Enantioselective Synthesis of D-α-Amino Amides from Aliphatic Aldehydes

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SI-II-X

Figure 1. ^{1}H NMR (400 MHz, $CDCl_3$) of **S1.**

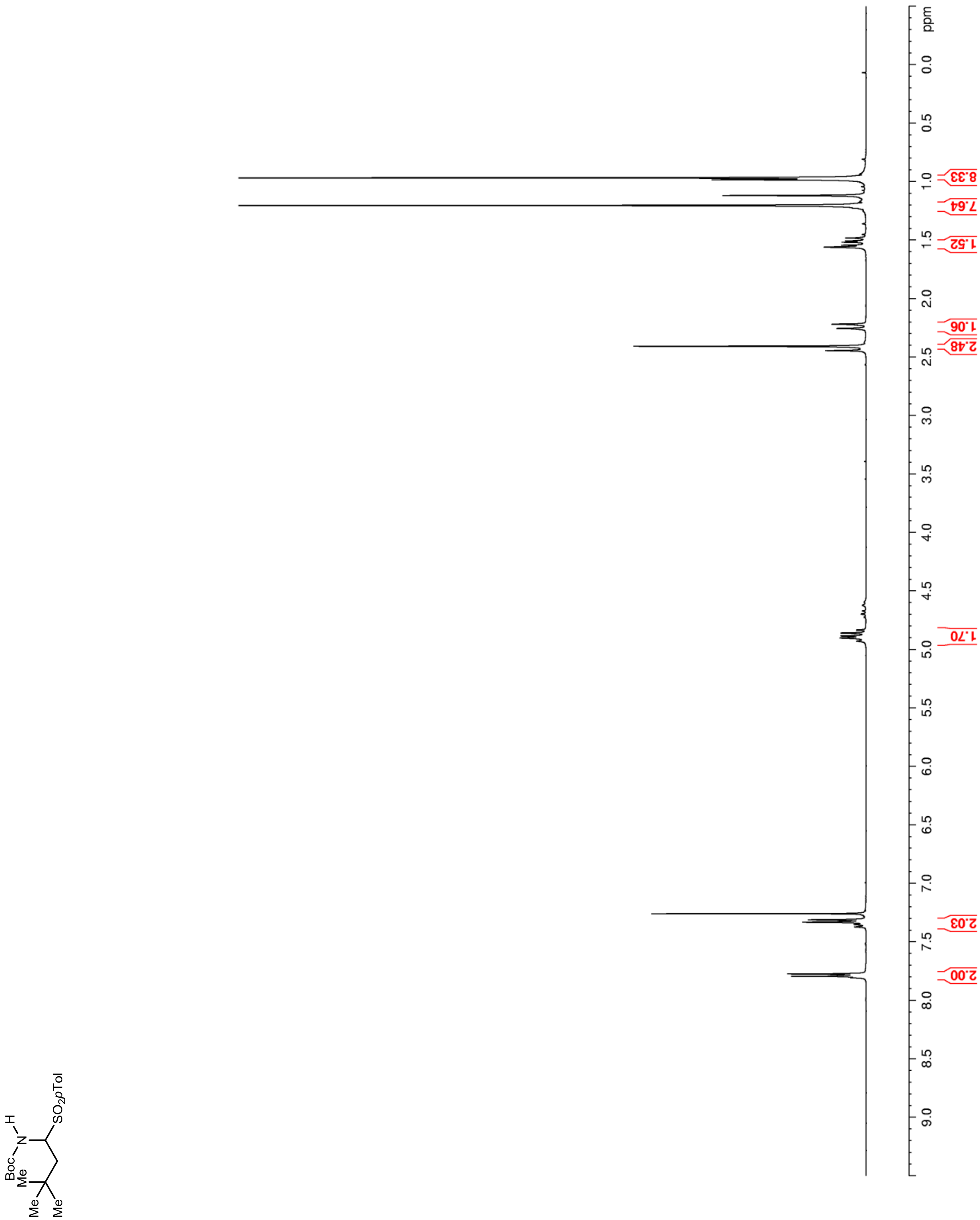


Figure 2. ^{13}C NMR (100 MHz, $CDCl_3$) of **S1.**

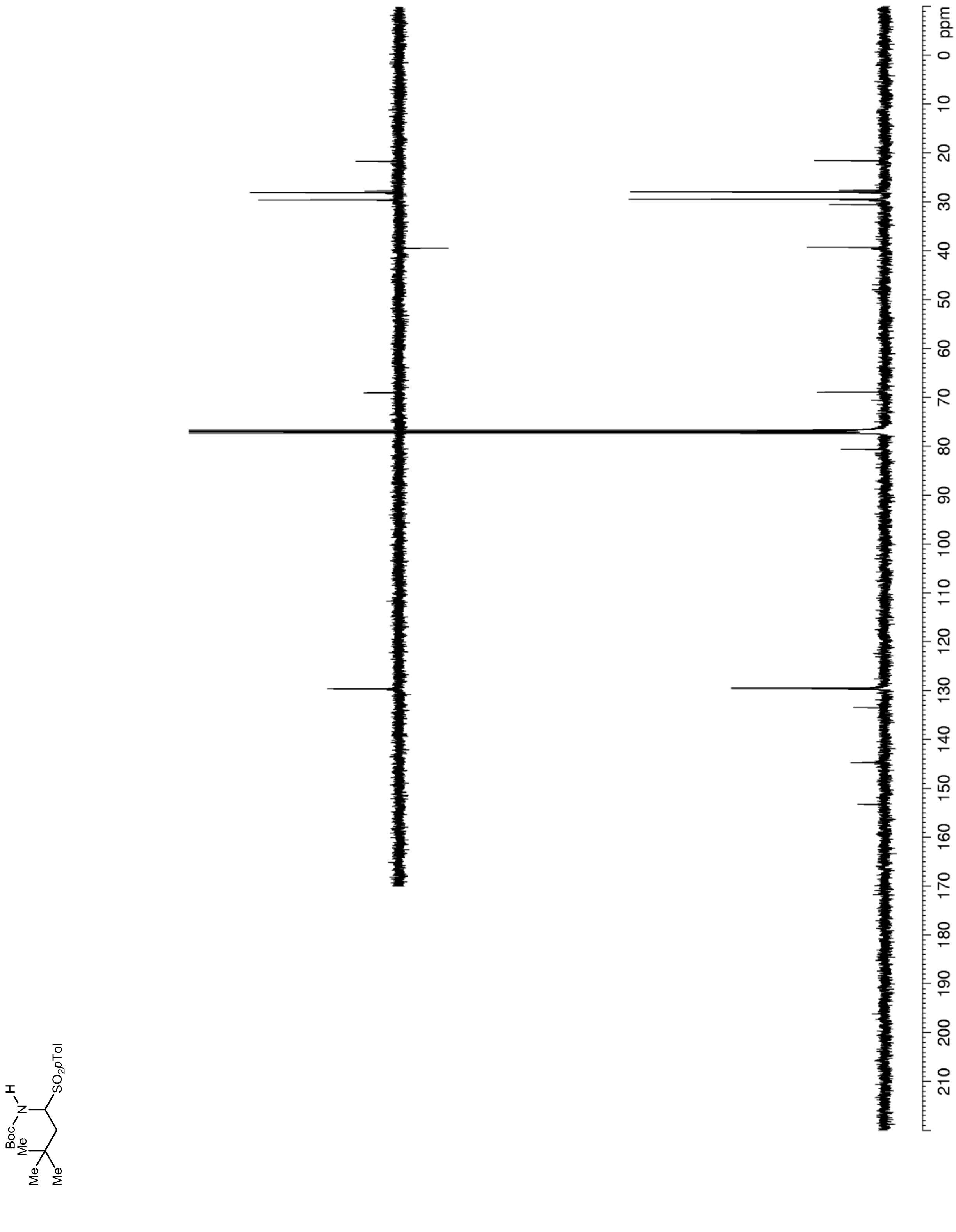


Figure 3. [1]H NMR (400 MHz, $CDCl_3$) of **S2**.

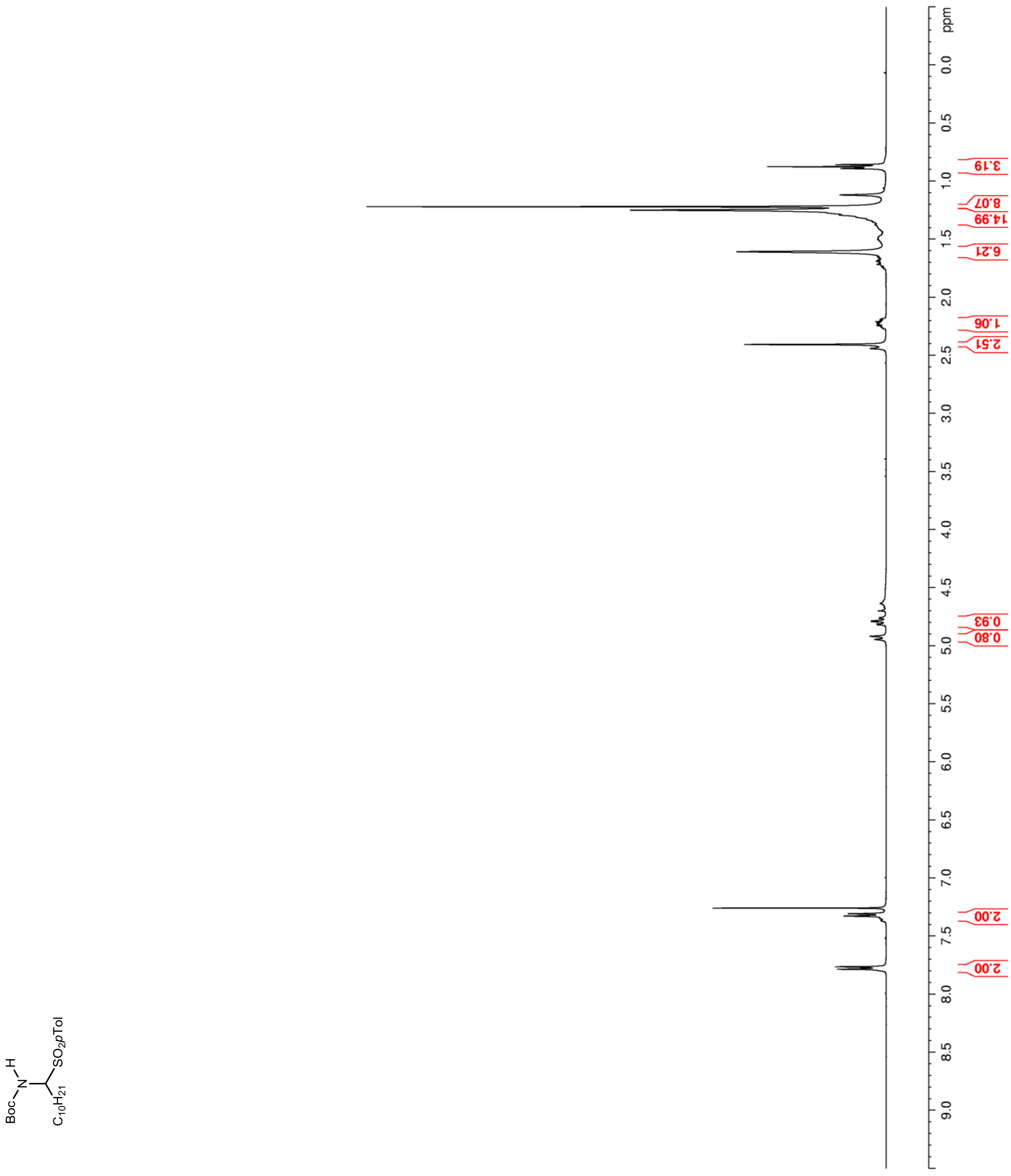


Figure 4. ^{13}C NMR (100 MHz, $CDCl_3$) of **S2**.

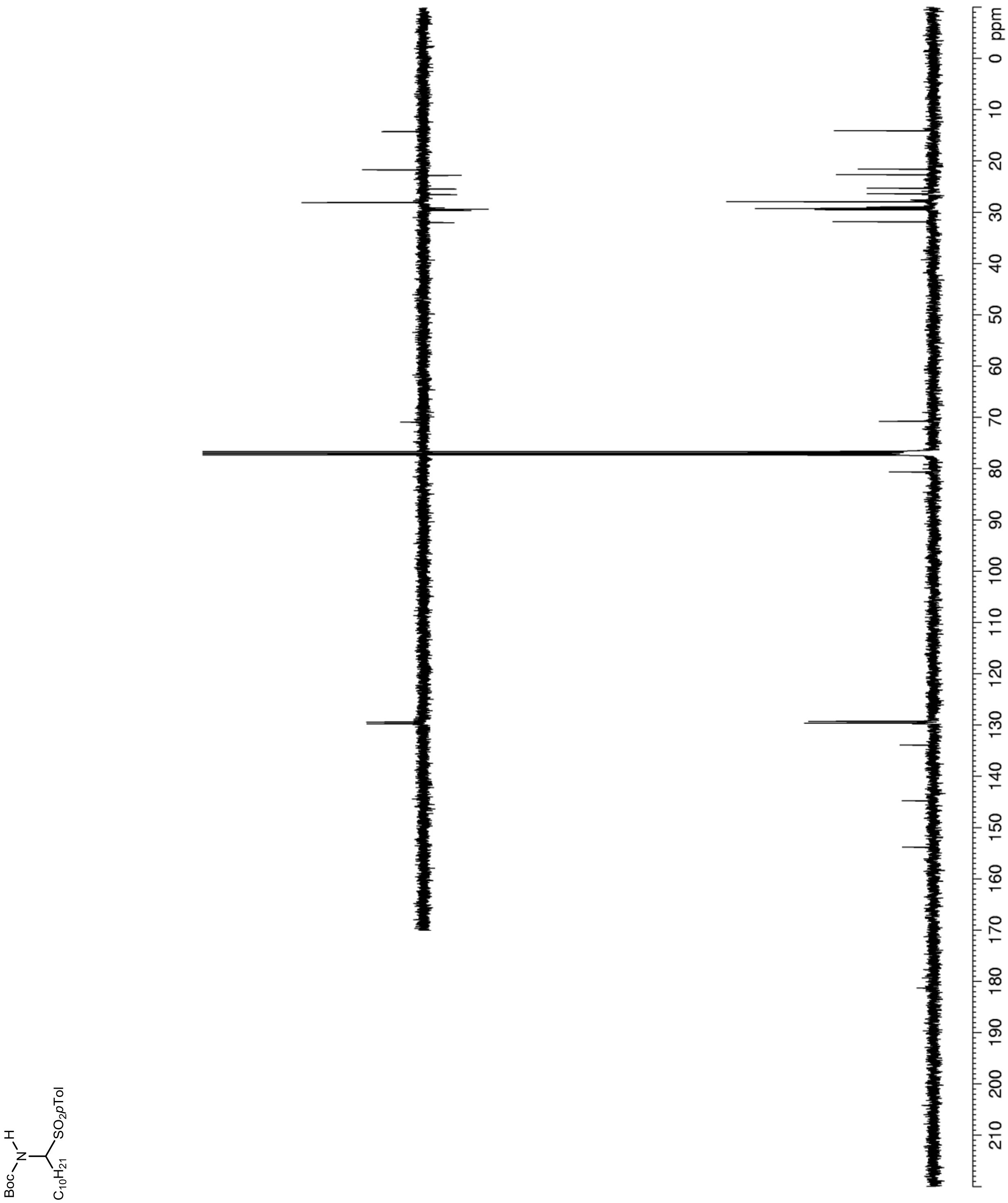


Figure 5. ^{1}H NMR (400 MHz, $CDCl_3$) of **S3.**

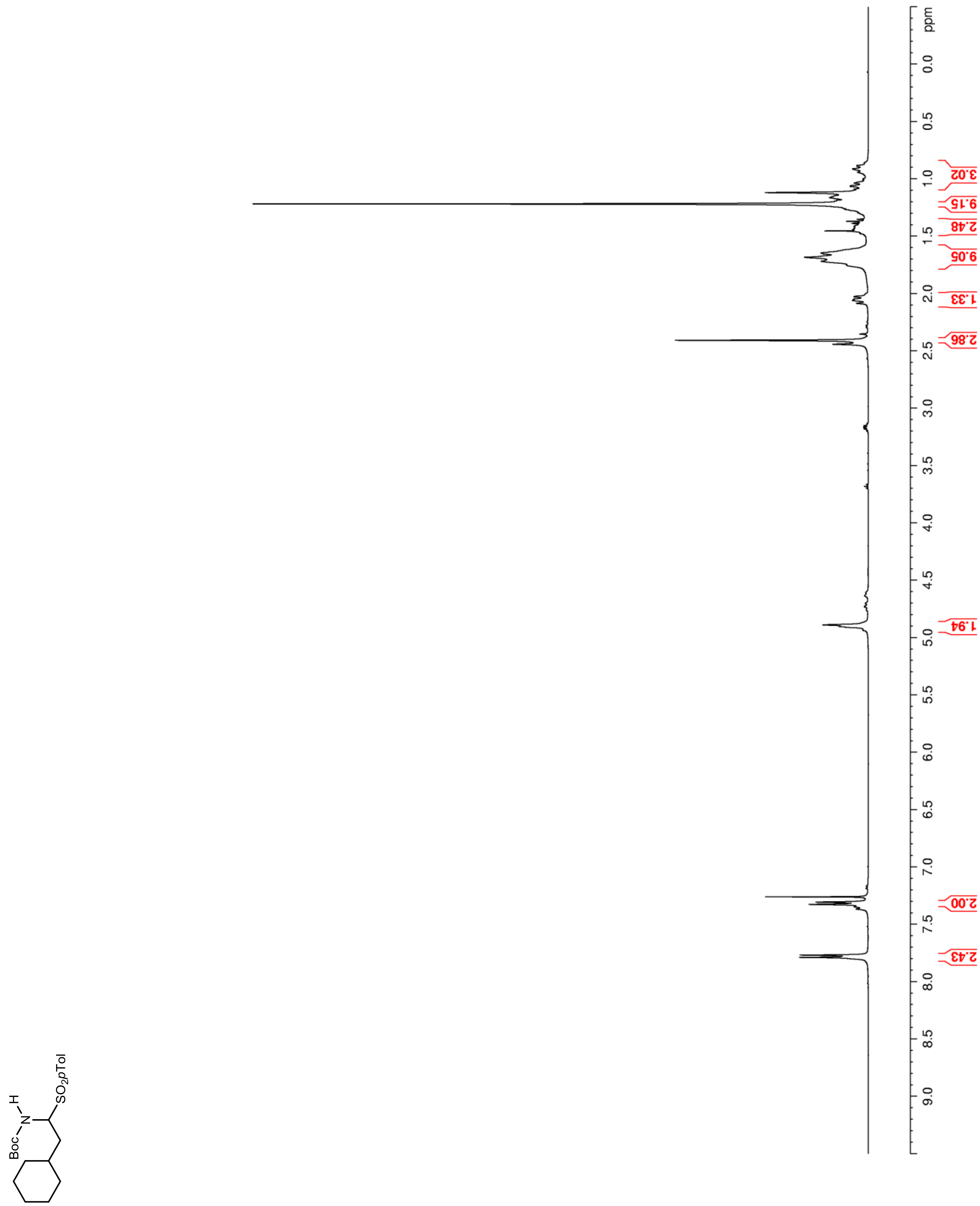


Figure 6. ^{13}C NMR (100 MHz, $CDCl_3$) of **S3.**

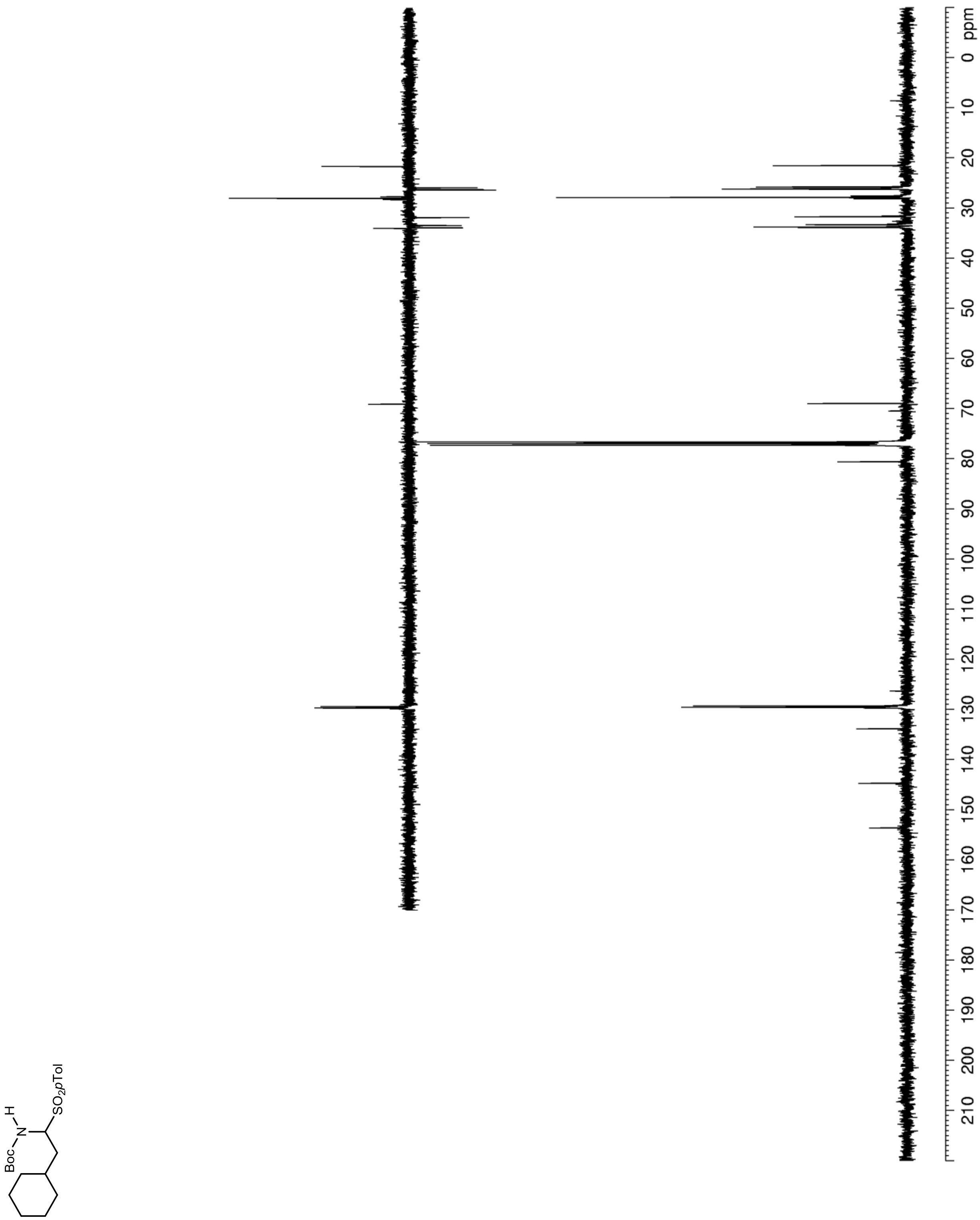


Figure 7. ^{1}H NMR (400 MHz, $CDCl_3$) of **S4.**

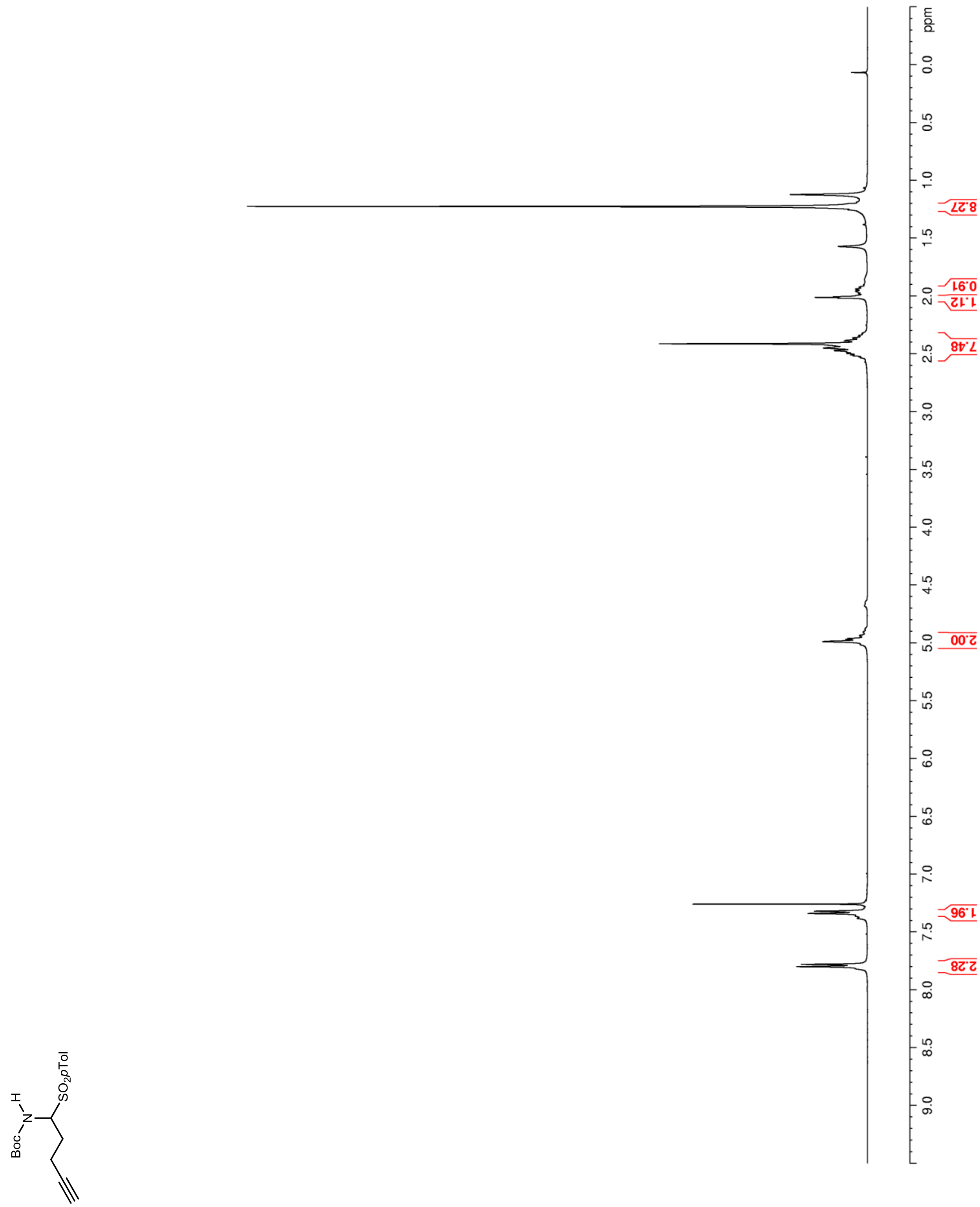


Figure 8. ^{13}C NMR (100 MHz, $CDCl_3$) of **S4**.

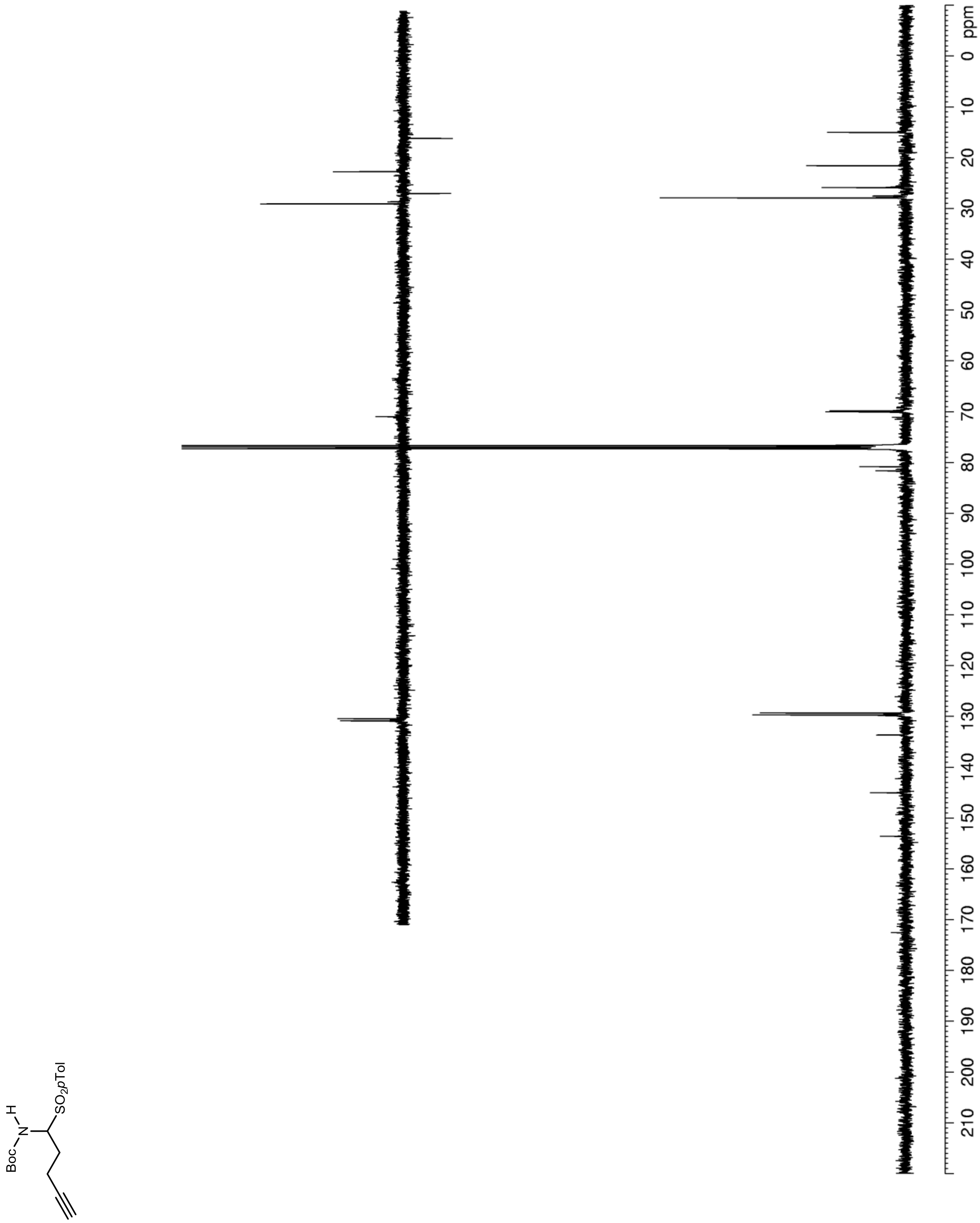


Figure 9. ^{1}H NMR (400 MHz, $CDCl_3$) of **S5.**

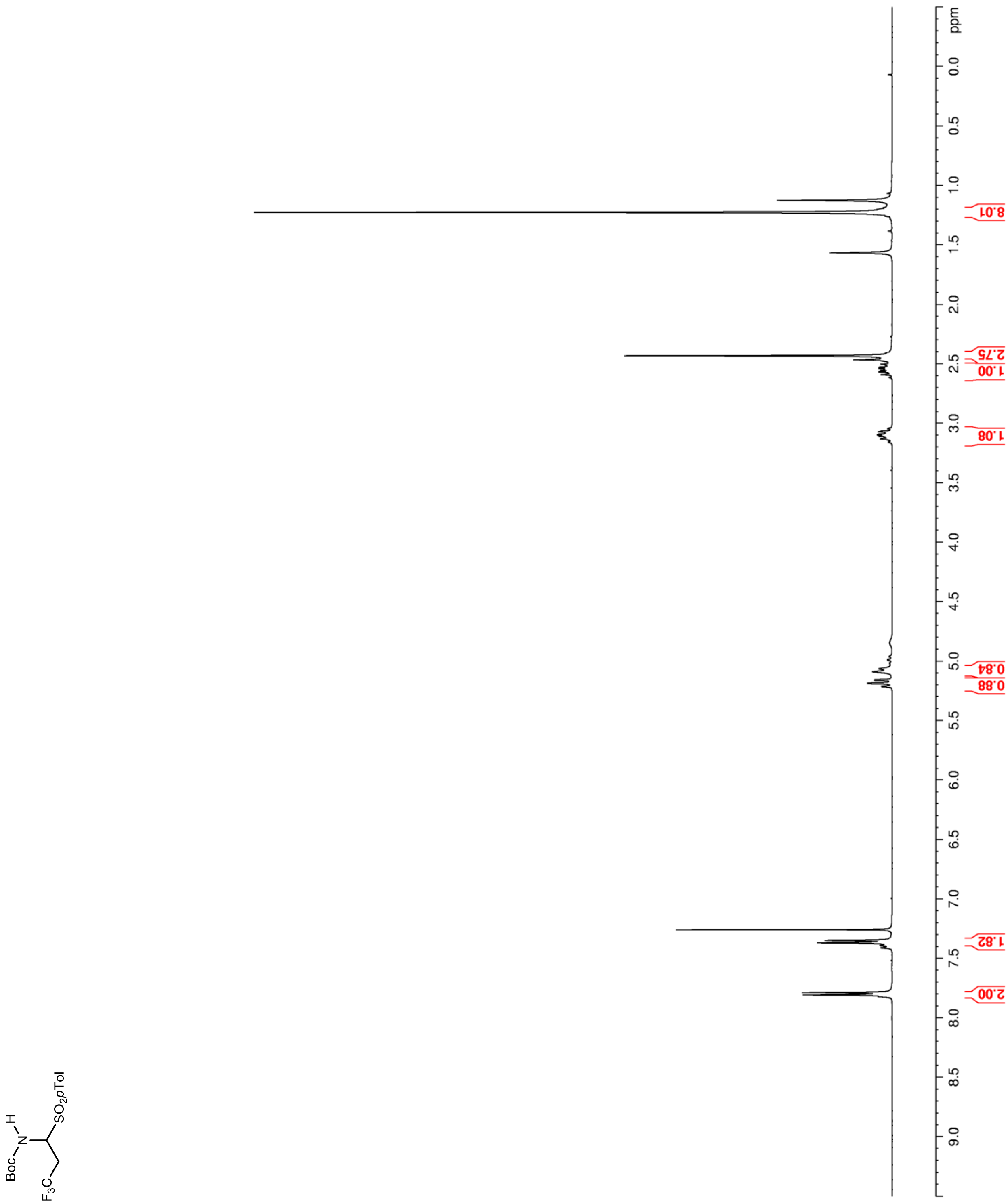


Figure 10. ^{13}C NMR (100 MHz, $CDCl_3$) of **S5.**

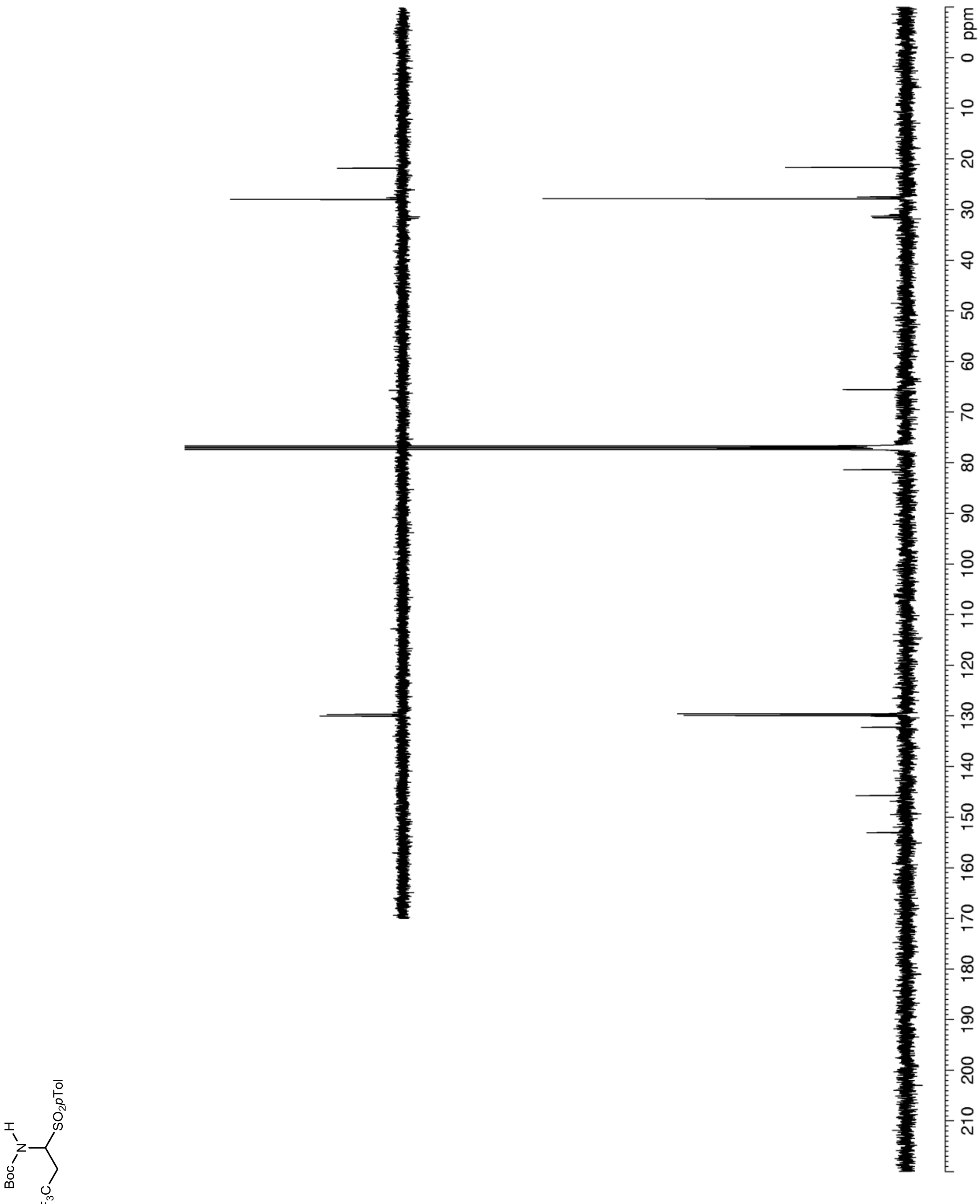


Figure 11. ^{1}H NMR (400 MHz, $CDCl_3$) of **S6.**

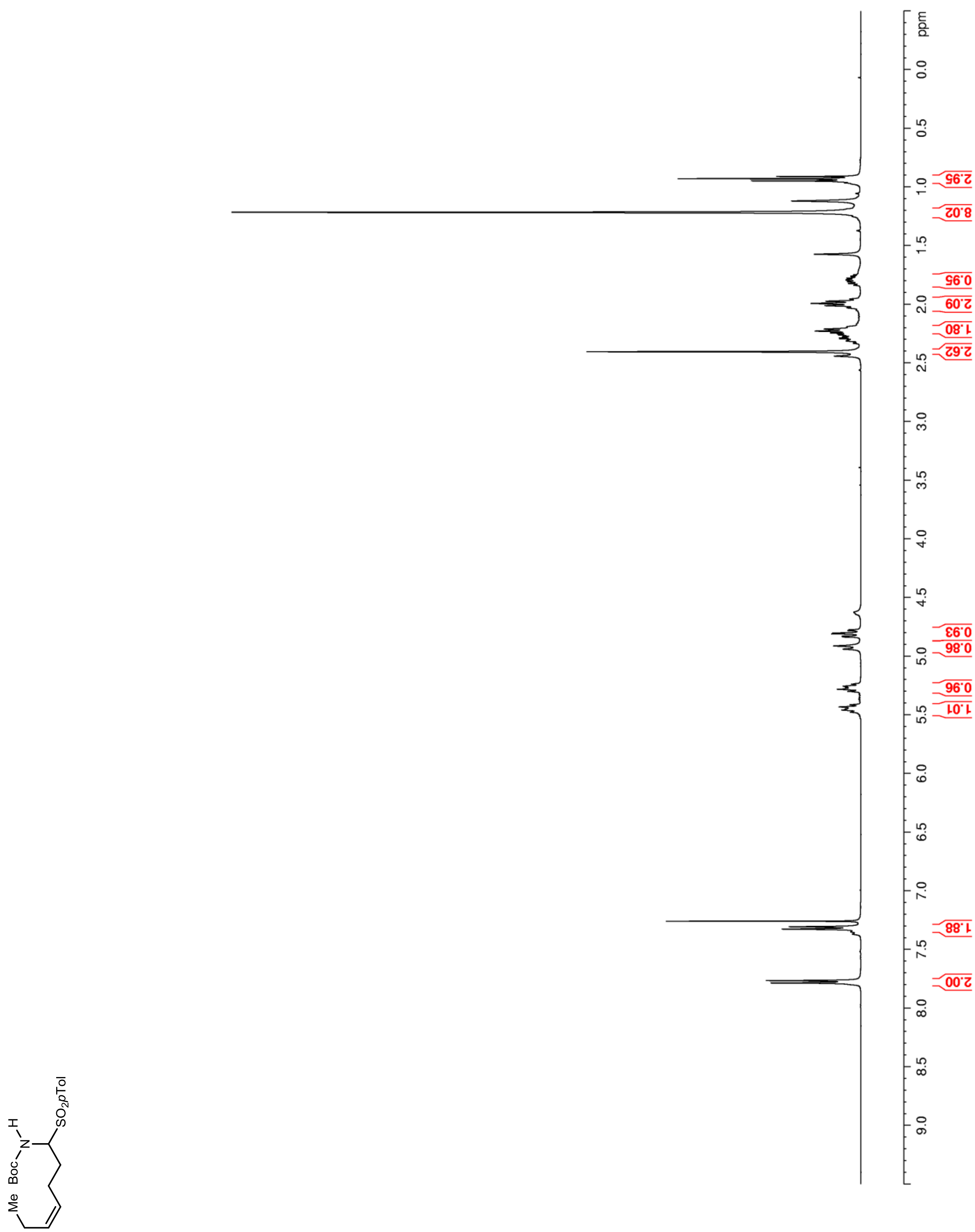


Figure 12. ^{13}C NMR (100 MHz, $CDCl_3$) of **S6**.

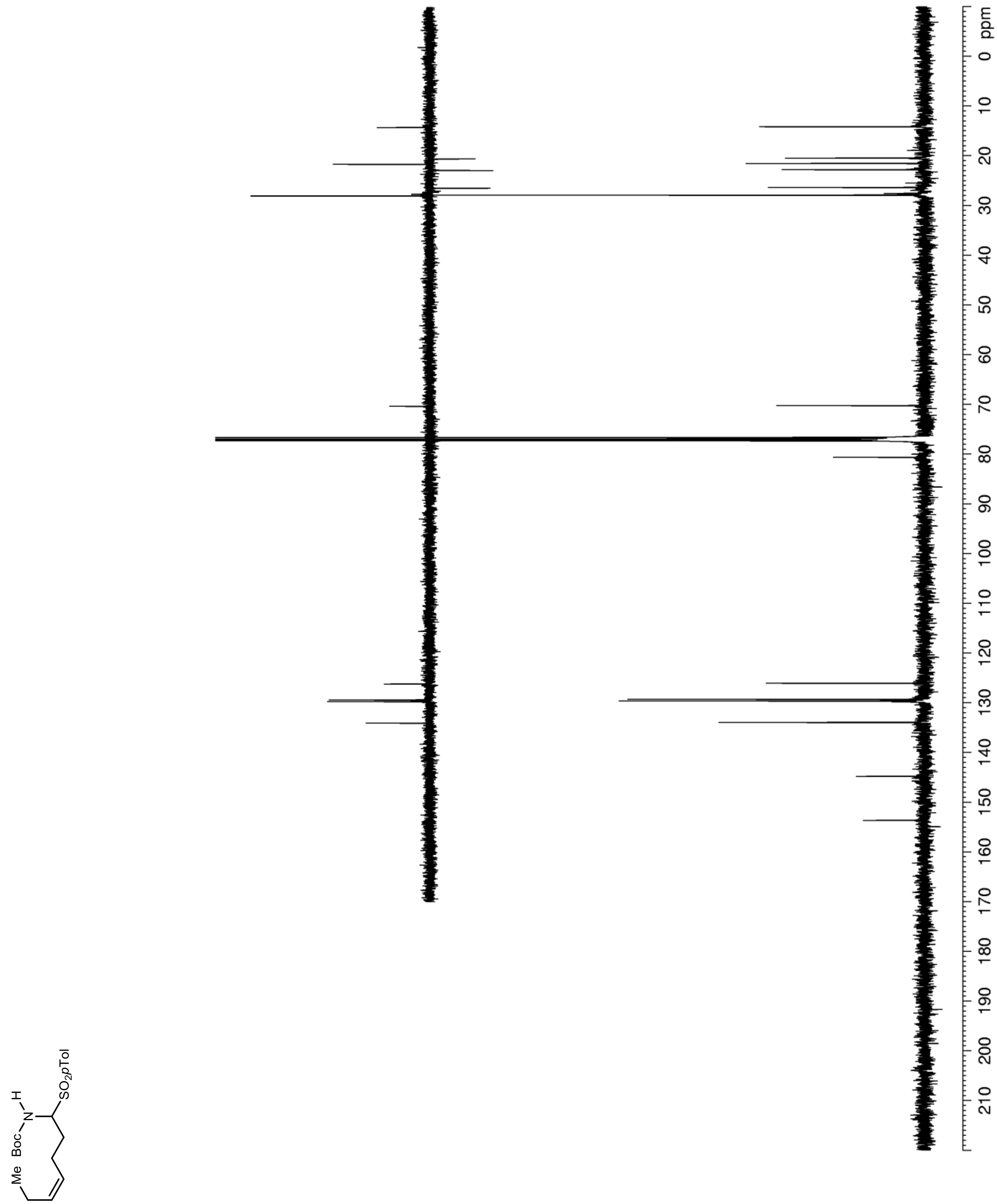


Figure 13. ^{1}H NMR (400 MHz, $CDCl_3$) of **S7.**

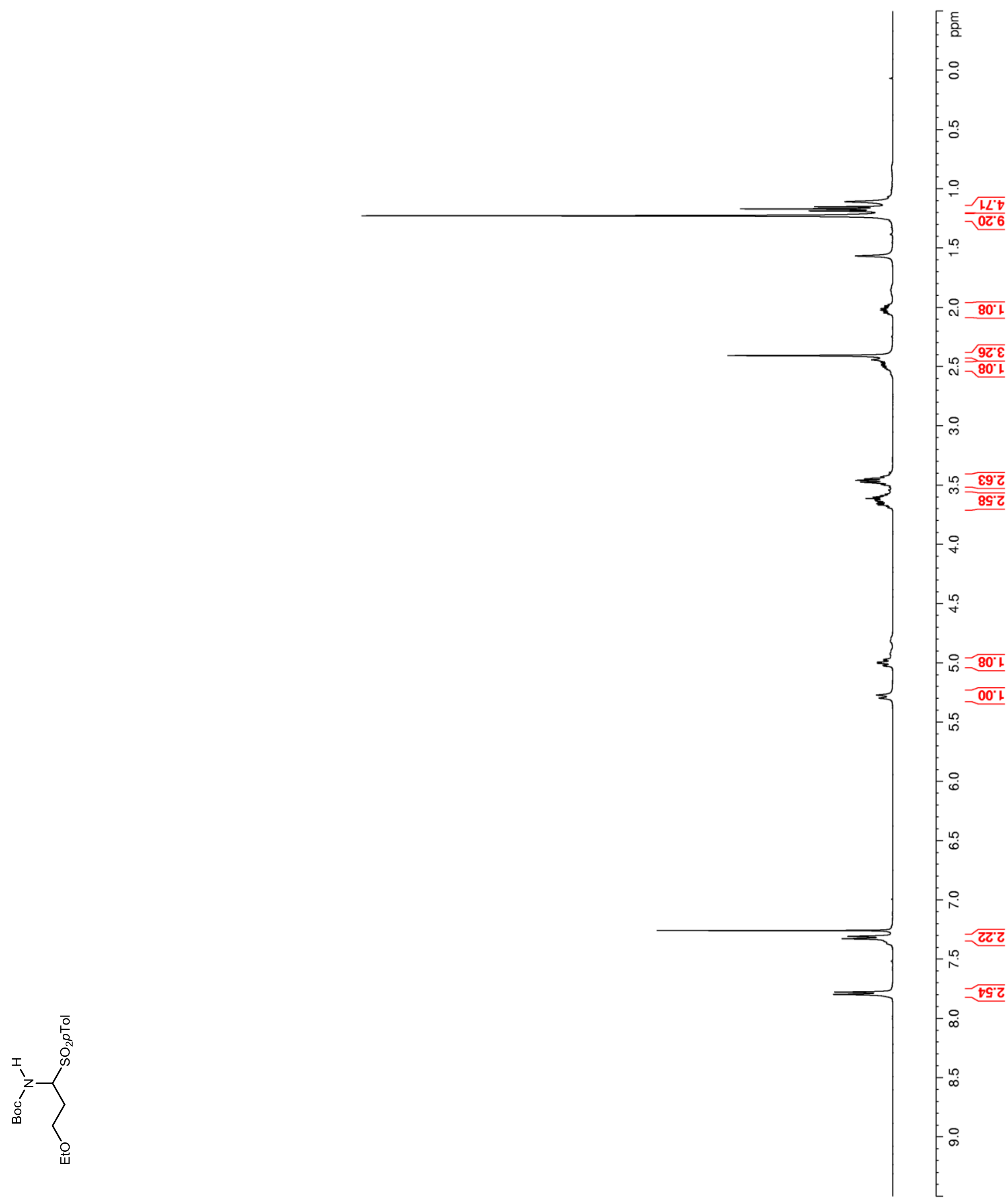


Figure 14. ^{13}C NMR (100 MHz, $CDCl_3$) of **S7.**

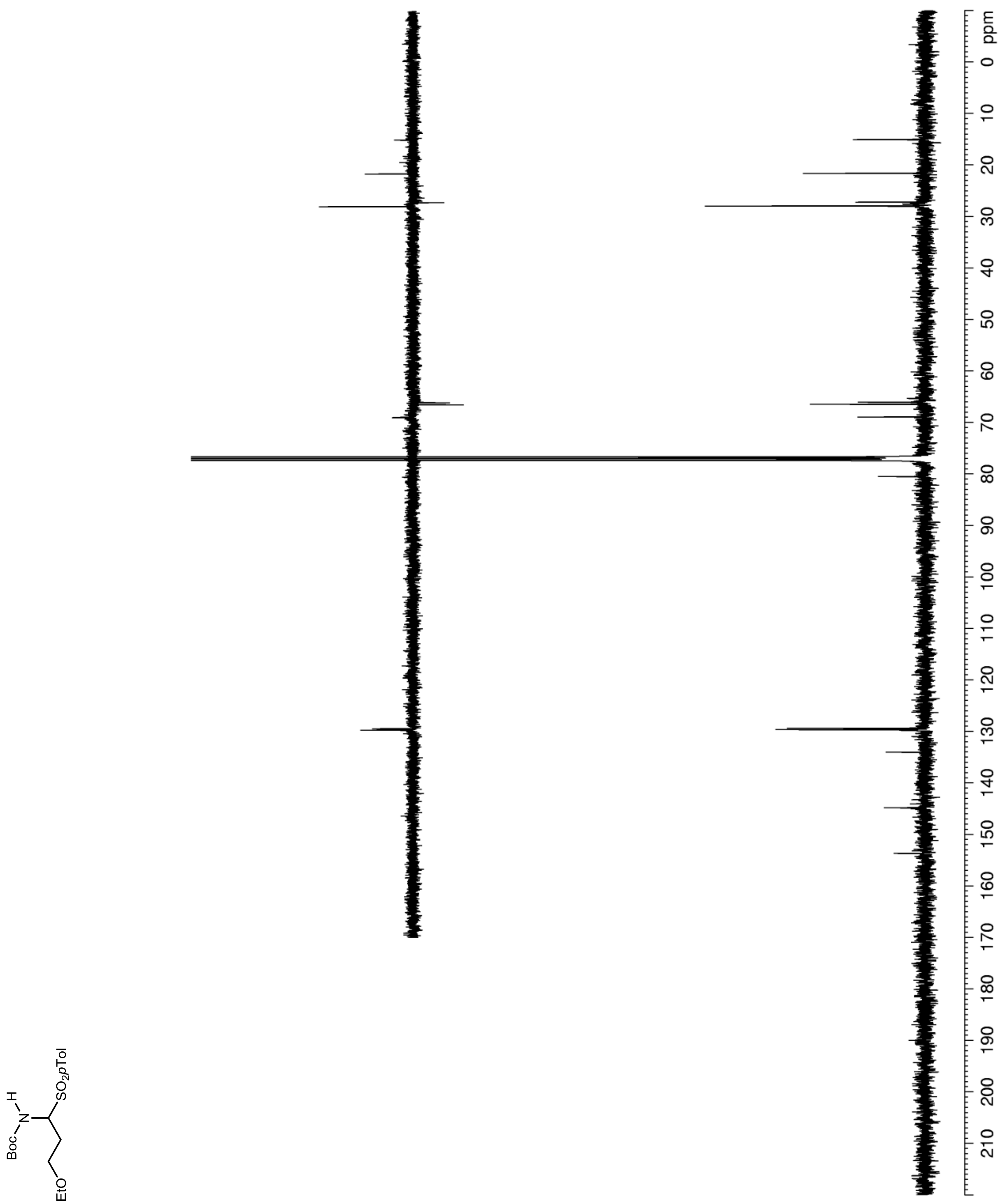


Figure 15. ^{1}H NMR (600 MHz, $CDCl_3$) of **4**.

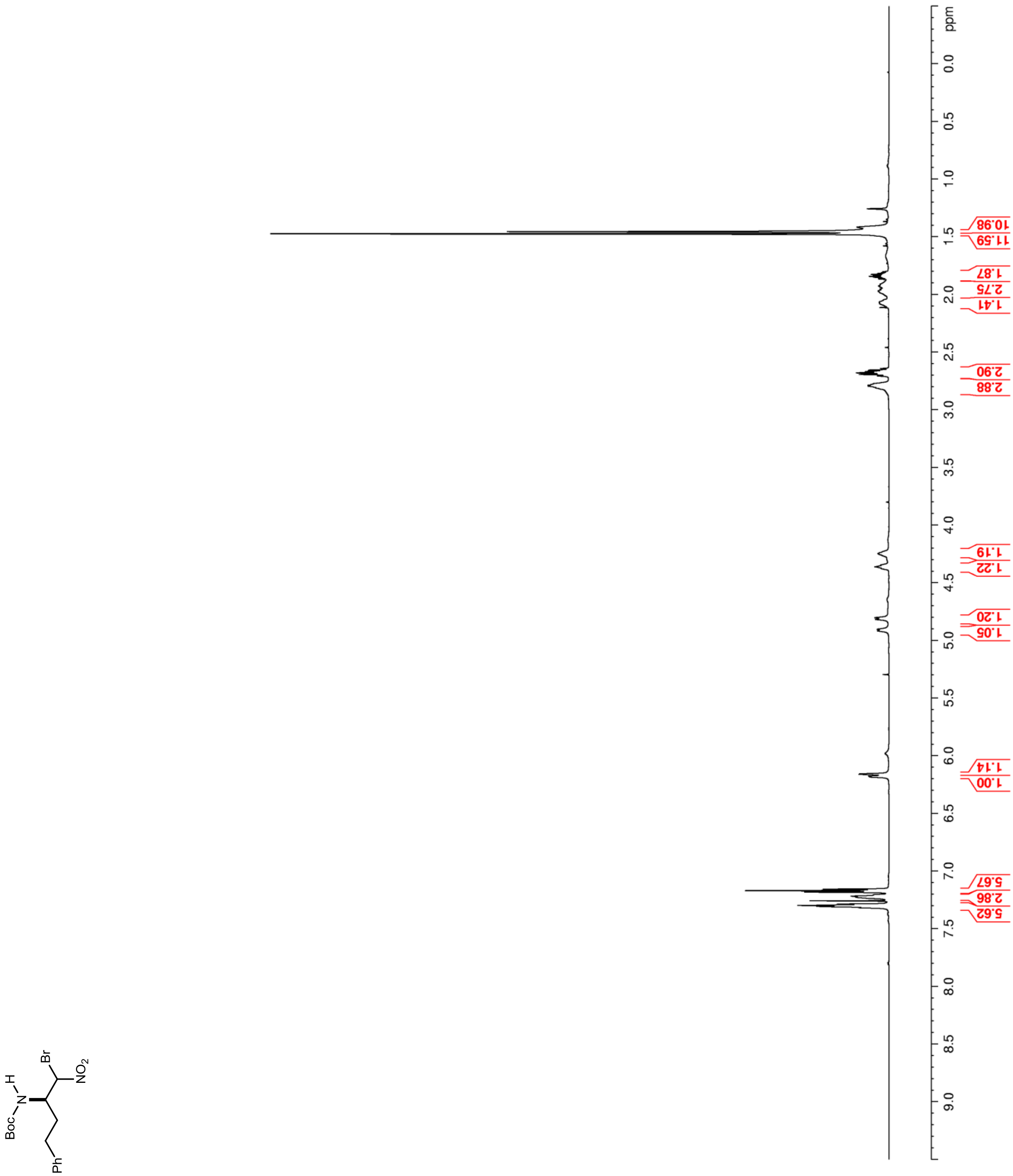


Figure 16. ^{13}C NMR (150 MHz, $CDCl_3$) of **4**.

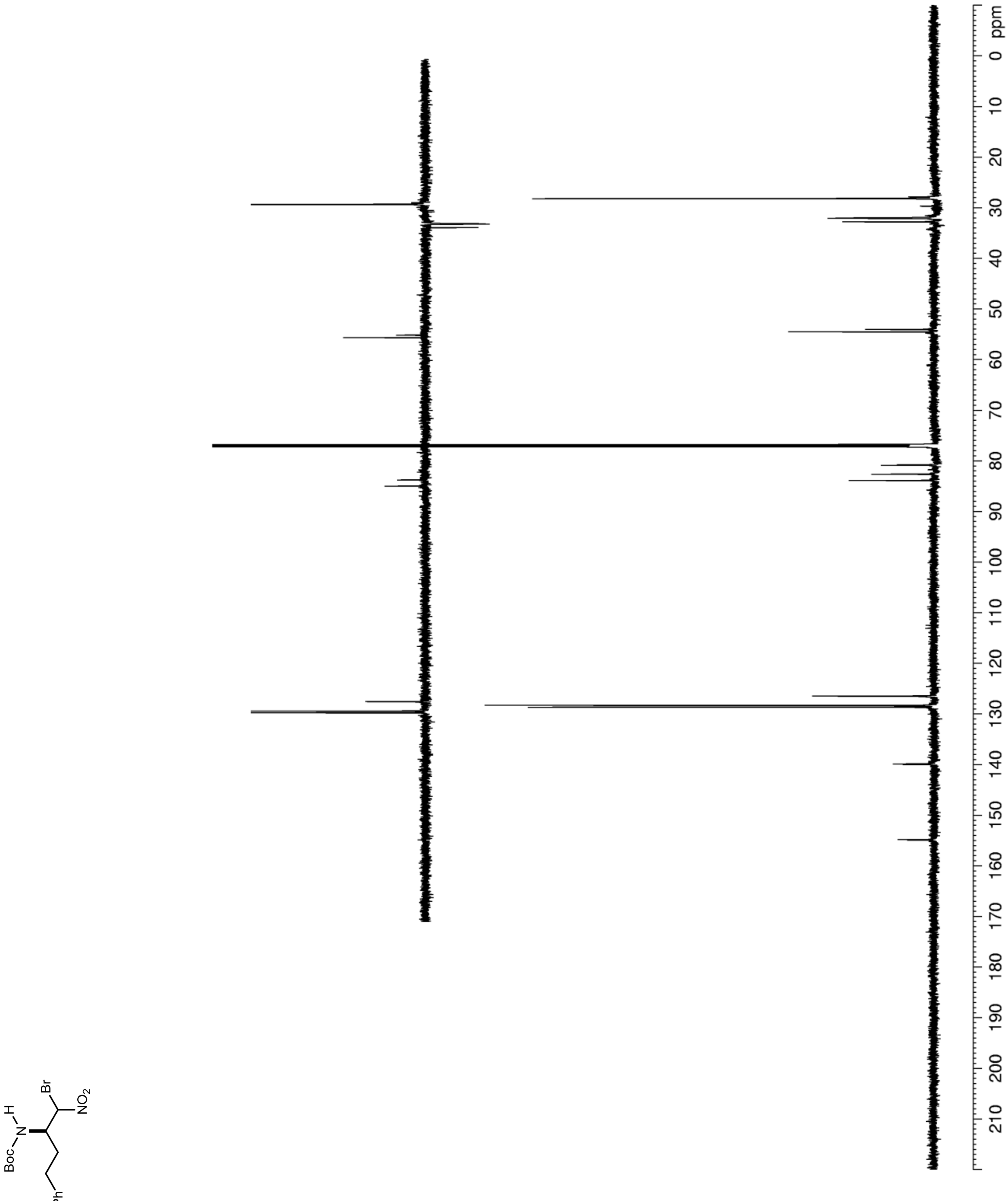


Figure 17. ^{1}H NMR (600 MHz, $CDCl_3$) of **7**

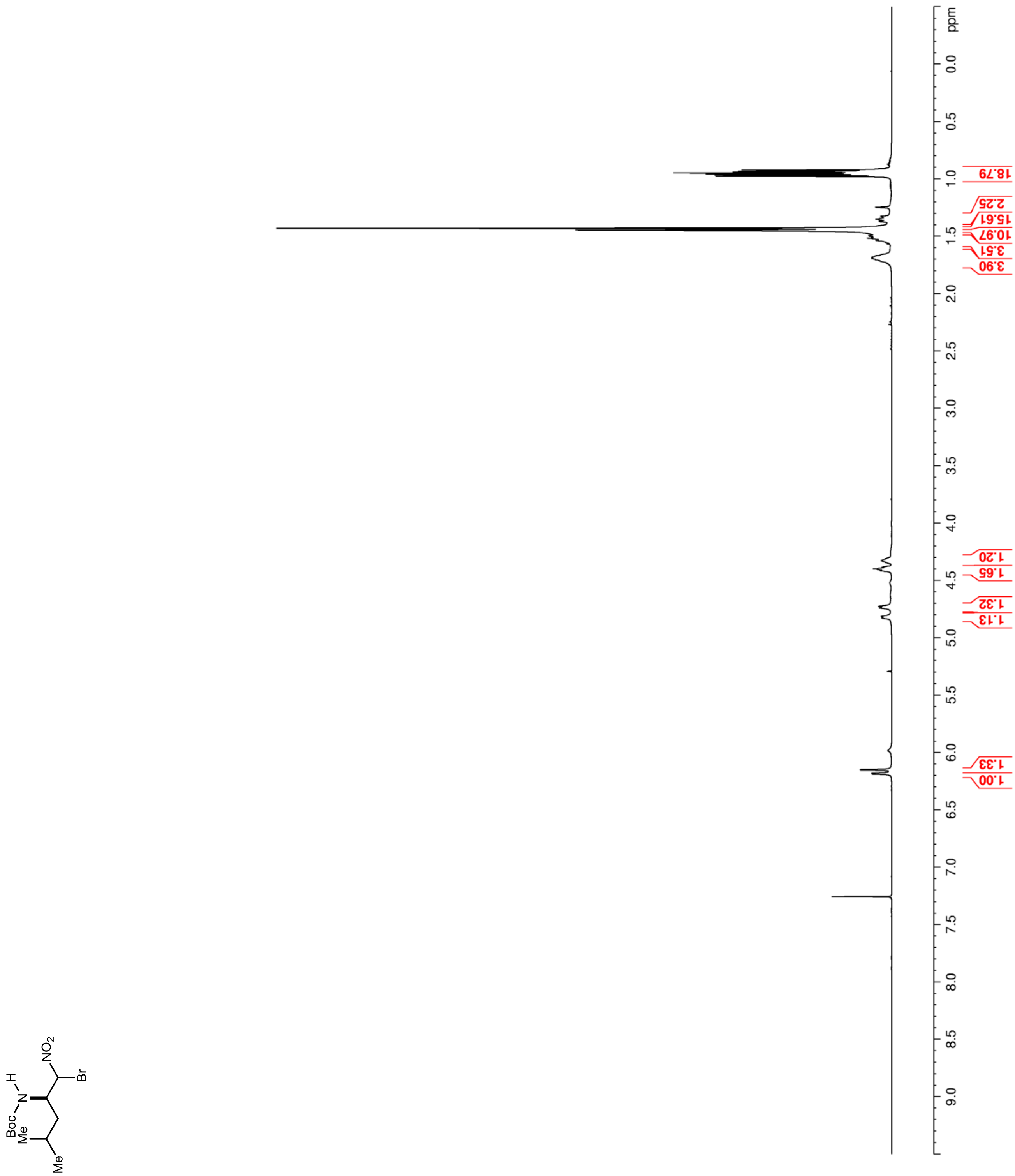


Figure 18. ^{13}C NMR (150 MHz, $CDCl_3$) of **7**

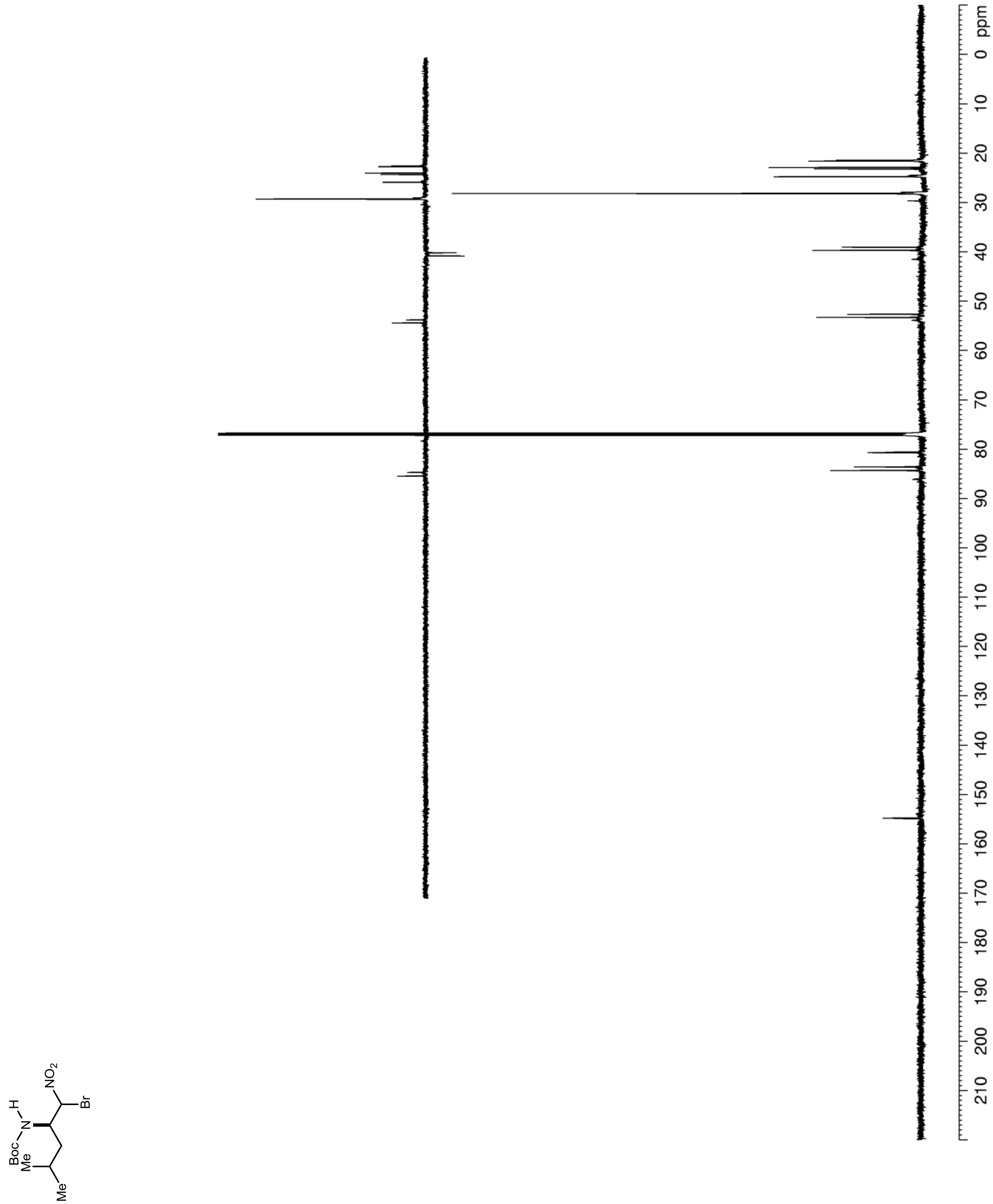
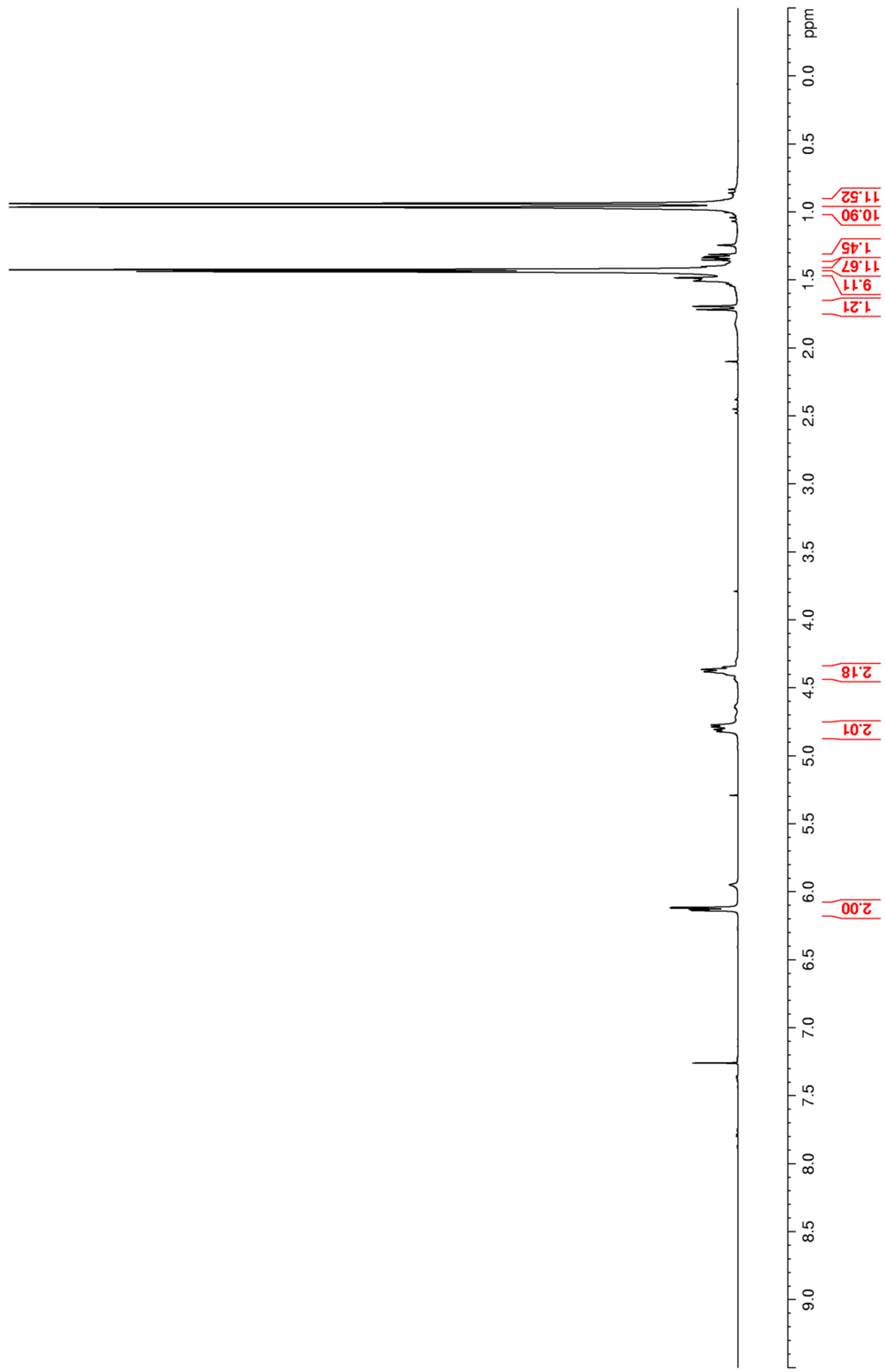


Figure 19. ^{1}H NMR (600 MHz, $CDCl_3$) of **8.**



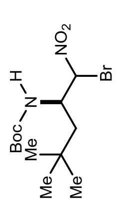


Figure 20. ^{13}C NMR (150 MHz, $CDCl_3$) of **8**

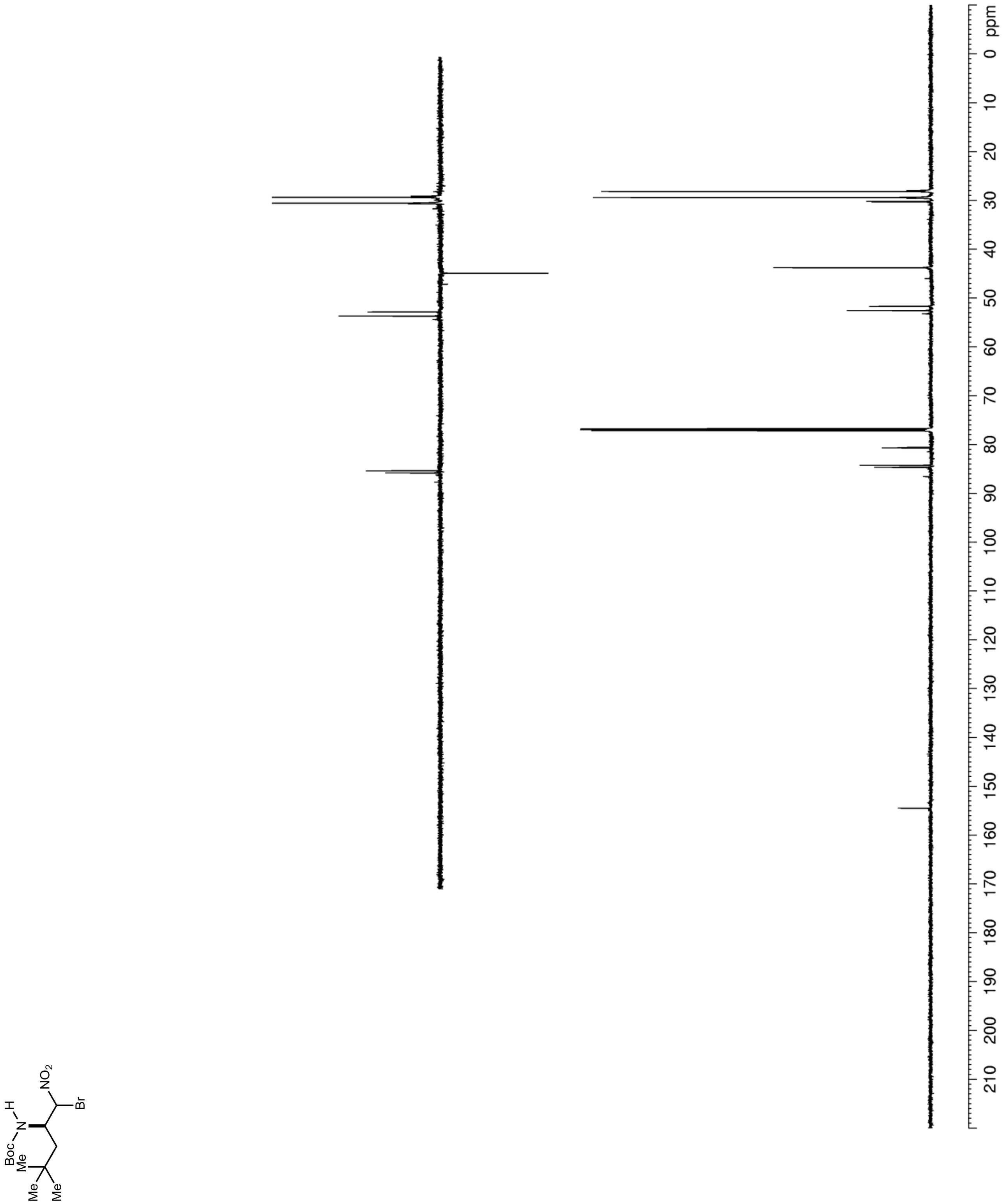


Figure 21. ^{1}H NMR (600 MHz, $CDCl_3$) of **9.**

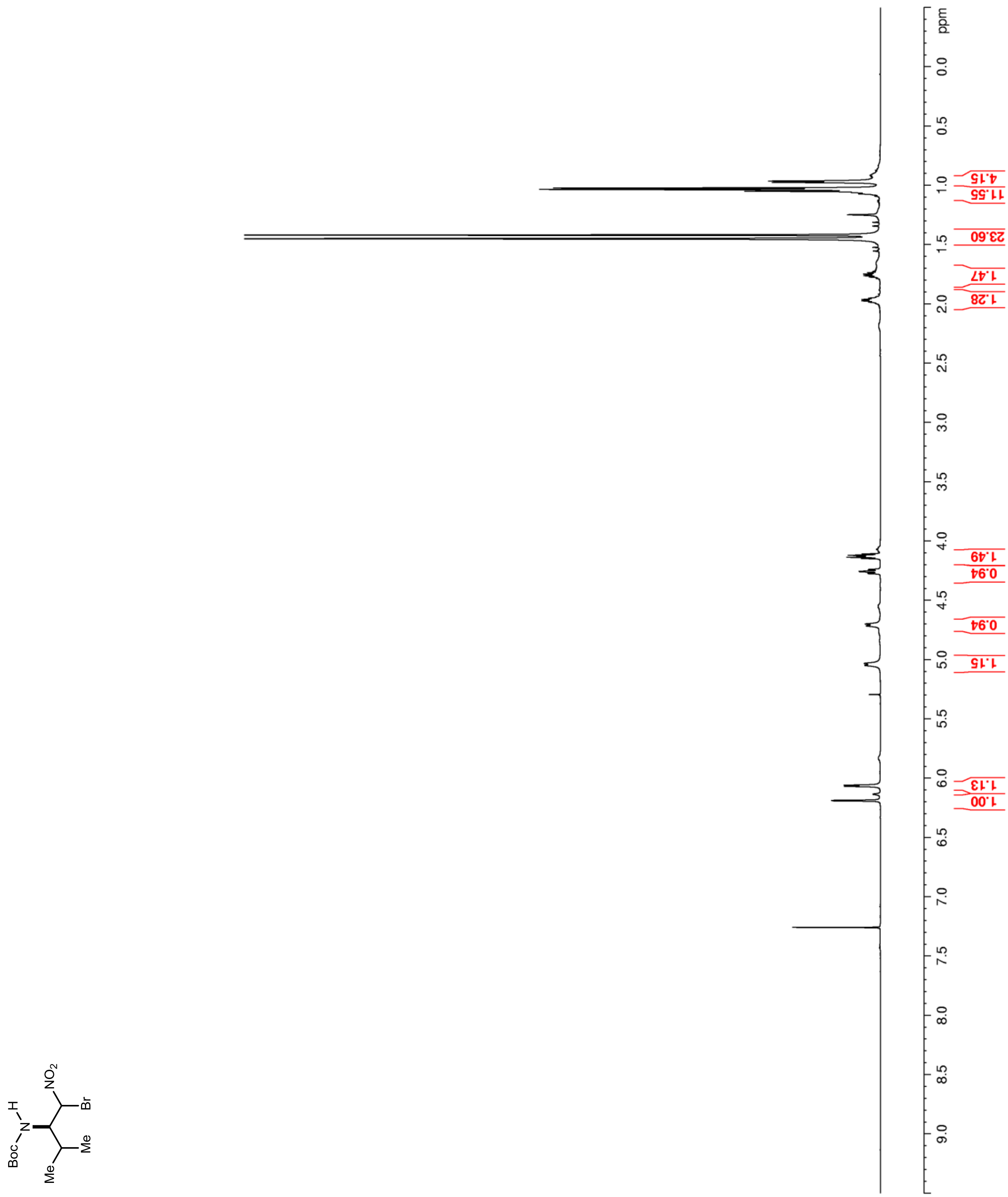


Figure 22. ^{13}C NMR (150 MHz, $CDCl_3$) of **9.**

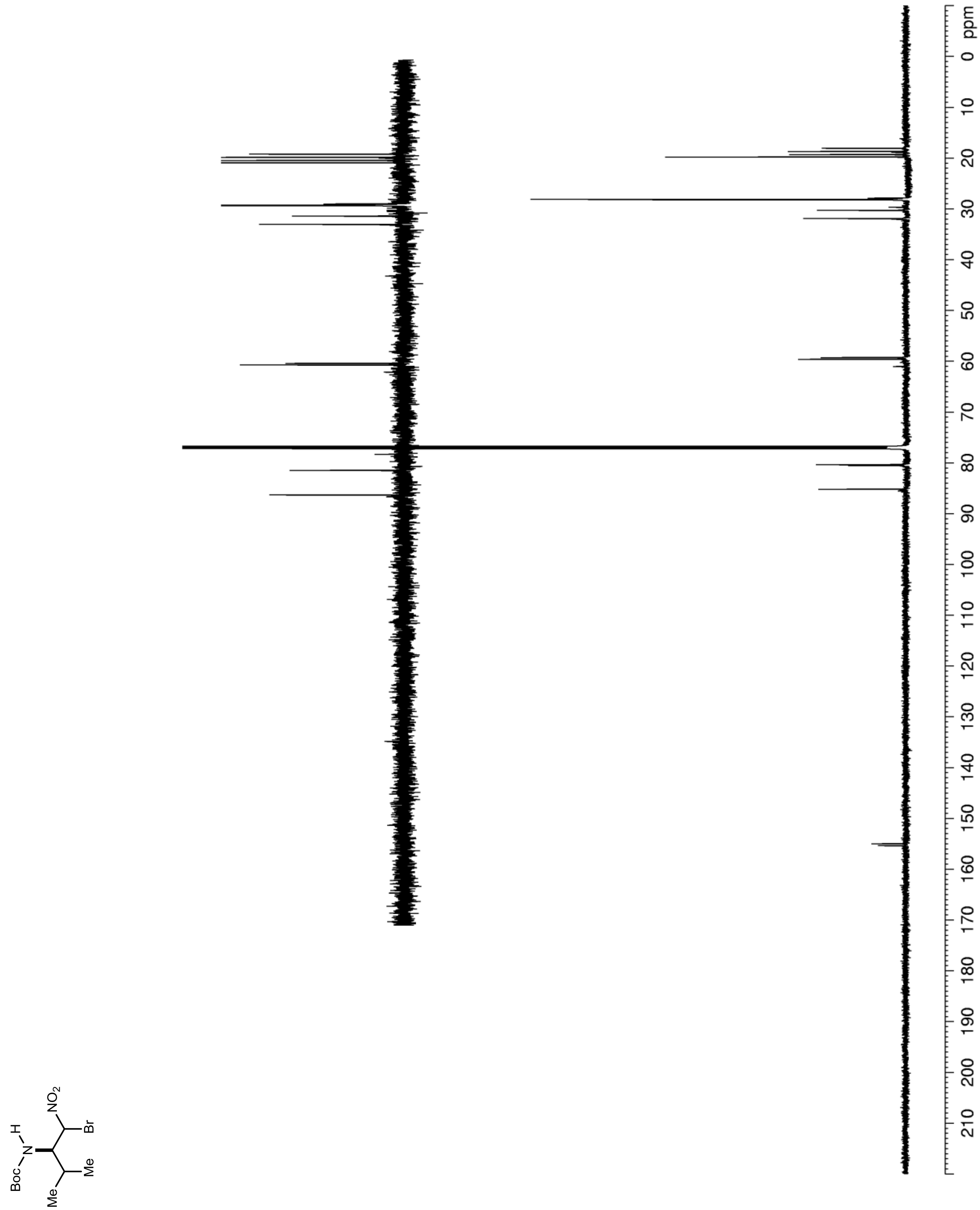
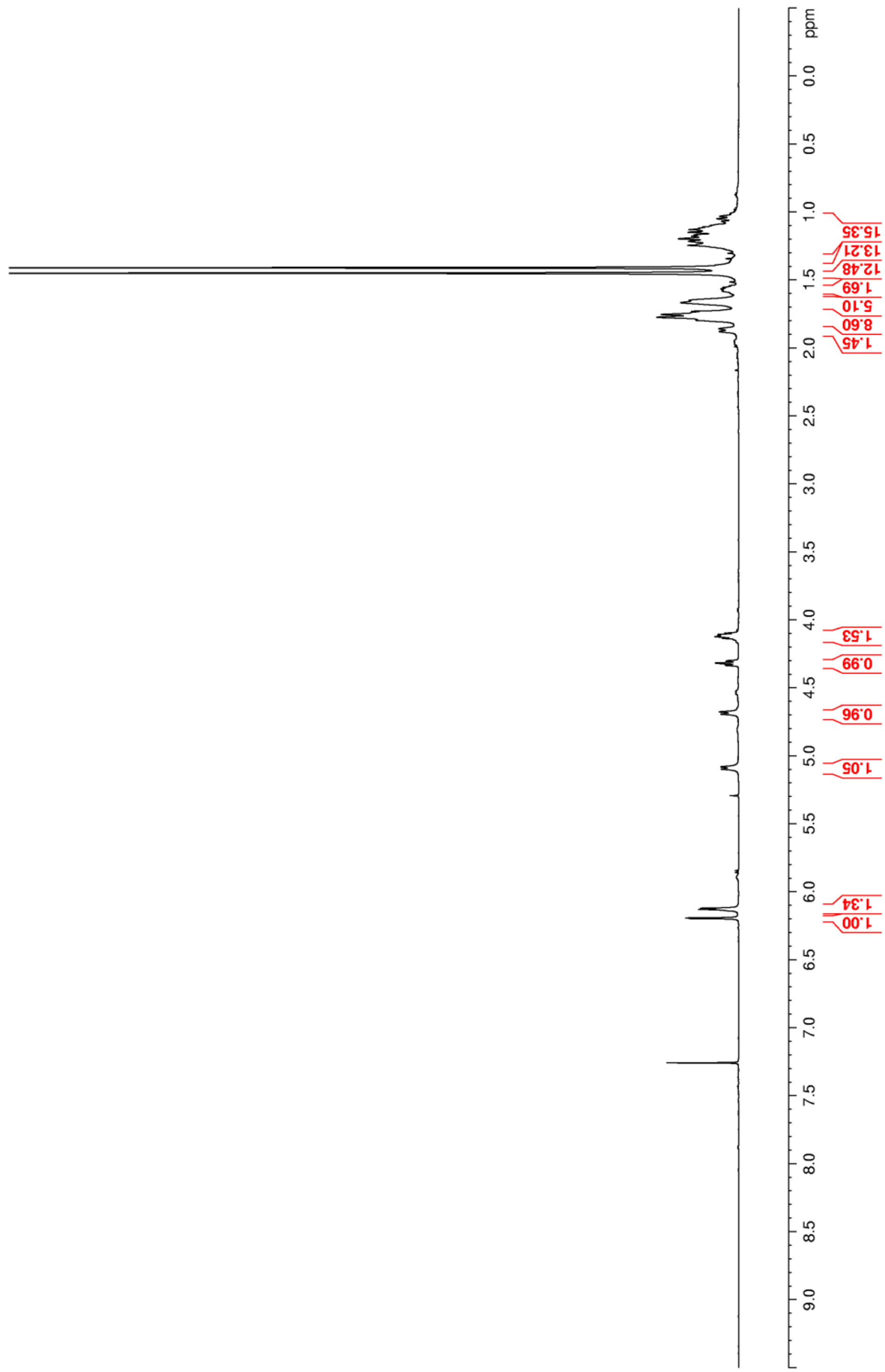


Figure 23. ^{1}H NMR (600 MHz, $CDCl_3$) of **10**.



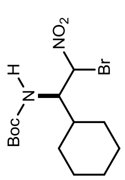


Figure 24. ^{13}C NMR (150 MHz, $CDCl_3$) of **10**.

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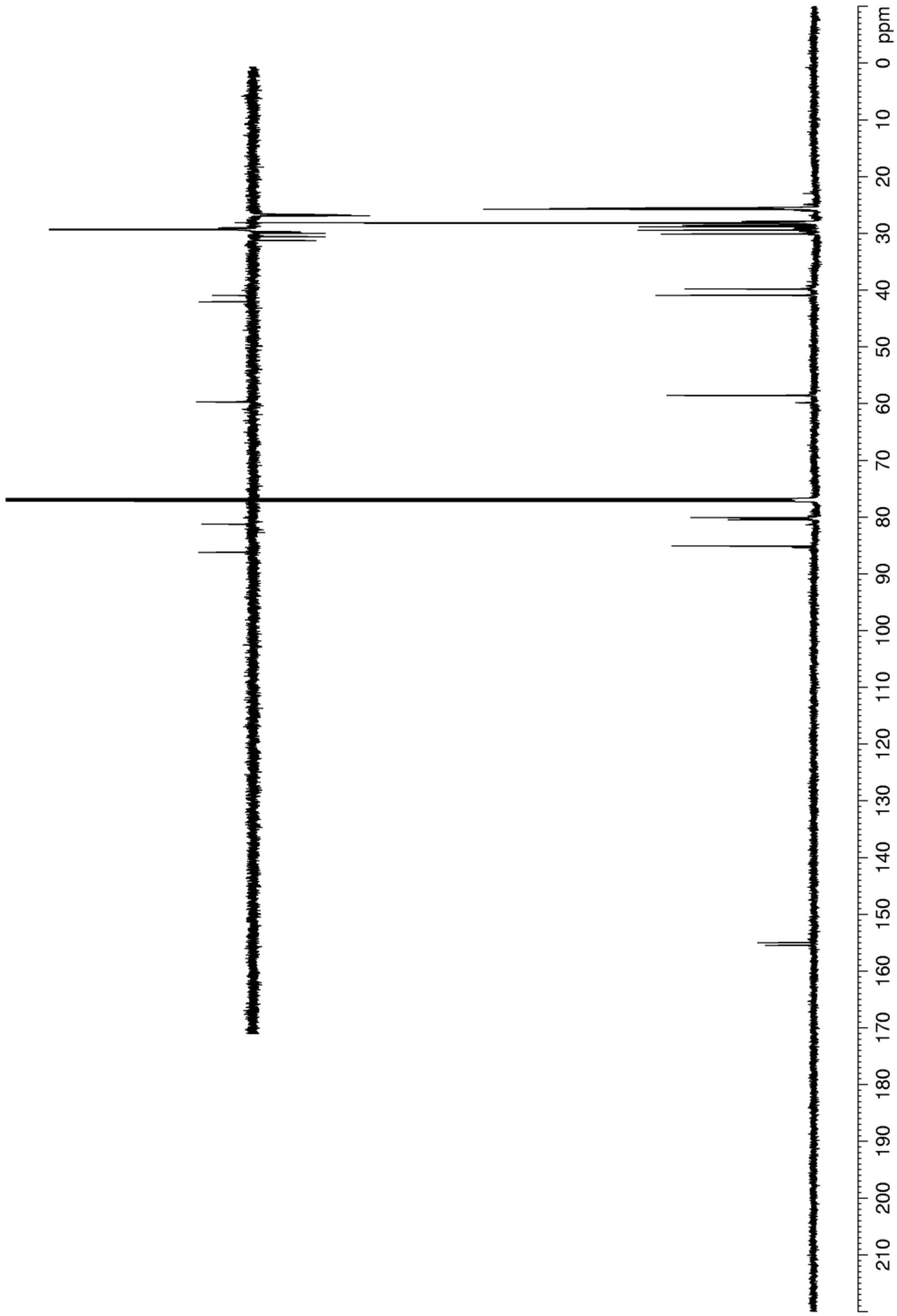


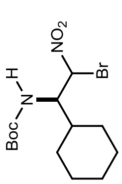


Figure 25. [1]H NMR (600 MHz, $CDCl_3$) of **11**.

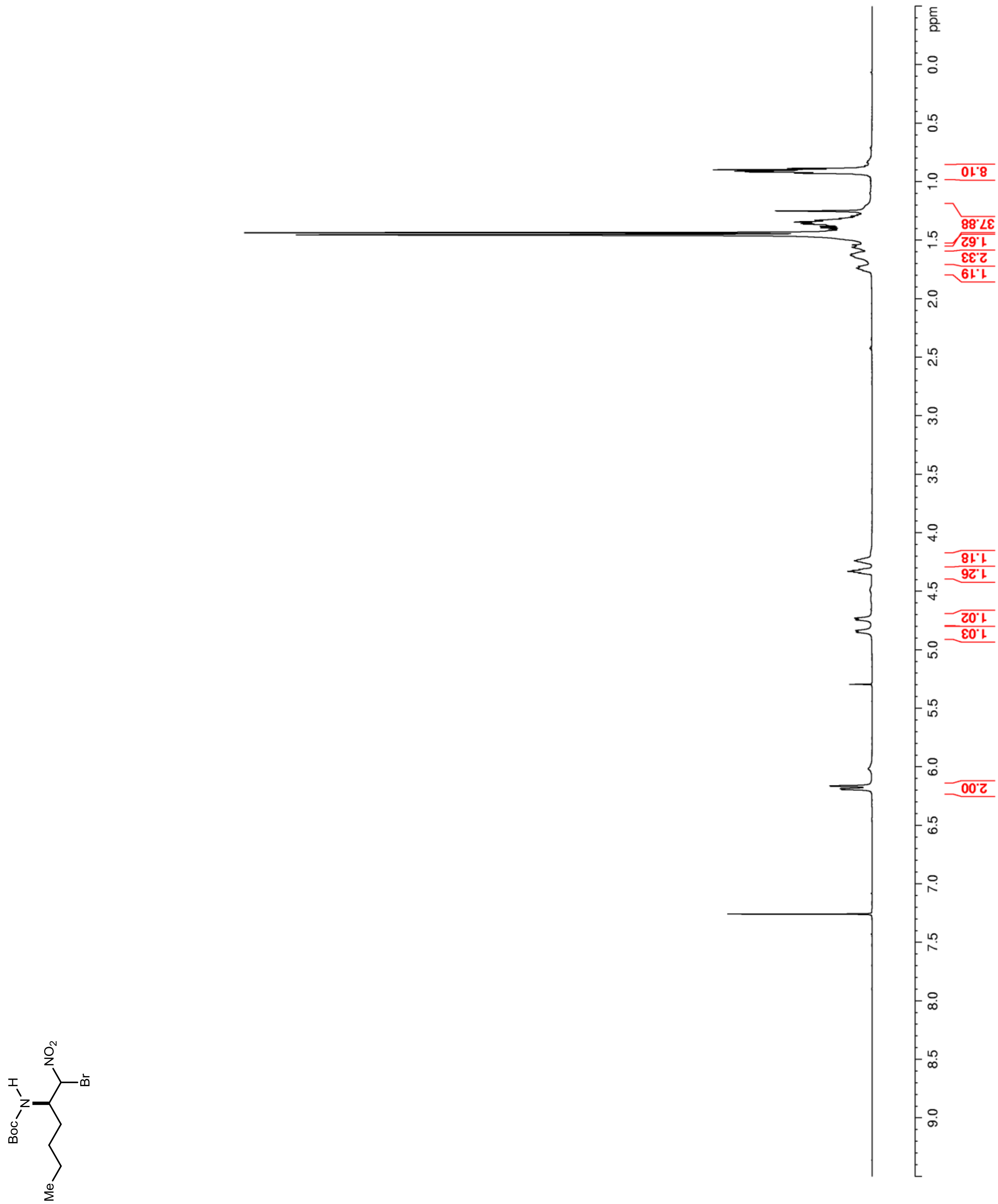
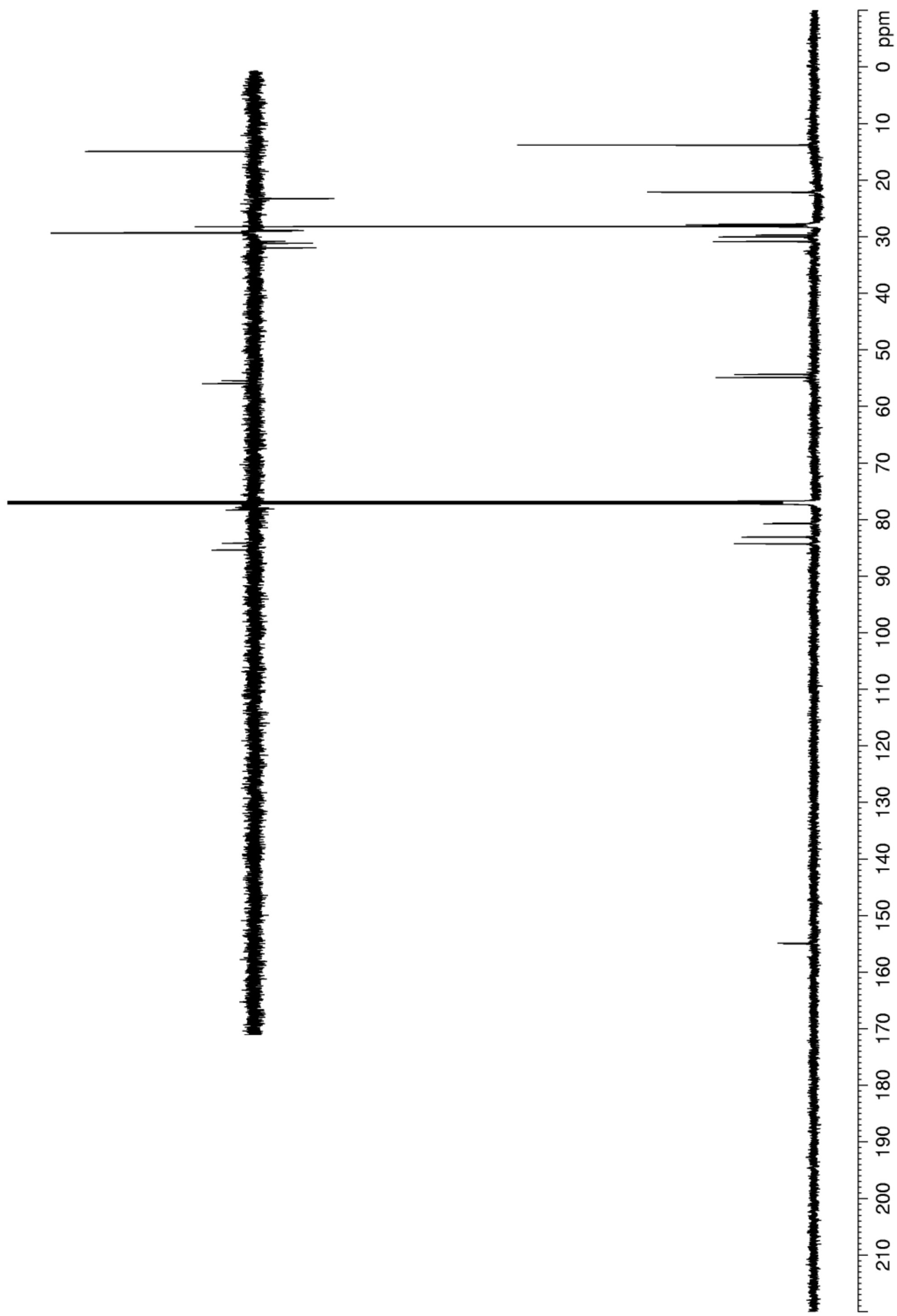


Figure 26. ^{13}C NMR (150 MHz, $CDCl_3$) of **11**.



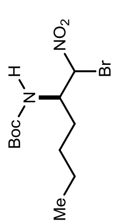


Figure 27. ^{1}H NMR (600 MHz, $CDCl_3$) of **12.**

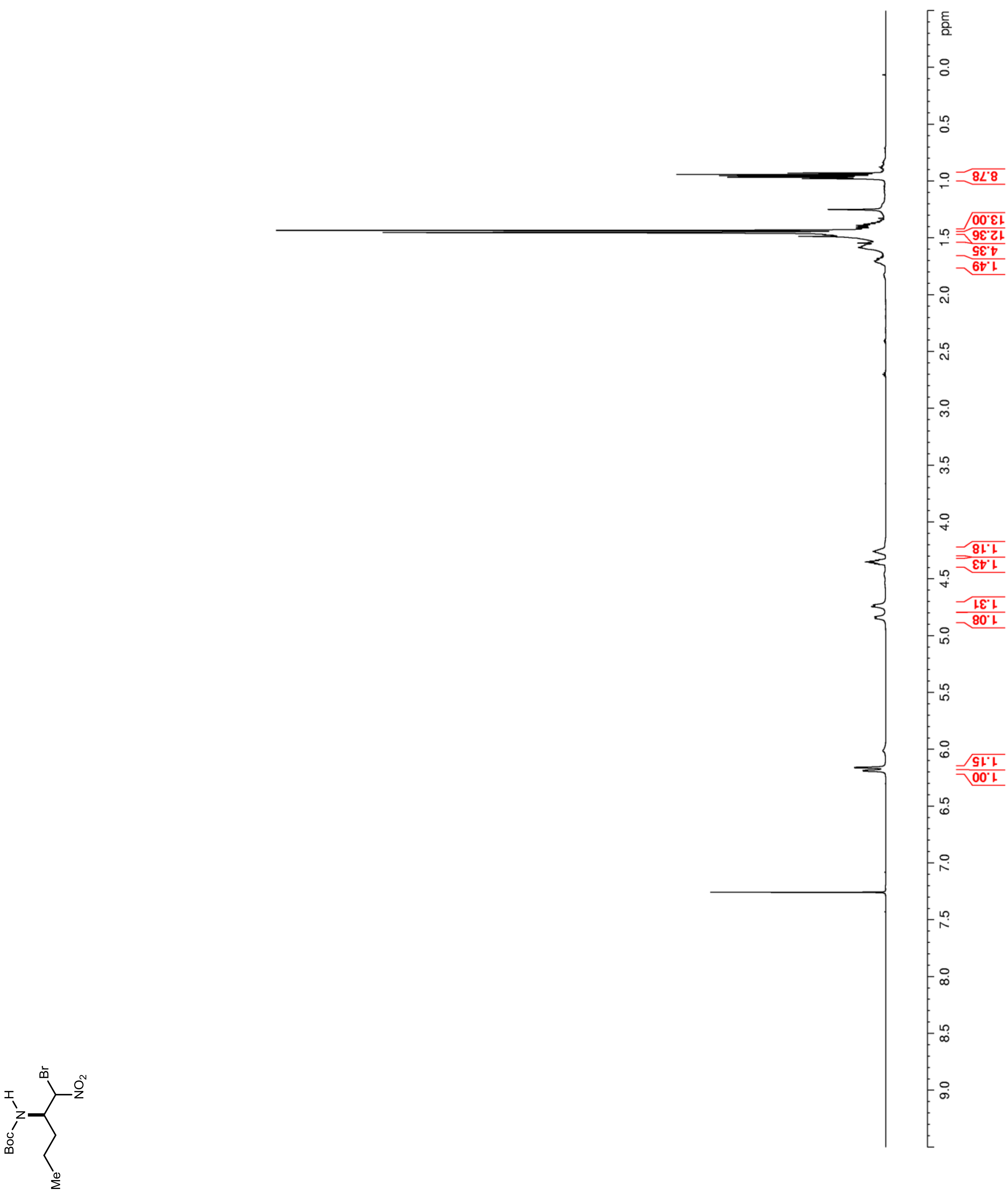


Figure 28. ^{13}C NMR (150 MHz, $CDCl_3$) of **12.**

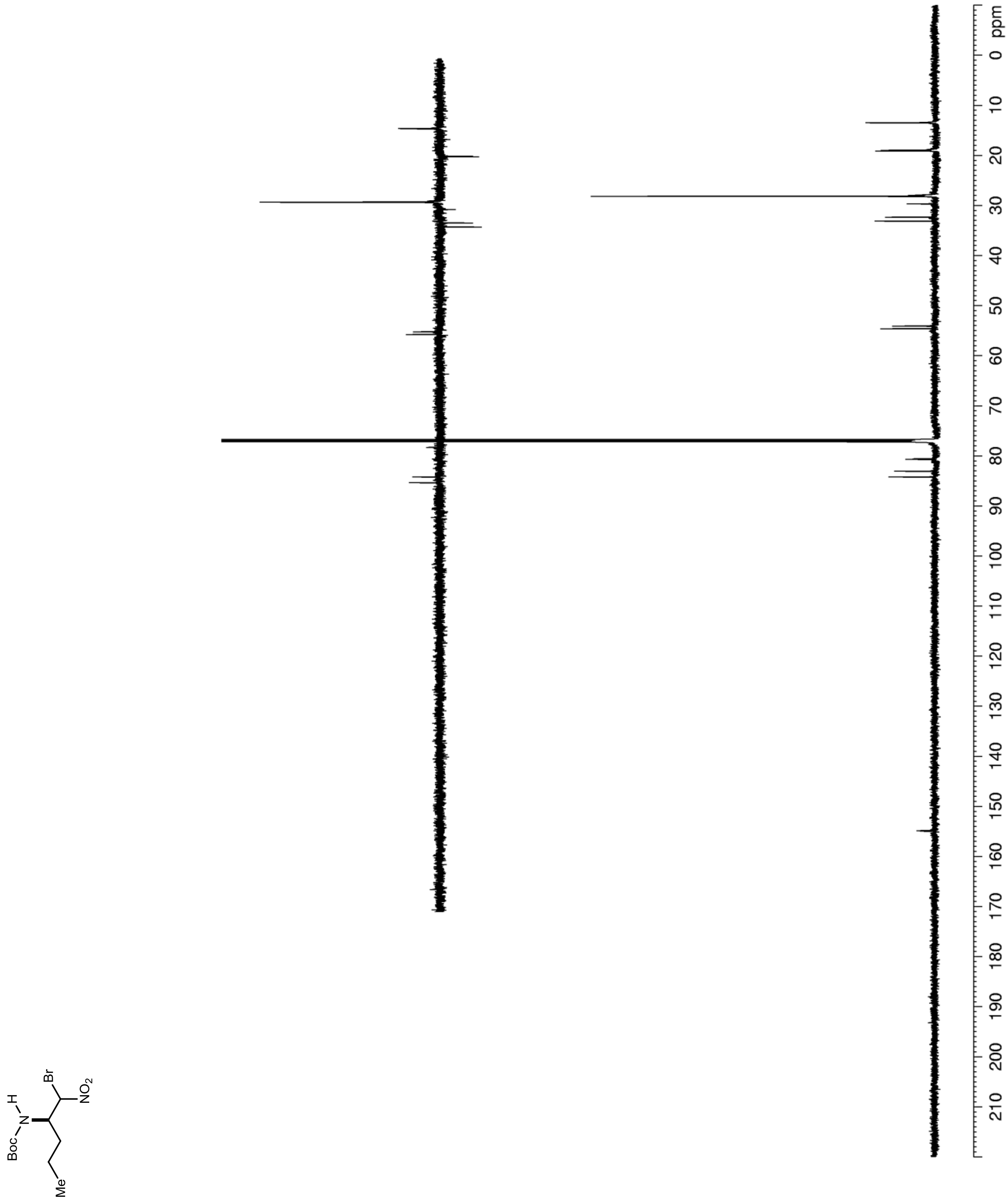
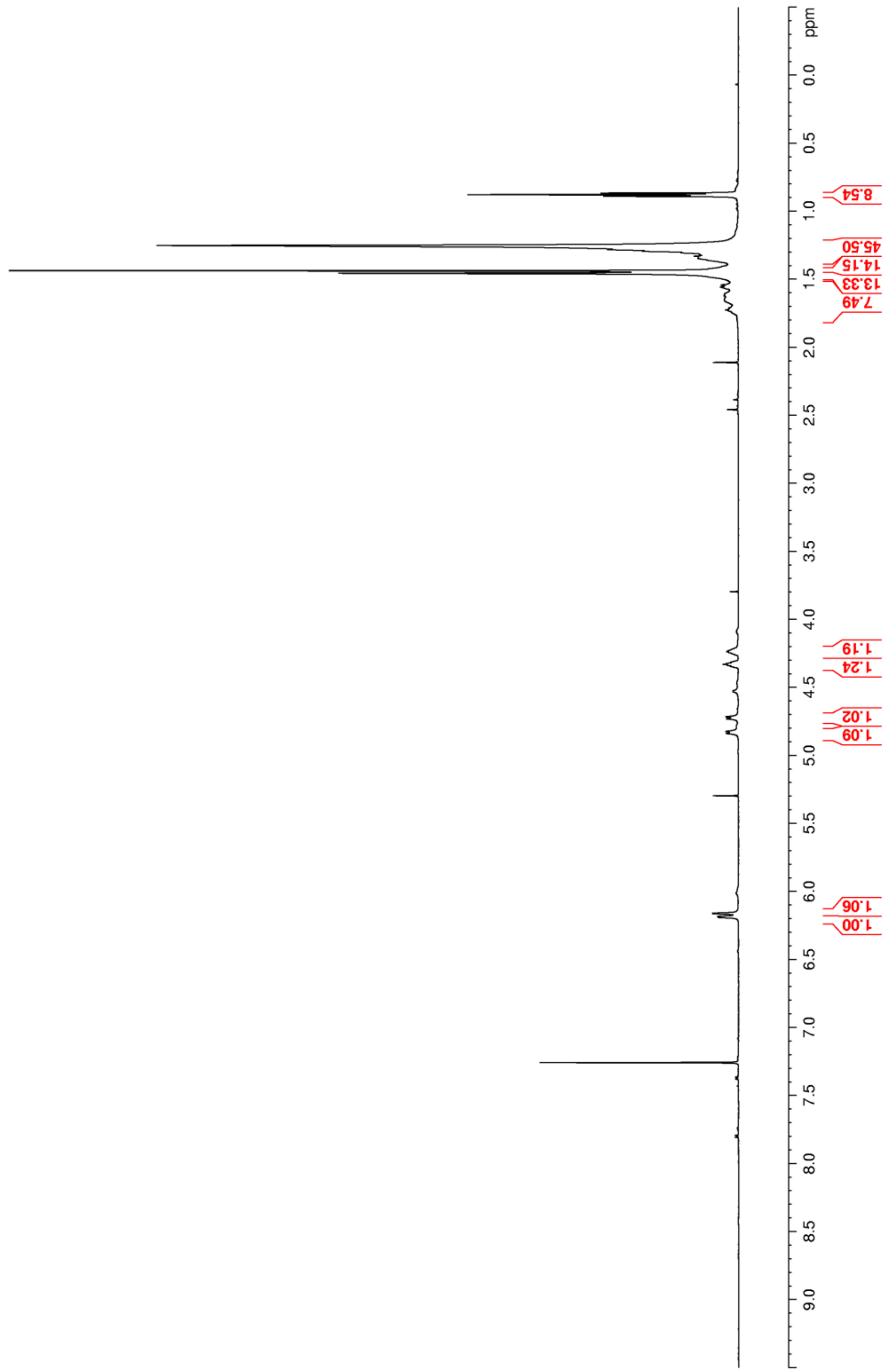


Figure 29. ^{1}H NMR (600 MHz, $CDCl_3$) of **13.**



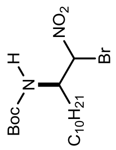


Figure 30. ^{13}C NMR (150 MHz, $CDCl_3$) of **13**.

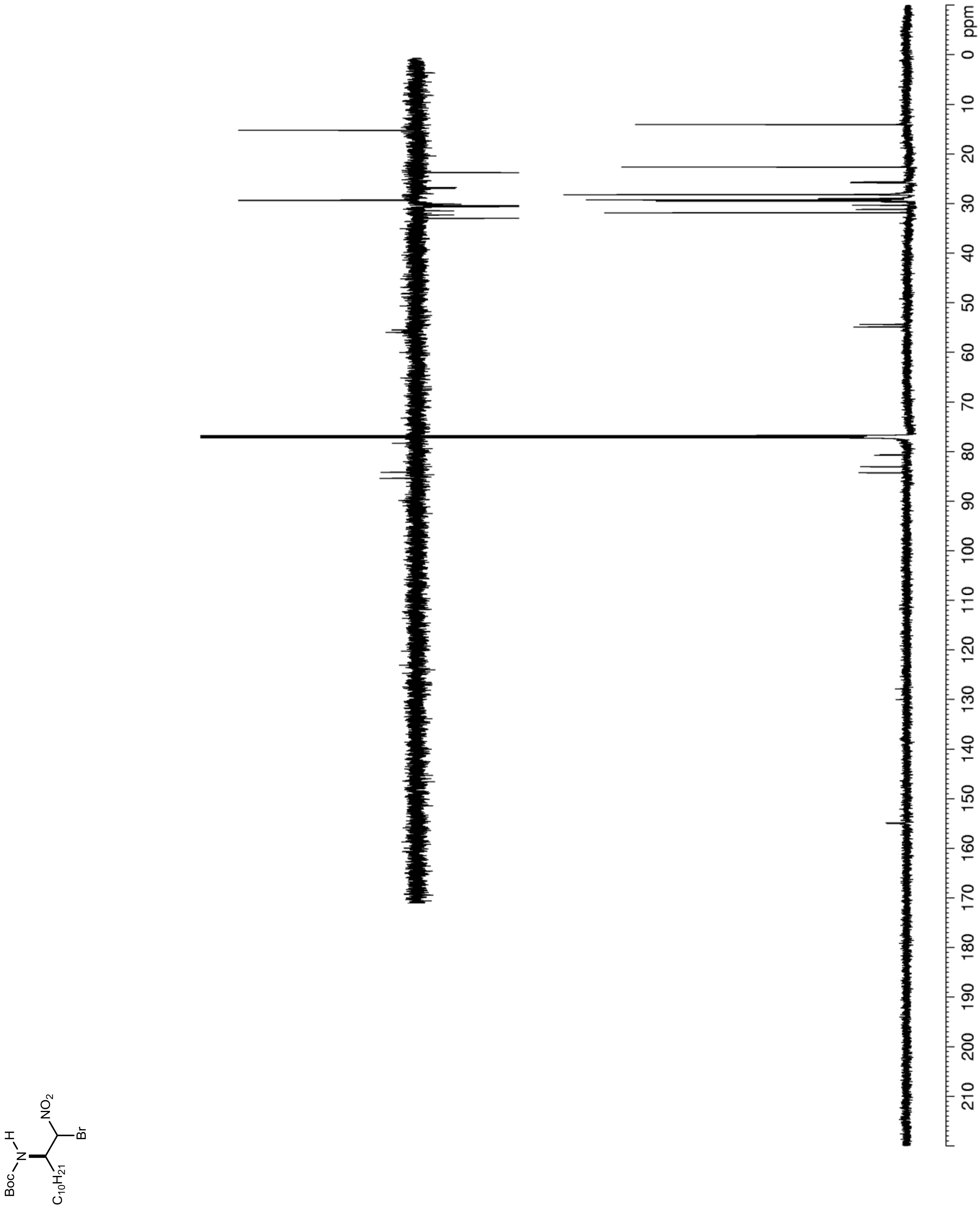


Figure 31. ^{1}H NMR (600 MHz, $CDCl_3$) of **14.**

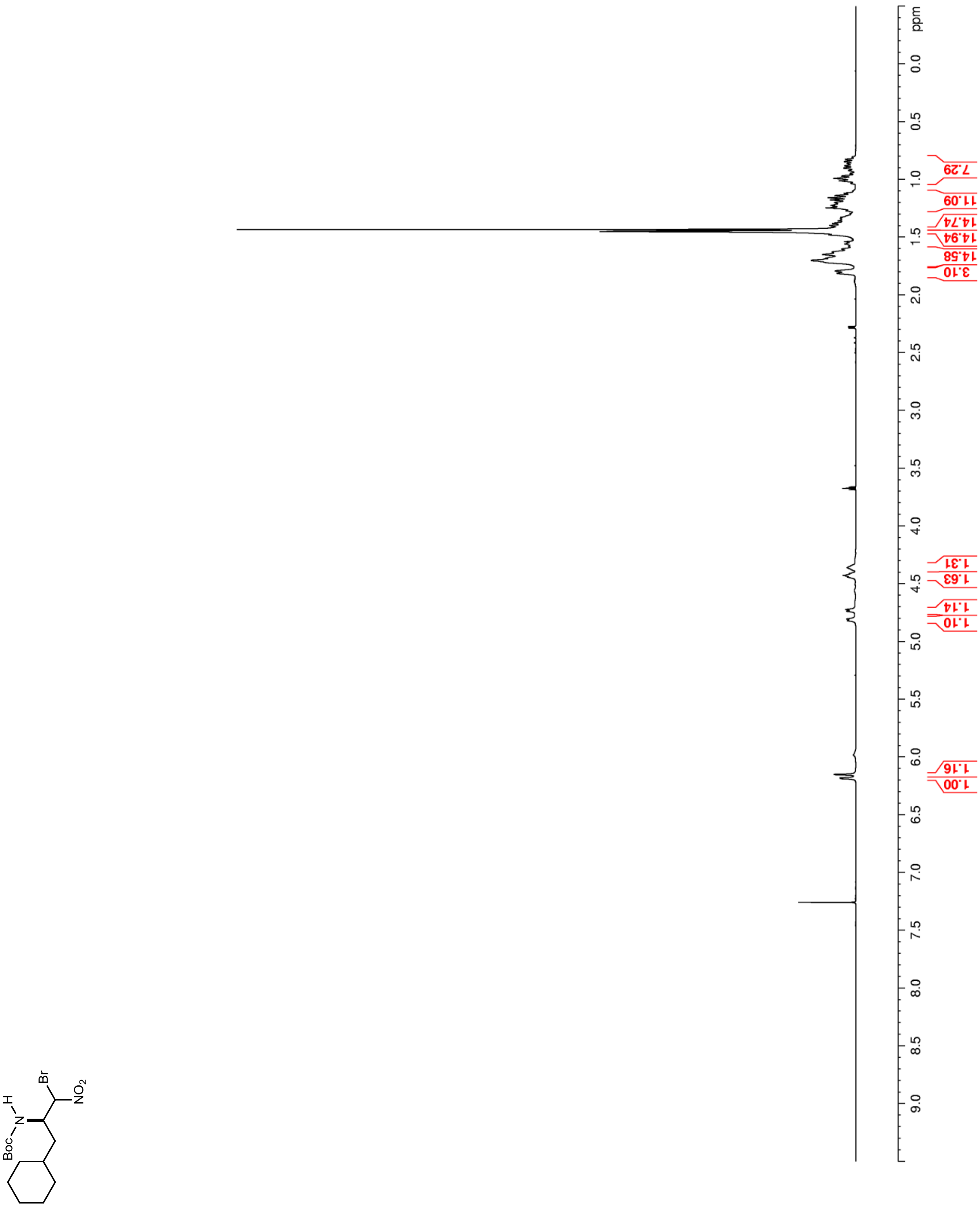


Figure 32. ^{13}C NMR (150 MHz, $CDCl_3$) of **14**.

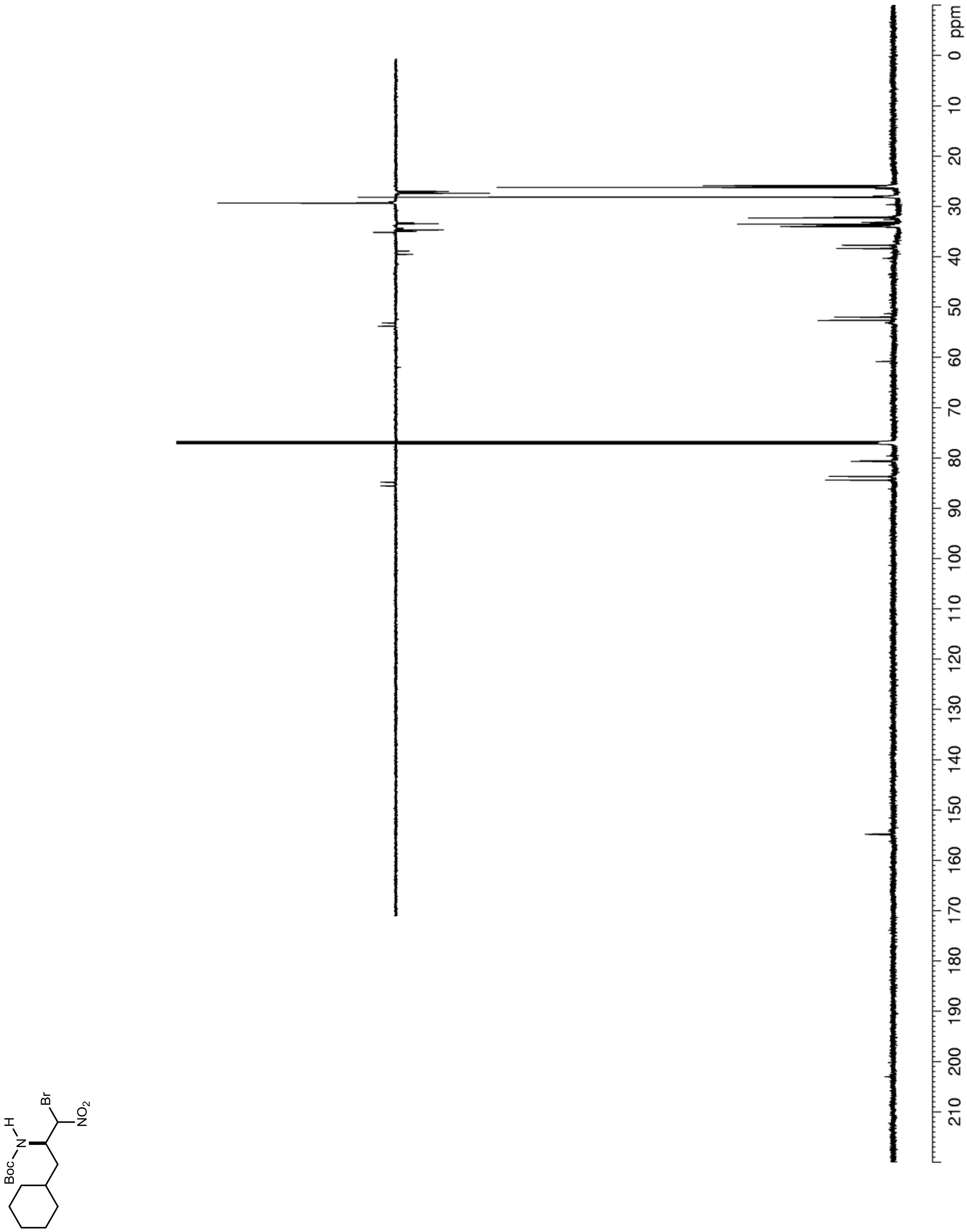


Figure 33. ^{1}H NMR (600 MHz, $CDCl_3$) of **15.**

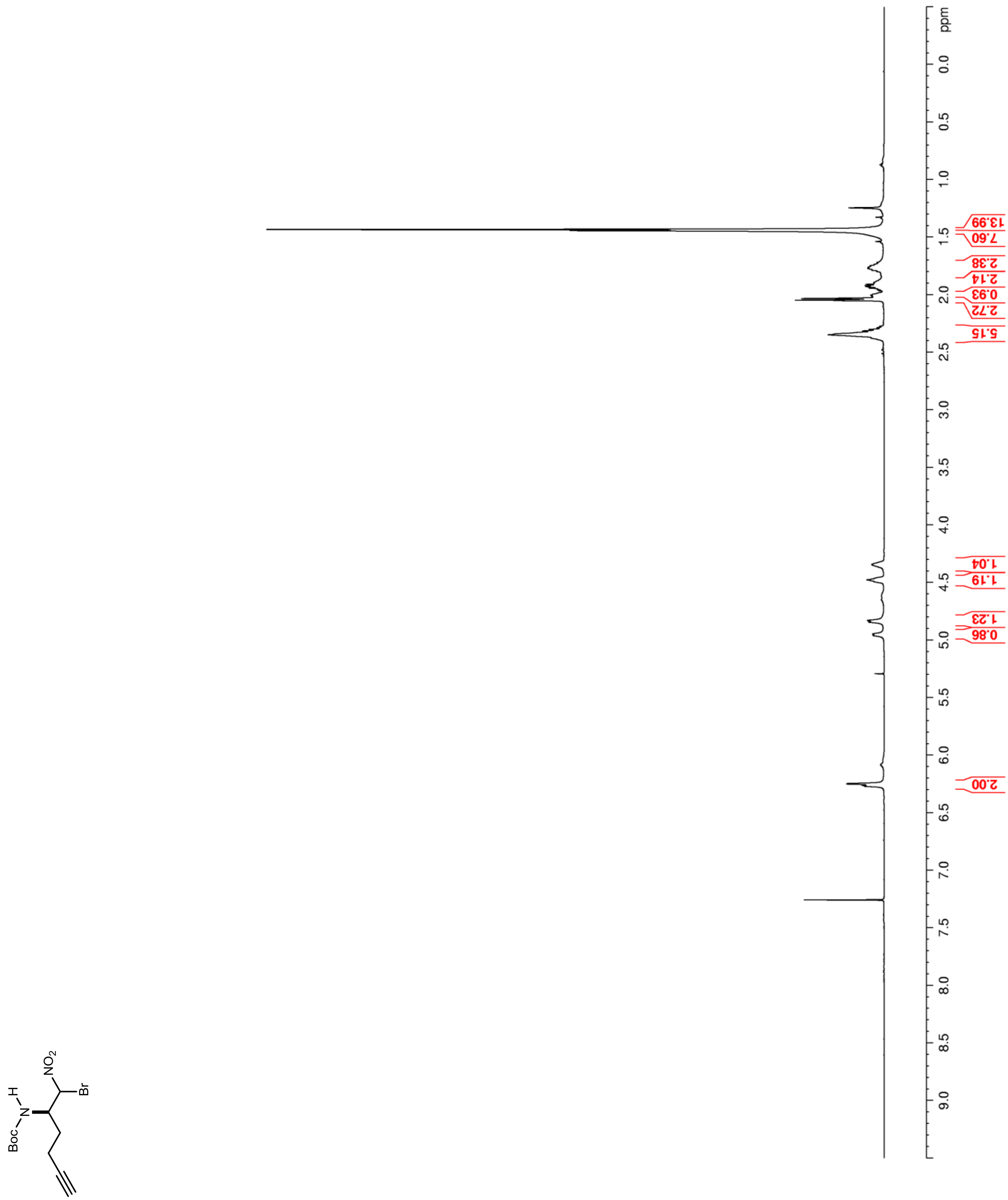


Figure 34. ^{13}C NMR (150 MHz, $CDCl_3$) of **15**.

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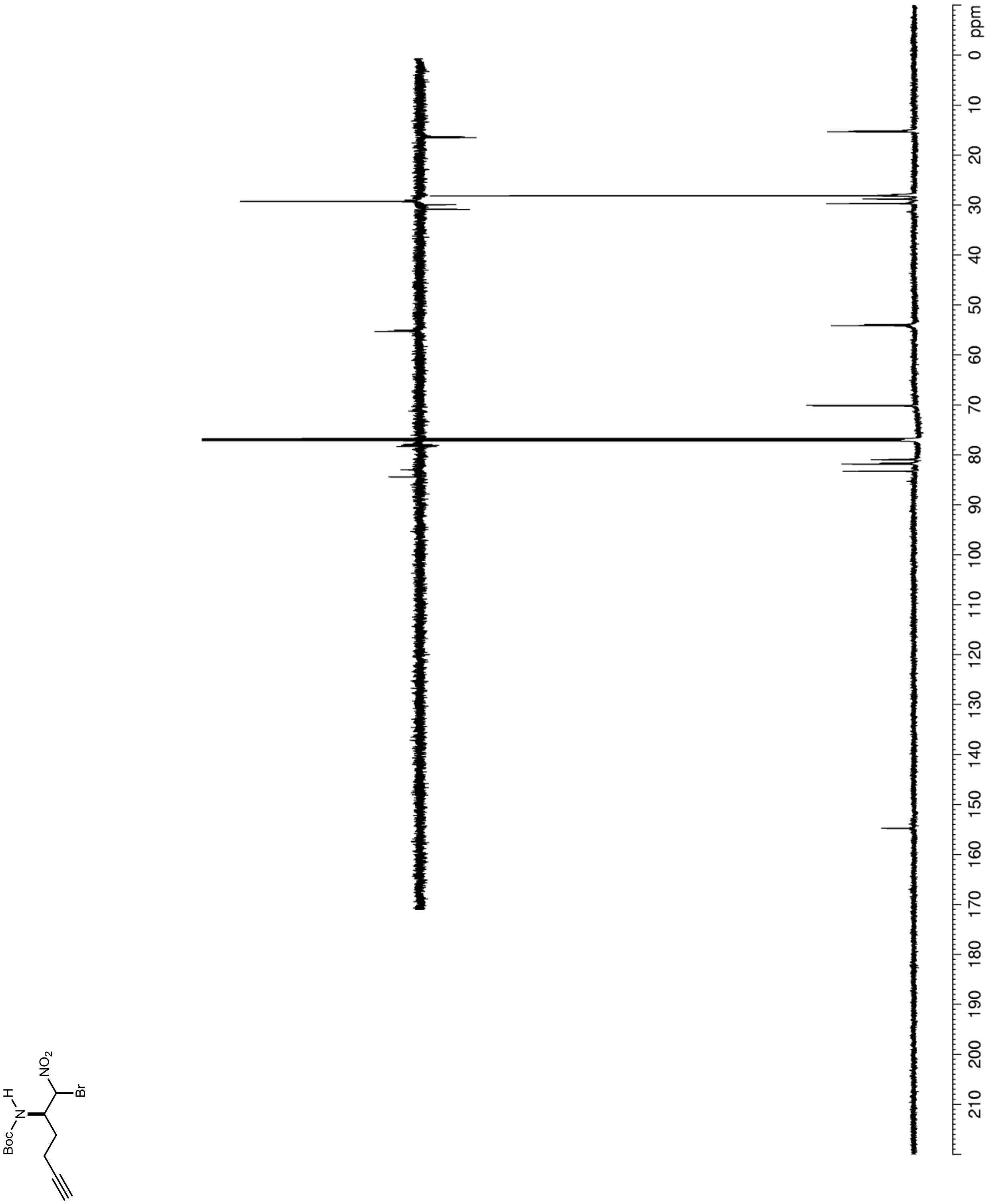
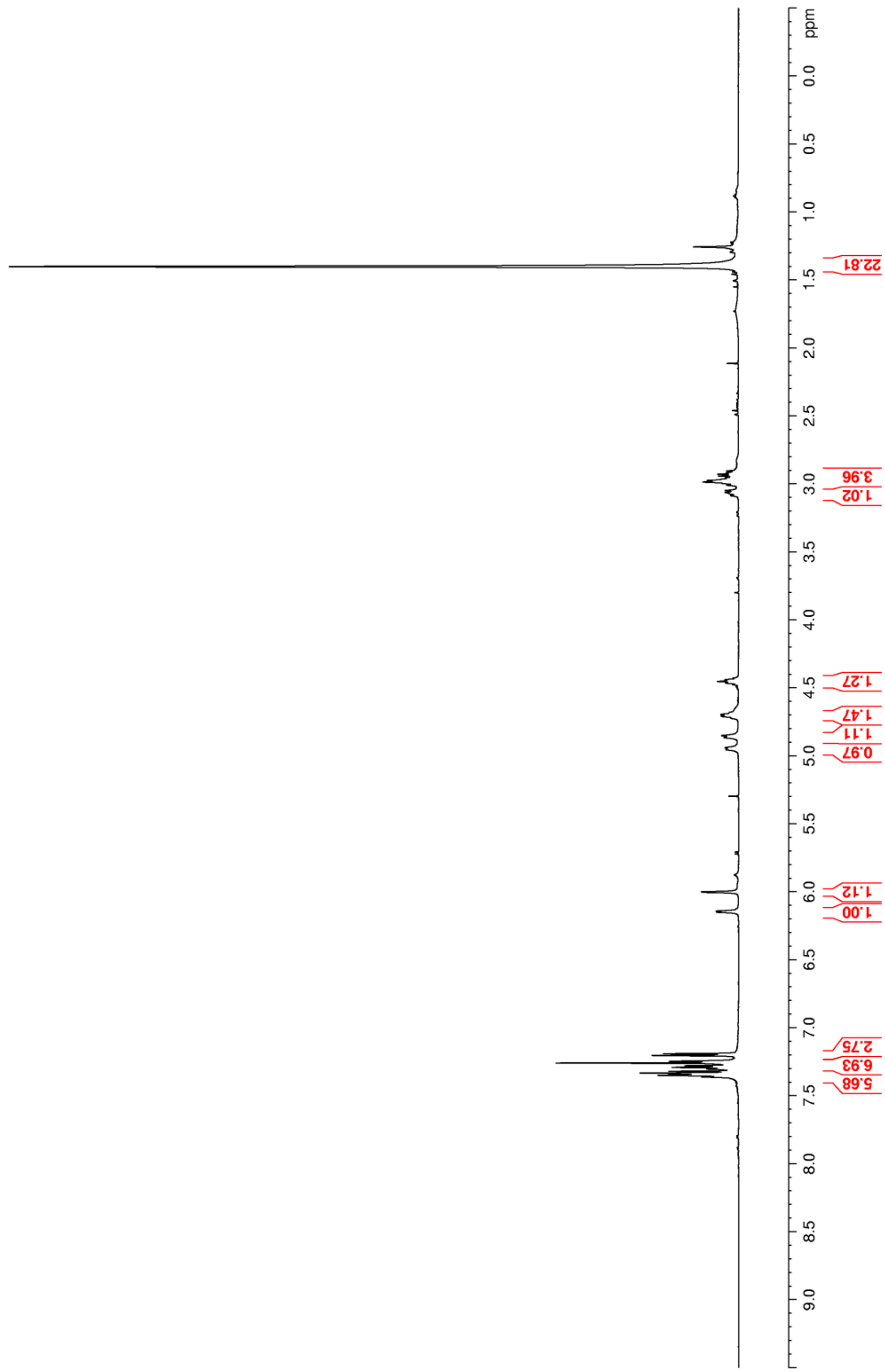


Figure 35. ^{1}H NMR (600 MHz, $CDCl_3$) of **16.**



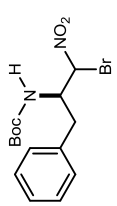
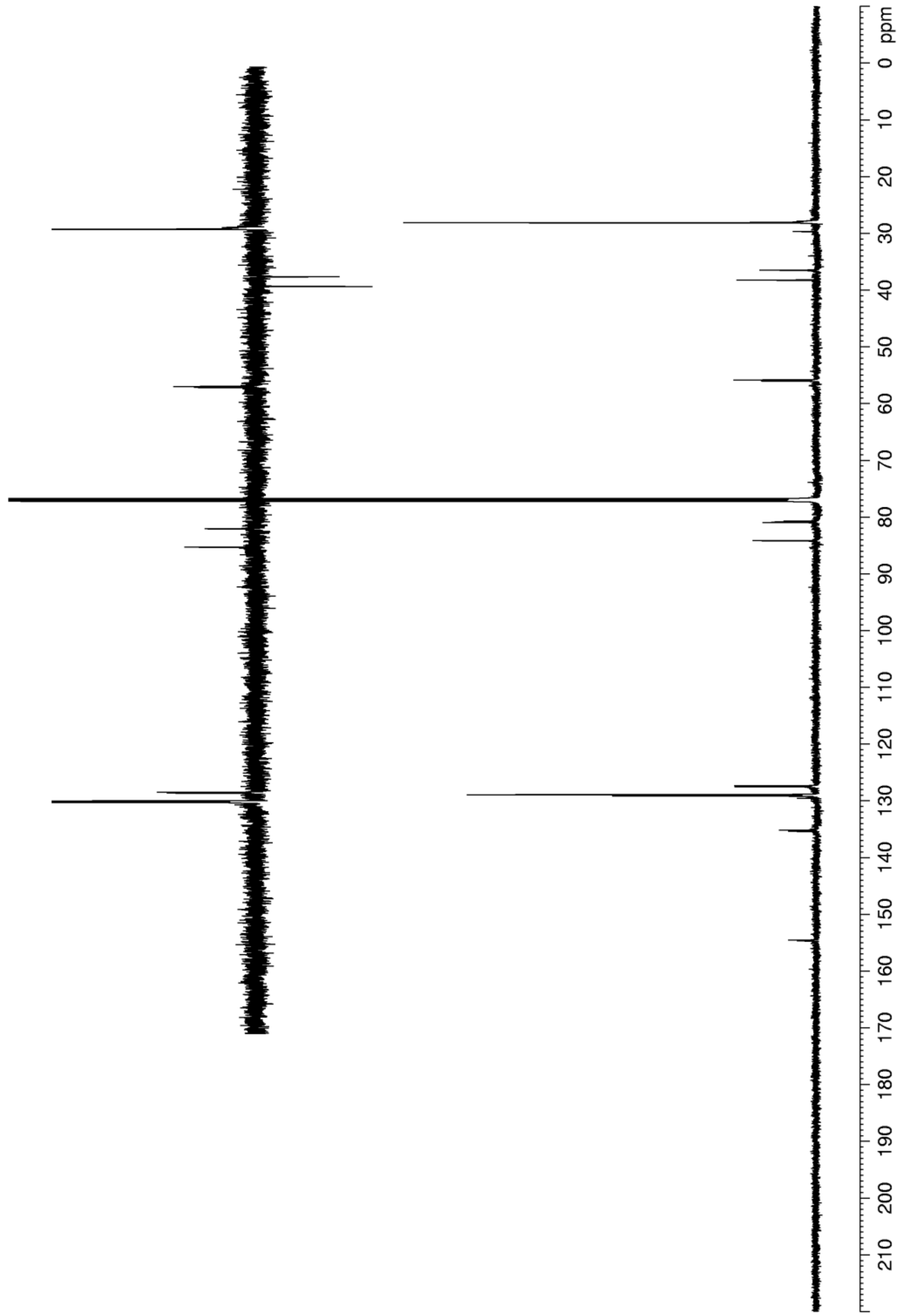


Figure 36. ^{13}C NMR (150 MHz, $CDCl_3$) of **16.**



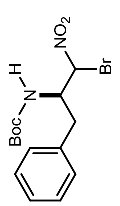


Figure 37. [1]H NMR (600 MHz, $CDCl_3$) of **17.**

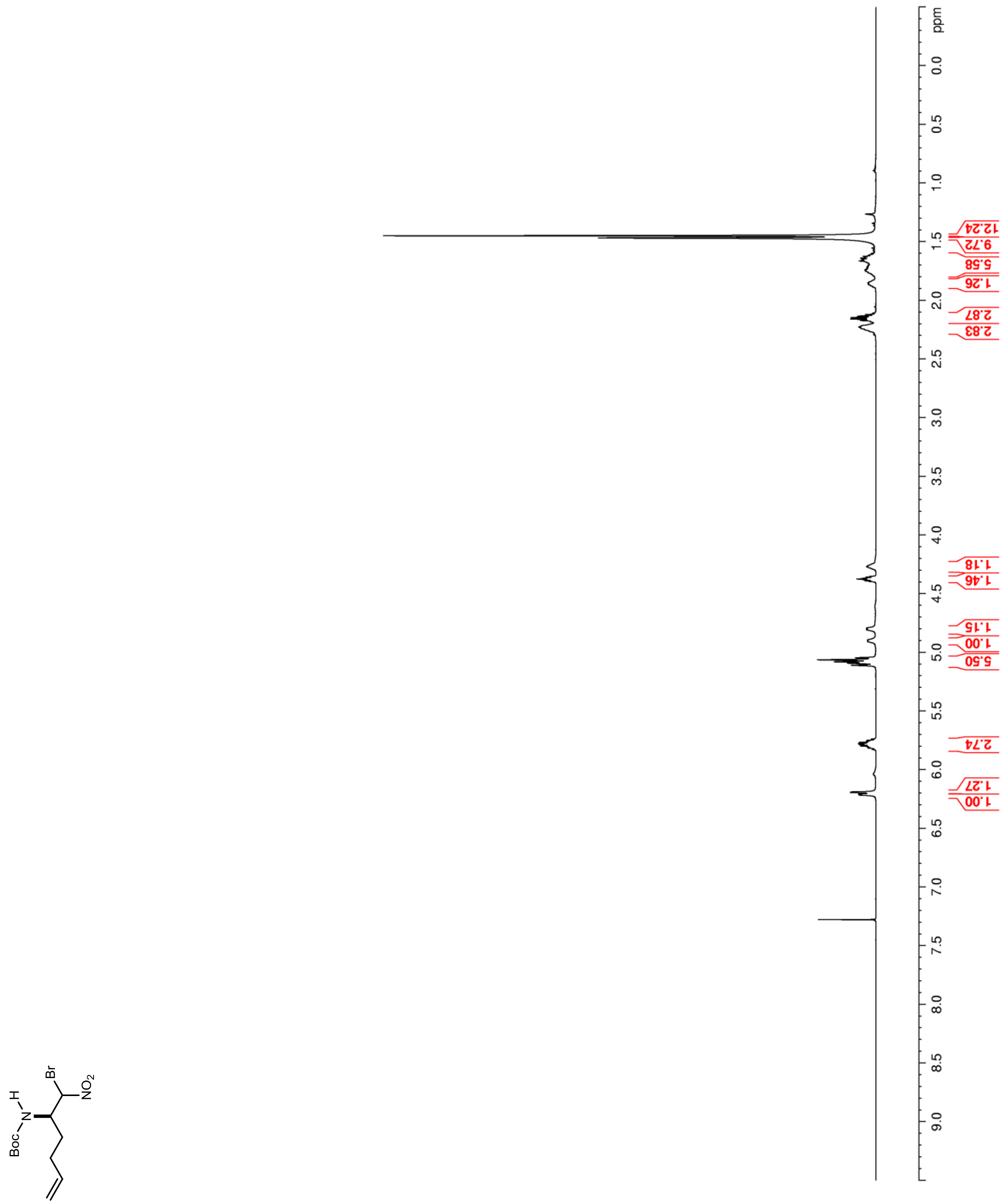


Figure 38. ^{13}C NMR (150 MHz, $CDCl_3$) of **17.**

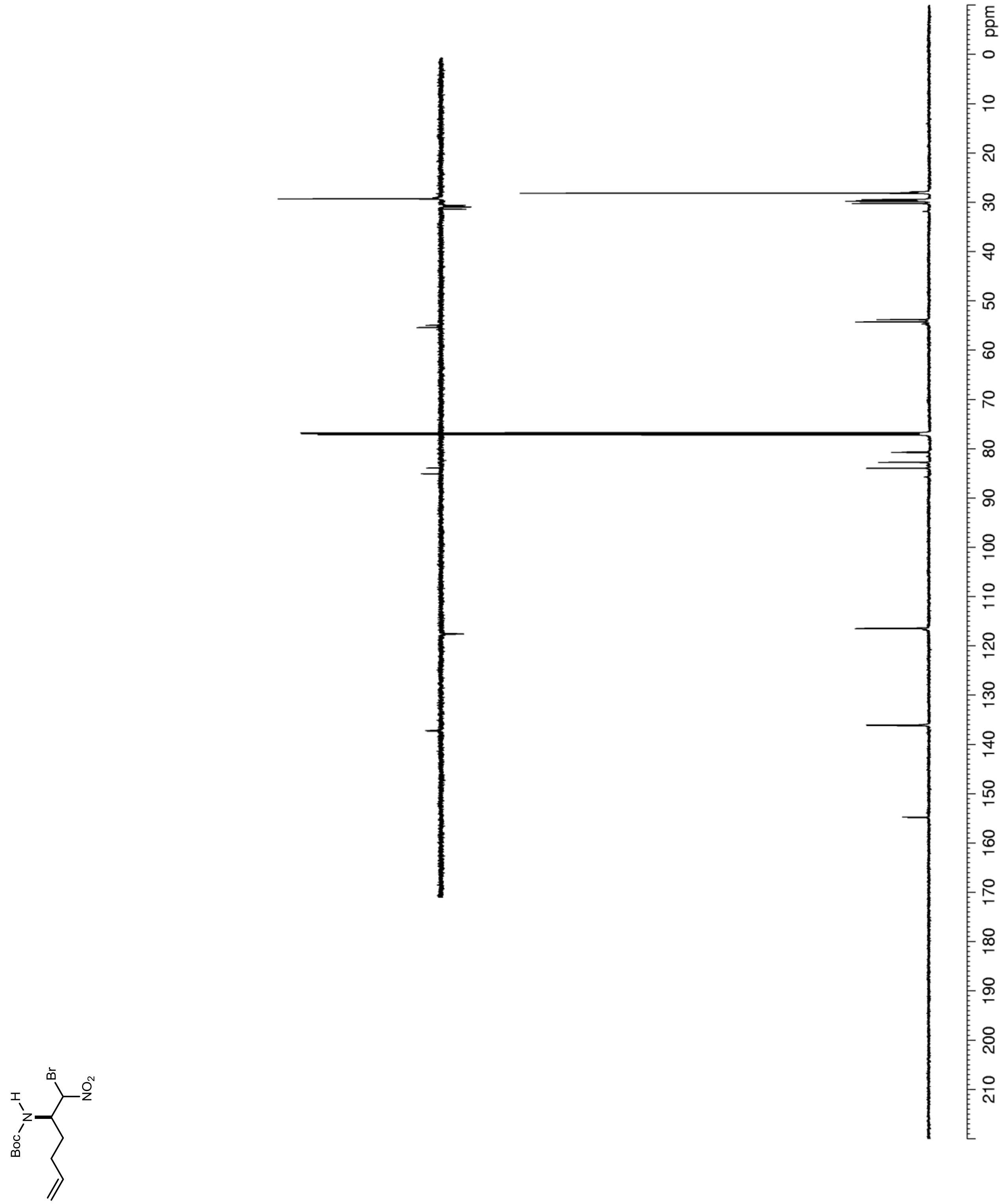
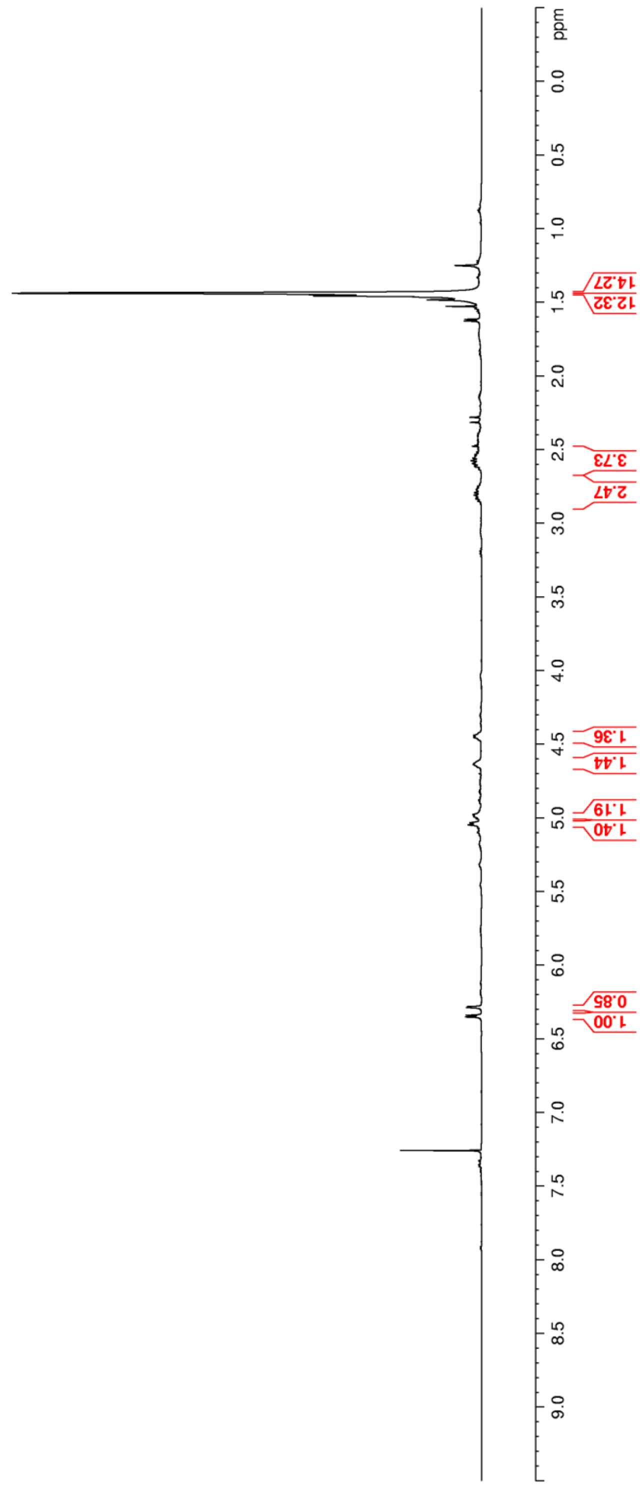


Figure 39. ^{1}H NMR (600 MHz, $CDCl_3$) of **18.**



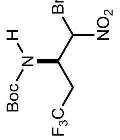


Figure 40. ^{13}C NMR (150 MHz, $CDCl_3$) of **18**.

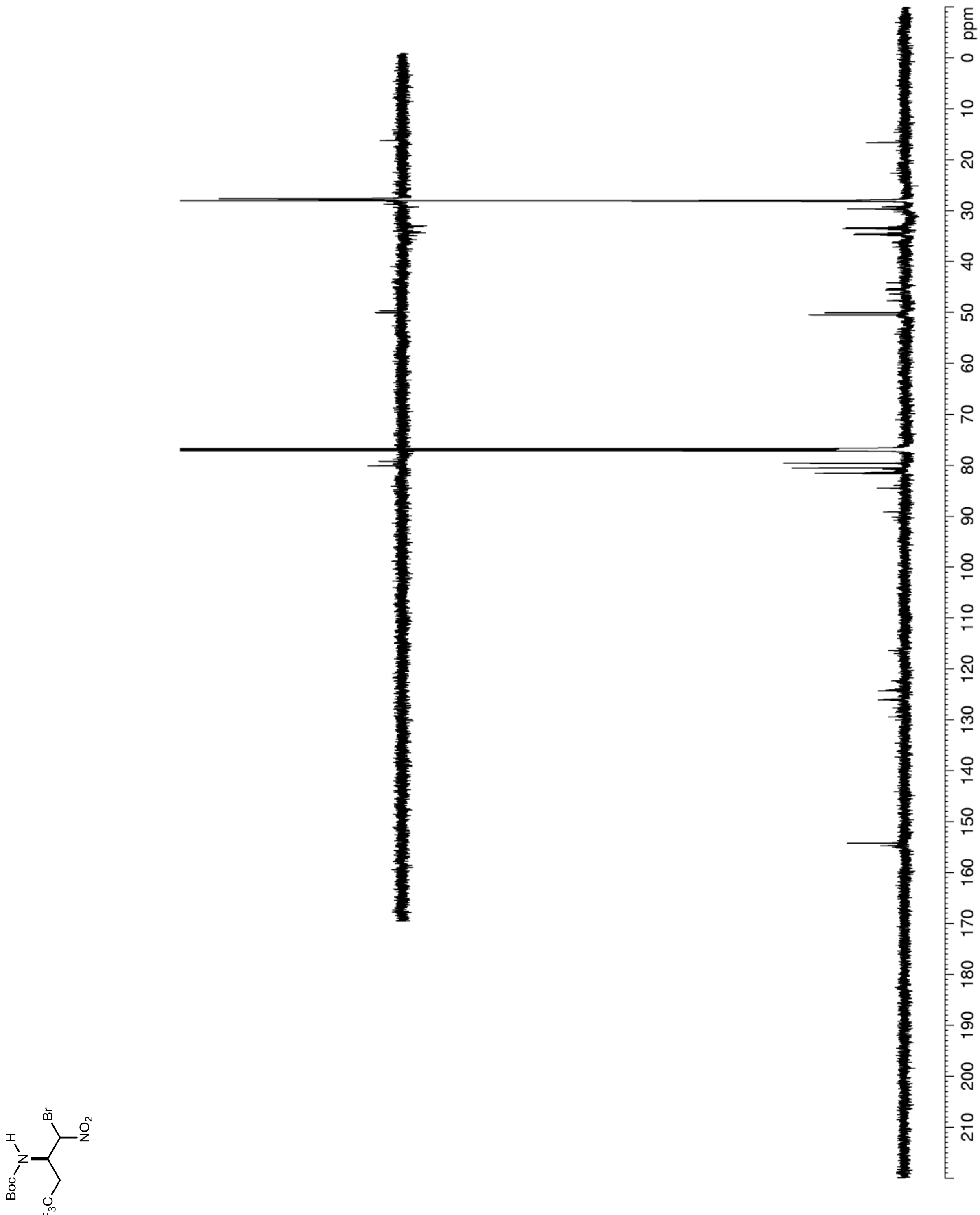


Figure 41. ^{1}H NMR (600 MHz, $CDCl_3$) of **19.**

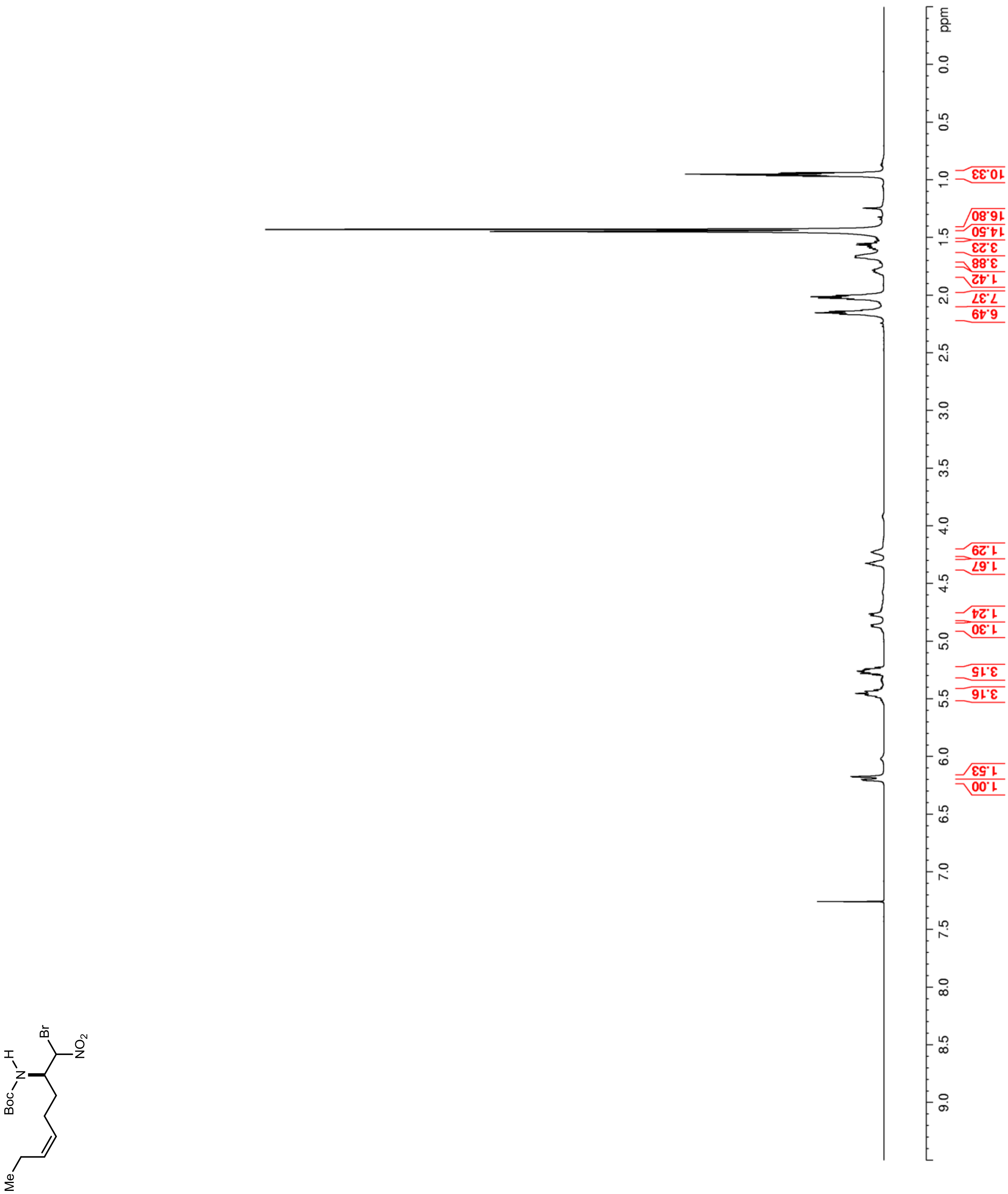


Figure 42. ^{13}C NMR (150 MHz, $CDCl_3$) of **19.**

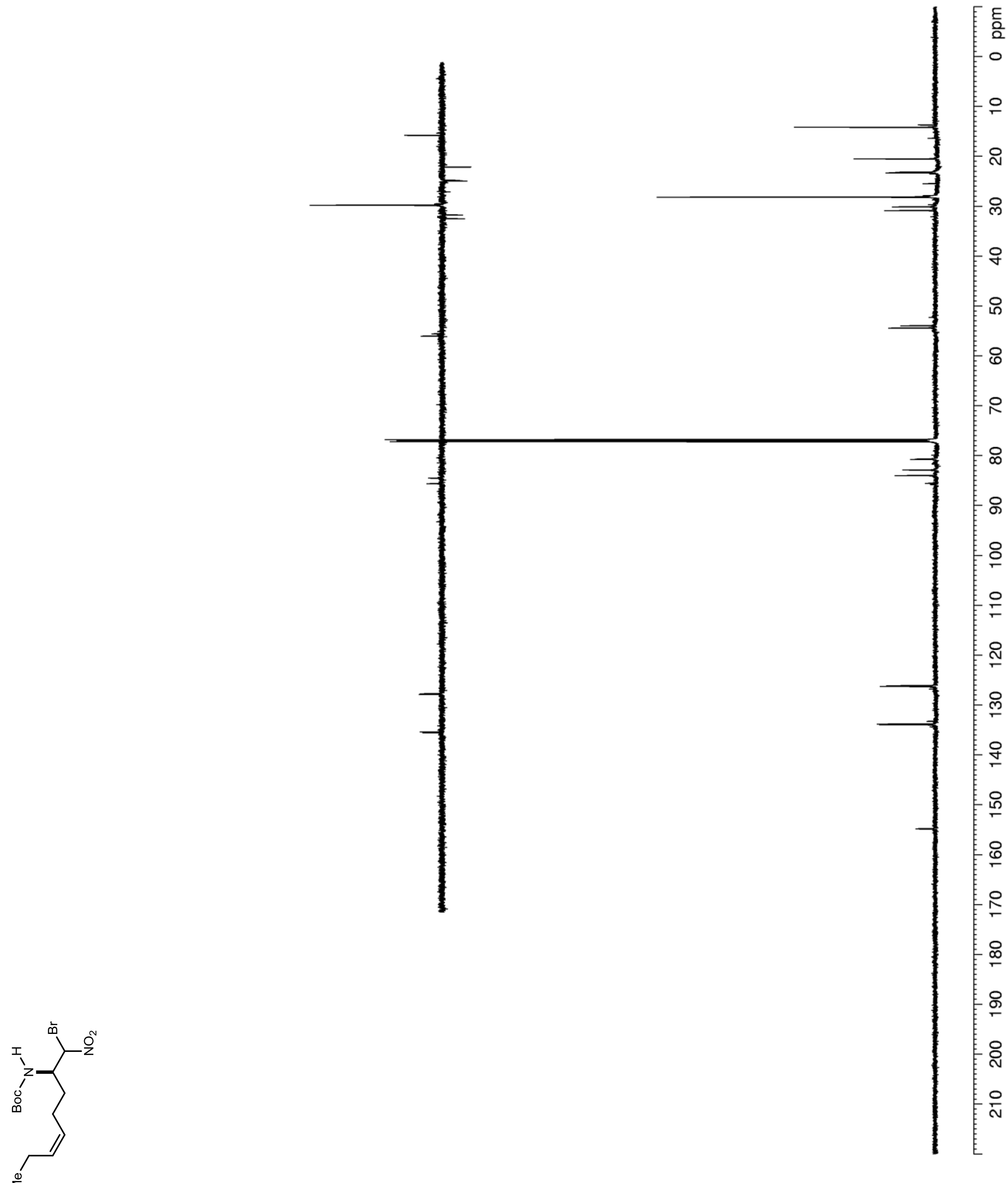
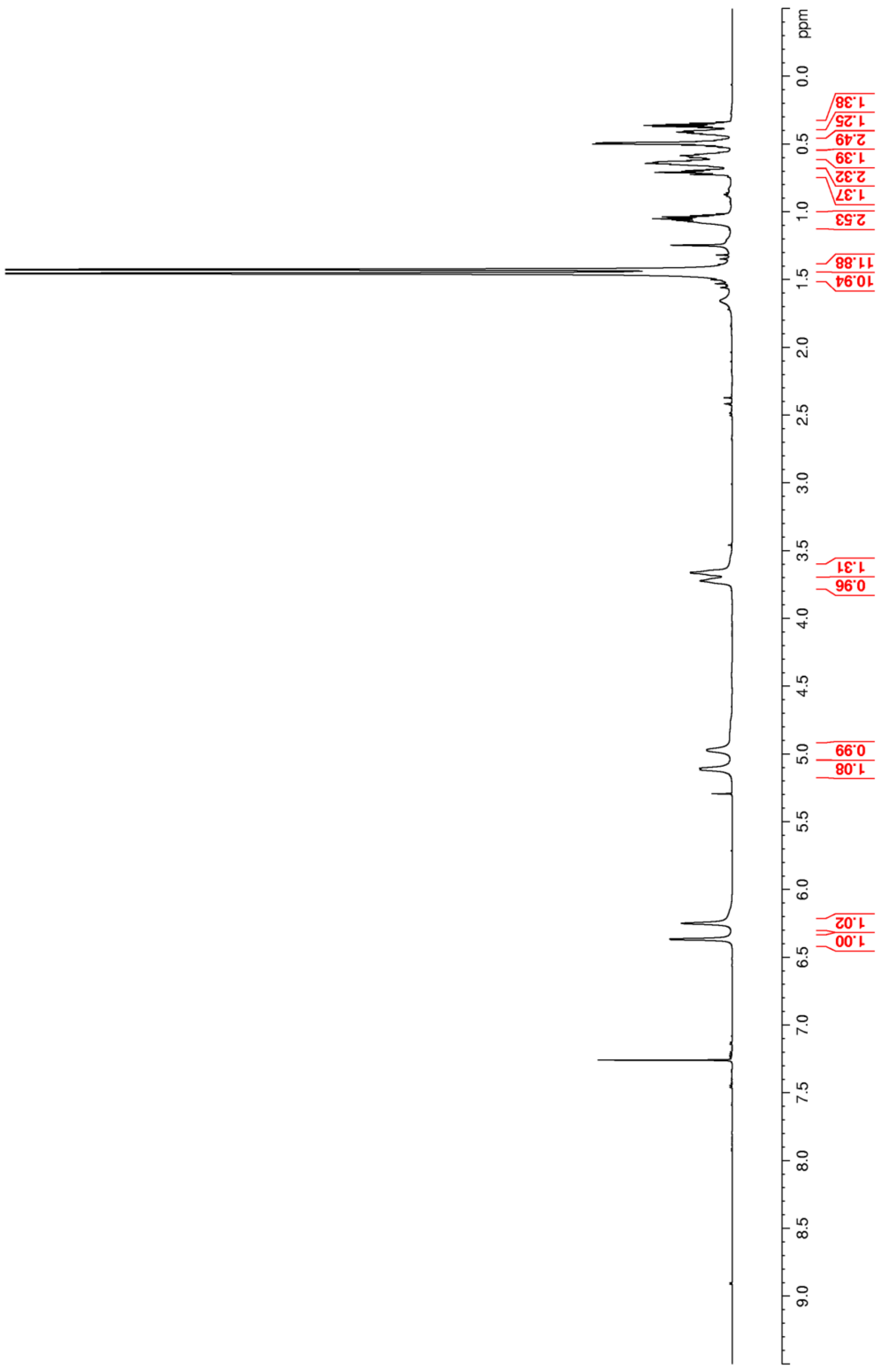


Figure 43. ^{1}H NMR (600 MHz, $CDCl_3$) of **20.**



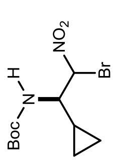
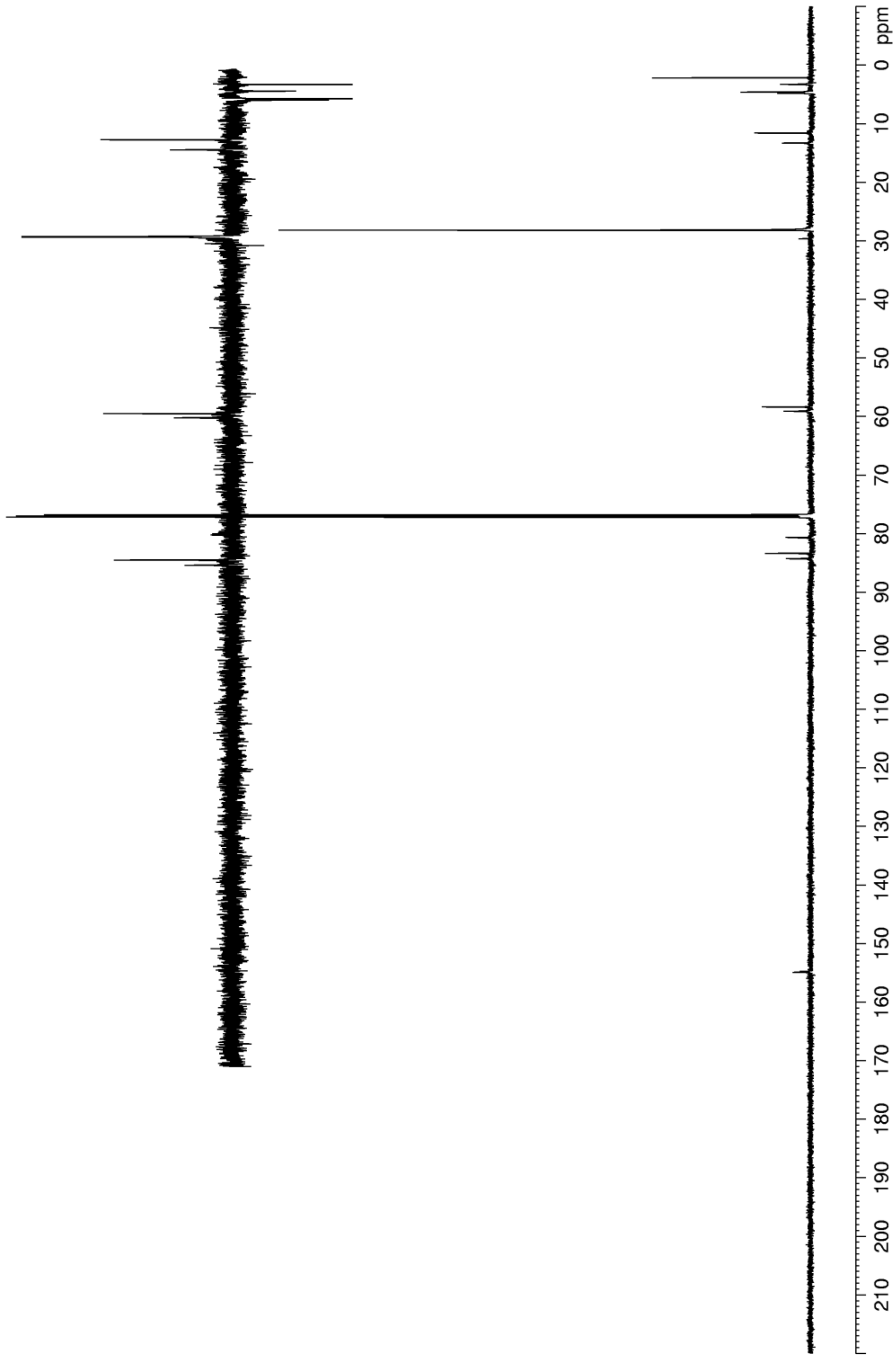


Figure 44. ^{13}C NMR (150 MHz, $CDCl_3$) of **20**.



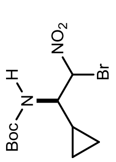


Figure 45. ^{1}H NMR (600 MHz, $CDCl_3$) of **21.**

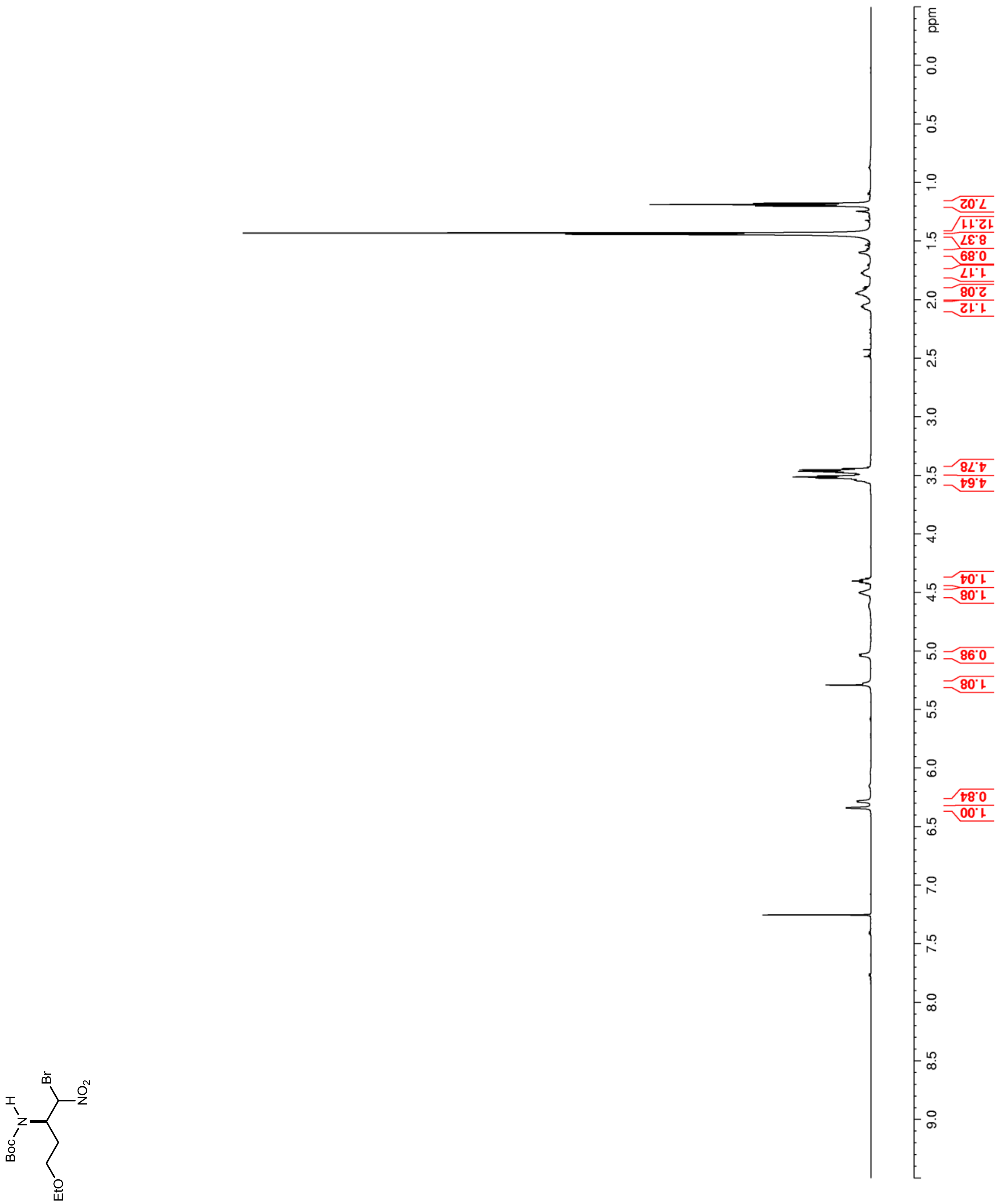


Figure 46. ^{13}C NMR (150 MHz, $CDCl_3$) of **21.**

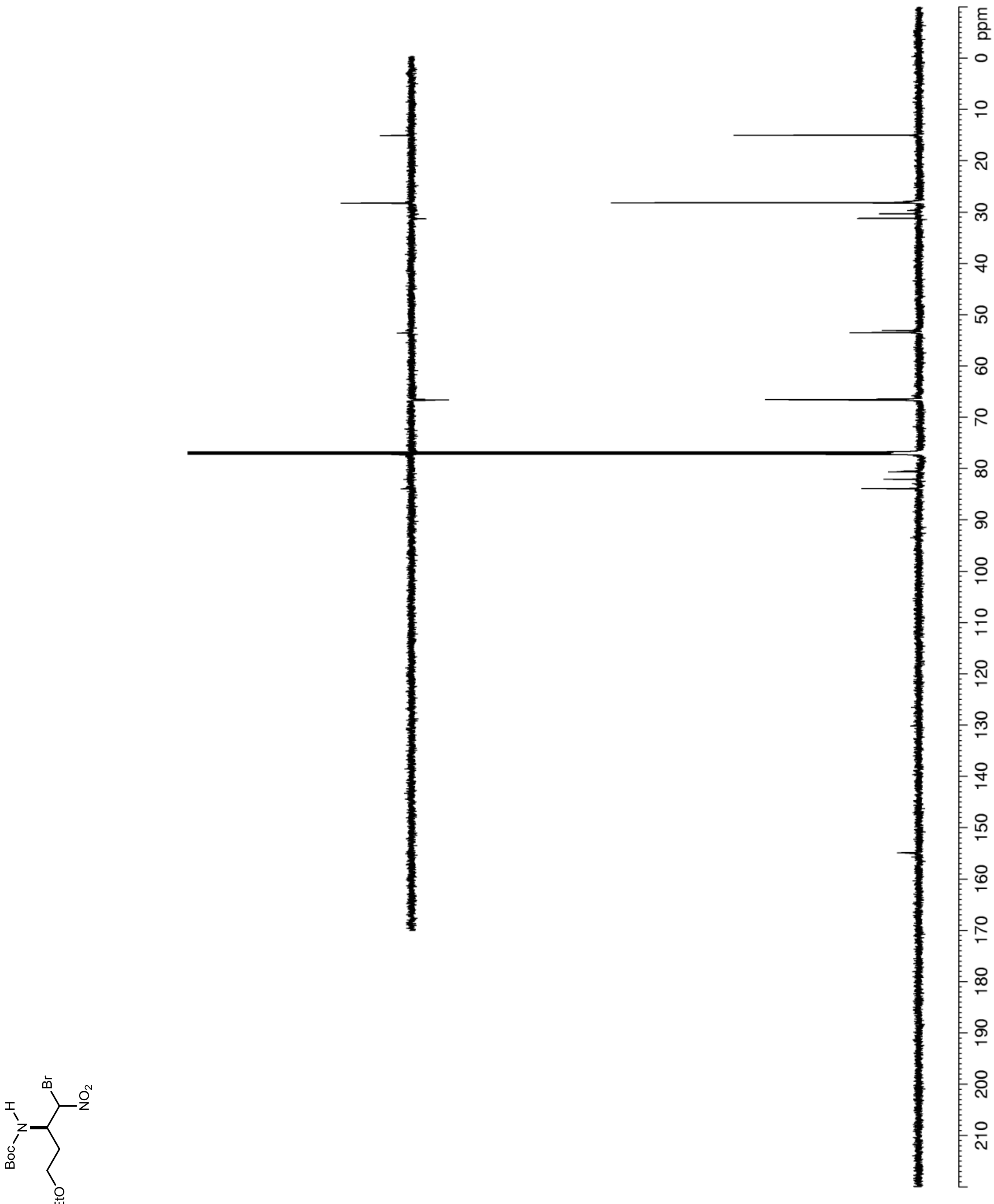


Figure 47. ^{1}H NMR (600 MHz, $CDCl_3$) of **22.**

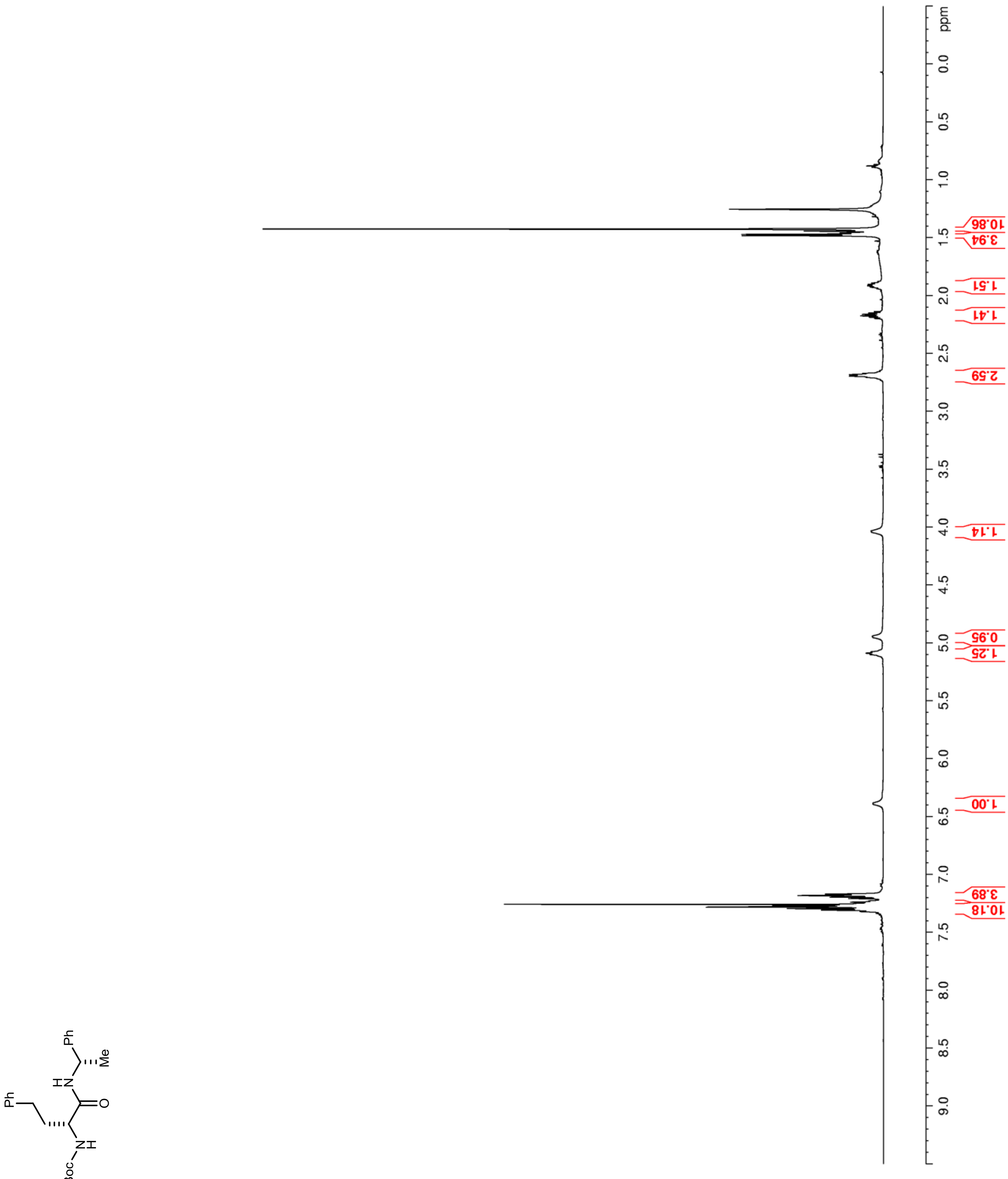


Figure 48. ^{13}C NMR (150 MHz, $CDCl_3$) of **22.**

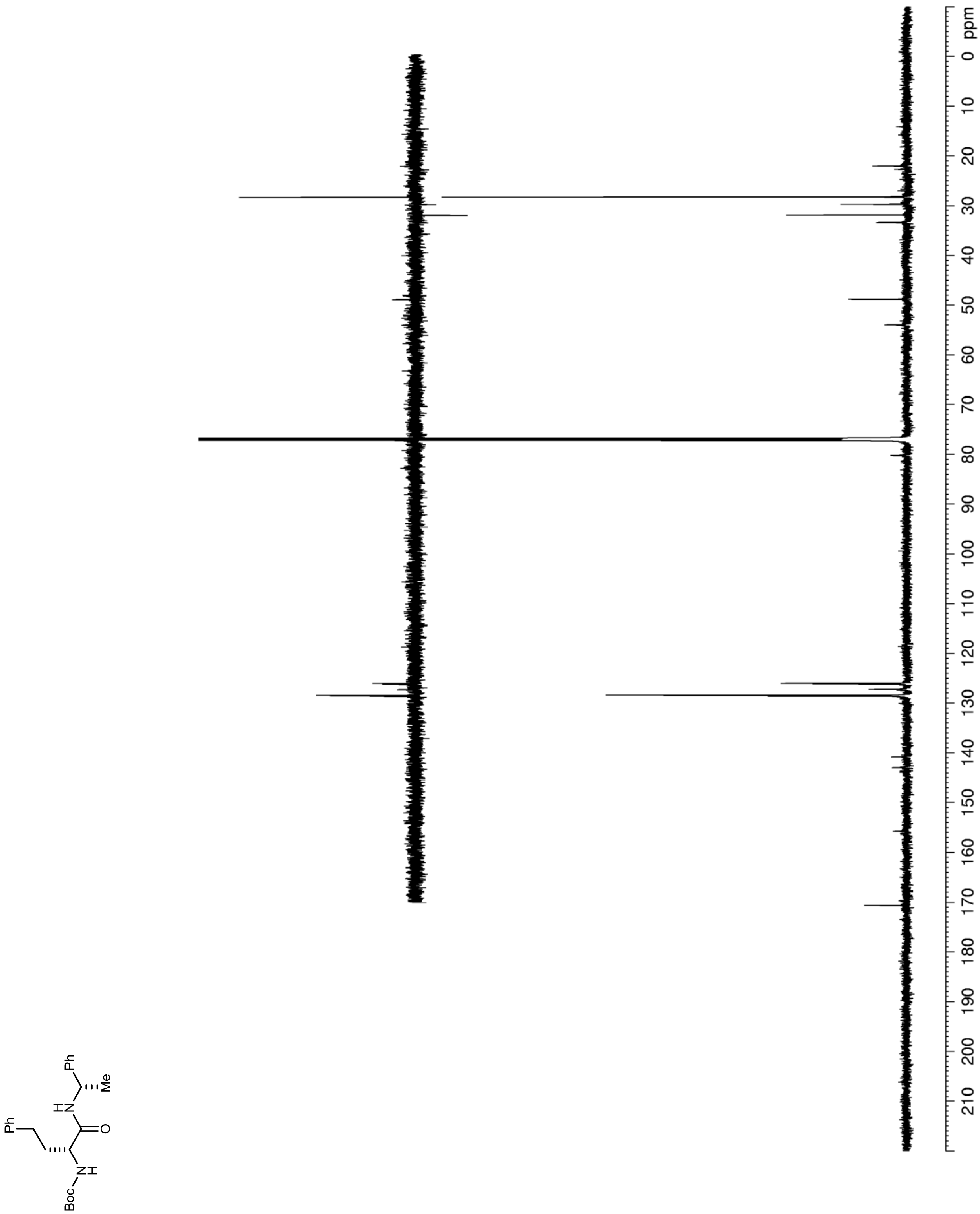


Figure 49. ^{1}H NMR (600 MHz, $CDCl_3$) of **23.**

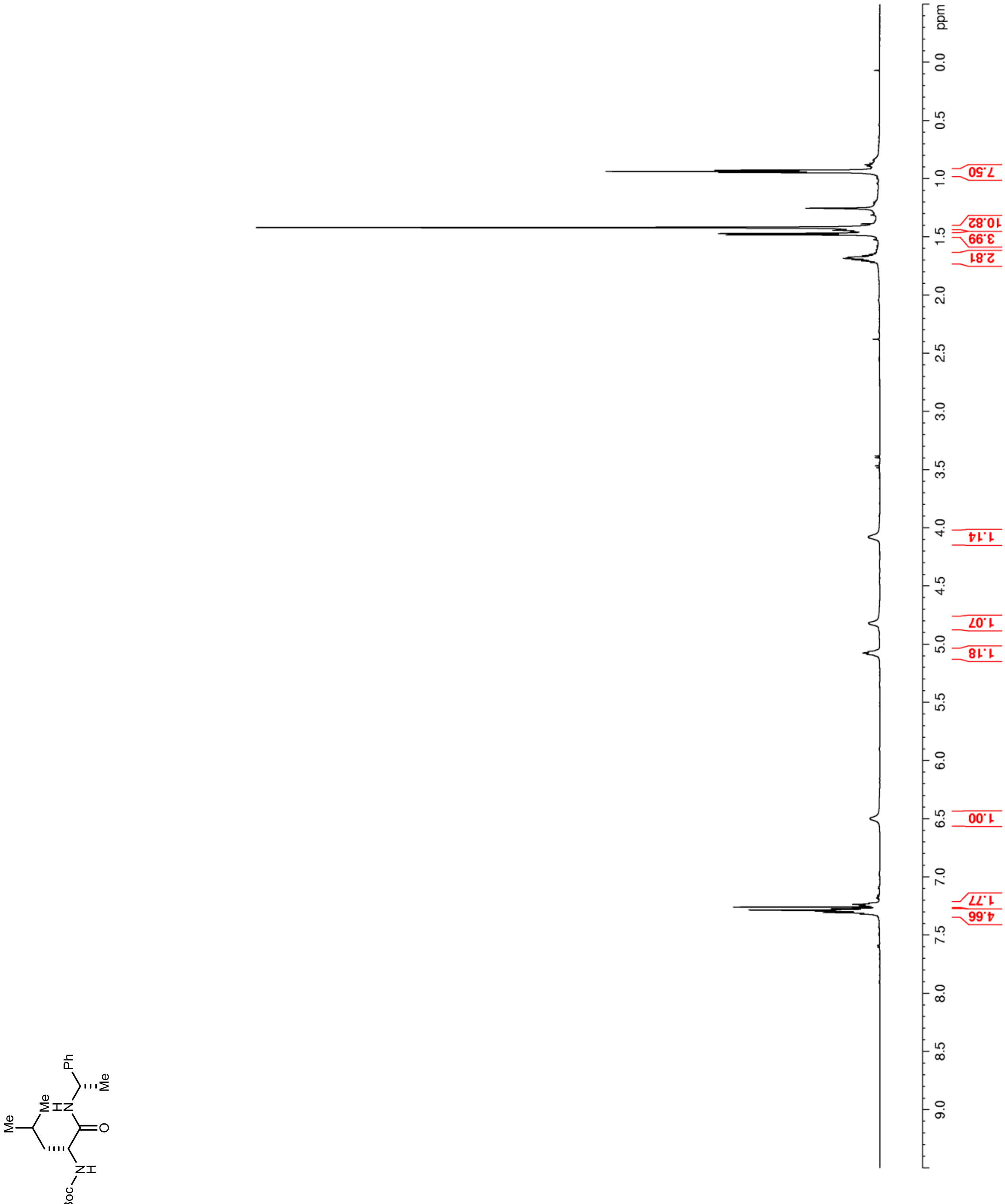


Figure 50. ^{13}C NMR (150 MHz, $CDCl_3$) of **23.**

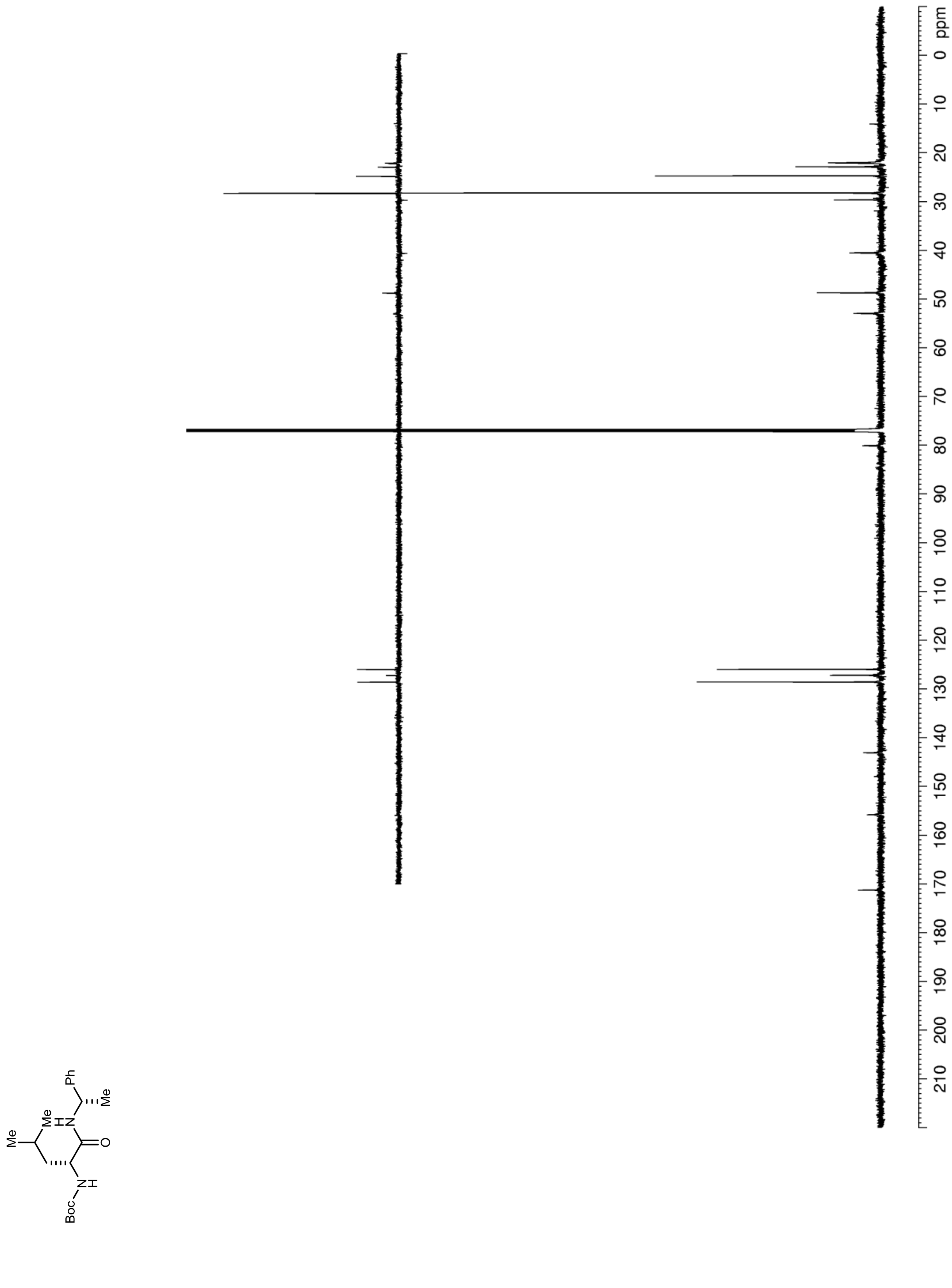
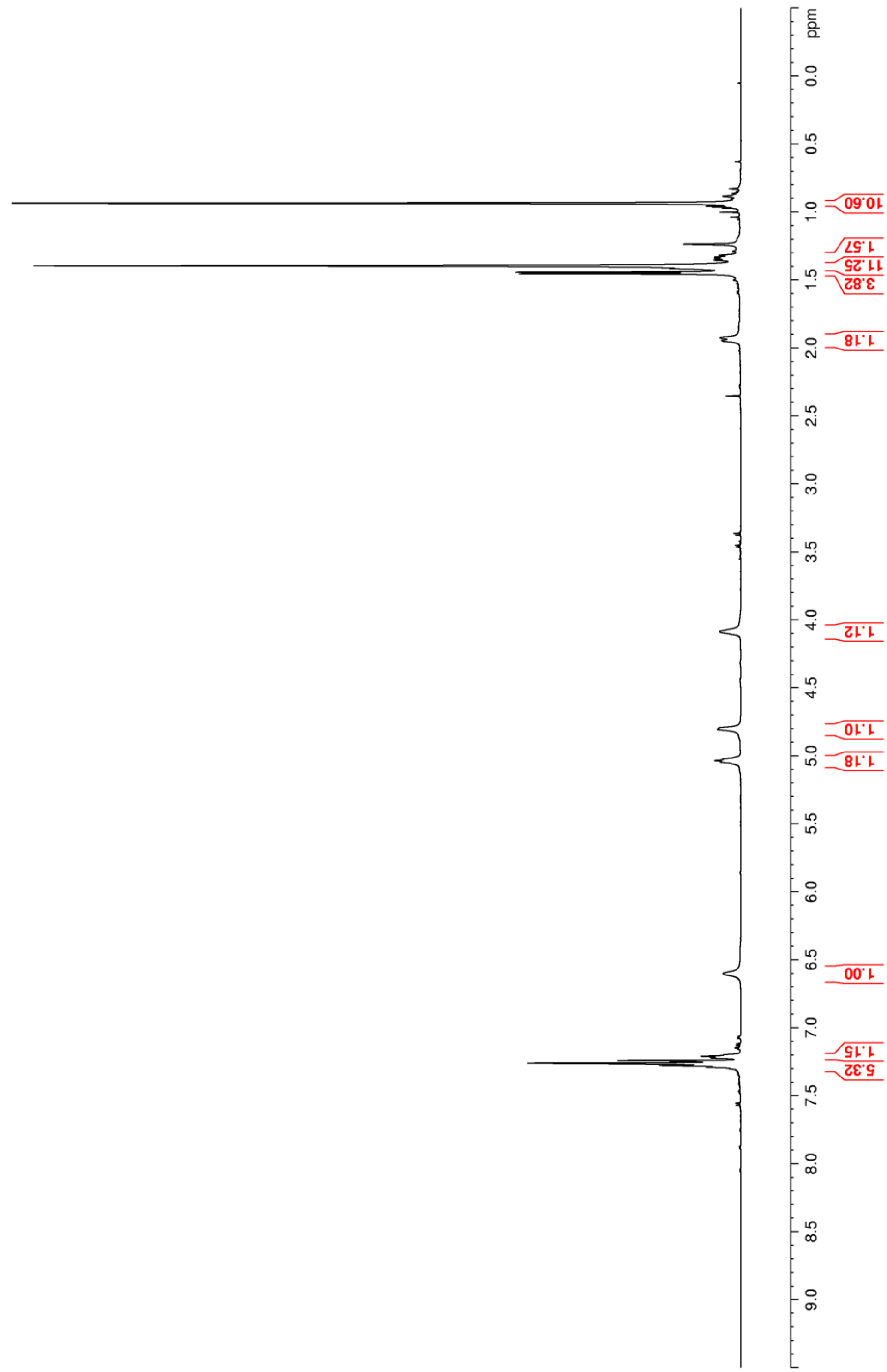


Figure 51. ^{1}H NMR (600 MHz, $CDCl_3$) of **24.**



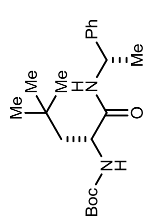


Figure 52. ^{13}C NMR (150 MHz, $CDCl_3$) of **24.**

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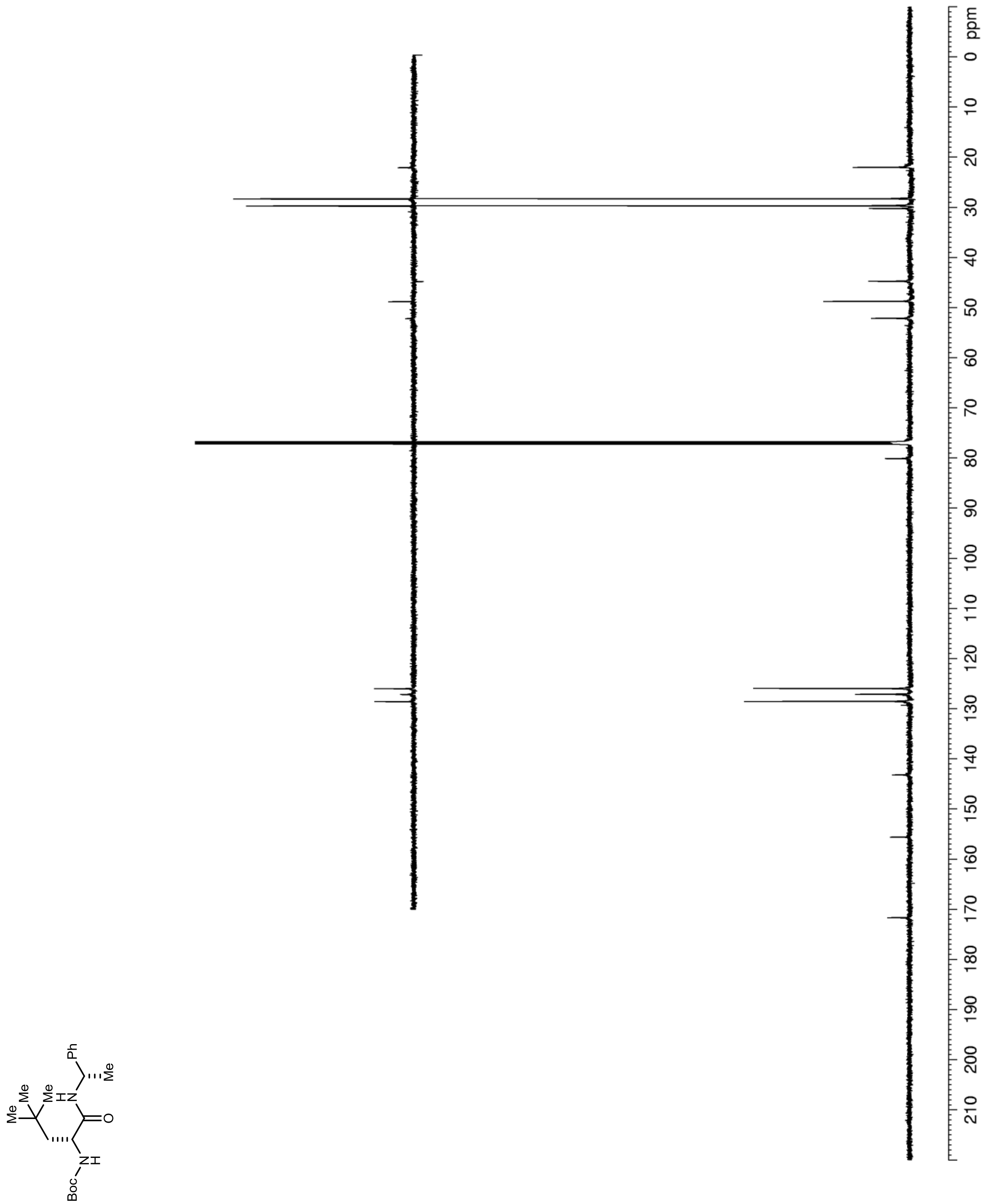


Figure 53. ^{1}H NMR (600 MHz, $CDCl_3$) of **25**

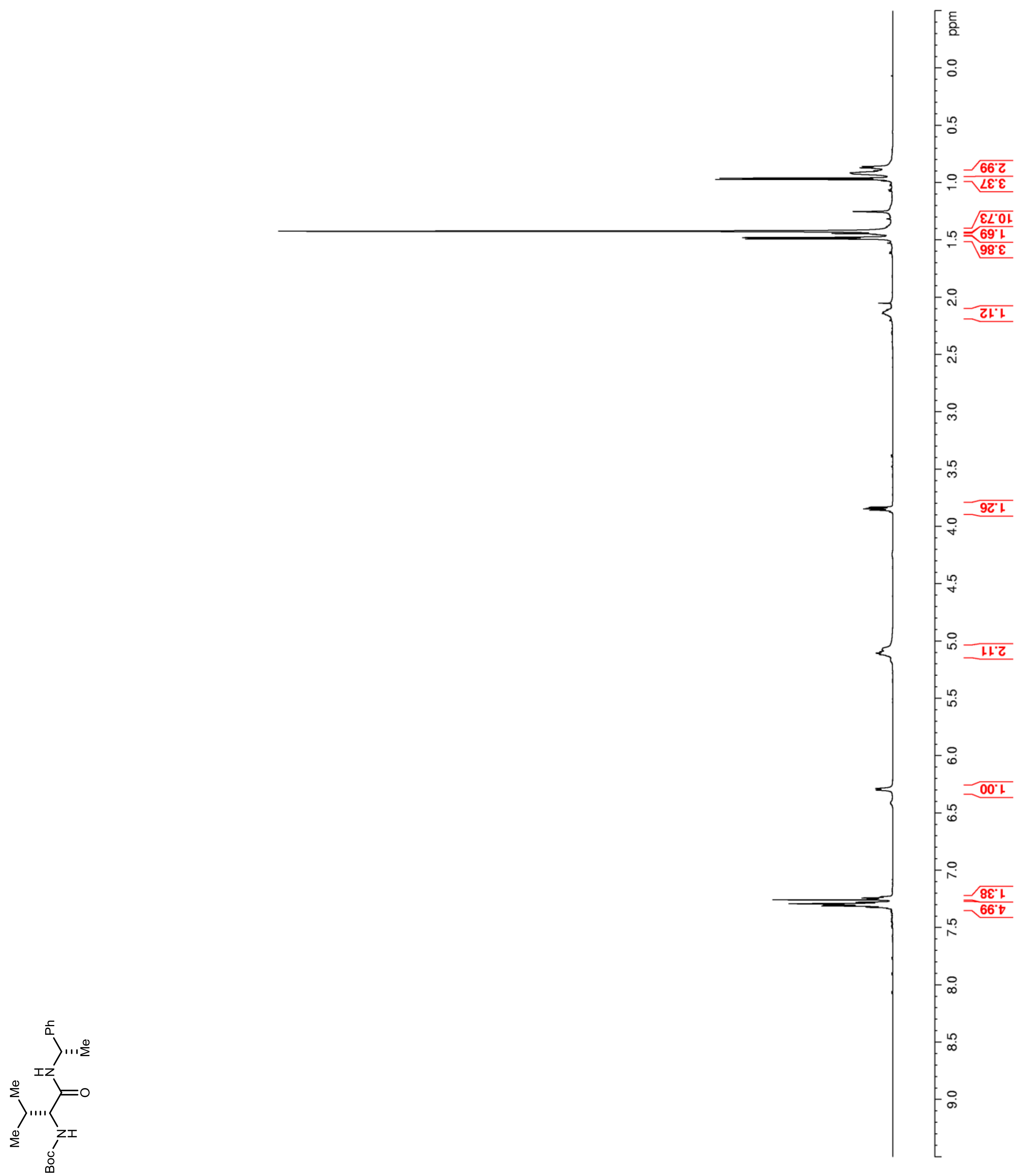


Figure 54. ^{13}C NMR (150 MHz, $CDCl_3$) of **25**

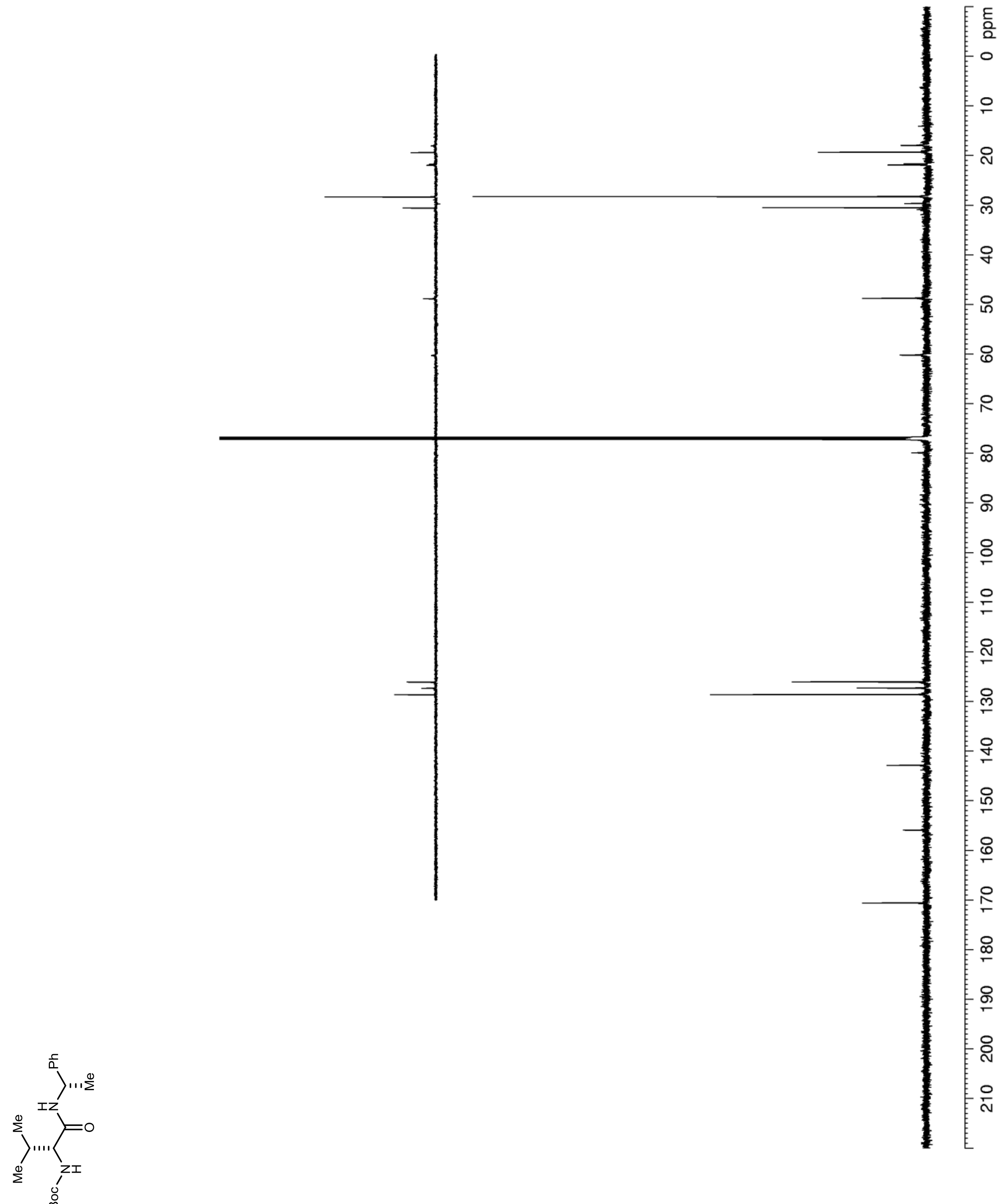


Figure 55. ^{1}H NMR (600 MHz, $CDCl_3$) of **26.**

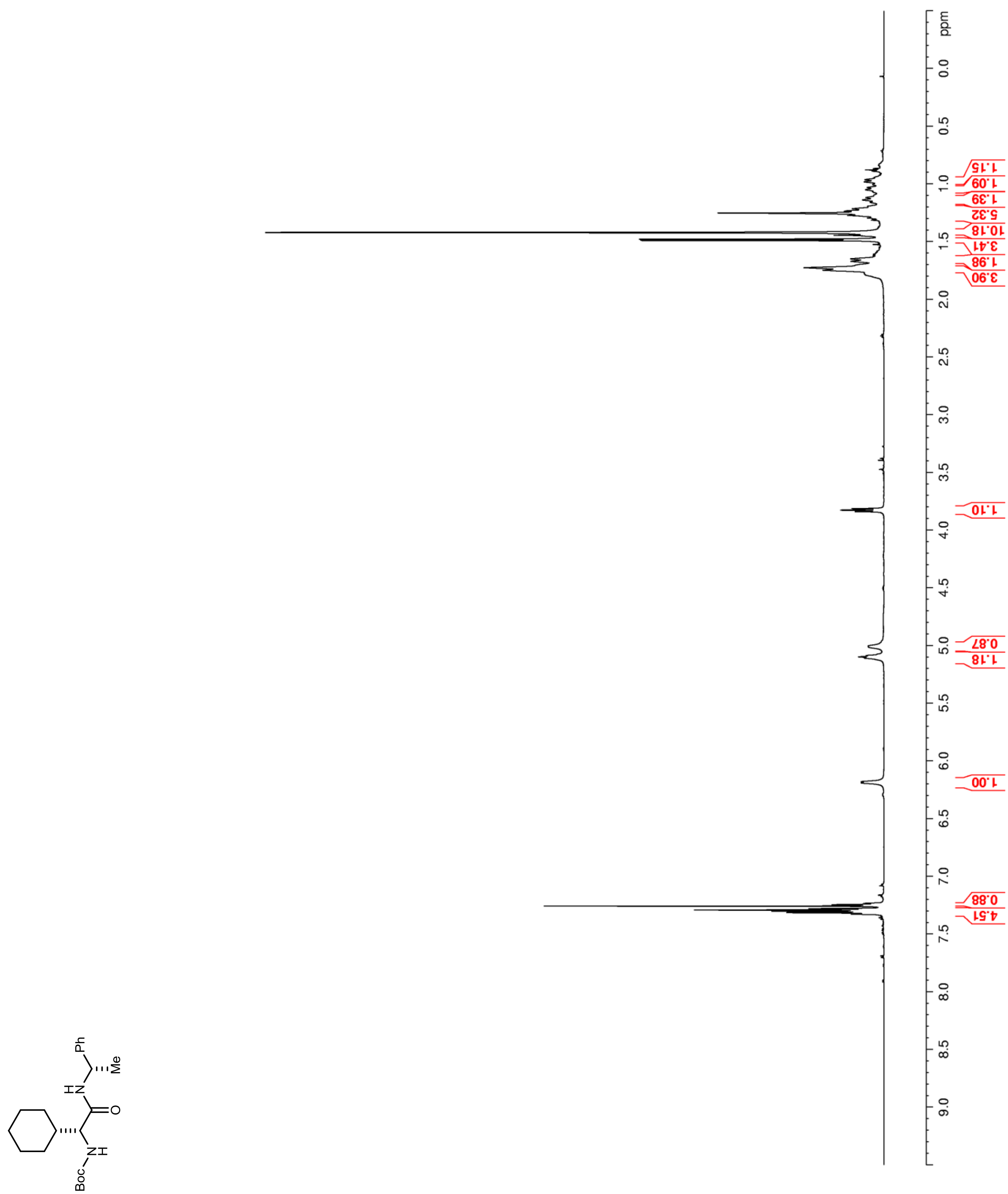


Figure 56. ^{13}C NMR (150 MHz, $CDCl_3$) of **26.**

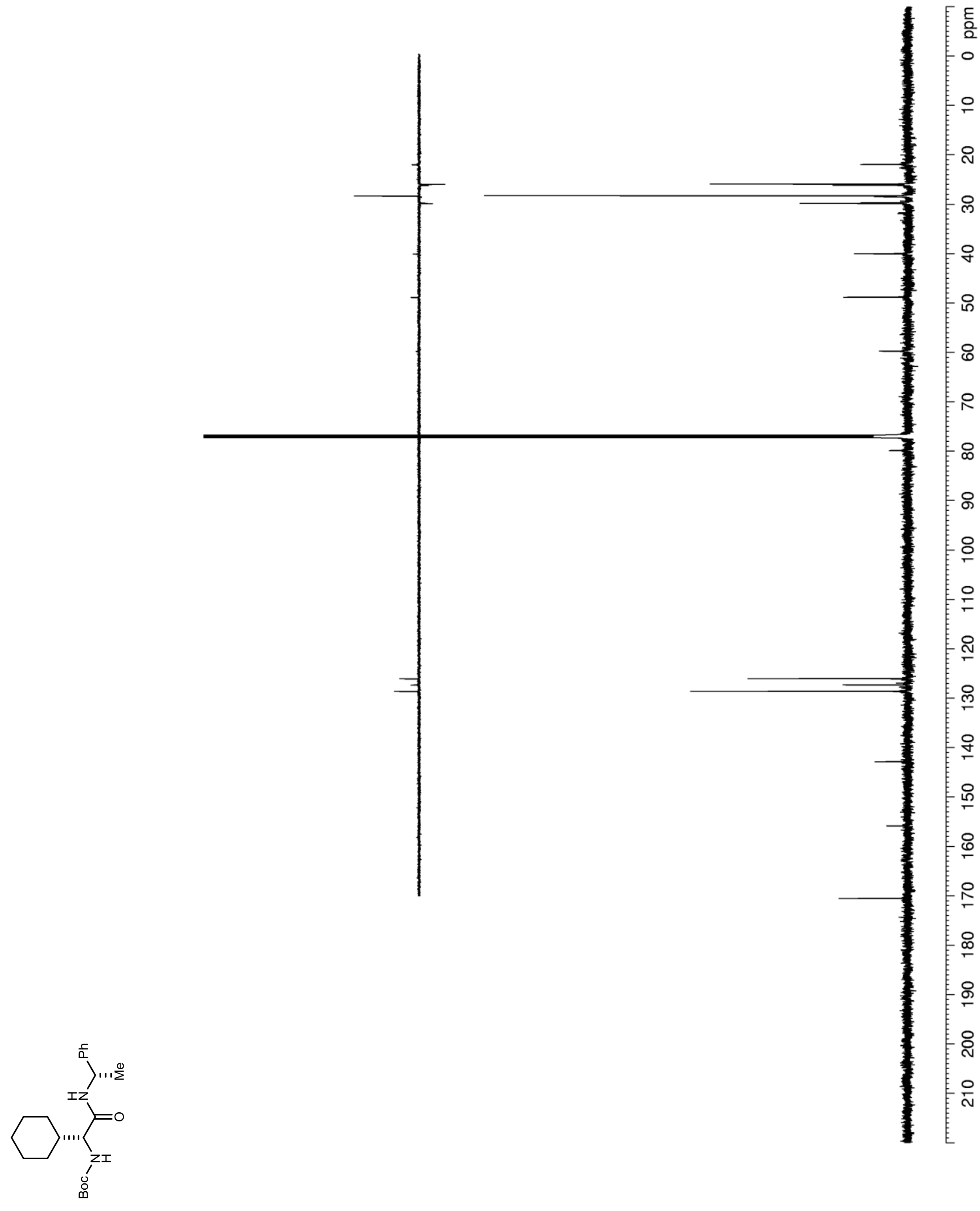
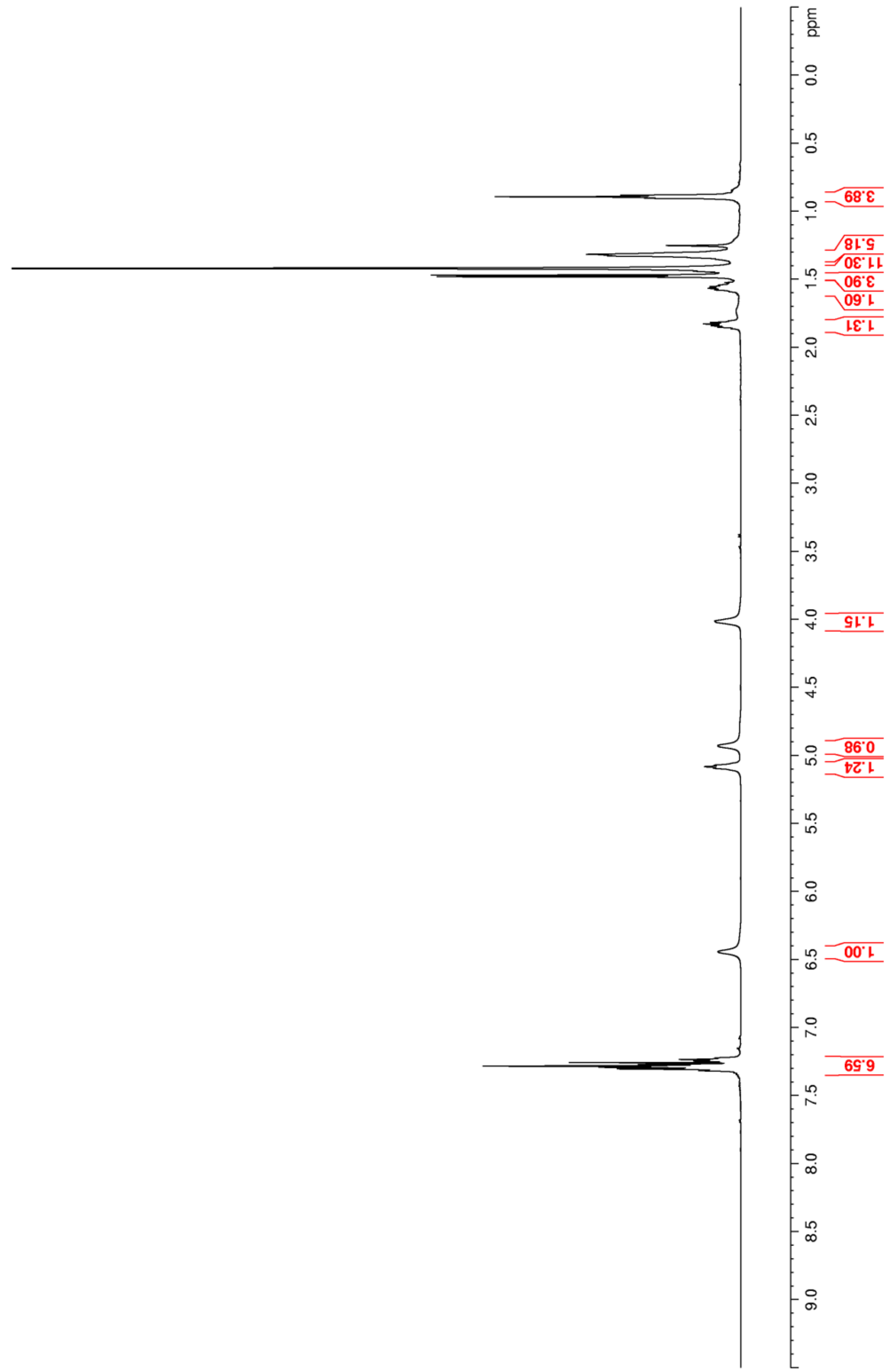


Figure 57. ^{1}H NMR (600 MHz, $CDCl_3$) of **27.**



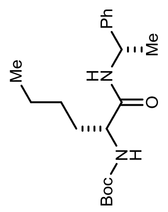


Figure 58. ^{13}C NMR (150 MHz, $CDCl_3$) of **27.**

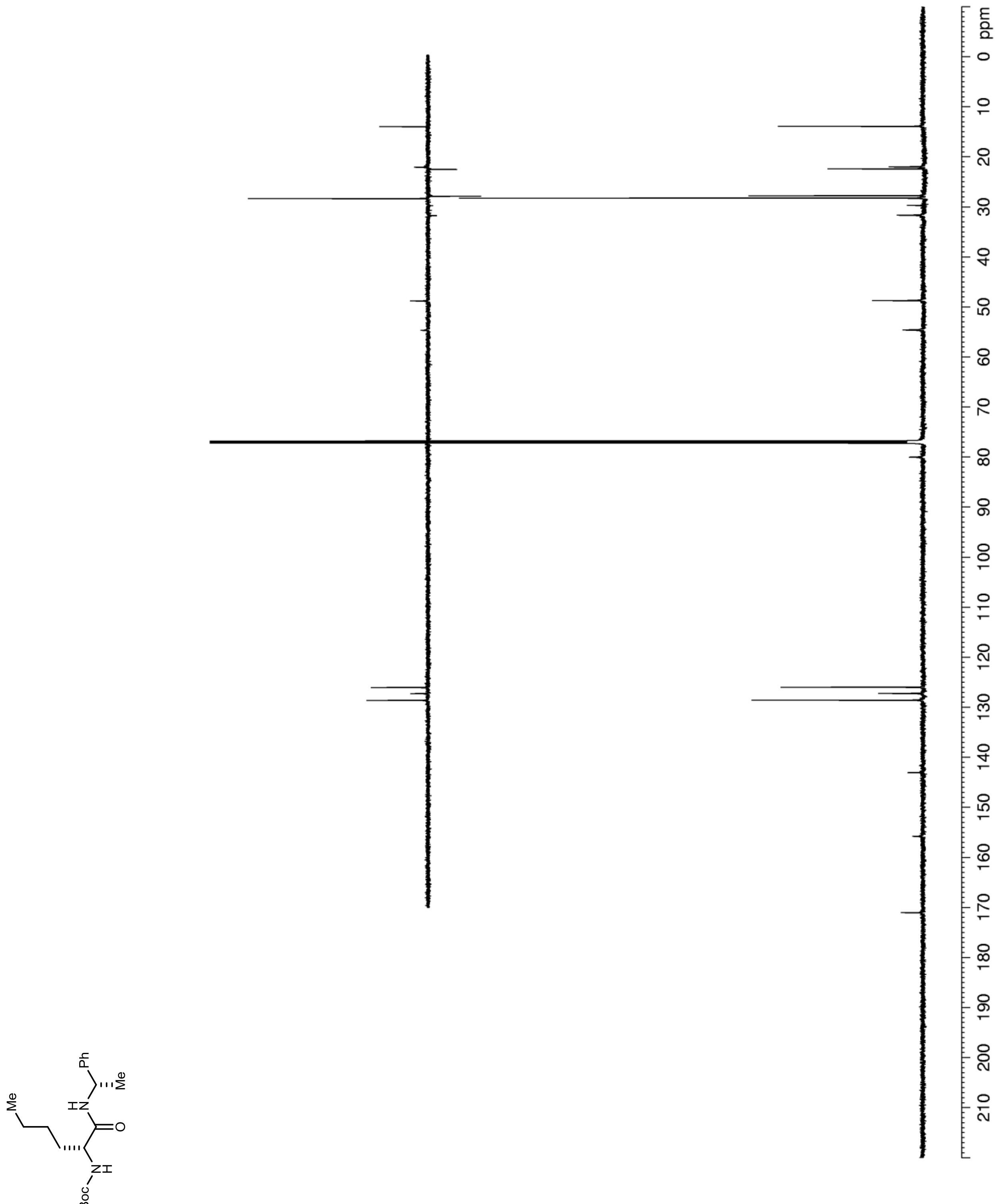


Figure 59. ^{1}H NMR (600 MHz, $CDCl_3$) of **28.**

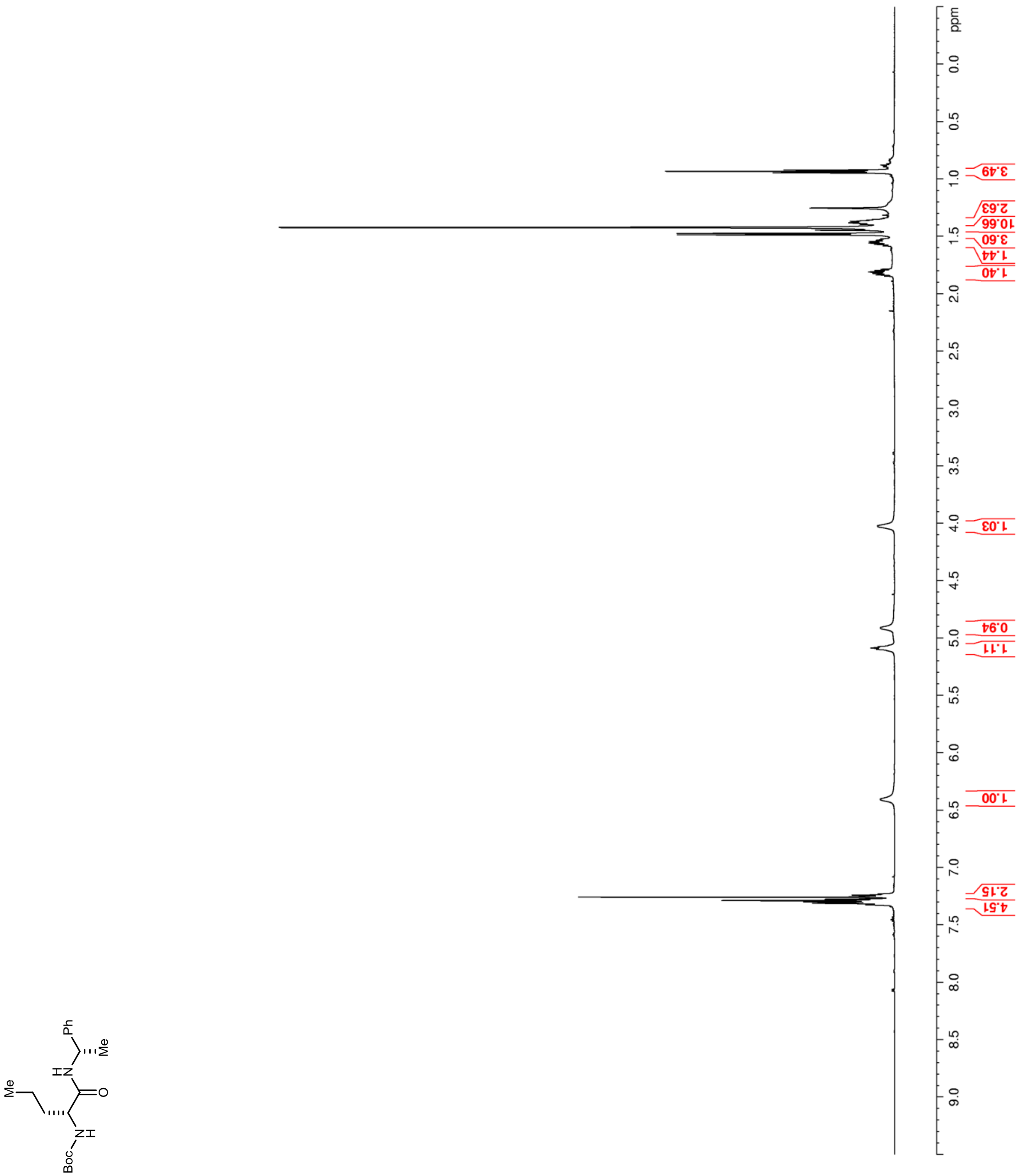


Figure 60. ^{13}C NMR (150 MHz, $CDCl_3$) of **28.**

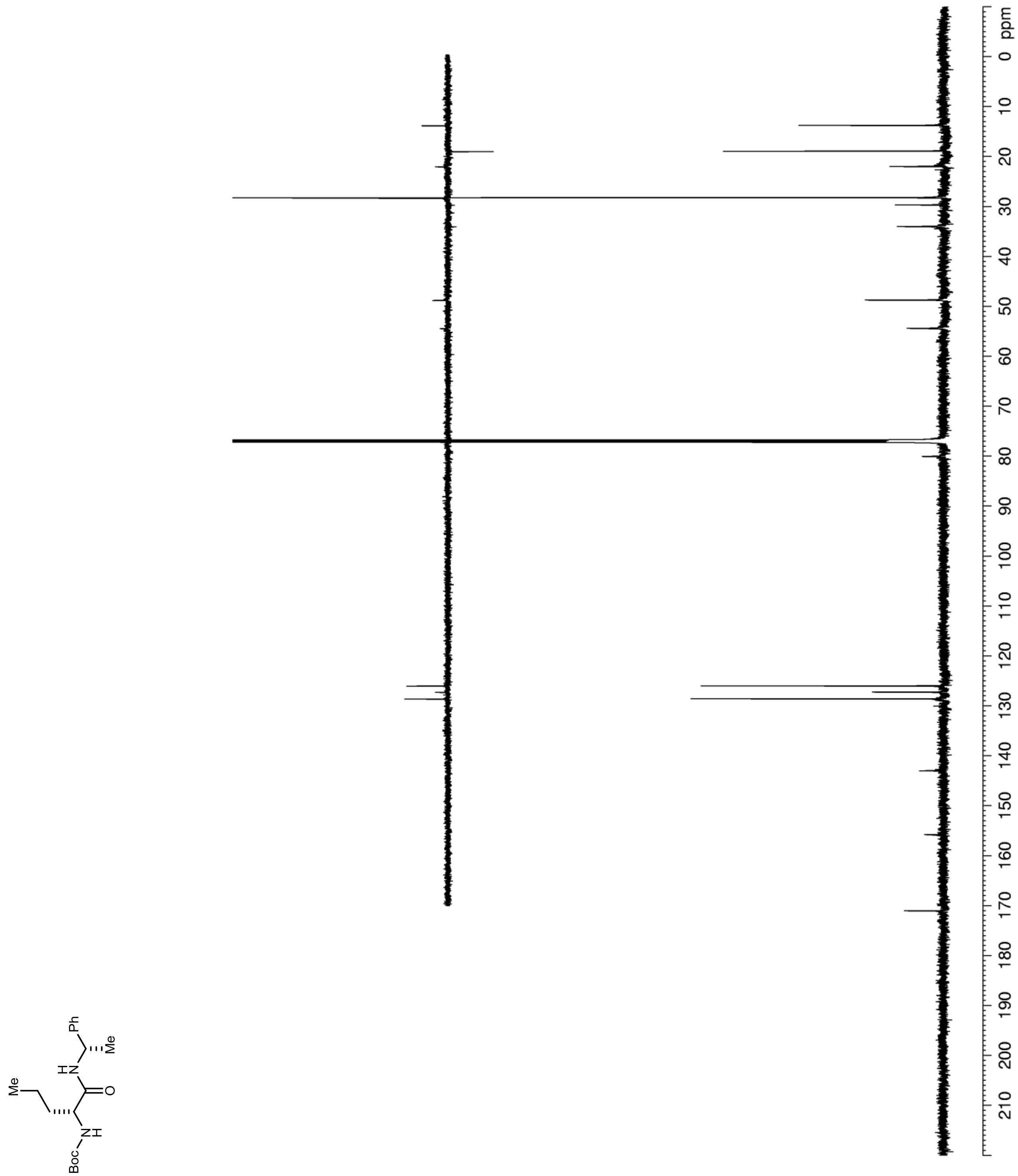


Figure 61. ^{1}H NMR (600 MHz, $CDCl_3$) of **29.**

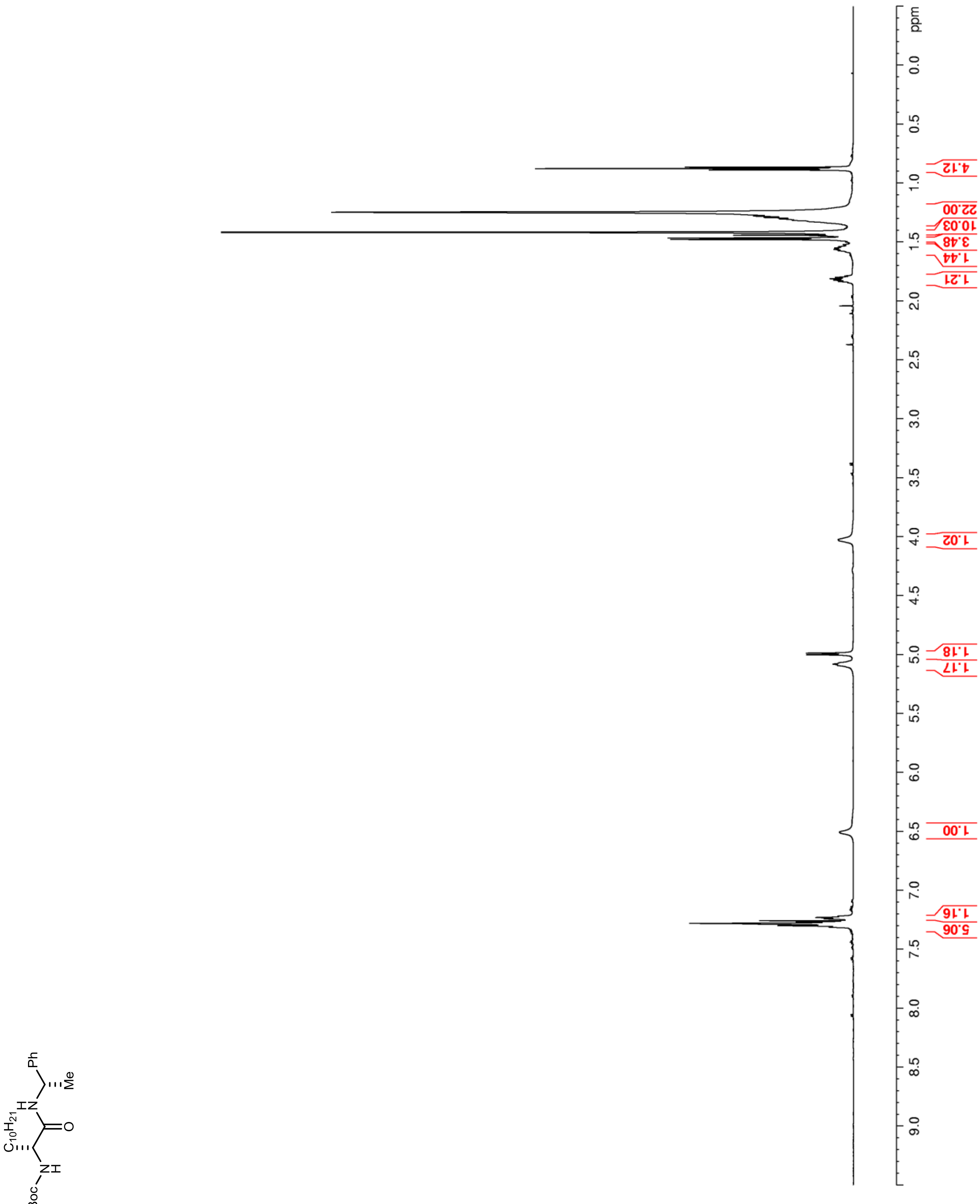


Figure 62. ^{13}C NMR (150 MHz, $CDCl_3$) of **29.**

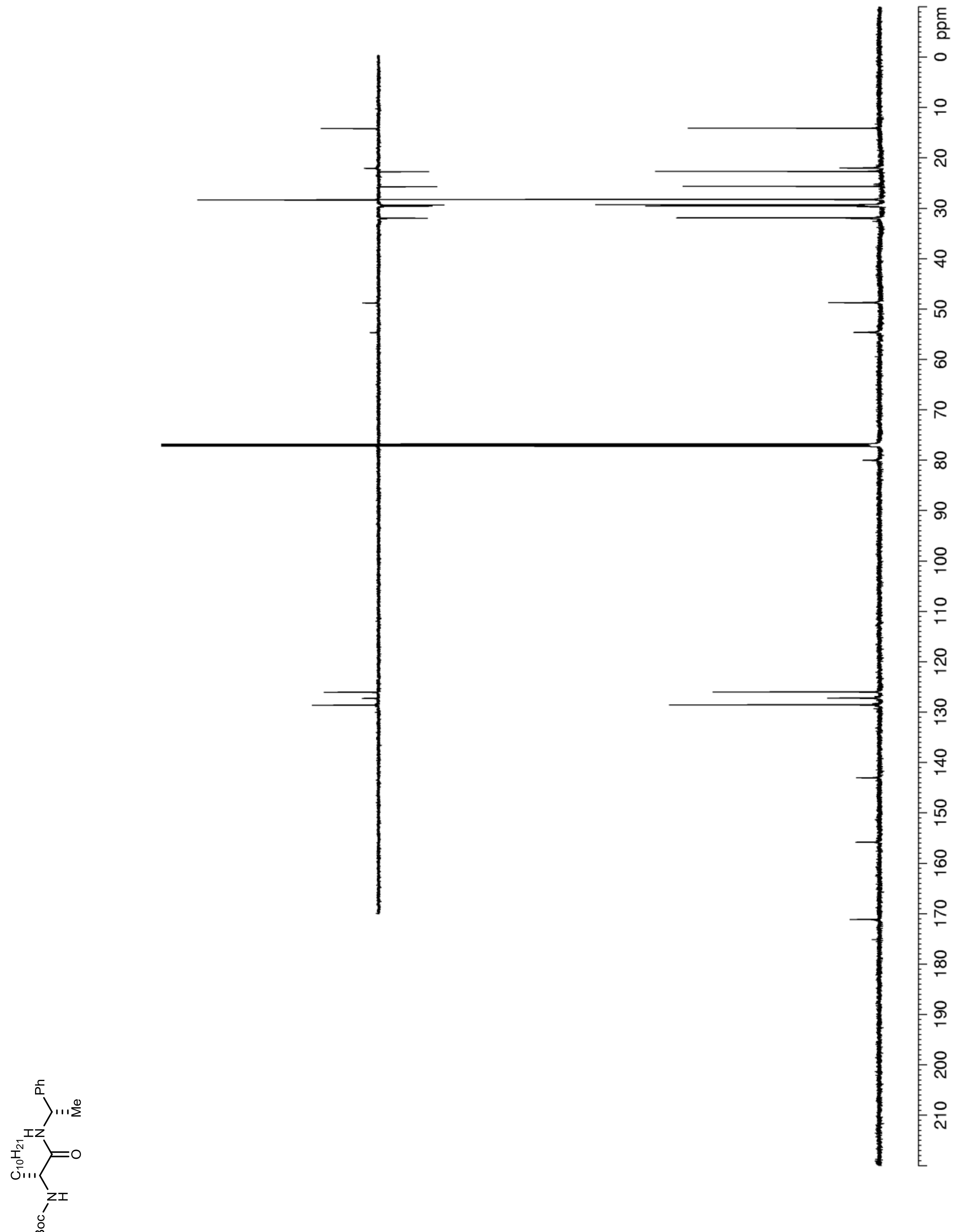
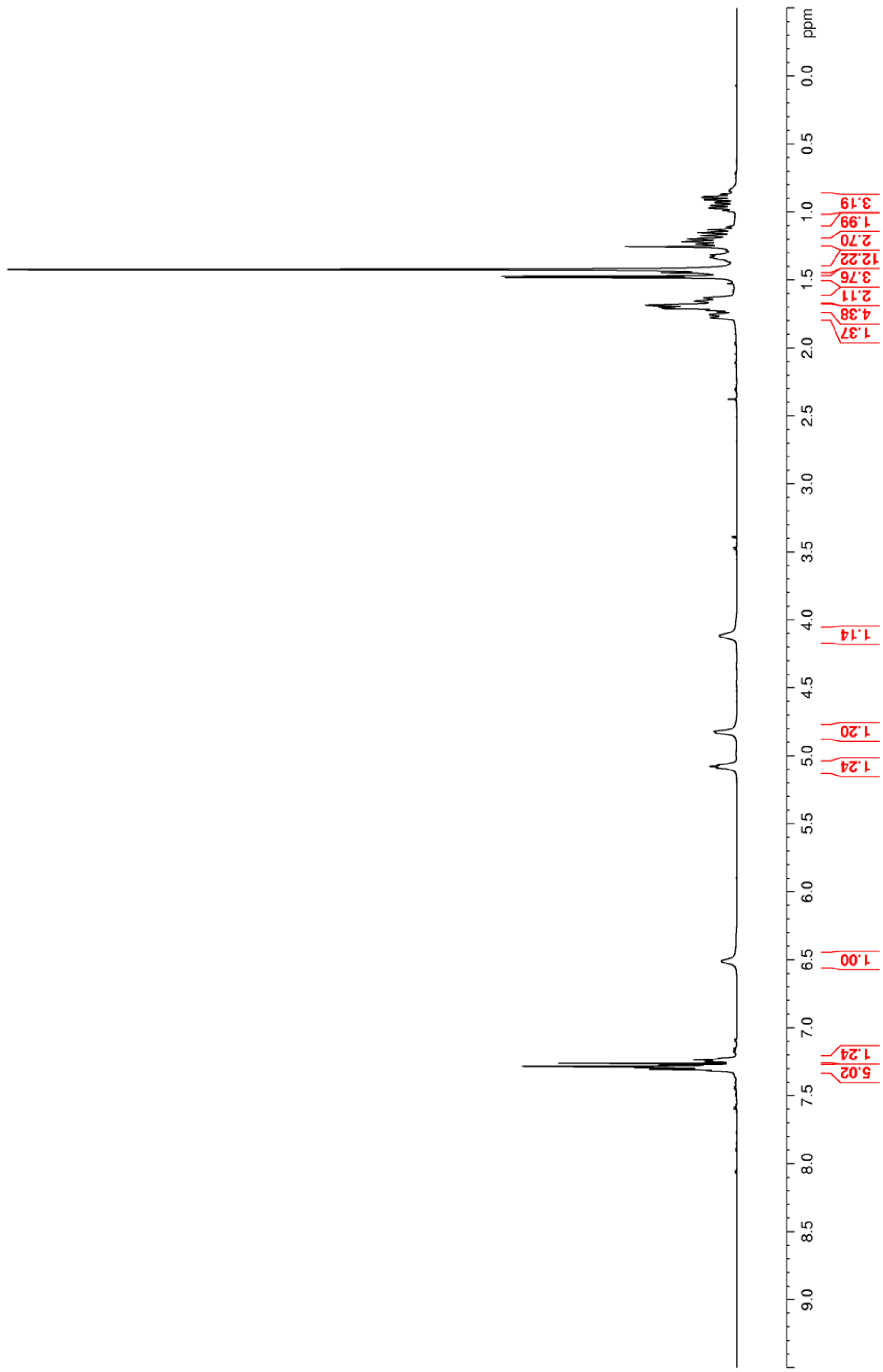


Figure 63. ^{1}H NMR (600 MHz, $CDCl_3$) of **30.**



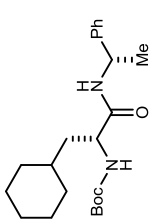
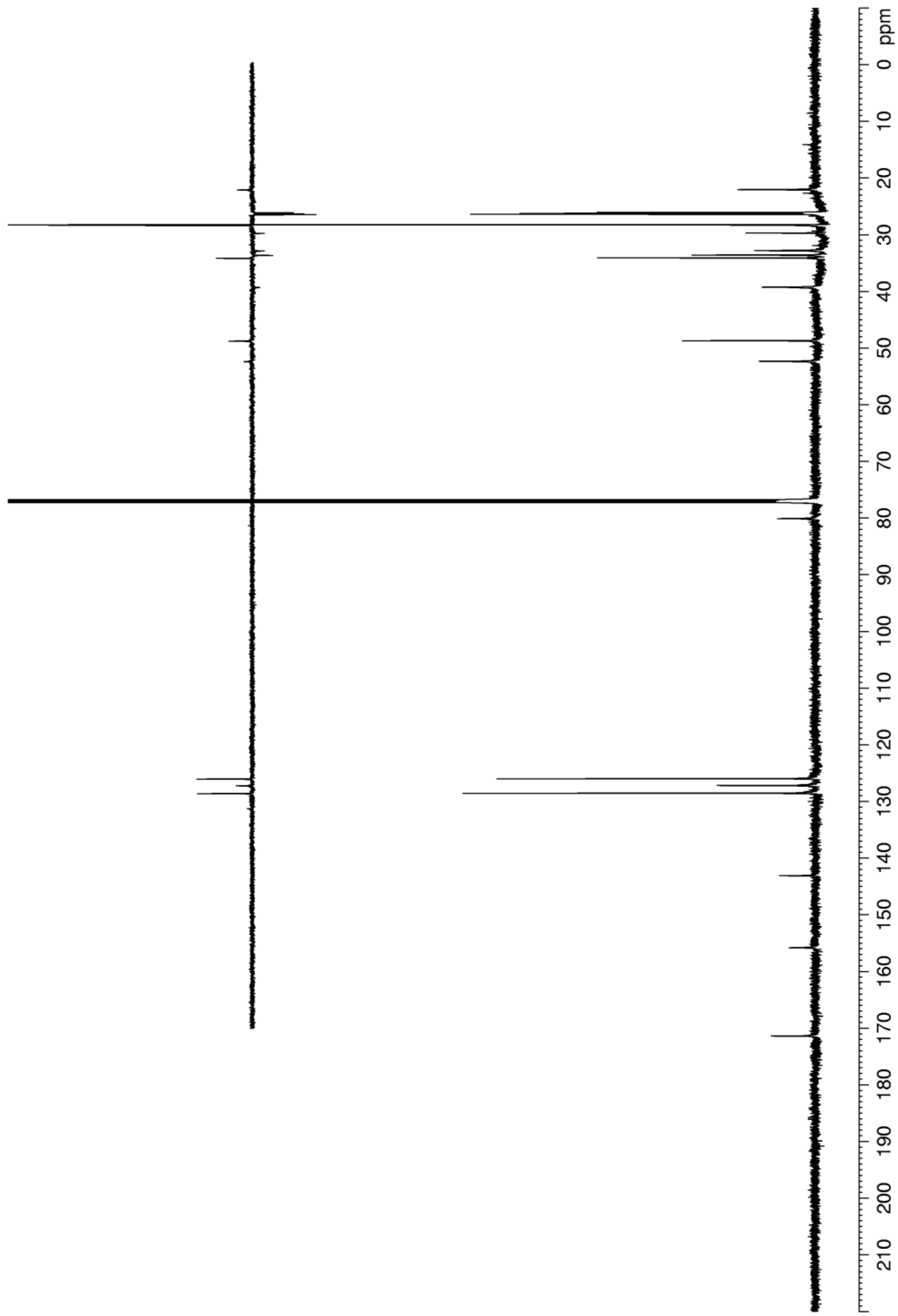


Figure 64. ^{13}C NMR (150 MHz, $CDCl_3$) of **30.**



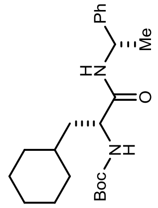


Figure 65. ^{1}H NMR (600 MHz, $CDCl_3$) of **31.**

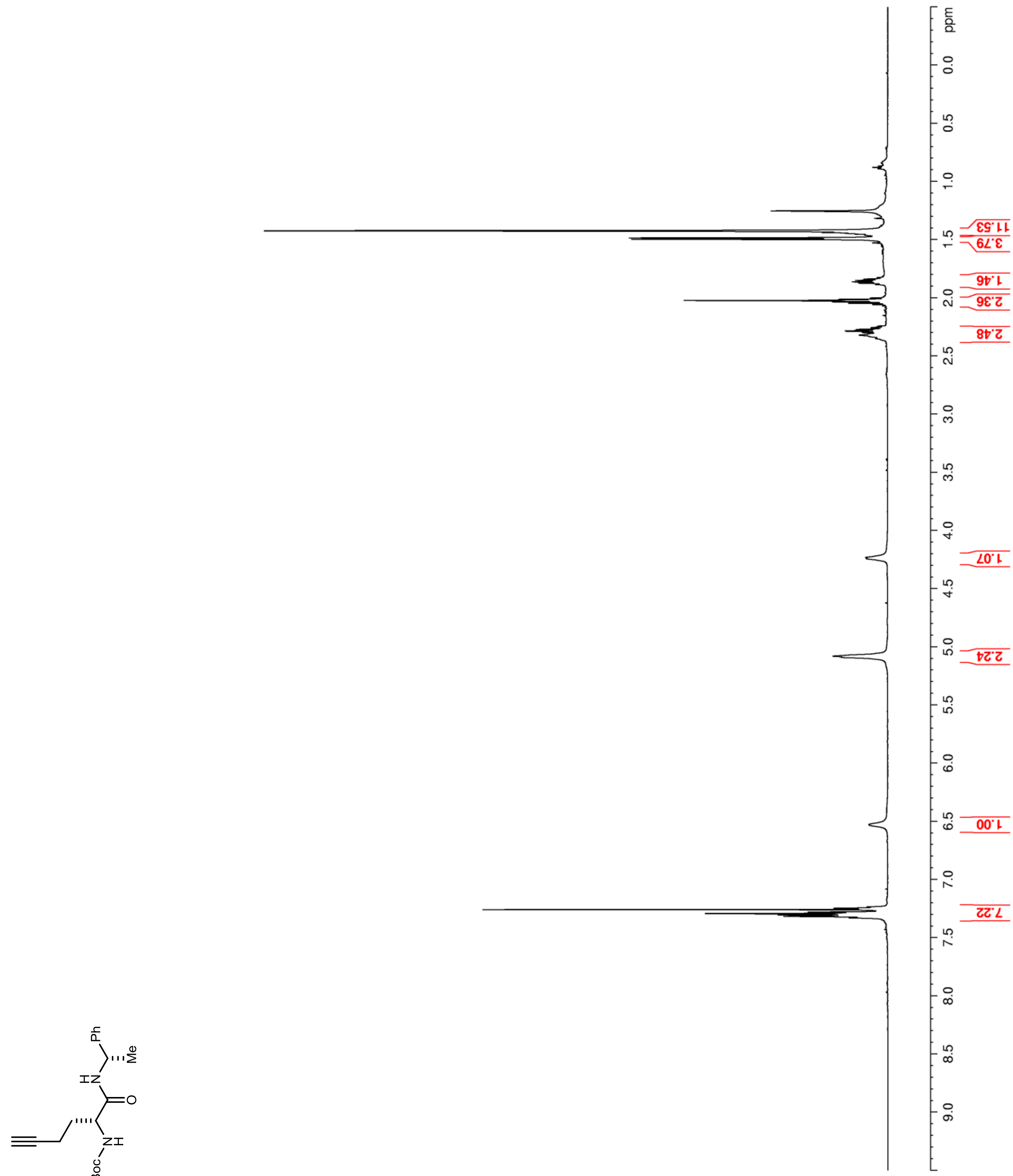


Figure 66. ^{13}C NMR (150 MHz, $CDCl_3$) of **31.**

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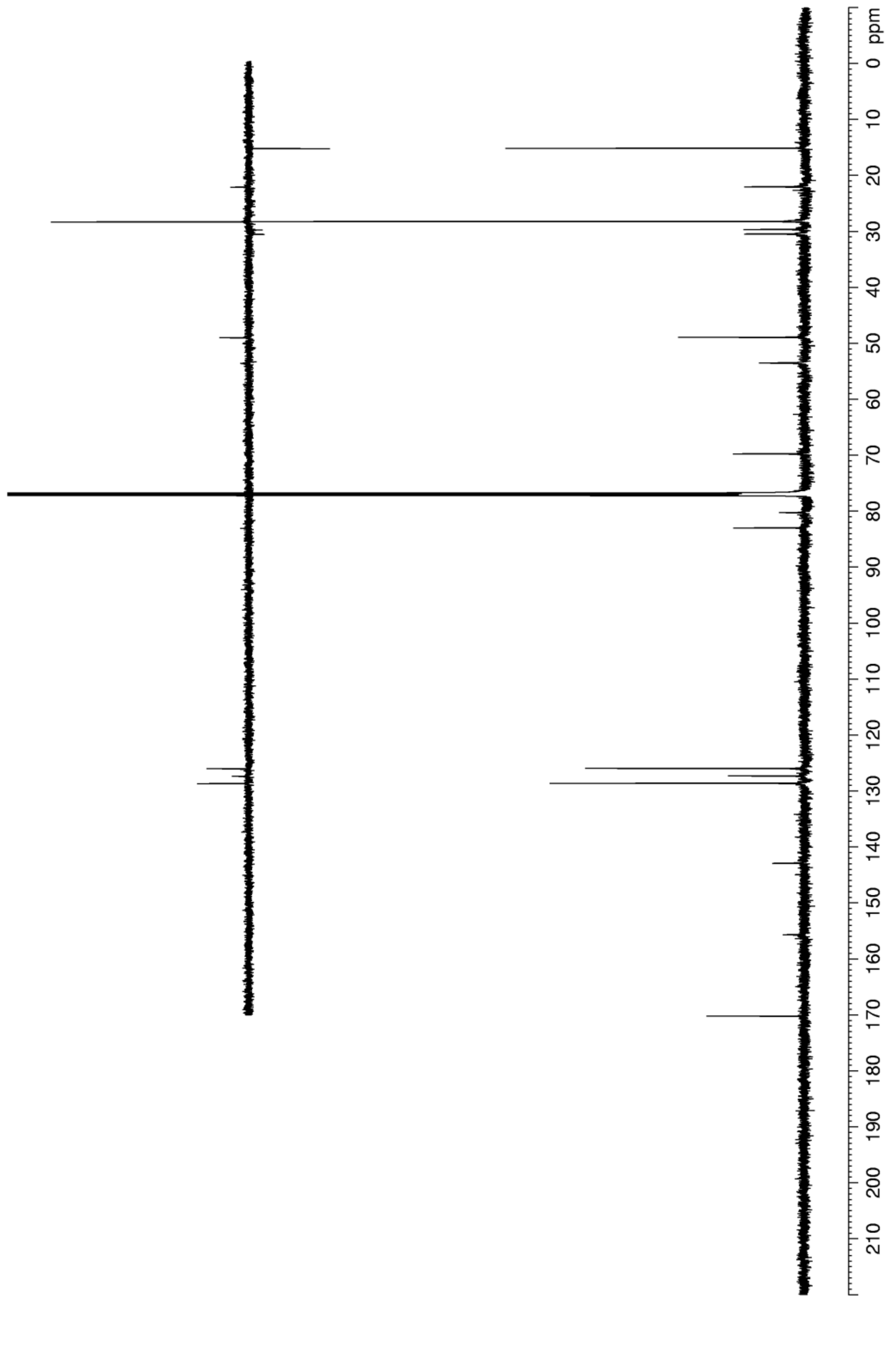


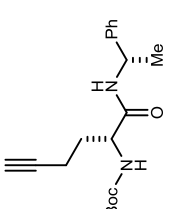


Figure 67. ^{1}H NMR (600 MHz, $CDCl_3$) of **32.**

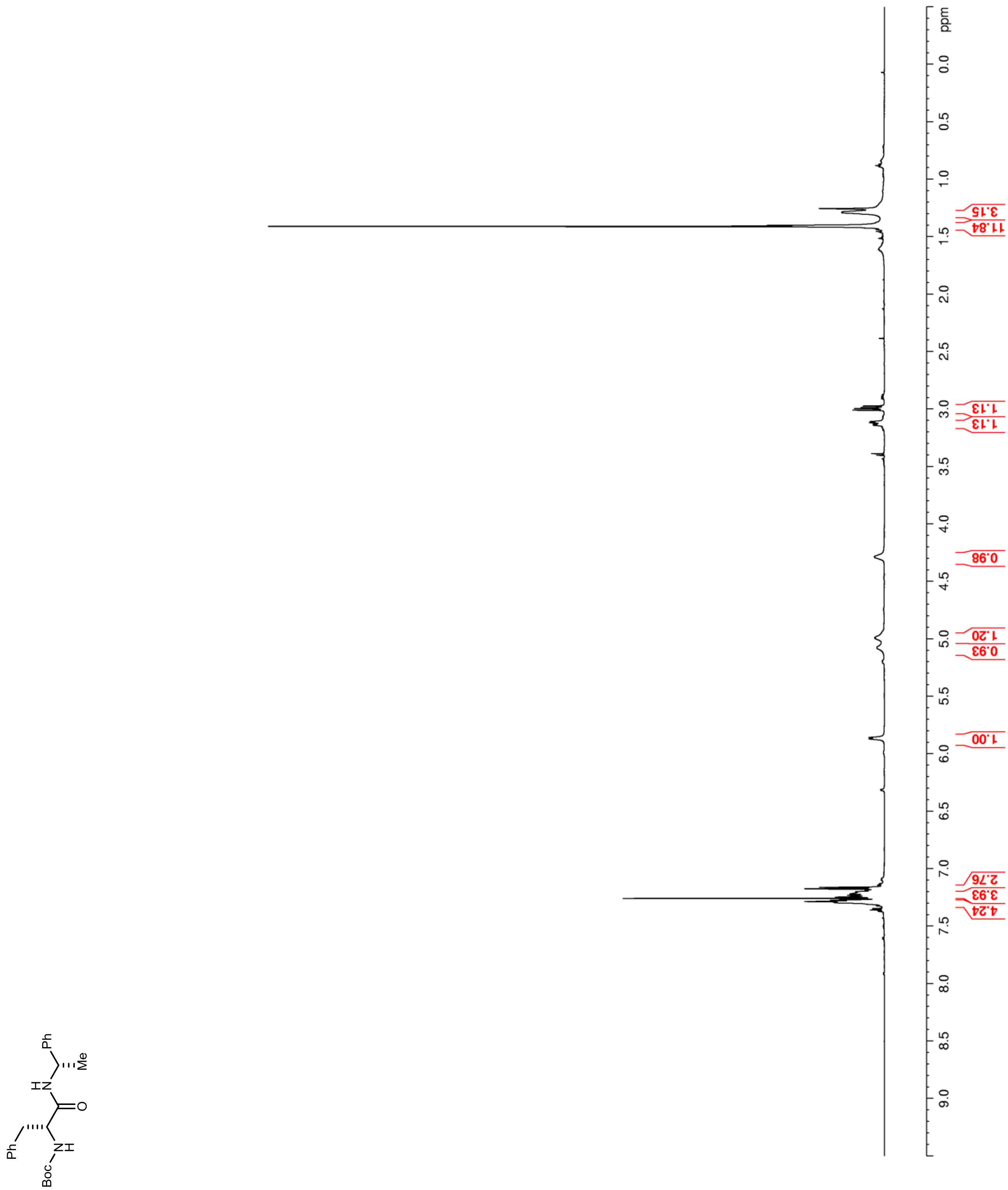


Figure 68. ^{13}C NMR (150 MHz, $CDCl_3$) of **32.**

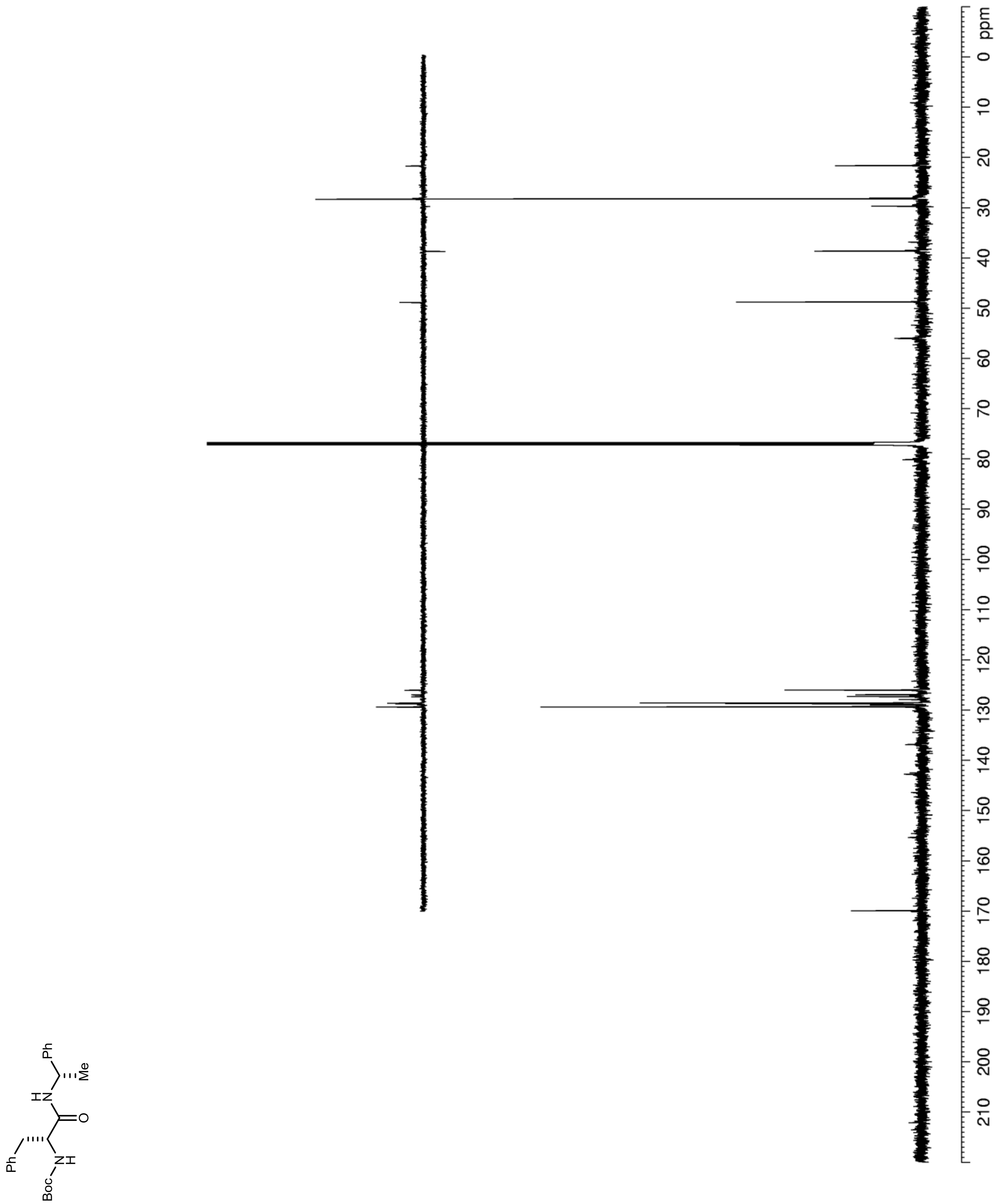
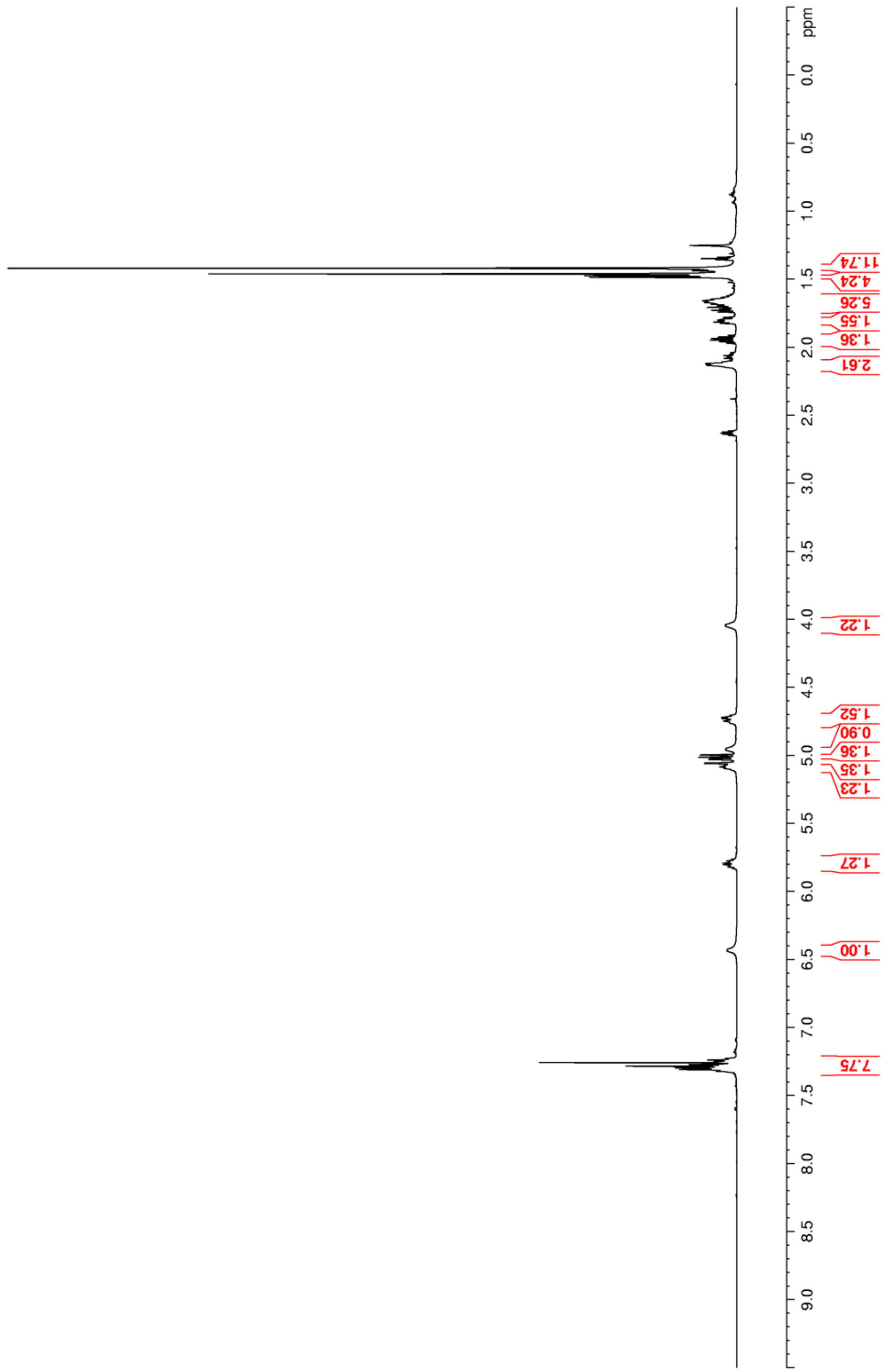


Figure 69. ^{1}H NMR (600 MHz, $CDCl_3$) of **33.**



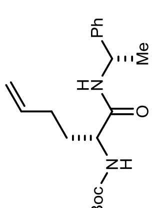


Figure 70. ^{13}C NMR (150 MHz, $CDCl_3$) of **33.**

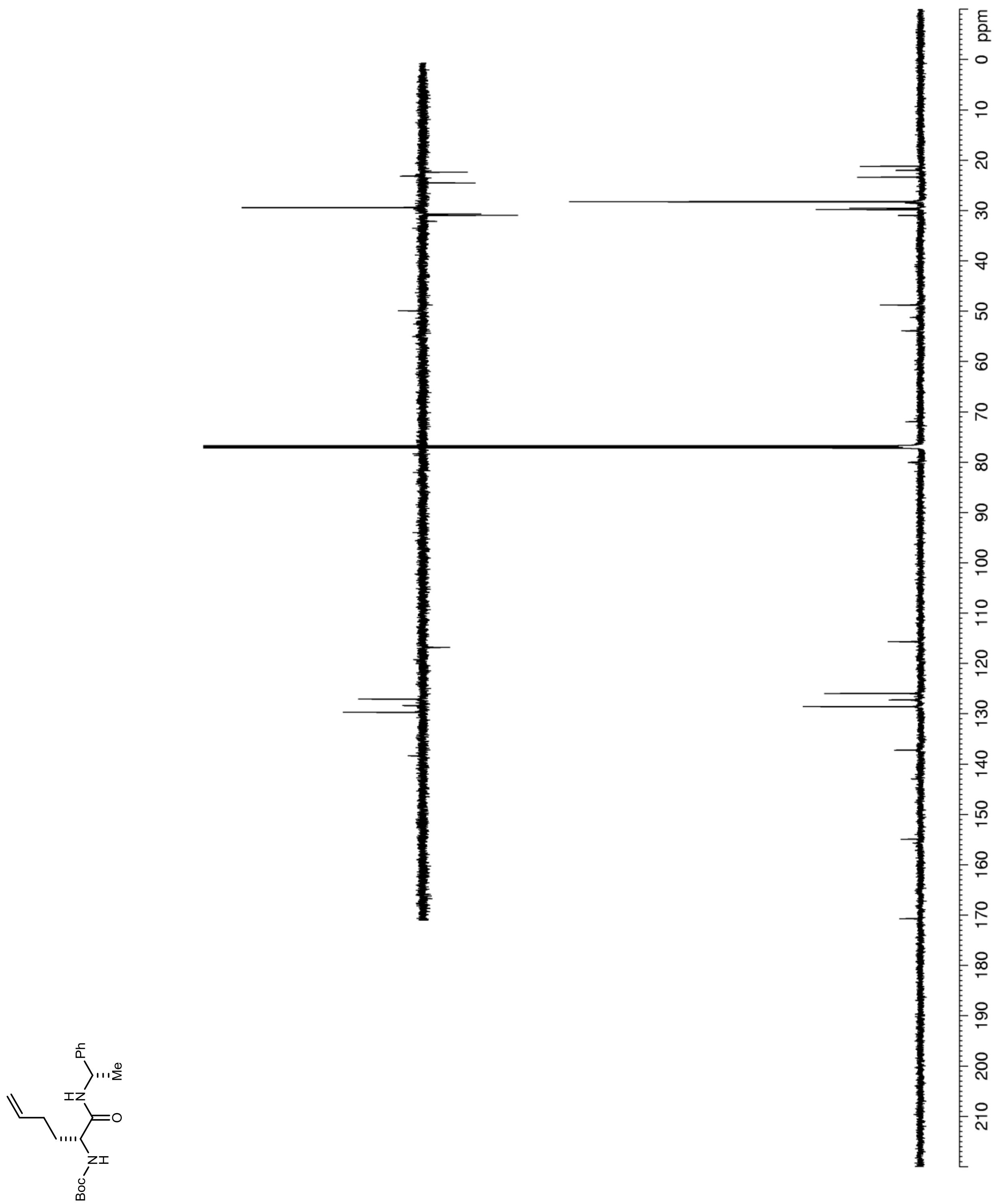


Figure 71. ^{1}H NMR (600 MHz, $CDCl_3$) of **34**

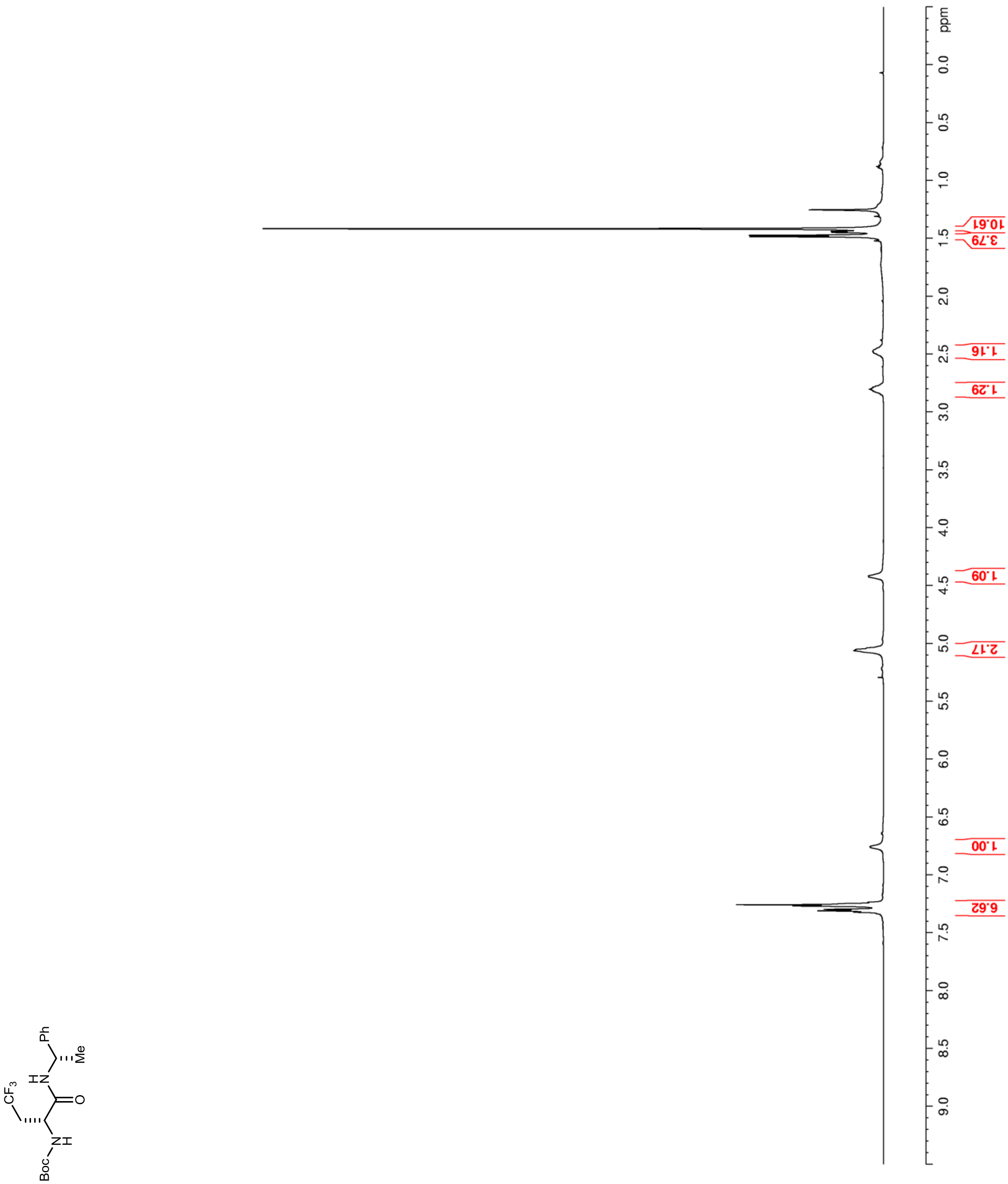


Figure 72. ^{13}C NMR (150 MHz, $CDCl_3$) of **34**

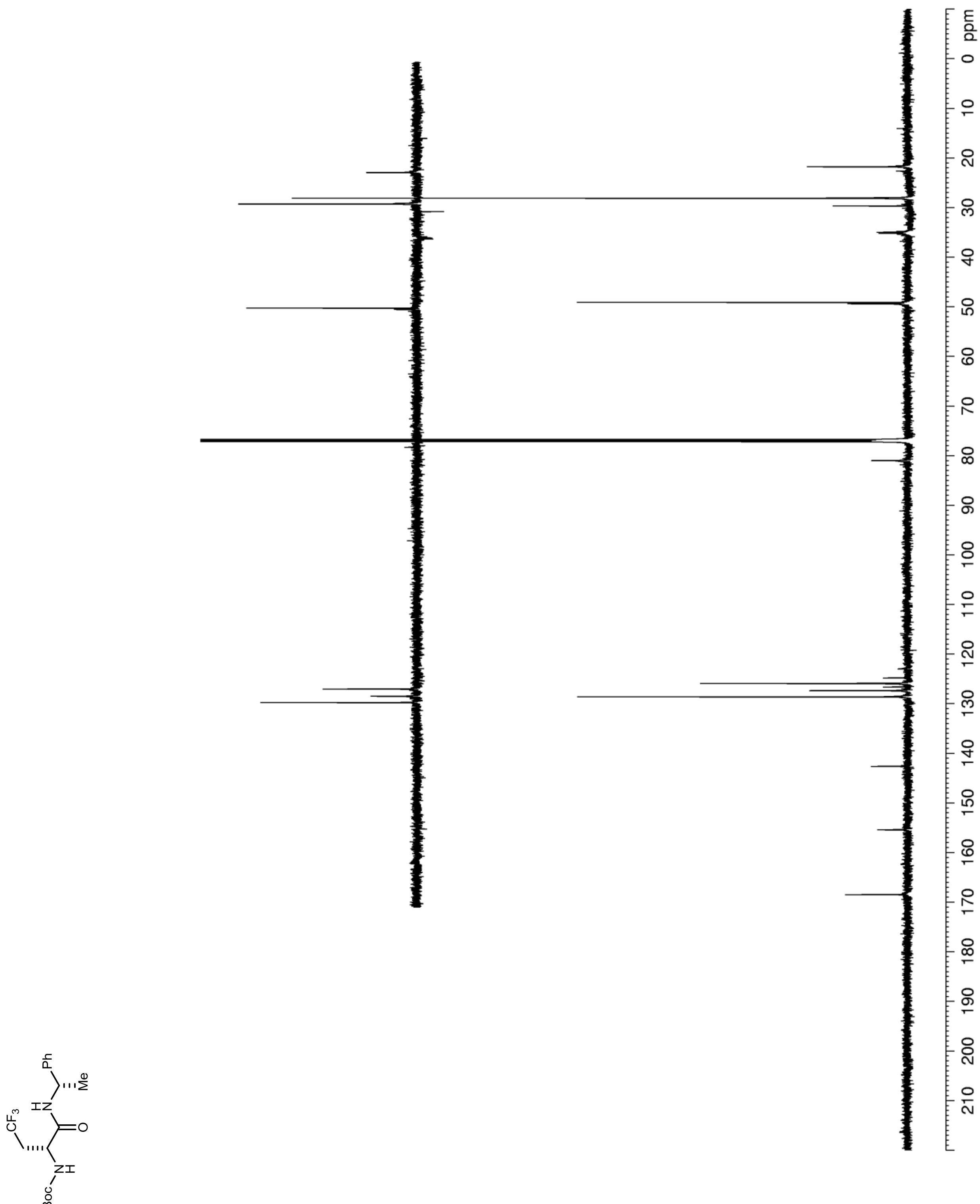


Figure 73. [1]H NMR (600 MHz, $CDCl_3$) of **35.**

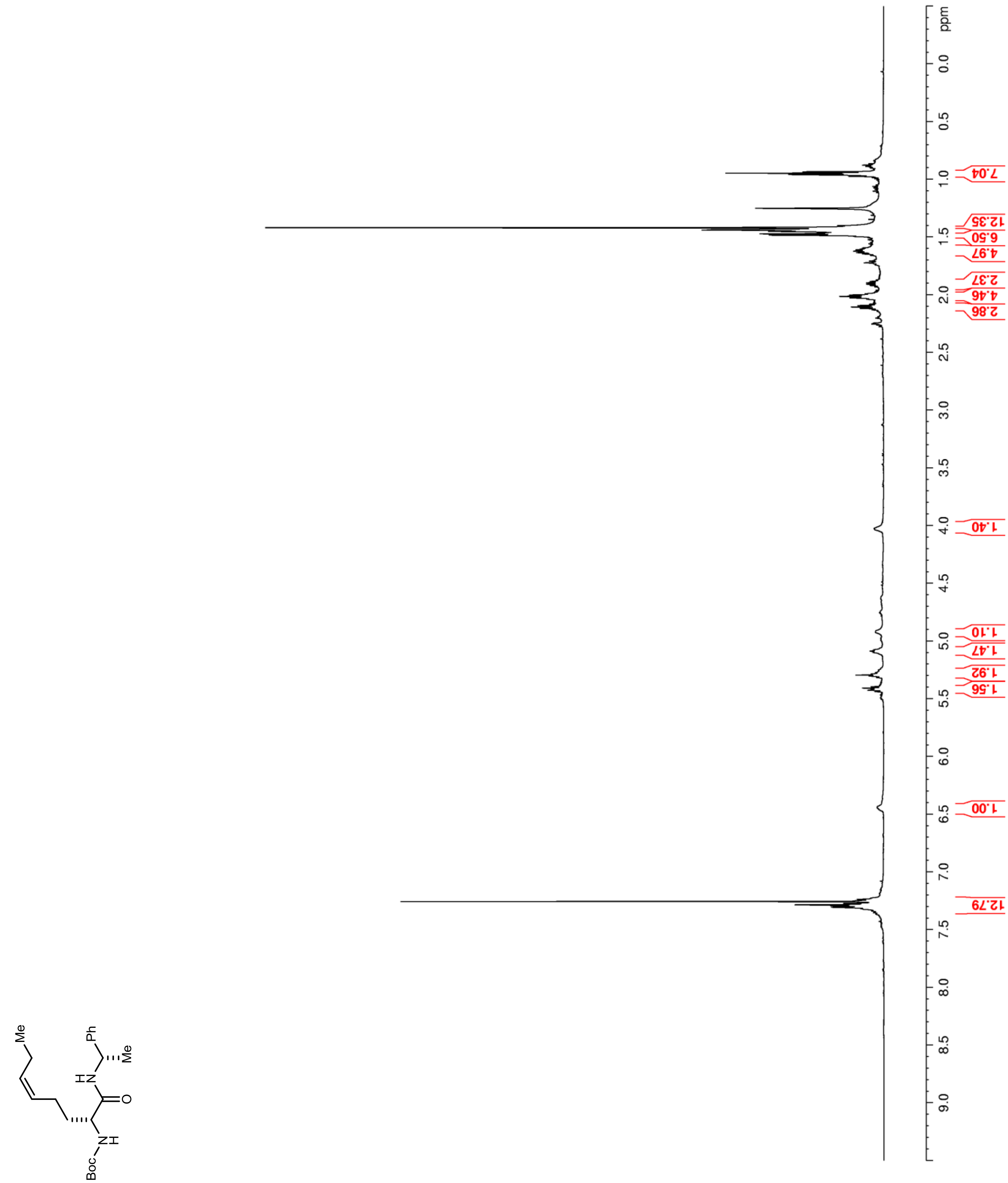
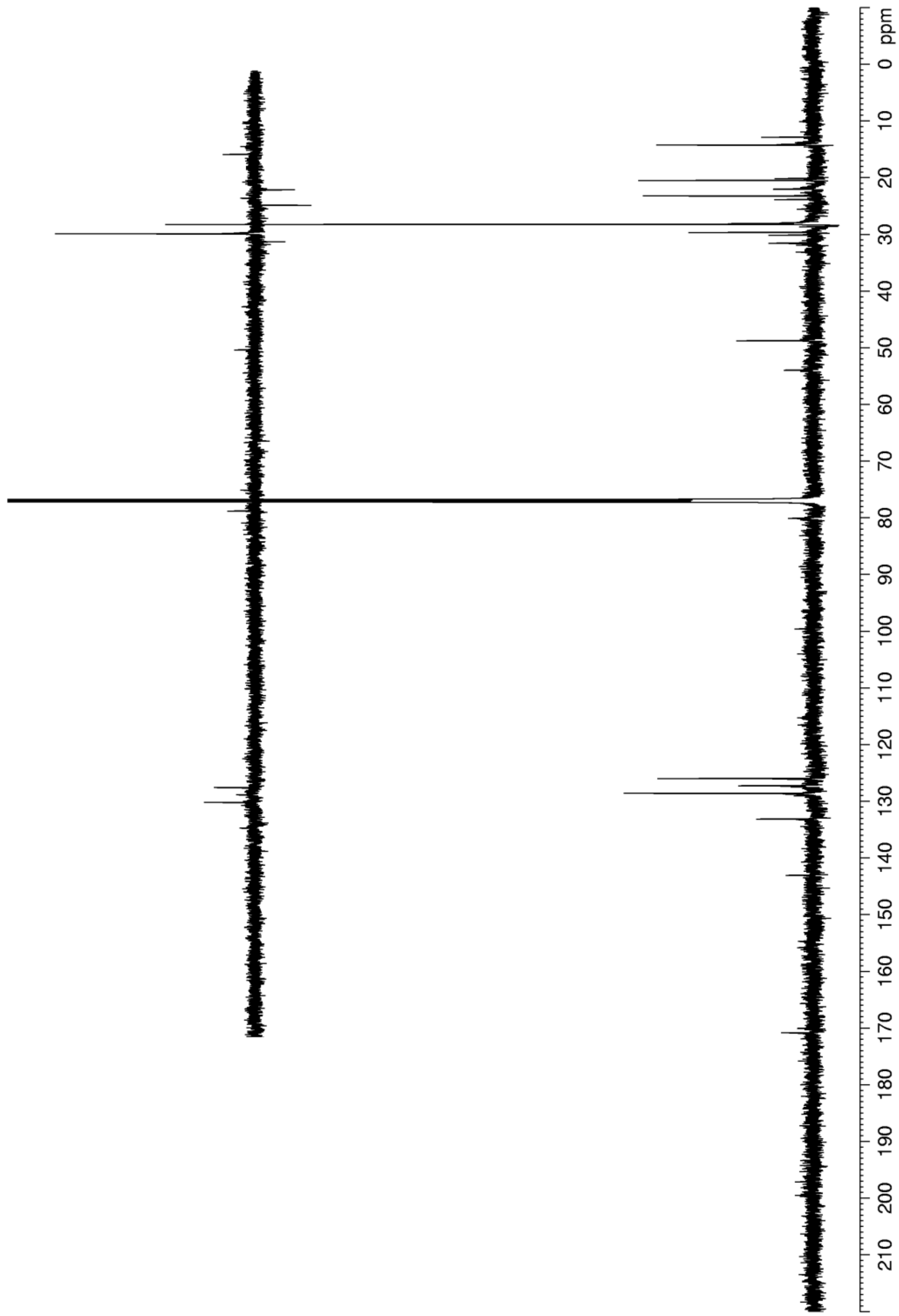


Figure 74. ^{13}C NMR (150 MHz, $CDCl_3$) of **35.**



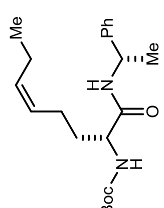


Figure 75. ^{1}H NMR (600 MHz, $CDCl_3$) of **36.**

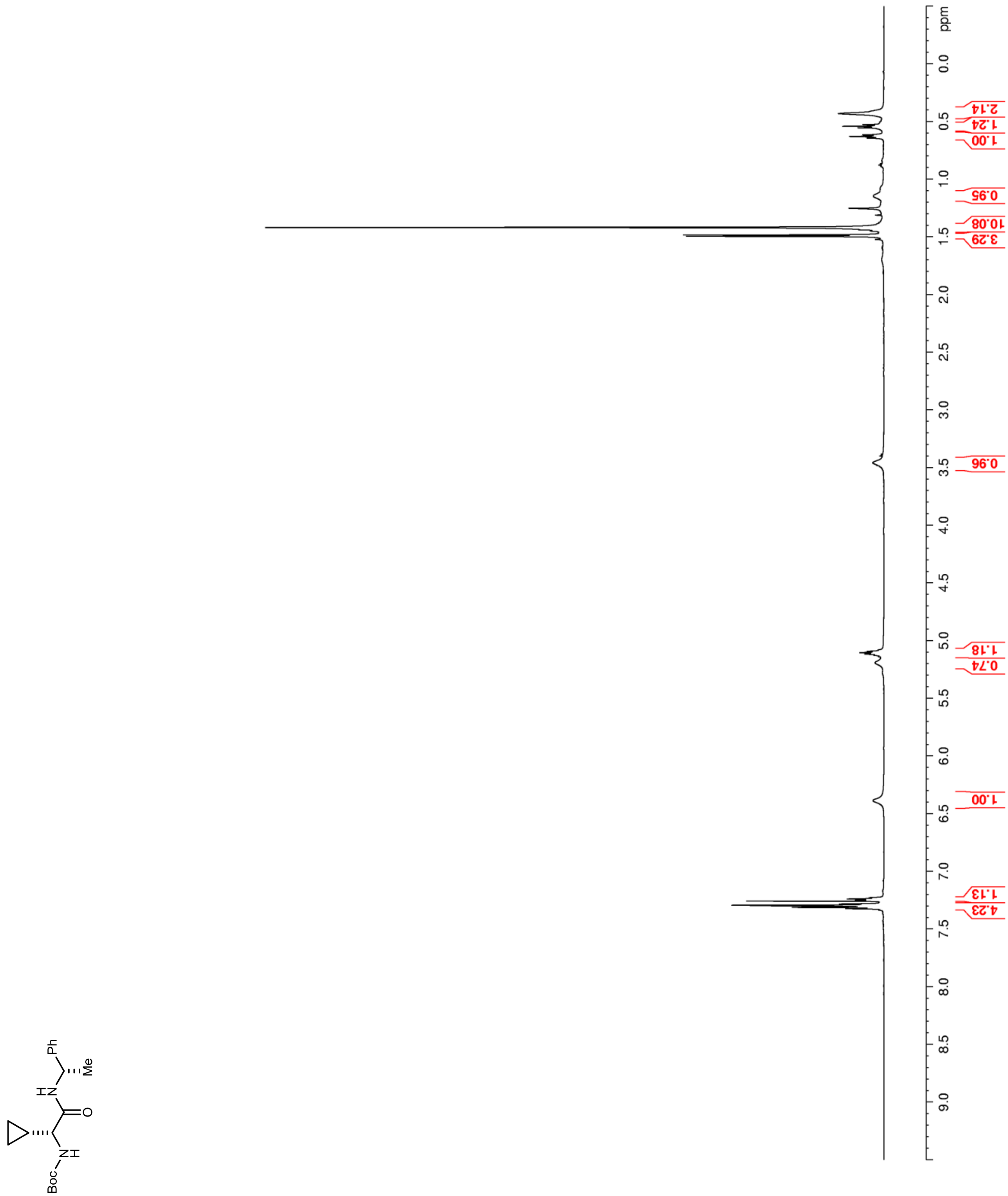


Figure 76. ^{13}C NMR (150 MHz, $CDCl_3$) of **36.**

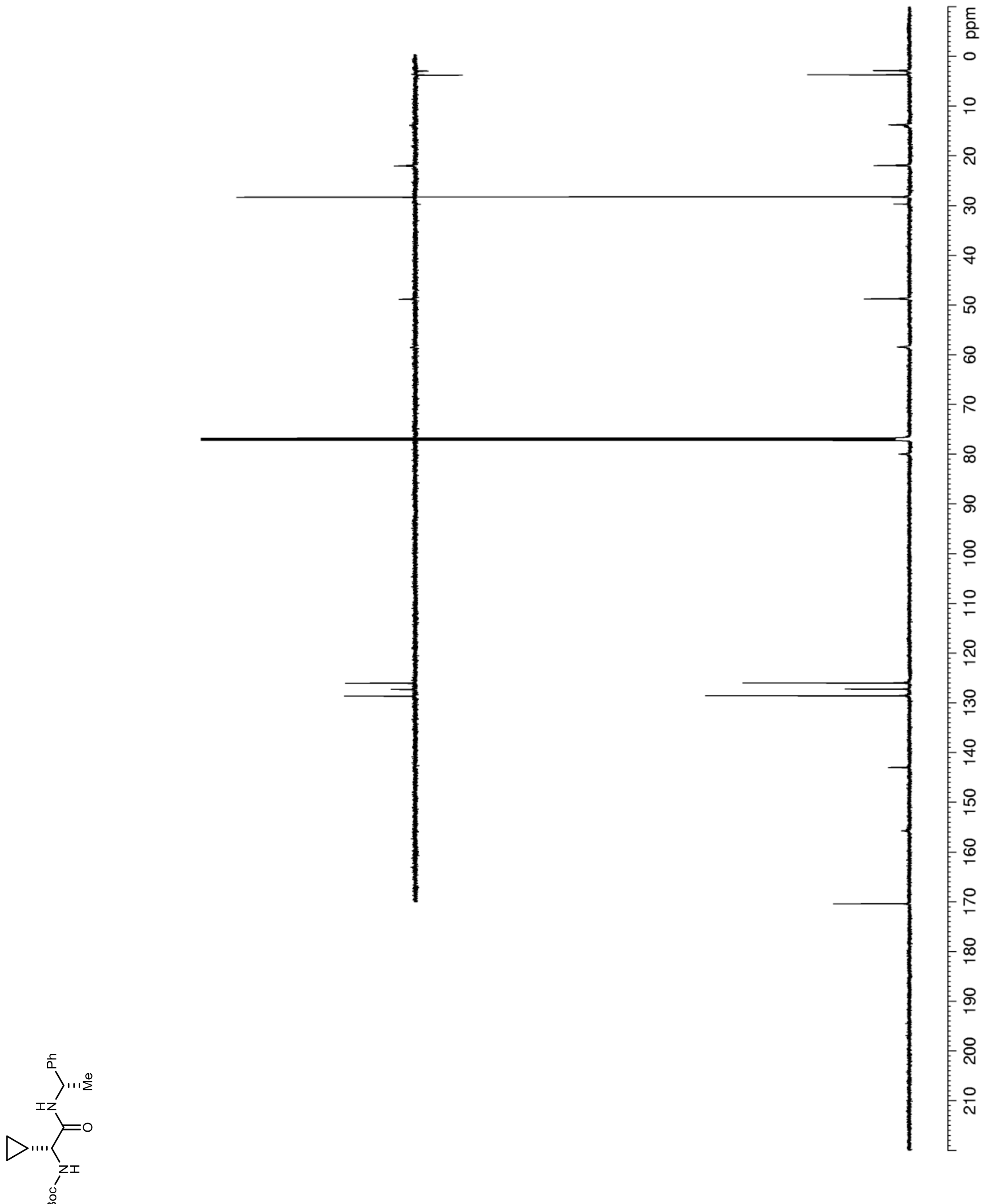


Figure 77. ^{1}H NMR (600 MHz, $CDCl_3$) of **37.**

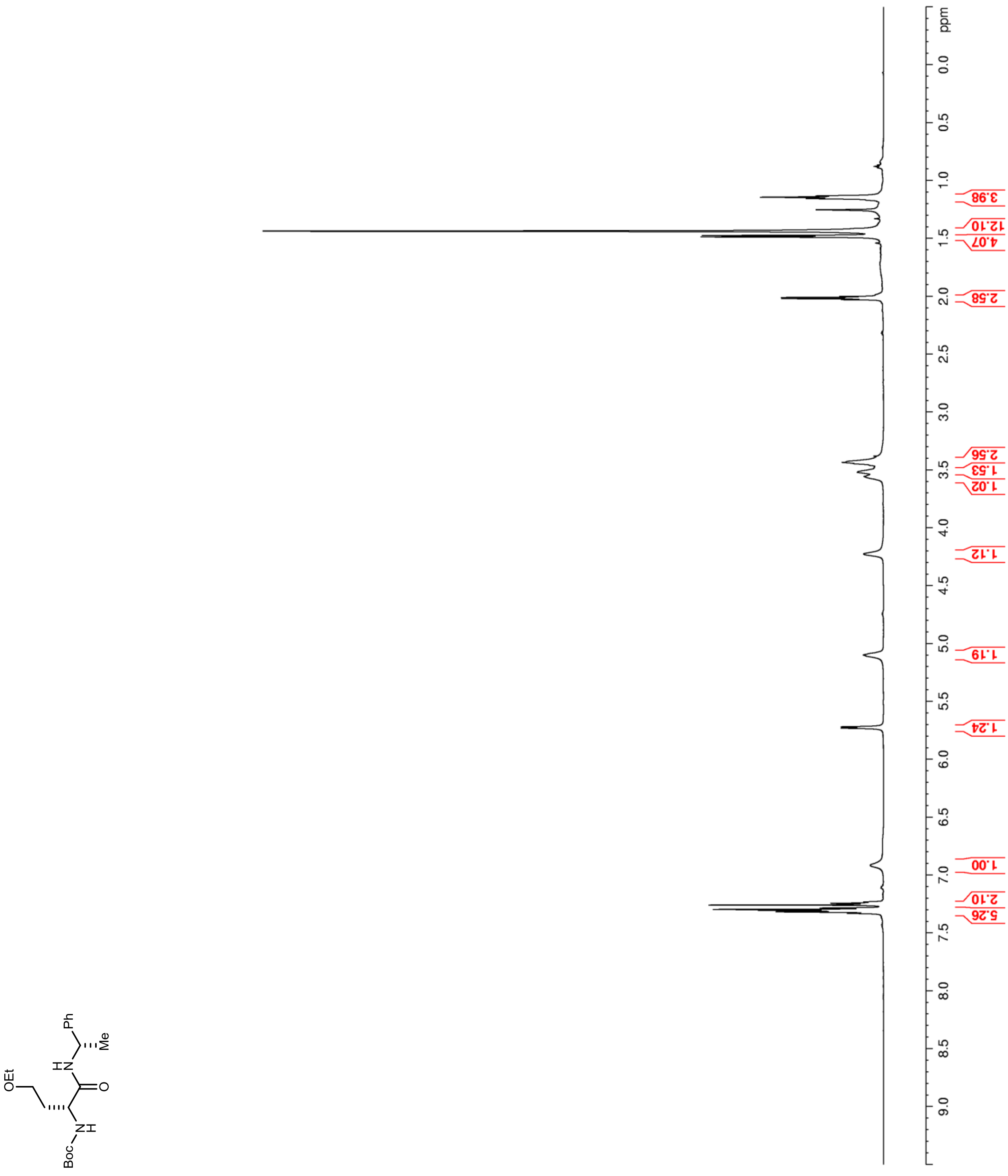


Figure 78. ^{13}C NMR (150 MHz, $CDCl_3$) of **37.**

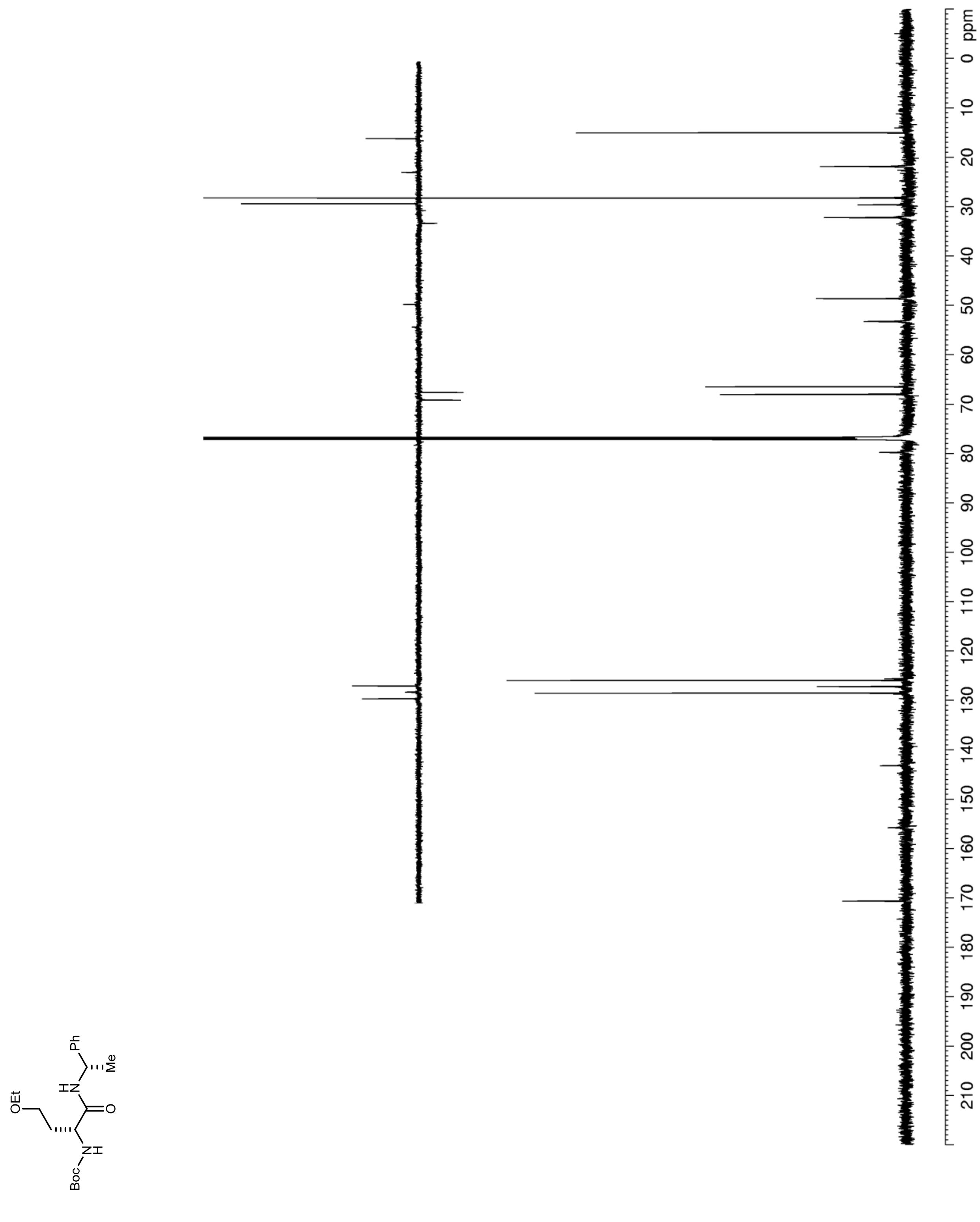
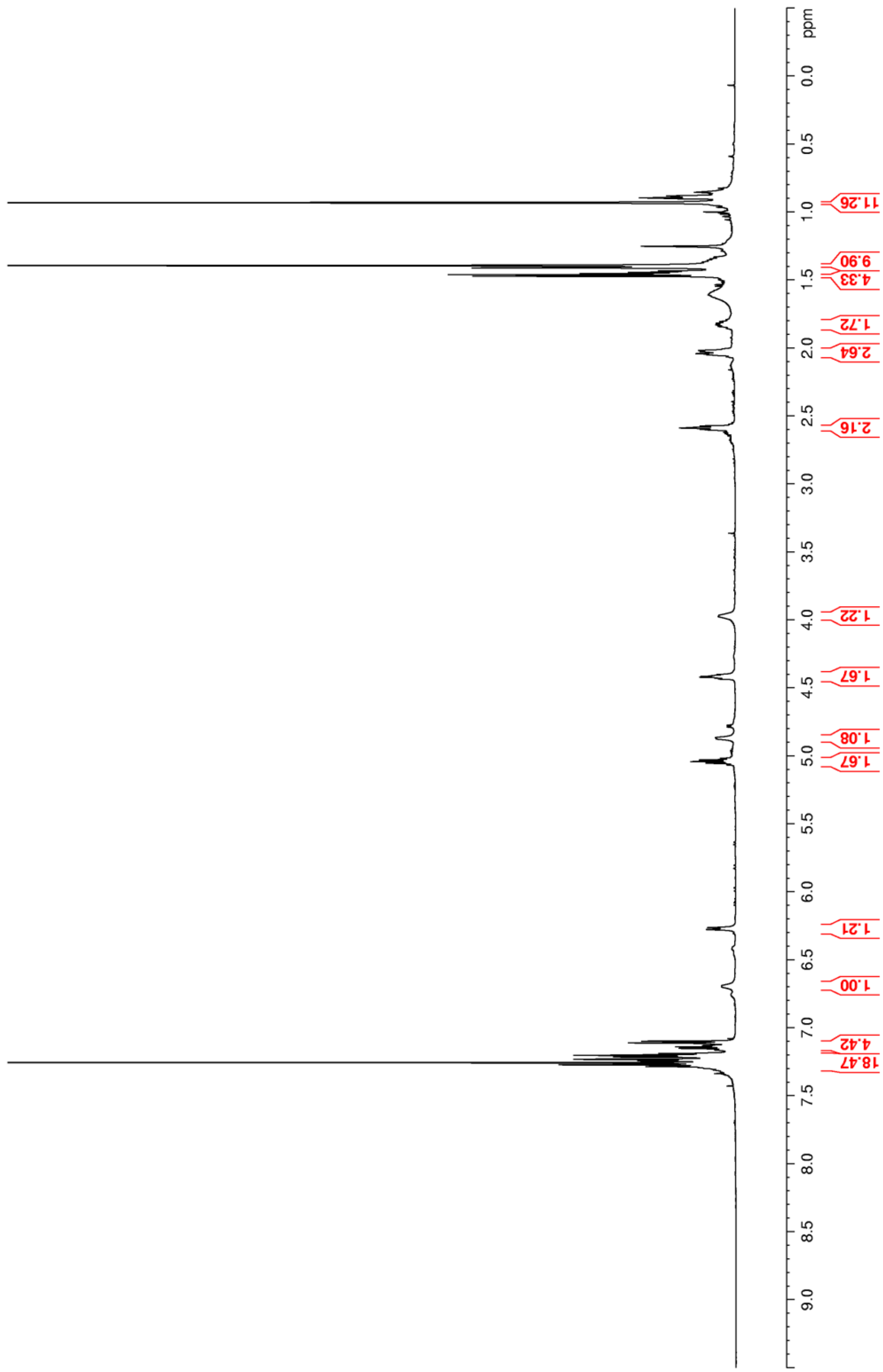


Figure 79. [1]H NMR (600 MHz, $CDCl_3$) of **44.**



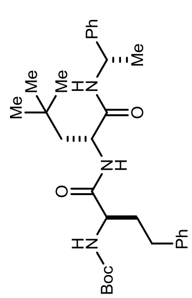


Figure 80. ^{13}C NMR (150 MHz, $CDCl_3$) of **44.**

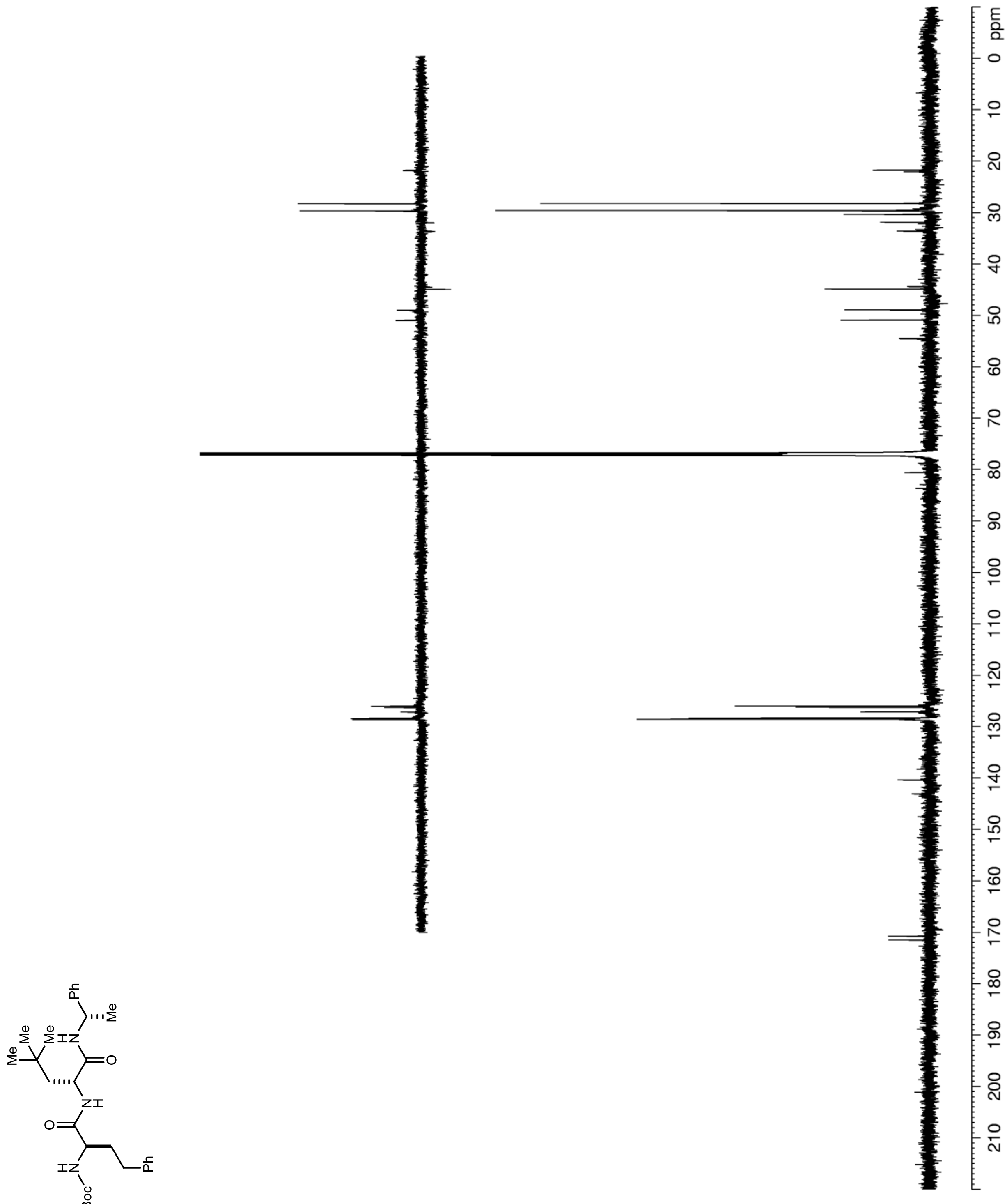
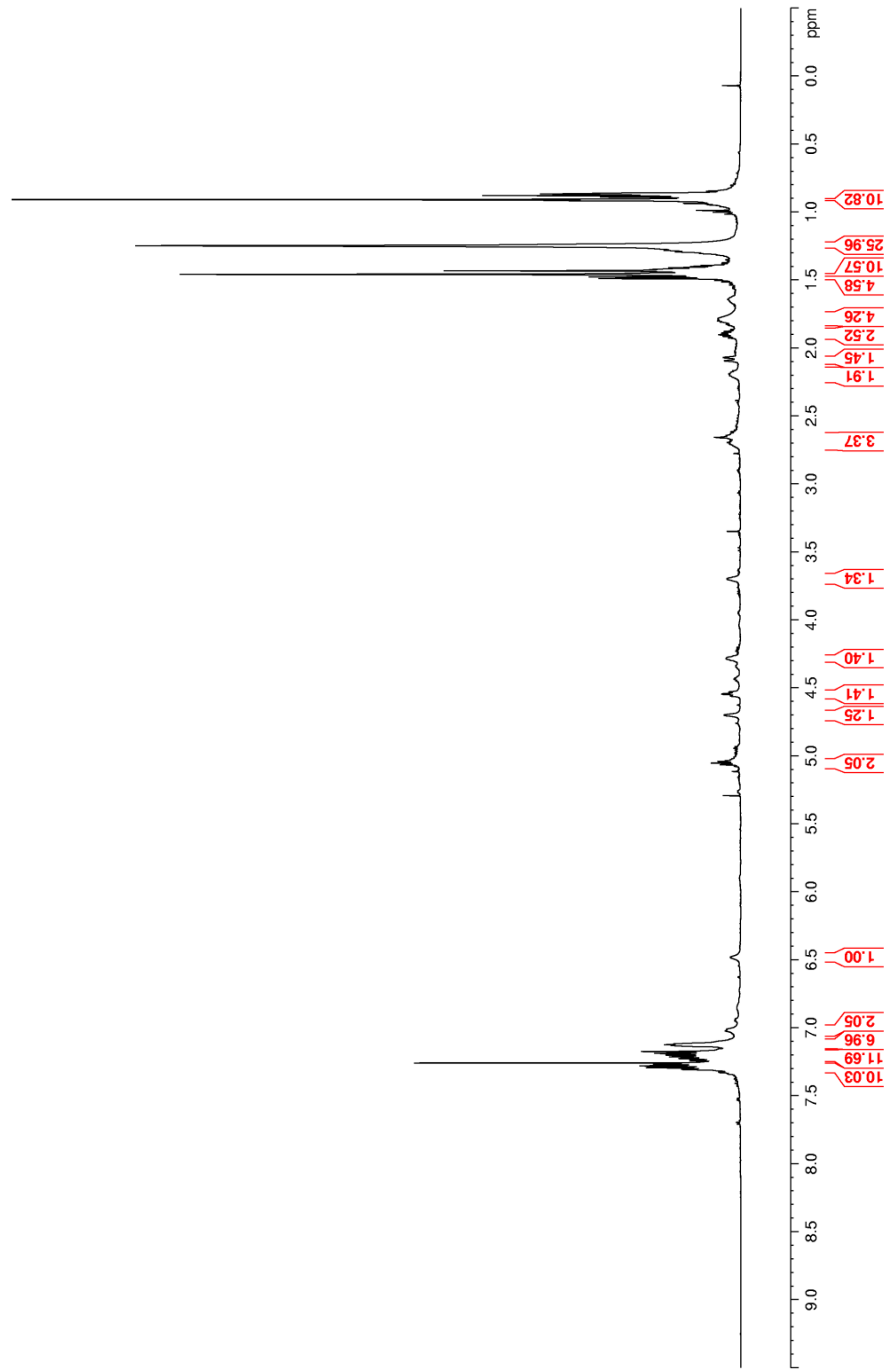


Figure 81. ^{1}H NMR (600 MHz, $CDCl_3$) of **46.**



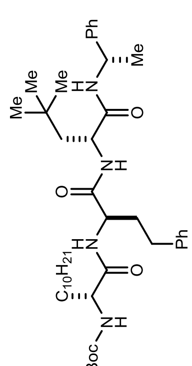


Figure 82. ^{13}C NMR (150 MHz, $CDCl_3$) of **46.**

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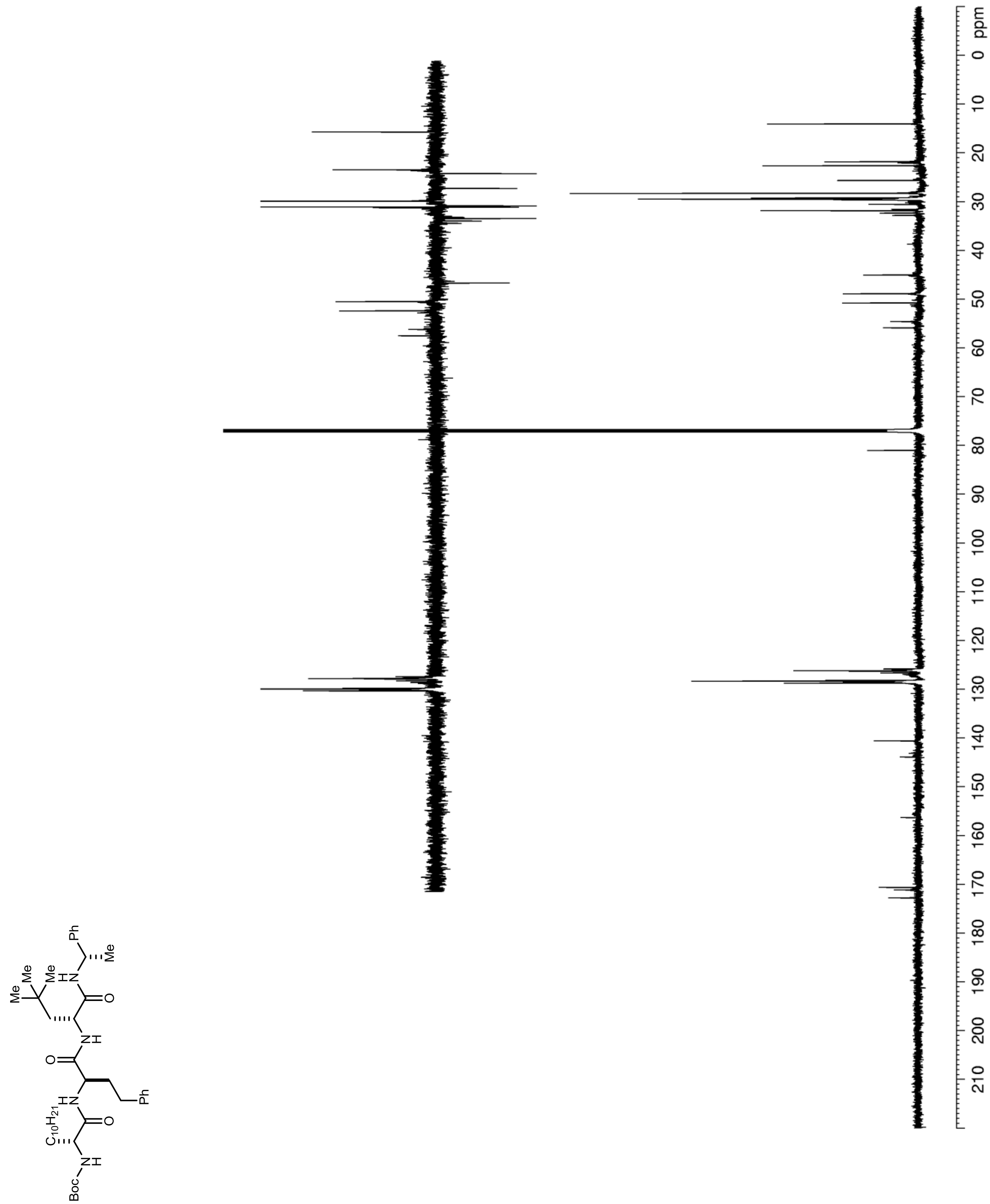
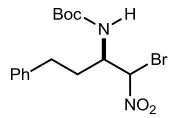
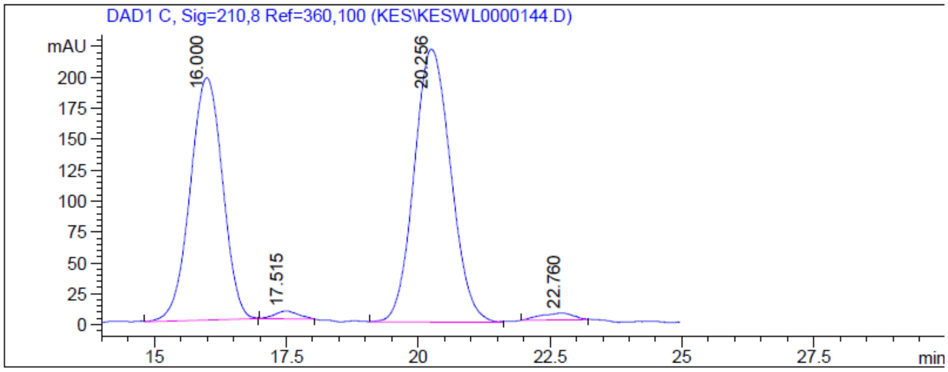


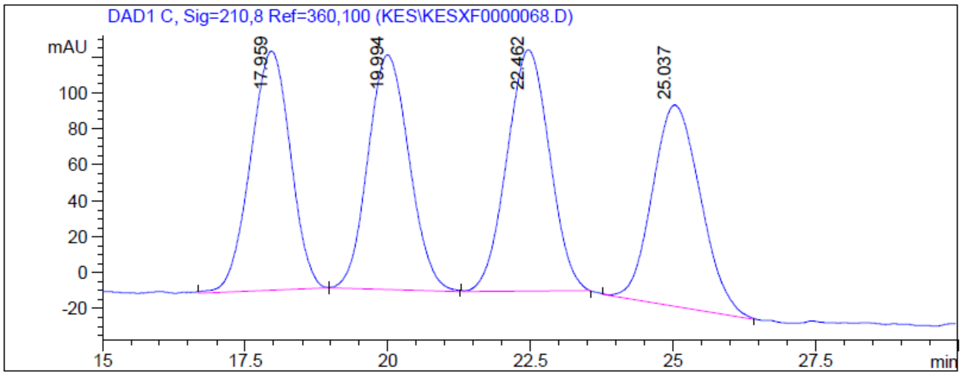
Figure 83. HPLC trace of **4**.





Signal 1: DAD1 C, Sig=210,8 Ref=360,100

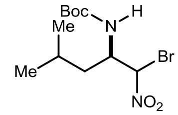
Peak #	RT [min]	Width [min]	Area	Area %
1	16.000	0.713	8378.103	43.04
2	17.515	0.504	188.335	0.97
3	20.256	0.805	10667.901	54.80
4	22.760	0.732	232.792	1.20

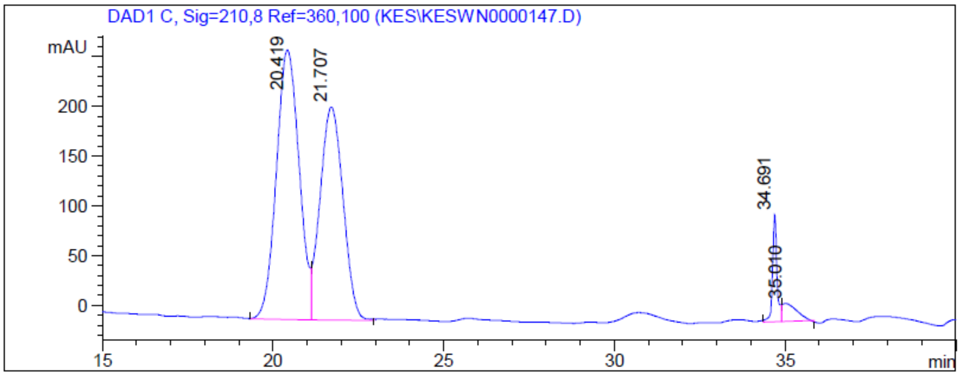


Signal 1: DAD1 C, Sig=210,8 Ref=360,100

Peak #	RT [min]	Width [min]	Area	Area %
1	17.959	0.814	6502.464	24.39
2	19.994	0.841	6582.387	24.69
3	22.462	0.868	6996.328	26.24
4	25.037	0.980	6584.132	24.69

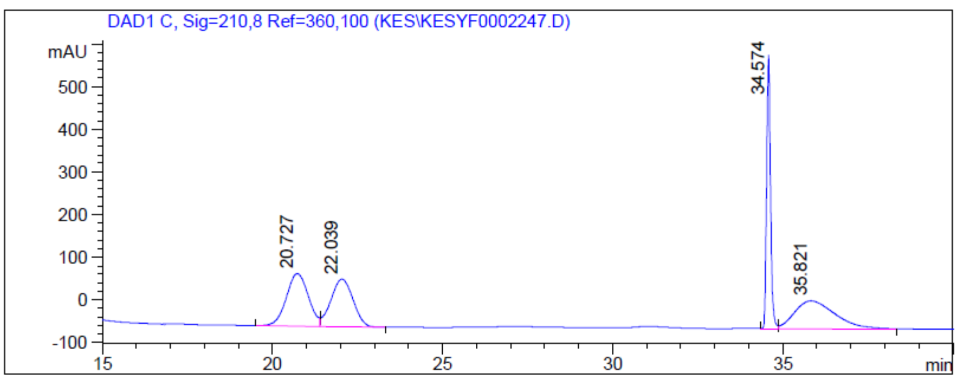
Figure 84. HPLC trace of **7.**





Signal 1: DAD1 C, Sig=210,8 Ref=360,100

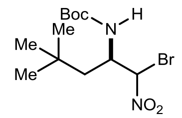
Peak #	RT [min]	Width [min]	Area	Area %
1	20.419	0.776	12605.589	52.26
2	21.707	0.779	10006.817	41.49
3	34.691	0.151	976.129	4.05
4	35.010	0.496	532.862	2.21

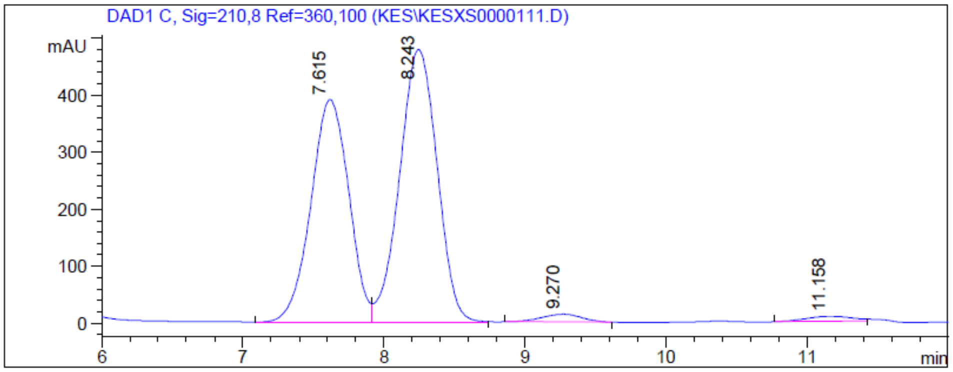


Signal 1: DAD1 C, Sig=210,8 Ref=360,100

Peak #	RT [min]	Width [min]	Area	Area %
1	20.727	0.705	5527.214	26.05
2	22.039	0.708	5041.059	23.76
3	34.574	0.119	5125.187	24.15
4	35.821	1.204	5525.594	26.04

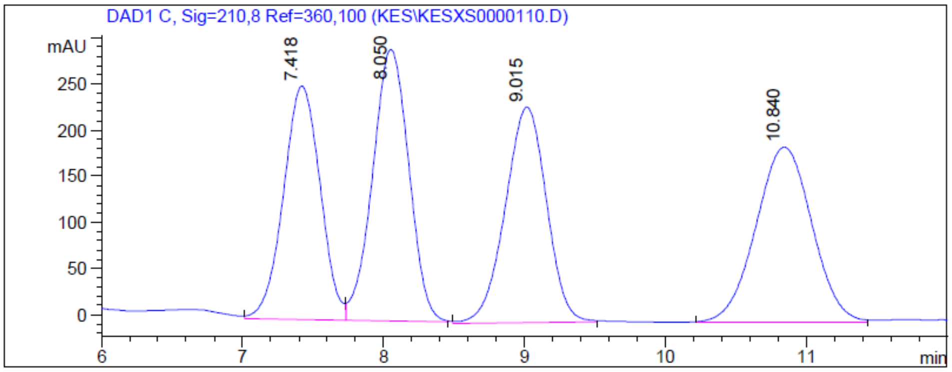
Figure 85. HPLC trace of **8.**





Signal 1: DAD1 C, Sig=210,8 Ref=360,100

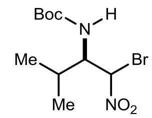
Peak #	RT [min]	Width [min]	Area	Area %
1	7.615	0.312	7331.742	44.10
2	8.243	0.308	8856.113	53.26
3	9.270	0.319	252.585	1.52
4	11.158	0.372	186.228	1.12

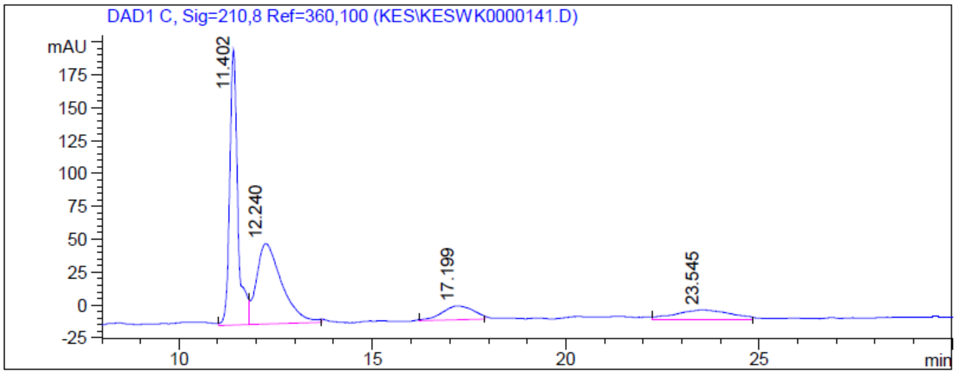


Signal 1: DAD1 C, Sig=210,8 Ref=360,100

Peak #	RT [min]	Width [min]	Area	Area %
1	7.418	0.302	4589.519	23.19
2	8.050	0.298	5253.340	26.54
3	9.015	0.339	4748.808	23.99
4	10.840	0.458	5203.492	26.29

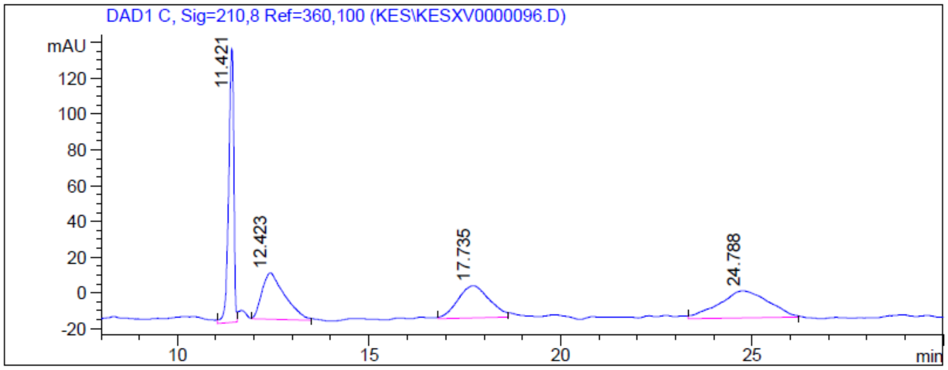
Figure 86. HPLC trace of **9.**





Signal 1: DAD1 C, Sig=210,8 Ref=360,100

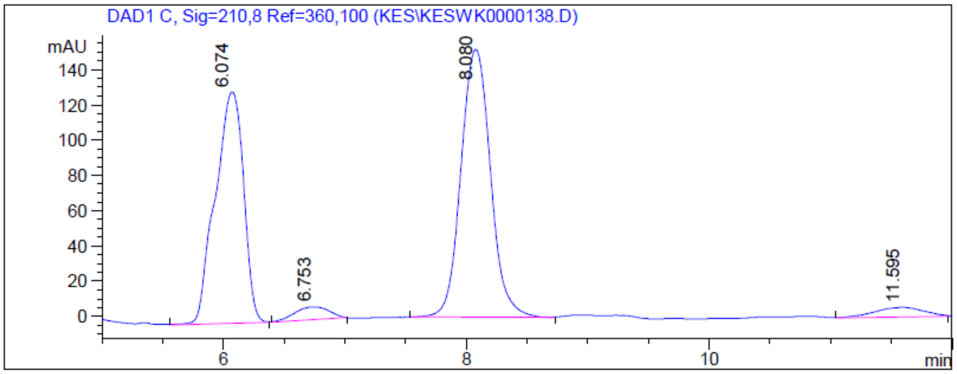
Peak #	RT [min]	Width [min]	Area	Area %
1	11.402	0.242	3048.868	42.63
2	12.240	0.764	2804.731	39.22
3	17.199	0.676	606.170	8.48
4	23.545	1.626	691.953	9.68

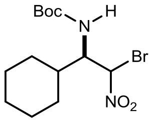


Signal 1: DAD1 C, Sig=210,8 Ref=360,100

Peak #	RT [min]	Width [min]	Area	Area %
1	11.421	0.156	1431.929	29.05
2	12.423	0.693	1078.494	21.88
3	17.735	0.964	1040.948	21.12
4	24.788	1.510	1377.935	27.95

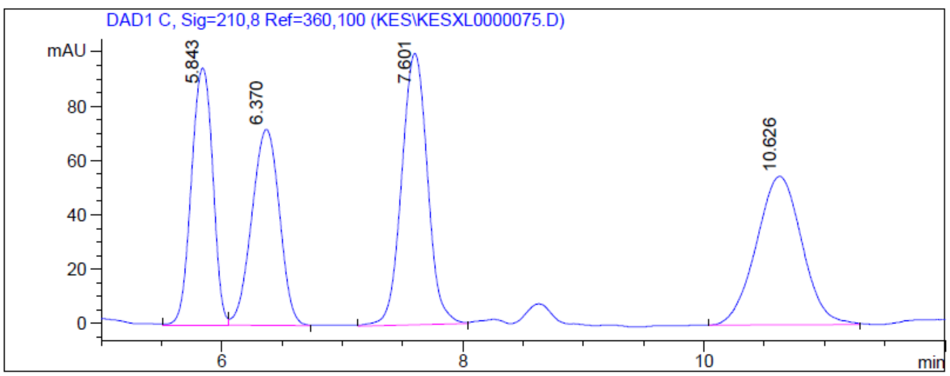
Figure 87. HPLC trace of **10.**





Signal 1: DAD1 C, Sig=210,8 Ref=360,100

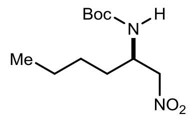
Peak #	RT [min]	Width [min]	Area	Area %
1	6.074	0.269	2120.699	42.50
2	6.753	0.331	142.202	2.85
3	8.080	0.282	2569.699	51.50
4	11.595	0.474	157.058	3.15

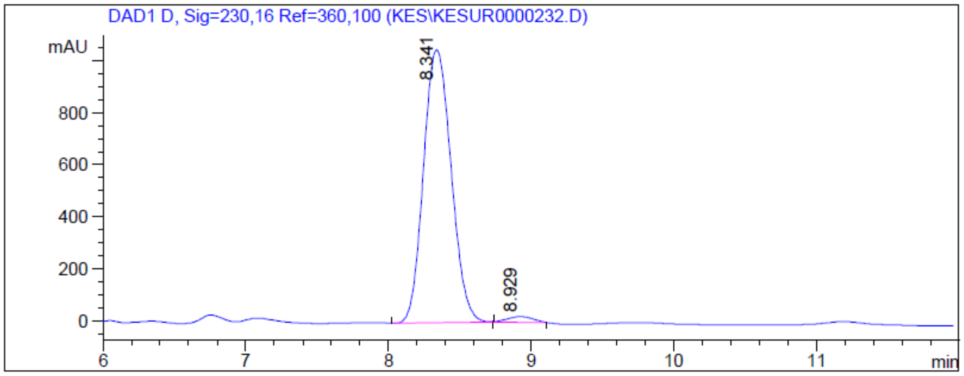


Signal 1: DAD1 C, Sig=210,8 Ref=360,100

Peak #	RT [min]	Width [min]	Area	Area %
1	5.843	0.205	1164.348	22.23
2	6.370	0.266	1151.221	21.98
3	7.601	0.247	1483.777	28.33
4	10.626	0.438	1437.213	27.45

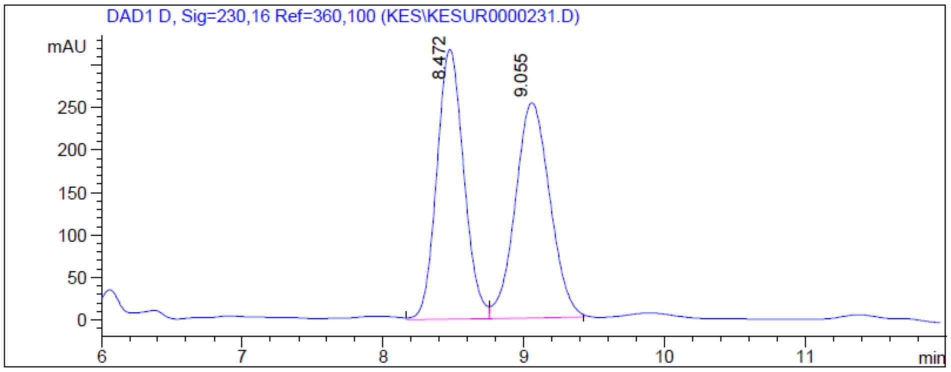
Figure 88. HPLC trace of **11.**





Signal 1: DAD1 D, Sig=230,16 Ref=360,100

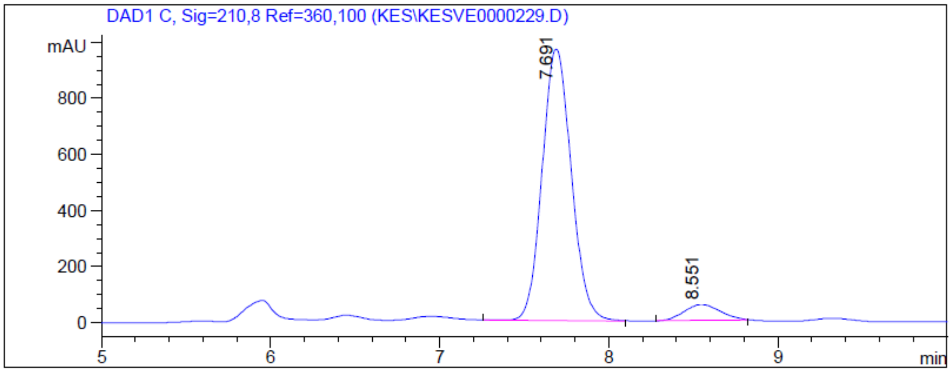
Peak #	RT [min]	Width [min]	Area	Area %
1	8.341	0.225	14160.931	98.00
2	8.929	0.216	288.657	2.00

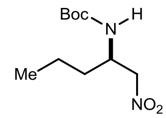


Signal 1: DAD1 D, Sig=230,16 Ref=360,100

Peak #	RT [min]	Width [min]	Area	Area %
1	8.472	0.222	4244.789	49.50
2	9.055	0.284	4330.040	50.50

Figure 89. HPLC trace of **12.**





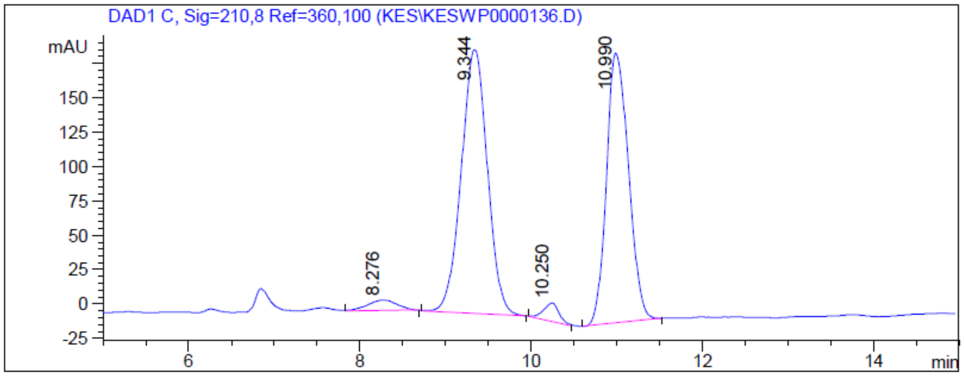
Signal 1: DAD1 C, Sig=210,8 Ref=360,100

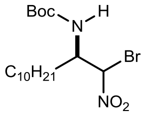
Peak #	RT [min]	Width [min]	Area	Area %
1	7.691	0.200	11584.120	93.36
2	8.551	0.245	824.098	6.64

Based on literature assay.[1]

[1] Palomo, C.; Oiarbide, M.; Laso, A.; López, R. *J. Am. Chem. Soc.* **2005**, *127*, 17622

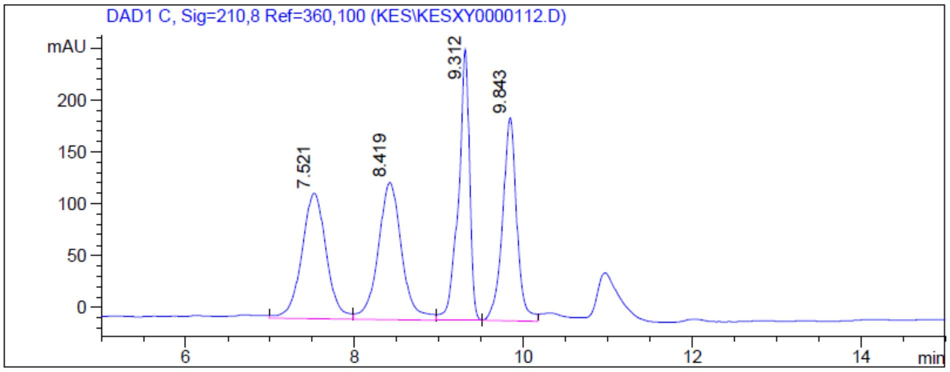
Figure 90. HPLC trace of **13.**





Signal 1: DAD1 C, Sig=210,8 Ref=360,100

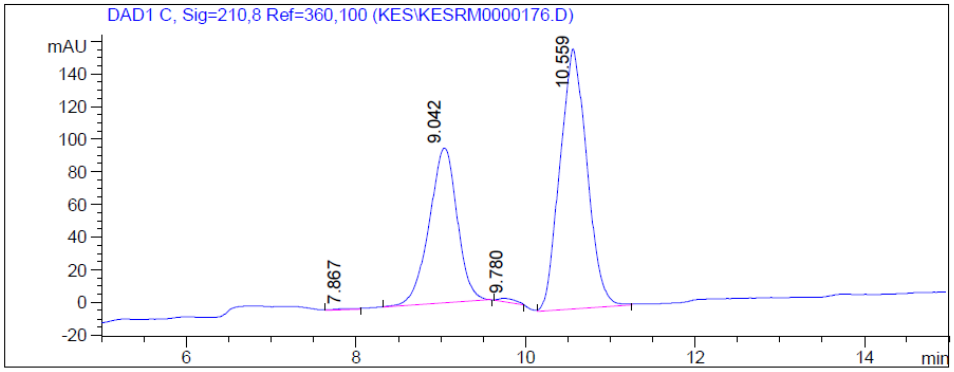
Peak #	RT [min]	Width [min]	Area	Area %
1	8.276	0.401	180.828	2.29
2	9.344	0.354	4068.313	51.42
3	10.250	0.208	166.412	2.10
4	10.990	0.297	3496.621	44.19

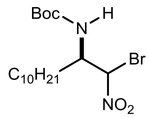


Signal 1: DAD1 C, Sig=210,8 Ref=360,100

Peak #	RT [min]	Width [min]	Area	Area %
1	7.521	0.309	2455.734	25.30
2	8.419	0.294	2563.828	26.41
3	9.312	0.131	2386.716	24.59
4	9.843	0.173	2300.407	23.70

Figure 91. HPLC trace of recrystallized **13**.

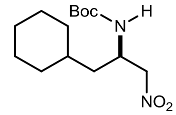


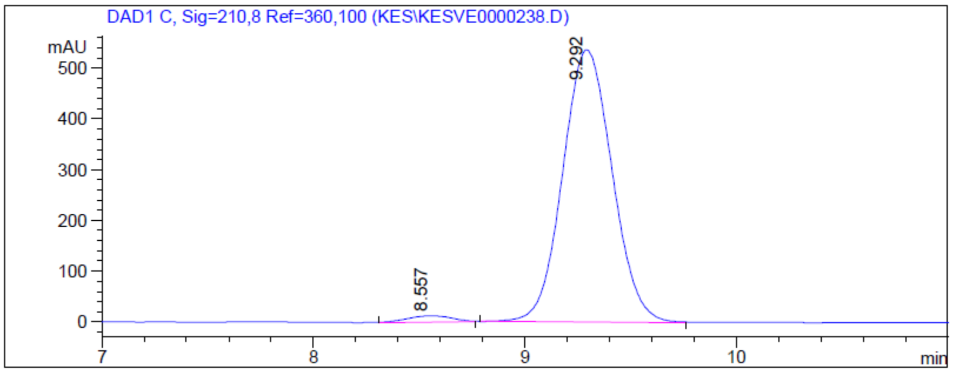


Signal 1: DAD1 C, Sig=210,8 Ref=360,100

Peak #	RT [min]	Width [min]	Area	Area %
1	7.867	0.222	11.722	0.20
2	9.042	0.382	2168.692	37.85
3	9.780	0.238	30.617	0.53
4	10.559	0.368	3518.577	61.41

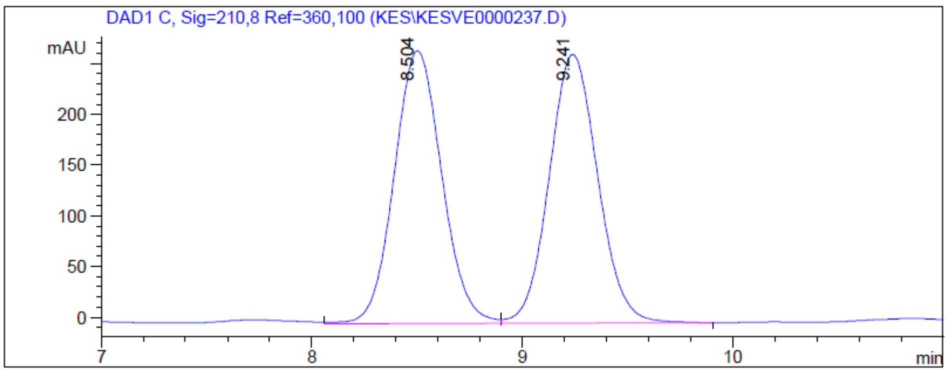
Figure 92. HPLC trace of **14.**





Signal 1: DAD1 C, Sig=210,8 Ref=360,100

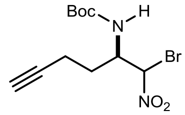
Peak #	RT [min]	Width [min]	Area	Area %
1	8.557	0.243	187.354	2.11
2	9.292	0.271	8712.142	97.89

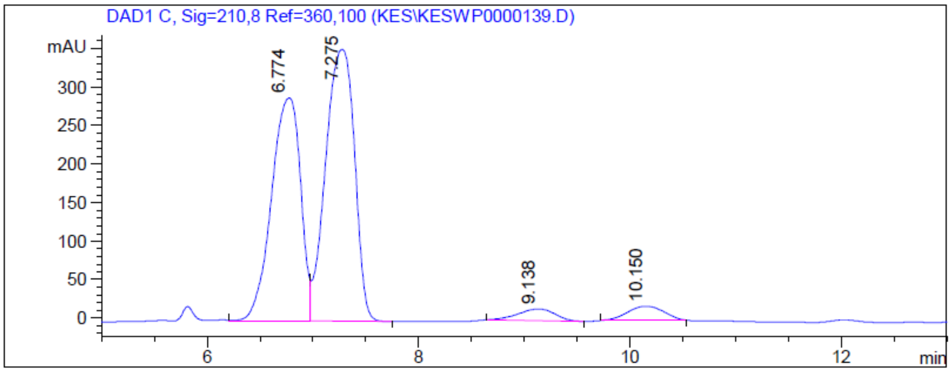


Signal 1: DAD1 C, Sig=210,8 Ref=360,100

Peak #	RT [min]	Width [min]	Area	Area %
1	8.504	0.245	4223.312	49.88
2	9.241	0.251	4243.221	50.12

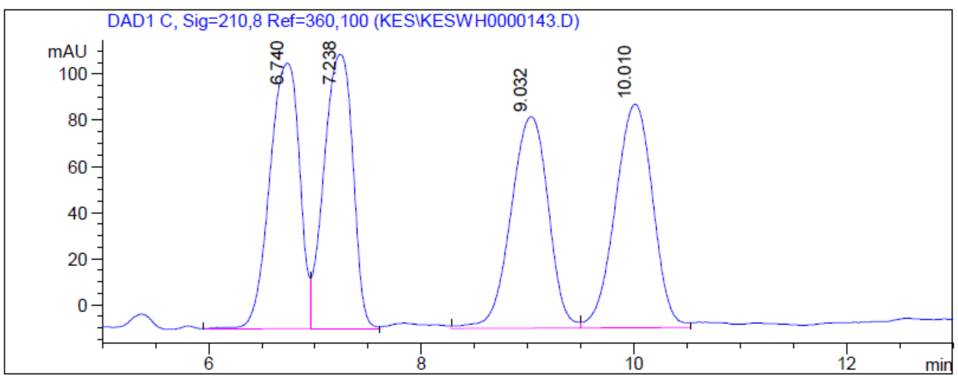
Figure 93. HPLC trace of **15.**





Signal 1: DAD1 C, Sig=210,8 Ref=360,100

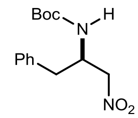
Peak #	RT [min]	Width [min]	Area	Area %
1	6.774	0.319	5552.345	42.40
2	7.275	0.318	6727.819	51.38
3	9.138	0.407	368.636	2.82
4	10.150	0.402	445.921	3.41

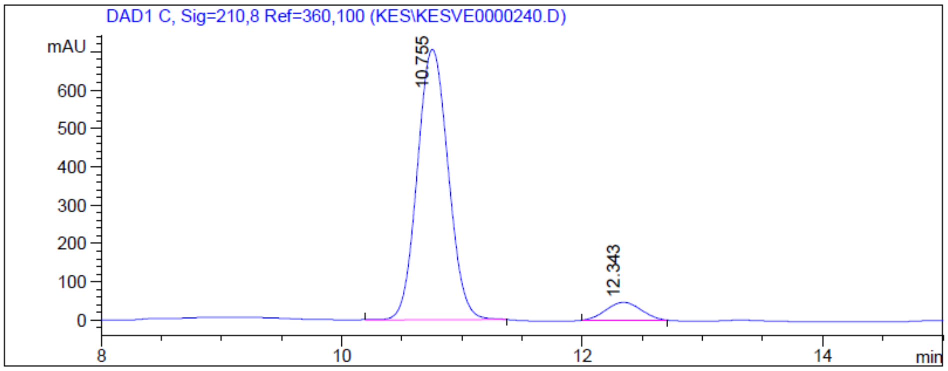


Signal 1: DAD1 C, Sig=210,8 Ref=360,100

Peak #	RT [min]	Width [min]	Area	Area %
1	6.740	0.312	2255.689	24.71
2	7.238	0.305	2247.246	24.61
3	9.032	0.386	2245.698	24.60
4	10.010	0.390	2381.641	26.09

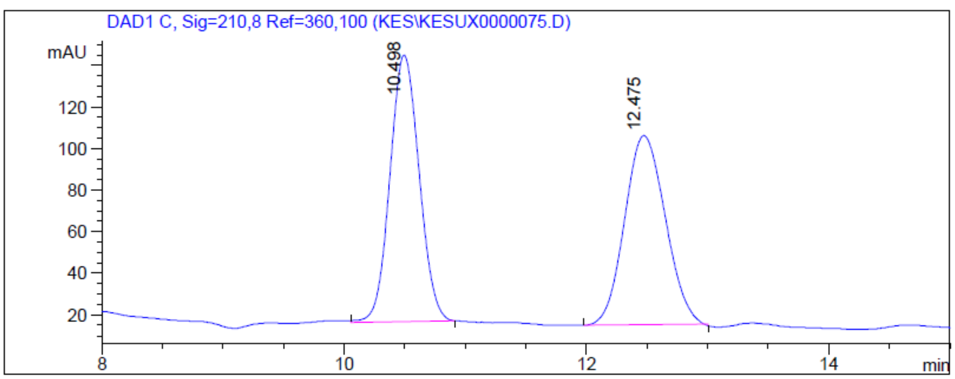
Figure 94. HPLC trace of **16.**





Signal 1: DAD1 C, Sig=210,8 Ref=360,100

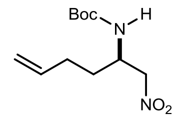
Peak #	RT [min]	Width [min]	Area	Area %
1	10.755	0.297	12554.079	93.23
2	12.343	0.331	911.479	6.77

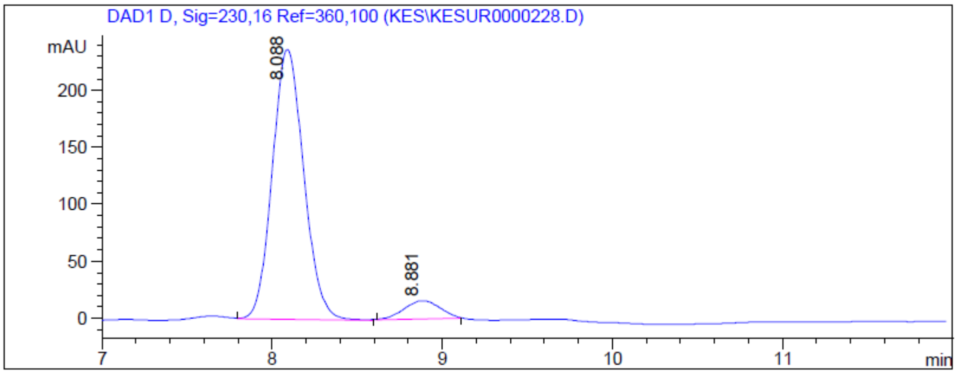


Signal 1: DAD1 C, Sig=210,8 Ref=360,100

Peak #	RT [min]	Width [min]	Area	Area %
1	10.498	0.279	2143.544	50.28
2	12.475	0.388	2119.343	49.72

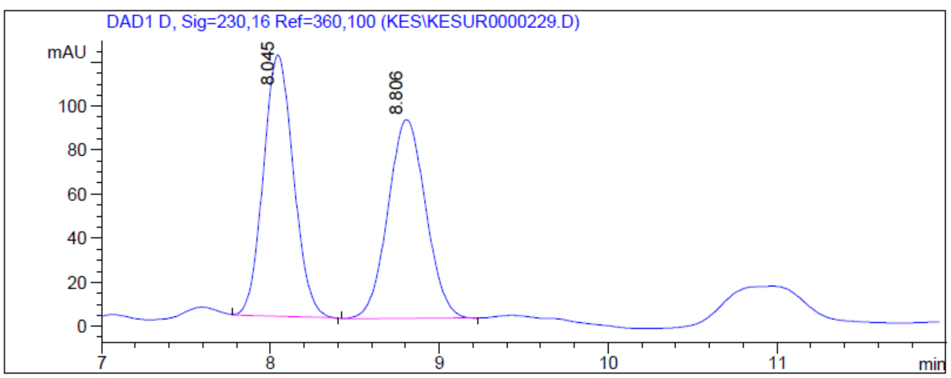
Figure 95. HPLC trace of **17.**





Signal 1: DAD1 D, Sig=230,16 Ref=360,100

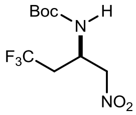
Peak #	RT [min]	Width [min]	Area	Area %
1	8.088	0.214	3048.847	92.85
2	8.881	0.244	234.871	7.15

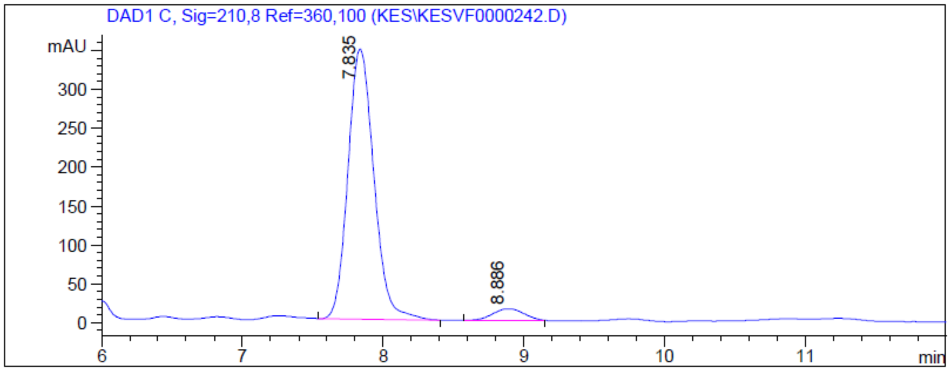


Signal 1: DAD1 D, Sig=230,16 Ref=360,100

Peak #	RT [min]	Width [min]	Area	Area %
1	8.045	0.207	1473.206	51.15
2	8.806	0.260	1406.843	48.85

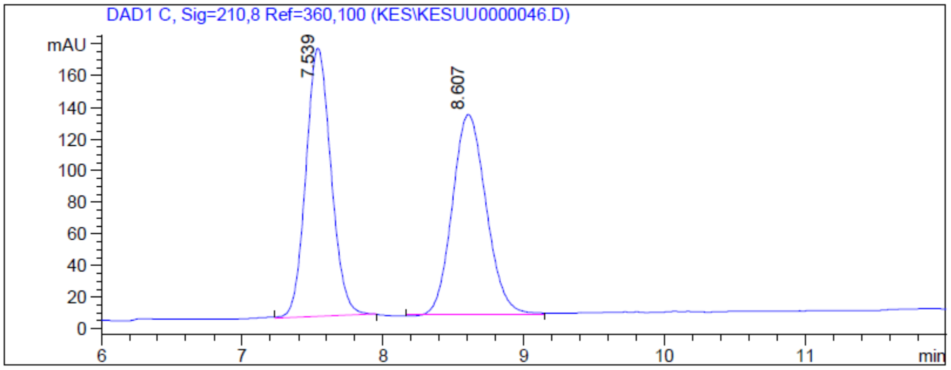
Figure 96. HPLC trace of **18.**





Signal 1: DAD1 C, Sig=210,8 Ref=360,100

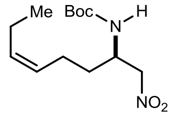
Peak #	RT [min]	Width [min]	Area	Area %
1	7.835	0.214	4458.328	95.20
2	8.886	0.252	224.879	4.80

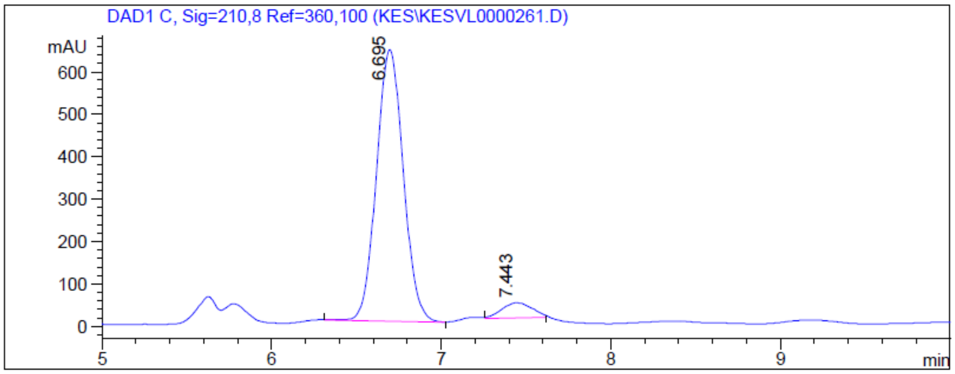


Signal 1: DAD1 C, Sig=210,8 Ref=360,100

Peak #	RT [min]	Width [min]	Area	Area %
1	7.539	0.207	2098.937	50.08
2	8.607	0.277	2092.085	49.92

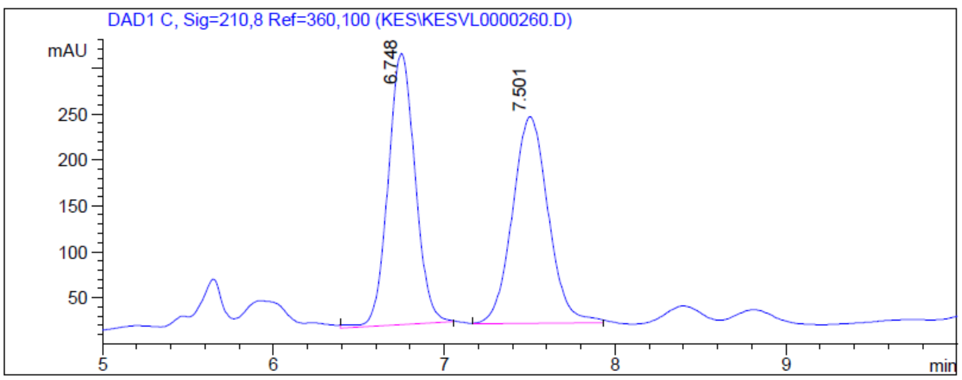
Figure 97. HPLC trace of **19.**





Signal 1: DAD1 C, Sig=210,8 Ref=360,100

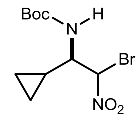
Peak #	RT [min]	Width [min]	Area	Area %
1	6.695	0.183	7051.388	94.05
2	7.443	0.209	446.144	5.95

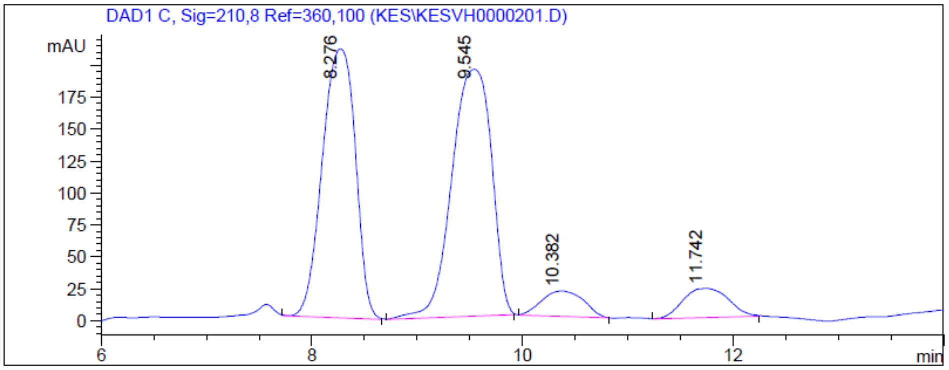


Signal 1: DAD1 C, Sig=210,8 Ref=360,100

Peak #	RT [min]	Width [min]	Area	Area %
1	6.748	0.183	3230.231	49.58
2	7.501	0.243	3284.427	50.42

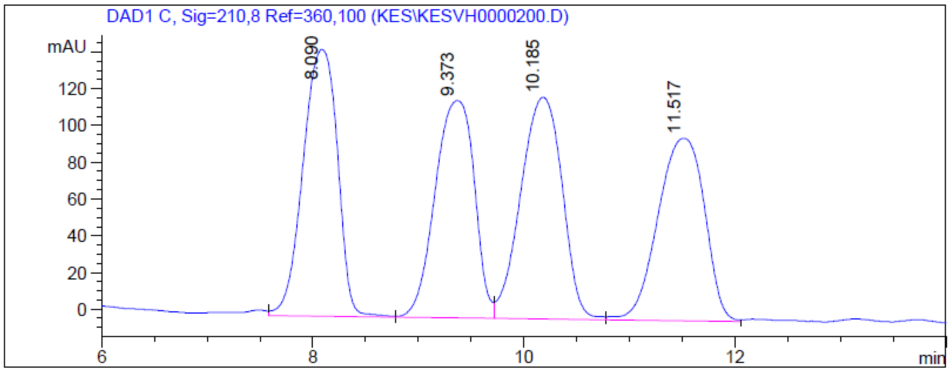
Figure 98. HPLC trace of **20.**





Signal 1: DAD1 C, Sig=210,8 Ref=360,100

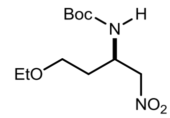
Peak #	RT [min]	Width [min]	Area	Area %
1	8.276	0.365	4606.396	42.19
2	9.545	0.439	5080.101	46.53
3	10.382	0.461	550.527	5.04
4	11.742	0.495	681.689	6.24

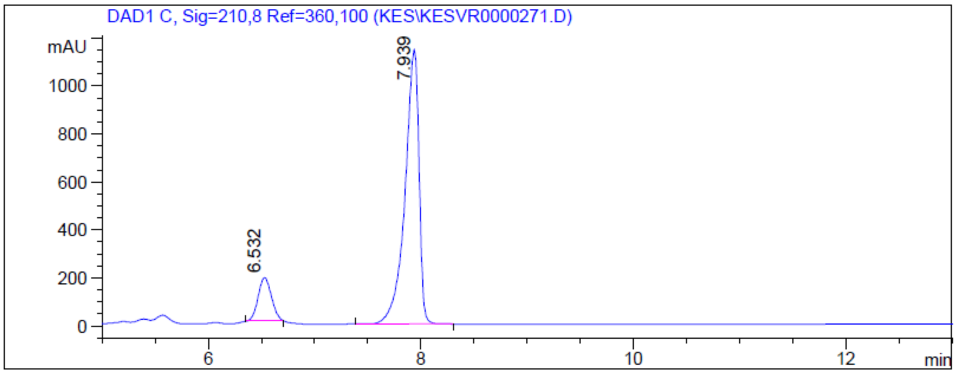


Signal 1: DAD1 C, Sig=210,8 Ref=360,100

Peak #	RT [min]	Width [min]	Area	Area %
1	8.090	0.370	3308.149	25.96
2	9.373	0.422	3063.356	24.04
3	10.185	0.444	3308.714	25.97
4	11.517	0.499	3060.615	24.02

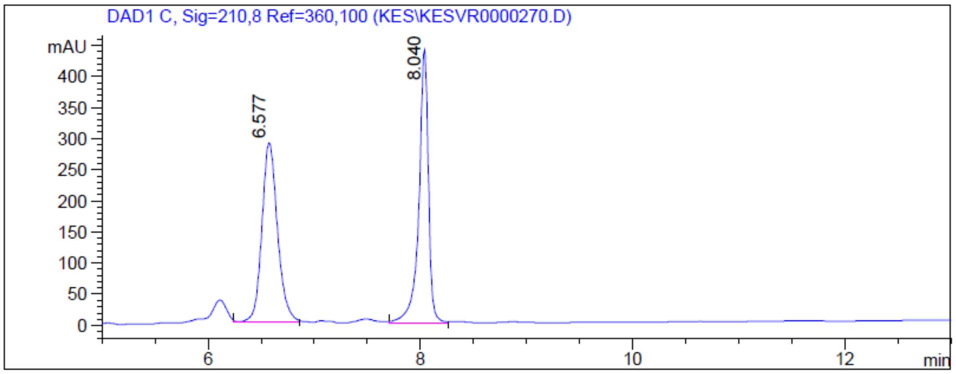
Figure 99. HPLC trace of **21.**





Signal 1: DAD1 C, Sig=210,8 Ref=360,100

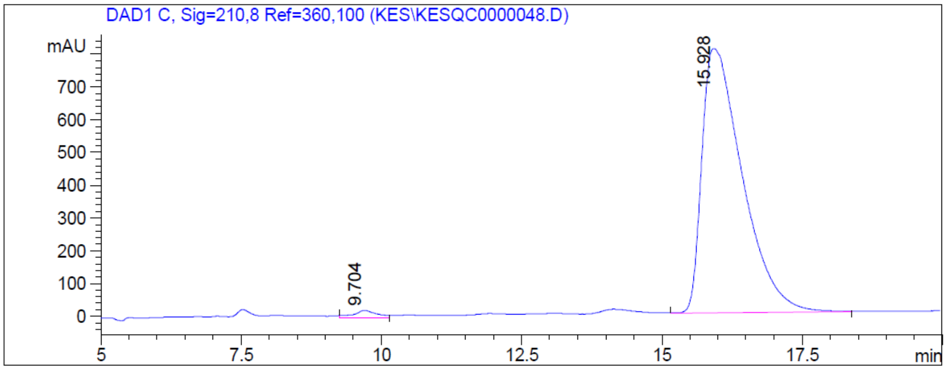
Peak #	RT [min]	Width [min]	Area	Area %
1	6.532	0.146	1589.153	13.18
2	7.939	0.152	10468.359	86.82

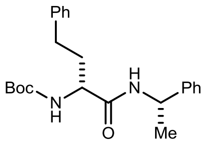


Signal 1: DAD1 C, Sig=210,8 Ref=360,100

Peak #	RT [min]	Width [min]	Area	Area %
1	6.577	0.170	2928.512	51.42
2	8.040	0.105	2766.864	48.58

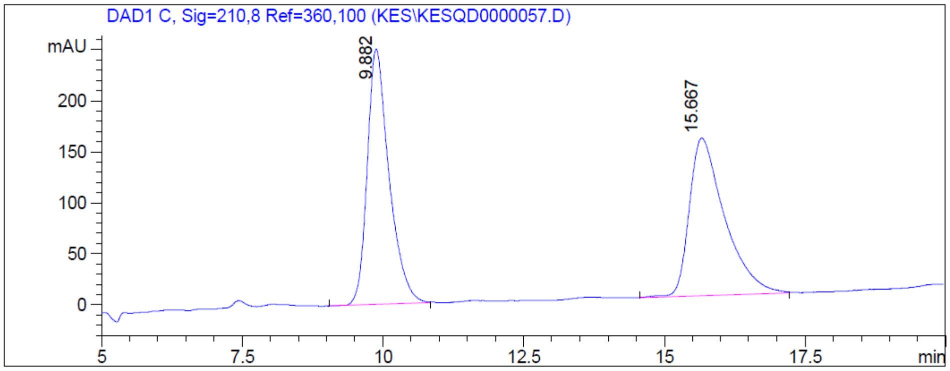
Figure 100. HPLC trace of **22.**





Signal 1: DAD1 C, Sig=210,8 Ref=360,100

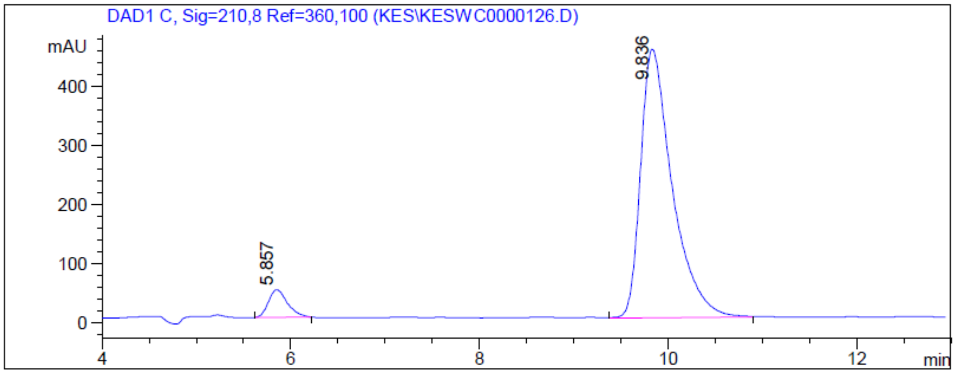
Peak #	RT [min]	Width [min]	Area	Area %
1	9.704	0.479	629.836	1.53
2	15.928	0.835	40410.633	98.47

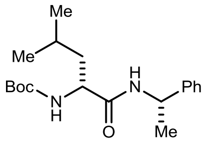


Signal 1: DAD1 C, Sig=210,8 Ref=360,100

Peak #	RT [min]	Width [min]	Area	Area %
1	9.882	0.397	6774.301	50.15
2	15.667	0.621	6733.175	49.85

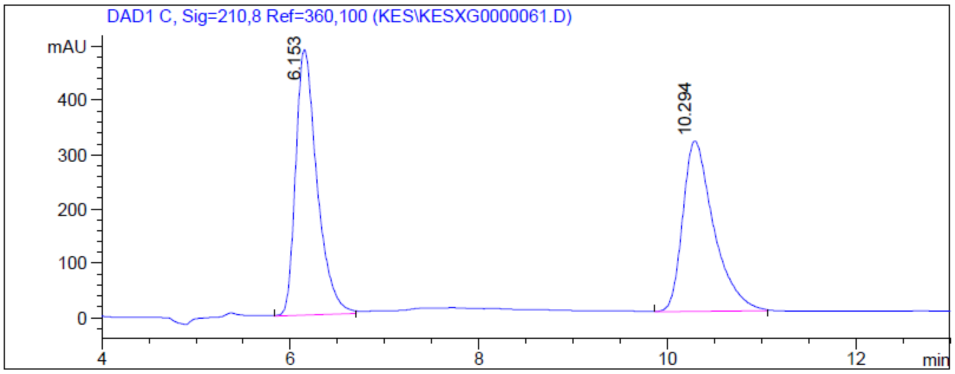
Figure 101. HPLC trace of **23.**






```
Signal 1: DAD1 C, Sig=210,8 Ref=360,100
```

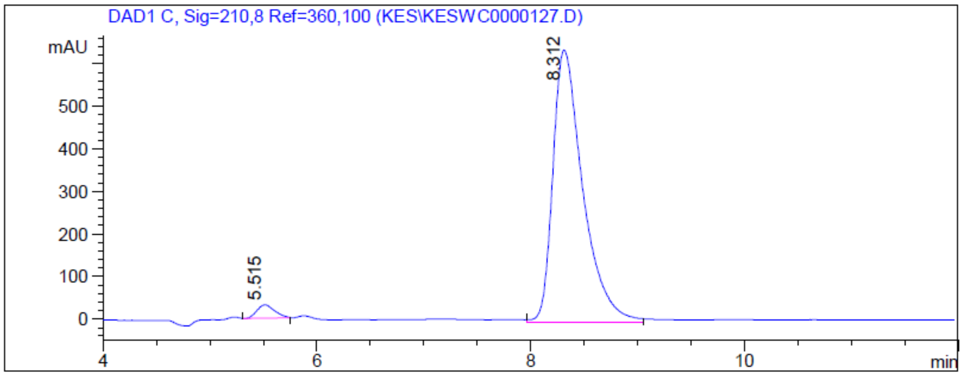
Peak #	RT [min]	Width [min]	Area	Area %
1	5.857	0.235	660.275	5.87
2	9.836	0.389	10593.490	94.13

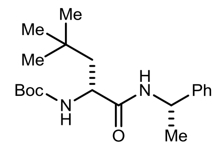



```
Signal 1: DAD1 C, Sig=210,8 Ref=360,100
```

Peak #	RT [min]	Width [min]	Area	Area %
1	6.153	0.263	7704.800	51.75
2	10.294	0.382	7183.816	48.25

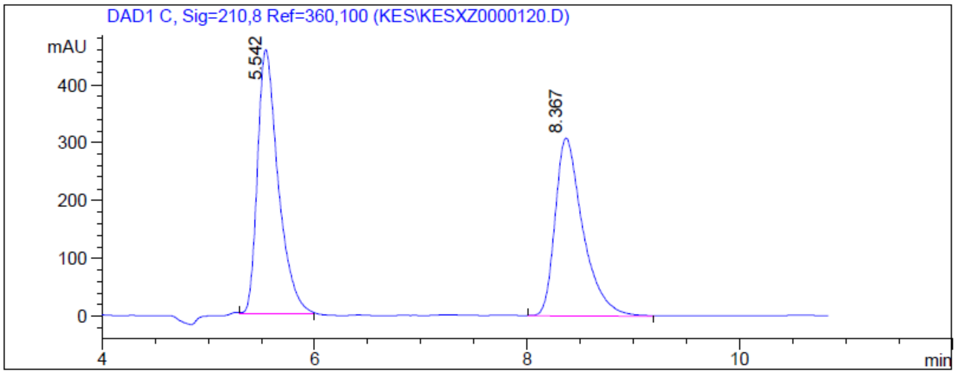
Figure 102. HPLC trace of **24.**





Signal 1: DAD1 C, Sig=210,8 Ref=360,100

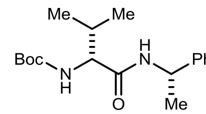
Peak #	RT [min]	Width [min]	Area	Area %
1	5.515	0.193	357.410	2.79
2	8.312	0.324	12456.632	97.21

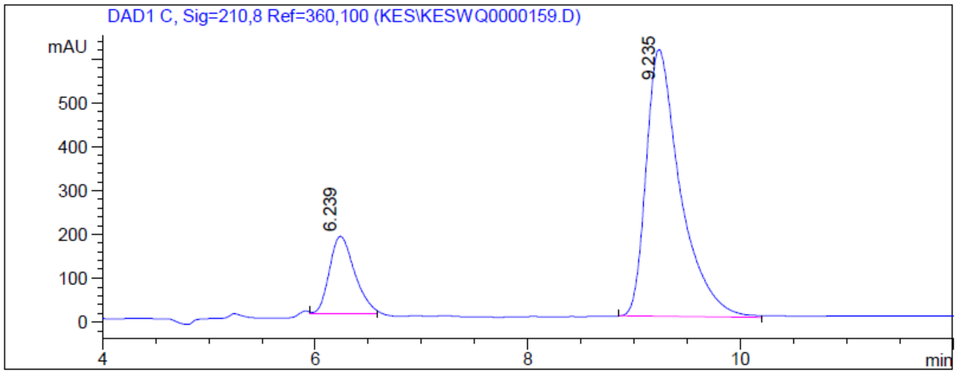


Signal 1: DAD1 C, Sig=210,8 Ref=360,100

Peak #	RT [min]	Width [min]	Area	Area %
1	5.542	0.225	6136.816	52.31
2	8.367	0.303	5595.277	47.69

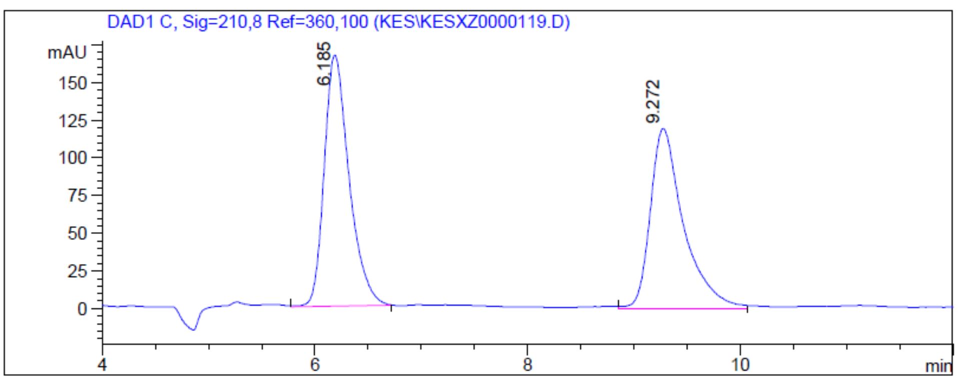
Figure 103. HPLC trace of **25.**






```
Signal   1: DAD1 C, Sig=210,8 Ref=360,100
```

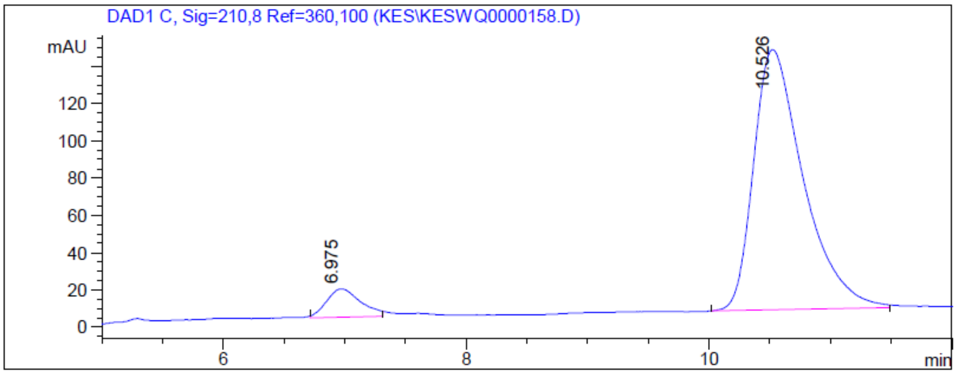
Peak #	RT [min]	Width [min]	Area	Area %
1	6.239	0.270	2828.864	17.15
2	9.235	0.374	13663.194	82.85

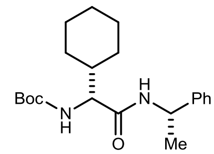



```
Signal   1: DAD1 C, Sig=210,8 Ref=360,100
```

Peak #	RT [min]	Width [min]	Area	Area %
1	6.185	0.272	2718.587	51.22
2	9.272	0.362	2588.798	48.78

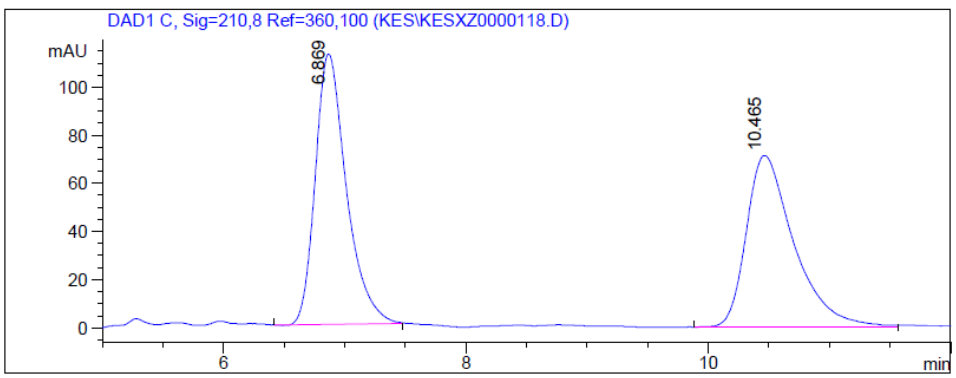
Figure 104. HPLC trace of **26.**





Signal 1: DAD1 C, Sig=210,8 Ref=360,100

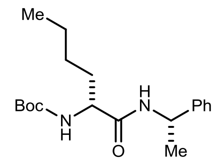
Peak #	RT [min]	Width [min]	Area	Area %
1	6.975	0.324	293.220	6.88
2	10.526	0.474	3970.541	93.12

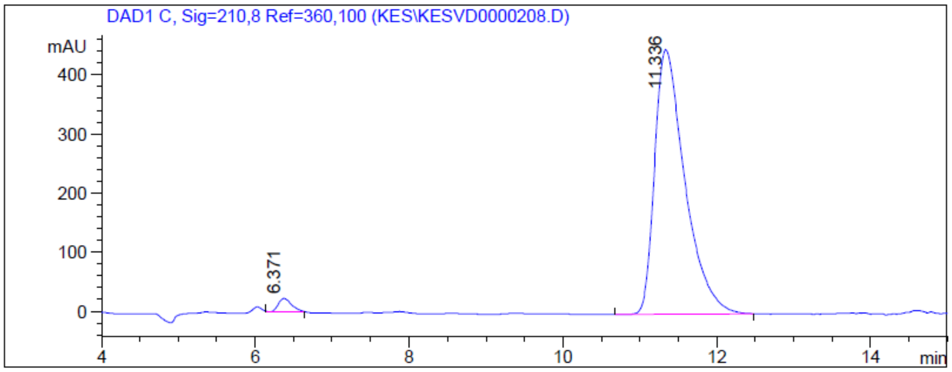


Signal 1: DAD1 C, Sig=210,8 Ref=360,100

Peak #	RT [min]	Width [min]	Area	Area %
1	6.869	0.298	2013.638	50.98
2	10.465	0.453	1936.296	49.02

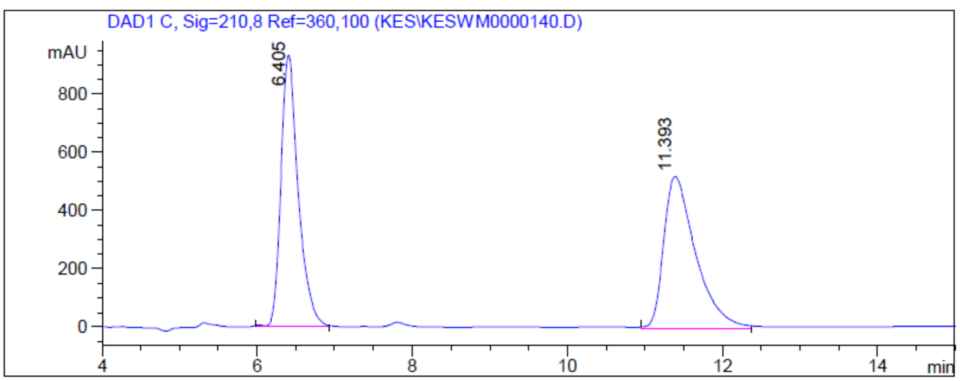
Figure 105. HPLC trace of **27.**





Signal 1: DAD1 C, Sig=210,8 Ref=360,100

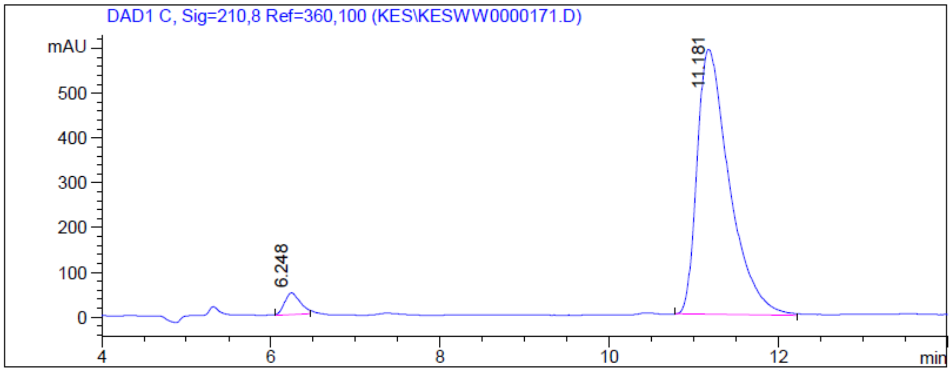
Peak #	RT [min]	Width [min]	Area	Area %
1	6.371	0.212	297.915	2.37
2	11.336	0.456	12260.380	97.63

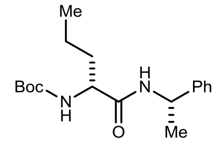


Signal 1: DAD1 C, Sig=210,8 Ref=360,100

Peak #	RT [min]	Width [min]	Area	Area %
1	6.405	0.256	14290.754	48.85
2	11.393	0.479	14966.102	51.15

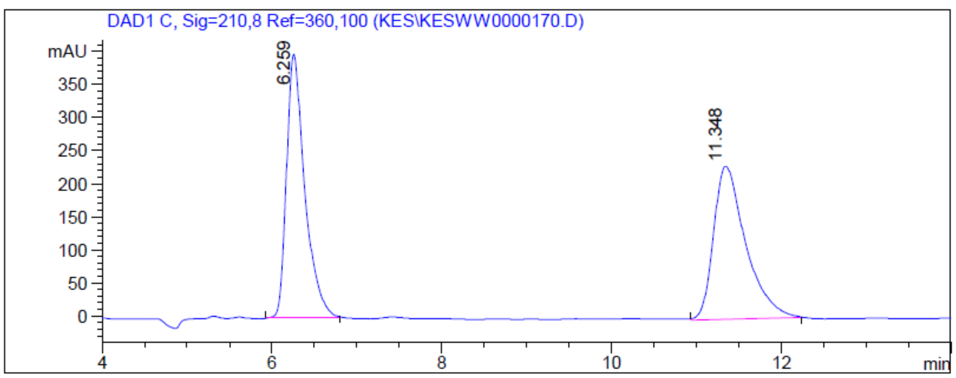
Figure 106. HPLC trace of **28.**





Signal 1: DAD1 C, Sig=210,8 Ref=360,100

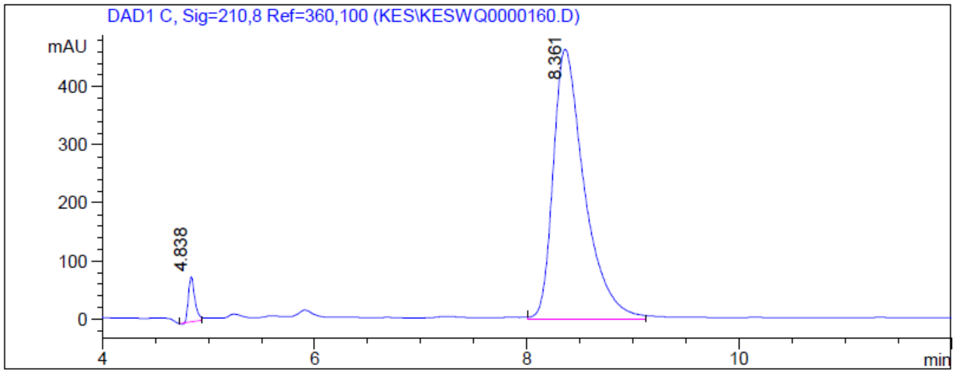
Peak #	RT [min]	Width [min]	Area	Area %
1	6.248	0.216	633.736	3.88
2	11.181	0.443	15711.052	96.12

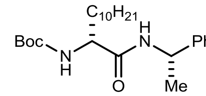


Signal 1: DAD1 C, Sig=210,8 Ref=360,100

Peak #	RT [min]	Width [min]	Area	Area %
1	6.259	0.248	5936.624	49.35
2	11.348	0.438	6093.895	50.65

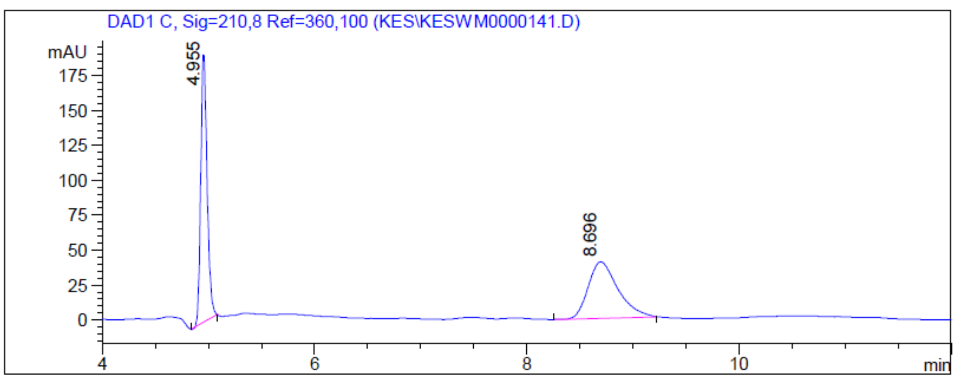
Figure 107. HPLC trace of **29.**





Signal 1: DAD1 C, Sig=210,8 Ref=360,100

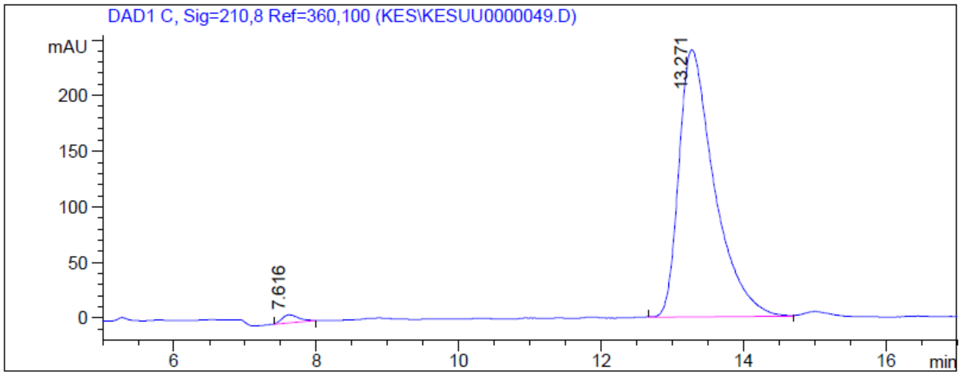
Peak #	RT [min]	Width [min]	Area	Area %
1	4.838	0.070	328.407	3.35
2	8.361	0.340	9477.934	96.65

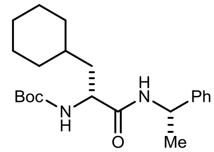


Signal 1: DAD1 C, Sig=210,8 Ref=360,100

Peak #	RT [min]	Width [min]	Area	Area %
1	4.955	0.069	800.514	50.01
2	8.696	0.329	800.144	49.99

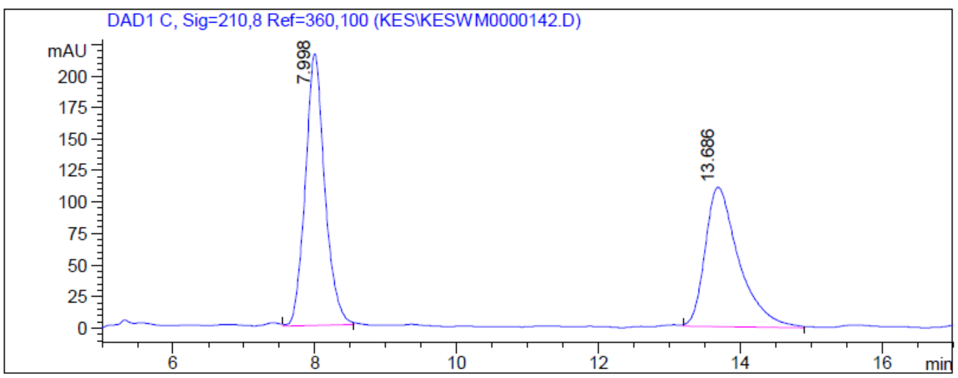
Figure 108. HPLC trace of **30.**





Signal 1: DAD1 C, Sig=210,8 Ref=360,100

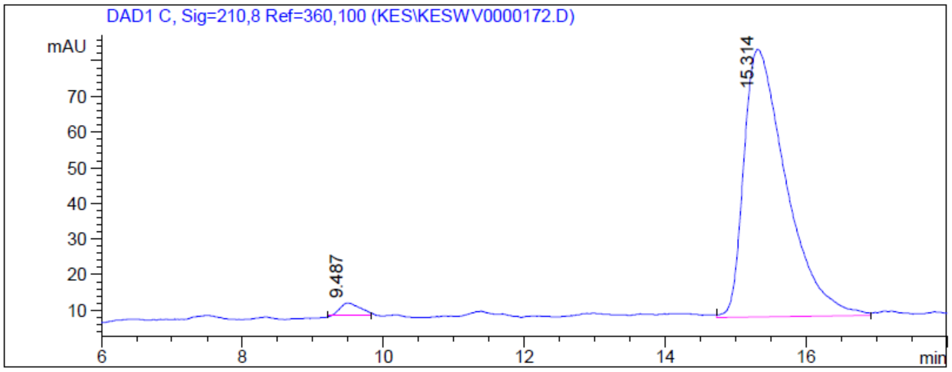
Peak #	RT [min]	Width [min]	Area	Area %
1	7.616	0.266	116.611	1.38
2	13.271	0.577	8324.212	98.62

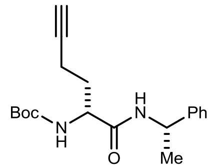


Signal 1: DAD1 C, Sig=210,8 Ref=360,100

Peak #	RT [min]	Width [min]	Area	Area %
1	7.998	0.319	4127.397	53.02
2	13.686	0.551	3657.124	46.98

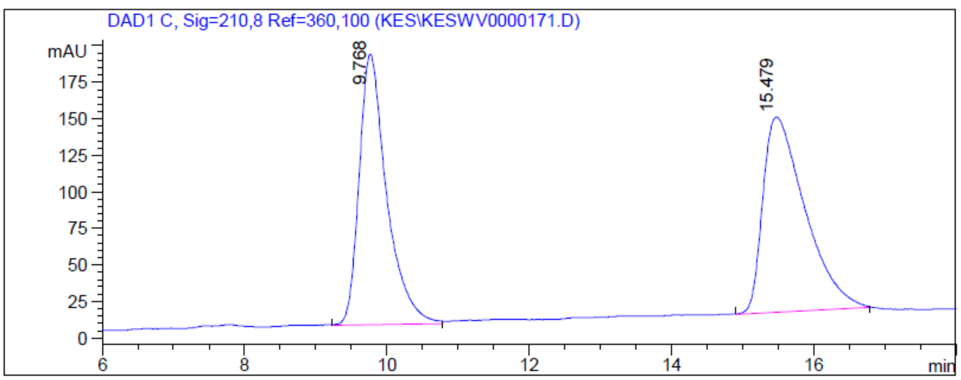
Figure 109. HPLC trace of **31.**





Signal 1: DAD1 C, Sig=210,8 Ref=360,100

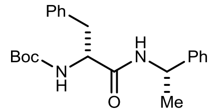
Peak #	RT [min]	Width [min]	Area	Area %
1	9.487	0.334	70.269	2.19
2	15.314	0.697	3140.238	97.81

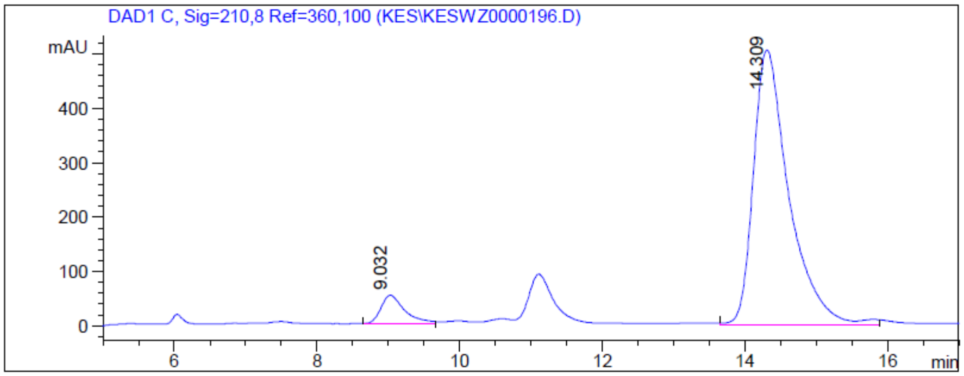


Signal 1: DAD1 C, Sig=210,8 Ref=360,100

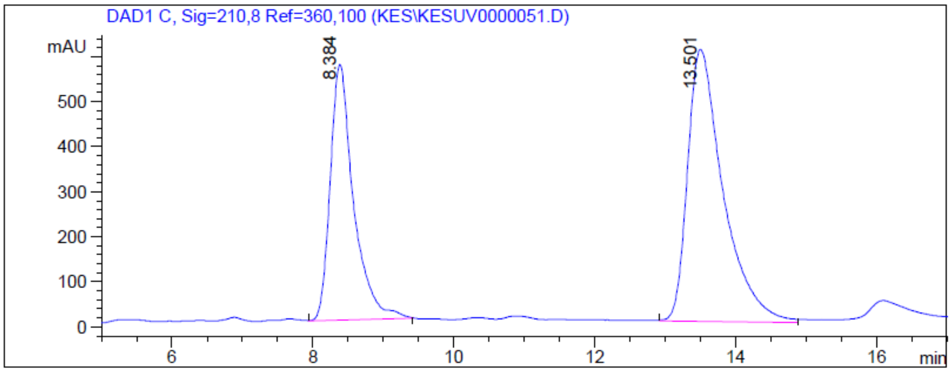
Peak #	RT [min]	Width [min]	Area	Area %
1	9.768	0.448	4972.060	47.41
2	15.479	0.688	5514.219	52.59

Figure 110. HPLC trace of **32.**



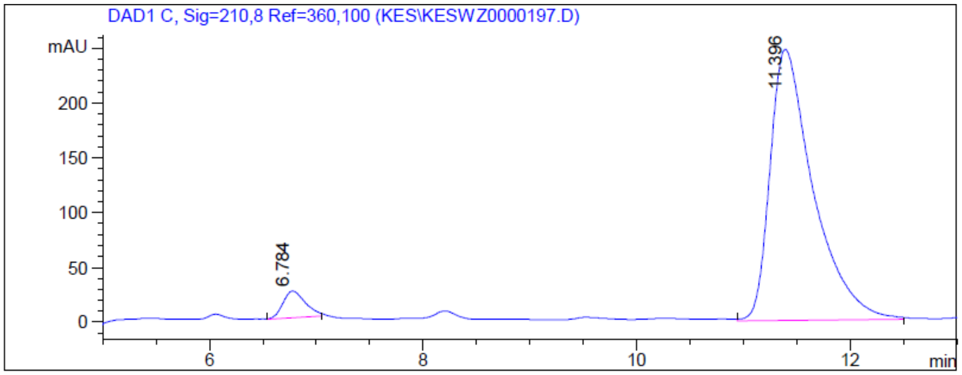


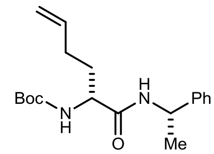

```
Signal   1: DAD1 C, Sig=210,8 Ref=360,100

Peak    RT      Width     Area      Area %
 #     [min]    [min]
----------------------------------------
   1    9.032   0.392   1229.454    6.49
   2   14.309   0.583  17709.516   93.51
----------------------------------------
```




```
Signal   1: DAD1 C, Sig=210,8 Ref=360,100

Peak    RT      Width     Area      Area %
 #     [min]    [min]
----------------------------------------
   1    8.384   0.384  13109.295   38.16
   2   13.501   0.586  21245.809   61.84
----------------------------------------
```

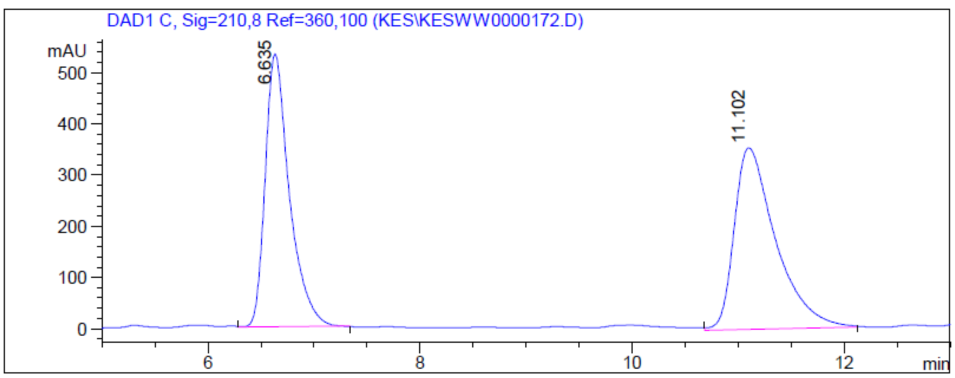
Figure 111. HPLC trace of **33.**





Signal 1: DAD1 C, Sig=210,8 Ref=360,100

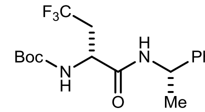
Peak #	RT [min]	Width [min]	Area	Area %
1	6.784	0.242	355.052	4.85
2	11.396	0.469	6966.001	95.15

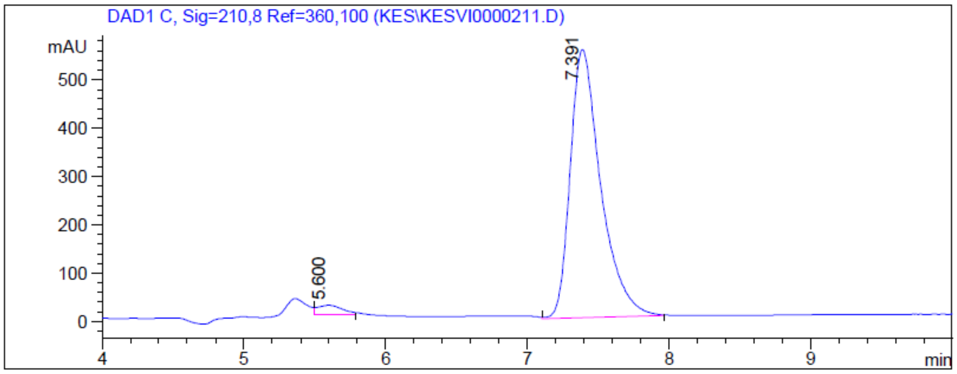


Signal 1: DAD1 C, Sig=210,8 Ref=360,100

Peak #	RT [min]	Width [min]	Area	Area %
1	6.635	0.264	8455.787	46.75
2	11.102	0.453	9631.794	53.25

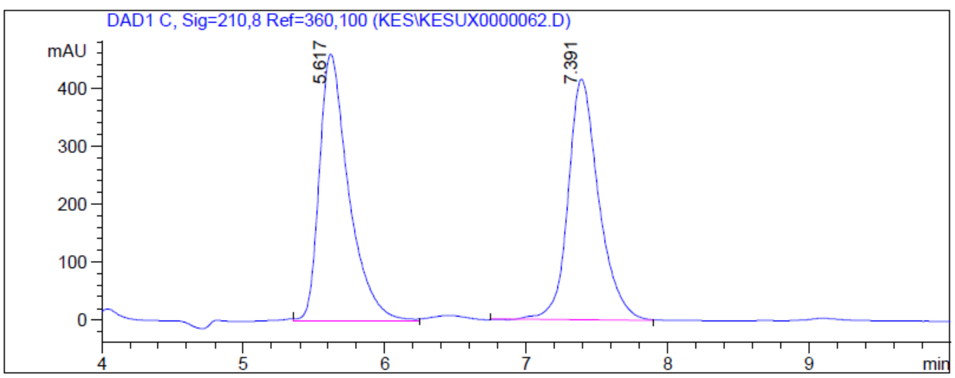
Figure 112. HPLC trace of **34.**






```
Signal   1: DAD1 C, Sig=210,8 Ref=360,100
```

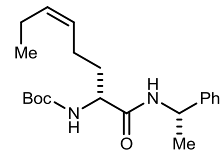
Peak #	RT [min]	Width [min]	Area	Area %
1	5.600	0.203	234.552	2.74
2	7.391	0.250	8330.422	97.26

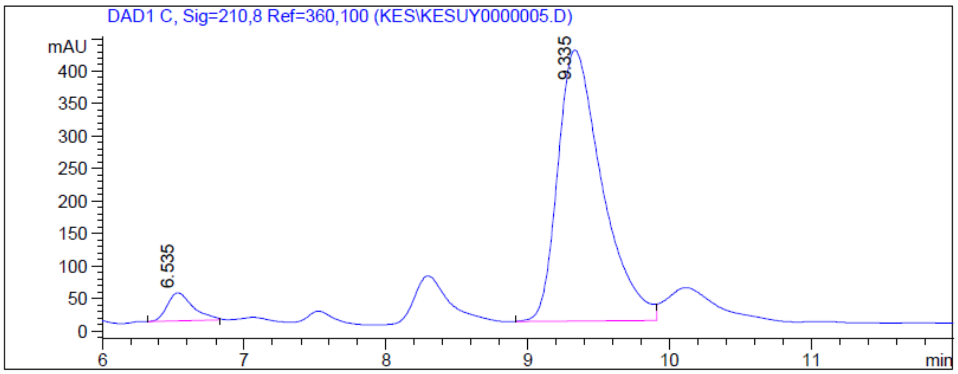



```
Signal   1: DAD1 C, Sig=210,8 Ref=360,100
```

Peak #	RT [min]	Width [min]	Area	Area %
1	5.617	0.239	6593.606	51.26
2	7.391	0.252	6270.104	48.74

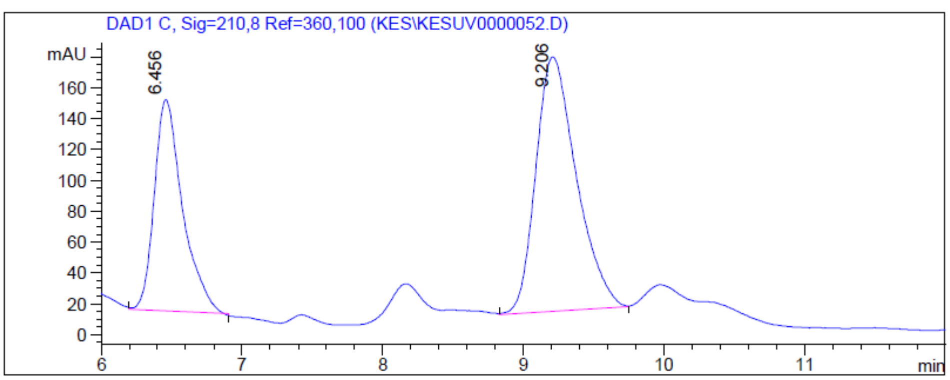
Figure 113. HPLC trace of **35.**





Signal 1: DAD1 C, Sig=210,8 Ref=360,100

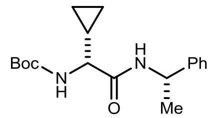
Peak #	RT [min]	Width [min]	Area	Area %
1	6.535	0.209	541.696	5.62
2	9.335	0.363	9093.938	94.38

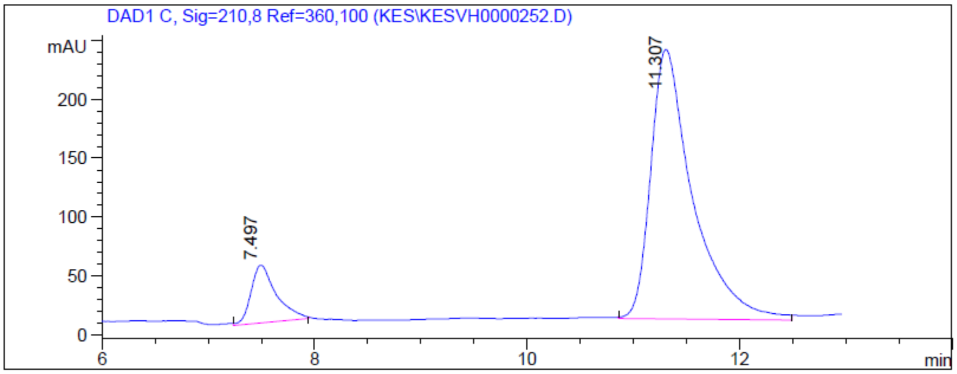


Signal 1: DAD1 C, Sig=210,8 Ref=360,100

Peak #	RT [min]	Width [min]	Area	Area %
1	6.456	0.233	1909.106	36.61
2	9.206	0.334	3306.083	63.39

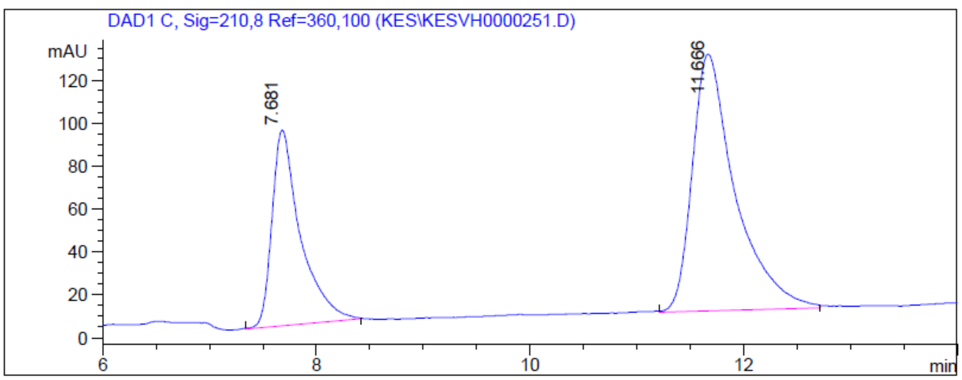
Figure 114. HPLC trace of **36.**





Signal 1: DAD1 C, Sig=210,8 Ref=360,100

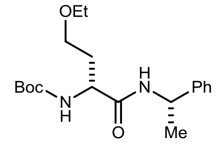
Peak #	RT [min]	Width [min]	Area	Area %
1	7.497	0.275	813.074	11.37
2	11.307	0.461	6337.186	88.63

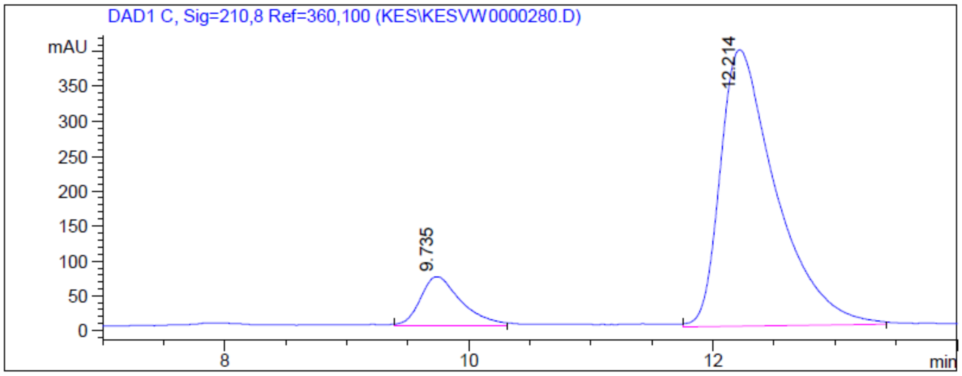


Signal 1: DAD1 C, Sig=210,8 Ref=360,100

Peak #	RT [min]	Width [min]	Area	Area %
1	7.681	0.308	1689.121	33.52
2	11.666	0.466	3350.754	66.48

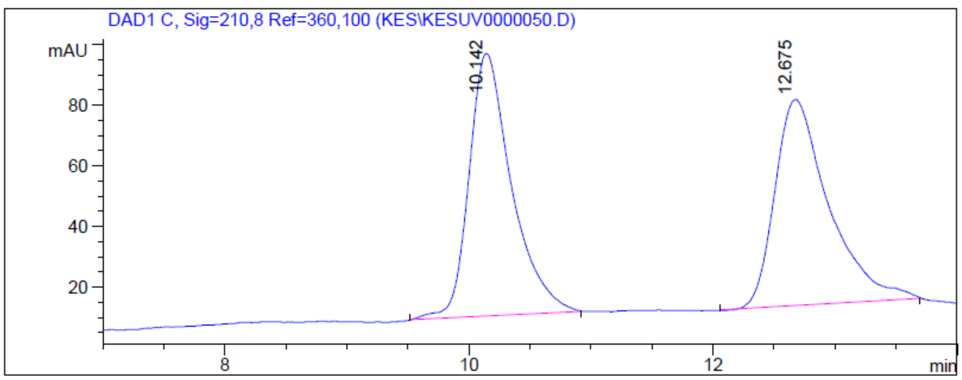
Figure 115. HPLC trace of **37.**





Signal 1: DAD1 C, Sig=210,8 Ref=360,100

Peak #	RT [min]	Width [min]	Area	Area %
1	9.735	0.387	1636.389	11.46
2	12.214	0.531	12641.171	88.54



Signal 1: DAD1 C, Sig=210,8 Ref=360,100

Peak #	RT [min]	Width [min]	Area	Area %
1	10.142	0.404	2104.111	50.15
2	12.675	0.511	2091.183	49.85