

SUPPORTING INFORMATION FOR:

Rational and Predictable Chemoselective Synthesis of Oligoamines via Buchwald-Hartwig Amination of (Hetero)Aryl Chlorides Employing Mor-DalPhos

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^aDepartment of Chemistry, Dalhousie University, 6274 Coburg Road, P.O. Box 15000, Halifax, Nova Scotia, Canada B3H 4R2.

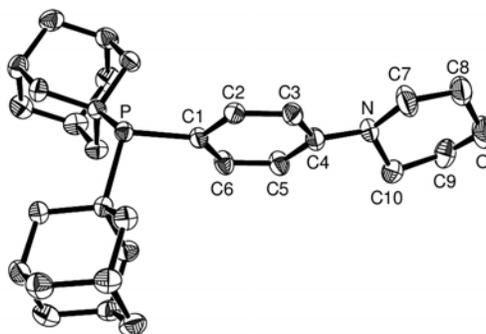
^bX-Ray Crystallography Laboratory, Department of Chemistry, University of Alberta, Edmonton, Alberta, Canada T6G 2G2.

Contents:

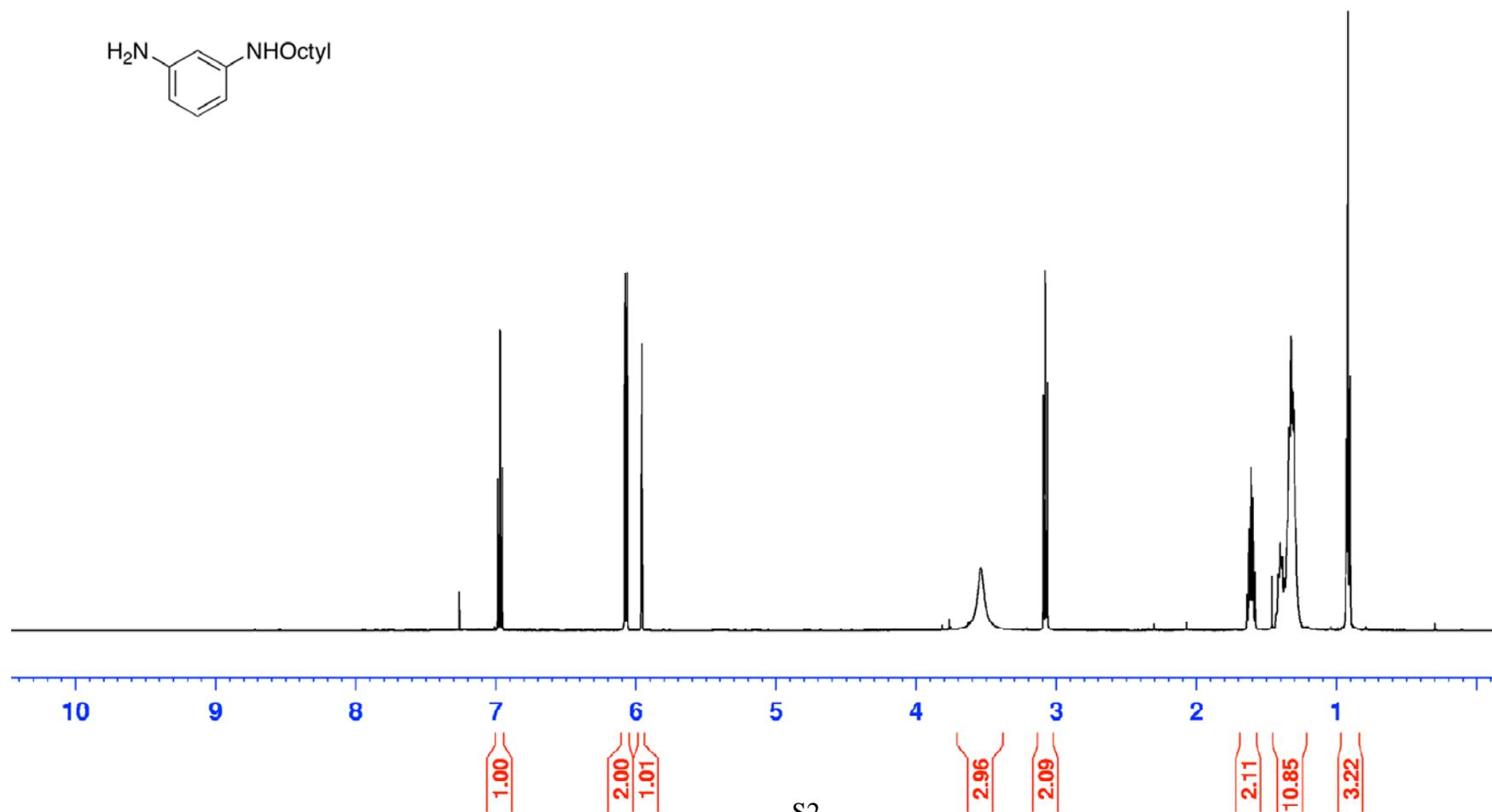
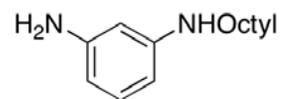
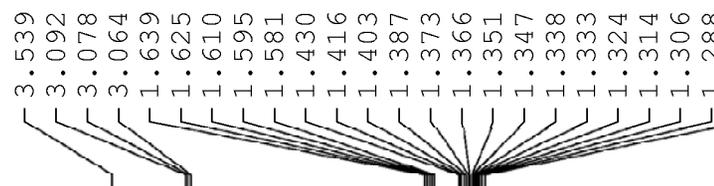
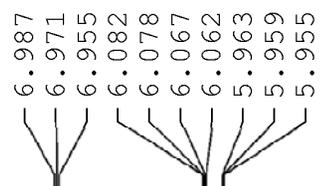
- **Crystallographic data for L2 and 7•CH₂Cl₂ (Table S1).....p S1**
- **The crystallographically determined structure of L2 (Figure S1),,....p S1**
- **NMR spectral characterization data.....p S2**

Table S1. Crystallographic Data for L2 and 7•CH₂Cl₂.

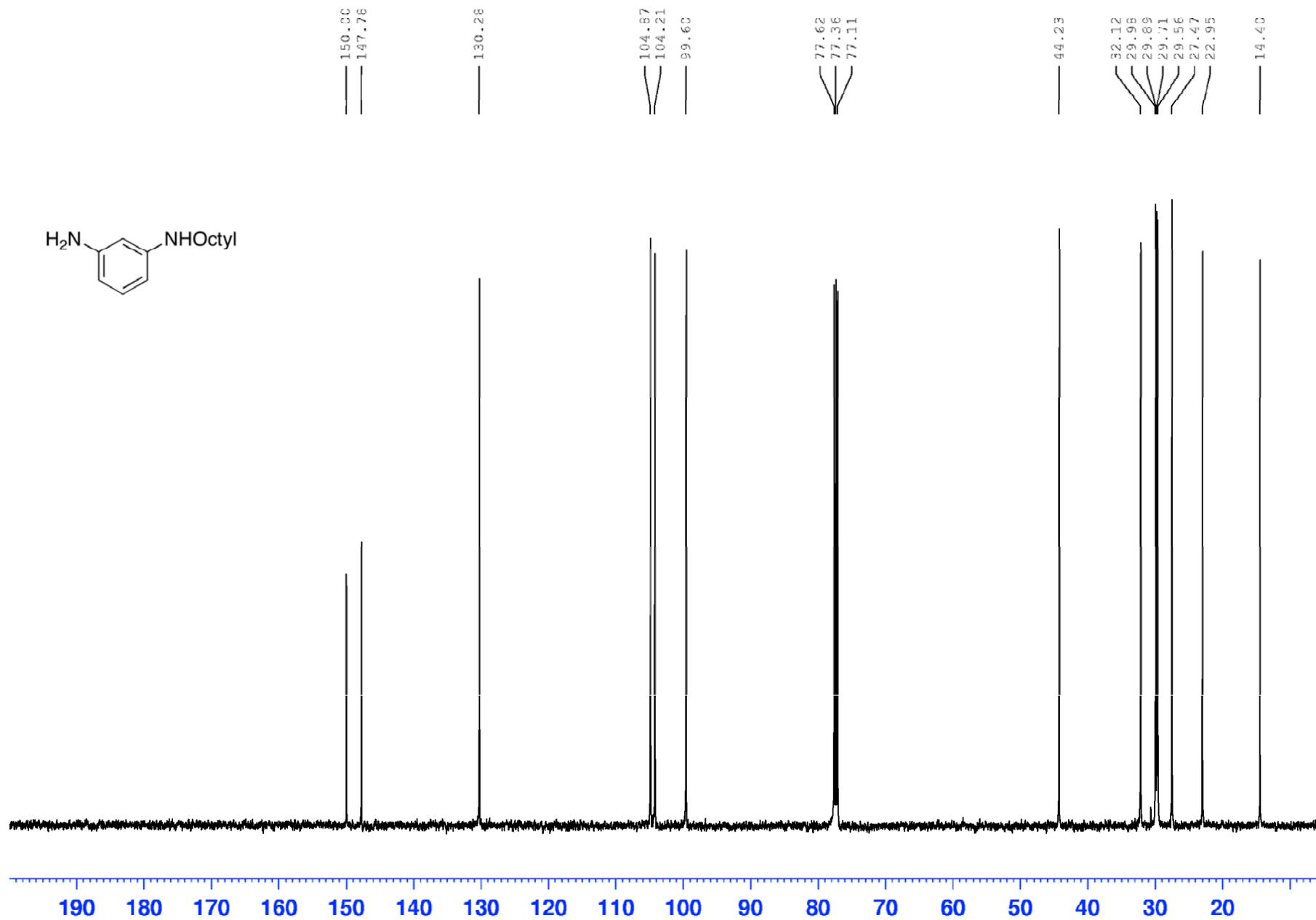
	L2	7•CH ₂ Cl ₂
Empirical formula	C ₃₀ H ₄₂ NOP	C ₄₇ H ₆₃ Cl ₂ F ₃ N ₃ O ₄ PPdS
Formula weight	463.62	1031.33
Crystal dimensions	0.36 × 0.35 × 0.19	0.41 × 0.31 × 0.26
Crystal system	triclinic	triclinic
Space group	<i>P</i> $\bar{1}$	<i>P</i> $\bar{1}$
<i>a</i> (Å)	10.2665 (6)	10.6924 (7)
<i>b</i> (Å)	11.0209 (6)	12.4945 (8)
<i>c</i> (Å)	12.1446 (7)	18.4352 (12)
α (deg)	67.6814 (7)	102.5936 (7)
β (deg)	81.4590 (7)	96.5551 (8)
γ (deg)	79.9256 (7)	96.1075 (7)
<i>V</i> (Å ³)	1246.48 (12)	2365.9 (3)
<i>Z</i>	2	2
ρ_{calcd} (g cm ⁻³)	1.235	1.448
μ (mm ⁻¹)	0.134	0.641
Range of transmission	0.9745–0.9538	0.8531–0.7782
2θ limit (deg)	55.24	54.98
	-13 ≤ <i>h</i> ≤ 13	-13 ≤ <i>h</i> ≤ 13
	-14 ≤ <i>k</i> ≤ 14	-16 ≤ <i>k</i> ≤ 16
	-15 ≤ <i>l</i> ≤ 15	-23 ≤ <i>l</i> ≤ 23
Total data collected	11062	21291
Independent reflections (<i>R</i> _{int})	5699 (0.0179)	10798 (0.0103)
Observed reflections	4727	10218
Data/restraints/parameters	5699 / 0 / 325	10798 / 7 / 645
Goodness-of-fit	1.042	1.066
<i>R</i> ₁ [<i>F</i> _o ² ≥ 2σ(<i>F</i> _o ²)]	0.0437	0.0308
<i>wR</i> ₂ [<i>F</i> _o ² ≥ -3σ(<i>F</i> _o ²)]	0.1232	0.0888
Largest peak, hole (eÅ ⁻³)	0.610, -0.355	0.876 and -1.307

**Figure S1.** The crystallographically determined structure of **L2**, shown with 50% ellipsoids; hydrogen atoms have been omitted for clarity (P-C1 1.8368(15) Å, N-C4 1.416(6) Å).

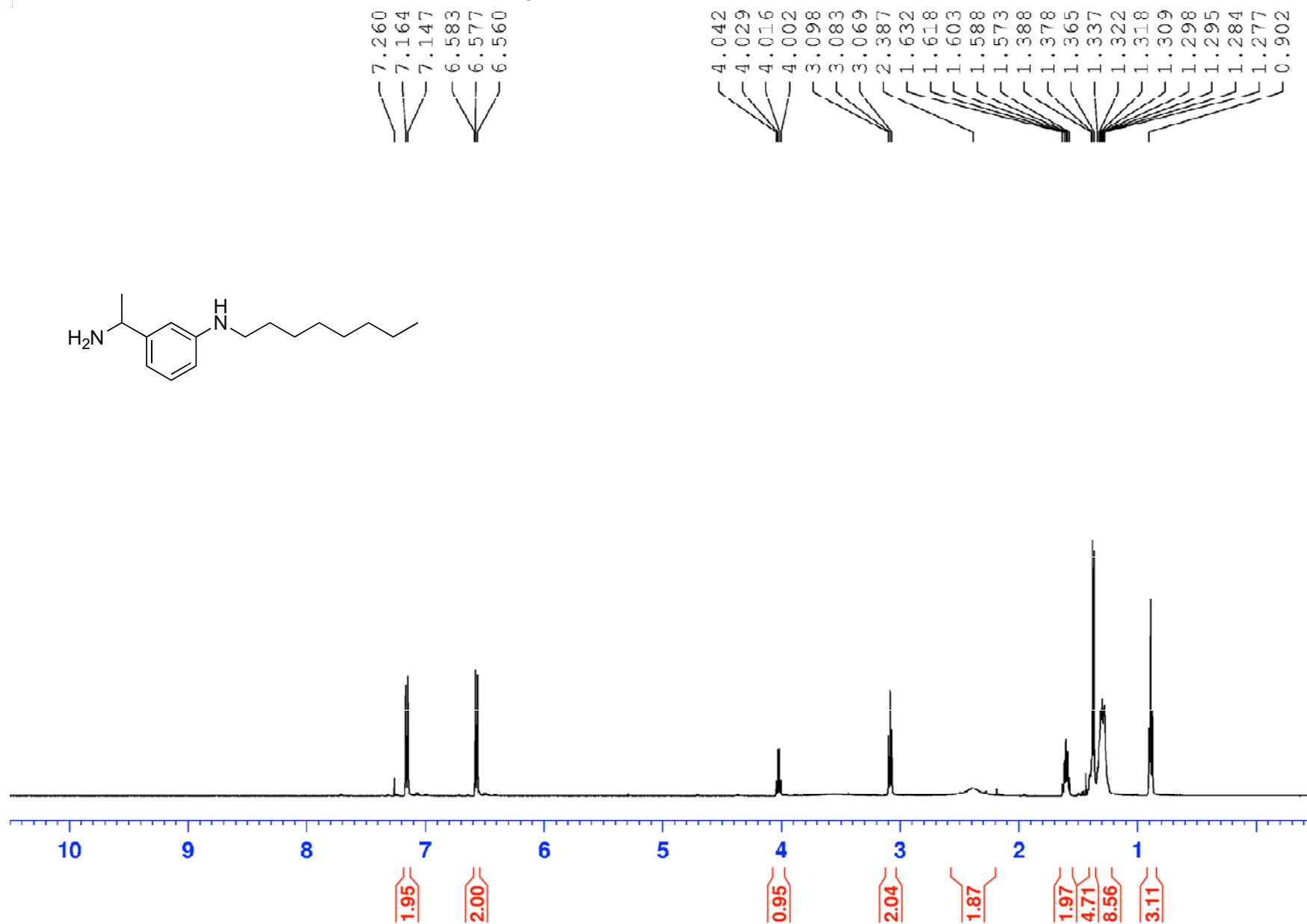
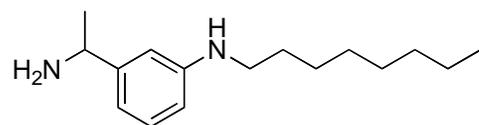
¹H NMR of *N*¹-octylbenzene-1,3-diamine (2a) (CDCl₃, 500 MHz, 300K)



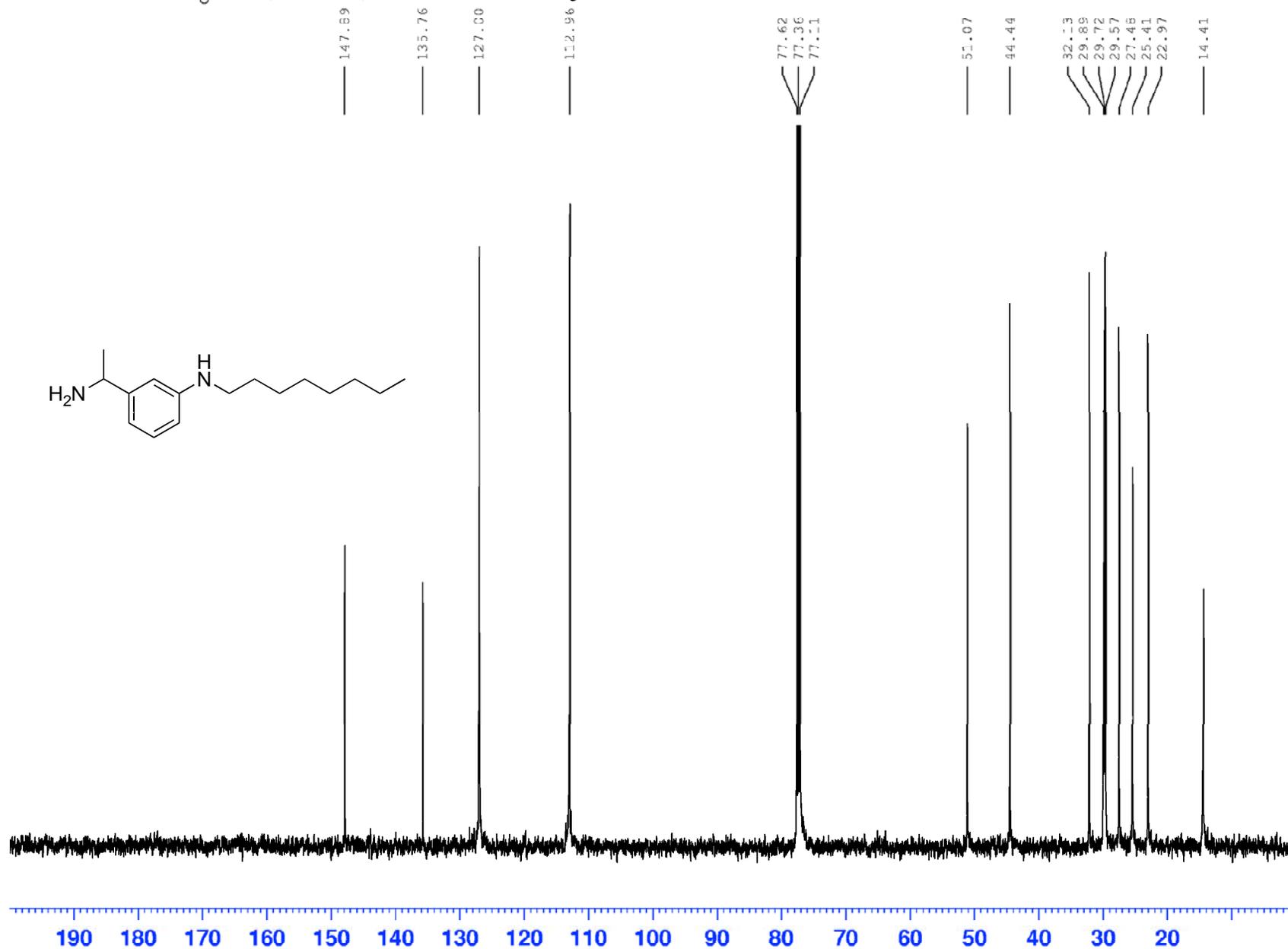
$^{13}\text{C}\{^1\text{H}\}$ NMR of N^1 -octylbenzene-1,3-diamine (2a) (CDCl_3 , 126 MHz, 300K)



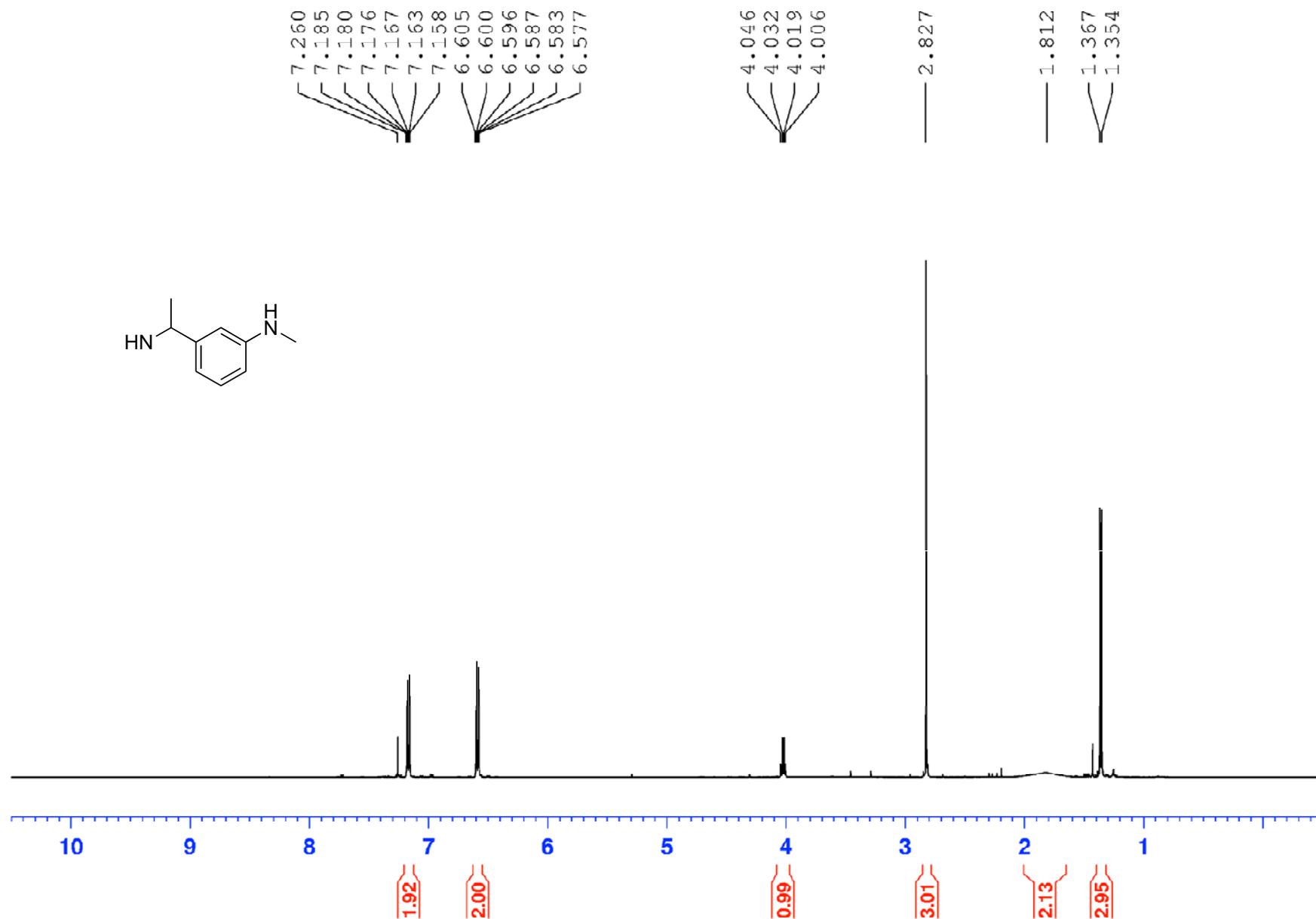
¹H NMR of 3-(1-aminoethyl)-N-octylaniline (2b) (CDCl₃, 500 MHz, 300K)



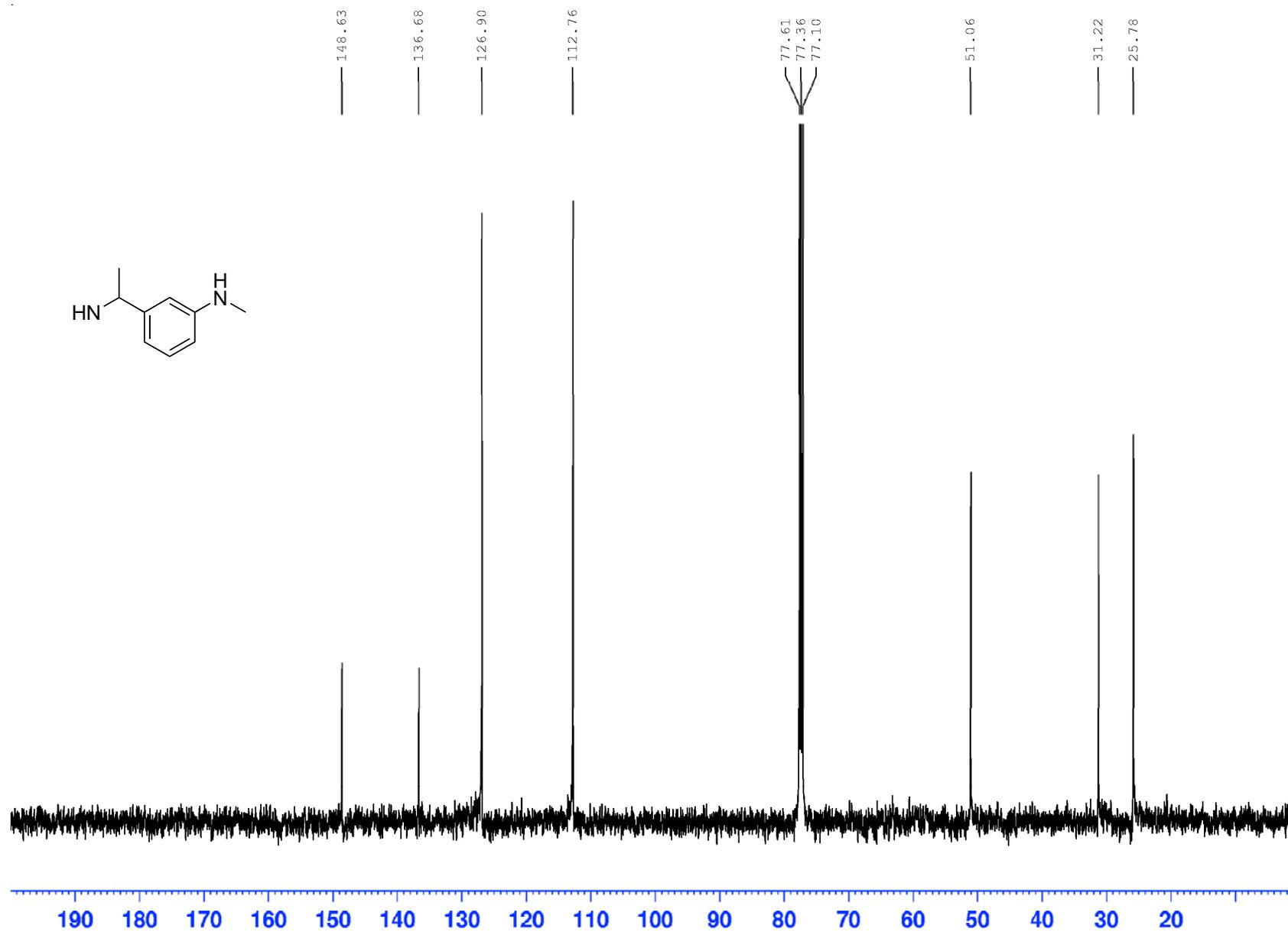
$^{13}\text{C}\{^1\text{H}\}$ NMR of 3-(1-aminoethyl)-N-octylaniline (2b) (CDCl_3 , 126 MHz, 300K)



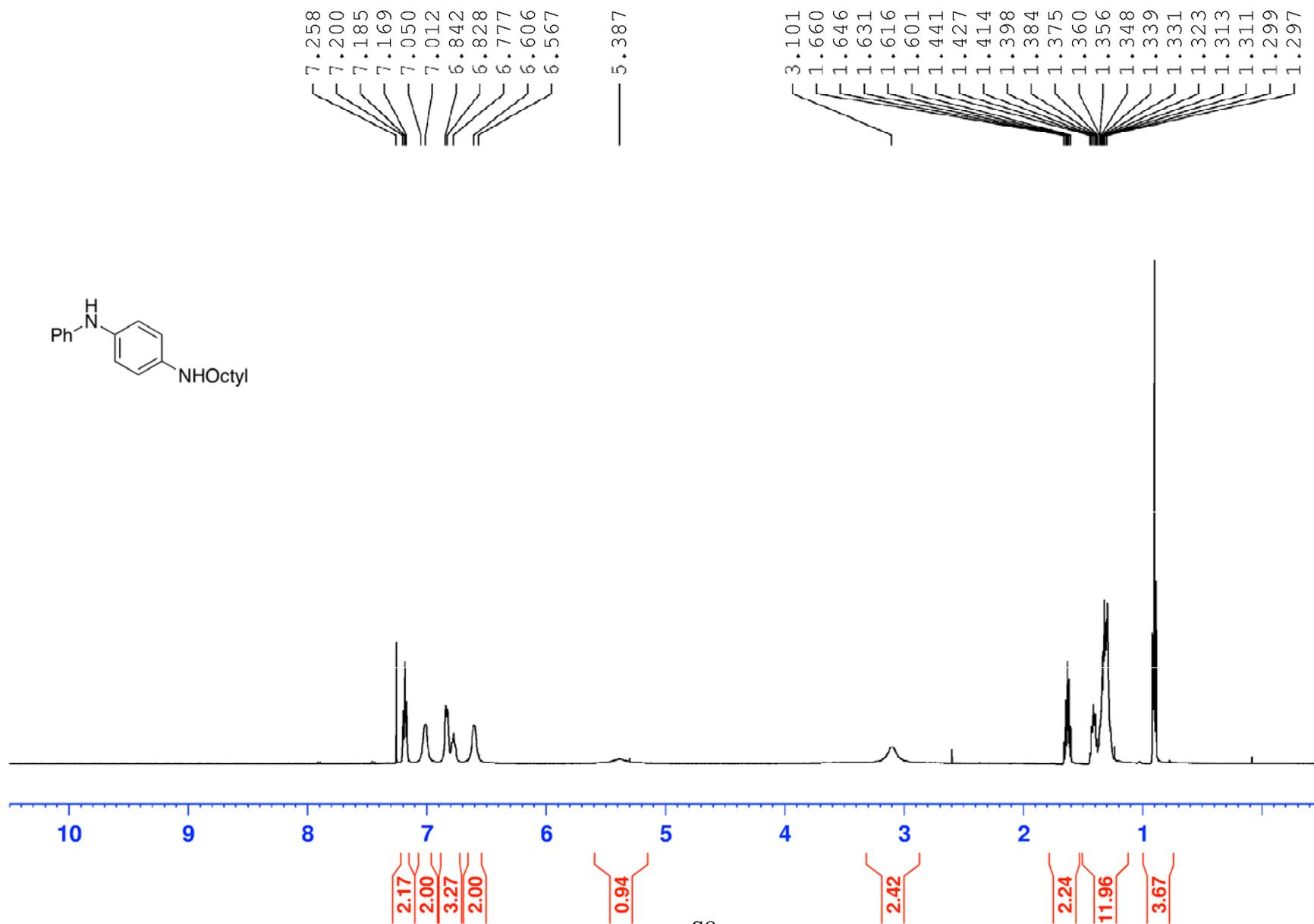
¹H NMR of 3-(1-aminoethyl)-N-methylaniline (2c) (CDCl₃, 500 MHz, 300K)



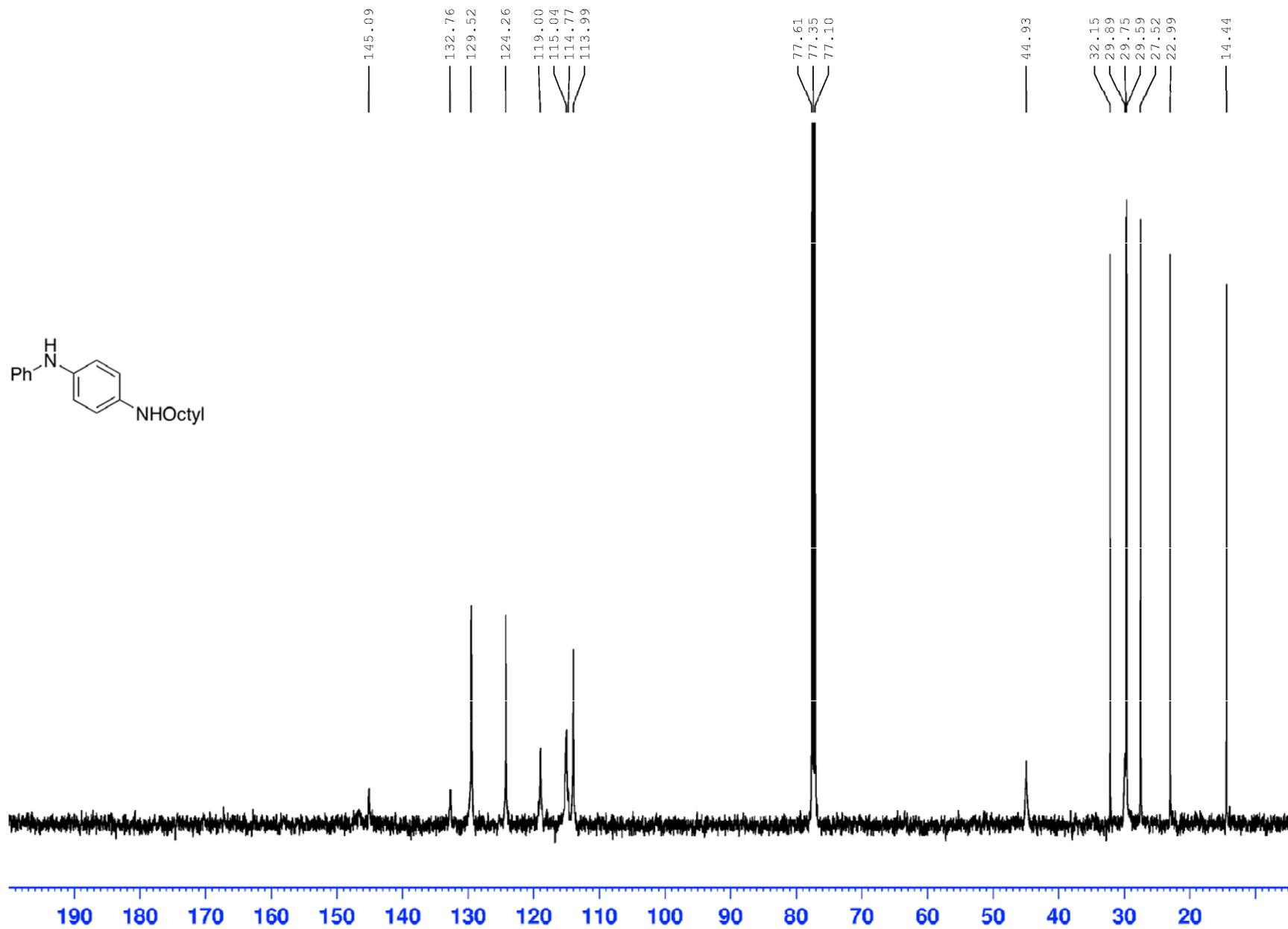
$^{13}\text{C}\{^1\text{H}\}$ NMR of 3-(1-aminoethyl)-N-methylaniline (2c) (CDCl_3 , 126 MHz, 300K)



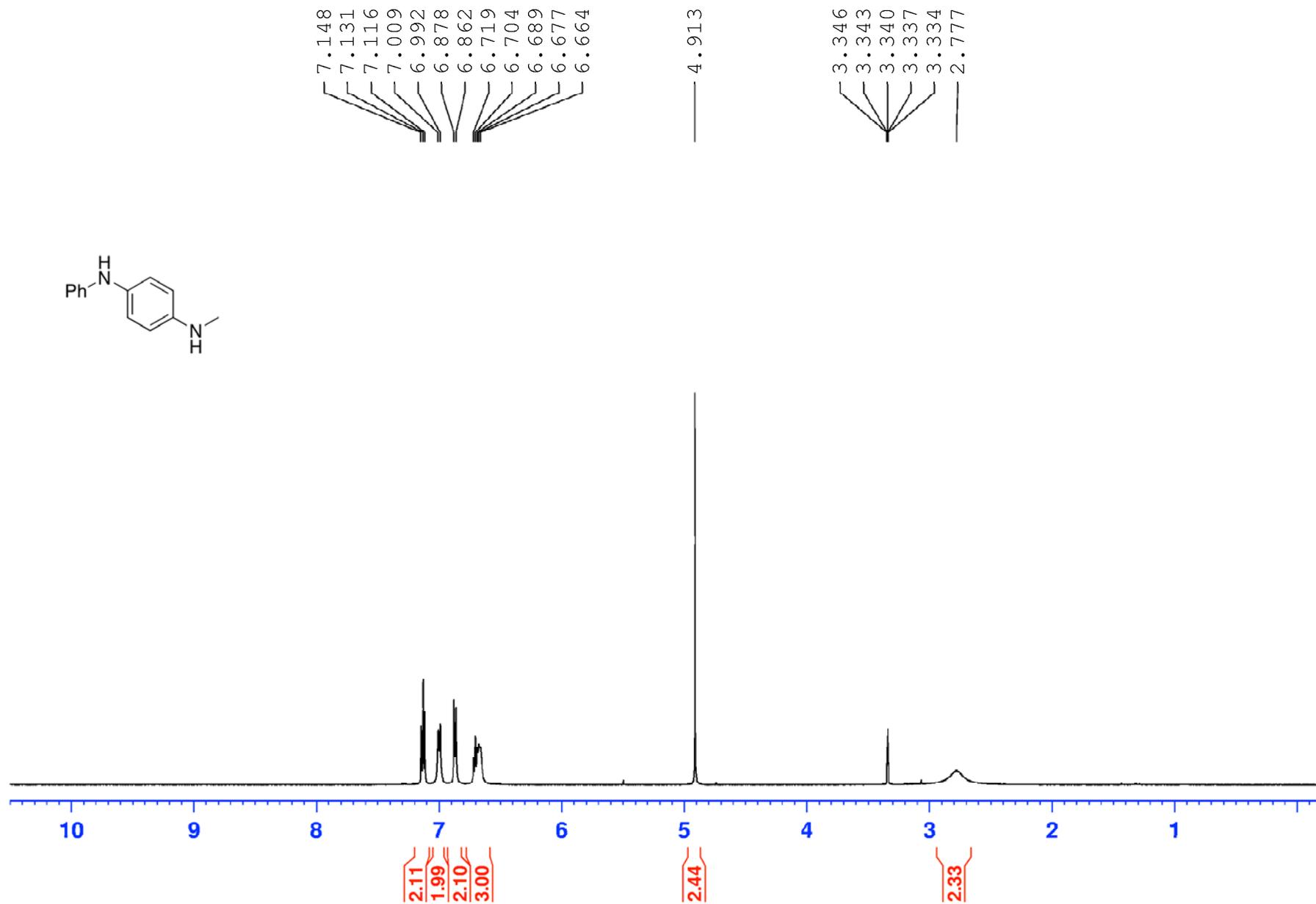
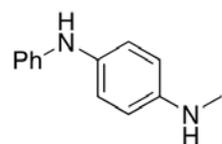
¹H NMR of *N*¹-octyl-*N*⁴-phenylbenzene-1,4-diamine (2d) (CDCl₃, 500 MHz, 300K)



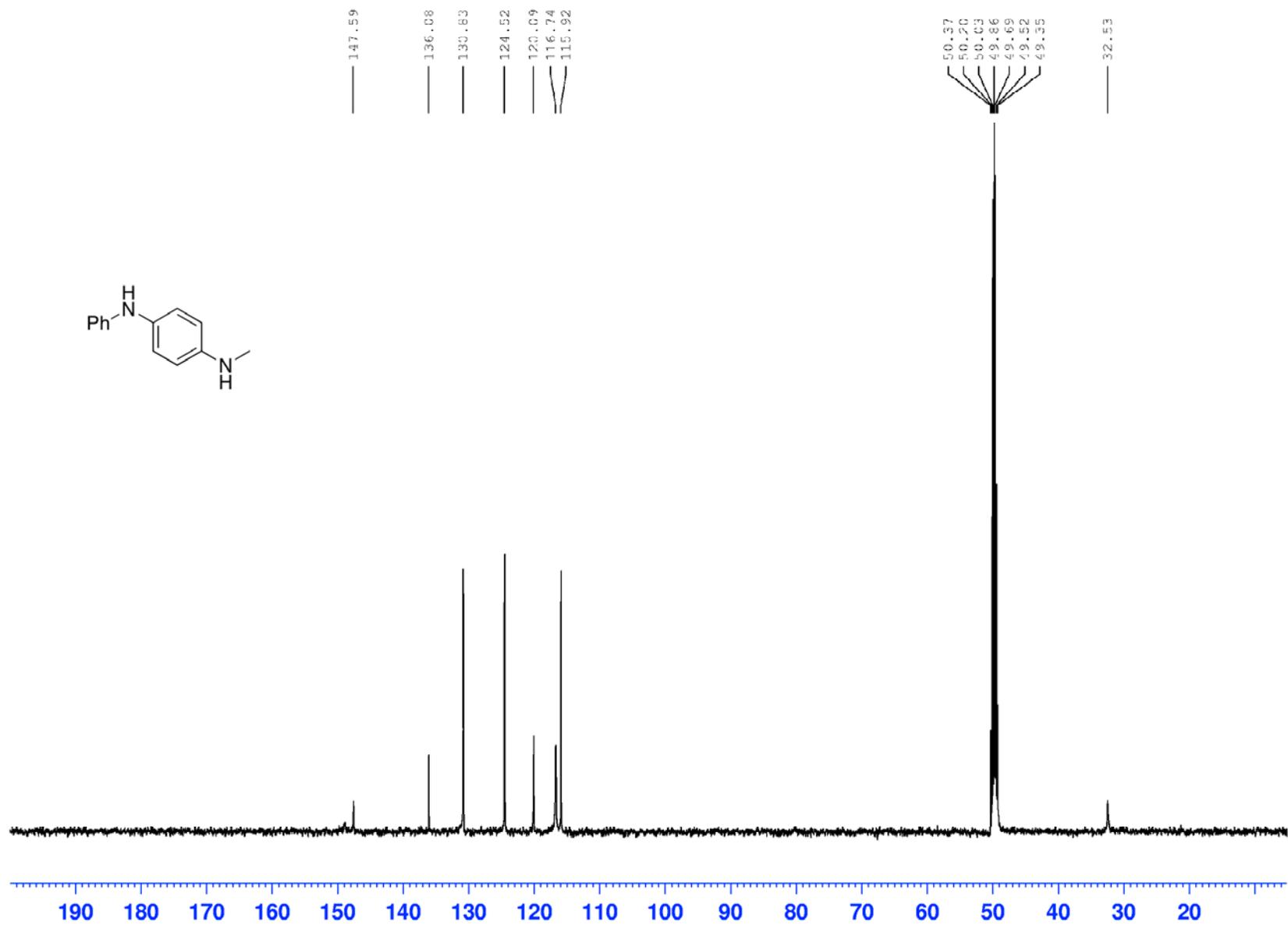
$^{13}\text{C}\{^1\text{H}\}$ NMR of N^1 -octyl- N^4 -phenylbenzene-1,4-diamine (2d) (CDCl_3 , 126 MHz, 300K)



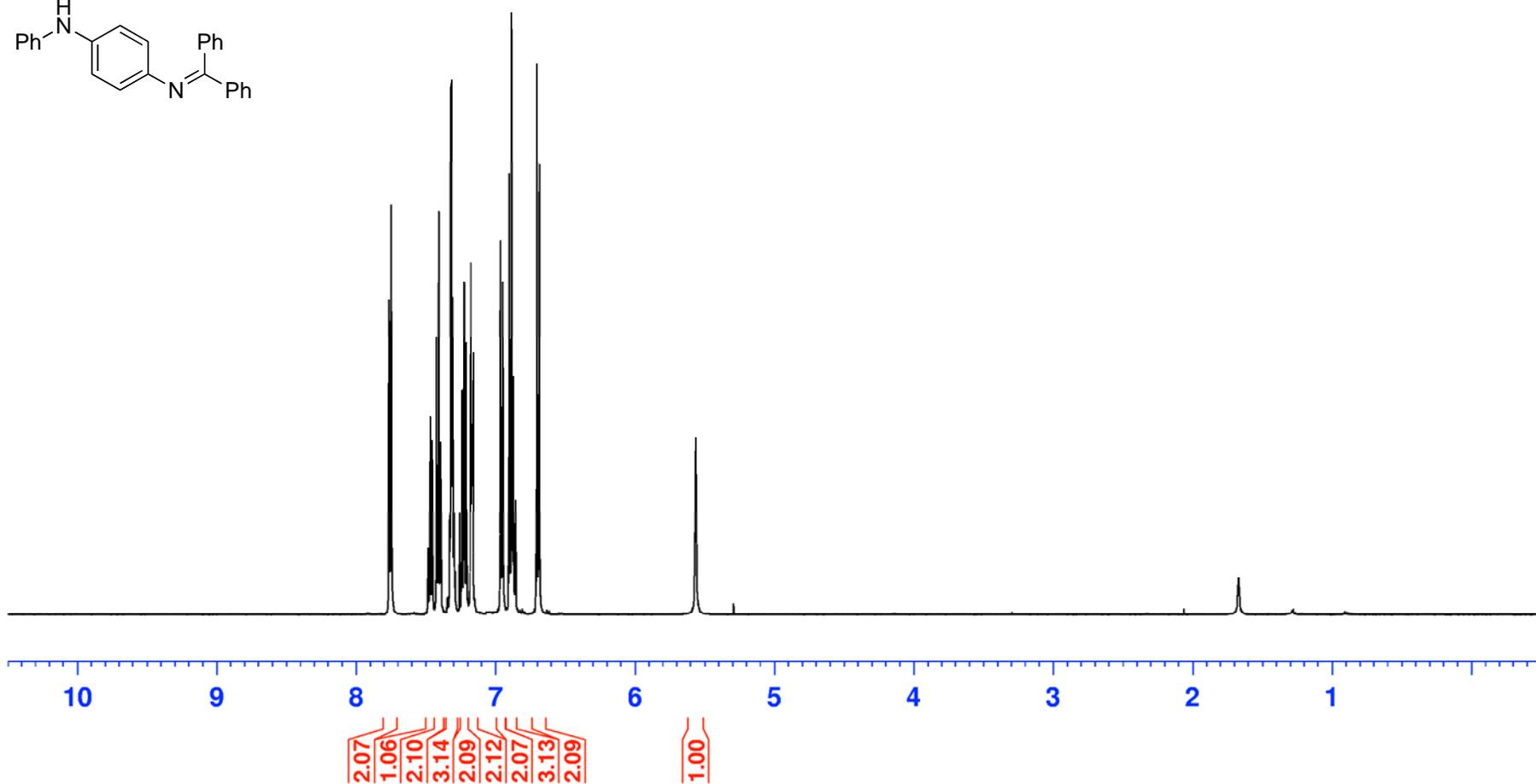
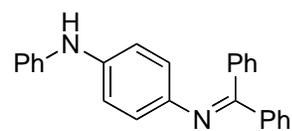
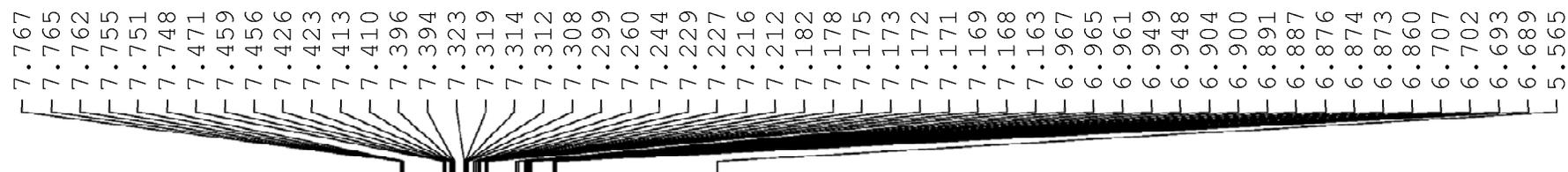
¹H NMR of *N*¹-methyl-*N*⁴-phenylbenzene-1,4-diamine (2e) (MeOD, 500 MHz, 300K)



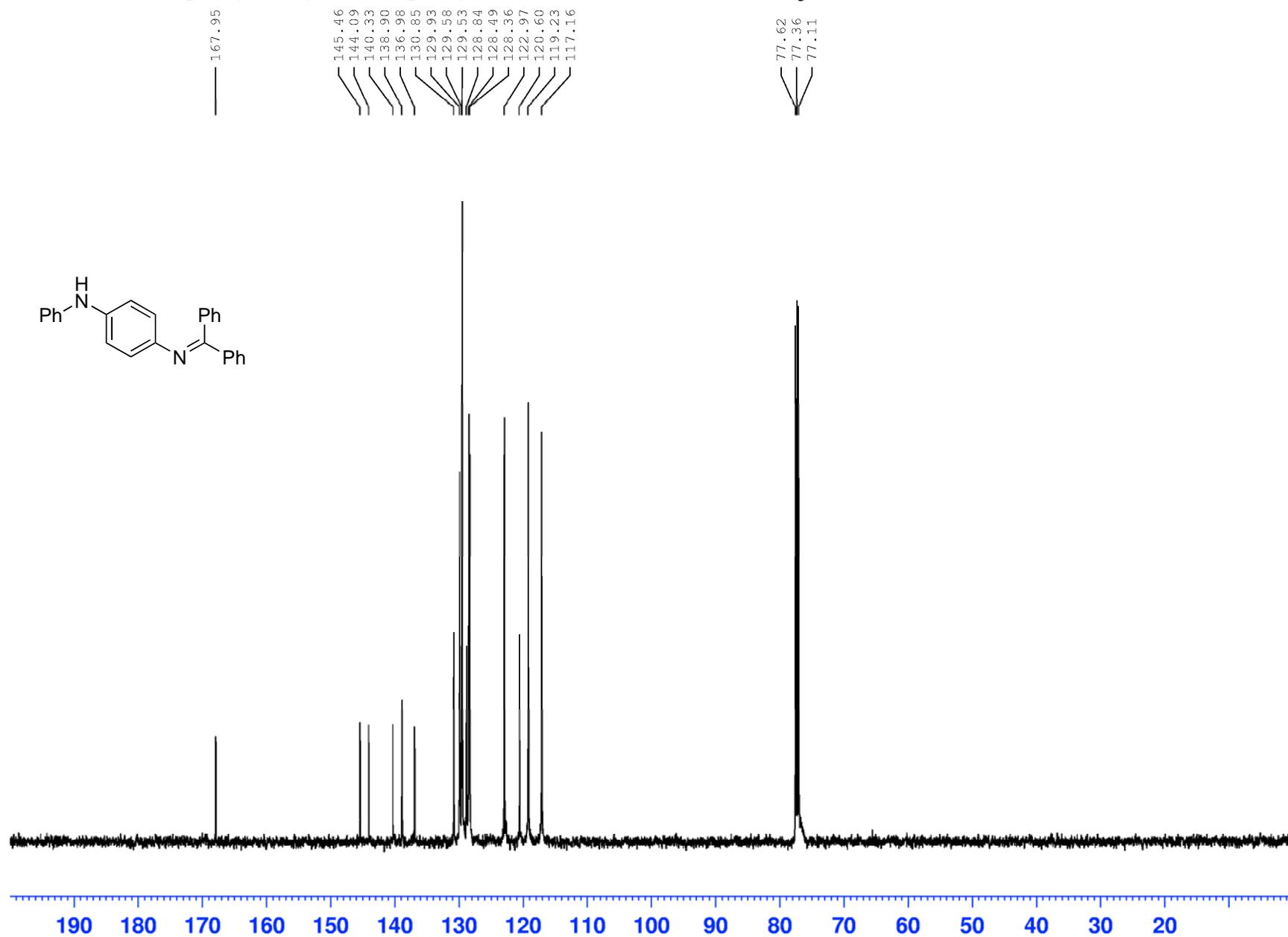
$^{13}\text{C}\{^1\text{H}\}$ NMR of *N*¹-methyl-*N*⁴-phenylbenzene-1,4-diamine (2e) (MeOD, 126 MHz, 300K)



¹H NMR of N¹-(diphenylmethylene)-N⁴-phenylbenzene-1,4-diamine (2f) (CDCl₃, 500 MHz, 300K)



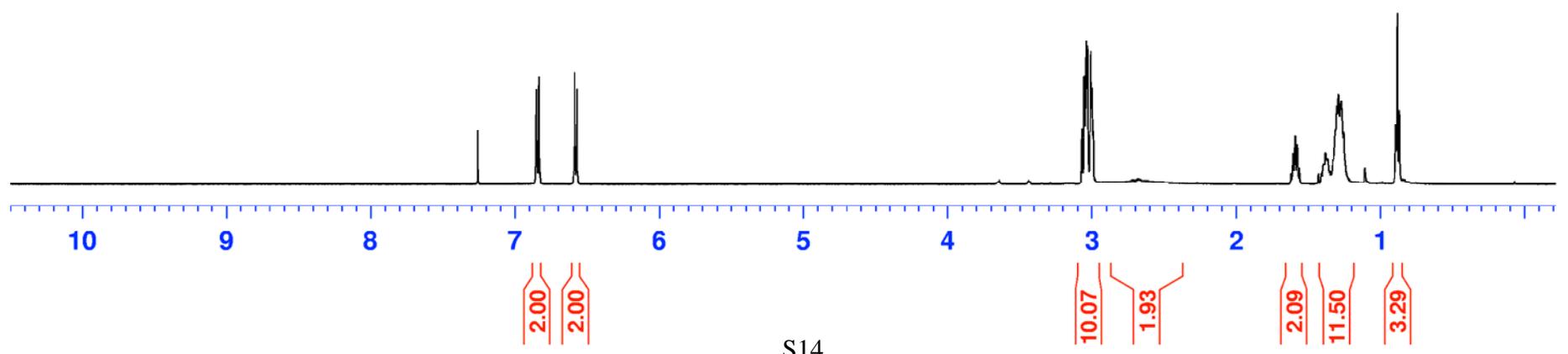
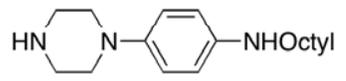
$^{13}\text{C}\{^1\text{H}\}$ NMR of N^1 -(diphenylmethylene)- N^4 -phenylbenzene-1,4-diamine (2f) (CDCl_3 , 126 MHz, 300K)



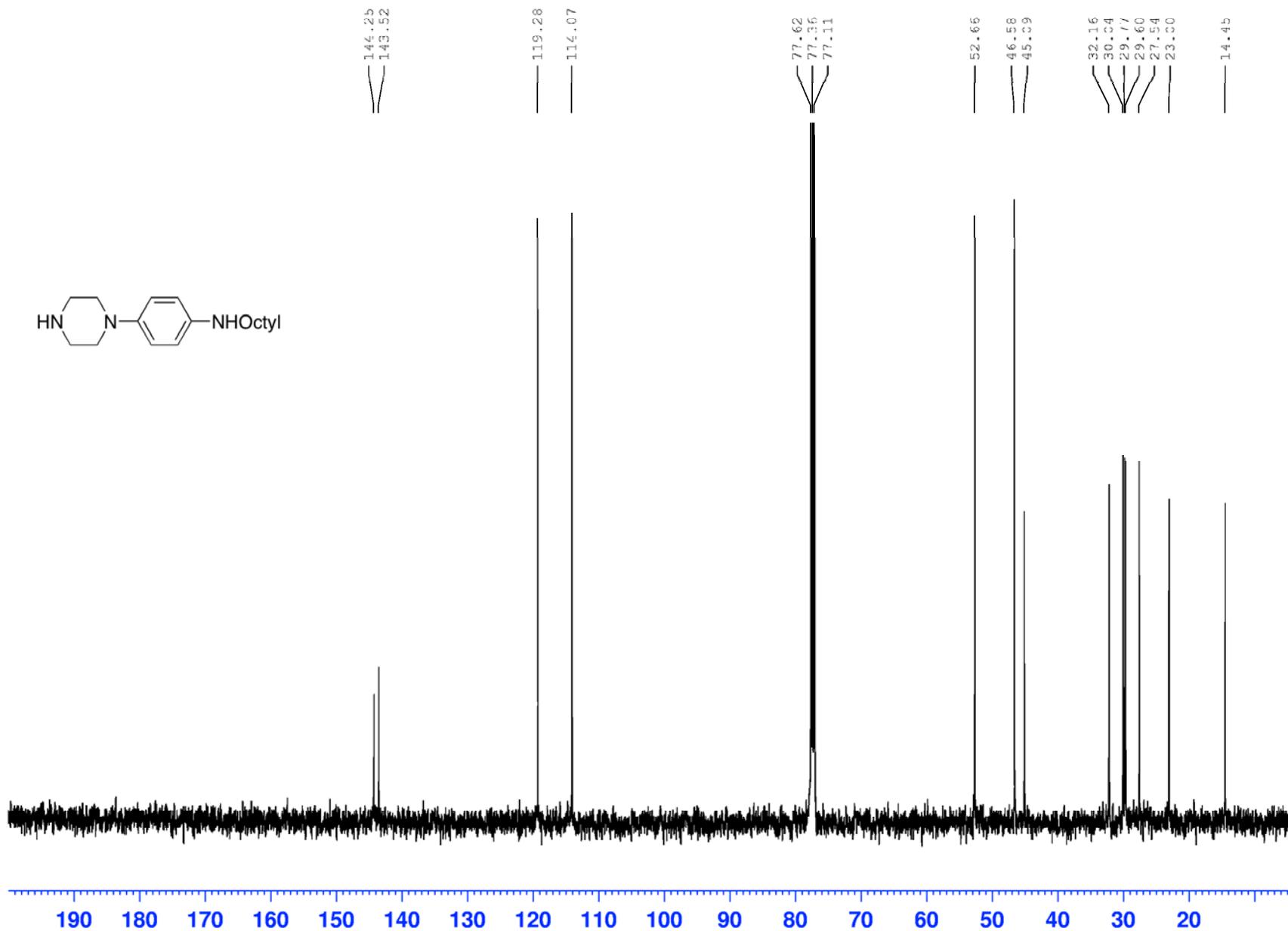
¹H NMR of *N*-octyl-4-(piperazin-1-yl)aniline (2g) (CDCl₃, 500 MHz, 300K)

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6.830
6.596
6.589
6.576
6.572
6.565

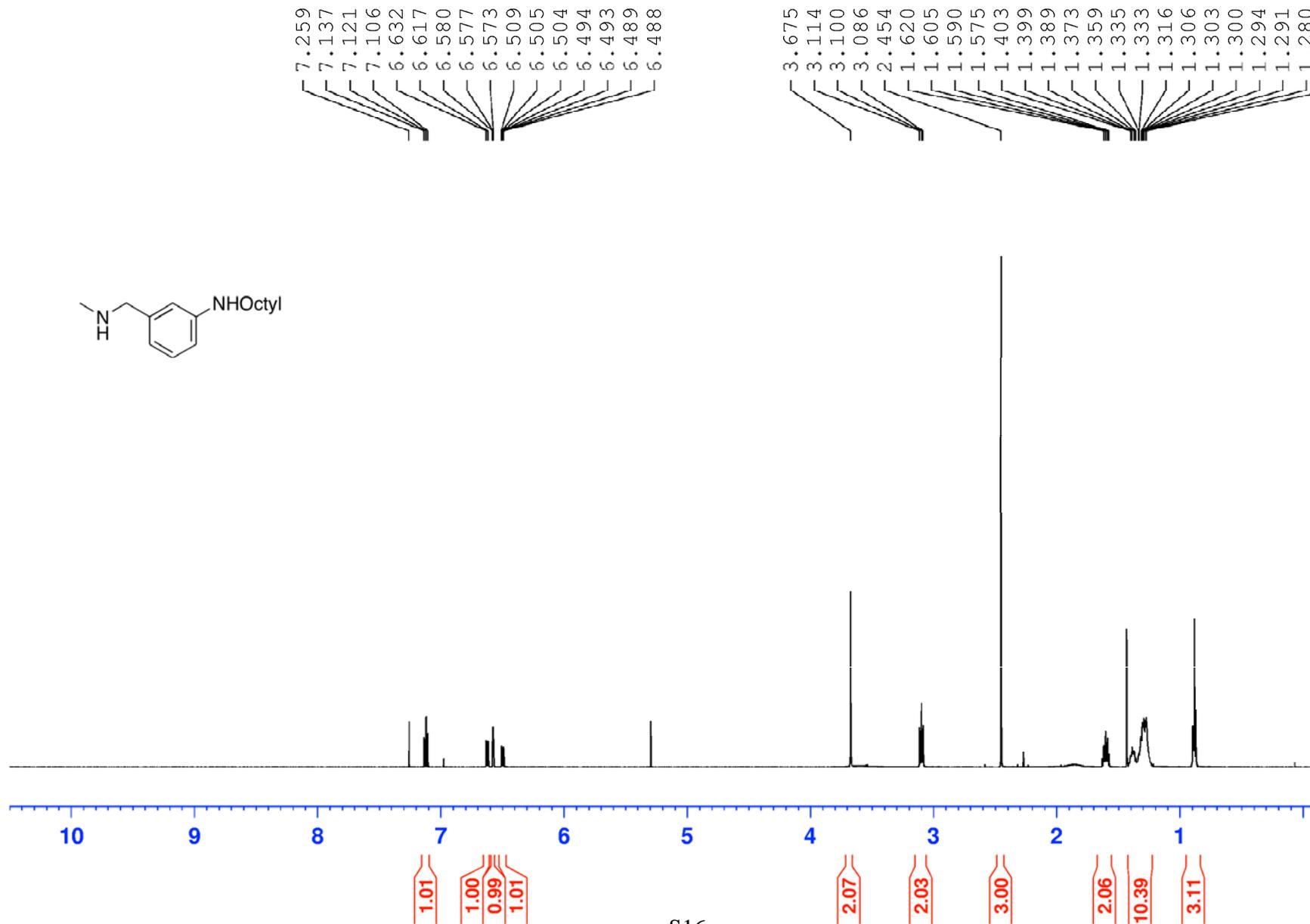
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3.055
3.042
3.037
3.032
3.009
2.997
2.991
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1.269



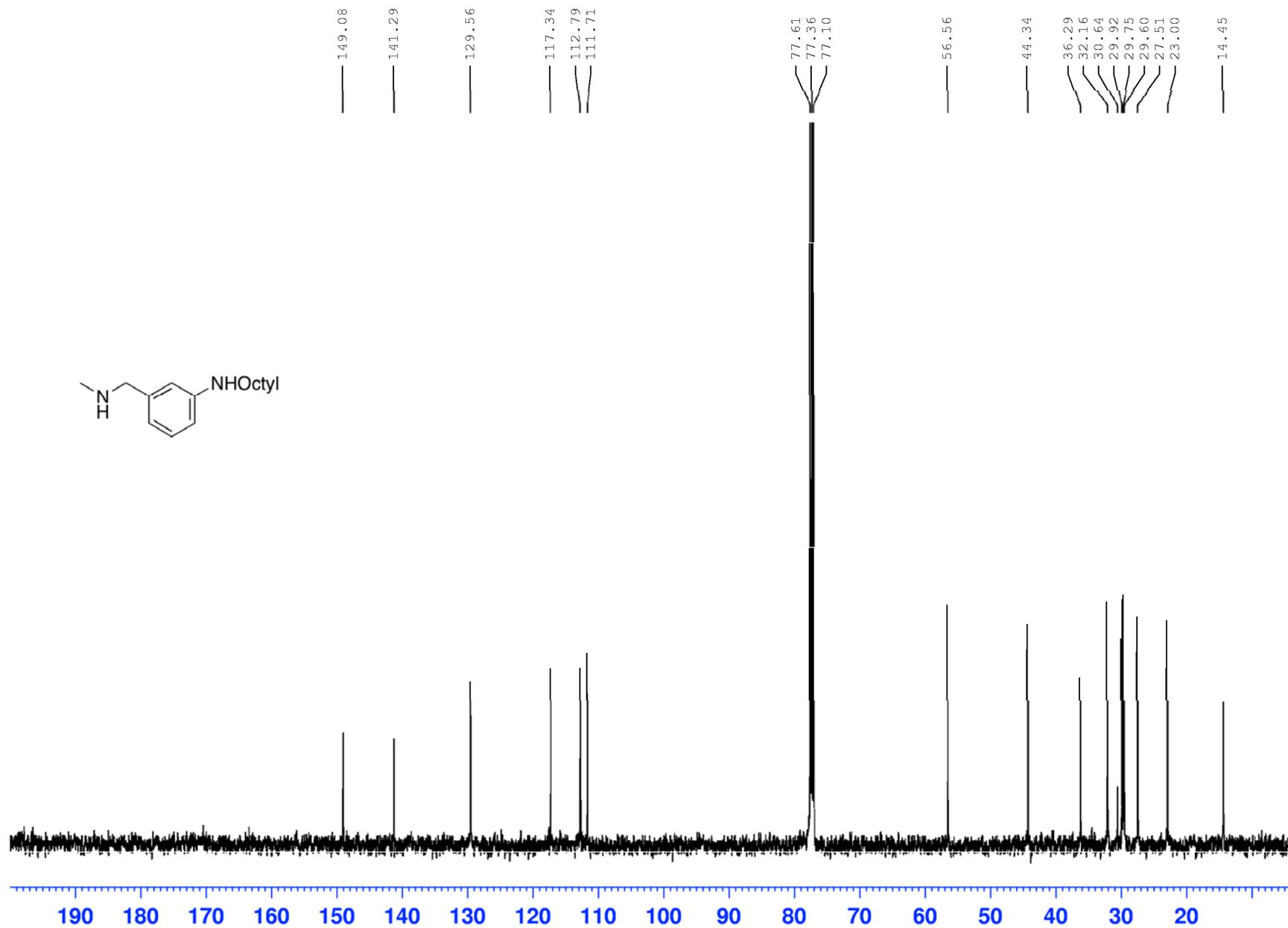
$^{13}\text{C}\{^1\text{H}\}$ NMR of *N*-octyl-4-(piperazin-1-yl)aniline (2g) (CDCl_3 , 126 MHz, 300K)



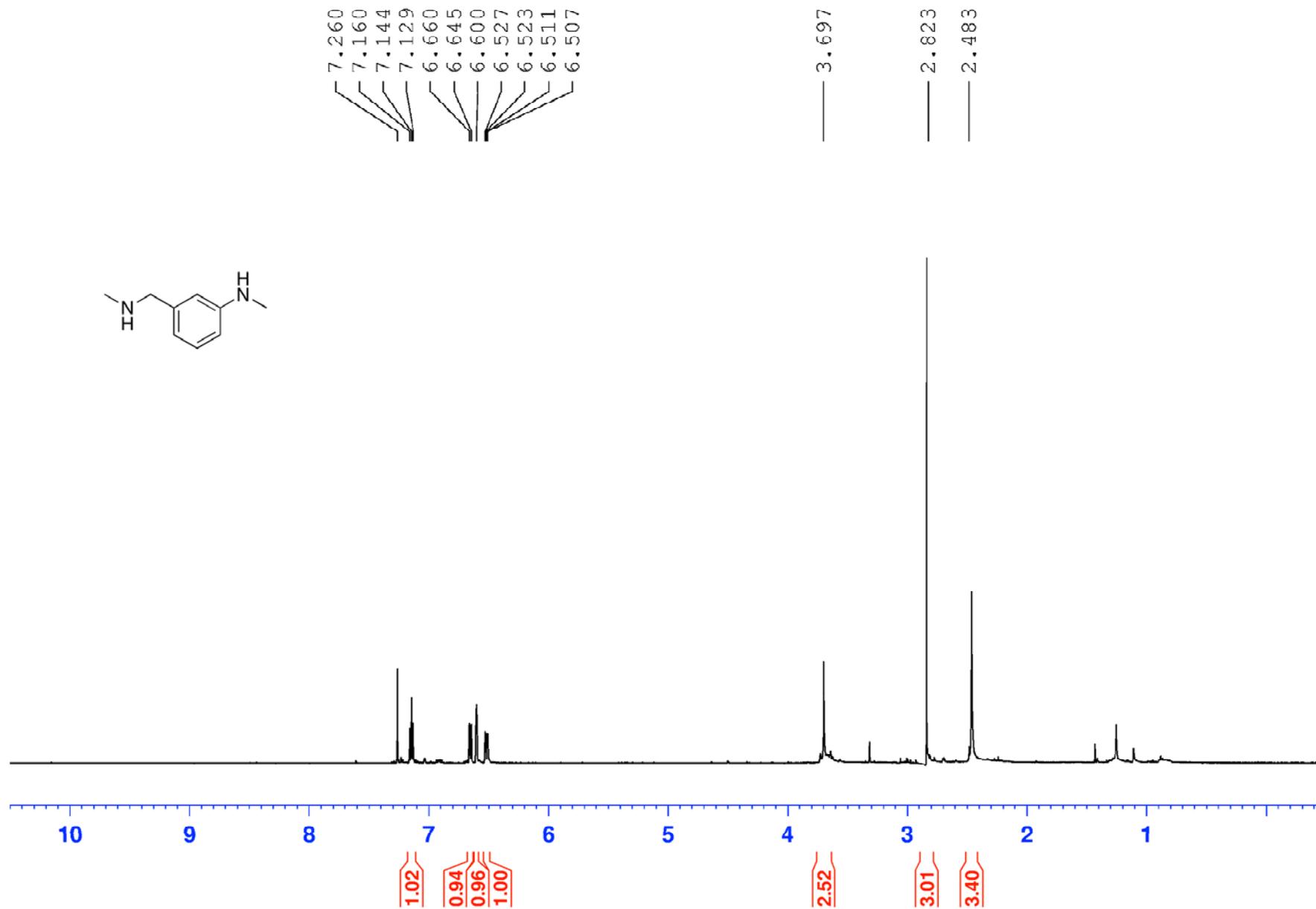
¹H NMR of 3-((methylamino)methyl)-*N*-octylaniline (2h) (CDCl₃, 500 MHz, 300K)



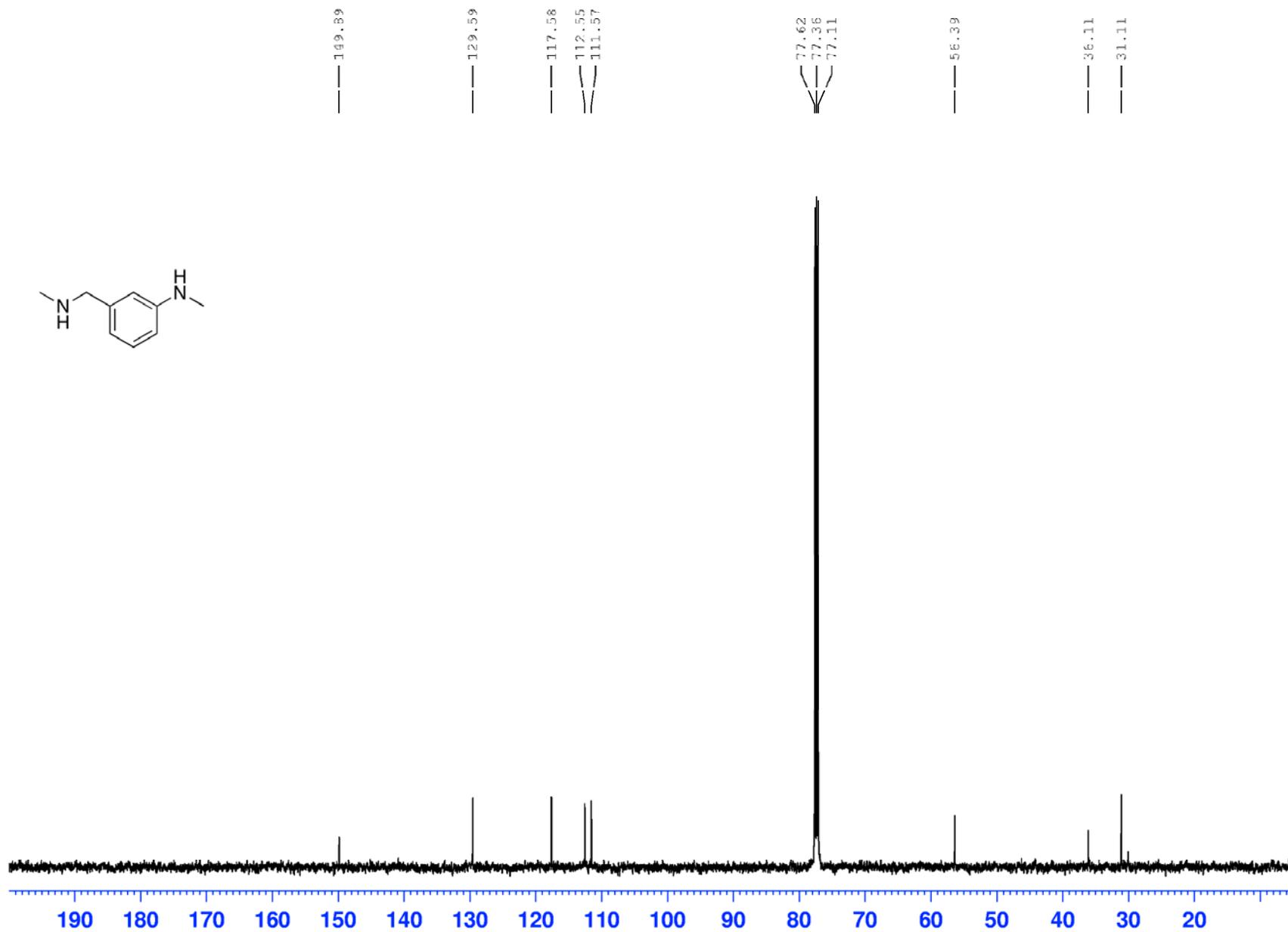
$^{13}\text{C}\{^1\text{H}\}$ NMR of 3-((methylamino)methyl)-*N*-octylaniline (2h) (CDCl_3 , 126 MHz, 300K)



¹H NMR of N-methyl-3-((methylamino)methyl)aniline (2i) (CDCl₃, 500 MHz, 300K)

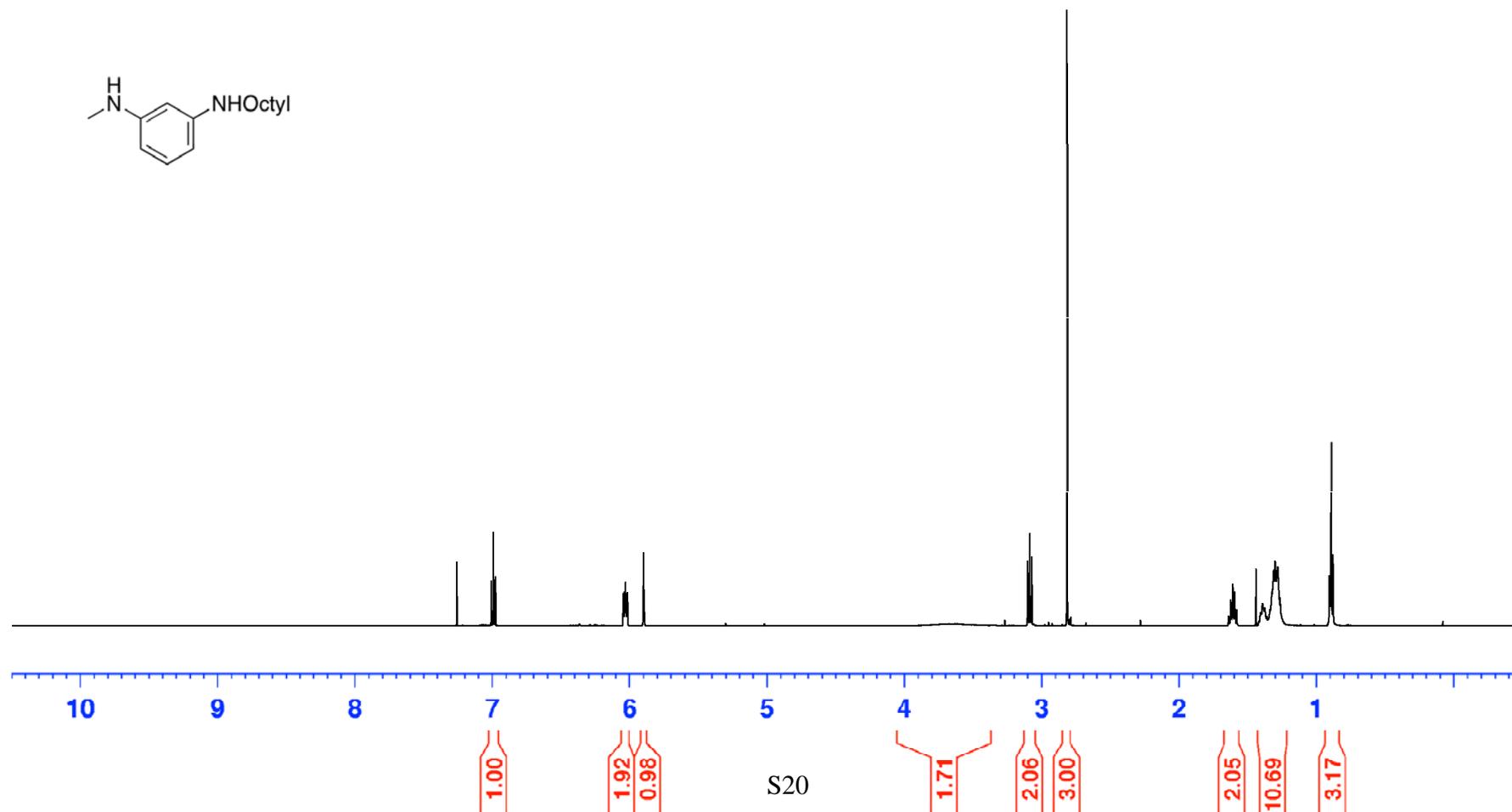
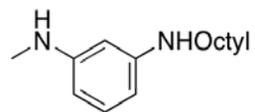


$^{13}\text{C}\{^1\text{H}\}$ NMR of N-methyl-3-((methylamino)methyl)aniline (2i) (CDCl_3 , 126 MHz, 300K)

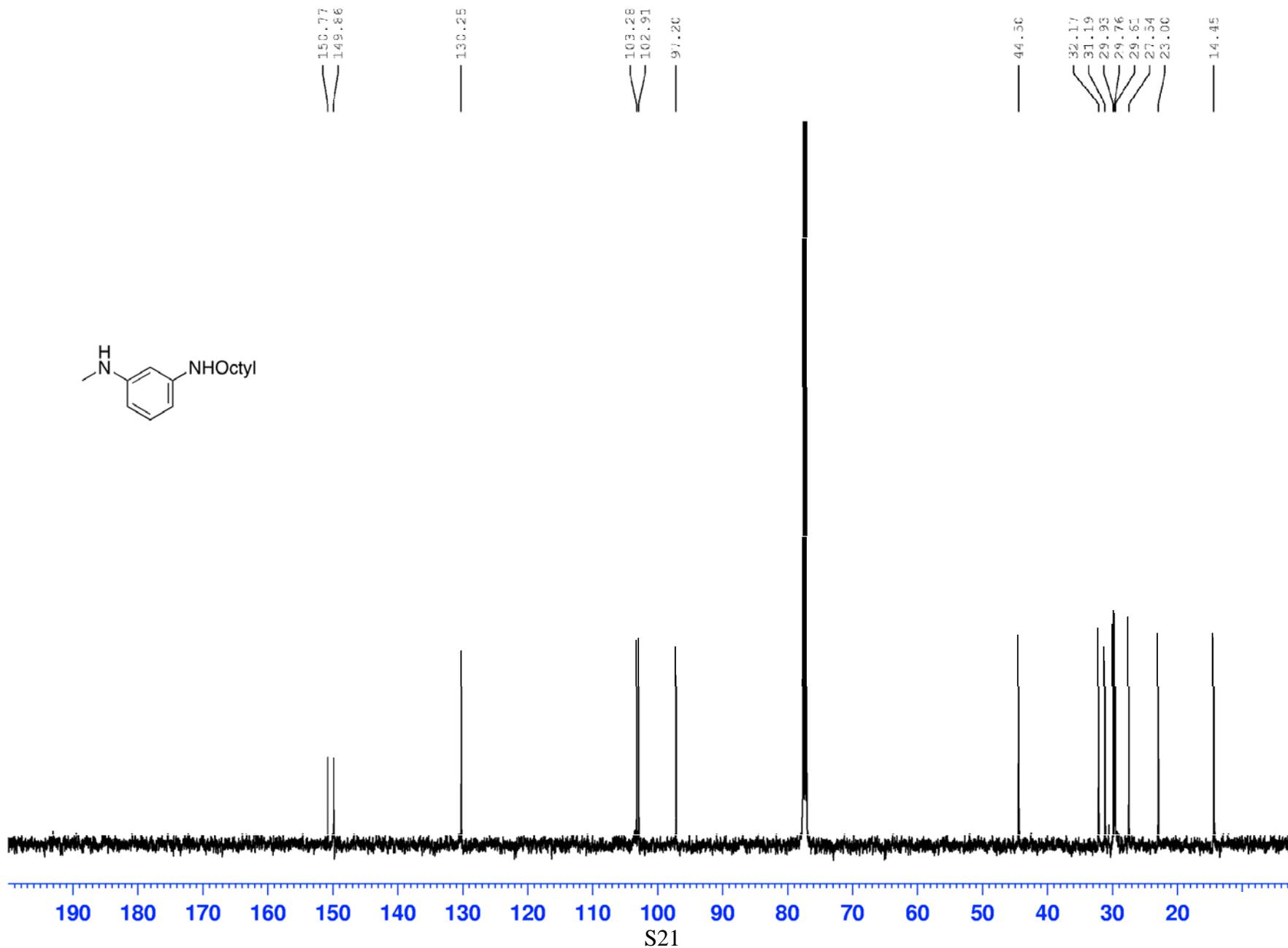
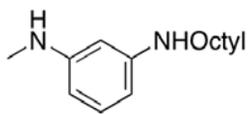


¹H NMR of N¹-methyl-N³-octylbenzene-1,3-diamine (2j) (CDCl₃, 500 MHz, 300K)

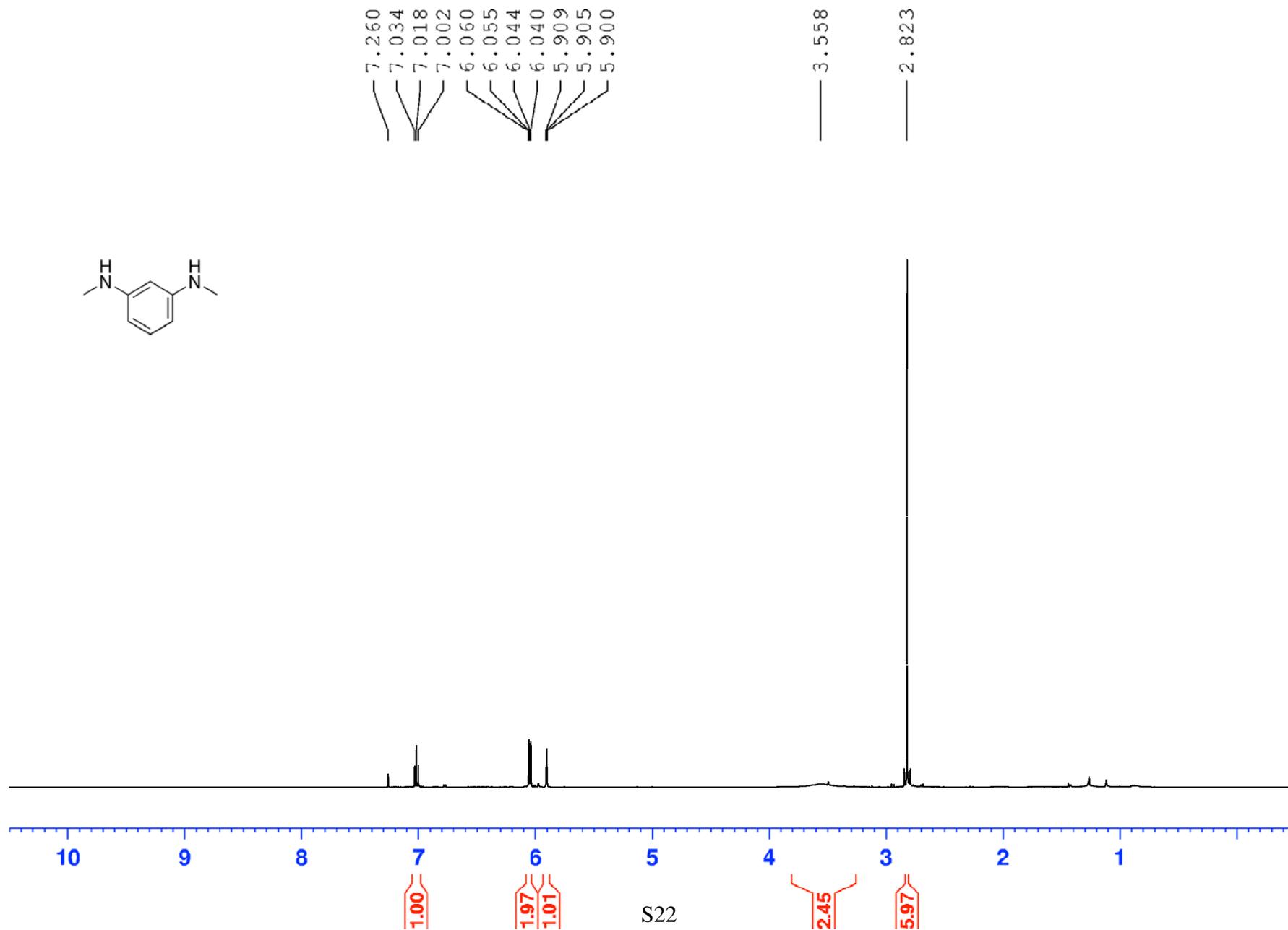
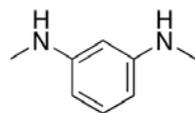
7.260
7.010
6.994
6.978
6.048
6.046
6.044
6.042
6.039
6.037
6.034
6.032
6.031
6.028
6.026
6.023
6.021
6.018
6.017
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5.895
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1.302



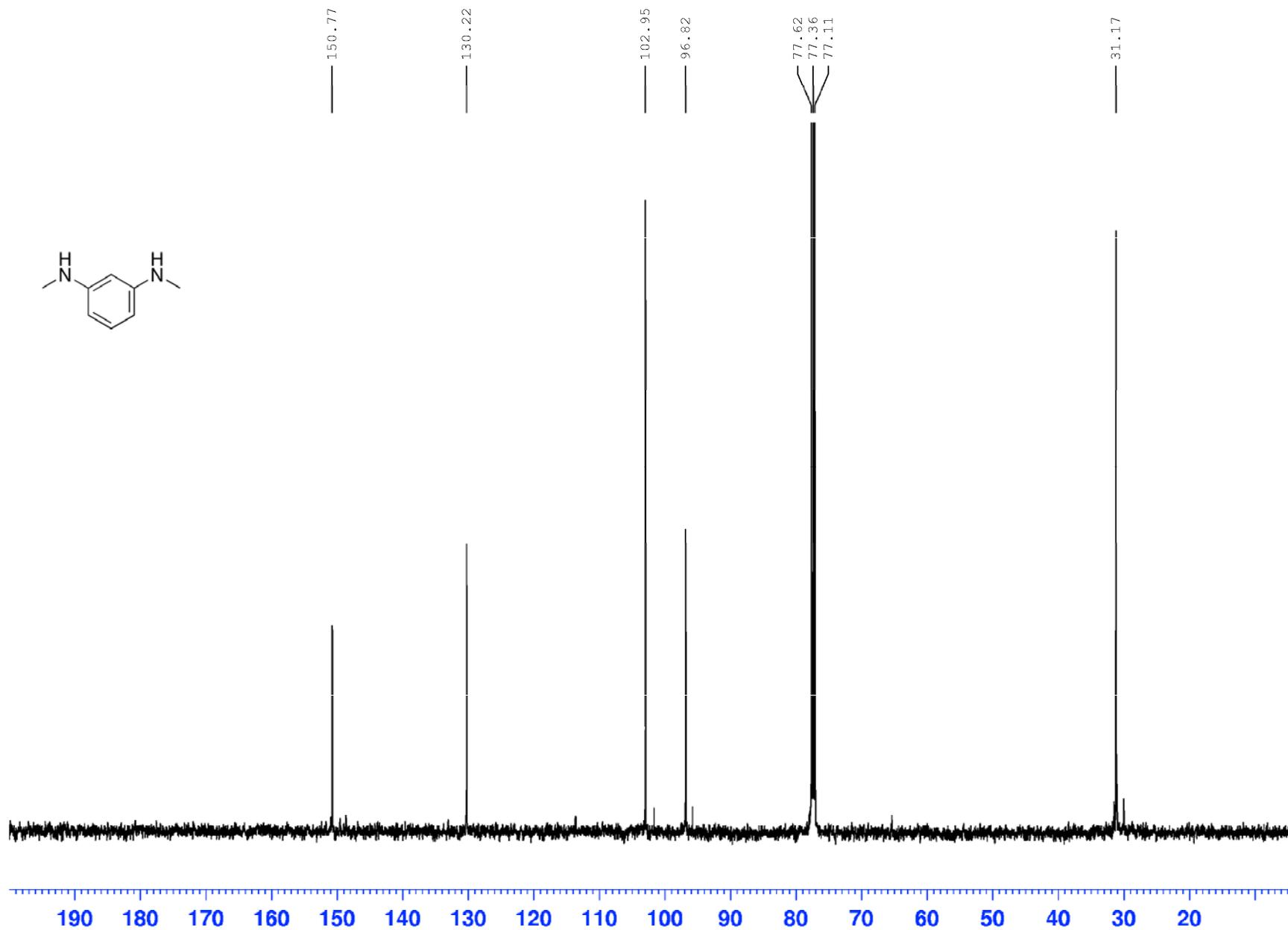
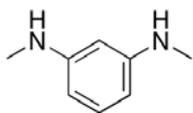
$^{13}\text{C}\{^1\text{H}\}$ NMR of N¹-methyl-N³-octylbenzene-1,3-diamine (2j) (CDCl₃, 126 MHz, 300K)



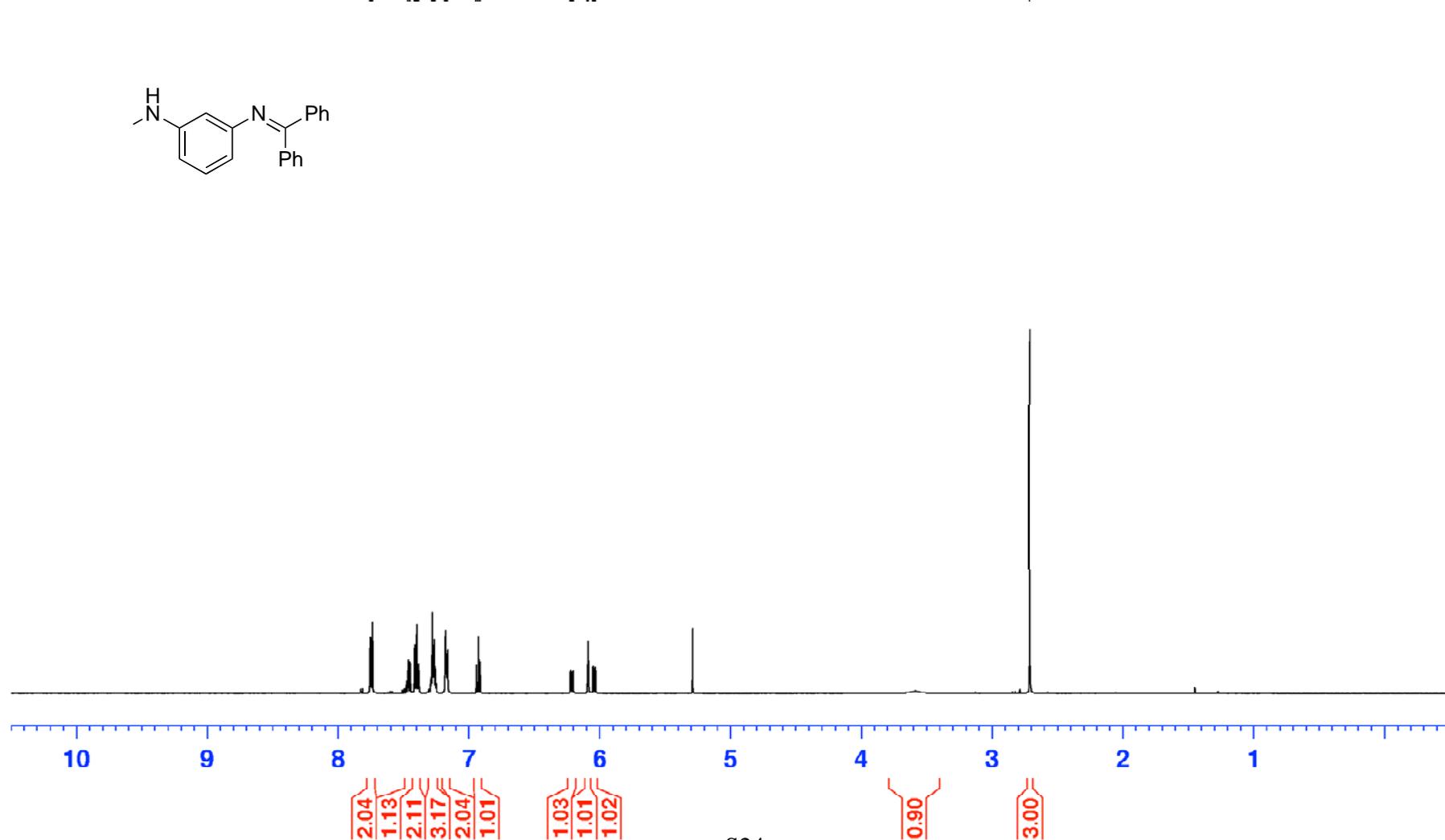
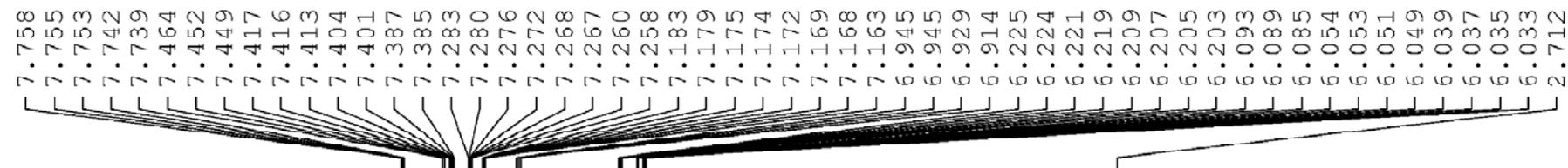
¹H NMR of N¹,N³-dimethylbenzene-1,3-diamine (2k) (CDCl₃, 500 MHz, 300K)



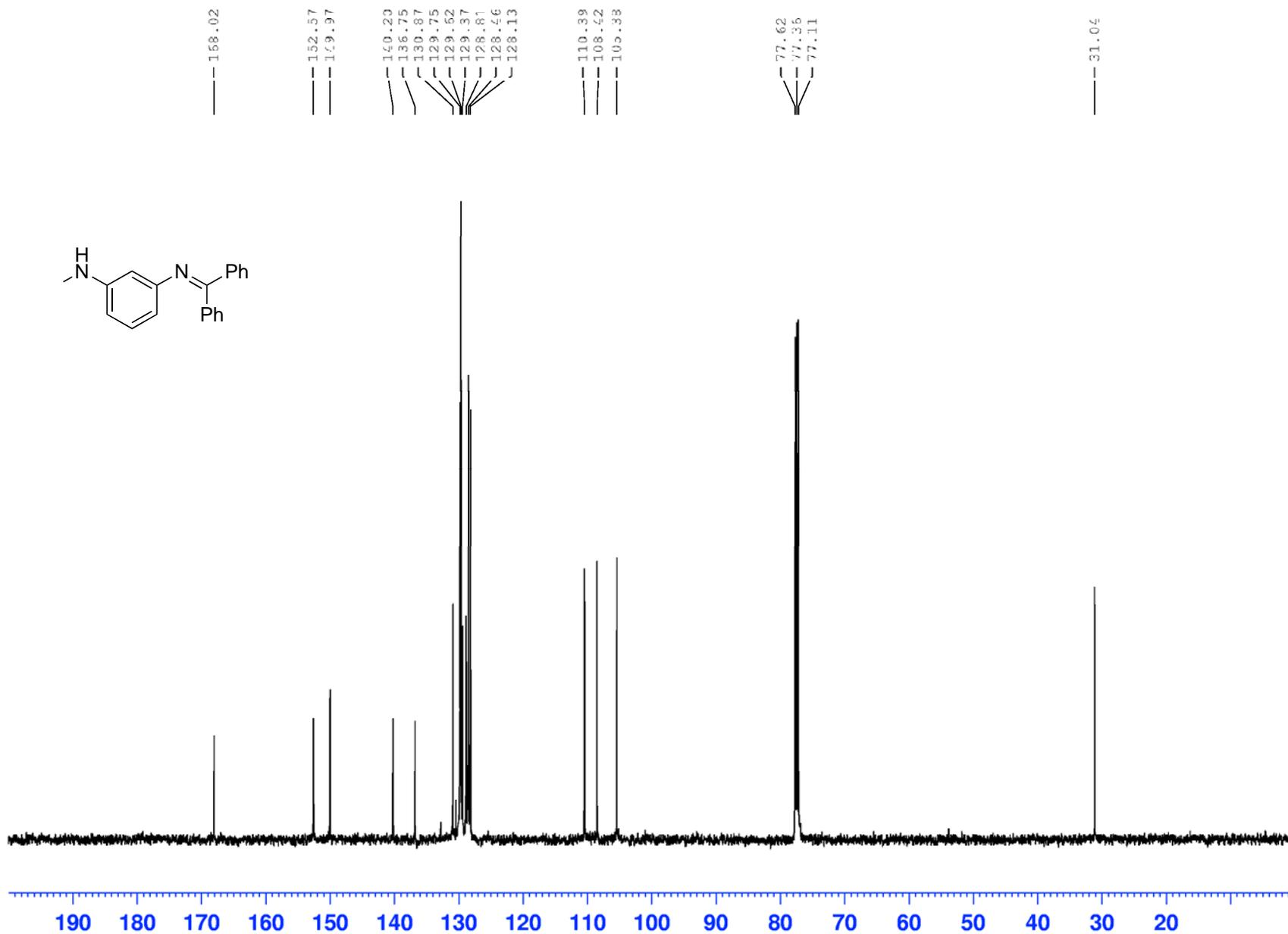
$^{13}\text{C}\{^1\text{H}\}$ NMR of N^1,N^3 -dimethylbenzene-1,3-diamine (2k) (CDCl_3 , 126 MHz, 300K)



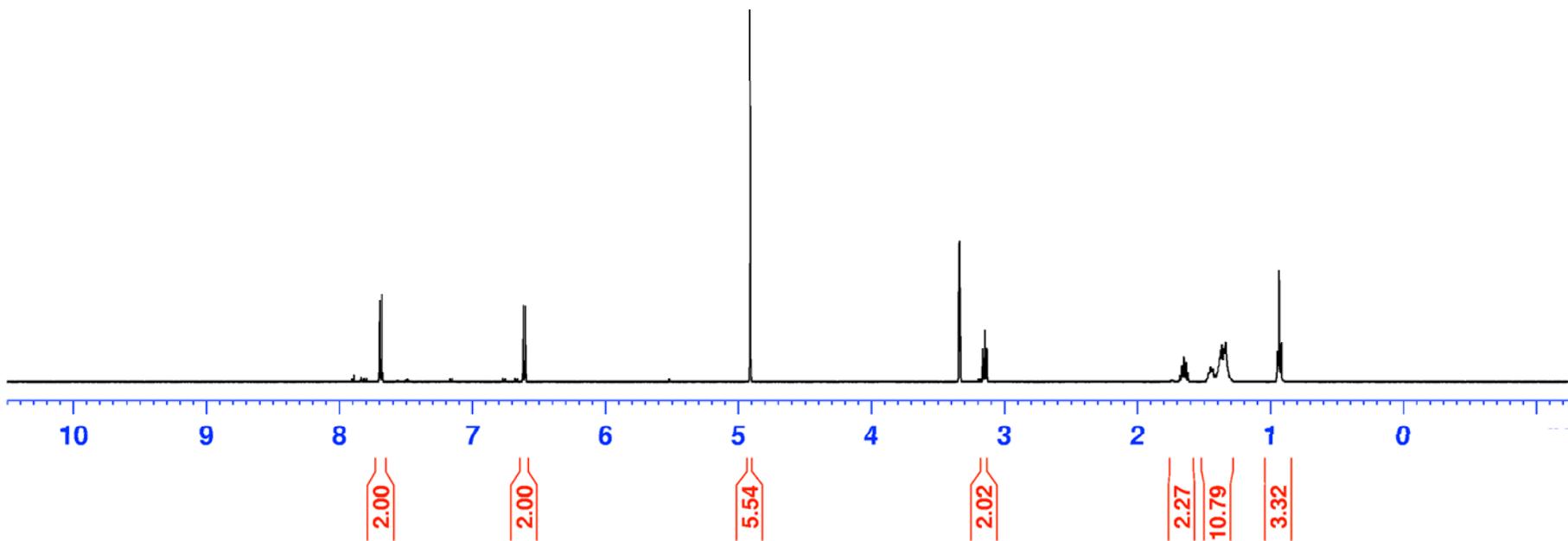
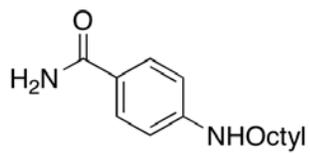
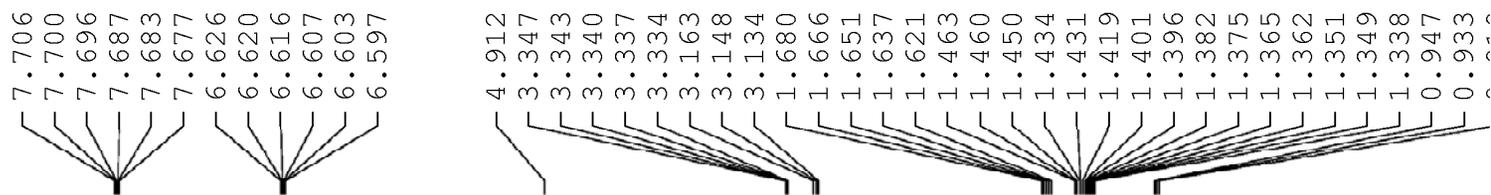
¹H NMR of N¹-(diphenylmethylene)-N³-methylbenzene-1,3-diamine (2l) (CDCl₃, 500 MHz, 300K)



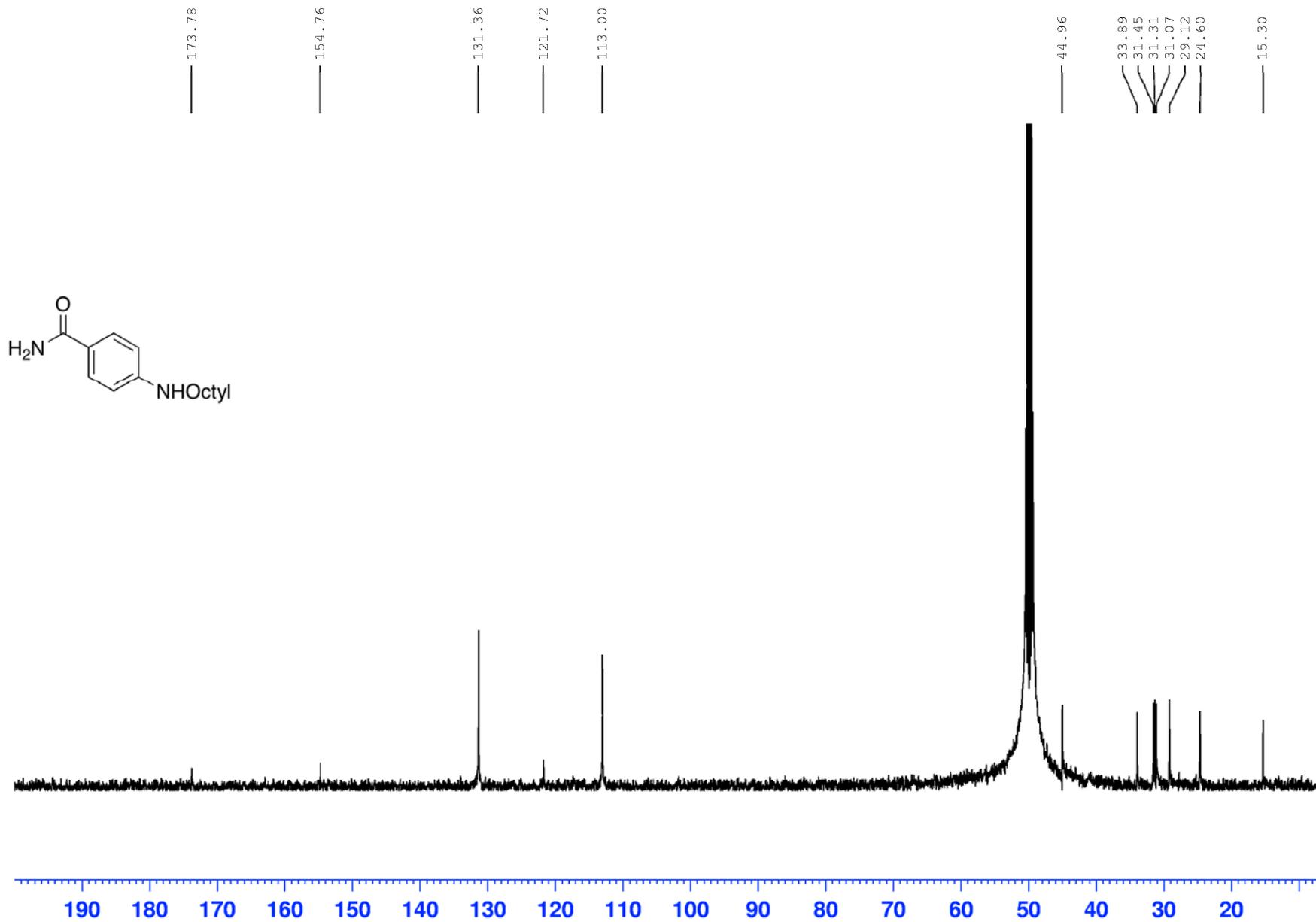
$^{13}\text{C}\{^1\text{H}\}$ NMR of N^1 -(diphenylmethylene)- N^3 -methylbenzene-1,3-diamine (2l) (CDCl_3 , 126 MHz, 300K)



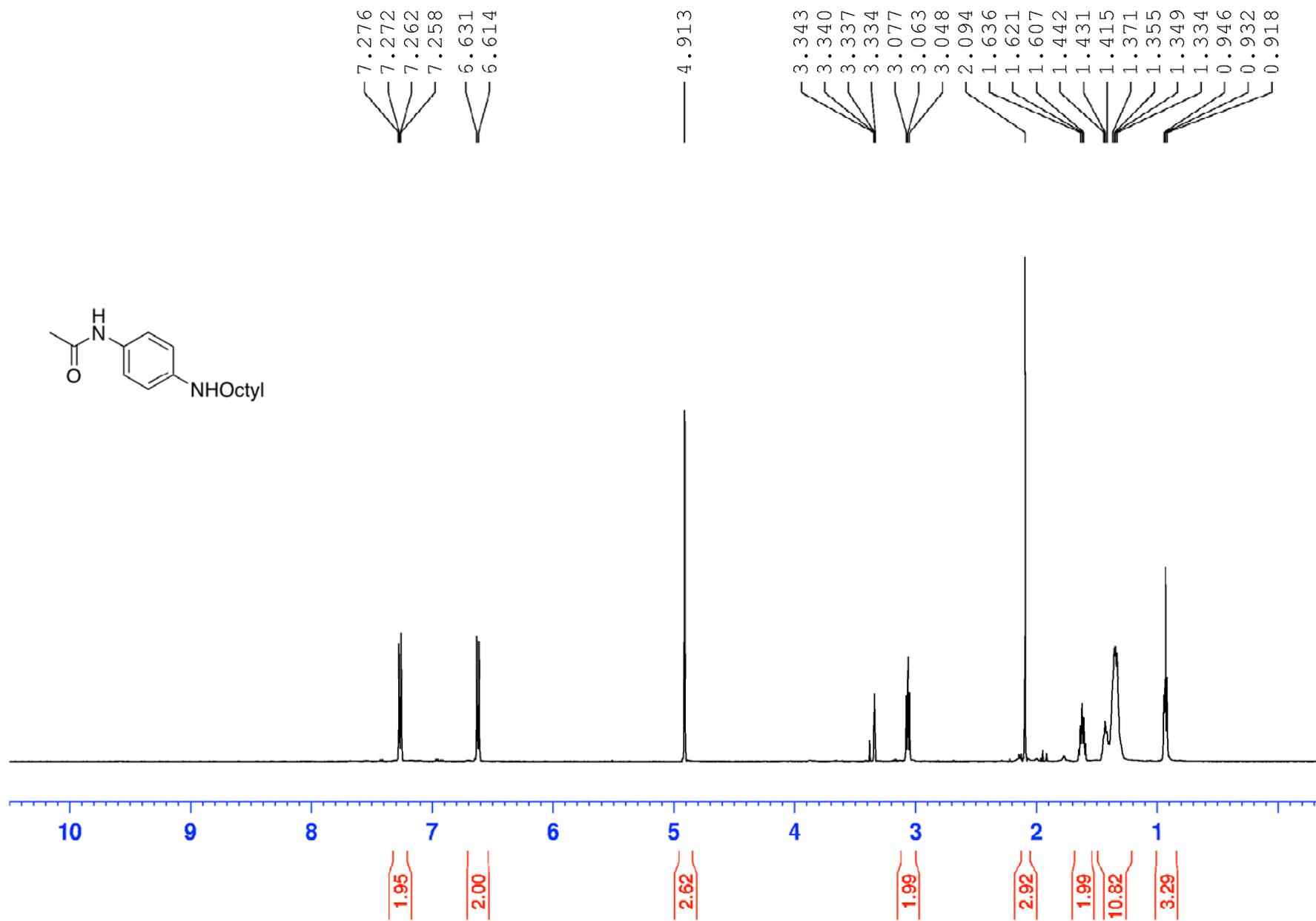
¹H NMR of 4-(octylamino)benzamide (2m) (MeOD, 500 MHz, 300K)



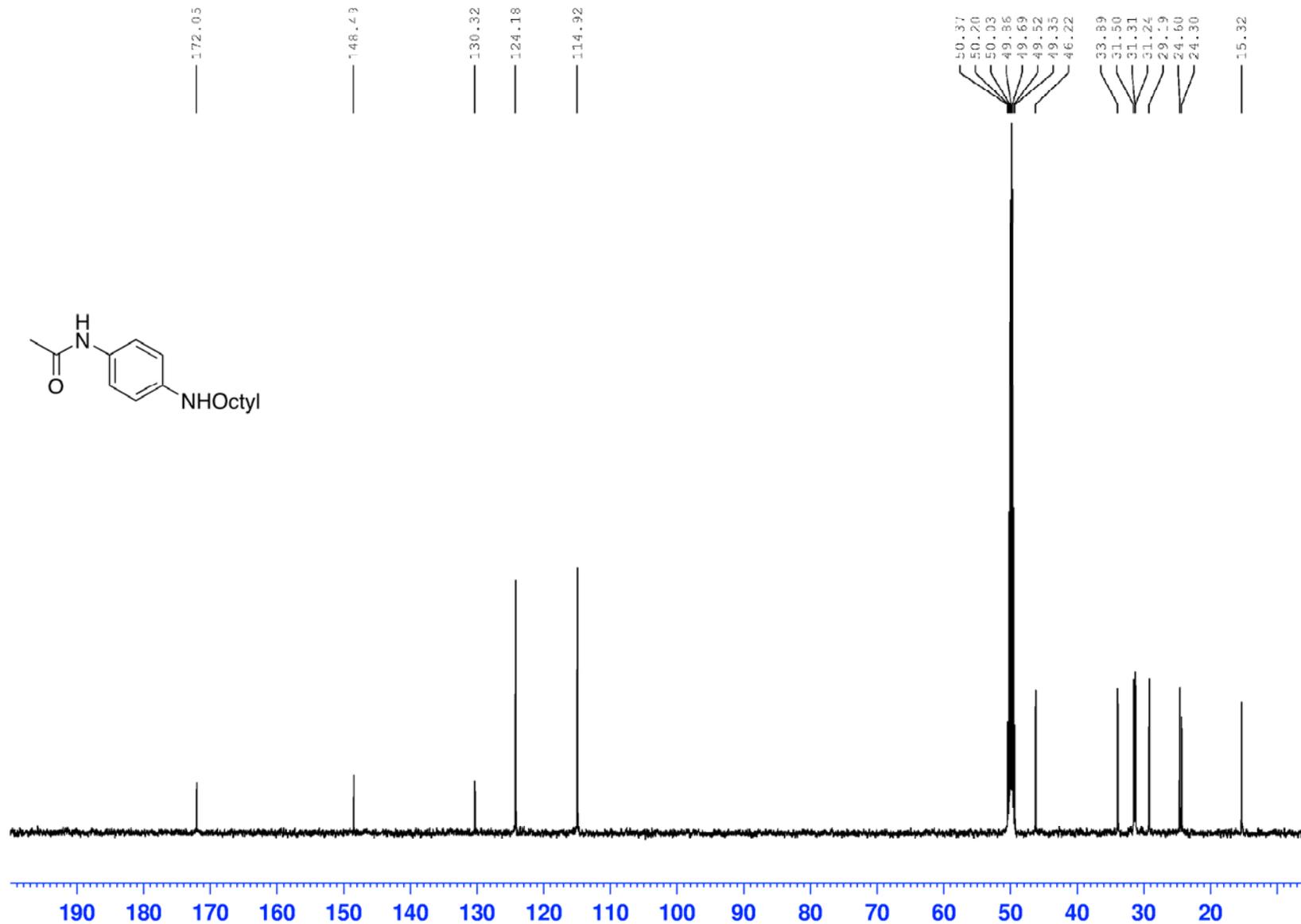
$^{13}\text{C}\{^1\text{H}\}$ NMR of 4-(octylamino)benzamide (2m) (MeOD, 126 MHz, 300K)



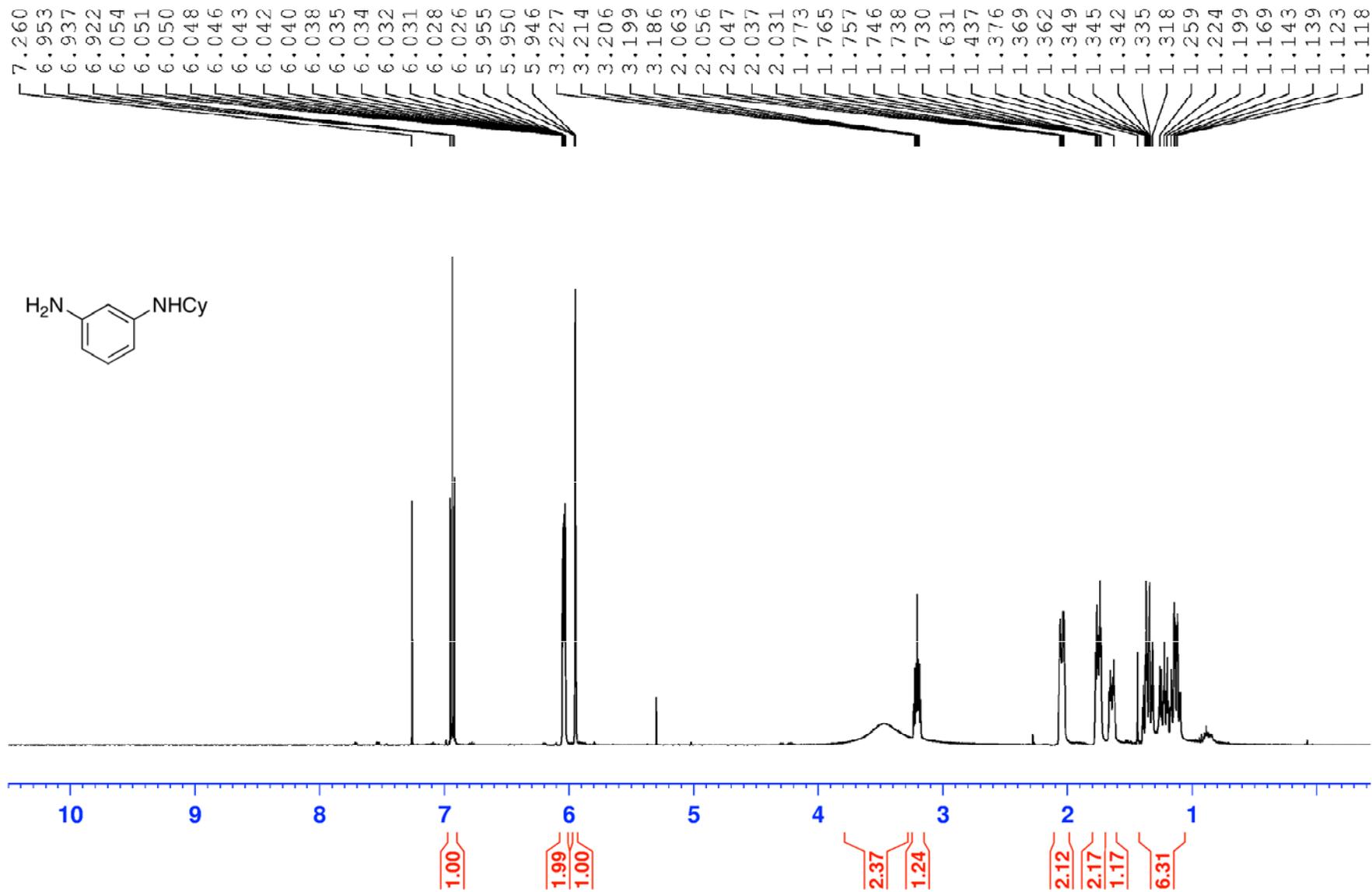
¹H NMR of *N*-(4-(octylamino)phenyl)acetamide (2n) (MeOD, 500 MHz, 300K)



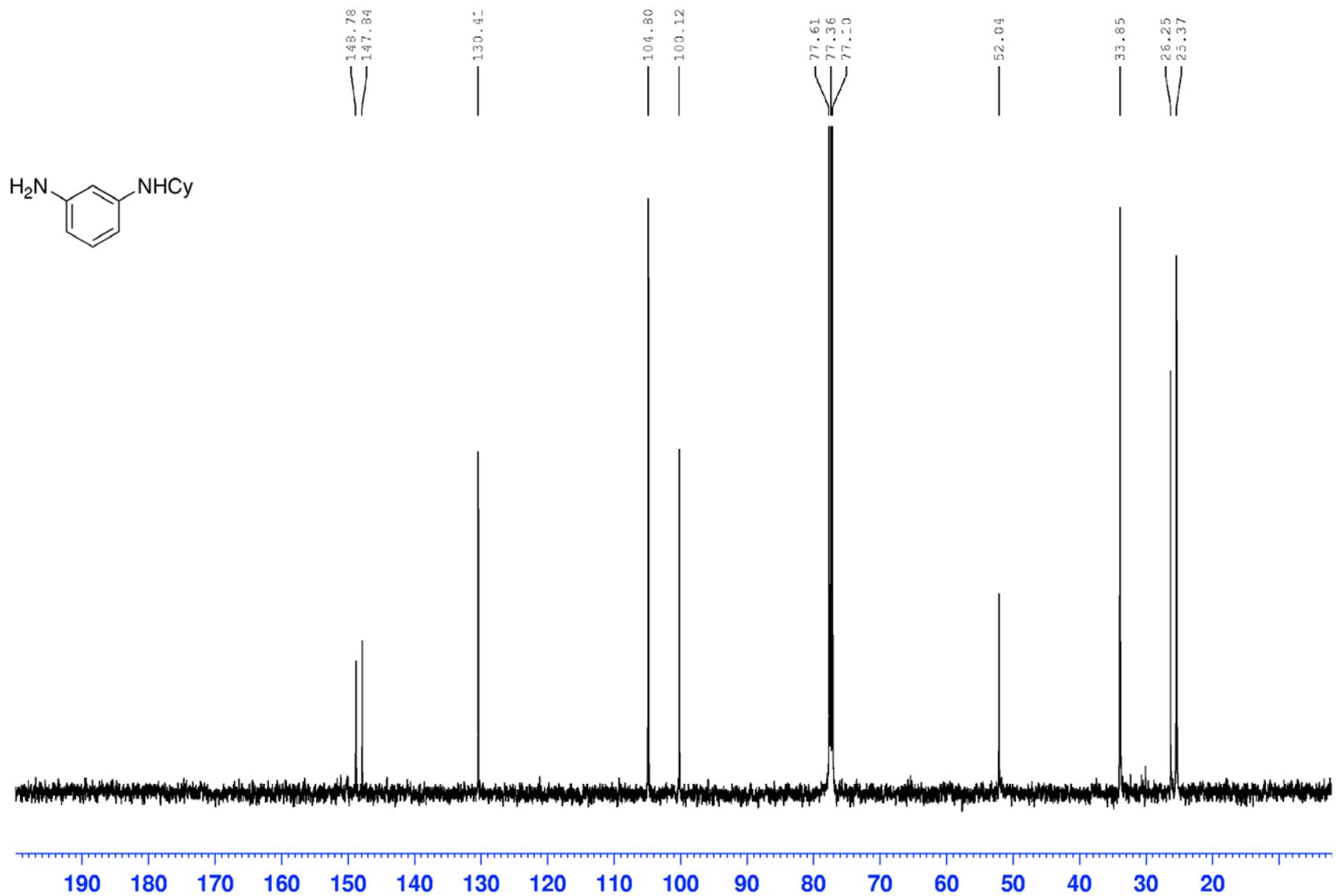
$^{13}\text{C}\{^1\text{H}\}$ NMR of *N*-(4-(octylamino)phenyl)acetamide (2n) (MeOD, 126 MHz, 300K)



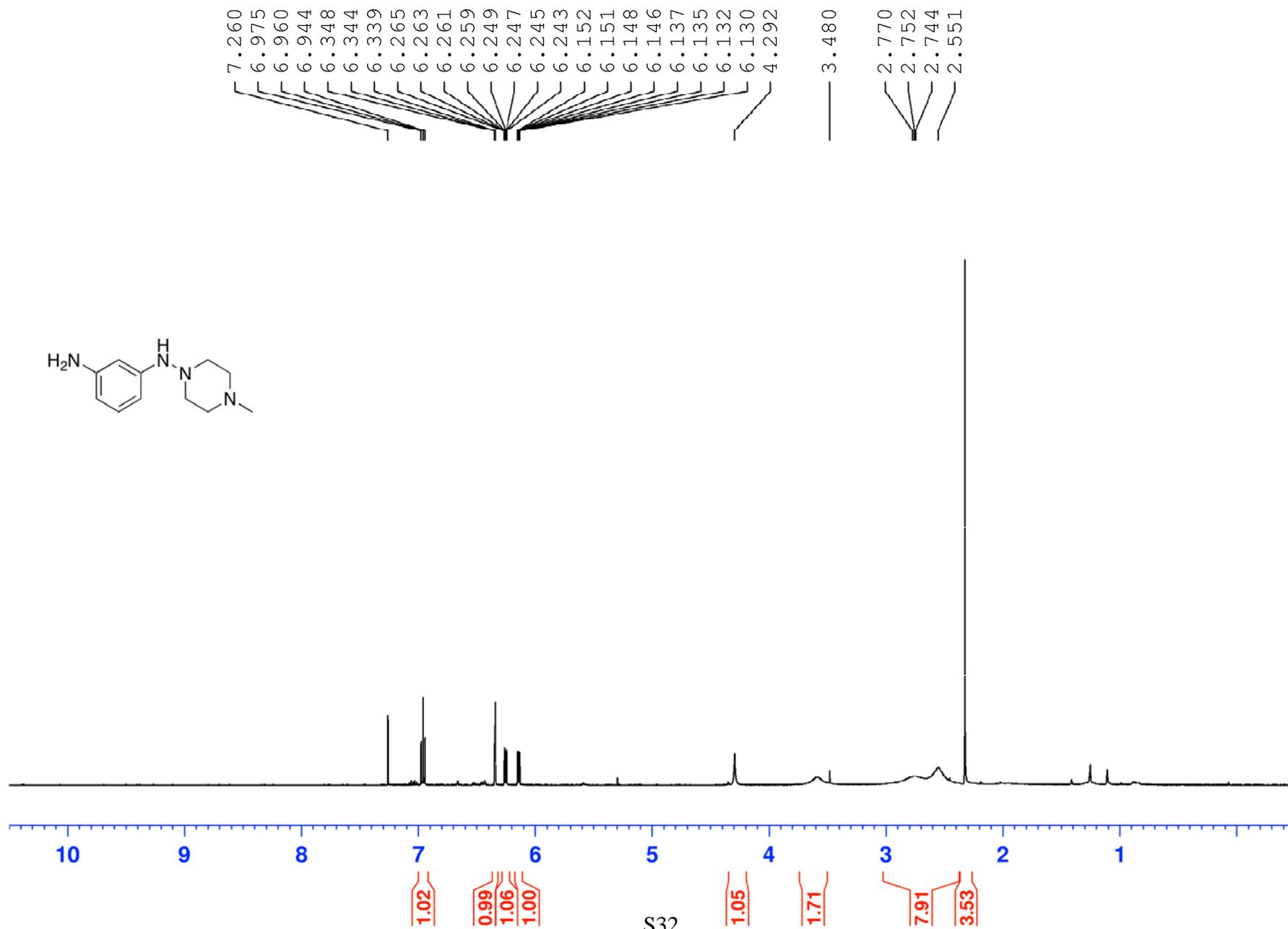
¹H NMR of *N*¹-cyclohexylbenzene-1,3-diamine (3a) (CDCl₃, 500 MHz, 300K)



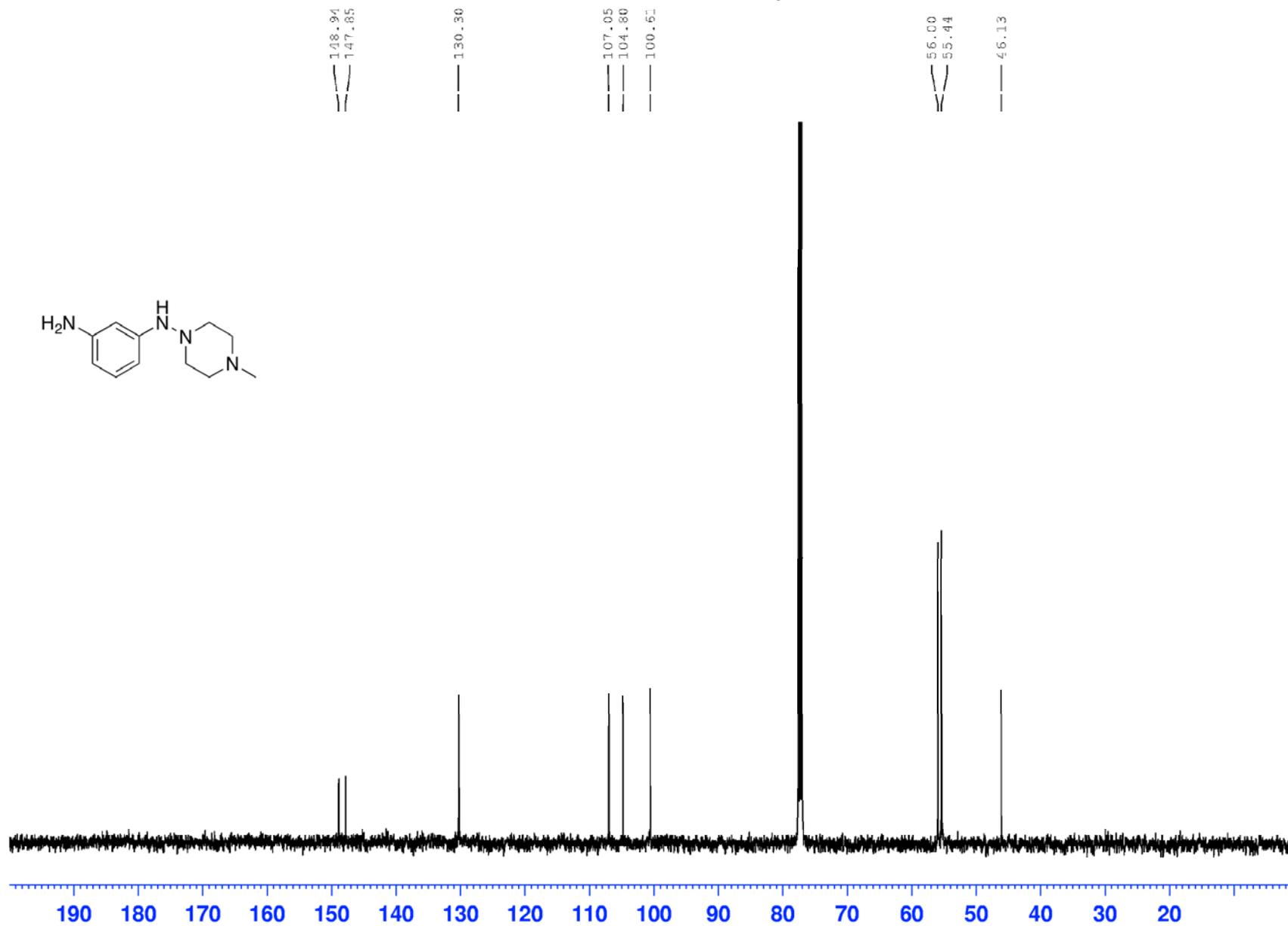
$^{13}\text{C}\{^1\text{H}\}$ NMR of N^1 -cyclohexylbenzene-1,3-diamine (**3a**) (CDCl_3 , 126 MHz, 300K)



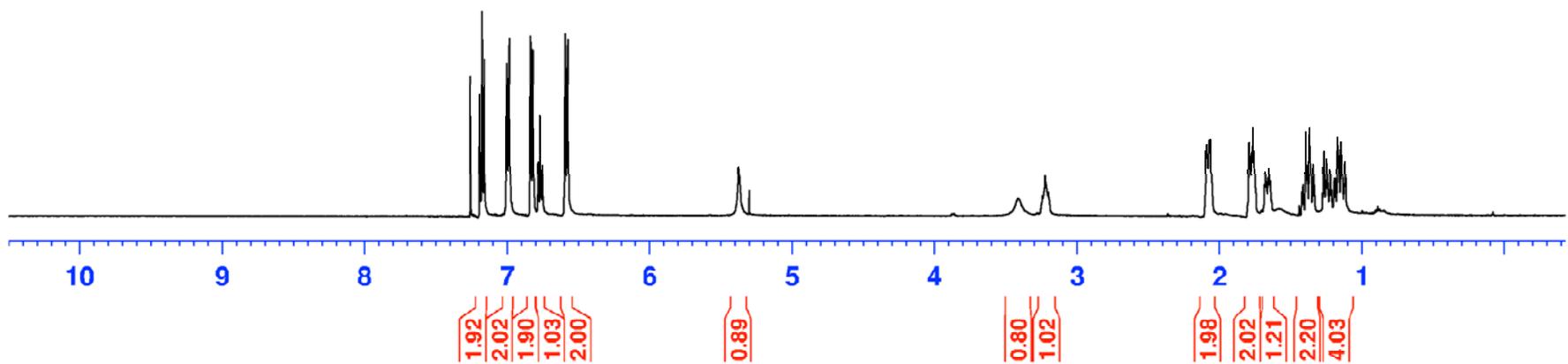
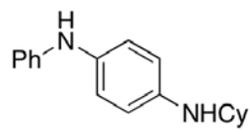
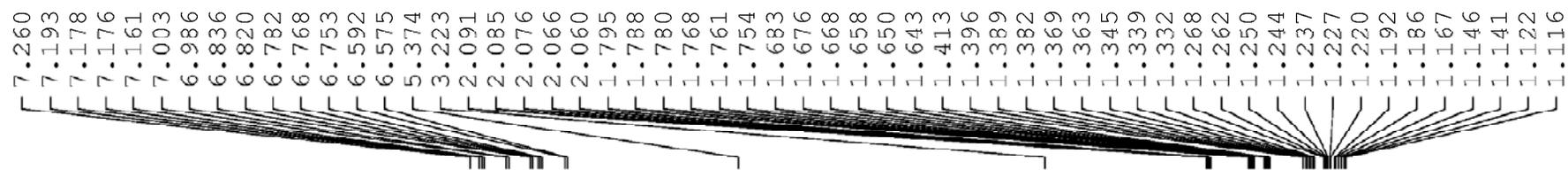
¹H NMR of *N*¹-(4-methylpiperazin-1-yl)benzene-1,3-diamine (3b) (CDCl₃, 500 MHz, 300K)



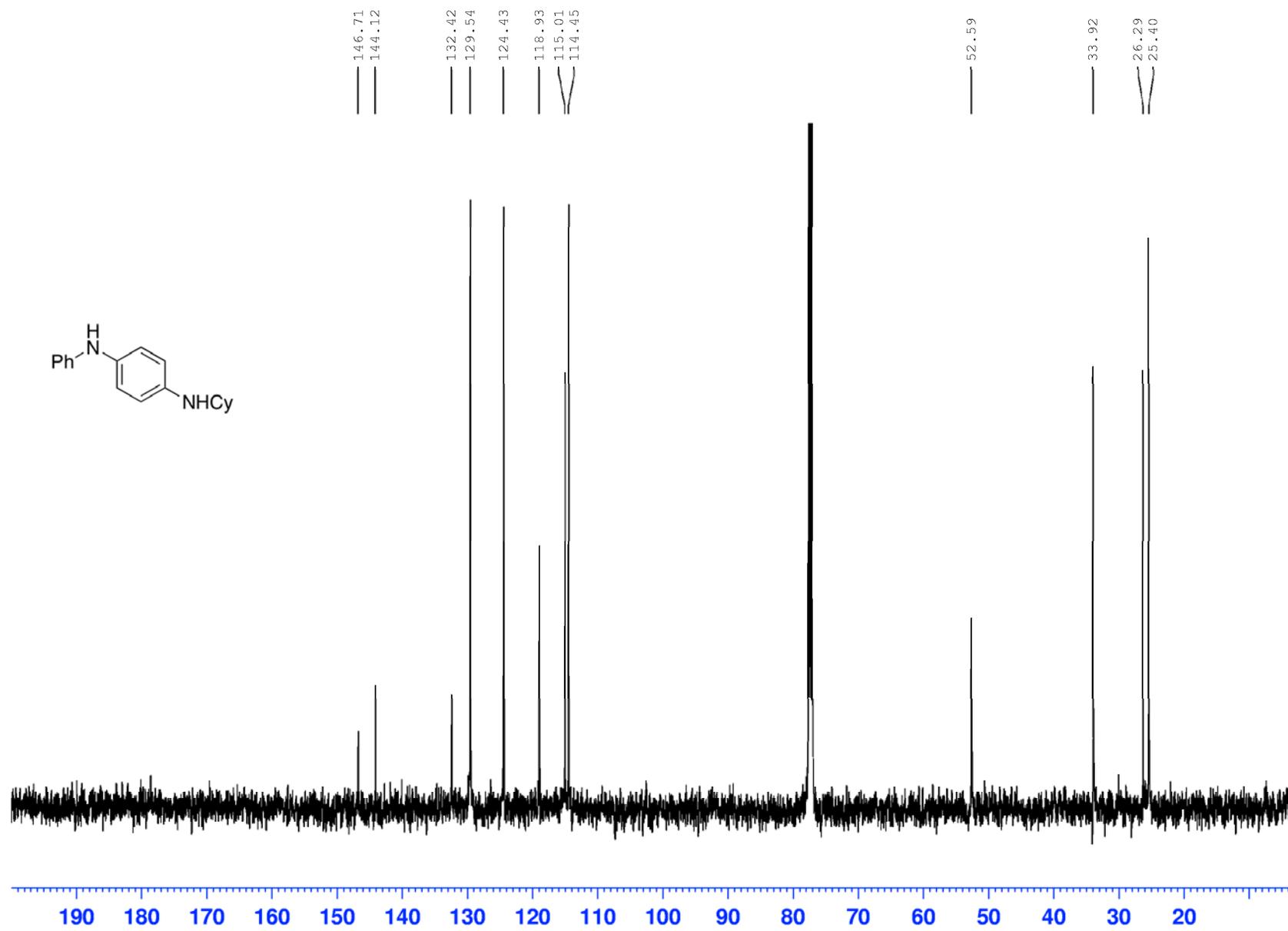
$^{13}\text{C}\{^1\text{H}\}$ NMR of *N*¹-(4-methylpiperazin-1-yl)benzene-1,3-diamine (3b) (CDCl_3 , 126 MHz, 300K)



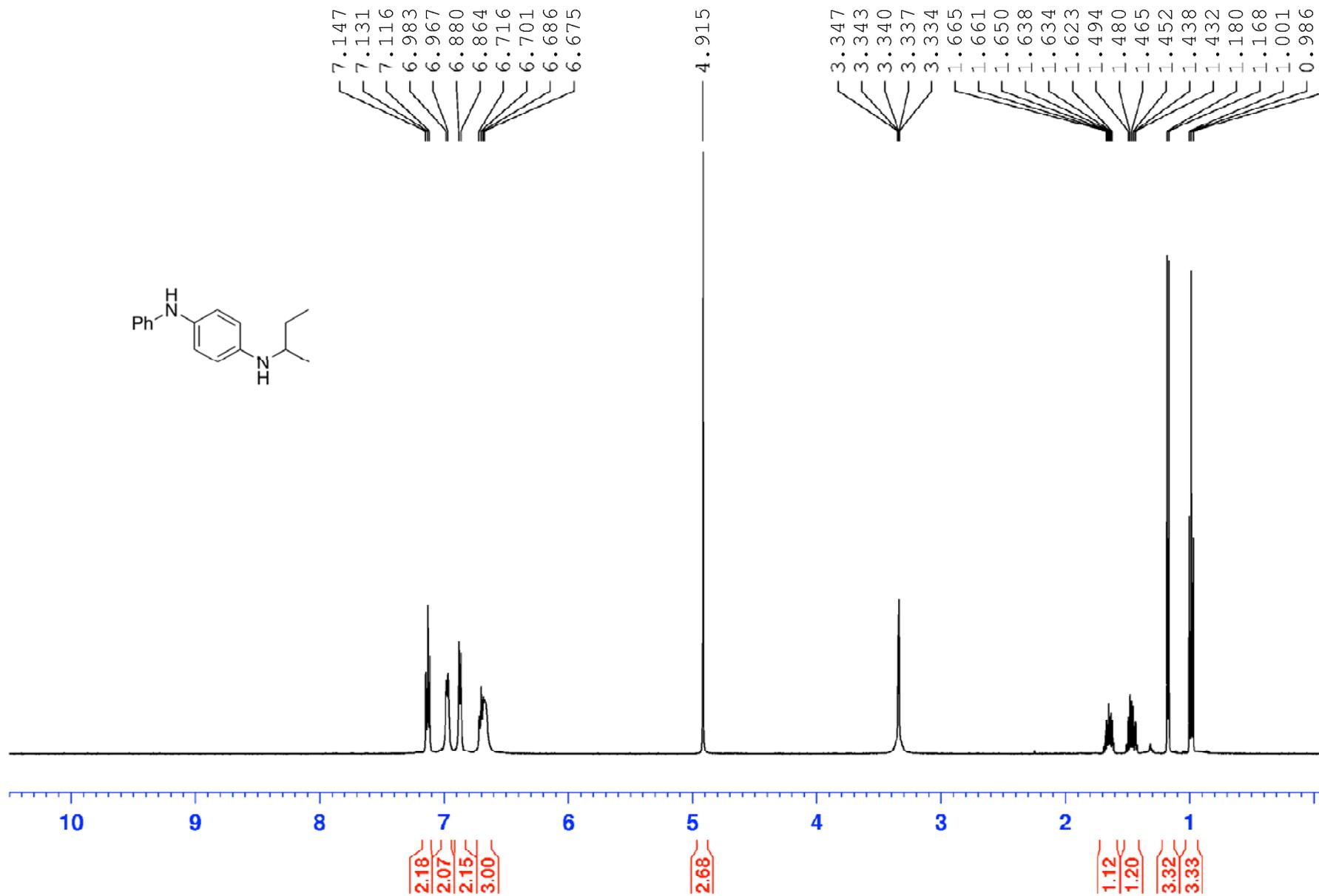
¹H NMR of *N*¹-cyclohexyl-*N*⁴-phenylbenzene-1,4-diamine (3c) (CDCl₃, 500 MHz, 300K)



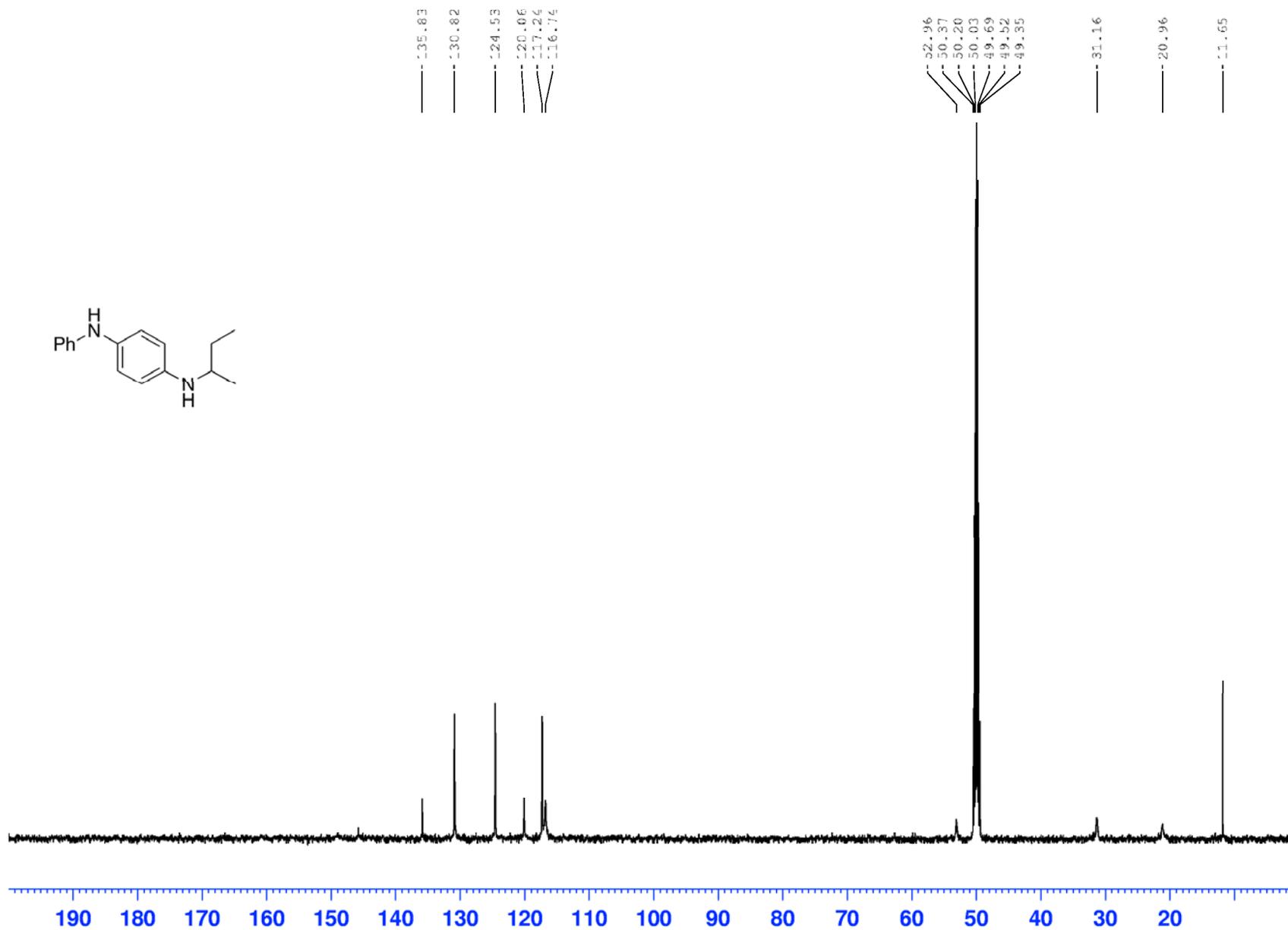
$^{13}\text{C}\{^1\text{H}\}$ NMR of *N*¹-cyclohexyl-*N*⁴-phenylbenzene-1,4-diamine (3c) (CDCl_3 , 126 MHz, 300K)



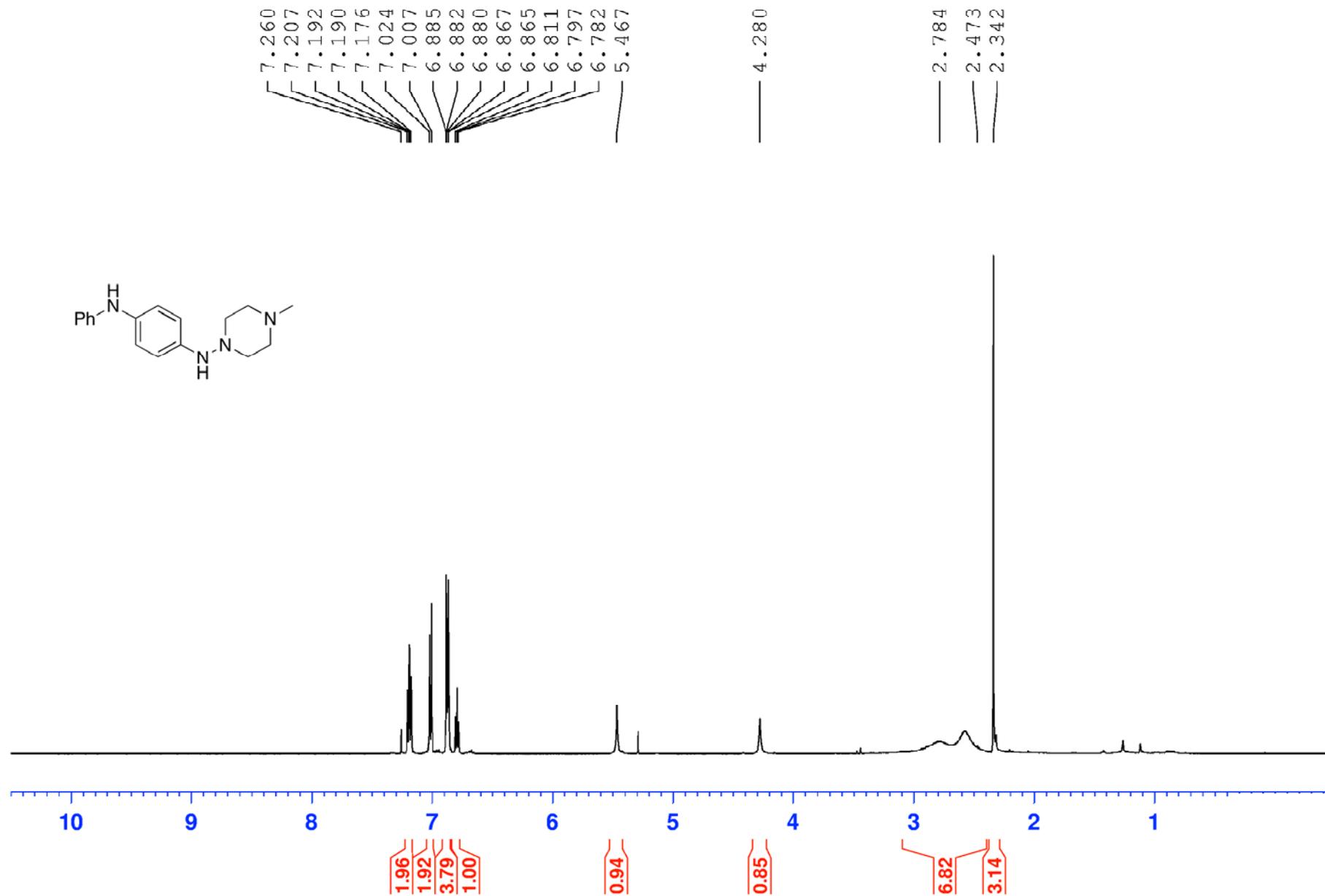
¹H NMR of *N*¹-*sec*-butyl-*N*⁴-phenylbenzene-1,4-diamine (3d) (MeOD, 500 MHz, 300K)



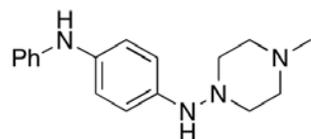
$^{13}\text{C}\{^1\text{H}\}$ NMR of *N*¹-*sec*-butyl-*N*⁴-phenylbenzene-1,4-diamine (3d) (MeOD, 126 MHz, 300K)



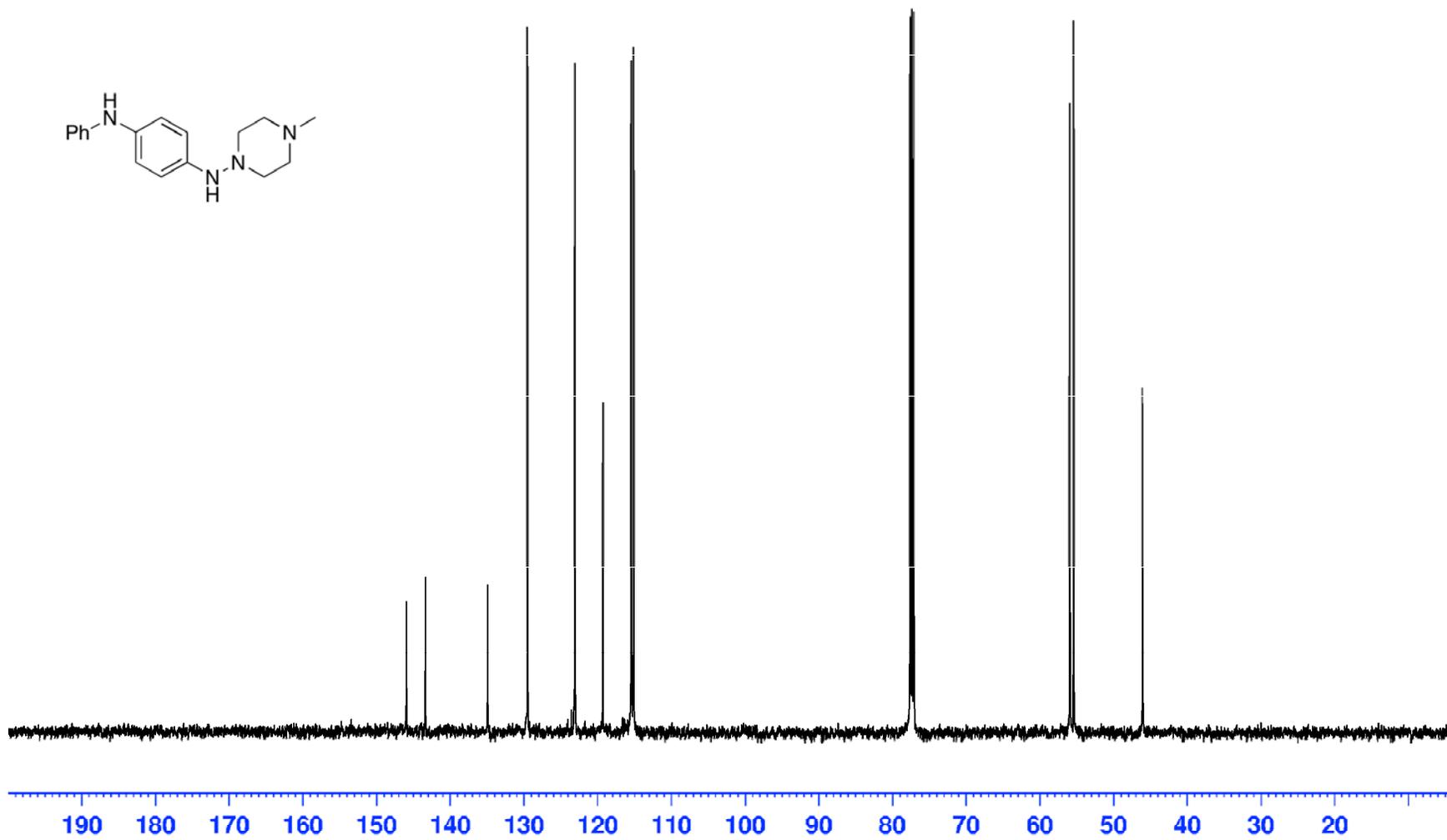
¹H NMR of N¹-(4-methylpiperazin-1-yl)-N⁴-phenylbenzene-1,4-diamine (3e) (CDCl₃, 500 MHz, 300K)



$^{13}\text{C}\{^1\text{H}\}$ NMR of N^1 -(4-methylpiperazin-1-yl)- N^4 -phenylbenzene-1,4-diamine (3e) (CDCl_3 , 126 MHz, 300K)

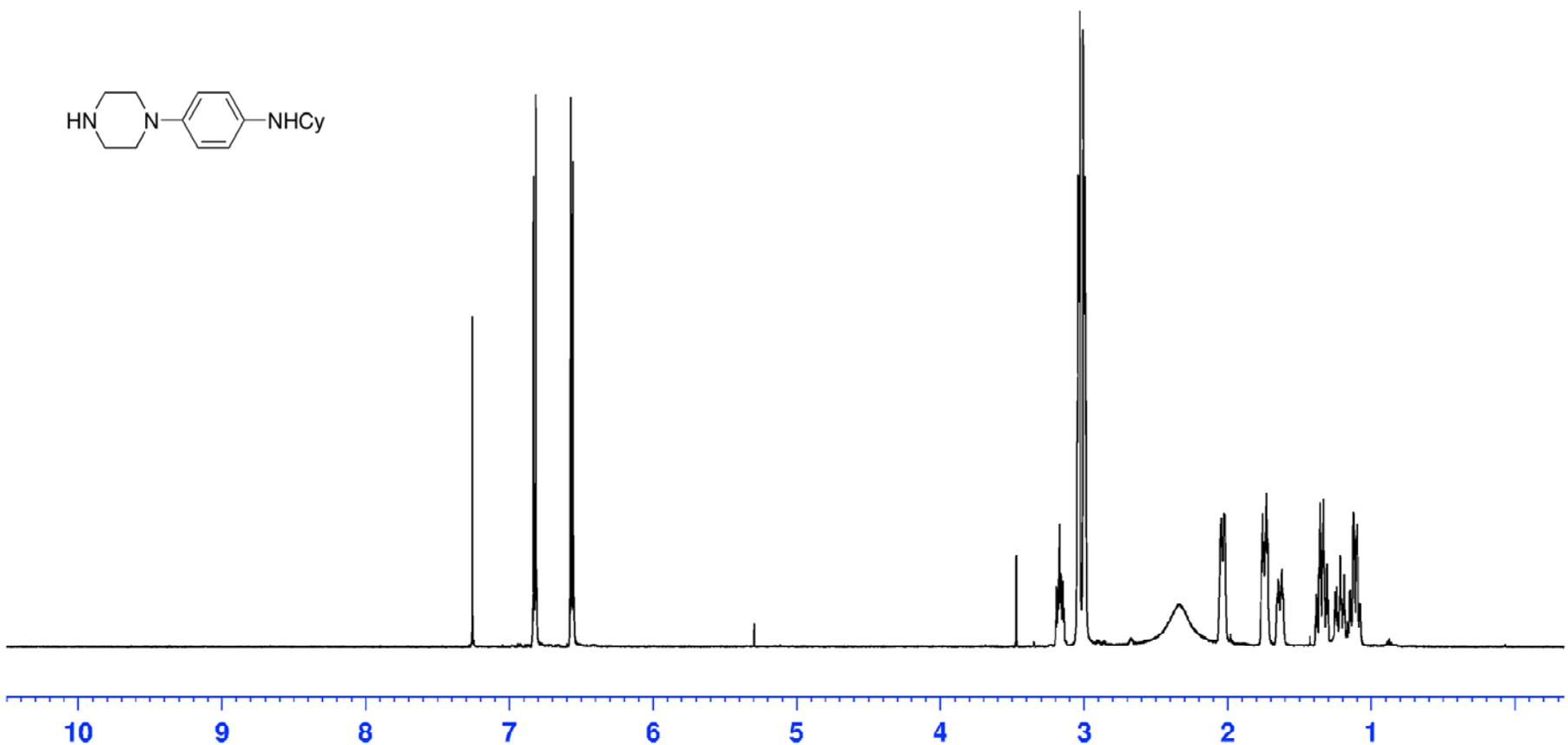
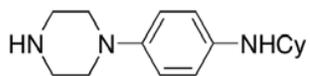


146.01
143.42
134.99
129.55
123.17
119.34
115.48
115.16
77.62
77.36
77.11
55.95
55.43
46.07



¹H NMR of *N*-cyclohexyl-4-(piperazin-1-yl)aniline (3f) (CDCl₃, 500 MHz, 300K)

7.260
6.833
6.829
6.820
6.816
6.809
6.582
6.575
6.571
6.561
6.557
6.550
3.189
3.176
3.169
3.162
3.148
3.048
3.041
3.029
3.006
3.001
2.994
2.987
2.051
2.045
2.035
2.026
2.019
1.764
1.757
1.749
1.737
1.730
1.723
1.649
1.641
1.631
1.623
1.615
1.382
1.365
1.358
1.351
1.332
1.308
1.249
1.240
1.222
1.216
1.191
1.150
1.144
1.125
1.104
1.099



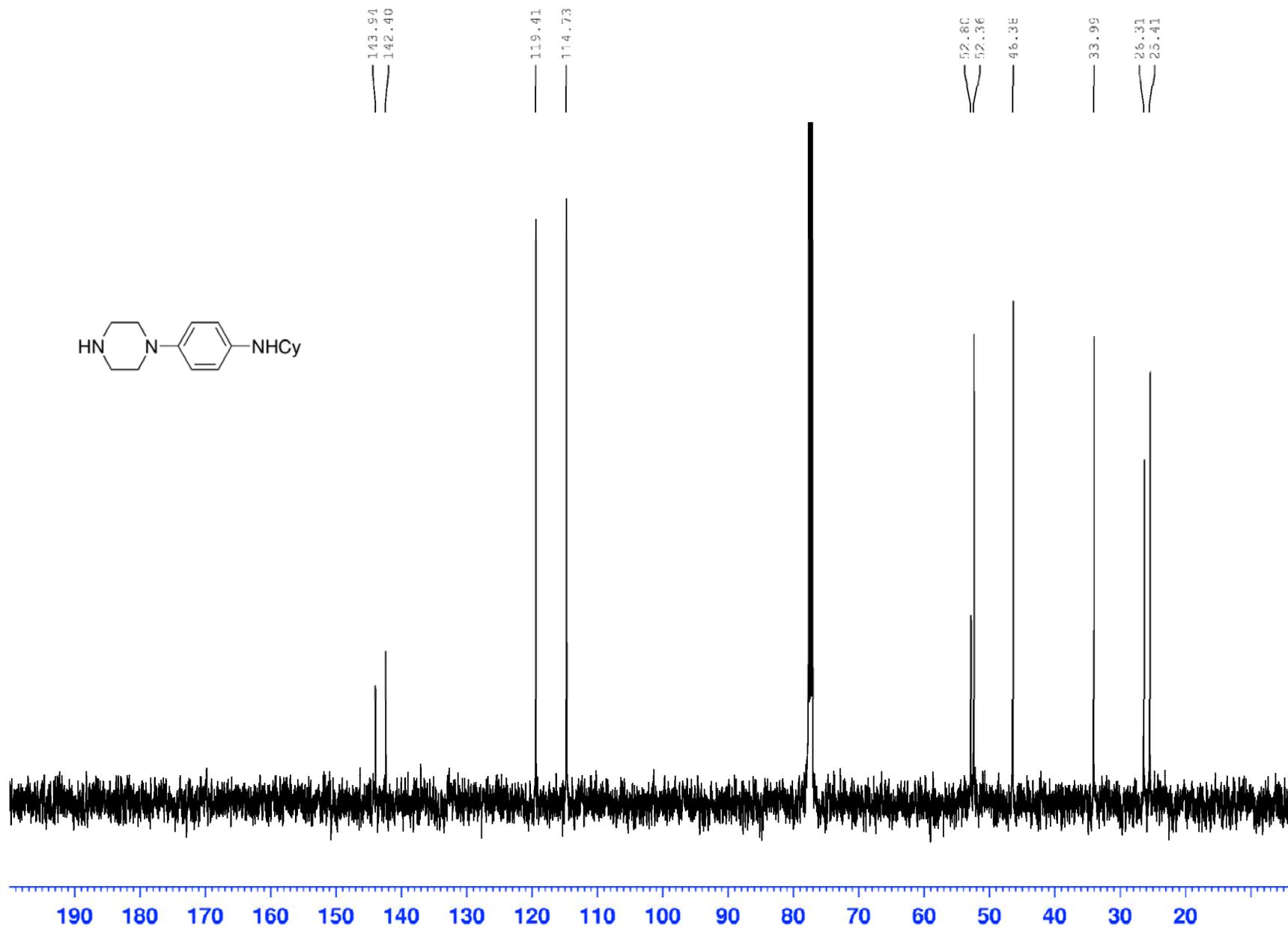
1.98
2.00

S40

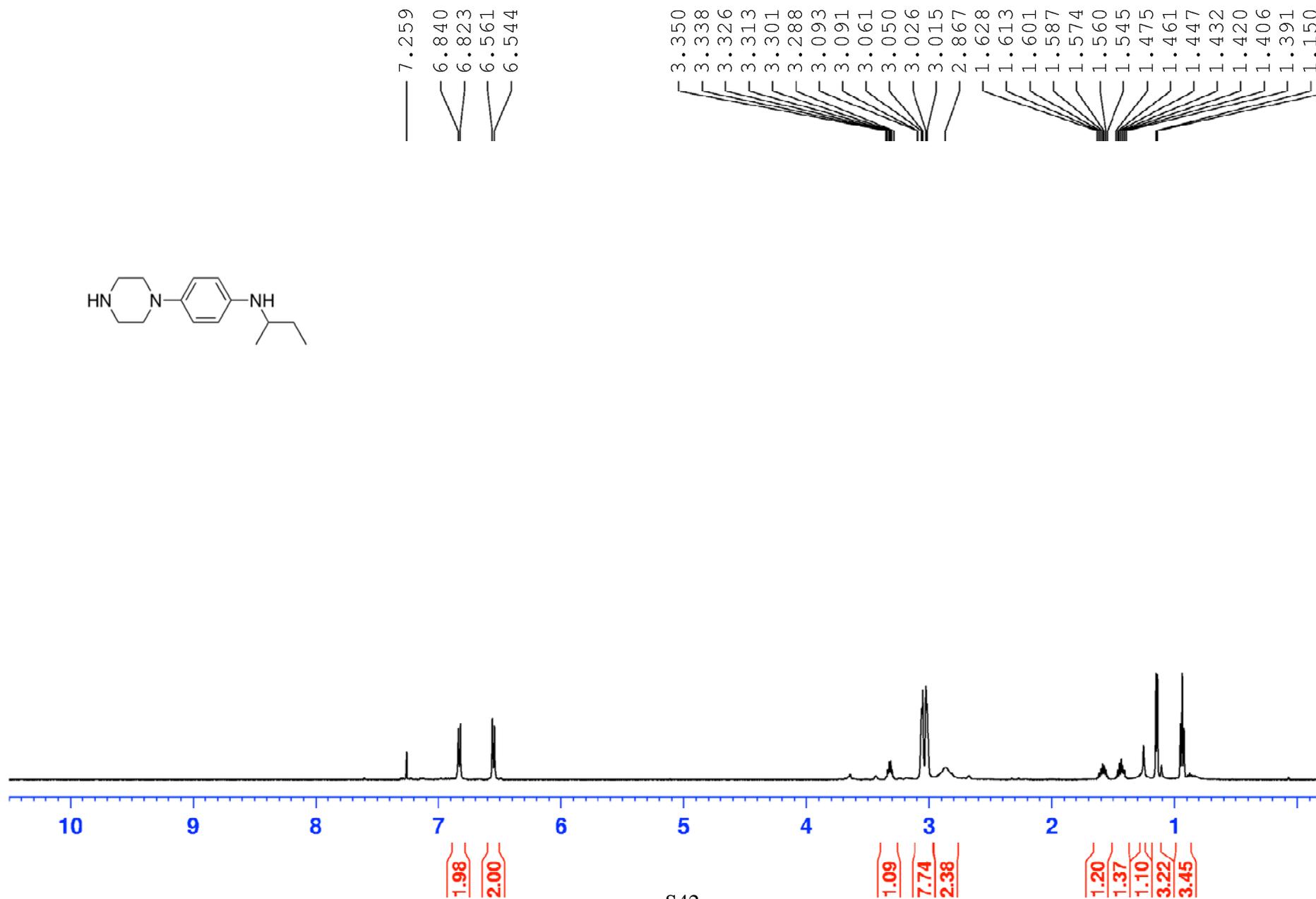
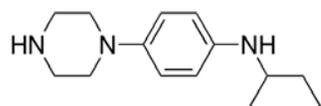
1.09
7.72

2.85
2.10
2.02
1.05
2.05
3.28

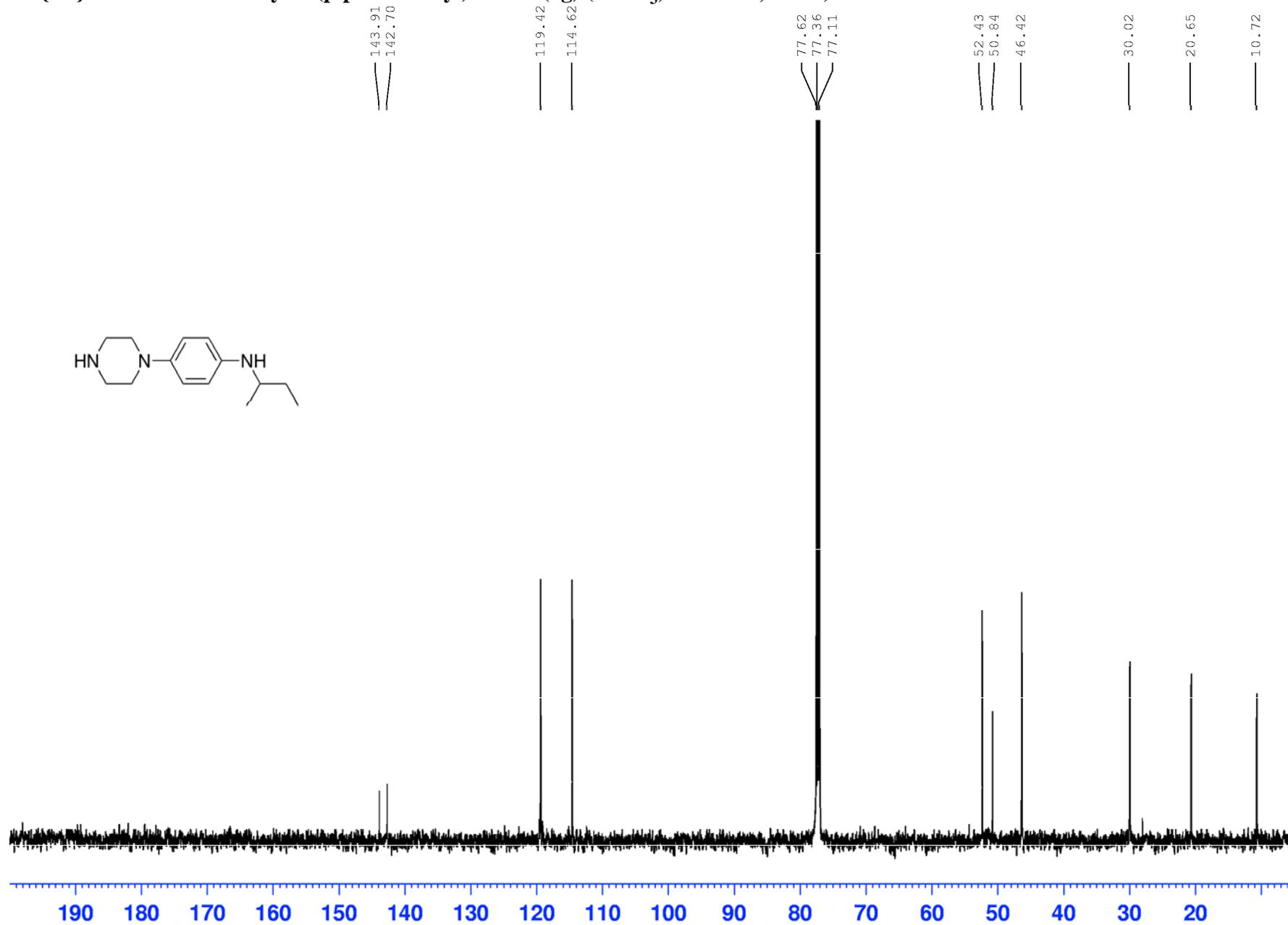
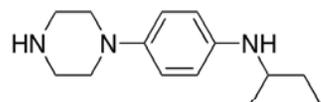
$^{13}\text{C}\{^1\text{H}\}$ NMR of *N*-cyclohexyl-4-(piperazin-1-yl)aniline (3f) (CDCl_3 , 126 MHz, 300K)



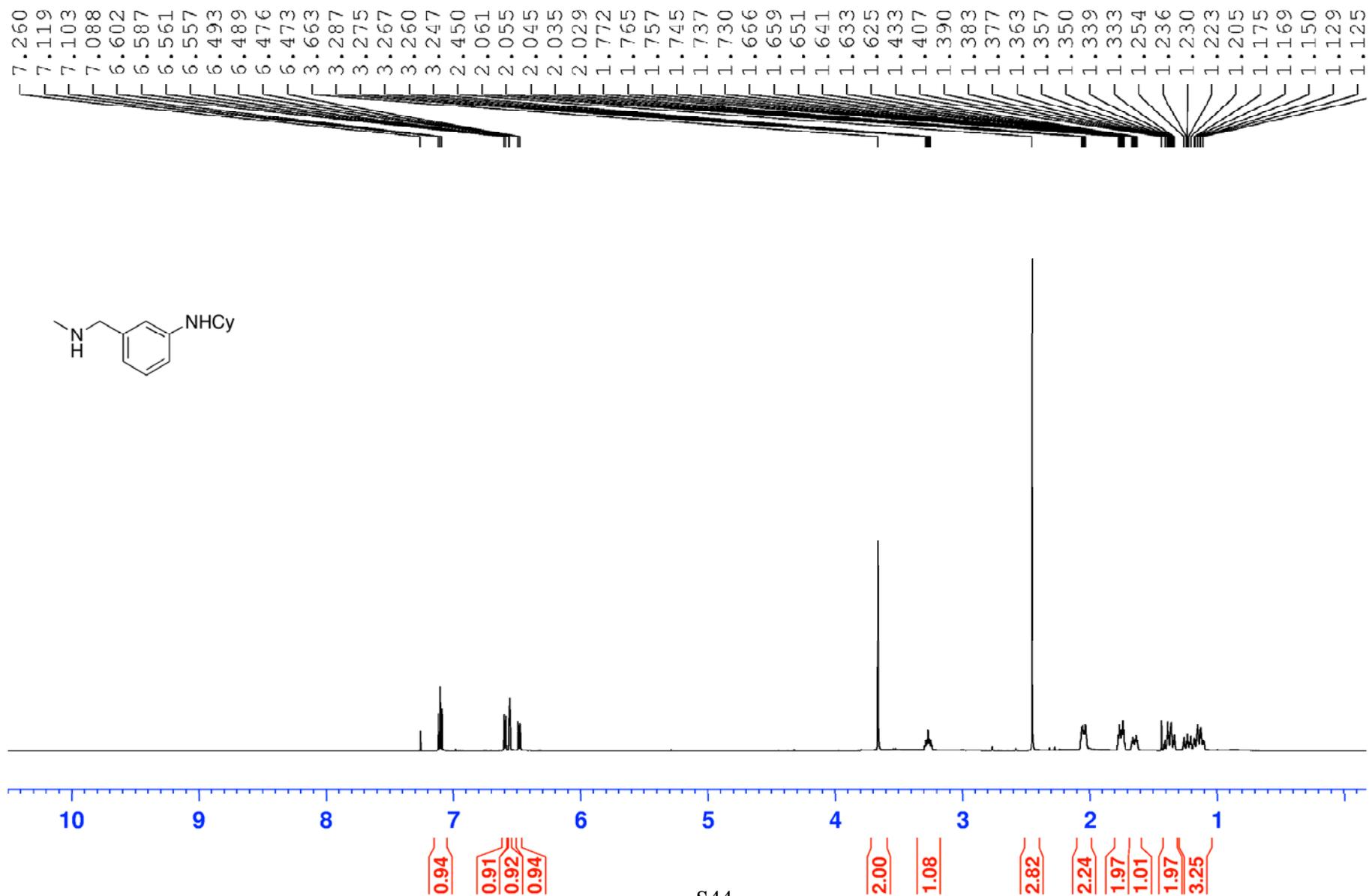
¹H NMR of *N*-*sec*-butyl-4-(piperazin-1-yl)aniline (3g) (CDCl₃, 500 MHz, 300K)



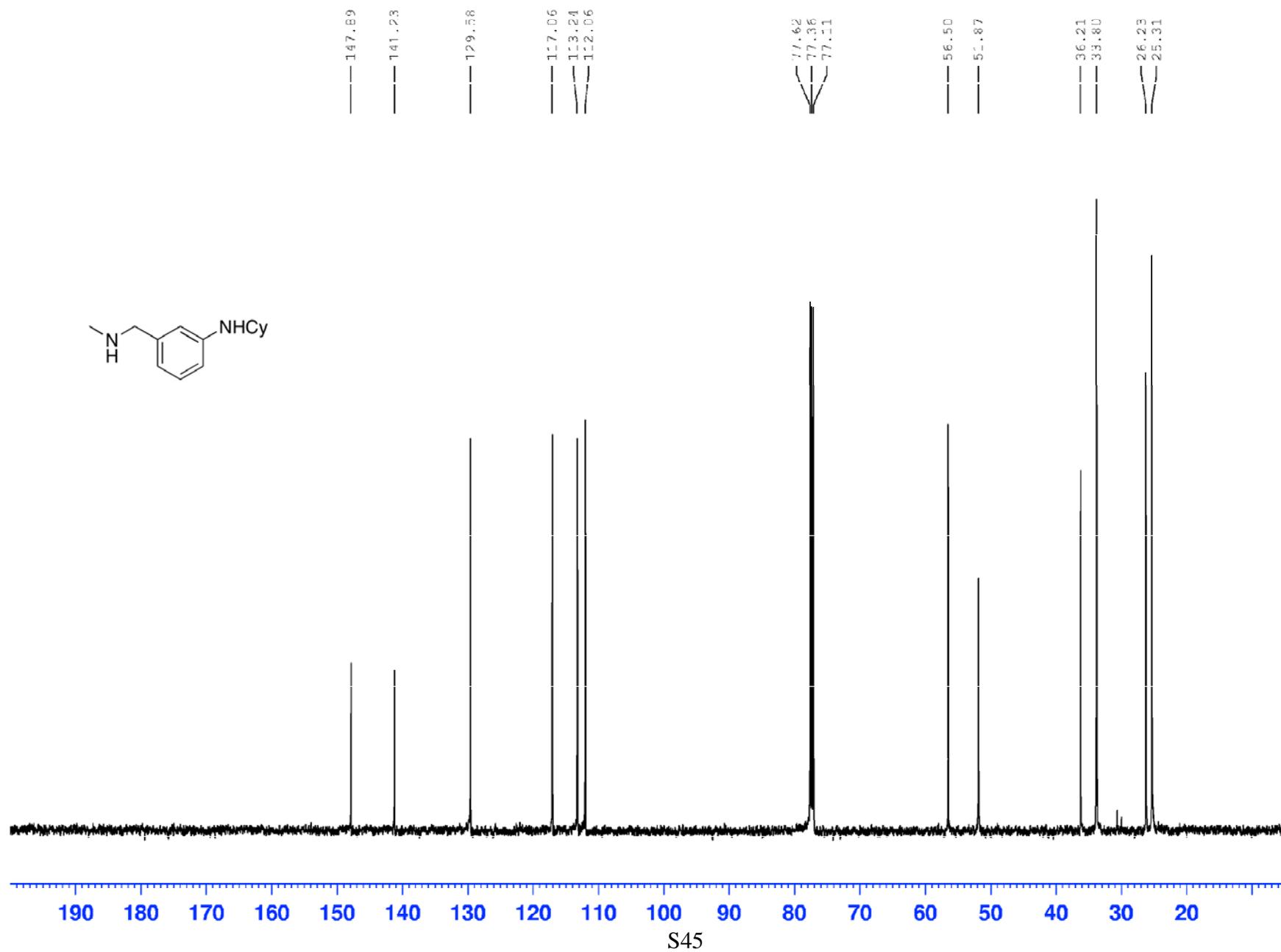
¹³C{¹H} NMR of *N*-*sec*-butyl-4-(piperazin-1-yl)aniline (3g) (CDCl₃, 126 MHz, 300K)



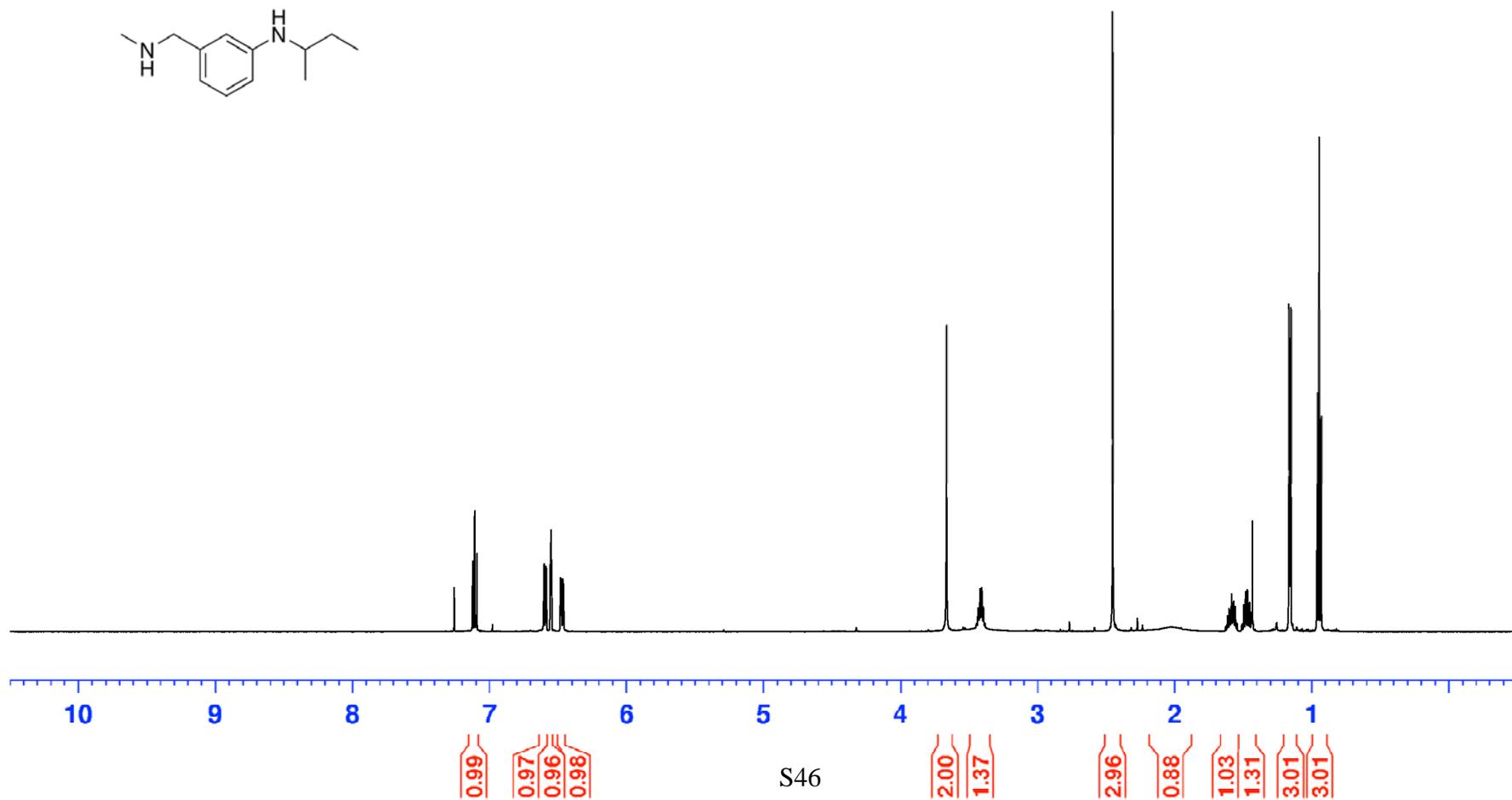
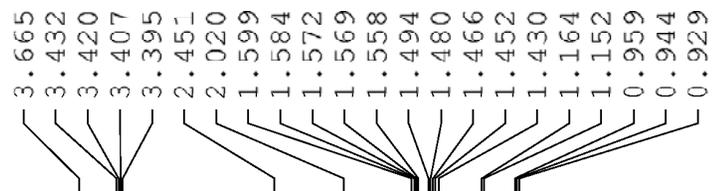
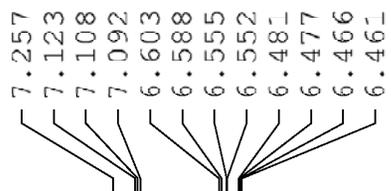
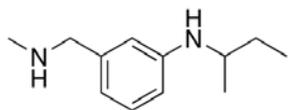
¹H NMR of *N*-cyclohexyl-3-((methylamino)methyl)aniline (**3h**) (CDCl₃, 500 MHz, 300K)



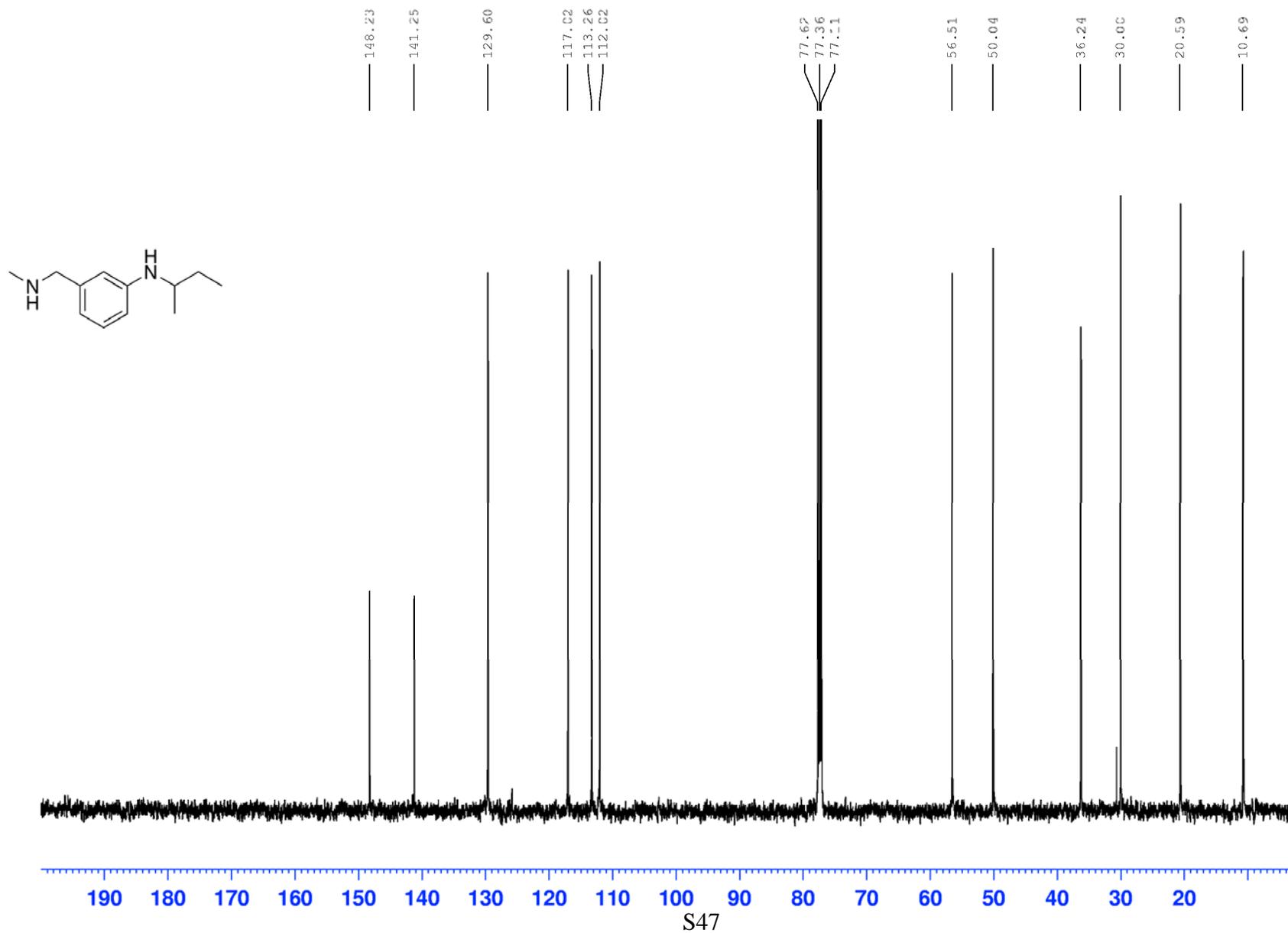
$^{13}\text{C}\{^1\text{H}\}$ NMR of *N*-cyclohexyl-3-((methylamino)methyl)aniline (**3h**) (CDCl_3 , 126 MHz, 300K)



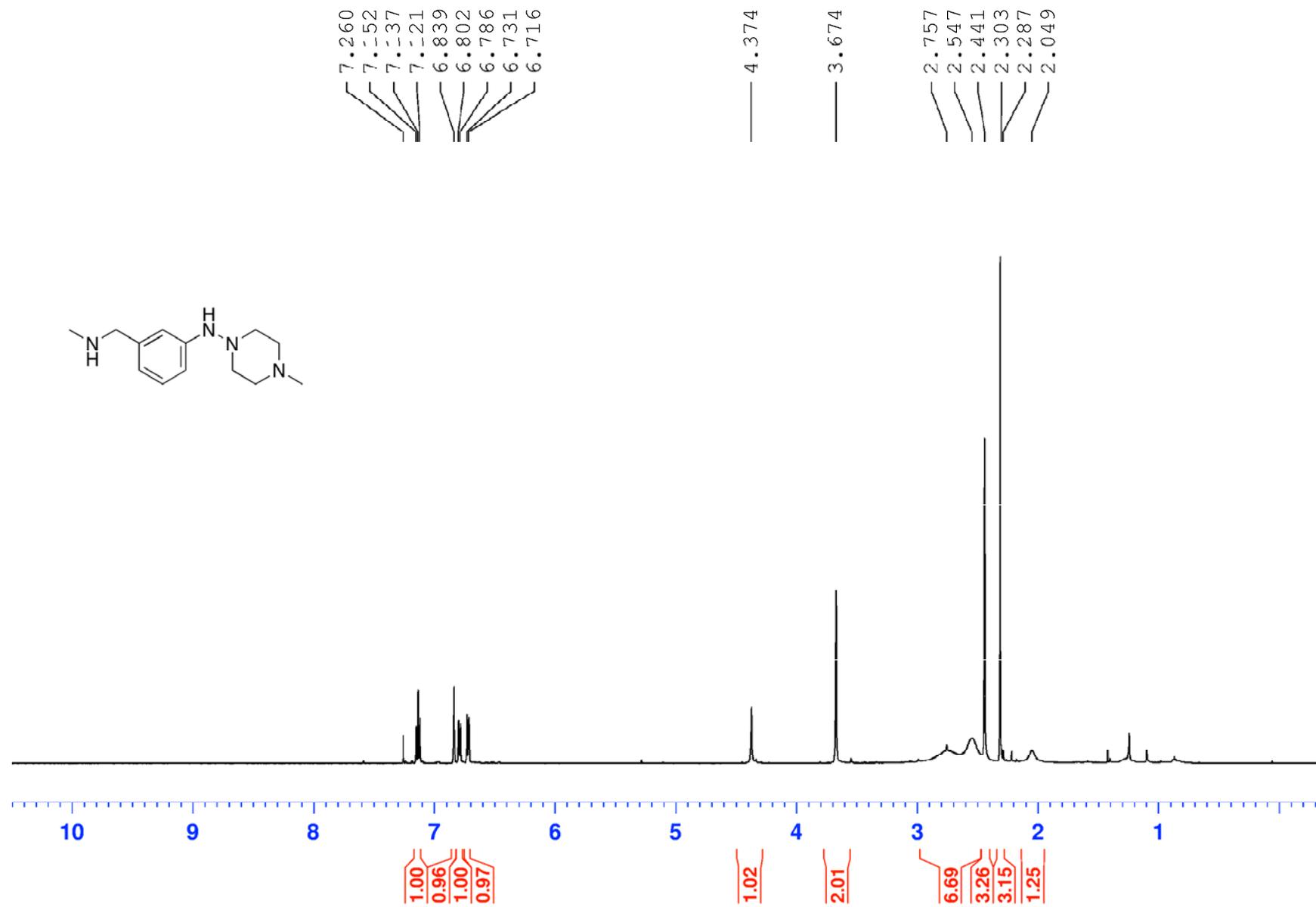
¹H NMR of *N*-*sec*-butyl-3-((methylamino)methyl)aniline (**3i**) (CDCl₃, 500 MHz, 300K)



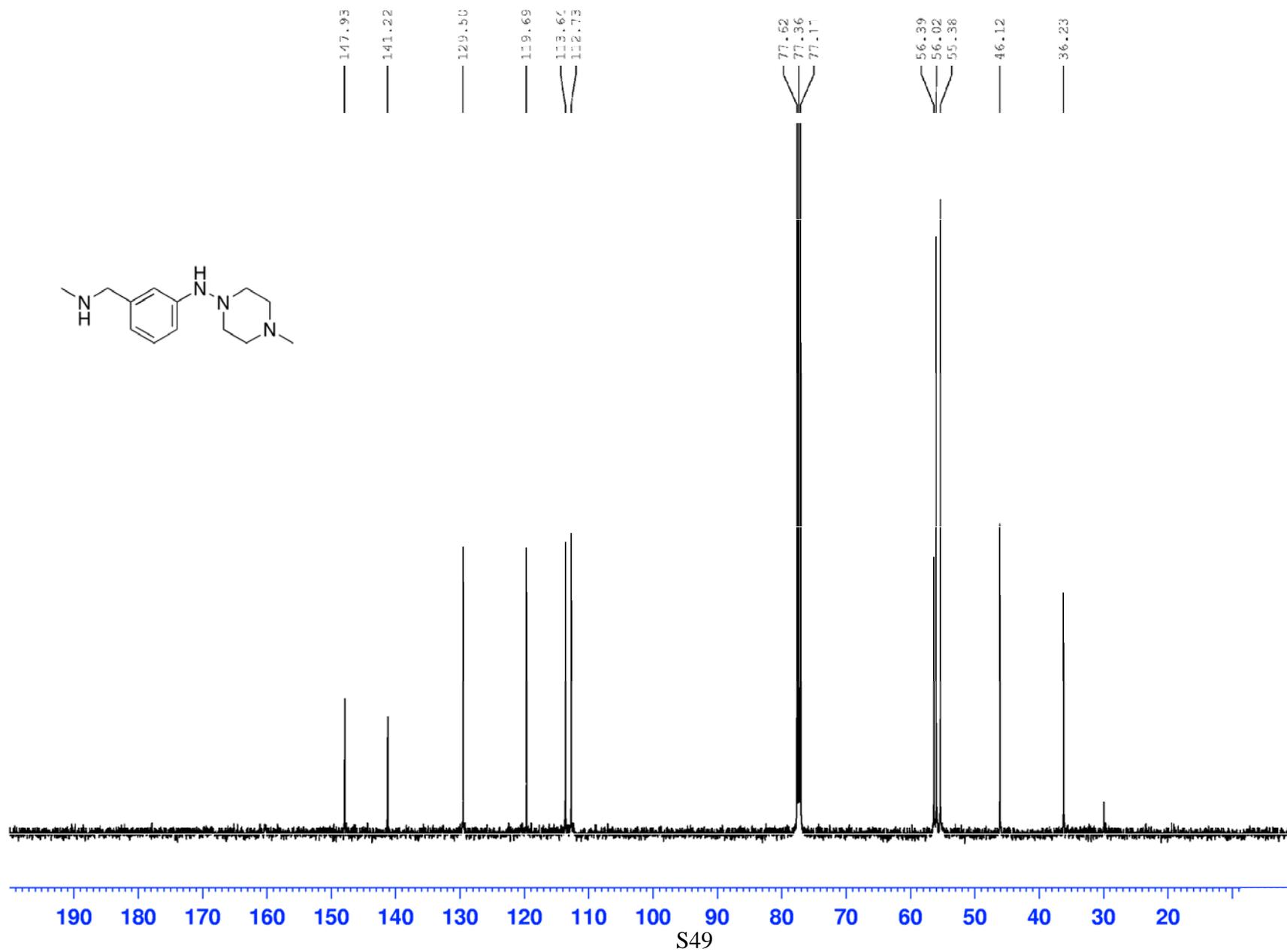
$^{13}\text{C}\{^1\text{H}\}$ NMR of *N*-*sec*-butyl-3-((methylamino)methyl)aniline (3i) (CDCl_3 , 126 MHz, 300K)



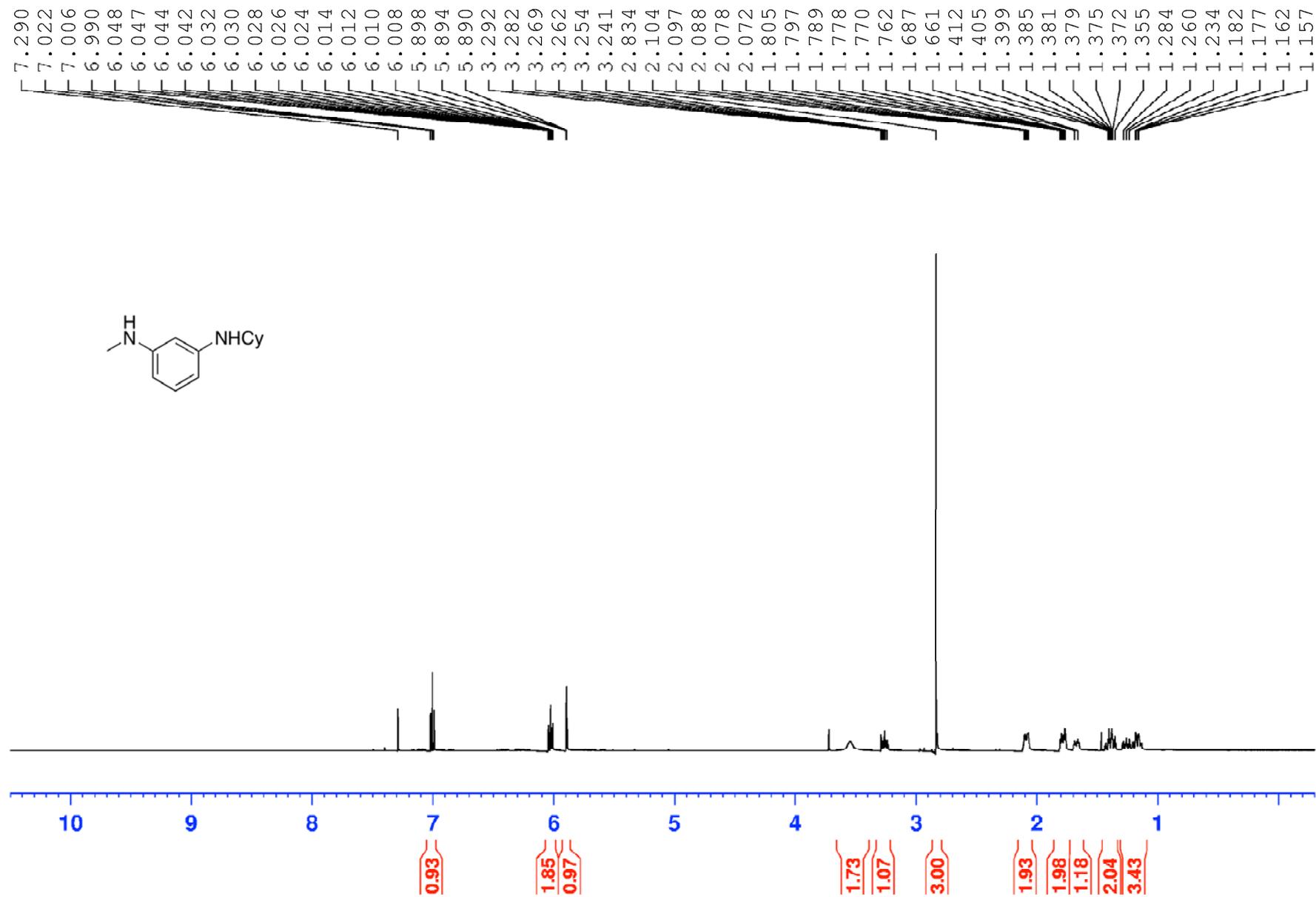
¹H NMR of 4-methyl-N-(3-((methylamino)methyl)phenyl)piperazin-1-amine (3j) (CDCl₃, 500 MHz, 300K)



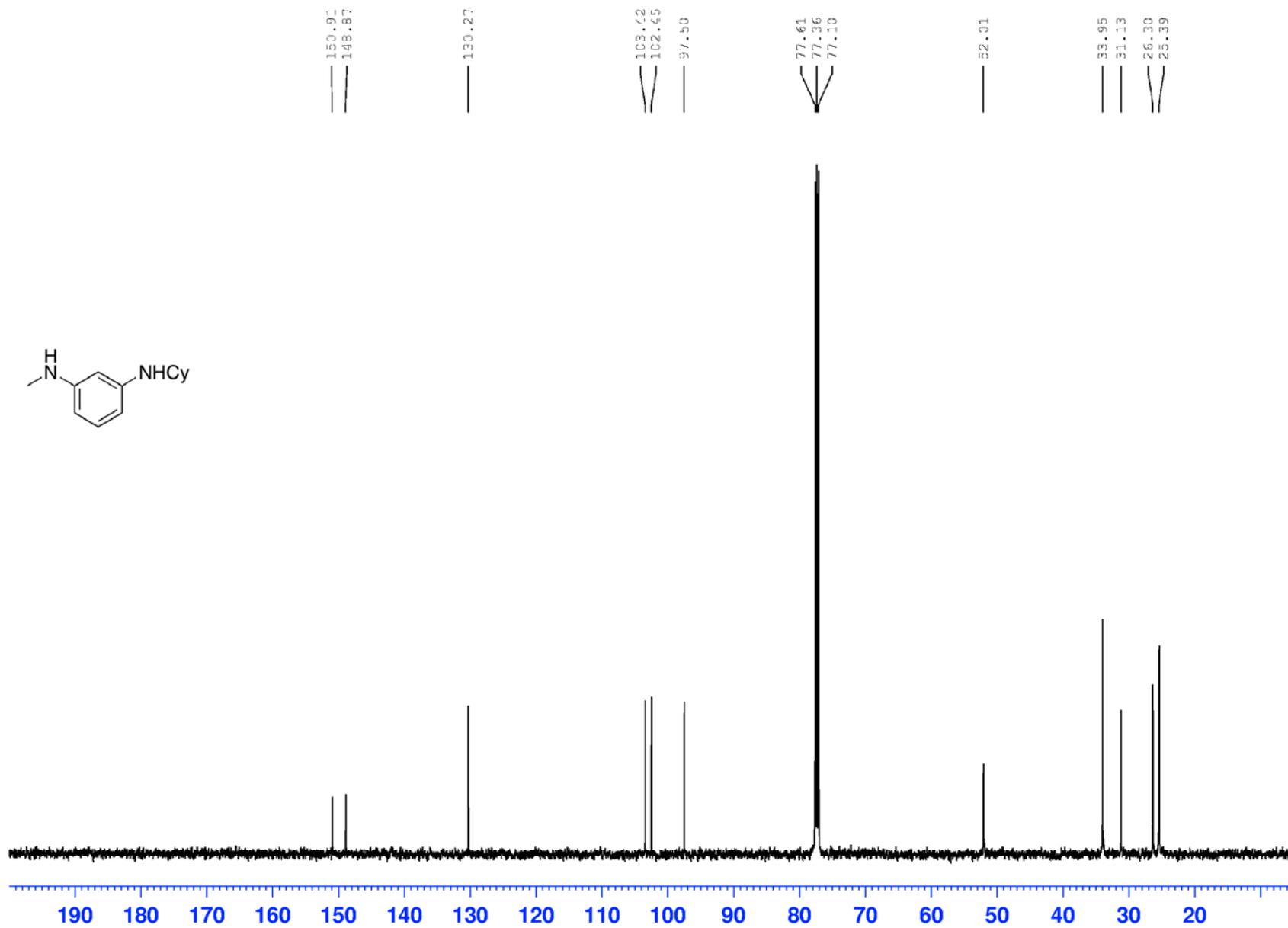
$^{13}\text{C}\{^1\text{H}\}$ NMR of 4-methyl-*N*-(3-((methylamino)methyl)phenyl)piperazin-1-amine (3j) (CDCl_3 , 126 MHz, 300K)



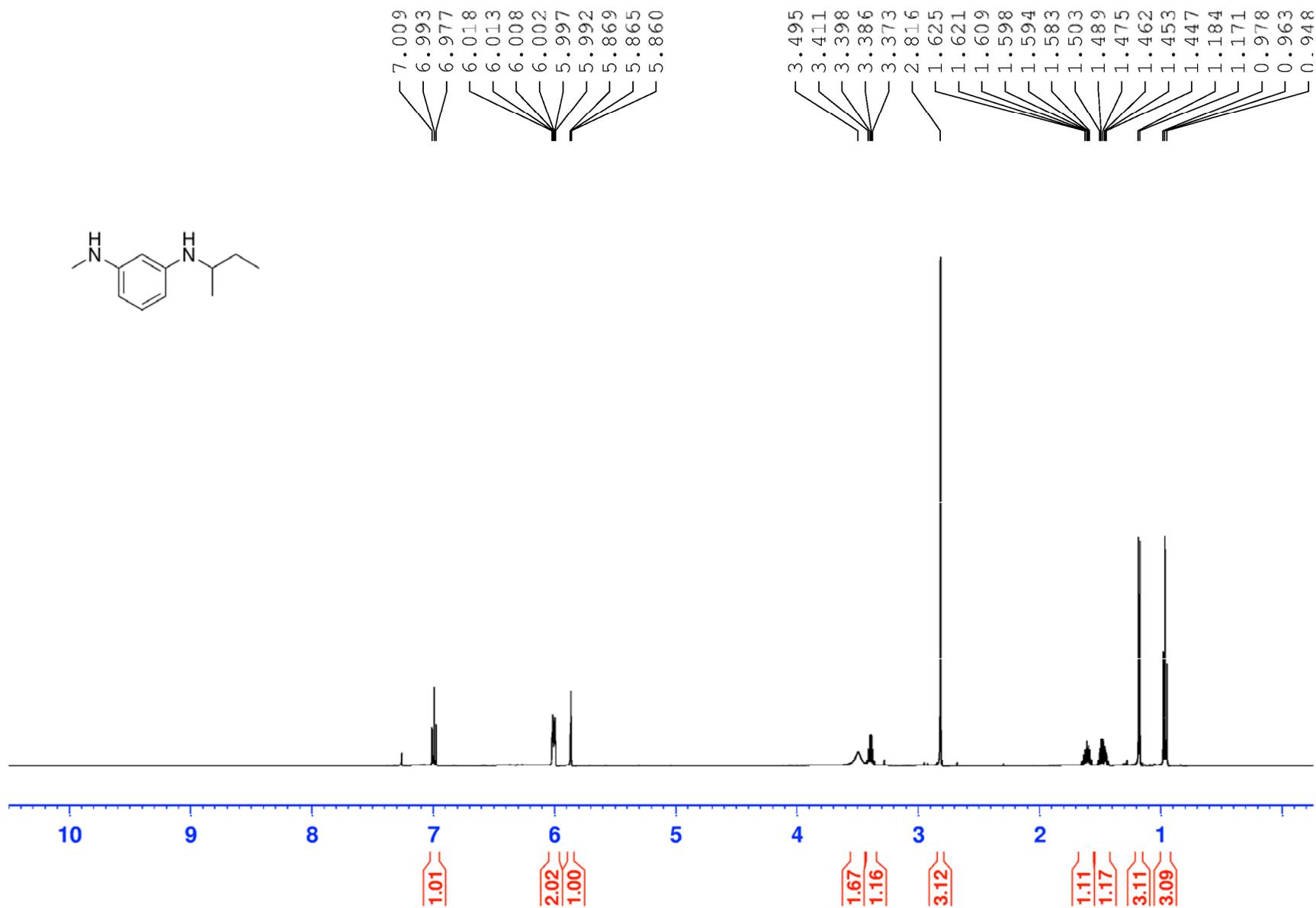
¹H NMR of *N*¹-cyclohexyl-*N*³-methylbenzene-1,3-diamine (**3k**) (CDCl₃, 500 MHz, 300K)



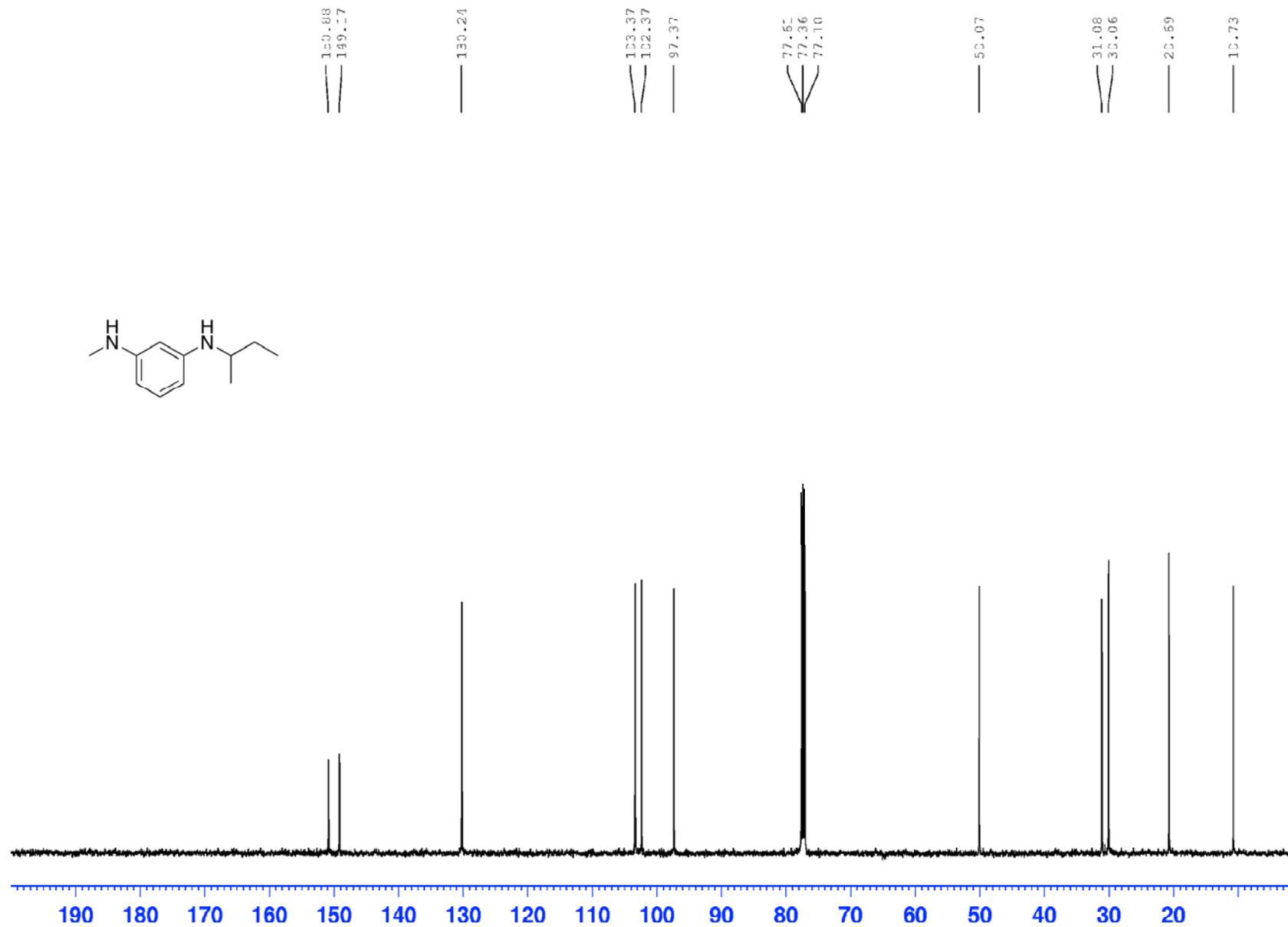
$^{13}\text{C}\{^1\text{H}\}$ NMR of *N*¹-cyclohexyl-*N*³-methylbenzene-1,3-diamine (**3k**) (CDCl_3 , 126 MHz, 300K)



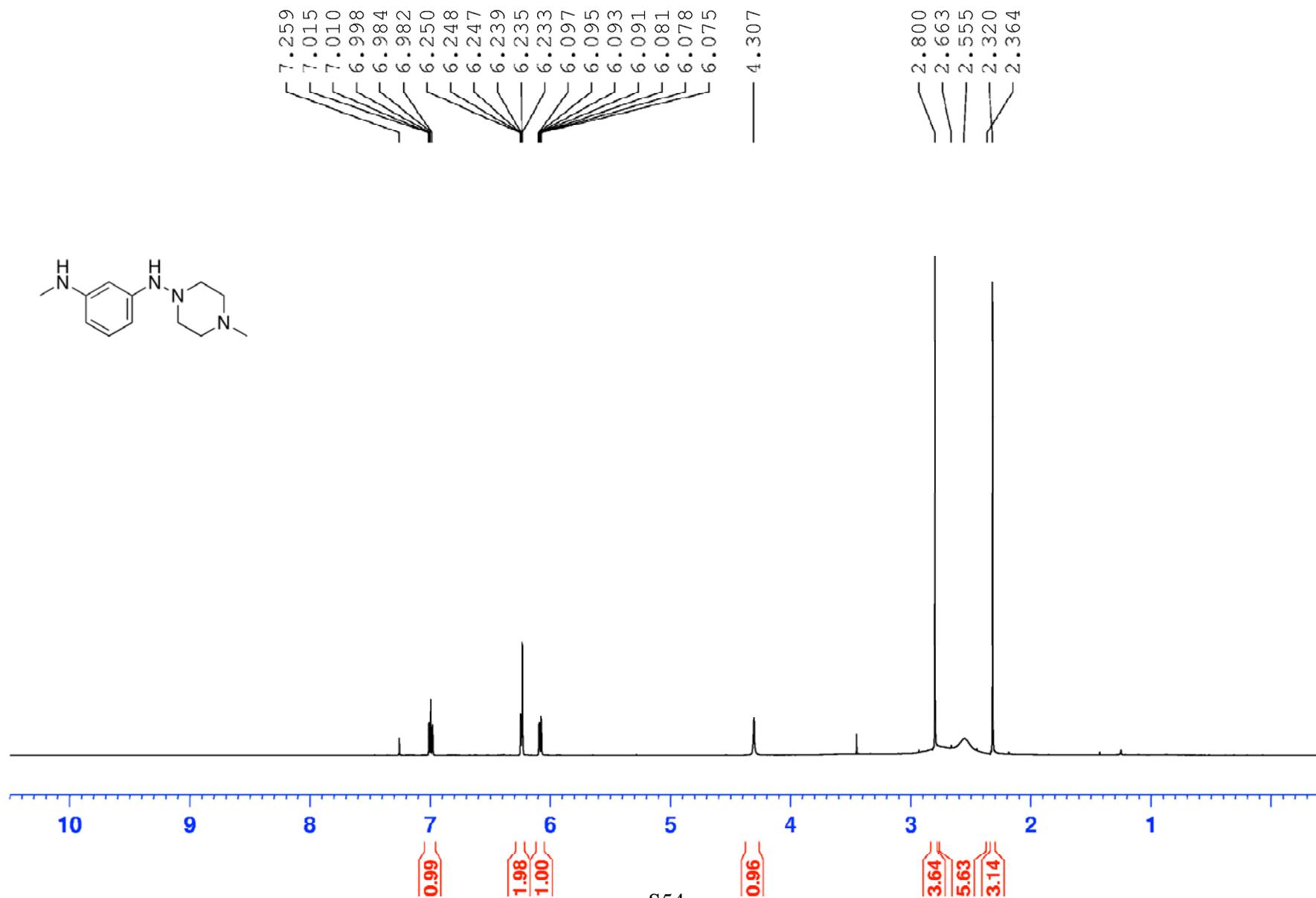
^1H NMR of N^1 -*sec*-butyl- N^3 -methylbenzene-1,3-diamine (3l) (CDCl_3 , 500 MHz, 300K)



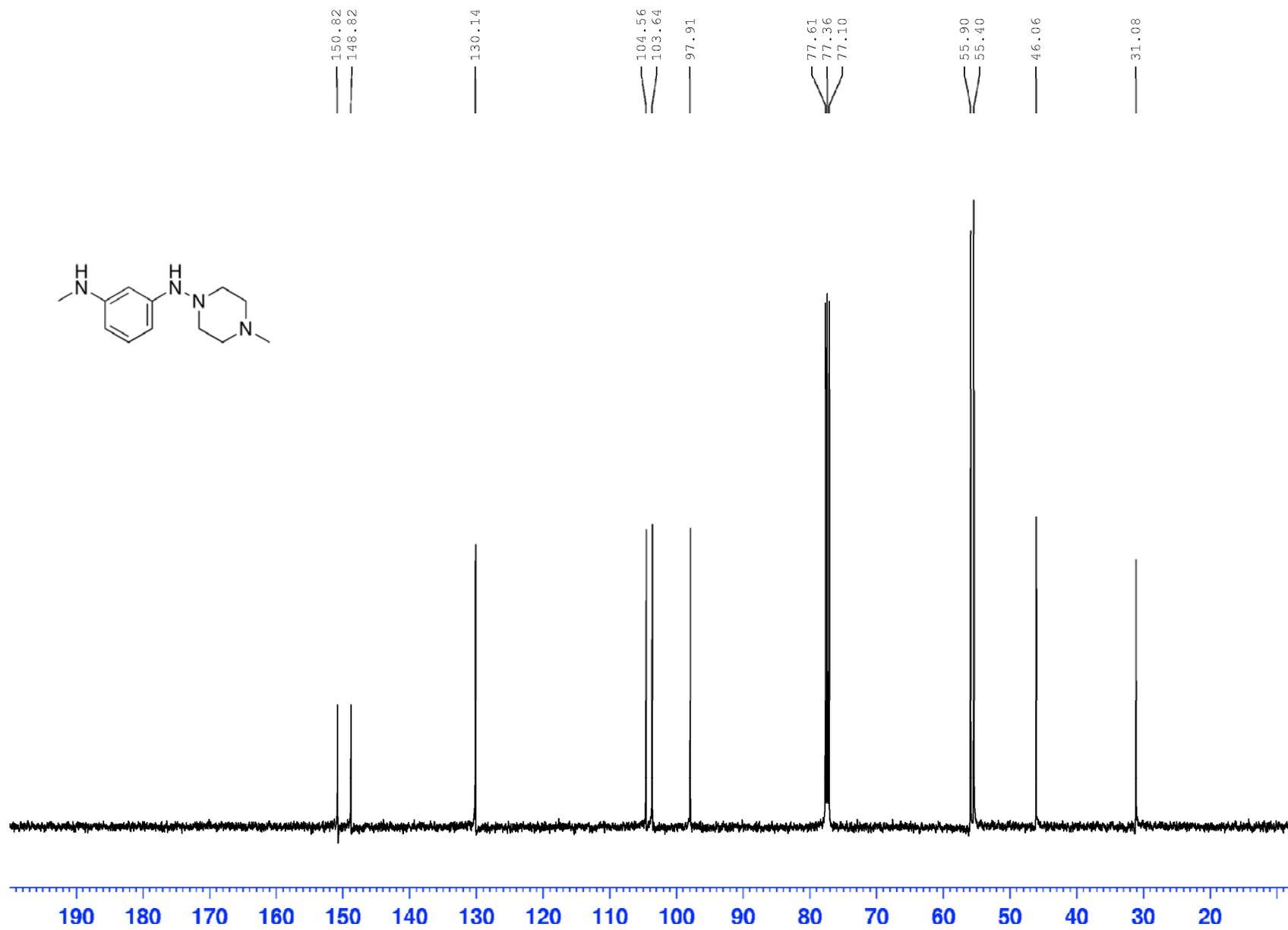
$^{13}\text{C}\{^1\text{H}\}$ NMR of *N*¹-*sec*-butyl-*N*³-methylbenzene-1,3-diamine (3l) (CDCl_3 , 126 MHz, 300K)



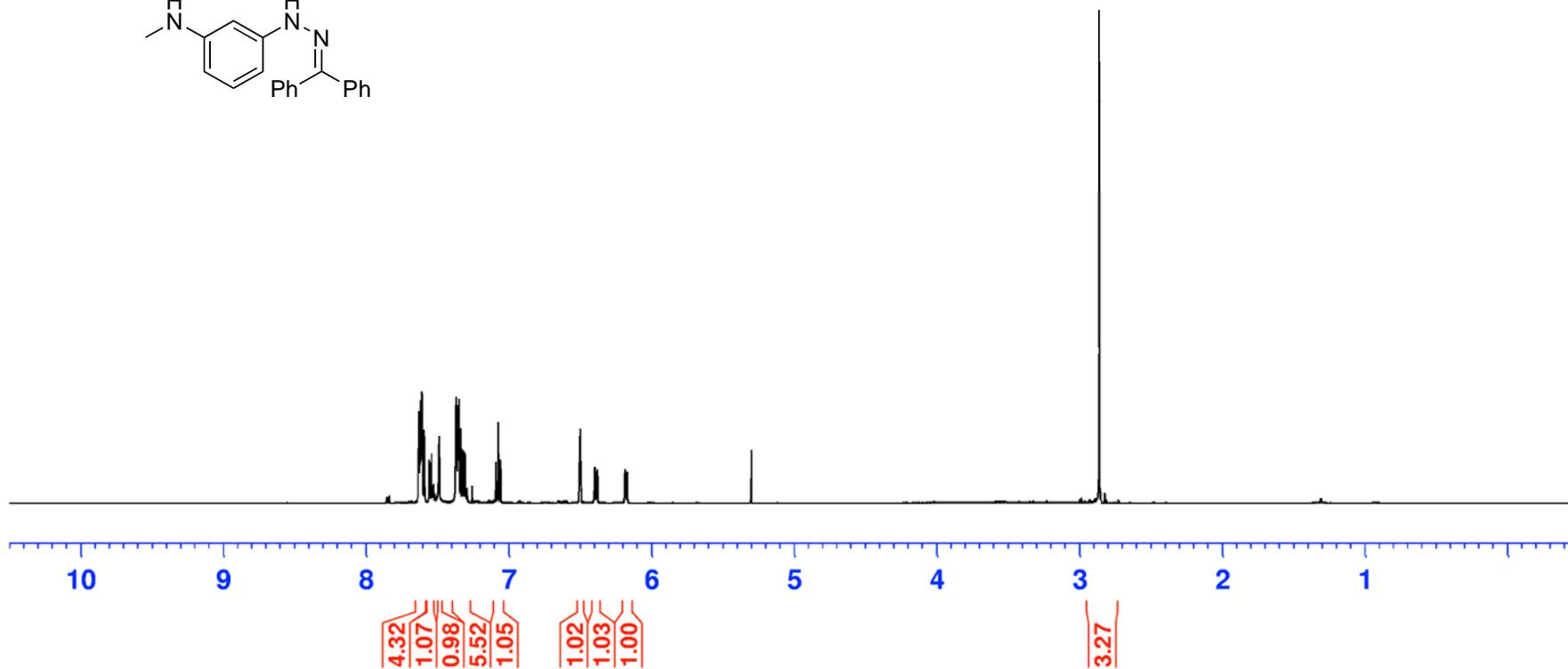
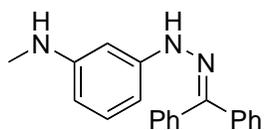
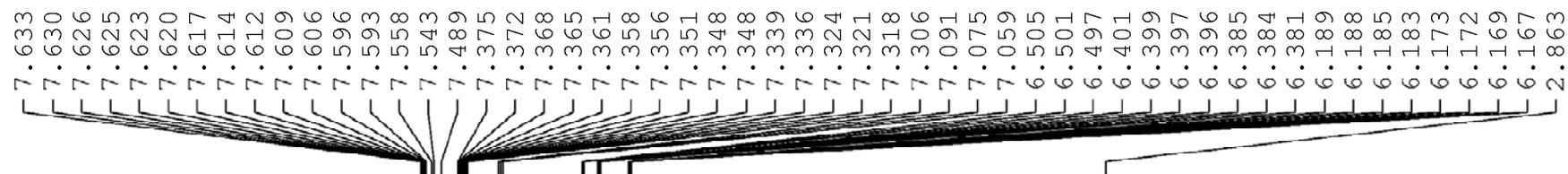
¹H NMR of *N*¹-methyl-*N*³-(4-methylpiperazin-1-yl)benzene-1,3-diamine (3m) (CDCl₃, 500 MHz, 300K)



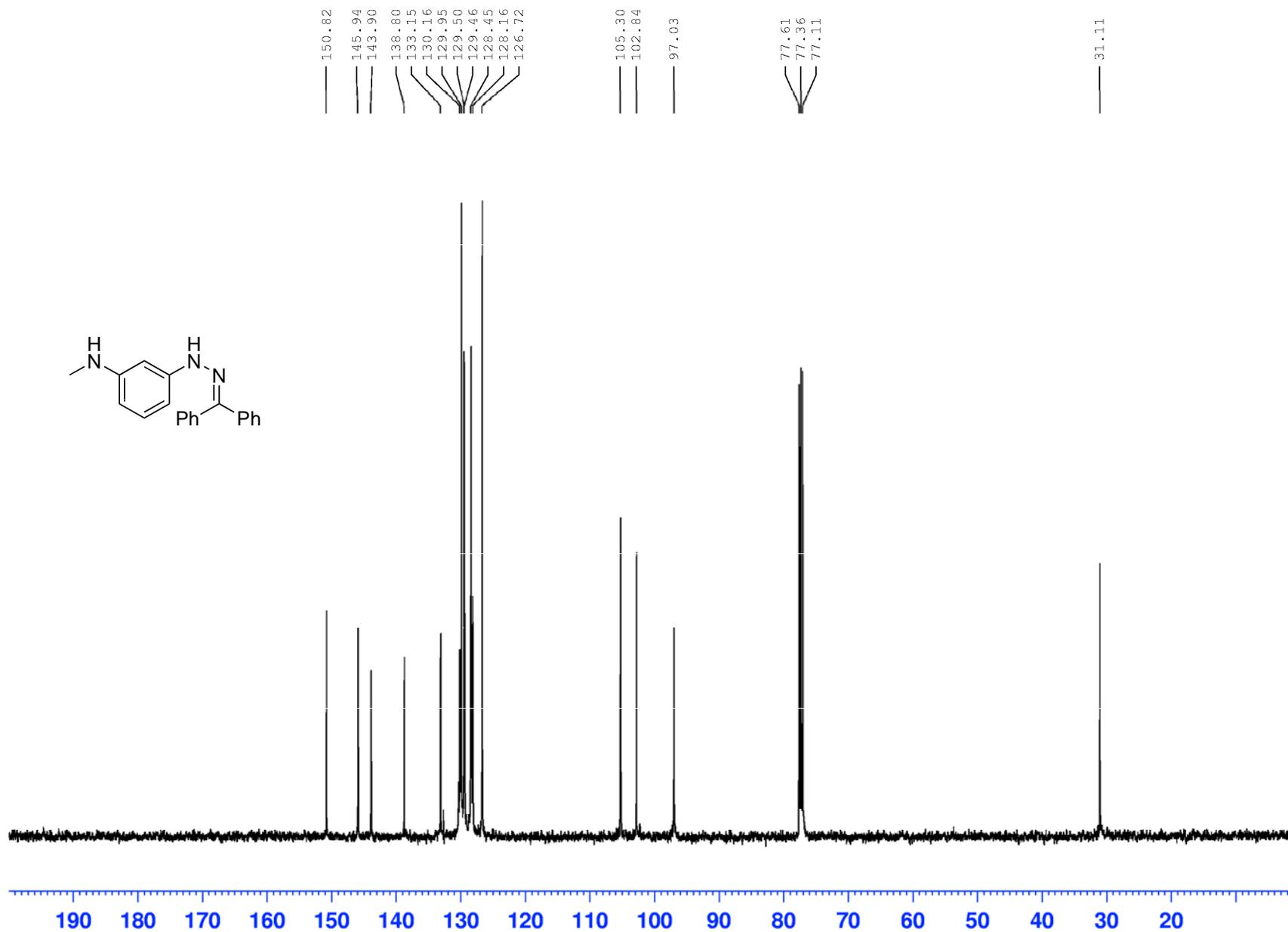
$^{13}\text{C}\{^1\text{H}\}$ NMR of *N*¹-methyl-*N*³-(4-methylpiperazin-1-yl)benzene-1,3-diamine (3m) (CDCl_3 , 126 MHz, 300K)



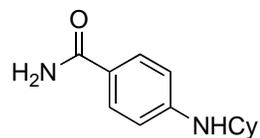
¹H NMR of 3-(2-(diphenylmethylene)hydrazinyl)-N-methylaniline (3n) (CDCl₃, 500 MHz, 300K)



$^{13}\text{C}\{^1\text{H}\}$ NMR of 3-(2-(diphenylmethylene)hydrazinyl)-N-methylaniline (3n) (CDCl_3 , 126 MHz, 300K)



¹H NMR of 4-(cyclohexylamino)benzamide (3o) (MeOD, 500 MHz, 300K)

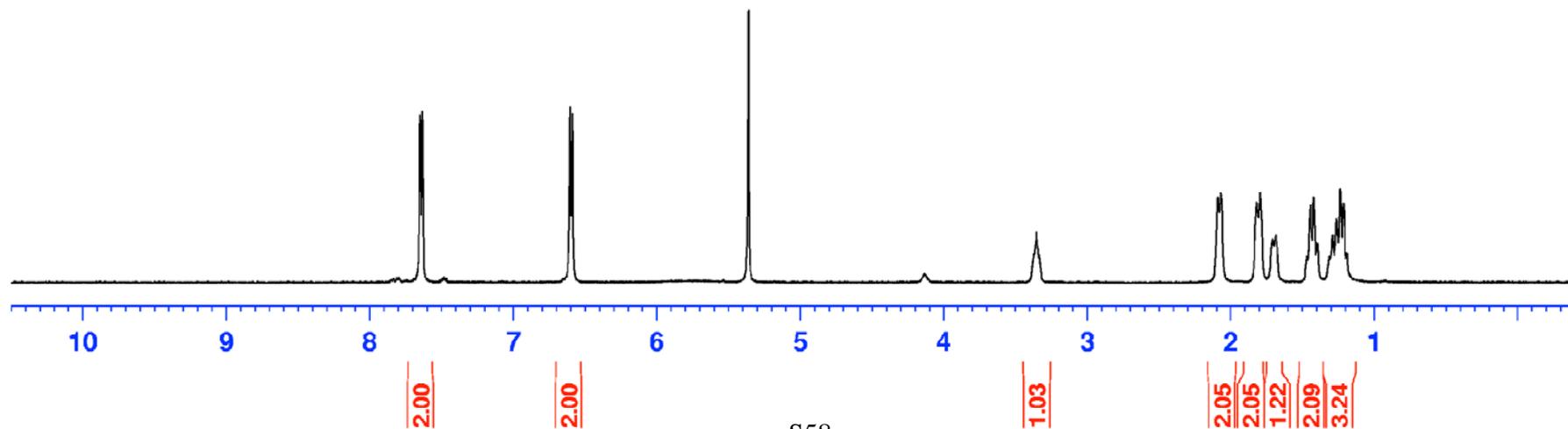


7.651
7.649
7.635

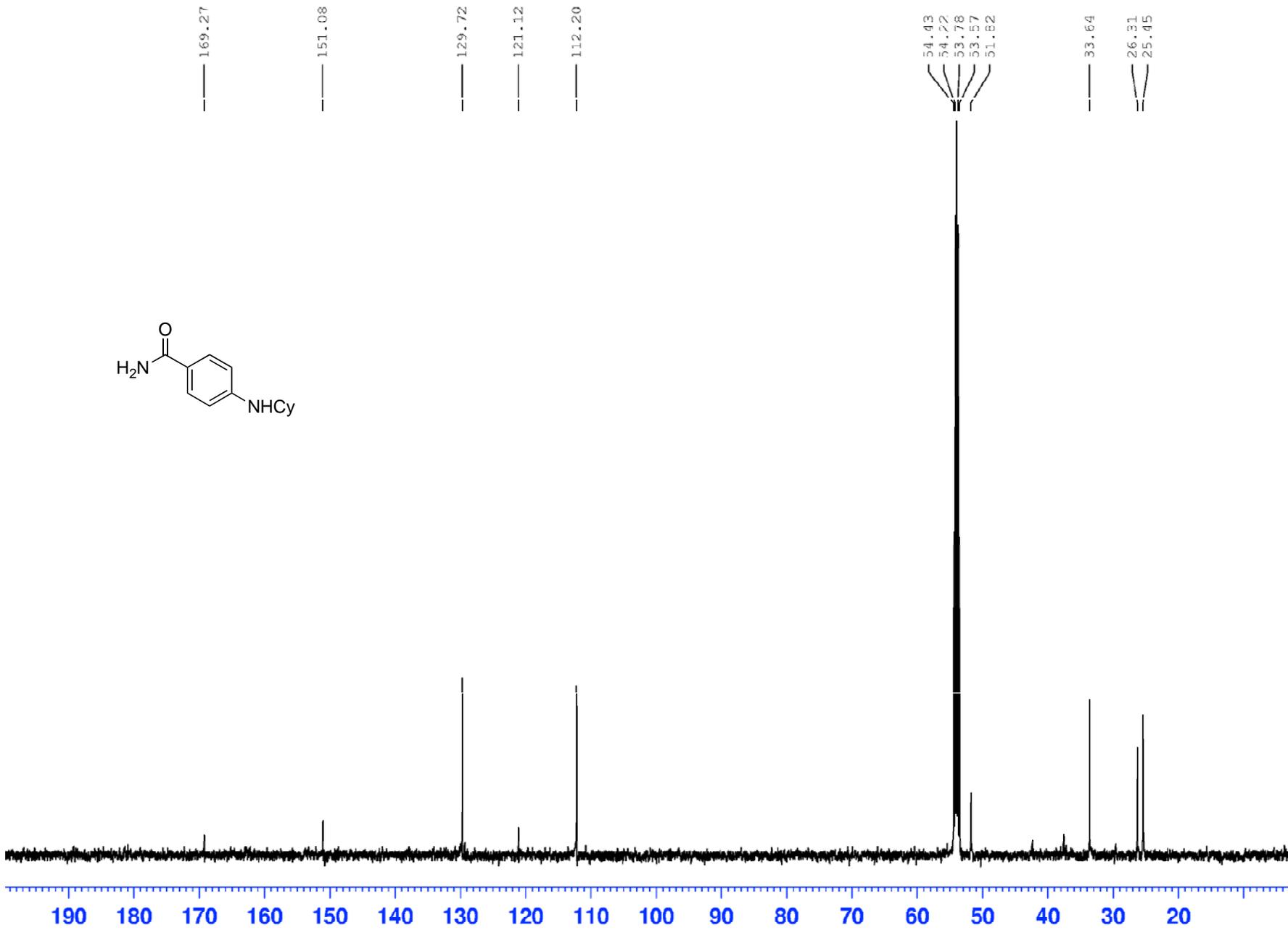
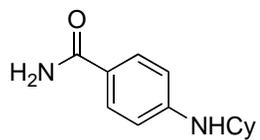
6.604
6.589

5.362

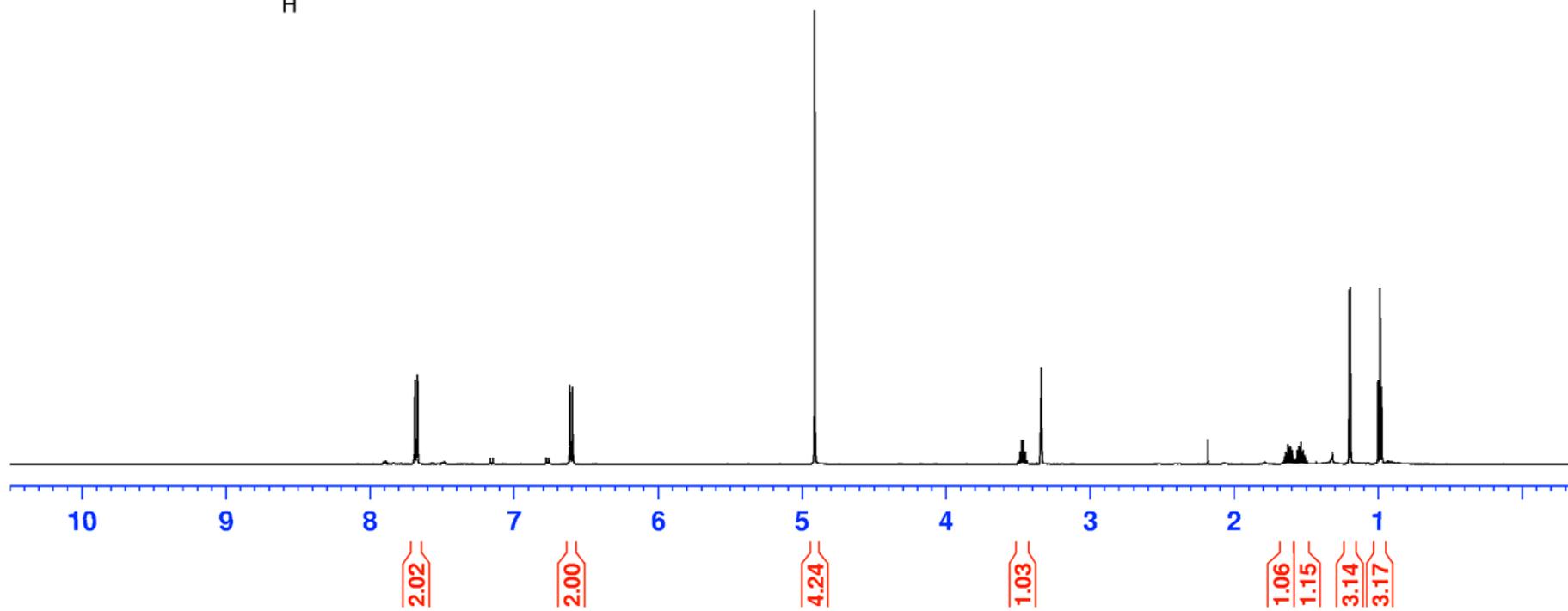
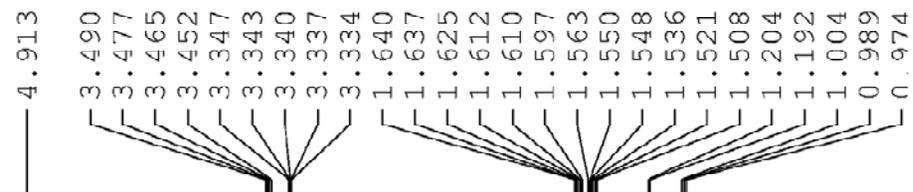
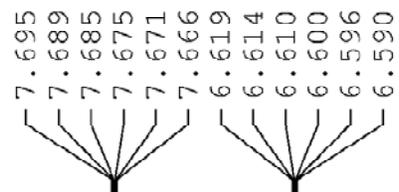
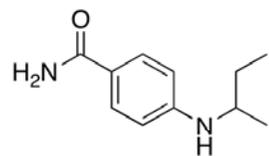
3.372
3.354
3.333
2.089
2.067
1.819
1.793
1.708
1.684
1.468
1.464
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1.444
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1.396
1.313
1.290
1.263
1.235
1.214
1.192



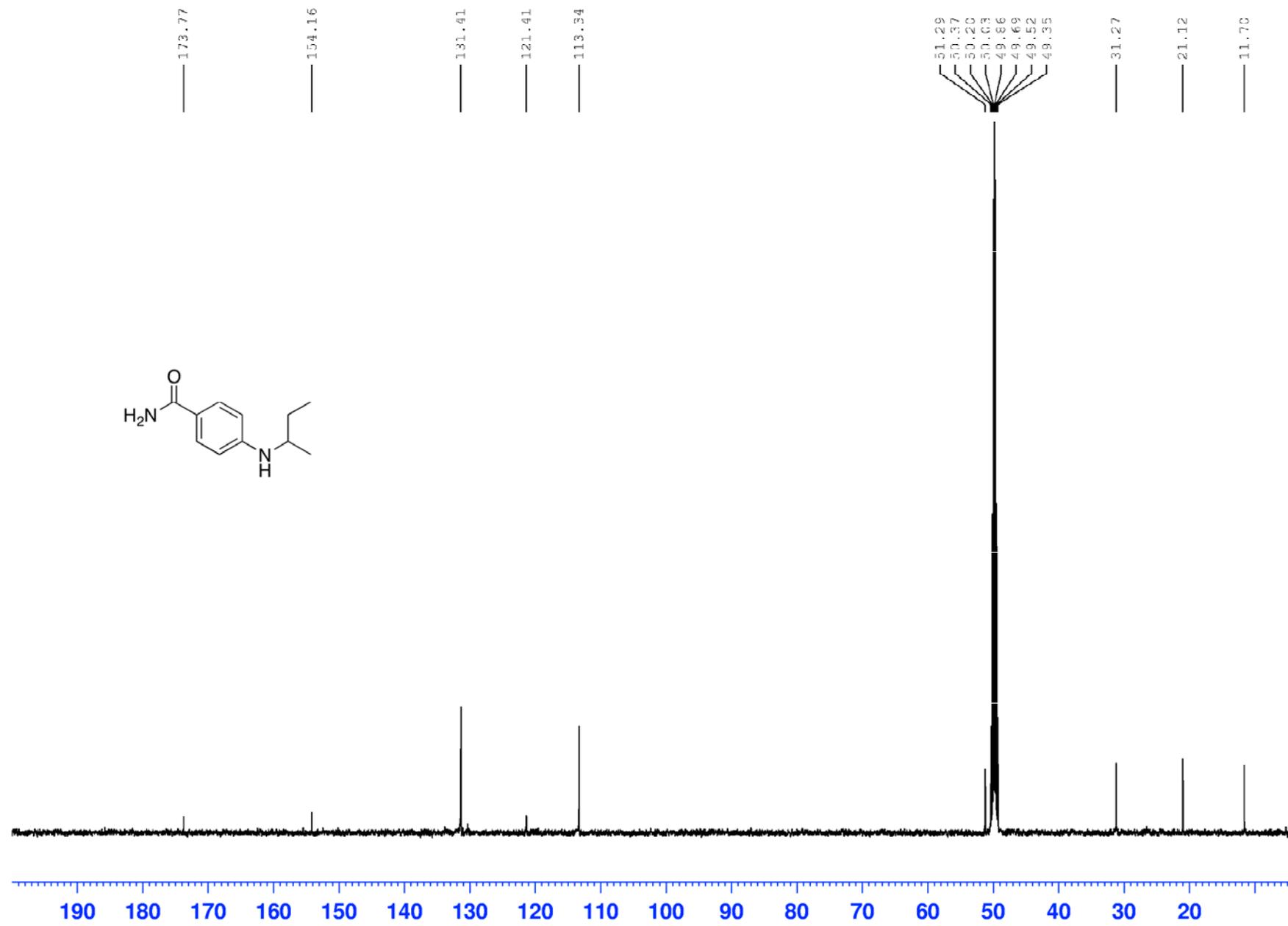
$^{13}\text{C}\{^1\text{H}\}$ NMR of 4-(cyclohexylamino)benzamide (3o) (MeOD, 126 MHz, 300K)



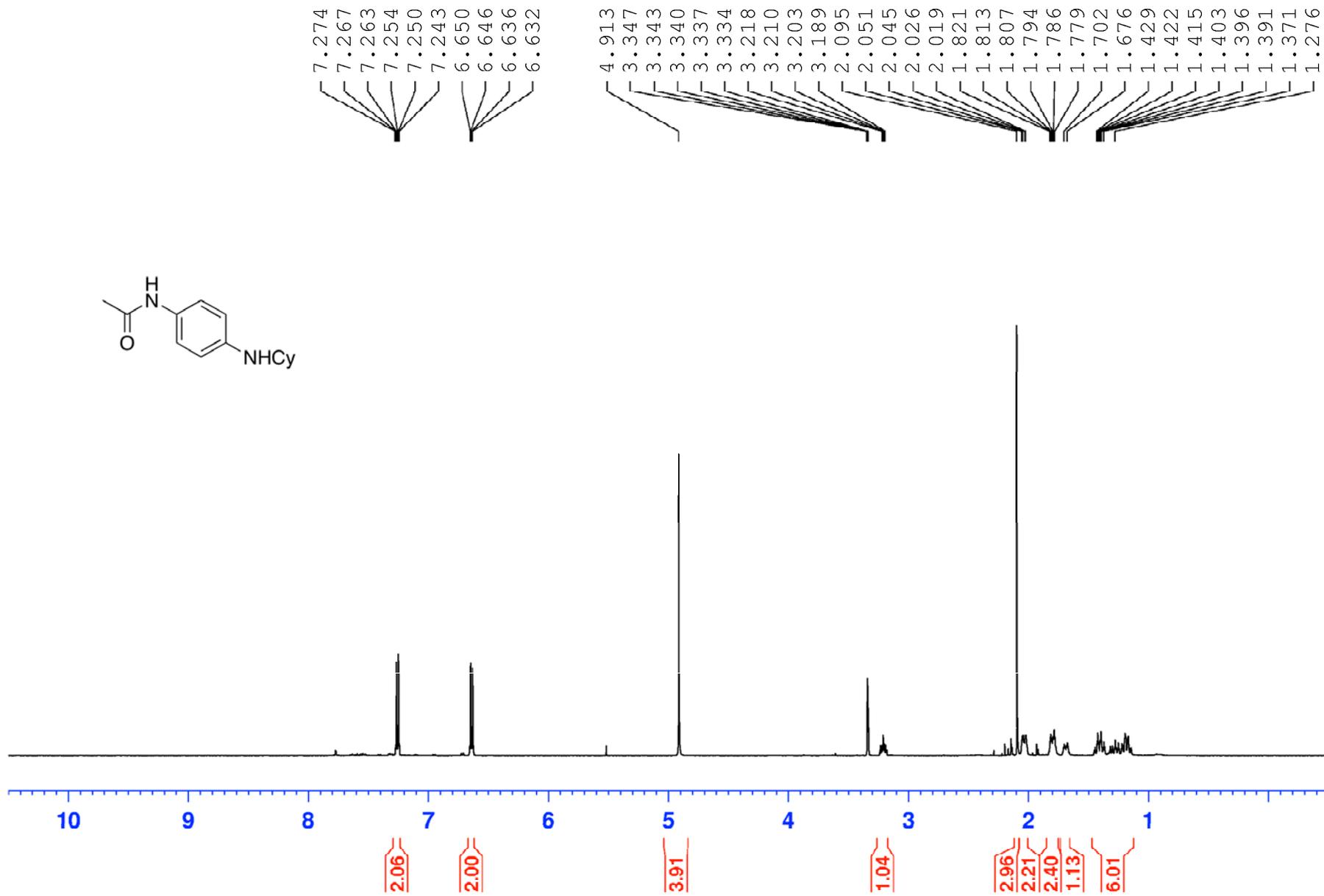
¹H NMR of 4-(*sec*-butylamino)benzamide (3p) (MeOD, 500 MHz, 300K)



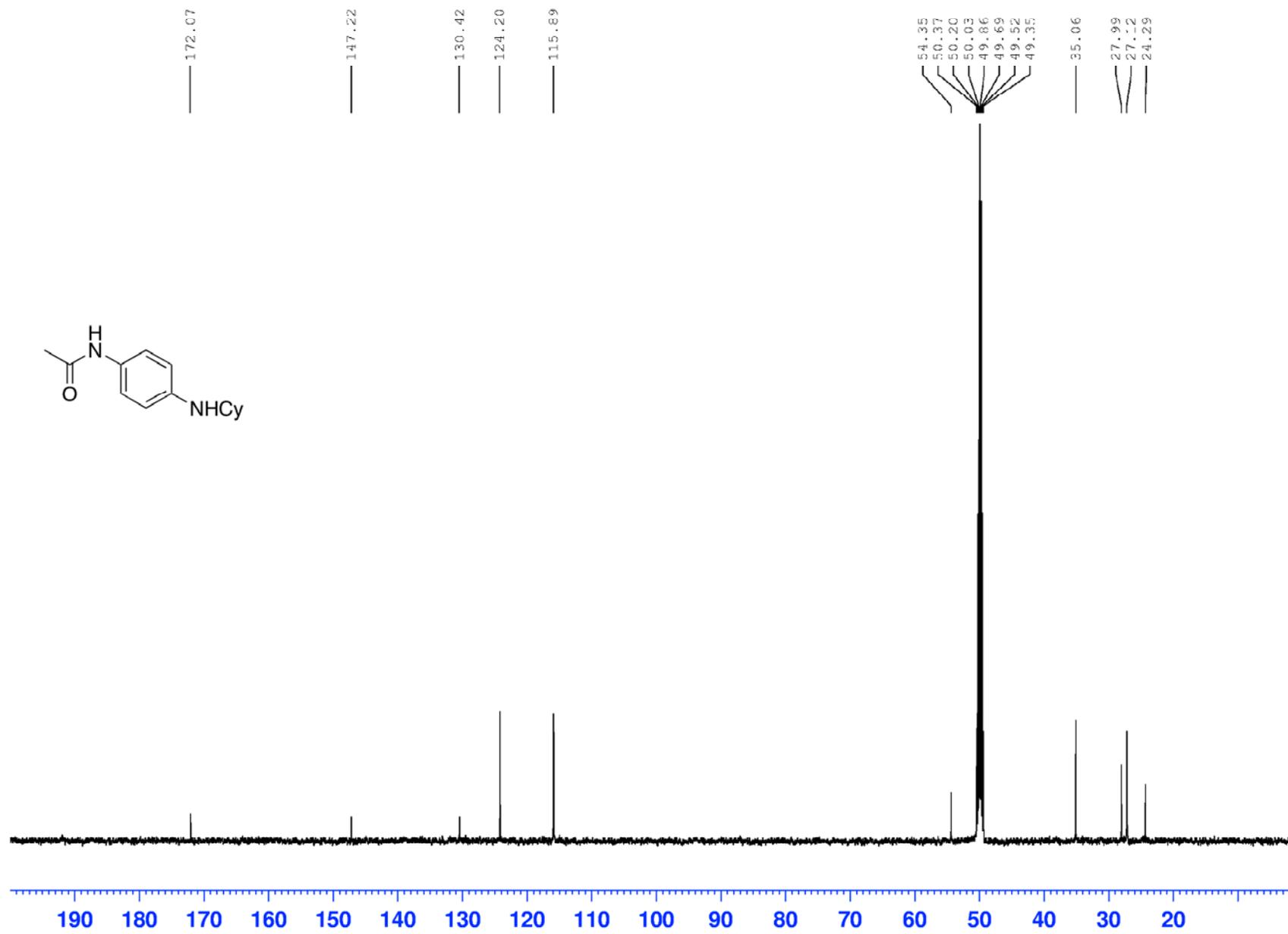
$^{13}\text{C}\{^1\text{H}\}$ NMR of 4-(*sec*-butylamino)benzamide (3p) (MeOD, 126 MHz, 300K)



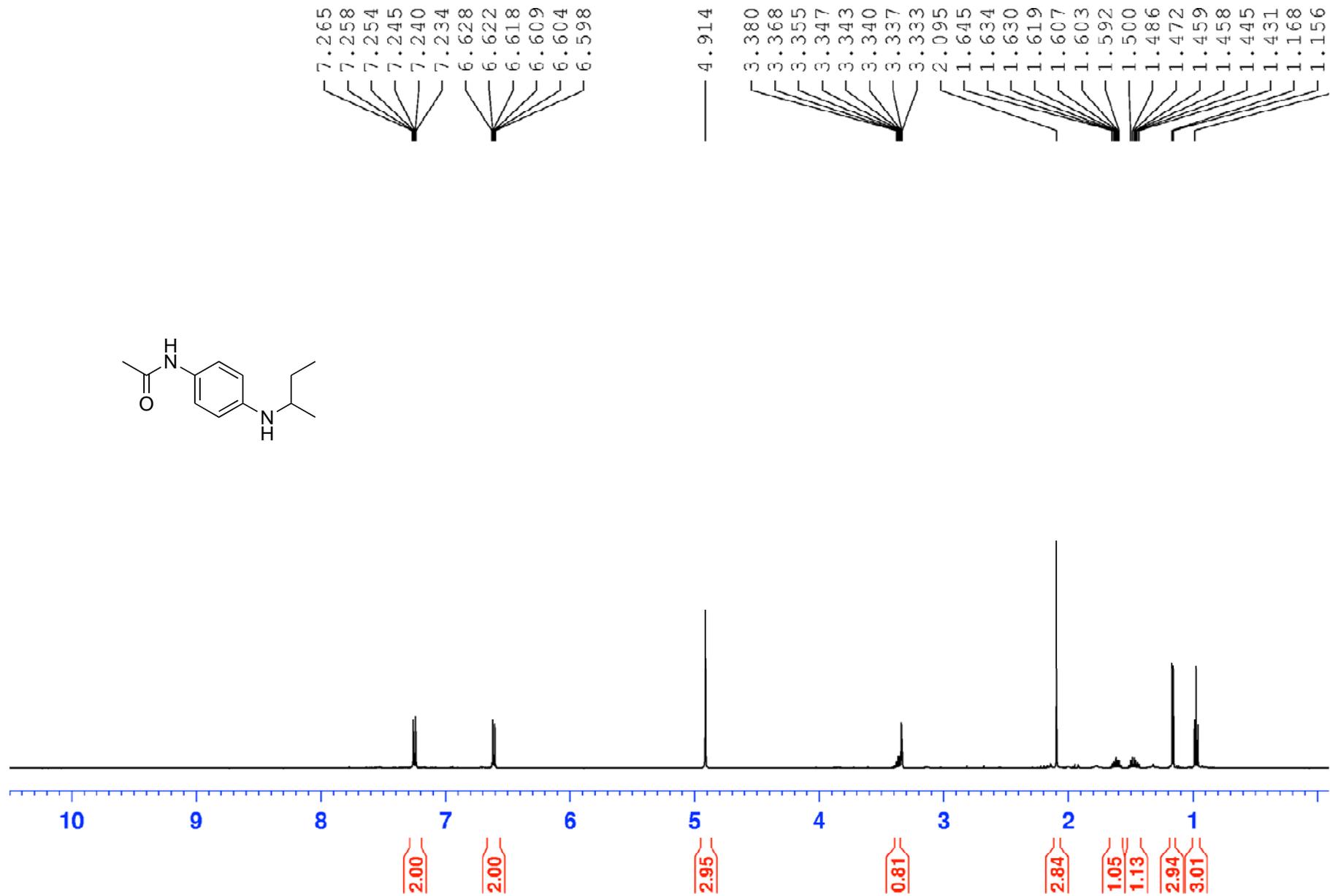
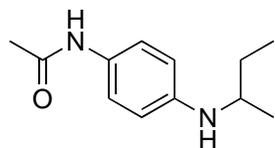
¹H NMR of N-(4-(cyclohexylamino)phenyl)acetamide (3q) (MeOD, 500 MHz, 300K)



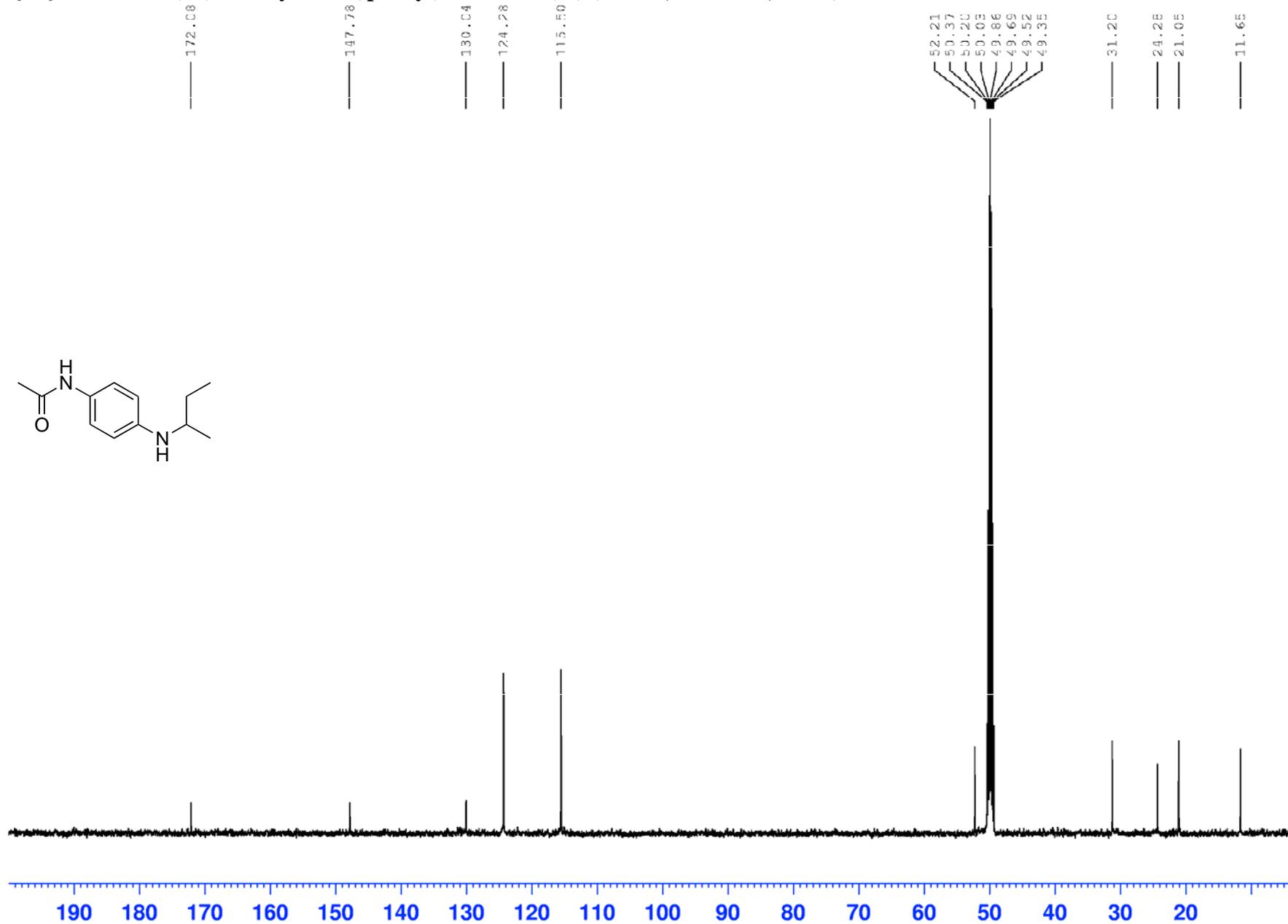
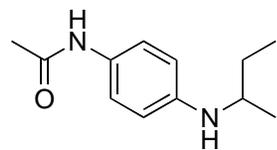
$^{13}\text{C}\{^1\text{H}\}$ NMR of N-(4-(cyclohexylamino)phenyl)acetamide (3q) (MeOD, 126 MHz, 300K)



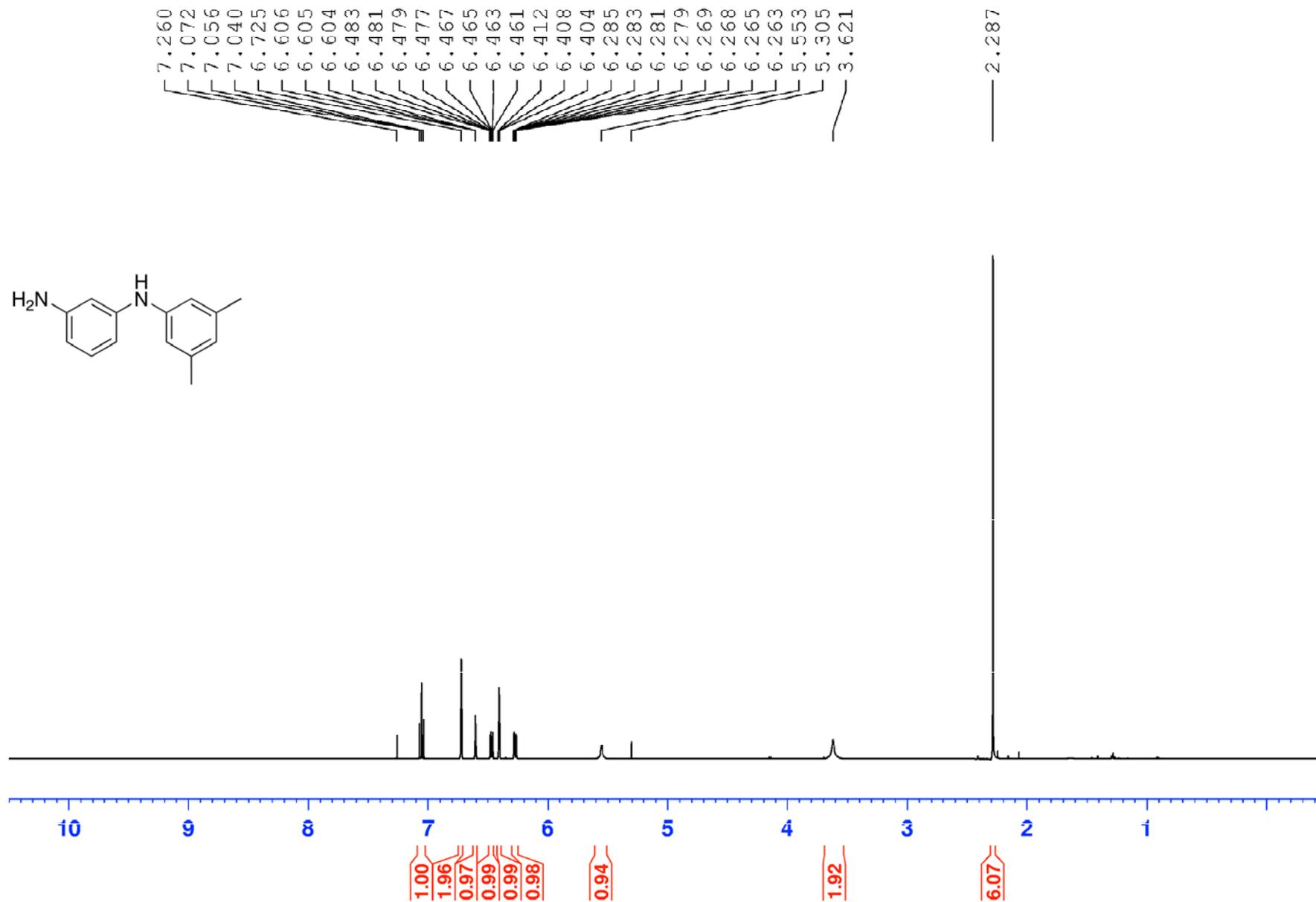
¹H NMR of N-(4-(sec-butylamino)phenyl)acetamide (3r) (MeOD, 500 MHz, 300K)



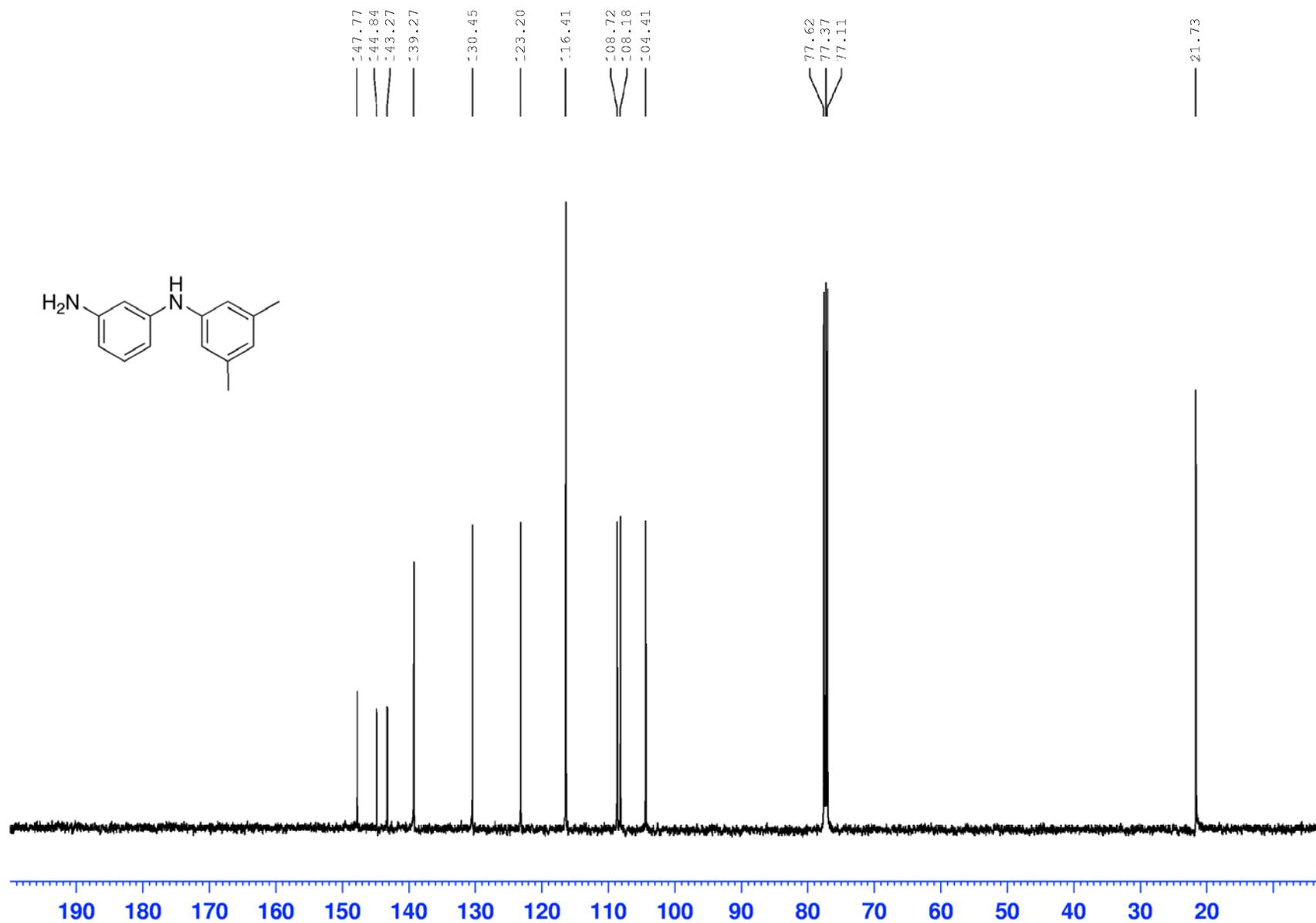
¹³C{¹H} NMR of N-(4-(sec-butylamino)phenyl)acetamide (3r) (MeOD, 126 MHz, 300K)



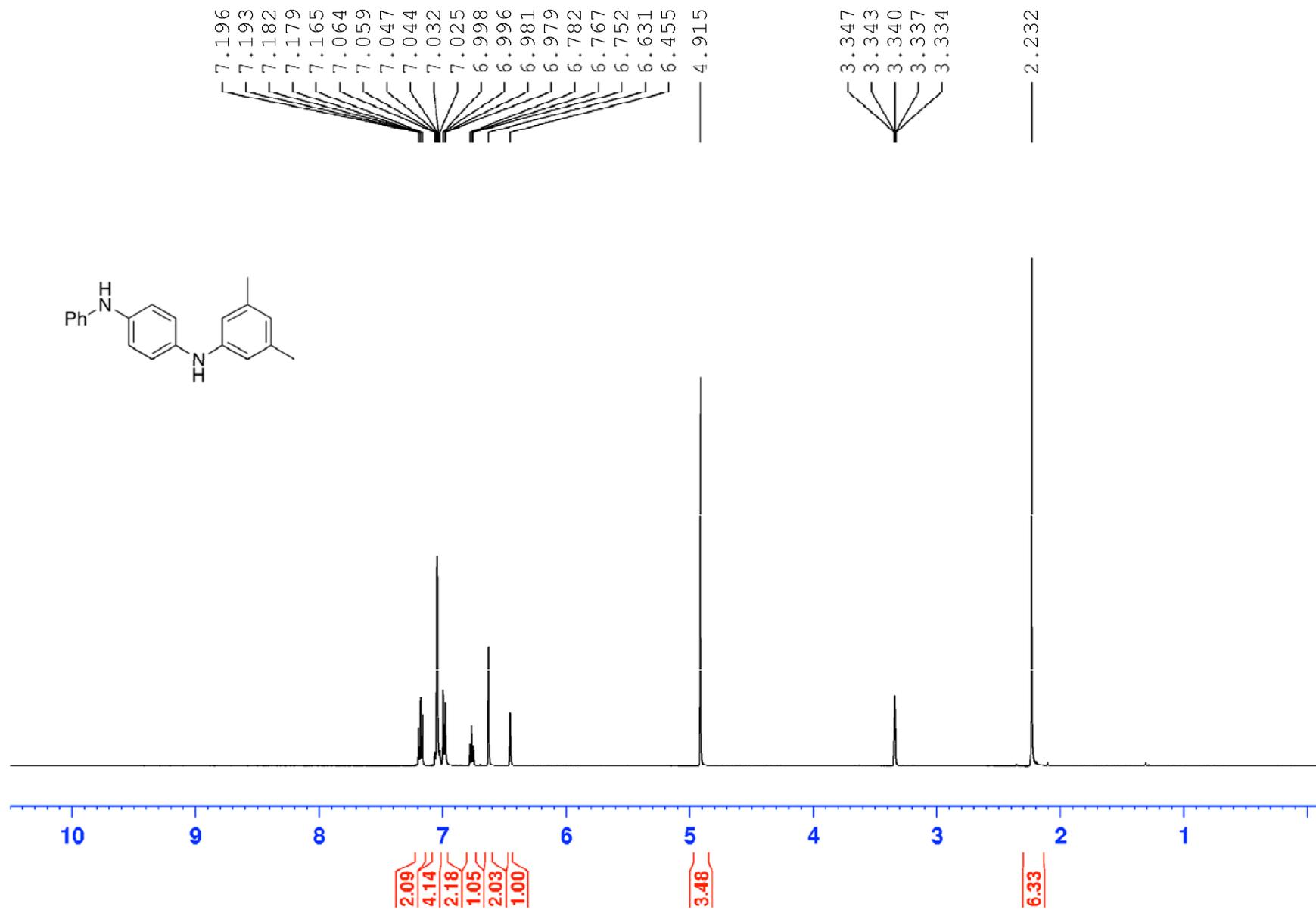
^1H NMR of N^1 -(3,5-dimethylphenyl)benzene-1,3-diamine (4a) (CDCl_3 , 500 MHz, 300K)



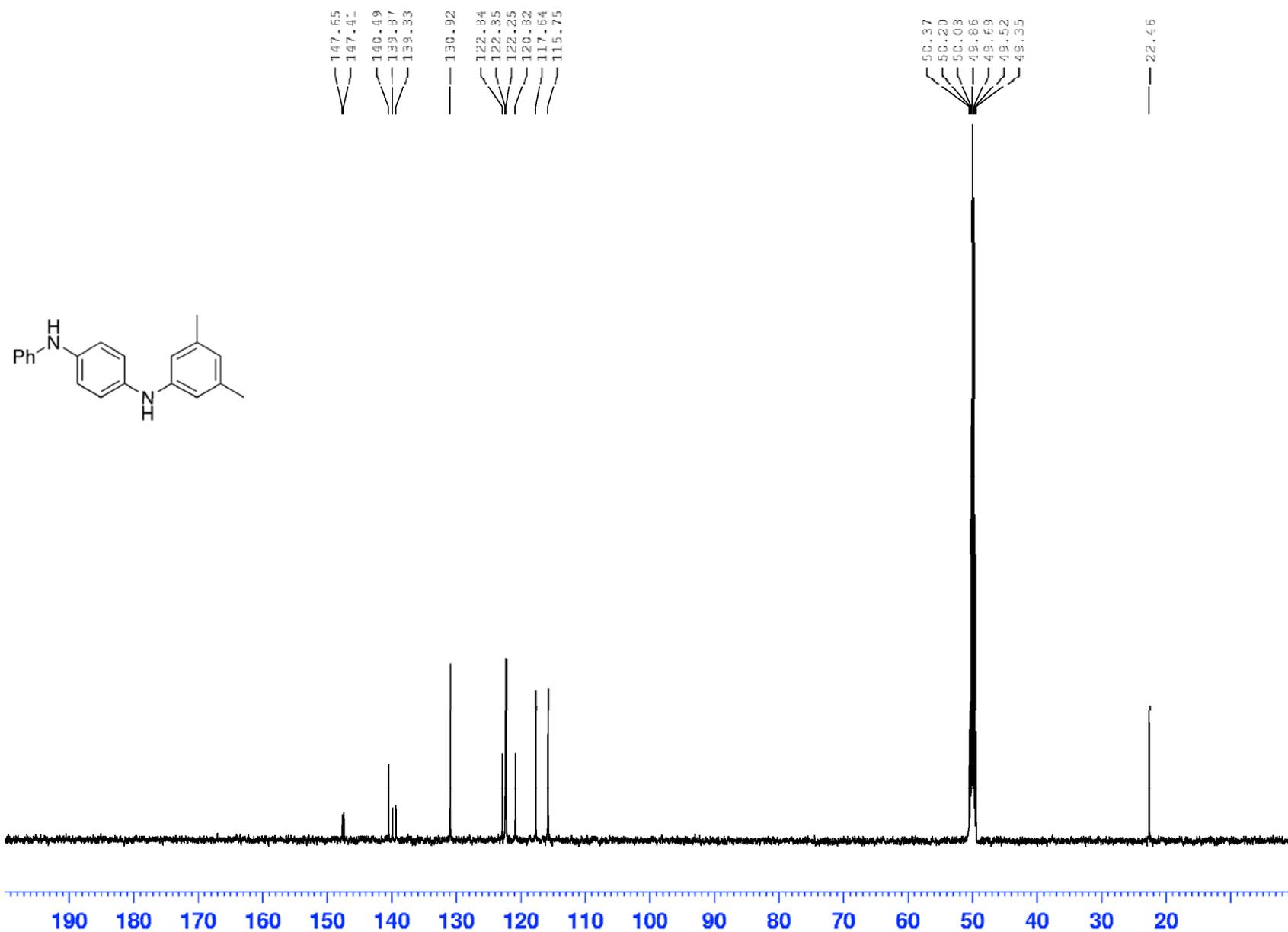
$^{13}\text{C}\{^1\text{H}\}$ NMR of N^1 -(3,5-dimethylphenyl)benzene-1,3-diamine (4b) (CDCl_3 , 126 MHz, 300K)



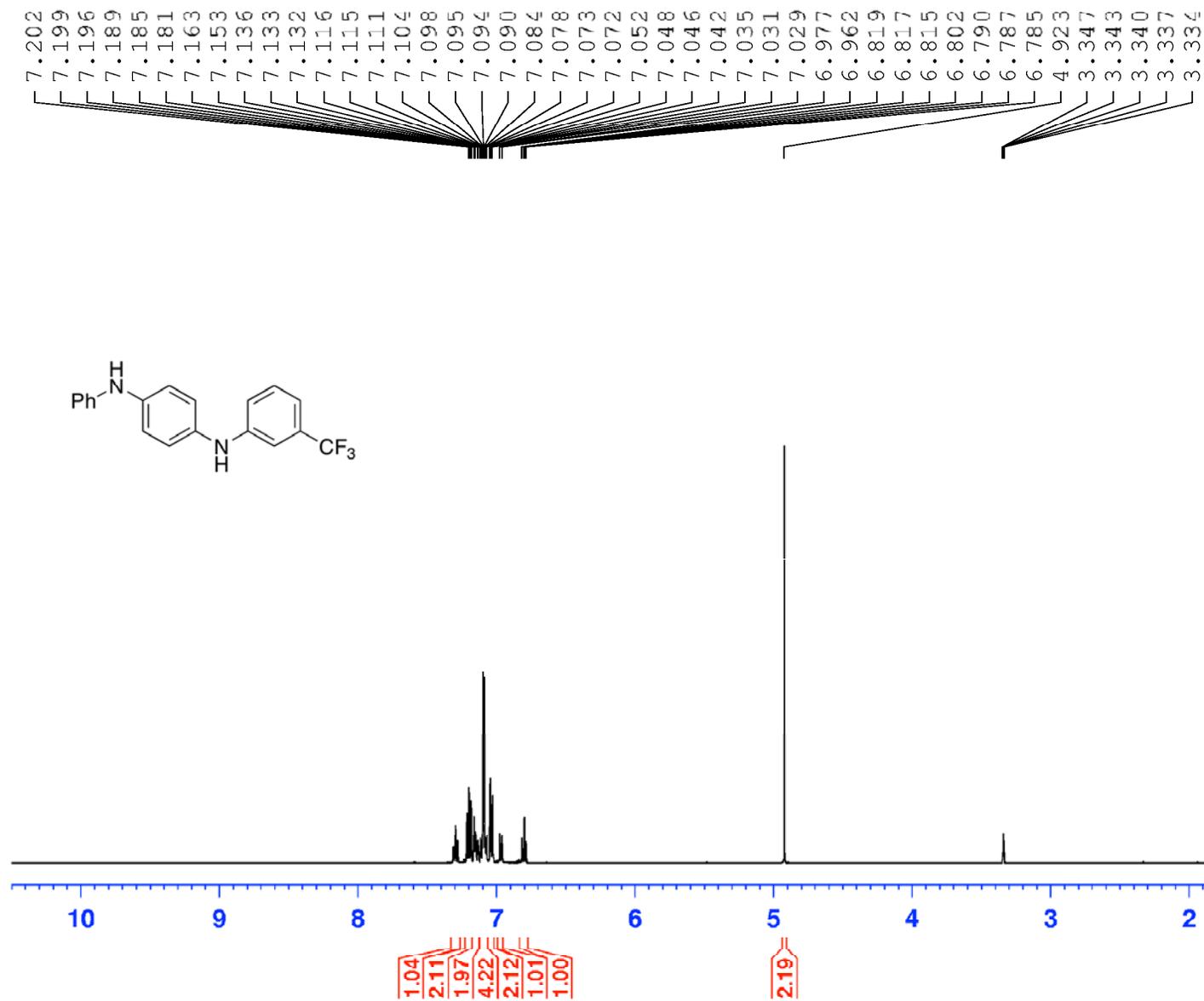
¹H NMR of *N*¹-(3,5-dimethylphenyl)-*N*⁴-phenylbenzene-1,4-diamine (**4b**) (MeOD, 500 MHz, 300K)



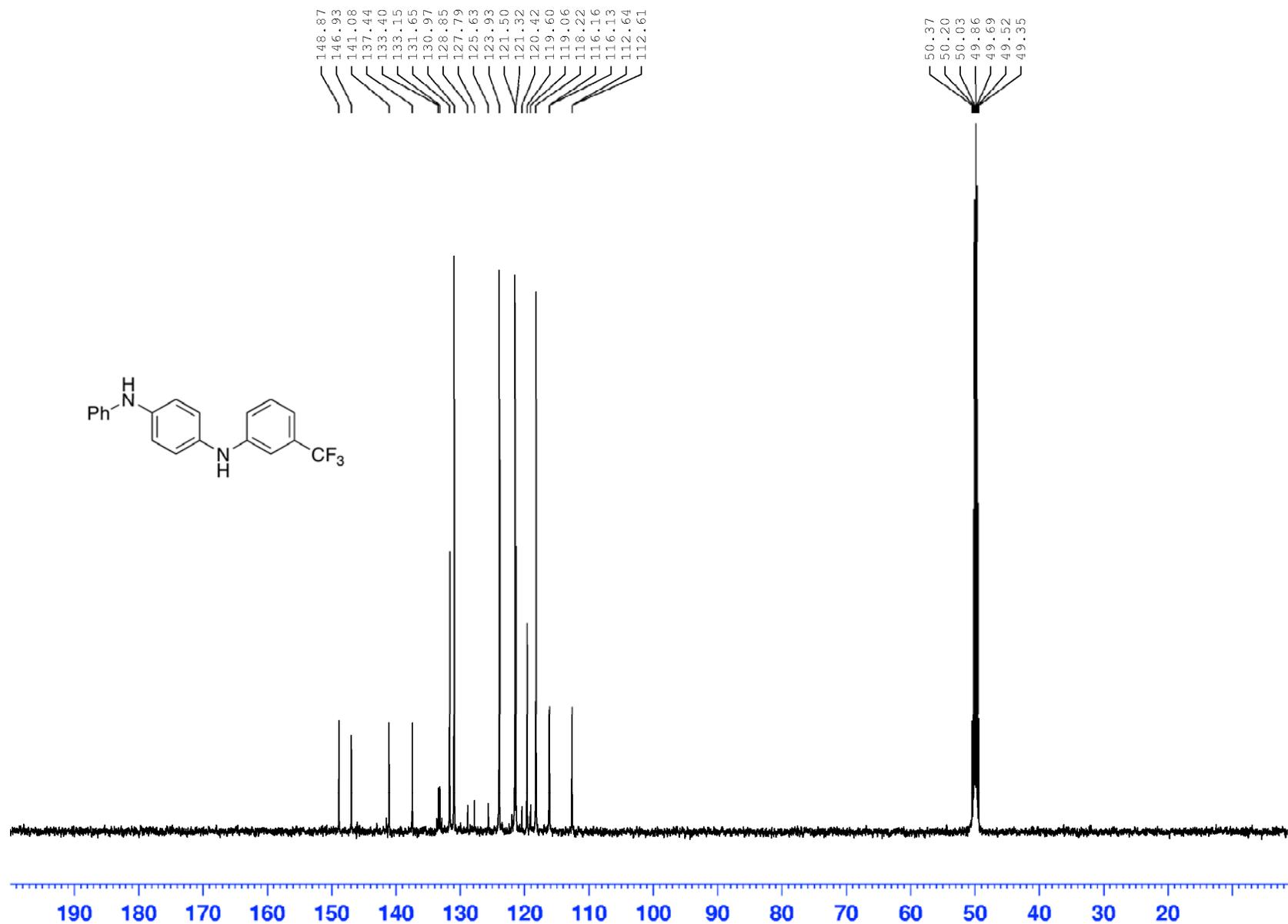
$^{13}\text{C}\{^1\text{H}\}$ NMR of *N*¹-(3,5-dimethylphenyl)-*N*⁴-phenylbenzene-1,4-diamine (4b) (MeOD, 126 MHz, 300K)



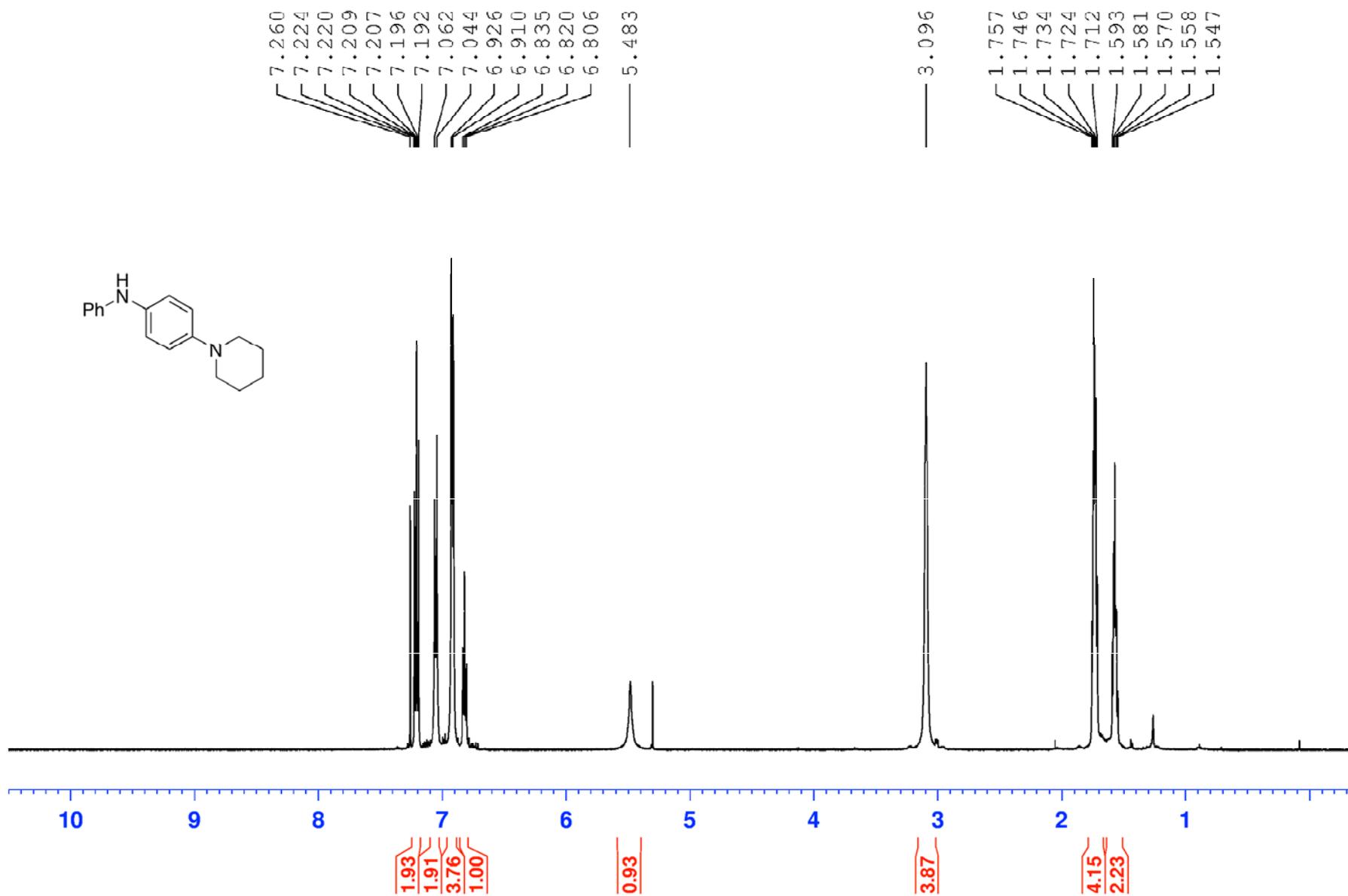
¹H NMR of *N*¹-phenyl-*N*⁴-(3-(trifluoromethyl)phenyl)benzene-1,4-diamine (4c) (MeOD, 500 MHz, 300K)



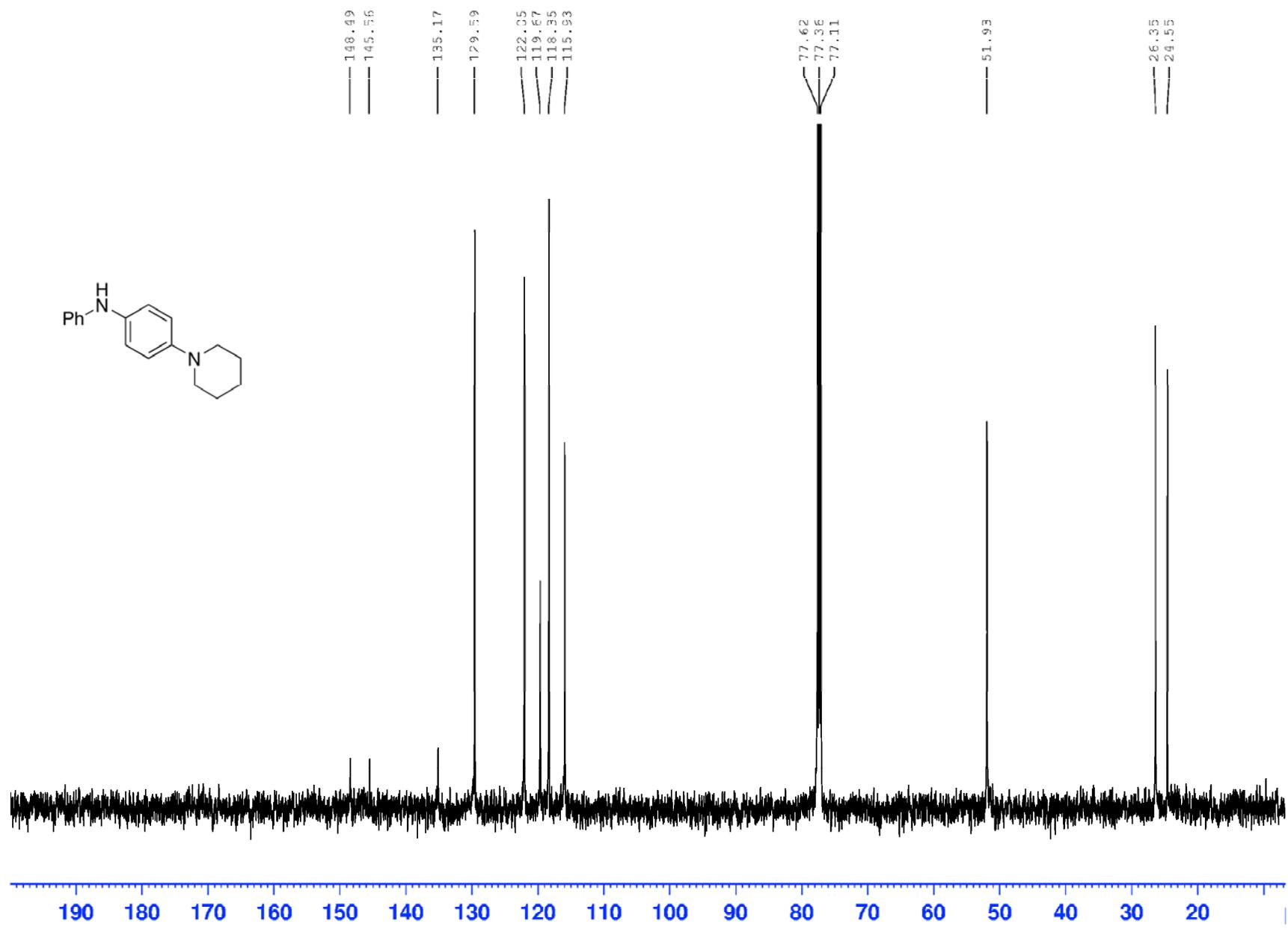
$^{13}\text{C}\{^1\text{H}\}$ NMR of *N*¹-phenyl-*N*⁴-(3-(trifluoromethyl)phenyl)benzene-1,4-diamine (4c) (MeOD, 126 MHz, 300K)



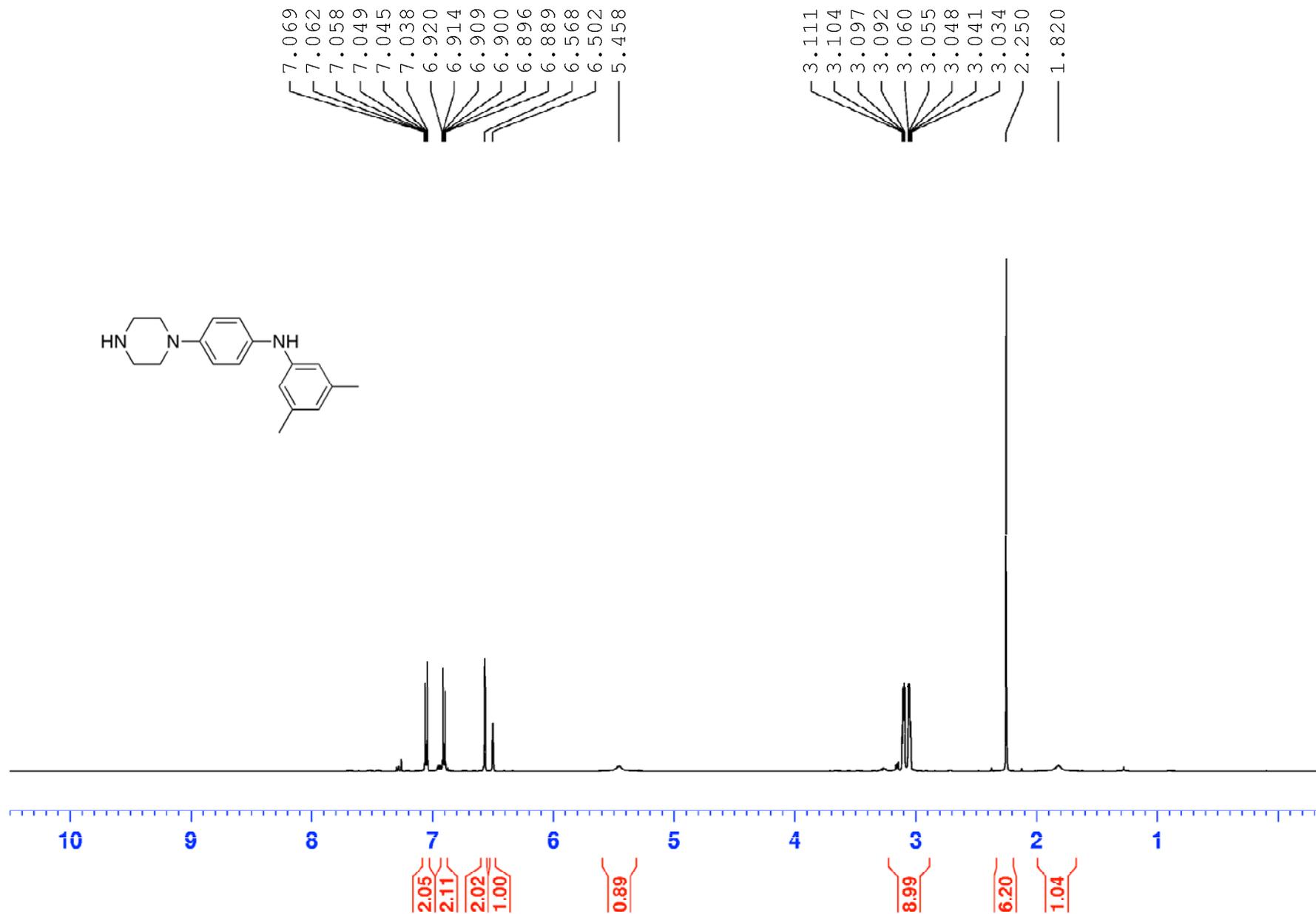
¹H NMR of *N*-phenyl-4-(piperidin-1-yl)aniline (4d) (CDCl₃, 500 MHz, 300K)



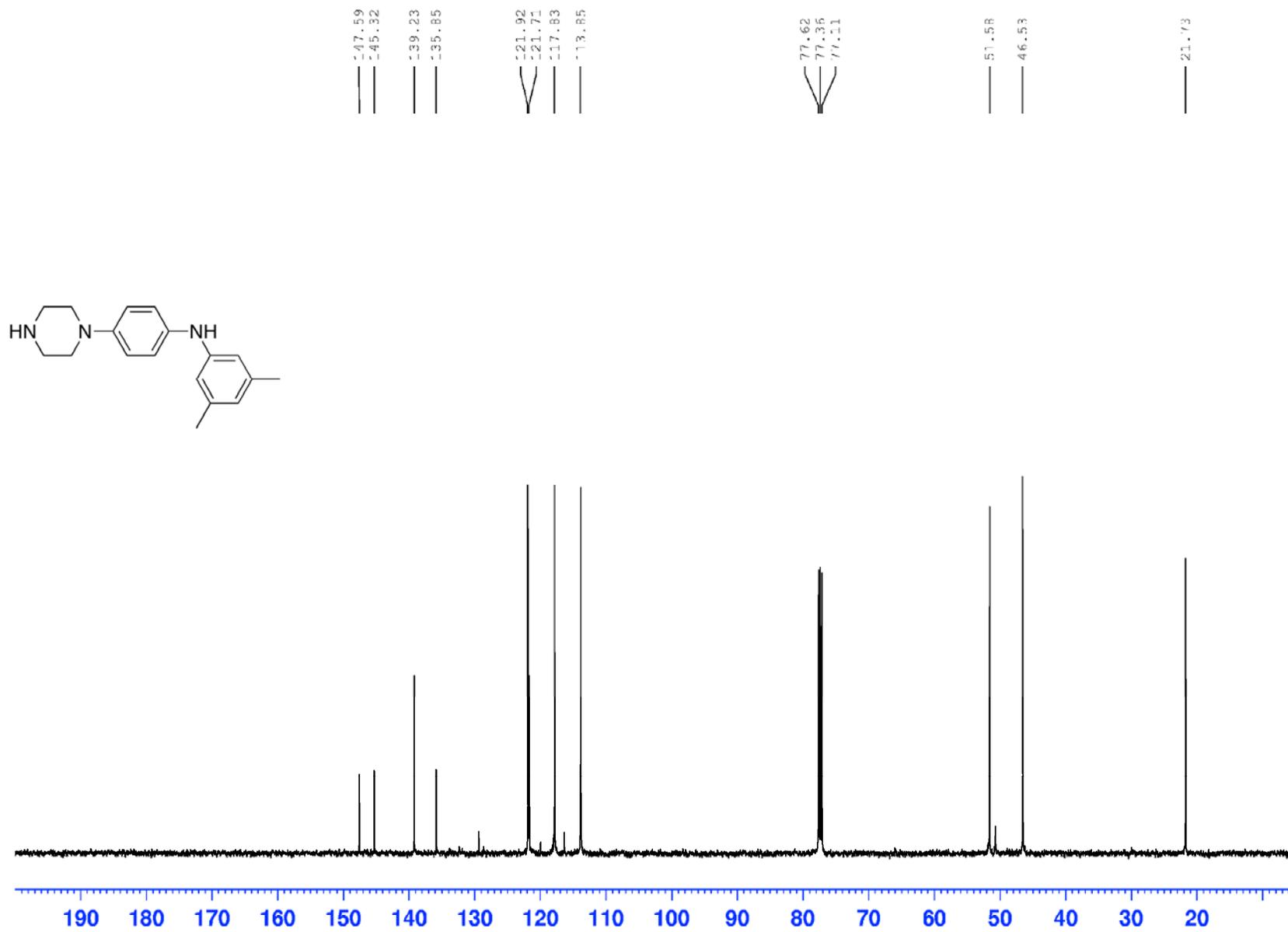
$^{13}\text{C}\{^1\text{H}\}$ NMR of *N*-phenyl-4-(piperidin-1-yl)aniline (**4d**) (CDCl_3 , 126 MHz, 300K)



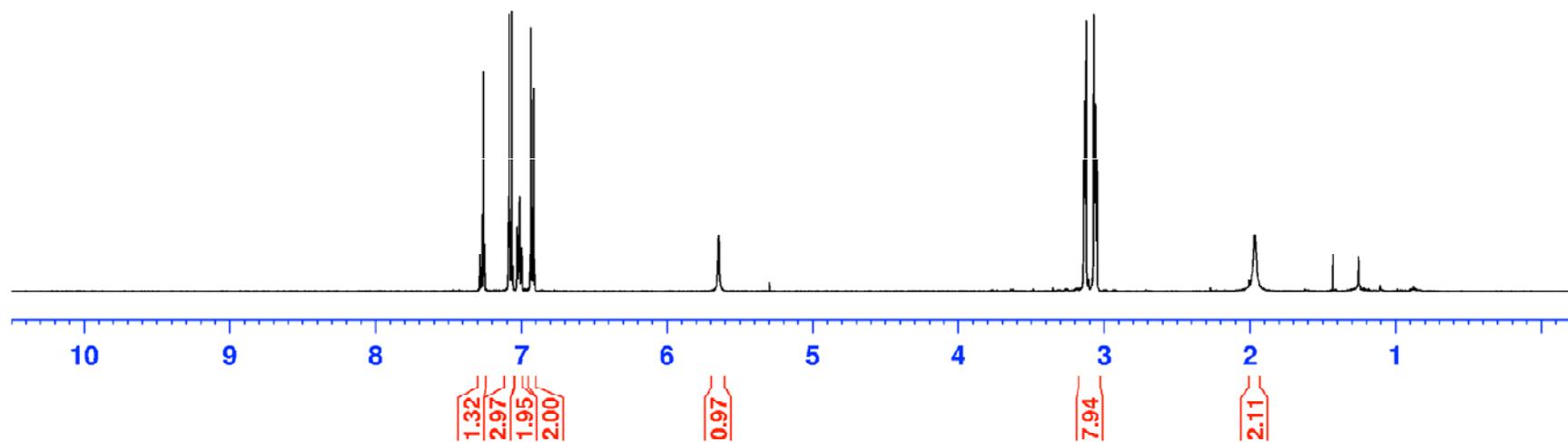
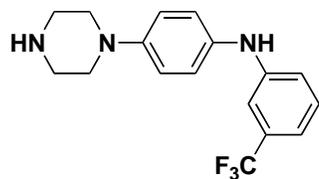
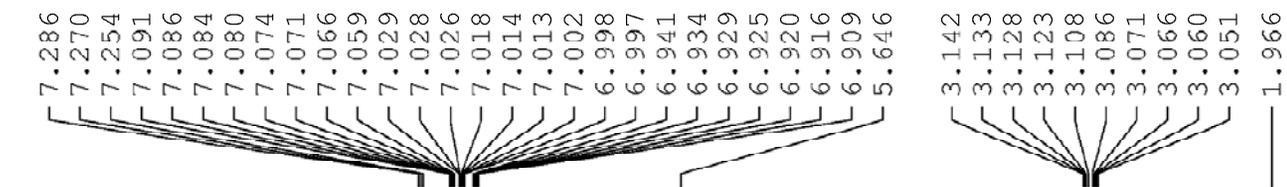
¹H NMR of 3,5-dimethyl-N-(4-(piperazin-1-yl)phenyl)aniline (4e) (CDCl₃, 500 MHz, 300K)



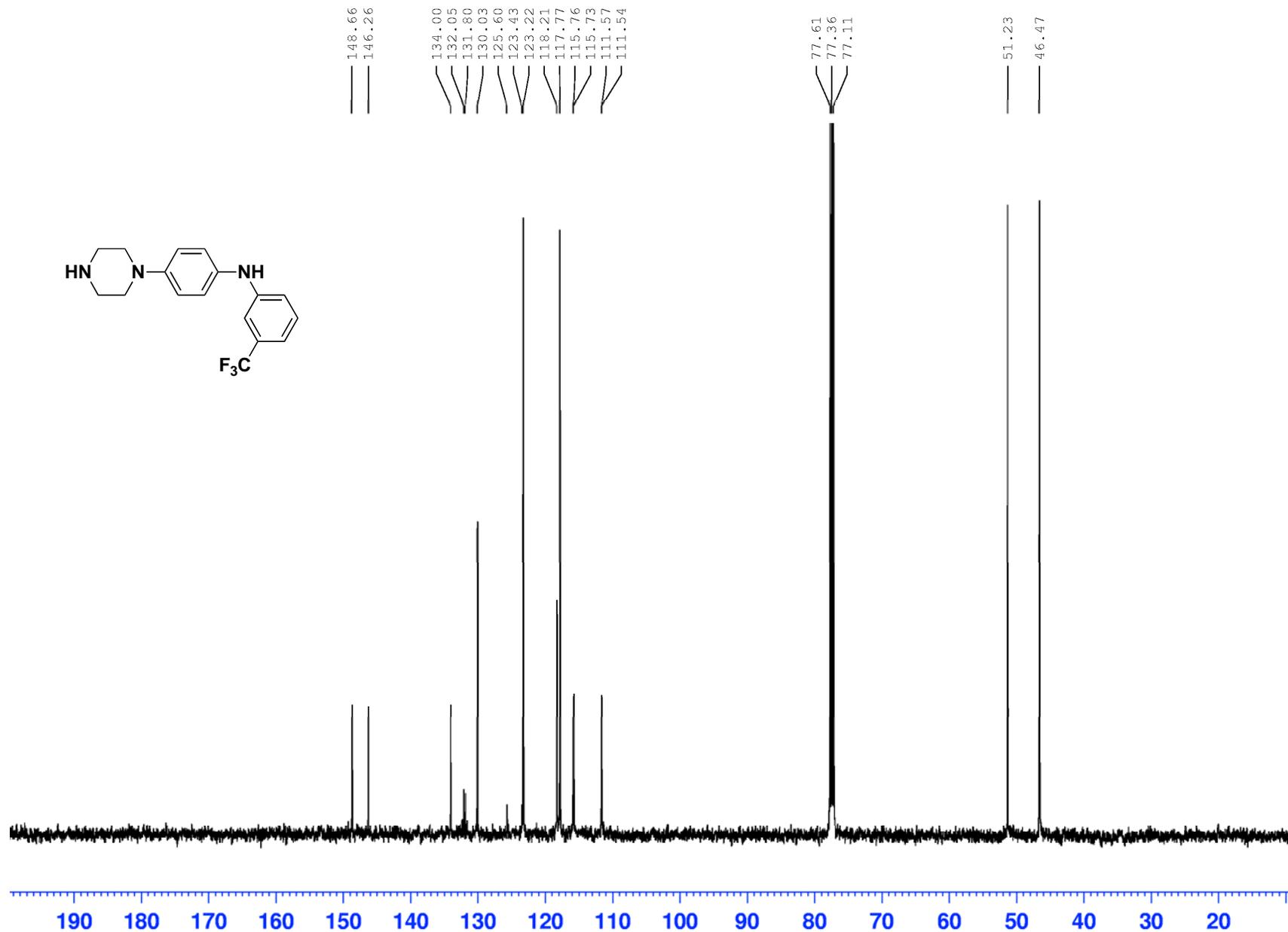
$^{13}\text{C}\{^1\text{H}\}$ NMR of 3,5-dimethyl-N-(4-(piperazin-1-yl)phenyl)aniline (4e) (CDCl_3 , 126 MHz, 300K)



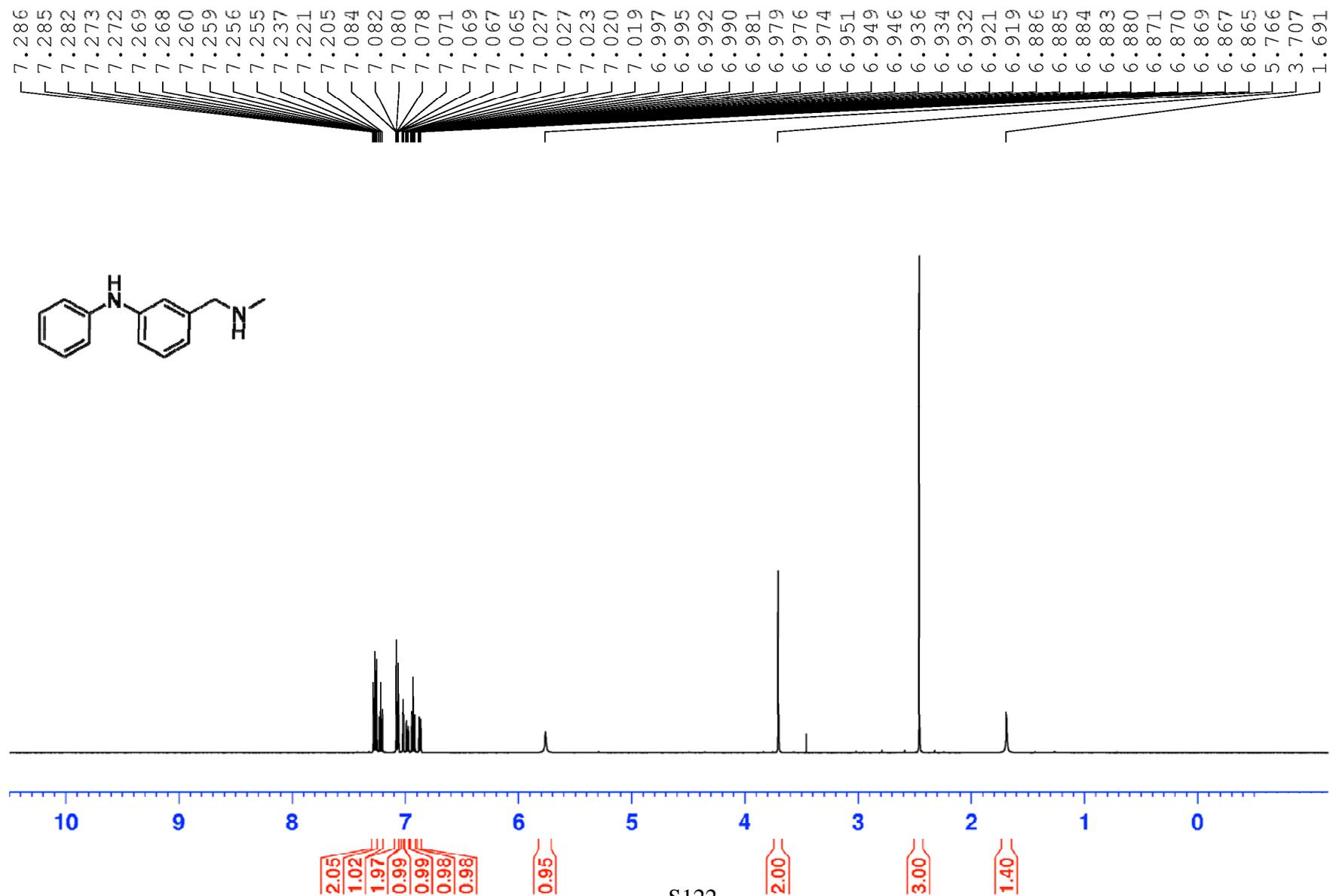
¹H NMR of N-(4-(piperazin-1-yl)phenyl)-3-(trifluoromethyl)aniline (4f) (CDCl₃, 500 MHz, 300K)



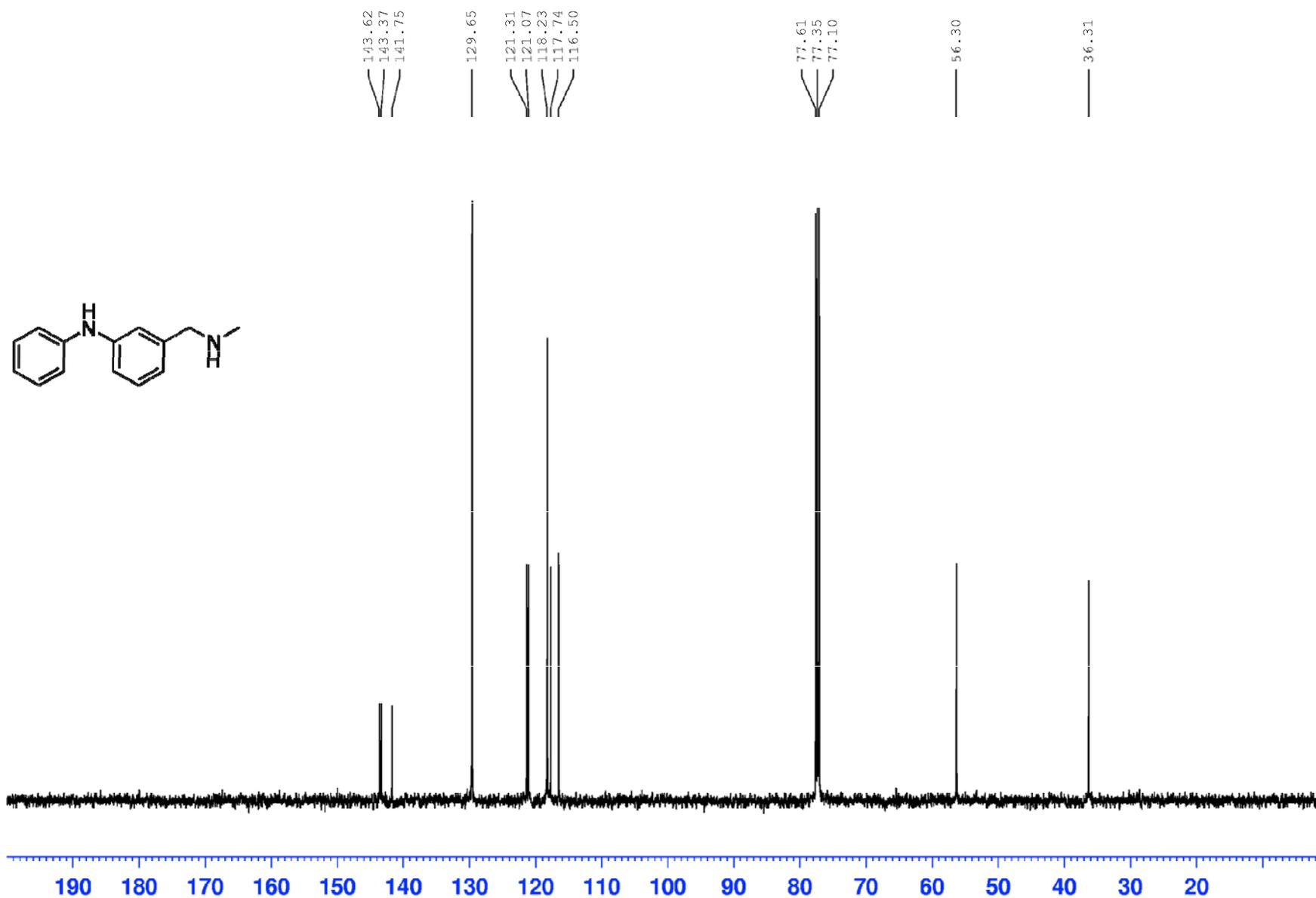
$^{13}\text{C}\{^1\text{H}\}$ NMR of N-(4-(piperazin-1-yl)phenyl)-3-(trifluoromethyl)aniline (4f) (CDCl_3 , 126 MHz, 300K)



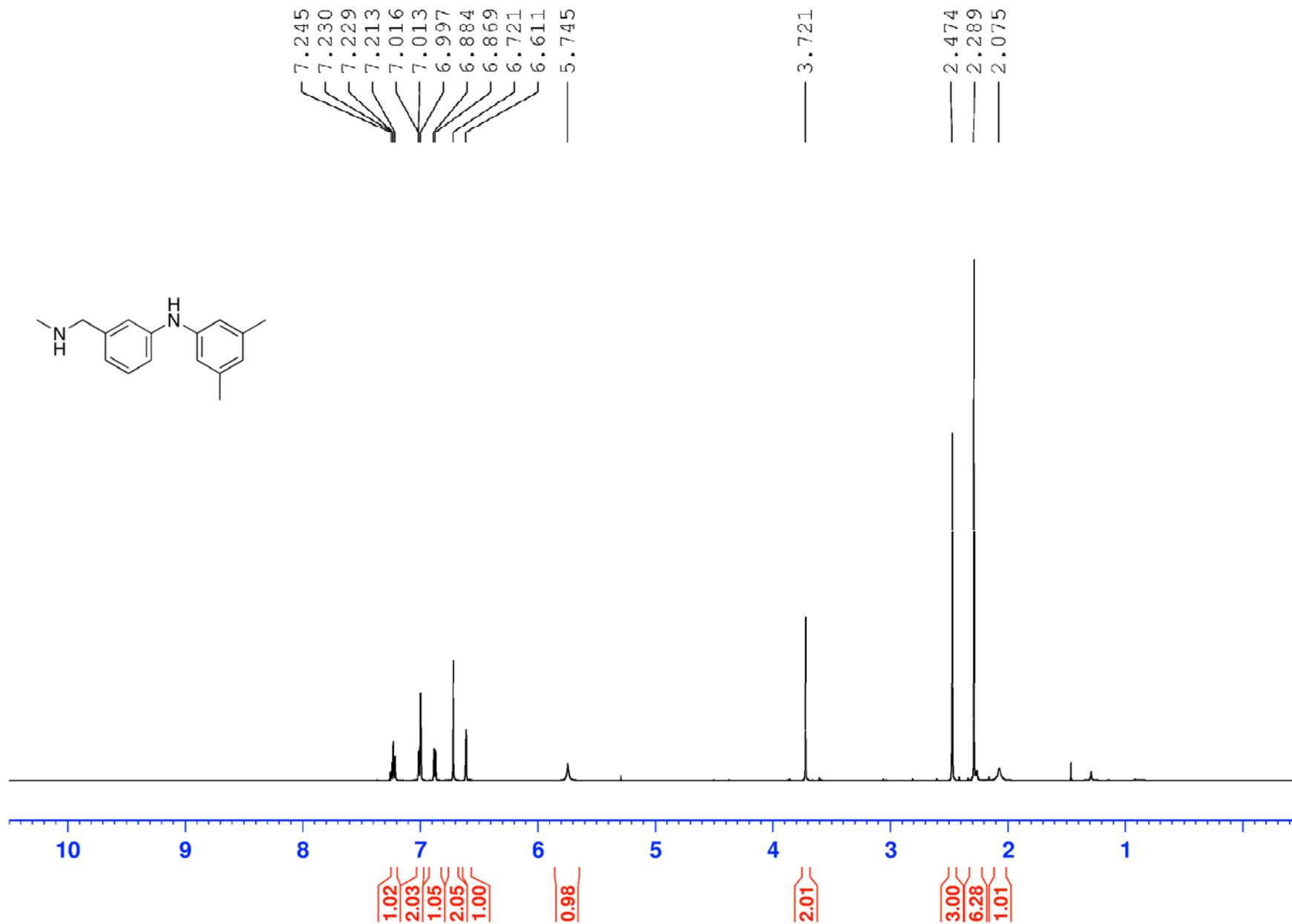
¹H NMR of 3-((methylamino)methyl)-*N*-phenylaniline (4g) (CDCl₃, 500 MHz, 300K)



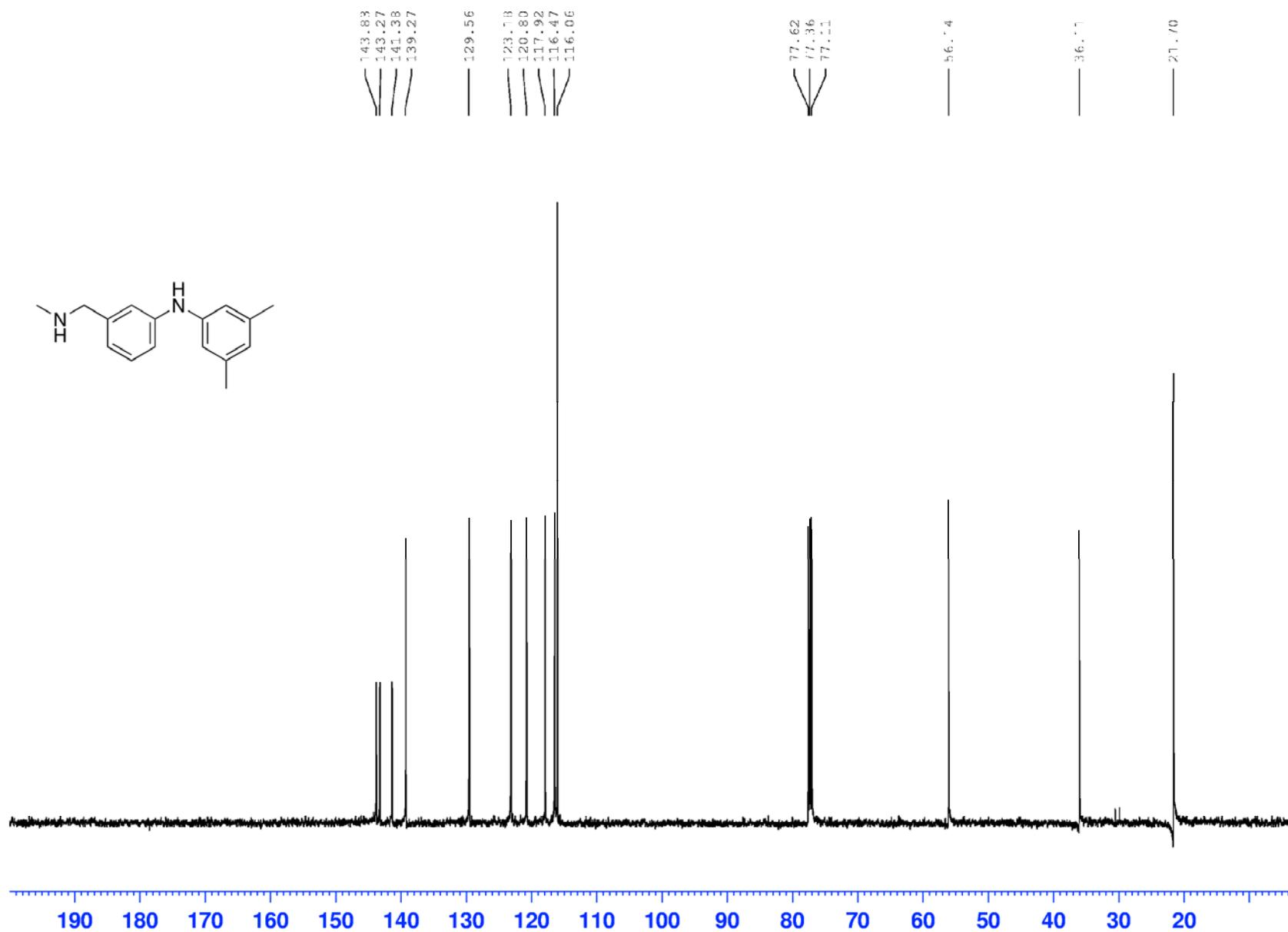
$^{13}\text{C}\{^1\text{H}\}$ NMR of 3-((methylamino)methyl)-*N*-phenylaniline (**4g**) (CDCl_3 , 126 MHz, 300K)



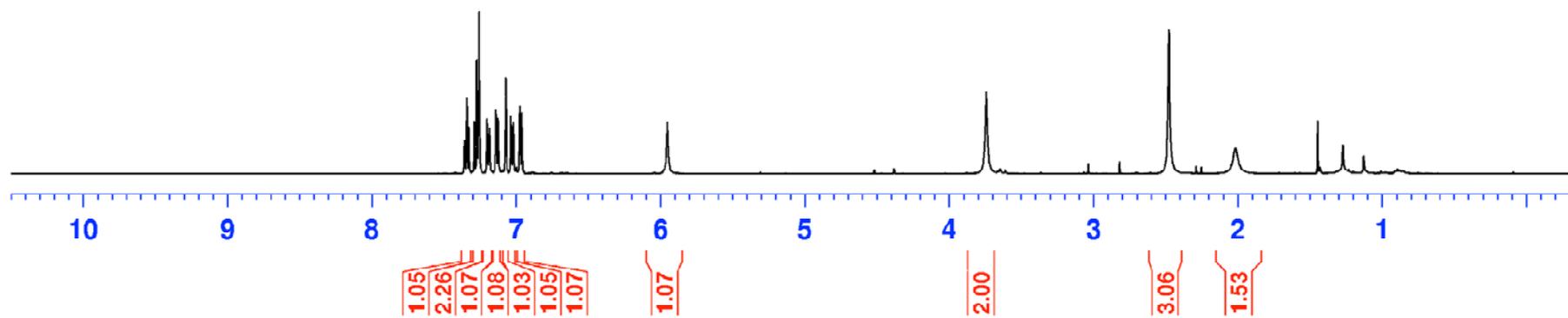
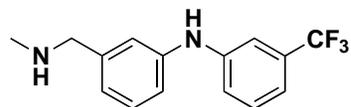
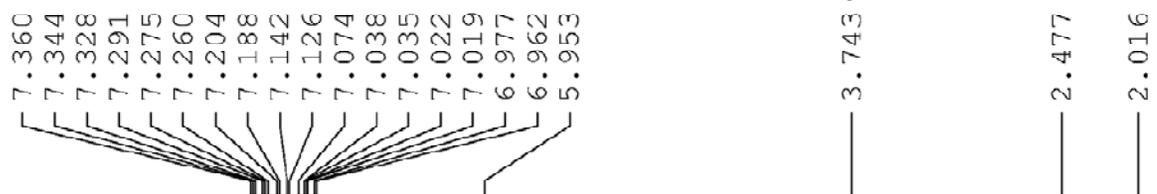
¹H NMR of 3,5-dimethyl-N-(3-((methylamino)methyl)phenyl)aniline (4h) (CDCl₃, 500 MHz, 300K)



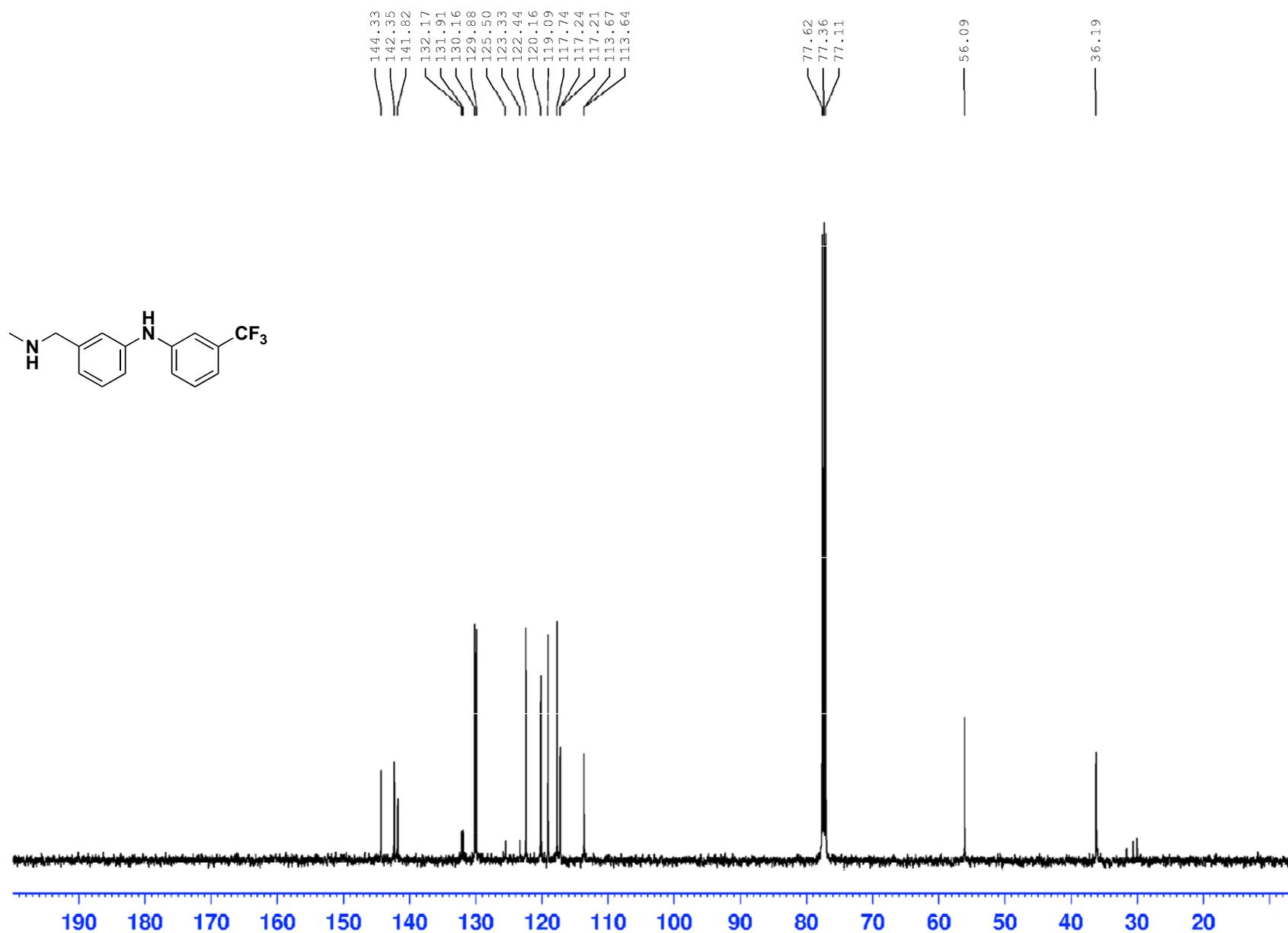
$^{13}\text{C}\{^1\text{H}\}$ NMR of 3,5-dimethyl-*N*-(3-((methylamino)methyl)phenyl)aniline (4h) (CDCl_3 , 126 MHz, 300K)



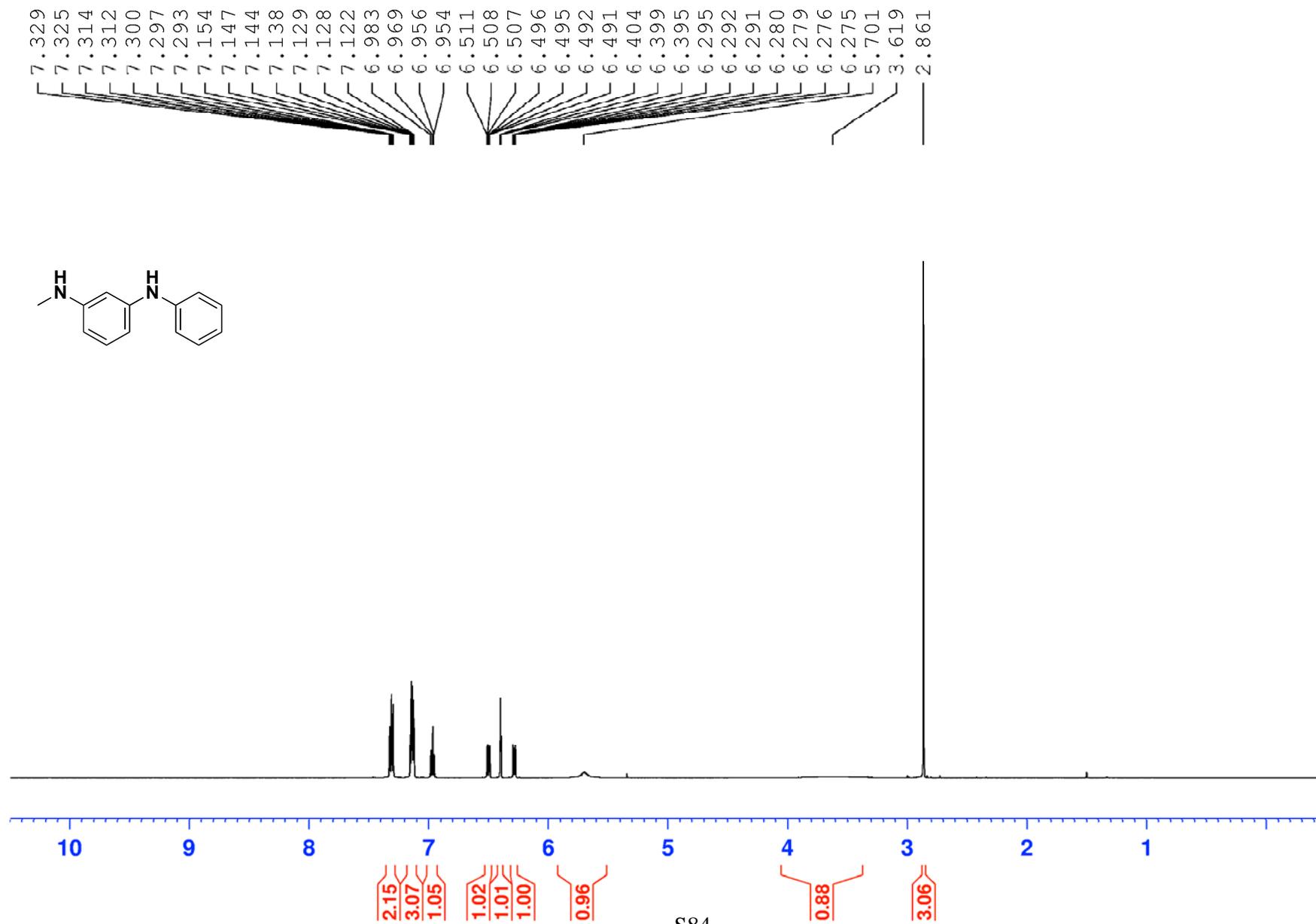
¹H NMR of 3-((methylamino)methyl)-N-(3-(trifluoromethyl)phenyl)aniline (4i) (CDCl₃, 500 MHz, 300K)



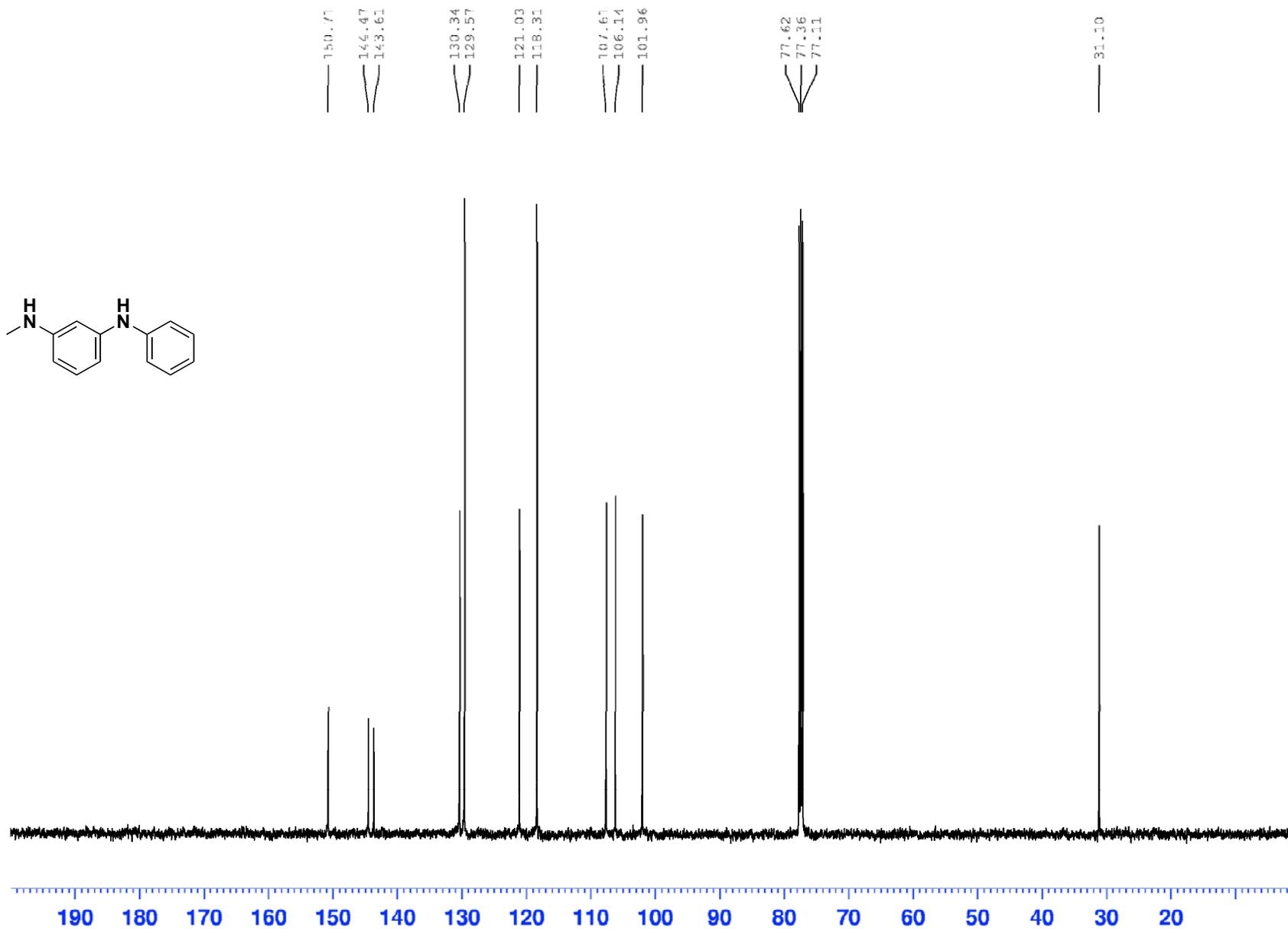
$^{13}\text{C}\{^1\text{H}\}$ NMR of 3-((methylamino)methyl)-*N*-(3-(trifluoromethyl)phenyl)aniline (4i) (CDCl_3 , 126 MHz, 300K)



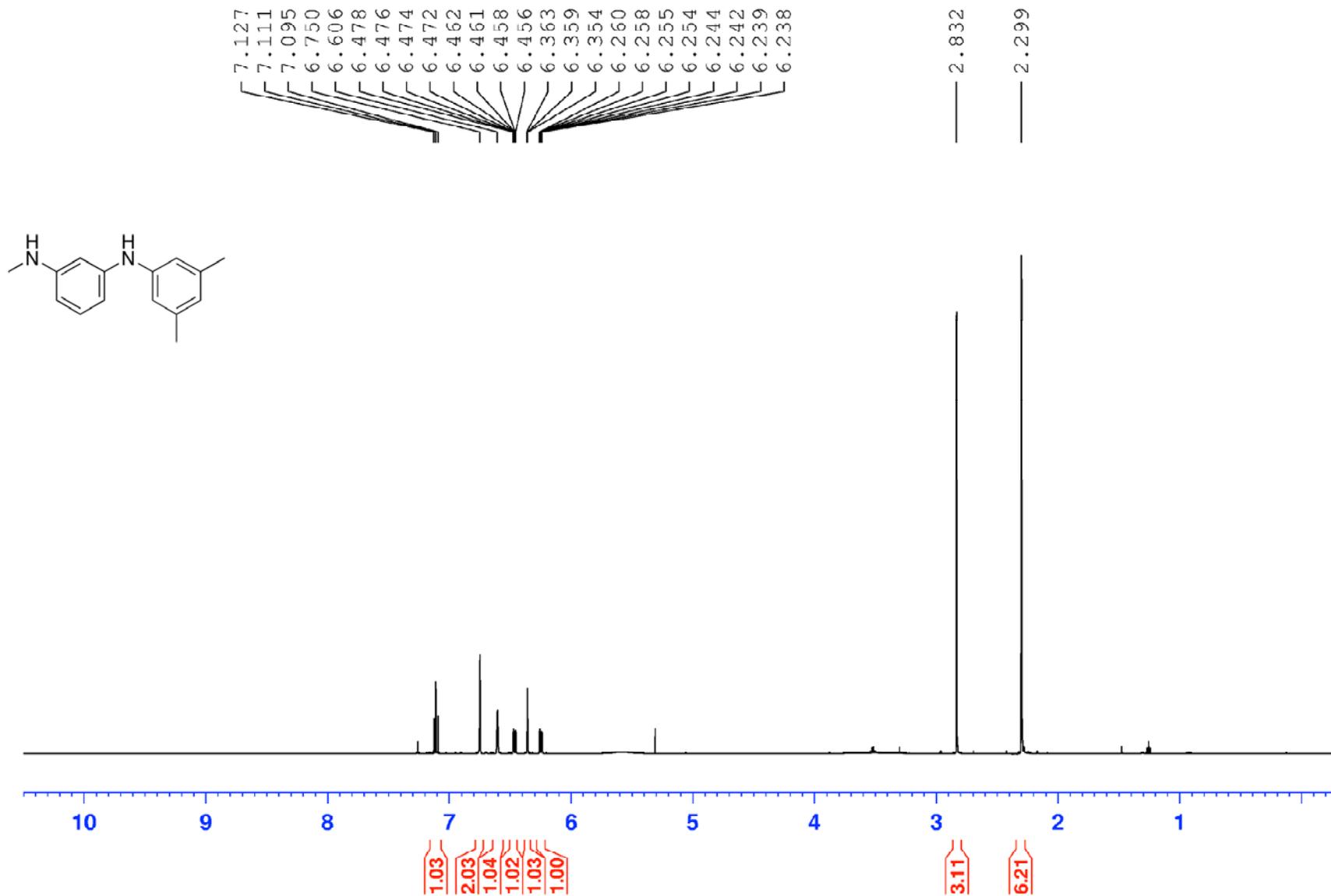
¹H NMR of *N*¹-methyl-*N*³-phenylbenzene-1,3-diamine (4j) (CDCl₃, 500 MHz, 300K)



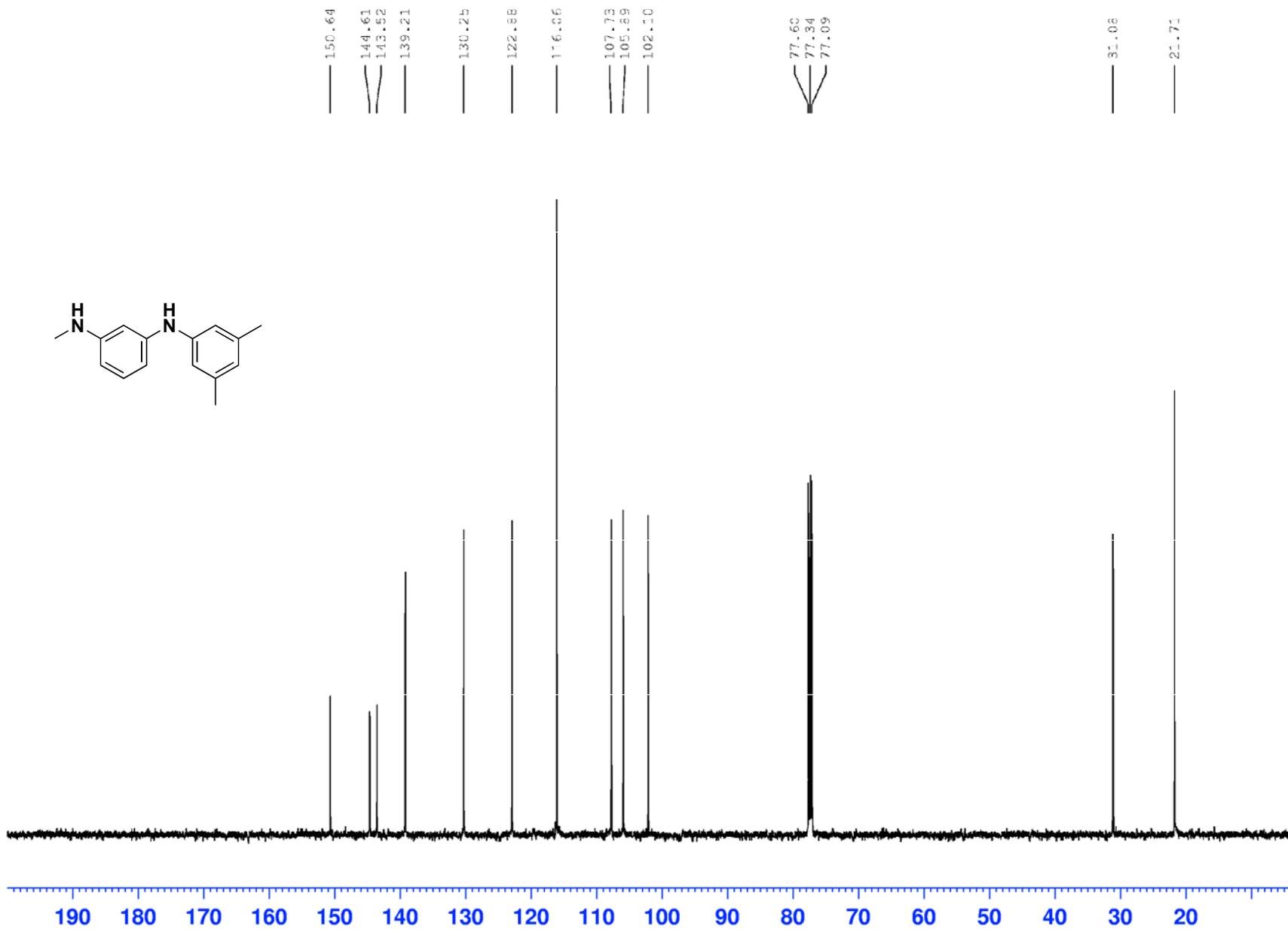
$^{13}\text{C}\{^1\text{H}\}$ NMR of *N*¹-methyl-*N*³-phenylbenzene-1,3-diamine (4j) (CDCl_3 , 126 MHz, 300K)



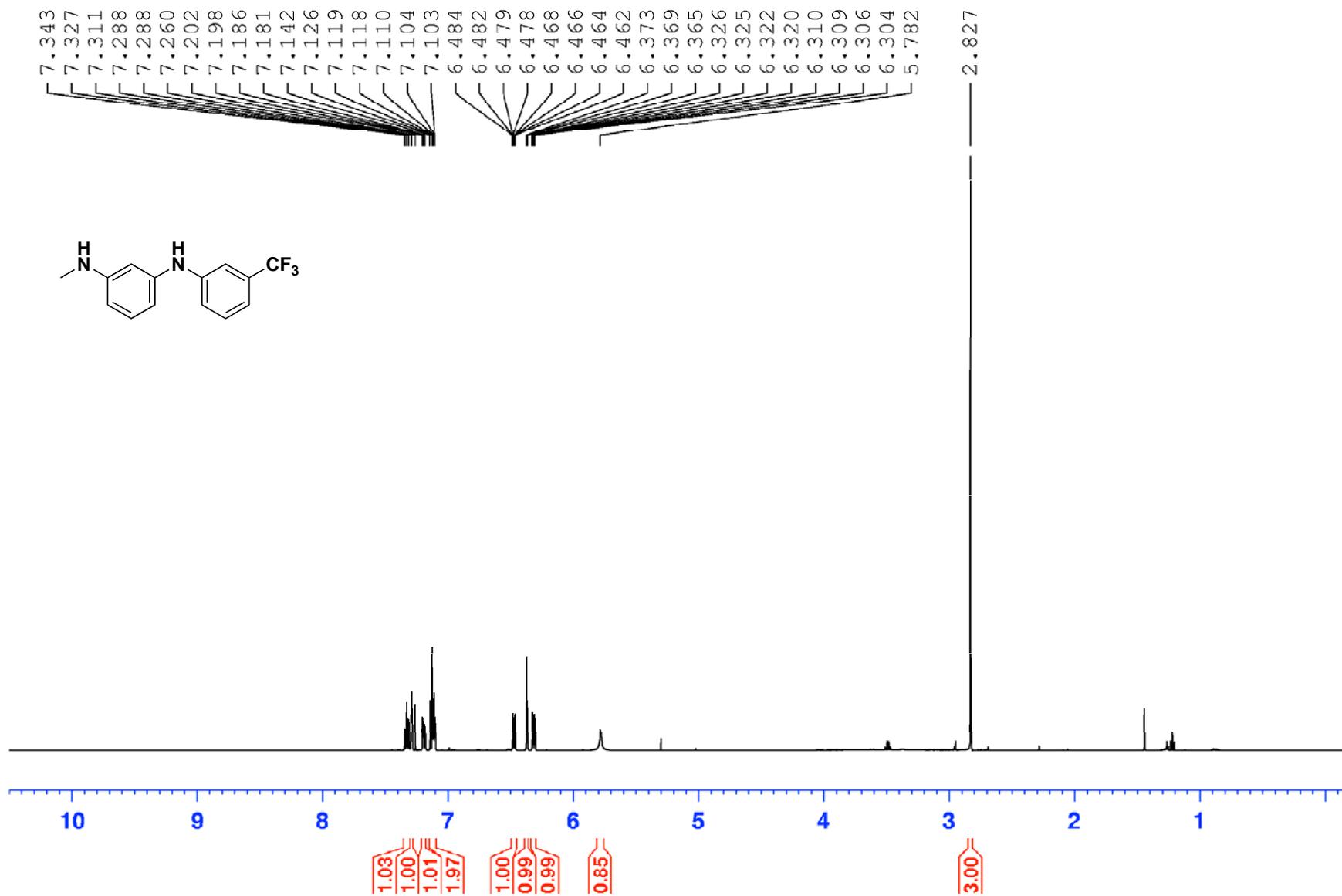
¹H NMR of *N*¹-(3,5-dimethylphenyl)-*N*³-methylbenzene-1,3-diamine (4k) (CDCl₃, 500 MHz, 300K)



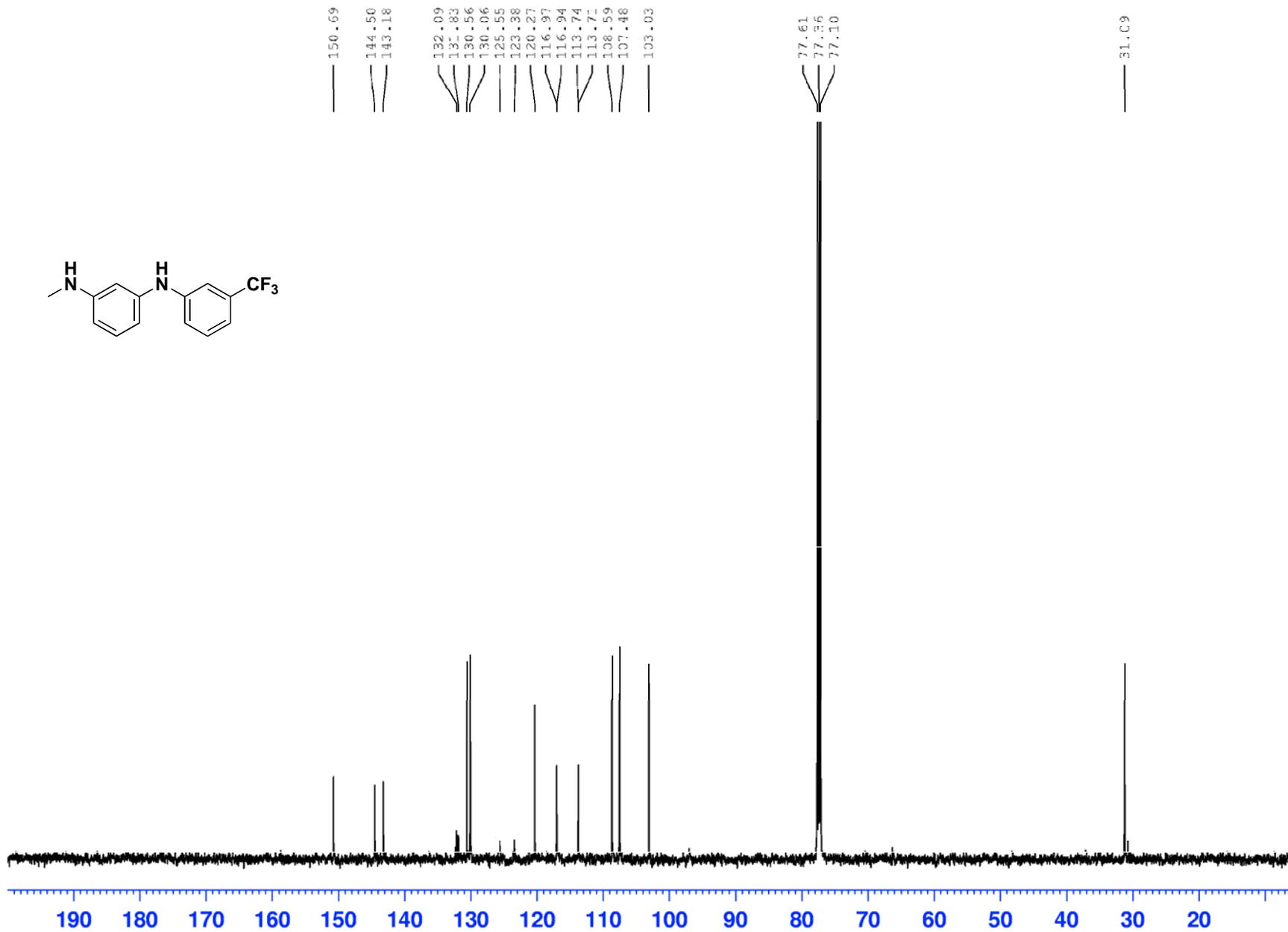
$^{13}\text{C}\{^1\text{H}\}$ NMR of *N*¹-(3,5-dimethylphenyl)-*N*³-methylbenzene-1,3-diamine (4k) (CDCl_3 , 126 MHz, 300K)



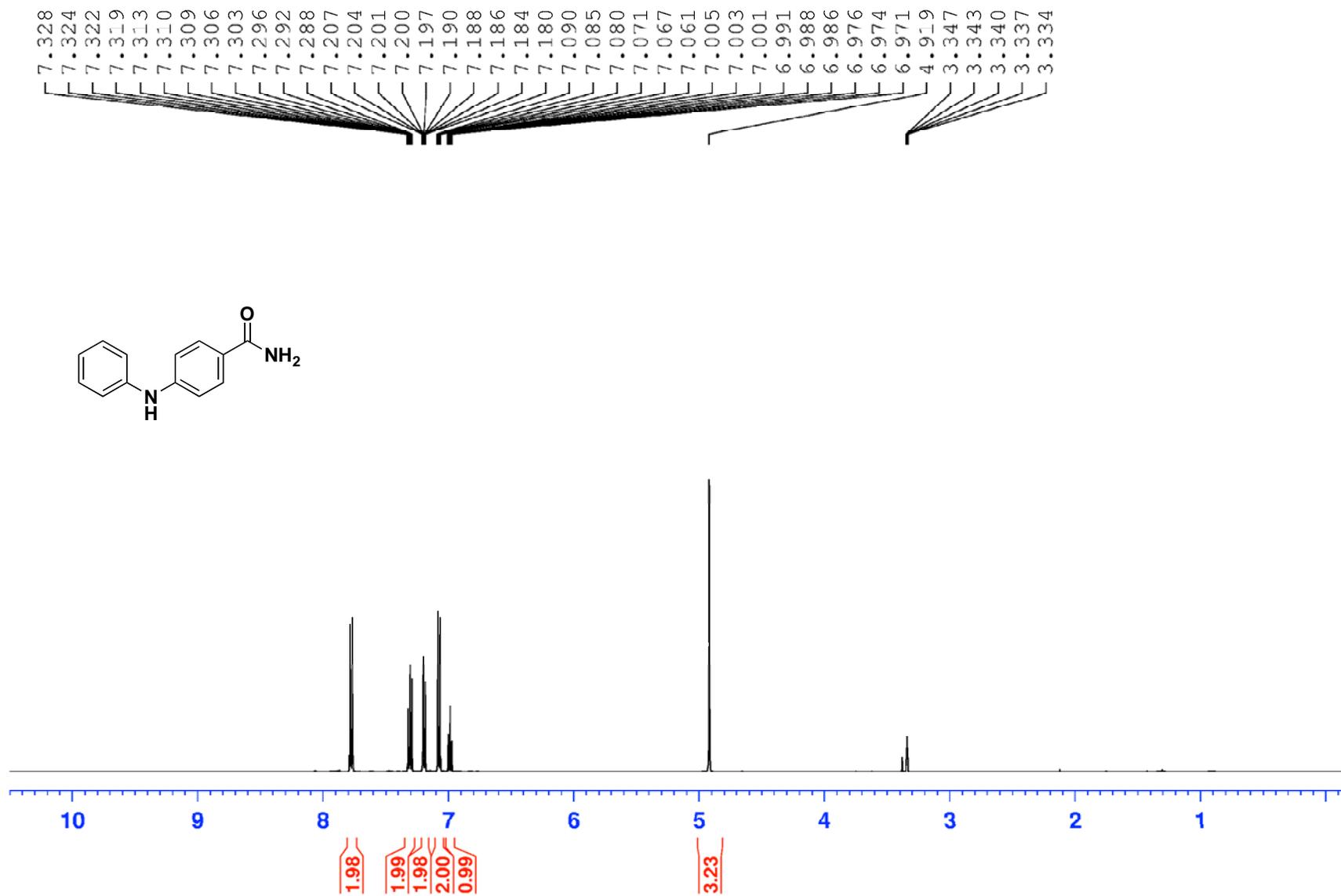
¹H NMR of *N*¹-methyl-*N*³-(3-(trifluoromethyl)phenyl)benzene-1,3-diamine (4l) (CDCl₃, 500 MHz, 300K)



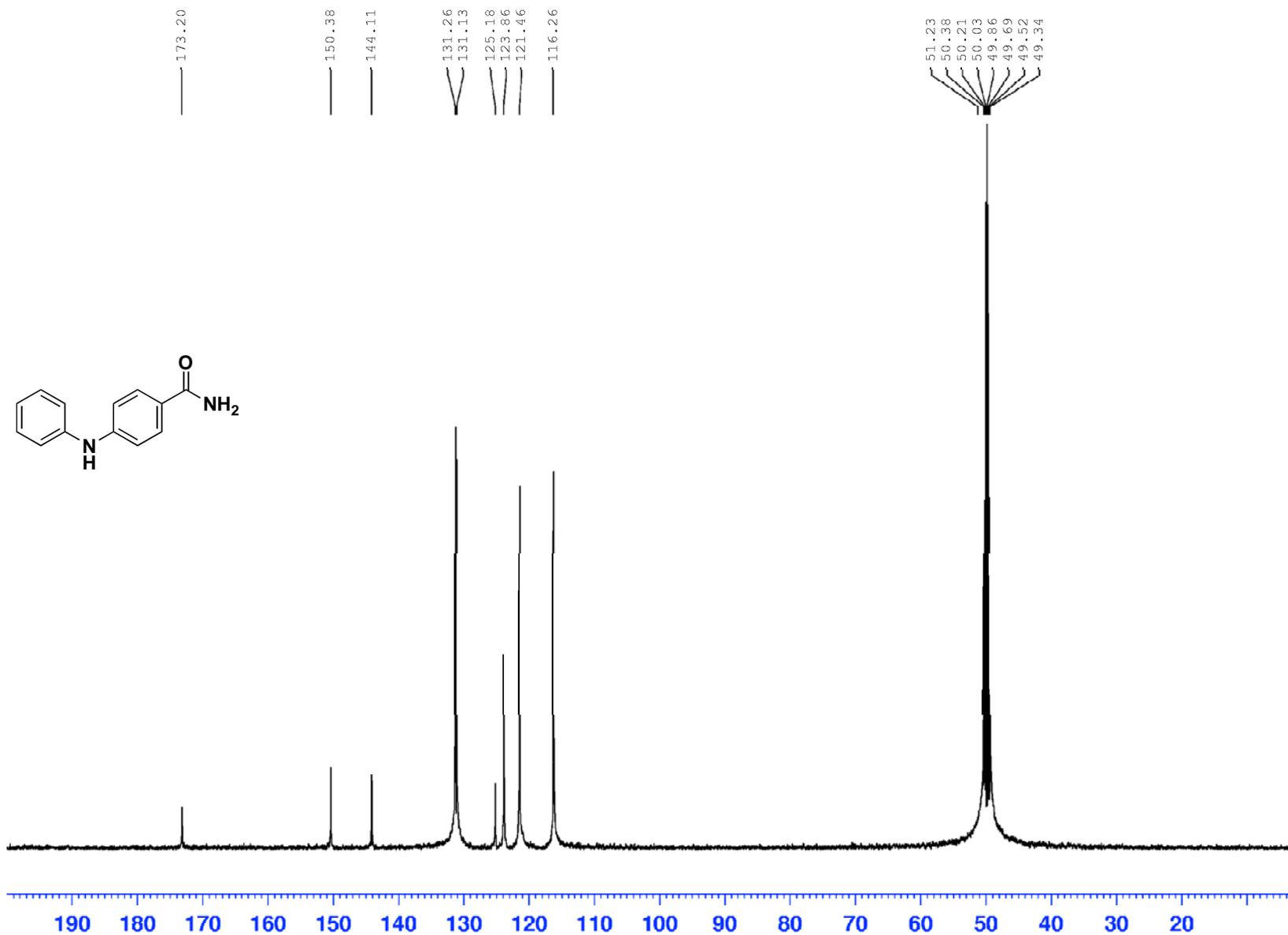
$^{13}\text{C}\{^1\text{H}\}$ NMR of *N*¹-methyl-*N*³-(3-(trifluoromethyl)phenyl)benzene-1,3-diamine (**4l**) (CDCl_3 , 126 MHz, 300K)



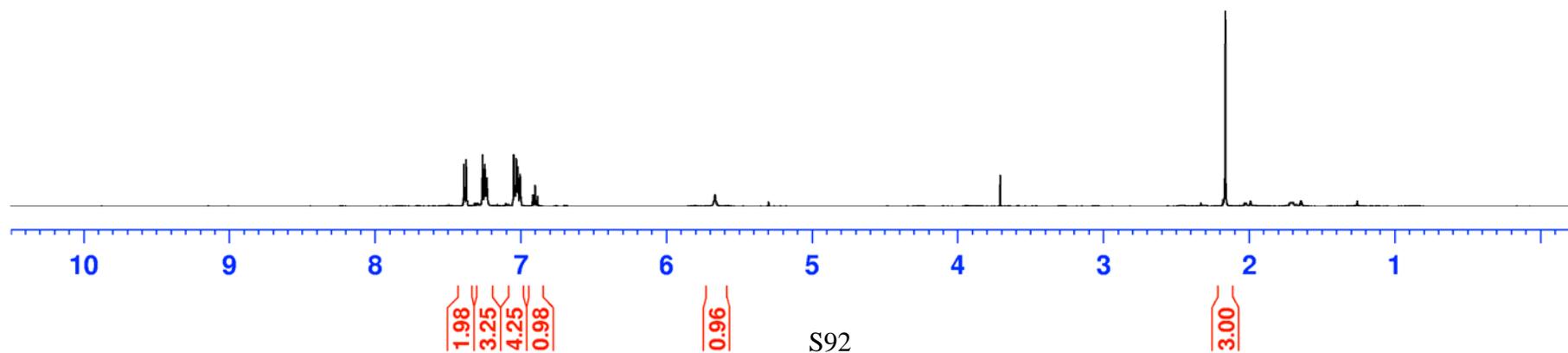
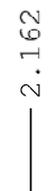
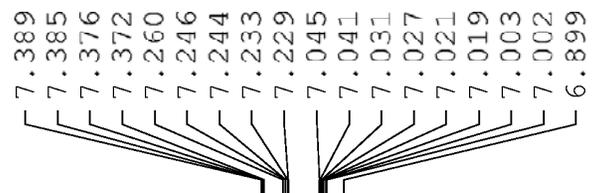
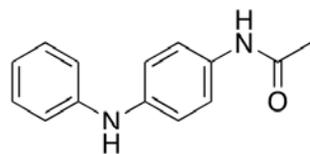
¹H NMR of 4-(phenylamino)benzamide (4m) (MeOD, 500 MHz, 300K)



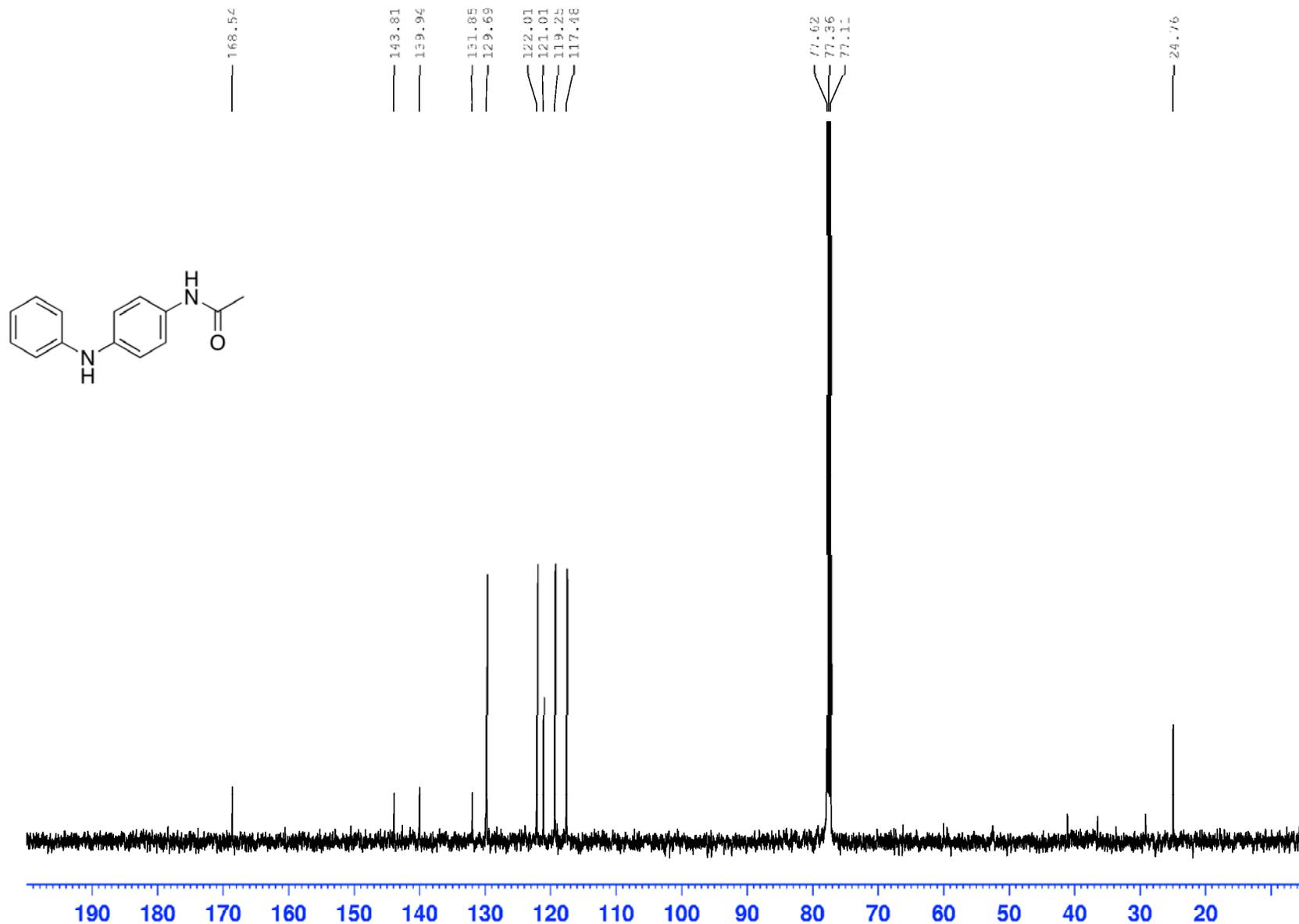
$^{13}\text{C}\{^1\text{H}\}$ NMR of 4-(phenylamino)benzamide (4m) (MeOD, 126 MHz, 300K)



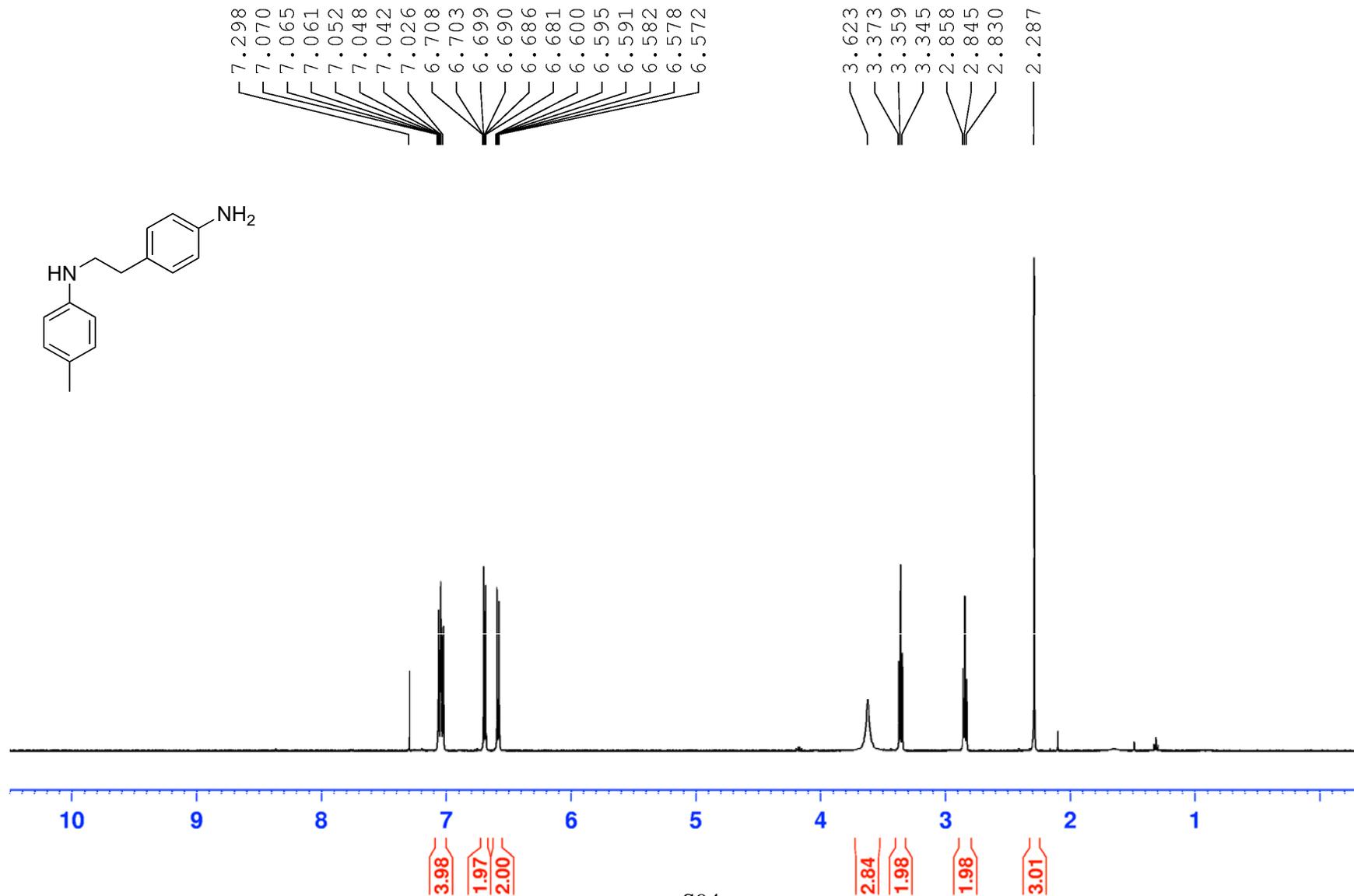
¹H NMR of *N*-(4-(phenylamino)phenyl)acetamide (4n) (CDCl₃, 500 MHz, 300K)



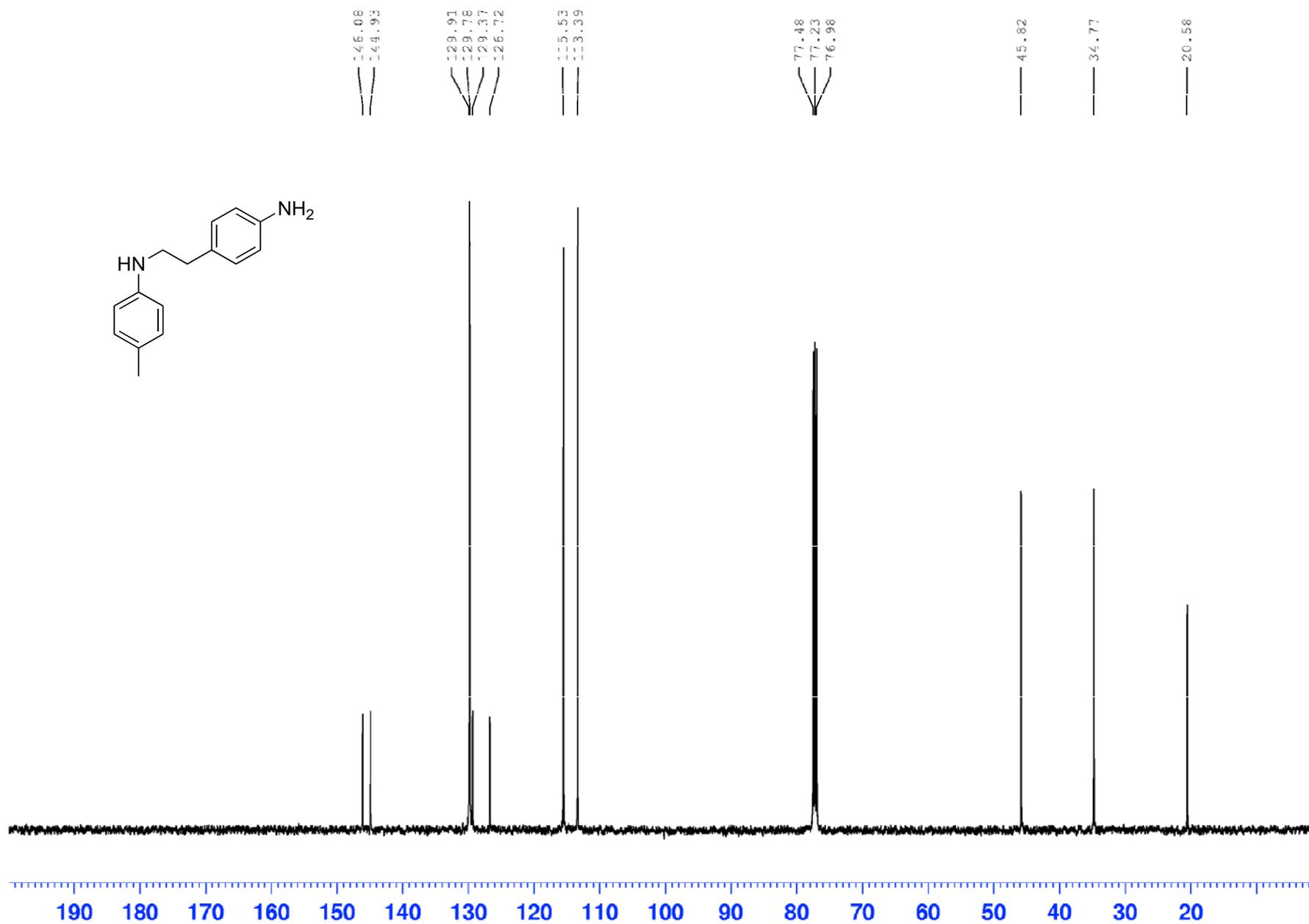
$^{13}\text{C}\{^1\text{H}\}$ NMR of *N*-(4-(phenylamino)phenyl)acetamide (**4n**) (CDCl_3 , 126 MHz, 300K)



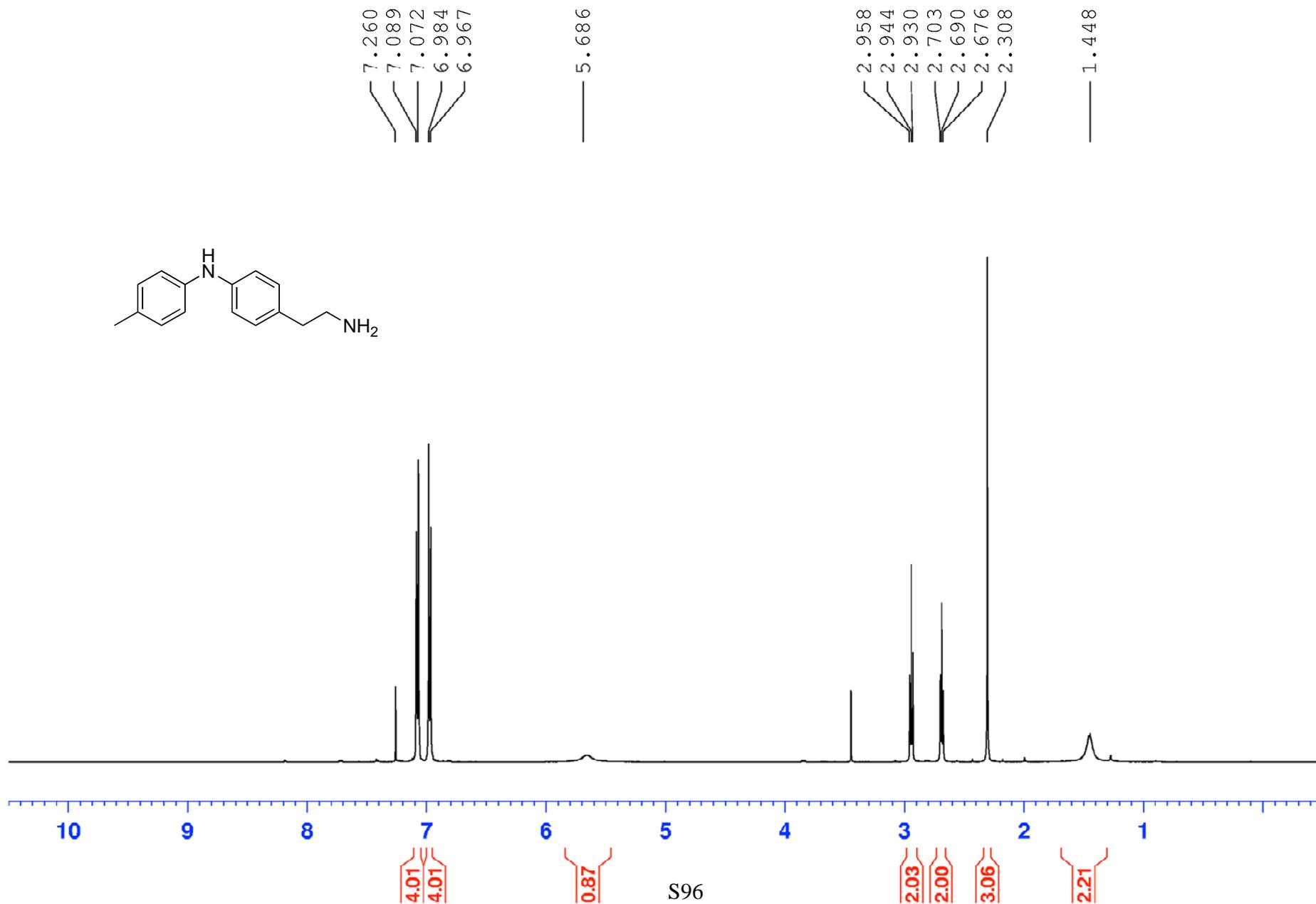
¹H NMR of *N*-(4-aminophenethyl)-4-methylaniline (**5a**) (CDCl₃, 500 MHz, 300K)



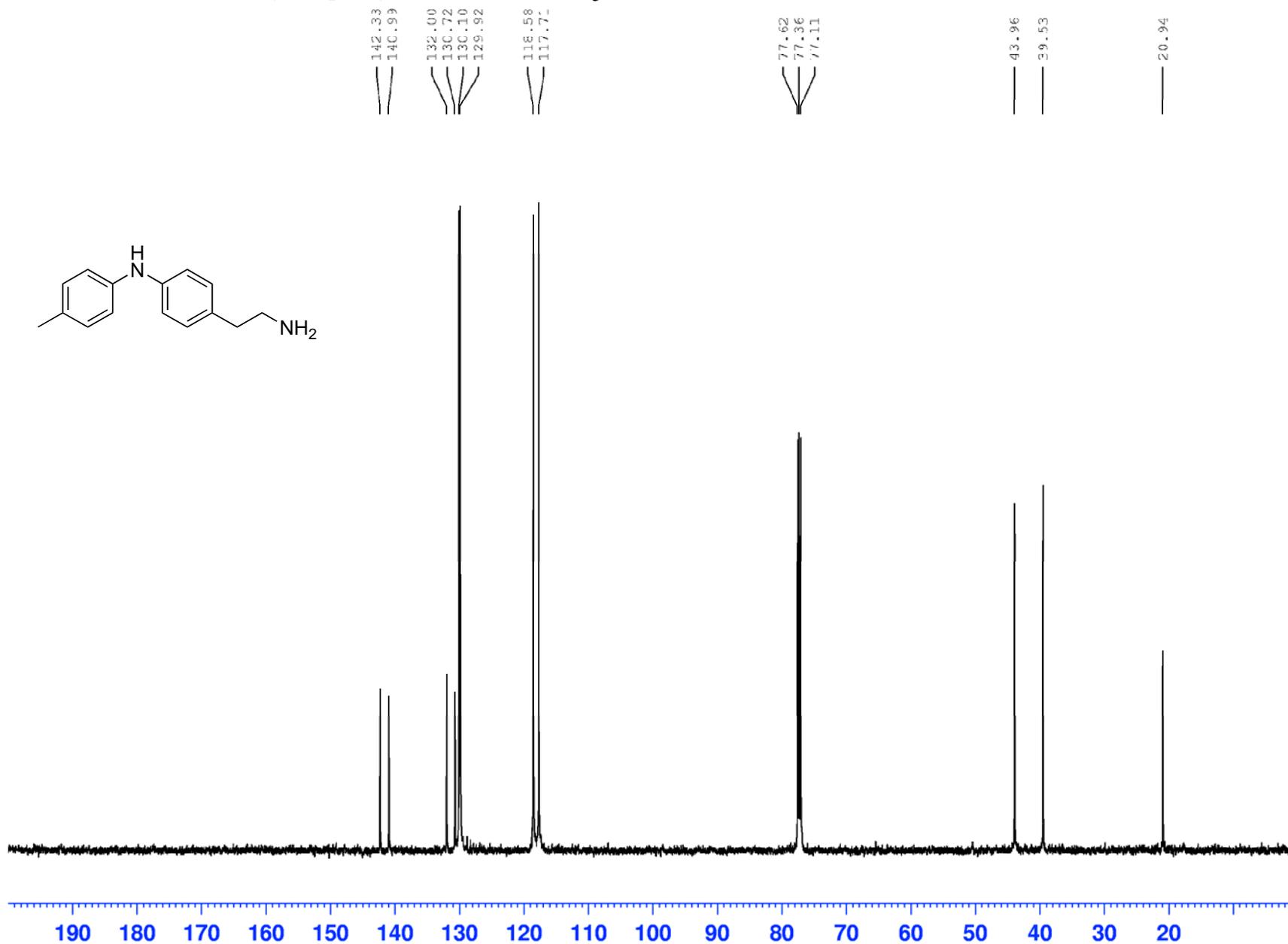
$^{13}\text{C}\{^1\text{H}\}$ NMR of *N*-(4-aminophenethyl)-4-methylaniline (**5a**) (CDCl_3 , 126 MHz, 300K)



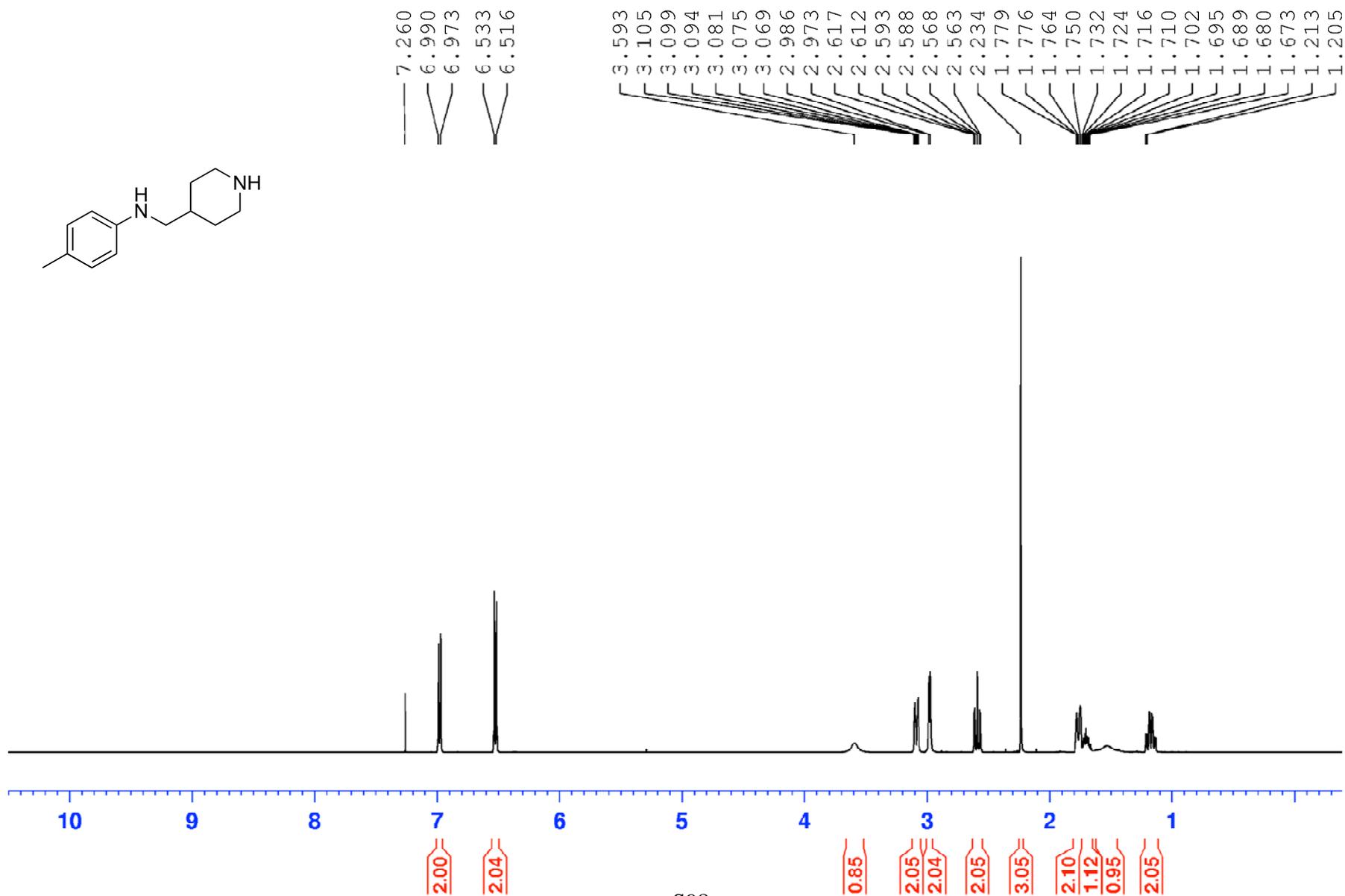
¹H NMR of 4-(2-aminoethyl)-N-p-tolylaniline (5a') (CDCl₃, 500 MHz, 300K)



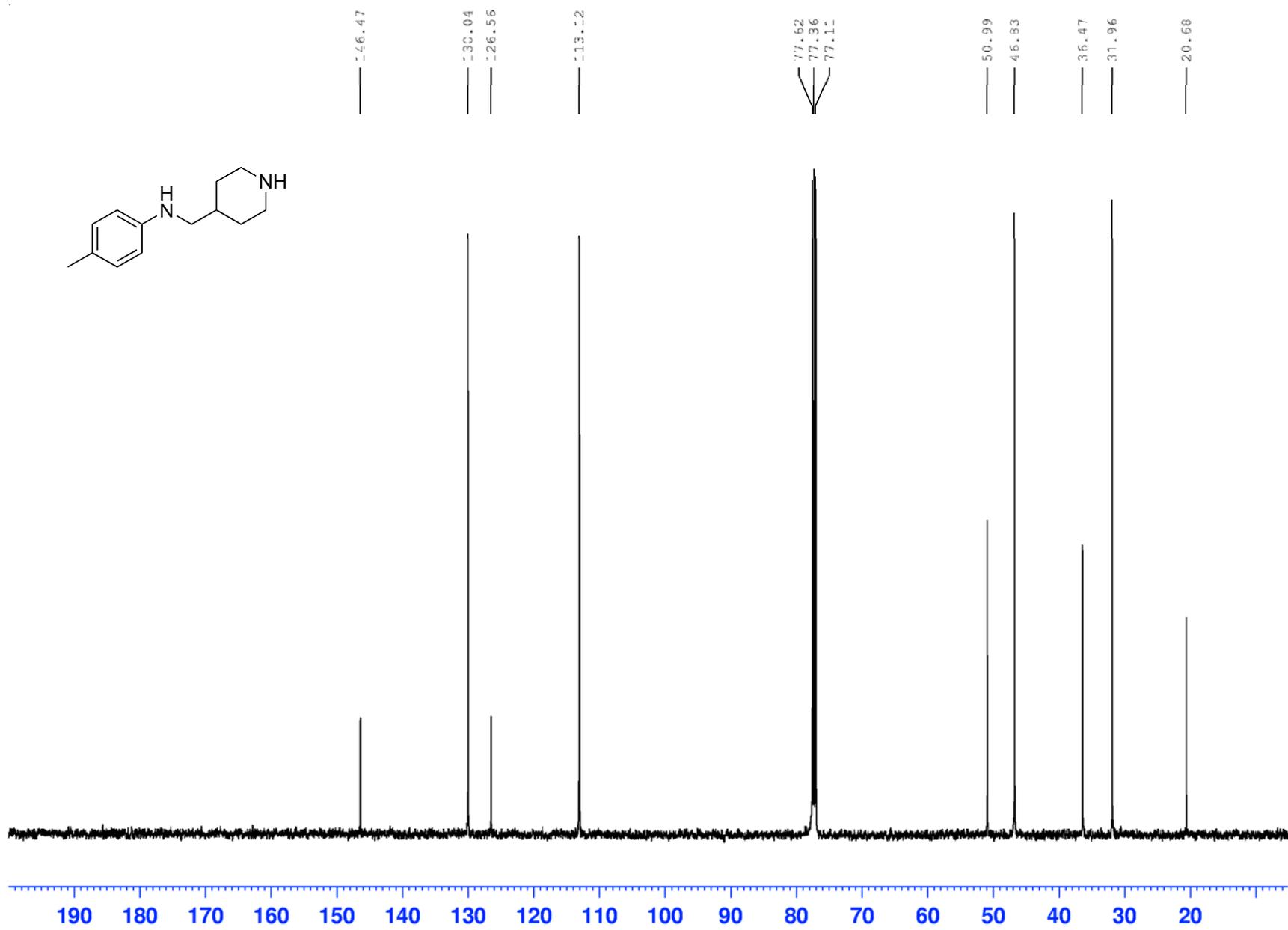
$^{13}\text{C}\{^1\text{H}\}$ -NMR of 4-(2-aminoethyl)-*N*-*p*-tolylaniline (5a') (CDCl_3 , 126 MHz, 300K)



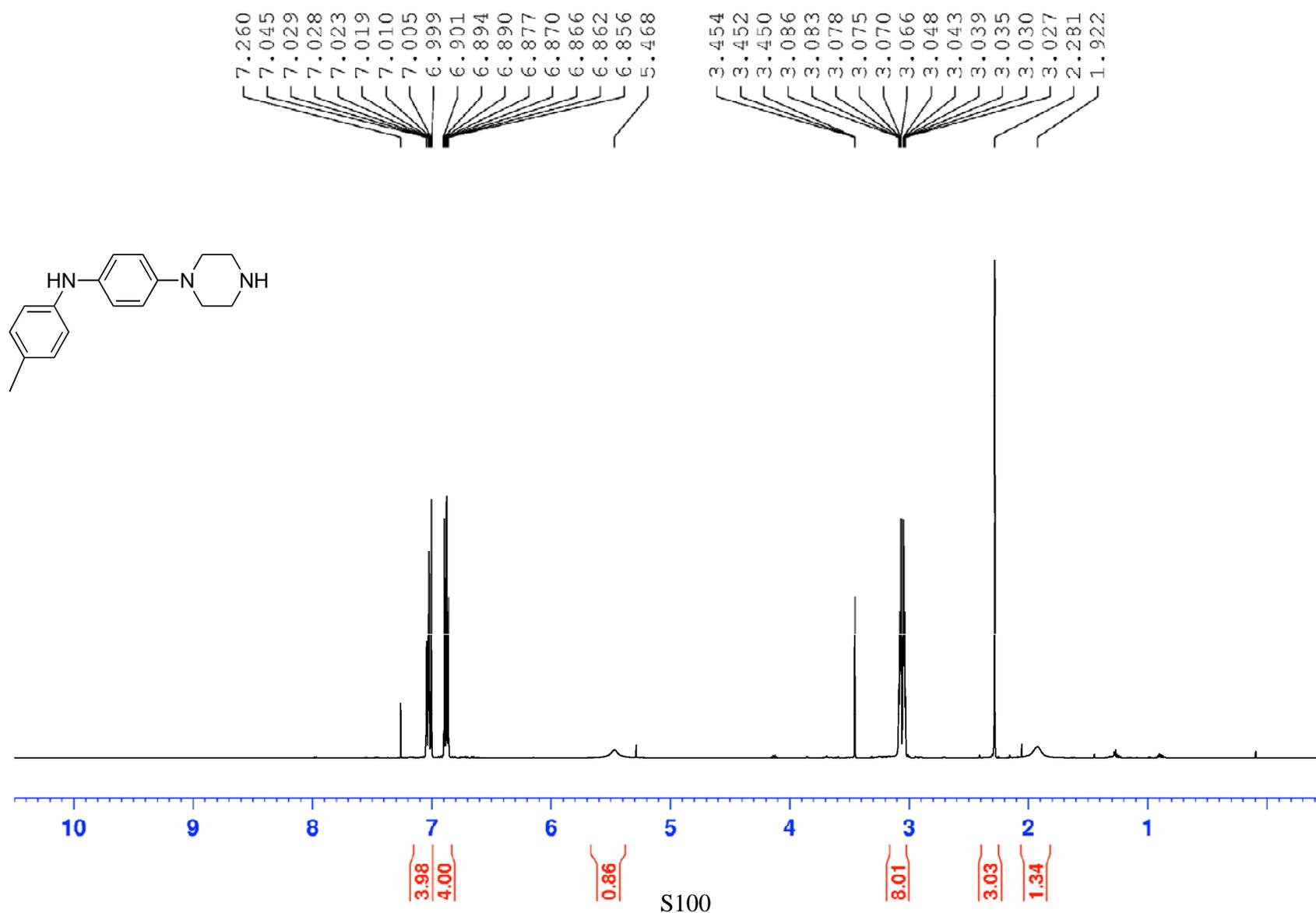
¹H NMR of 4-methyl-N-(piperidin-4-ylmethyl)aniline (5b) (CDCl₃, 500 MHz, 300K)



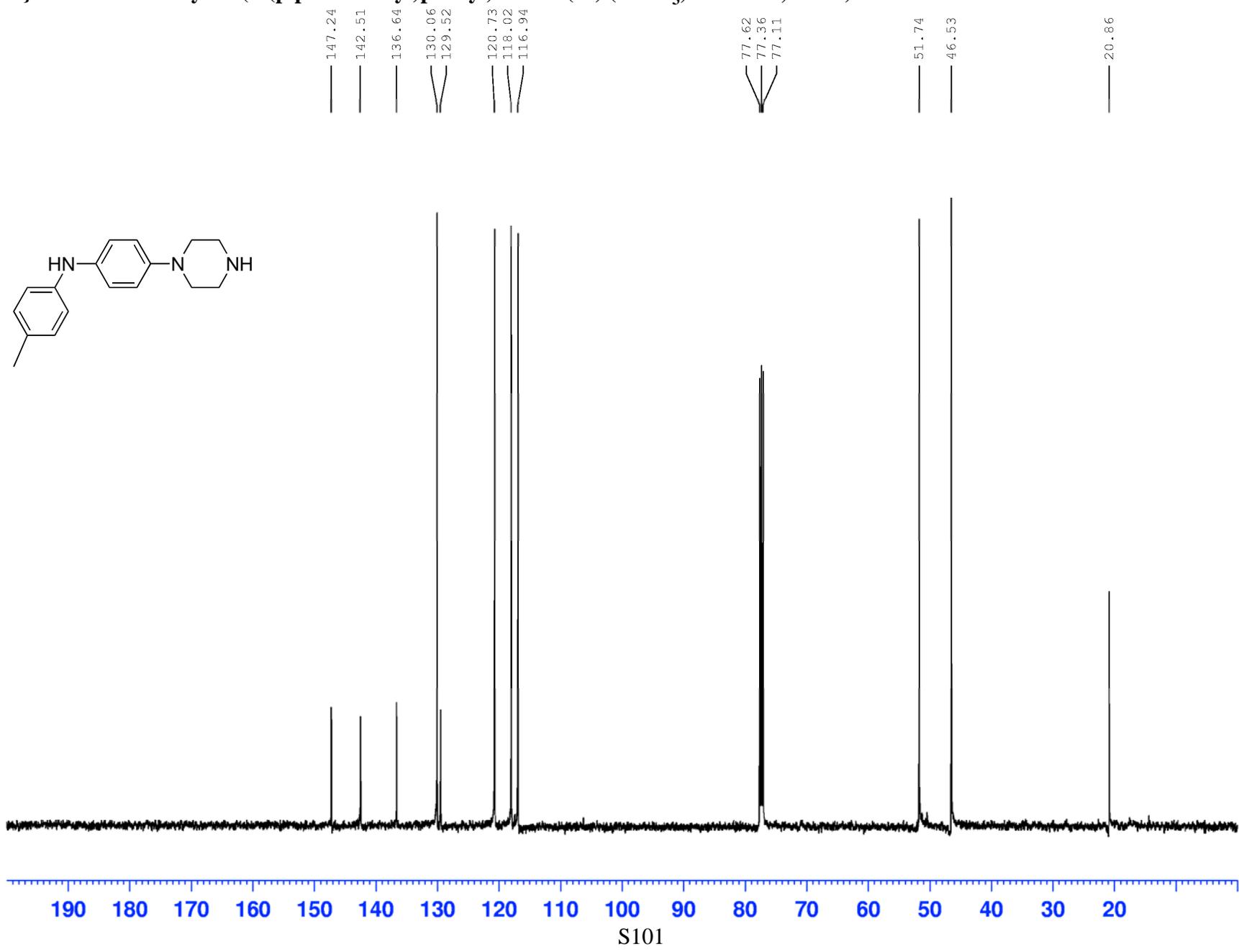
$^{13}\text{C}\{^1\text{H}\}$ NMR of 4-methyl-N-(piperidin-4-ylmethyl)aniline (5b) (CDCl_3 , 126 MHz, 300K)



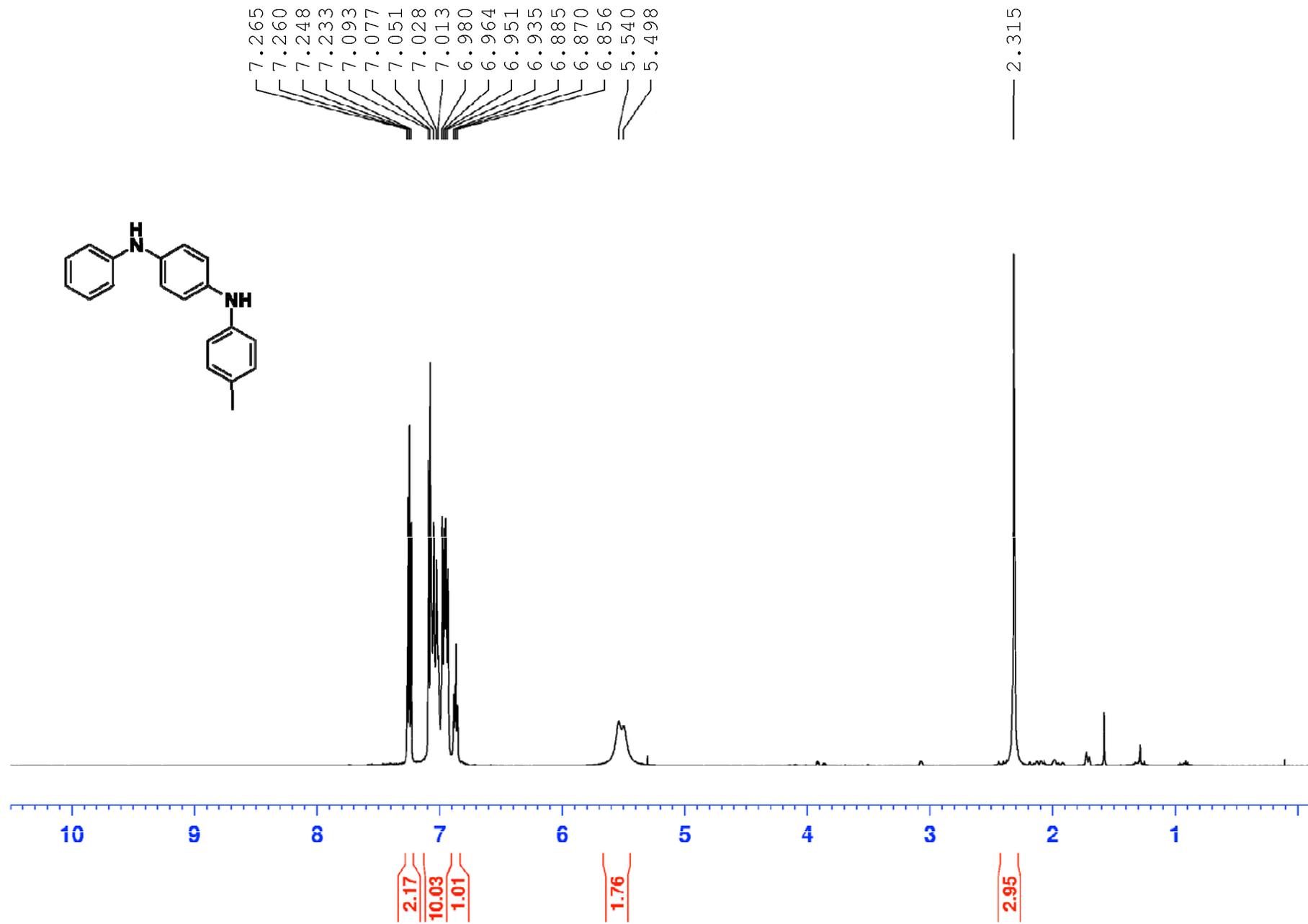
¹H NMR of 4-methyl-N-(4-(piperazin-1-yl)phenyl)aniline (5c) (CDCl₃, 500 MHz, 300K)



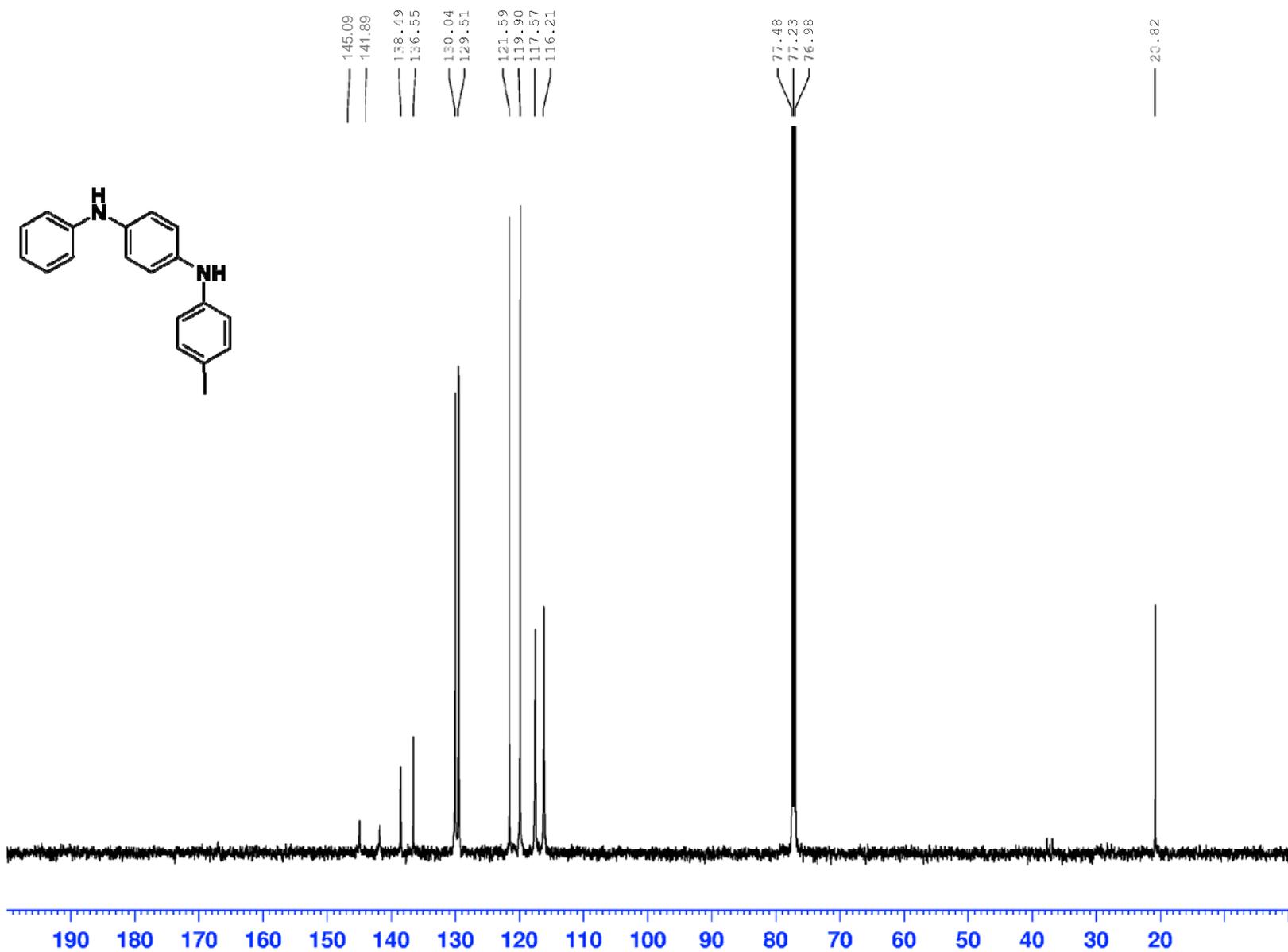
¹³C{¹H} NMR of 4-methyl-N-(4-(piperazin-1-yl)phenyl)aniline (5c) (CDCl₃, 126 MHz, 300K)



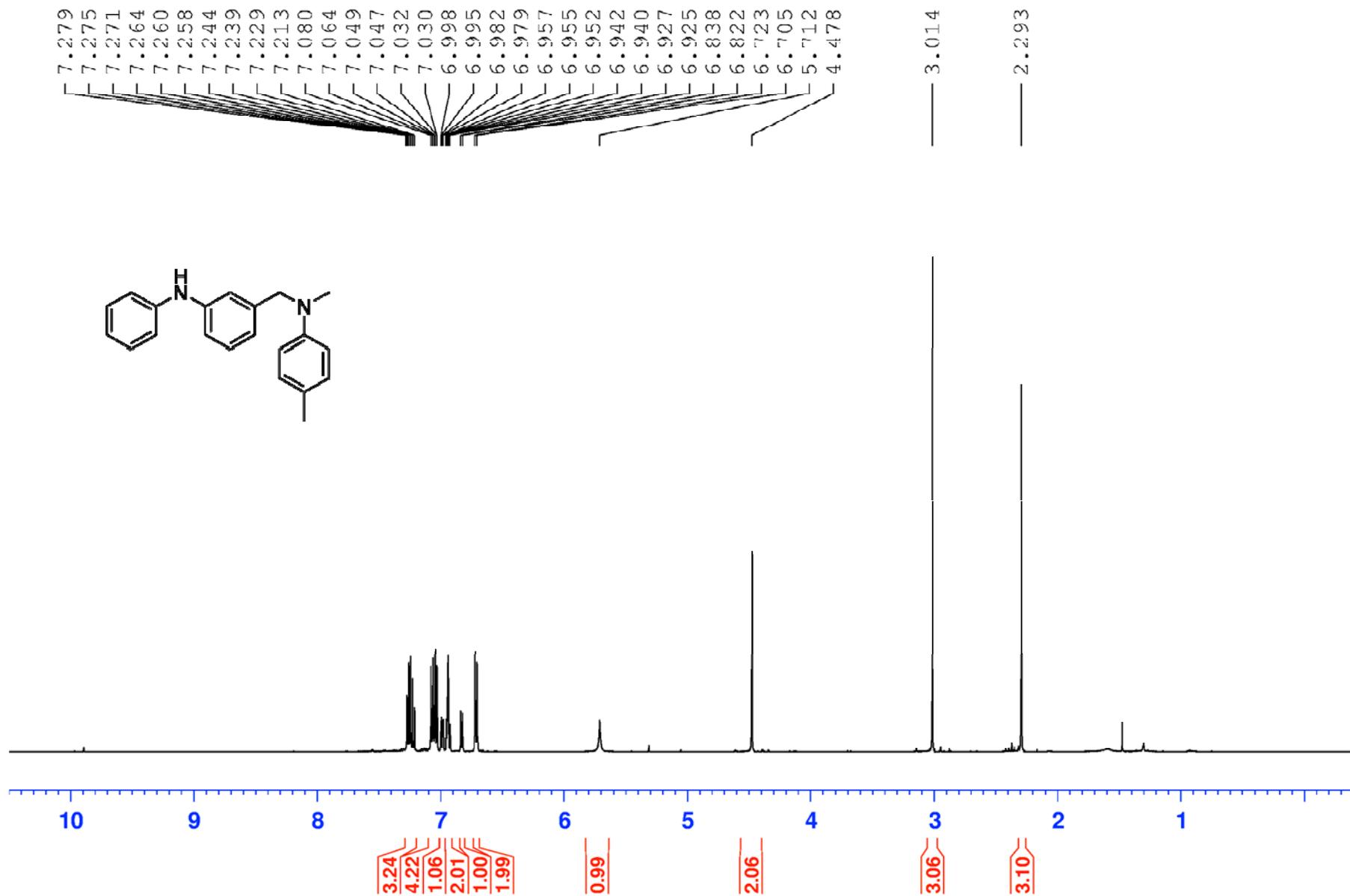
^1H NMR of N^1 -phenyl- N^4 - p -tolylbenzene-1,4-diamine (5d) (CDCl_3 , 500 MHz, 300K)



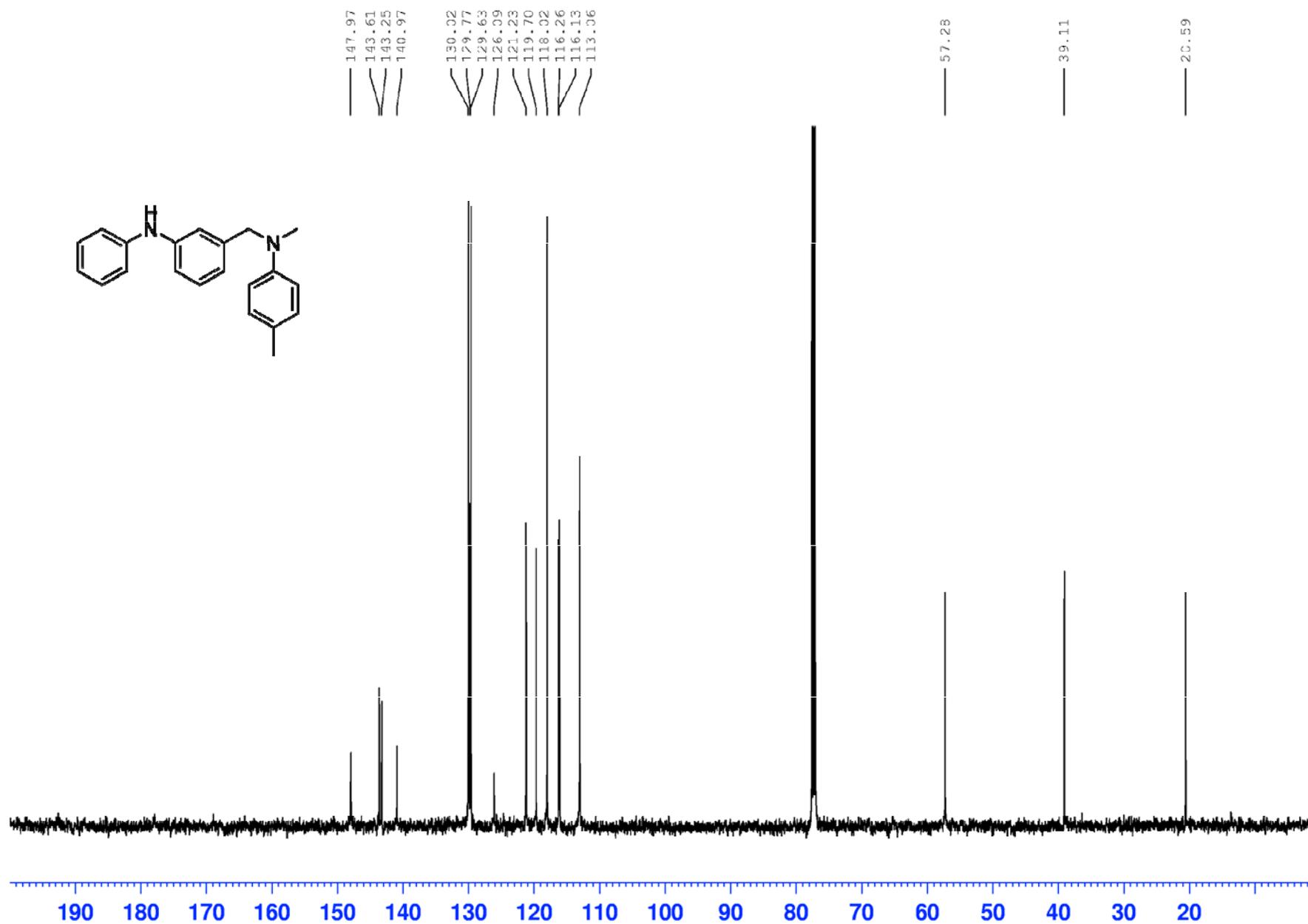
$^{13}\text{C}\{^1\text{H}\}$ NMR of *N*¹-phenyl-*N*⁴-*p*-tolylbenzene-1,4-diamine (5d) (CDCl_3 , 126 MHz, 300K)



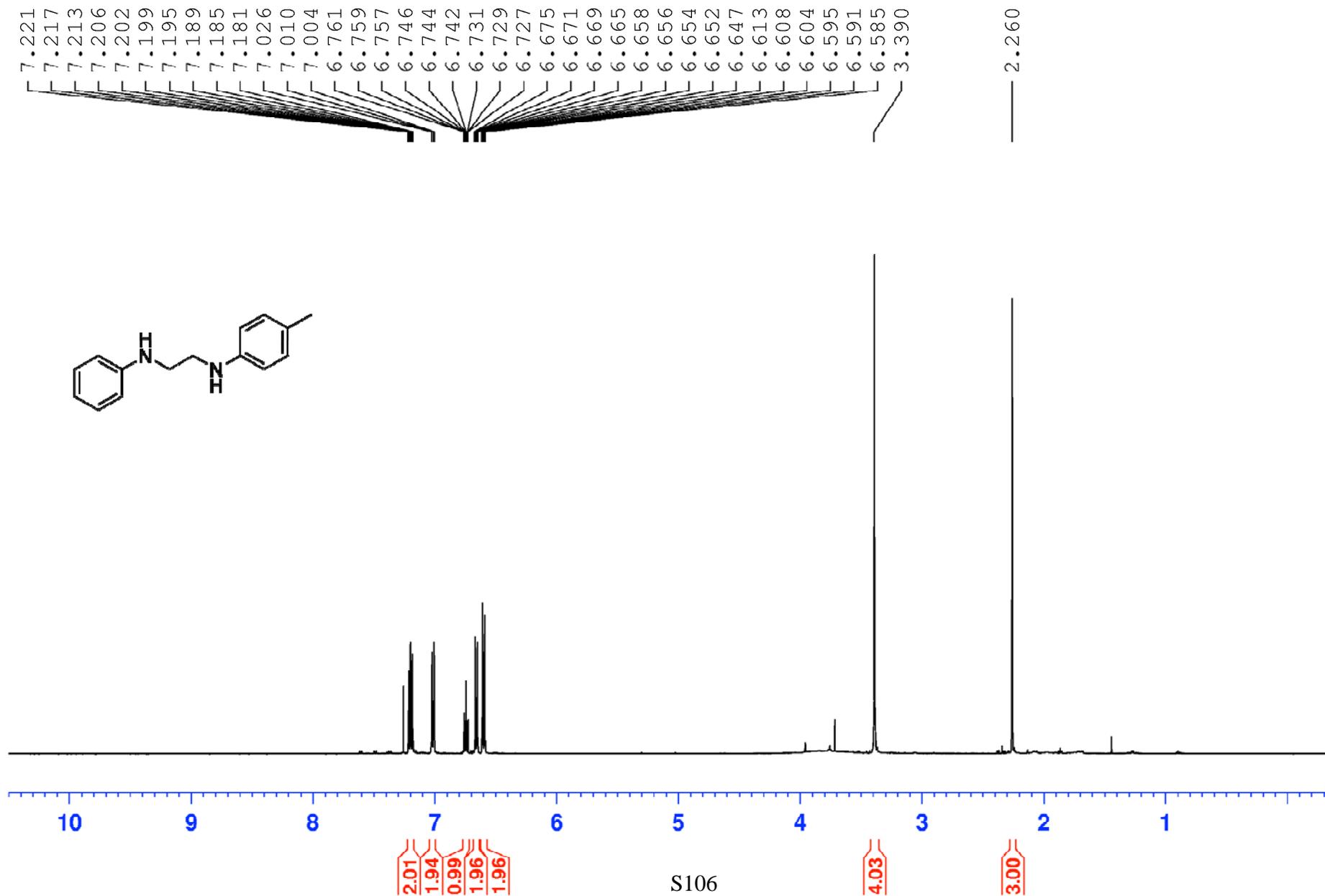
¹H NMR of *N*,4-dimethyl-*N*-(3-(phenylamino)benzyl)aniline (5e) (CDCl₃, 500 MHz, 300K)



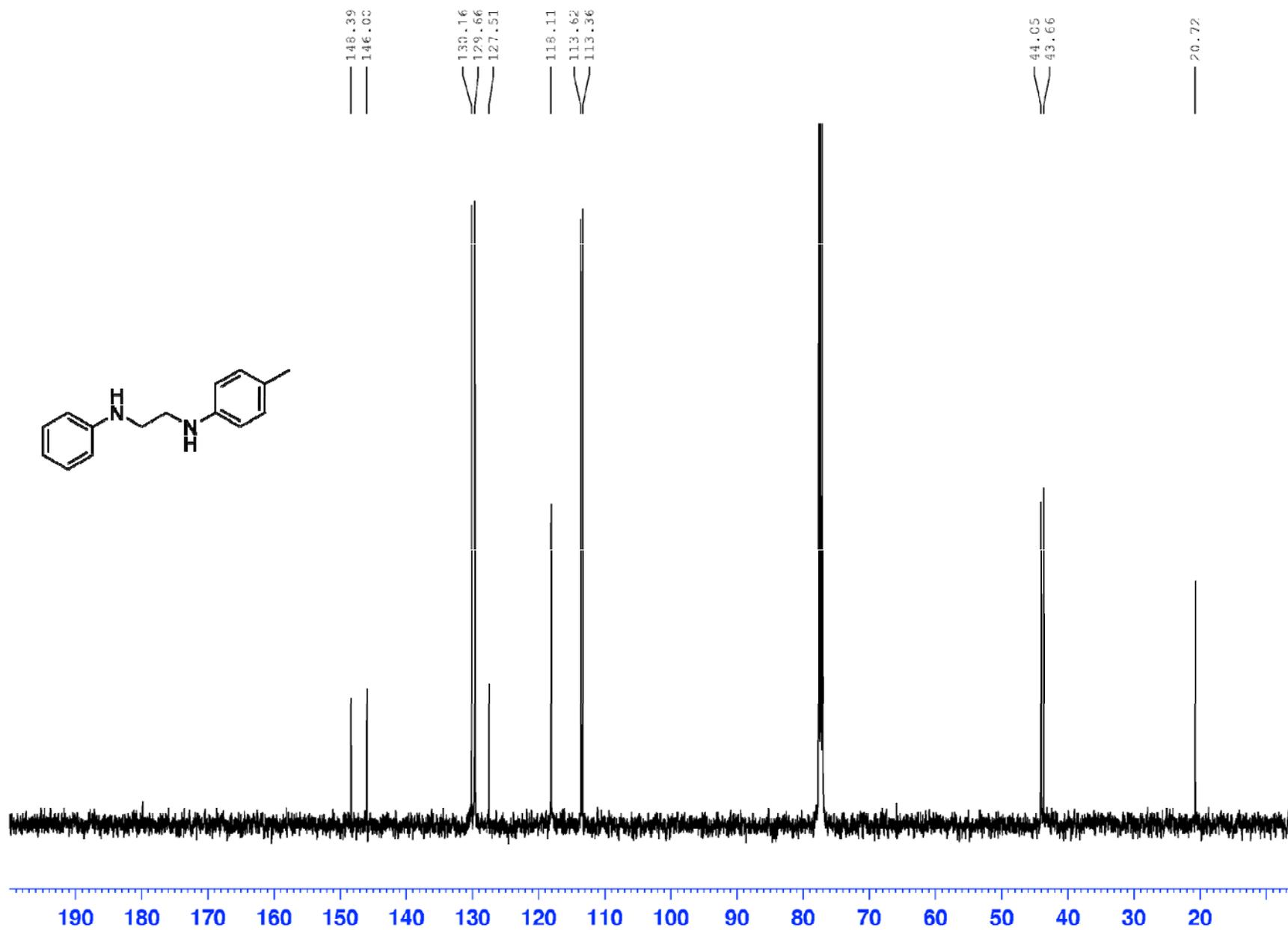
$^{13}\text{C}\{^1\text{H}\}$ NMR of *N*,4-dimethyl-*N*-(3-(phenylamino)benzyl)aniline (**5e**) (CDCl_3 , 126 MHz, 300K)



¹H NMR of N¹-phenyl-N²-p-tolyethane-1,2-diamine (5f) (CDCl₃, 500 MHz, 300K)



$^{13}\text{C}\{^1\text{H}\}$ NMR of N^1 -phenyl- N^2 -p-tolyethane-1,2-diamine (5f) (CDCl_3 , 126 MHz, 300K)



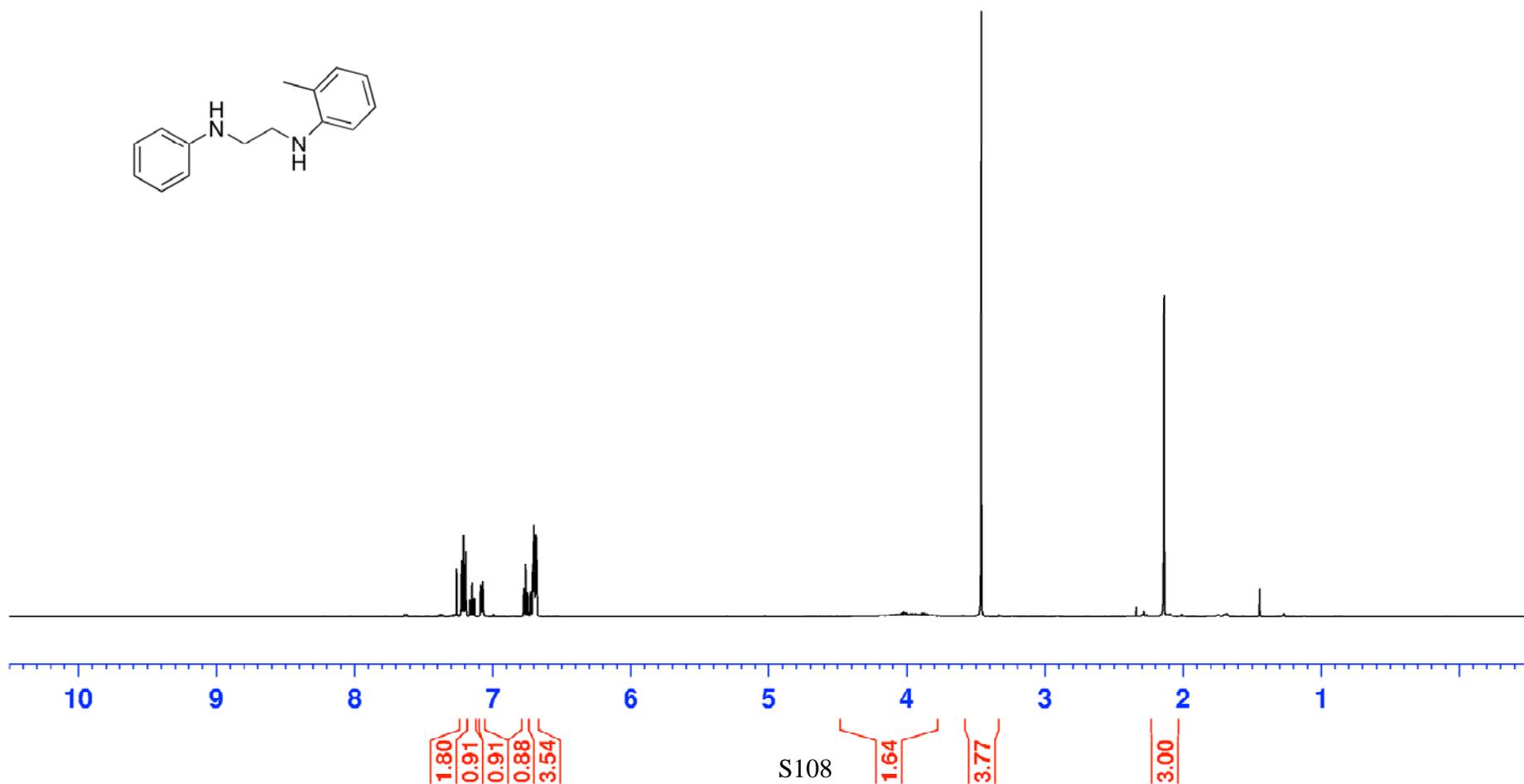
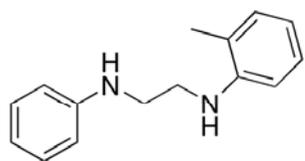
¹H NMR of N¹-phenyl-N²-o-tolyethane-1,2-diamine (5g) (CDCl₃, 500 MHz, 300K)

7.260
7.227
7.212
7.210
7.195
7.171
7.150
7.149
7.129
7.087
7.073
6.776
6.763
6.761
6.759
6.747
6.724
6.710
6.704
6.702
6.700
6.698
6.687
6.685
6.683

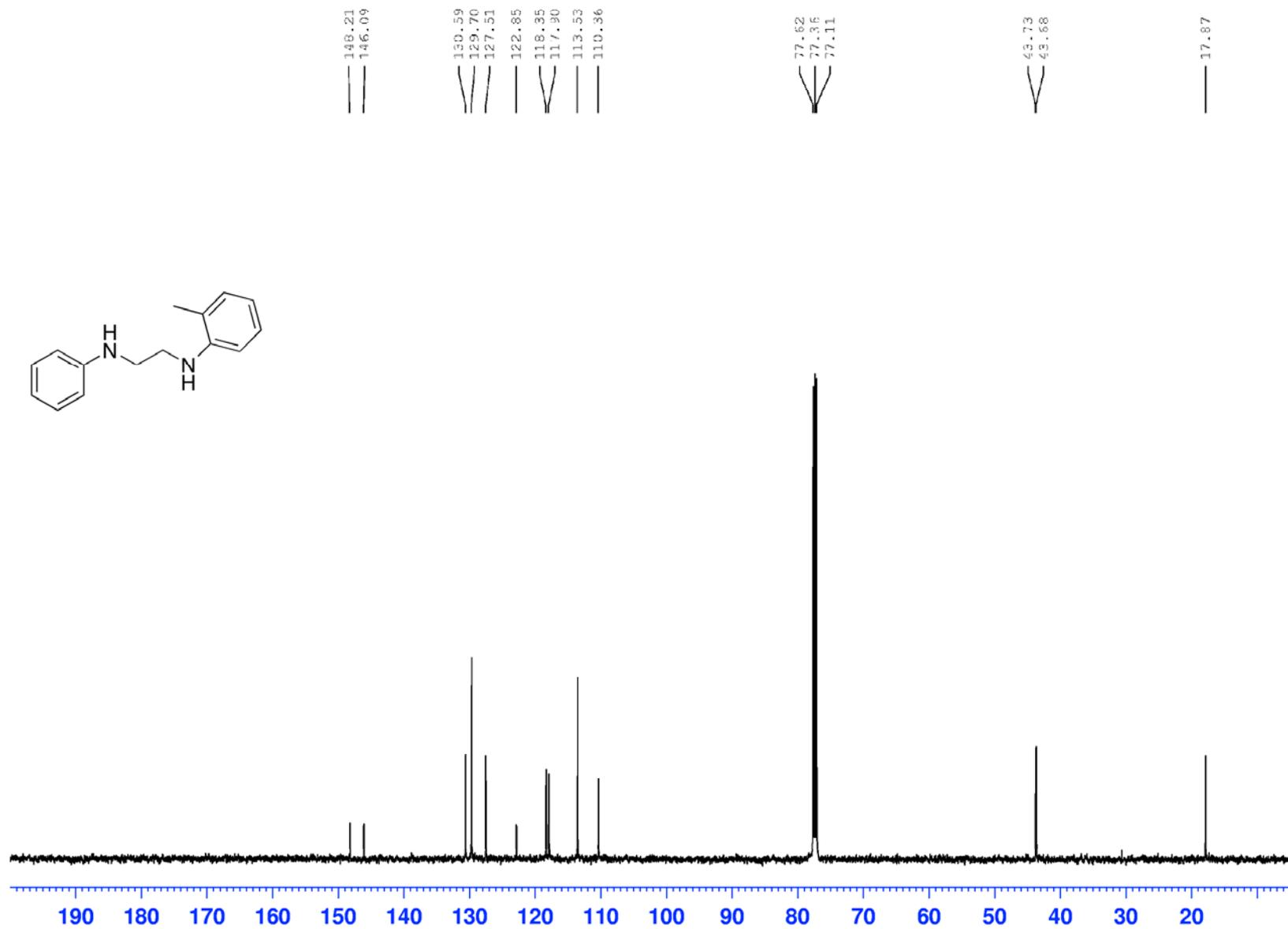
— 3.985

— 3.462

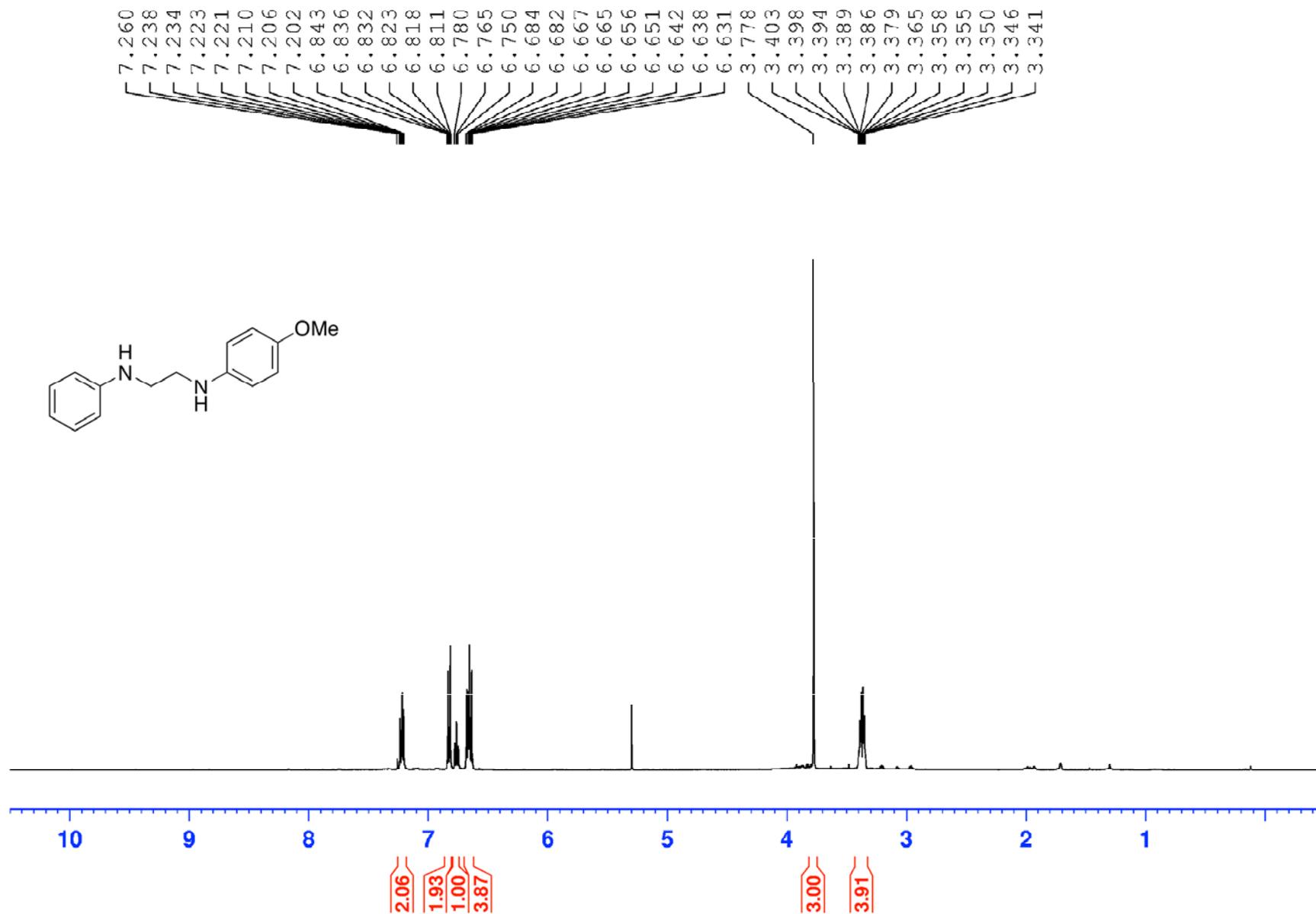
— 2.138



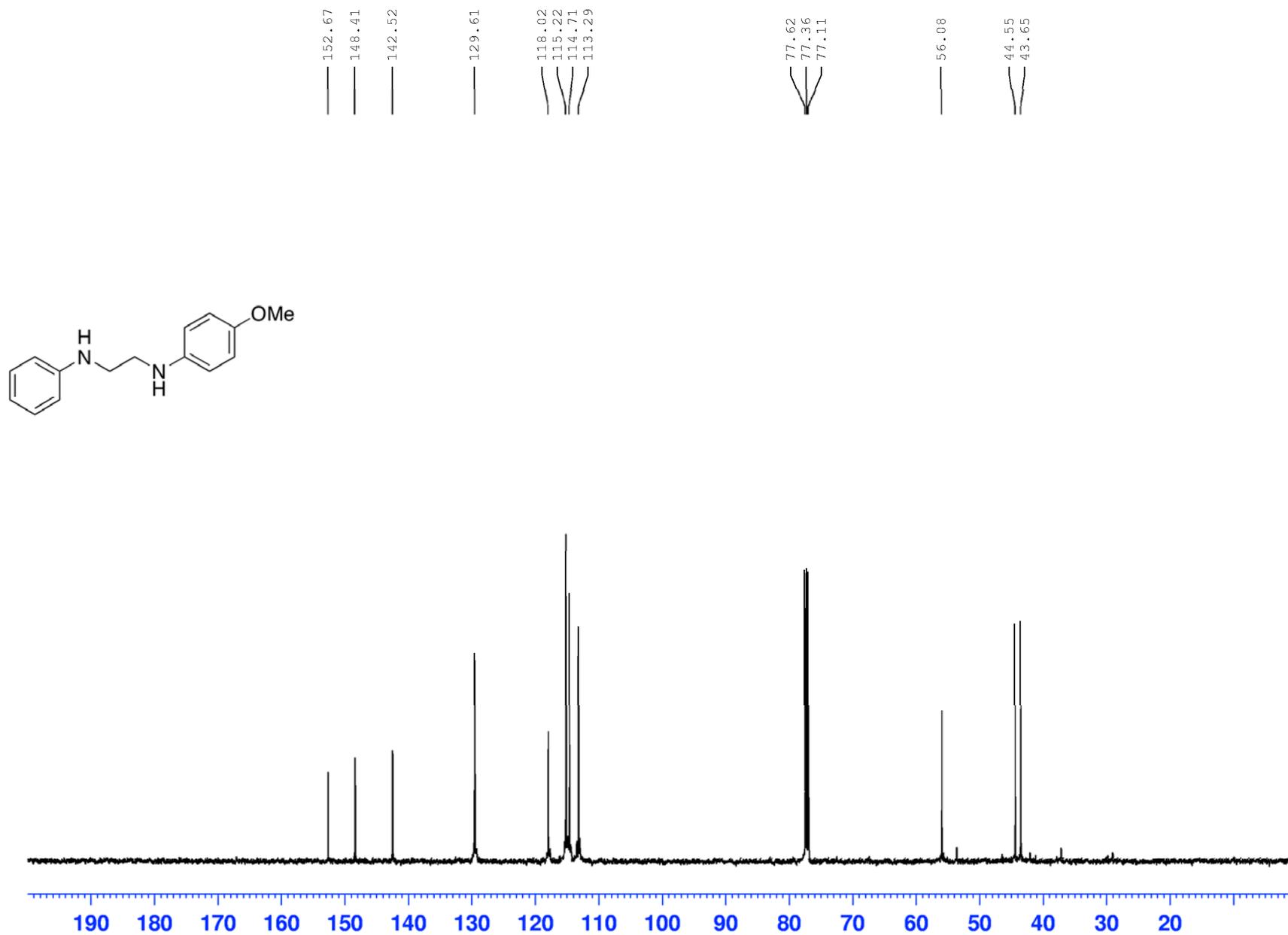
$^{13}\text{C}\{^1\text{H}\}$ NMR of N^1 -phenyl- N^2 -o-tolyethane-1,2-diamine (5g) (CDCl_3 , 126 MHz, 300K)



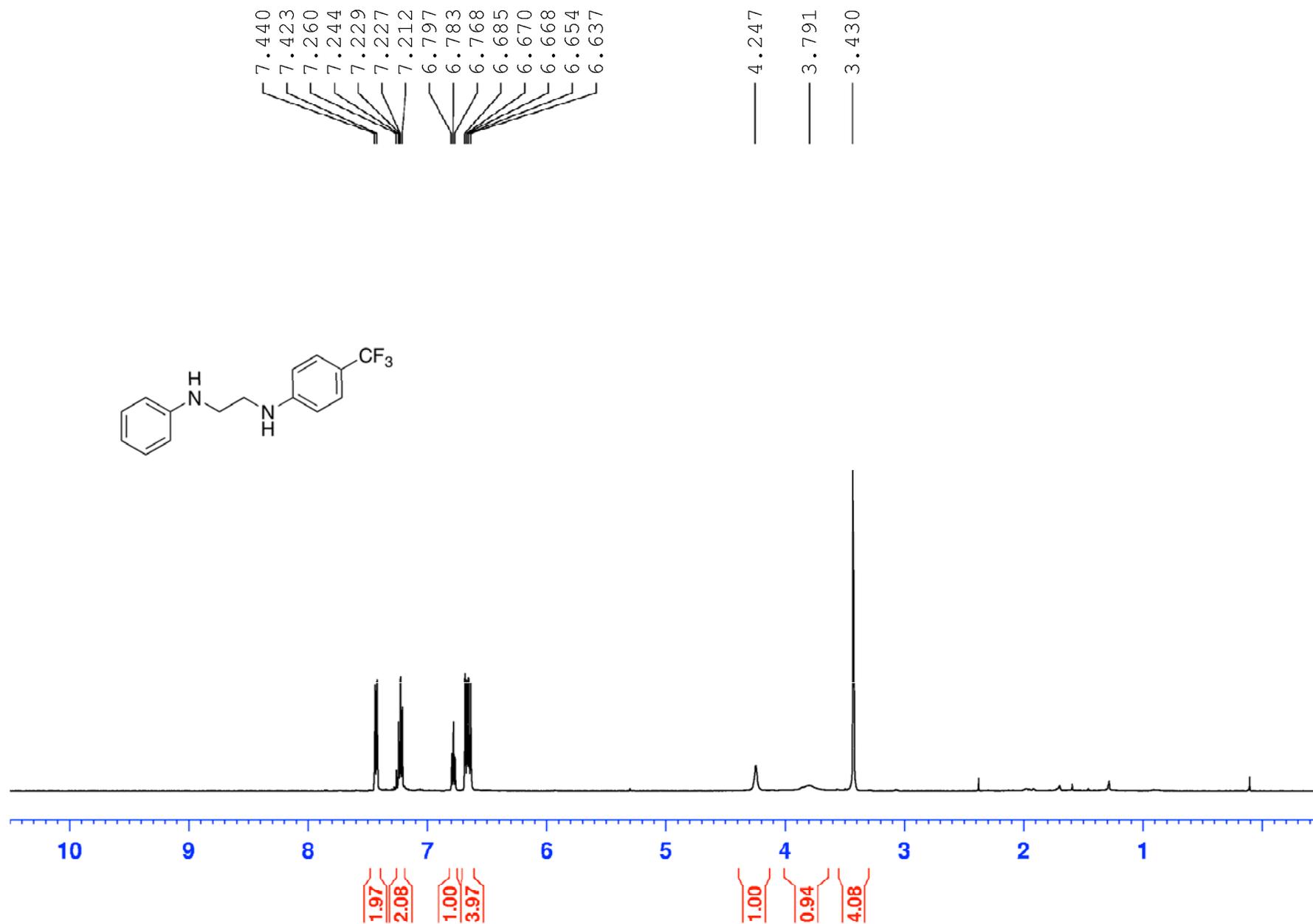
^1H NMR of N^1 -(4-methoxyphenyl)- N^2 -phenylethane-1,2-diamine (5h) (CDCl_3 , 500 MHz, 300K)



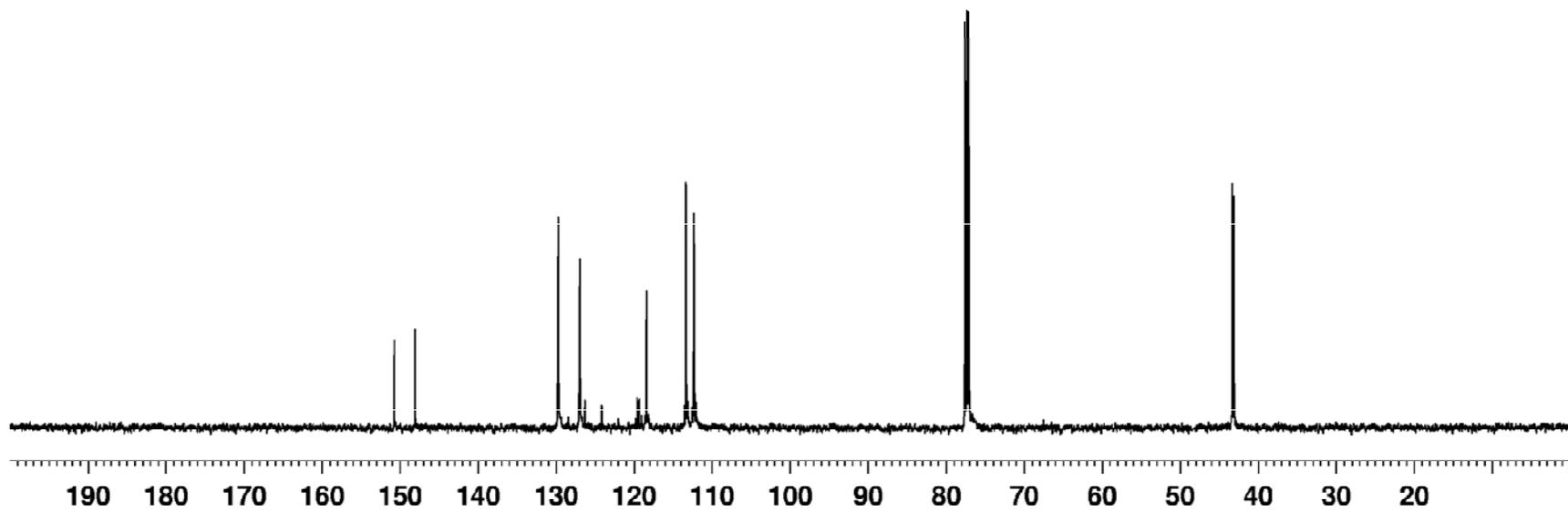
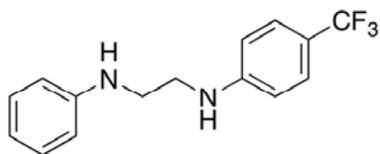
$^{13}\text{C}\{^1\text{H}\}$ NMR of N^1 -(4-methoxyphenyl)- N^2 -phenylethane-1,2-diamine (**5h**) (CDCl_3 , 126 MHz, 300K)



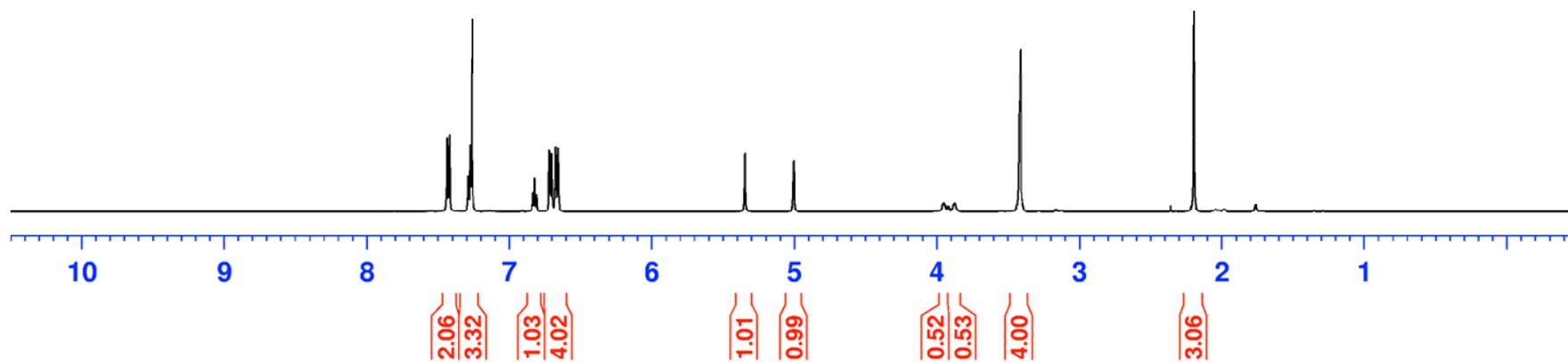
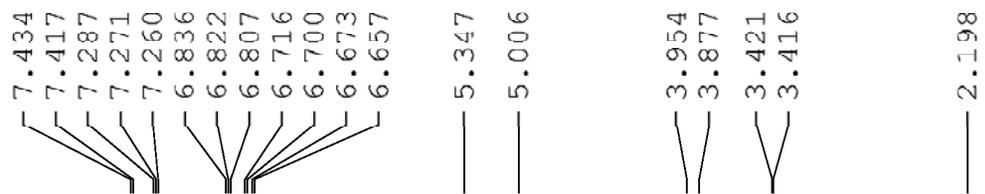
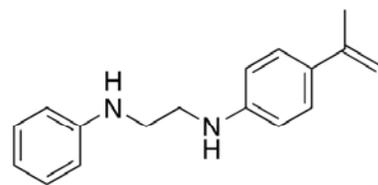
¹H NMR of N¹-phenyl-N²-(4-(trifluoromethyl)phenyl)ethane-1,2-diamine (5i) (CDCl₃, 500 MHz, 300K)



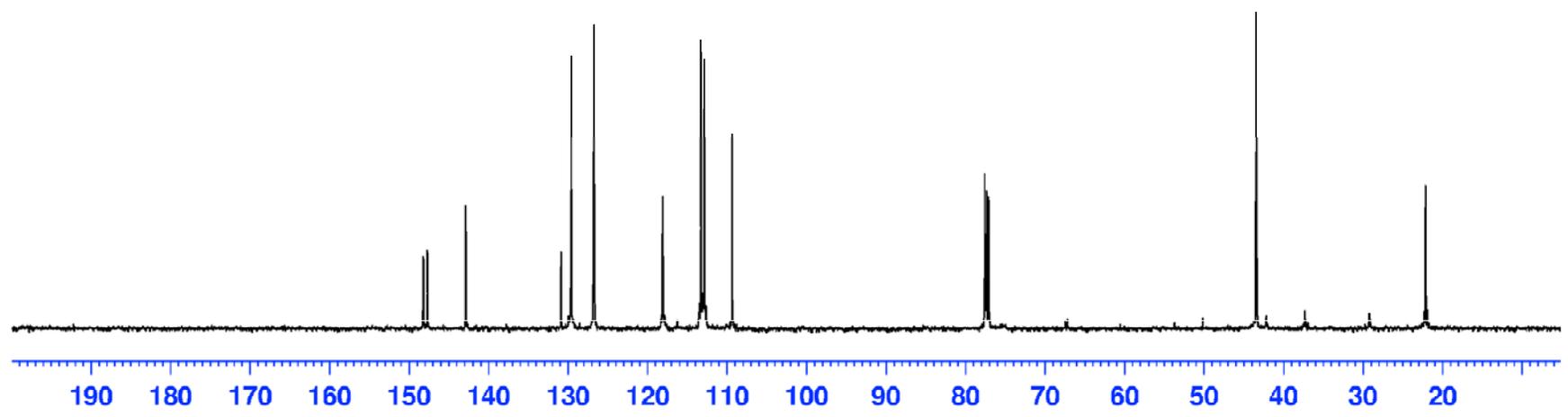
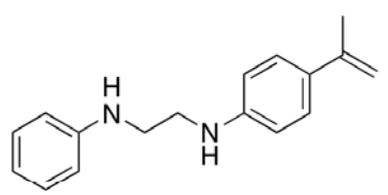
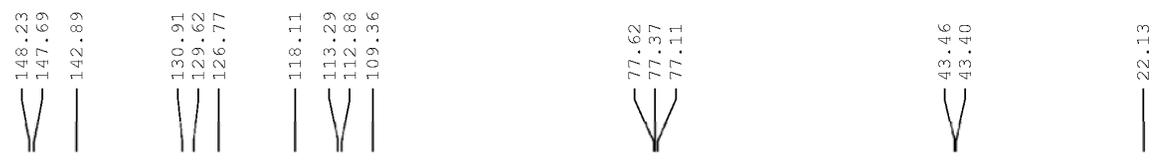
$^{13}\text{C}\{^1\text{H}\}$ NMR of N^1 -phenyl- N^2 -(4-(trifluoromethyl)phenyl)ethane-1,2-diamine (**5i**) (CDCl_3 , 126 MHz, 300K)



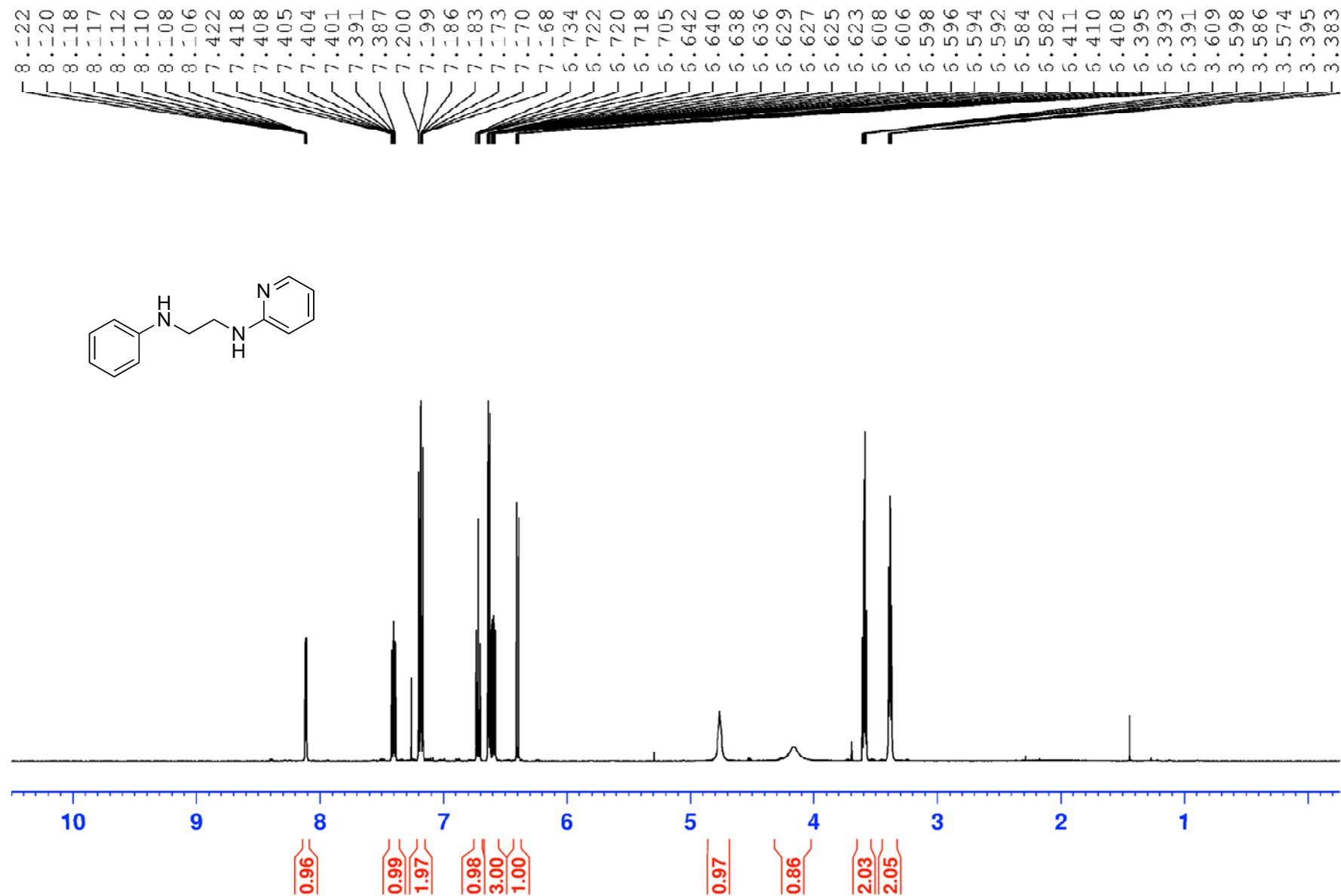
¹H NMR of N¹-phenyl-N²-(4-(prop-1-en-2-yl)phenyl)ethane-1,2-diamine (5j) (CDCl₃, 500 MHz, 300K)



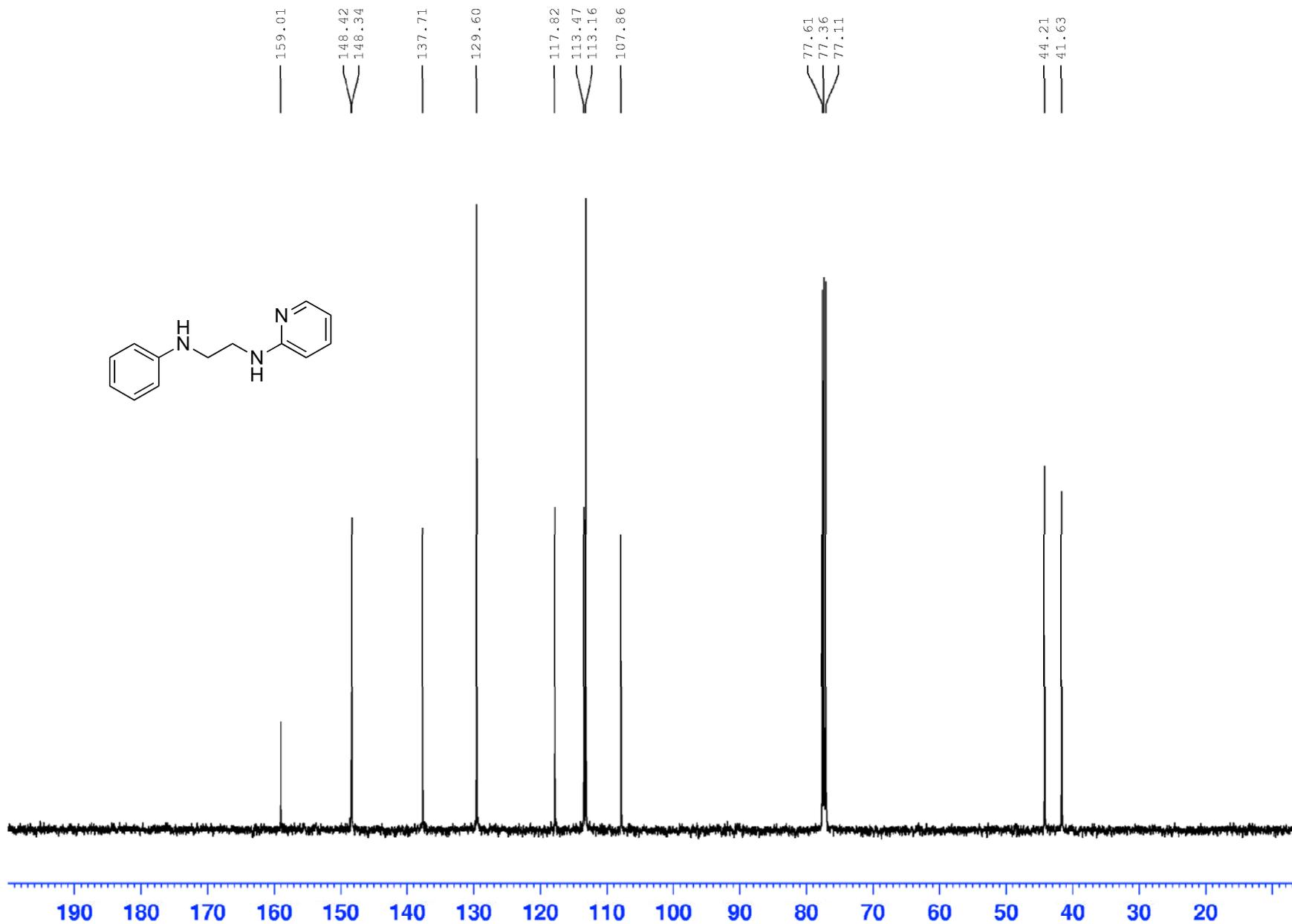
$^{13}\text{C}\{^1\text{H}\}$ NMR of N^1 -phenyl- N^2 -(4-(prop-1-en-2-yl)phenyl)ethane-1,2-diamine (5j) (CDCl_3 , 126 MHz, 300K)



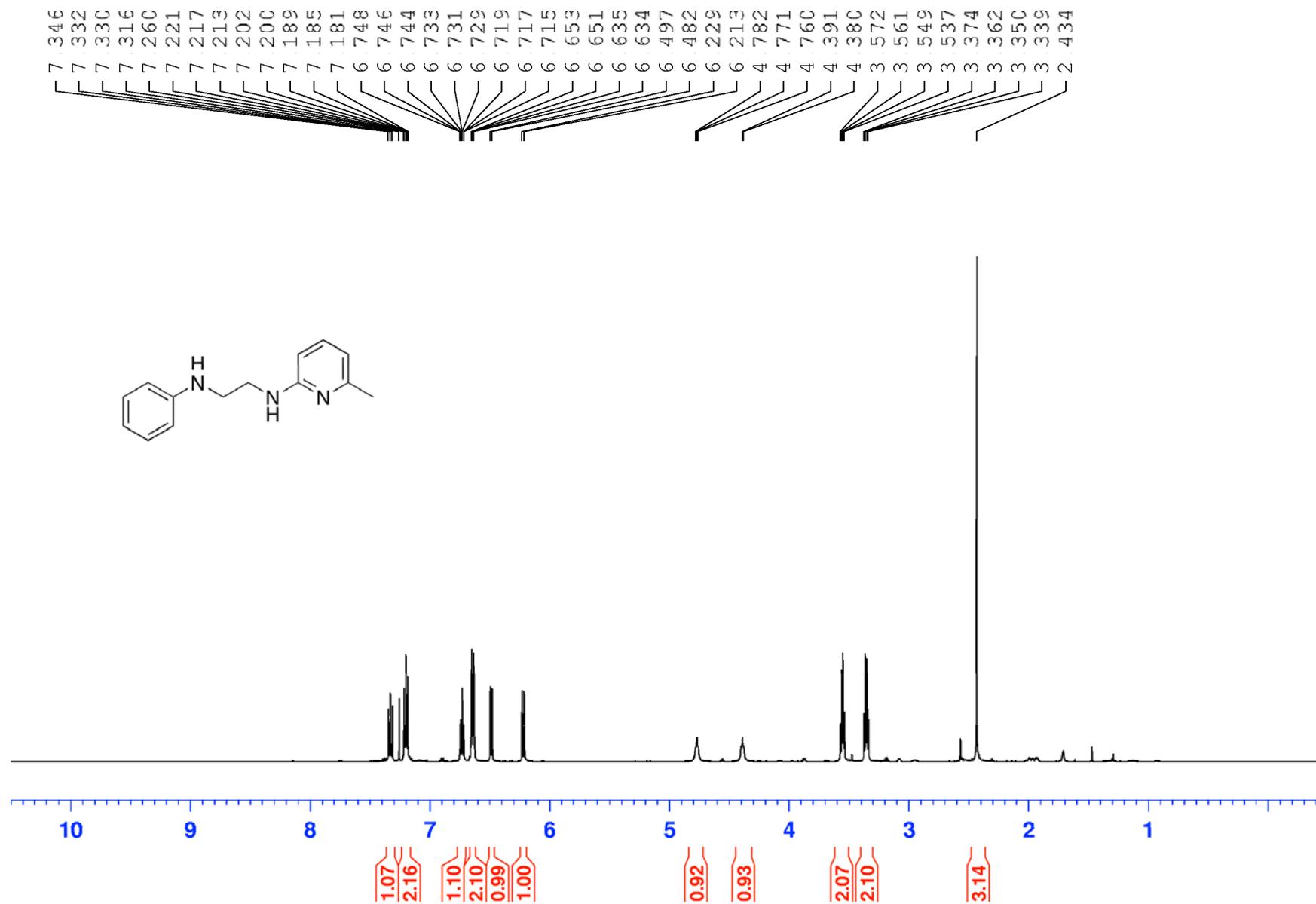
¹H NMR of N¹-phenyl-N²-(pyridin-2-yl)ethane-1,2-diamine (5k) (CDCl₃, 500 MHz, 300K)



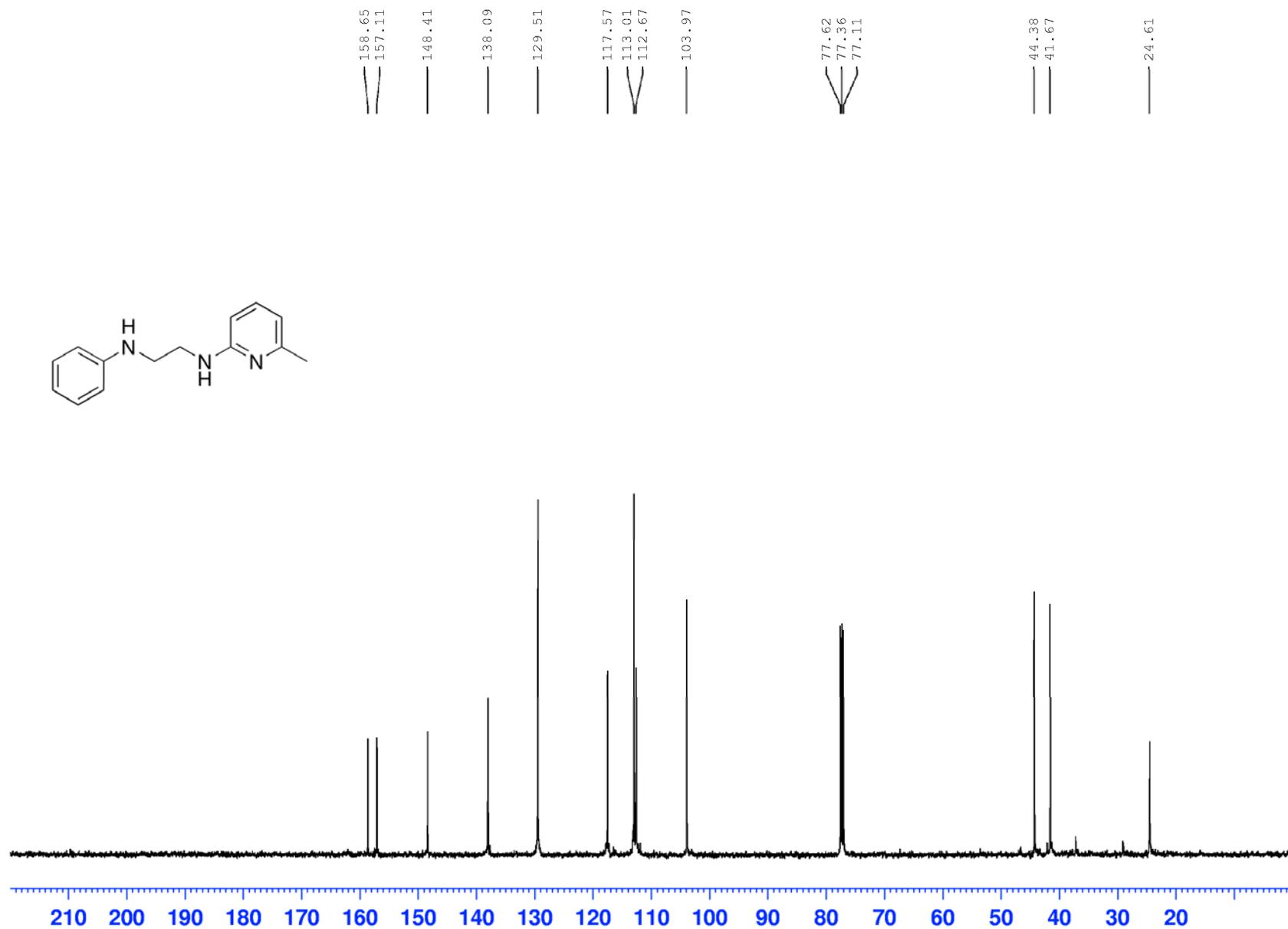
$^{13}\text{C}\{^1\text{H}\}$ NMR of N¹-phenyl-N²-(pyridin-2-yl)ethane-1,2-diamine (5k) (CDCl₃, 126 MHz, 300K)



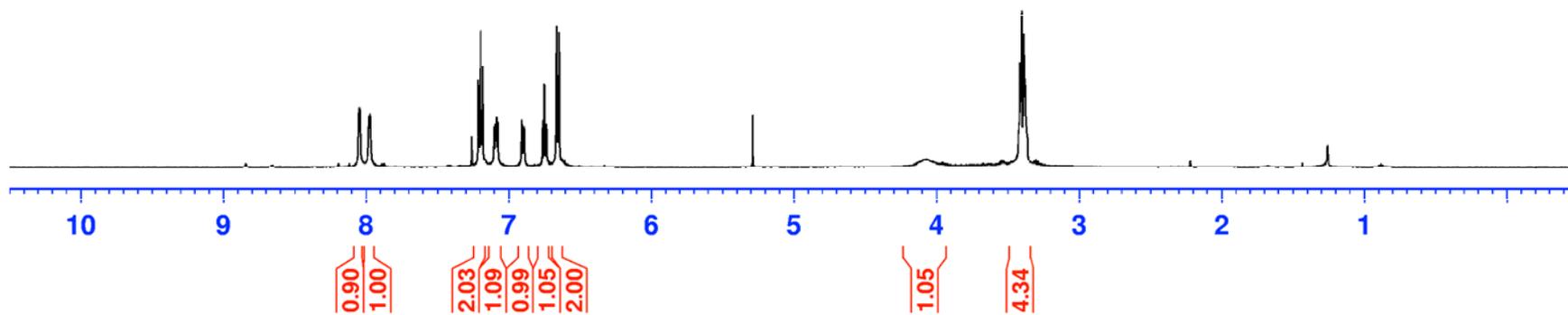
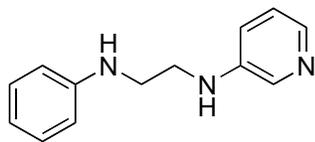
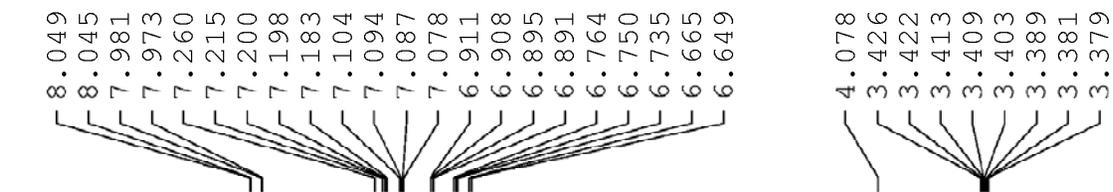
¹H NMR of N¹-(6-methylpyridin-2-yl)-N²-phenylethane-1,2-diamine (5l) (CDCl₃, 500 MHz, 300K)



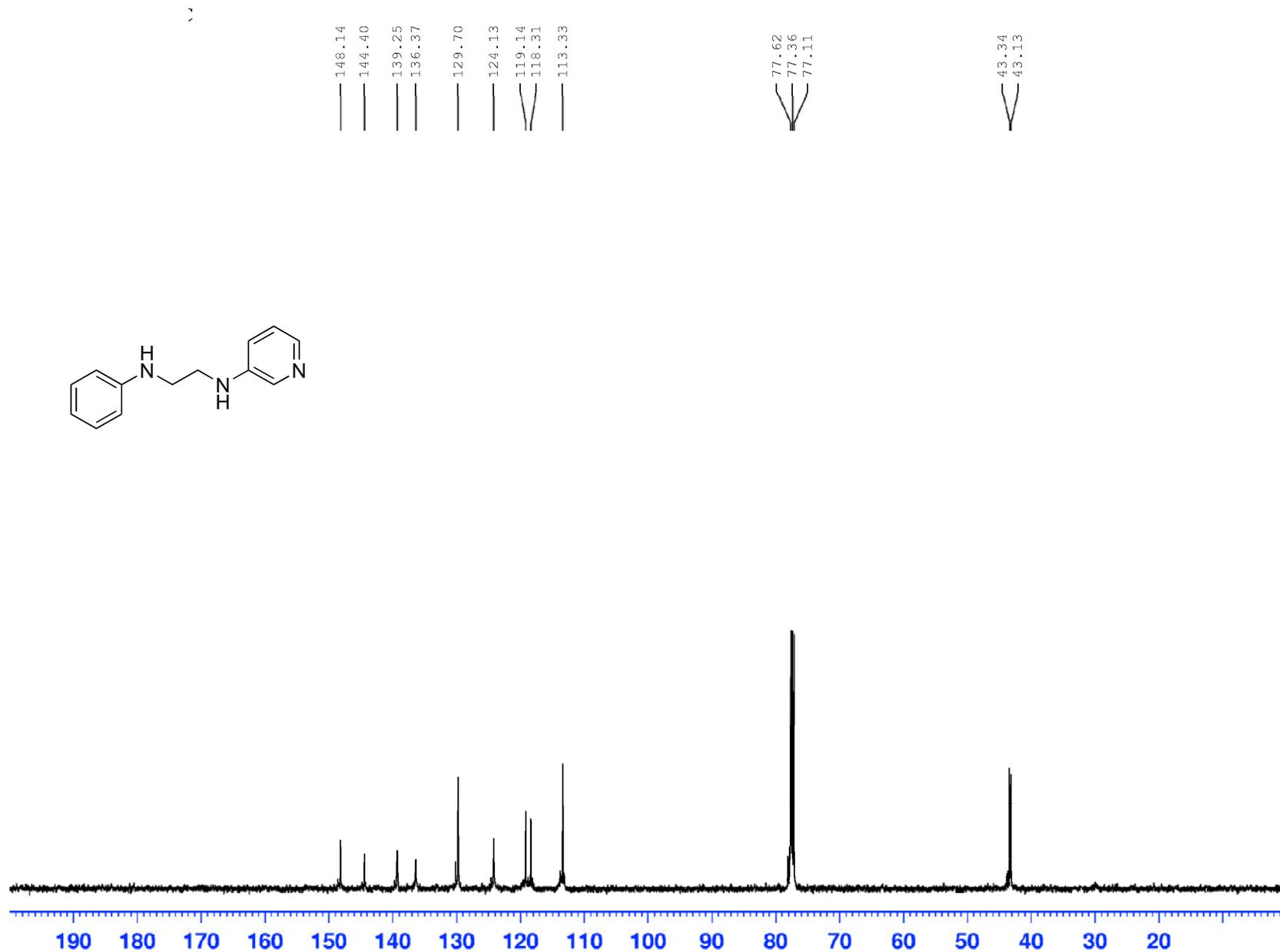
$^{13}\text{C}\{^1\text{H}\}$ NMR of N^1 -(6-methylpyridin-2-yl)- N^2 -phenylethane-1,2-diamine (5I) (CDCl_3 , 126 MHz, 300K)



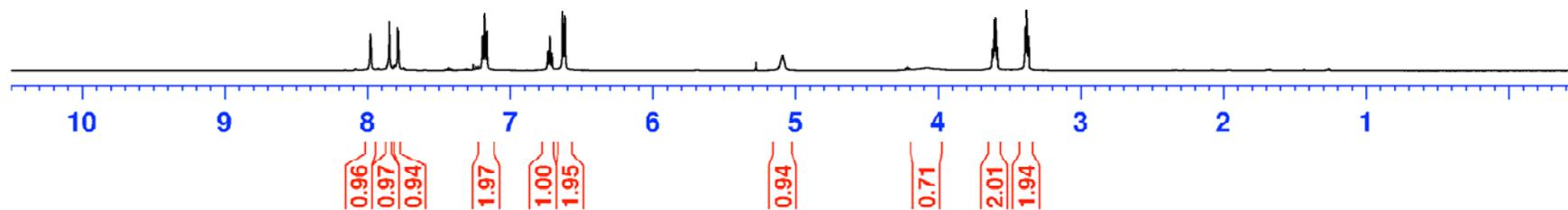
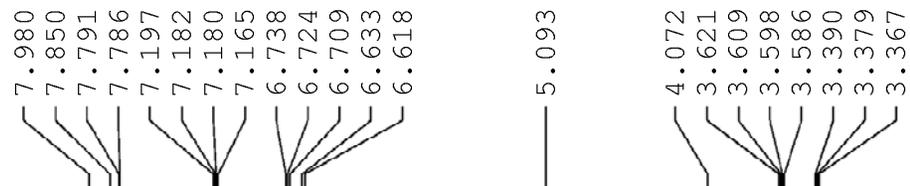
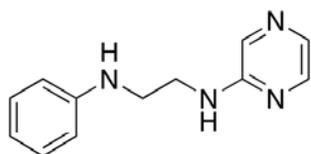
¹H NMR of N¹-phenyl-N²-(pyridin-3-yl)ethane-1,2-diamine (5m) (CDCl₃, 500 MHz, 300K)



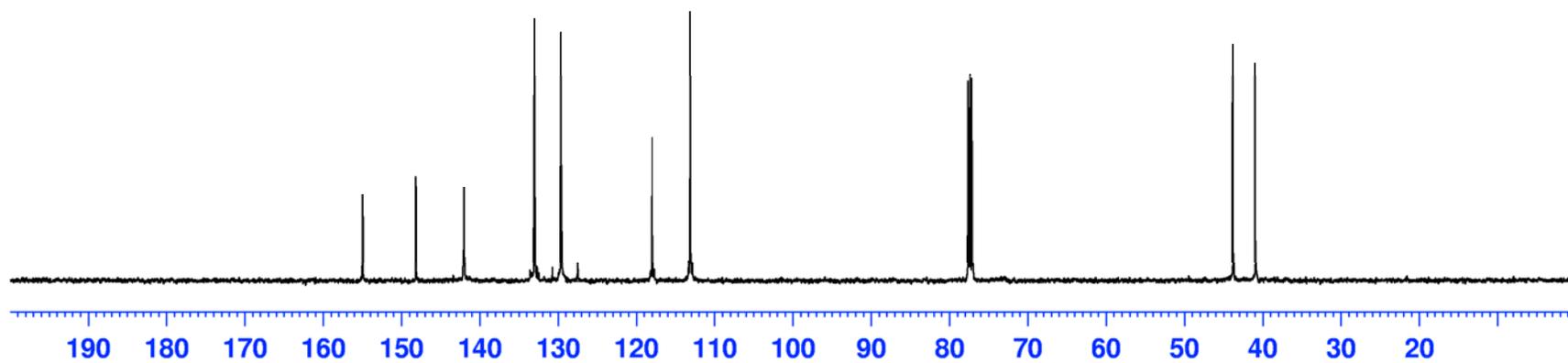
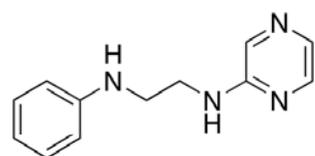
$^{13}\text{C}\{^1\text{H}\}$ NMR of N^1 -phenyl- N^2 -(pyridin-3-yl)ethane-1,2-diamine (5m) (CDCl_3 , 126 MHz, 300K)



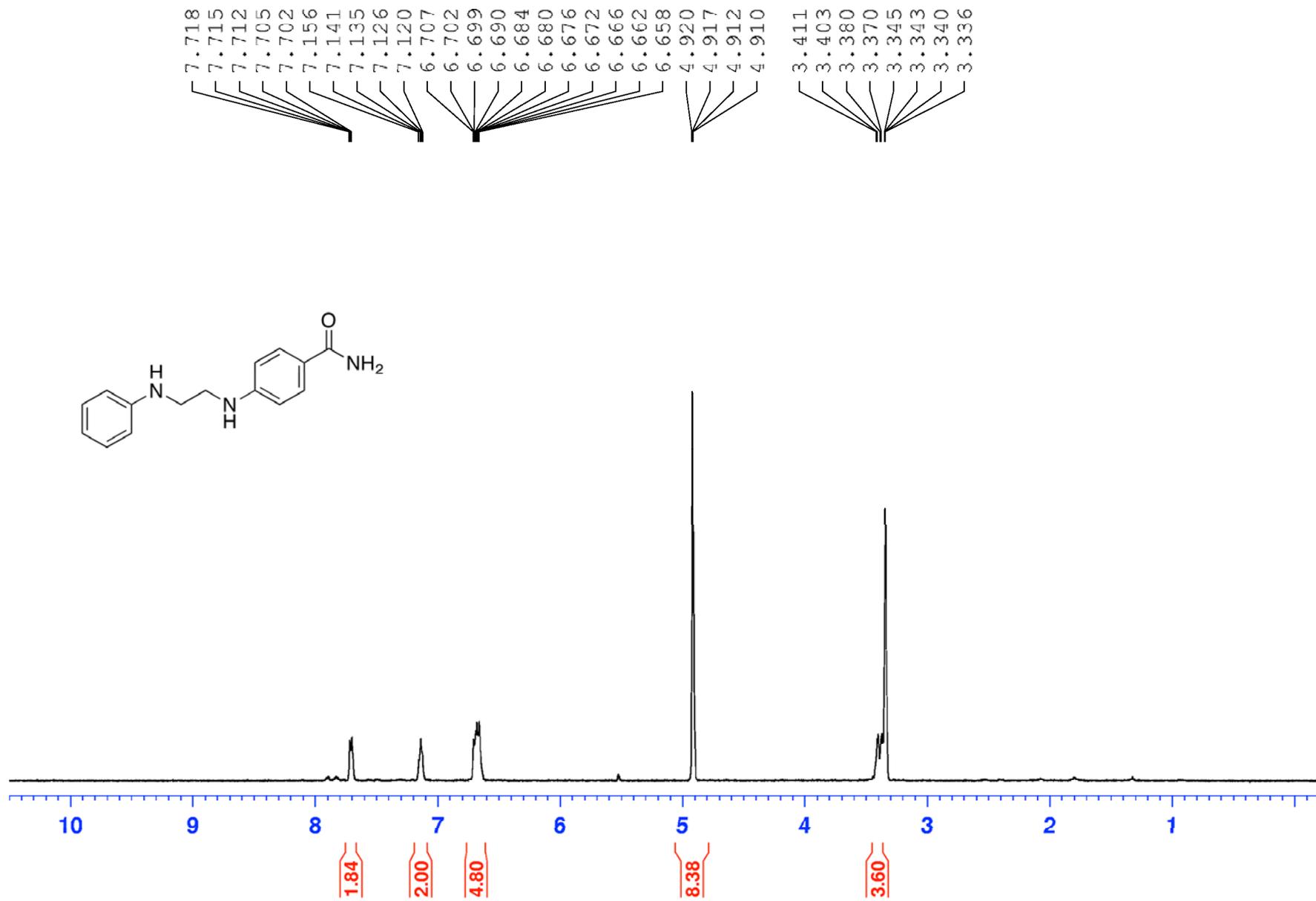
¹H NMR of N¹-phenyl-N²-(pyrazin-2-yl)ethane-1,2-diamine (5n) (CDCl₃, 500 MHz, 300K)



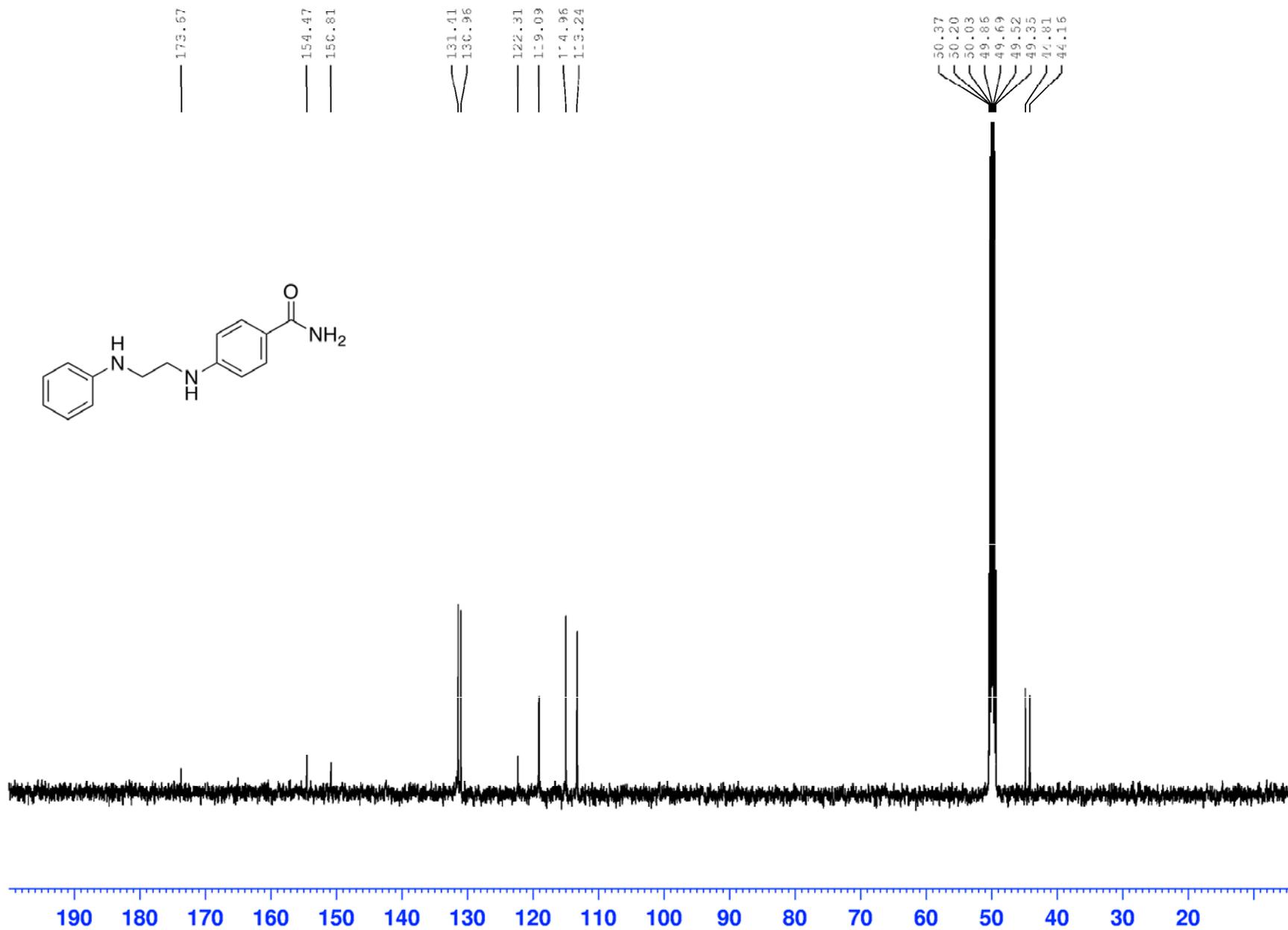
$^{13}\text{C}\{^1\text{H}\}$ NMR of N^1 -phenyl- N^2 -(pyrazin-2-yl)ethane-1,2-diamine (5n) (CDCl_3 , 126 MHz, 300K)



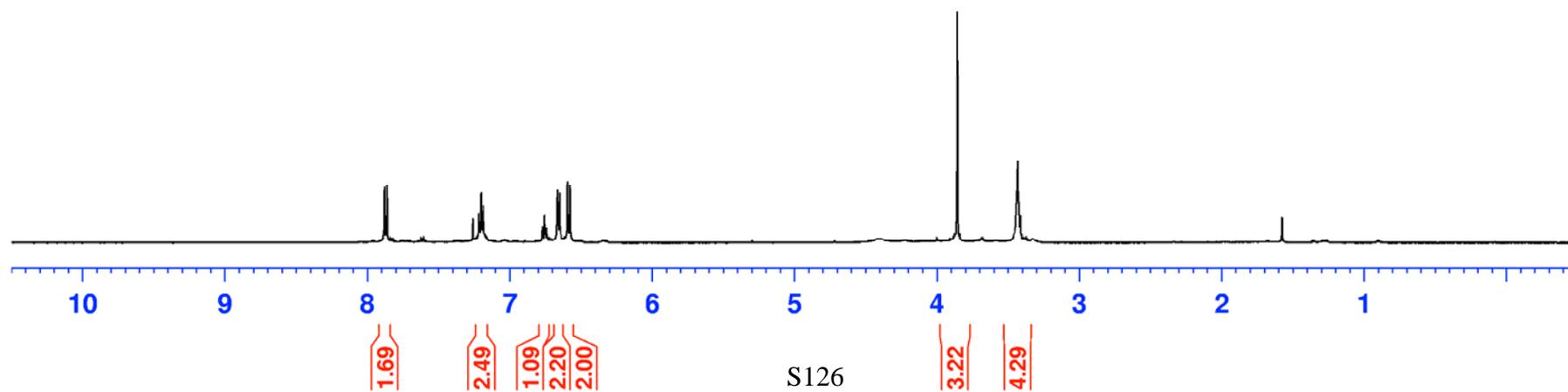
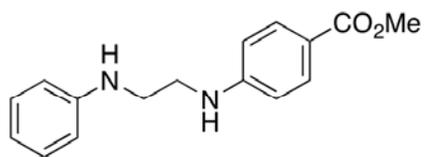
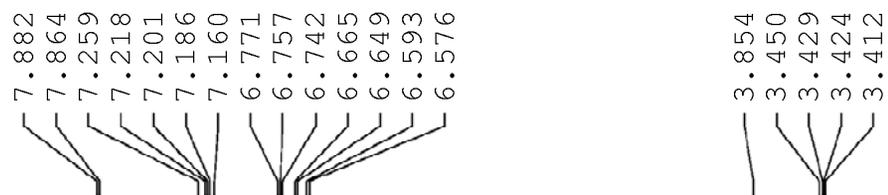
¹H NMR of 4-(2-(phenylamino)ethylamino)benzamide (5o) (MeOD, 500 MHz, 300K)



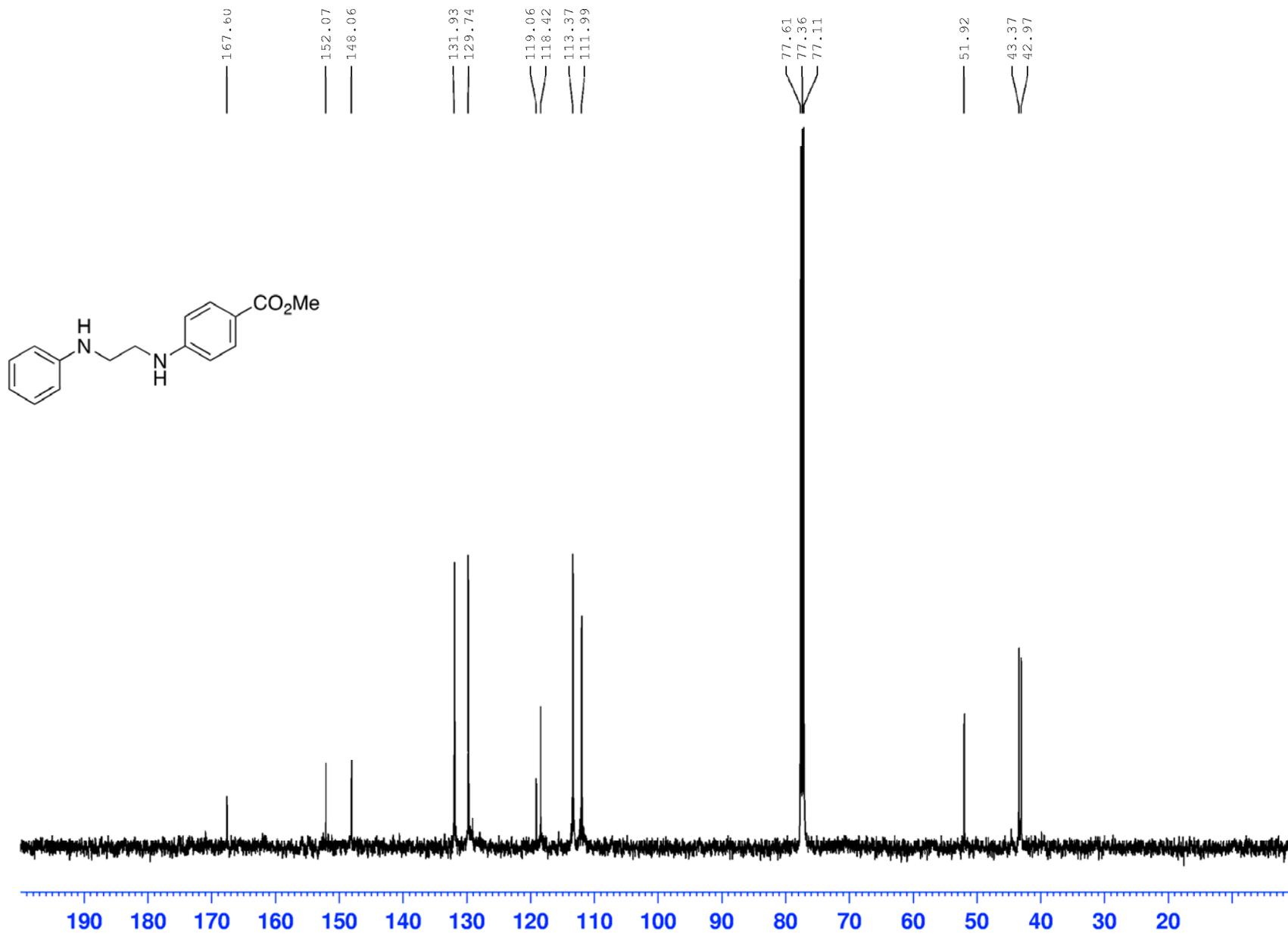
$^{13}\text{C}\{^1\text{H}\}$ NMR of 4-(2-(phenylamino)ethylamino)benzamide (5o) 126 MHz, 300K



¹H NMR of methyl 4-(2-(phenylamino)ethylamino)benzoate (5p) (CDCl₃, 500 MHz, 300K)



$^{13}\text{C}\{^1\text{H}\}$ NMR of methyl 4-(2-(phenylamino)ethylamino)benzoate (5p) (CDCl_3 , 126 MHz, 300K)

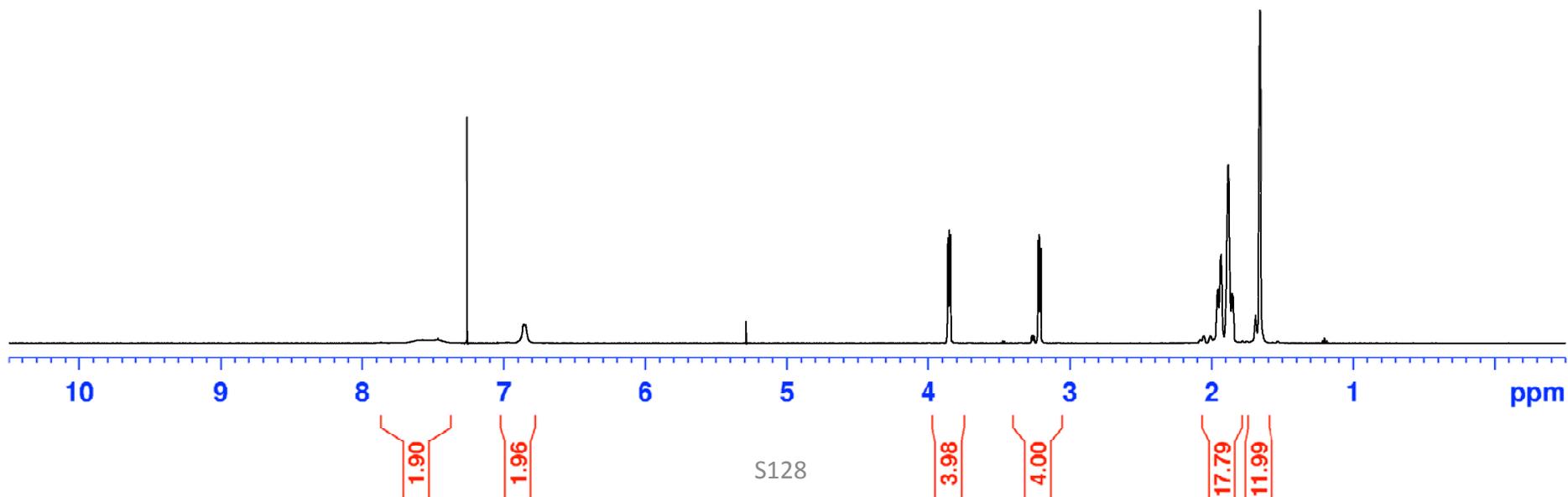
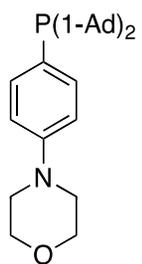


¹H NMR of p-Mor-DalPhos (L2) (CDCl₃, 500 MHz, 300K)

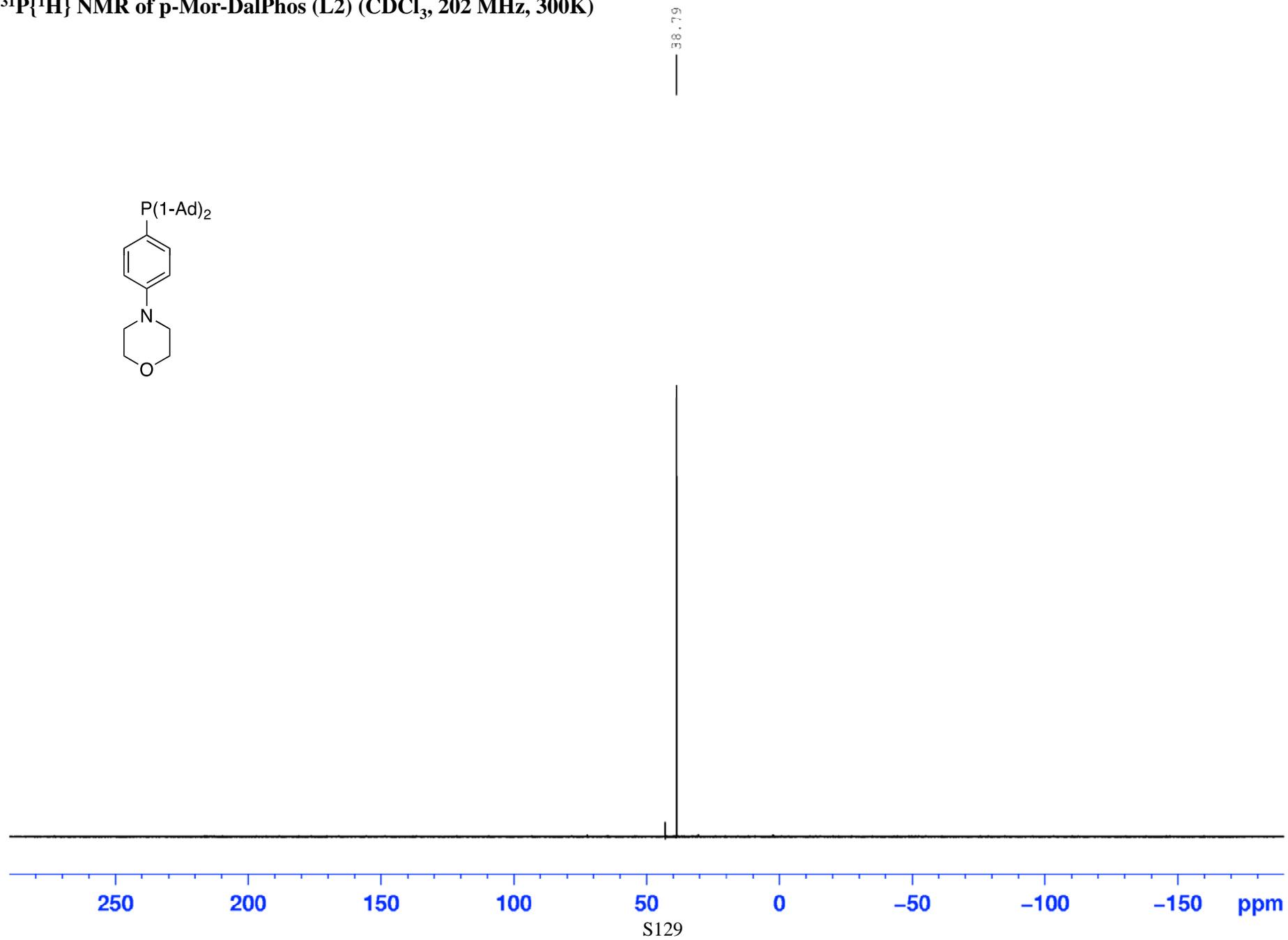
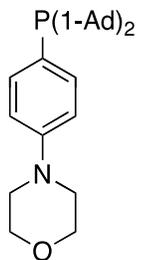
7.529
7.260
6.862
6.849

3.867
3.857
3.847
3.229
3.219
3.209

1.958
1.937
1.934
1.884
1.856
1.692
1.661



$^{31}\text{P}\{^1\text{H}\}$ NMR of p-Mor-DalPhos (L2) (CDCl_3 , 202 MHz, 300K)



$^{13}\text{C}\{^1\text{H}\}$ NMR of p-Mor-DalPhos (L2) (CDCl_3 , 126 MHz, 300K)

