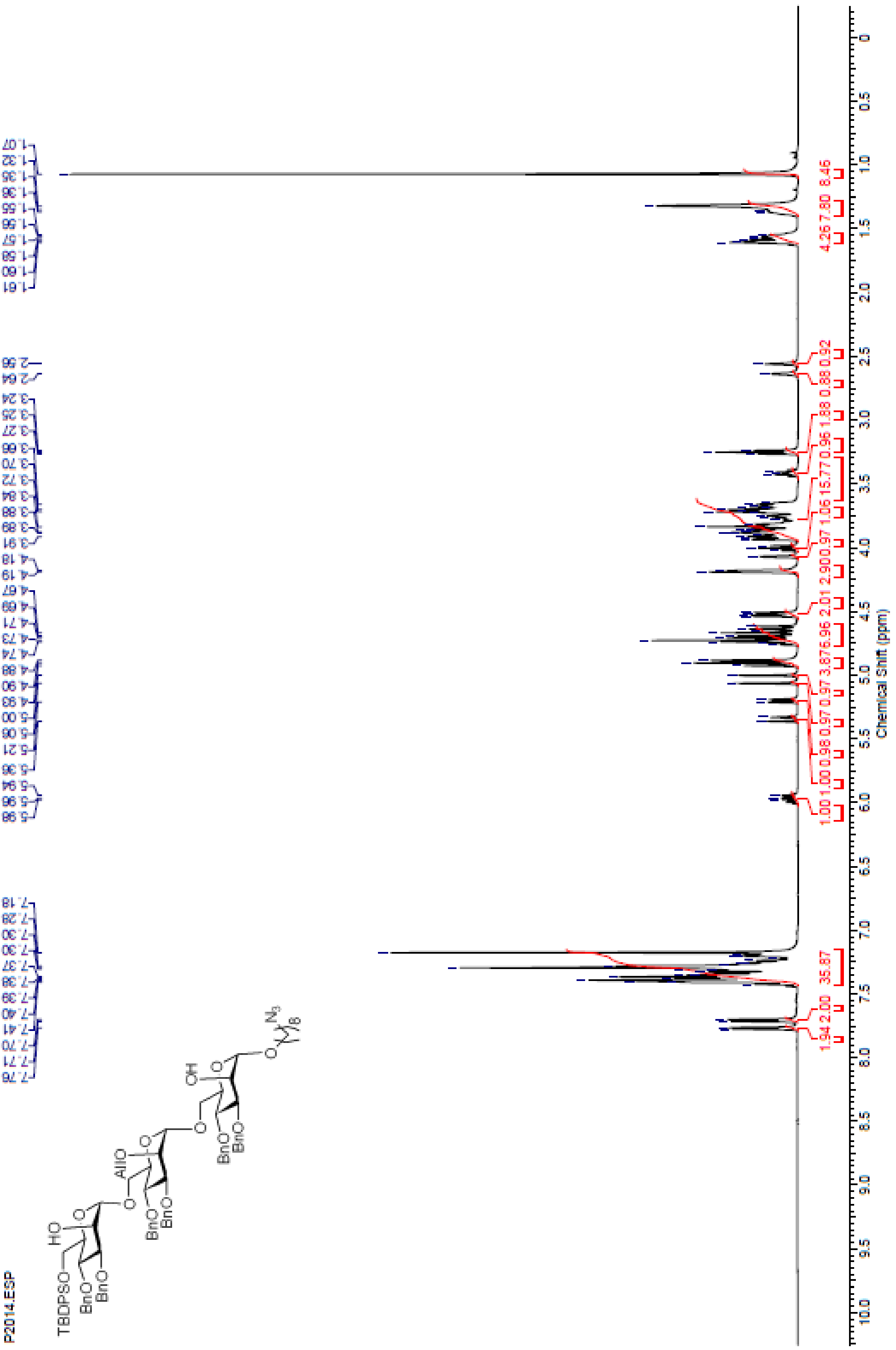
[1]H NMR for compound **34** (600 MHz, $CDCl_3$)



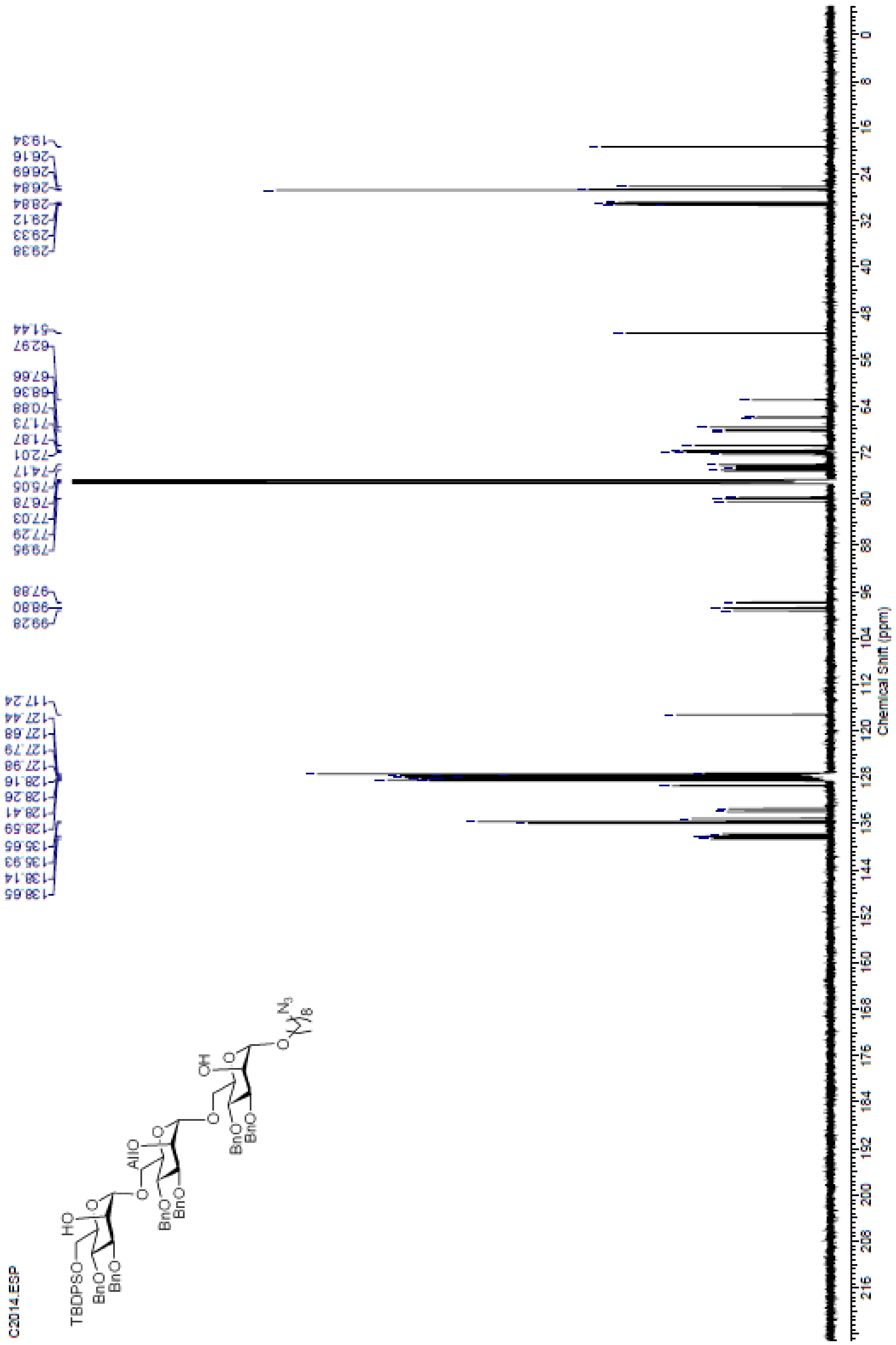
^{13}C NMR for compound **34** (126 MHz, CDCl$_3$)



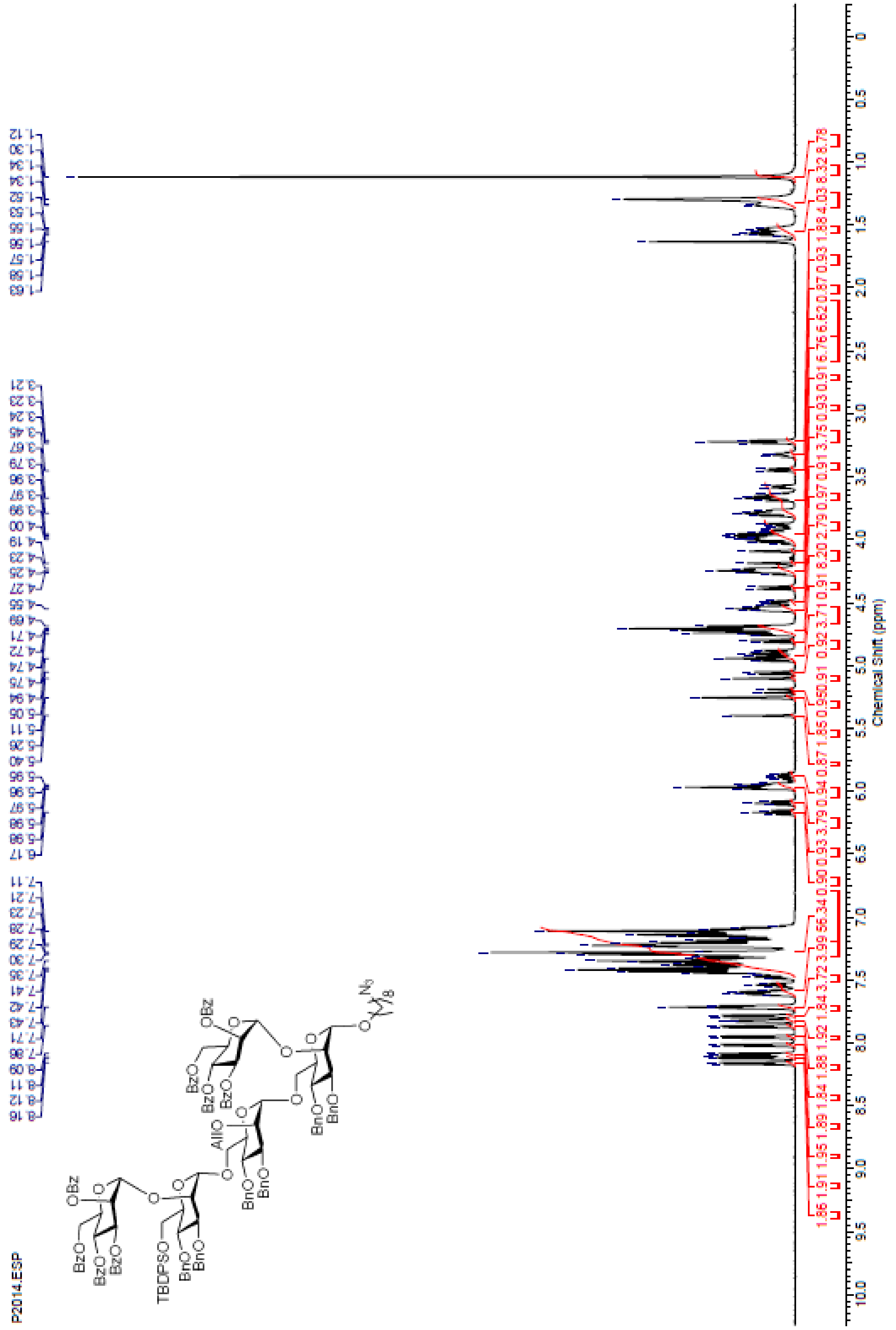
[1]H NMR for compound **35** (500 MHz, $CDCl_3$)



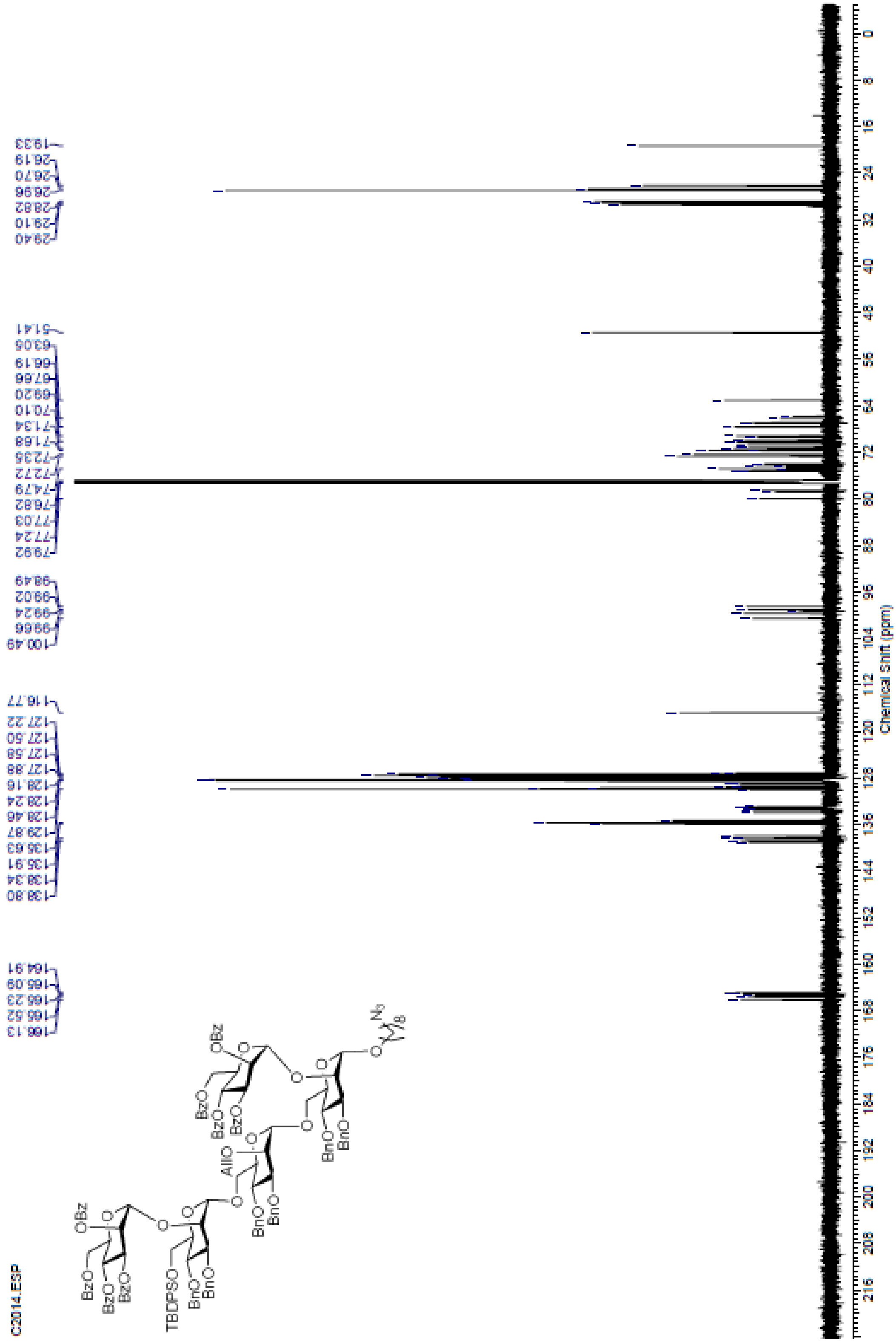
^{13}C NMR for compound **35** (126 MHz, $CDCl_3$)



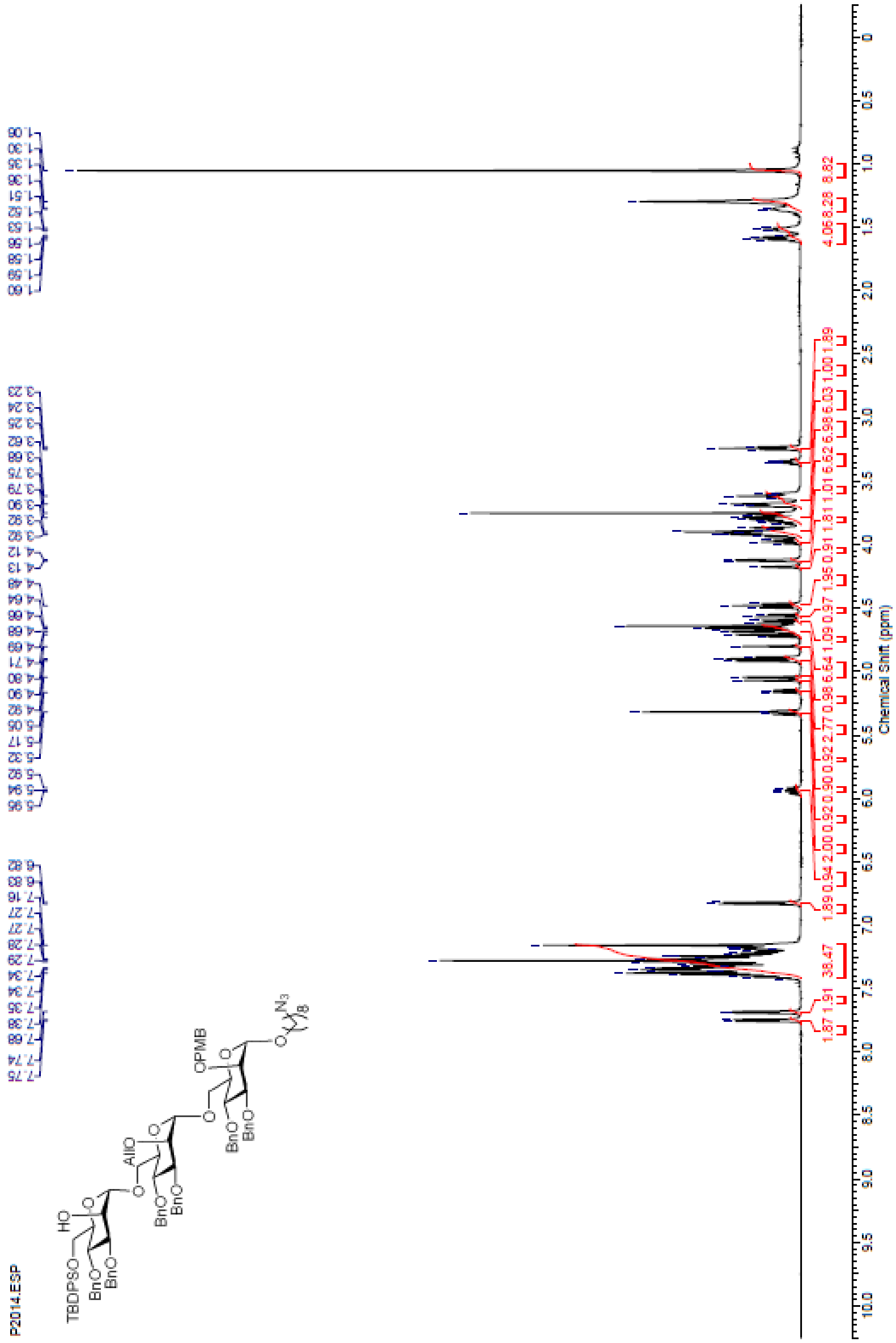
^{1}H NMR for compound **36** (600 MHz, $CDCl_3$)



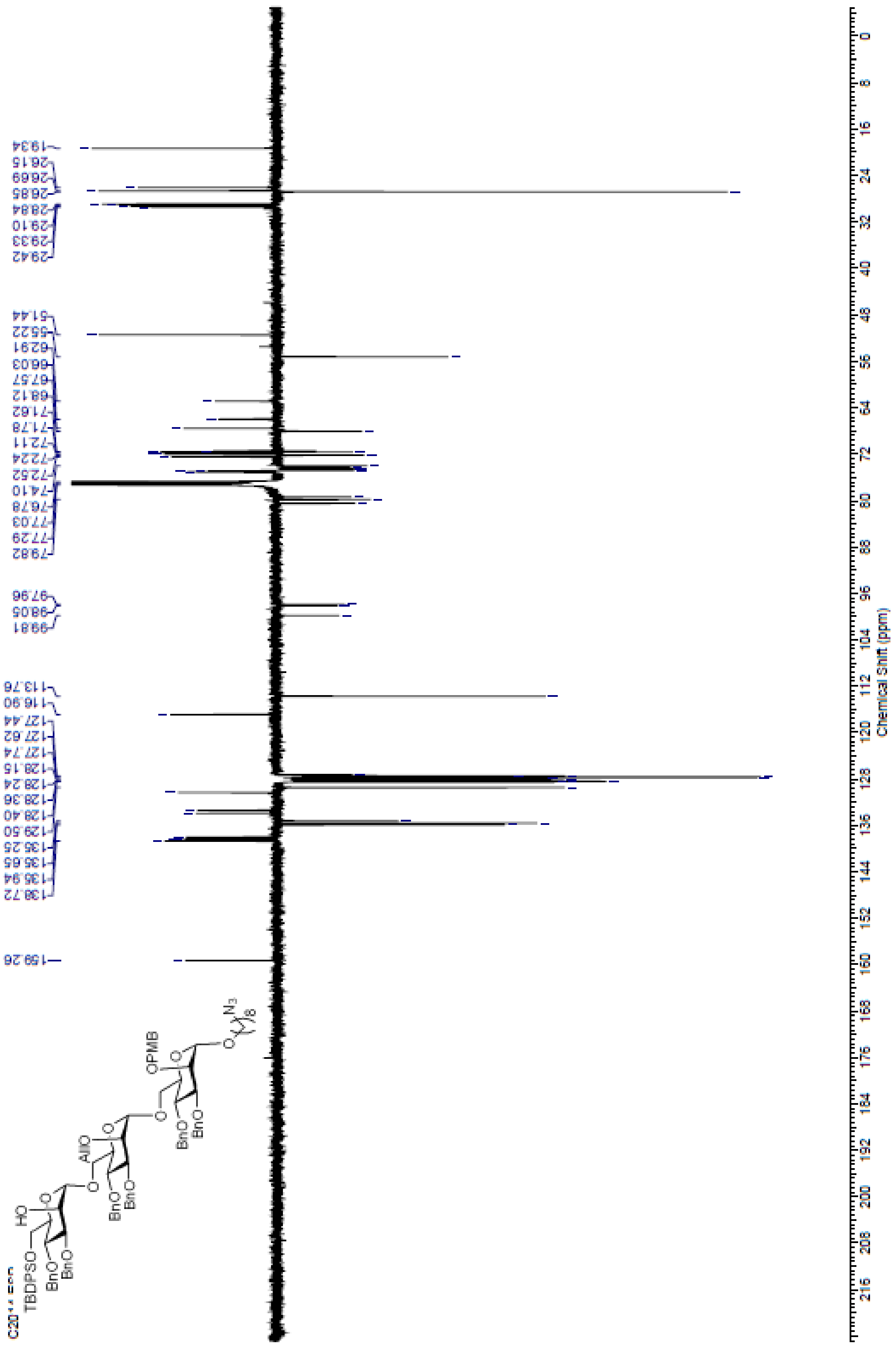
^{13}C NMR for compound **36** (151 MHz, $CDCl_3$)



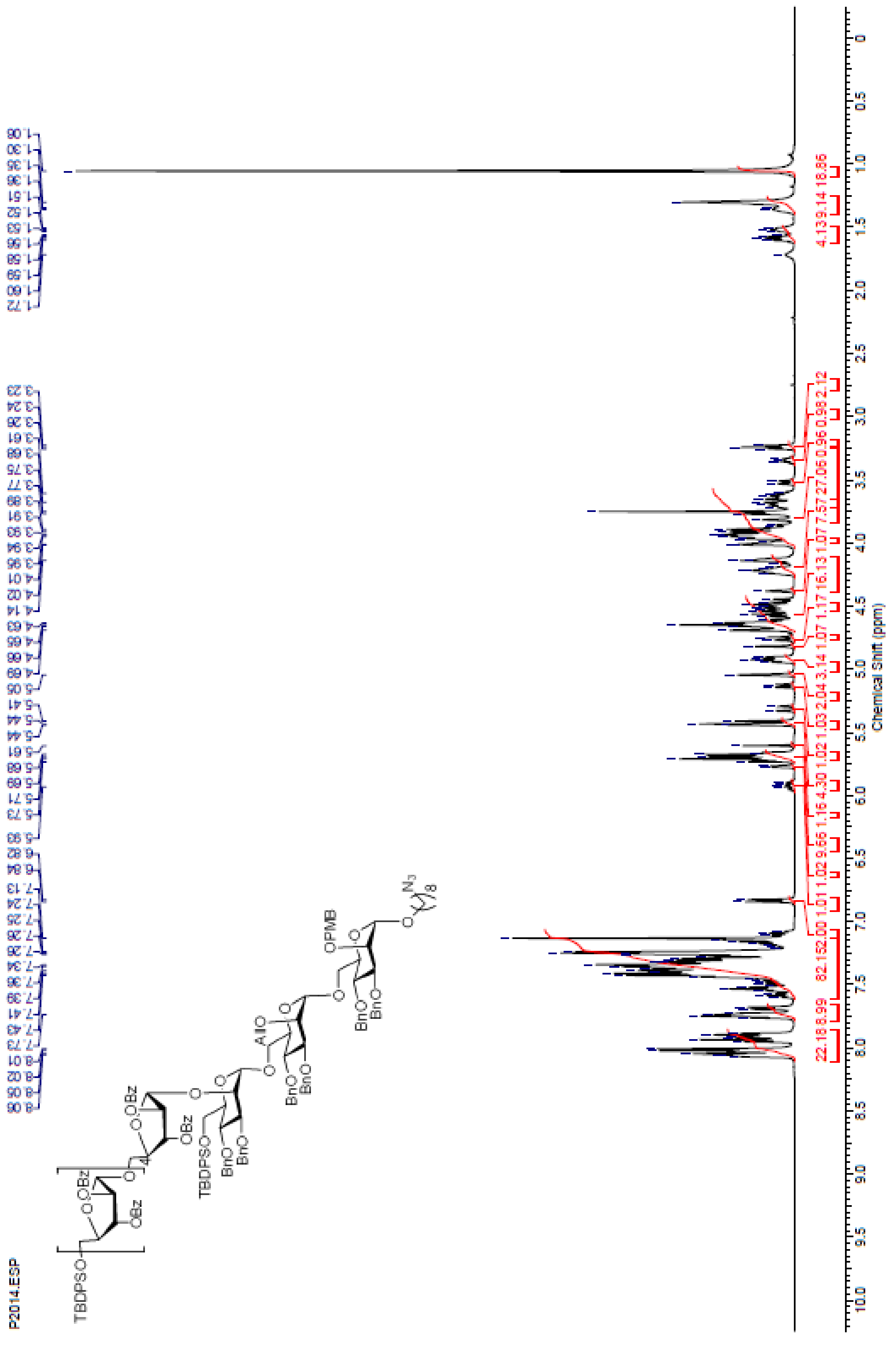
[1]H NMR for compound **37** (500 MHz, $CDCl_3$)



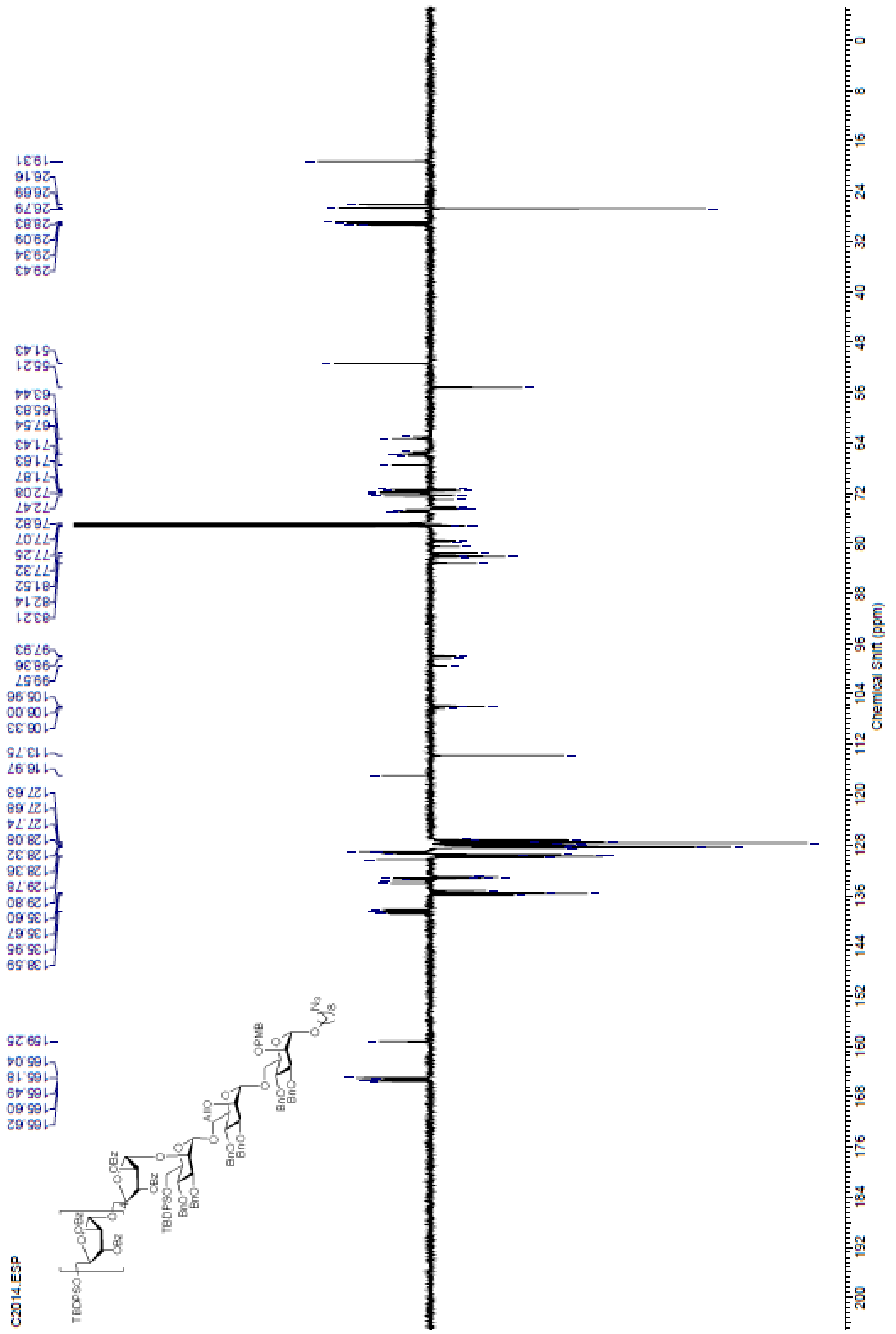
[13]C NMR for compound **37** (126 MHz, $CDCl_3$)



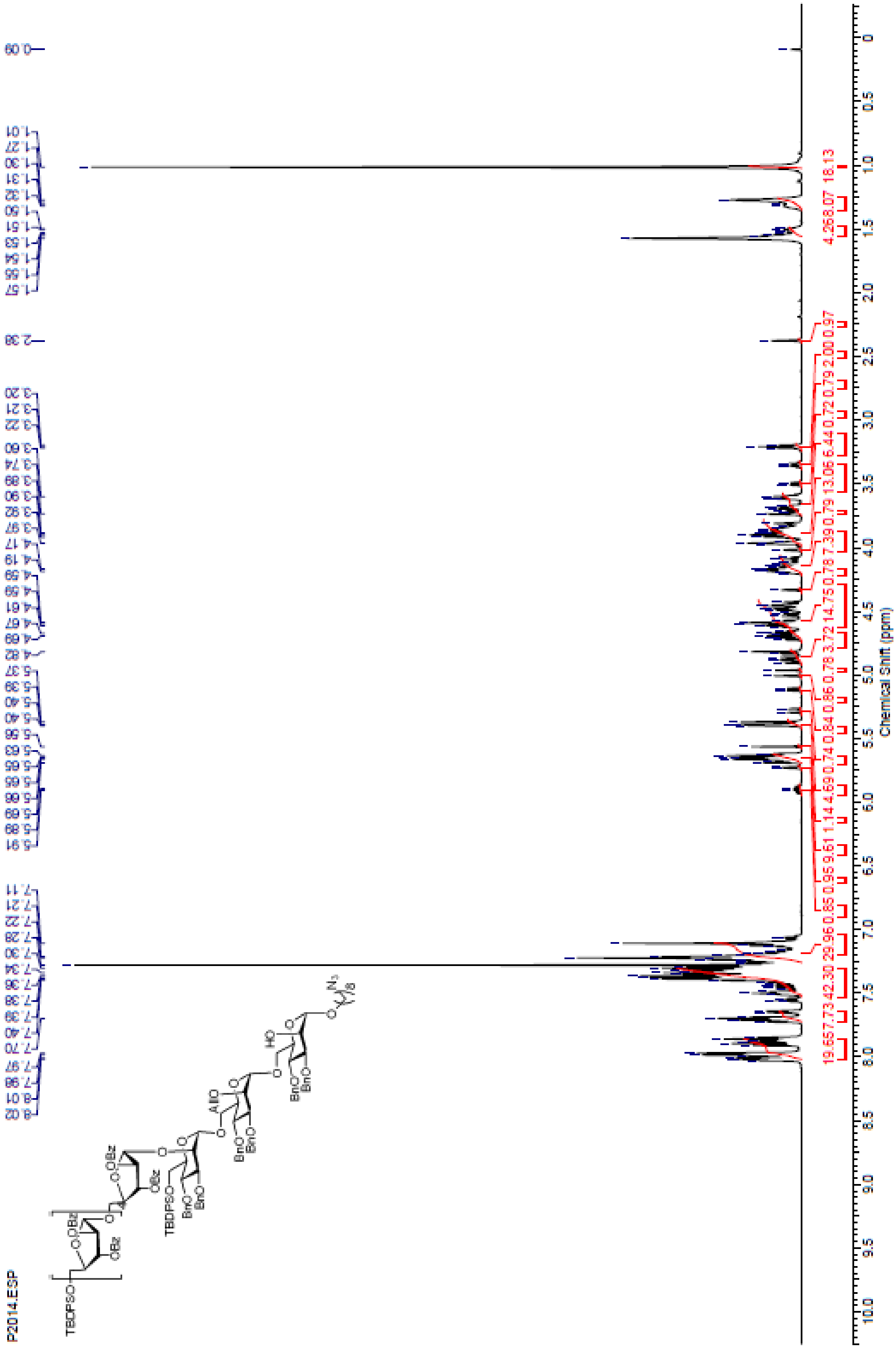
[1]H NMR for compound **38** (600 MHz, $CDCl_3$)



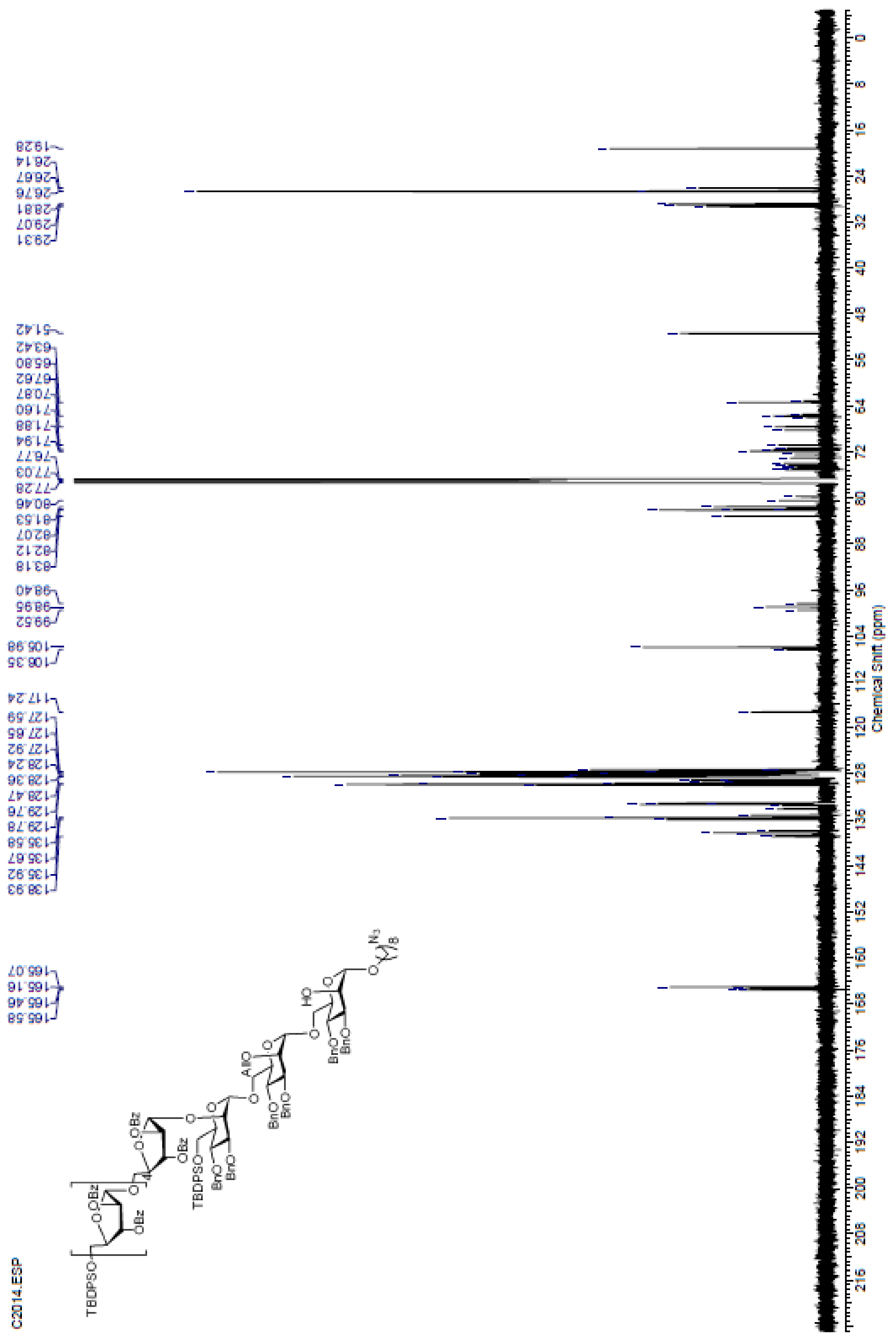
^{13}C NMR for compound **38** (126 MHz, $CDCl_3$)



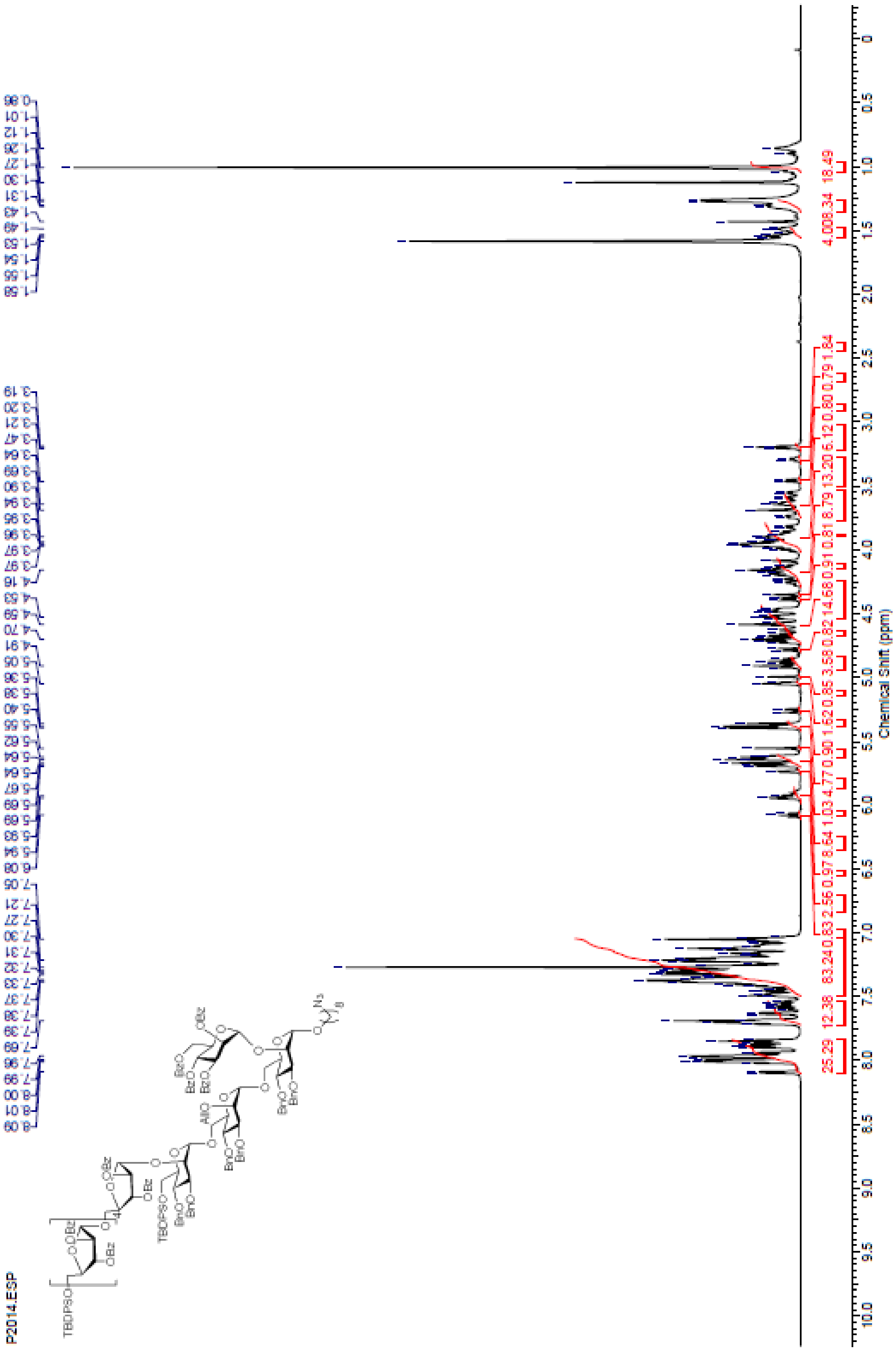
[1]H NMR for compound **39** (600 MHz, $CDCl_3$)



[13]C NMR for compound **39** (126 MHz, $CDCl_3$)



[1]H NMR for compound **40** (600 MHz, $CDCl_3$)



^{13}C NMR for compound **40** (126 MHz, $CDCl_3$)

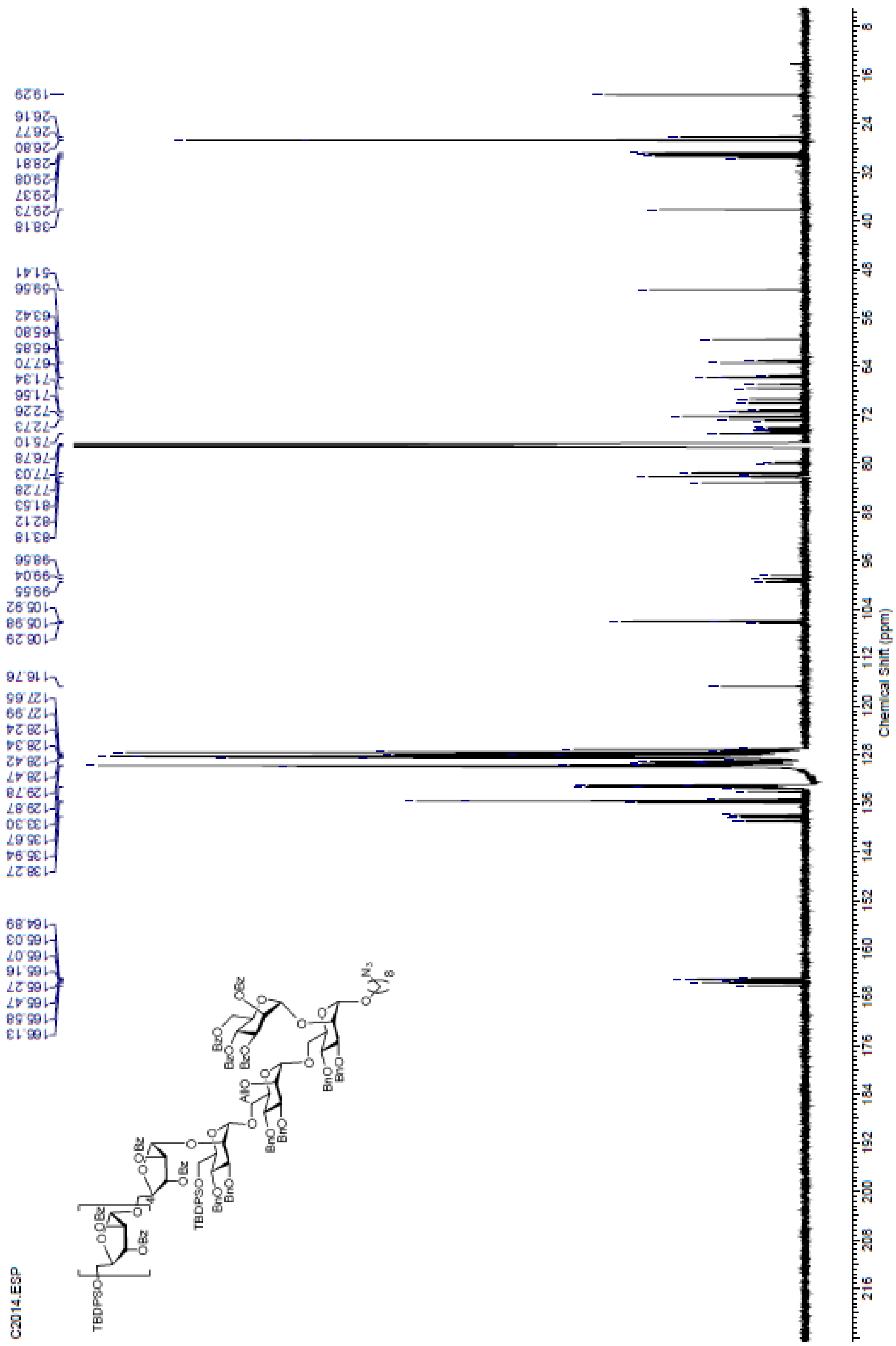


Table S1. Summary of chemical shifts (ppm) of the anomeric carbon and hydrogen resonances

Com-pound										
1	^{1}H	5.09	4.98	4.89	4.81					
	^{13}C	102.4	99.9	99.4	98.1					
2	^{1}H	5.13	5.07	5.03	5.01	4.89				
	^{13}C	102.4	102.3	99.6	98.3	98.1				
3	^{1}H	5.13	5.07–5.03				4.99	4.87	4.82	
	^{13}C	110.4	108.5	108.5	108.5	108.4	100.8	100.8	99.8	
4	^{1}H	5.17	5.07	5.07	5.07	5.07	5.01	4.88	4.84	
	^{13}C	109.5	107.6	107.6	107.5	107.4	99.9	99.5	98.8	
5	^{1}H	5.12	5.04	5.04	5.04	5.04	4.94	4.86	4.84	
	^{13}C	110.4	108.5	108.5	108.5	108.4	100.5	100.4	100.0	
6	^{1}H	5.15	5.10	5.08–5.04				5.00	4.98	4.82
	^{13}C	109.5	107.5	107.5	107.4	107.4	102.3	99.9	98.8	98.2
7	^{1}H	5.14	5.07–5.02					5.00–4.96		4.87
	^{13}C	109.4	107.5	107.5	107.4	107.4	102.4	99.5	98.8	98.2
8	^{1}H	5.08	4.97–4.88	4.87						
	^{13}C	98.2	98.1	98.0						
9	^{1}H	5.08	4.95	4.81						
	^{13}C	98.2	98.2	97.9						
12	^{1}H	5.76–5.73	5.40	5.40	5.39	5.58				
	^{13}C	106.0	106.0	105.9	105.9	91.6				
13	^{1}H	4.83								
	^{13}C	97.5								
14	^{1}H	4.84								
	^{13}C	98.3								
15	^{1}H	5.00	4.88							
	^{13}C	98.0	97.6							
16	^{1}H	5.07	4.86							
	^{13}C	98.5	97.9							
18	^{1}H	5.67–5.62	5.38							
	^{13}C	106.1	101.0							
22	^{1}H	5.76–5.73	5.39	5.39						
	^{13}C	106.0	106.0	91.6						
23	^{1}H	5.80–5.77	5.46	5.44						
	^{13}C	105.9	105.9	91.6						
24	^{1}H	5.06	4.97	4.87						
	^{13}C	98.8	98.0	97.7						
25	^{1}H	5.03	5.01	4.99–4.93	4.93–4.85					
	^{13}C	99.7	99.2	98.0	97.8					
26	^{1}H	5.72–5.62	5.43–5.35				5.05	5.00	4.87–4.82	
	^{13}C	106.2	106.0	106.0	105.8	105.8	99.8	97.8	97.8	
28	^{1}H	5.71–5.61	5.42–5.36				5.02	5.01	4.85	
	^{13}C	106.3	106.0	106.0	106.0	105.9	99.6	98.4	97.9	
29	^{1}H	5.69	5.43–5.35				5.01	5.01	5.01	4.86
	^{13}C	106.5	106.0	106.0	106.0	105.9	99.6	99.6	99.2	97.9
30	^{1}H	5.02	4.96–4.89	4.88–4.83						

	^{13}C	99.0	98.2	97.8						
31	^{1}H	4.76								
	^{13}C	98.3								
32	^{1}H	4.96	4.80							
	^{13}C	98.0	97.6							
33	^{1}H	5.07	4.80							
	^{13}C	98.4	97.8							
34	^{1}H	5.75–5.61	5.44–5.36				5.05	4.97–4.82		
	^{13}C	106.4	106.0	106.0	105.9	105.9	99.4	98.3	97.9	
35	^{1}H	5.05	4.99	4.92–4.84						
	^{13}C	99.3	98.8	97.9						
36	^{1}H	5.40	5.26	5.26	5.11	4.93				
	^{13}C	100.5	99.7	99.3	99.0	98.5				
37	^{1}H	5.07	5.05	4.81						
	^{13}C	99.8	98.1	98.0						
38	^{1}H	5.75–5.65	5.47–5.39				5.05	5.05	4.82	
	^{13}C	106.3	106.0	106.0	106.0	105.9	99.6	98.4	97.9	
39	^{1}H	5.70–5.60	5.43–5.33				5.01	4.97	4.82	
	^{13}C	106.4	106.0	106.0	105.9	105.9	99.5	99.0	98.4	
40	^{1}H	5.71–5.59	5.43–5.33					5.07–5.03	5.01	4.97
	^{13}C	106.3	106.0	106.0	105.9	105.9	99.6	99.3	99.0	98.5