

## Lanthanum Triflate Catalysed Acyl Transfer from $\beta$ -Diketones to Amines:

### Conversion of Aryl Methyl Ketones to Amides

Rajendra Prasad, Purnima Pradhan, Partha Ghosh\*

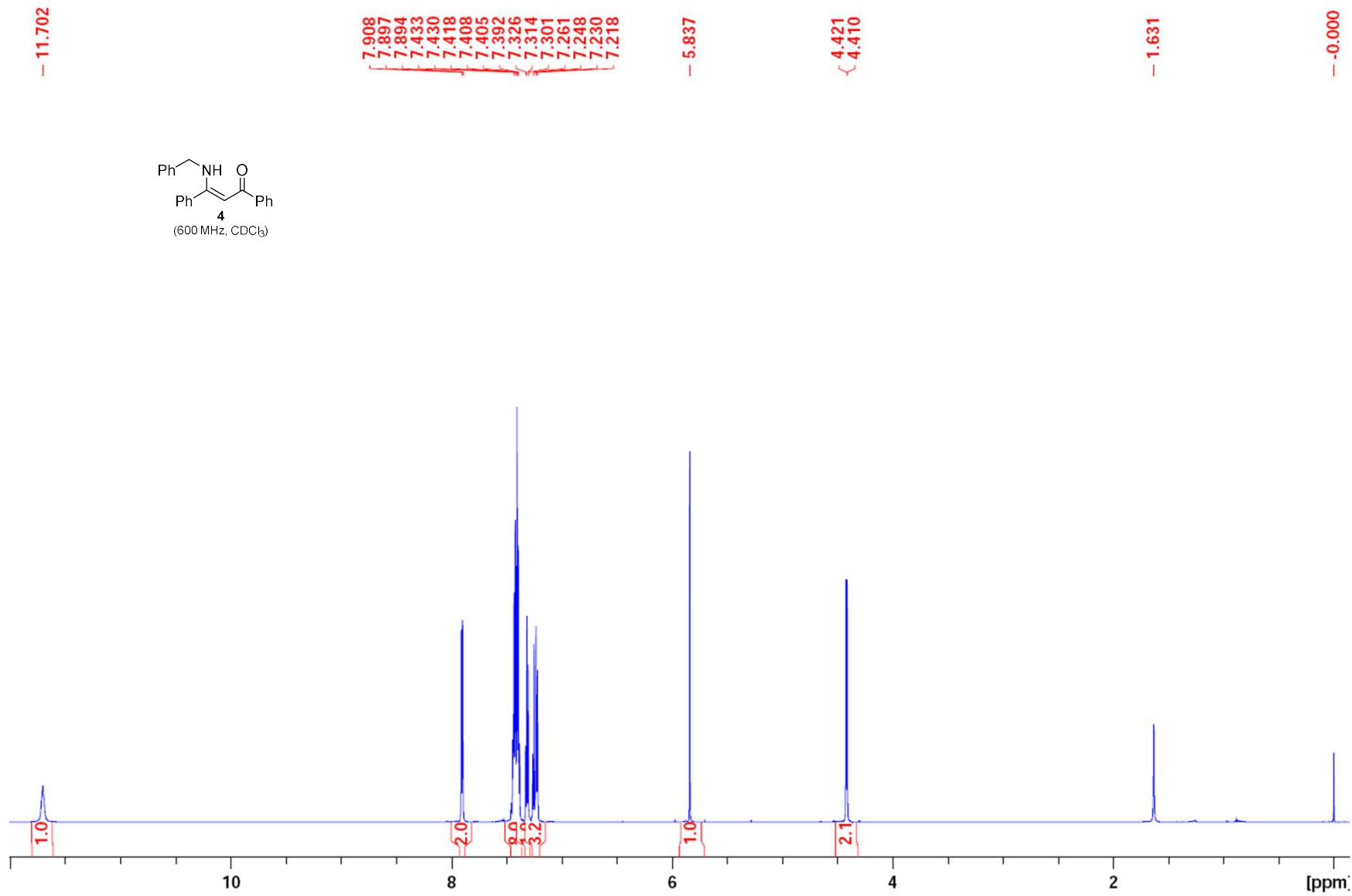
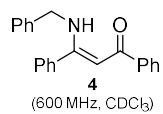
\*Department of Chemistry, Central University of Jharkhand, Cheri-Manatu, Ranchi-835222, India

Email: [partha.ghosh@cuja.ac.in](mailto:partha.ghosh@cuja.ac.in)

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1. Copies of  $^1\text{H}$  and  $^{13}\text{C}$  NMR Spectra

S2

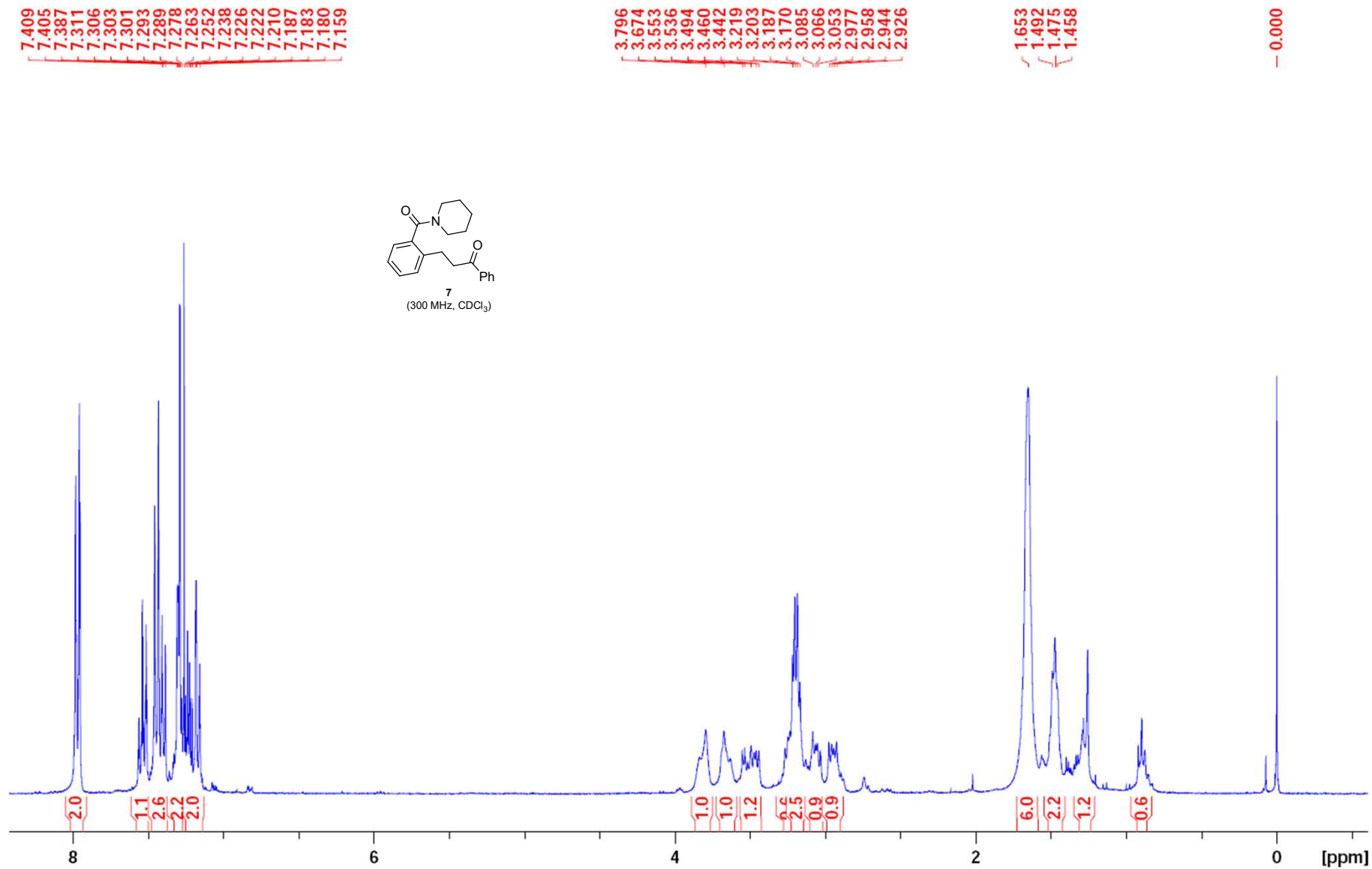
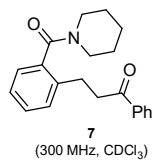


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7.405  
7.387  
7.311  
7.306  
7.303  
7.301  
7.293  
7.289  
7.278  
7.263  
7.252  
7.238  
7.226  
7.222  
7.210  
7.187  
7.183  
7.180  
7.159

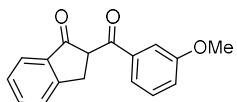
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3.460  
3.442  
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3.203  
3.187  
3.170  
3.085  
3.066  
3.053  
2.977  
2.958  
2.944  
2.926

1.653  
1.492  
1.475  
1.458

-0.000



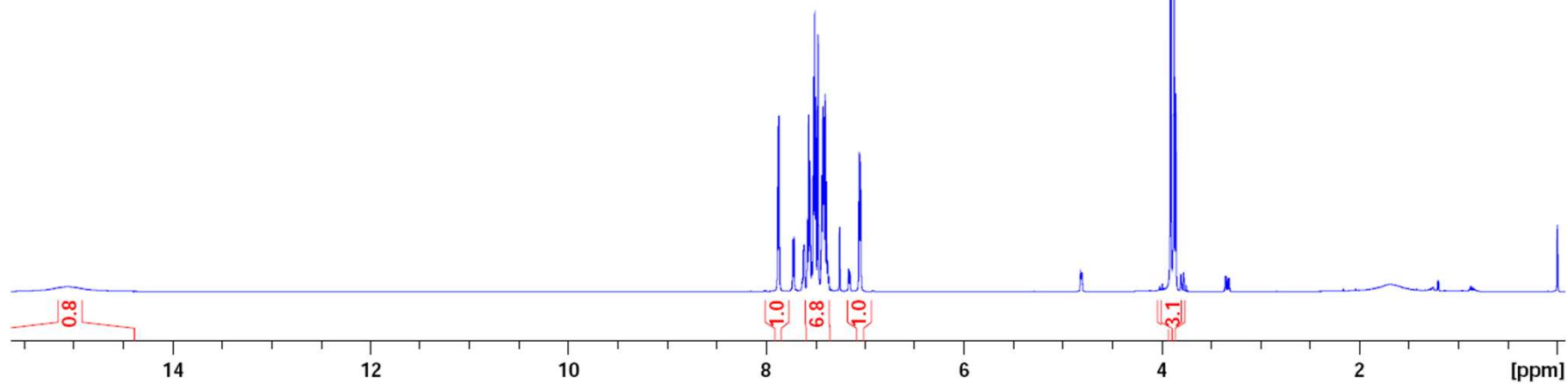
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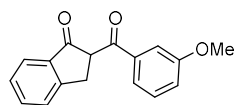


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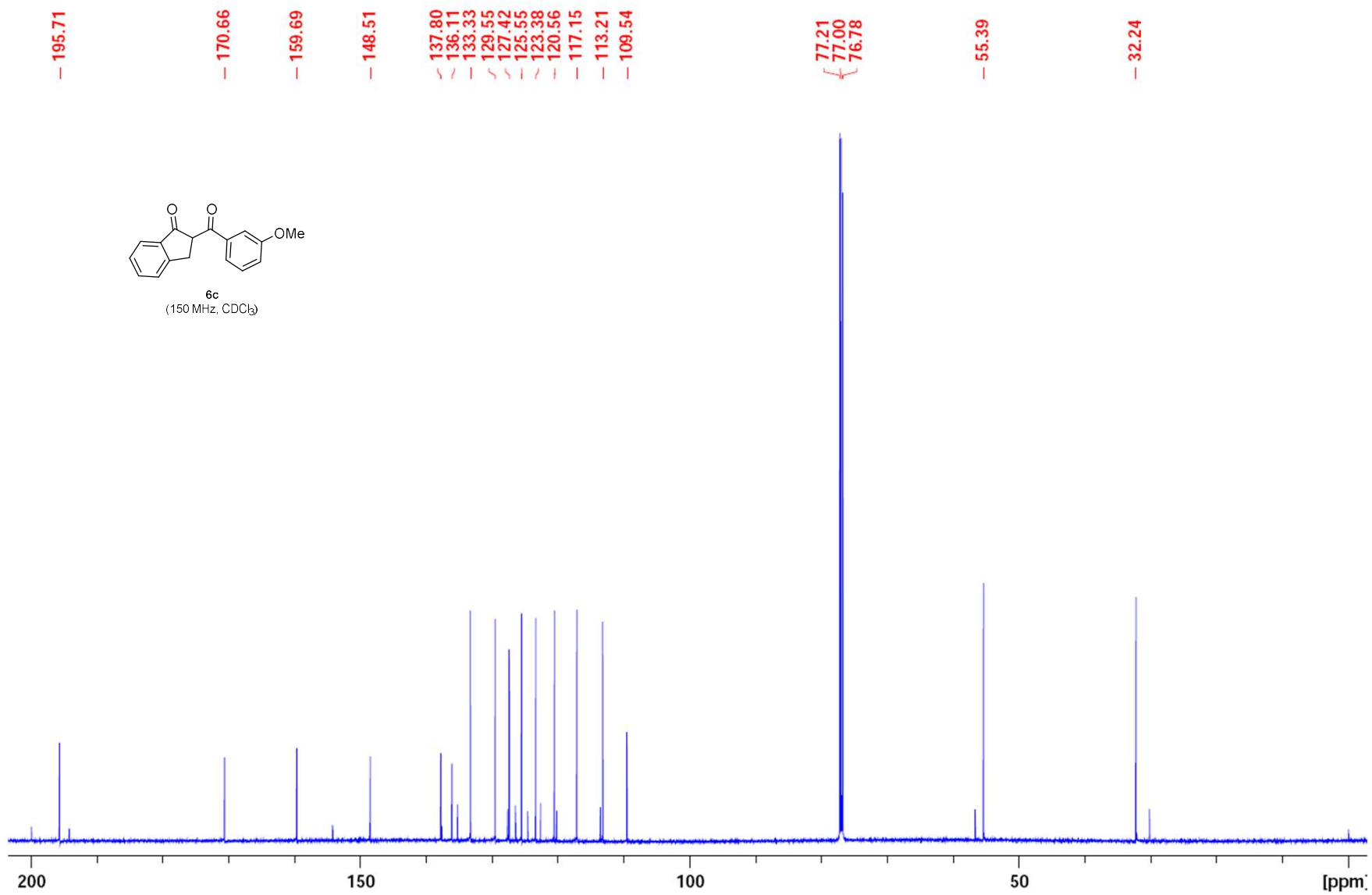
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7.559  
7.523  
7.510  
7.498  
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7.427  
7.417  
7.404  
7.391  
7.059  
7.046

3.910  
3.877

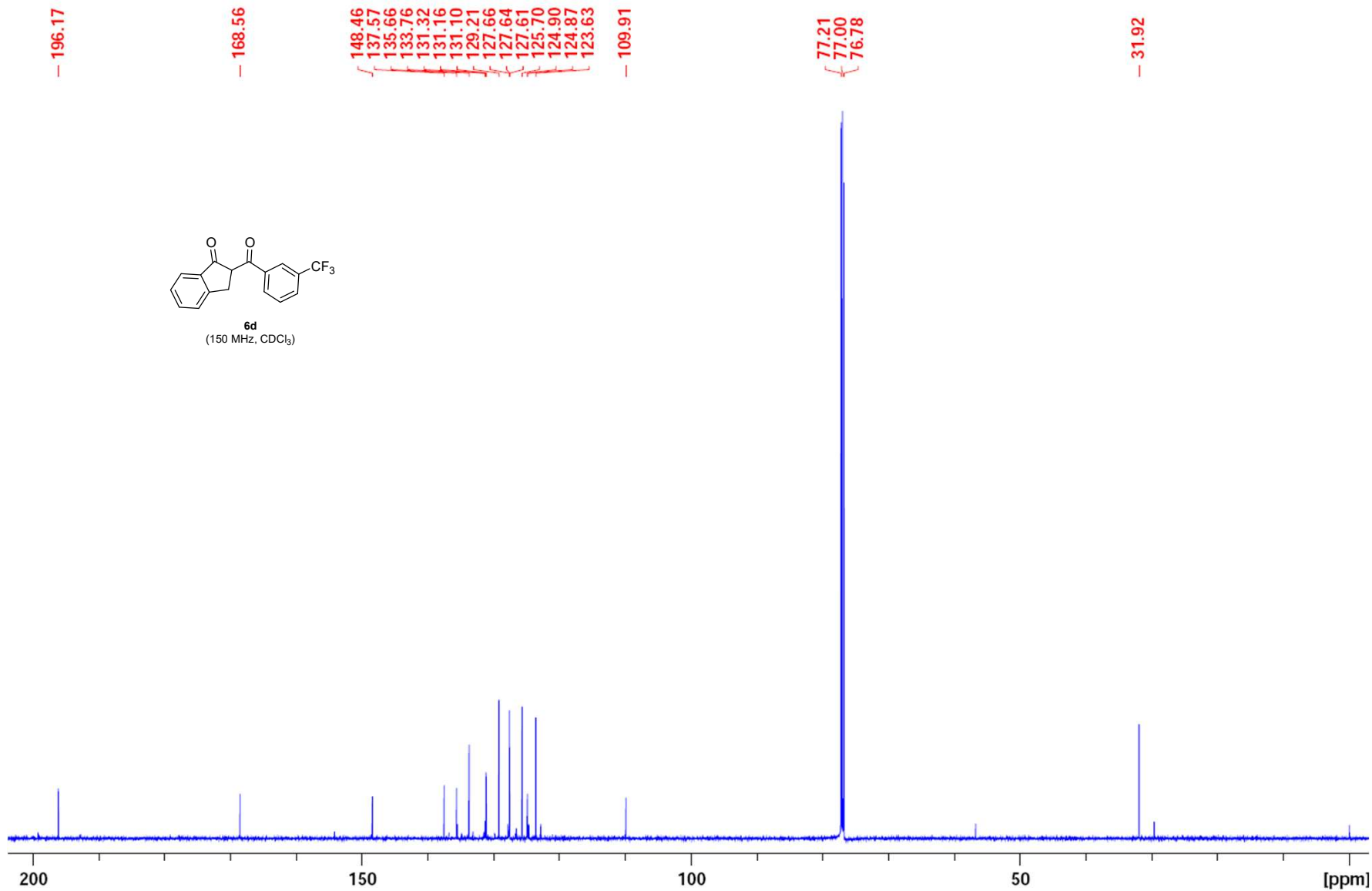




6c  
(150 MHz, CDCl<sub>3</sub>)





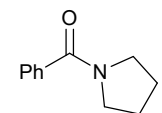


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7.271

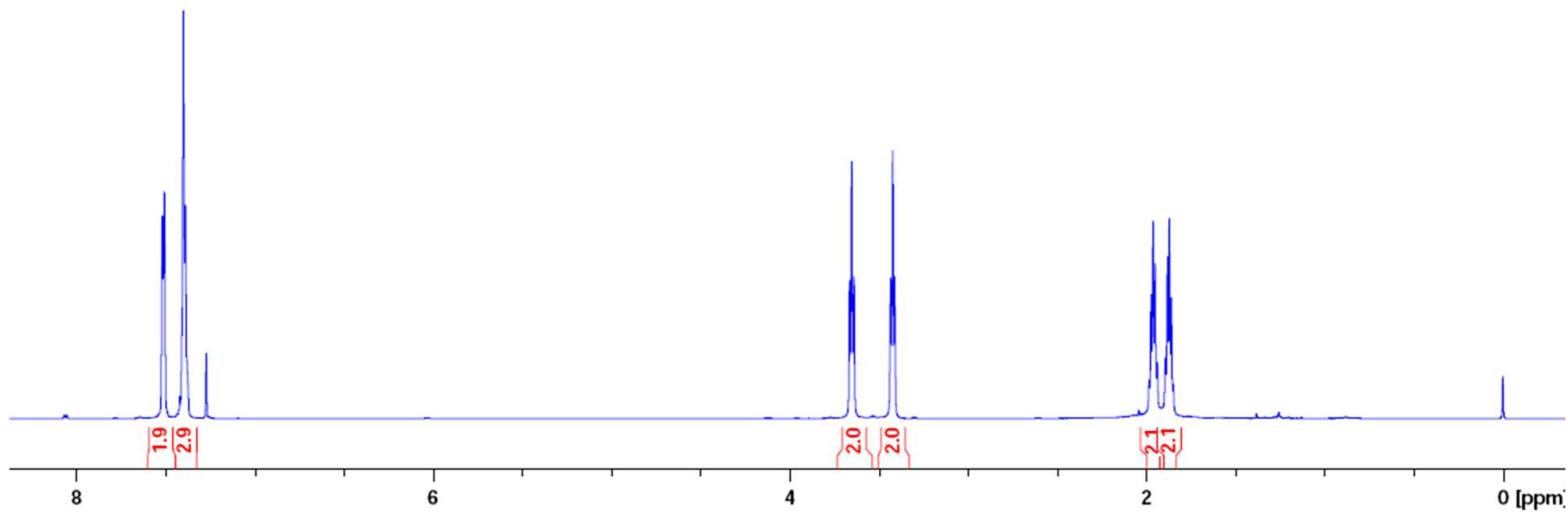
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3.422  
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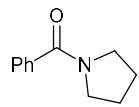
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-0.000

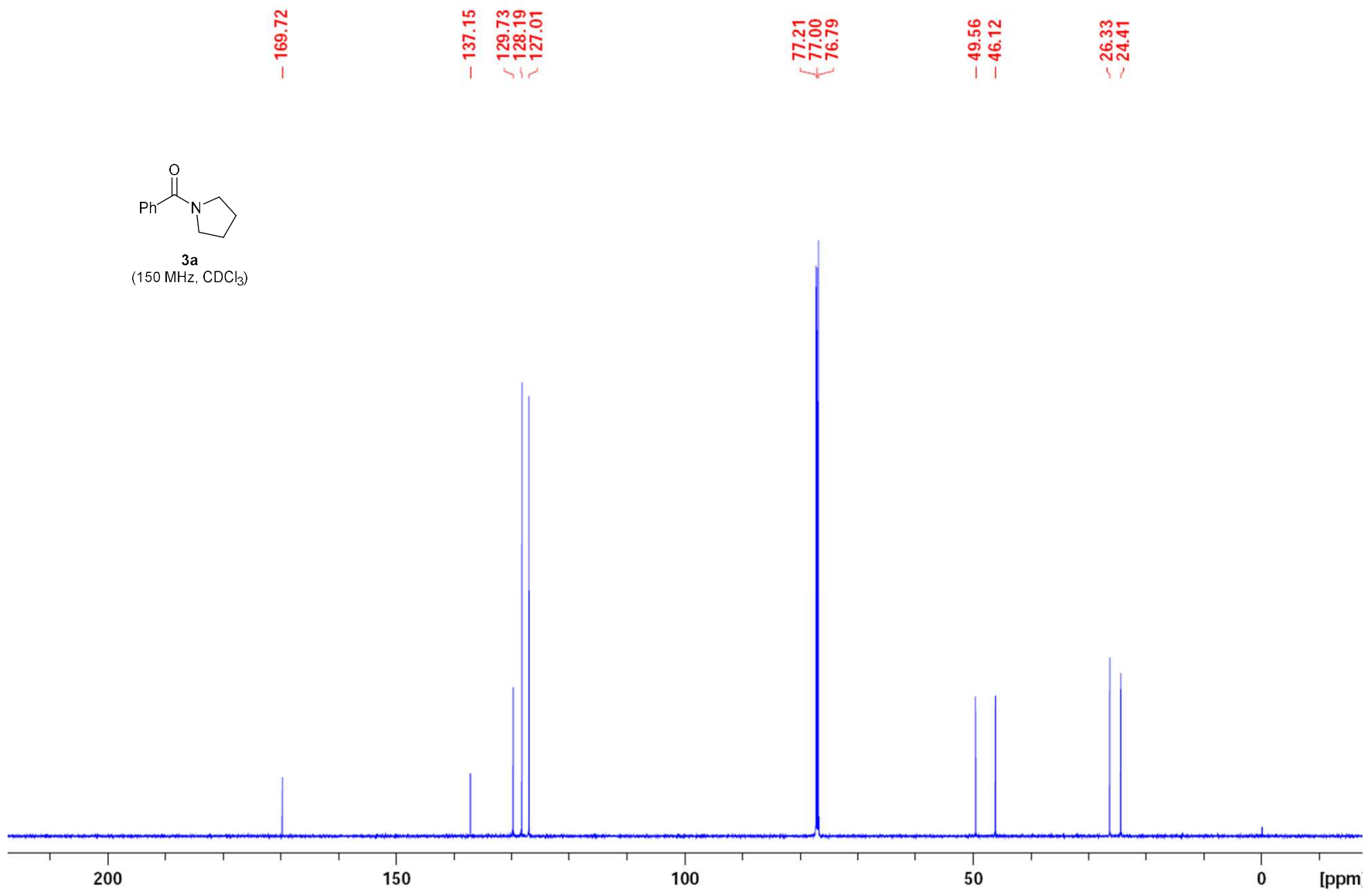


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**3a**  
(150 MHz, CDCl<sub>3</sub>)

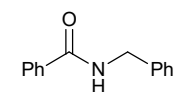


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7.486  
7.473  
7.421  
7.408  
7.396  
7.344  
7.337  
7.299  
7.292  
7.285  
7.278  
7.252

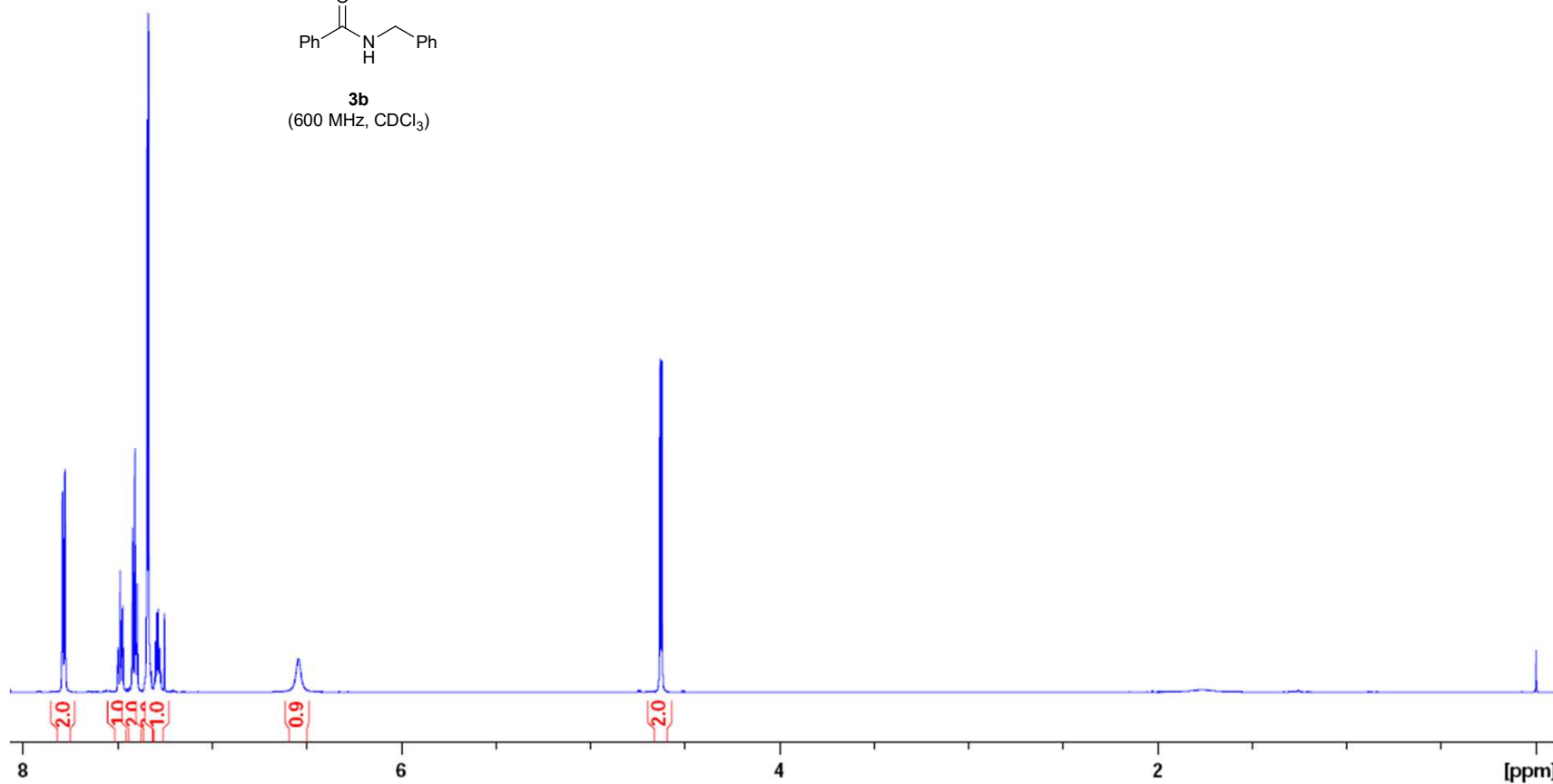
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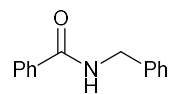
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4.623

-0.000

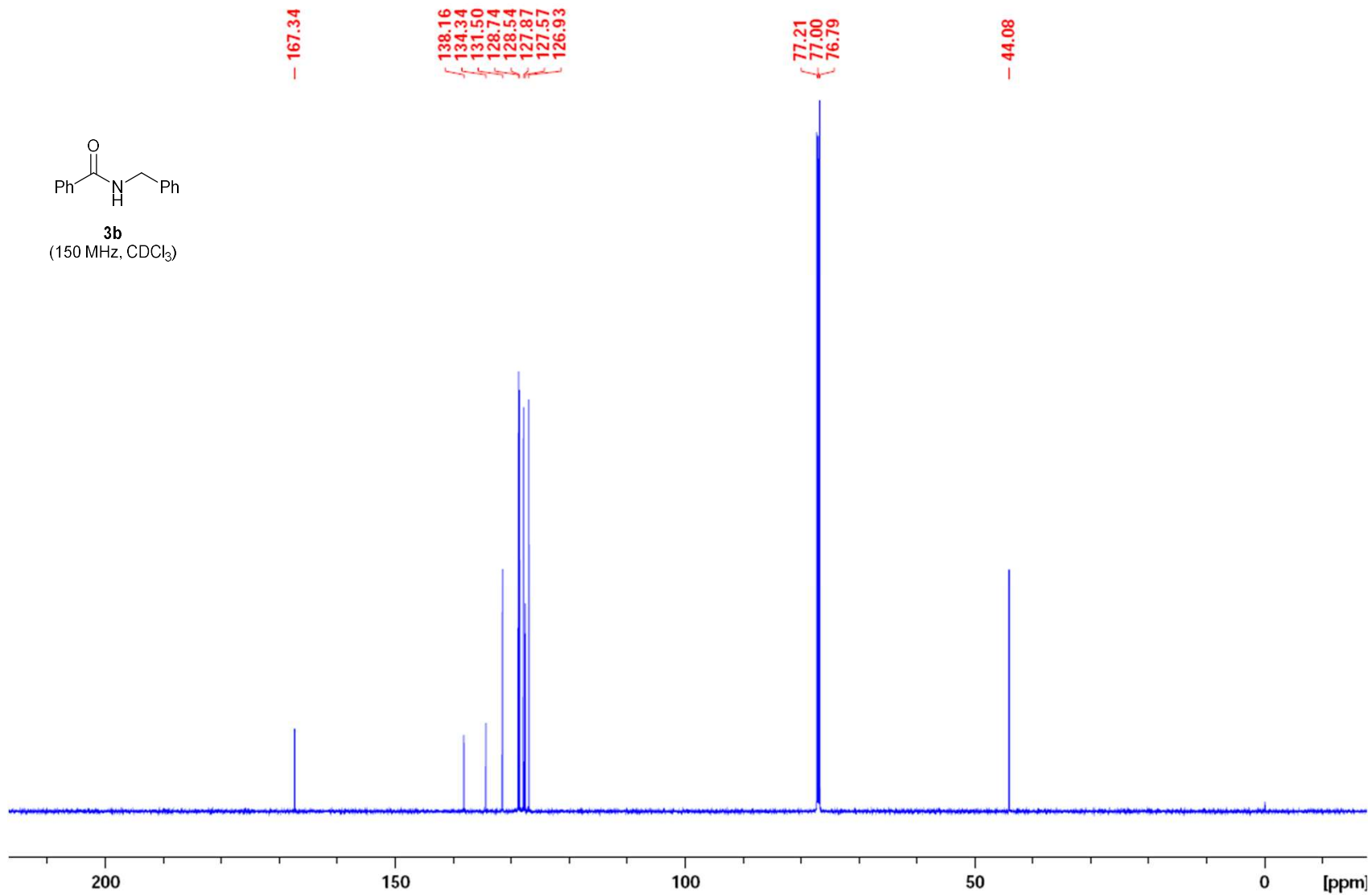


**3b**  
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**3b**  
(150 MHz, CDCl<sub>3</sub>)



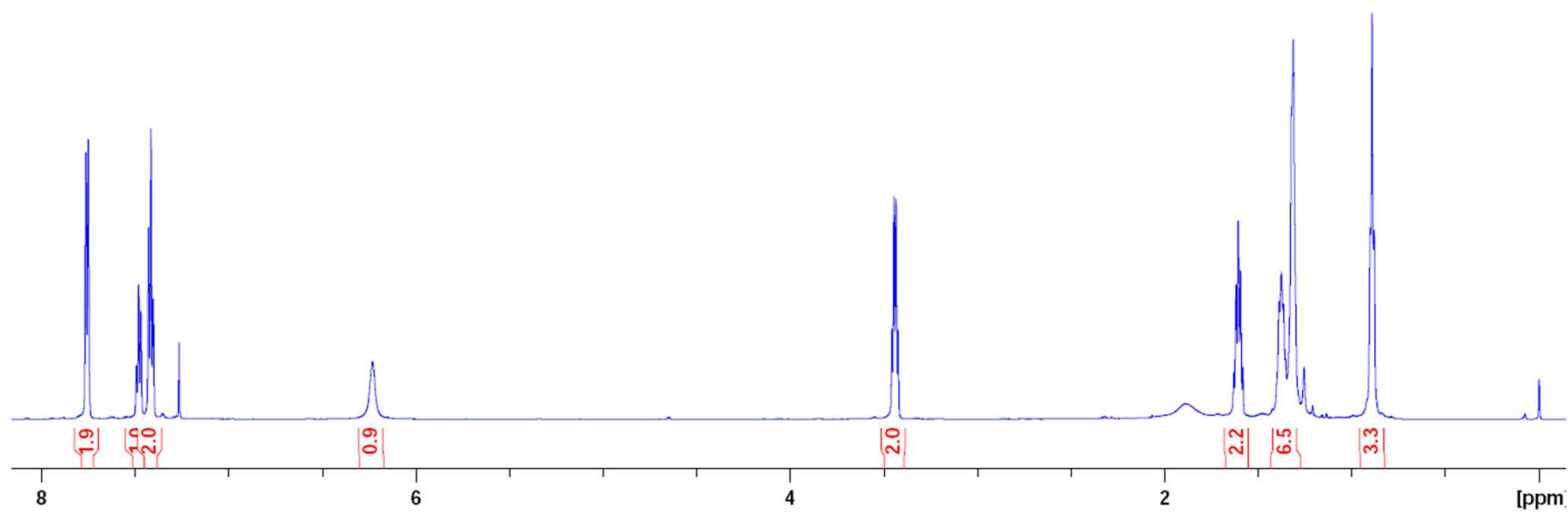
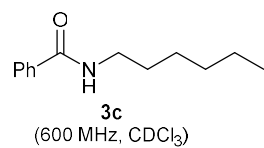
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7.429  
7.417  
7.404  
7.267

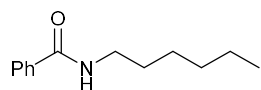
6.233

3.458  
3.447  
3.435  
3.425

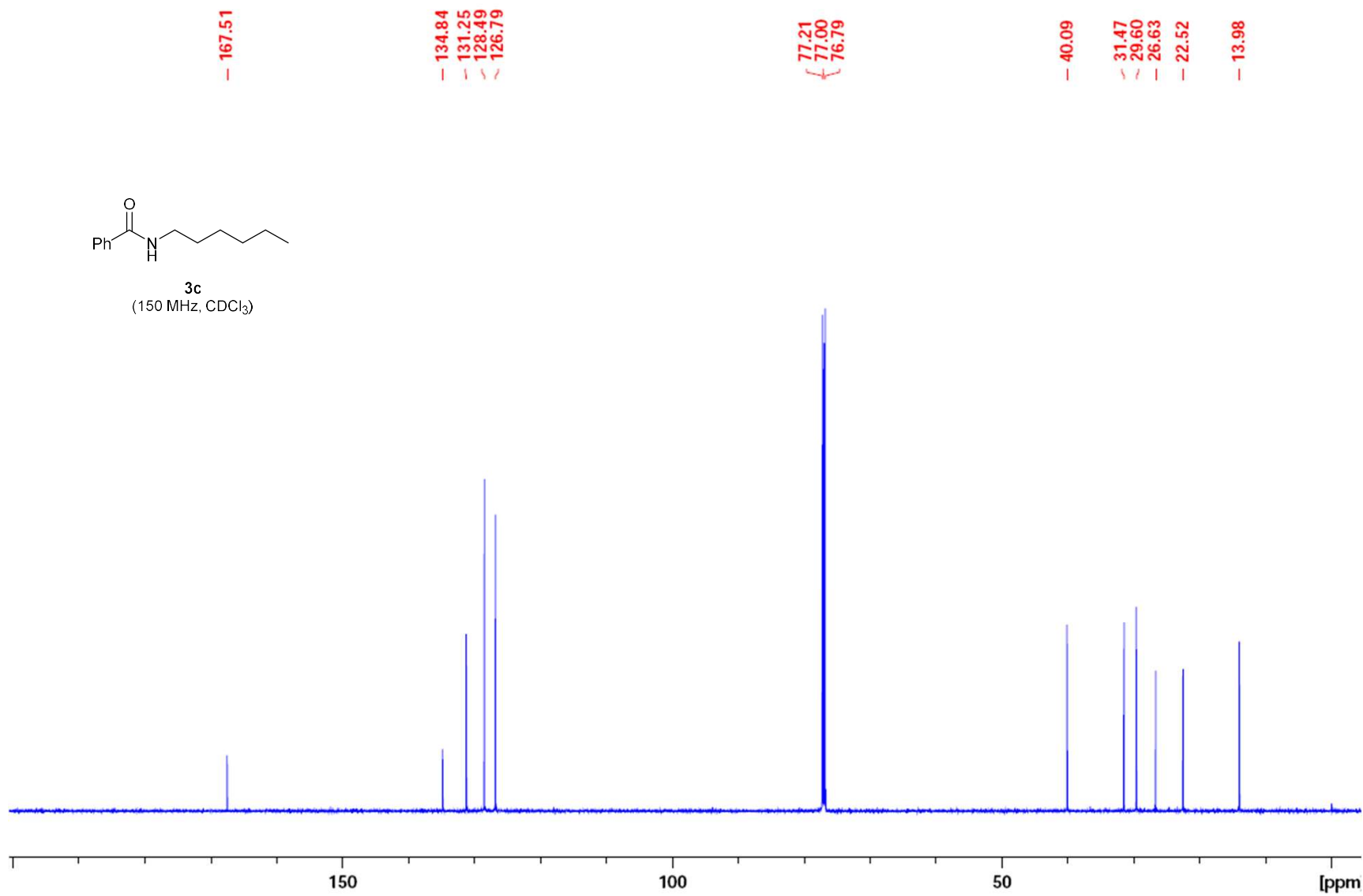
1.619  
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1.595  
1.389  
1.377  
1.365  
1.322  
1.313  
0.902  
0.892  
0.881

-0.000





**3c**  
(150 MHz, CDCl<sub>3</sub>)



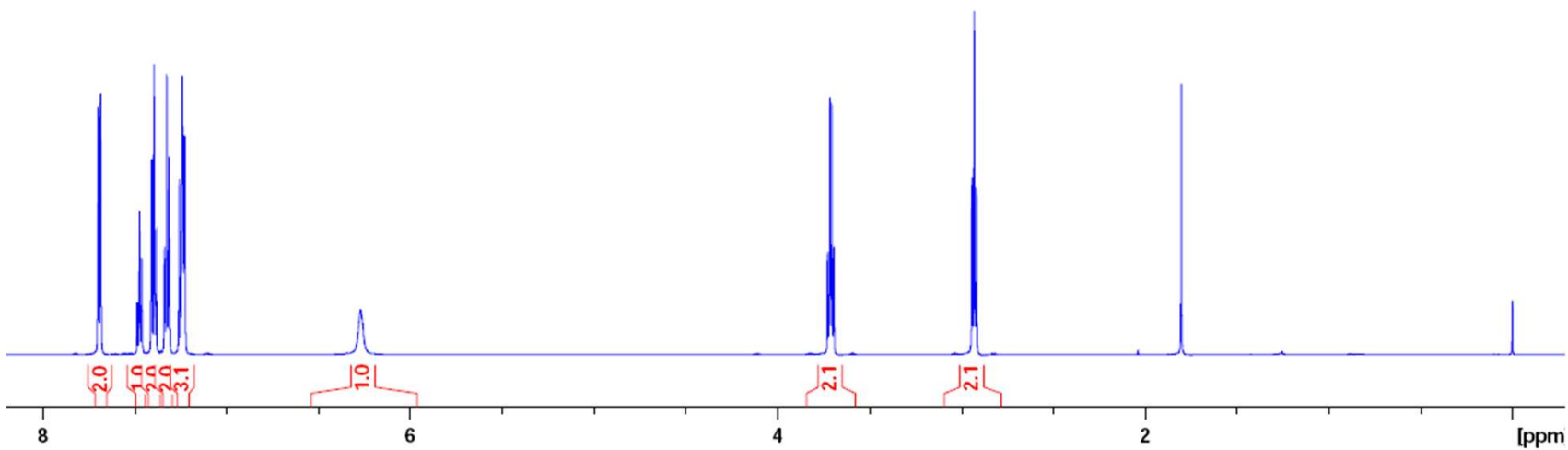
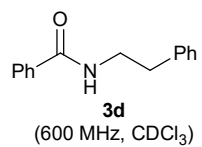
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7.472  
7.459  
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7.255  
7.243  
7.239  
7.226

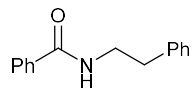
— 6.268

3.726  
3.714  
3.704  
3.693

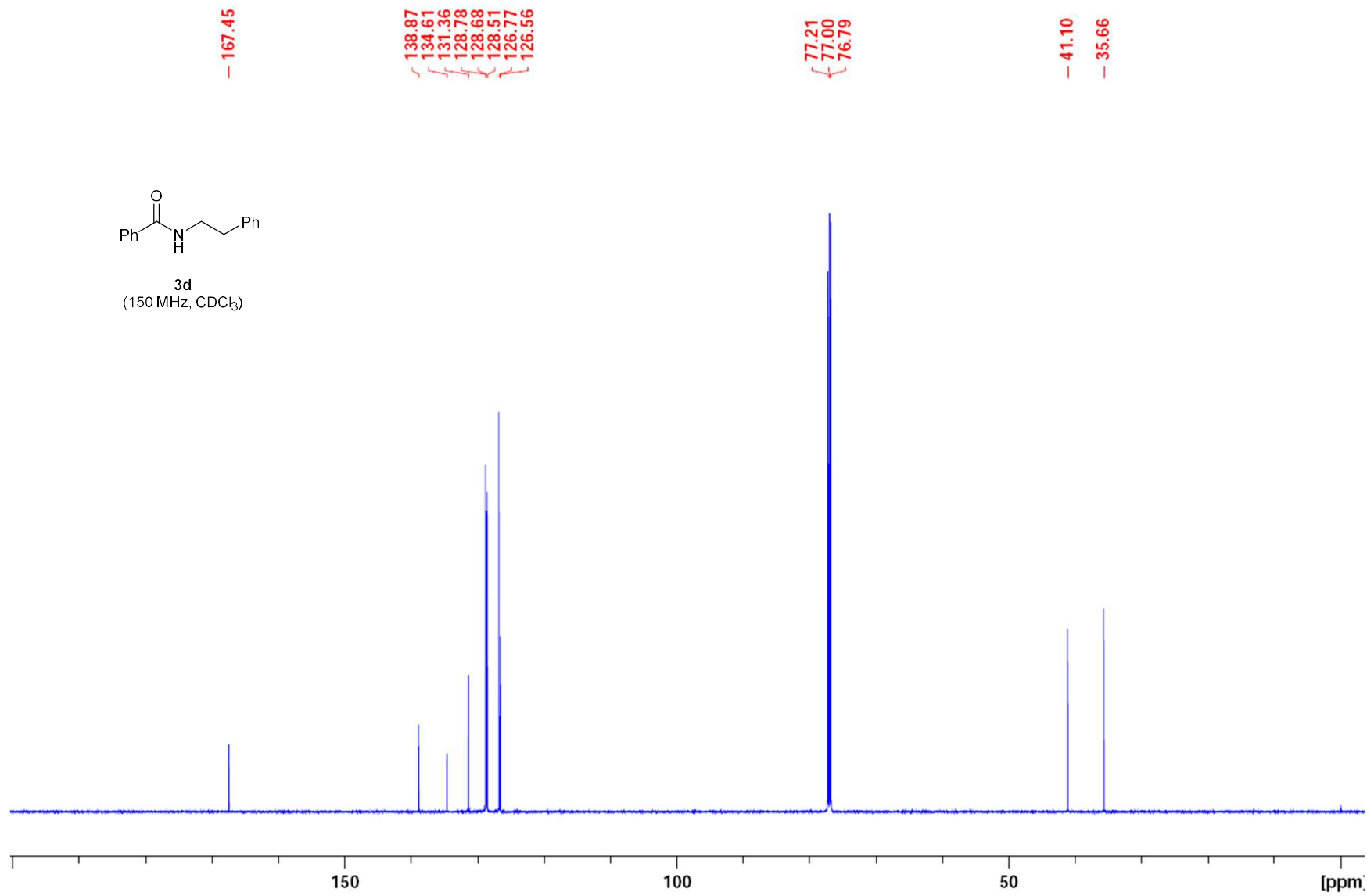
2.940  
2.929  
2.917

— 0.000





**3d**  
(150 MHz, CDCl<sub>3</sub>)

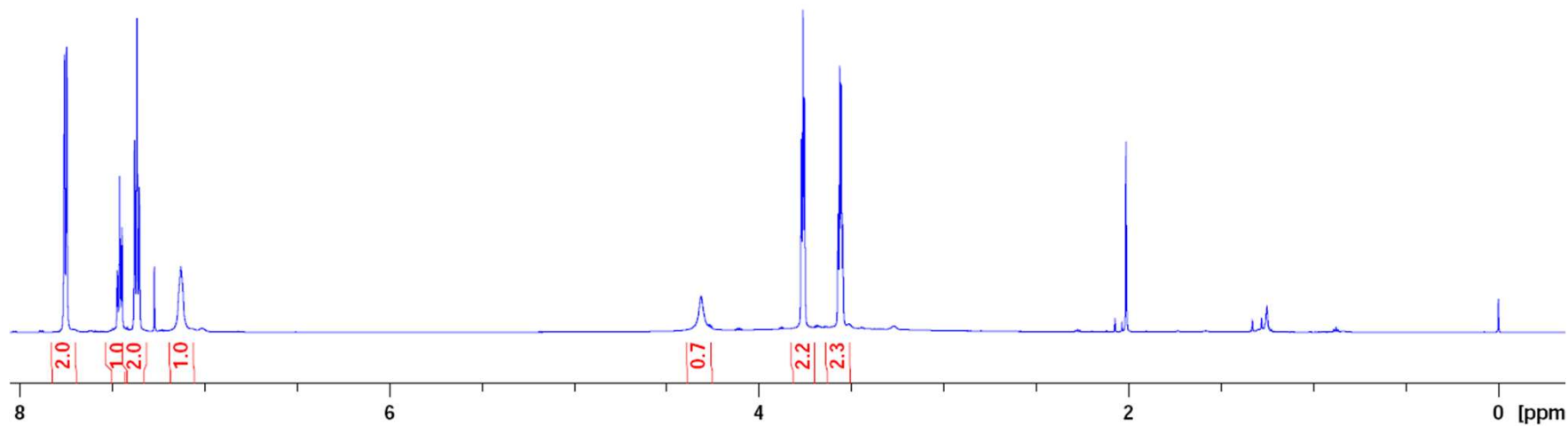
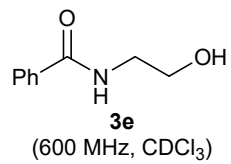


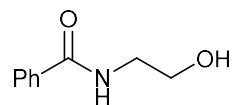
7.759  
7.747  
7.473  
7.460  
7.448  
7.379  
7.366  
7.354  
7.272  
7.129

- 4.314

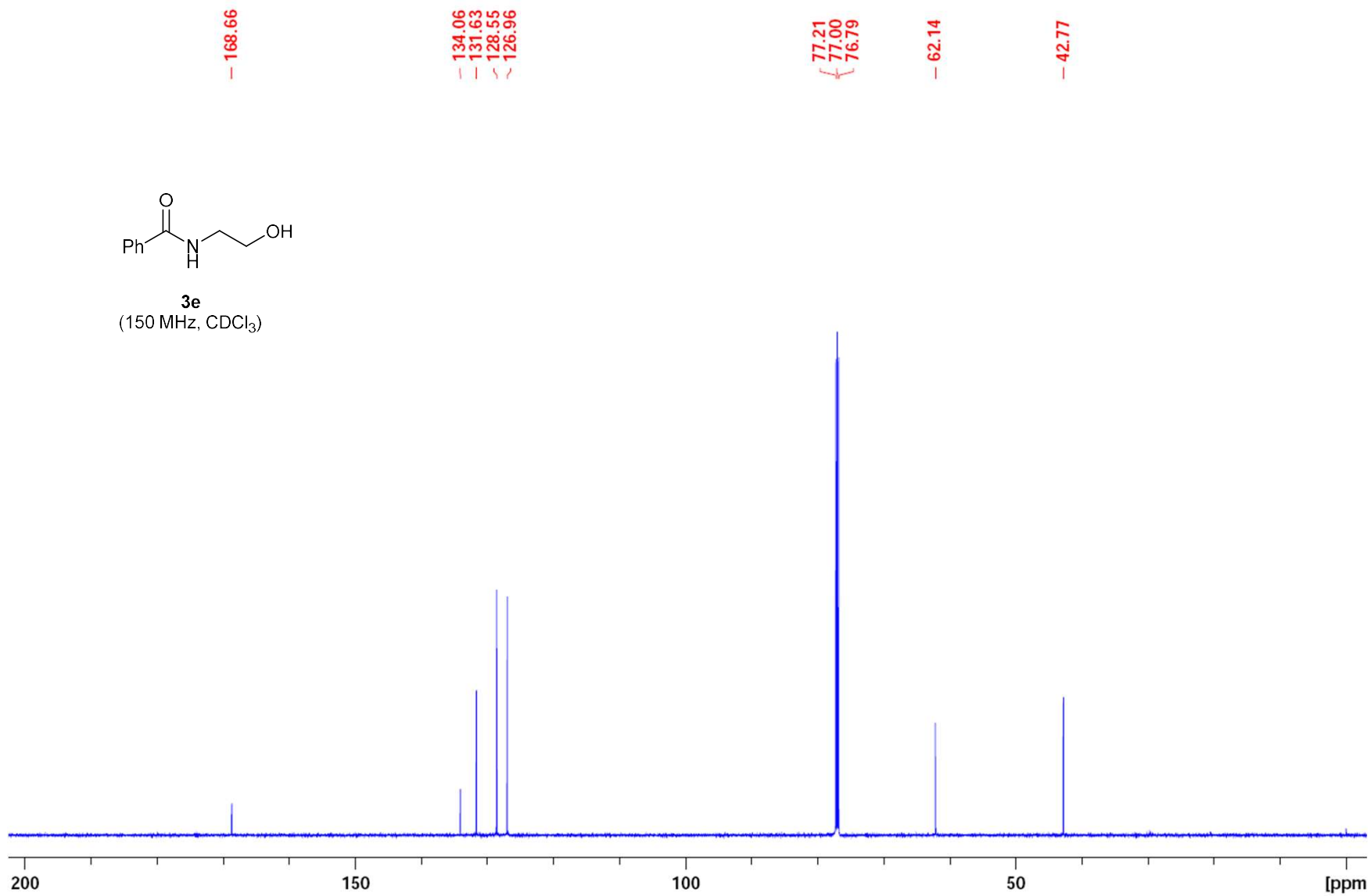
3.771  
3.763  
3.754  
3.573  
3.564  
3.555  
3.546

- -0.000





**3e**  
(150 MHz, CDCl<sub>3</sub>)



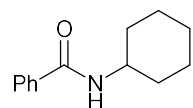
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7.743  
7.488  
7.476  
7.464  
7.425  
7.413  
7.400  
7.265

- 6.025

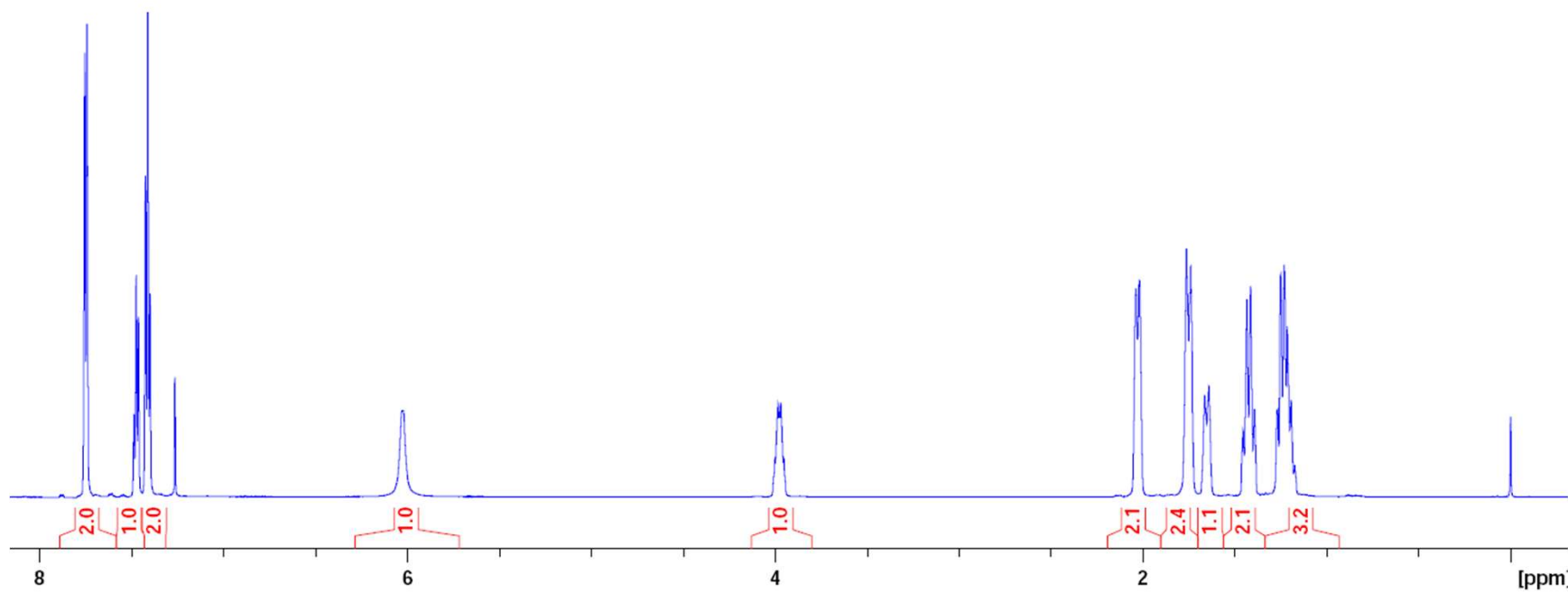
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3.977  
3.971

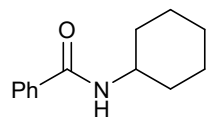
2.037  
2.020  
1.763  
1.740  
1.663  
1.642  
1.455  
1.435  
1.414  
1.393  
1.271  
1.267  
1.251  
1.232  
1.214  
1.194

- 0.000

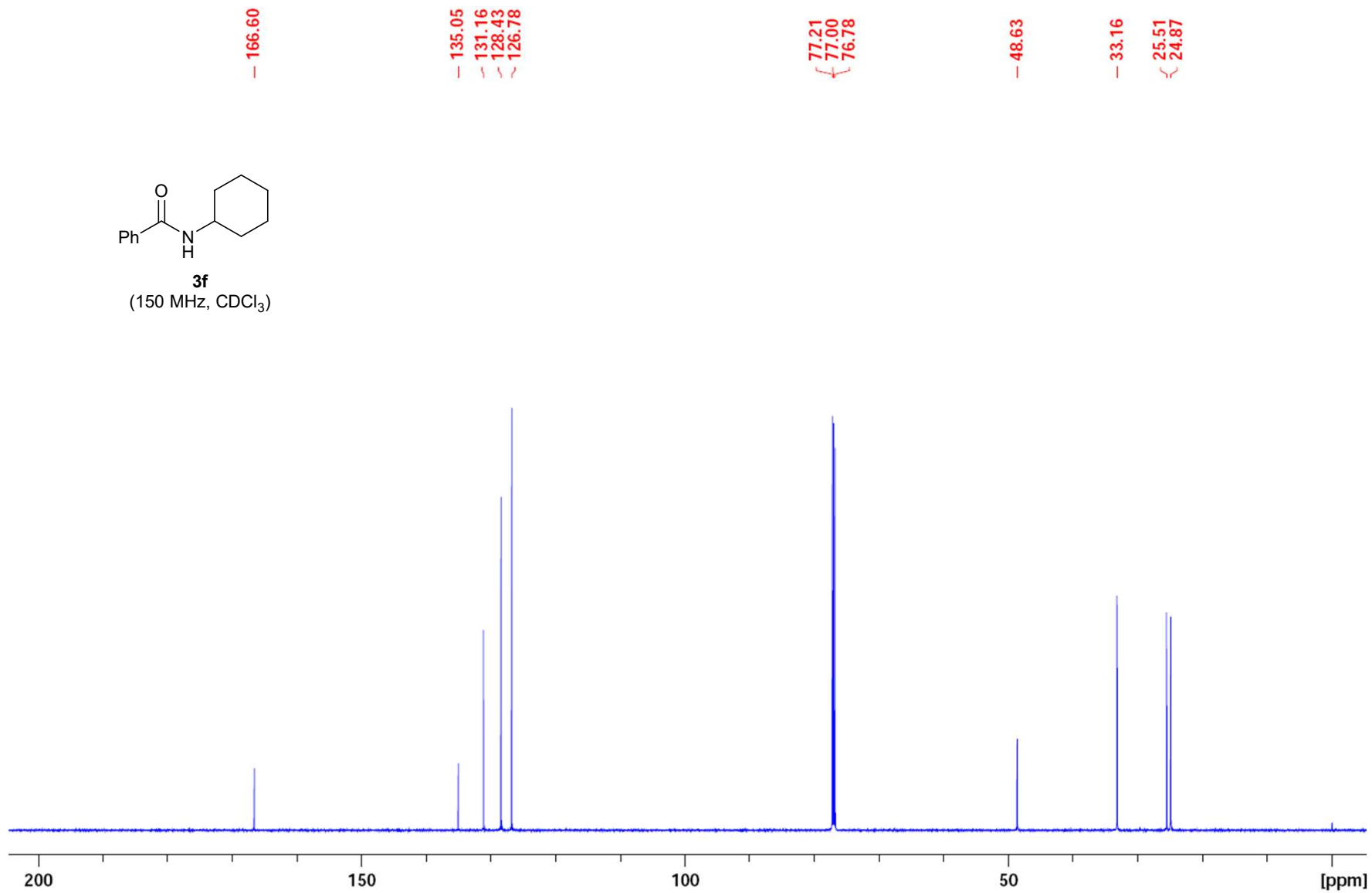


**3f**  
(600 MHz, CDCl<sub>3</sub>)



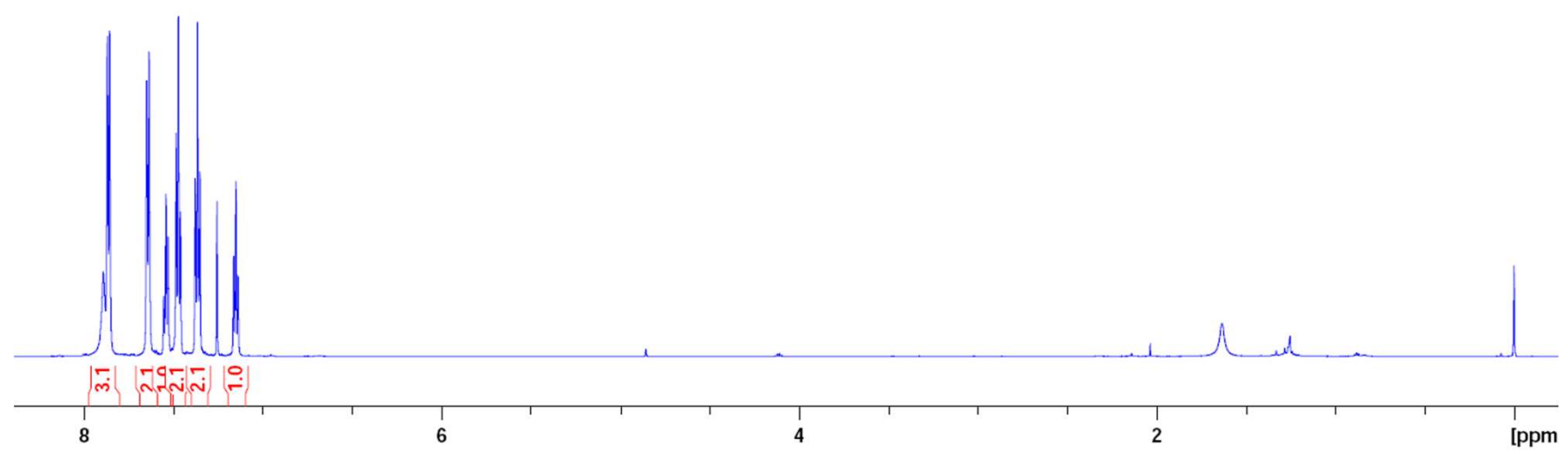
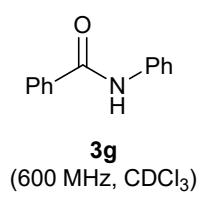


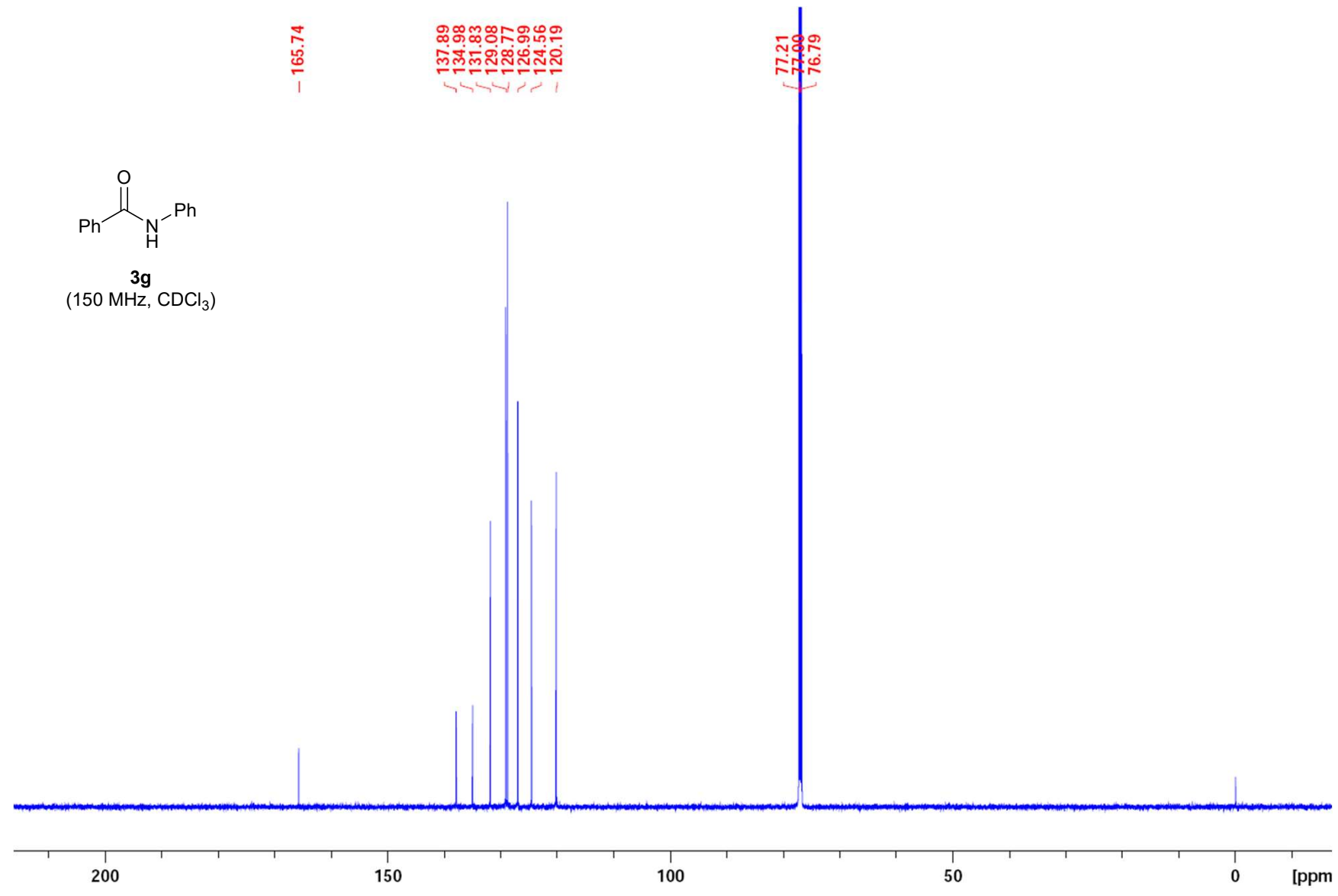
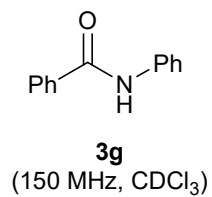
**3f**  
(150 MHz, CDCl<sub>3</sub>)



7.869  
7.856  
7.648  
7.635  
7.541  
7.529  
7.485  
7.472  
7.460  
7.377  
7.364  
7.351  
7.255  
7.163  
7.150

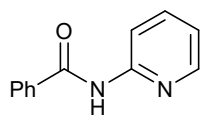
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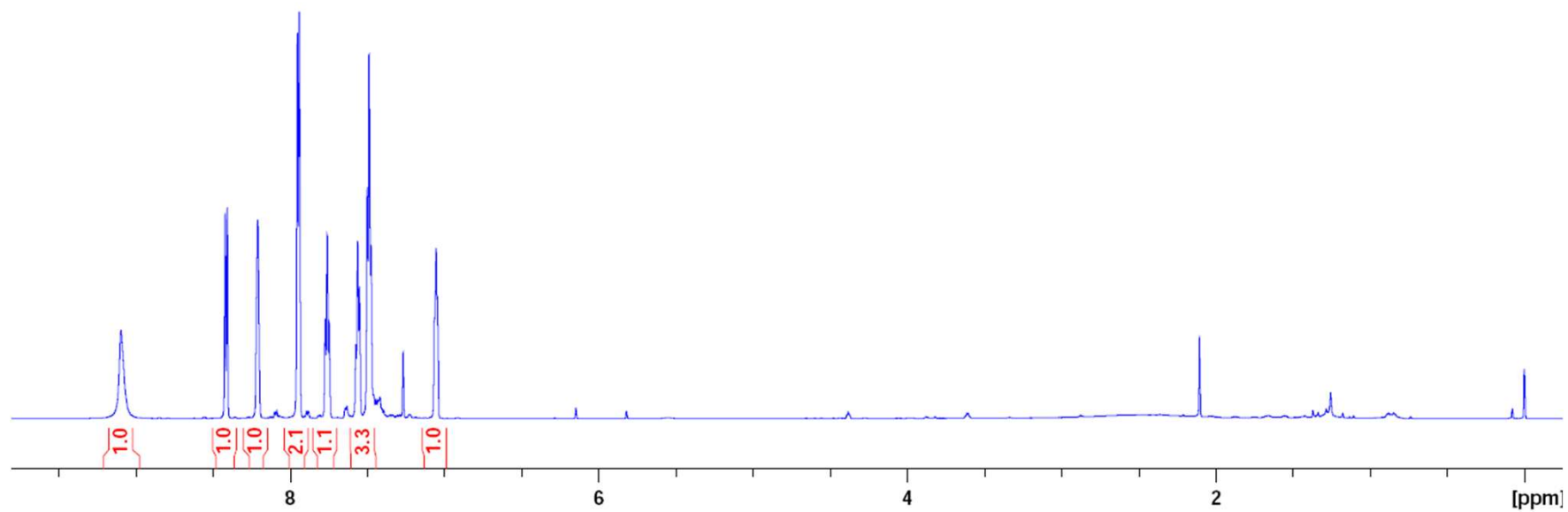


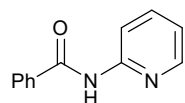
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8.420  
8.406  
8.208  
7.951  
7.939  
7.771  
7.758  
7.746  
7.573  
7.561  
7.549  
7.499  
7.487  
7.475  
7.266  
7.064  
7.053  
7.046

-0.000



**3h**  
(600 MHz, CDCl<sub>3</sub>)





**3h**  
(150 MHz, CDCl<sub>3</sub>)

— 165.85

— 151.62

— 147.79

— 138.46

— 134.28

— 132.17

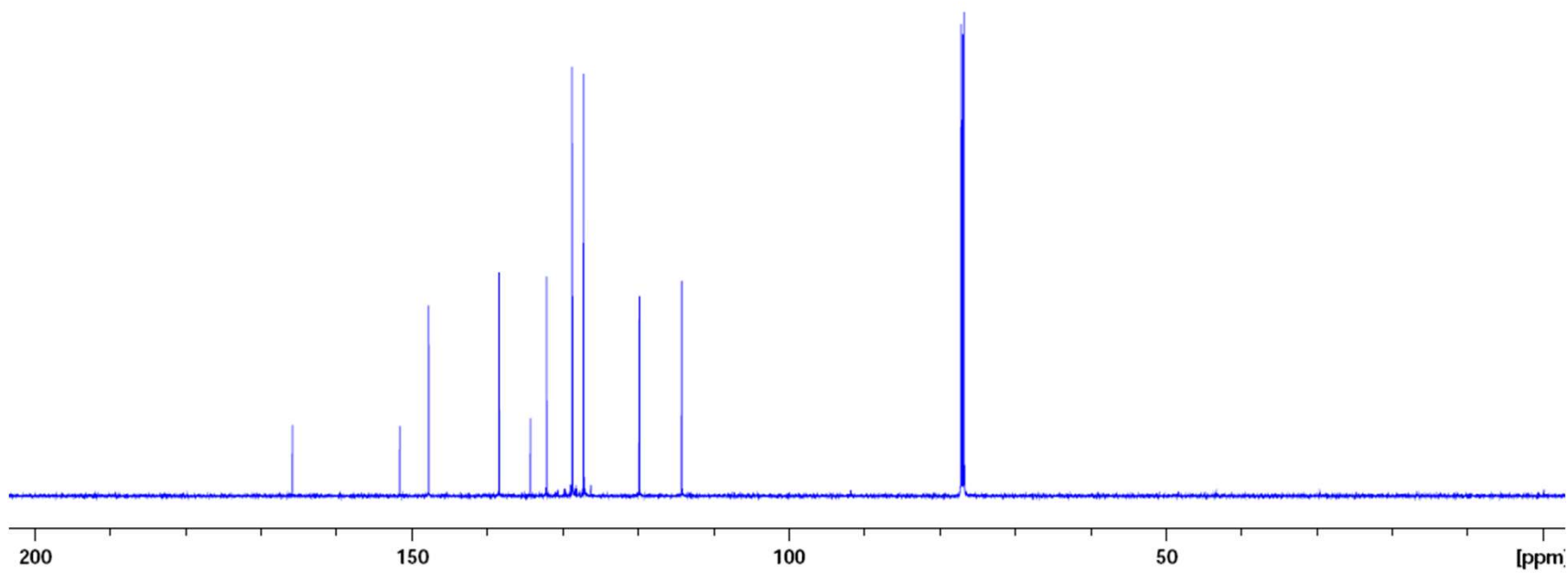
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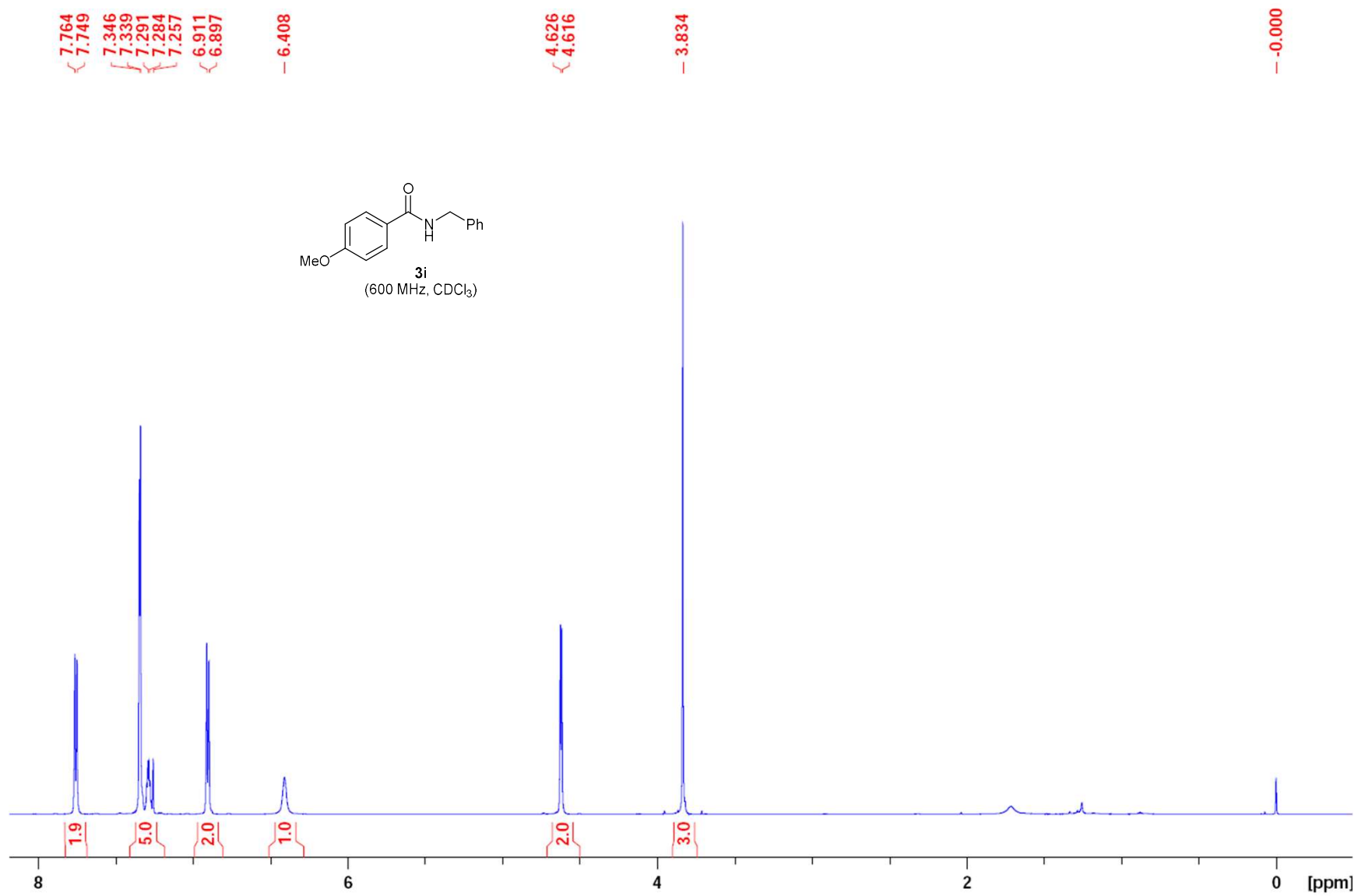
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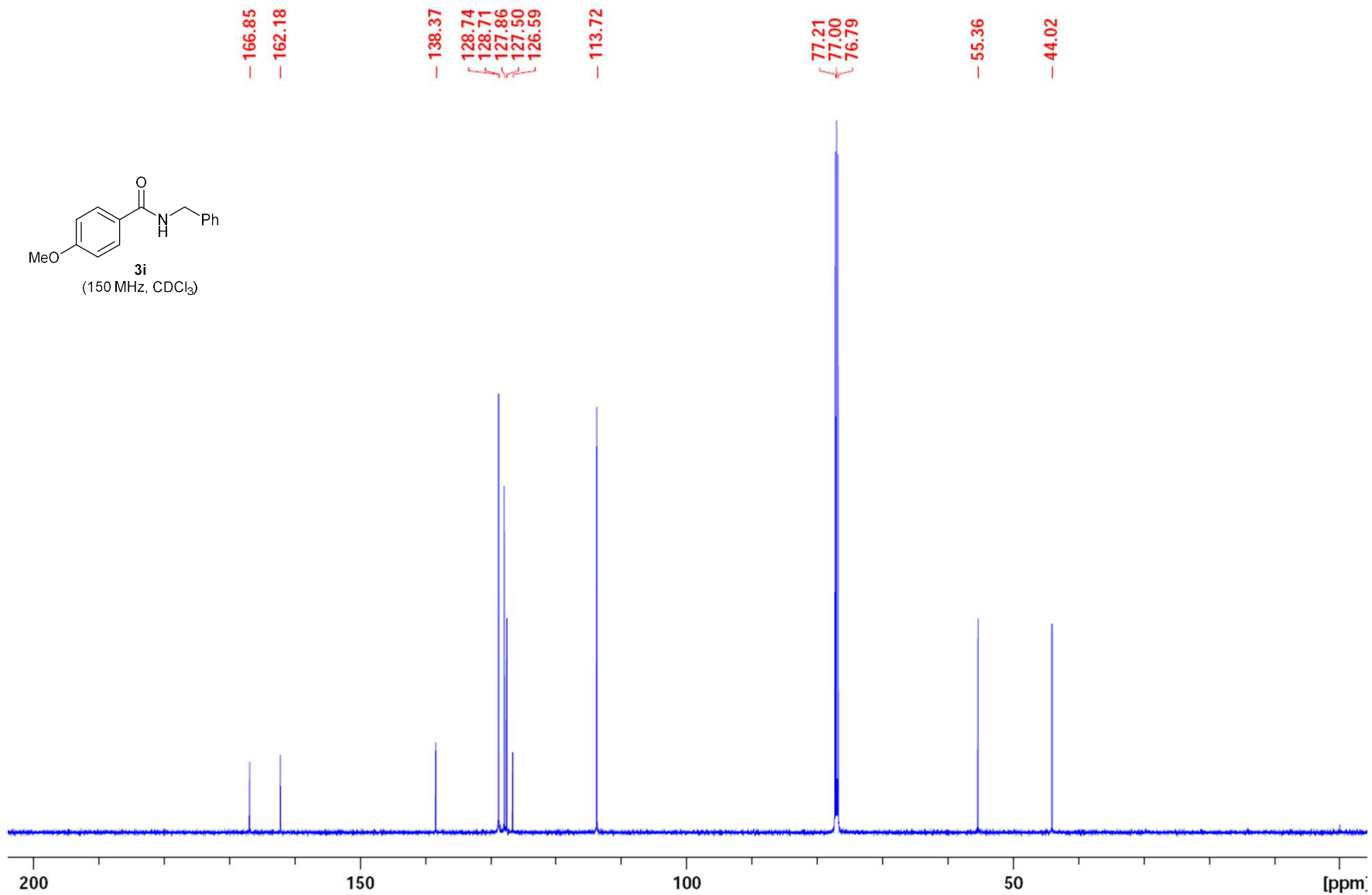
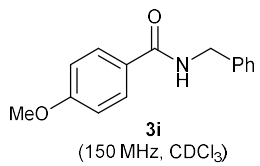
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— 114.24

{ 77.21  
77.00  
76.79 }







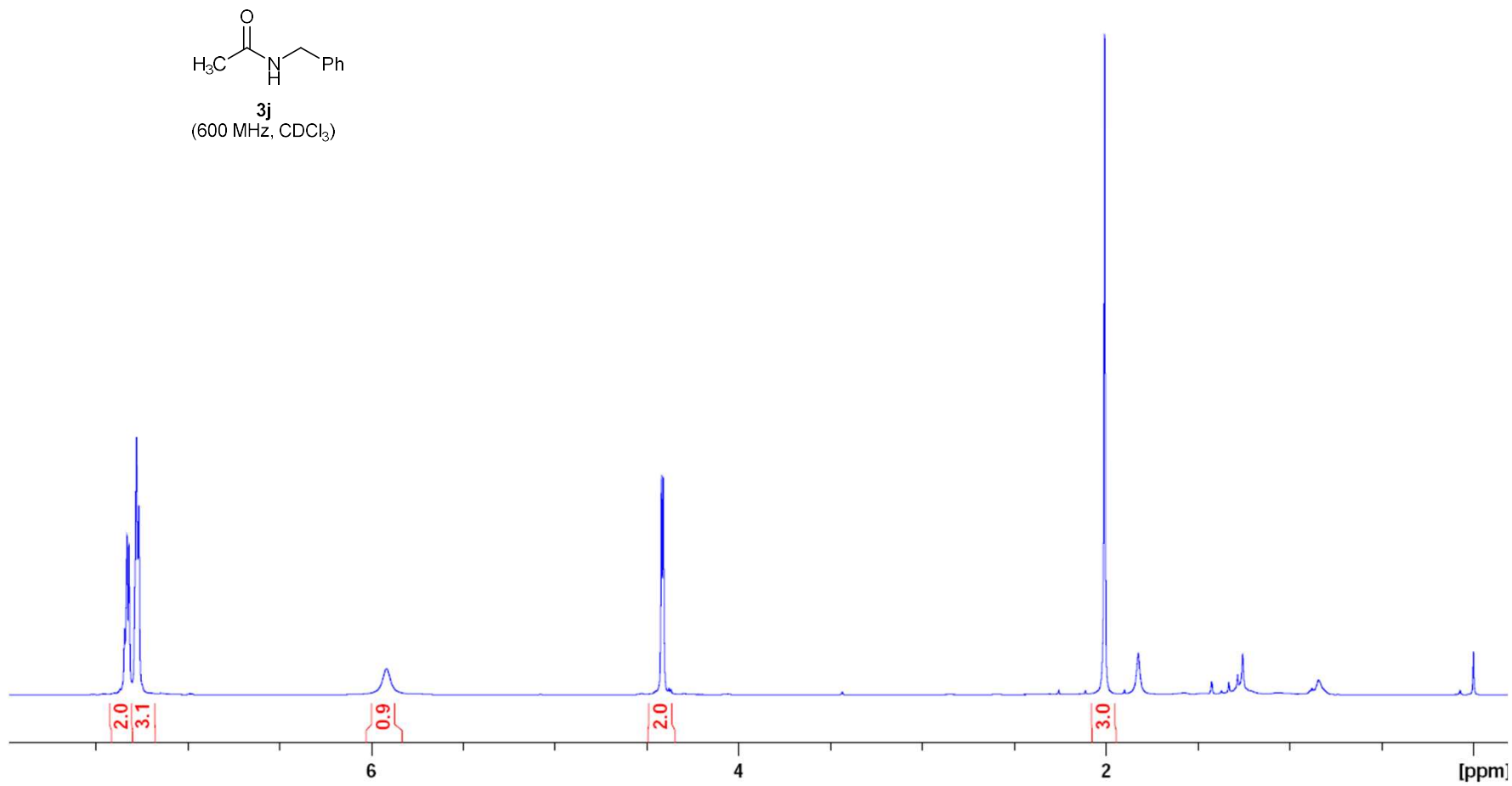
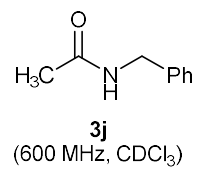
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7.318  
7.278  
7.265

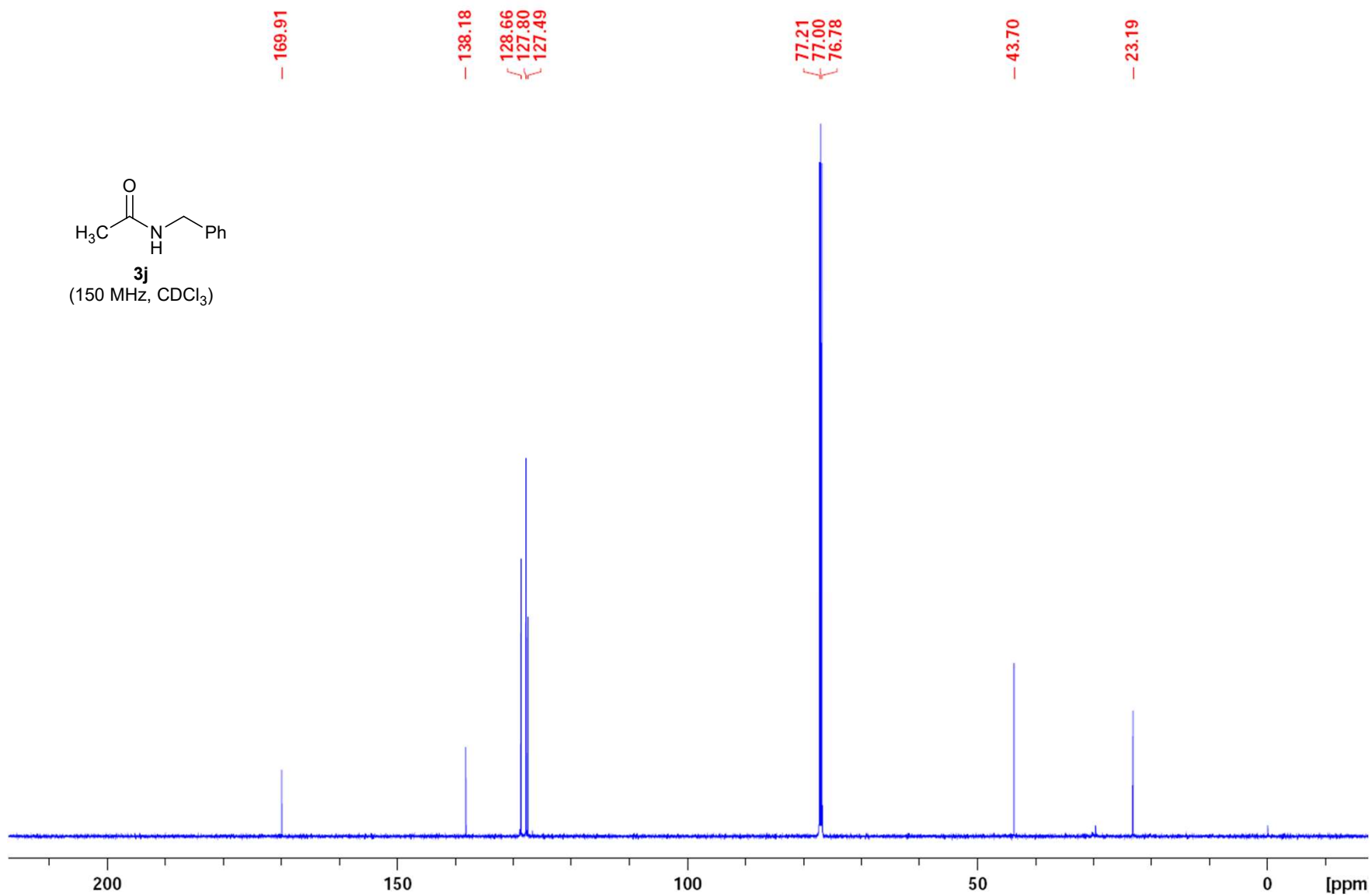
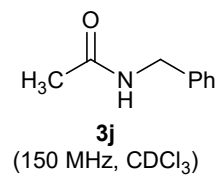
- 5.916

4.419  
4.410

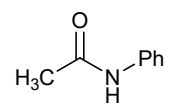
- 2.007

- -0.000





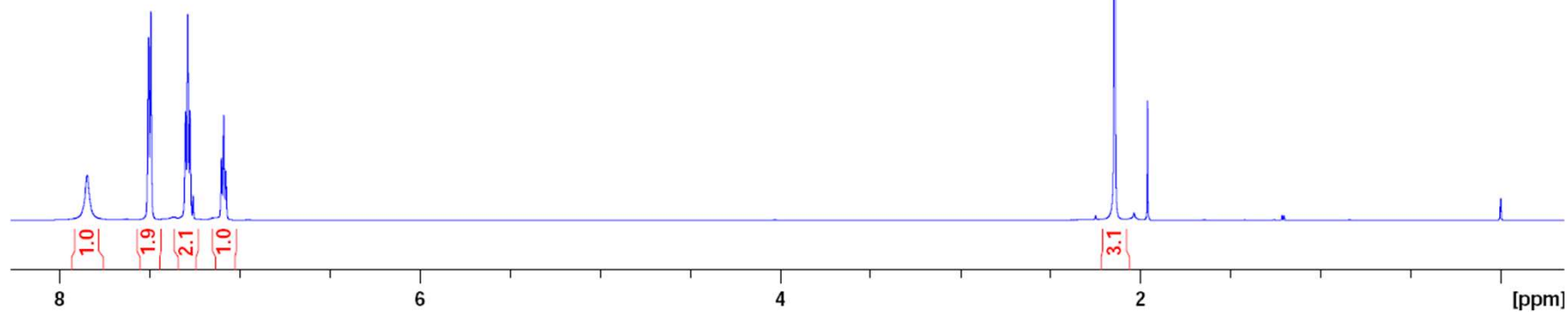
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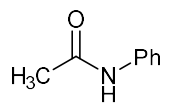


**3k**  
(600 MHz, CDCl<sub>3</sub>)

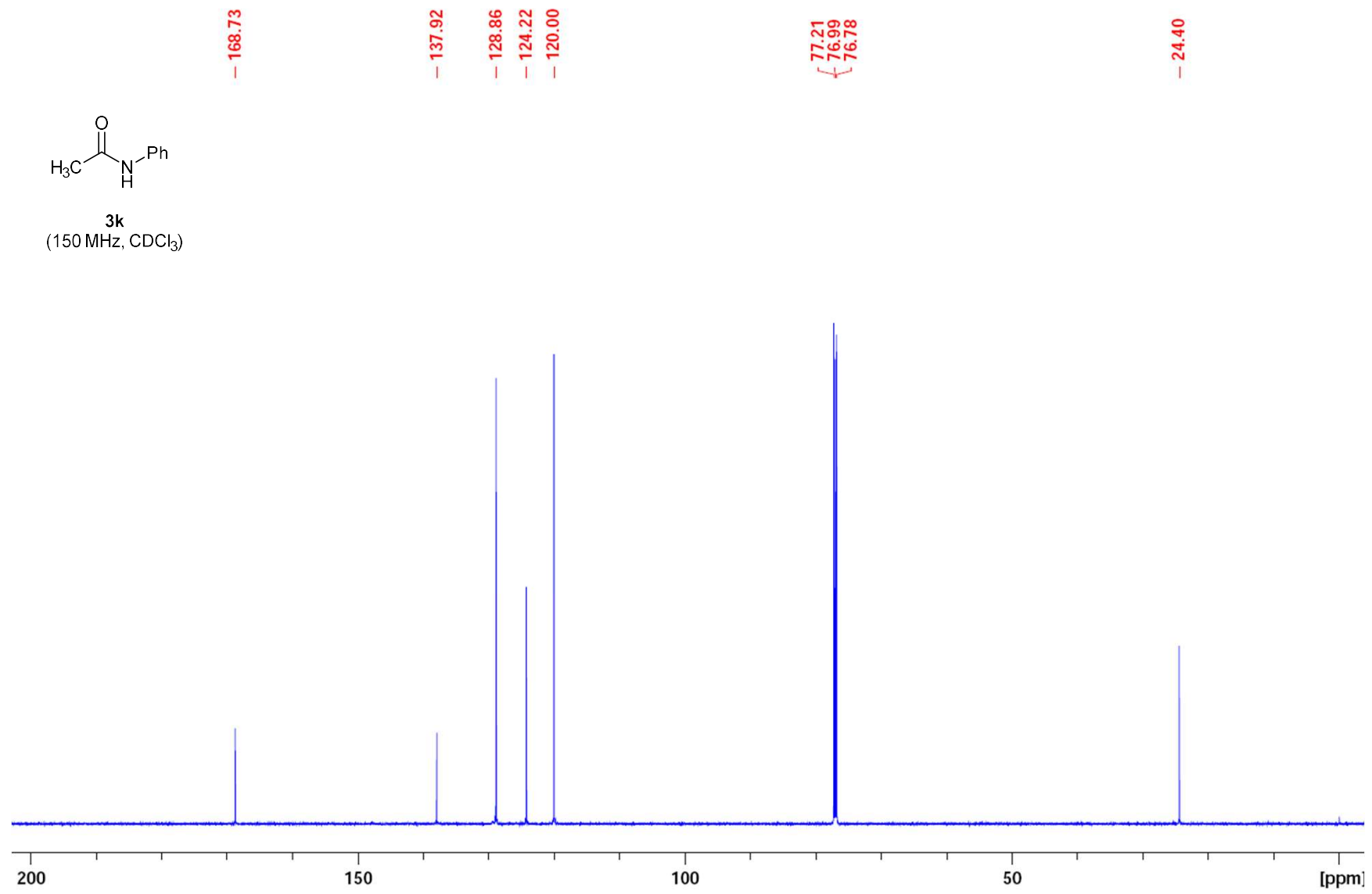
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- -0.000

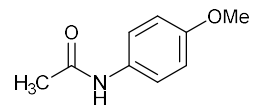




**3k**  
(150 MHz, CDCl<sub>3</sub>)



- 7.730  
{ 7.388  
7.373  
7.267  
{ 6.831  
6.817

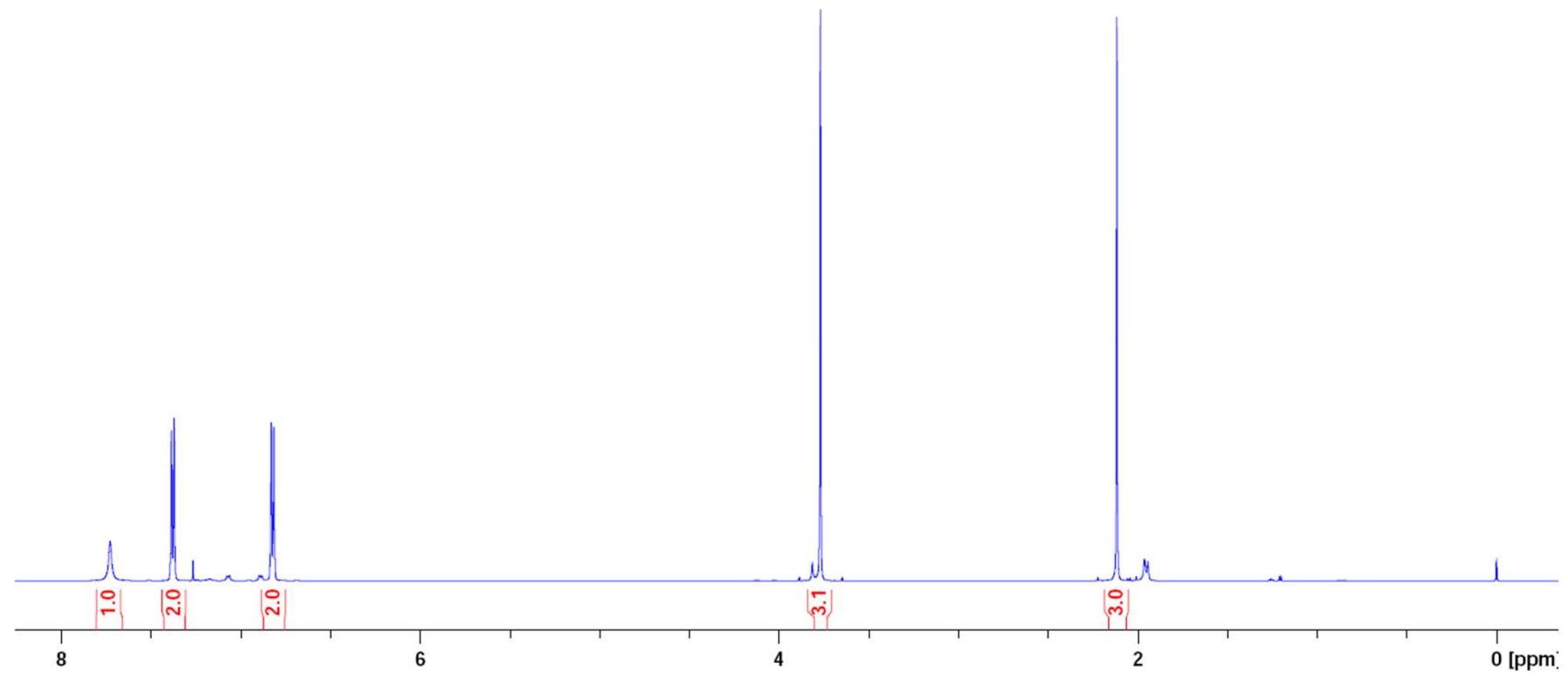


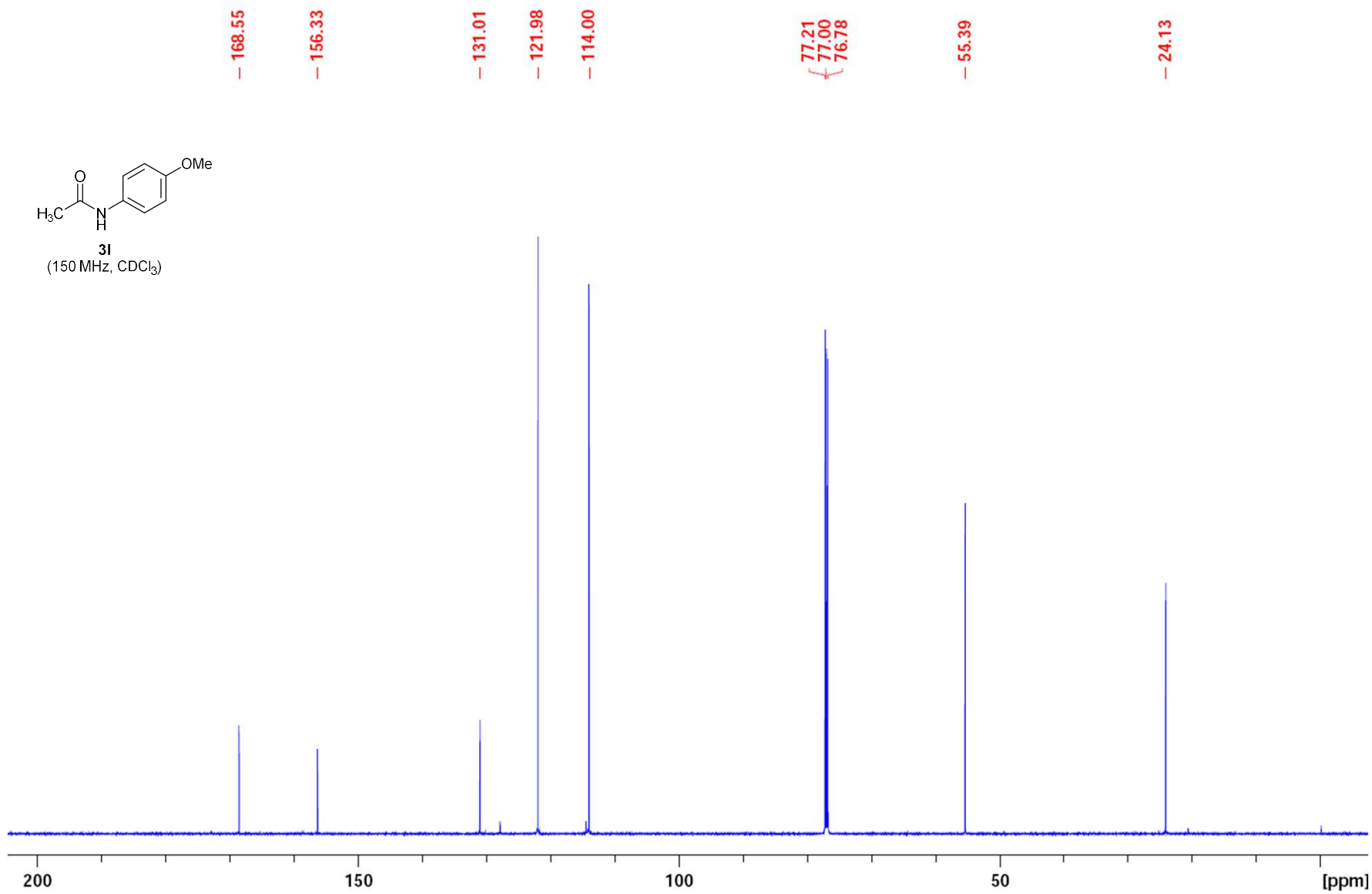
**31**  
(600 MHz, CDCl<sub>3</sub>)

- 3.770

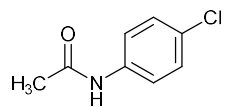
- 2.116

- -0.000





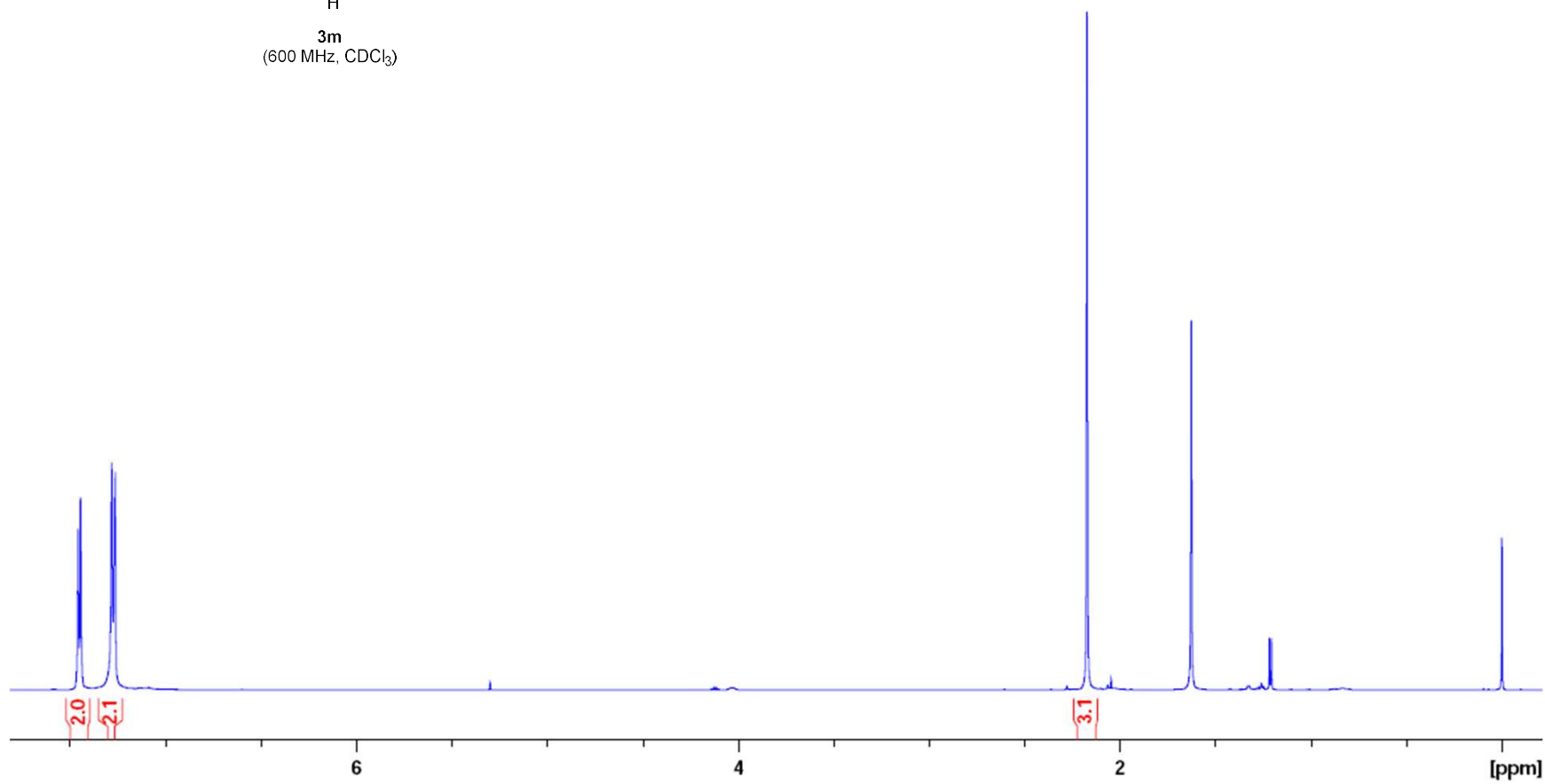
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7.444  
7.281  
7.267  
7.263

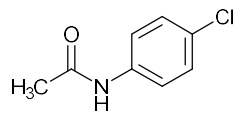


**3m**  
(600 MHz, CDCl<sub>3</sub>)

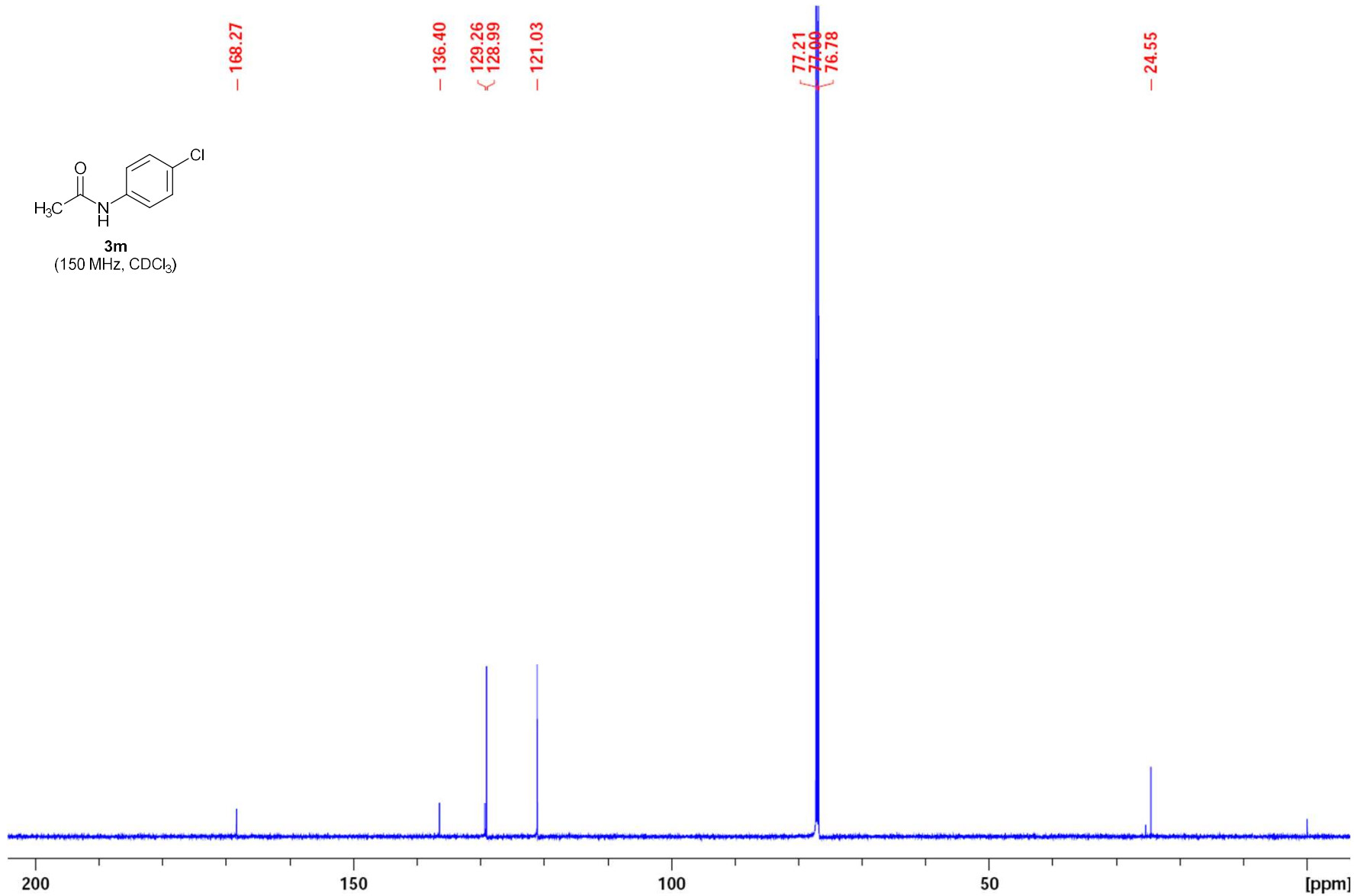
- 2.173

- -0.000





**3m**  
(150 MHz, CDCl<sub>3</sub>)



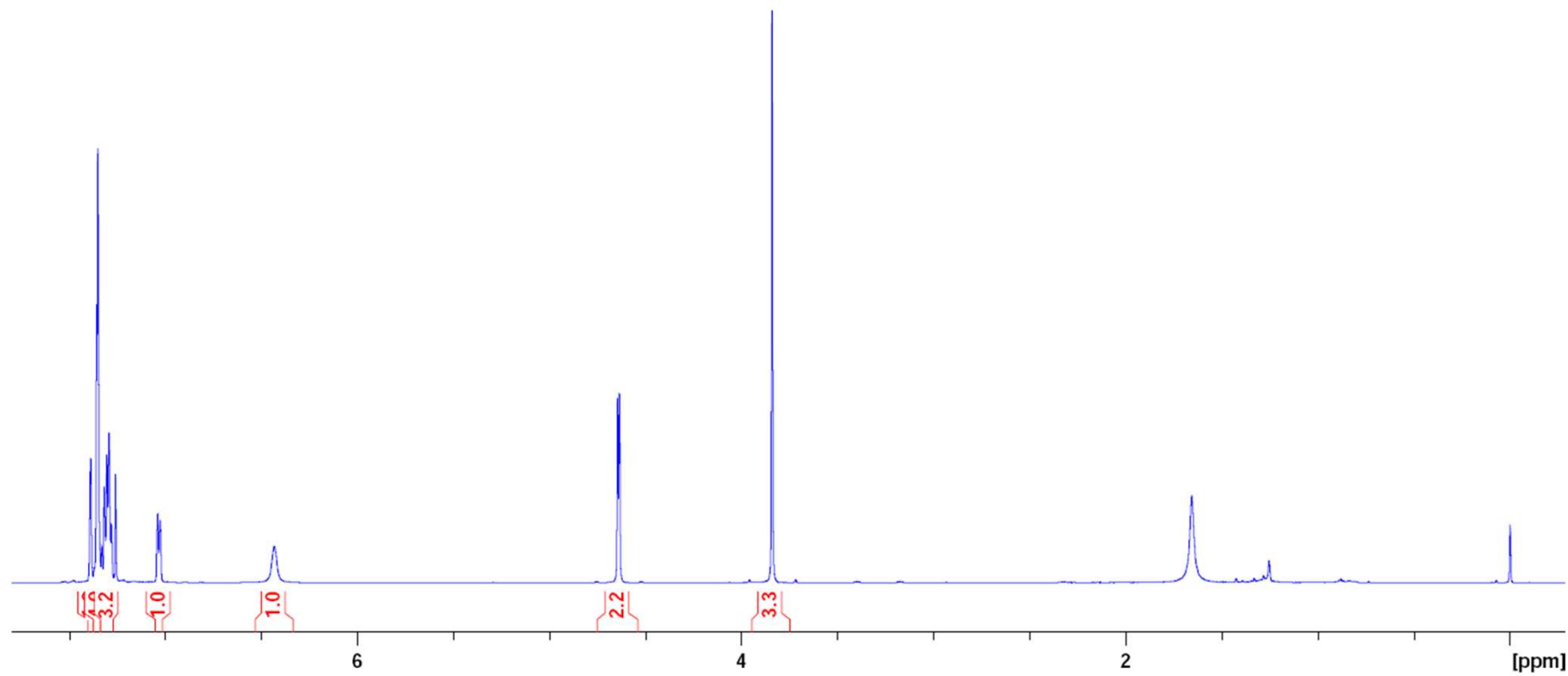
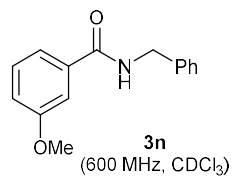
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7.306  
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7.040  
7.027

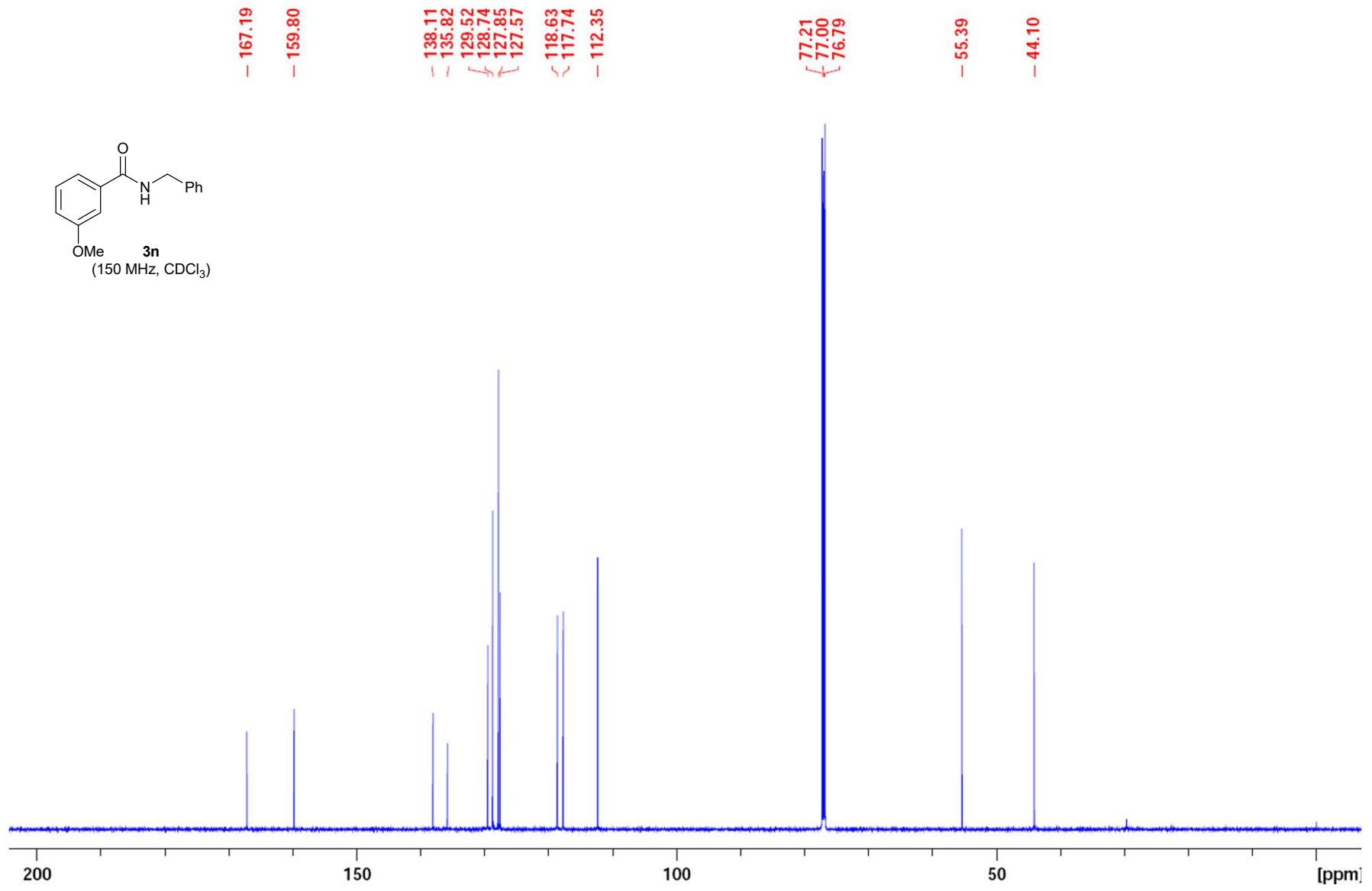
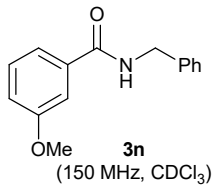
6.433

4.646  
4.637

3.842

-0.000



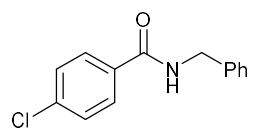


7.725  
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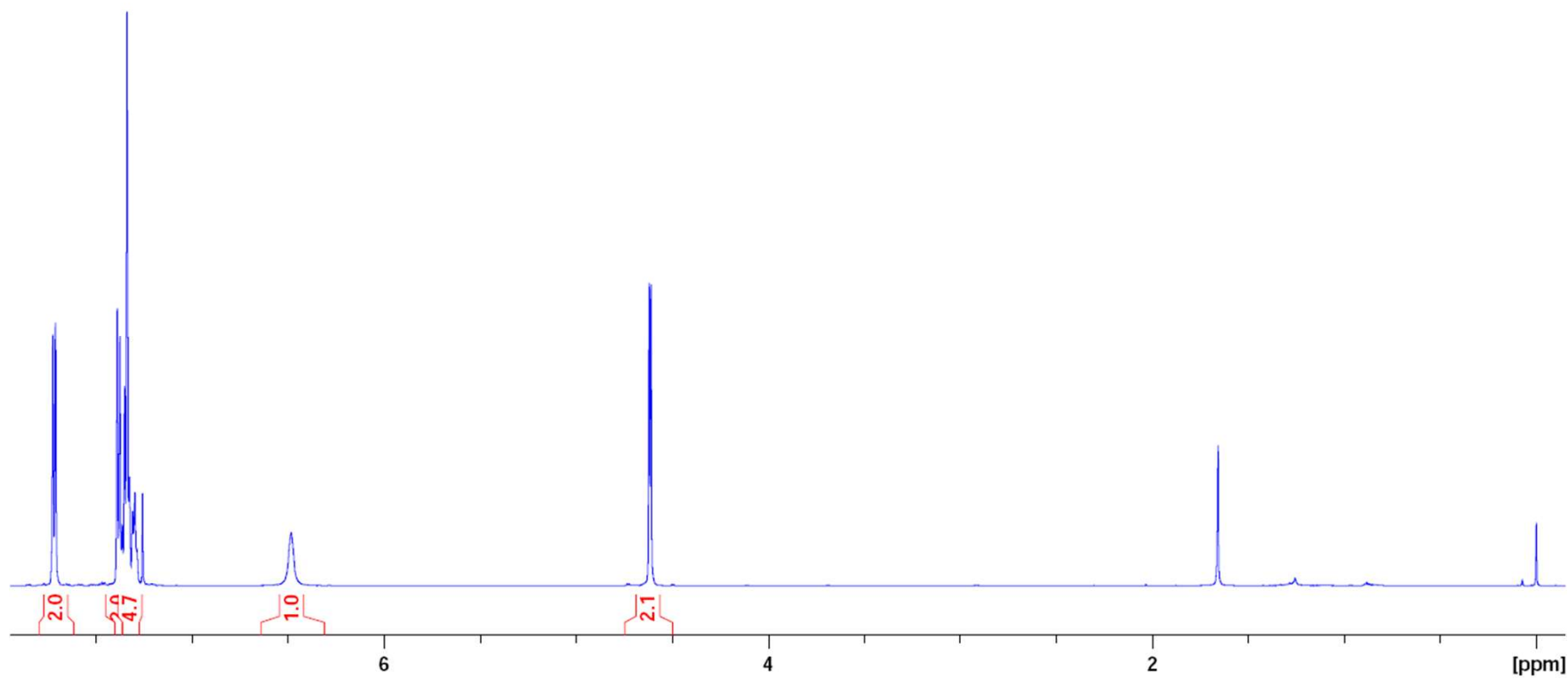
- 6.484

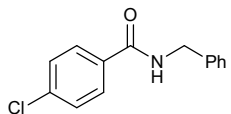
4.620  
4.610

- -0.000

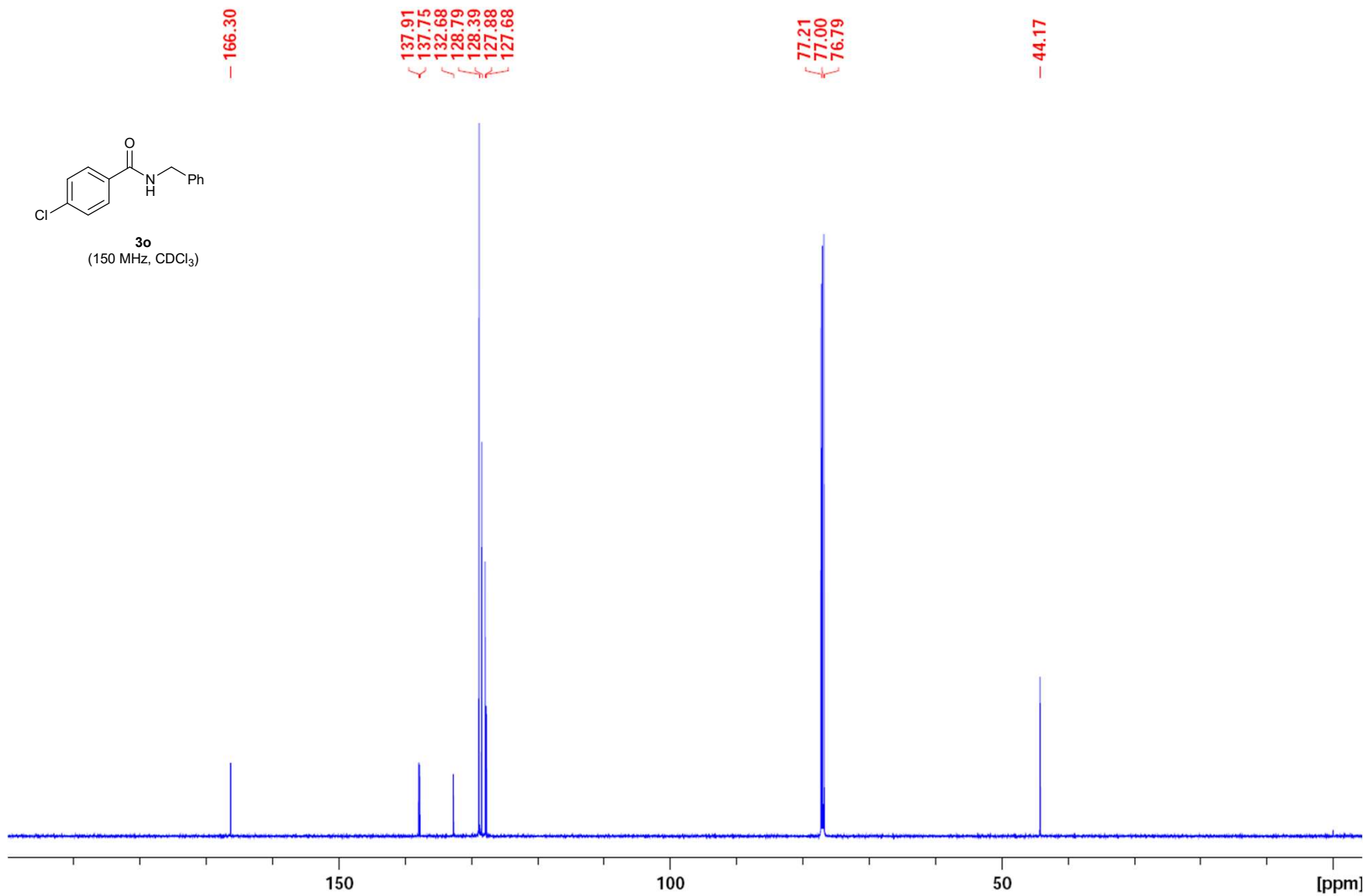


**3o**  
(600 MHz, CDCl<sub>3</sub>)





**3o**  
(150 MHz, CDCl<sub>3</sub>)

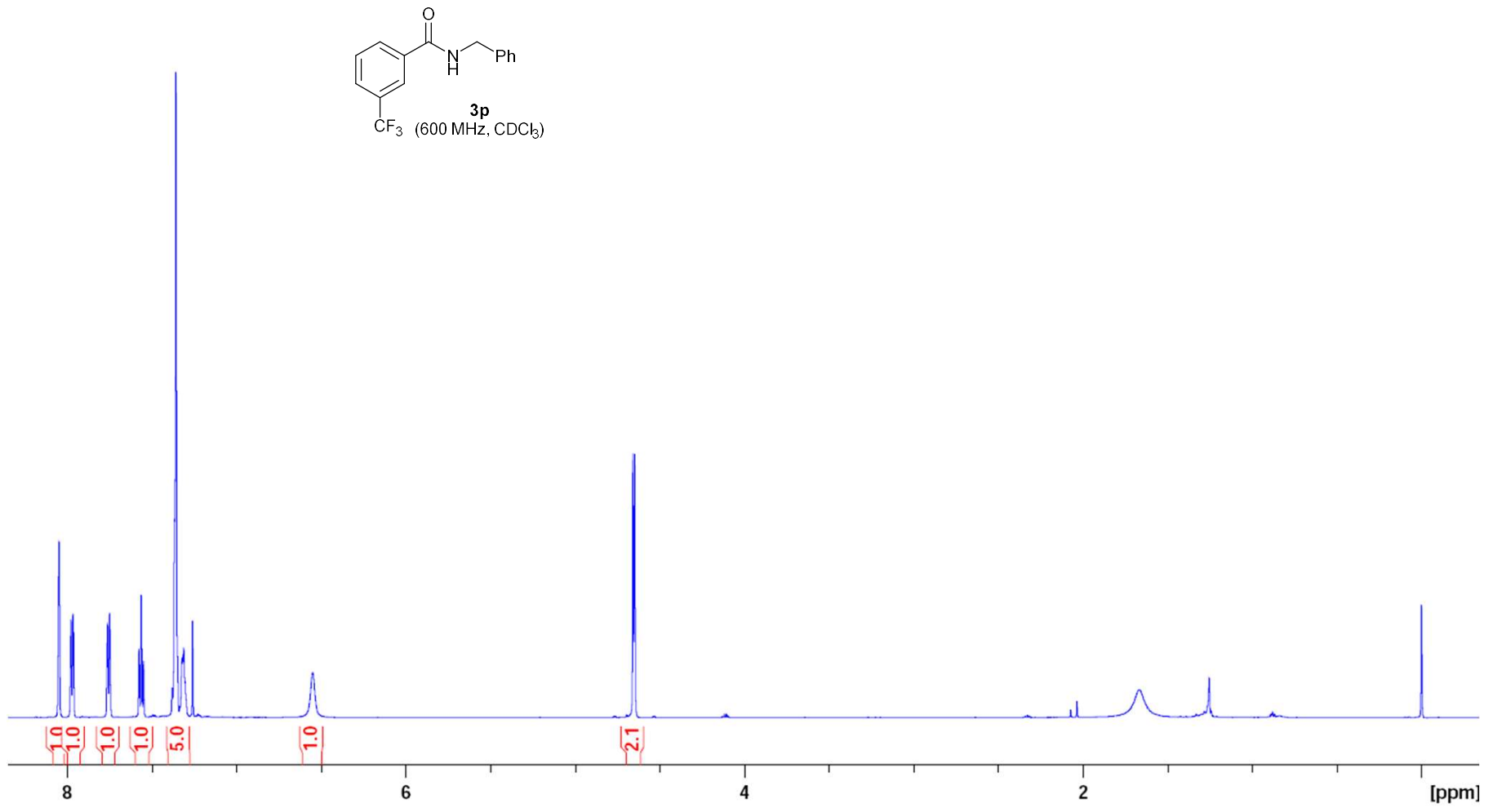
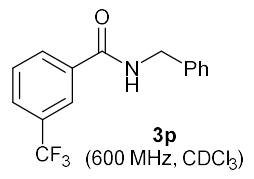


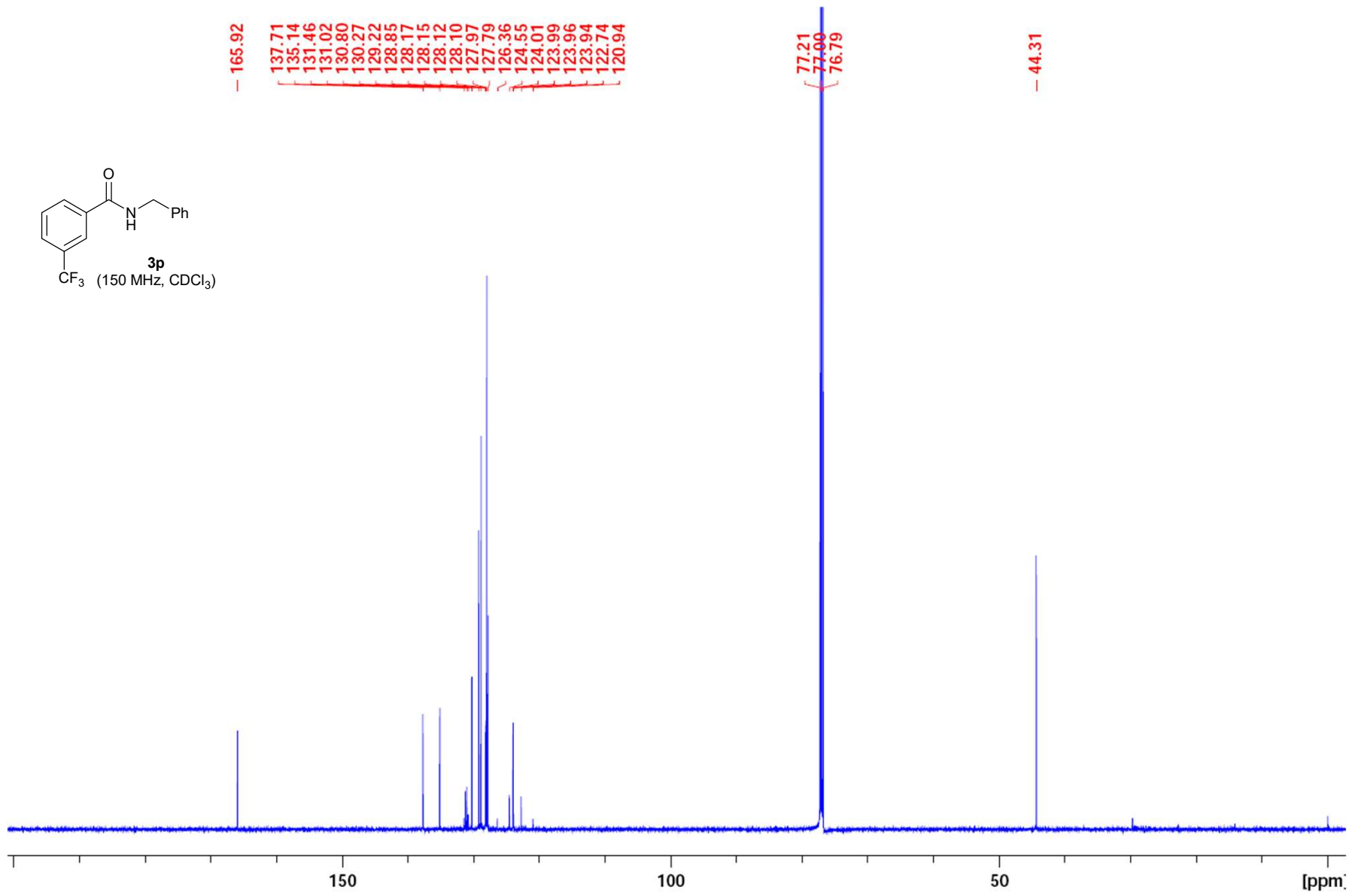
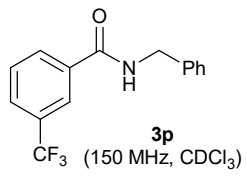
7.977  
7.964  
7.761  
7.748  
7.575  
7.562  
7.549  
7.366  
7.362  
7.357  
7.321  
7.312  
7.260

- 6.549

4.657  
4.647

-0.000

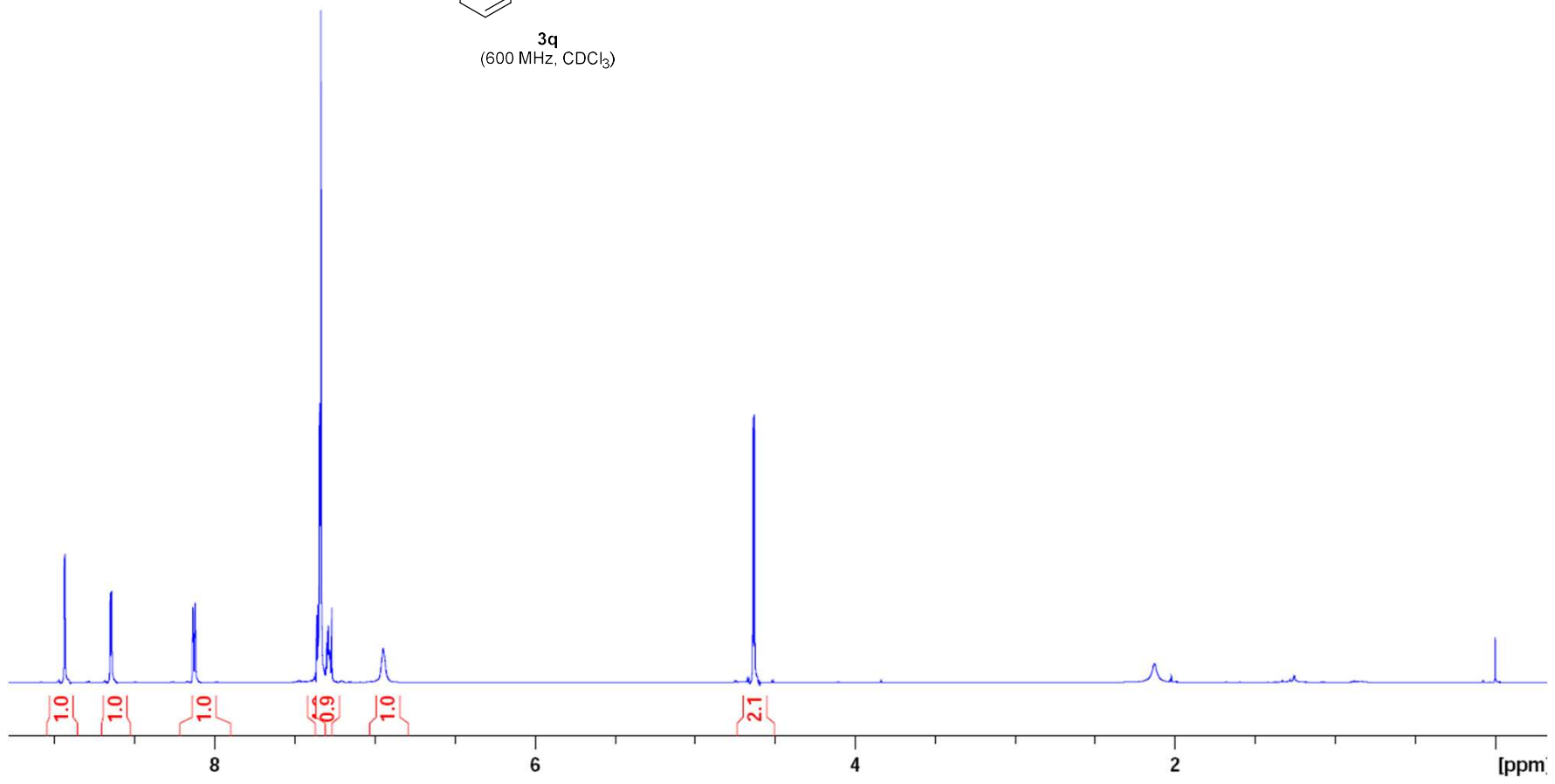
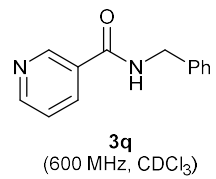


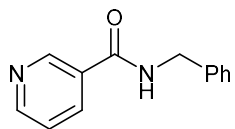


8.936  
8.654  
8.652  
8.646  
8.644  
8.139  
8.136  
8.133  
8.126  
8.122  
8.119  
7.363  
7.355  
7.350  
7.345  
7.343  
7.337  
7.329  
7.297  
7.289  
7.269  
6.947

4.637  
4.628

-0.000





**3q**  
(150 MHz, CDCl<sub>3</sub>)

— 165.48

— 152.09

— 147.82

— 137.73

— 135.24

— 130.07

— 128.76

— 127.88

— 127.68

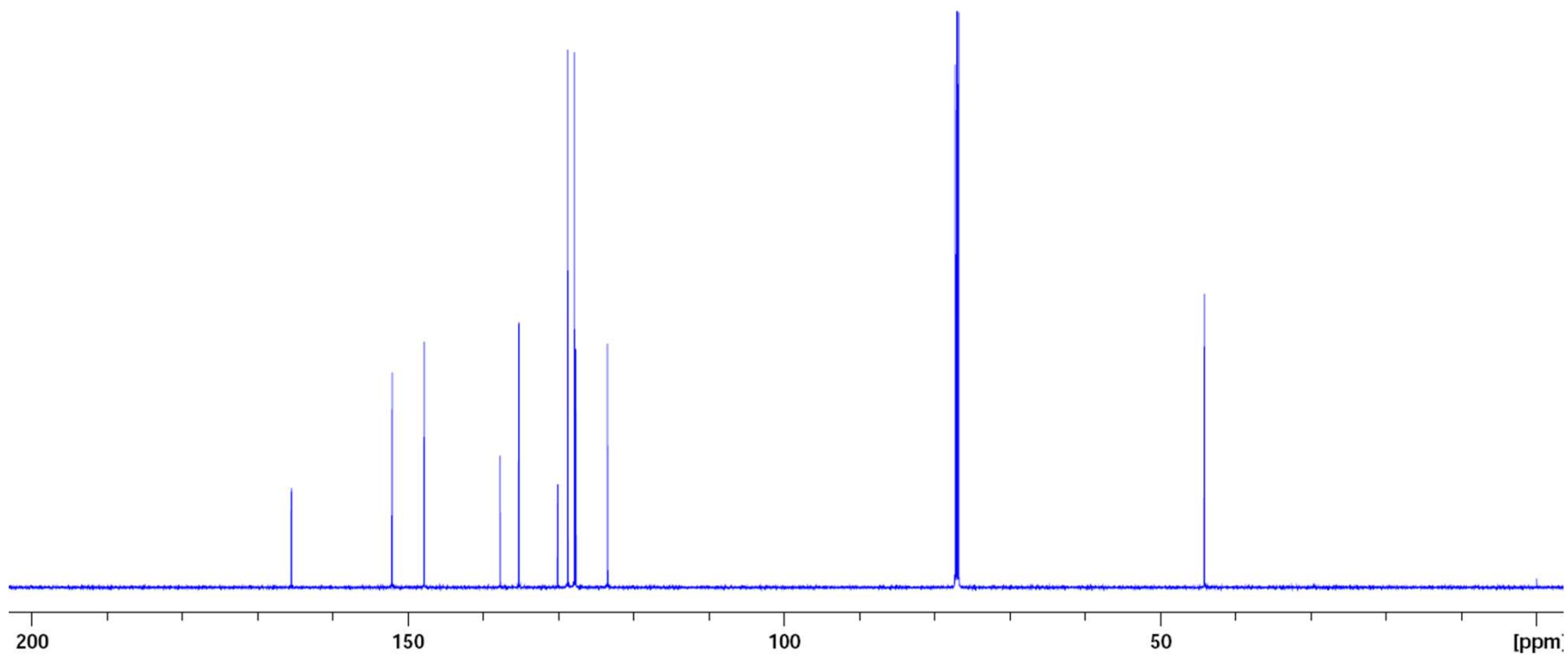
— 123.47

{ 77.21

{ 77.00

{ 76.79

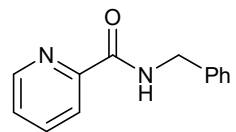
— 44.10



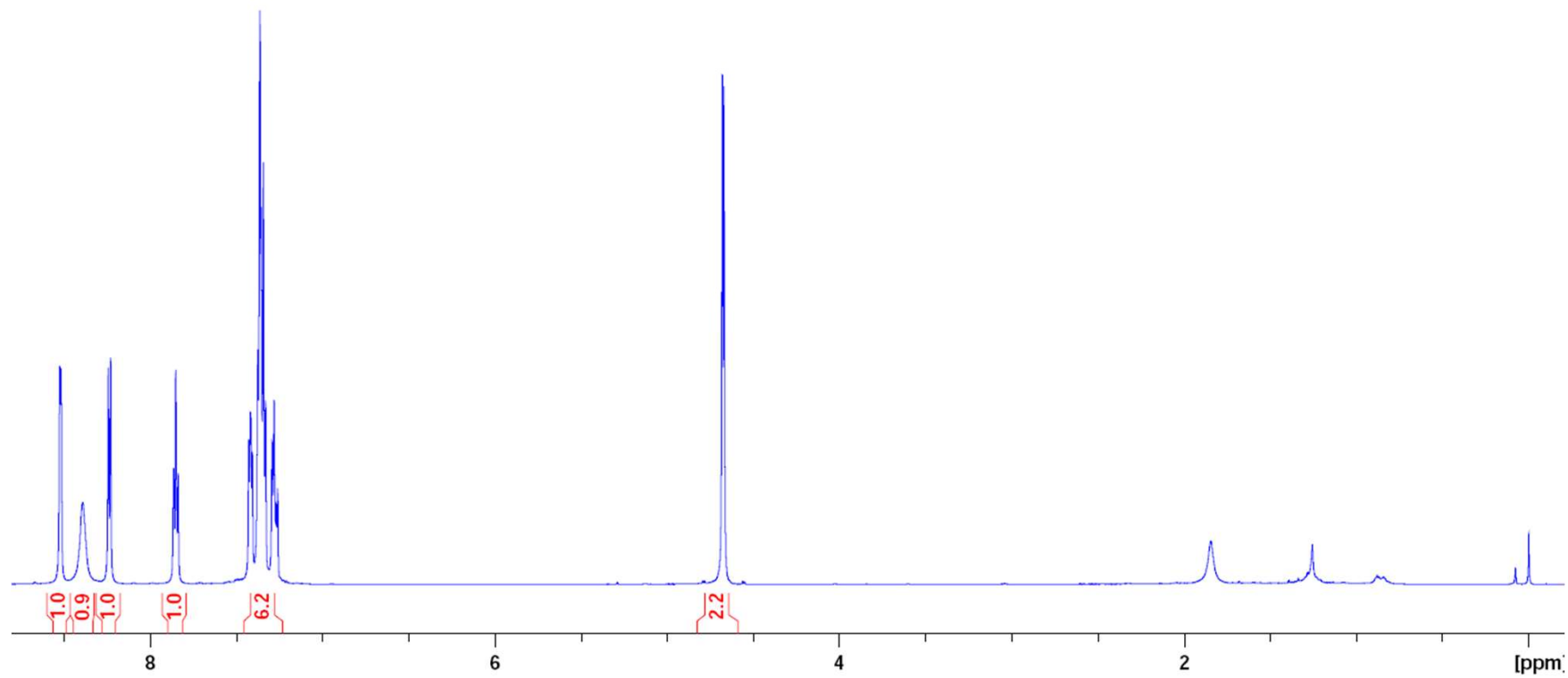
8.518  
8.392  
8.244  
8.231  
7.865  
7.852  
7.839  
7.428  
7.420  
7.408  
7.377  
7.365  
7.357  
7.344  
7.332  
7.293  
7.282  
7.270  
7.262

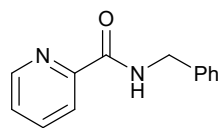
4.680  
4.670

-0.000

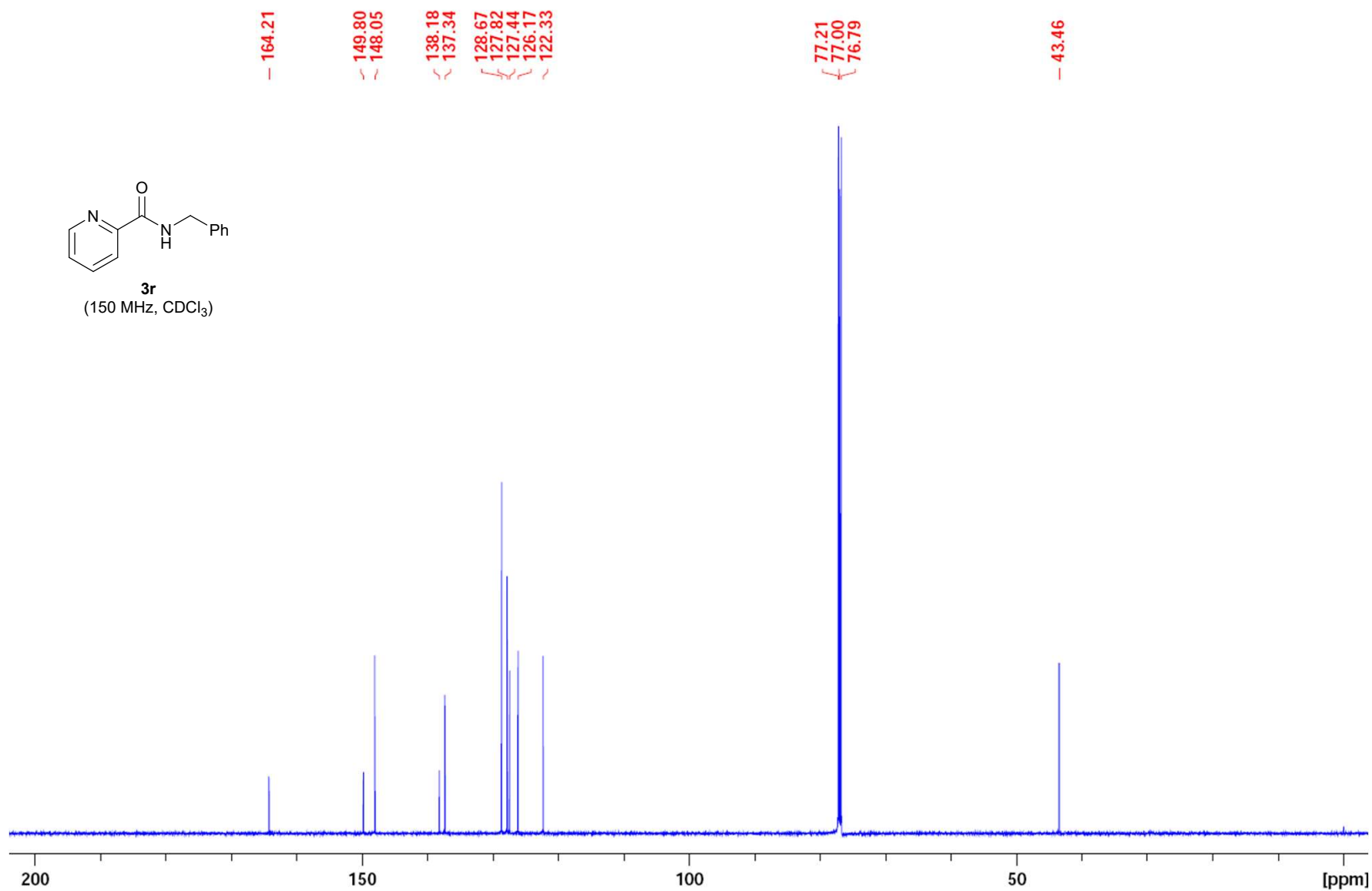


**3r**  
(600 MHz, CDCl<sub>3</sub>)





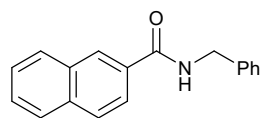
**3r**  
(150 MHz, CDCl<sub>3</sub>)



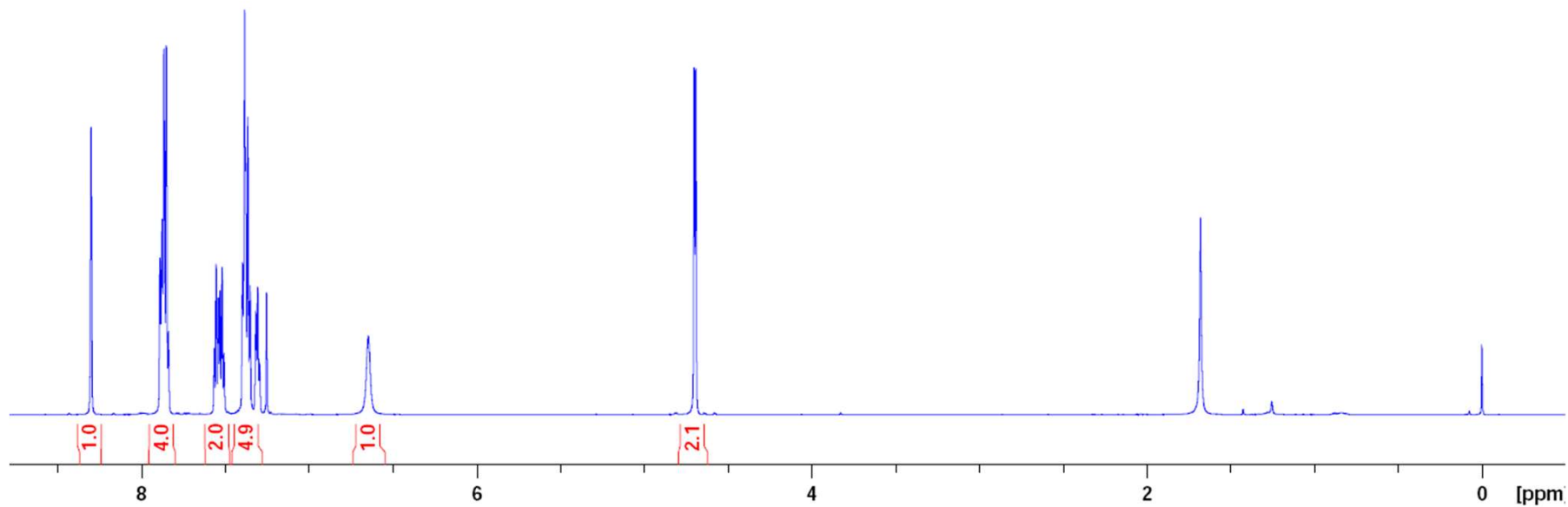
7.876  
7.865  
7.851  
7.838  
7.565  
7.553  
7.541  
7.530  
7.518  
7.506  
7.396  
7.383  
7.376  
7.363  
7.351  
7.317  
7.305  
7.294  
7.253  
6.645

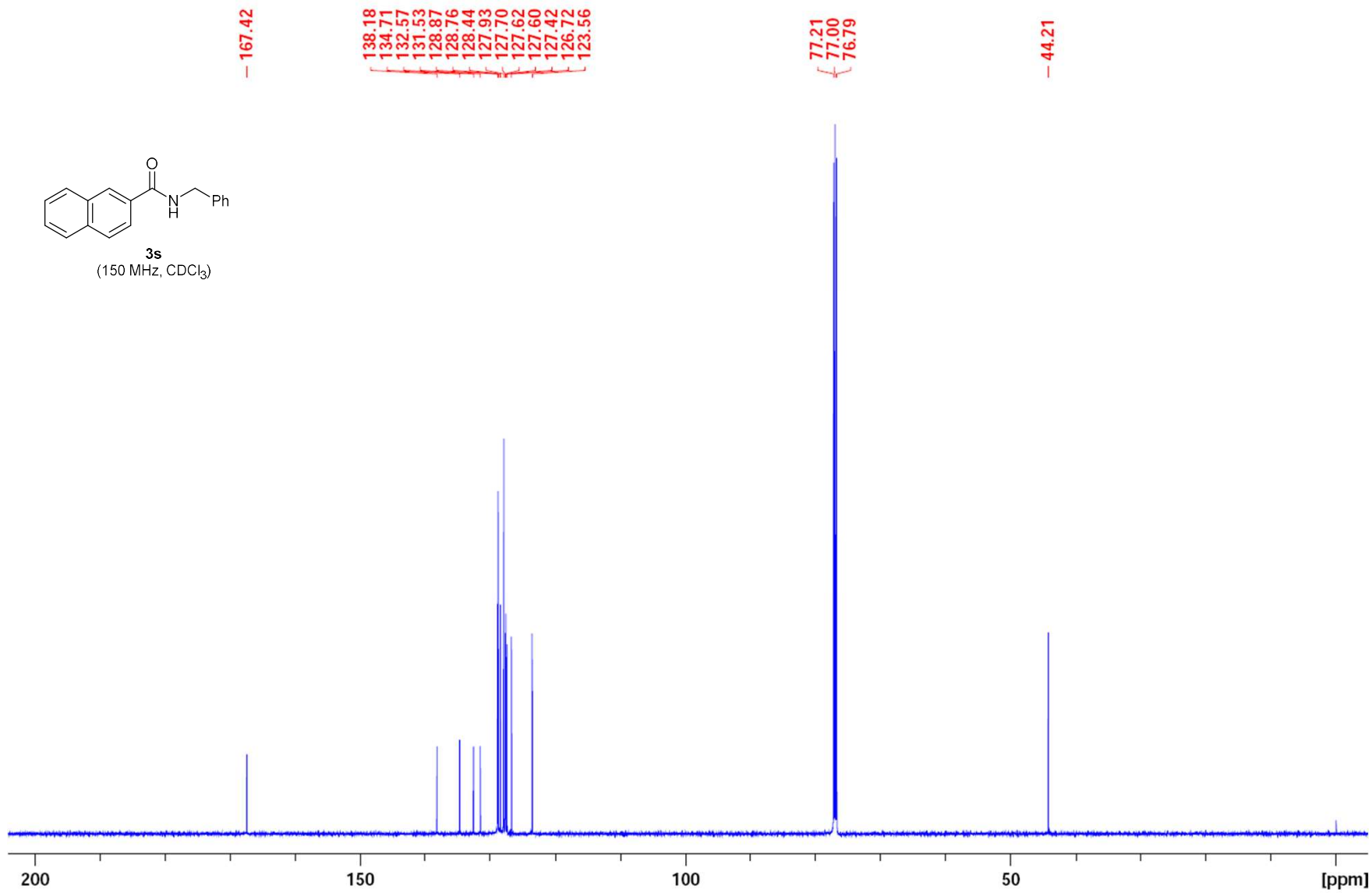
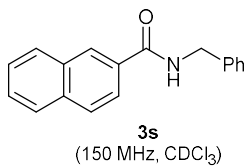
4.701  
4.691

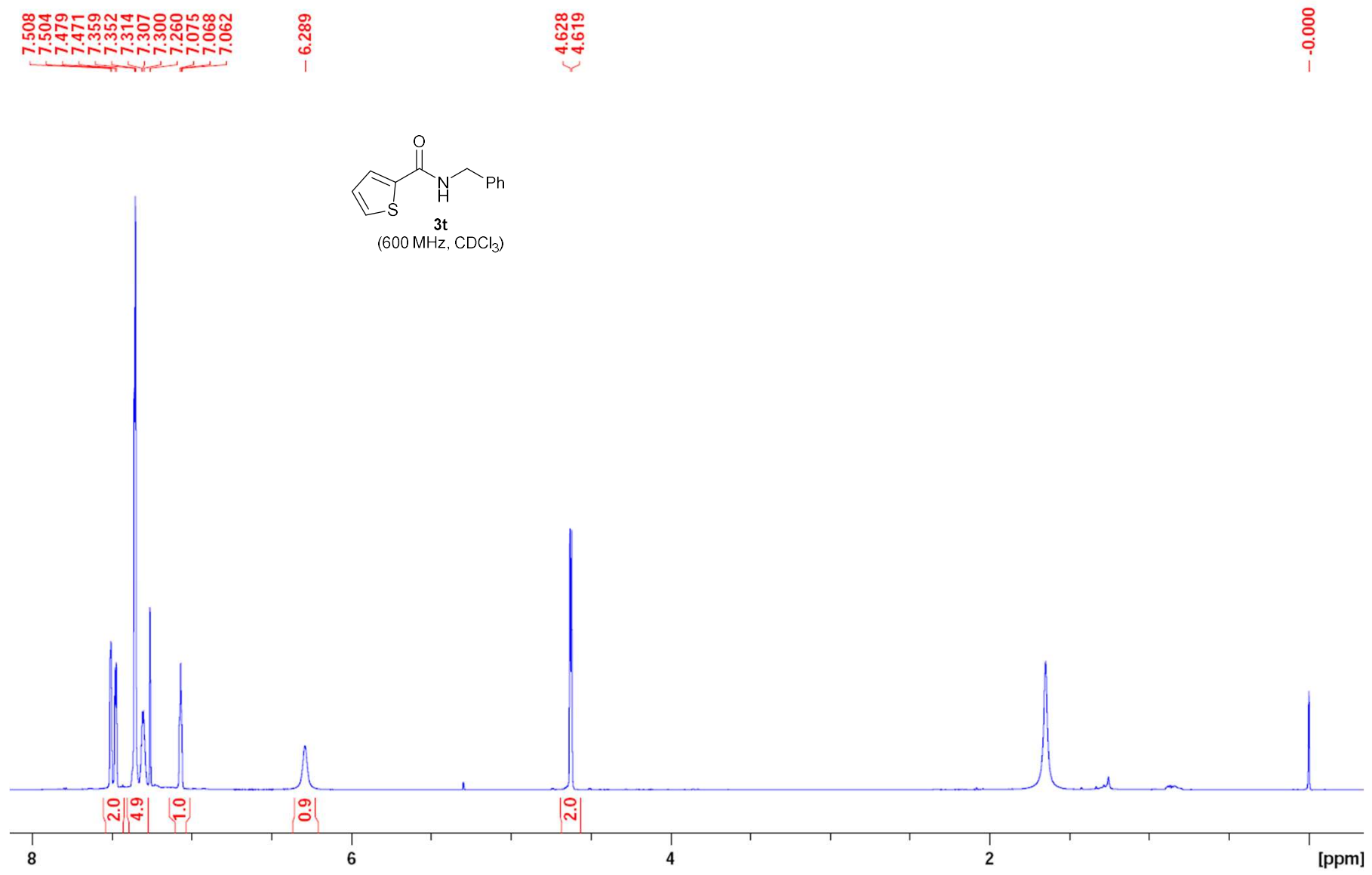
-0.000

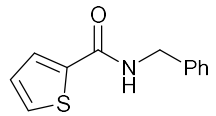


**3s**  
(600 MHz, CDCl<sub>3</sub>)

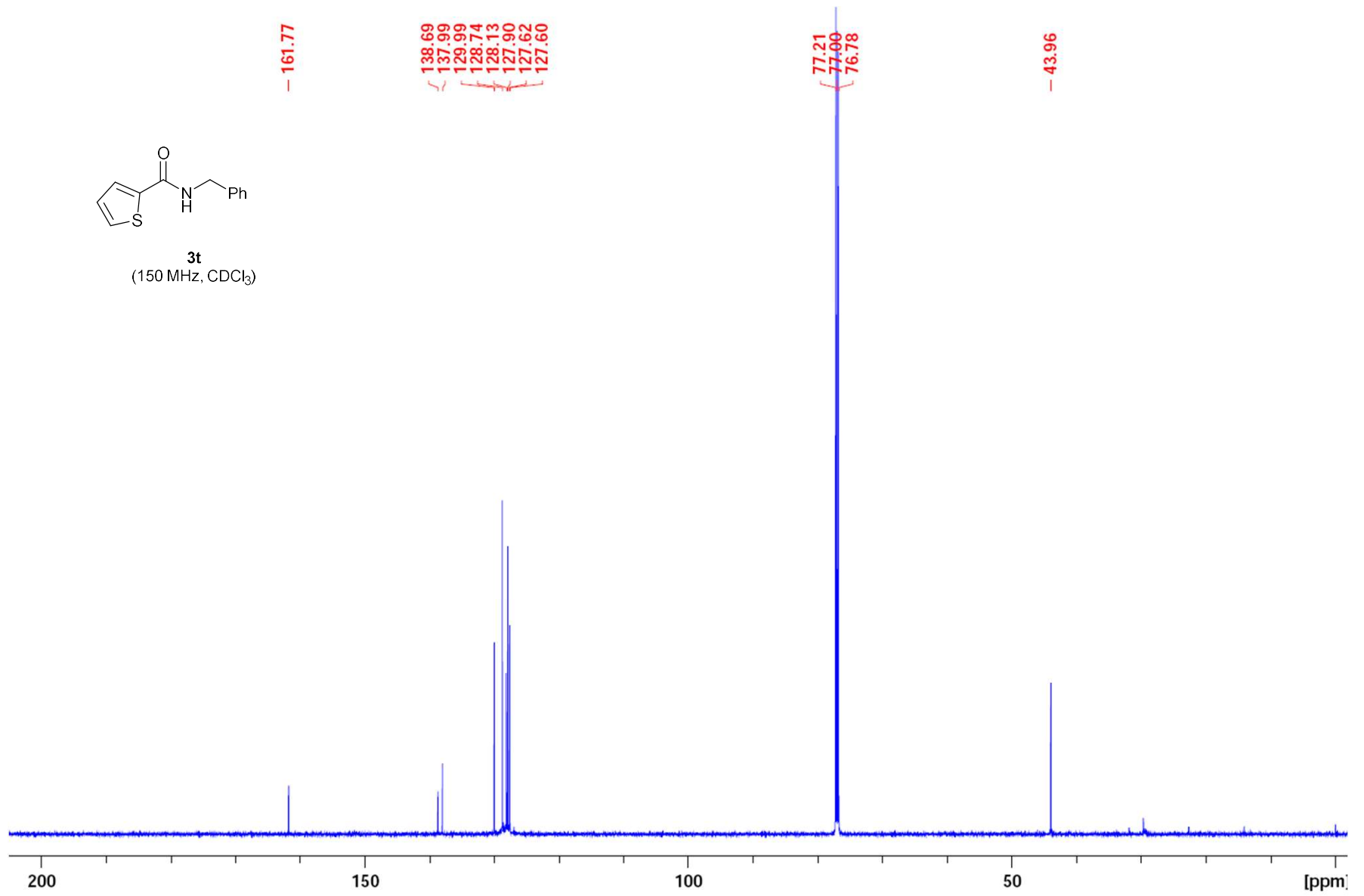








**3t**  
(150 MHz, CDCl<sub>3</sub>)

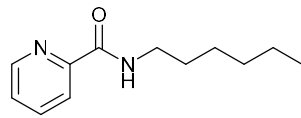


8.211  
8.198  
8.062  
7.863  
7.860  
7.850  
7.847  
7.837  
7.834  
7.433  
7.432  
7.425  
7.424  
7.421  
7.419  
7.413  
7.411  
7.266

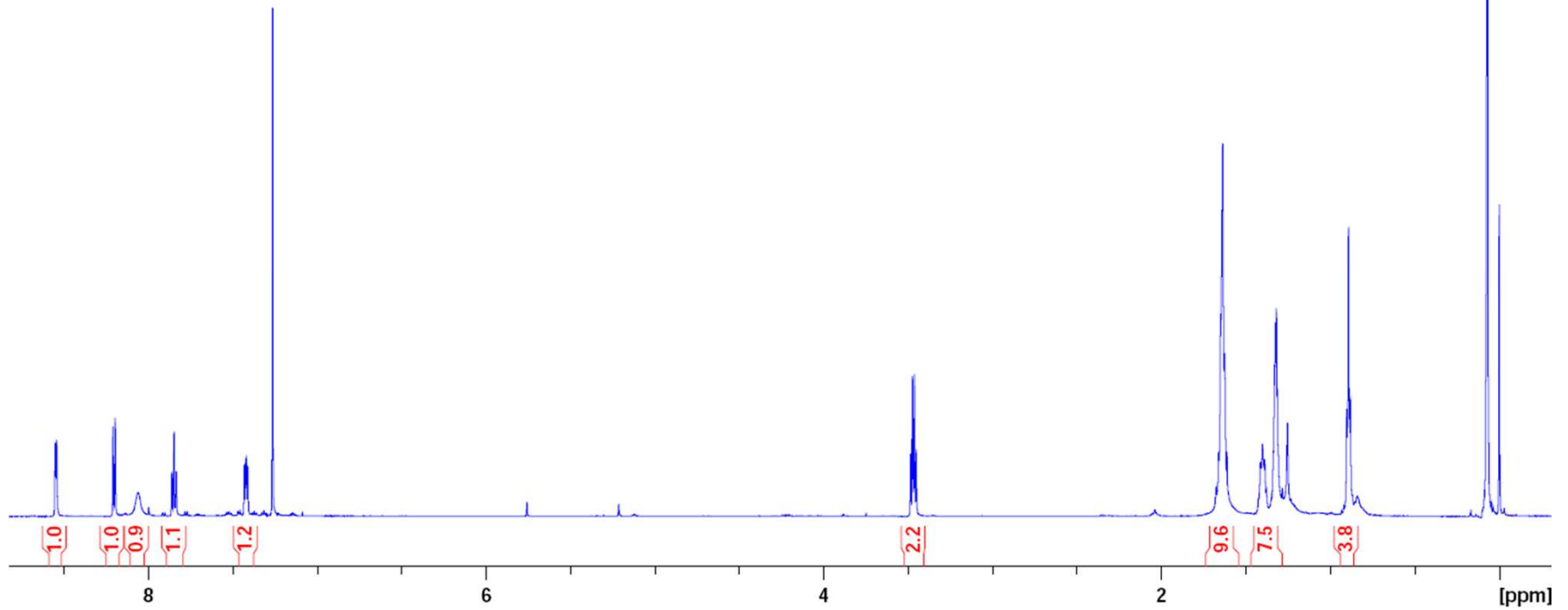
3.487  
3.475  
3.465  
3.453

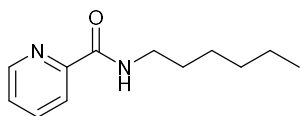
1.662  
1.650  
1.638  
1.626  
1.613  
1.403  
1.338  
1.332  
1.326  
1.320  
1.314  
1.309  
1.254  
0.904  
0.893  
0.881

0.000

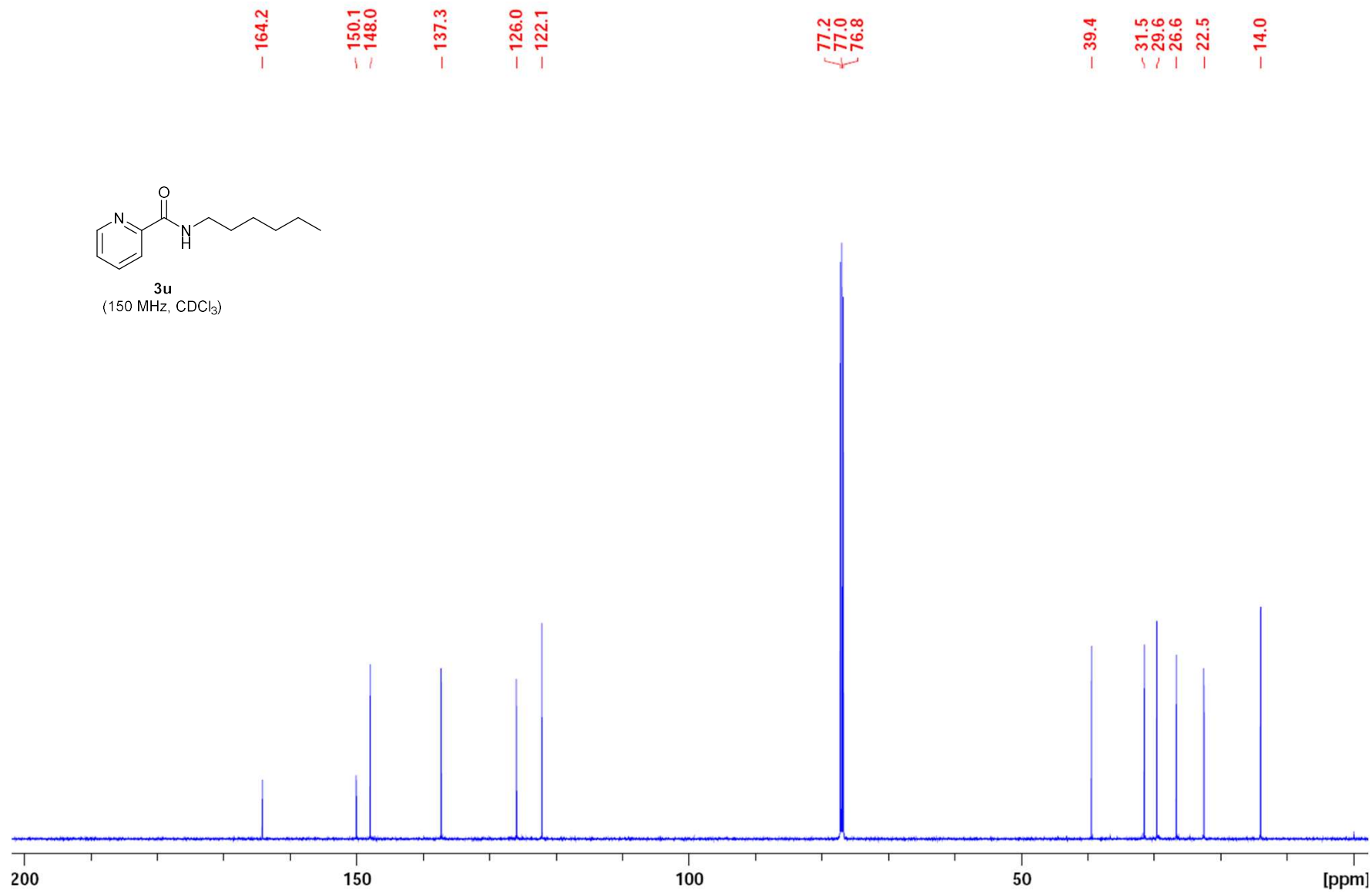


**3u**  
(600 MHz, CDCl<sub>3</sub>)





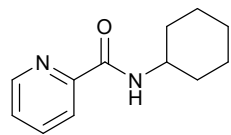
**3u**  
(150 MHz, CDCl<sub>3</sub>)



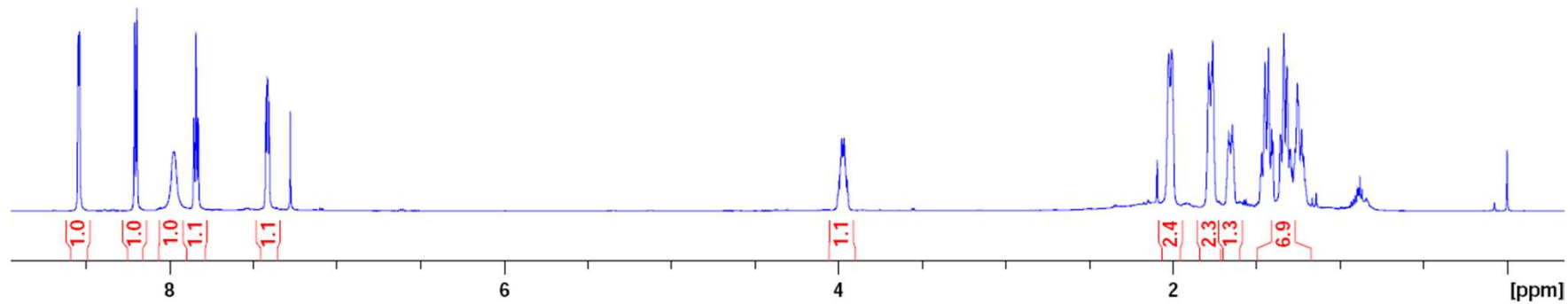
8.545  
8.538  
8.209  
8.196  
7.974  
7.854  
7.841  
7.828  
7.424  
7.415  
7.412  
7.404  
7.277

3.980  
3.972  
3.965  
2.023  
2.007  
2.003  
1.784  
1.778  
1.768  
1.762  
1.756  
1.665  
1.658  
1.649  
1.643  
1.469  
1.449  
1.428  
1.412  
1.407  
1.400  
1.357  
1.353  
1.336  
1.318  
1.316  
1.300  
1.295  
1.268  
1.255  
1.249  
1.228  
1.216

-0.000



**3v**  
(600 MHz, CDCl<sub>3</sub>)



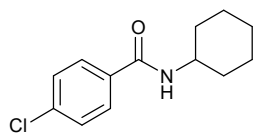
7.696  
7.683  
7.398  
7.384  
7.267

5.967

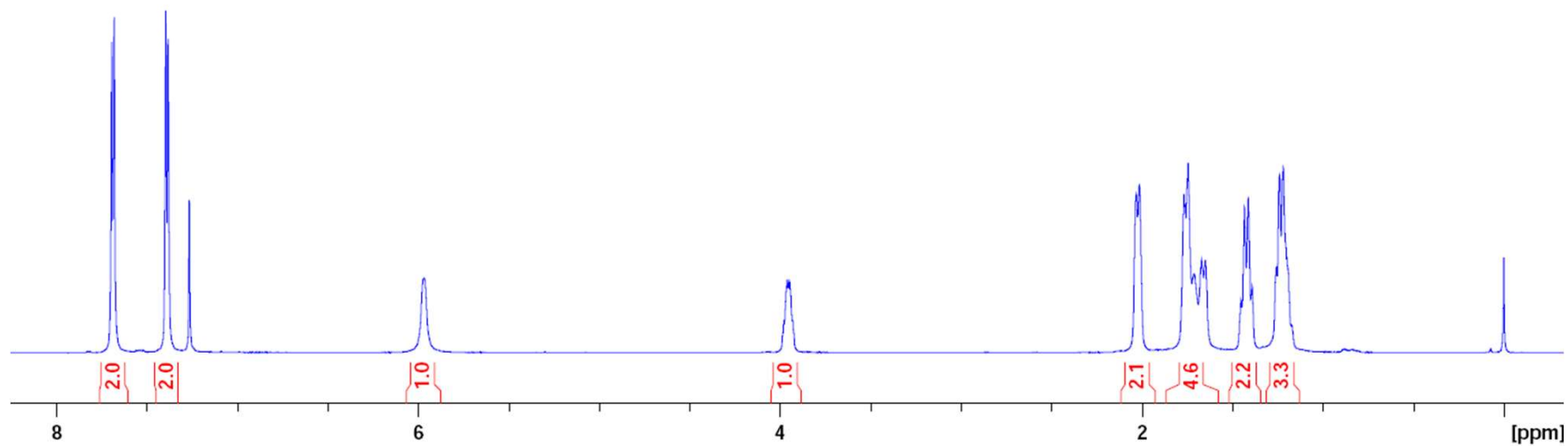
3.962  
3.956  
3.949

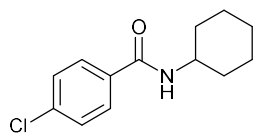
2.032  
2.015  
1.768  
1.762  
1.746  
1.712  
1.671  
1.649  
1.433  
1.412  
1.391  
1.257  
1.239  
1.219  
1.199  
1.192

-0.000



**3w**  
(600 MHz, CDCl<sub>3</sub>)





**3w**  
(150 MHz, CDCl<sub>3</sub>)

— 165.5

— 137.4

— 133.4

{ 128.7

{ 128.3

{ 77.2

{ 77.0

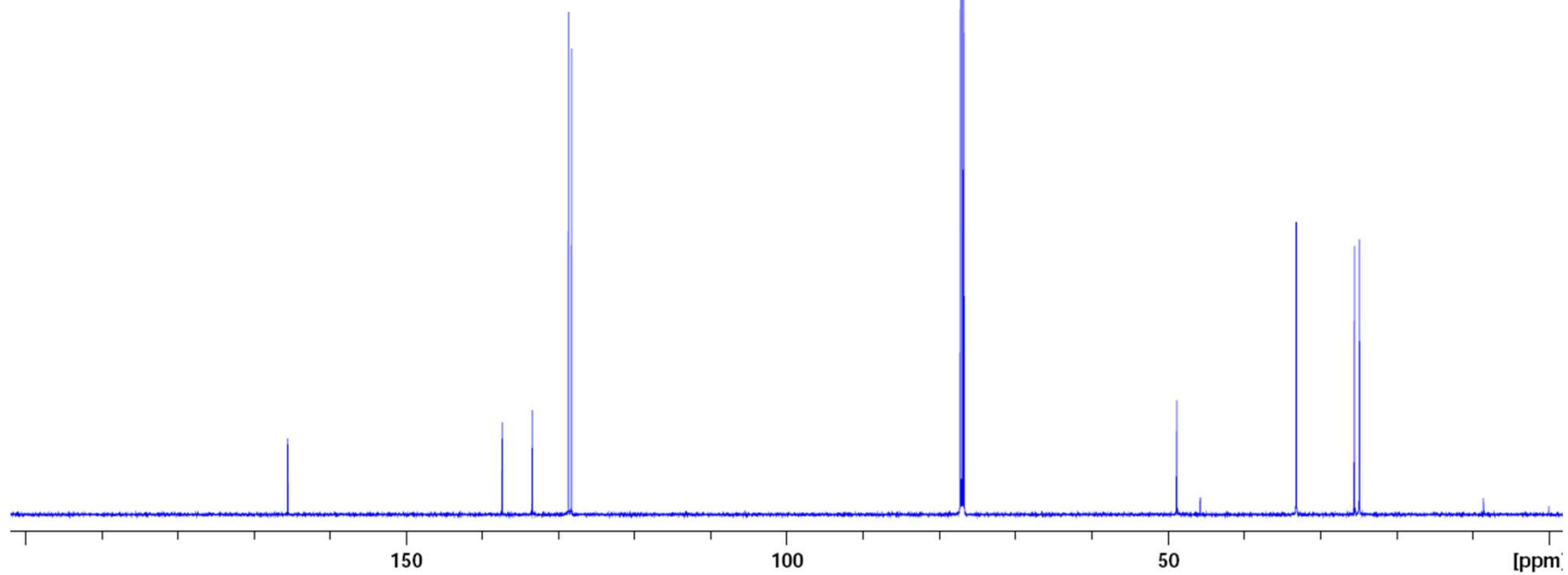
{ 76.8

— 48.8

— 33.1

{ 25.5

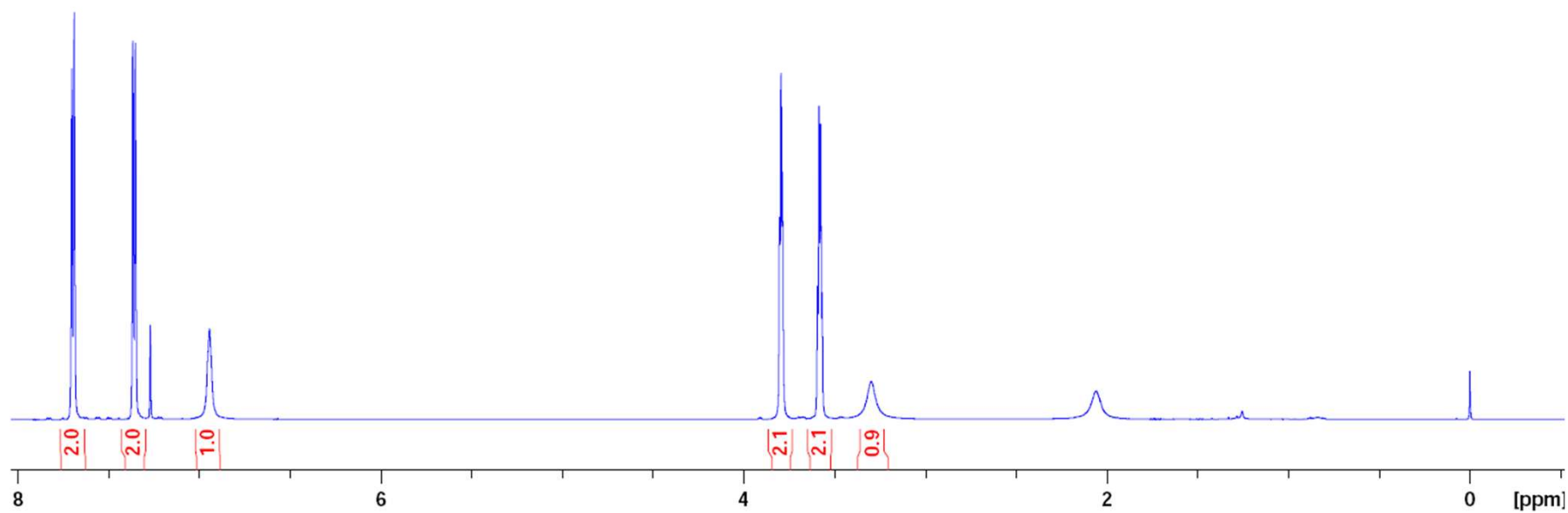
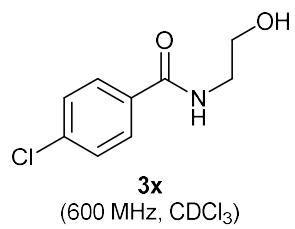
{ 24.9

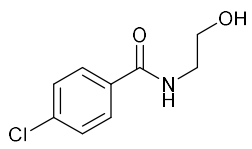


7.703  
7.689  
7.367  
7.353  
7.271  
6.944

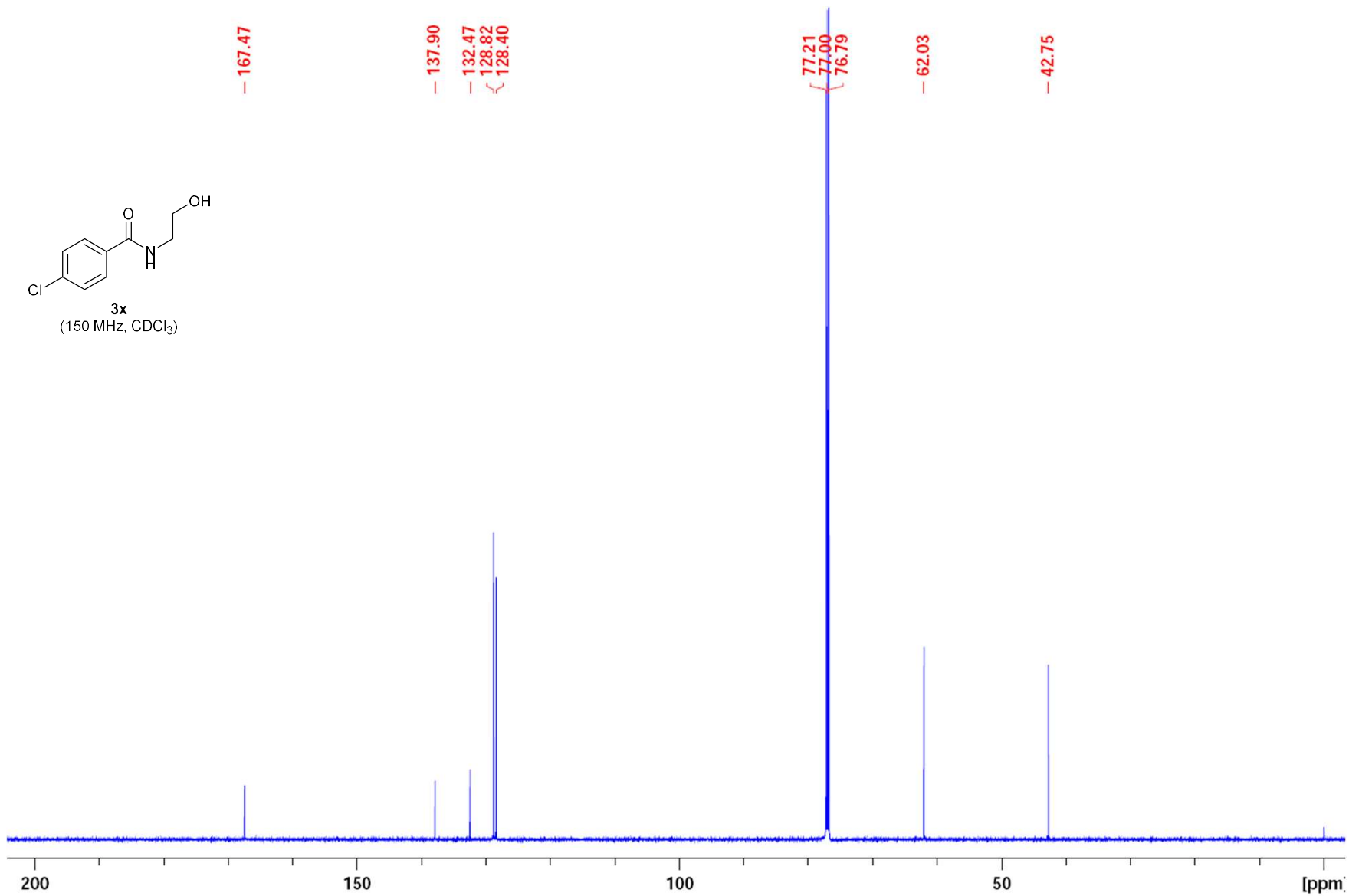
3.803  
3.795  
3.787  
3.594  
3.585  
3.577  
3.569  
3.298

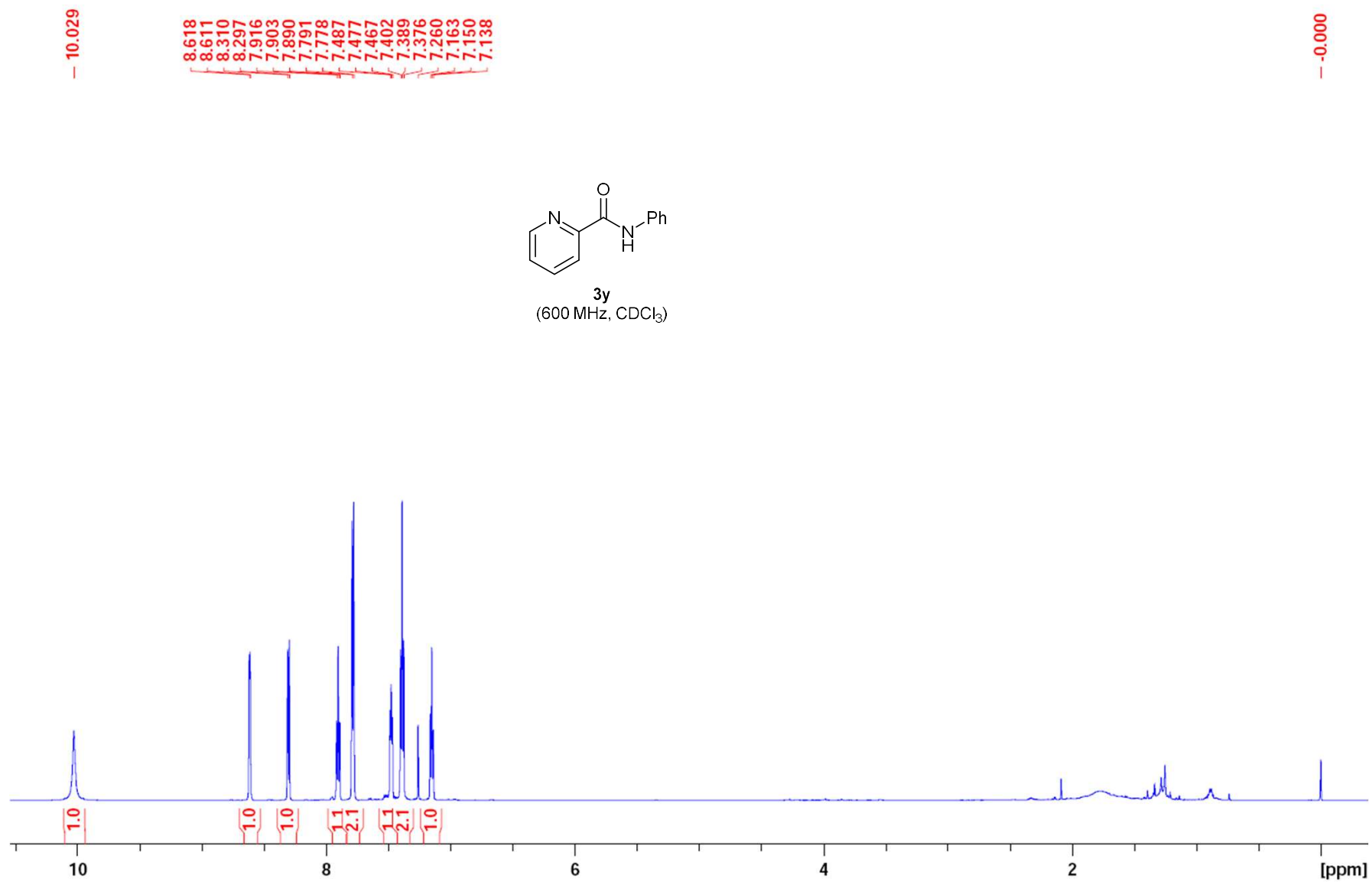
-0.000

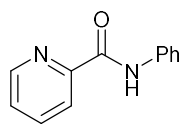




**3x**  
(150 MHz, CDCl<sub>3</sub>)

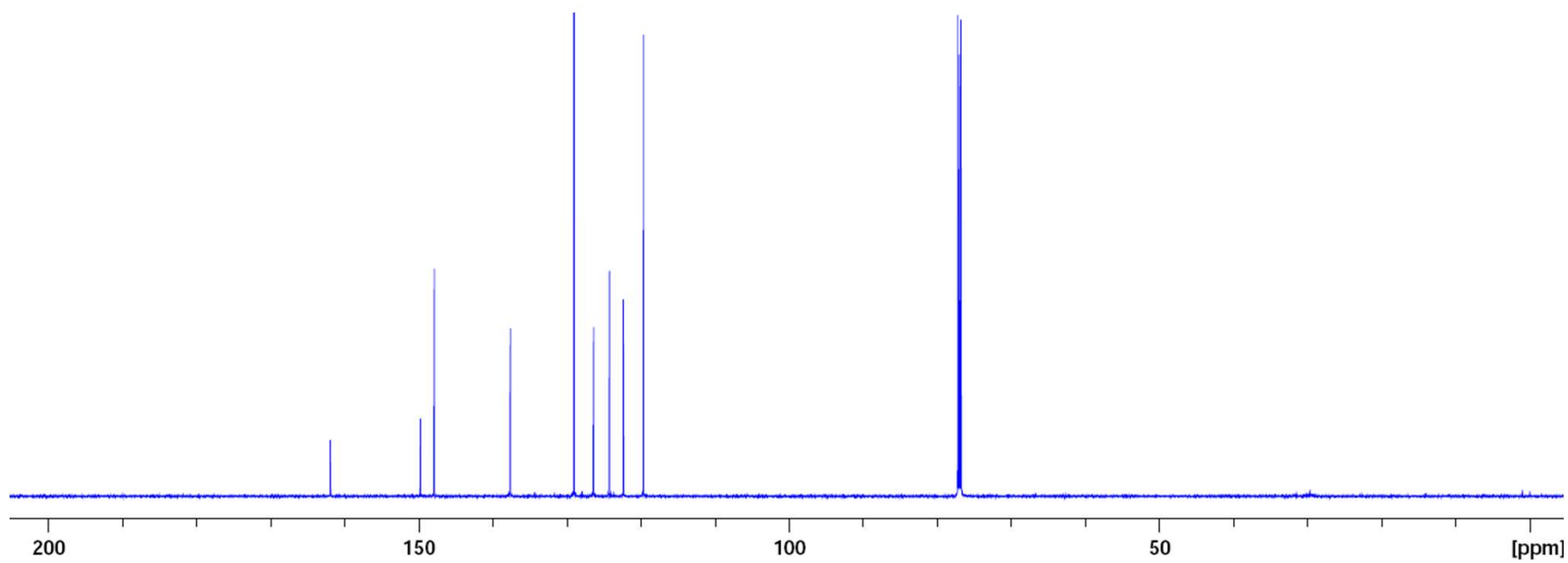






**3y**  
(150 MHz, CDCl<sub>3</sub>)

161.96  
149.77  
147.92  
137.70  
137.64  
129.04  
126.41  
124.27  
122.37  
119.65  
77.21  
77.00  
76.79



7.882  
7.874  
7.871  
7.867  
7.782  
7.779  
7.767  
7.756  
7.753  
7.484  
7.480  
7.477  
7.469  
7.466  
7.462  
7.264  
7.092  
7.090  
7.083  
7.082  
7.080  
7.078  
7.071  
7.070

-0.000

