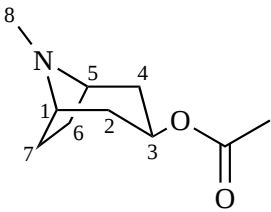
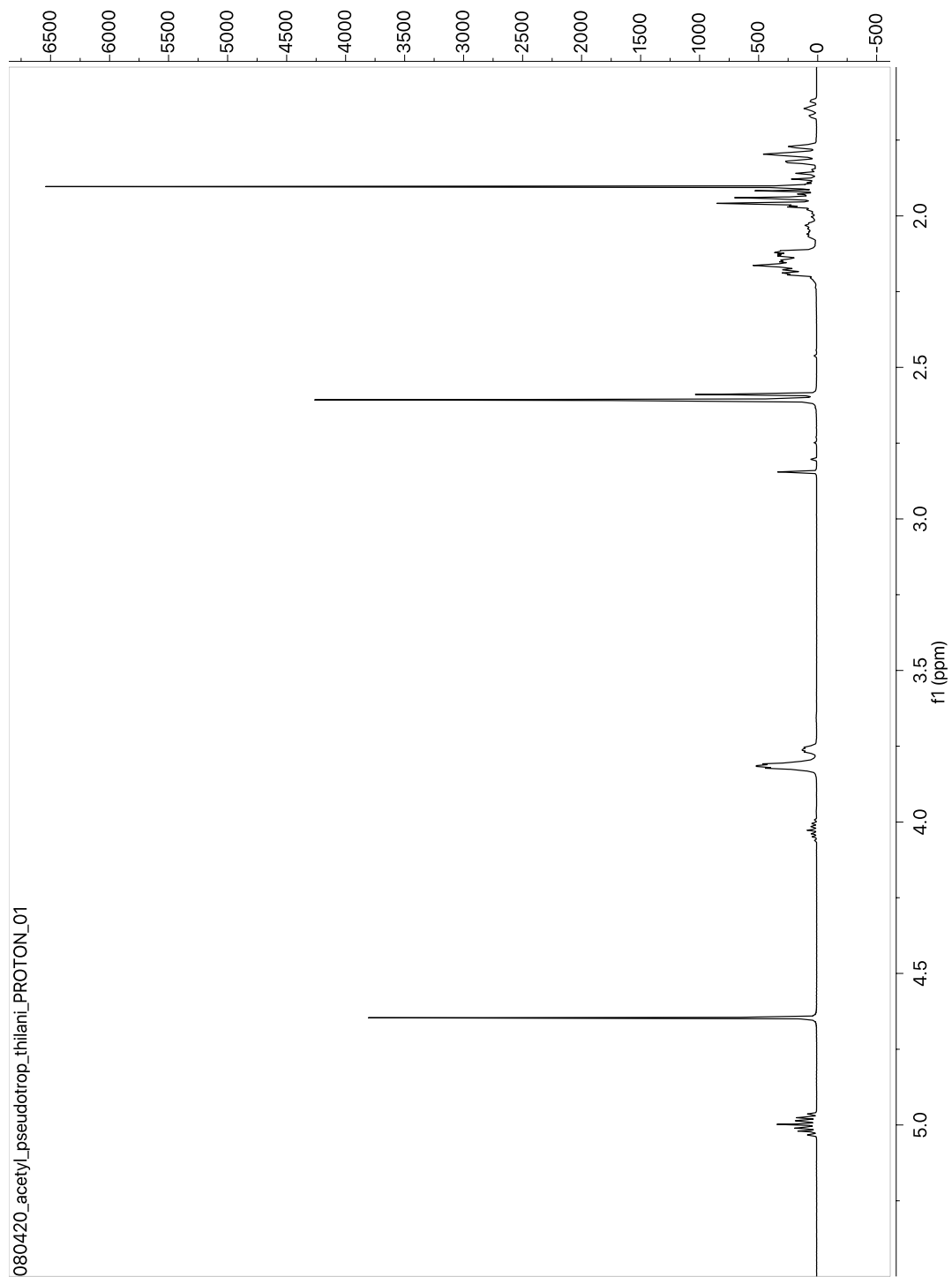


## O-Acyl pseudotropine

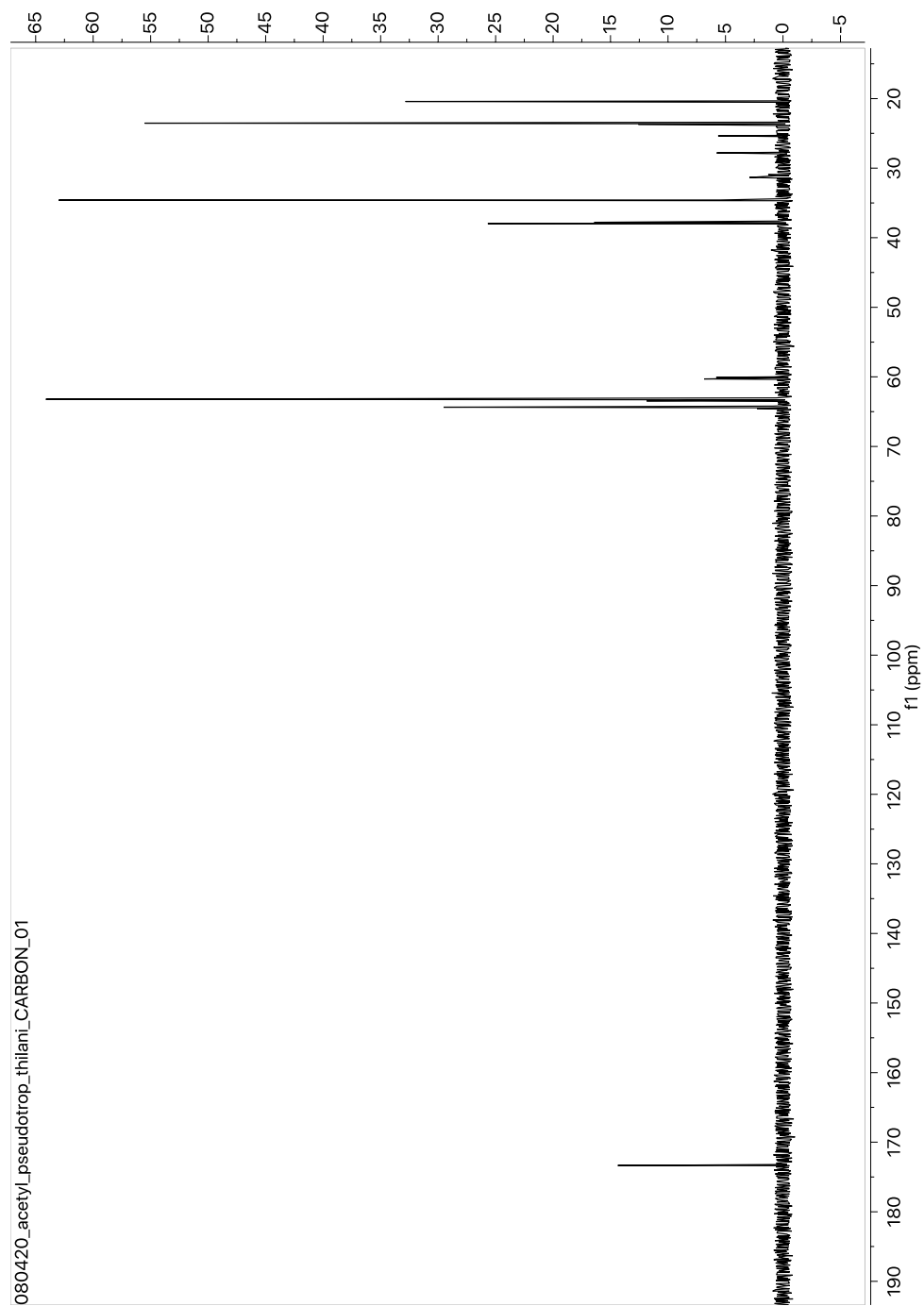
### A. 3-Acetyl pseudotropine

#### NMR chemical shifts values for 3-Acetyl pseudotropine

|  | <p>8-methyl-8-azabicyclo[3.2.1]octan-3<math>\beta</math>-yl acetate<br/>(3-Acetyl pseudotropine)</p> <p>Chemical Formula: C<sub>10</sub>H<sub>17</sub>NO<sub>2</sub><br/>Experimental <i>m/z</i>: 184.1332<br/>Theoretical <i>m/z</i> of [M+H]<sup>+</sup>: 184.13321<br/>InChI Key: MDIDMOWWLBGYPG-ILWJIGKKSA-N<br/>SMILES:<br/>[H][C@]1(OC(C)=O)C[C@@H]2CC[C@@H](N2C)C1<br/>NMR (500 MHz, D<sub>2</sub>O) ~2 mg</p> |                                                |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|
| Carbon #<br>(group)                                                               | <sup>1</sup> H (ppm)                                                                                                                                                                                                                                                                                                                                                                                                  | <sup>13</sup> C (ppm)<br>From HMBC<br>and HSQC |
| <b>1,5</b> (CH)                                                                   | 3.81 (p, <i>J</i> = 6.2 Hz, 2H)                                                                                                                                                                                                                                                                                                                                                                                       | 63.15                                          |
| <b>2,4</b> (CH <sub>2</sub> )                                                     | Axial 1.80 (m, <i>J</i> = 14.4, 11.0, 6.2 Hz, 2H)<br>Equatorial 2.16 (dt, <i>J</i> = 14.4, 6.2 Hz, 2H)                                                                                                                                                                                                                                                                                                                | 34.59                                          |
| <b>3</b> (CH)<br>- 1 (CO)<br>- 2 (CH <sub>3</sub> )                               | 5.00 (tt, <i>J</i> = 11.0, 6.2 Hz, 1H)<br>-<br>1.90 (s, 3H)                                                                                                                                                                                                                                                                                                                                                           | 64.30<br>174.18<br>20.48                       |
| <b>6,7</b> (CH <sub>2</sub> )                                                     | 1.95 (dd, <i>J</i> = 6.2, 14.2 Hz, 2H), 2.17 (m, <i>J</i> = 14.2 Hz, 2H)                                                                                                                                                                                                                                                                                                                                              | 23.48                                          |
| <b>8</b> N(CH <sub>3</sub> )                                                      | 2.35 (s, 3H)                                                                                                                                                                                                                                                                                                                                                                                                          | 38.03                                          |



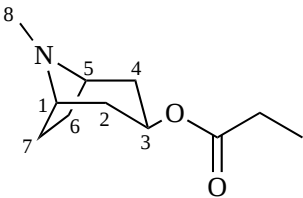
$^1\text{H}$  NMR spectrum for 3-acetyl pseudotropine

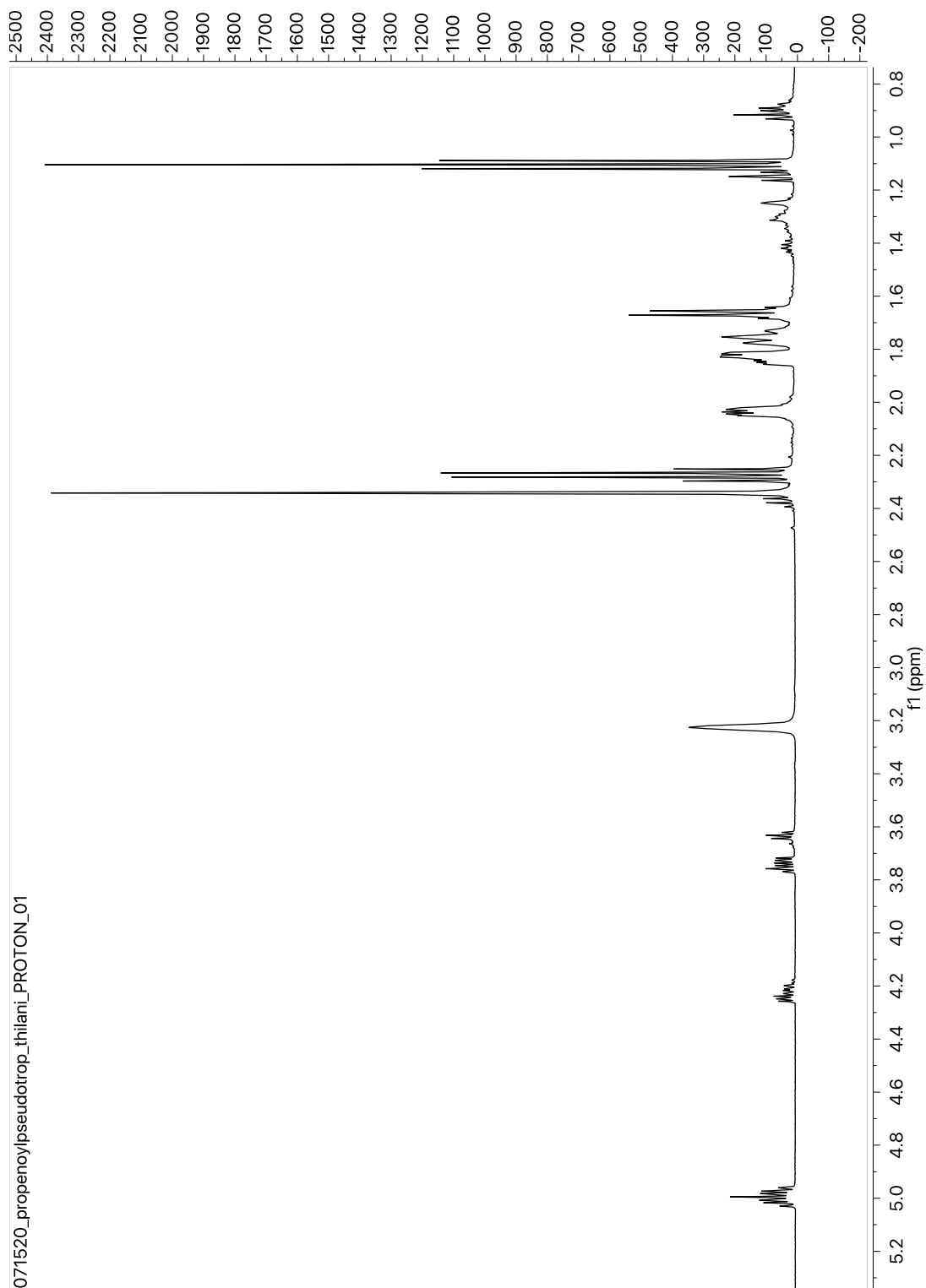


<sup>13</sup>C NMR spectrum for 3-acetyl pseudotropine

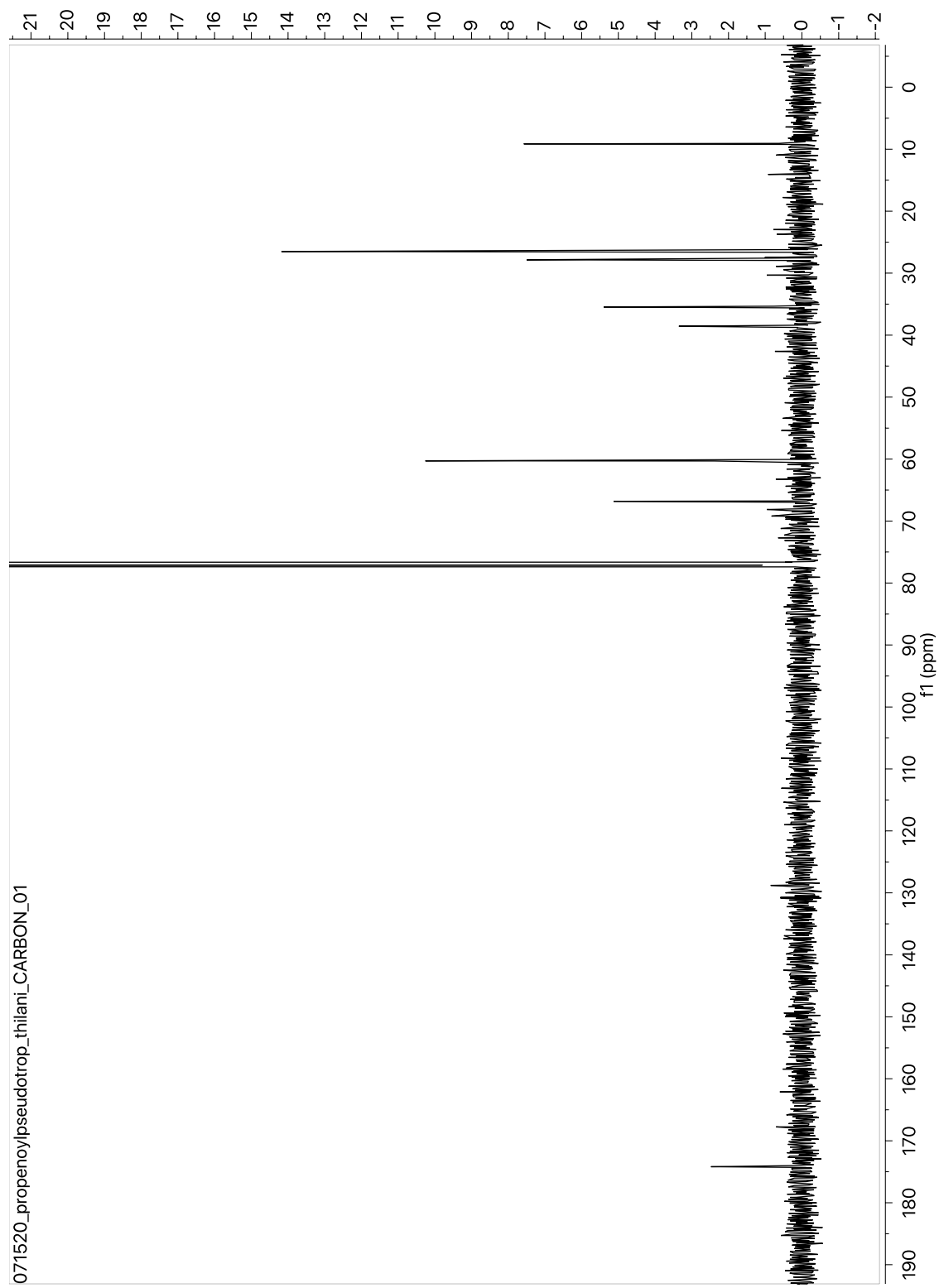
## B. 3-Propionyl pseudotropine

### NMR chemical shifts values for 3-propionyl pseudotropine

|  | <p>8-methyl-8-azabicyclo[3.2.1]octan-3<math>\beta</math>-yl propionate<br/>(3-Propionyl pseudotropine)</p> <p>Chemical Formula: C<sub>11</sub>H<sub>19</sub>NO<sub>2</sub><br/>           Experimental <math>m/z</math> of [M+H]<sup>+</sup>: 198.1494<br/>           Theoretical <math>m/z</math> of [M+H]<sup>+</sup>: 198.14886<br/>           InChI Key: NUFSBXOAMBFLRJ-ILWJIGKKSA-N<br/>           SMILES:<br/> <chem>[H][C@]1(OC(CC)=O)C[C@@H]2CC[C@@H](N2C)C1</chem><br/>           NMR (500 MHz, CDCl<sub>3</sub>) ~2 mg</p> |                                  |
|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| Carbon #<br>(group)                                                               | <sup>1</sup> H (ppm)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <sup>13</sup> C (ppm)            |
| <b>1,5</b> (CH)                                                                   | 3.22 (p, $J$ = 5.0 Hz, 2H)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 60.29                            |
| <b>2,4</b> (CH <sub>2</sub> )                                                     | Axial 1.76 (t, $J$ = 5.0 Hz, 2H)<br>Equatorial 1.83 (dt, $J$ = 16.5, 5.0 Hz, 2H)                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 35.45                            |
| <b>3</b> (CH)<br>- 1 (CO)<br>- 2 (CH <sub>2</sub> )<br>- 2 (CH <sub>3</sub> )     | 4.99 (tt, $J$ = 5.0 Hz, 1H)<br>-<br>2.27 (q, $J$ = 7.6 Hz, 2H)<br>1.10 (t, $J$ = 7.6 Hz, 3H)                                                                                                                                                                                                                                                                                                                                                                                                                                         | 66.81<br>174.18<br>27.85<br>9.17 |
| <b>6,7</b> (CH <sub>2</sub> )                                                     | 1.66 (dd, $J$ = 5.0, 13.5 Hz, 2H), 2.04 (m, $J$ = 13.5 Hz, 2H)                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 26.50                            |
| <b>8</b> N(CH <sub>3</sub> )                                                      | 2.35 (s, 3H)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 38.70                            |

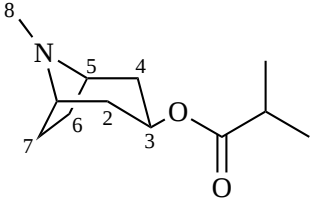


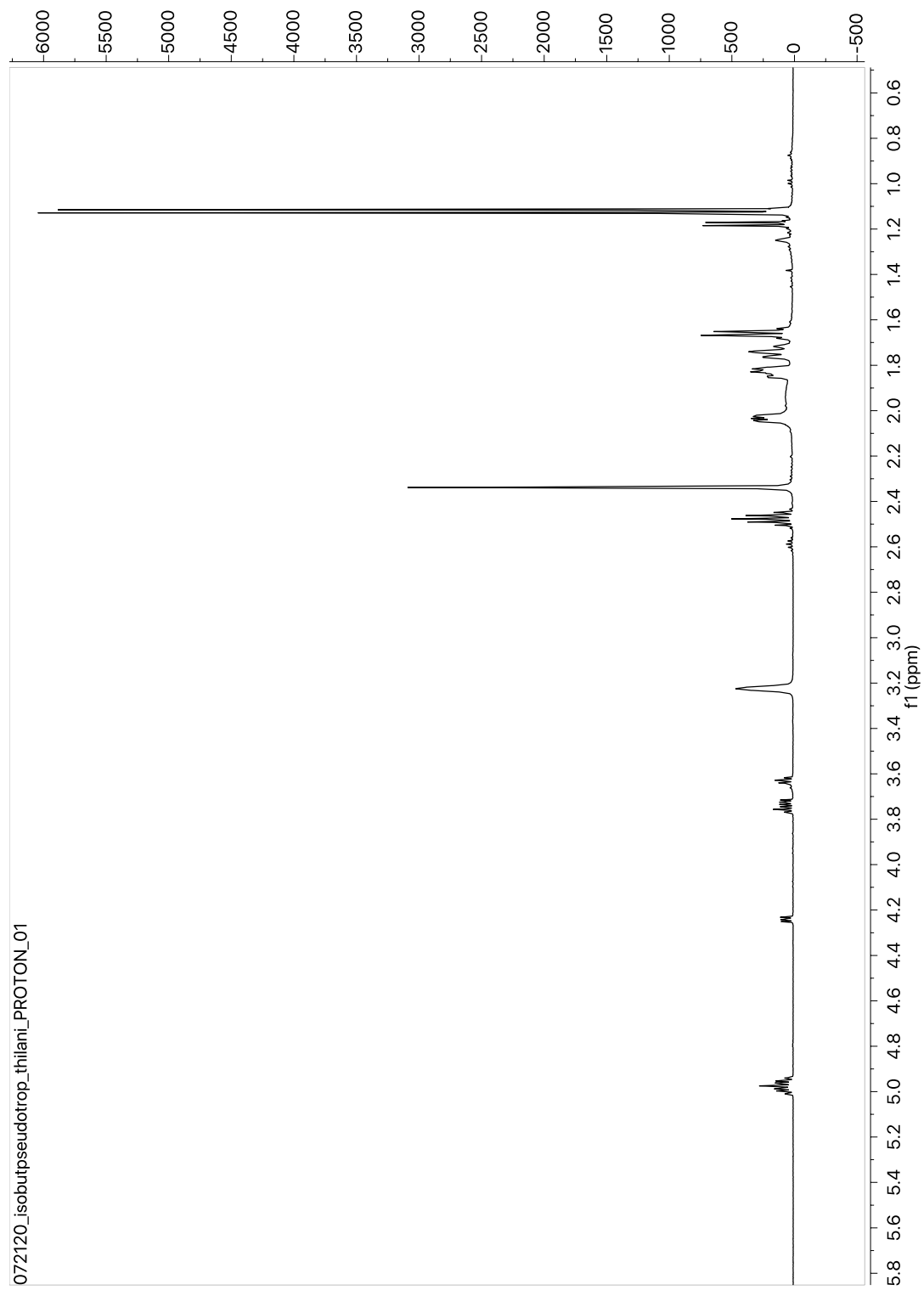
**$^1\text{H}$  NMR spectrum for 3-propionyl pseudotropine**



### C. 3-Isobutyryl pseudotropine

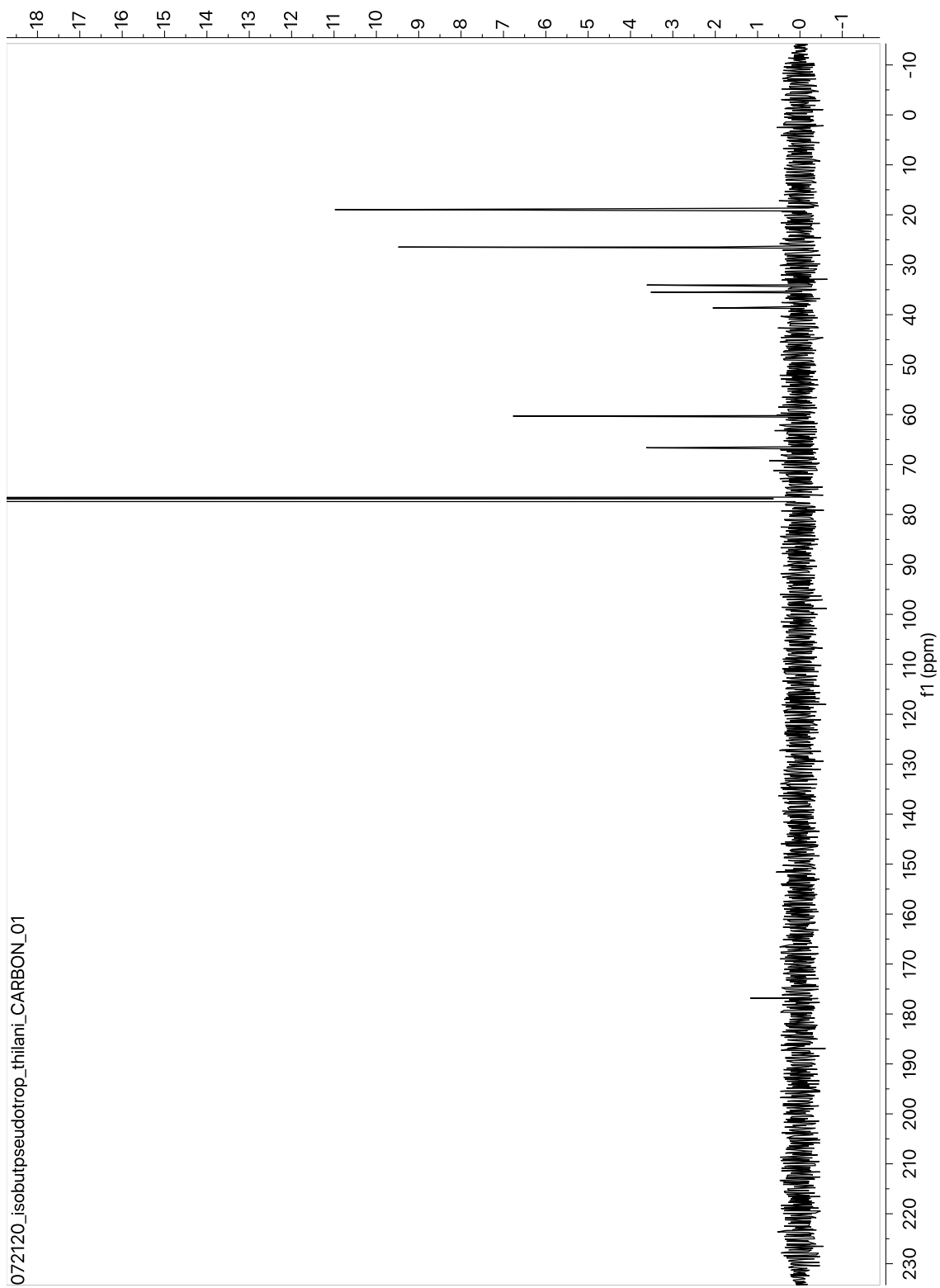
#### NMR chemical shifts values for 3-isobutyryl pseudotropine

|  | <p>8-methyl-8-azabicyclo[3.2.1]octan-3<math>\beta</math>-yl isobutyrate<br/>(3-Isobutyryl pseudotropine)</p> <p>Chemical Formula: C<sub>12</sub>H<sub>21</sub>NO<sub>2</sub><br/>           Experimental <math>m/z</math> of [M+H]<sup>+</sup>: 212.1650<br/>           Theoretical <math>m/z</math> of [M+H]<sup>+</sup>: 212.16451<br/>           InChI Key: UAINLAXRDPKCOO-JGPRNRPPSA-N<br/>           SMILES:<br/> <chem>[H][C@]1(OC(C(C)C)=O)C[C@@H]2CC[C@@H](N2C)C1</chem><br/>           NMR (500 MHz, CDCl<sub>3</sub>) ~2 mg</p> |                                   |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|
| Carbon #<br>(group)                                                               | <sup>1</sup> H (ppm)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <sup>13</sup> C (ppm)             |
| <b>1,5</b> (CH)                                                                   | 3.22 (p, $J$ = 5.2 Hz, 2H)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 60.31                             |
| <b>2,4</b> (CH <sub>2</sub> )                                                     | Axial 1.74 (m, $J$ = 15.2, 5.2 Hz, 2H)<br>Equatorial 1.83 (m, $J$ = 15.2, 5.2 Hz, 2H)                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 35.50                             |
| <b>3</b> (CH)<br>- 1 (CO)<br>- 2 (CH)<br>- 3,4 (CH <sub>3</sub> )                 | 4.97 (tt, $J$ = 10.8, 6.4 Hz, 1H)<br>-<br>2.48 (hept, $J$ = 7.0 Hz, 1H)<br>1.12 (d, $J$ = 7.0 Hz, 6H)                                                                                                                                                                                                                                                                                                                                                                                                                                     | 66.69<br>176.13<br>34.07<br>18.94 |
| <b>6,7</b> (CH <sub>2</sub> )                                                     | 1.66 (m, $J$ = 5.2, 9.5 Hz, 2H), 2.05 (m, $J$ = 9.5 Hz, 2H)                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 26.46                             |
| <b>8</b> N(CH <sub>3</sub> )                                                      | 2.33 (s, 3H)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 40.04                             |



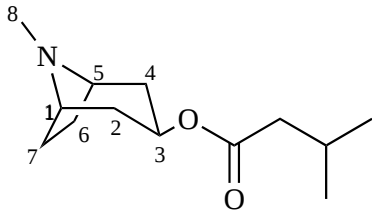
$^1\text{H}$  NMR spectrum for 3-isobutyryl pseudotropine

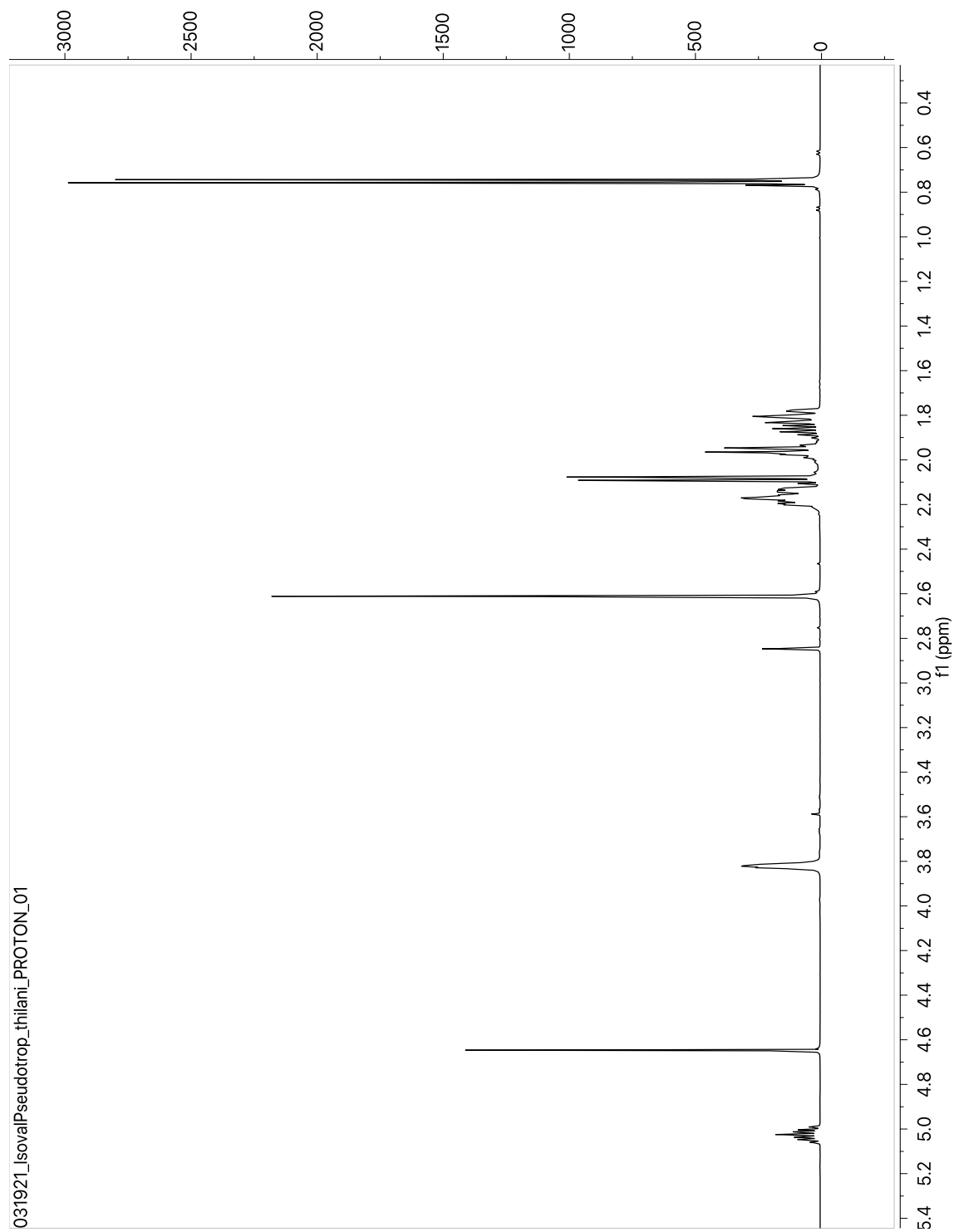
<sup>13</sup>C NMR spectrum for 3-isobutyryl pseudotropine



## D. 3-Isovaleryl pseudotropine

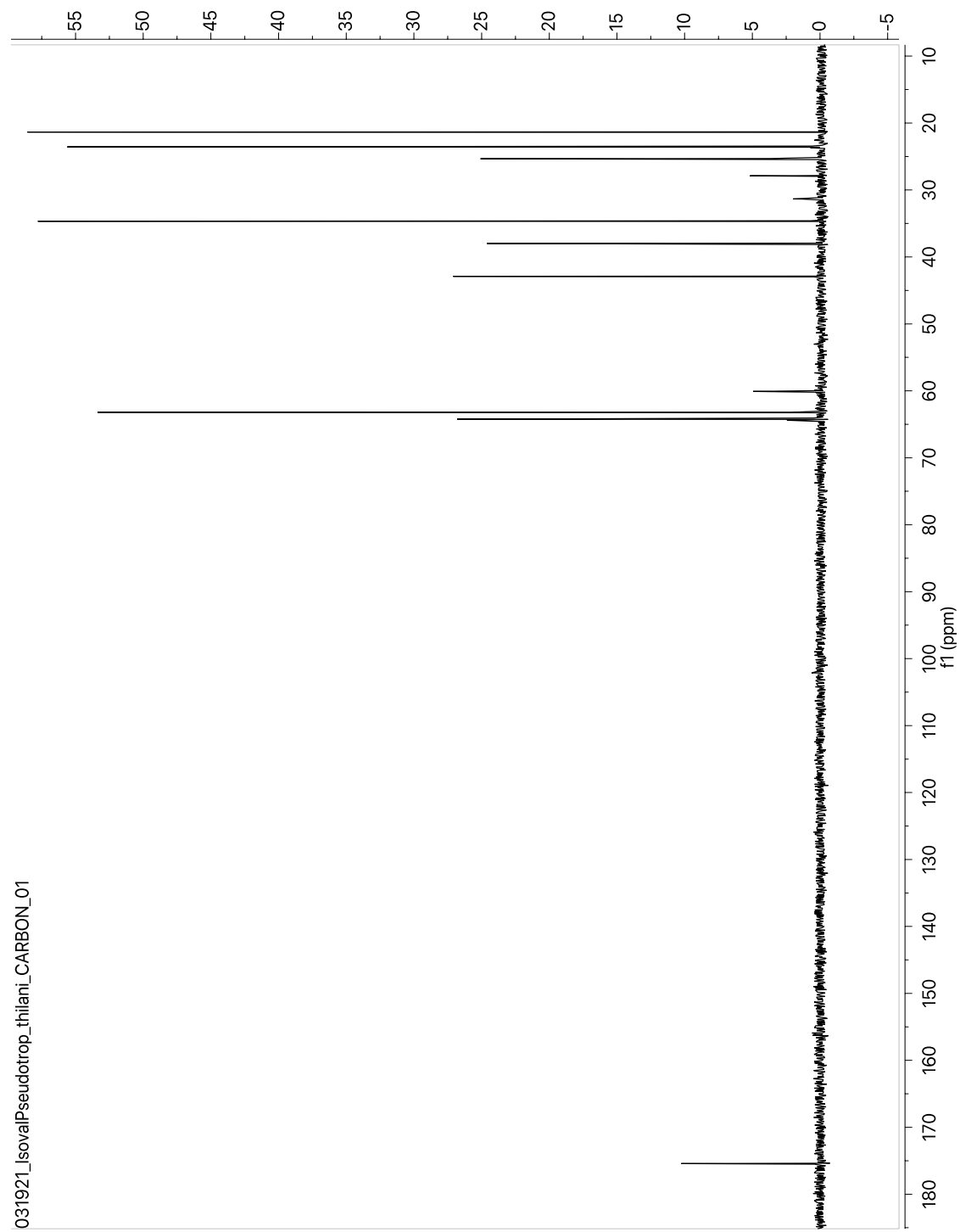
### NMR chemical shifts values for 3-isovaleryl pseudotropine

|            | <p>8-methyl-8-azabicyclo[3.2.1]octan-3β-yl 3-methylbutanoate<br/>(3-Isovaleryl pseudotropine)</p> <p>Chemical Formula: C<sub>13</sub>H<sub>23</sub>NO<sub>2</sub><br/>Experimental <i>m/z</i>: 226.1807<br/>Theoretical <i>m/z</i> of [M+H]<sup>+</sup>: 226.18016<br/>InChI Key: LXXKOLHRNROBTR-ZSBIGDGJSA-N<br/>SMILES:<br/>[H][C@]1(OC(CC(C)C)=O)C[C@@H]2CC[C@@H](N2C)C1<br/>NMR (500 MHz, D<sub>2</sub>O) ~10 mg</p> |                                            |
|---------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| Carbon #<br>(group)                                                                         | <sup>1</sup> H (ppm)                                                                                                                                                                                                                                                                                                                                                                                                     | <sup>13</sup> C (ppm)                      |
| <b>1,5</b> (CH)                                                                             | 3.82 (p, <i>J</i> = 6.2 Hz, 2H)                                                                                                                                                                                                                                                                                                                                                                                          | 63.22                                      |
| <b>2,4</b> (CH <sub>2</sub> )                                                               | Axial 1.81 (m, <i>J</i> = 14.6, 10.9 Hz, 2H)<br>Equatorial 2.15 (m, <i>J</i> = 14.6, 6.2 Hz, 2H)                                                                                                                                                                                                                                                                                                                         | 34.65                                      |
| <b>3</b> (CH)<br>- 1 (CO)<br>- 2 (CH <sub>2</sub> )<br>- 3 (CH)<br>- 4,5 (CH <sub>3</sub> ) | 5.02 (tt, <i>J</i> = 10.9, 6.2 Hz, 1H)<br>-<br>2.09 (d, <i>J</i> = 7.0 Hz, 2H)<br>1.88 (m, <i>J</i> = 7.0 Hz, 1H)<br>0.75 (d, <i>J</i> = 7.0 Hz, 6H)                                                                                                                                                                                                                                                                     | 64.25<br>175.60<br>34.91<br>25.33<br>21.38 |
| <b>6,7</b> (CH <sub>2</sub> )                                                               | 1.95 (m, <i>J</i> = 6.2 Hz, 2H), 2.20 (m, <i>J</i> = 6.2 Hz, 2H)                                                                                                                                                                                                                                                                                                                                                         | 23.56                                      |
| <b>8</b> N(CH <sub>3</sub> )                                                                | 2.61 (s, 3H)                                                                                                                                                                                                                                                                                                                                                                                                             | 37.98                                      |



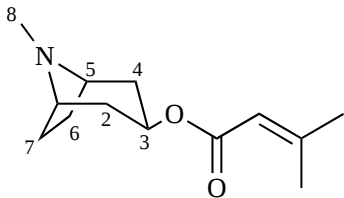
**$^1\text{H}$  NMR spectrum for 3-isovaleryl pseudotropine**

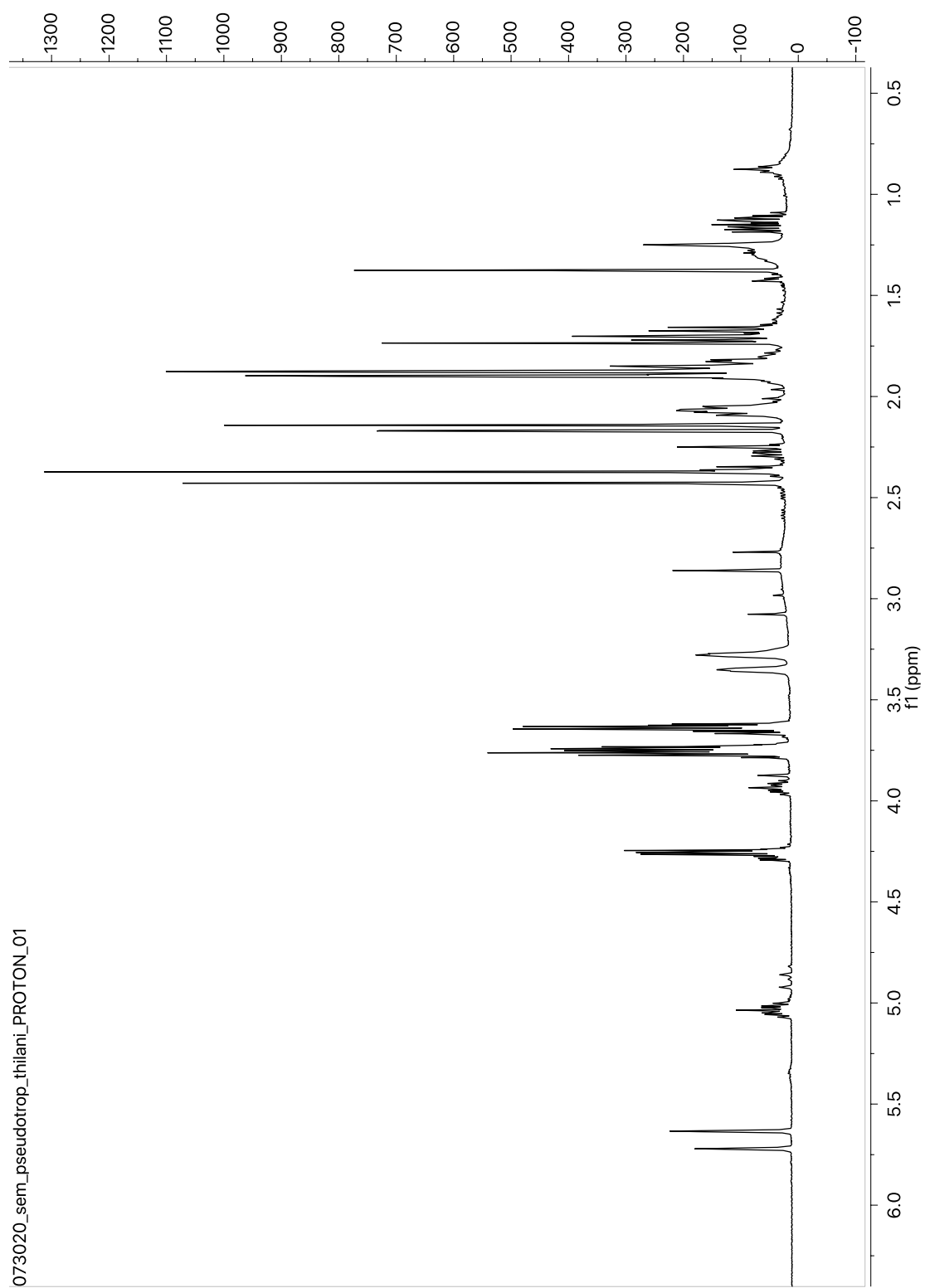
**$^{13}\text{C}$  NMR spectrum for 3-isovaleryl pseudotropine**



## E. 3-Senecieryl pseudotropine

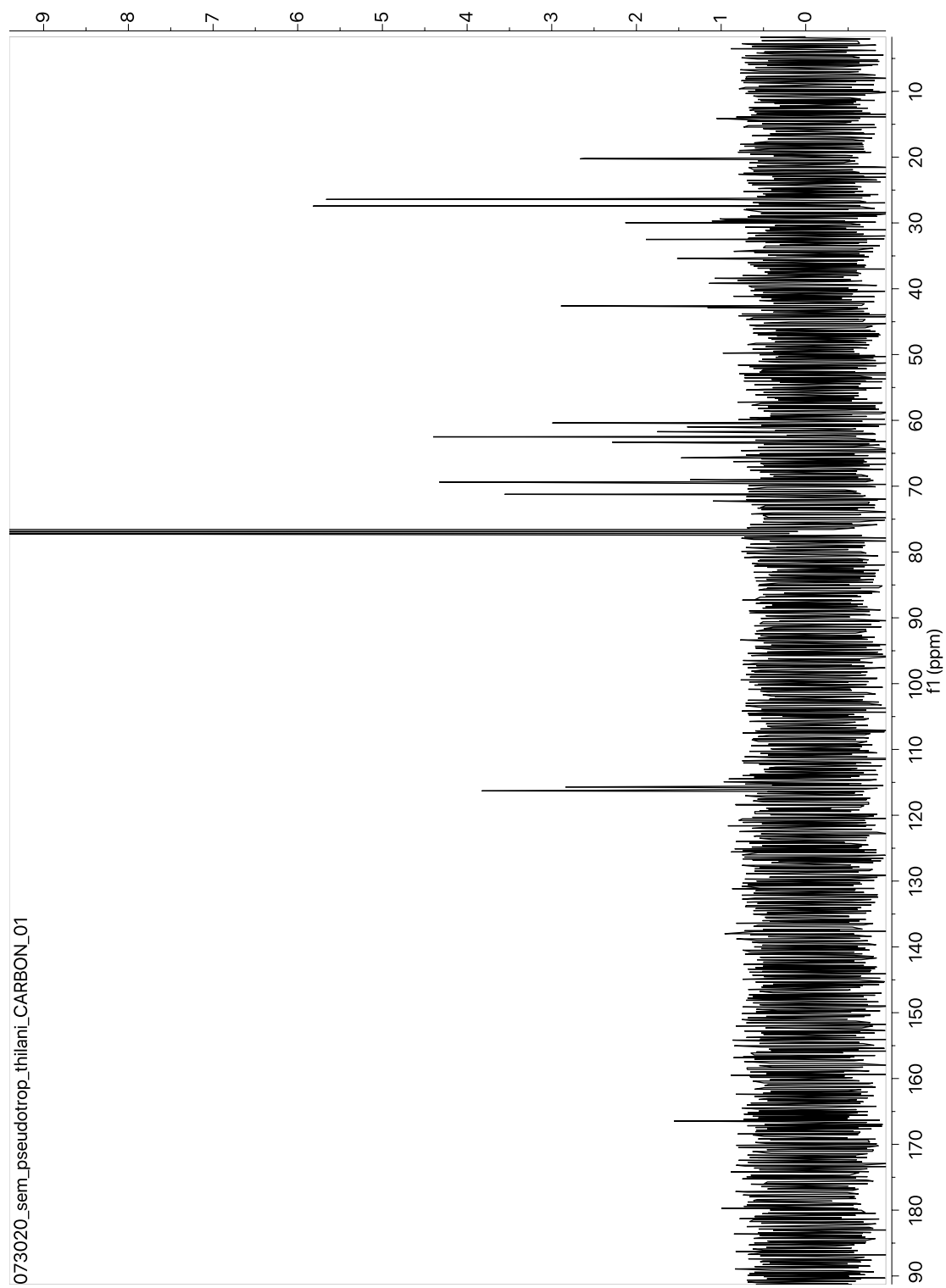
### NMR chemical shift values for 3-senecieryl pseudotropine

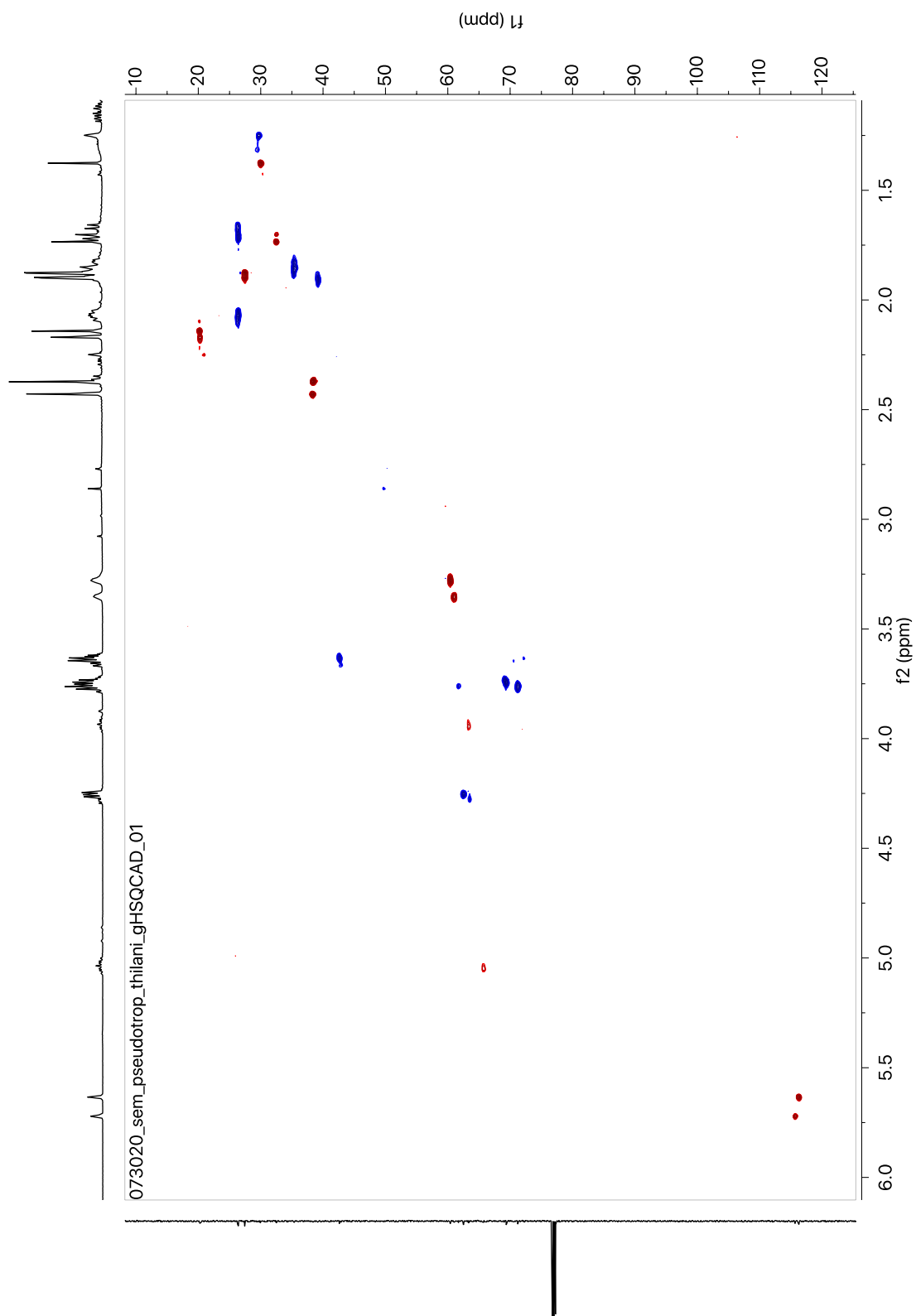
|                  | <p>8-methyl-8-azabicyclo[3.2.1]octan-3<math>\beta</math>-yl 3-methylbut-2-enoate<br/>(3-Senecieryl pseudotropine)</p> <p>Chemical Formula: C<sub>13</sub>H<sub>21</sub>NO<sub>2</sub><br/>           Experimental <i>m/z</i> of [M+H]<sup>+</sup>: 224.1645<br/>           Theoretical <i>m/z</i> of [M+H]<sup>+</sup>: 224.16451<br/>           InChI Key: PFQFRMFXPJMNJJ-ZSBIGDGSJA-N<br/>           SMILES:<br/> <chem>[H][C@]1(OC(=C(C)C)=O)C[C@@H]2CC[C@@H](N2C)C1</chem><br/>           NMR (500 MHz, CDCl<sub>3</sub>) ~2 mg</p> |                                                                    |
|---------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|
| Carbon #<br>(group)                                                                               | <sup>1</sup> H (ppm)<br><sup>a</sup> from HSQC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <sup>13</sup> C (ppm)<br><sup>b</sup> from HMBC                    |
| <b>1,5</b> (CH)                                                                                   | 3.26 (m, <i>J</i> = 5.2 Hz, 2H)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 60.39                                                              |
| <b>2,4</b> (CH <sub>2</sub> )                                                                     | Axial 1.83 <sup>a</sup> (m, <i>J</i> = 5.5, 11.4 Hz, 2H)<br>Equatorial 1.88 <sup>a</sup> (m, <i>J</i> = 5.2, 11.4 Hz, 2H)                                                                                                                                                                                                                                                                                                                                                                                                               | 35.40                                                              |
| <b>3</b> (CH)<br>- 1 (CO)<br>- 2 (CH)<br>- 3(C)<br>- 4(CH <sub>3</sub> )<br>- 5(CH <sub>3</sub> ) | 5.04 (t, <i>J</i> = 5.4 Hz, 1H)<br>-<br>5.64 (hept, <i>J</i> = 1.3 Hz, 1H)<br>-<br>2.17 (m, <i>J</i> = 2.6, 1.3 Hz, 3H)<br>1.90 (m, <i>J</i> = 12.6, 1.3 Hz, 3H)                                                                                                                                                                                                                                                                                                                                                                        | 65.71<br>166.47<br>116.30<br>156.70 <sup>b</sup><br>20.16<br>27.43 |
| <b>6,7</b> (CH <sub>2</sub> )                                                                     | 1.68 (m, <i>J</i> = 5.2 Hz, 2H), 2.06 (m, <i>J</i> = 11.9, 5.2 Hz, 2H)                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 26.34                                                              |
| <b>8</b> N(CH <sub>3</sub> )                                                                      | 2.37 (s, 3H)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 38.44                                                              |



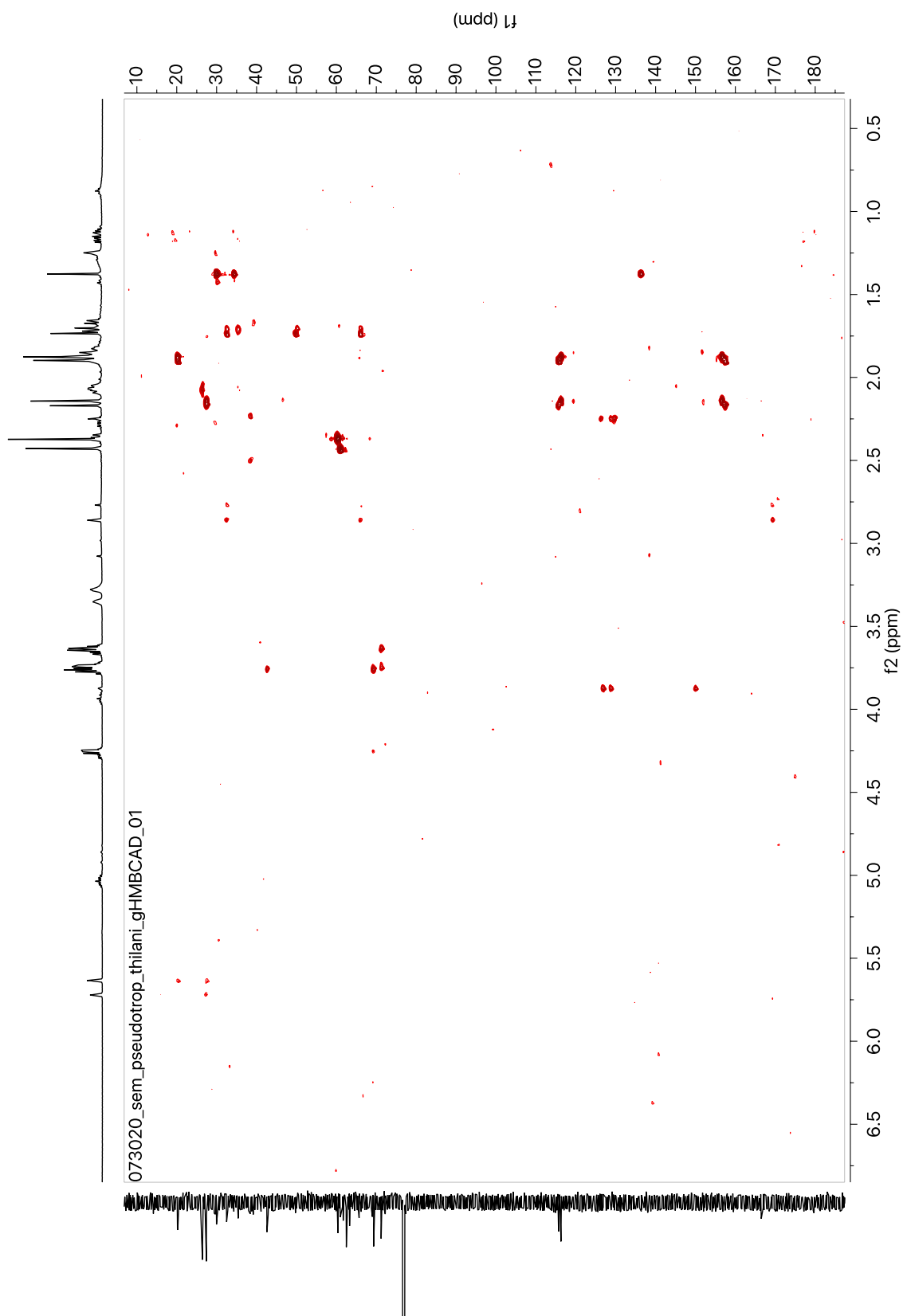
$^1\text{H}$  NMR spectrum for 3-senecioid pseudotropine

<sup>13</sup>C NMR spectrum for 3-senecioid pseudotropine





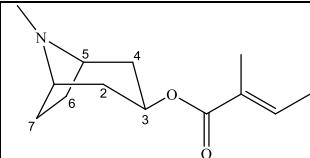
gHSQCAD spectrum for 3-senecioid pseudotropine

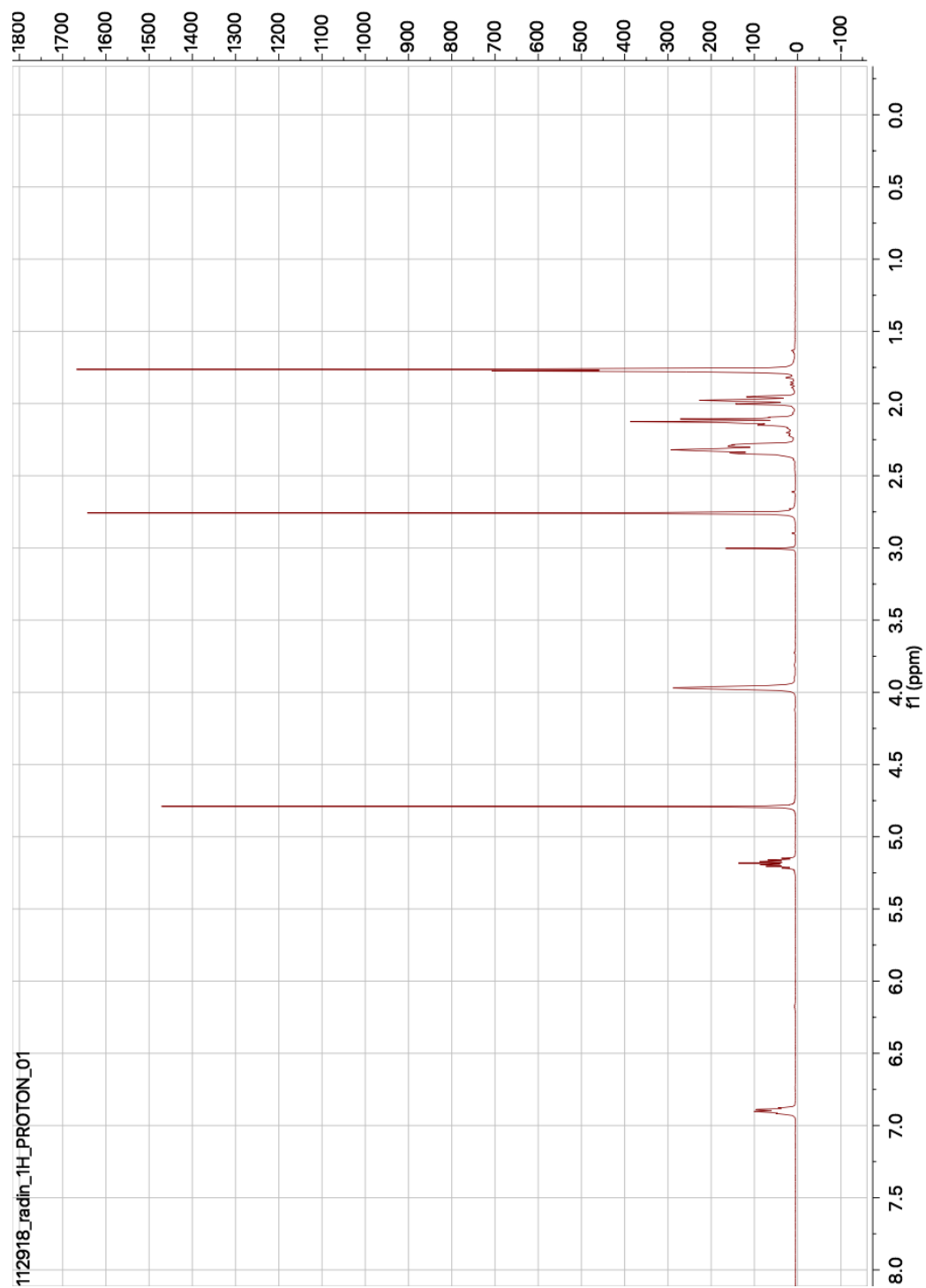


gHMBCAD spectrum for 3-senecieryl pseudotropine

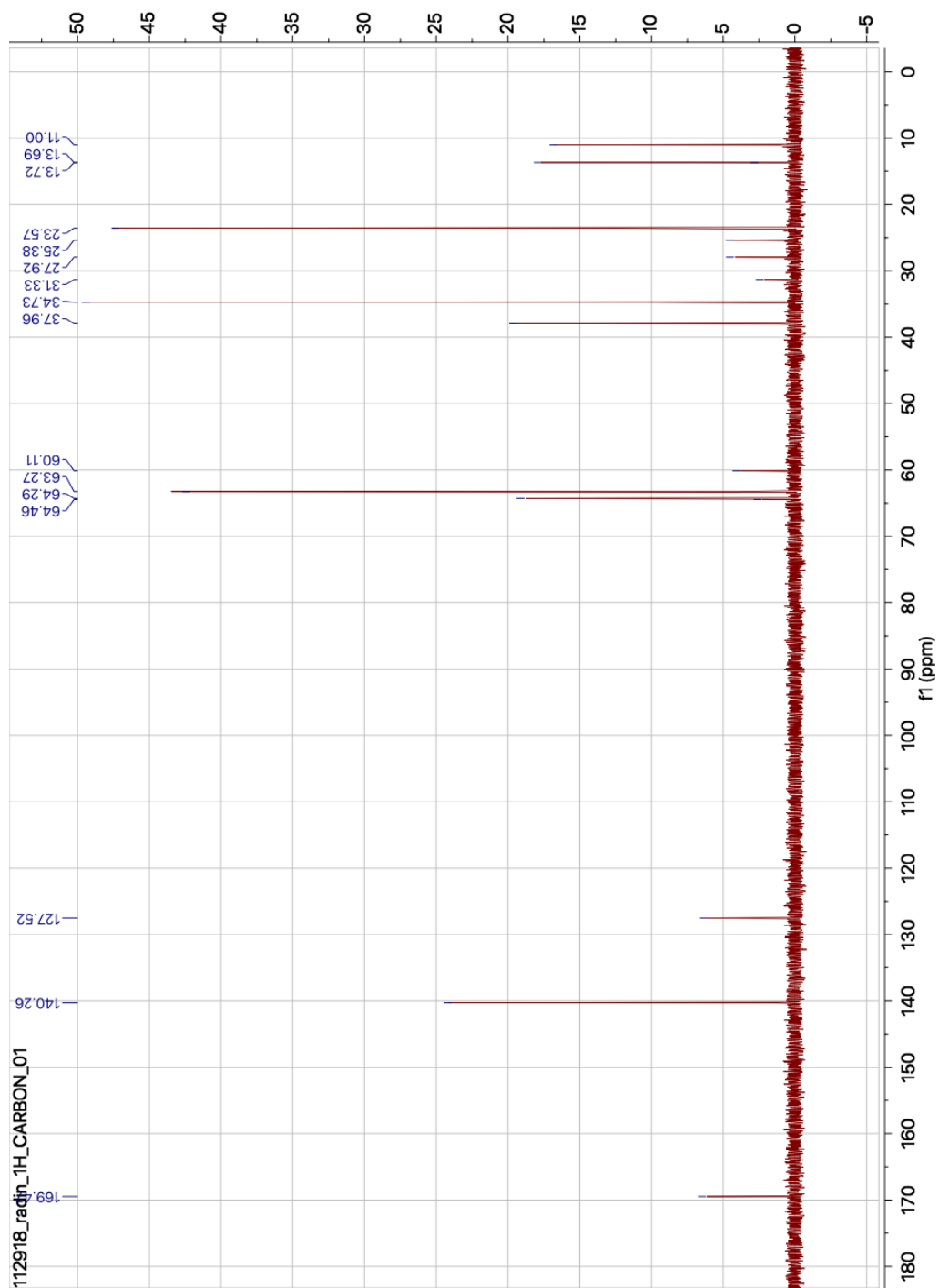
## F. 3-Tigloyl pseudotropine

### NMR chemical shift values for 3-tigloyl pseudotropine

|                     | <p>8-methyl-8-azabicyclo[3.2.1]octan-3<math>\beta</math>-yl (<i>E</i>)-2-methylbut-2-enoate<br/>(3-Tigloyl pseudotropine)</p> <p>Chemical Formula: C<sub>13</sub>H<sub>21</sub>NO<sub>2</sub><br/>Experimental <i>m/z</i> of [M+H]<sup>+</sup>: 224.1659<br/>Theoretical <i>m/z</i> of [M+H]<sup>+</sup>: 224.16451<br/>InChI Key: UVHGSMZRSVGWDJ-WJKWMCMVSA-N<br/>SMILES:<br/><chem>[H][C@]1(OC(/C(C)=C/C)=O)C[C@@H]2CC[C@@H](N2C)C1</chem><br/>NMR (500 MHz, D<sub>2</sub>O) ~2 mg</p> |                                                       |
|------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|
| Carbon #<br>(group)                                                                                  | <sup>1</sup> H (ppm)                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <sup>13</sup> C (ppm)                                 |
| <b>1,5</b> (CH)                                                                                      | 3.97 (m, 2H)                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 63.27                                                 |
| <b>2,4</b> (CH <sub>2</sub> )                                                                        | Axial 1.98 (ddd, J = 14.1, 10.9, 2.8 Hz, 2H)<br>Equatorial 2.32 (m, 2H)                                                                                                                                                                                                                                                                                                                                                                                                                  | 34.73                                                 |
| <b>3</b> (CH)<br>- 1 (CO)<br>- 2 (C)<br>- 3 (CH <sub>3</sub> )<br>- 4 (CH)<br>- 5 (CH <sub>3</sub> ) | 5.18 (tt, J = 11.2, 6.2 Hz, 1H)<br>-<br>-<br>1.77 (d, J = 6.3 Hz, 3H)<br>6.90 (m, 1H)<br>1.77 (d, J = 6.3 Hz, 3H)                                                                                                                                                                                                                                                                                                                                                                        | 64.29<br>169.47<br>127.52<br>11.00<br>140.26<br>13.69 |
| <b>6,7</b> (CH <sub>2</sub> )                                                                        | 2.32 (tq, J = 14.9, 5.9, 4.5 Hz, 2H), 2.13 (m, 2H)                                                                                                                                                                                                                                                                                                                                                                                                                                       | 23.57                                                 |
| <b>8</b> N(CH <sub>3</sub> )                                                                         | 2.76 (s, 3H)                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 37.96                                                 |



$^1\text{H}$  NMR spectrum for 3-tigloyl pseudotropine

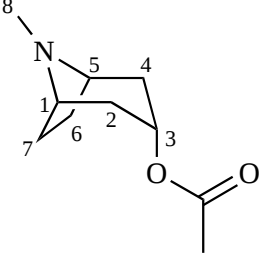


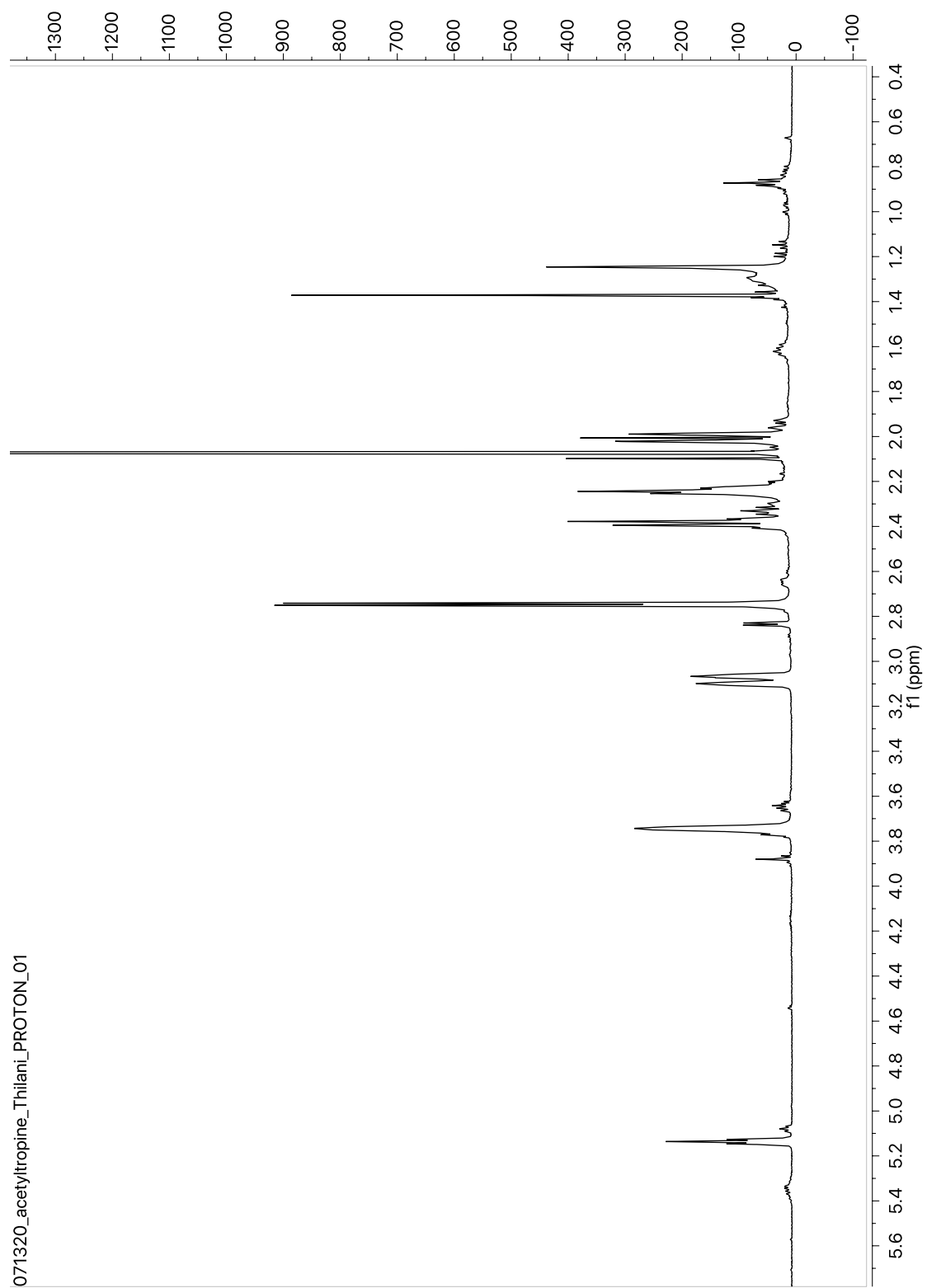
$^{13}\text{C}$  NMR spectrum for 3-tigloyl pseudotropine

## O-ACYL TROPINE

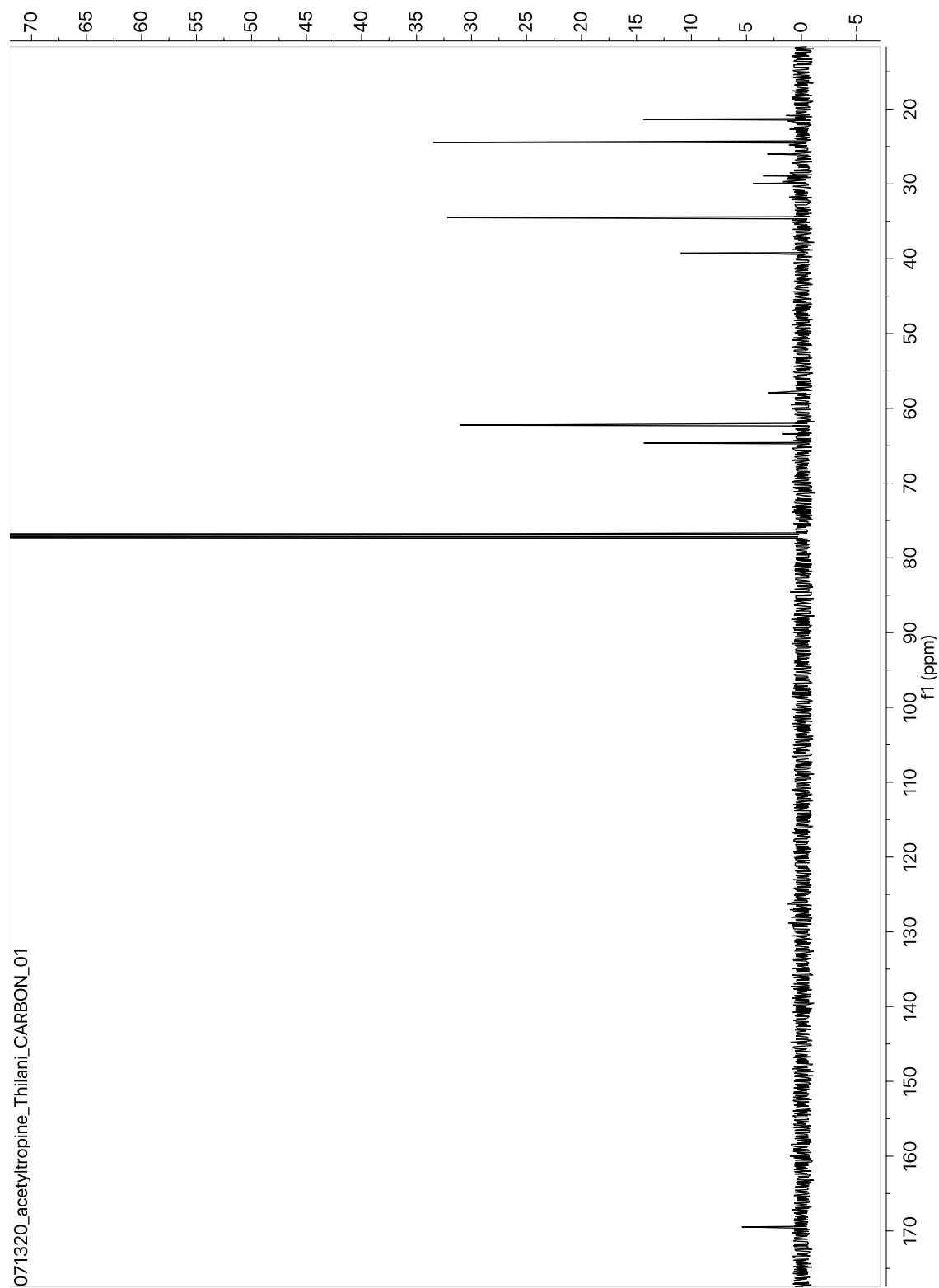
### G. 3-Acetyl tropine

#### NMR chemical shifts values for 3-acetyl tropine

|  | <p style="text-align: center;">8-methyl-8-azabicyclo[3.2.1]octan-3<math>\alpha</math>-yl acetate<br/>(3-Acetyl tropine)</p> <p style="text-align: center;">Chemical Formula: C<sub>10</sub>H<sub>17</sub>NO<sub>2</sub><br/>           Experimental <math>m/z</math> of [M+H]<sup>+</sup>: 184.1333<br/>           Theoretical <math>m/z</math> of [M+H]<sup>+</sup>: 184.13321<br/>           InChI Key: MDIDMOWWLBGYPG-MYJAWHEDSA-N<br/>           SMILES:<br/> <chem>[H][C@@]1(OC(C)=O)C[C@@H]2CC[C@@H](N2C)C1</chem><br/>           NMR (500 MHz, D<sub>2</sub>O) ~2 mg</p> |                          |
|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| Carbon #<br>(group)                                                               | <sup>1</sup> H (ppm)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <sup>13</sup> C (ppm)    |
| <b>1,5</b> (CH)                                                                   | 3.74 (m, $J$ = 5.0 Hz, 2H)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 62.24                    |
| <b>2,4</b> (CH <sub>2</sub> )                                                     | Axial 1.98 (dd, $J$ = 16.5, 4.9 Hz, 2H)<br>Equatorial 3.08 (dt, $J$ = 16.5, 4.9 Hz, 2H)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 34.57                    |
| <b>3</b> (CH)<br>- 1 (CO)<br>- 2 (CH <sub>3</sub> )                               | 5.14 (t, $J$ = 4.9 Hz, 1H)<br>-<br>2.07 (s, 3H)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 64.65<br>169.47<br>21.36 |
| <b>6,7</b> (CH <sub>2</sub> )                                                     | 2.24 (dd, $J$ = 7.4, 5.0 Hz, 2H), 2.39 (d, $J$ = 7.4 Hz, 2H)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 24.44                    |
| <b>8</b> N(CH <sub>3</sub> )                                                      | 2.75 (d, $J$ = 5.0 Hz, 3H)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 39.26                    |



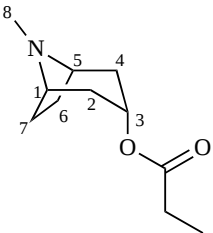
$^1\text{H}$  NMR spectrum for 3-acetyl tropine

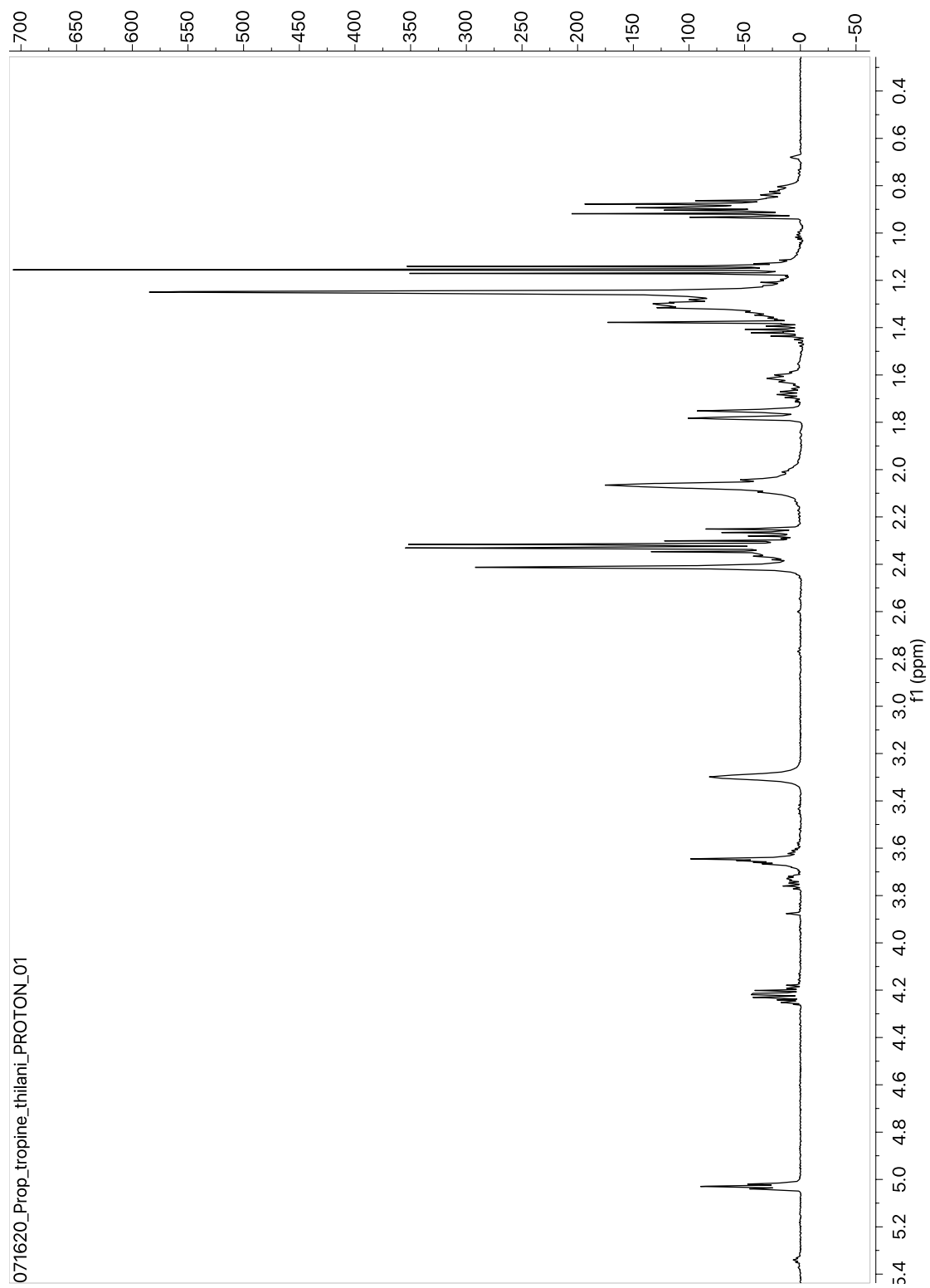


$^{13}\text{C}$  NMR spectrum for 3-acetyl tropine

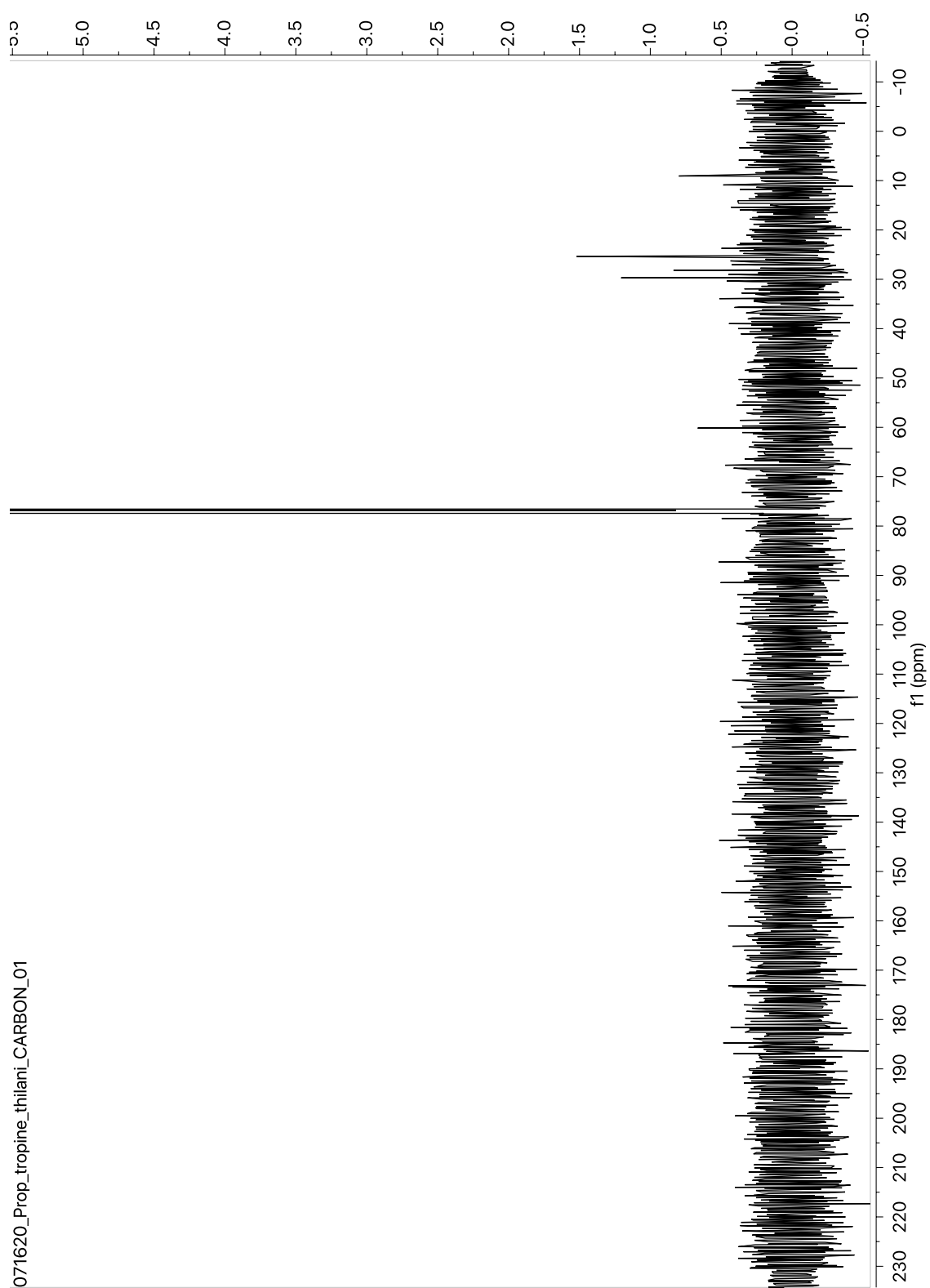
## H. 3-Propionyl tropine

### NMR chemical shifts values for 3-propionyl tropine

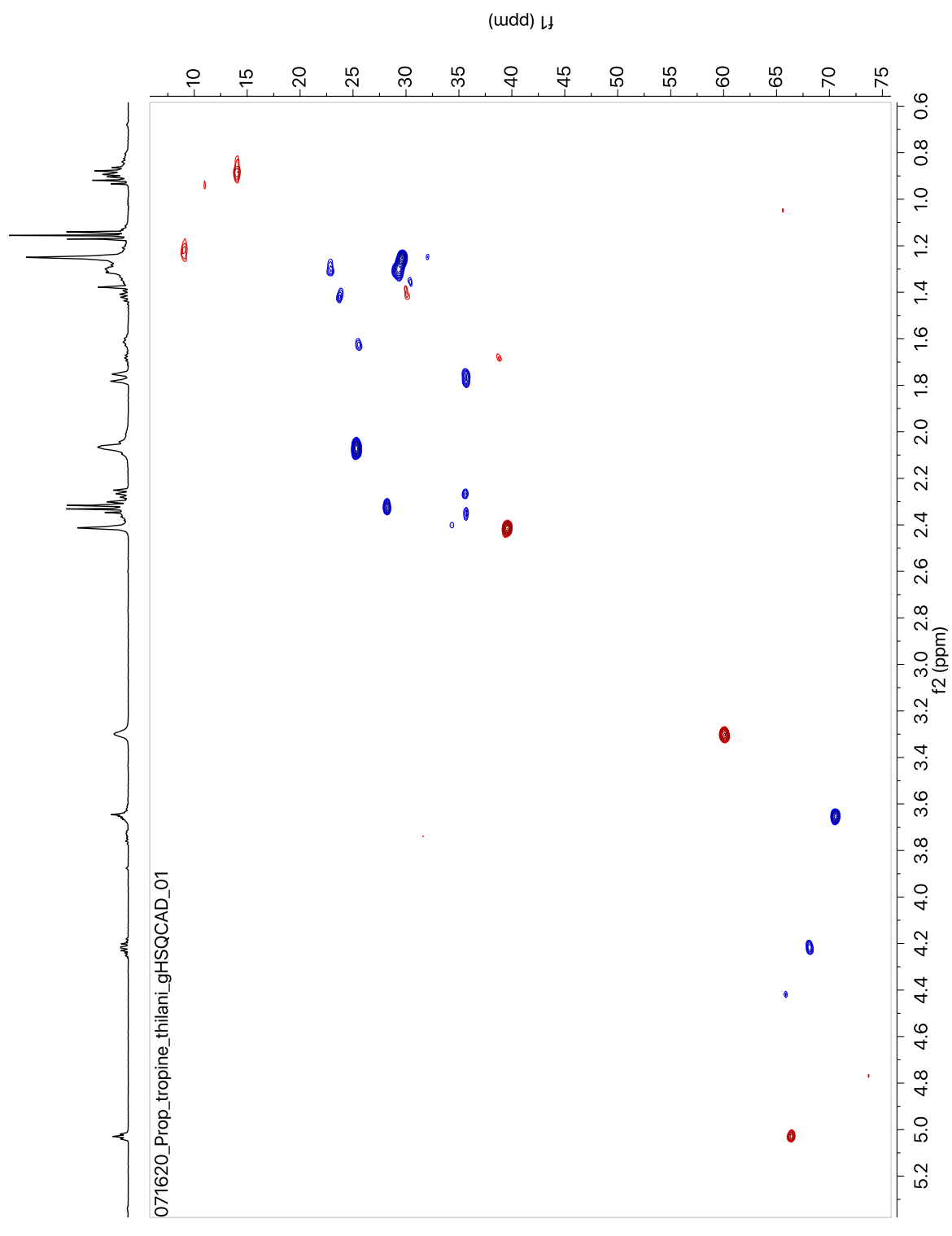
|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                        |  |
|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|--|
|  | <p>8-methyl-8-azabicyclo[3.2.1]octan-3<math>\alpha</math>-yl propionate<br/>(3-Propionyl tropine)</p> <p>Chemical Formula: C<sub>11</sub>H<sub>19</sub>NO<sub>2</sub><br/>Experimental <math>m/z</math> of [M+H]<sup>+</sup>: 198.1493<br/>Theoretical <math>m/z</math> of [M+H]<sup>+</sup>: 198.14886<br/>InChI Key: NUFSBXOAMBFLRJ-MYJAWHEDSA-N<br/>SMILES:<br/><chem>[H][C@@]1(OC(CC)=O)C[C@@H]2CC[C@@H](N2C)C1</chem><br/>NMR (500 MHz, CDCl<sub>3</sub>) ~2 mg</p> |                                                        |  |
| <b>Carbon #<br/>(group)</b>                                                       | <b><sup>1</sup>H (ppm)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b><sup>13</sup>C (ppm)<br/>From HMBC<br/>and HSQC</b> |  |
| <b>1,5</b> (CH)                                                                   | 3.30 (m, $J$ = 5.3 Hz, 2H)                                                                                                                                                                                                                                                                                                                                                                                                                                               | 60.11                                                  |  |
| <b>2,4</b> (CH <sub>2</sub> )                                                     | Axial 1.76 (d, $J$ = 15.2 Hz, 2H)<br>Equatorial 1.83 (dt, $J$ = 15.2, 5.6 Hz, 2H)                                                                                                                                                                                                                                                                                                                                                                                        | 35.71                                                  |  |
| <b>3</b> (CH)<br>- 1 (CO)<br>- 2 (CH <sub>2</sub> )<br>- 2 (CH <sub>3</sub> )     | 5.03 (t, $J$ = 5.3 Hz, 1H)<br>-<br>2.32 (q, $J$ = 7.6 Hz, 2H)<br>1.16 (t, $J$ = 7.6 Hz, 3H)                                                                                                                                                                                                                                                                                                                                                                              | 66.38<br>173.83<br>28.20<br>9.23                       |  |
| <b>6,7</b> (CH <sub>2</sub> )                                                     | 1.64 (m, $J$ = 5.3 Hz, 2H), 2.07 (m, $J$ = 5.3 Hz, 2H)                                                                                                                                                                                                                                                                                                                                                                                                                   | 26.50                                                  |  |
| <b>8</b> N(CH <sub>3</sub> )                                                      | 2.41 (s, 3H)                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 39.57                                                  |  |



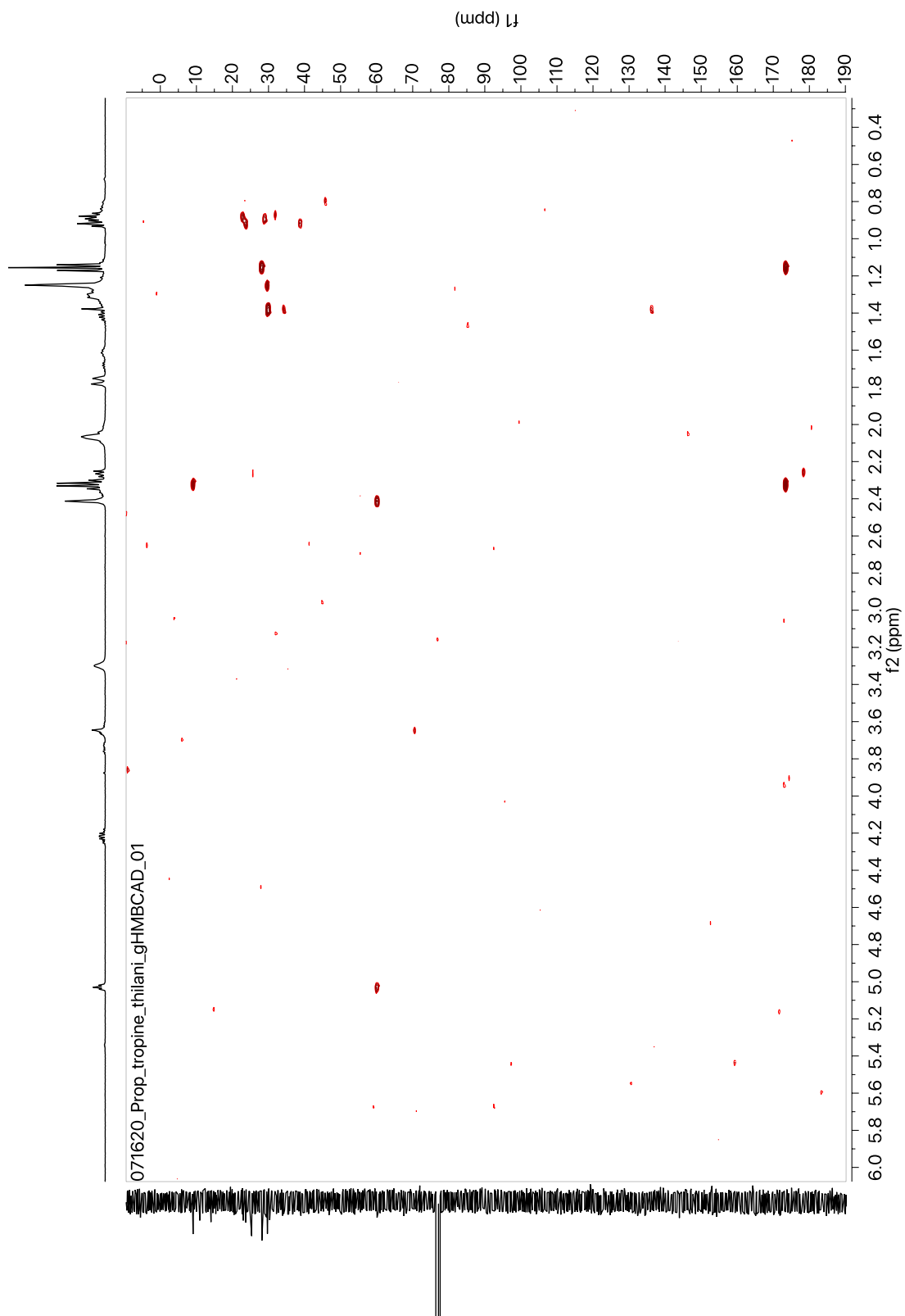
$^1\text{H}$  NMR spectrum for 3-propionyl tropine



$^{13}\text{C}$  NMR spectrum for 3-propionyl tropine



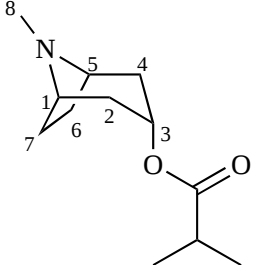
gHSQCAD NMR spectrum for 3-propionyl tropine

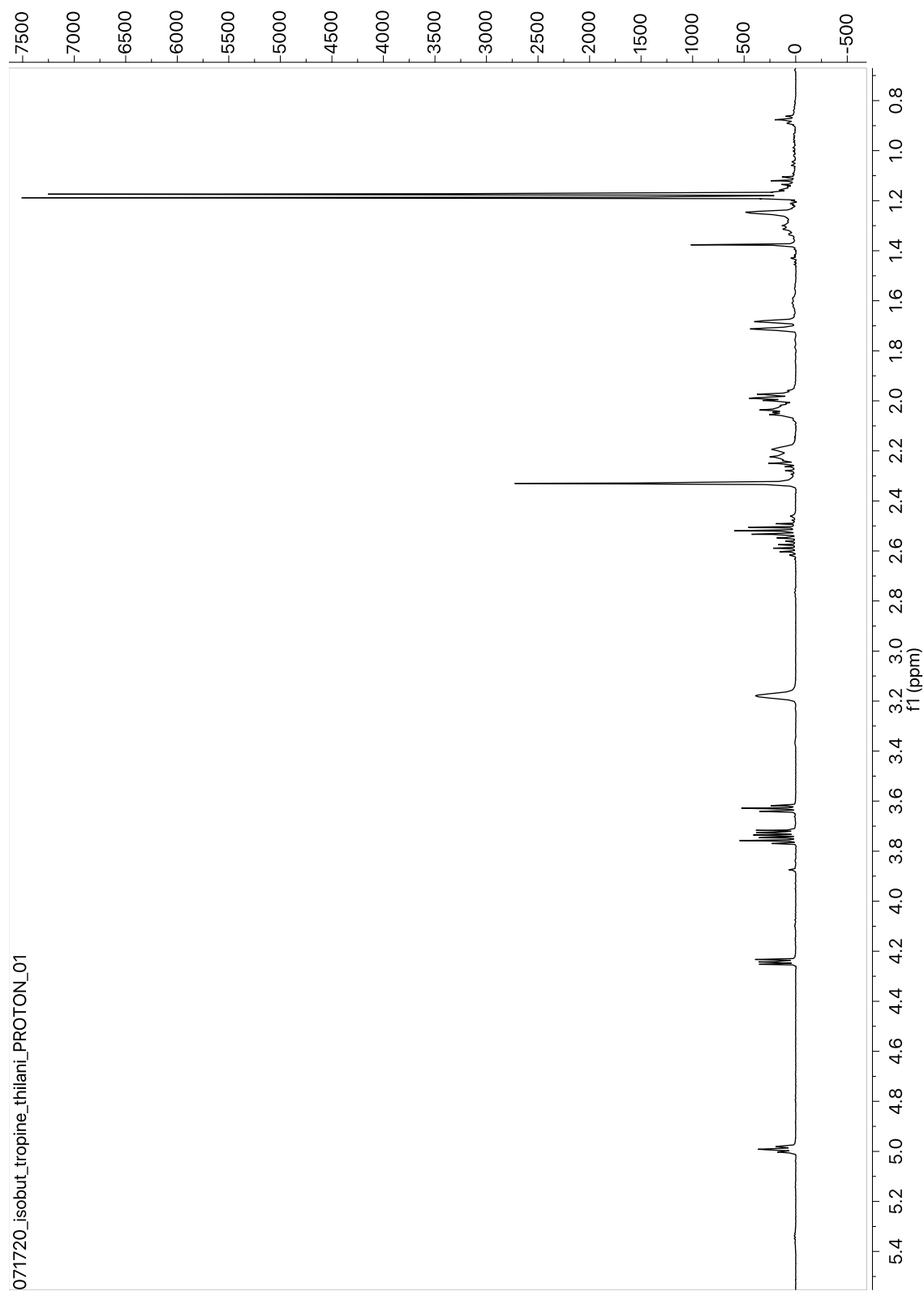


gHMBCAD NMR spectrum for 3-propionyl tropine

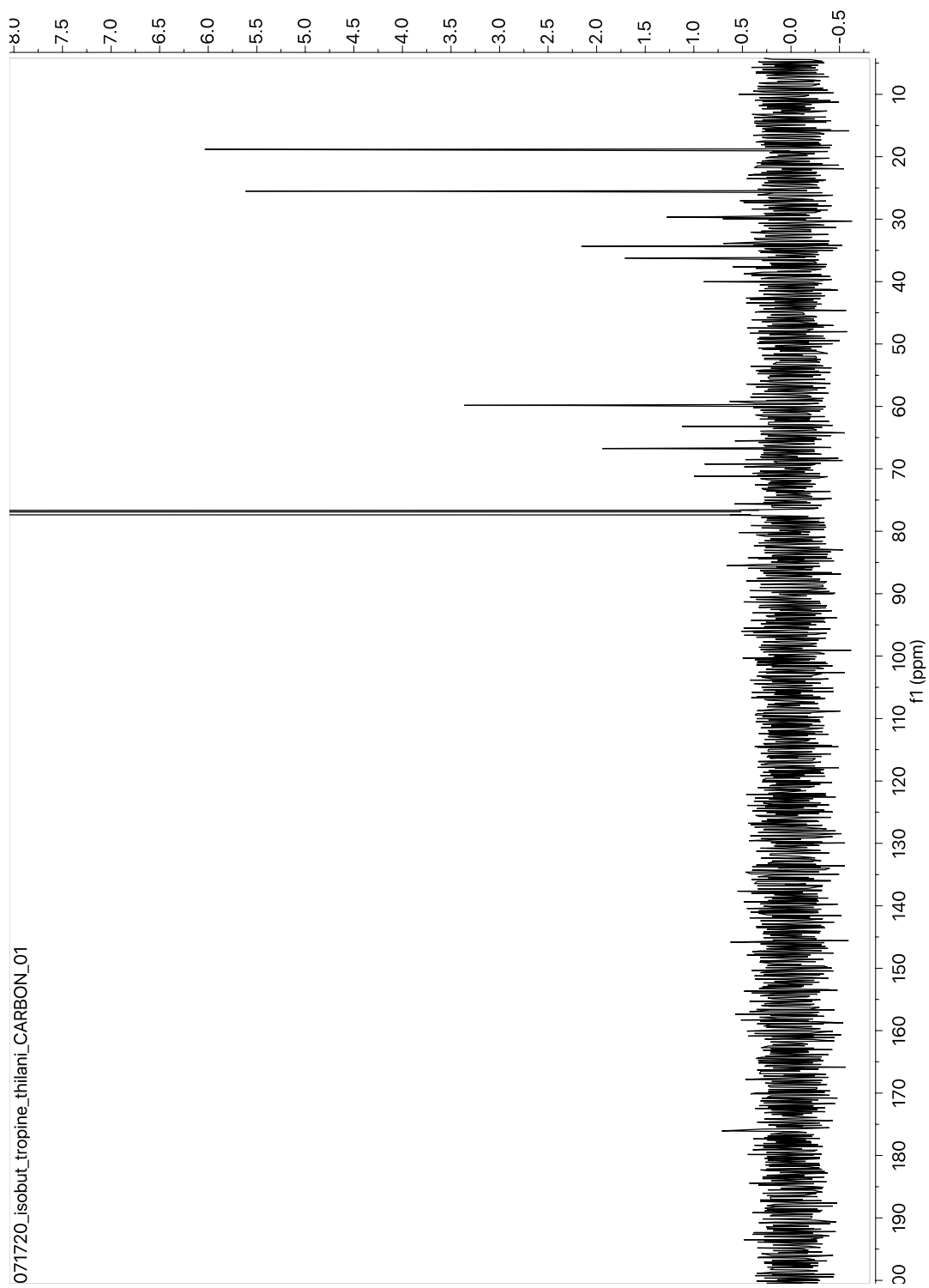
# I. 3-Isobutyryl tropine

## NMR chemical shift values for 3-isobutyryl tropine

|  | <p>8-methyl-8-azabicyclo[3.2.1]octan-3<math>\alpha</math>-yl isobutyrate<br/>(3-Isobutyryl tropine)</p> <p>Chemical Formula: C<sub>12</sub>H<sub>21</sub>NO<sub>2</sub><br/> Experimental <math>m/z</math> of [M+H]<sup>+</sup>: 212.1648<br/> Theoretical <math>m/z</math> of [M+H]<sup>+</sup>: 212.16451<br/> InChI Key: UAINLAXRDPKCOO-URLYPYJESA-N<br/> SMILES:<br/> [H][C@@]1(OC(C(C)C)=O)C[C@@H]2CC[C@@H](N2C)C1<br/> NMR (500 MHz, CDCl<sub>3</sub>) ~2 mg</p> |                                   |
|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|
| Carbon #<br>(group)                                                               | <sup>1</sup> H (ppm)                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <sup>13</sup> C (ppm)             |
| <b>1,5</b> (CH)                                                                   | 3.18 (m, $J$ = 5.2 Hz, 2H)                                                                                                                                                                                                                                                                                                                                                                                                                                             | 59.83                             |
| <b>2,4</b> (CH <sub>2</sub> )                                                     | Axial 1.71 (d, $J$ = 15.2 Hz, 2H)<br>Equatorial 2.23 (m, $J$ = 15.2, 5.6 Hz, 2H)                                                                                                                                                                                                                                                                                                                                                                                       | 36.25                             |
| <b>3</b> (CH)<br>- 1 (CO)<br>- 2 (CH)<br>- 3,4 (CH <sub>3</sub> )                 | 4.99 (t, $J$ = 5.5 Hz, 1H)<br>-<br>2.51 (hept, $J$ = 7.0 Hz, 1H)<br>1.18 (d, $J$ = 7.0 Hz, 6H)                                                                                                                                                                                                                                                                                                                                                                         | 66.72<br>176.13<br>34.36<br>18.87 |
| <b>6,7</b> (CH <sub>2</sub> )                                                     | 1.99 (m, $J$ = 5.2, 9.5 Hz, 2H), 2.04 (m, $J$ = 5.2 Hz, 2H)                                                                                                                                                                                                                                                                                                                                                                                                            | 25.49                             |
| <b>8</b> N(CH <sub>3</sub> )                                                      | 2.33 (s, 3H)                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 40.04                             |



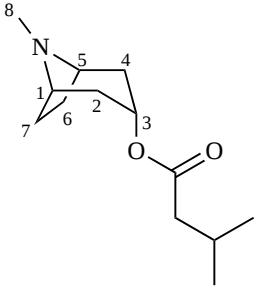
**$^1\text{H}$  NMR spectrum for 3-isobutyryl tropine**

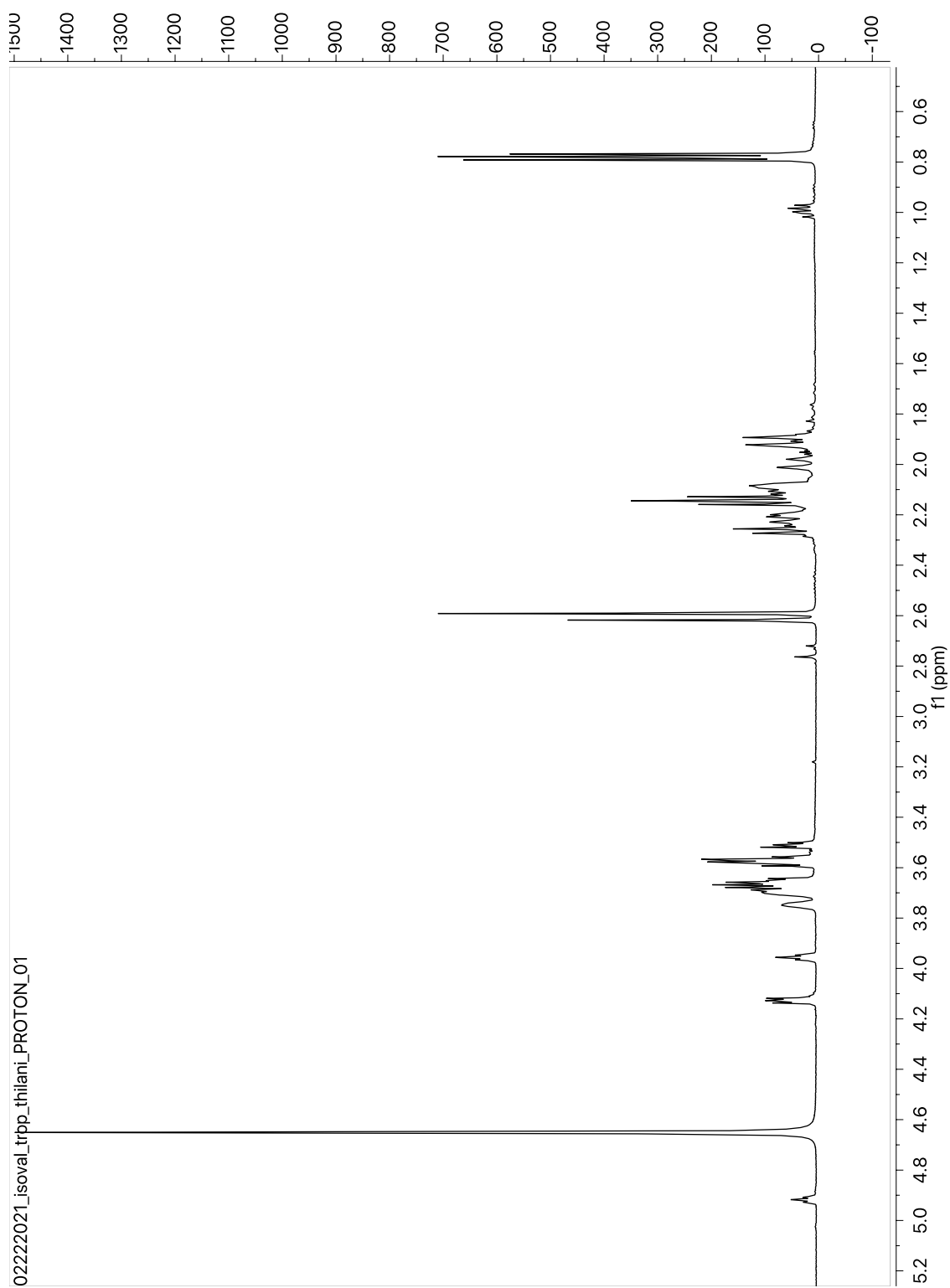


$^{13}\text{C}$  NMR spectrum for 3-isobutyryl tropine

### J. 3-Isovaleryl tropine

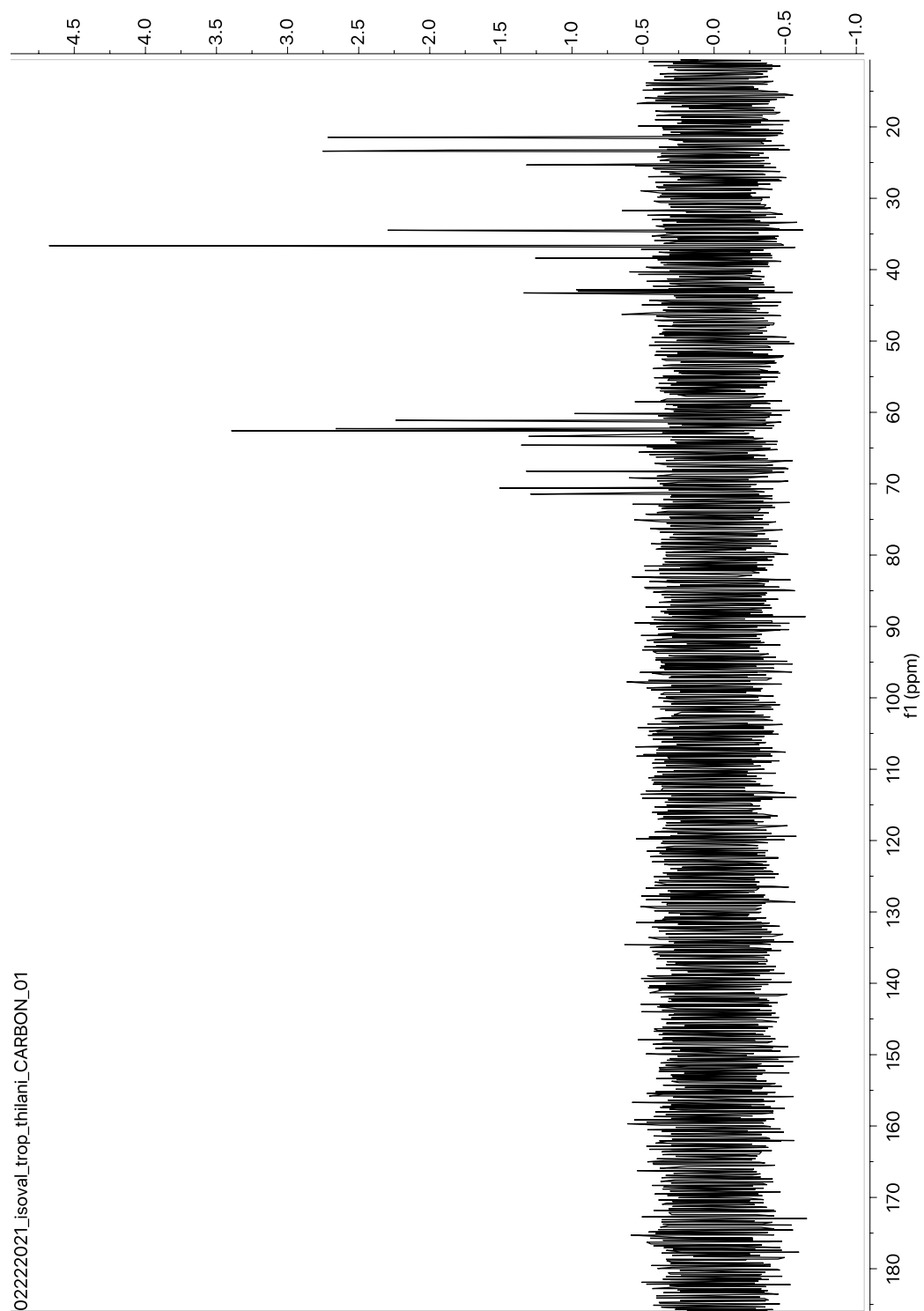
#### NMR chemical shift values for 3-isovaleryl tropine

|             | <p>8-methyl-8-azabicyclo[3.2.1]octan-3<math>\alpha</math>-yl 3-methylbutanoate<br/>(3-Isovaleryl tropine)</p> <p>Chemical Formula: C<sub>13</sub>H<sub>23</sub>NO<sub>2</sub><br/>           Experimental <i>m/z</i>: 226.1804<br/>           Theoretical <i>m/z</i> of [M+H]<sup>+</sup>: 226.18016<br/>           InChI Key: LXXKKOLHRNROBTR-GDNZZTSVSA-N<br/>           SMILES:<br/> <chem>[H][C@@]1(OC(CC(C)C)=O)C[C@@H]2CC[C@@H](N2C)C1</chem><br/>           NMR (500 MHz, D<sub>2</sub>O) ~3 mg</p> |                                                |
|----------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|
| Carbon #<br>(group)                                                                          | <sup>1</sup> H (ppm)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <sup>13</sup> C (ppm)<br>From HMBC<br>and HSQC |
| <b>1,5</b> (CH)                                                                              | 3.96 (m, <i>J</i> = 5.0 Hz, 2H)                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 61.05                                          |
| <b>2,4</b> (CH <sub>2</sub> )                                                                | Axial 1.98 (dd, <i>J</i> = 16.6, 5.0 Hz, 2H)<br>Equatorial 2.22 (dt, <i>J</i> = 16.6, 4.9 Hz, 2H)                                                                                                                                                                                                                                                                                                                                                                                                          | 36.64                                          |
| <b>3</b> (CH)<br>- 1 (CO)<br>- 2 (CH <sub>2</sub> )<br>- 3 (CH)<br>- 4, 5 (CH <sub>3</sub> ) | 4.92 (t, <i>J</i> = 5.0 Hz, 1H)<br>-<br>2.14 (dd, <i>J</i> = 7.0, 12.5 Hz, 2H)<br>1.91(m, <i>J</i> = 7.0 Hz, 1H)<br>0.78 (d, <i>J</i> = 7.0 Hz, 6H)                                                                                                                                                                                                                                                                                                                                                        | 64.89<br>175.32<br>43.20<br>25.38<br>21.60     |
| <b>6,7</b> (CH <sub>2</sub> )                                                                | 1.91 (m, <i>J</i> = 7.6 Hz, 2H), 2.12 (m, <i>J</i> = 5.0, 7.6 Hz, 2H)                                                                                                                                                                                                                                                                                                                                                                                                                                      | 23.40                                          |
| <b>8</b> N(CH <sub>3</sub> )                                                                 | 2.58 (s, 3H)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 38.44                                          |



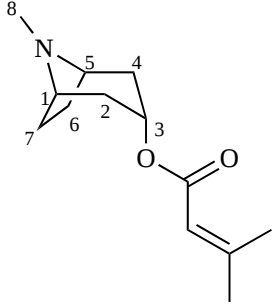
$^1\text{H}$  NMR spectrum for 3-isovaleryl tropine

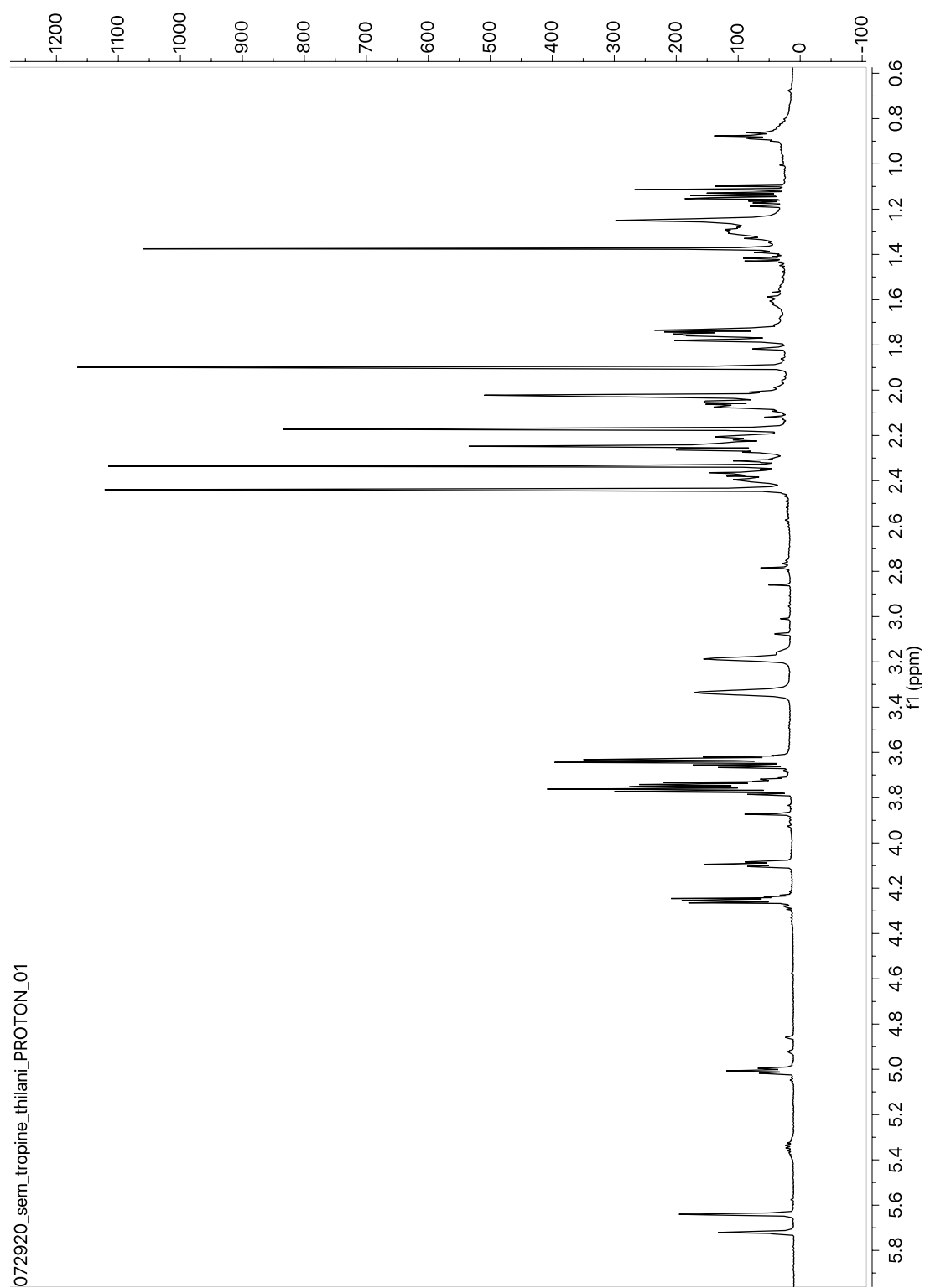
<sup>13</sup>C NMR spectrum for 3-isovaleryl tropine



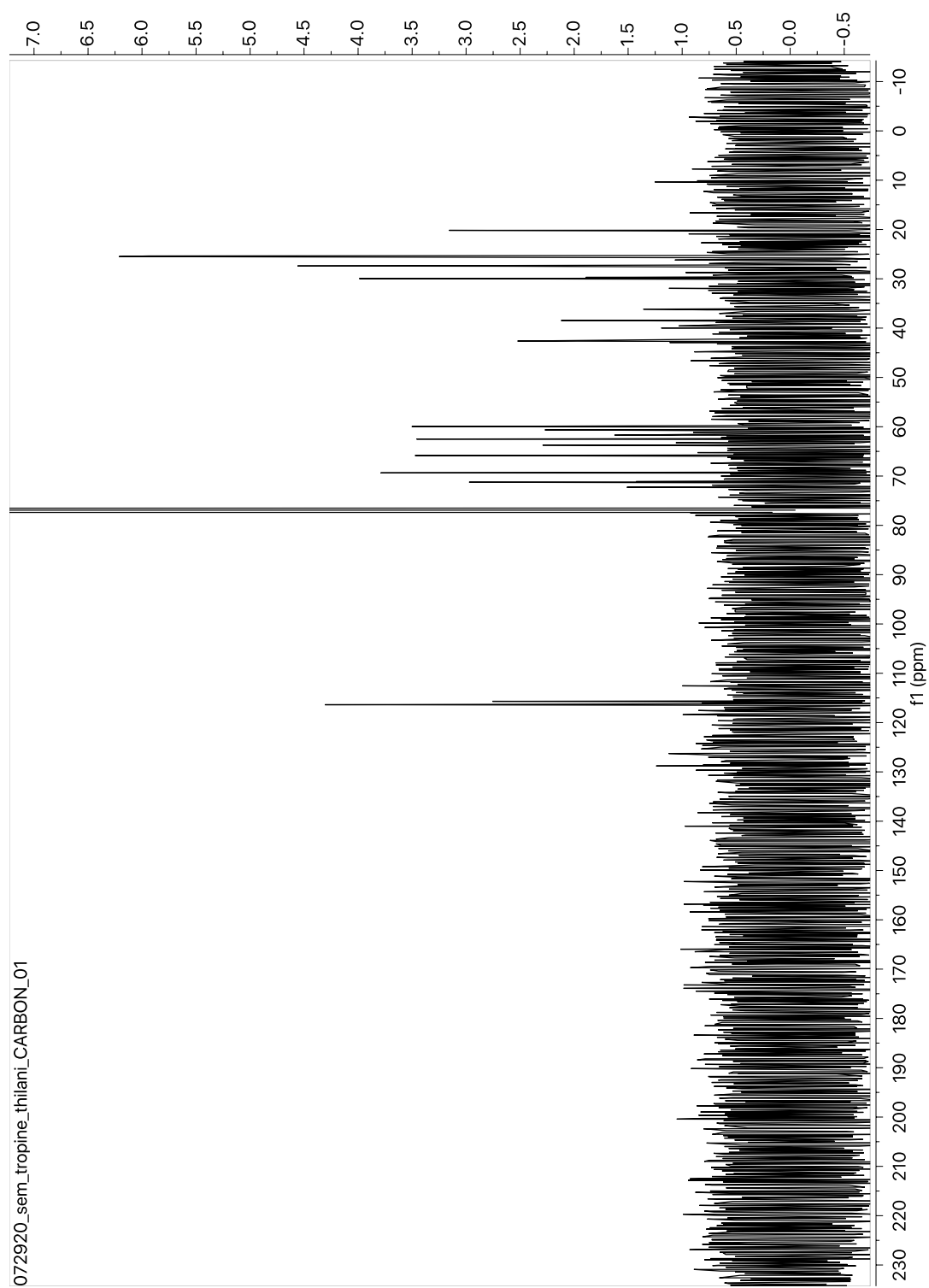
### K. 3-Senecioid tropine

#### NMR chemical shift values for 3-senecioid tropine

|                     | <p>8-methyl-8-azabicyclo[3.2.1]octan-3<math>\alpha</math>-yl 3-methylbut-2-enoate<br/>(3-Senecioid tropine)</p> <p>Chemical Formula: C<sub>13</sub>H<sub>21</sub>NO<sub>2</sub><br/>           Experimental <math>m/z</math> of [M+H]<sup>+</sup>: 224.1653<br/>           Theoretical <math>m/z</math> of [M+H]<sup>+</sup>: 224.16451<br/>           InChI Key: PFQFRMFXPJMNJJ-GDNZZTSVSA-N<br/>           SMILES:<br/> <chem>[H][C@@]1(OC(/C=C(C)\C)=O)C[C@@H]2CC[C@@H](N2C)C1</chem><br/>           NMR (500 MHz, CDCl<sub>3</sub>) ~2 mg</p> |                                                                                 |
|------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|
| Carbon #<br>(group)                                                                                  | <sup>1</sup> H (ppm)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <sup>13</sup> C (ppm)<br><sup>a</sup> from HMBC                                 |
| <b>1,5</b> (CH)                                                                                      | 3.19 (m, $J$ = 5.5 Hz, 2H)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 60.01                                                                           |
| <b>2,4</b> (CH <sub>2</sub> )                                                                        | Axial 1.73 (m, $J$ = 13.5 Hz, 2H)<br>Equatorial 2.25 (m, $J$ = 13.5, 5.5 Hz, 2H)                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 36.17                                                                           |
| <b>3</b> (CH)<br>- 1 (CO)<br>- 2 (CH)<br>- 3 (C)<br>- 4 (CH <sub>3</sub> )<br>- 5 (CH <sub>3</sub> ) | 5.01 (t, $J$ = 5.4 Hz, 1H)<br>-<br>5.64 (hept, $J$ = 1.3 Hz, 1H)<br>-<br>2.17 (m, $J$ = 2.6, 1.3 Hz, 3H)<br>1.90 (m, $J$ = 12.6, 1.3 Hz, 3H)                                                                                                                                                                                                                                                                                                                                                                                                      | 65.88<br>166.33 <sup>a</sup><br>116.36<br>156.94 <sup>a</sup><br>20.16<br>27.43 |
| <b>6,7</b> (CH <sub>2</sub> )                                                                        | 2.03 (m, $J$ = 5.5, 9.5 Hz, 2H), 2.25 (m, $J$ = 5.2 Hz, 2H)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 25.53                                                                           |
| <b>8</b> N(CH <sub>3</sub> )                                                                         | 2.33 (s, 3H)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 40.06                                                                           |

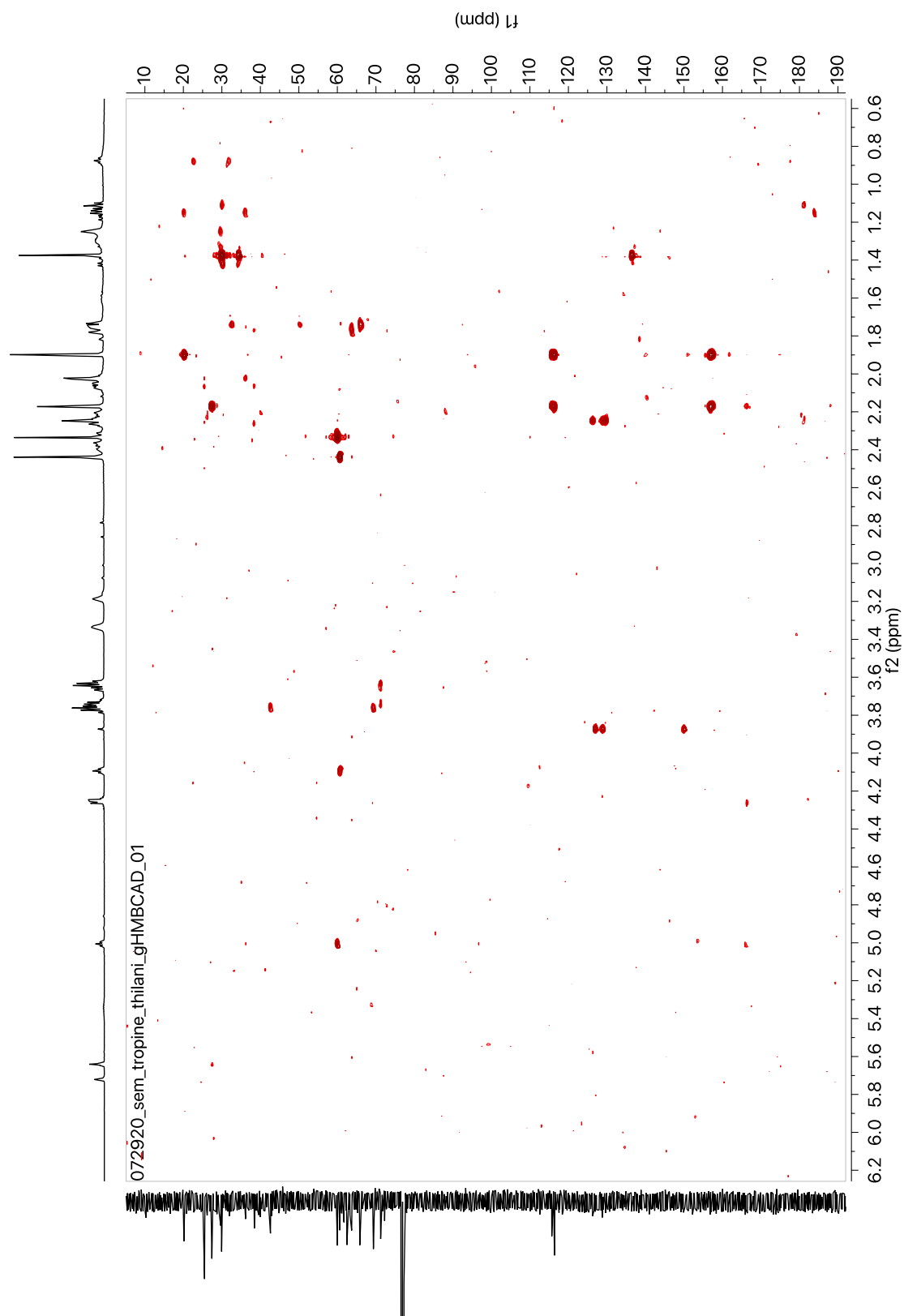


$^1\text{H}$  NMR spectrum for 3-senecioid tropine



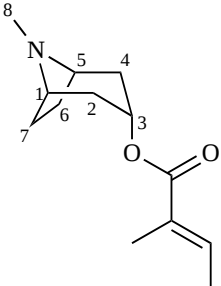
$^{13}\text{C}$  NMR spectrum for 3-senecioid tropine

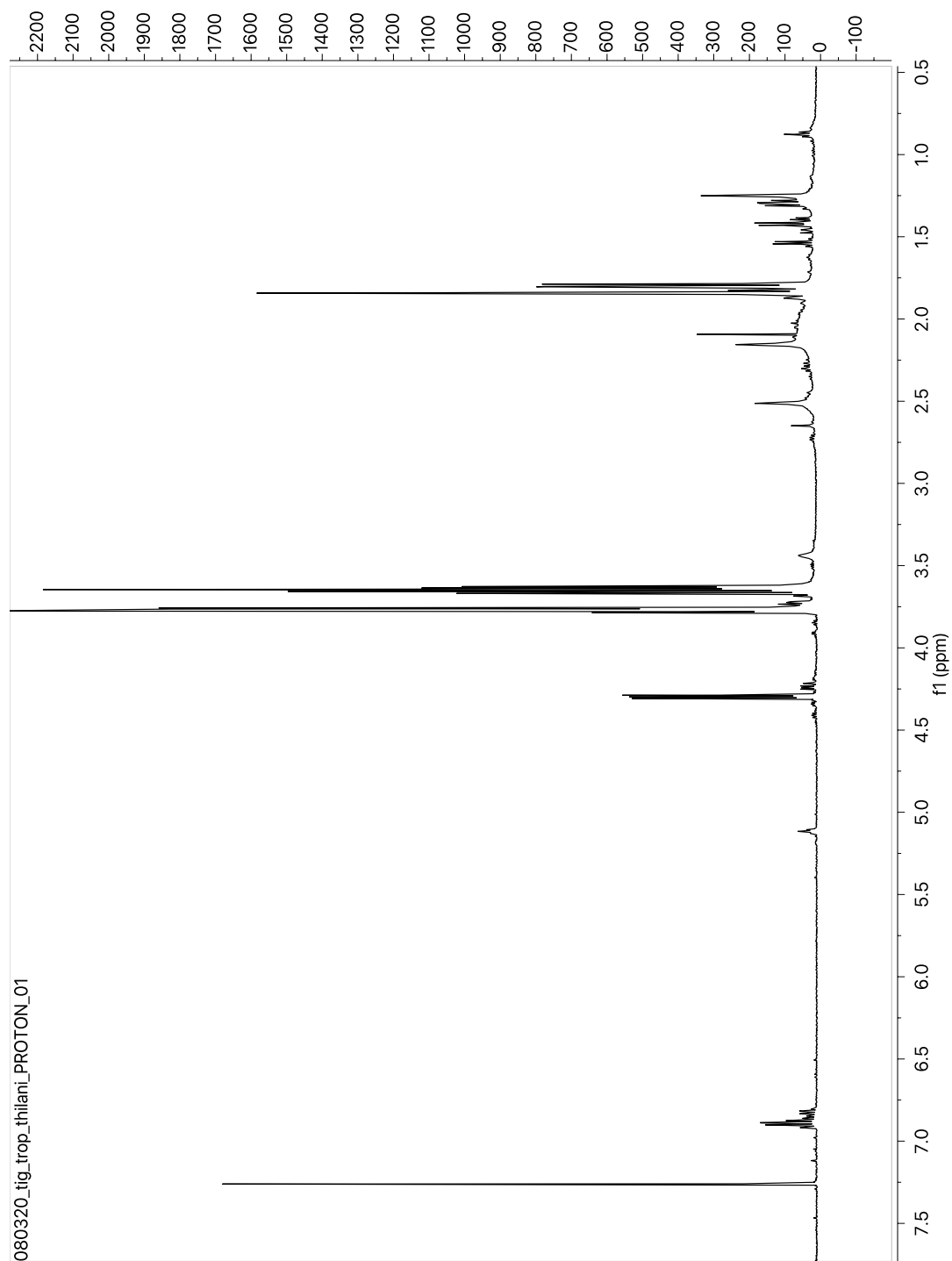
gHMBCAD spectrum for 3-senecioid tropine



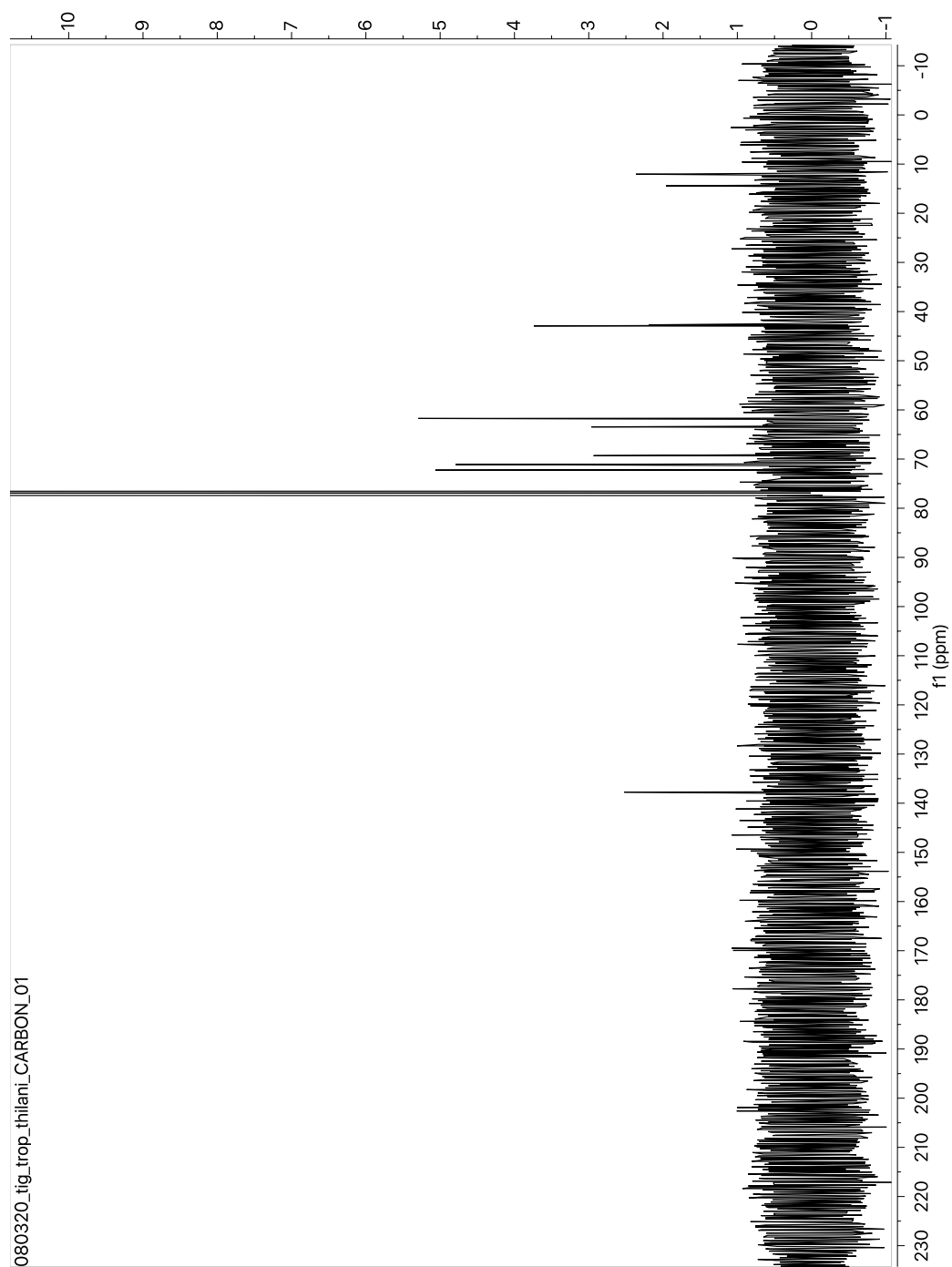
## K. 3-Tigloyl tropine

### NMR chemical shift values for 3-tigloyl tropine

|                     | <p>8-methyl-8-azabicyclo[3.2.1]octan-3<math>\alpha</math>-yl (<i>E</i>)-2-methylbut-2-enoate<br/>(3-Tigloyl tropine)</p> <p>Chemical Formula: C<sub>13</sub>H<sub>21</sub>NO<sub>2</sub><br/>           Experimental <i>m/z</i>: 224.1648<br/>           Theoretical <i>m/z</i> of [M+H]<sup>+</sup>: 224.16451<br/>           InChI Key: UVHGSMZRSVGWDJ-LKQNJMEQSA-N<br/>           SMILES:<br/> <chem>[H][C@@]1(OC(=C(C)=C)O)C[C@@H]2CC[C@@H](N2C)C1</chem><br/>           NMR (500 MHz, CDCl<sub>3</sub>) ~ 1 mg</p> |                                                       |
|------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|
| Carbon #<br>(group)                                                                                  | <sup>1</sup> H (ppm)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <sup>13</sup> C (ppm)                                 |
| <b>1,5</b> (CH)                                                                                      | 3.44 (m, <i>J</i> = 5.2, 2H)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 61.73                                                 |
| <b>2,4</b> (CH <sub>2</sub> )                                                                        | Axial 1.84 (m, <i>J</i> = 13.7, 5.1 Hz, 2H)<br>Equatorial 2.51 (m, 2H)                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 34.60                                                 |
| <b>3</b> (CH)<br>- 1 (CO)<br>- 2 (C)<br>- 3 (CH <sub>3</sub> )<br>- 4 (CH)<br>- 5 (CH <sub>3</sub> ) | 5.12 (t, <i>J</i> = 5.1 Hz, 1H)<br>-<br>-<br>1.84 (d, <i>J</i> = 1.3 Hz, 3H)<br>6.90 (qq, <i>J</i> = 6.7, 1.3 Hz, 1H)<br>1.80 (d, <i>J</i> = 6.7 Hz, 3H)                                                                                                                                                                                                                                                                                                                                                                | 63.45<br>169.96<br>128.86<br>12.04<br>140.26<br>14.39 |
| <b>6,7</b> (CH <sub>2</sub> )                                                                        | 1.80 (m, <i>J</i> = 5.2, 9.5 Hz, 2H), 2.16 (m, 2H)                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 25.25                                                 |
| <b>8</b> N(CH <sub>3</sub> )                                                                         | 2.52 (s, 3H)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 38.99                                                 |



$^1\text{H}$  NMR spectrum for 3-tigloyl tropine

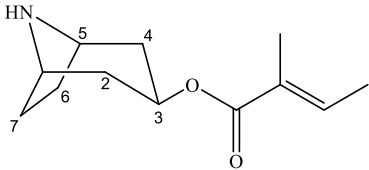


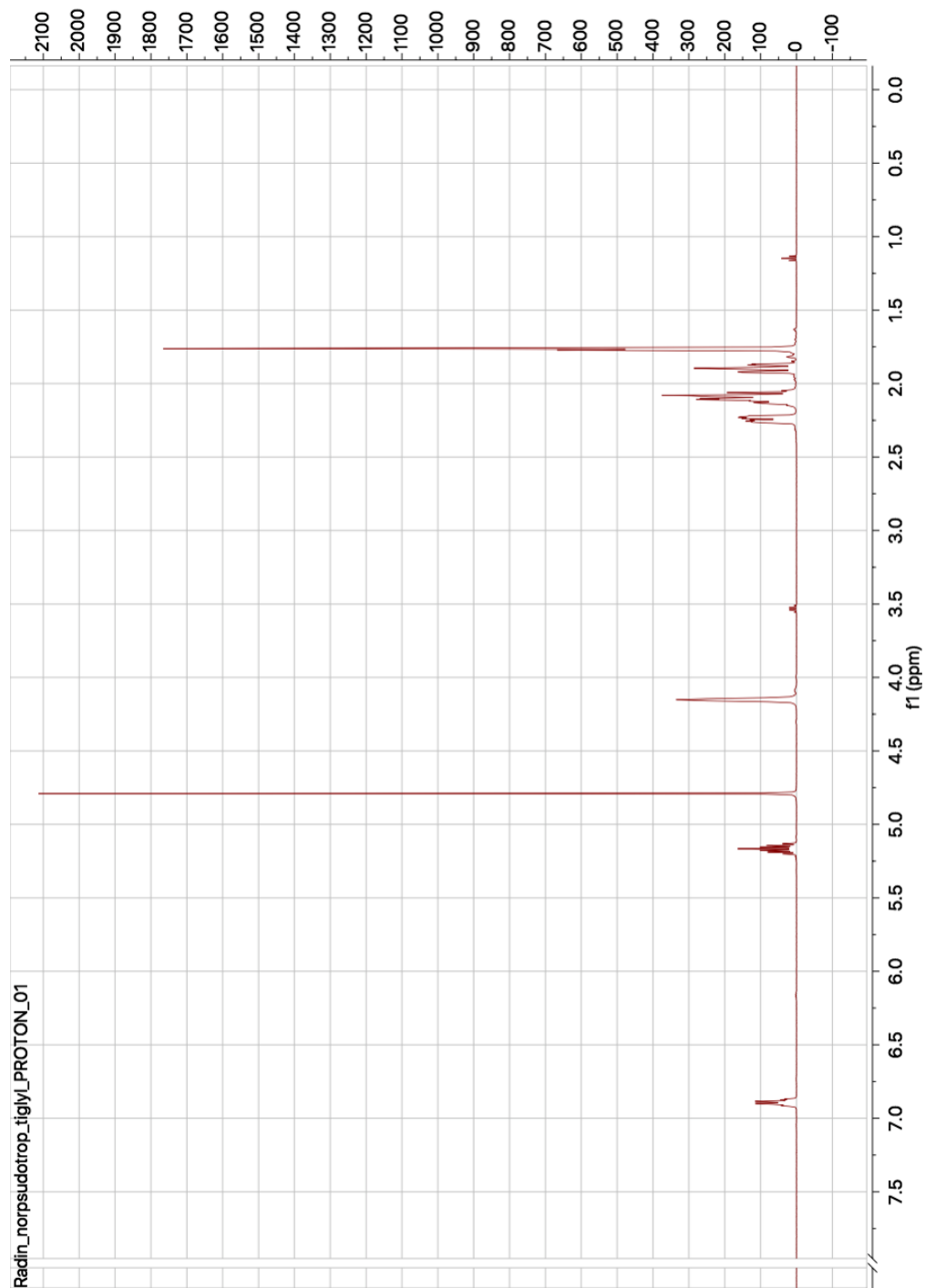
$^{13}\text{C}$  NMR spectrum for 3-tigloyl tropine

## NORPSEUDOTROPINE ALKALOIDS

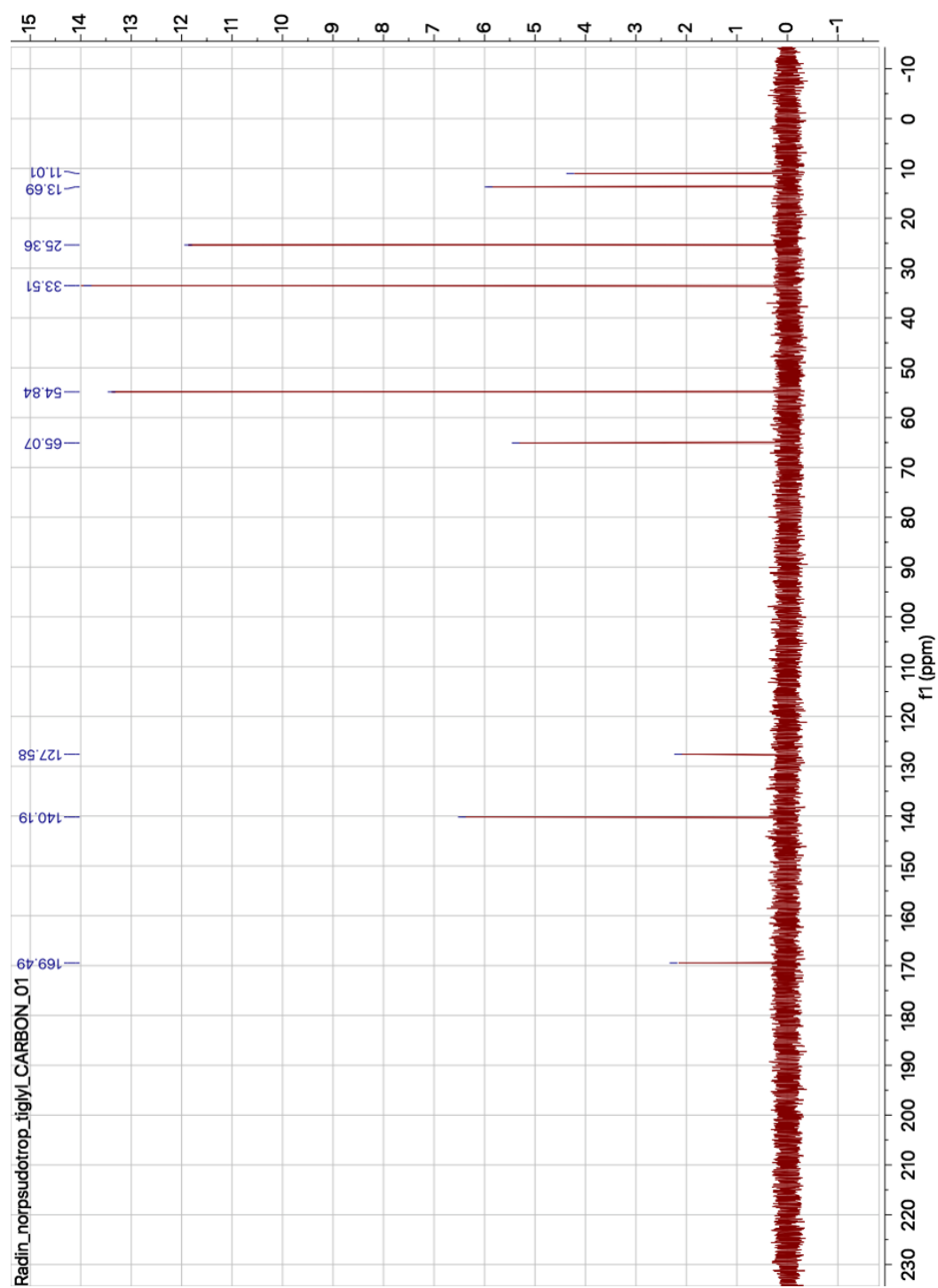
### L. 3-Tigloyl norpseudotropine

#### NMR chemical shifts values for 3-tigloyl norpseudotropine

|                     | <p style="text-align: center;">8-azabicyclo[3.2.1]octan-3-yl (<i>E</i>)-2-methylbut-2-enoate<br/>(3-Tigloyl norpseudotropine)</p> <p style="text-align: center;">Chemical Formula: C<sub>12</sub>H<sub>19</sub>NO<sub>2</sub><br/>           Experimental m/z [M+H]<sup>+</sup>: 210.1488<br/>           Theoretical m/z [M+H]<sup>+</sup>: 210.1489<br/>           InChI Key: KLFGVBUPYUSQKV-FGUDHKIESA-N<br/>           SMILES:<br/> <chem>[H][C@]1(OC/C(C)=C/C=O)C[C@@H]2CC[C@@H](N2)C1</chem><br/>           NMR (500 MHz, D<sub>2</sub>O) ~2 mg</p> |                                                       |
|------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|
| Carbon #<br>(group)                                                                                  | <sup>1</sup> H (ppm)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <sup>13</sup> C (ppm)                                 |
| <b>1,5</b> (CH)                                                                                      | 4.15 (p, <i>J</i> = 3.0 Hz, 2H)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 54.84                                                 |
| <b>2,4</b> (CH <sub>2</sub> )                                                                        | Axial 1.90 (ddd, <i>J</i> = 14.2, 11.0, 2.9 Hz, 2H)<br>Equatorial 2.25 (m, 2H)                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 33.51                                                 |
| <b>3</b> (CH)<br>- 1 (CO)<br>- 2 (C)<br>- 3 (CH <sub>3</sub> )<br>- 4 (CH)<br>- 5 (CH <sub>3</sub> ) | 5.17 (tt, <i>J</i> = 11.3, 6.1 Hz, 1H)<br>-<br>-<br>1.76 (m, 3H)<br>6.89 (tdt, <i>J</i> = 7.5, 5.7, 2.0 Hz, 1H)<br>1.76 (m, 3H)                                                                                                                                                                                                                                                                                                                                                                                                                          | 65.07<br>169.49<br>127.58<br>11.01<br>140.19<br>13.69 |
| <b>6,7</b> (CH <sub>2</sub> )                                                                        | 2.32 (m, 4H)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 25.36                                                 |
| <b>8</b> N(H)                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                       |



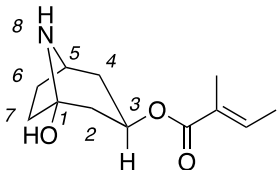
$^1\text{H}$  NMR spectrum for tigloyl norpseudotropine



$^{13}\text{C}$  NMR spectrum for 3-tigloyl norpseudotropine

### M. 3-Tigloyl hydroxynorpseudotropine isomer 1

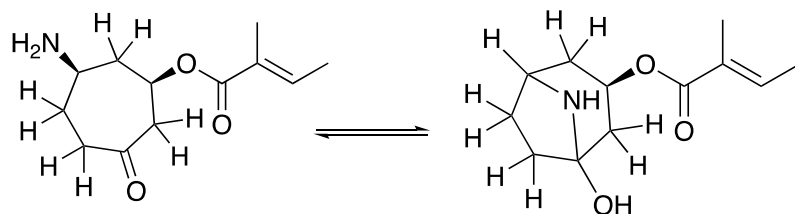
#### NMR chemical shifts values for 3-tigloyl hydroxynorpseudotropine isomer 1

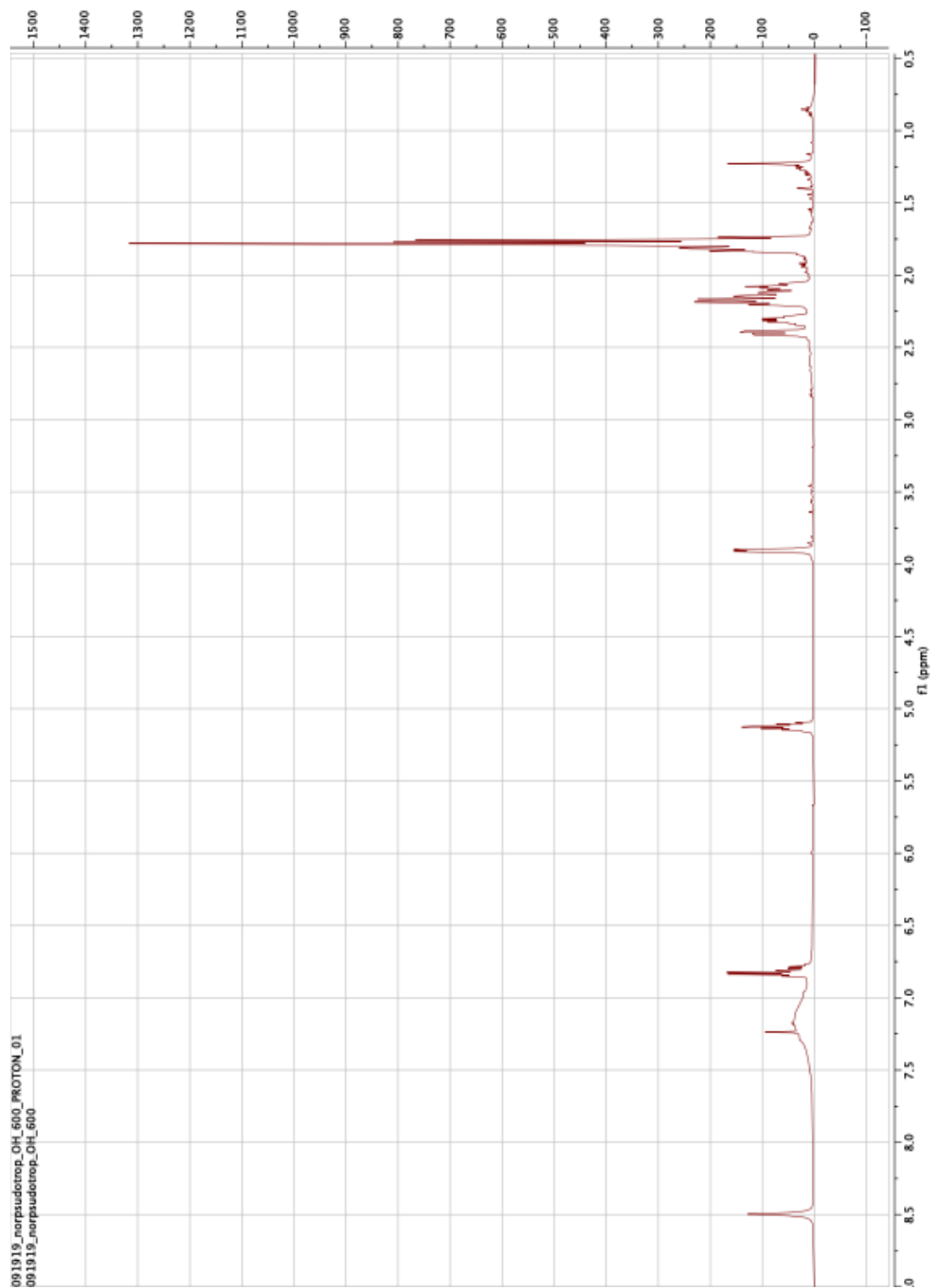
|                     | <p>1-Hydroxy-8-azabicyclo[3.2.1]octan-3-yl (<i>E</i>)-2-methylbut-2-enoate</p> <p>Chemical Formula: C<sub>12</sub>H<sub>19</sub>NO<sub>3</sub><br/>           Experimental <i>m/z</i>: 226.1441<br/>           Theoretical <i>m/z</i> of [M+H]<sup>+</sup>: 226.14377</p> <p>InChI key: VJPUKJOSMVWYQS-WOCUHLHXSA-N<br/>           SMILES:<br/> <chem>[H][C@]1(OC(=C(C)=C)O)C[C@@]2(O)CC[C@@H](N2)C1</chem></p> <p>NMR (600 MHz, CDCl<sub>3</sub>) ~2 mg</p> |                                                       |
|------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|
| Carbon #<br>(group)                                                                                  | <sup>1</sup> H (ppm)                                                                                                                                                                                                                                                                                                                                                                                                                                         | <sup>13</sup> C (ppm)                                 |
| <b>1</b> C(OH)                                                                                       | -                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <i>a</i>                                              |
| <b>2</b> (CH <sub>2</sub> )                                                                          | Axial 2.19 (m, <i>J</i> = 13.2, 11.1 Hz, 1H)<br>Equatorial 2.40 (dd, <i>J</i> = 13.1, 6.1 Hz, 1H)                                                                                                                                                                                                                                                                                                                                                            | 41.90                                                 |
| <b>3</b> (CH)<br>- 1 (CO)<br>- 2 (C)<br>- 3 (CH <sub>3</sub> )<br>- 4 (CH)<br>- 5 (CH <sub>3</sub> ) | 5.13 (tt, <i>J</i> = 11.2, 6.0 Hz, 1H)<br>-<br>-<br>1.79 (m, 3H)<br>6.83 (m, 1H)<br>1.79 (m, 3H)                                                                                                                                                                                                                                                                                                                                                             | 65.38<br>167.15<br>128.09<br>11.91<br>138.31<br>14.36 |
| <b>4</b> (CH <sub>2</sub> )                                                                          | Axial 1.81 (m, <i>J</i> = 13.2, 1H)<br>Equatorial 2.14 (m, <i>J</i> = 13.1, 3.4, 1H)                                                                                                                                                                                                                                                                                                                                                                         | 34.36                                                 |
| <b>5</b> (CH)                                                                                        | 3.91 (dt, <i>J</i> = 7.1, 3.2 Hz, 1H)                                                                                                                                                                                                                                                                                                                                                                                                                        | 51.85                                                 |
| <b>6</b> (CH <sub>2</sub> )                                                                          | 2.31 (dq, <i>J</i> = 13.2, 7.0, 6.4 Hz, 1H), 1.82 ( <i>J</i> = 13.2, 1H)                                                                                                                                                                                                                                                                                                                                                                                     | 25.95                                                 |
| <b>7</b> (CH <sub>2</sub> )                                                                          | 2.17 (m, 1H), 2.08 (m, 1H)                                                                                                                                                                                                                                                                                                                                                                                                                                   | 32.77                                                 |
| <b>8</b> N(H)                                                                                        | <i>b</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                     | -                                                     |

*a.* Signal not detected at 25 °C due to rapid tautomerization\*

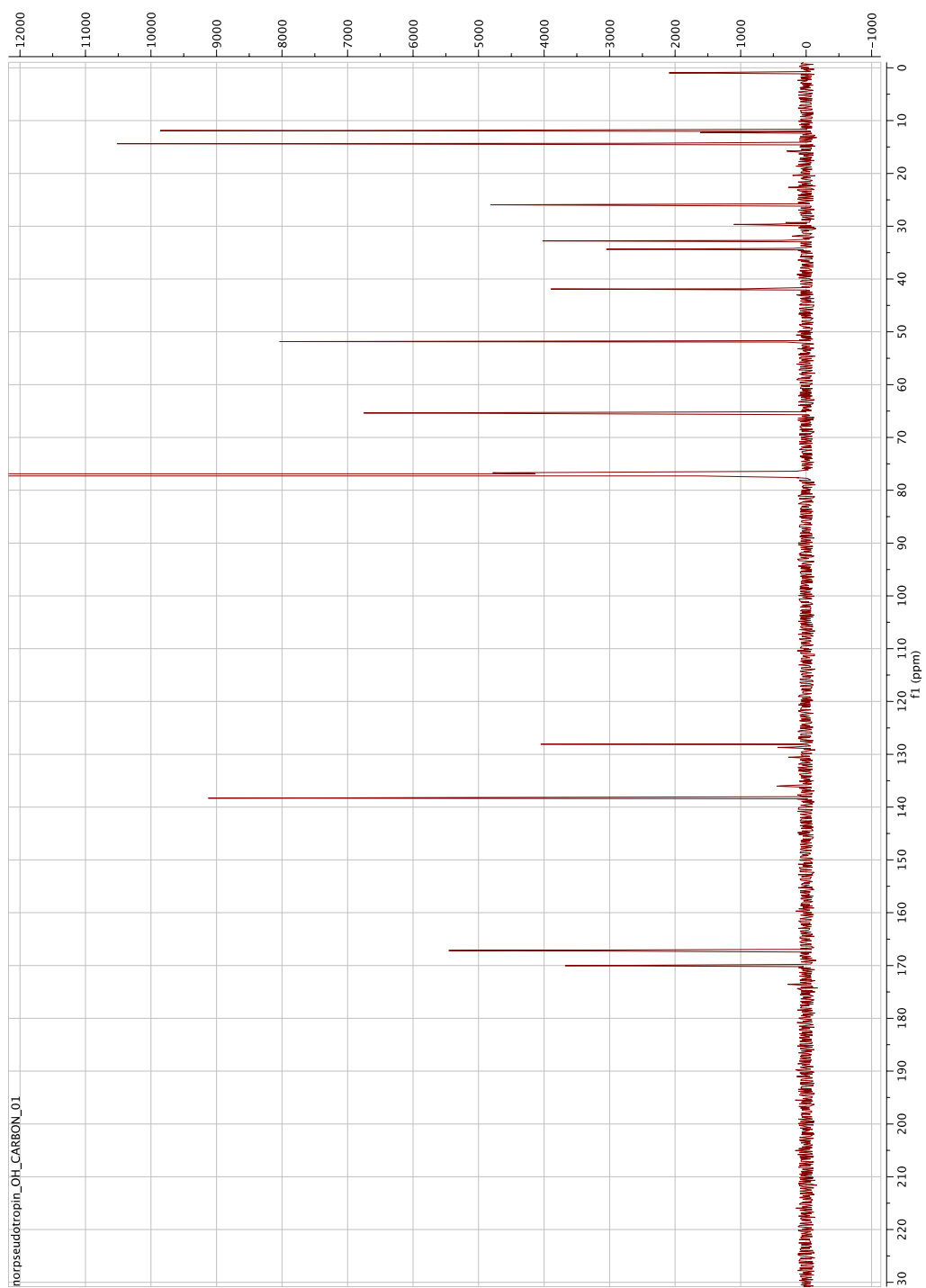
*b.* Broad signal at 25 °C

\*

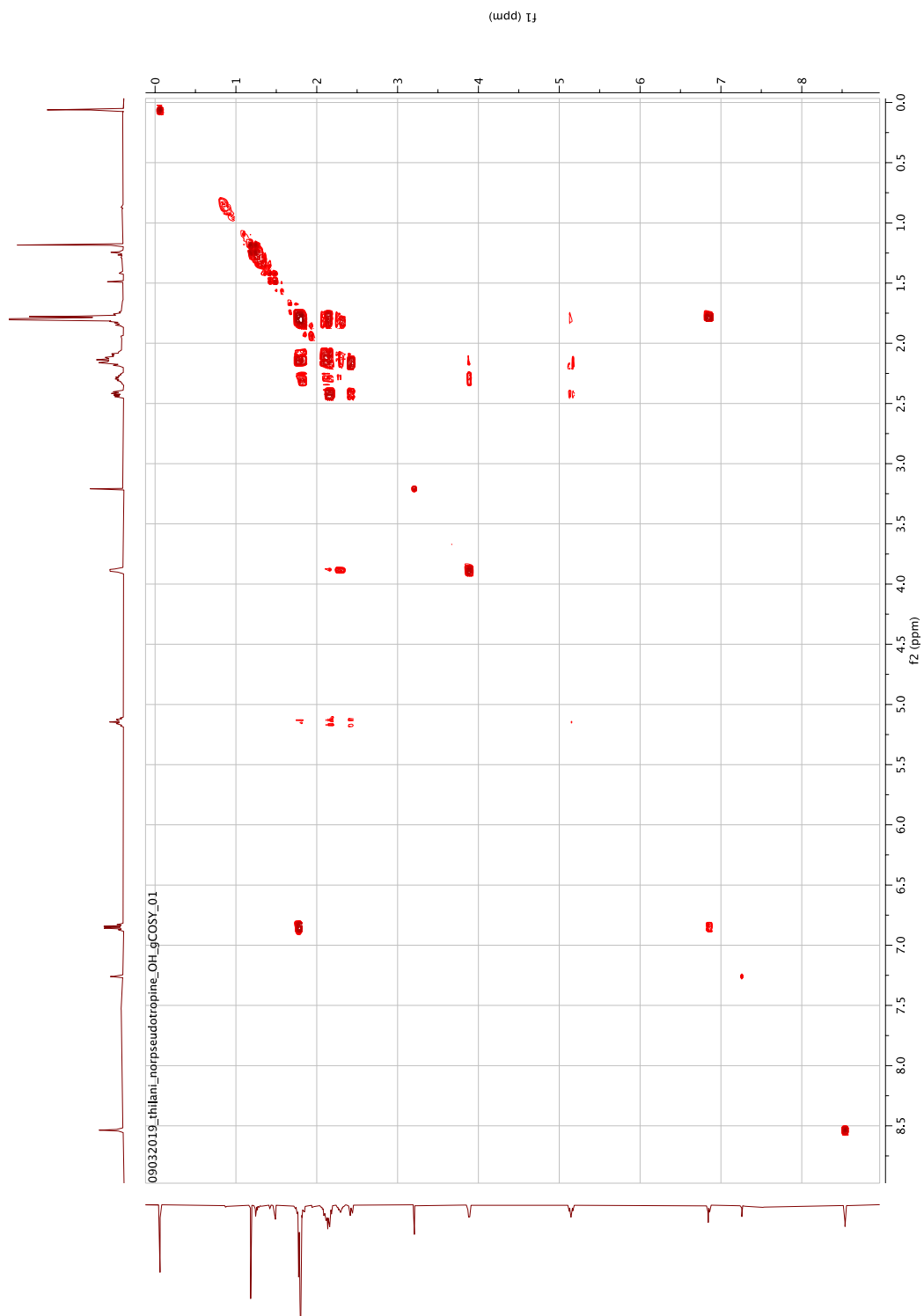




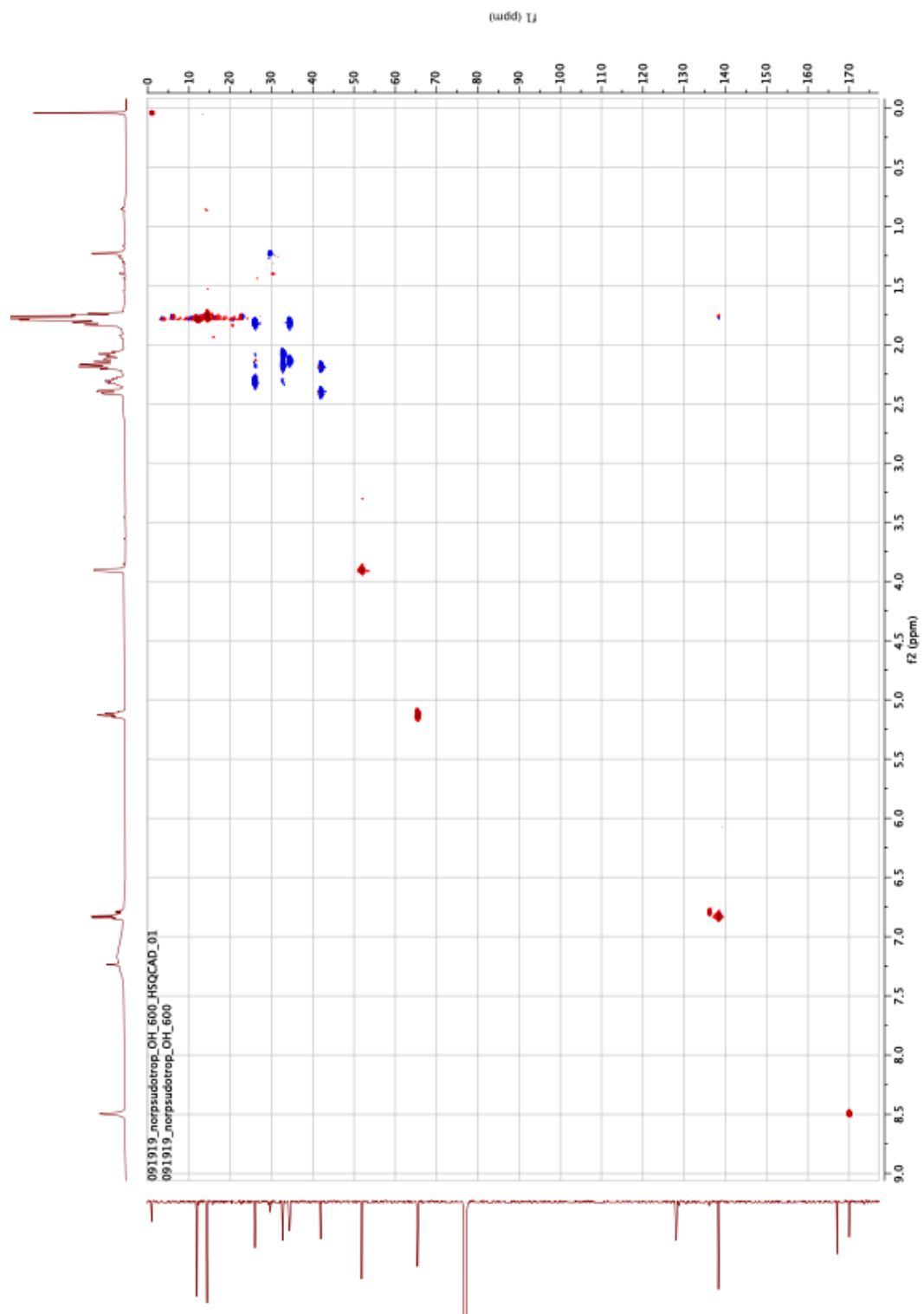
$^1\text{H}$  NMR spectrum for 3-tigloyl hydroxynorpseudotropine isomer 1



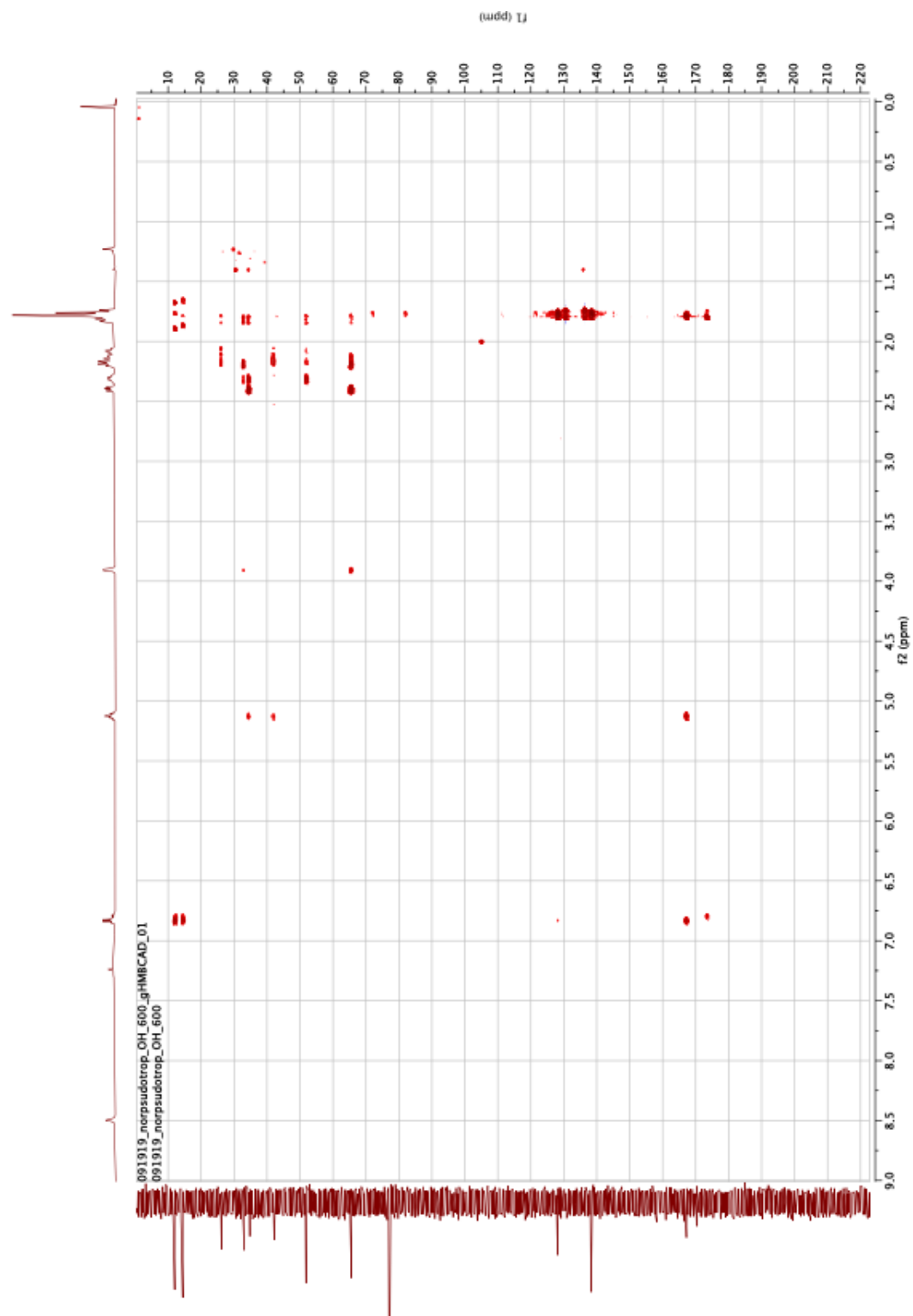
$^{13}\text{C}$  NMR spectrum for 3-tigloyl hydroxynorpseudotropine isomer 1



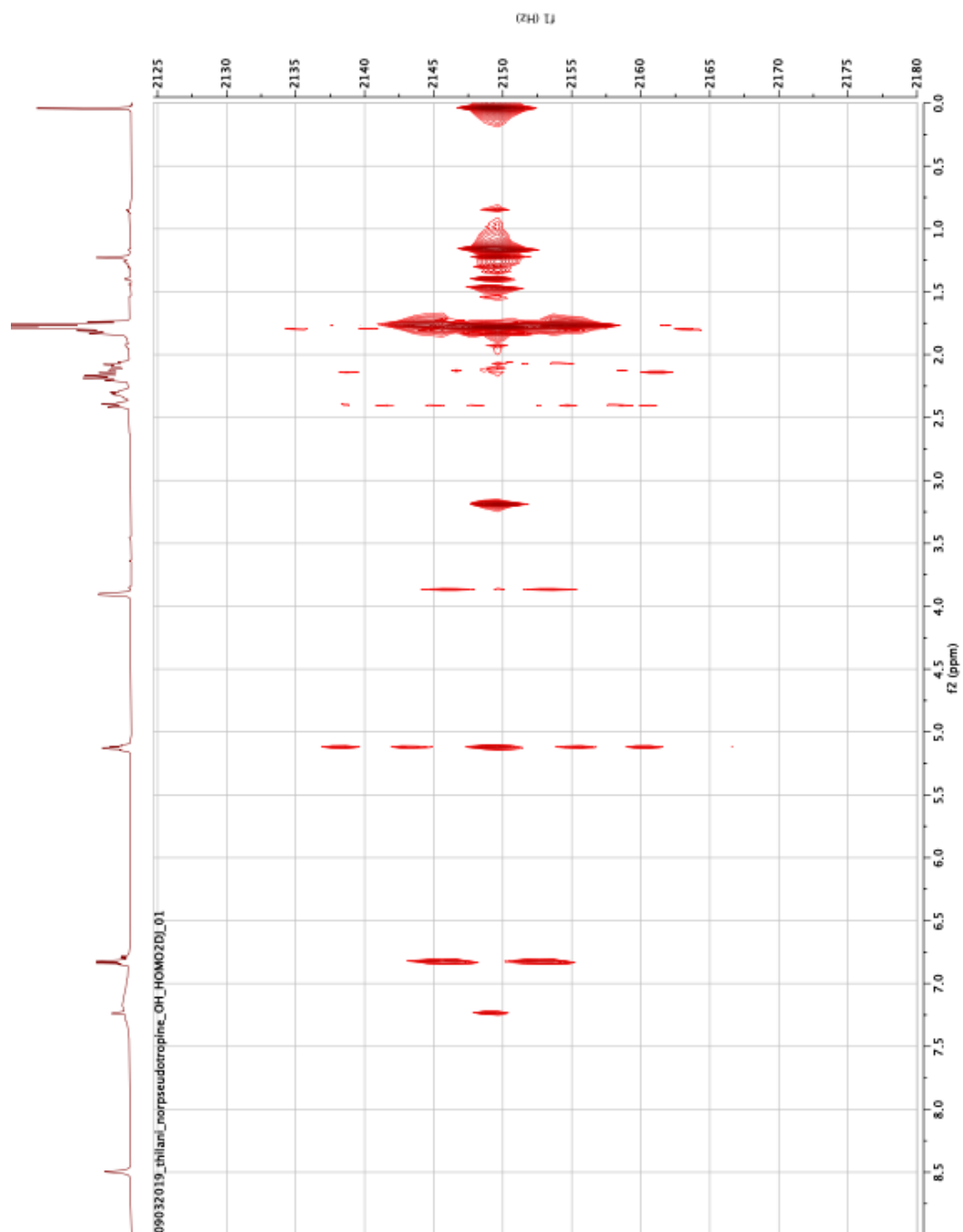
**$^1\text{H}$ - $^1\text{H}$  gCOSY NMR spectrum for 3-tigloyl hydroxynorpseudotropine isomer 1**



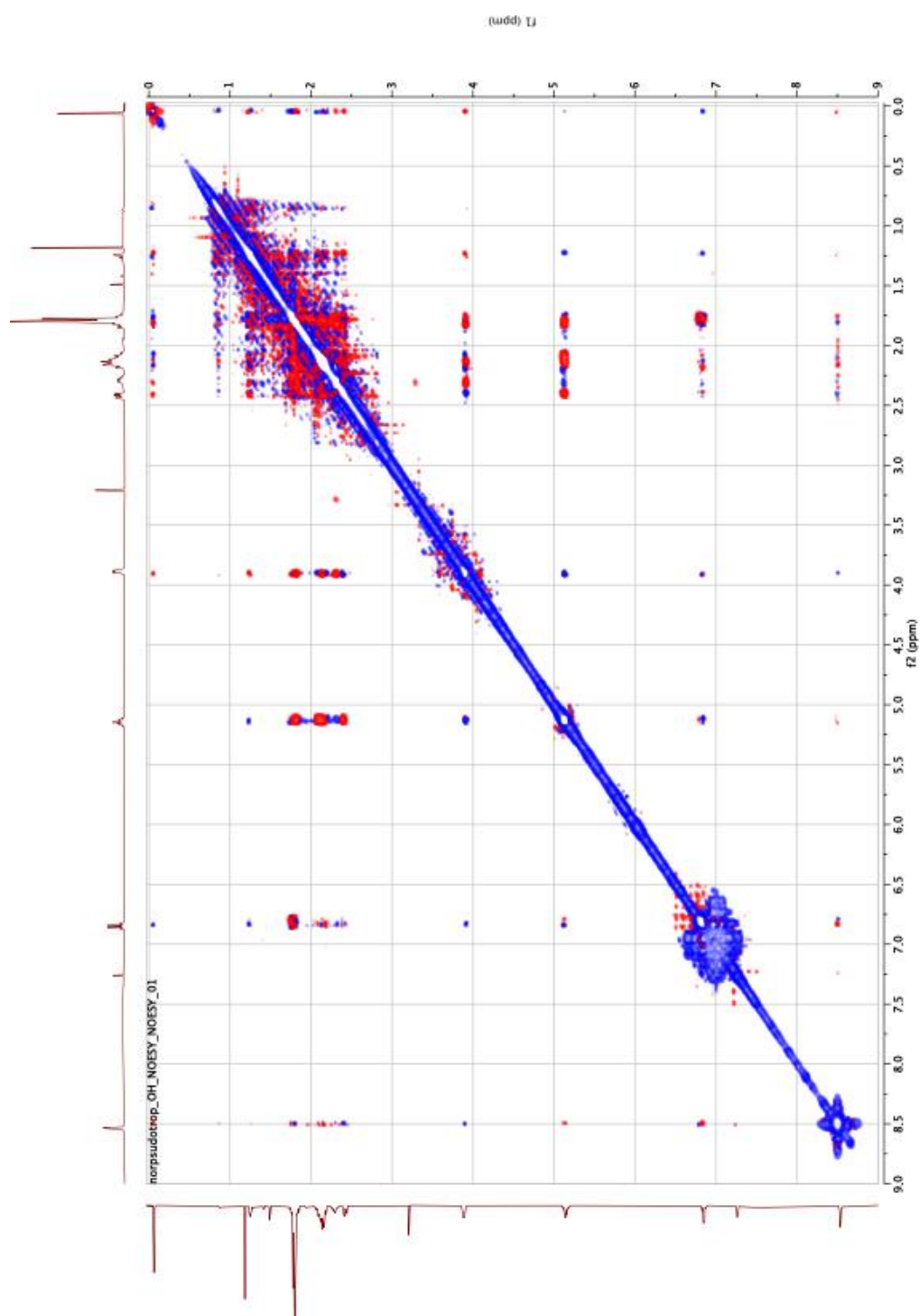
$^1\text{H}$ - $^{13}\text{C}$  gHSQC NMR spectrum for 3-tigloyl hydroxynorpseudotropine isomer 1



$^1\text{H}$ - $^{13}\text{C}$  gHMBC NMR spectrum for 3-tigloyl hydroxynorpseudotropine isomer 1



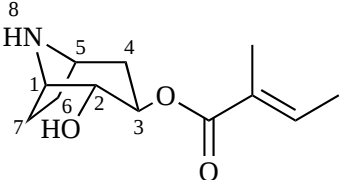
J-resolved  $^1\text{H}$ - $^1\text{H}$  NMR spectrum for 3-tigloyl hydroxynorpseudotropine isomer 1



$^1\text{H}$ - $^1\text{H}$  NOESY NMR spectrum for 3-tigloyl hydroxynorpseudotropine isomer 1

## N. 3-Tigloyl hydroxynorpseudotropine isomer 2

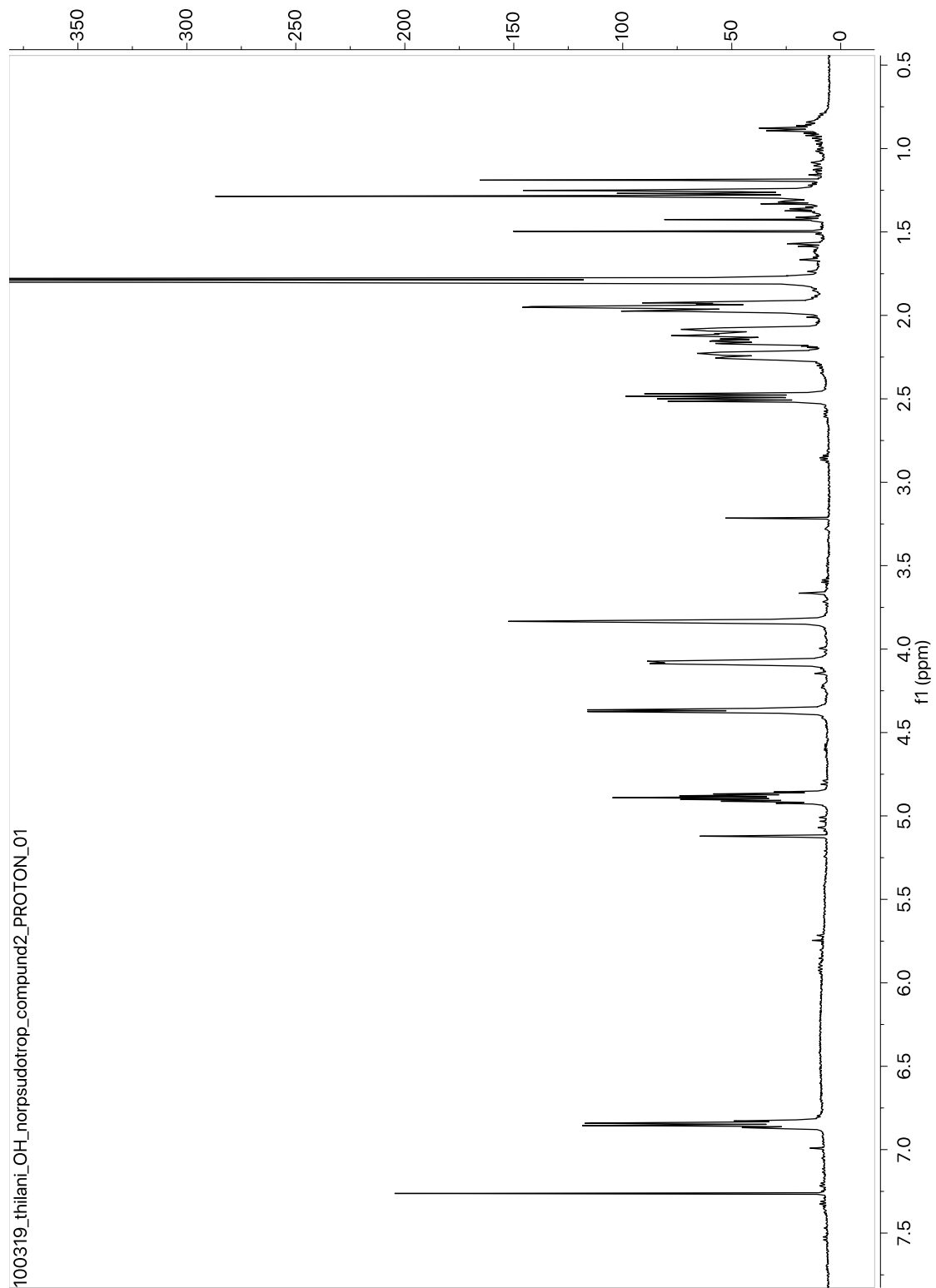
### NMR chemical shifts values for 3-tigloyl hydroxynorpseudotropine isomer 2

|                     | <p>2-Hydroxy-8-azabicyclo[3.2.1]octan-3<math>\beta</math>-yl (<i>E</i>)-2-methylbut-2-enoate</p> <p>Chemical Formula: C<sub>12</sub>H<sub>19</sub>NO<sub>3</sub><br/>           Experimental <i>m/z</i>: 226.1438<br/>           Theoretical <i>m/z</i> of [M+H]<sup>+</sup>: 226.14377<br/>           InChI Key: FLUIERQXKMFGPY-WGJUQJDTSA-N<br/>           SMILES:<br/> <chem>[H][C@]1(OC(=C(C)=C)O)[C@@](O)([H])[C@@H]2CC[C@@H](N2)C1</chem><br/>           NMR (600 MHz, CDCl<sub>3</sub>) ~2 mg</p> |                                                       |
|------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|
| Carbon #<br>(group)                                                                                  | <sup>1</sup> H (ppm)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <sup>13</sup> C (ppm)                                 |
| <b>1</b> CH                                                                                          | 4.37 (dd, <i>J</i> = 7.7, 3.4 Hz, 1H)                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 72.74                                                 |
| <b>2</b> (CH) OH                                                                                     | 3.83 (t, <i>J</i> = 3.4 Hz, 1H)                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 63.18                                                 |
| <b>3</b> (CH)<br>- 1 (CO)<br>- 2 (C)<br>- 3 (CH <sub>3</sub> )<br>- 4 (CH)<br>- 5 (CH <sub>3</sub> ) | 4.89 (td, <i>J</i> = 11.4, 6.0 Hz, 1H)<br>-<br>-<br>1.79 (s, 3H)<br>6.83 (q, <i>J</i> =7.1 Hz, 1H)<br>1.79 (d, <i>J</i> =7.1 Hz, 3H)                                                                                                                                                                                                                                                                                                                                                                     | 64.48<br>167.60<br>128.36<br>11.95<br>138.48<br>14.45 |
| <b>4</b> (CH <sub>2</sub> )                                                                          | Axial 1.95 (m, <i>J</i> = 11.4, 3.7 Hz, 1H)<br>Equatorial 2.25 (dt, <i>J</i> = 6.1, 3.7 Hz, 1H)                                                                                                                                                                                                                                                                                                                                                                                                          | 32.21                                                 |
| <b>5</b> (CH)                                                                                        | 4.08 (dd, <i>J</i> = 7.0, 3.7 Hz, 1H)                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 54.30                                                 |
| <b>6</b> (CH <sub>2</sub> )                                                                          | 2.49 (dd, <i>J</i> = 14.8, 7.0 Hz, 1H), 2.16 (m, <i>J</i> = 3.1, 6.2 Hz, 1H)                                                                                                                                                                                                                                                                                                                                                                                                                             | 39.45                                                 |
| <b>7</b> (CH <sub>2</sub> )                                                                          | 2.09 (m, <i>J</i> = 7.7, 6.2 Hz, 1H), 1.95 (m, <i>J</i> = 14.8, 3.4 Hz, 1H)                                                                                                                                                                                                                                                                                                                                                                                                                              | 33.76                                                 |
| <b>8</b> N(H)                                                                                        | a                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | -                                                     |

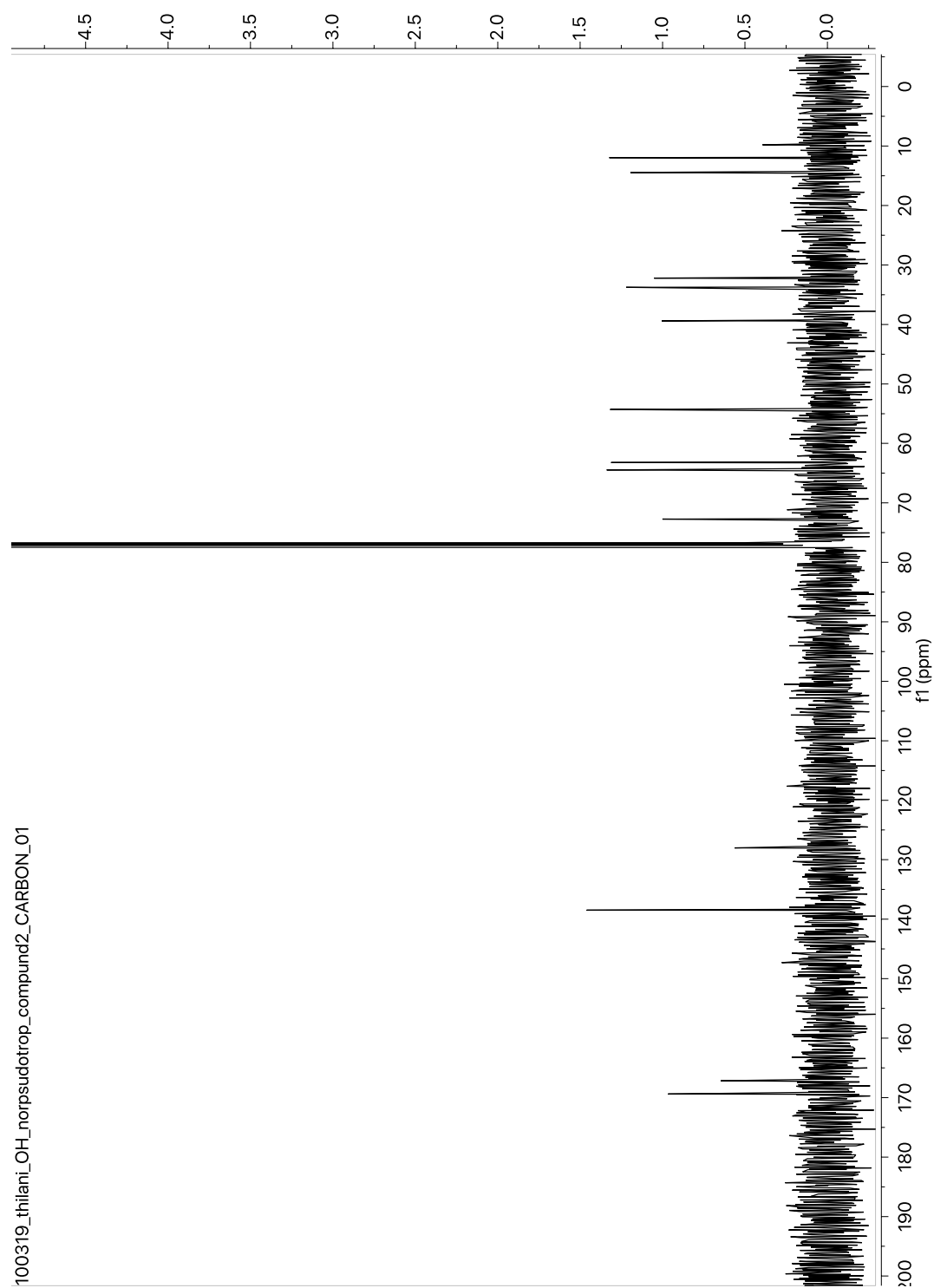
a. Broad signal at 25 °C

**2** (CH) OH : H is axial because 1H-2H from H-H *J* res matches literature value

100319\_thilani\_OH\_norpsudotrop\_compund2\_PROTON\_01



<sup>1</sup>H NMR spectrum for 3-tigloyl hydroxynorpseudotropine isomer 2



$^{13}\text{C}$  NMR spectrum for 3-tigloyl hydroxynorpseudotropine isomer 2