

## Supporting Information

for

# **Pd(OAc)<sub>2</sub>-catalyzed dehydrogenative C–H activation: An expedient synthesis of uracil-annulated β-carbolinones**

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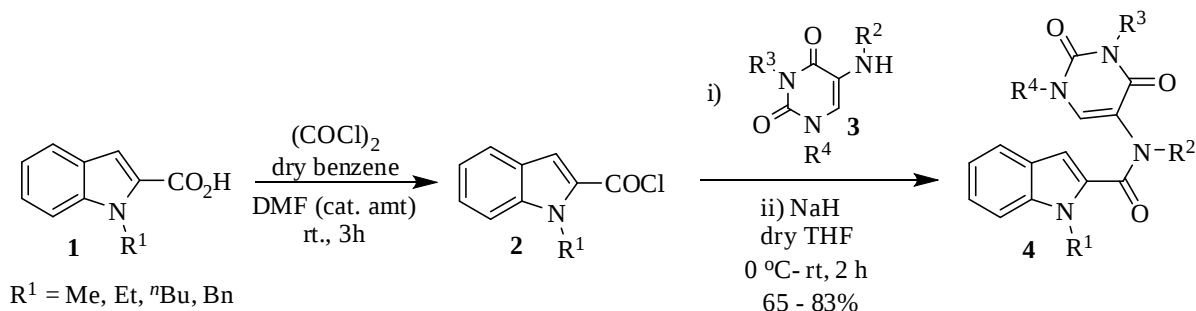
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## (1) General remarks

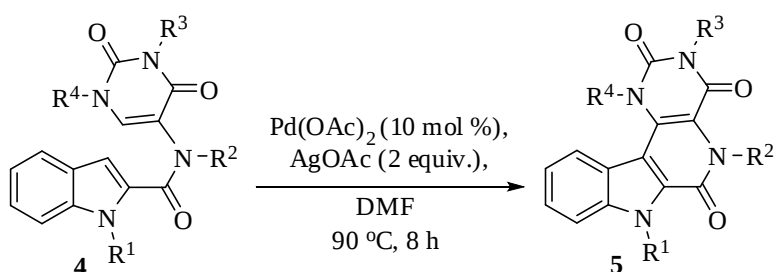
Melting points were measured in open capillaries and are uncorrected. The  $^1\text{H}$  and  $^{13}\text{C}$  NMR spectroscopic data were recorded in  $\text{CDCl}_3$  with TMS as the internal standard (chemical shift in  $\delta$ ) with a Bruker DPX-400 spectrometer. Data are reported as follows: chemical shifts, multiplicity (s = singlet, d = doublet, t = triplet, q = quartet, quintet = quintet, m = multiplet, brs = broad singlet), coupling constant (Hz). In case of **5f** two peaks are missing at 40.13 ppm and at 139.86 ppm and in case of starting materials (except **4i** and **4j**) one peak is missing in the region  $\sim 138$  ppm in  $^{13}\text{C}$  NMR (assumed from DEPT NMR of **4c**) and equivalent carbons are marked in  $^{13}\text{C}$  spectra of **5f** and **4a**. HRMS (ESI) spectra were taken using Waters Xevo G2 QToF mass spectrometer. Silica gel [60-120 mesh (Rankem, India), (230-400 mesh (Spectrochem, India))] was used for the chromatographic separations. Silica gel G and GF 254 (CDH, India) was used for TLC. Petroleum ether refers to the fraction boiling between 60 and 80  $^\circ\text{C}$ .

## (2) (a) General procedure<sup>1</sup> for the preparation of starting material (4):

To a stirred solution of 1 equiv. of indole-2-carboxylic acid **1** in 10 mL of dry benzene containing 2 drops of *N,N*-dimethylformamide, 1.5 equiv. of oxalyl chloride was added. The resulting solution was stirred at rt for 3 h, subsequently, the solvent was removed under reduced pressure and taken up in 5 mL of dry THF. In a separate flask, 1 equiv. of 5-amino uracil derivative **3** dissolved in 3 mL of dry THF was added to a suspension of 1.2 equiv. of NaH in 5 mL of dry THF at 0  $^\circ\text{C}$ . The solution was allowed to stir at 0  $^\circ\text{C}$  for 30 min and the preformed acid chloride **2** was added drop wise. The resulting solution was allowed to warm to rt and stirred for 2 h. The solution was quenched with water and extracted with DCM. The combined organic layer was washed with brine, dried over  $\text{Na}_2\text{SO}_4$  and concentrated under reduced pressure. The crude residue was subjected to flash silica gel chromatography to give the corresponding amide **4**.



**(b) General procedure for the preparation of uracil annulated  $\beta$ -carbolinones (**5**):**



In a flame dried round bottomed flask equipped with a magnetic bar, a mixture of 1 equiv. starting material (**4**), 5 mL dry DMF, 2 equiv. of  $\text{AgOAc}$  and 10 mol %  $\text{Pd}(\text{OAc})_2$  was taken and stirred at room temperature for 5 min. Then the reaction mixture was heated in an oil bath fixed at  $90^\circ\text{C}$  for 8 h under air. Completion of the reaction was monitored by checking TLC. The reaction mixture was cooled to room temperature, diluted with water and 50 mL of EtOAc and passed through a celite pad. The ethyl acetate part was washed with  $\text{H}_2\text{O}$  ( $2 \times 10$  mL) and saturated  $\text{NaCl}$  (aq) ( $1 \times 10$  mL). The organic part was dried over  $\text{Na}_2\text{SO}_4$ , evaporated and purified by flash chromatography, using ethyl acetate/petroleum ether (2:8) as the eluent to afford product **5**.

### (3) Characterization data

#### (a) Characterization data of uracil annulated $\beta$ -carbolinones (5):

##### **1,3,5,7-tetramethyl-5,7-dihydro-1*H*-pyrimido[4',5':5,6]pyrido[3,4-*b*]indole-2,4,6(3*H*)-trione (5a):**

Colourless solid; mp: 190-192 °C

<sup>1</sup>H-NMR (400 MHz, CDCl<sub>3</sub>, ppm):  $\delta$  7.98 (d, *J* = 8 Hz, 1H), 7.61 (d, *J* = 3.6 Hz, 2H), 7.39 - 7.43 (m, 1H), 4.46 (s, 3H), 4.12 (s, 3H), 3.81 (s, 3H), 3.48 (s, 3H).

<sup>13</sup>C-NMR (100 MHz, CDCl<sub>3</sub>, ppm):  $\delta$  157.5, 155.0, 151.7, 139.8, 130.5, 129.4, 126.9, 123.7, 121.9, 120.4, 116.1, 113.6, 111.1, 46.7, 40.1, 37.2, 33.7.

HRMS calcd. for C<sub>17</sub>H<sub>16</sub>N<sub>4</sub>O<sub>3</sub> [M + H]<sup>+</sup>: 325.1301; found: 325.1298

##### **1,3-Diethyl-5,7-dimethyl-5,7-dihydro-1*H*-pyrimido[4',5':5,6]pyrido[3,4-*b*]indole-2,4,6(3*H*)-trione (5b):**

White solid; mp: 242-244 °C

<sup>1</sup>H-NMR (400 MHz, CDCl<sub>3</sub>, ppm):  $\delta$  7.94 (d, *J* = 8 Hz, 1H), 7.60 (d, *J* = 3.6 Hz, 2H), 7.39 - 7.42 (m, 1H), 4.55 (q, *J* = 6.8 Hz, 2H), 4.45 (s, 3H), 4.12 (s, 3H), 4.12 (q, *J* = 6.8 Hz, 2H), 1.32 (t, *J* = 7.2 Hz, 3H), 1.03 (t, *J* = 6.8 Hz, 3H).

<sup>13</sup>C-NMR (100 MHz, CDCl<sub>3</sub>, ppm):  $\delta$  157.5, 155.5, 151.6, 140.9, 131.1, 129.5, 127.0, 123.6, 122.0, 120.2, 116.4, 113.4, 111.0, 46.6, 37.2, 33.7, 31.8, 13.1, 13.0.

HRMS calcd. for C<sub>19</sub>H<sub>20</sub>N<sub>4</sub>O<sub>3</sub> [M + H]<sup>+</sup>: 353.1614; found: 353.1616

##### **5-Ethyl-1,3,7-trimethyl-5,7-dihydro-1*H*-pyrimido[4',5':5,6]pyrido[3,4-*b*]indole-2,4,6(3*H*)-trione (5c):**

White solid; mp: 212-214 °C

<sup>1</sup>H-NMR (400 MHz, CDCl<sub>3</sub>, ppm): δ 7.97 (d, *J* = 8 Hz, 1H), 7.60 (d, *J* = 3.6 Hz, 2H), 7.38 - 7.42 (m, 1H), 4.83 (q, *J* = 6.8 Hz, 2H), 4.46 (s, 3H), 3.80 (s, 3H), 3.49 (s, 3H), 1.47 (t, *J* = 7.2 Hz, 3H).

<sup>13</sup>C-NMR (100 MHz, CDCl<sub>3</sub>, ppm): δ 157.3, 155.0, 152.3, 140.9, 131.5, 130.8, 126.9, 123.8, 121.9, 120.3, 114.3, 112.9, 111.0, 41.4, 40.2, 31.9, 28.8, 15.2.

HRMS calcd. for C<sub>18</sub>H<sub>18</sub>N<sub>4</sub>O<sub>3</sub> [M + H]<sup>+</sup>: 339.1457; found: 339.1458

**3,5-Diethyl-1,7-dimethyl-5,7-dihydro-1*H*-pyrimido[4',5':5,6]pyrido[3,4-*b*]indole-2,4,6(3*H*)-trione (5d):**

Colourless solid; mp: 182-184 °C

<sup>1</sup>H-NMR (400 MHz, CDCl<sub>3</sub>, ppm): δ 7.93 (d, *J* = 8.4 Hz, 1H), 7.59 (d, *J* = 4 Hz, 2H), 7.38 - 7.42 (m, 1H), 4.83 (q, *J* = 6.8 Hz, 2H), 4.55 (q, *J* = 7.2 Hz, 2H), 4.45 (s, 3H), 3.47 (s, 3H), 1.47 (t, *J* = 6.8 Hz, 3H), 1.02 (t, *J* = 6.8 Hz, 3H).

<sup>13</sup>C-NMR (100 MHz, CDCl<sub>3</sub>, ppm): δ 157.5, 155.2, 151.9, 140.9, 131.2, 129.5, 127.0, 123.5, 122.0, 120.2, 115.7, 113.4, 111.1, 46.5, 41.4, 31.9, 28.7, 15.2, 13.2.

HRMS calcd. for C<sub>19</sub>H<sub>20</sub>N<sub>4</sub>O<sub>3</sub> [M + H]<sup>+</sup>: 353.1614; found: 353.1618

**3-Ethyl-1,5,7-trimethyl-5,7-dihydro-1*H*-pyrimido[4',5':5,6]pyrido[3,4-*b*]indole-2,4,6(3*H*)-trione (5e):**

Colourless solid; mp: 186-188 °C

<sup>1</sup>H-NMR (400 MHz, CDCl<sub>3</sub>, ppm): δ 7.93 (d, *J* = 8.4 Hz, 1H), 7.60 (d, *J* = 4 Hz, 2H), 7.38 - 7.42 (m, 1H), 4.55 (q, *J* = 6.8 Hz, 2H), 4.45 (s, 3H), 4.13 (s, 3H), 3.46 (s, 3H), 1.03 (t, *J* = 6.8 Hz, 3H).

<sup>13</sup>C-NMR (100 MHz, CDCl<sub>3</sub>, ppm): δ 158.0, 155.5, 152.0, 140.9, 131.1, 129.4, 127.0, 123.5, 122.0, 120.2, 116.2, 113.4, 111.1, 46.9, 33.6, 31.9, 28.6, 13.1.

HRMS calcd. for C<sub>18</sub>H<sub>18</sub>N<sub>4</sub>O<sub>3</sub> [M + H]<sup>+</sup>: 339.1457; found: 339.1457

**7-Ethyl-1,3,5-trimethyl-5,7-dihydro-1*H*-pyrimido[4',5':5,6]pyrido[3,4-*b*]indole-2,4,6(3*H*)-trione (5f):**

White solid; mp: 188-190 °C

<sup>1</sup>H-NMR (400 MHz, CDCl<sub>3</sub>, ppm): δ 7.98 (d, *J* = 8.4 Hz, 1H), 7.57 - 7.64 (m, 2H), 7.38 - 7.42 (m, 1H), 5.03 (q, *J* = 7.2 Hz, 2H), 4.12 (s, 3H), 3.81 (s, 3H), 3.49 (s, 3H), 1.52 (t, *J* = 7.2 Hz, 3H).

<sup>13</sup>C-NMR (100 MHz, CDCl<sub>3</sub>, ppm): δ 158.2, 155.1, 152.5, 139.9, 130.8, 126.8, 123.9, 121.8, 120.4, 114.9, 113.0, 111.1, 40.1, 33.9, 28.7, 15.9.

HRMS calcd. for C<sub>18</sub>H<sub>18</sub>N<sub>4</sub>O<sub>3</sub> [M + H]<sup>+</sup>: 339.1457; found: 339.1460

**5,7-Diethyl-1,3-dimethyl-5,7-dihydro-1*H*-pyrimido[4',5':5,6]pyrido[3,4-*b*]indole-2,4,6(3*H*)-trione (5g):**

White solid; mp: 165-167 °C

<sup>1</sup>H-NMR (400 MHz, CDCl<sub>3</sub>, ppm): δ 7.97 (d, *J* = 8 Hz, 1H), 7.56 - 7.64 (m, 2H), 7.37 - 7.41 (m, 1H), 5.02 (q, *J* = 7.2 Hz, 2H), 4.83 (q, *J* = 6.8 Hz, 2H), 3.80 (s, 3H), 3.49 (s, 3H), 1.52 (t, *J* = 7.2 Hz, 3H), 1.48 (t, *J* = 6.8 Hz, 3H).

<sup>13</sup>C-NMR (100 MHz, CDCl<sub>3</sub>, ppm): δ 157.3, 154.6, 152.4, 139.8, 130.9, 130.7, 126.8, 123.9, 121.8, 120.4, 114.3, 113.0, 111.1, 41.5, 40.2, 40.1, 28.8, 16.0, 15.2.

HRMS calcd. for C<sub>19</sub>H<sub>20</sub>N<sub>4</sub>O<sub>3</sub> [M + H]<sup>+</sup>: 353.1614; found: 353.1612

**1,3,7-Triethyl-5-methyl-5,7-dihydro-1*H*-pyrimido[4',5':5,6]pyrido[3,4-*b*]indole-2,4,6(3*H*)-trione (5h):**

White solid; mp: 172-174 °C

<sup>1</sup>H-NMR (400 MHz, CDCl<sub>3</sub>, ppm): δ 7.94 (d, *J* = 8 Hz, 1H), 7.56 - 7.63 (m, 2H), 7.37 - 7.41 (m, 1H), 5.01 (q, *J* = 7.2 Hz, 2H), 4.54 (q, *J* = 6.8 Hz, 2H), 4.13 (s, 3H), 4.12 (q, *J* = 6.8 Hz, 2H), 1.52 (t, *J* = 7.2 Hz, 3H), 1.31 (t, *J* = 7.2 Hz, 3H), 1.05 (t, *J* = 6.8 Hz, 3H).

<sup>13</sup>C-NMR (100 MHz, CDCl<sub>3</sub>, ppm): δ 157.5, 155.0, 151.7, 139.8, 130.5, 129.4, 126.9, 123.7, 121.9, 120.4, 116.4, 113.6, 111.1, 46.7, 40.7, 37.2, 33.7, 16.0, 13.1, 13.0.

HRMS calcd. for C<sub>20</sub>H<sub>22</sub>N<sub>4</sub>O<sub>3</sub> [M + H]<sup>+</sup>: 367.1770; found: 367.1768

**7-Benzyl-1,3,5-triethyl-5,7-dihydro-1*H*-pyrimido[4',5':5,6]pyrido[3,4-*b*]indole-2,4,6(3*H*)-trione (5i):**

White solid; mp: 138-140 °C

<sup>1</sup>H-NMR (400 MHz, CDCl<sub>3</sub>, ppm): δ 7.88 (d, *J* = 8 Hz, 1H), 7.50 (d, *J* = 8.4 Hz, 1H), 7.44 (t, *J* = 8.4 Hz, 1H), 7.30 (t, *J* = 7.2 Hz, 1H), 7.15 - 7.24 (m, 5H), 6.23 (s, 2H), 4.76 (q, *J* = 6.8 Hz, 2H), 4.47 (q, *J* = 6.8 Hz, 2H), 4.07 (q, *J* = 7.2 Hz, 2H), 1.39 (t, *J* = 6.8 Hz, 3H), 1.25 (t, *J* = 7.2 Hz, 3H), 0.98 (t, *J* = 6.8 Hz, 3H).

<sup>13</sup>C-NMR (100 MHz, CDCl<sub>3</sub>, ppm): δ 157.0, 154.9, 151.6, 140.4, 137.4, 130.8, 129.4, 128.7, 127.6, 127.1, 127.0, 123.6, 122.1, 120.5, 116.2, 114.0, 111.9, 48.2, 46.8, 41.6, 37.3, 15.2, 13.1, 13.0.

HRMS calcd. for  $C_{26}H_{26}N_4O_3$   $[M + H]^+$ : 443.2083; found: 443.2088

**7-Benzyl-1,3-diethyl-5-methyl-5,7-dihydro-1*H*-pyrimido[4',5':5,6]pyrido[3,4-*b*]indole-2,4,6(3*H*)-trione (5j):**

White solid; mp: 156-158 °C

$^1H$ -NMR (400 MHz,  $CDCl_3$ , ppm):  $\delta$  7.98 (d,  $J$  = 8.4 Hz, 1H), 7.60 (d,  $J$  = 8 Hz, 1H), 7.54 (t,  $J$  = 8 Hz, 1H), 7.40 (t,  $J$  = 7.6 Hz, 1H), 7.24 - 7.42 (m, 5H), 6.27 (s, 2H), 4.57 (q,  $J$  = 7.2 Hz, 2H), 4.15 (s, 3H), 4.10 - 4.20 (m, 2H), 1.34 (t,  $J$  = 7.2 Hz, 3H), 1.08 (t,  $J$  = 6.8 Hz, 3H).

$^{13}C$ -NMR (100 MHz,  $CDCl_3$ , ppm):  $\delta$  157.5, 155.2, 151.6, 140.4, 137.3, 130.6, 129.3, 128.8, 127.6, 127.2, 126.9, 123.7, 122.2, 120.5, 116.7, 114.0, 111.9, 48.2, 46.7, 37.2, 33.8, 13.1, 13.0.

HRMS calcd. for  $C_{25}H_{24}N_4O_3$   $[M + H]^+$ : 429.1927; found: 429.1930

**7-Butyl-1,3-diethyl-5-methyl-5,7-dihydro-1*H*-pyrimido[4',5':5,6]pyrido[3,4-*b*]indole-2,4,6(3*H*)-trione (5k):**

White solid; mp: 115-117 °C

$^1H$ -NMR (400 MHz,  $CDCl_3$ , ppm):  $\delta$  7.87 (d,  $J$  = 8.4 Hz, 1H), 7.48-7.55 (m, 2H), 7.31 - 7.33 (m, 1H), 4.86 (t,  $J$  = 7.6 Hz, 2H), 4.47 (q,  $J$  = 6.8 Hz, 2H), 4.05 (q,  $J$  = 6.8 Hz, 2H), 4.05 (s, 3H), 1.83 – 1.84 (m, 2H), 1.36 – 1.42 (m, 2H), 1.24 (t,  $J$  = 7.2 Hz, 3H), 0.97 (t,  $J$  = 6.8 Hz, 3H), 0.91 (t,  $J$  = 7.2 Hz, 3H).

$^{13}C$ -NMR (100 MHz,  $CDCl_3$ , ppm):  $\delta$  157.5, 155.1, 151.7, 140.1, 130.7, 129.4, 126.8, 123.6, 121.8, 120.2, 116.4, 113.5, 111.3, 46.7, 44.9, 37.1, 33.7, 33.0, 20.2, 13.9, 13.1, 13.0.

HRMS calcd. for  $C_{22}H_{26}N_4O_3$   $[M + H]^+$ : 395.2083; found: 395.2083

**7-Butyl-1,3,5-triethyl-5,7-dihydro-1*H*-pyrimido[4',5':5,6]pyrido[3,4-*b*]indole-2,4,6(3*H*)-trione (5l):**

White solid; mp: 162-164 °C

<sup>1</sup>H-NMR (400 MHz, CDCl<sub>3</sub>, ppm): δ 7.86 (d, *J* = 8.4 Hz, 1H), 7.47 – 7.54 (m, 2H), 7.28 - 7.32 (m, 1H), 4.86 (t, *J* = 7.6 Hz, 2H), 4.75 (q, *J* = 6.8 Hz, 2H), 4.46 (q, *J* = 6.8 Hz, 2H), 4.06 (q, *J* = 7.2 Hz, 2H), 1.78 – 1.86 (m, 2H), 1.41 (t, *J* = 6.8 Hz, 3H), 1.34-1.43 (m, 2H), 1.24 (t, *J* = 7.2 Hz, 3H), 0.97 (t, *J* = 6.8 Hz, 3H), 0.91 (t, *J* = 7.2 Hz, 3H).

<sup>13</sup>C-NMR (100 MHz, CDCl<sub>3</sub>, ppm): δ 157.0, 154.7, 151.6, 140.1, 130.9, 129.5, 126.8, 123.6, 121.8, 120.3, 115.9, 113.5, 111.3, 46.7, 44.9, 41.5, 37.2, 33.0, 20.2, 15.2, 13.9, 13.1, 13.0.

HRMS calcd. for C<sub>23</sub>H<sub>28</sub>N<sub>4</sub>O<sub>3</sub> [*M* + *H*]<sup>+</sup>: 409.2240; found: 409.2238

**(b) Experimental characterization data of starting material (4):**

***N*-(1,3-Dimethyl-2,4-dioxo-1,2,3,4-tetrahydropyrimidin-5-yl)-*N*,1-dimethyl-1*H*-indole-2-carboxamide (4a):**

Colourless gummy gel

<sup>1</sup>H-NMR (400 MHz, CDCl<sub>3</sub>, ppm): δ 7.55 (d, *J* = 7.6 Hz, 1H); 7.26-7.35 (m, 3H, indole C3-H and two ArH); 7.10 (t, *J* = 7.2 Hz, 1H); 6.46 (s, 1H, uracil C6-H); 3.89 (s, 3H); 3.42 (s, 3H), 3.37 (s, 3H); 3.32 (s, 3H).

<sup>13</sup>C-NMR (100 MHz, CDCl<sub>3</sub>, ppm): δ 165.4, 160.7, 150.9, 141.1, 138.1, 131.9, 126.0, 123.7, 121.8, 120.2, 110.0, 105.3, 37.8, 37.3, 31.3, 28.5.

HRMS calcd. for C<sub>17</sub>H<sub>18</sub>N<sub>4</sub>O<sub>3</sub> [*M* + *H*]<sup>+</sup>: 327.1457; found: 327.1455

***N*-(1,3-Diethyl-2,4-dioxo-1,2,3,4-tetrahydropyrimidin-5-yl)-*N*,1-dimethyl-1*H*-indole-2-carboxamide (4b):**

White solid; mp: 135-137 °C

<sup>1</sup>H-NMR (400 MHz, CDCl<sub>3</sub>, ppm): δ 7.53 (d, *J* = 7.2 Hz, 1H); 7.33 (d, *J* = 8.4 Hz, 1H); 7.25-7.29 (m, 2H, indole C3-H and one ArH); 7.10 (t, *J* = 7.2 Hz, 1H), 6.43 (s, 1H, uracil C6-H); 3.91-3.92 (m, 2H, NCH<sub>2</sub>CH<sub>3</sub>), 3.88 (s, 3H); 3.71-3.77 (m, 2H, NCH<sub>2</sub>CH<sub>3</sub>); 3.35 (s, 3H); 1.23-1.31(m, 3H, NCH<sub>2</sub>CH<sub>3</sub>); 1.08 (s, 3H, NCH<sub>2</sub>CH<sub>3</sub>).

<sup>13</sup>C-NMR (100 MHz, CDCl<sub>3</sub>, ppm): δ 165.4, 160.2, 149.9, 139.7, 137.9, 132.1, 126.1, 123.6, 121.6, 120.2, 109.9, 105.0, 45.1, 37.3, 37.1, 31.3, 14.3, 12.6.

HRMS calcd. for C<sub>19</sub>H<sub>22</sub>N<sub>4</sub>O<sub>3</sub> [M + H]<sup>+</sup>: 355.1770; found: 355.1771

***N*-(1,3-Dimethyl-2,4-dioxo-1,2,3,4-tetrahydropyrimidin-5-yl)-*N*-ethyl-1-methyl-1*H*-indole-2-carboxamide (4c):**

White solid; mp: 154-156 °C

<sup>1</sup>H-NMR (400 MHz, CDCl<sub>3</sub>, ppm): δ 7.55 (d, *J* = 7.6 Hz, 1H); 7.34 (d, *J* = 8.0 Hz, 1H); 7.27-7.29 (m, 2H, one ArH and one indole C3-H ), 7.10 (t, *J* = 7.2 Hz, 1H); 6.27 (s, 1H, uracil C6-H); 3.89 (s, 3H); 3.79 (brs, 2H, NCH<sub>2</sub>CH<sub>3</sub>); 3.40 (s, 3H); 3.27 (s, 3H); 1.23 (t, *J* = 6.8 Hz, 3H, NCH<sub>2</sub>CH<sub>3</sub>).

<sup>13</sup>C-NMR (100 MHz, CDCl<sub>3</sub>, ppm): δ 165.0, 161.0, 150.9, 141.1, 138.0, 132.5, 126.1, 123.5, 121.7, 120.1, 110.0, 104.7, 44.7, 37.4, 31.3, 28.5, 13.1.

HRMS calcd. for C<sub>18</sub>H<sub>20</sub>N<sub>4</sub>O<sub>3</sub> [M + H]<sup>+</sup>: 341.1614; found: 341.1619

***N*-Ethyl-*N*-(3-ethyl-1-methyl-2,4-dioxo-1,2,3,4-tetrahydropyrimidin-5-yl)-1-methyl-1*H*-indole-2-carboxamide (4d):**

Colourless gummy gel

$^1\text{H}$ -NMR (400 MHz,  $\text{CDCl}_3$ , ppm):  $\delta$  7.53 (d,  $J$  = 7.6 Hz, 1H); 7.33 (d,  $J$  = 8 Hz, 1H); 7.25-7.28 (m, 2H, one ArH and one indole C3-H ); 7.09 (t,  $J$  = 7.2 Hz, 1H); 6.40 (s, 1H, uracil C6-H); 3.86-3.91 (m, 4H, one N-Me and 1H of  $\text{NCH}_2\text{CH}_3$ ); 3.70-3.80 (m, 3H, 1H of  $\text{NCH}_2\text{CH}_3$  and 2H of  $\text{NCH}_2\text{CH}_3$ ); 3.26 (s, 3H, N-Me); 1.23 (t,  $J$  = 6.8 Hz, 6H, two  $\text{NCH}_2\text{CH}_3$ ).

$^{13}\text{C}$ -NMR (100 MHz,  $\text{CDCl}_3$ , ppm):  $\delta$  165.0, 160.9, 150.4, 140.3, 138.0, 132.5, 126.1, 123.5, 121.6, 120.1, 109.9, 104.8, 45.2, 44.4, 31.3, 28.5, 14.4, 13.2.

HRMS calcd. for  $\text{C}_{19}\text{H}_{22}\text{N}_4\text{O}_3$   $[\text{M} + \text{H}]^+$ : 355.1770; found: 355.1767

***N*-(3-Ethyl-1-methyl-2,4-dioxo-1,2,3,4-tetrahydropyrimidin-5-yl)-*N*,1-dimethyl-1*H*-indole-2-carboxamide (4e):**

Colourless gummy gel

$^1\text{H}$ -NMR (400 MHz,  $\text{CDCl}_3$ , ppm):  $\delta$  7.53 (d,  $J$  = 8 Hz, 1H); 7.33 (d,  $J$  = 8 Hz, 1H); 7.25-7.29 (m, 2H, one ArH and one indole C3-H ); 7.10 (t,  $J$  = 7.6 Hz, 1H); 6.44 (s, 1H, uracil C6-H); 3.77 (s, 3H, N-Me); 3.77 (q,  $J$  = 7.2 Hz, 2H,  $\text{NCH}_2\text{CH}_3$ ); 3.33 (s, 3H, N-Me); 3.27 (s, 3H, N-Me); 1.26 (t,  $J$  = 7.2 Hz, 3H,  $\text{NCH}_2\text{CH}_3$ ).

$^{13}\text{C}$ -NMR (100 MHz,  $\text{CDCl}_3$ , ppm):  $\delta$  165.5, 160.6, 150.4, 140.1, 138.0, 132.0, 126.1, 123.6, 121.7, 120.2, 110.0, 105.3, 45.2, 37.5, 31.3, 28.4, 14.3.

HRMS calcd. for  $\text{C}_{18}\text{H}_{20}\text{N}_4\text{O}_3$   $[\text{M} + \text{H}]^+$ : 341.1614; found: 341.1617

***N*-(1,3-Dimethyl-2,4-dioxo-1,2,3,4-tetrahydropyrimidin-5-yl)-1-ethyl-*N*-methyl-1*H*-indole-2-carboxamide (4f):**

Colourless gummy gel

<sup>1</sup>H-NMR (400 MHz, CDCl<sub>3</sub>, ppm): δ 7.57 (d, *J* = 7.6 Hz, 1H); 7.37 (d, *J* = 8.4 Hz, 1H); 7.28 (d, *J* = 7.6 Hz, 1H); 7.26 (s, 1H, indole C3-H); 7.11 (t, *J* = 7.6 Hz, 1H); 6.48 (s, 1H, uracil C6-H); 4.40 (q, *J* = 7.2 Hz, 2H, NCH<sub>2</sub>CH<sub>3</sub>) 3.39 (s, 3H, N-Me); 3.33 (s, 3H, N-Me); 3.31 (s, 3H, N-Me); 1.46 (t, *J* = 7.2 Hz, 3H, NCH<sub>2</sub>CH<sub>3</sub>).

<sup>13</sup>C-NMR (100 MHz, CDCl<sub>3</sub>, ppm): δ 165.4, 160.6, 150.9, 141.2, 137.0, 131.0, 126.3, 123.6, 121.9, 120.1, 110.2, 105.5, 39.7, 38.1, 37.4, 28.5, 15.6.

HRMS calcd. for C<sub>18</sub>H<sub>20</sub>N<sub>4</sub>O<sub>3</sub> [M + H]<sup>+</sup>: 341.1614; found: 341.1611

***N*-(1,3-Dimethyl-2,4-dioxo-1,2,3,4-tetrahydropyrimidin-5-yl)-*N*,1-diethyl-1*H*-indole-2-carboxamide (4g):**

Colourless solid mp: 85-87 °C

<sup>1</sup>H-NMR (400 MHz, CDCl<sub>3</sub>, ppm): δ 7.56 (d, *J* = 6.8 Hz, 1H); 7.36 (d, *J* = 8.0 Hz, 1H); 7.22-7.28 (m, 2H, one ArH and one indole C3-H ); 7.09 (t, *J* = 7.2 Hz, 1H); 6.45 (s, 1H, uracil C6-H); 4.38 (d, *J* = 6.8 Hz, 2H, NCH<sub>2</sub>CH<sub>3</sub>) 3.70-3.82 (m, 2H, NCH<sub>2</sub>CH<sub>3</sub>); 3.38 (s, 3H, N-Me); 3.30 (s, 3H, N-Me); 1.44-1.48 (m, 3H, NCH<sub>2</sub>CH<sub>3</sub>); 1.20-1.1.26 (m, 3H, NCH<sub>2</sub>CH<sub>3</sub>).

<sup>13</sup>C-NMR (100 MHz, CDCl<sub>3</sub>, ppm): δ 165.4, 160.5, 150.4, 140.1, 136.9, 131.1, 126.3, 123.6, 121.8, 120.1, 110.2, 105.5, 45.2, 39.7, 37.2, 28.4, 15.6, 14.3.

HRMS calcd. for C<sub>19</sub>H<sub>22</sub>N<sub>4</sub>O<sub>3</sub> [M + H]<sup>+</sup>: 355.1770; found: 355.1773

***N*-(1,3-Diethyl-2,4-dioxo-1,2,3,4-tetrahydropyrimidin-5-yl)-1-ethyl-*N*-methyl-1*H*-indole-2-carboxamide (4h):**

White solid; mp:126-128 °C

<sup>1</sup>H-NMR (400 MHz, CDCl<sub>3</sub>, ppm): δ 7.53 (d, *J* = 7.2 Hz, 1H); 7.36 (d, *J* = 8.0 Hz, 1H); 7.22-7.28 (m, 2H, one ArH and one indole C3-H ); 7.09 (t, *J* = 7.2 Hz, 1H); 6.44 (s, 1H, uracil C6-H); 4.39 (q, *J* = 6.8 Hz, 2H, NCH<sub>2</sub>CH<sub>3</sub>); 3.93 (d, *J* = 6.4 Hz, 2H, NCH<sub>2</sub>CH<sub>3</sub>); 3.75 (d, *J* = 6.8 Hz, 2H, NCH<sub>2</sub>CH<sub>3</sub>); 3.34 (s, 3H, N-Me); 1.45 (t, *J* = 7.2 Hz, 3H, NCH<sub>2</sub>CH<sub>3</sub>); 1.22 (s, 3H, NCH<sub>2</sub>CH<sub>3</sub>); 1.12 (s, 3H, NCH<sub>2</sub>CH<sub>3</sub>).

<sup>13</sup>C-NMR (100 MHz, CDCl<sub>3</sub>, ppm): δ 165.4, 160.2, 150.0, 139.9, 136.8, 131.2, 126.4, 123.5, 121.8, 120.1, 110.1, 105.2, 45.1, 39.6, 37.3, 37.1, 15.6, 14.3, 12.7.

HRMS calcd. for C<sub>20</sub>H<sub>24</sub>N<sub>4</sub>O<sub>3</sub> [M + H]<sup>+</sup>: 369.1927; found: 369. 1923

**1-Benzyl-*N*-(1,3-diethyl-2,4-dioxo-1,2,3,4-tetrahydropyrimidin-5-yl)-*N*-ethyl-1*H*-indole-2-carboxamide (4i):**

White solid; mp:132-134 °C

<sup>1</sup>H-NMR (400 MHz, CDCl<sub>3</sub>, ppm): δ 7.51 (d, *J* = 8.4 Hz, 2H); 7.22-7.34 (m, 7H, six ArH and one indole C3-H ); 7.11 (t, *J* = 7.6 Hz, 1H); 6.40 (s, 1H, uracil C6-H); 5.43 (s, 2H); 4.18 (s, 1H, NCH<sub>2</sub>CH<sub>3</sub> ); 3.99 (q, *J* = 7.2 Hz, 2H, NCH<sub>2</sub>CH<sub>3</sub>); 3.42 (s, 1H, NCH<sub>2</sub>CH<sub>3</sub> ); 3.27 (s, 1H, NCH<sub>2</sub>CH<sub>3</sub> ); 3.12 (s, 1H, NCH<sub>2</sub>CH<sub>3</sub> ); 1.99 (t, *J* = 7.2 Hz, 3H, NCH<sub>2</sub>CH<sub>3</sub>); 1.12 (t, *J* = 7.2 Hz, 3H, NCH<sub>2</sub>CH<sub>3</sub>); 0.88 (s, 3H, NCH<sub>2</sub>CH<sub>3</sub>).

<sup>13</sup>C-NMR (100 MHz, CDCl<sub>3</sub>, ppm): δ 163.9, 160.0, 149.3, 140.2, 138.9, 137.1, 130.9, 128.2, 127.9, 127.2, 125.9, 123.3, 121.4, 119.8, 116.8, 109.3, 104.2, 46.4, 44.2, 41.8, 36.5, 13.7, 12.2, 11.9.

HRMS calcd. for  $C_{26}H_{29}N_4O_3$   $[M + H]^+$ : 444.2161; found: 444.2159

**1-Benzyl-*N*-(1,3-diethyl-2,4-dioxo-1,2,3,4-tetrahydropyrimidin-5-yl)-*N*-methyl-1*H*-indole-2-carboxamide (4j):**

White solid; mp: 116-118 °C

$^1H$ -NMR (400 MHz,  $CDCl_3$ , ppm):  $\delta$  7.54 (d,  $J$  = 7.6 Hz, 1H); 7.48 (d,  $J$  = 8.4 Hz, 1H); 7.26-7.35 (m, 7H, six ArH and one indole C3-H); 7.13 (t,  $J$  = 7.6 Hz, 1H); 6.43 (s, 1H, uracil C6-H); 5.70 (s, 2H); 4.38 (s, 1H,  $NCH_2CH_3$ ); 4.02 (q,  $J$  = 6.8 Hz, 2H,  $NCH_2CH_3$ ); 3.44 (s, 1H,  $NCH_2CH_3$ ); 3.26 (s, 3H,  $NCH_3$ ); 1.22 (t,  $J$  = 6.8 Hz, 3H,  $NCH_2CH_3$ ); 0.93 (s, 3H,  $NCH_2CH_3$ ).

$^{13}C$ -NMR (100 MHz,  $CDCl_3$ , ppm):  $\delta$  164.8, 160.3, 149.8, 140.1, 139.1, 137.6, 131.2, 128.7, 127.9, 127.7, 126.4, 123.9, 121.9, 120.4, 119.4, 110.0, 105.1, 47.1, 44.8, 36.9, 36.2, 14.2, 12.8.

HRMS calcd. for  $C_{25}H_{26}N_4O_3$   $[M + H]^+$ : 431.2083; found: 431.2082

**1-Butyl-*N*-(1,3-diethyl-2,4-dioxo-1,2,3,4-tetrahydropyrimidin-5-yl)-*N*-methyl-1*H*-indole-2-carboxamide (4k):**

Colourless gummy liquid

$^1H$ -NMR (400 MHz,  $CDCl_3$ , ppm):  $\delta$  7.55 (d,  $J$  = 7.2 Hz, 1H); 7.37 (d,  $J$  = 8.0 Hz, 1H); 7.26 (d,  $J$  = 8.0 Hz, 1H); 7.20 (s, 1H, C3-H of indole); 7.11 (t,  $J$  = 7.2 Hz, 1H); 6.49 (s, 1H, C6-H of uracil); 4.35 (s, 2H,  $NCH_2CH_3$ ); 3.98 (d,  $J$  = 6.8 Hz, 2H, may  $NCH_2CH_2$  or  $NCH_2CH_3$ ); 3.75 (d,  $J$  = 6.8 Hz, 2H, may  $NCH_2CH_2$  or  $NCH_2CH_3$ ); 3.36 (s, 3H,  $NCH_3$ ); 1.85 (quintet,  $J$  = 7.6 Hz, 2H,  $NCH_2CH_2CH_2$ ); 1.29-1.45 (m, 2H,  $-CH_2CH_2CH_3$ ); 1.22 (s, 3H,  $NCH_2CH_3$ ); 1.64 (s, 3H,  $NCH_2CH_3$ ); 0.98 (t,  $J$  = 7.6 Hz, 3H,  $-CH_2CH_3$ ).

$^{13}C$ -NMR (100 MHz,  $CDCl_3$ , ppm):  $\delta$  165.3, 160.2, 150.0, 139.9, 137.3, 131.2, 126.3, 123.5, 121.8, 120.1, 110.3, 105.3, 45.1, 44.5, 37.2, 37.1, 32.5, 20.3, 14.3, 13.9, 12.7.

HRMS calcd. for  $C_{22}H_{28}N_4O_3$   $[M + H]^+$ : 397.2240; found: 397.2243

**1-Butyl-*N*-(1,3-diethyl-2,4-dioxo-1,2,3,4-tetrahydropyrimidin-5-yl)-*N*-ethyl-1*H*-indole-2-carboxamide (4l):**

Colourless solid; mp: 82-84 °C

$^1H$ -NMR (400 MHz,  $CDCl_3$ , ppm):  $\delta$  7.45 (d,  $J$  = 7.2 Hz, 1H); 7.26 (t,  $J$  = 8.0 Hz, 1H); 7.14-7.19 (m, 1H); 7.01 (t,  $J$  = 7.2 Hz, 2H); 6.37 (s, 1H, C6-H of uracil); 4.25 (s, 2H, may  $NCH_2CH_2$  or  $NCH_2CH_3$ ); 3.89 (d,  $J$  = 6.4 Hz, 3H, may  $NCH_2CH_2$  or  $NCH_2CH_3$ ); 3.67-3.72 (m, 3H, may  $NCH_2CH_2$  or  $NCH_2CH_3$ ); 1.76 (quintet,  $J$  = 7.6 Hz, 2H,  $NCH_2CH_2CH_2$ ); 1.21-1.28 (m, 2H,  $-CH_2CH_2CH_3$ ); 1.16 (t,  $J$  = 7.2 Hz, 6H,  $NCH_2CH_3$ ); 1.01 (s, 3H,  $NCH_2CH_3$ ); 0.89 (t,  $J$  = 7.6 Hz, 3H,  $-CH_2CH_3$ ).

$^{13}C$ -NMR (100 MHz,  $CDCl_3$ , ppm):  $\delta$  164.9, 160.5, 150.0, 140.2, 137.2, 131.7, 126.3, 123.3, 121.7, 120.0, 110.2, 104.7, 45.0, 44.5, 44.0, 37.1, 32.5, 20.3, 14.3, 13.9, 13.2, 12.6.

HRMS calcd. for  $C_{23}H_{30}N_4O_3$   $[M + H]^+$ : 411.2396; found: 411.2391

***N*-(1,3-Diethyl-2,4-dioxo-1,2,3,4-tetrahydropyrimidin-5-yl)-*N*-methyl-1*H*-indole-2-carboxamide (4m):**

White solid; mp: 210-212 °C

$^1H$ -NMR (400 MHz,  $CDCl_3$ , ppm):  $\delta$  9.52 (s, 1H, NH); 7.47 (d,  $J$  = 7.2 Hz, 1H); 7.34 (d,  $J$  = 8.4 Hz, 1H); 7.28 (s, 1H, C3-H of indole); 7.19 (t,  $J$  = 8.4 Hz, 1H); 7.02 (t,  $J$  = 7.2 Hz, 1H); 6.13 (s, 1H, C6-H of uracil); 4.00 (q,  $J$  = 6.8 Hz, 2H,  $NCH_2CH_3$ ); 3.77 (q,  $J$  = 7.2 Hz, 2H,  $NCH_2CH_3$ ); 3.32 (s, 3H,  $NCH_3$ ); 1.24 (t,  $J$  = 7.2 Hz, 3H,  $NCH_2CH_3$ ); 1.18 (t,  $J$  = 6.8 Hz, 3H,  $NCH_2CH_3$ ).

$^{13}C$ -NMR (100 MHz,  $CDCl_3$ , ppm):  $\delta$  163.4, 160.2, 150.3, 141.2, 135.6, 129.1, 127.6, 124.7, 122.1, 120.5, 118.6, 111.9, 105.9, 45.2, 37.8, 37.2, 14.5, 12.8.

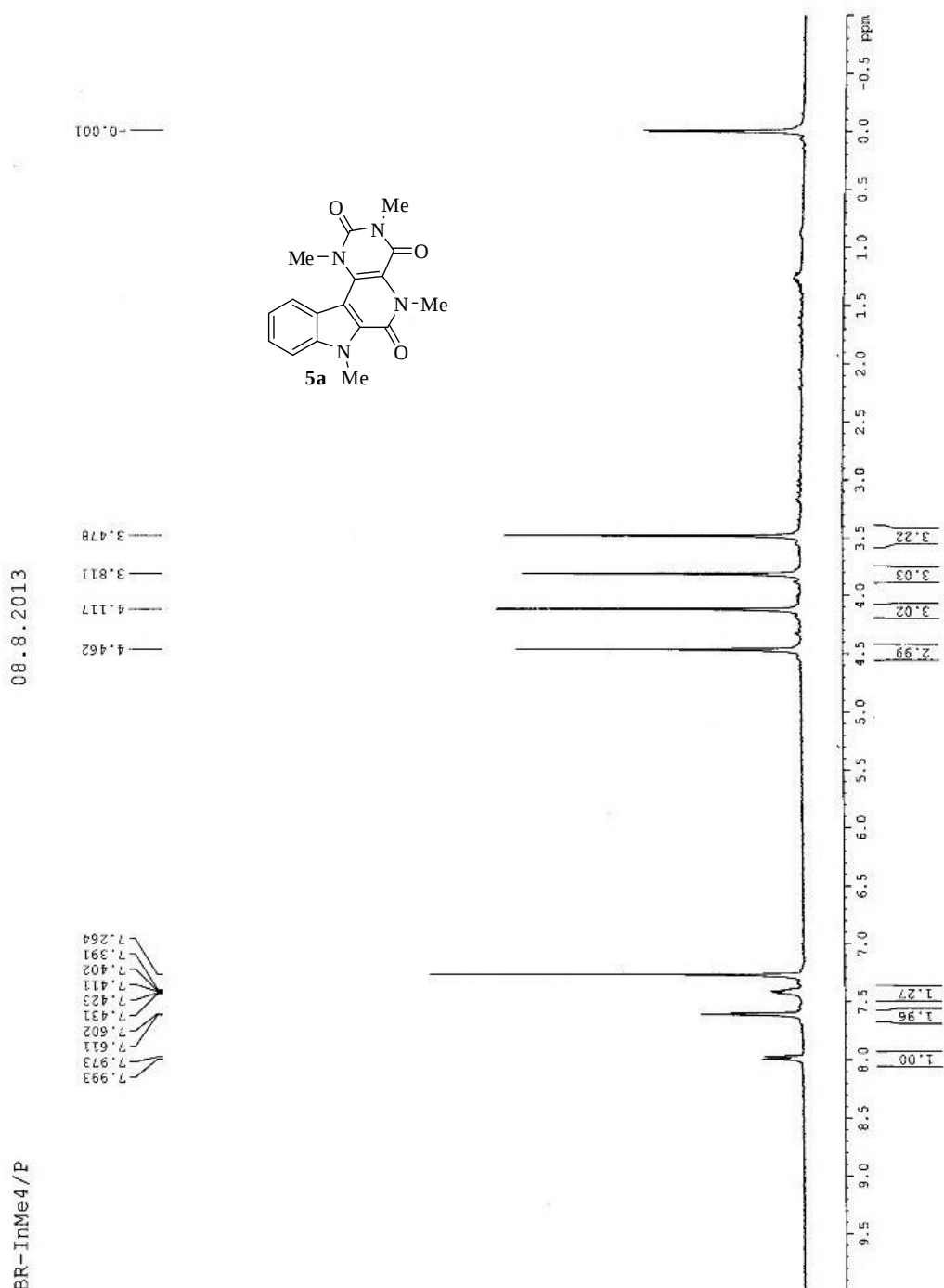
HRMS calcd. for  $C_{18}H_{20}N_4O_3$   $[M + H]^+$ : 341.1614; found: 341.1618

**(4) References:**

1. D. B. England; A. Padwa *Org. Lett.* **2008**, *10*, 3631.

(5) NMR ( $^1\text{H}$  and  $^{13}\text{C}$ ) spectra of products (5):

1,3,5,7-Tetramethyl-5,7-dihydro-1*H*-pyrimido[4',5':5,6]pyrido[3,4-*b*]indole-2,4,6(3*H*)-trione (5a):



BR-InMe4/p

12.8.2012

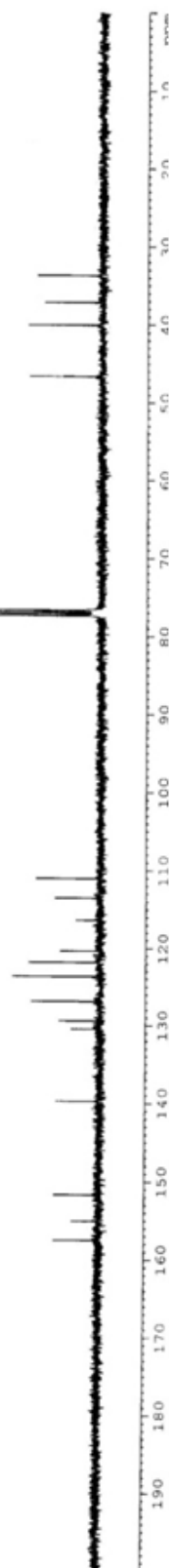
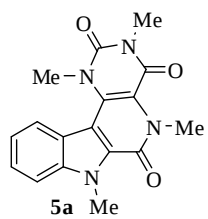
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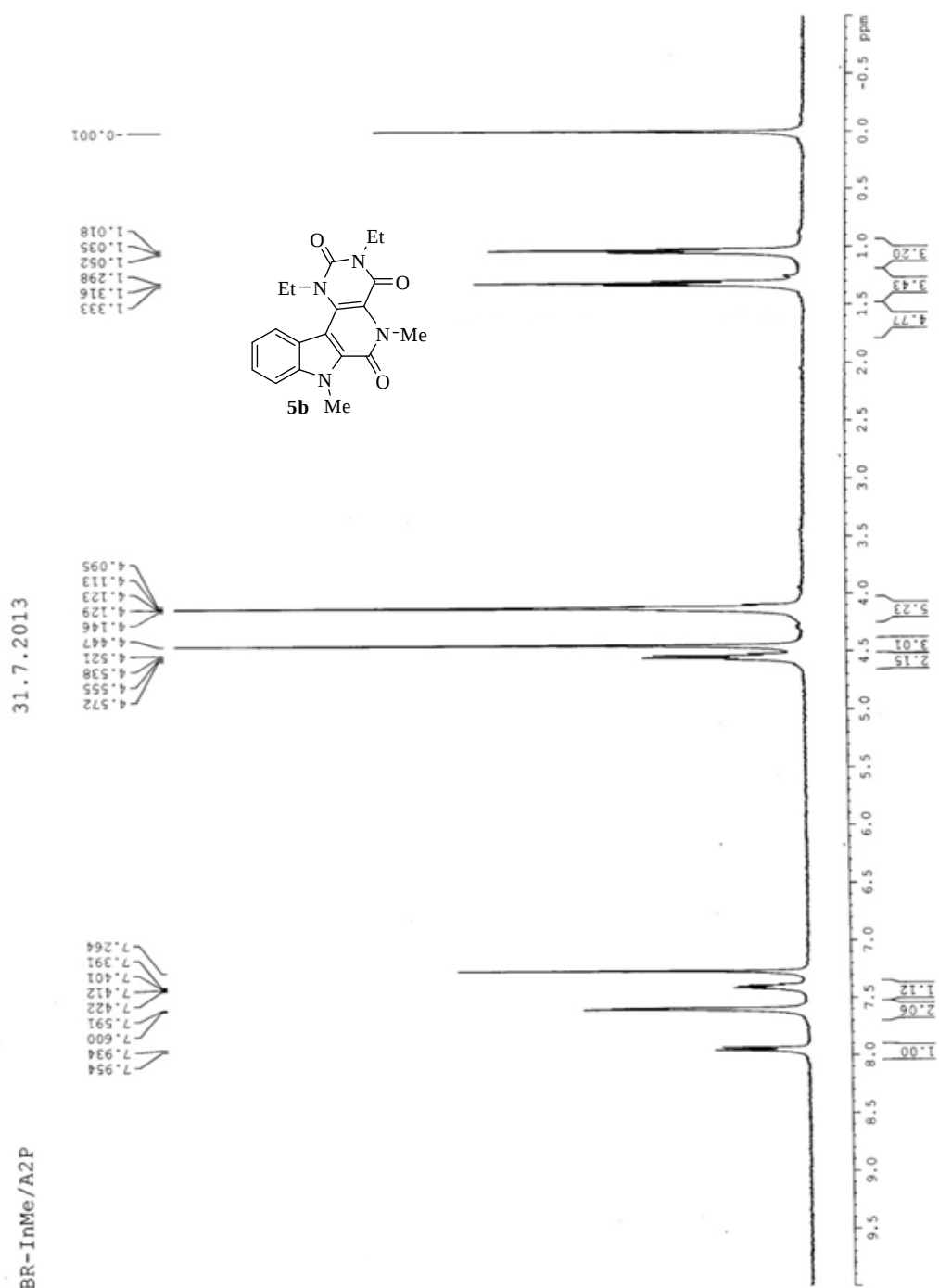
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76.73

46.66  
40.07  
37.17  
33.73



**1,3-Diethyl-5,7-dimethyl-5,7-dihydro-1*H*-pyrimido[4',5':5,6]pyrido[3,4-*b*]indole-2,4,6(3*H*)-trione (5b):**



BR-InMe/A2P

01.8.2013

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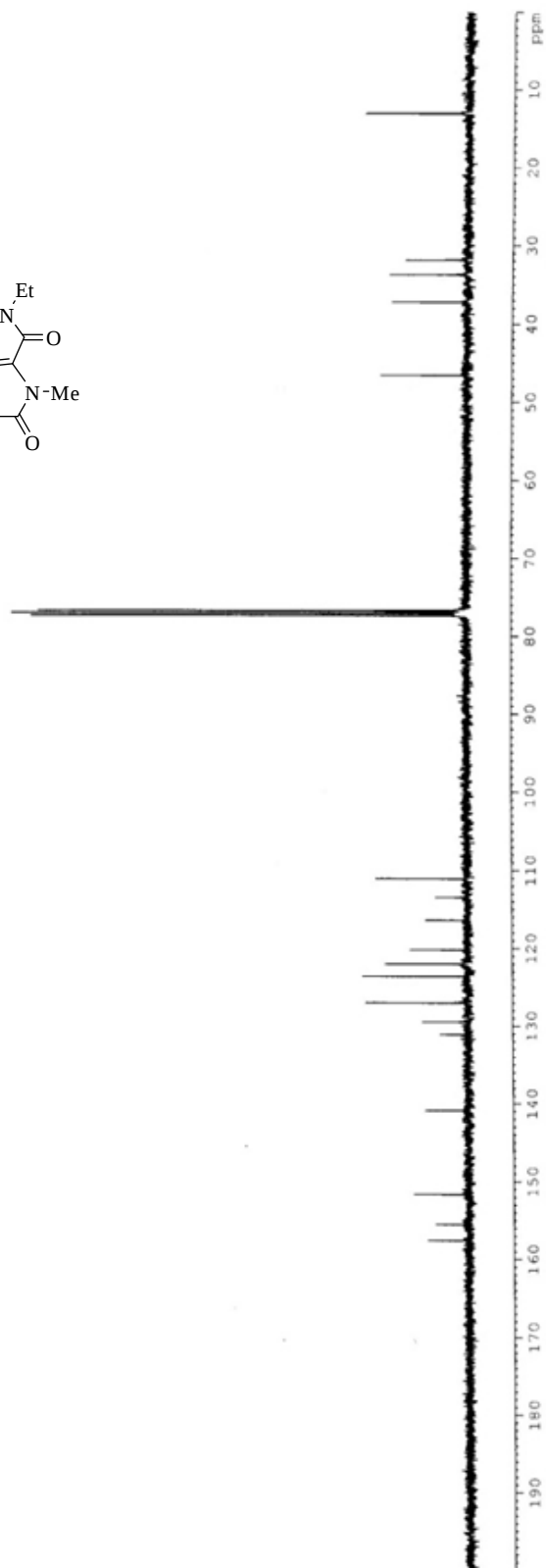
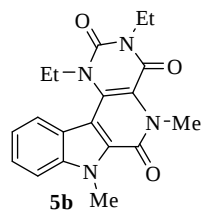
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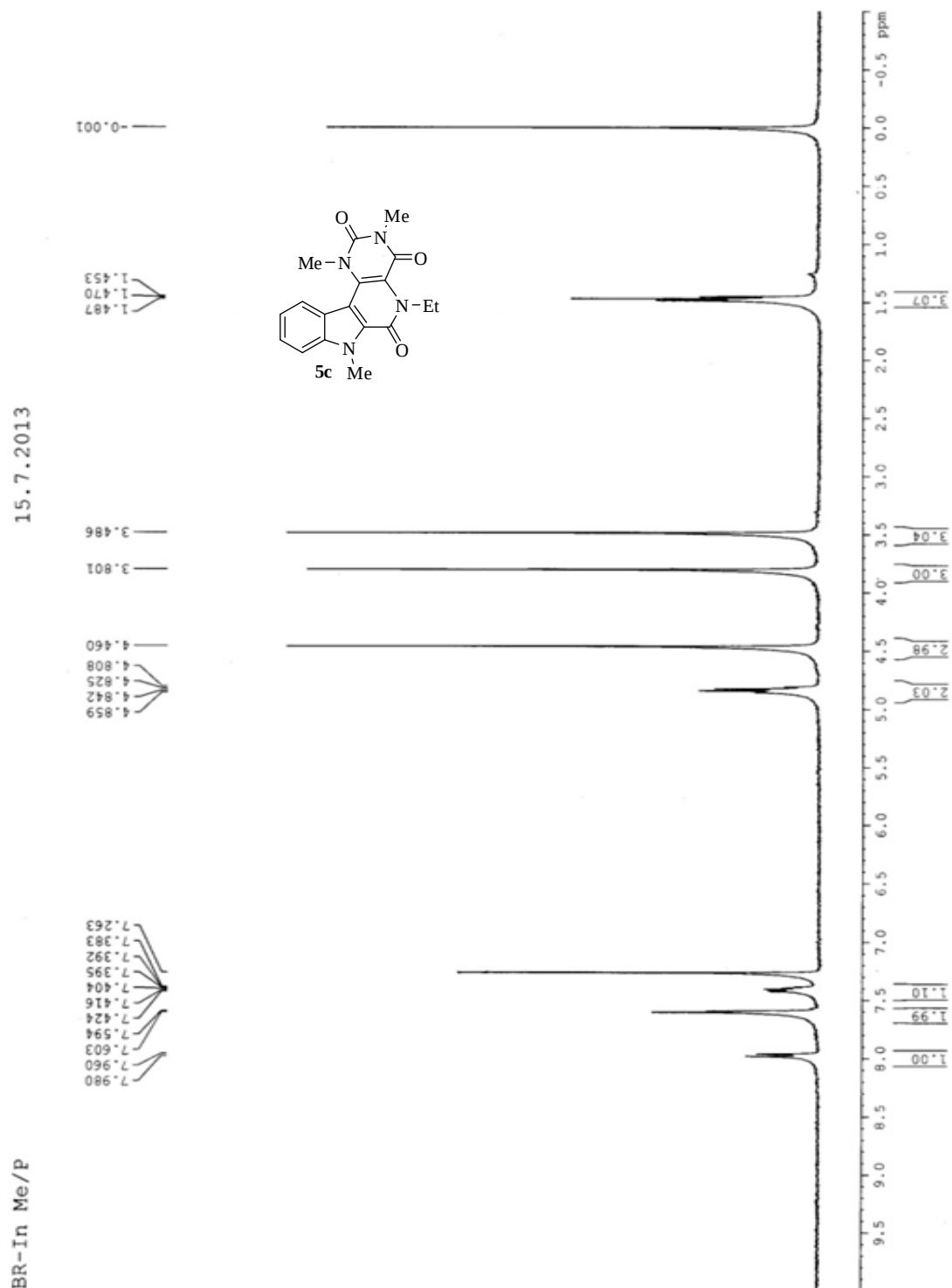
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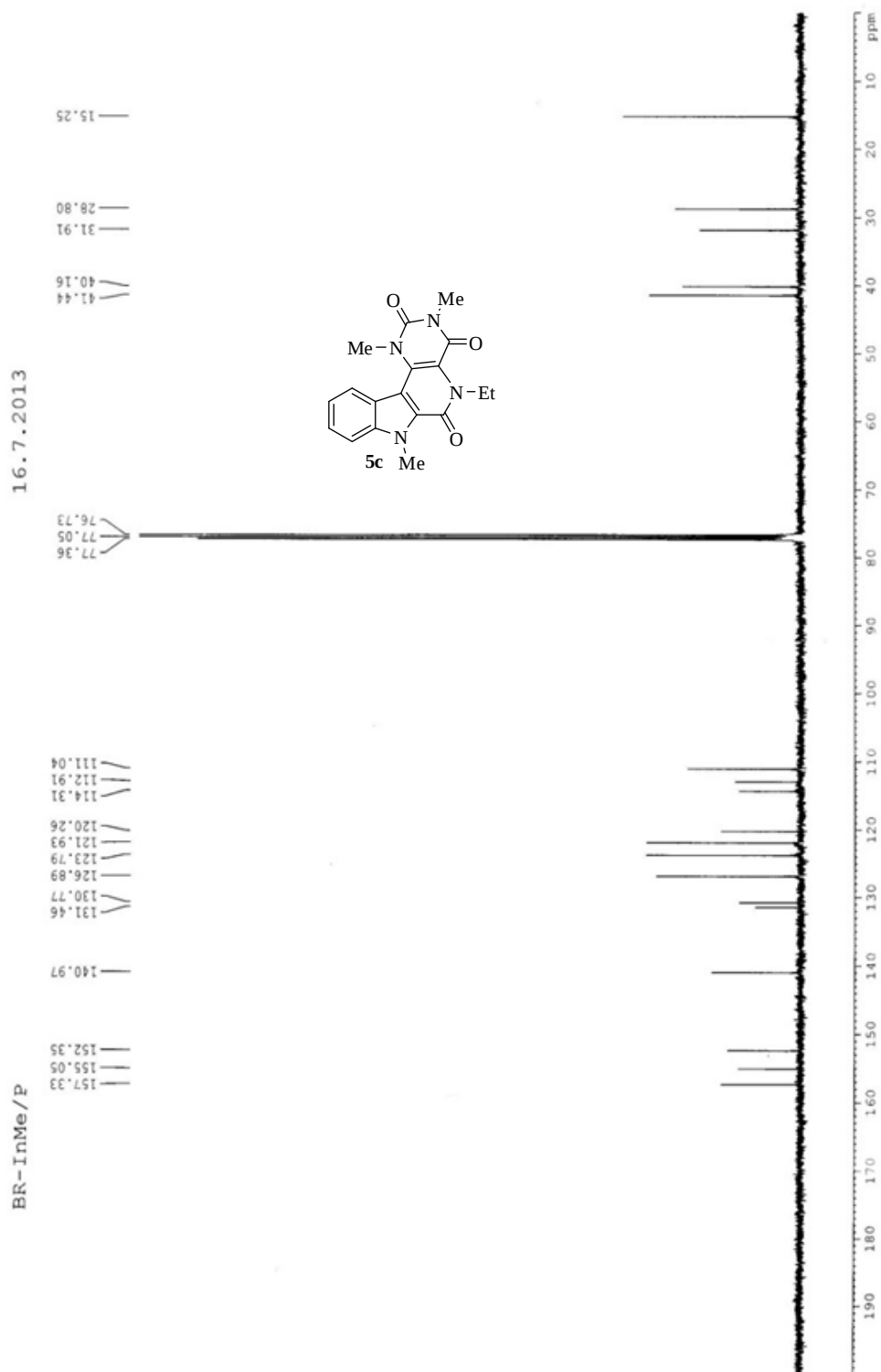
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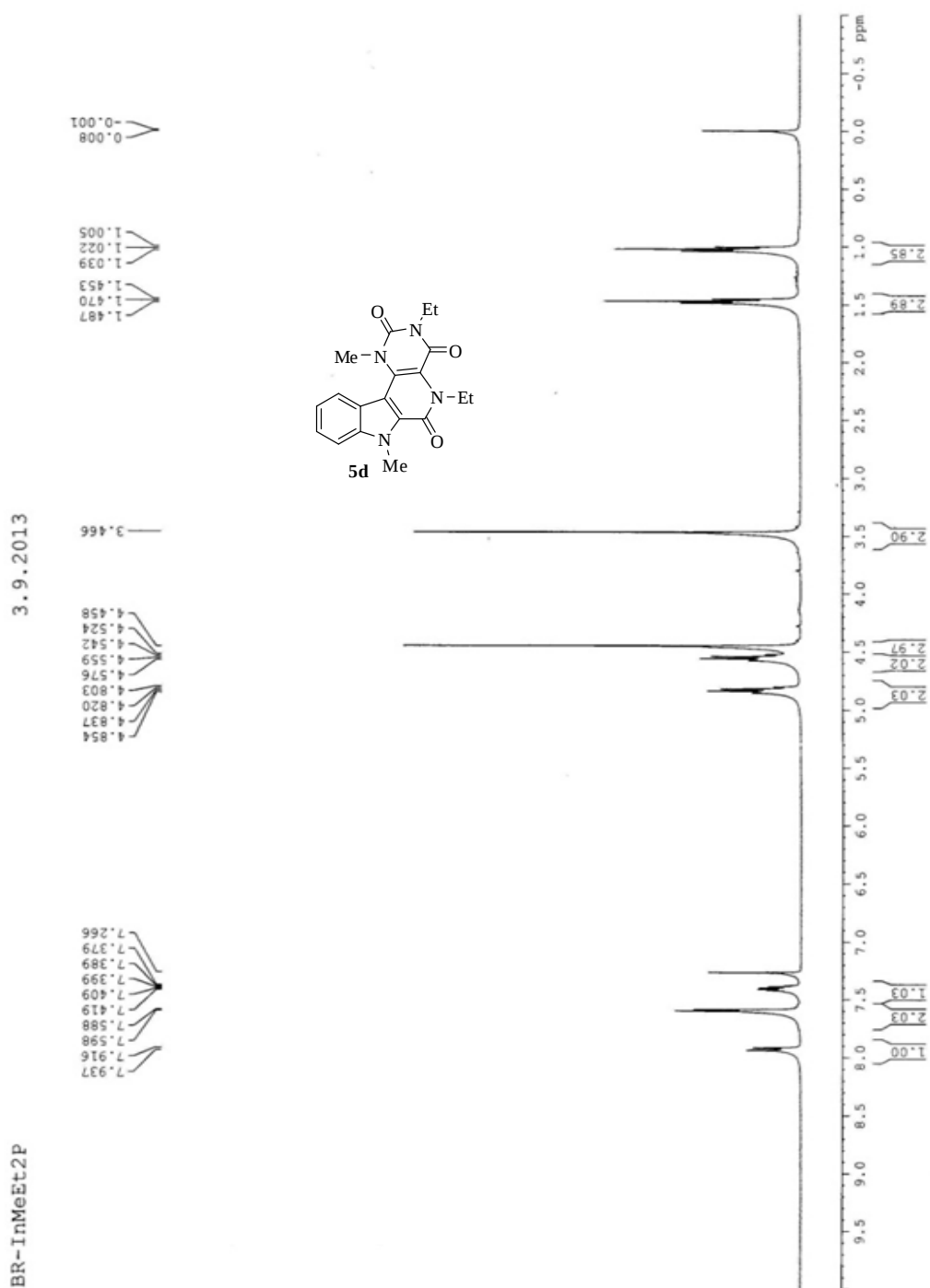


**5-Ethyl-1,3,7-trimethyl-5,7-dihydro-1*H*-pyrimido[4',5':5,6]pyrido[3,4-*b*]indole-2,4,6(3*H*)-trione (5c):**



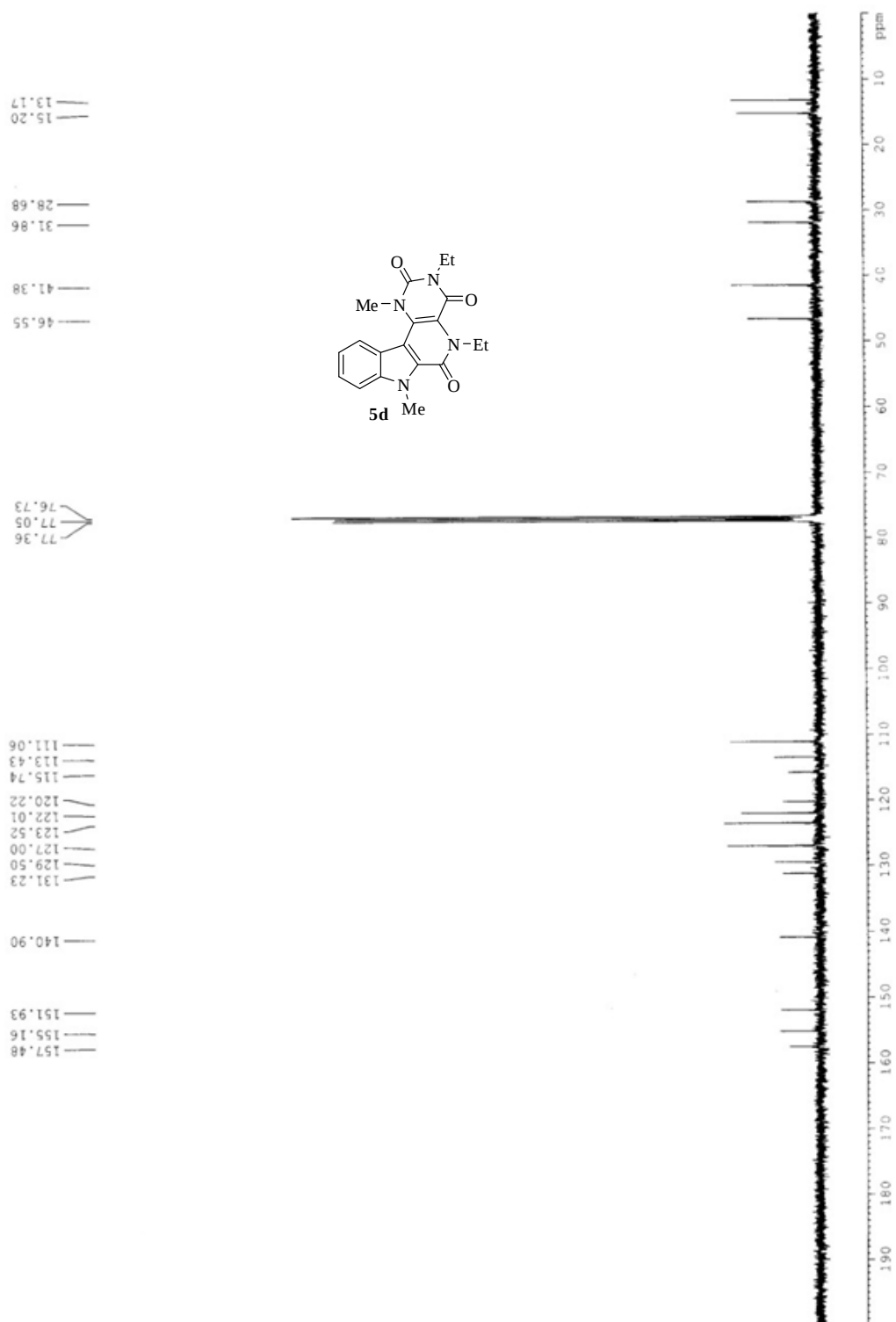


**3,5-Diethyl-1,7-dimethyl-5,7-dihydro-1*H*-pyrimido[4',5':5,6]pyrido[3,4-*b*]indole-2,4,6(3*H*)-trione (5d):**

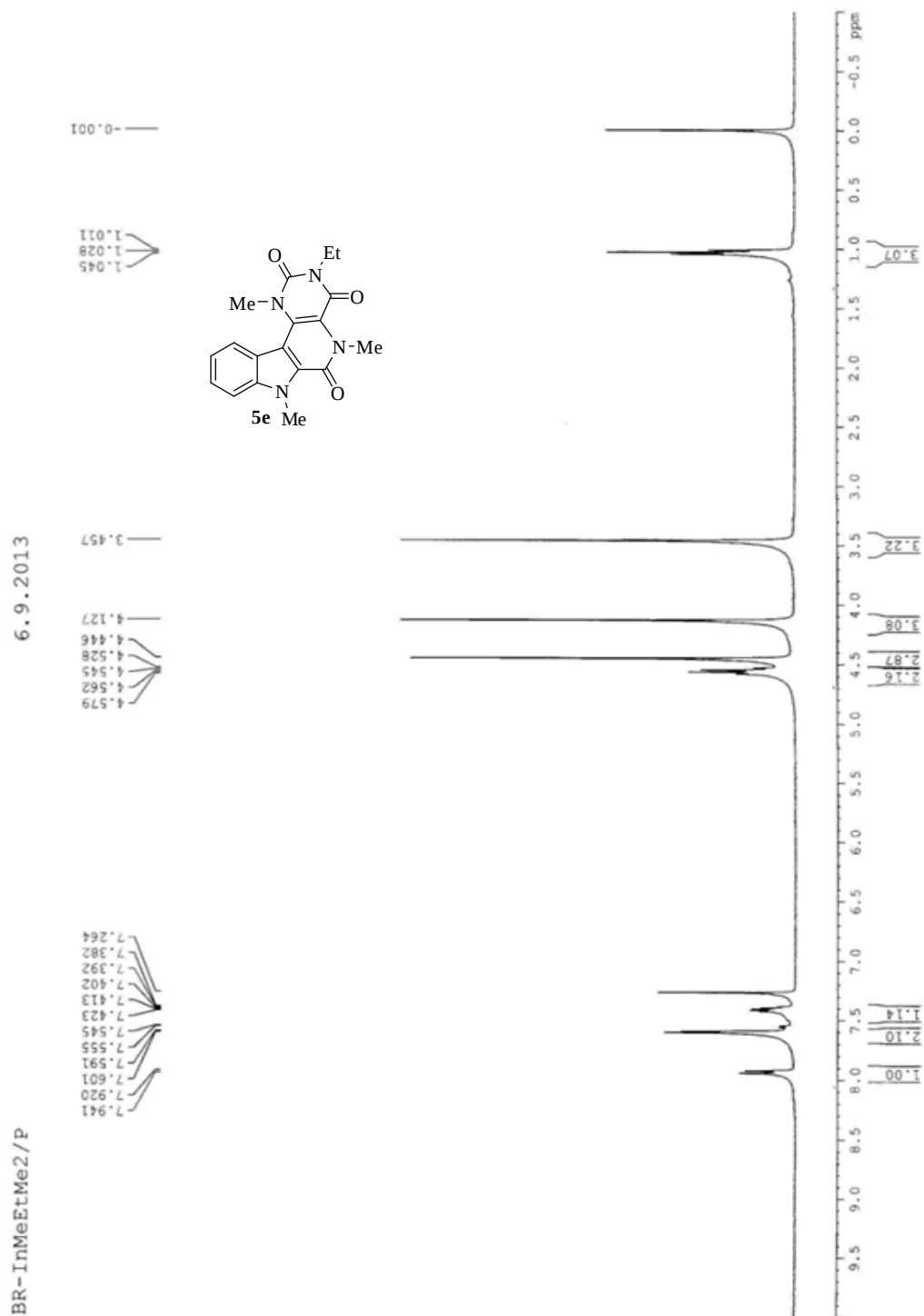


BR-InMeEt2/P

4.9.2013

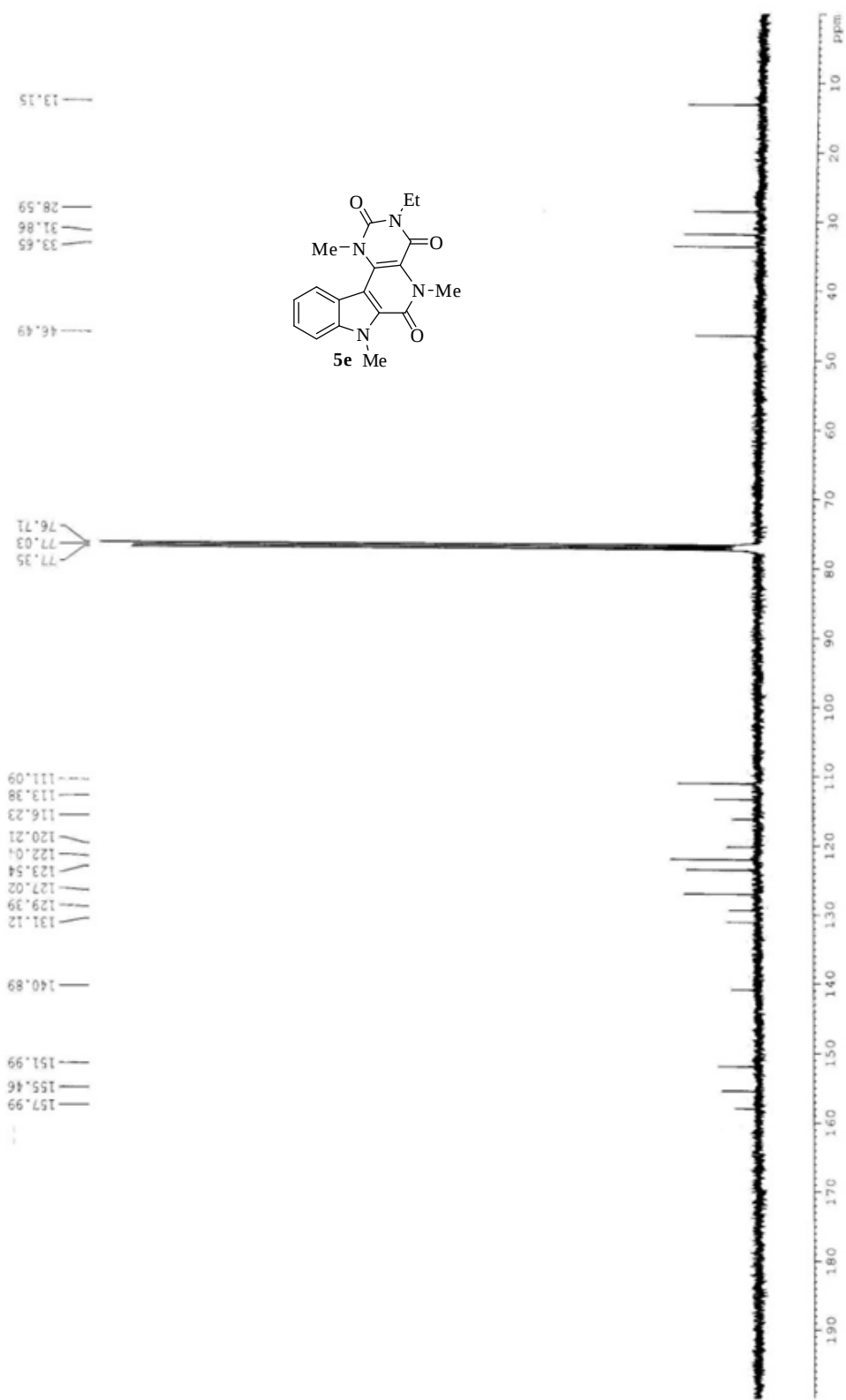


**3-Ethyl-1,5,7-trimethyl-5,7-dihydro-1*H*-pyrimido[4',5':5,6]pyrido[3,4-*b*]indole-2,4,6(3*H*)-trione (5e):**

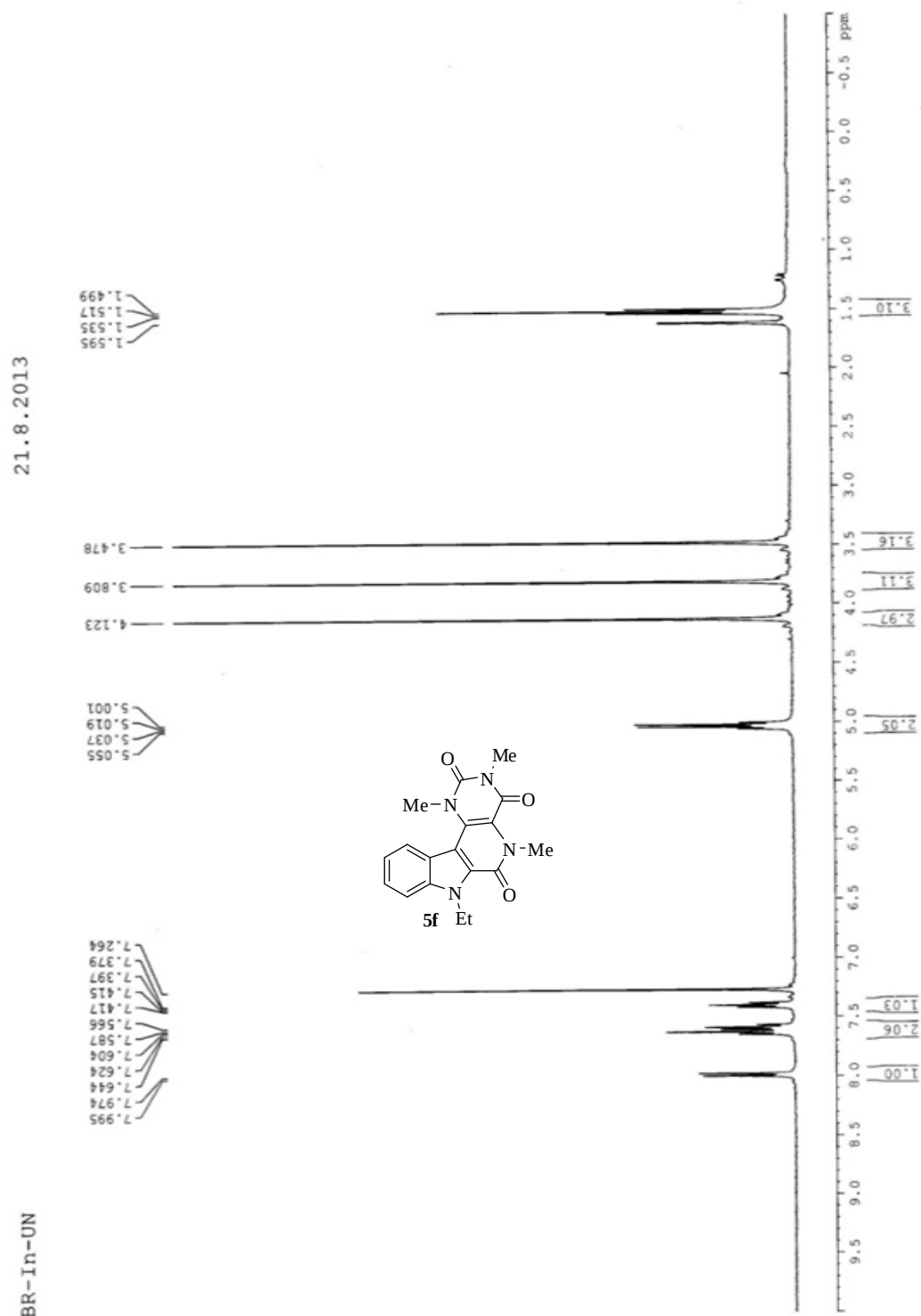


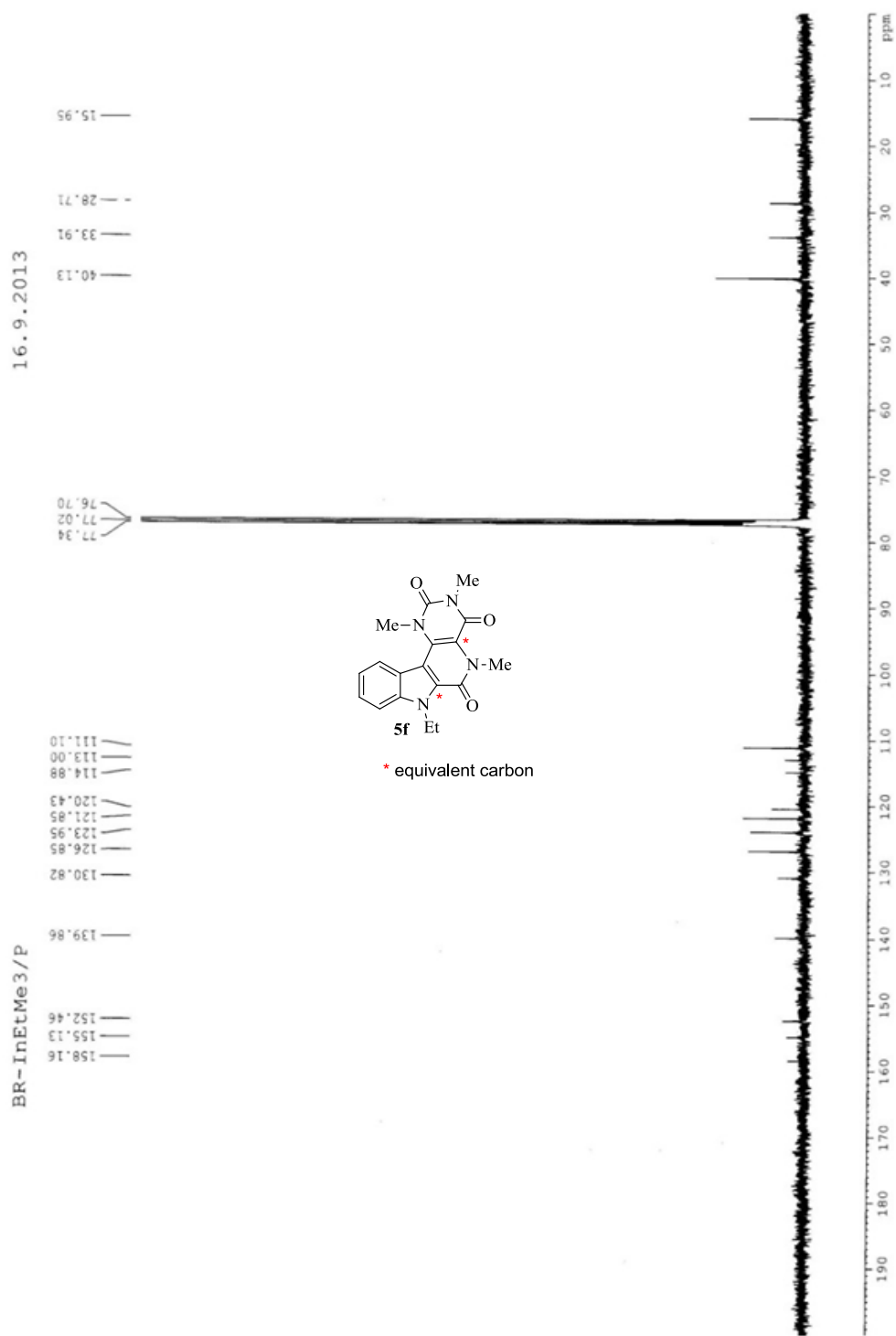
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12.9.2013

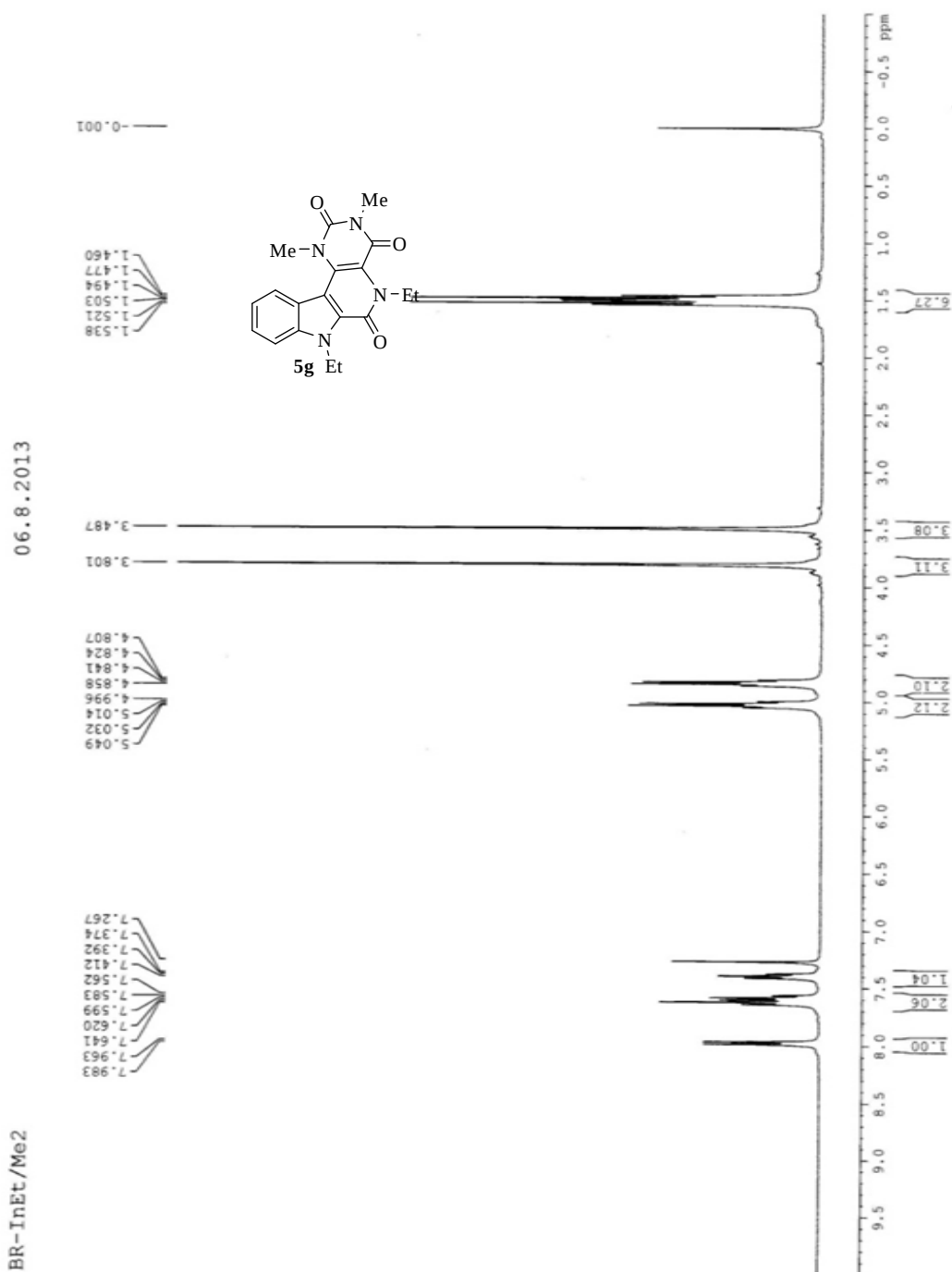


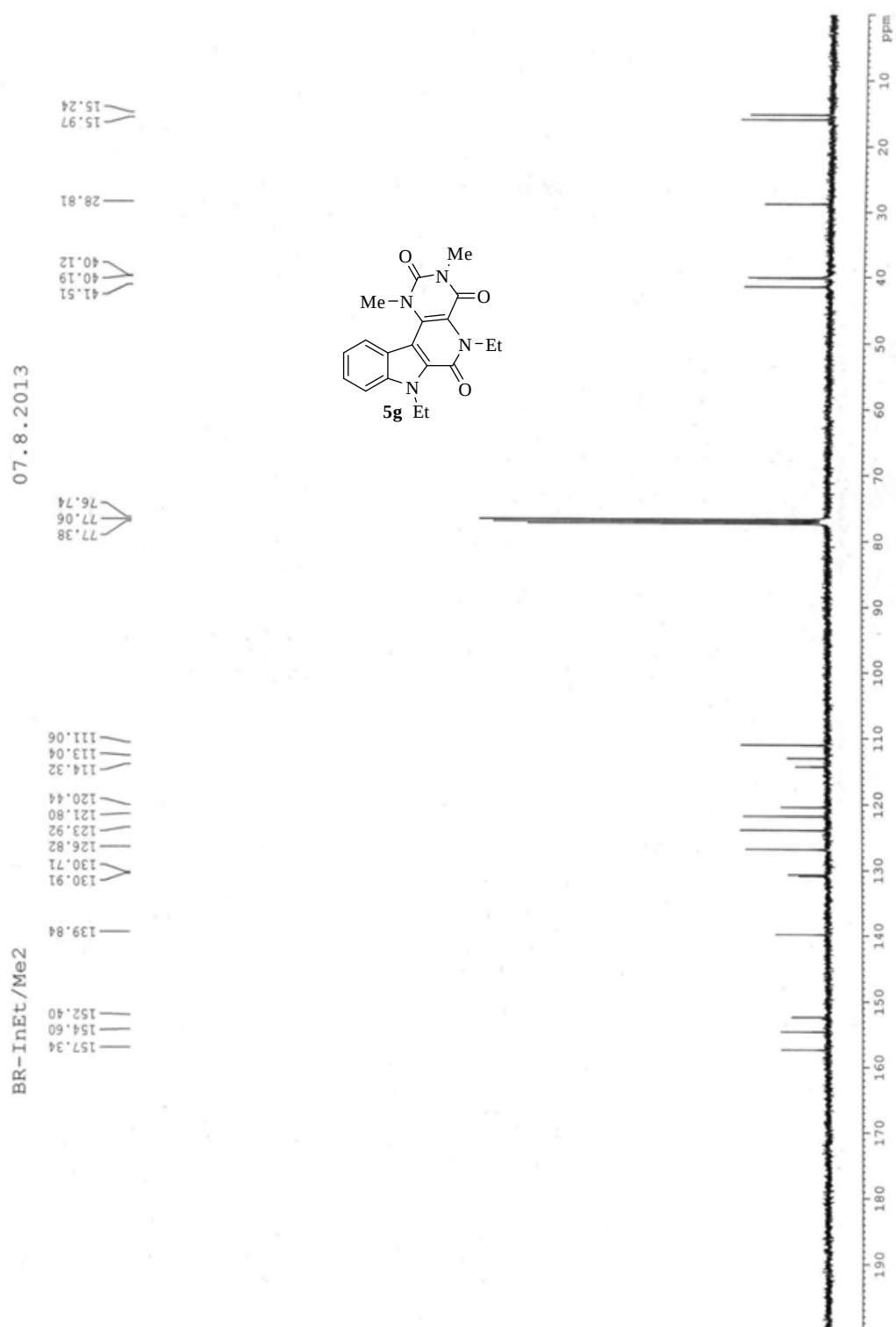
7-Ethyl-1,3,5-trimethyl-5,7-dihydro-1*H*-pyrimido[4',5':5,6]pyrido[3,4-*b*]indole-2,4,6(3*H*)-trione (5f):



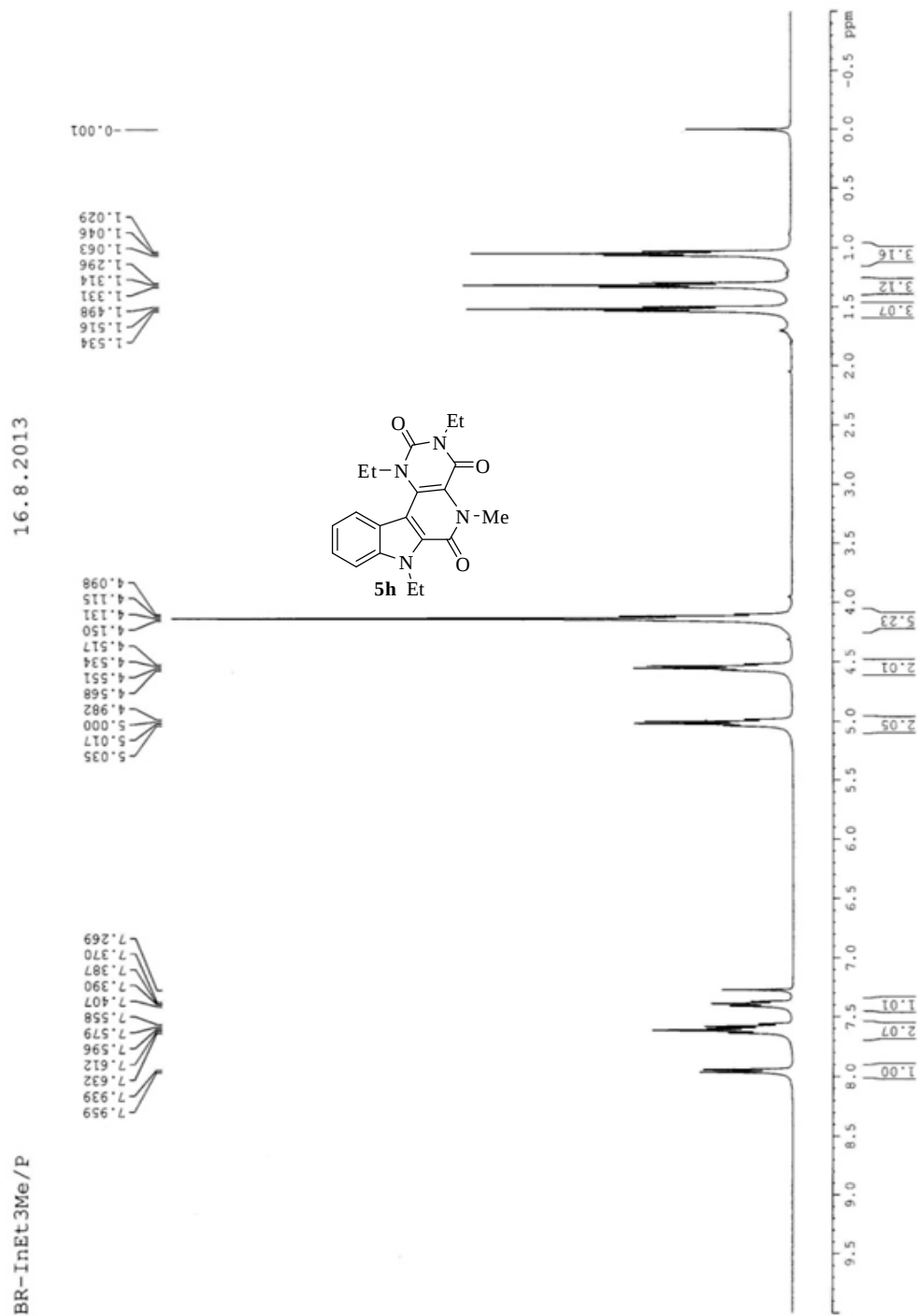


5,7-Diethyl-1,3-dimethyl-5,7-dihydro-1*H*-pyrimido[4',5':5,6]pyrido[3,4-*b*]indole-2,4,6(3*H*)-trione (5g):



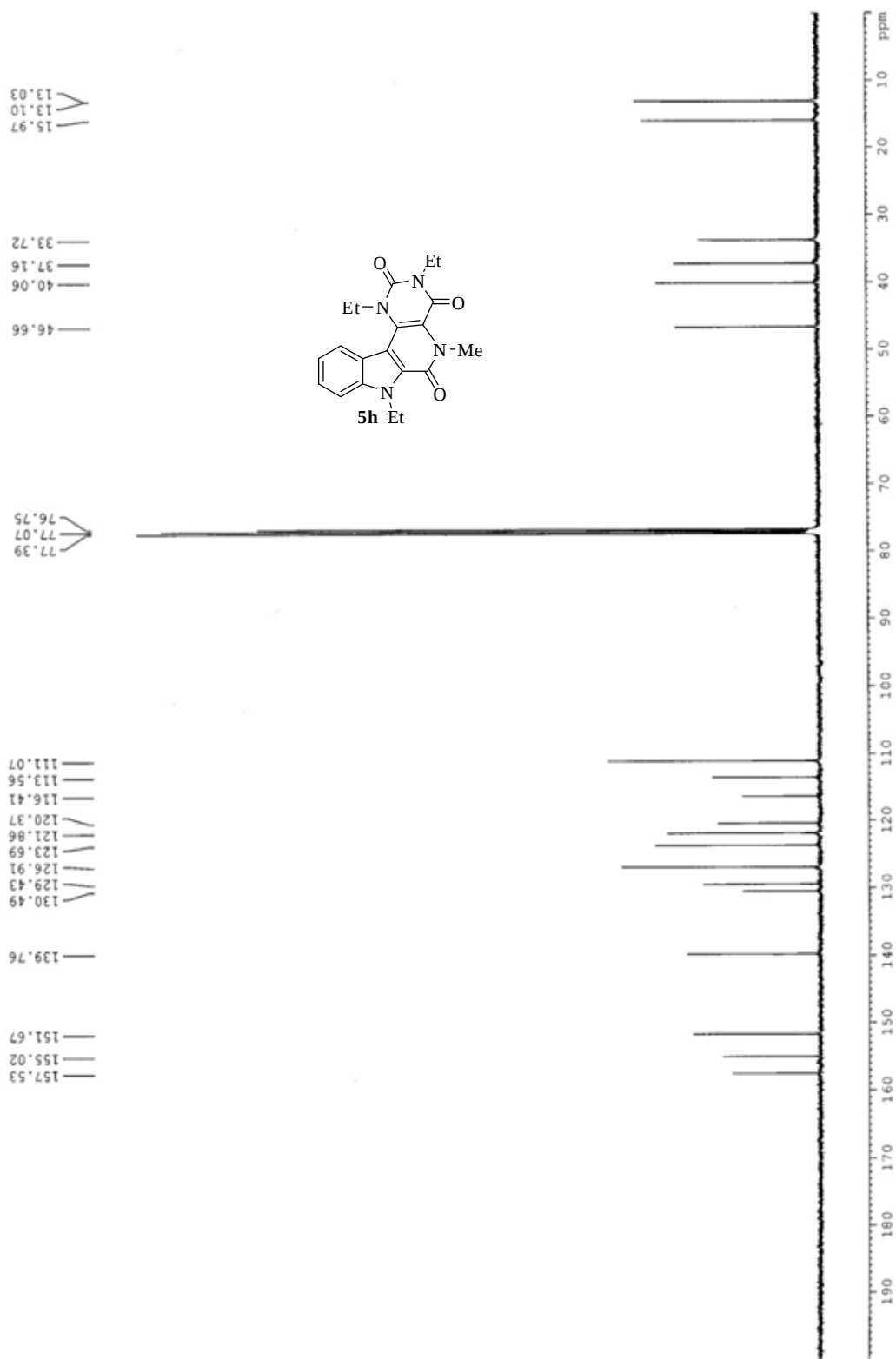


**1,3,7-Triethyl-5-methyl-5,7-dihydro-1*H*-pyrimido[4',5':5,6]pyrido[3,4-*b*]indole-2,4,6(3*H*)-trione (5h):**



BR-InEt3Me/P

21.8.2013



**trione (5i):**



BR-Benzyl/AP

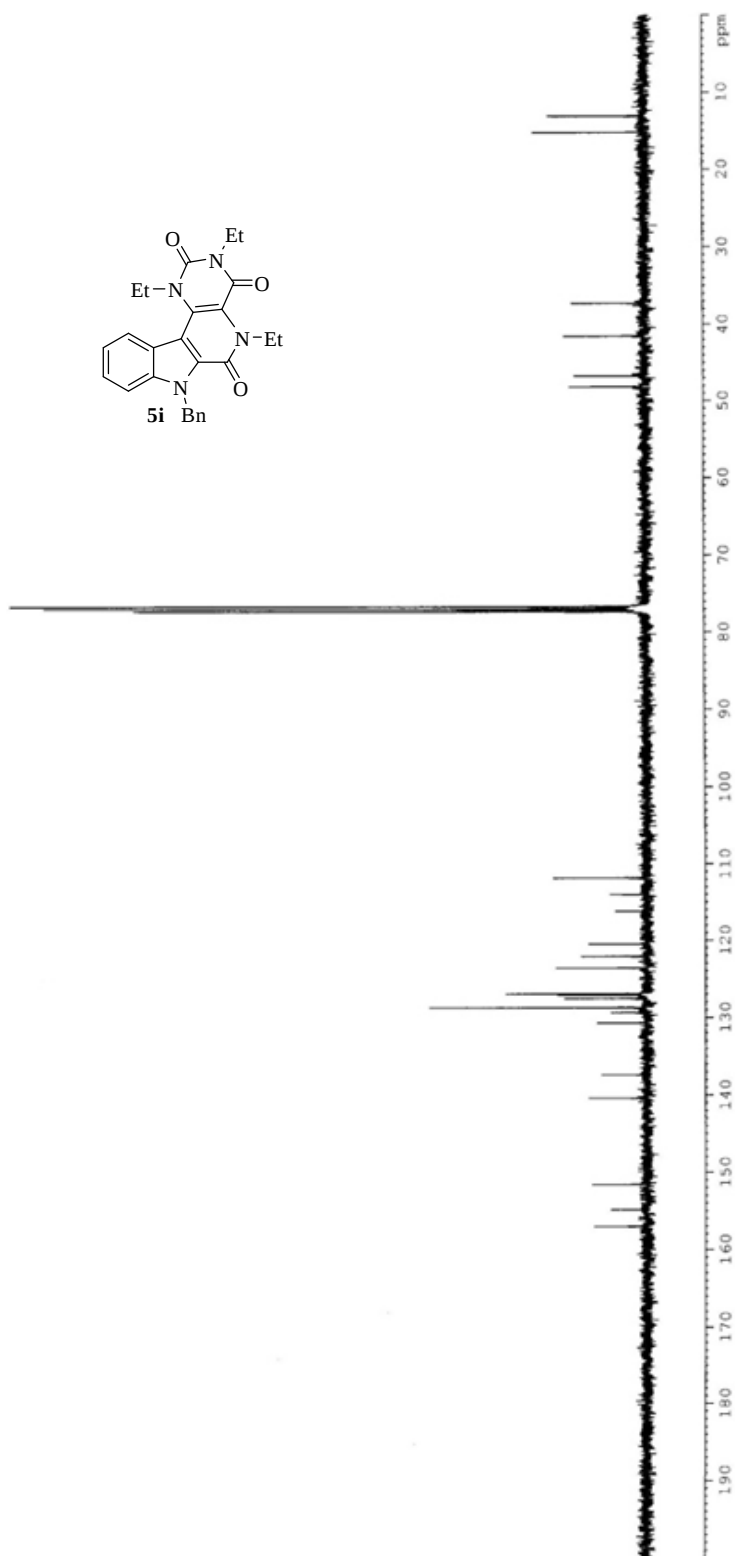
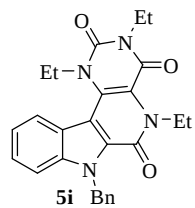
08.01.2014

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114.05  
111.87

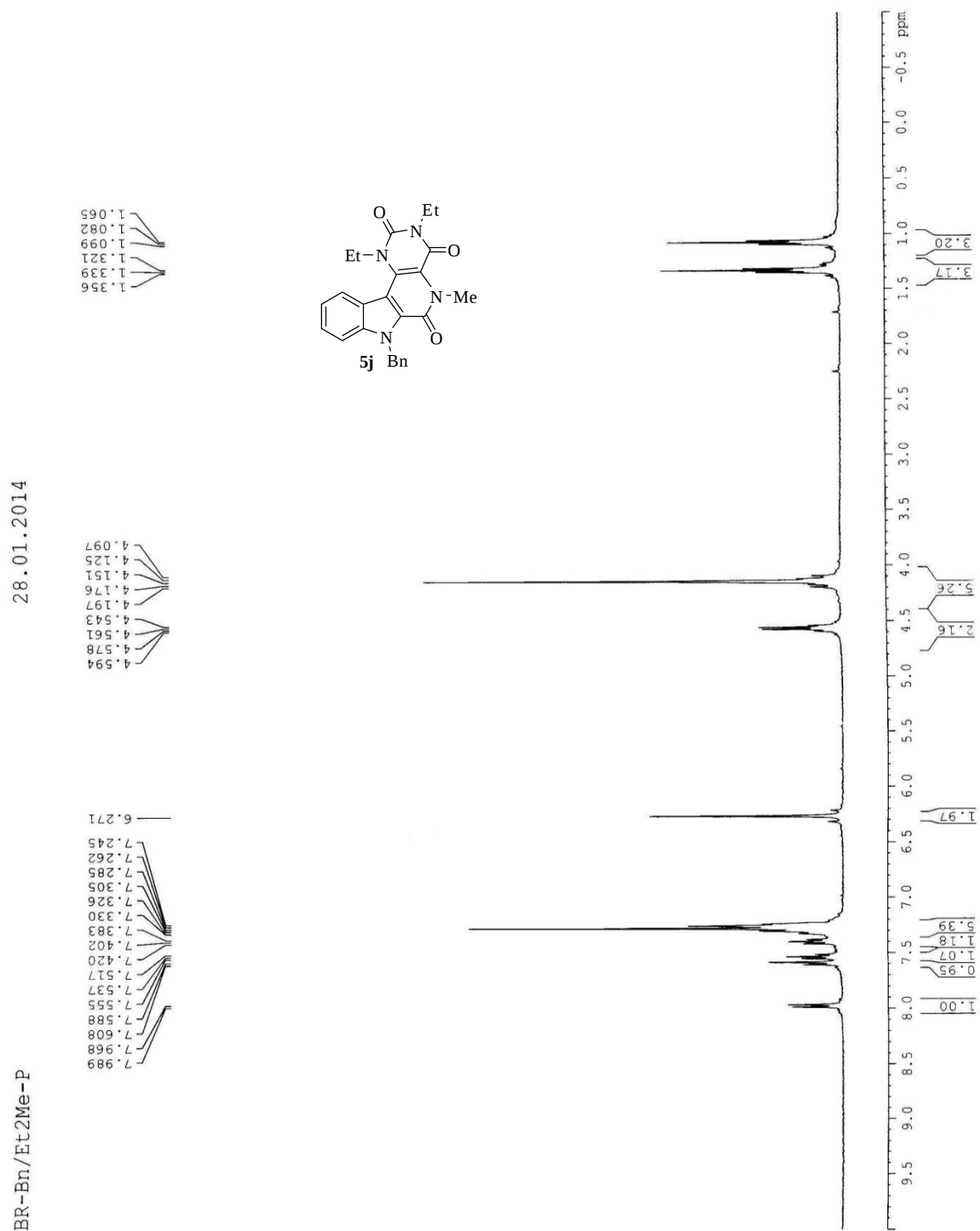
77.36  
77.05  
76.73

48.16  
46.78  
41.57  
37.28

15.21  
13.13  
13.05



**7-Benzyl-1,3-diethyl-5-methyl-5,7-dihydro-1*H*-pyrimido[4',5':5,6]pyrido[3,4-*b*]indole-2,4,6(3*H*)-trione (5j):**



BR-Br-Et2Me-P

30.1.2014

157.54  
155.20  
151.65

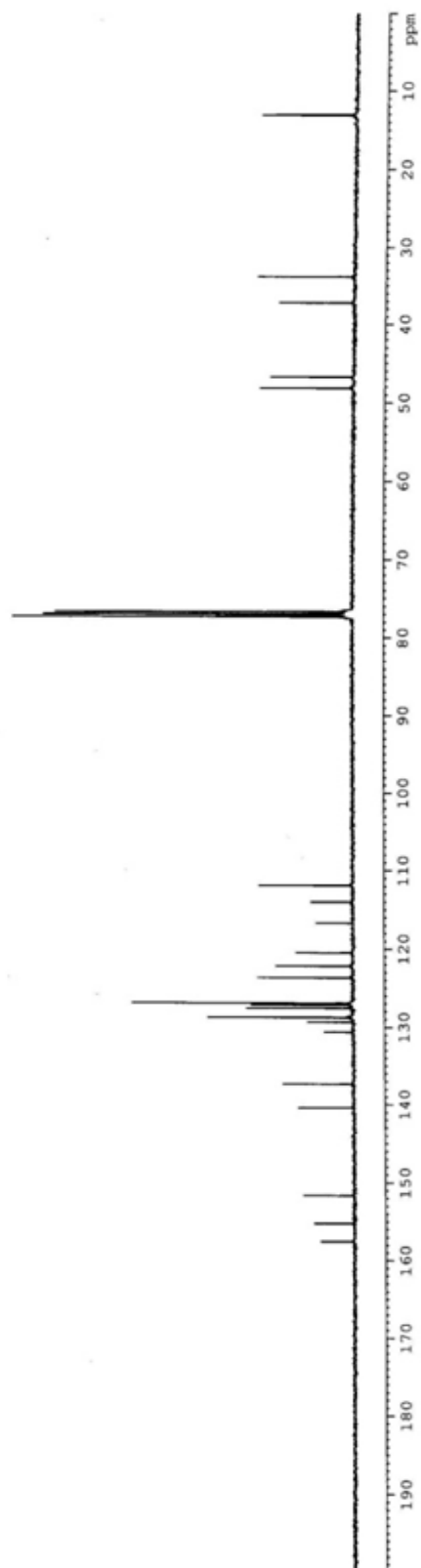
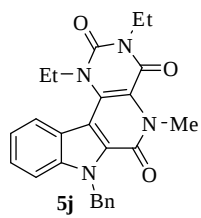
140.41  
137.35  
130.62  
129.34  
128.77  
127.58  
127.17  
126.92  
123.66  
122.16  
120.46  
116.70  
114.00  
111.89

77.37  
77.26  
77.05  
76.74

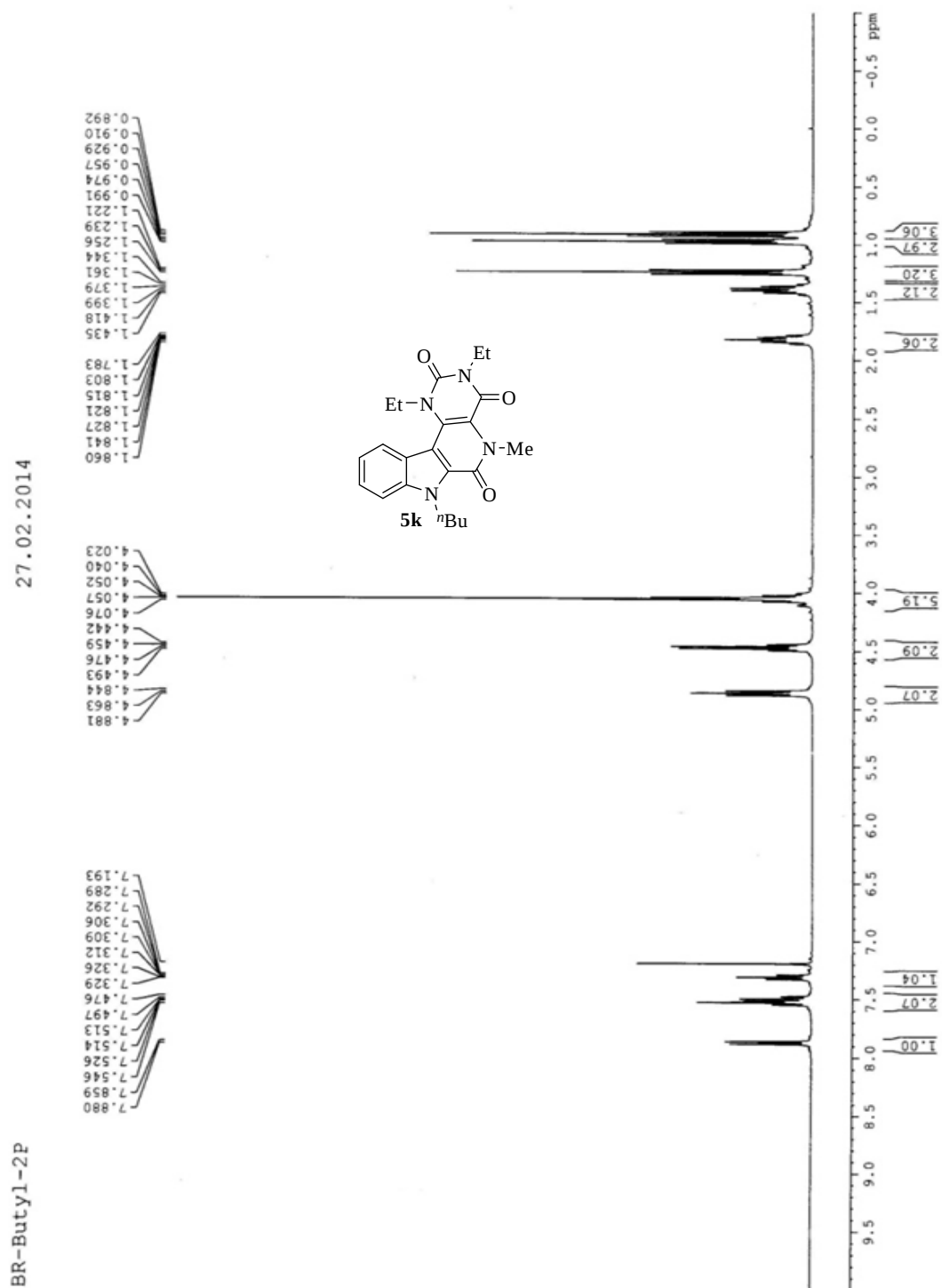
48.18  
46.75

37.22  
33.84

13.12  
13.04



7-Butyl-1,3-diethyl-5-methyl-5,7-dihydro-1*H*-pyrimido[4',5':5,6]pyrido[3,4-*b*]indole-2,4,6(3*H*)-trione (5k):



BR-Butyl-2P

06.03.2014

157.51  
155.07  
151.67

140.12

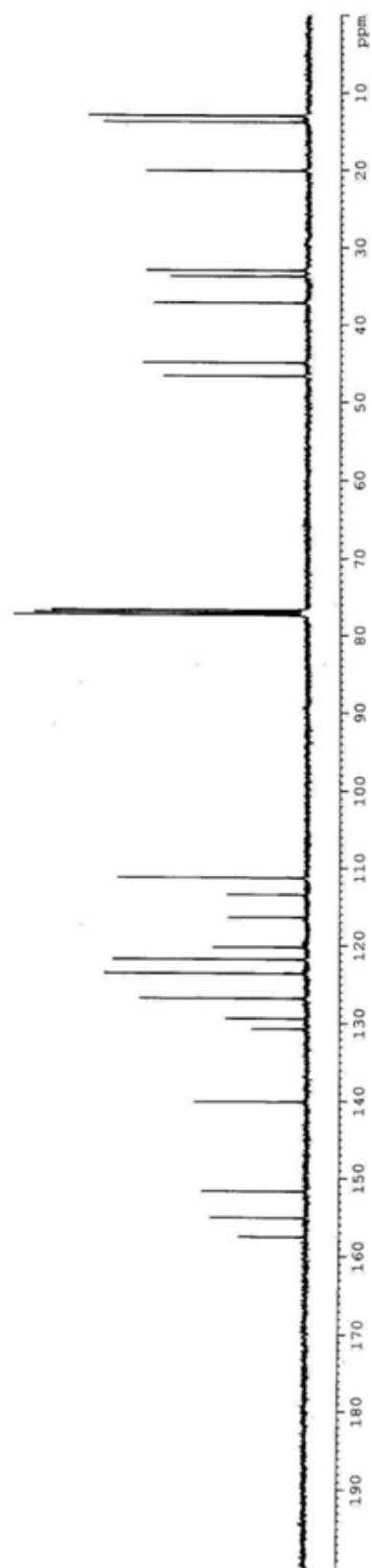
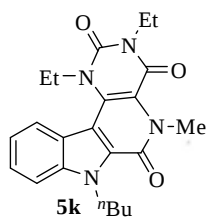
130.71  
129.42  
126.82  
123.61  
121.81  
120.24  
116.39  
113.49  
111.31

77.40  
77.08  
76.77

46.66  
44.93

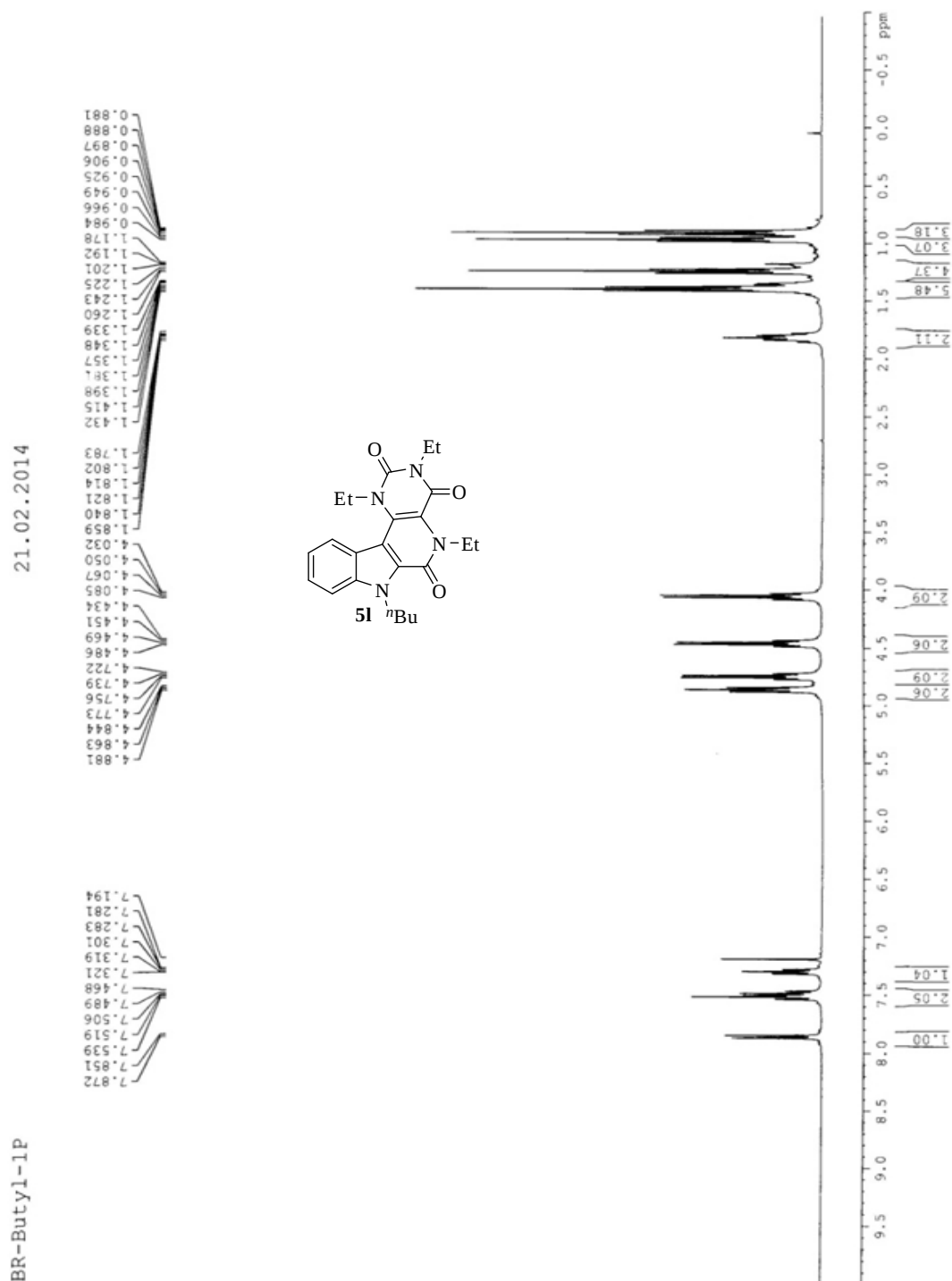
37.15  
33.74  
33.00

20.17  
13.87  
13.09  
13.02



7-Butyl-1,3,5-triethyl-5,7-dihydro-1*H*-pyrimido[4',5':5,6]pyrido[3,4-*b*]indole-2,4,6(3*H*)-trione

(5l):



BR-Butyl-1P

26.02.2014

157.00  
154.74  
151.62

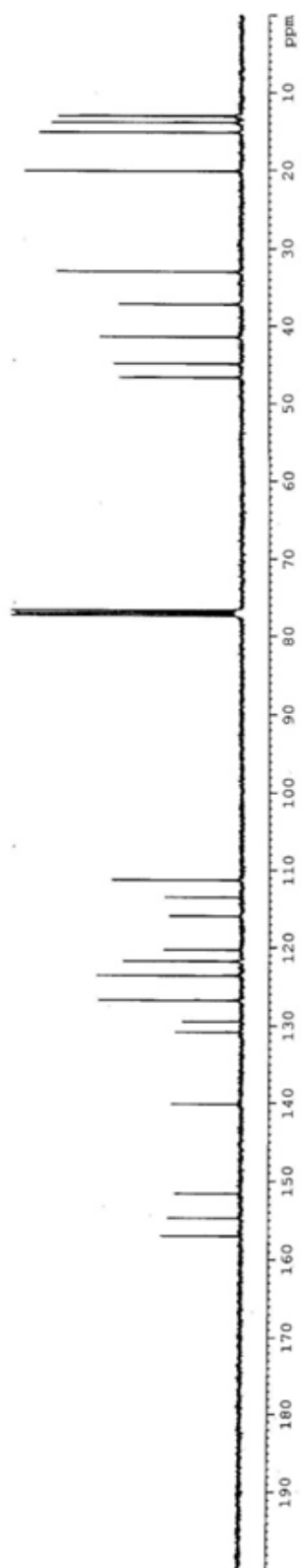
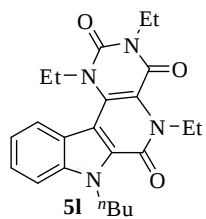
140.13

130.86  
129.50  
126.78  
123.60  
121.77  
120.28  
115.93  
113.54  
111.29

77.39  
77.07  
76.75

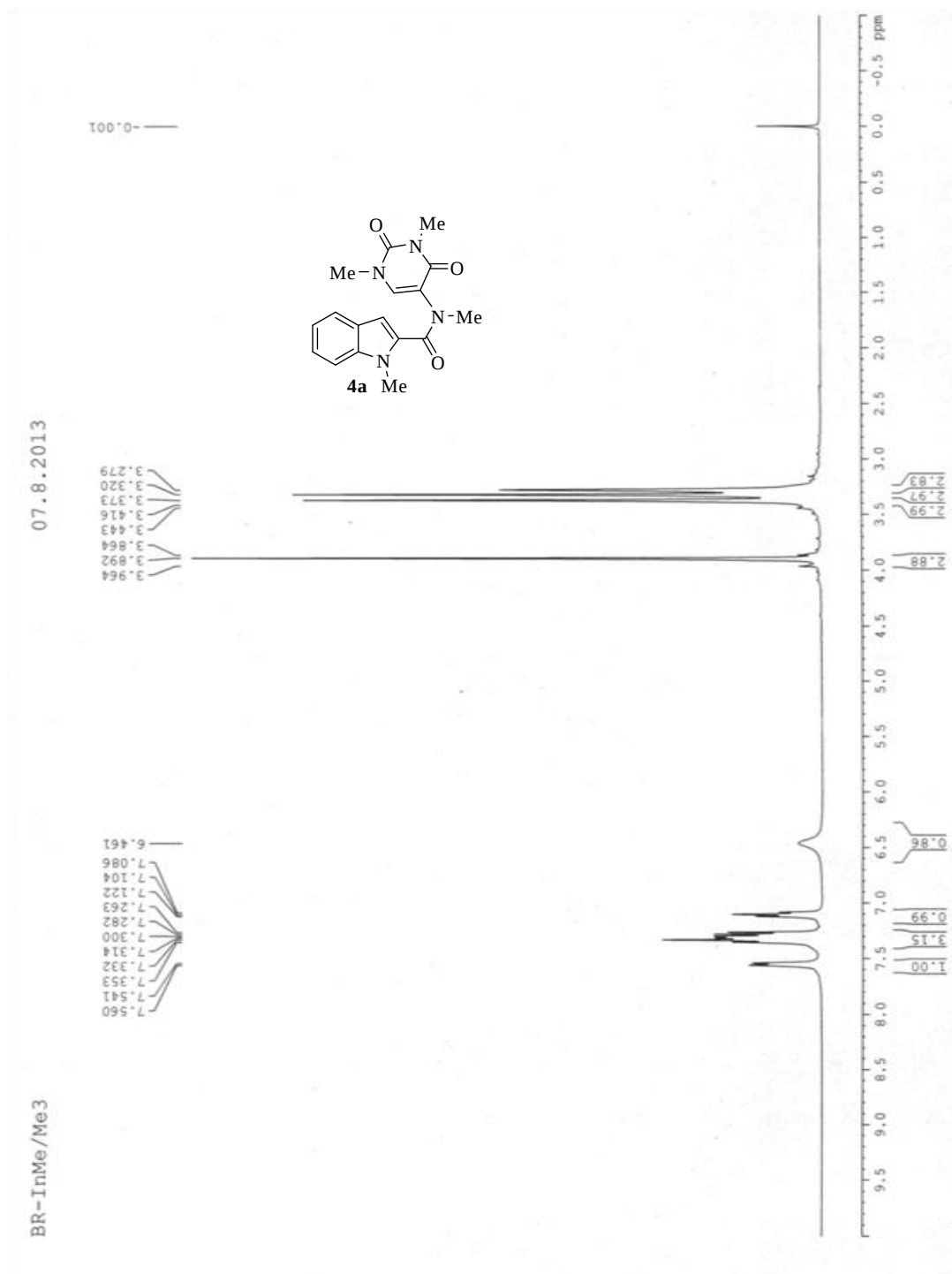
46.70  
44.92  
41.46  
37.21  
33.02

20.16  
19.20  
13.91  
13.09  
13.03



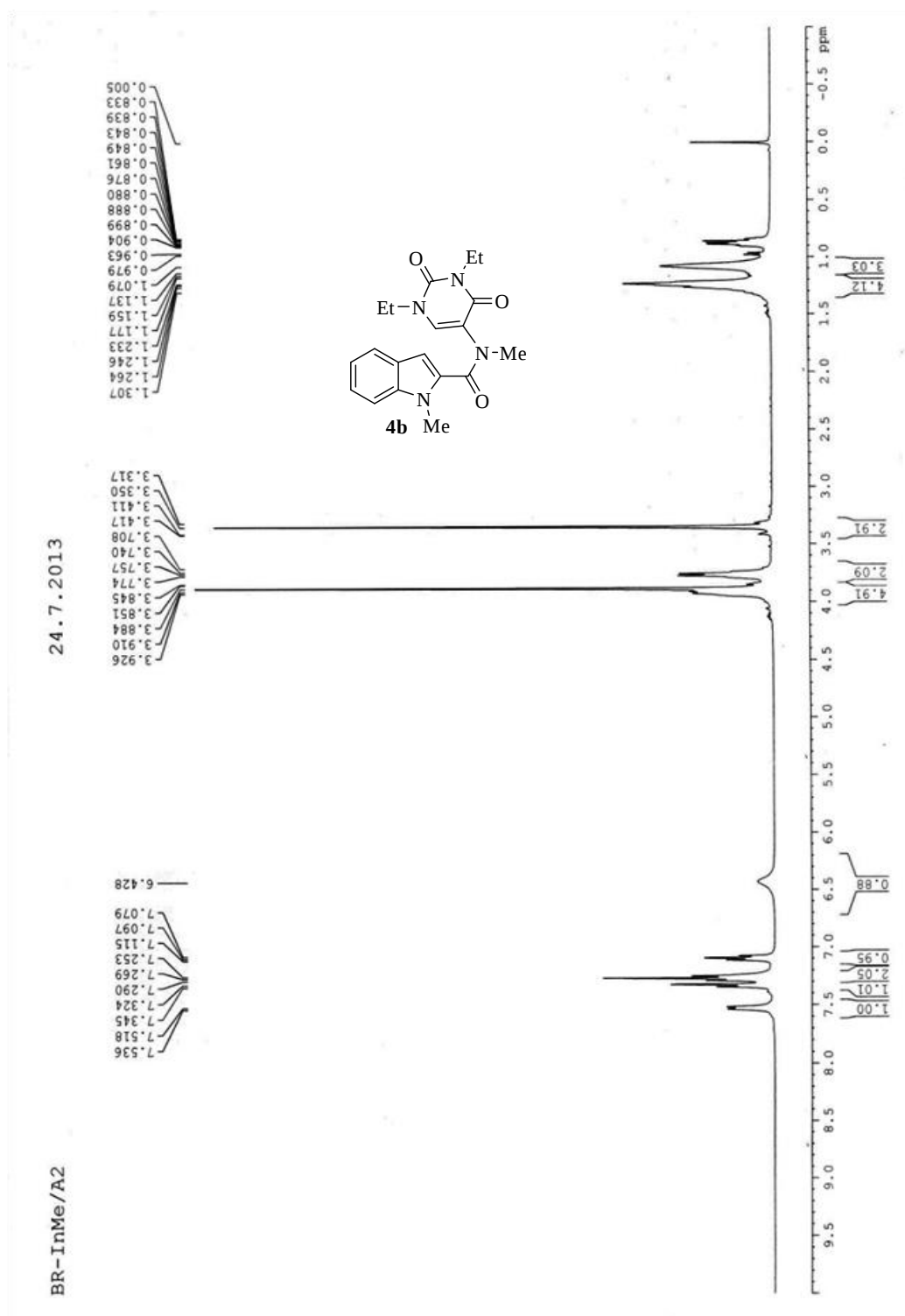
NMR ( $^1\text{H}$  and  $^{13}\text{C}$ ) spectra of starting materials (4):

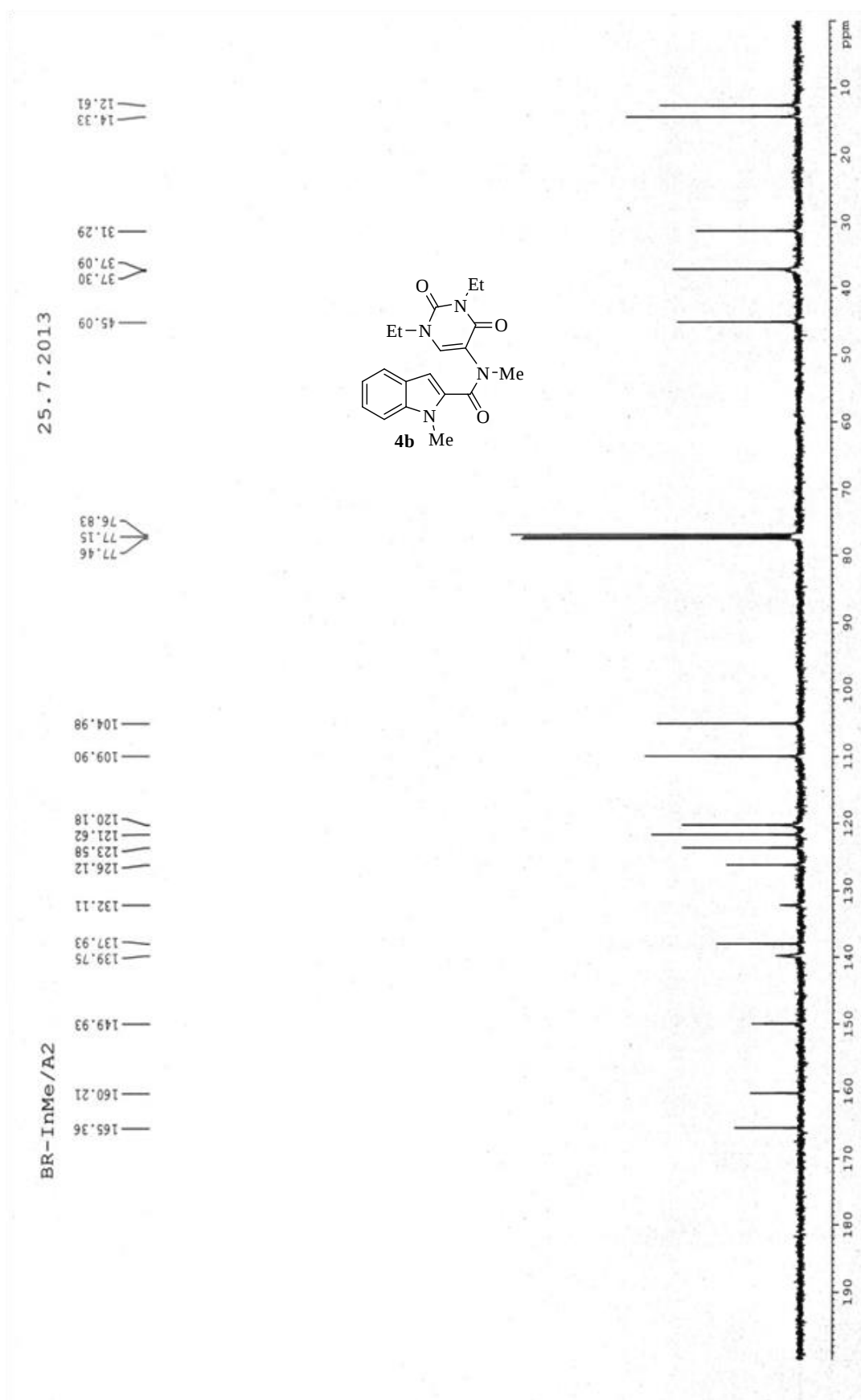
*N*-(1,3-Dimethyl-2,4-dioxo-1,2,3,4-tetrahydropyrimidin-5-yl)-*N*,1-dimethyl-1*H*-indole-2-carboxamide (**4a**):



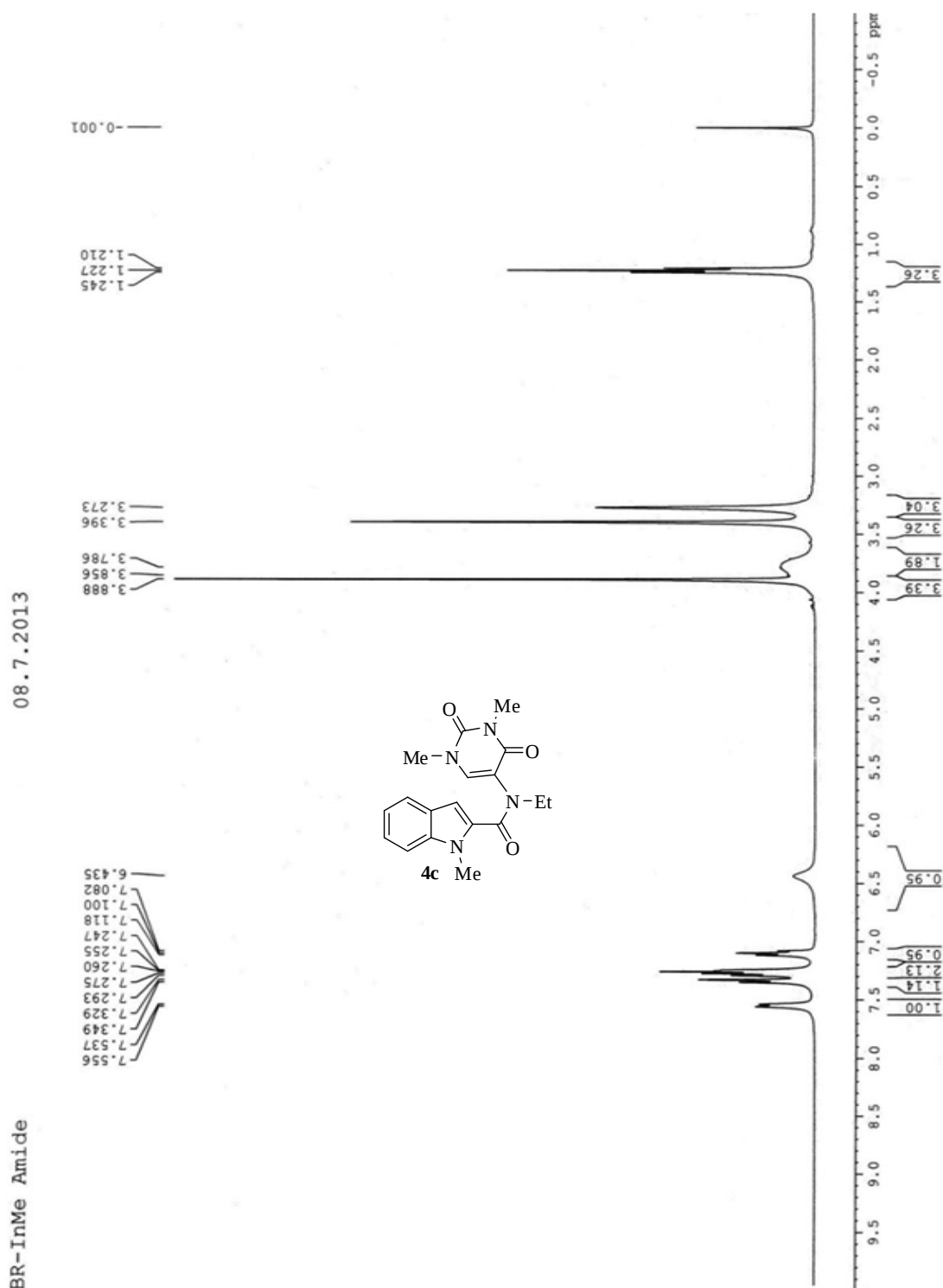


***N*-(1,3-Diethyl-2,4-dioxo-1,2,3,4-tetrahydropyrimidin-5-yl)-*N*,1-dimethyl-1*H*-indole-2-carboxamide (4b):**

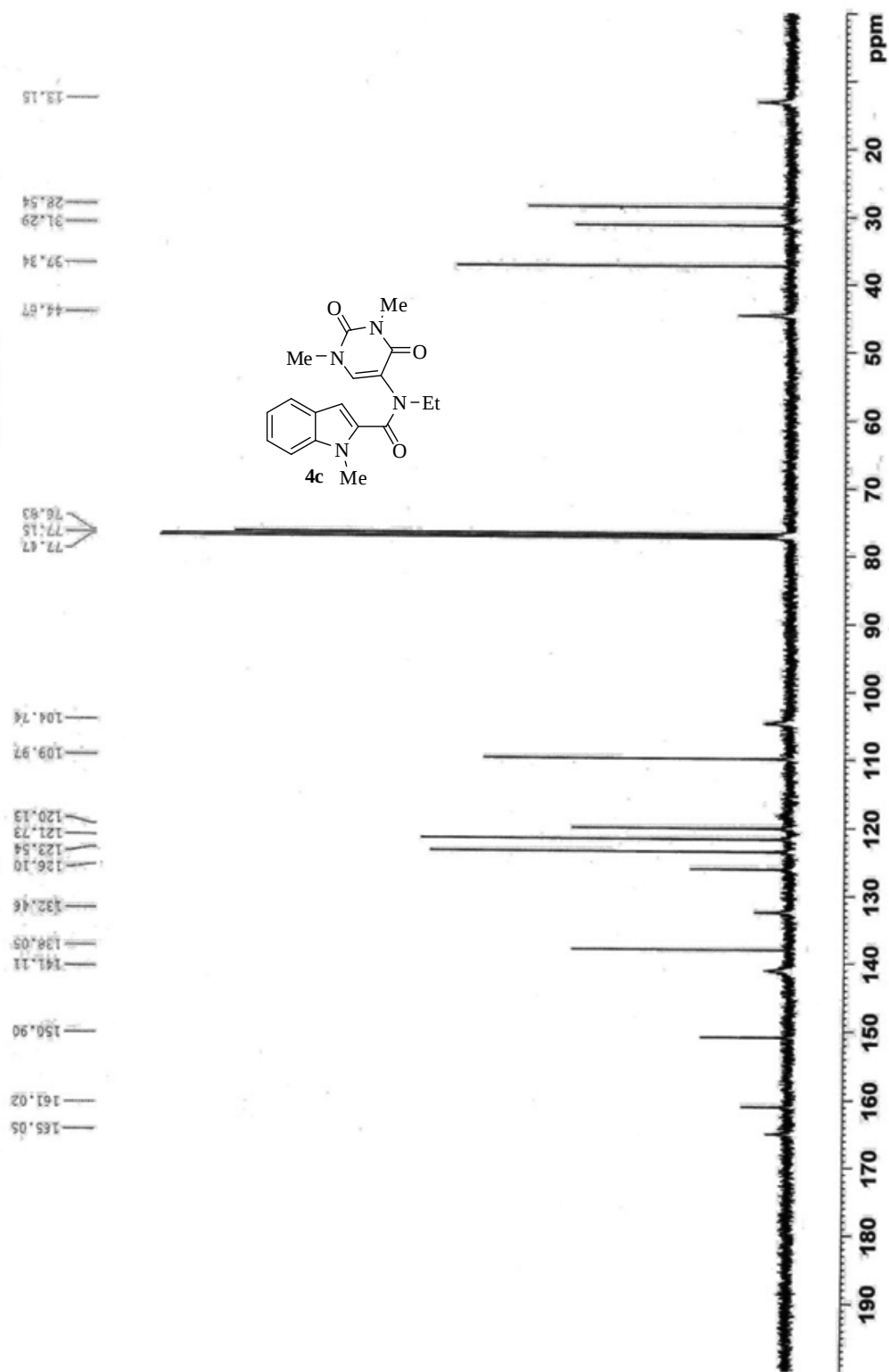




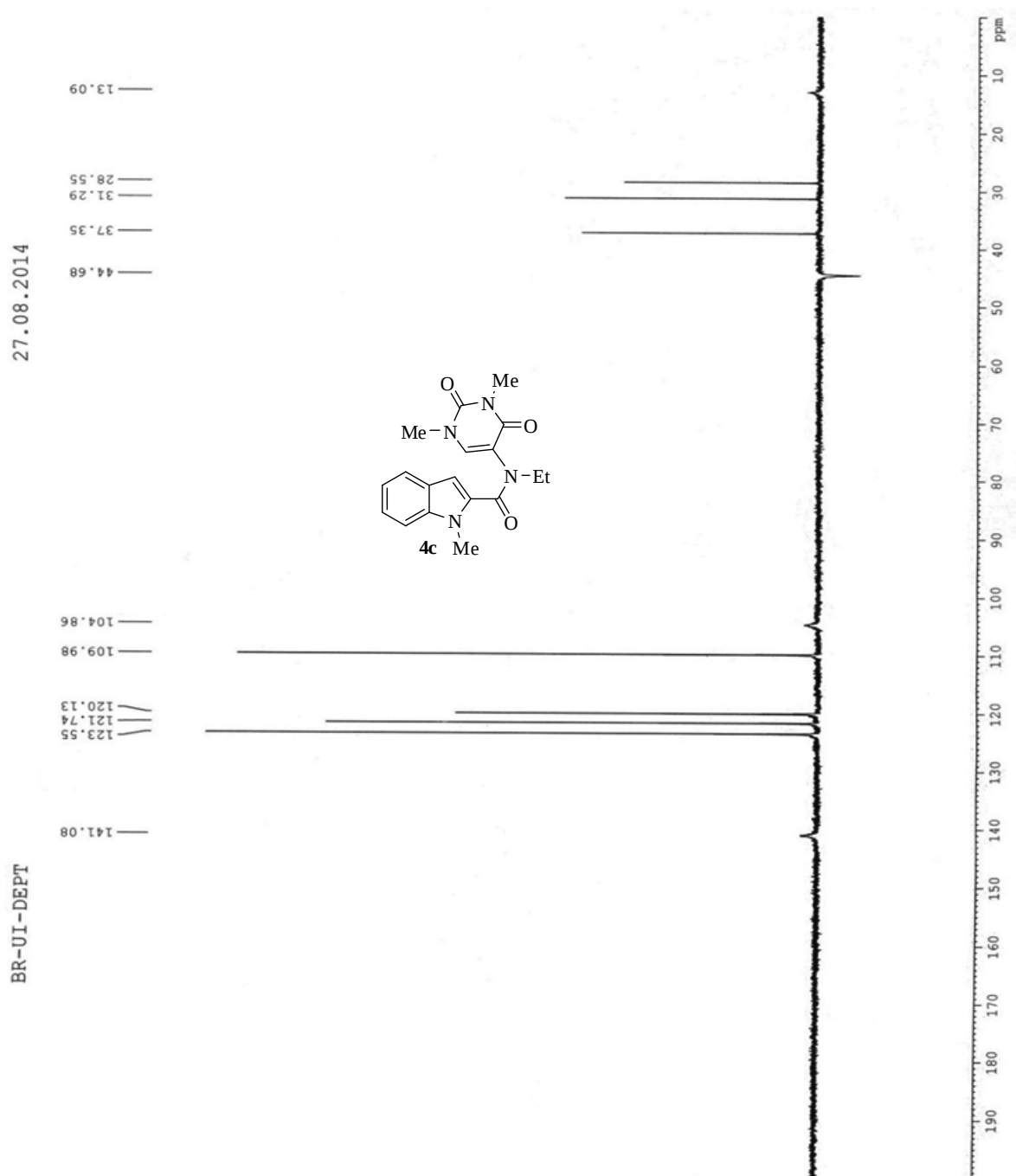
***N*-(1,3-Dimethyl-2,4-dioxo-1,2,3,4-tetrahydropyrimidin-5-yl)-*N*-ethyl-1-methyl-1*H*-indole-2-carboxamide (4c):**



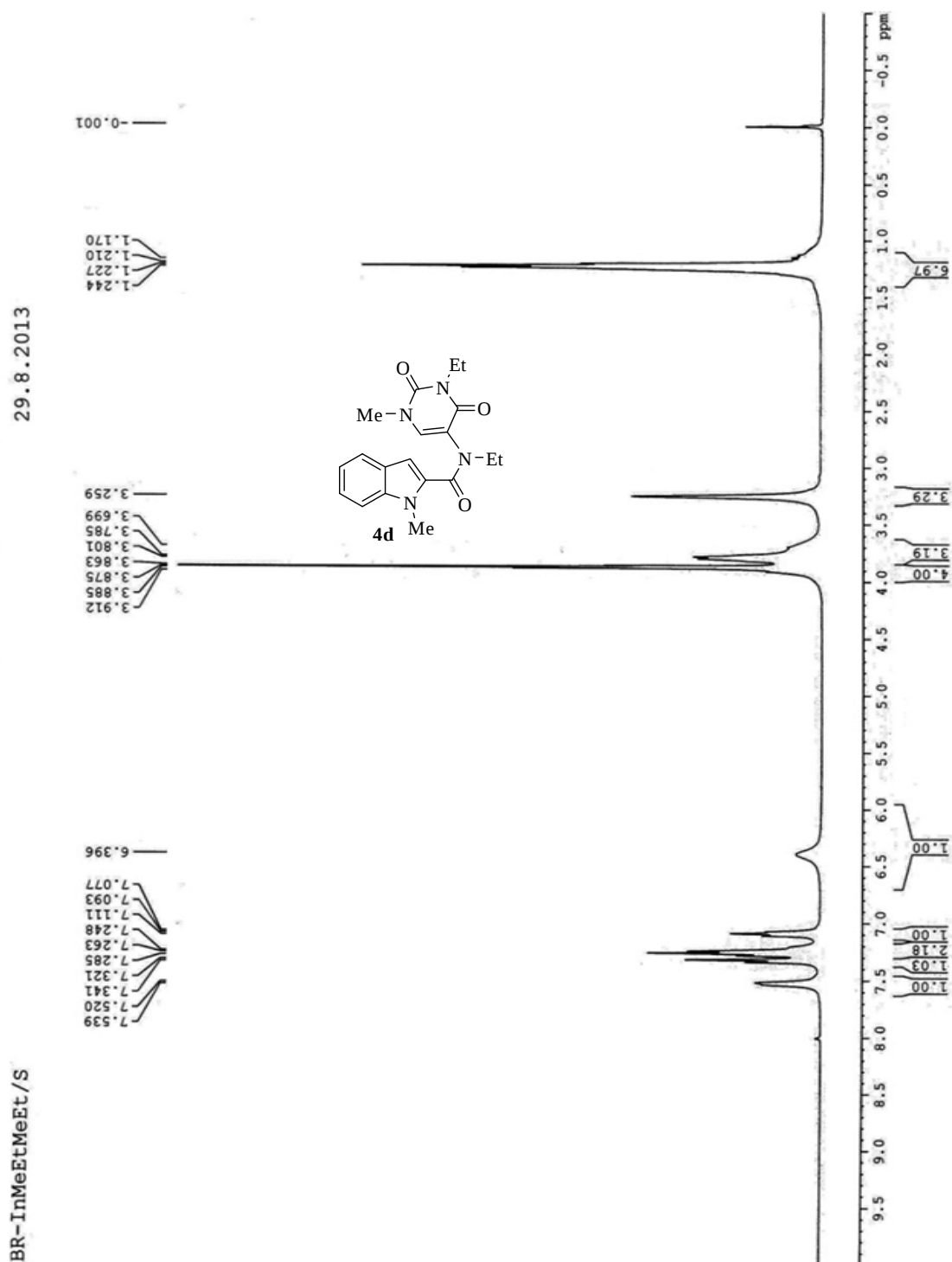
09.7.2013



DEPT spectra of 4c:



***N*-Ethyl-*N*-(3-ethyl-1-methyl-2,4-dioxo-1,2,3,4-tetrahydropyrimidin-5-yl)-1-methyl-1*H*-indole-2-carboxamide (4d):**



BR-InMe2Et2/S

24.9.2013

165.03  
160.94  
150.40

140.26  
137.96  
132.49

126.14  
123.51  
121.64  
120.14

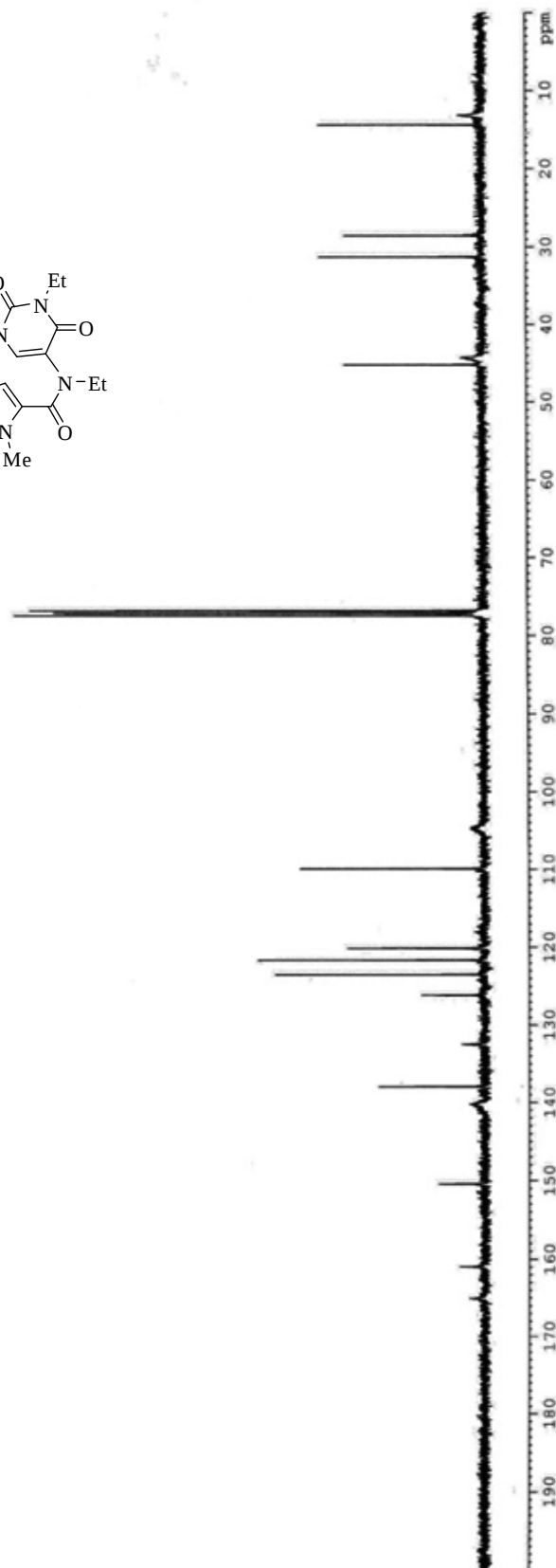
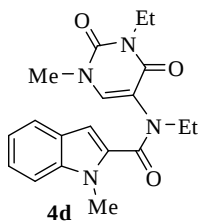
109.89  
104.85

77.45  
77.13  
76.81

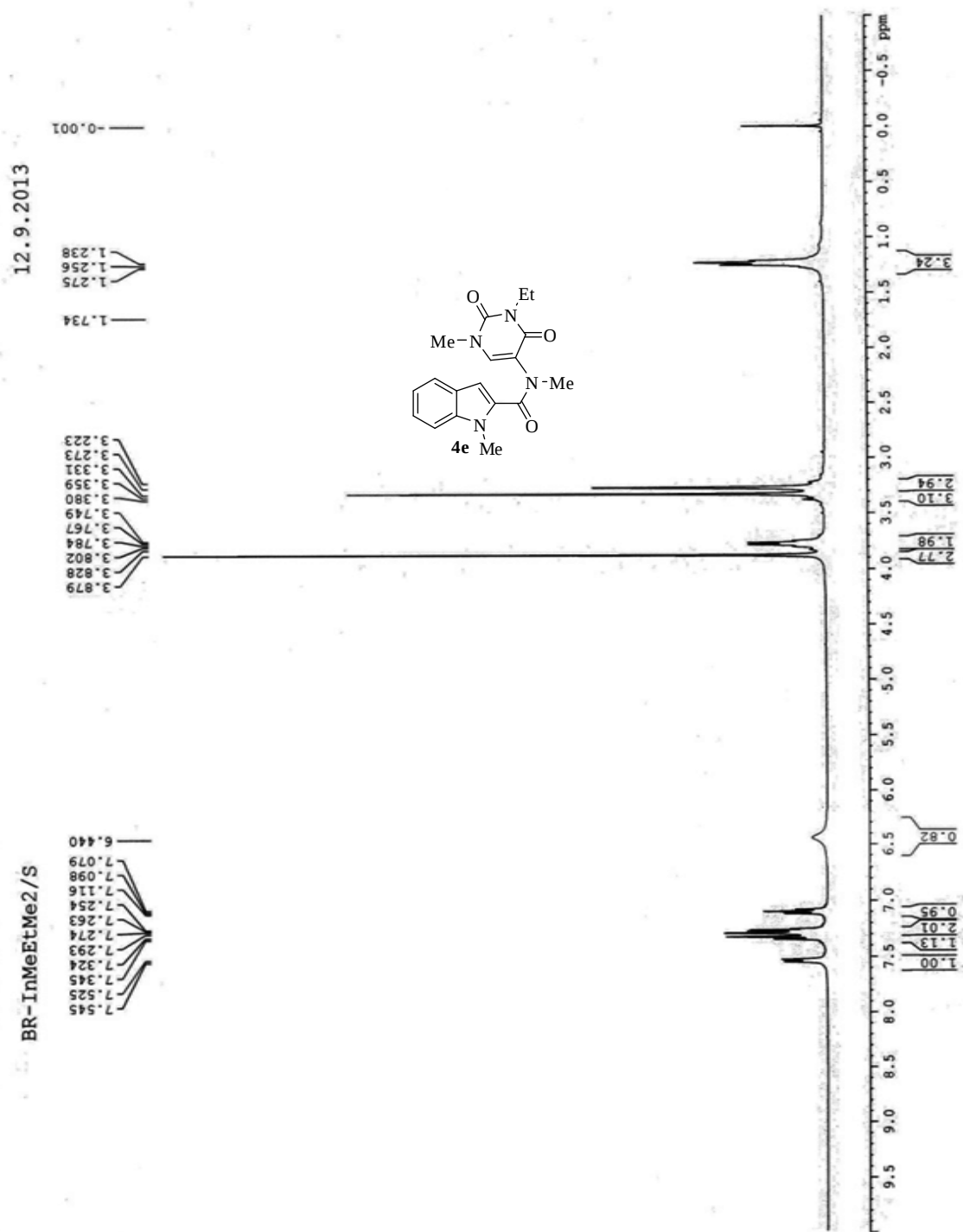
45.20  
44.37

31.20  
28.15

14.37  
13.17



***N*-(3-Ethyl-1-methyl-2,4-dioxo-1,2,3,4-tetrahydropyrimidin-5-yl)-*N*,1-dimethyl-1*H*-indole-2-carboxamide (4e):**



19.9.2013

BR-InMeEtMe2/S

14.33

28.45

31.30

37.55

45.28

76.81  
77.13  
77.45

105.26

109.99

120.20

121.69

123.64

126.08

132.01

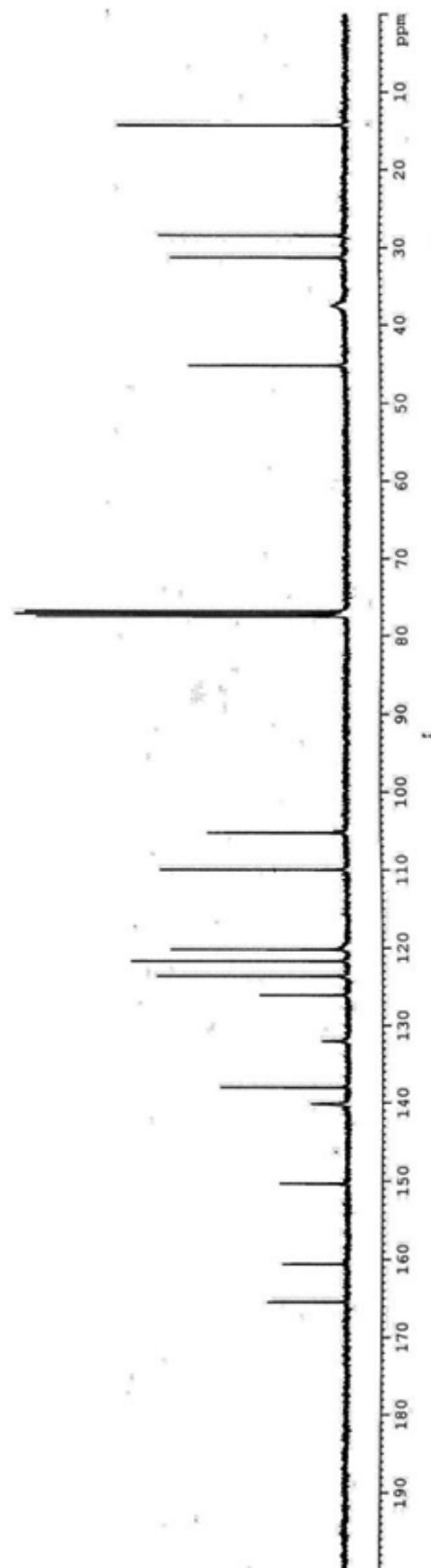
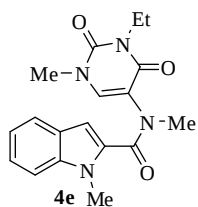
138.01

140.15

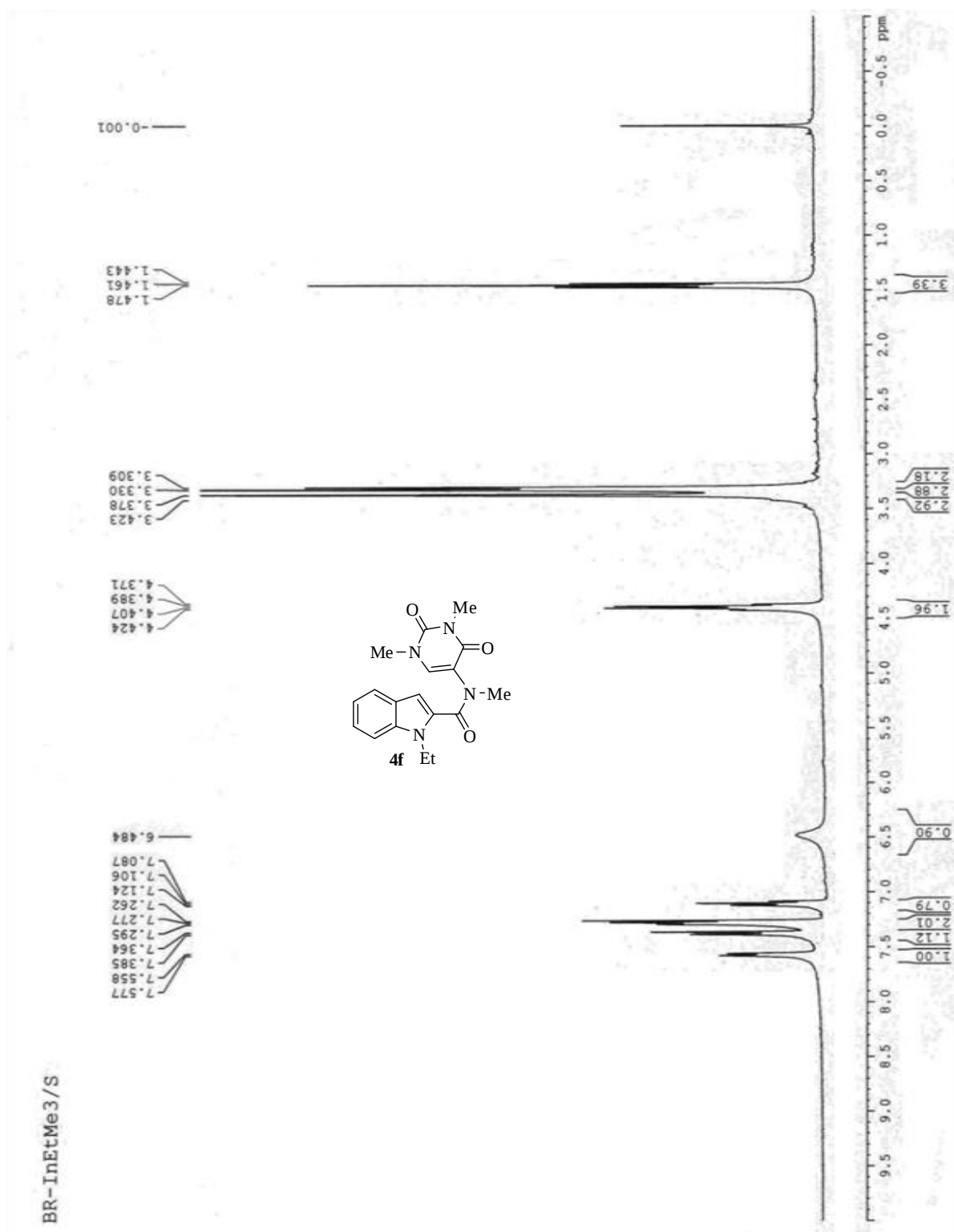
150.36

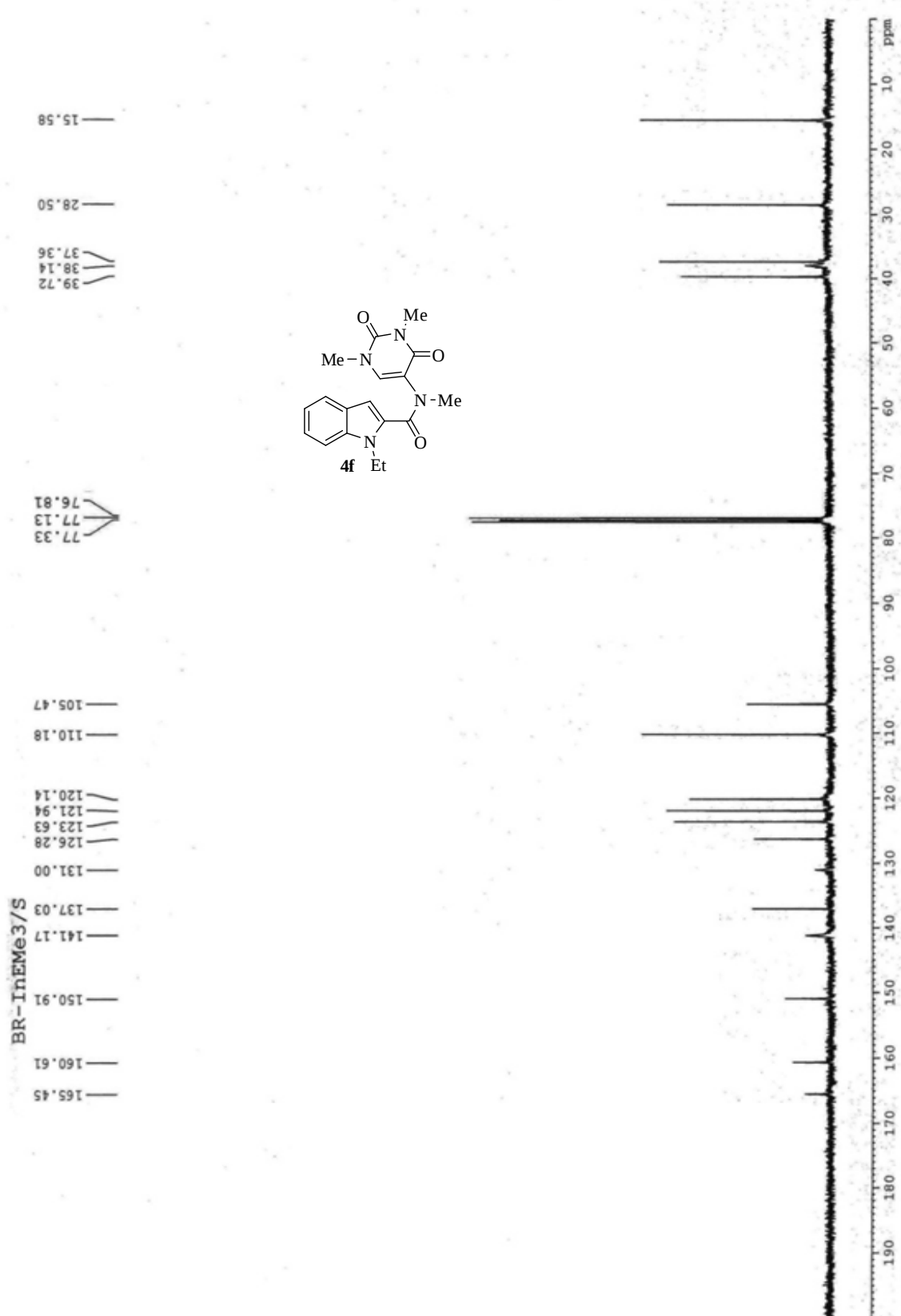
160.60

165.47

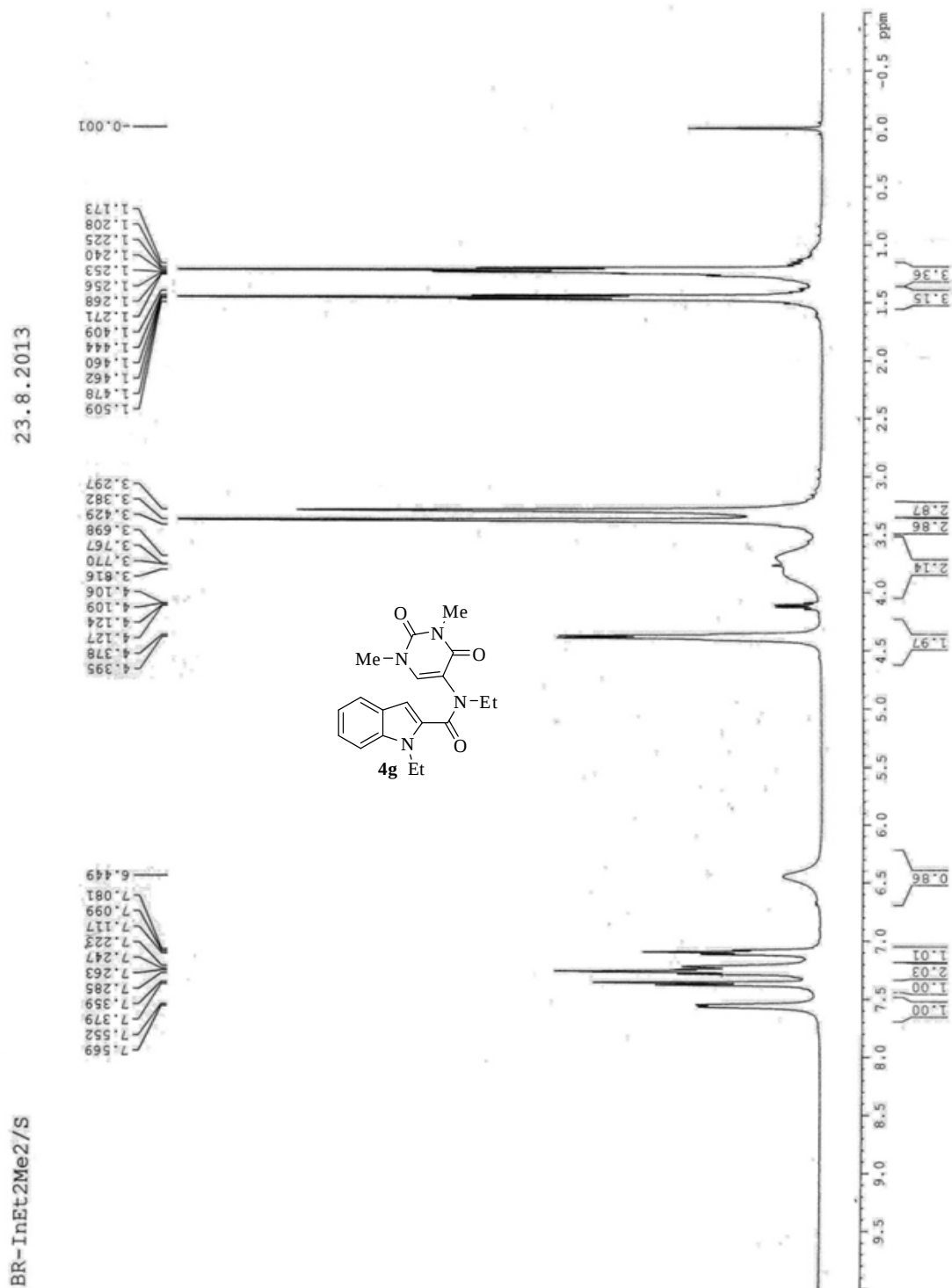


***N*-(1,3-Dimethyl-2,4-dioxo-1,2,3,4-tetrahydropyrimidin-5-yl)-1-ethyl-*N*-methyl-1*H*-indole-2-carboxamide (4f):**





***N*-(1,3-Dimethyl-2,4-dioxo-1,2,3,4-tetrahydropyrimidin-5-yl)-*N*,1-diethyl-1*H*-indole-2-carboxamide (4g):**



26.9.2013

BR-InEt2Me2/S

15.56  
14.33

28.44

37.22

39.68

45.22

77.44  
77.12  
76.80

109.17

112.11

120.15

121.85

123.97

126.94

131.11

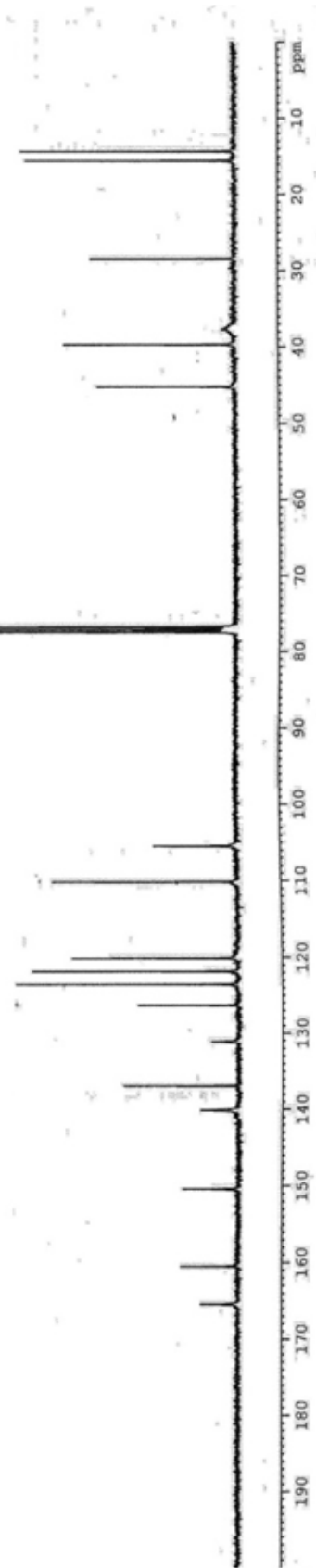
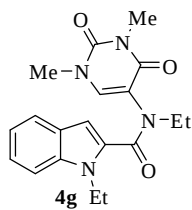
136.93

140.14

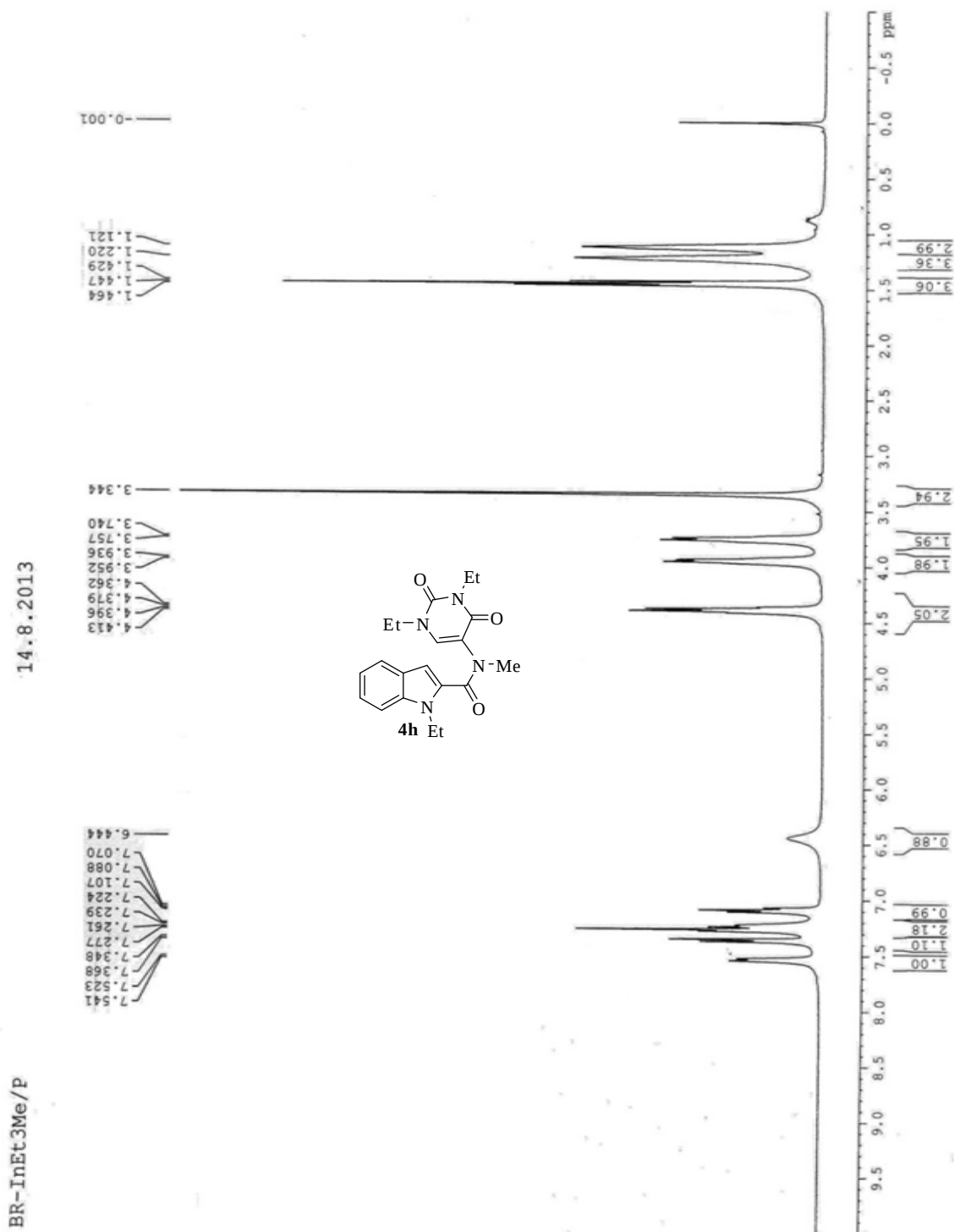
150.40

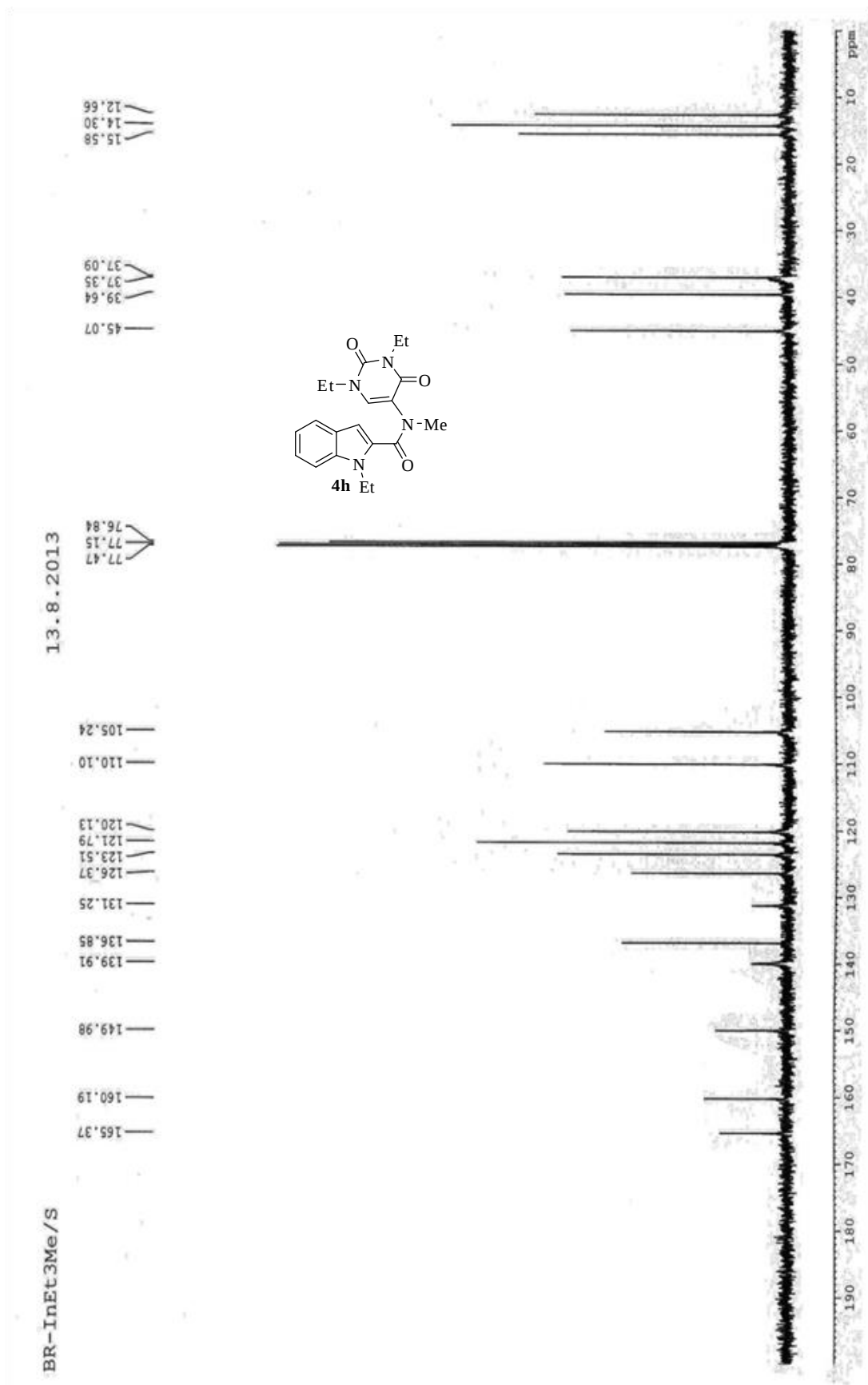
160.52

165.44

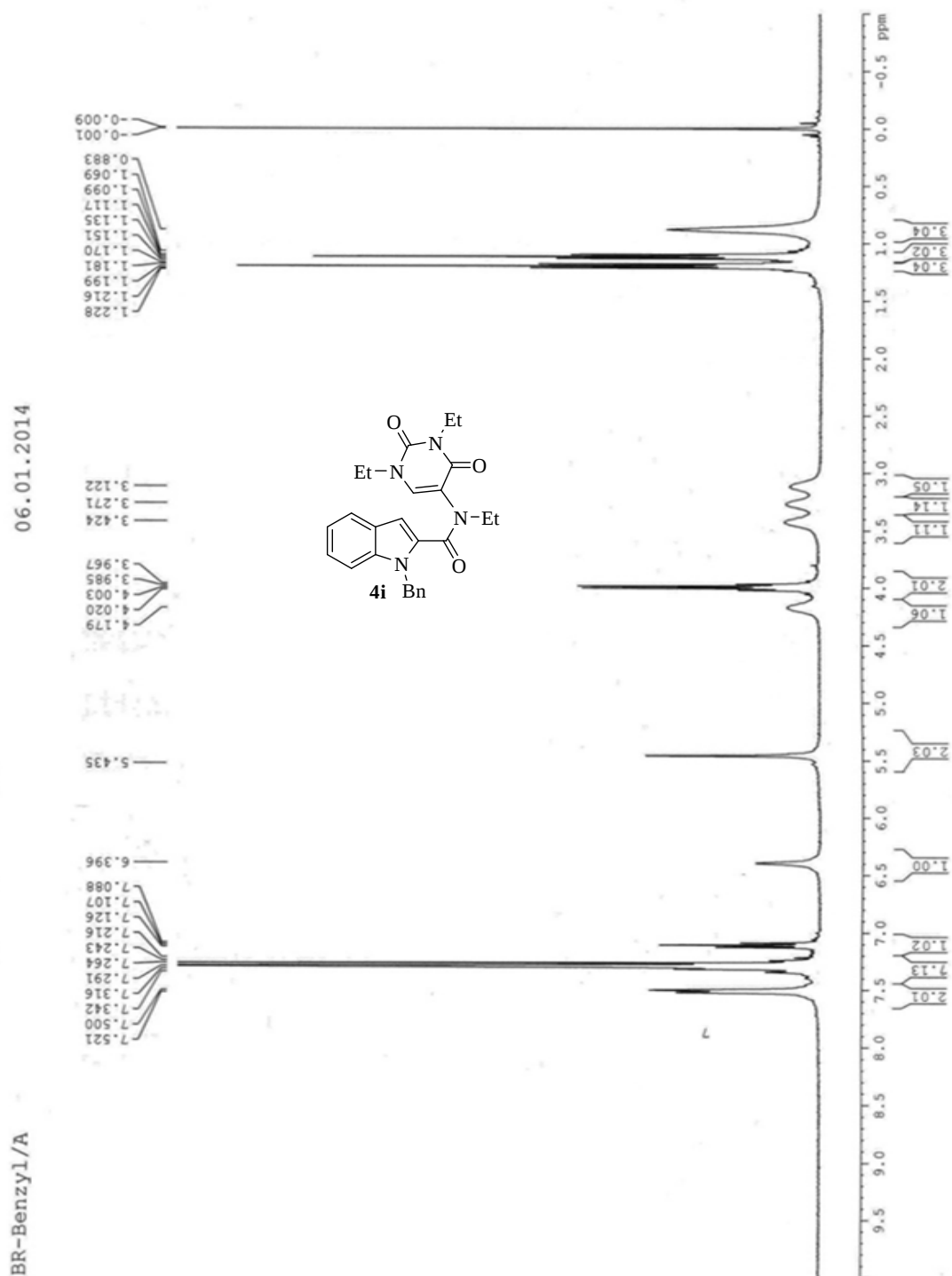


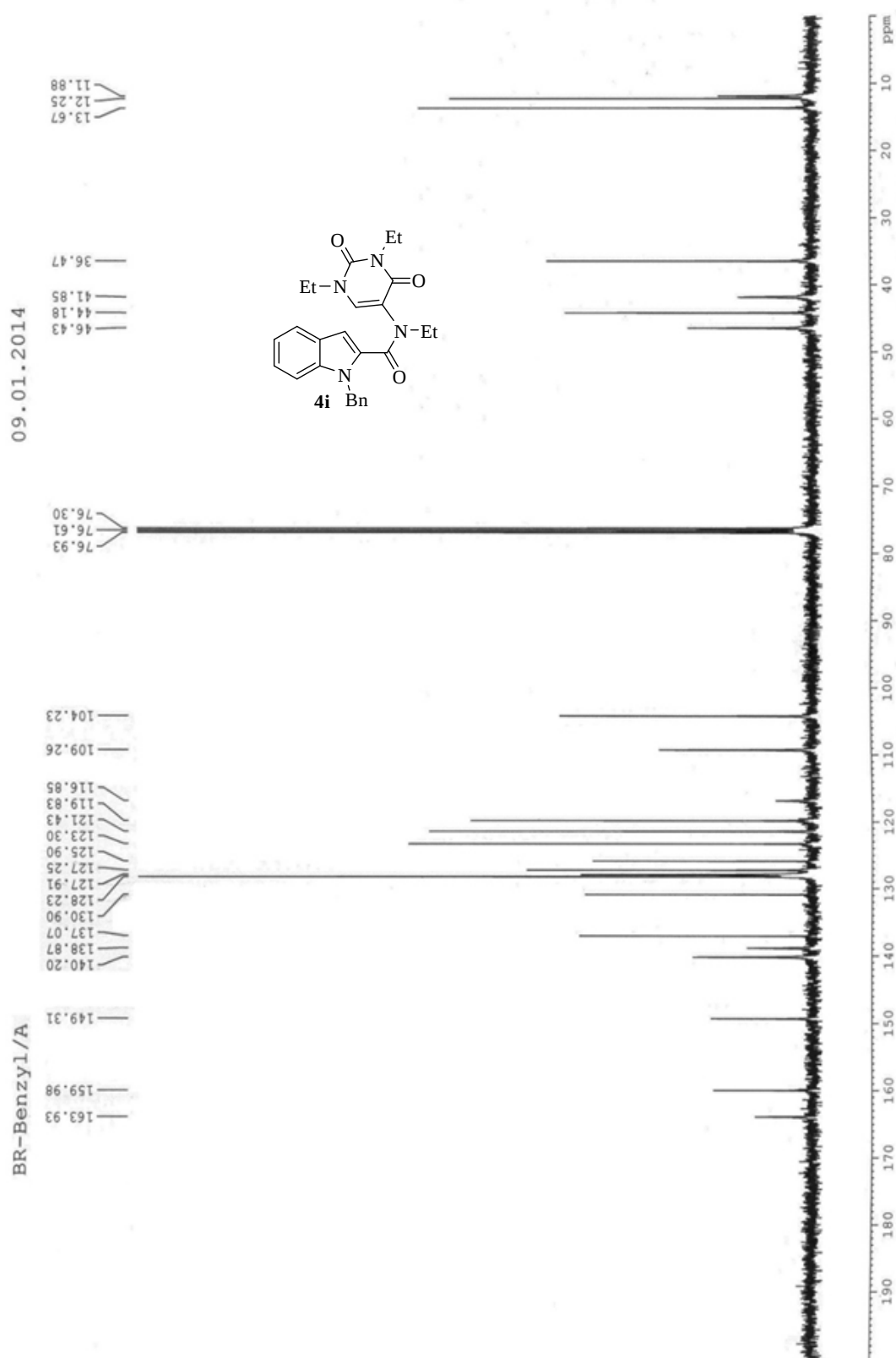
***N*-(1,3-Diethyl-2,4-dioxo-1,2,3,4-tetrahydropyrimidin-5-yl)-1-ethyl-*N*-methyl-1*H*-indole-2-carboxamide (4h):**



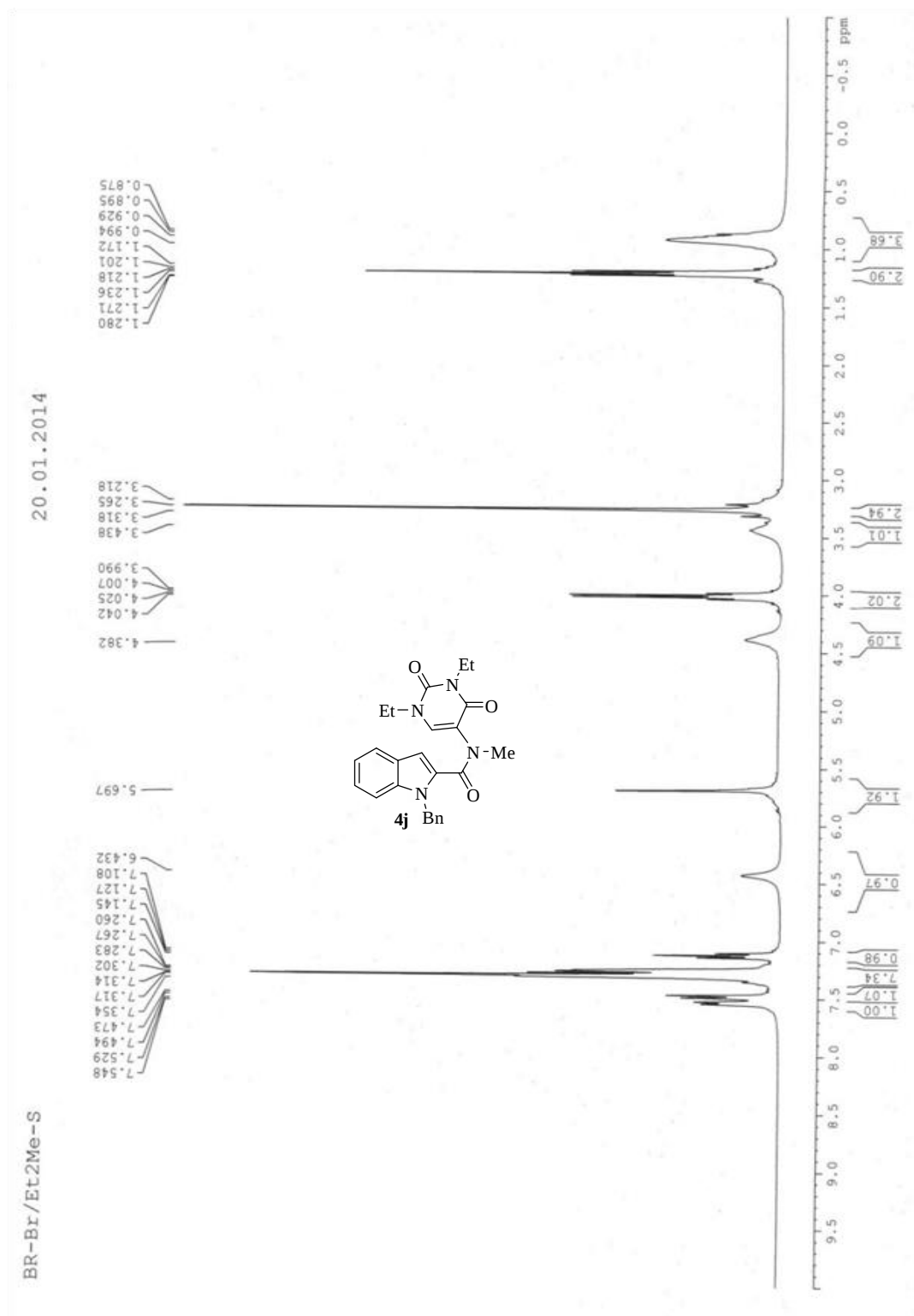


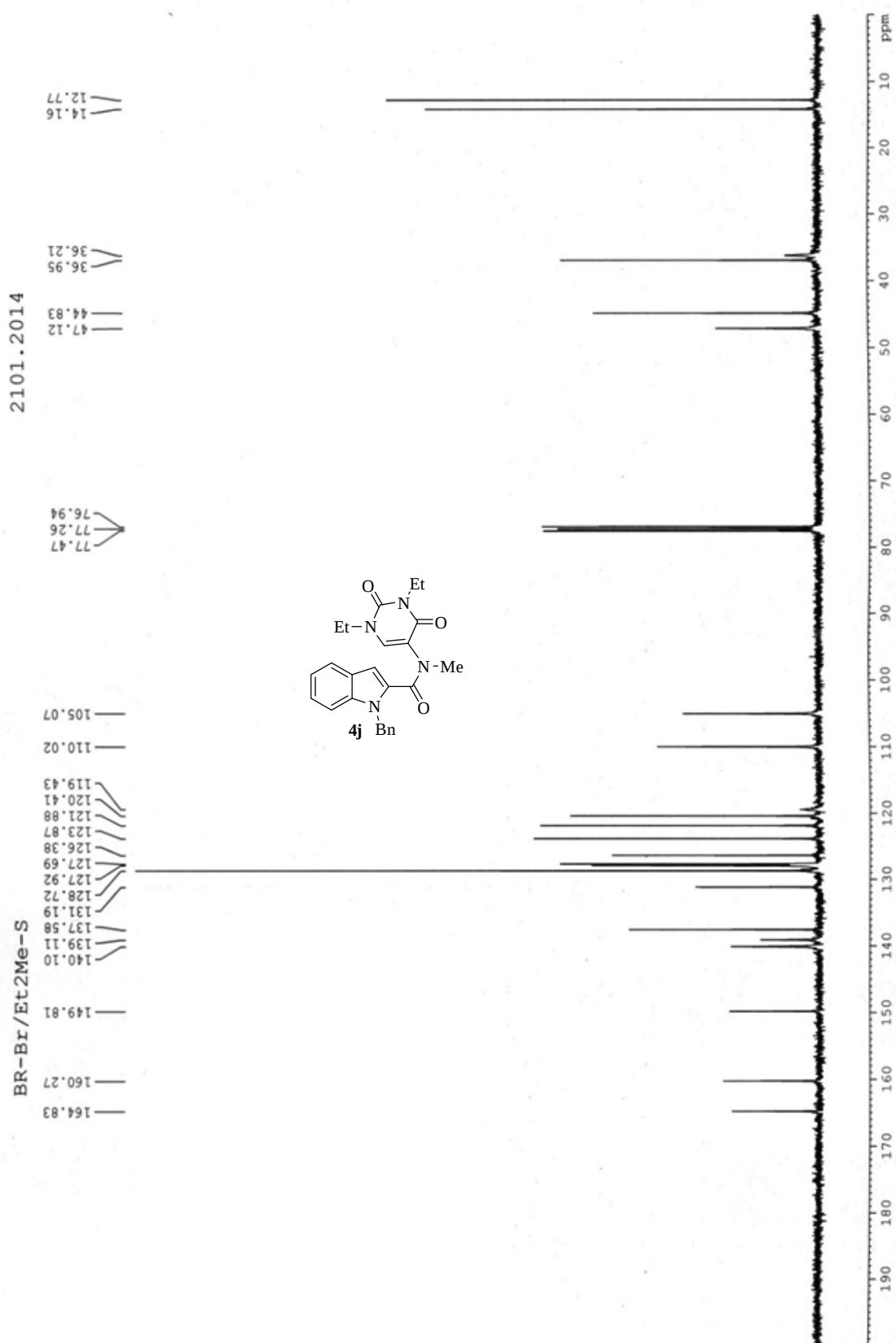
**1-Benzyl-*N*-(1,3-diethyl-2,4-dioxo-1,2,3,4-tetrahydropyrimidin-5-yl)-*N*-ethyl-1*H*-indole-2-carboxamide (4i):**



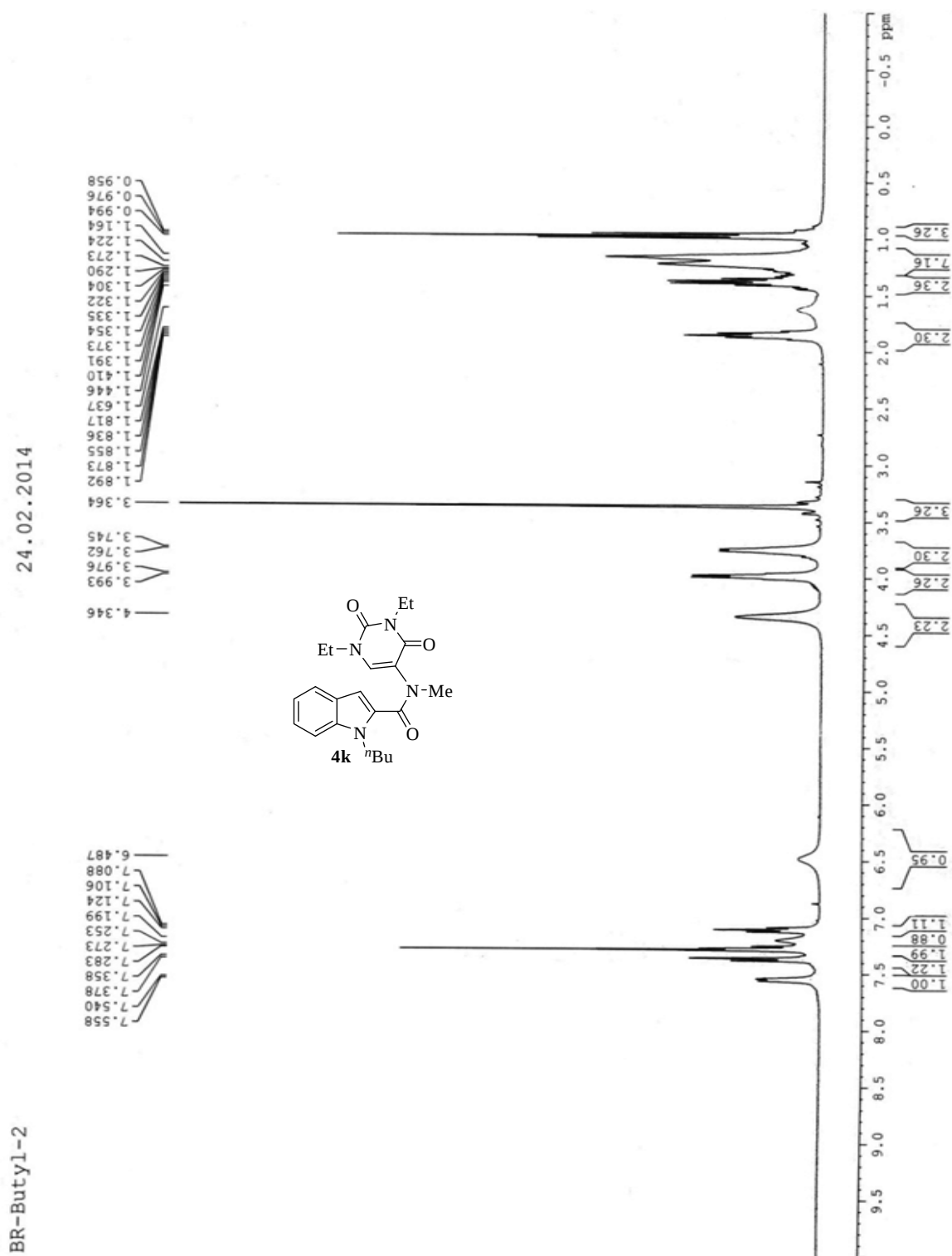


**1-Benzyl-*N*-(1,3-diethyl-2,4-dioxo-1,2,3,4-tetrahydropyrimidin-5-yl)-*N*-methyl-1*H*-indole-2-carboxamide (4j):**



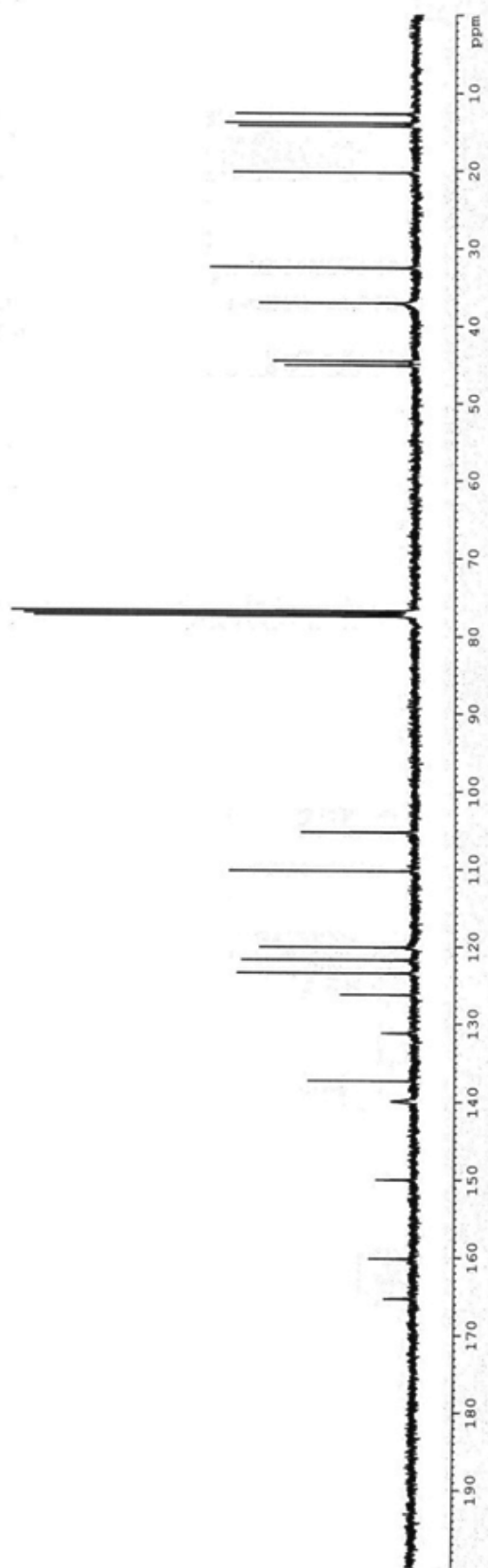
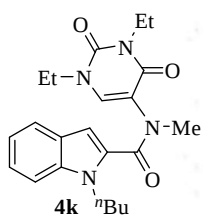


**1-Butyl-N-(1,3-diethyl-2,4-dioxo-1,2,3,4-tetrahydropyrimidin-5-yl)-N-methyl-1H-indole-2-carboxamide (4k):**

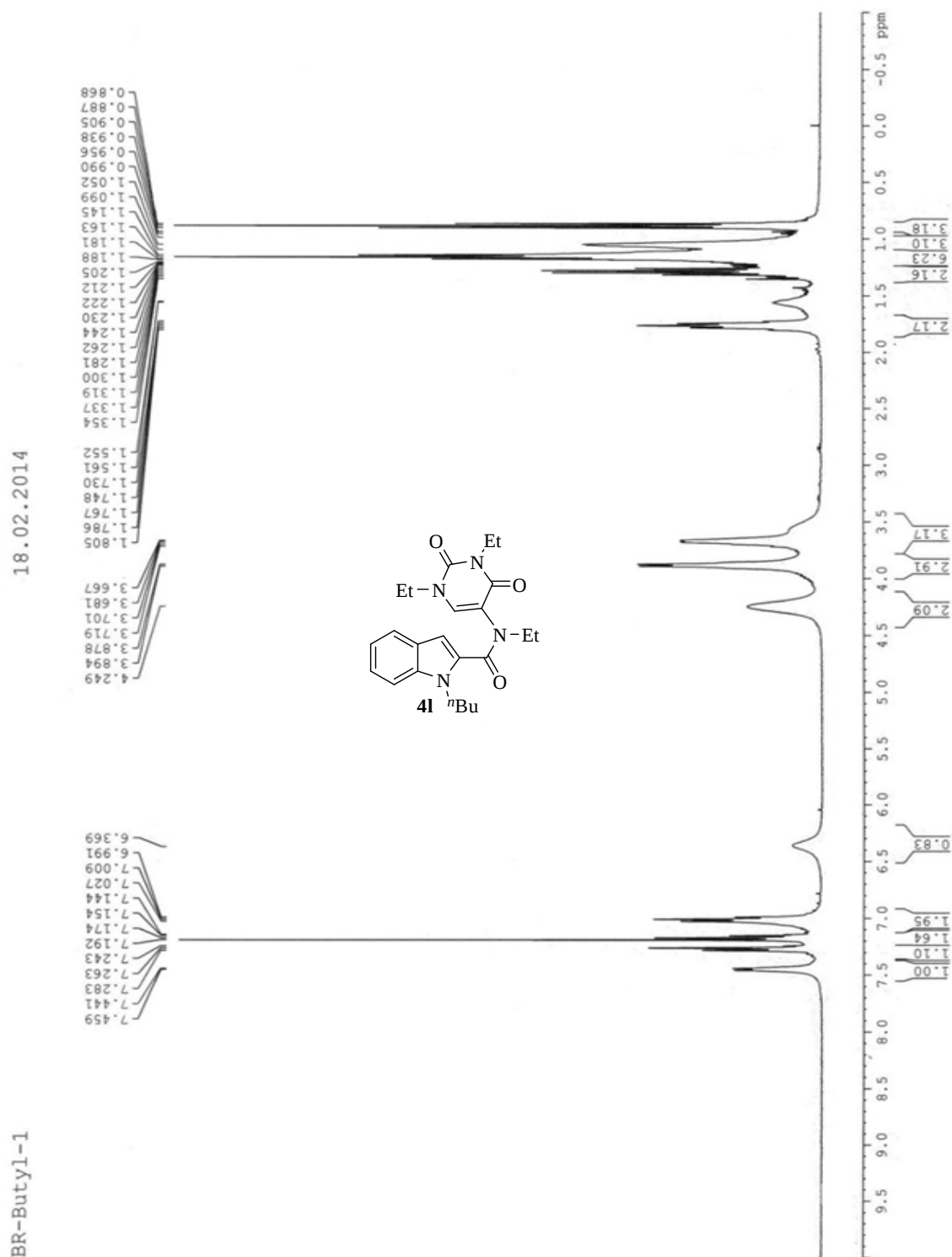


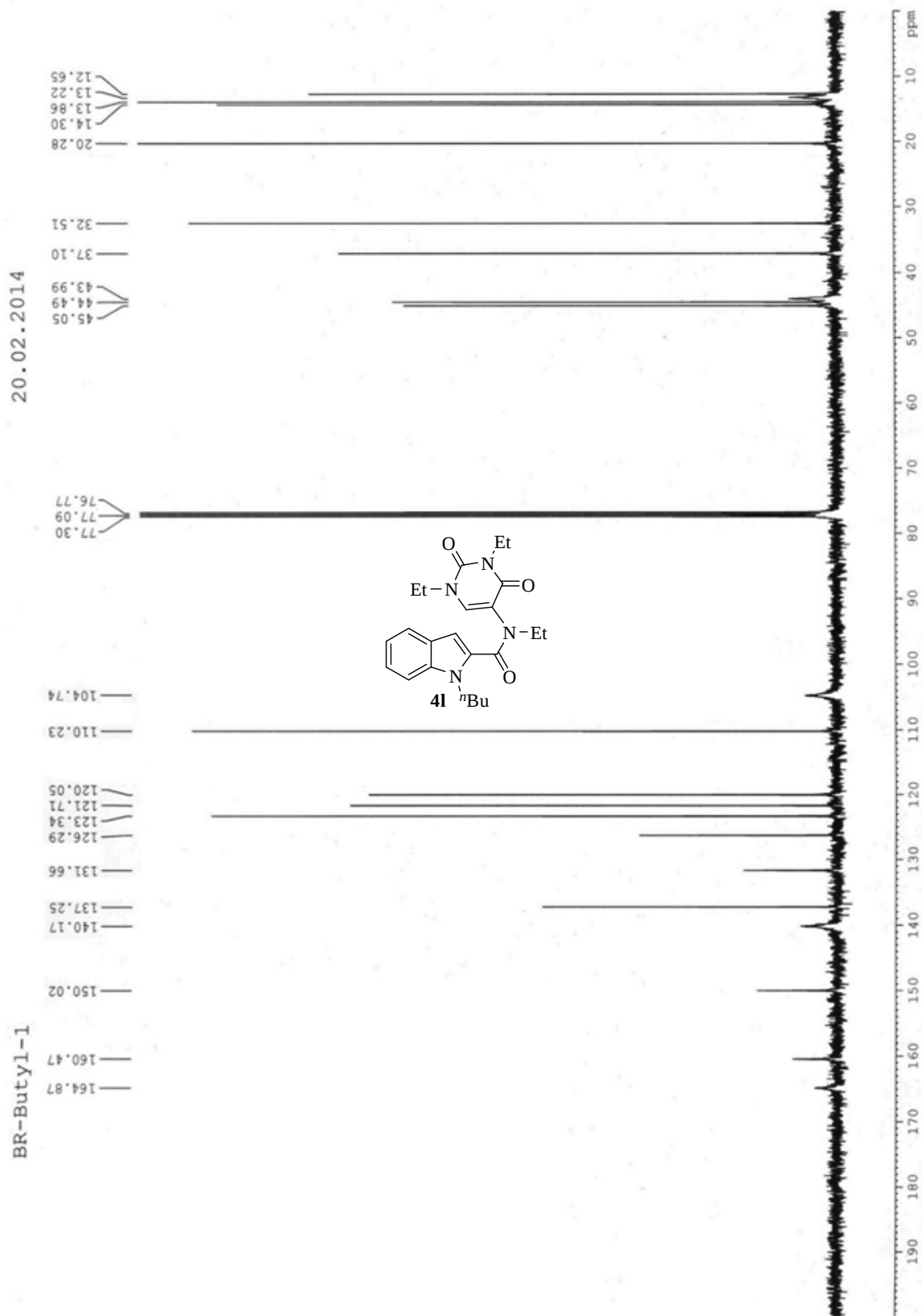
BR-Butyl-2

27.02.2014

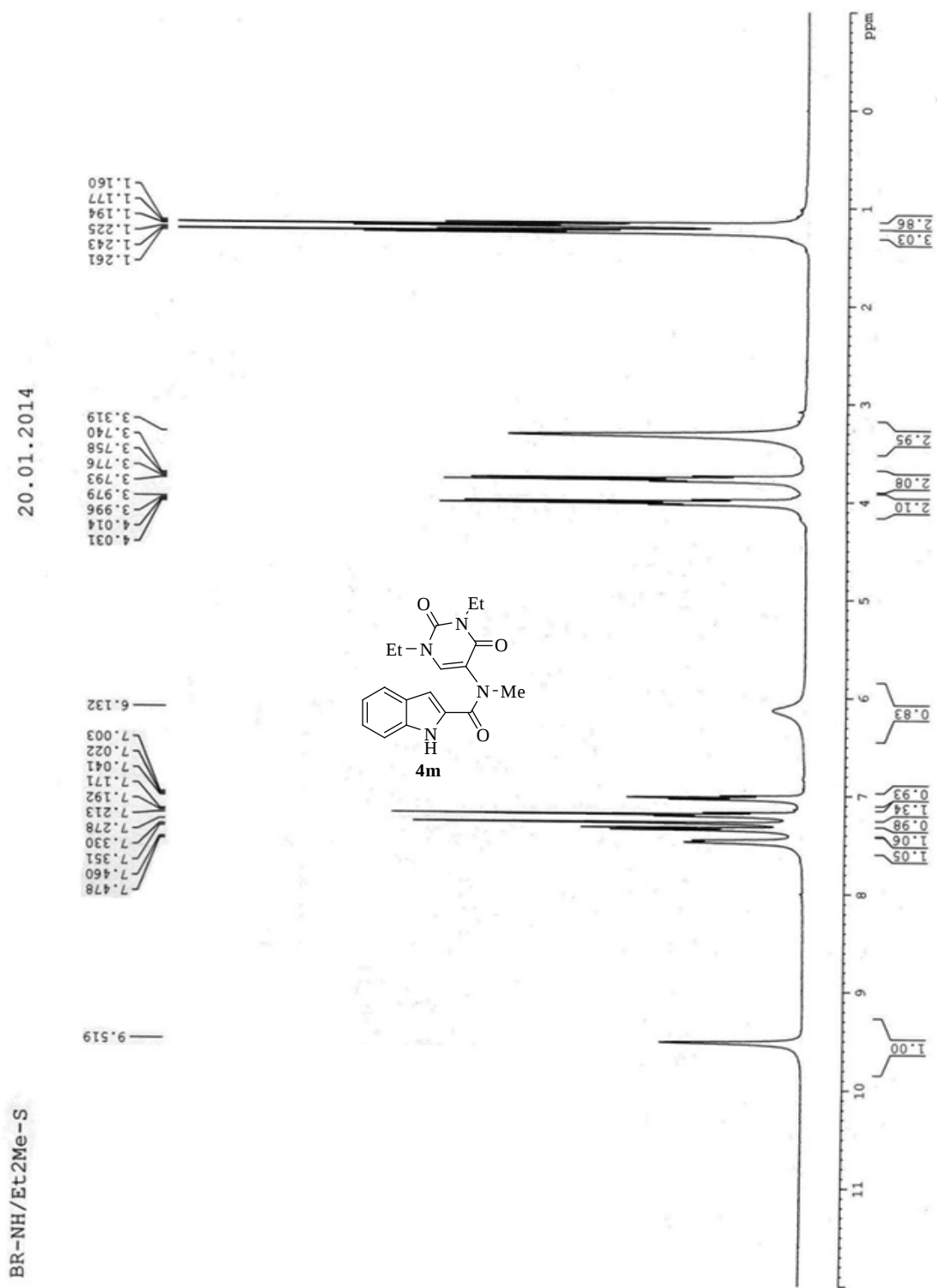


**1-Butyl-N-(1,3-diethyl-2,4-dioxo-1,2,3,4-tetrahydropyrimidin-5-yl)-N-ethyl-1*H*-indole-2-carboxamide (4l):**





***N*-(1,3-Diethyl-2,4-dioxo-1,2,3,4-tetrahydropyrimidin-5-yl)-*N*-methyl-1*H*-indole-2-carboxamide (4m):**



BR-NH/Et2Me-S

06.02.2014

