

## Supporting Information

### In(III)-Mediated Chemoselective Dehydrogenative Interaction of ClMe<sub>2</sub>SiH with Carboxylic Acids: Direct Chemo- and Regioselective Friedel-Crafts Acylation of Aromatic Ethers

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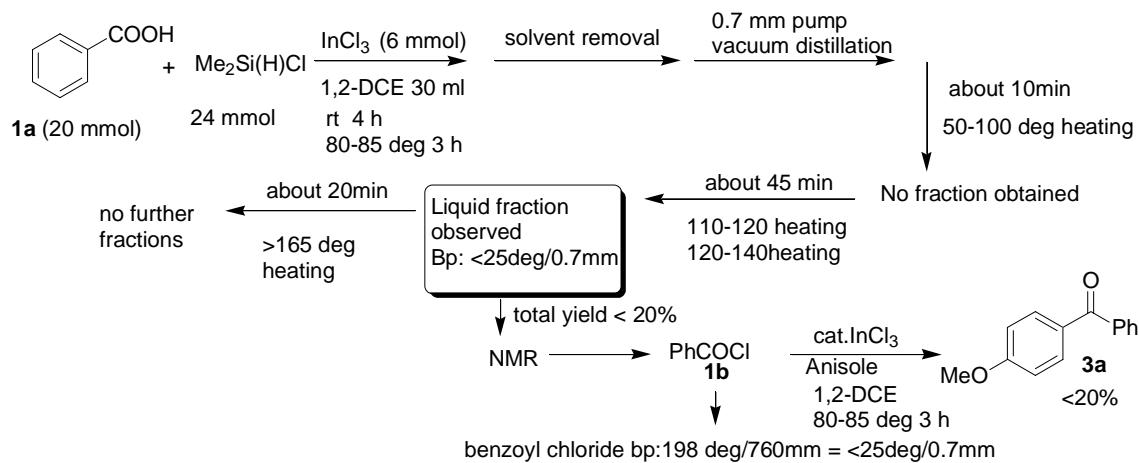
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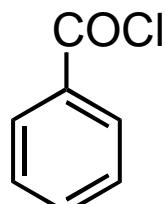
**Experimental procedure and  $^{13}\text{C}$  NMR spectral studies for the detection of reactive intermediates in the direct Friedel-Crafts acylation from the RCOOH.**

**General procedure:** In a NMR tube containing a solution of carboxylic acid **1a** (1 mmol) in  $\text{CD}_2\text{Cl}_2$  (0.7 mL) was sequentially added  $\text{ClMe}_2\text{SiH}$  (1.2 mmol) and  $\text{InX}_3$  (0.3 mmol) under an inert atmosphere. After the addition of  $\text{InCl}_3$  or  $\text{InBr}_3$  gradual evolution of hydrogen gas could be observed (in the NMR Tube Cap a tiny hole was made through with a syringe needle was inserted with a balloon filled with nitrogen). Then the  $^{13}\text{C}$  NMR spectrum was followed at various intervals at rt. Similar procedure was employed for other studies.

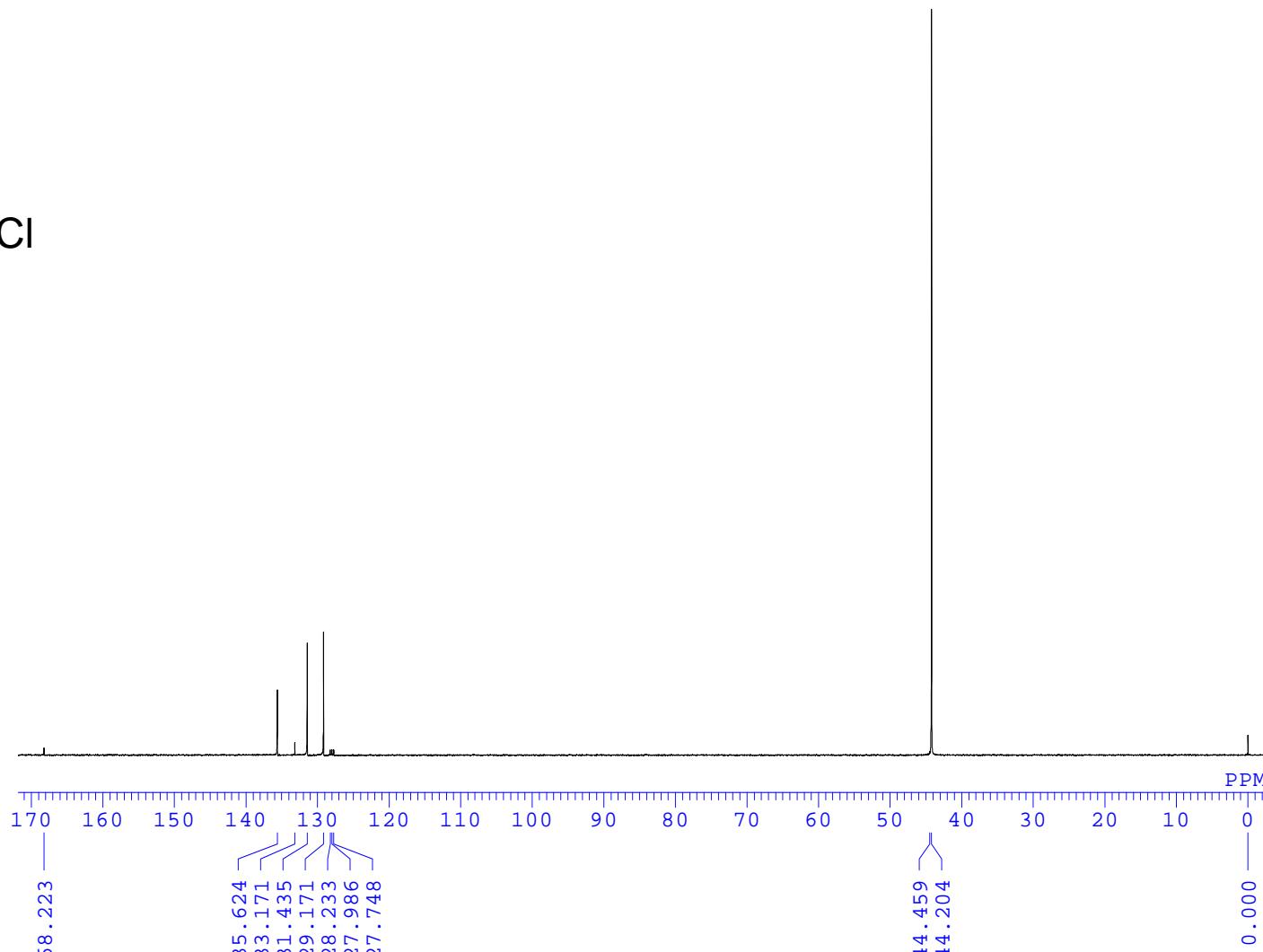
**Observation of Benzoyl chloride (**1b**), Distillation under reduced pressure and high temperature:** In a flame dried flask containing a solution of carboxylic acid **1a** (20 mmol) in 1,2-DCE (30 mL) was sequentially added  $\text{ClMe}_2\text{SiH}$  (24 mmol) and  $\text{InX}_3$  (6 mmol) under an inert atmosphere. After the addition of  $\text{InCl}_3$  or  $\text{InBr}_3$  gradual evolution of hydrogen gas could be observed. Then the reaction mixture was stirred at rt for 4 h. Then heated to 80-85 °C for 3 h. After this initially, the solvent was distilled off under inert atmosphere. Then the resulting crude material was subjected to Vacuum distillation. For about 10 min no product was distilling out at 50-100 °C. After 45 min of heating, at 110-140 °C, a liquid fraction having  $\text{Bp} < 25^\circ\text{C} / 0.7 \text{ mm}$  was distilling out which was confirmed as benzoyl chloride (**1b**). See the spectra for details. Heating >165 °C gave no further distillation products. The Above procedure can be summarized as follows. Treatment of the isolated benzoyl chloride under catalytic FC acylation using  $\text{InCl}_3$  condition with anisole gave the acylation product **3a** (see below).



**PhCOCl (Commercial sample) in  $\text{CICH}_2\text{CH}_2\text{Cl}$  with external standard (benzene- $d_6$ )**

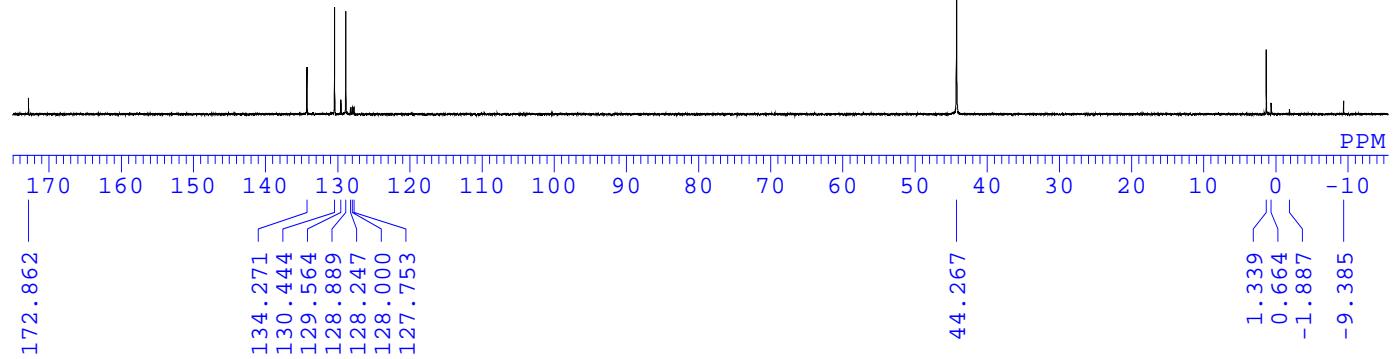
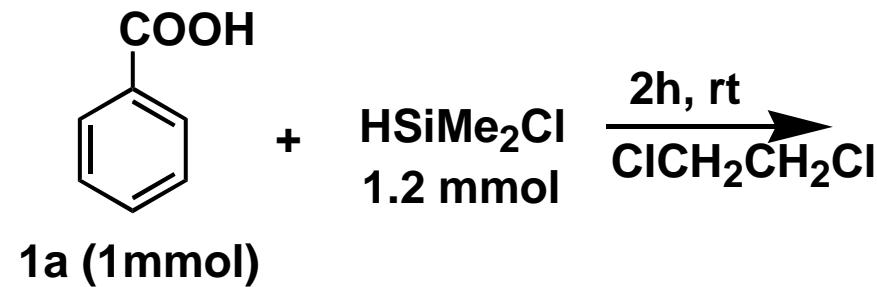


**1b**



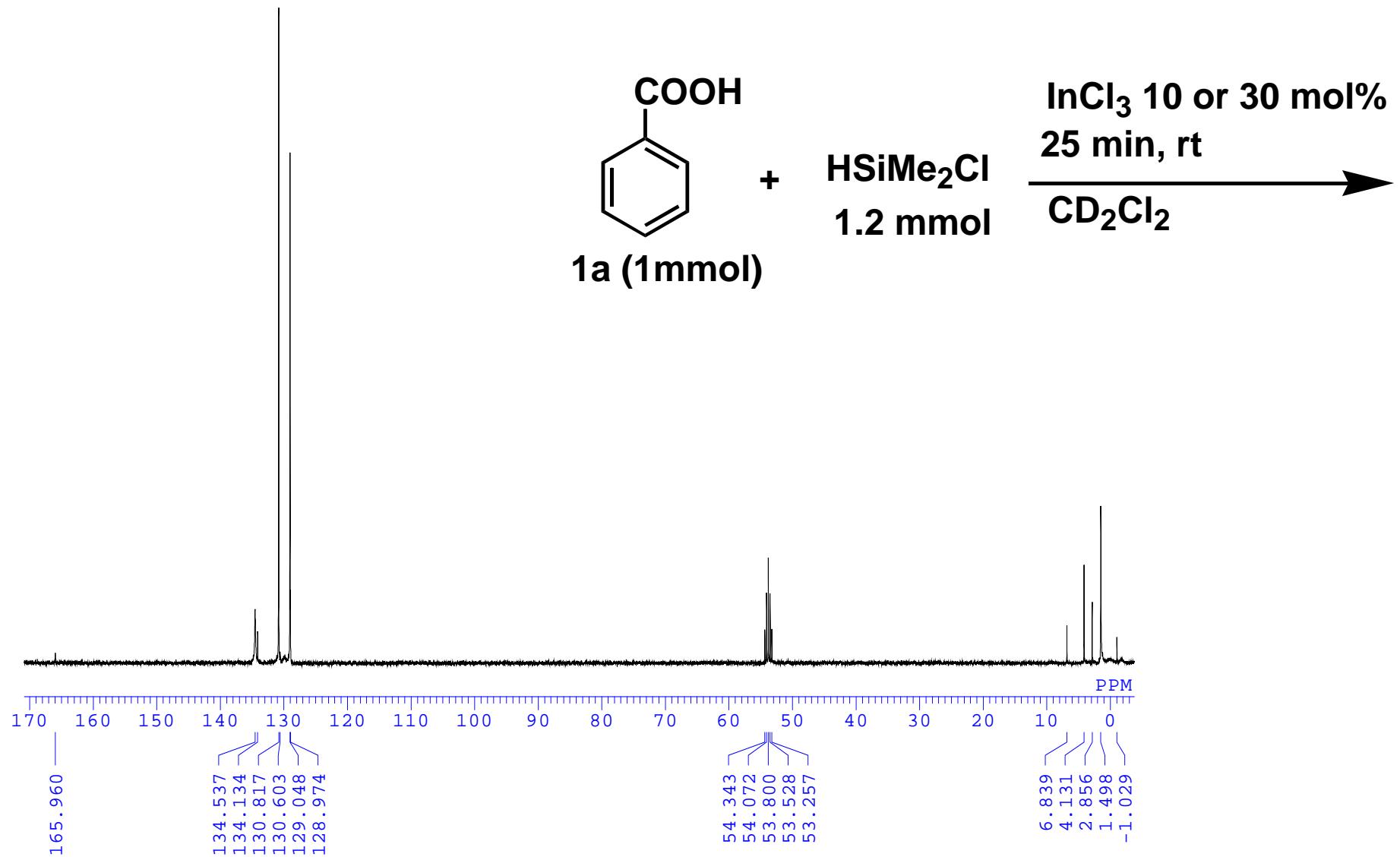
**S3**

PhCOOH - HSiMe<sub>2</sub>Cl, 2 h, in CICH<sub>2</sub>CH<sub>2</sub>Cl, external standard (benzene-d<sub>6</sub>)

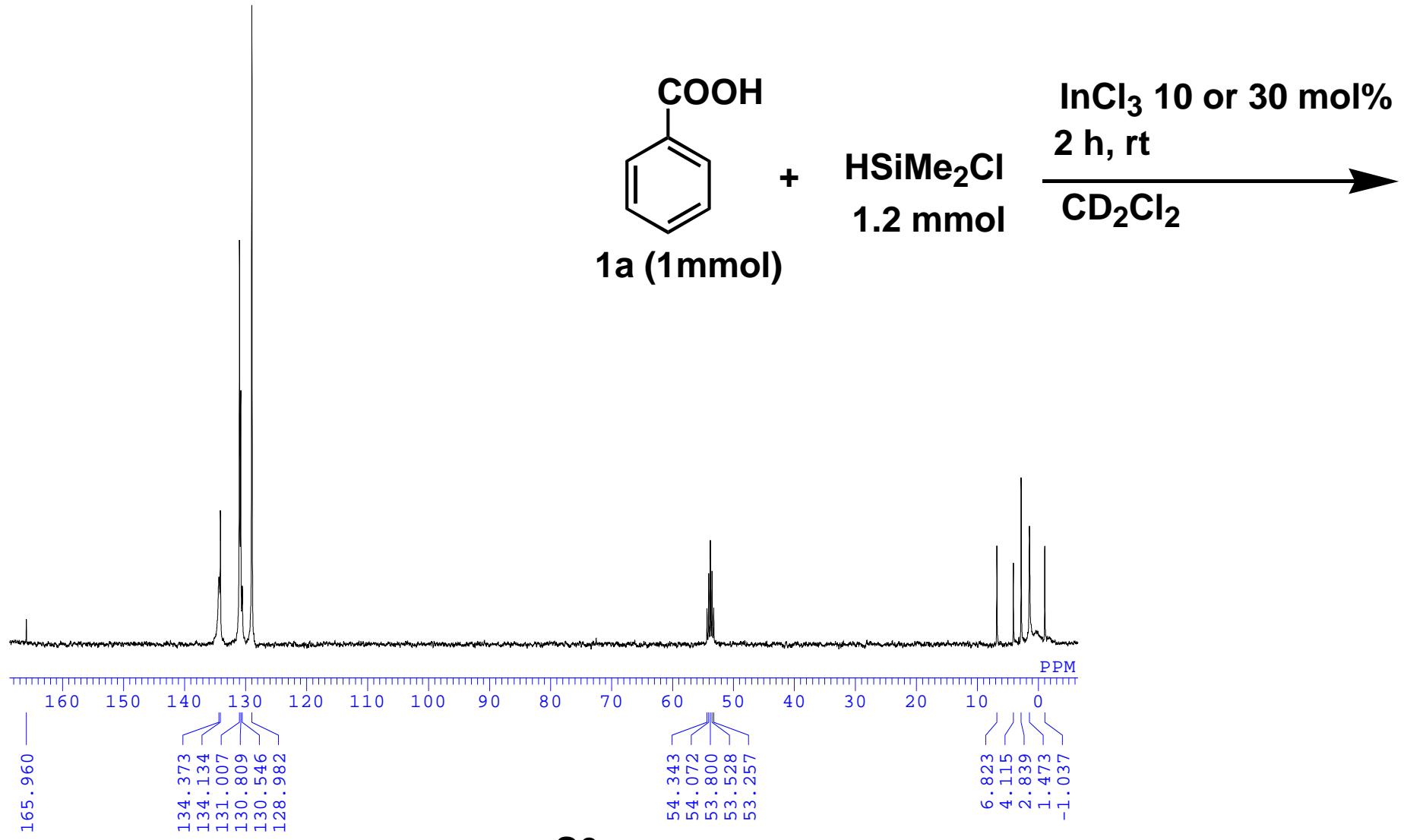


S4

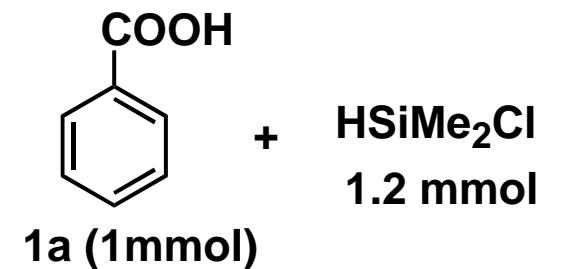
PhCOOH - HSiMe<sub>2</sub>Cl-InCl<sub>3</sub> in CD<sub>2</sub>Cl<sub>2</sub>, rt, 25min



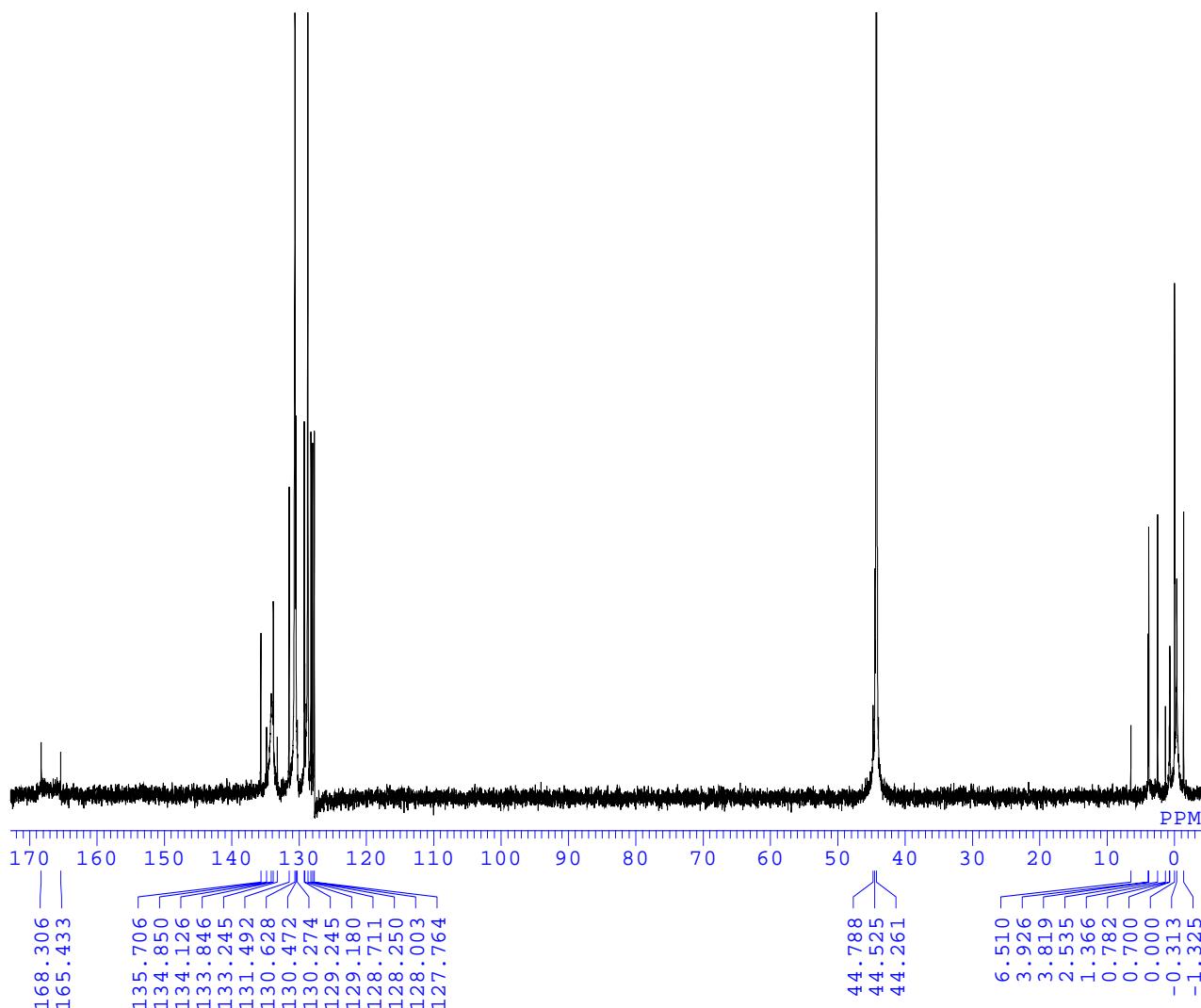
S5



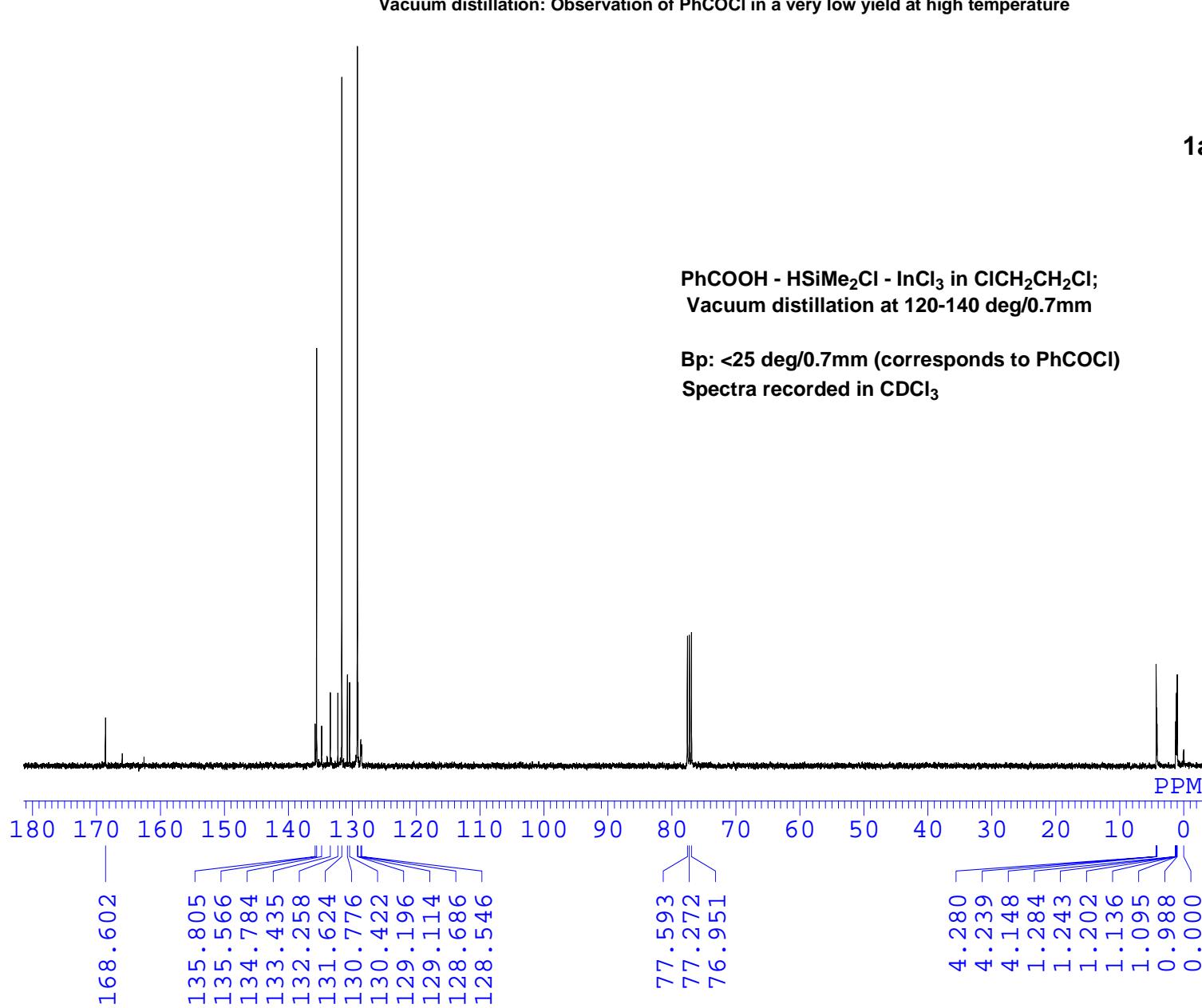
PhCOOH - HSiMe<sub>2</sub>Cl - InCl<sub>3</sub> in  
CICH<sub>2</sub>CH<sub>2</sub>Cl; rt - 4 h, 80 °C - 3 h  
with external standard



InCl<sub>3</sub> 30 mol%  
CICH<sub>2</sub>CH<sub>2</sub>Cl;  
rt - 4 h,  
80 °C - 3 h



S7



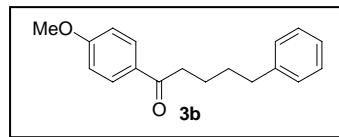
## Experimental Section

**General.** Ultrasonication was carried out using Eyela (MUS 10) ultrasonic cleaner (38 kHz, 120 W). Melting points are uncorrected. IR spectra were recorded as thin films or KBr pellets on a HORIBA FT-720 spectrophotometer.  $^1\text{H}$  and  $^{13}\text{C}$  NMR spectra were recorded on JEOL JNM-GSX-270 or 400 (270/67.9 or 400/100 MHz) spectrometers, respectively with TMS as internal or external standard. Mass spectra were recorded on a JEOL JMS-DS303 spectrometer. Column chromatography was performed on silica gel (100-200 mesh, Wako silica gel). Reagents were added to the reaction flask through syringe. Analytical thin layer chromatography (TLC) was performed on silica plates and components were visualized by observation under iodine or UV light. Yields were determined from  $^1\text{H}$  NMR spectra using internal standards or after isolation in column chromatography. Solvents were dried prior to use Carboxylic acids, aromatic ethers and Lewis acids used in this work were commercially purchased.

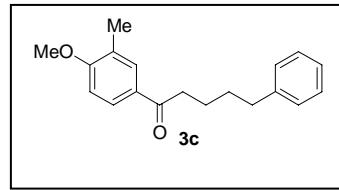
**General experimental procedure:** In a flame-dried flask containing a solution of aromatic compound (1.5 or 2 mmol) and carboxylic acid (1 mmol) in 1,2-dichloroethane (3 mL) was sequentially added  $\text{ClMe}_2\text{SiH}$  (1.2 mmol) and  $\text{InX}_3$  (0.3 mmol) or other Lewis acid (0.3 mmol) at 25 °C under an inert atmosphere (please see the Tables in the article for specific entry). After the addition of  $\text{InCl}_3$  or  $\text{InBr}_3$  gradual evolution of hydrogen gas could be observed. The reaction mixture was stirred at 25 °C for 1 h. Then the colourless reaction mixture was heated to 80 °C for 4-5 h to afford a brown or red solution. After this period, the reaction mixture was cooled to rt, quenched with water (5 mL) and subjected to ultrasonication for 1 min. Then, extraction with diethyl ether, evaporation of the solvent afforded a residue which was purified in silica gel column to afford the pure product. Note: a) In the cases of hydroxyl carboxylic acids and 4-substituted benzoic acids, 6 mL of solvent was used. b) In the cases of hydroxyl carboxylic acids, 2.4 mmol of  $\text{ClMe}_2\text{SiH}$  was used.

**(4-Methoxyphenyl)-phenyl-methanone (3a):** Spectral data was consistent with the commercial authentic sample.

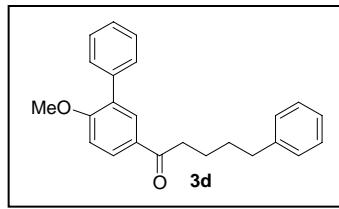
**1-(4-Methoxyphenyl)-5-phenylpentan-1-one (3b):**<sup>1</sup> Pale yellow thick oil; IR: (deposit from CDCl<sub>3</sub>) 2935, 1677, 1600, 1508 cm<sup>-1</sup>; <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ 7.92 (2 H, d, *J* = 8.8 Hz, arom-*H*), 7.29-7.15 (5 H, m, arom-*H*), 6.92 (2 H, d, *J* = 8.8 Hz, arom-*H*), 3.86 (3 H, s, OCH<sub>3</sub>), 2.93 (2 H, t, *J* = 7.6 Hz, CH<sub>2</sub>), 2.66 (2 H, t, *J* = 7.2 Hz, CH<sub>2</sub>), 1.82-1.63 (4 H, m, CH<sub>2</sub>); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ 198.9, 163.3, 142.2, 130.3, 130.1, 128.3, 128.2, 125.7, 55.4, 38.0, 35.8, 31.2, 24.2; MS: (EI) *m/z* 268 (M<sup>+</sup>, 16.6), 163 (23.0), 150 (70.0), 135 (100), 107 (7.5), 91 (10.1), 77 (15.5), 55 (2.8), 51 (1.4%); HRMS: (EI) calcd for C<sub>18</sub>H<sub>20</sub>O<sub>2</sub> 268.1463, found *m/z* 268.1461 (M<sup>+</sup>).



**1-(4-Methoxy-3-methylphenyl)-5-phenylpentan-1-one(3c):** Colorless thick oil; IR: (deposit from CDCl<sub>3</sub>) 1673, 1600 cm<sup>-1</sup>; <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ 7.80 (1 H, dd, *J*<sub>1</sub> = 8.4, *J*<sub>1</sub> = 2.0 Hz, arom-*H*), 7.75 (1 H, d, *J* = 2.0 Hz, arom-*H*), 7.29-7.15 (5 H, m, arom-*H*), 6.82 (1 H, d, *J* = 8.4 Hz, arom-*H*), 3.87 (3 H, s, OCH<sub>3</sub>), 2.92 (2 H, t, *J* = 7.6 Hz, CH<sub>2</sub>), 2.67 (2 H, t, *J* = 7.6 Hz, CH<sub>2</sub>), 2.24 (3 H, s, CH<sub>3</sub>), 1.82-1.66 (4 H, m, CH<sub>2</sub>); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ 199.2, 161.6, 142.3, 130.6, 129.5, 128.4, 128.2, 128.1, 126.6, 125.6, 109.1, 55.4, 37.9, 35.8, 31.1, 24.2, 16.2; MS: (EI) *m/z* 282 (M<sup>+</sup>, 19.2), 178 (2.7), 177 (19.7), 164 (66.9), 150 (9.8), 149 (100), 122 (2.9), 121 (3.02), 91 (24.2%); HRMS: (EI) calcd for C<sub>19</sub>H<sub>22</sub>O<sub>2</sub> 282.1620, found *m/z* 282.1623 (M<sup>+</sup>).

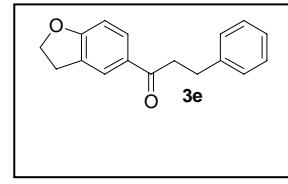


**1-(6-Methoxybiphenyl-3-yl)-5-phenylpentan-1-one (3d):** Pale yellow solid, mp 50-52 °C; IR: (deposit from CDCl<sub>3</sub>) 1673, 1596 cm<sup>-1</sup>; <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ 7.95 (1 H, dd, *J*<sub>2</sub> = 8.4, *J*<sub>2</sub> = 2.0 Hz, arom-*H*), 7.92 (1 H, d, *J* = 2.0 Hz, arom-*H*), 7.52-7.14 (10 H, m, arom-*H*), 6.98 (1 H, d, *J* = 8.4 Hz, arom-*H*), 3.88 (3 H, s, OCH<sub>3</sub>), 2.96 (2 H, t, *J* = 7.6 Hz, CH<sub>2</sub>), 2.66 (2 H, t, *J* = 7.6 Hz, CH<sub>2</sub>), 1.84-1.66 (4 H, m, CH<sub>2</sub>); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ 198.7, 160.0, 142.1,

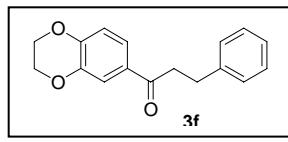


137.4, 131.0, 130.4, 129.9, 129.3, 129.2, 128.2, 128.1, 127.9, 127.8, 127.4, 127.2, 125.5, 110.4, 55.6, 37.9, 35.6, 31.0, 24.1; MS: (EI)  $m/z$  344 ( $M^+$ , 28.7), 239 (19.3), 227 (15.0), 226 (95.8), 212 (15.2), 211 (100), 168 (20.6), 139 (13.4), 91 (11.9%); HRMS: (EI) calcd for  $C_{24}H_{24}O_2$  344.1776, found  $m/z$  344.1778 ( $M^+$ ). Anal. Calcd for  $C_{24}H_{24}O_2$ : C, 83.69; H, 7.02. Found: C, 83.59; H, 7.00.

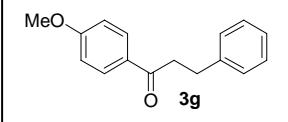
**1-(2,3-Dihydrobenzofuran-5-yl)-3-phenylpropan-1-one (3e):**<sup>2</sup> Colorless solid, mp 42-44°C; IR: (deposit from  $CDCl_3$ ) 1673, 1608  $cm^{-1}$ ;  $^1H$  NMR (400 MHz,  $CDCl_3$ )  $\delta$  7.85 (1 H, d,  $J$  = 2.0 Hz, arom-H), 7.79 (1 H, dd,  $J_1$  = 8.4,  $J_2$  = 2.0 Hz, arom-H), 7.31-7.17 (5 H, m, arom-H), 6.78 (1 H, d,  $J$  = 8.4 Hz, arom-H), 4.64 (2 H, t,  $J$  = 8.8 Hz,  $CH_2$ ), 3.24-3.21 (4 H, m,  $CH_2$ ), 3.04 (2 H, t,  $J$  = 8.8 Hz,  $CH_2$ );  $^{13}C$  NMR (100 MHz,  $CDCl_3$ )  $\delta$  197.7, 164.3, 141.5, 130.2, 129.9, 128.4, 128.3, 127.6, 126.0, 125.3, 108.9, 72.1, 40.1, 30.4, 28.9; MS: (EI)  $m/z$  252 ( $M^+$ , 24.1), 148 (9.7), 147 (100), 133 (2.7), 119 (4.3), 91 (14.0), 77 (2.7), 77 (5.8), 65 (6.3%); HRMS: (EI) calcd for  $C_{17}H_{16}O_2$  252.1150, found  $m/z$  252.1140 ( $M^+$ ).



**1-(2,3-Dihydr-benzo[1,4]dioxin-6-yl)-3-phenylpropan-1-one (3f):**<sup>2</sup> Colorless solid, mp 35-37 °C; IR: (deposit from  $CDCl_3$ ) 2935, 1677, 1581  $cm^{-1}$ ;  $^1H$  NMR (400 MHz,  $CDCl_3$ )  $\delta$  7.50 (1 H, s, arom-H), 7.47 (1 H, d,  $J$  = 2.0 Hz, arom-H), 7.30-7.17 (5 H, m, arom-H), 6.88 (1 H, d,  $J$  = 8.4 Hz, arom-H), 4.29-4.24 (4 H, m,  $CH_2$ ), 3.21 (2 H, t,  $J$  = 7.2 Hz,  $CH_2$ ), 3.03 (2 H, t,  $J$  = 7.2 Hz,  $CH_2$ );  $^{13}C$  NMR (100 MHz,  $CDCl_3$ )  $\delta$  197.6, 147.9, 143.3, 141.3, 130.7, 128.4, 128.3, 126.0, 122.1, 117.5, 117.1, 64.6, 64.0, 40.3, 30.2; MS: (EI)  $m/z$  268 ( $M^+$ , 28.1), 164 (10.8), 163 (100), 135 (6.4), 107 (6.3), 91 (6.3), 79 (2.9), 51 (4.1%); HRMS: (EI) calcd for  $C_{17}H_{16}O_3$  268.1099, found  $m/z$  268.1104 ( $M^+$ ).

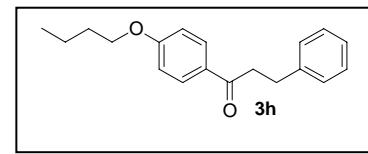


**1-(4-Methoxyphenyl)-3-phenylpropan-1-one (3g):**<sup>3</sup> Colorless solid, mp 90-92 °C; IR: (deposit from  $CDCl_3$ ) 1677, 1600  $cm^{-1}$ ;  $^1H$  NMR (400 MHz,  $CDCl_3$ )  $\delta$  7.94 (2 H, d,  $J$  = 8.8 Hz, arom-H), 7.31-7.18 (5 H, m, arom-H), 6.91 (2 H, d,  $J$  = 8.8 Hz, arom-H), 3.86 (3 H, s,  $OCH_3$ ), 3.25

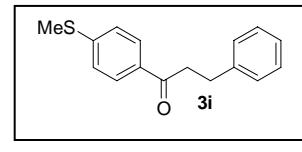


(2 H, t,  $J$  = 7.6 Hz,  $CH_2$ ), 3.05 (3 H, t,  $J$  = 7.6 Hz,  $CH_2$ );  $^{13}C$  NMR (100 MHz,  $CDCl_3$ )  $\delta$  197.8, 163.4, 141.4, 130.3, 129.9, 128.5, 128.4, 126.1, 113.7, 55.4, 40.1, 30.3; MS: (EI)  $m/z$  240 ( $M^+$ , 28.8), 209 (1.3), 137 (0.9), 136 (9.1), 135 (100), 121 (2.0), 107 (4.7), 92 (5.2), 77 (8.2%); HRMS: (EI) calcd for  $C_{16}H_{16}O_2$  240.1150, found  $m/z$  240.1137 ( $M^+$ ).

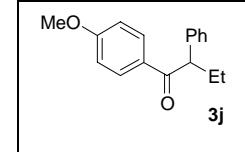
**1-(4-Butoxyphenyl)-3-phenylpropan-1-one (3h):** Colorless solid, mp 35-37 °C; IR: (deposit from  $CDCl_3$ ) 2958, 1677, 1600, 1508  $cm^{-1}$ ;  $^1H$  NMR (400 MHz,  $CDCl_3$ )  $\delta$  7.92 (2 H, d,  $J$  = 8.8 Hz, arom- $H$ ), 7.31-7.18 (5 H, m, arom- $H$ ), 6.90 (2 H, d,  $J$  = 8.8 Hz, arom- $H$ ), 4.01 (2 H, t,  $J$  = 6.8 Hz,  $CH_2$ ), 3.24 (2 H, t,  $J$  = 7.2 Hz,  $CH_2$ ), 3.05 (2 H, t,  $J$  = 6.8 Hz,  $CH_2$ ), 1.82-1.74 (2 H, m,  $CH_2$ ), 1.54-1.49 (2 H, m,  $CH_2$ ), 0.98 (3 H, t,  $J$  = 7.2 Hz,  $CH_3$ );  $^{13}C$  NMR (100 MHz,  $CDCl_3$ )  $\delta$  197.8, 163.0, 141.5, 130.2, 129.6, 128.5, 128.4, 126.0, 114.1, 67.9, 40.0, 31.1, 30.3, 19.2, 13.8; MS: (EI)  $m/z$  282 ( $M^+$ , 36.0), 281 (2.3), 209 (3.0), 178 (12.5), 177 (100), 163 (1.3), 150 (2.8), 121 (82.2), 91 (13.1%); HRMS: (EI) calcd for  $C_{19}H_{22}O_2$  282.1620, found  $m/z$  282.1629 ( $M^+$ ).



**1-(4-Methylsulfanylphenyl)-3-phenylpropan-1-one (3i):<sup>4</sup>** Colorless solid, mp 73-75 °C; IR: (deposit from  $CDCl_3$ ) 3027, 1677, 1589  $cm^{-1}$ ;  $^1H$  NMR (400 MHz,  $CDCl_3$ )  $\delta$  7.84 (2 H, d,  $J$  = 8.4 Hz, arom- $H$ ), 7.30-7.17 (7 H, m, arom- $H$ ), 3.23 (2 H, t,  $J$  = 7.2 Hz,  $CH_2$ ), 3.04 (2 H, t,  $J$  = 8.4 Hz,  $CH_2$ ), 2.51 (3 H, s,  $CH_3$ );  $^{13}C$  NMR (100 MHz,  $CDCl_3$ )  $\delta$  198.1, 145.7, 141.2, 133.0, 128.4, 128.3, 128.2, 126.0, 124.8, 40.1, 30.1, 14.6; MS: (EI)  $m/z$  256 ( $M^+$ , 35.2), 241 (1.2), 209 (5.6), 191 (0.5), 151 (100), 108 (4.7), 91 (8.8), 77 (5.7%); HRMS: (EI) calcd for  $C_{16}H_{16}OS$  256.0922, found  $m/z$  256.0915 ( $M^+$ ).

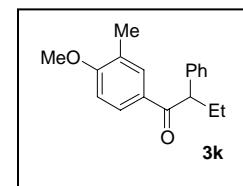


**1-(4-Methoxyphenyl)-2-phenylbutan-1-one (3j):<sup>5</sup>** Colorless thick oil, IR: (deposit from  $CDCl_3$ ) 2965, 1673, 1600, 1492  $cm^{-1}$ ;  $^1H$  NMR (400 MHz,  $CDCl_3$ )  $\delta$  7.96 (2 H, d,  $J$  = 8.8 Hz, arom- $H$ ), 7.31-7.17 (5 H, m, arom- $H$ ), 6.85 (2 H, d,  $J$  = 8.8 Hz, arom- $H$ ), 4.40 (1 H, t,  $J$  = 7.2 Hz,  $CH$ ), 3.80 (3 H, s,  $OCH_3$ ), 2.24-2.13 (1 H, m,  $CH_2$ ), 1.90-1.79 (1 H, m,  $CH_2$ ), 0.89 (3 H, t,  $J$  = 7.2 Hz,  $CH_3$ );  $^{13}C$  NMR (100 MHz,  $CDCl_3$ )  $\delta$  198.6, 163.2, 140.0, 130.9, 130.0, 128.7, 128.1, 126.8, 113.6, 55.3, 55.0, 27.1, 12.3; MS: (EI)  $m/z$  254 ( $M^+$ , 0.9), 136

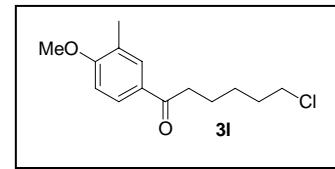


(9.5), 135 (100), 107 (3.4), 92 (3.9), 91 (3.4), 77 (5.8), 64 (0.9%); HRMS: (EI) calcd for C<sub>17</sub>H<sub>18</sub>O<sub>2</sub> 254.1307, found *m/z* 254.1314 (M<sup>+</sup>).

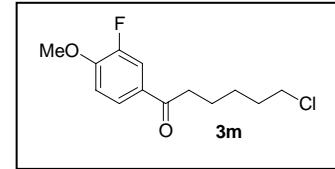
**1-(4-Methoxy-3-methylphenyl)-2-phenylbutan-1-one (3k):**<sup>6</sup> Colorless thick oil; IR: (deposit from CDCl<sub>3</sub>) 2985, 1727, 1600, 1461 cm<sup>-1</sup>; <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ 7.84 (1 H, dd, *J*<sub>1</sub> = 8.6 Hz, *J*<sub>2</sub> = 2.0 Hz, arom-H), 7.80 (1 H, d, *J* = 2.0 Hz, arom-H), 7.32-7.16 (5 H, m, arom-H), 6.76 (1 H, d, *J* = 8.8 Hz, arom-H), 4.41 (1 H, t, *J* = 7.2 Hz, CH), 3.82 (3 H, s, OCH<sub>3</sub>), 2.24-2.13 (1 H, m, CH<sub>2</sub>), 2.21 (3 H, s, CH<sub>3</sub>), 1.90-1.79 (1 H, m, CH<sub>2</sub>), 0.89 (3 H, t, *J* = 7.2 Hz, CH<sub>3</sub>); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ 198.9, 161.2, 140.2, 131.2, 129.5, 128.8, 128.7, 128.1, 126.7, 126.6, 109.0, 55.4, 54.9, 27.2, 16.2, 12.3; MS: (EI) *m/z* 268 (M<sup>+</sup>, 0.8), 150 (9.7), 149 (100), 121 (1.4), 106 (1.8), 91 (9.3), 77 (2.2), 51 (0.4%); HRMS: (EI) calcd for C<sub>18</sub>H<sub>20</sub>O<sub>2</sub> 268.1463, found *m/z* 268.1466 (M<sup>+</sup>).



**6-Chloro-1-(4-methoxy-3-methylphenyl)-hexan-1-one (3l):** Colorless solid, mp 44-46 °C; IR: (deposit from CDCl<sub>3</sub>) 2942, 1673, 1600, 1504 cm<sup>-1</sup>; <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ 7.82 (1 H, dd, *J*<sub>1</sub> = 8.4 Hz, *J*<sub>2</sub> = 2.0 Hz, arom-H), 7.77 (1 H, d, *J* = 2.0 Hz, arom-H), 6.84 (1 H, d, *J* = 8.4 Hz, arom-H), 3.89 (3 H, s, OCH<sub>3</sub>), 3.55 (2 H, t, *J* = 6.4 Hz, CH<sub>2</sub>), 2.93 (2 H, t, *J* = 7.6 Hz, CH<sub>2</sub>), 2.25 (3 H, s, CH<sub>3</sub>), 1.86-1.48 (6 H, m, CH<sub>2</sub>); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ 198.9, 161.6, 130.6, 129.5, 128.1, 126.7, 109.1, 55.5, 44.9, 37.9, 32.5, 26.6, 23.7, 16.2; MS: (EI) *m/z* 255 (M<sup>+</sup>+1, 0.4), 254 (M<sup>+</sup>, 1.9), 165 (4.8), 164 (42.7), 150 (9.5), 149 (100), 121 (1.9), 91 (12.1), 77 (4.7%); HRMS: (EI) calcd for C<sub>14</sub>H<sub>19</sub>ClO<sub>2</sub> 254.1074, found *m/z* 254.1076 (M<sup>+</sup>).

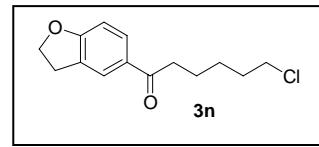


**6-Chloro-1-(3-fluoro-4-methoxyphenyl)-hexan-1-one (3m):** Yellow solid, mp 35-37 °C; IR: (deposit from CDCl<sub>3</sub>) 2938, 1681, 1612, 1519 cm<sup>-1</sup>; <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ 7.74 (1 H, dd, *J*<sub>1</sub> = 8.0 Hz, *J*<sub>2</sub> = 2.0 Hz, arom-H), 7.69 (1 H, dd, *J*<sub>1</sub> = 12.0 Hz, *J*<sub>2</sub> = 2.0 Hz, arom-H), 6.99 (1 H, t, *J* = 8.0 Hz, arom-H), 3.95 (3 H, s, OCH<sub>3</sub>), 3.56 (2 H, t, *J* = 5.2 Hz, CH<sub>2</sub>), 2.93 (2 H, t, *J* = 7.2 Hz, CH<sub>2</sub>), 1.86-1.48 (6 H, m, CH<sub>2</sub>); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ 197.6 (d, *J* = 1.6 Hz), 151.9 (d, *J* = 249.3 Hz),

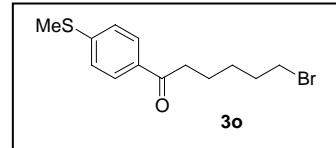


151.7 (d,  $J = 10.7$  Hz), 130.1 (d,  $J = 4.9$  Hz), 125.2 (d,  $J = 3.3$  Hz), 115.5 (d,  $J = 18.9$  Hz), 112.2 (d,  $J = 1.6$  Hz), 56.2, 44.8, 37.8, 32.4, 26.5, 23.4; MS: (EI)  $m/z$  259 ( $M^+ + 1$ , 0.2), 258 ( $M^+$ , 1.2), 223 (2.3), 169 (6.5), 168 (64.8), 153 (100), 125 (6.0), 110 (4.9), 95 (6.9%); HRMS: (EI) calcd for  $C_{13}H_{16}ClFO_2$  258.0823, found  $m/z$  258.0820 ( $M^+$ ).

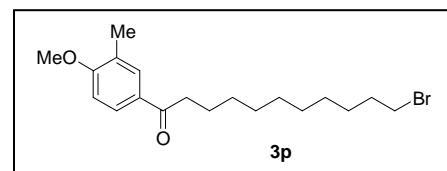
**6-Chloro-1-(2,3-dihydrobenzofuran-5-yl)-hexan-1-one (3n):** Colorless solid, mp 44–46 °C; IR: (deposit from  $CDCl_3$ ) 2942, 1670, 1604  $cm^{-1}$ ;  $^1H$  NMR (400 MHz,  $CDCl_3$ )  $\delta$  7.85 (1 H, d,  $J = 2.0$  Hz, arom-H), 7.80 (1 H, dd,  $J_1 = 8.4$ ,  $J_2 = 2.0$  Hz, arom-H), 6.79 (1 H, d,  $J = 8.4$  Hz, arom-H), 4.66 (2 H, t,  $J = 8.8$  Hz,  $CH_2$ ), 3.55 (2 H, t,  $J = 6.8$  Hz,  $CH_2$ ), 3.25 (2 H, t,  $J = 8.8$  Hz,  $CH_2$ ), 2.92 (2 H, t,  $J = 8.8$  Hz,  $CH_2$ ), 1.86–1.48 (6 H, m,  $CH_2$ );  $^{13}C$  NMR (100 MHz,  $CDCl_3$ )  $\delta$  198.5, 164.2, 130.3, 129.9, 127.6, 125.3, 108.9, 72.1, 44.9, 37.9, 32.4, 28.9, 26.6, 23.7; MS: (EI)  $m/z$  253 ( $M^+ + 1$ , 0.6), 252 ( $M^+$ , 2.3), 217 (2.3), 175 (1.9), 162 (44.7), 148 (9.6), 147 (100), 119 (4.4), 91 (8.3), 65 (4.5%); HRMS: (EI) calcd for  $C_{14}H_{17}ClO_2$  252.0917, found  $m/z$  252.0914 ( $M^+$ ). Anal. Calcd for  $C_{14}H_{17}ClO_2$ : C, 66.53; H, 6.78; Cl, 14.03. Found: C, 66.44; H, 6.81; Cl, 14.02.



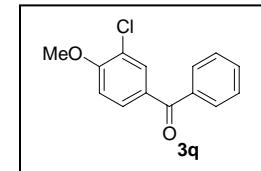
**6-Bromo-1-(4-methylsulfanylphenyl)-hexan-1-one (3o):** Colorless solid, mp 63–65 °C; IR: (deposit from  $CDCl_3$ ) 2938, 1677, 1589  $cm^{-1}$ ;  $^1H$  NMR (400 MHz,  $CDCl_3$ )  $\delta$  7.86 (2 H, d,  $J = 8.8$  Hz, arom-H), 7.25 (2 H, d,  $J = 8.8$  Hz, arom-H), 3.43 (2 H, t,  $J = 6.4$  Hz,  $CH_2$ ), 2.95 (2 H, t,  $J = 7.6$  Hz,  $CH_2$ ), 2.52 (3 H, s,  $CH_3$ ), 1.95–1.48 (6 H, m,  $CH_2$ );  $^{13}C$  NMR (100 MHz,  $CDCl_3$ )  $\delta$  199.0, 145.7, 133.2, 128.4, 125.0, 38.0, 33.6, 32.6, 27.6, 23.4, 14.7; MS: (EI)  $m/z$  302 ( $M^+ + 2$ , 5.2), 300 ( $M^+$ , 5.0), 222 (0.8), 166 (61.1), 151 (100), 123 (5.1), 108 (5.8), 79 (4.3), 77 (3.4%); HRMS: (EI) calcd for  $C_{13}H_{17}BrOS$  300.0183, found  $m/z$  300.0191 ( $M^+$ ).



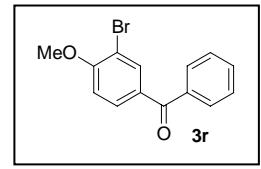
**11-Bromo-1-(4-methoxy-3-methylphenyl)-undecan-1-one (3p):** Colorless solid, mp 35-37 °C; IR: (deposit from CDCl<sub>3</sub>) 2927, 1673, 1600, 1504 cm<sup>-1</sup>; <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ 7.82 (1 H, dd, *J*<sub>1</sub> = 8.4 Hz, *J*<sub>2</sub> = 2.0 Hz, arom-H), 7.81 (1 H, d, *J* = 2.0 Hz, arom-H), 6.83 (1 H, d, *J* = 8.0 Hz, arom-H), 3.88 (3 H, s, OCH<sub>3</sub>), 3.39 (2 H, t, *J* = 6.8 Hz, CH<sub>2</sub>), 2.89 (2 H, t, *J* = 7.6 Hz, CH<sub>2</sub>), 2.24 (3 H, s, CH<sub>3</sub>), 1.87-1.67 (4 H, m, CH<sub>2</sub>), 1.41-1.29 (12 H, m, CH<sub>2</sub>); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ 199.4, 161.5, 130.6, 129.6, 128.1, 126.6, 109.1, 55.4, 38.2, 34.0, 32.8, 29.4, 29.3, 29.3, 28.7, 28.1, 24.6, 16.2; MS: (EI) *m/z* 370 (M<sup>+</sup>+2, 2.1), 368 (M<sup>+</sup>, 2.2), 289 (0.6), 177 (10.5), 165 (12.2), 164 (100), 150 (8.9), 149 (90.4), 106 (2.5%); HRMS: (EI) calcd for C<sub>19</sub>H<sub>29</sub>BrO<sub>2</sub> 368.1351, found *m/z* 368.1357 (M<sup>+</sup>).



**(3-Chloro-4-methoxyphenyl)-phenylmethanone (3q):<sup>7</sup>** Colorless solid, mp 77-79 °C; IR: (deposit from CDCl<sub>3</sub>) 1654, 1596 cm<sup>-1</sup>; <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ 7.90 (1 H, d, *J* = 2.0 Hz, arom-H), 7.77-7.74 (3 H, m, arom-H), 7.62-7.48 (3 H, m, arom-H), 7.00 (1 H, d, *J* = 8.4 Hz, arom-H), 3.99 (3 H, s, OCH<sub>3</sub>); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ 194.4, 158.4, 137.6, 132.3, 132.2, 130.7, 129.7, 128.3, 122.6, 111.1, 56.4; MS: (EI) *m/z* 247 (M<sup>+</sup>+1, 7.9), 246 (M<sup>+</sup>, 52.4), 211 (8.1), 203 (2.2), 171 (34.1), 169 (100), 141 (4.1), 126 (7.4), 105 (36.8), 77 (29.9), 63 (4.7%); HRMS: (EI) calcd for C<sub>14</sub>H<sub>11</sub>ClO<sub>2</sub> 246.0448, found *m/z* 246.0442 (M<sup>+</sup>).

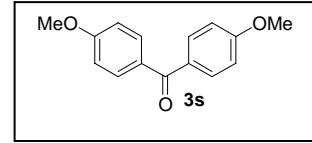


**(3-Bromo-4-methoxyphenyl)-phenylmethanone (3r):<sup>8</sup>** Colorless solid, mp 65-67°C; IR: (deposit from CDCl<sub>3</sub>) 1654, 1592 cm<sup>-1</sup>; <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ 8.07 (1 H, d, *J* = 2.0 Hz, arom-H), 7.79 (1 H, dd, *J*<sub>1</sub> = 8.4, *J*<sub>2</sub> = 2.0 Hz, arom-H), 7.74 (2 H, dd, *J*<sub>1</sub> = 8.0, *J*<sub>2</sub> = 2.0 Hz, arom-H), 7.61-7.51 (1 H, m, arom-H), 7.49 (2 H, t, *J* = 8.0 Hz, arom-H), 6.96 (1 H, d, *J* = 8.4 Hz, arom-H), 3.98 (3 H, s, OCH<sub>3</sub>); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ 194.2, 159.2, 137.5, 135.4, 132.2, 131.4, 131.1, 129.7, 128.3, 111.6, 110.9, 56.5; MS: (EI) *m/z* 291 (M<sup>+</sup>+2, 9.9), 289 (M<sup>+</sup>, 1.1), 249 (2.1), 247 (2.1), 215 (92.6), 213 (100), 211 (12.3), 157

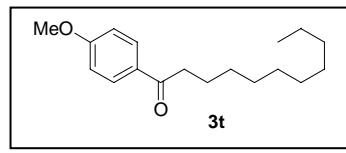


(4.9), 139 (6.4), 105 (65.4), 77 (47.9%); HRMS: (EI) calcd for C<sub>14</sub>H<sub>11</sub>BrO<sub>2</sub> 289.9942, found *m/z* 289.9948 (M<sup>+</sup>).

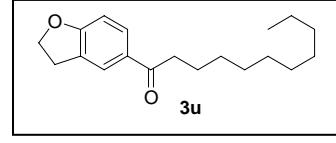
**Bis-(4-methoxyphenyl)-methanone (3s):**<sup>9</sup> Pale yellow solid, mp 129-135°C; IR: (deposit from CDCl<sub>3</sub>) 1635, 1604 cm<sup>-1</sup>; <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ 7.78 (4 H, d, *J* = 8.8 Hz), 6.96 (4 H, d, *J* = 8.8 Hz), 3.88 (6 H, s, OCH<sub>3</sub>); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ 194.4, 162.8, 132.2, 130.7, 113.4, 55.4; MS: (EI) *m/z* 242 (M<sup>+</sup>, 47.6), 241 (4.3), 211 (14.3), 199 (2.8), 171 (1.3), 135 (100), 107 (9.4), 77 (10.6%); HRMS: (EI) calcd for C<sub>15</sub>H<sub>14</sub>O<sub>3</sub> 242.0943, found *m/z* 242.0937 (M<sup>+</sup>).



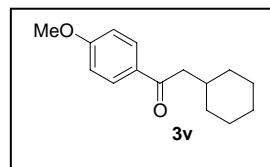
**1-(4-Methoxyphenyl)-undecan-1-one (3t):**<sup>10</sup> Colorless solid, mp 44-46 °C; IR: (deposit from CDCl<sub>3</sub>) 2927, 1673, 1600, 1511 cm<sup>-1</sup>; <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ 7.94 (2 H, d, *J* = 8.8 Hz, arom-H), 6.92 (2 H, d, *J* = 8.8 Hz, arom-H), 3.85 (3 H, s, OCH<sub>3</sub>), 2.90 (2 H, t, *J* = 7.6 Hz, CH<sub>2</sub>), 1.75-1.67 (2 H, m, CH<sub>2</sub>), 1.33-1.26 (14 H, m, CH<sub>2</sub>), 0.88 (3 H, t, *J* = 6.8 Hz, CH<sub>3</sub>); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ 199.1, 163.2, 130.2, 130.1, 113.5, 55.3, 38.2, 31.8, 29.5, 29.4, 29.3, 29.2, 24.6, 22.6, 14.0; MS: (EI) *m/z* 276 (M<sup>+</sup>, 3.7), 163 (12.1), 151 (10.0), 150 (100), 135 (95.9), 107 (4.0), 92 (6.1), 77 (7.7), 55 (1.9%); HRMS: (EI) calcd for C<sub>18</sub>H<sub>28</sub>O<sub>2</sub> 276.2089, found *m/z* 276.2092 (M<sup>+</sup>).



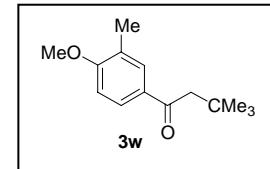
**1-(2,3-Dihydrobenzofuran-5-yl)-undecan-1-one (3u):** Colorless solid, mp 38-40 °C; IR: (deposit from CDCl<sub>3</sub>) 2927, 1670, 1589 cm<sup>-1</sup>; <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ 7.85 (1 H, d, *J* = 2.0 Hz, arom-H), 7.80 (1 H, dd, *J*<sub>1</sub> = 8.8, *J*<sub>2</sub> = 2.0 Hz, arom-H), 6.79 (1 H, d, *J* = 8.8 Hz, arom-H), 4.66 (2 H, t, *J* = 8.8 Hz, CH<sub>2</sub>), 3.25 (2 H, t, *J* = 8.8 Hz, CH<sub>2</sub>), 2.89 (2 H, t, *J* = 7.6 Hz, CH<sub>2</sub>), 1.74-1.67 (2 H, m, CH<sub>2</sub>), 1.33-1.26 (14 H, m, CH<sub>2</sub>), 0.88 (3 H, t, *J* = 7.2 Hz, CH<sub>3</sub>); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ 199.2, 164.1, 130.5, 129.9, 127.6, 125.3, 108.9, 72.1, 38.4, 31.9, 29.6, 29.5, 29.4, 29.4, 29.3, 29.0, 24.7, 22.7, 14.1; MS: (EI) *m/z* 288 (M<sup>+</sup>, 5.7), 175 (11.7), 163 (10.7), 162 (100), 147 (88.9), 119 (4.4), 91 (8.4), 65 (3.3%); HRMS: (EI) calcd for C<sub>19</sub>H<sub>28</sub>O<sub>2</sub> 288.2089, found *m/z* 288.2090 (M<sup>+</sup>).



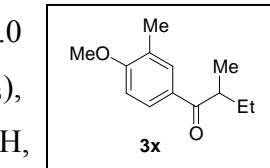
**2-Cyclohexyl-1-(4-methoxyphenyl)-ethanone (3v):**<sup>11</sup> Colorless thick oil; IR: (deposit from CDCl<sub>3</sub>) 2923, 1673, 1600, 1511 cm<sup>-1</sup>; <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ 7.93 (2 H, d, *J* = 8.8 Hz, arom-*H*), 6.92 (2 H, d, *J* = 8.8 Hz, arom-*H*), 3.86 (3 H, s, OCH<sub>3</sub>), 2.76 (2 H, d, *J* = 6.8 Hz), 1.99-1.64 (6 H, m), 1.32-0.96 (5 H, m); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ 198.9, 163.2, 130.6, 130.4, 113.6, 55.4, 45.9, 34.8, 33.4, 26.2, 26.1; MS: (EI) *m/z* 232 (M<sup>+</sup>, 2.9), 189 (1.3), 151 (9.4), 150 (100), 136 (5.1), 135 (53.6), 107 (3.5), 92 (4.4), 77 (6.6), 64 (1.0%); HRMS: (EI) calcd for C<sub>15</sub>H<sub>20</sub>O<sub>2</sub> 232.1463, found *m/z* 232.1466 (M<sup>+</sup>).



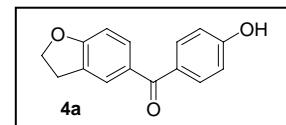
**1-(4-Methoxy-3-methylphenyl)-3,3-dimethylbutan-1-one (3w):** Thick oil; IR: (deposit from CDCl<sub>3</sub>) 2958, 1670, 1600, 1508 cm<sup>-1</sup>; <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ 7.80 (1 H, dd, *J*<sub>1</sub> = 8.4 Hz, *J*<sub>2</sub> = 2.0 Hz, arom-*H*), 7.77 (1 H, d, *J* = 2.0 Hz, arom-*H*), 6.83 (1 H, d, *J* = 8.4 Hz, arom-*H*), 3.89 (3 H, s, OCH<sub>3</sub>), 2.80 (2 H, s, CH<sub>2</sub>), 2.24 (3 H, m, CH<sub>3</sub>), 1.05 (9 H, s); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ 199.3, 161.5, 131.1, 130.9, 128.4, 126.6, 108.9, 55.4, 49.6, 31.4, 30.1, 16.3; MS: (EI) *m/z* 220 (M<sup>+</sup>, 11), 205 (3.1), 164 (56.4), 150 (10.7), 149 (100), 91 (13.1), 77 (4.5%); HRMS: (EI) calcd for C<sub>14</sub>H<sub>20</sub>O<sub>2</sub> 220.1463, found *m/z* 220.1465 (M<sup>+</sup>).



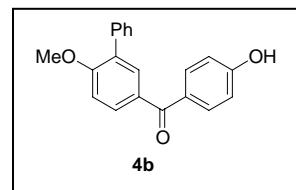
**1-(4-Methoxy-3-methylphenyl)-2-methylbutan-1-one (3x):** Thick oil; IR: (deposit from CDCl<sub>3</sub>) 2965, 1673, 1600, 1504 cm<sup>-1</sup>; <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ 7.83 (1 H, dd, *J*<sub>1</sub> = 8.4 Hz, *J*<sub>2</sub> = 2.0 Hz, arom-*H*), 7.79 (1 H, d, *J* = 2.0 Hz, arom-*H*), 6.85 (1 H, d, *J* = 8.4 Hz, arom-*H*), 3.89 (3 H, s, OCH<sub>3</sub>), 3.41-3.26 (1 H, m), 2.25 (3 H, m), 1.87-1.76 (1 H, m), 1.53-1.43 (1 H, m), 1.17 (3 H, d, *J* = 9.2 Hz, CH<sub>3</sub>), 0.91 (3 H, t, *J* = 7.6 Hz, CH<sub>3</sub>); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ 203.4, 161.6, 130.9, 129.3, 128.2, 126.8, 109.2, 55.5, 41.6, 26.9, 17.1, 16.2, 11.8; MS: (EI) *m/z* 206 (M<sup>+</sup>, 6.8), 150 (9.1), 149 (100), 121 (1.6), 106 (2.4), 91 (9.6), 77 (3.6), 51 (1.3%); HRMS: (EI) calcd for C<sub>13</sub>H<sub>18</sub>O<sub>2</sub> 206.1307, found *m/z* 206.1299 (M<sup>+</sup>).



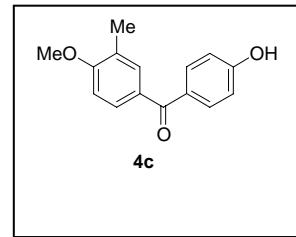
**(2,3-Dihydrobenzofuran-5-yl)-(4-hydroxyphenyl)-methanone (4a):** Pale red solid, mp 99-101 °C; IR: (deposit from CDCl<sub>3</sub>) 3310, 1635, 1604, 1511 cm<sup>-1</sup>; <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ 7.98 (1 H, br s), 7.76-7.61 (4 H, m, arom-H), 6.93 (2 H, d, *J* = 8.8 Hz, arom-H), 6.81 (1 H, d, *J* = 8.4 Hz, arom-H), 4.67 (2 H, t, *J* = 8.8 Hz, CH<sub>2</sub>), 3.25 (2 H, t, *J* = 8.8 Hz, CH<sub>2</sub>); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ 195.9, 164.0, 160.5, 132.7, 132.4, 130.6, 130.0, 127.5, 127.4, 115.2, 108.1, 72.2, 29.0; MS: (EI) *m/z* 240 (M<sup>+</sup>, 64.7), 239 (11.2), 223 (7.0), 211 (2.7), 148 (9.5), 147 (100), 121 (34.8), 91 (11.1), 65 (12.9%); HRMS: (EI) calcd for C<sub>15</sub>H<sub>12</sub>O<sub>3</sub> 240.0786, found *m/z* 240.0781 (M<sup>+</sup>).



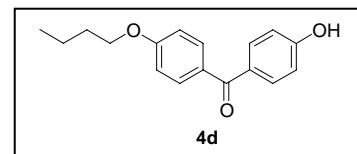
**(4-Hydroxyphenyl)-(6-methoxybiphenyl-3-yl)-methanone (4b):** Pale yellow solid, mp 93-95 °C; IR: (KBr) 3432, 1619, 1589, 1562, 1330 cm<sup>-1</sup>; <sup>1</sup>H NMR (400 MHz, CD<sub>3</sub>OD) δ 7.64-7.58 (4 H, m, arom-H), 7.37-7.17 (5 H, m, arom-H), 7.04 (1 H, d, *J* = 8.8 Hz, arom-H), 6.77 (2 H, d, *J* = 8.8 Hz, arom-H), 4.79 (1 H, s), 3.77 (3 H, s, OCH<sub>3</sub>); <sup>13</sup>C NMR (100 MHz, CD<sub>3</sub>OD) δ 196.8, 163.3, 161.4, 139.0, 133.7, 133.6, 132.6, 131.9, 130.5, 130.3, 129.1, 128.3, 116.1, 111.8, 56.3; MS: (EI) *m/z* 304 (M<sup>+</sup>, 100), 273 (17.1), 212 (13.5), 211 (89.6), 168 (15.5), 139 (13.8), 121 (58.9), 93 (10.9), 65 (8.8%); HRMS: (EI) calcd for C<sub>20</sub>H<sub>16</sub>O<sub>3</sub> 304.1099, found *m/z* 304.1102 (M<sup>+</sup>).



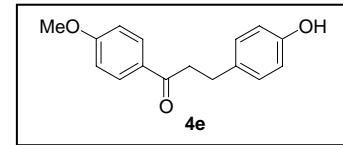
**(4-Hydroxyphenyl)-(4-methoxy-3-methylphenyl)-methanone (4c):** Pale red solid, mp 144-146 °C; IR: (KBr) 3286, 1631, 1604 cm<sup>-1</sup>; <sup>1</sup>H NMR (400 MHz, CD<sub>3</sub>OD) δ 7.55 (2 H, d, *J* = 8.8 Hz arom-H), 7.48 (1 H, dd, *J*<sub>1</sub> = 8.8, *J*<sub>2</sub> = 2.0 Hz, arom-H), 7.55 (1 H, d, *J* = 2.0 Hz, arom-H), 6.88 (1 H, d, *J* = 8.4 Hz, arom-H), 6.76 (2 H, d, *J* = 8.8 Hz, arom-H), 4.80 (1 H, s), 3.80 (3 H, s, OCH<sub>3</sub>), 2.12 (3 H, s, CH<sub>3</sub>); <sup>13</sup>C NMR (100 MHz, CD<sub>3</sub>OD) δ 197.2, 163.2, 162.8, 133.7, 133.3, 131.4, 131.4, 130.5, 127.7, 116.0, 110.2, 56.1, 16.4; MS: (EI) *m/z* 242 (M<sup>+</sup>, 65.5), 227 (10.1), 212 (13.5), 225 (2.6), 211 (9.2), 199 (2.7), 150 (9.6), 149 (100), 121 (46.6), 91 (12.0%); HRMS: (EI) calcd for C<sub>15</sub>H<sub>14</sub>O<sub>3</sub> 242.0943, found *m/z* 242.0938 (M<sup>+</sup>).



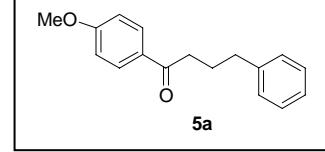
**(4-Butoxyphenyl)-(4-hydroxyphenyl)-methanone (4d):** Colorless solid, mp 128-130°C; IR: (KBr) 3116, 1600, 1565, 1311, 1160 cm<sup>-1</sup>; <sup>1</sup>H NMR (400 MHz, CD<sub>3</sub>OD-CDCl<sub>3</sub>) δ 7.75 (2 H, d, *J* = 8.8 Hz, arom-*H*), 7.70 (2 H, d, *J* = 8.8 Hz, arom-*H*), 6.97 (2 H, d, *J* = 8.8 Hz, arom-*H*), 6.90 (2 H, d, *J* = 8.8 Hz, arom-*H*), 4.57 (1 H, s), 4.06 (2 H, t, *J* = 6.4 Hz, CH<sub>2</sub>), 1.84-1.77 (2 H, m, CH<sub>2</sub>), 1.57-1.47 (2 H, m, CH<sub>2</sub>), 1.00 (3 H, t, *J* = 7.6 Hz, CH<sub>3</sub>). <sup>13</sup>C NMR (100 MHz, CD<sub>3</sub>OD-CDCl<sub>3</sub>) δ 195.6, 162.3, 161.1, 132.2, 131.8, 129.9, 128.8, 114.6, 113.5, 67.5, 30.7, 18.7, 13.1; MS: (EI) *m/z* 270 (M<sup>+</sup>, 38.8), 214 (30.0), 213 (13.7), 197 (11.4), 185 (6.6), 122 (7.9), 121 (100), 93 (8.9), 65 (7.2%); HRMS: (EI) calcd for C<sub>17</sub>H<sub>18</sub>O<sub>3</sub> 270.1256, found *m/z* 270.1254 (M<sup>+</sup>).



**3-(4-Hydroxyphenyl)-1-(4-methoxyphenyl)-propan-1-one (4e):<sup>12</sup>** Thick oil, IR: (deposit from CDCl<sub>3</sub>) 3374, 1662, 1600, 1515 cm<sup>-1</sup>; <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ 7.93 (2 H, d, *J* = 8.8 Hz, arom-*H*), 7.09 (2 H, d, *J* = 8.8 Hz, arom-*H*), 6.91 (2 H, d, *J* = 8.8 Hz, arom-*H*), 6.77 (2 H, d, *J* = 8.8 Hz, arom-*H*), 5.99 (1 H, s), 3.86 (3 H, s, OCH<sub>3</sub>), 3.20 (2 H, t, *J* = 8.0 Hz, CH<sub>2</sub>), 2.98 (2 H, t, *J* = 8.0 Hz, CH<sub>2</sub>); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ 198.8, 163.5, 154.1, 133.0, 130.4, 129.8, 129.4, 115.3, 113.7, 55.4, 40.4, 29.6; MS: (EI) *m/z* 256 (M<sup>+</sup>, 36.0), 255 (1.8), 136 (10.0), 135 (100), 128 (1.2), 107 (16.7), 77 (13.9), 64 (2.6), 63 (1.5%); HRMS: (EI) calcd for C<sub>16</sub>H<sub>16</sub>O<sub>3</sub> 256.1099, found *m/z* 256.1097 (M<sup>+</sup>).



**1-(4-Methoxyphenyl)-4-phenylbutan-1-one (5a):<sup>13</sup>** Pale yellow solid, mp 43-45°C; IR: (deposit from CDCl<sub>3</sub>) 1673, 1600 cm<sup>-1</sup>; <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ 7.89 (2 H, d, *J* = 8.8 Hz, arom-*H*), 7.29-7.16 (5 H, m, arom-*H*), 6.89 (2 H, d, *J* = 8.8 Hz, arom-*H*), 3.82 (3 H, s, OCH<sub>3</sub>), 2.91 (2 H, t, *J* = 7.2 Hz, CH<sub>2</sub>), 2.70 (2 H, t, *J* = 7.6 Hz, CH<sub>2</sub>), 2.09-1.85 (2 H, m, CH<sub>2</sub>); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ 198.7, 163.3, 141.6, 130.2, 129.9, 128.7, 128.4, 128.3, 125.8, 113.6, 55.3, 37.2, 35.1, 25.8; MS: (EI) *m/z* 254 (M<sup>+</sup>, 0.7), 151 (9.7), 150 (100), 135 (37.8), 107 (3.4), 91 (4.9), 77 (9.7), 64 (2.1), 51 (1.0%); HRMS: (EI) calcd for C<sub>17</sub>H<sub>18</sub>O<sub>2</sub> 254.1307, found *m/z* 254.1309 (M<sup>+</sup>).

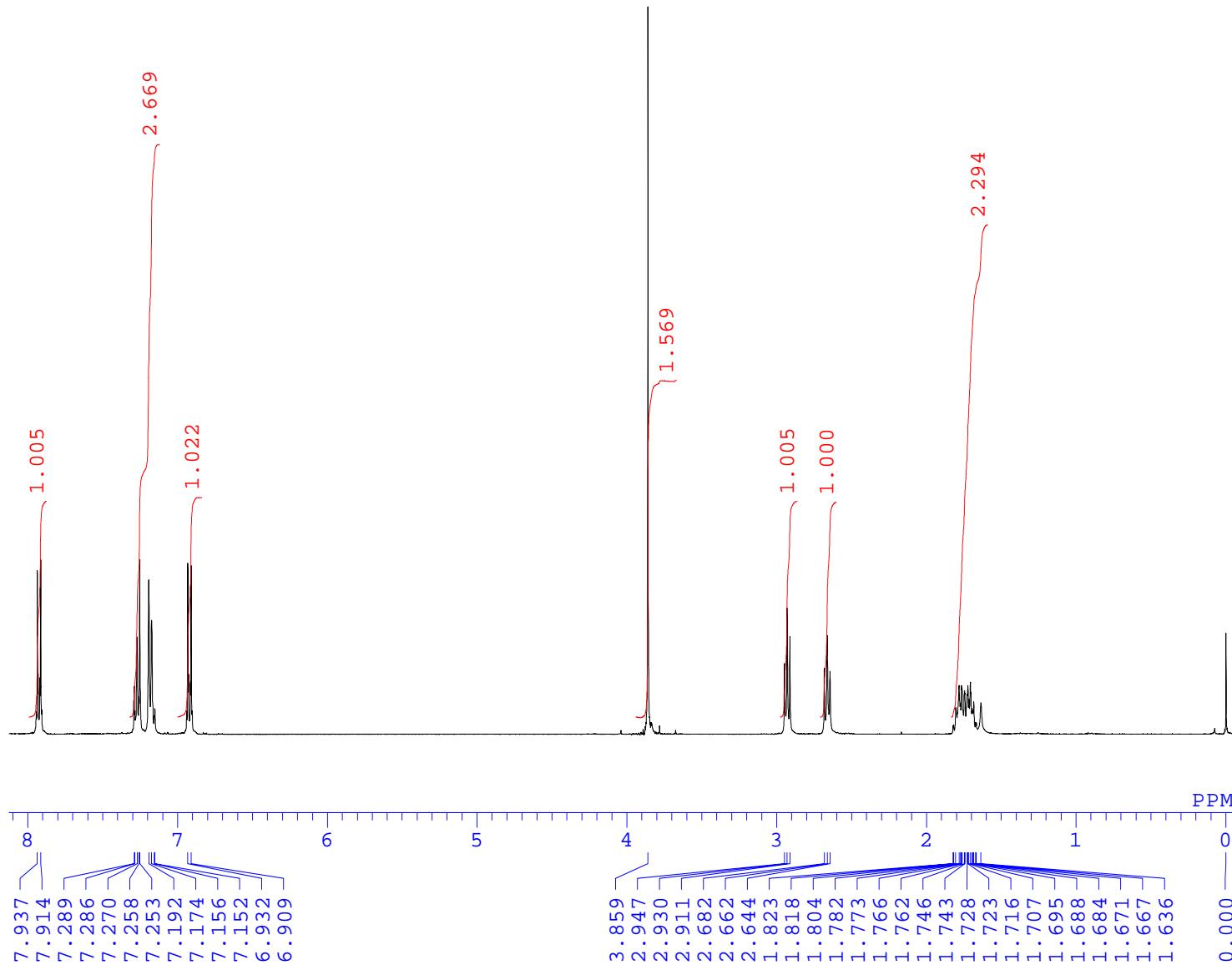
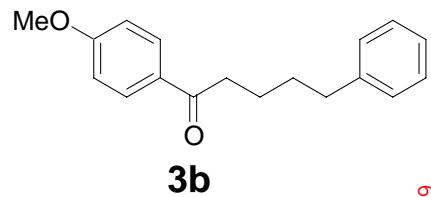


**1-Tetralone (6a):** Spectral data was consistent with the commercial authentic sample.

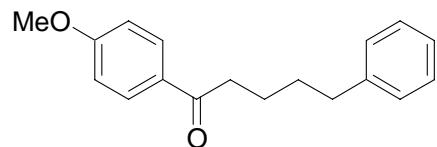
**7-Methoxy-1-tetralone (6b):** Spectral data was consistent with the commercial authentic sample.

**References:**

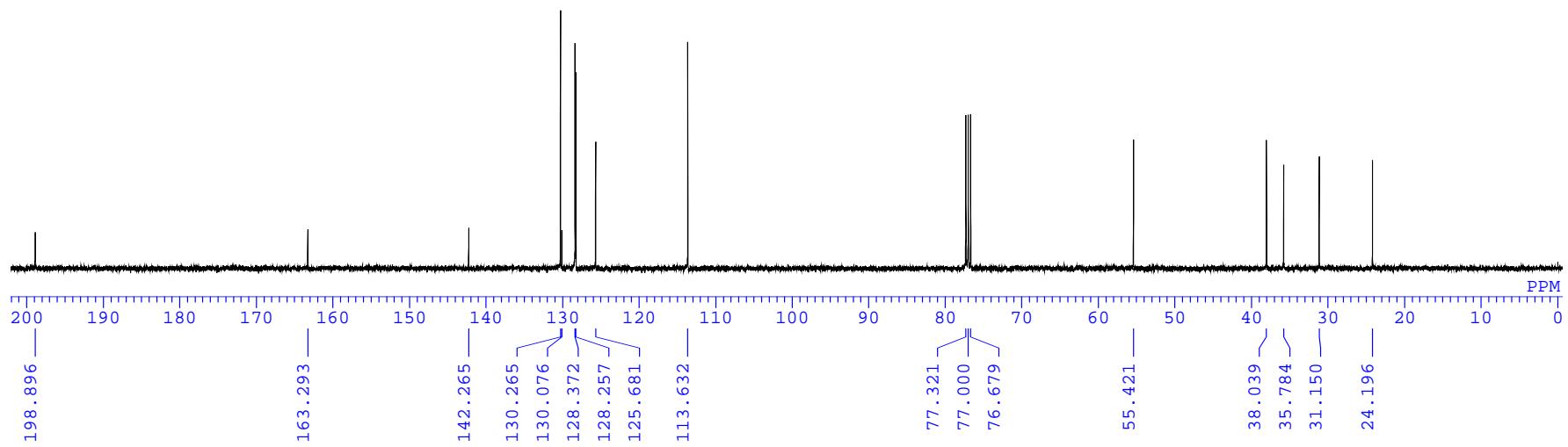
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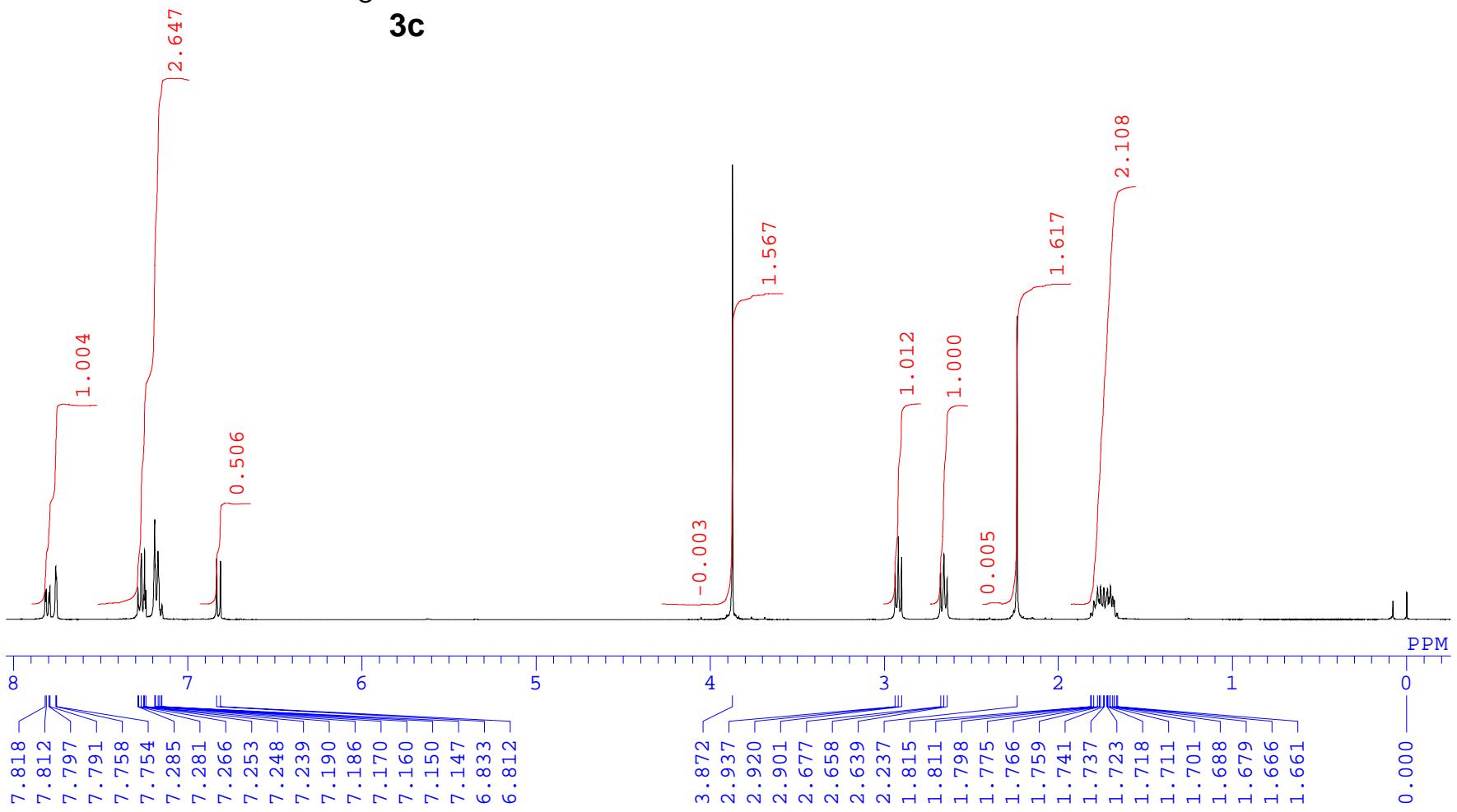
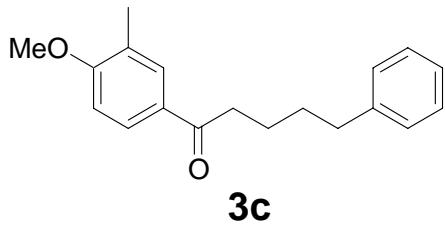
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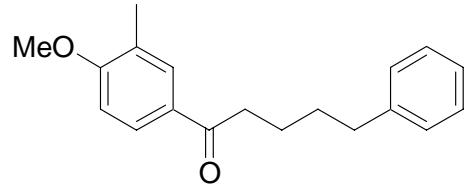


**3b**

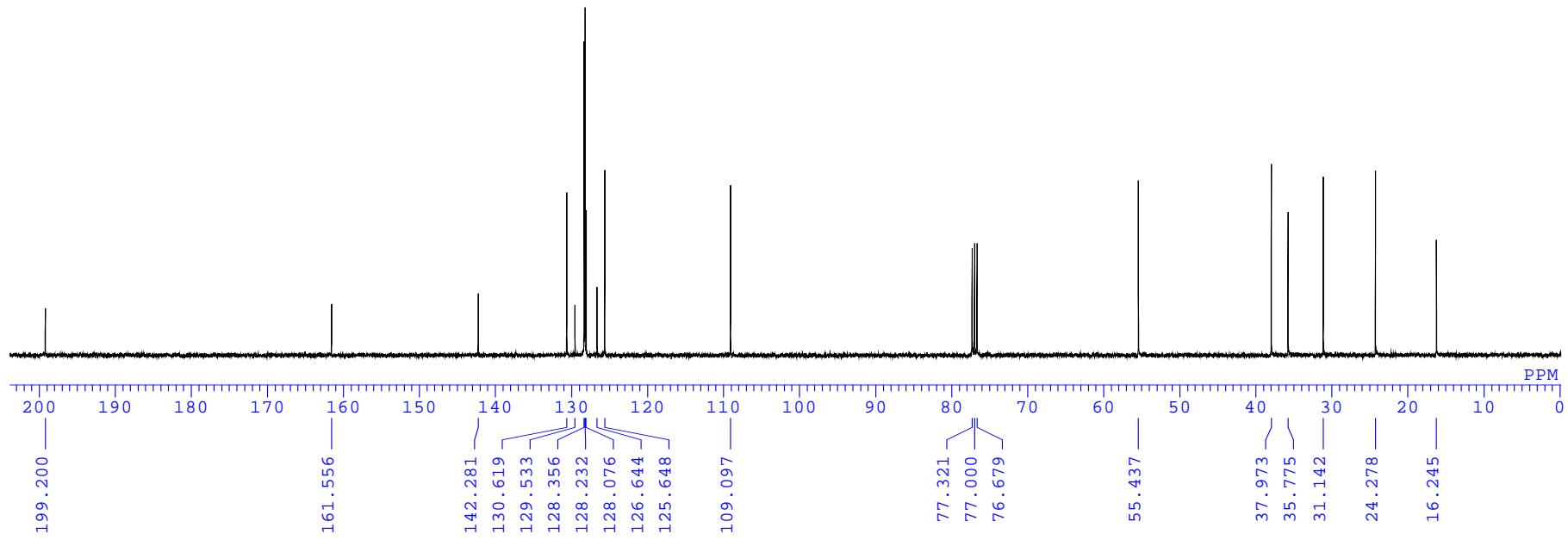


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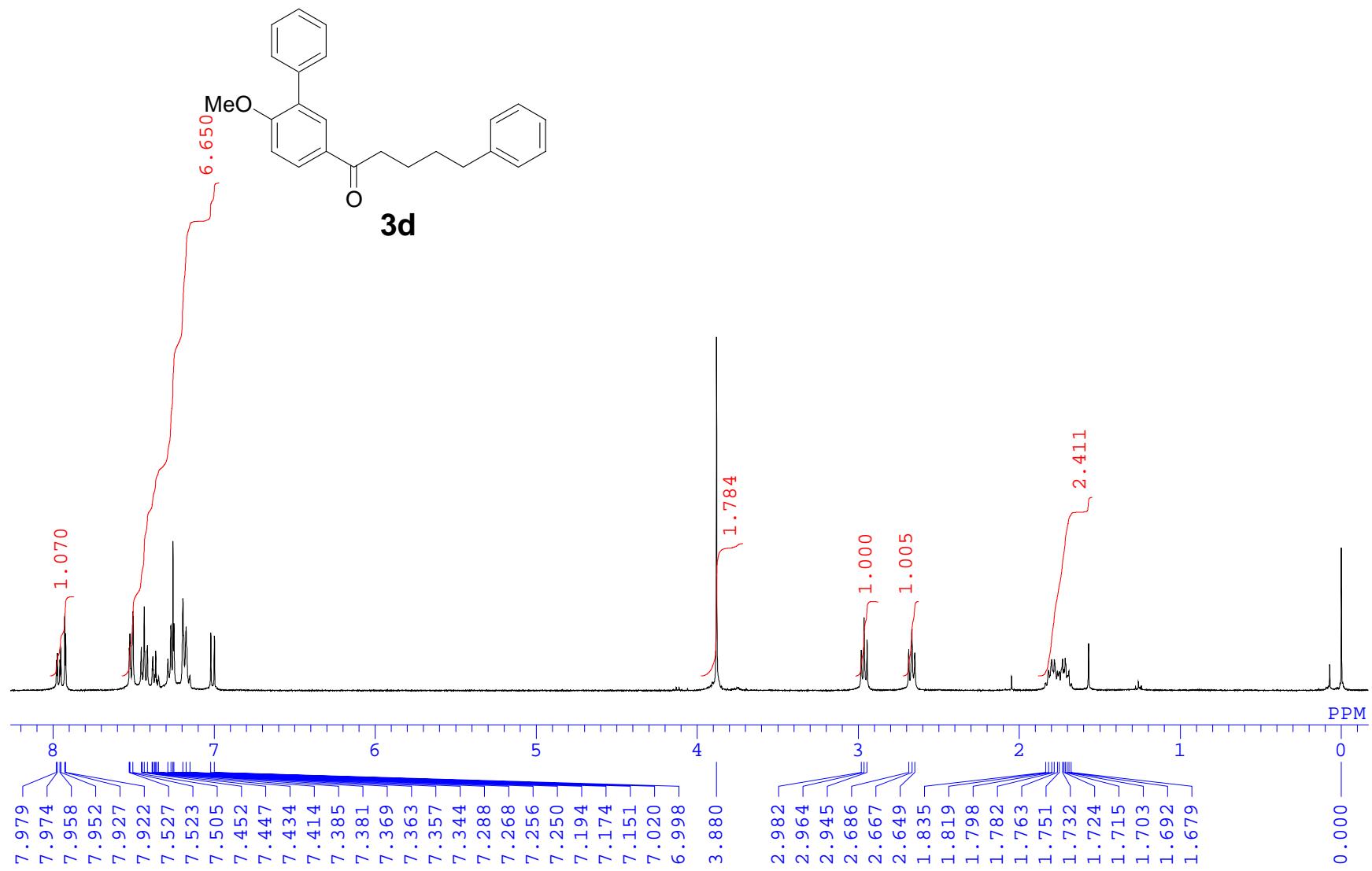




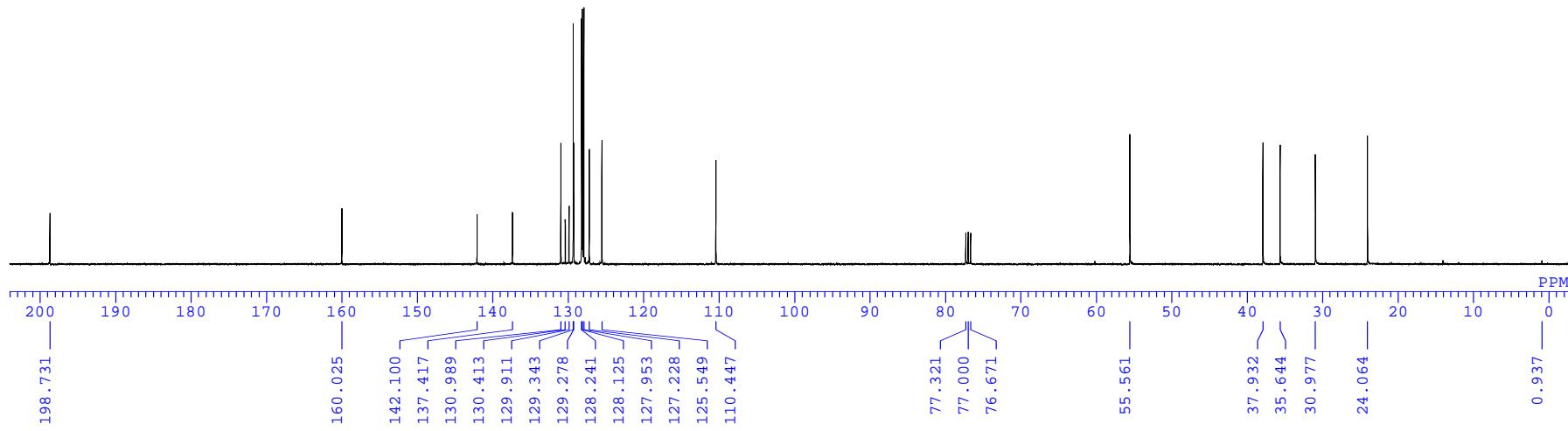
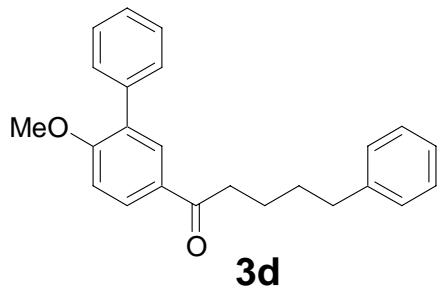
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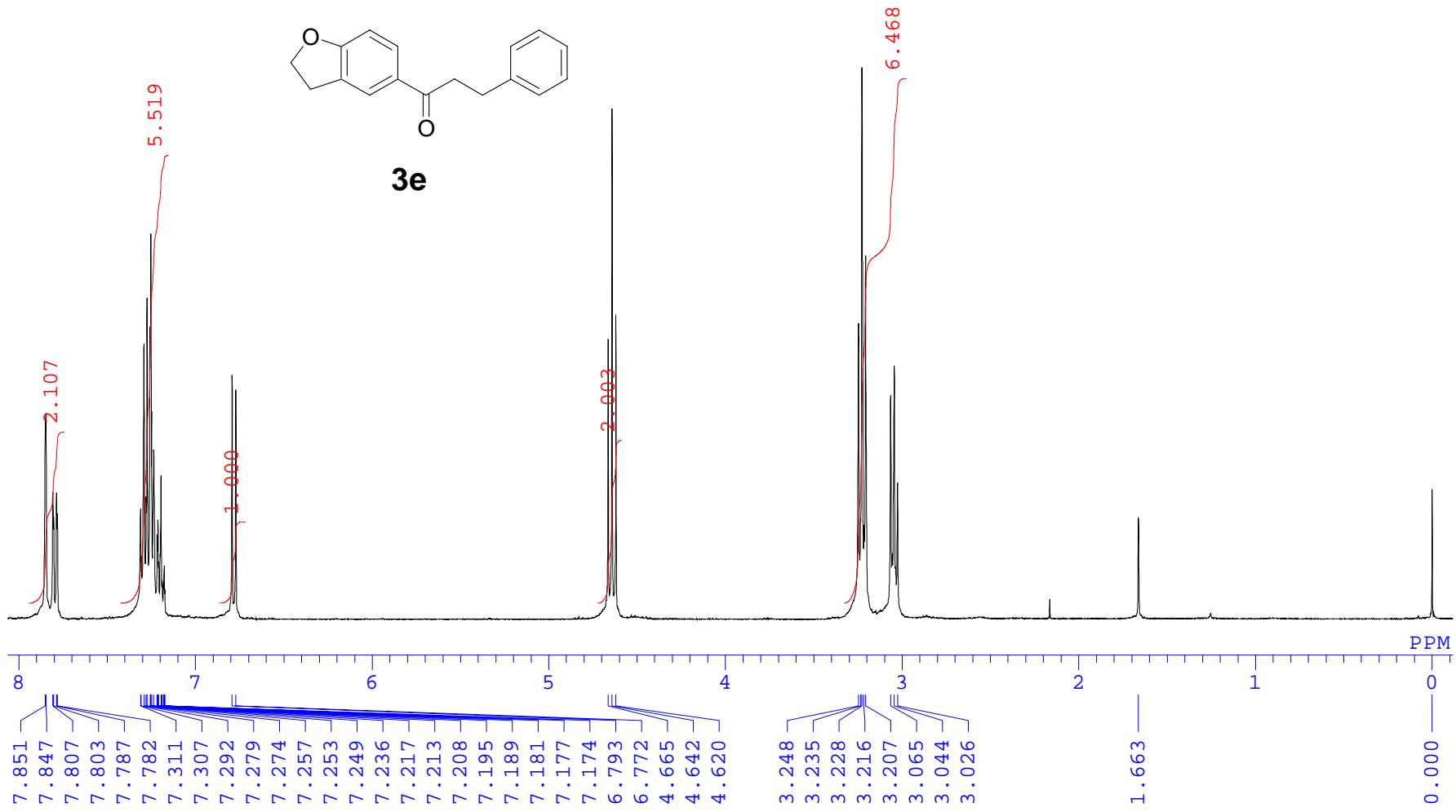
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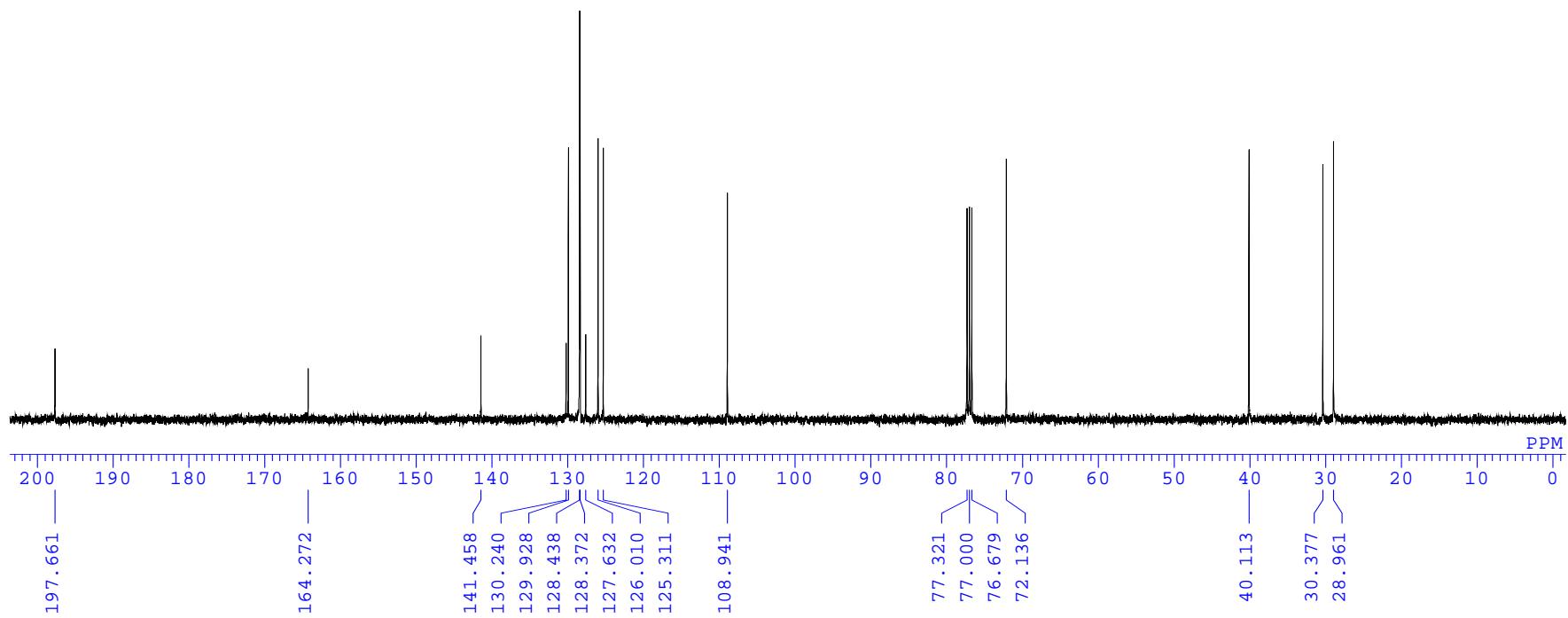
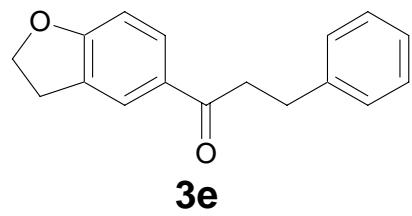


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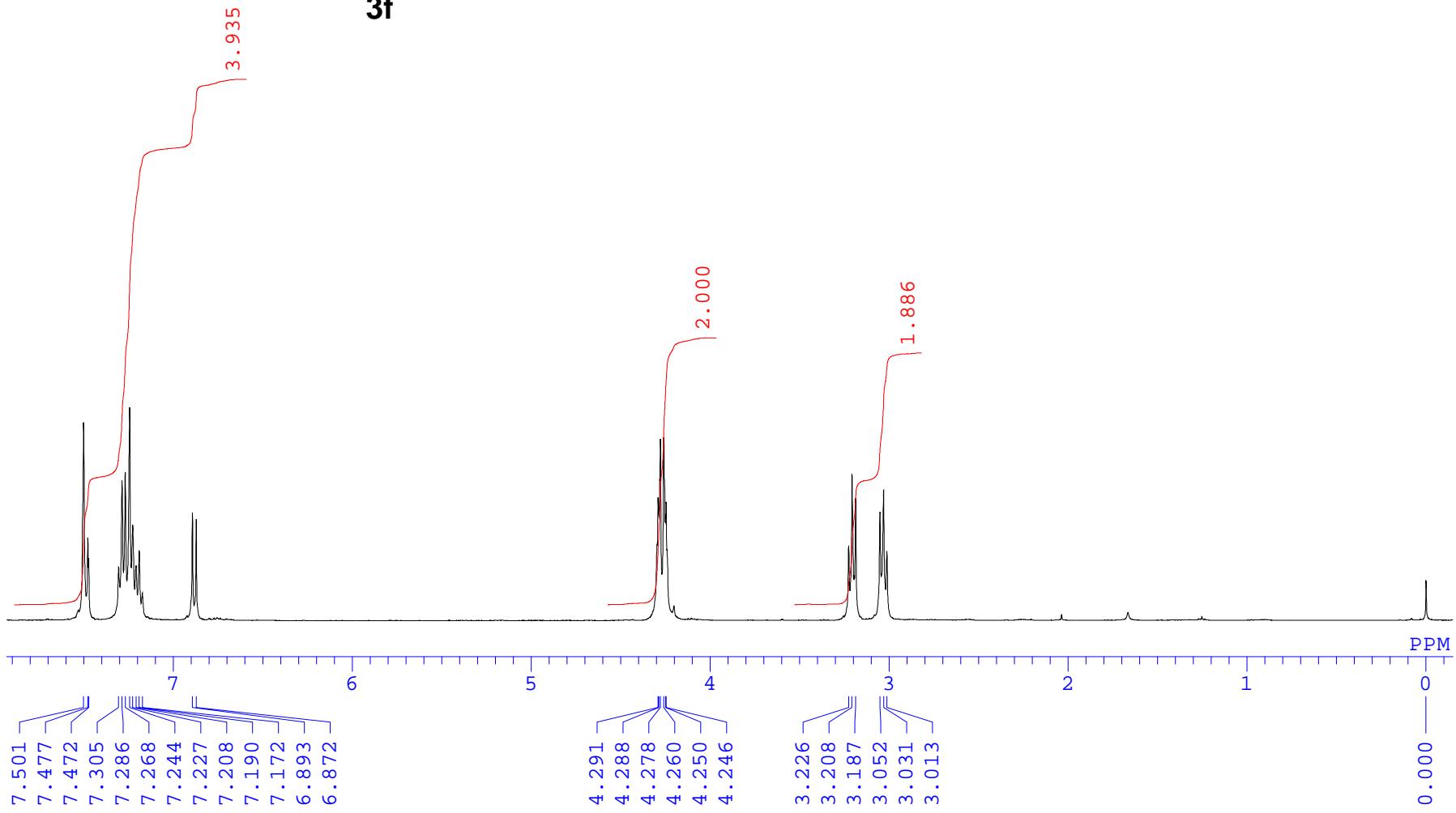
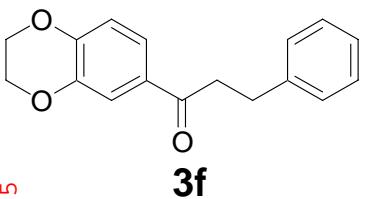


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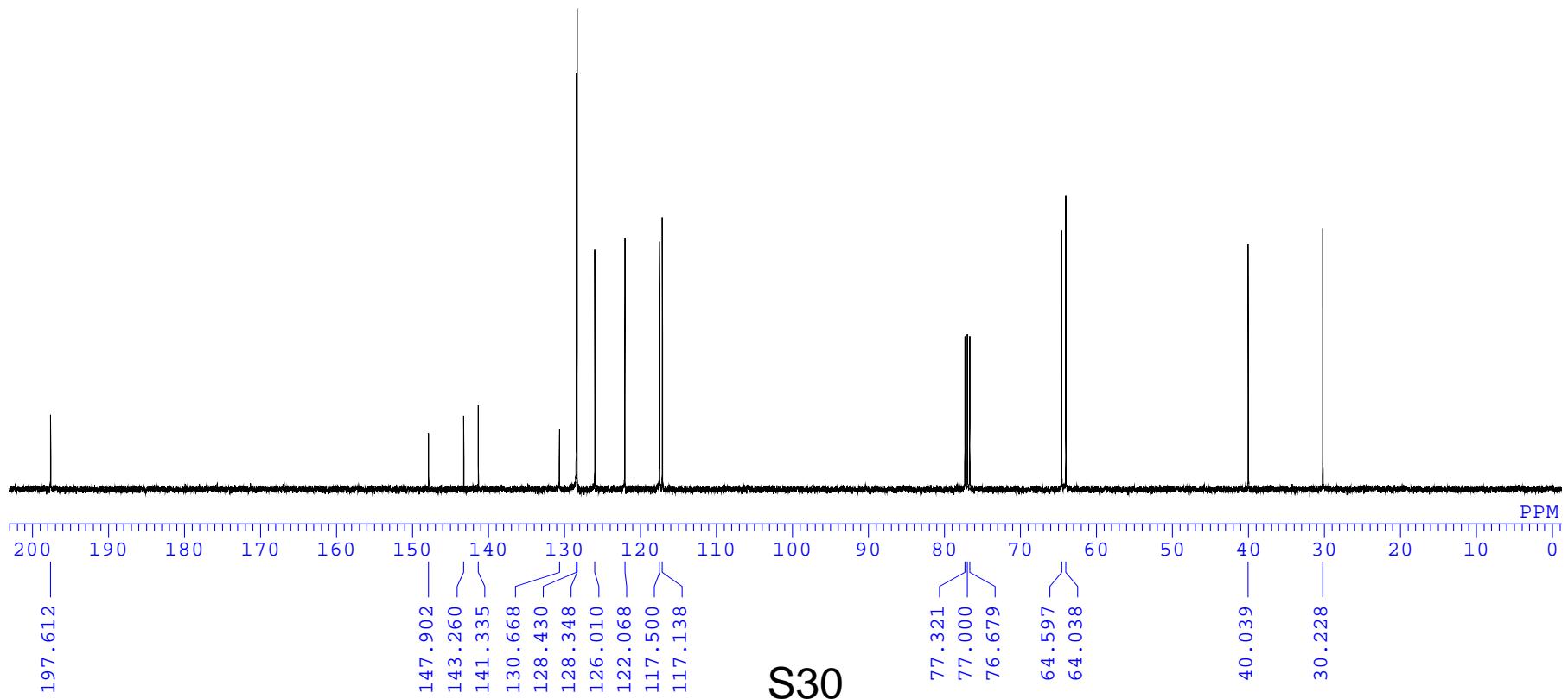
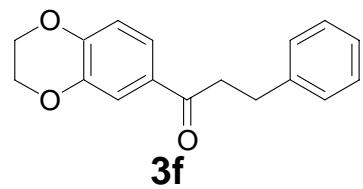


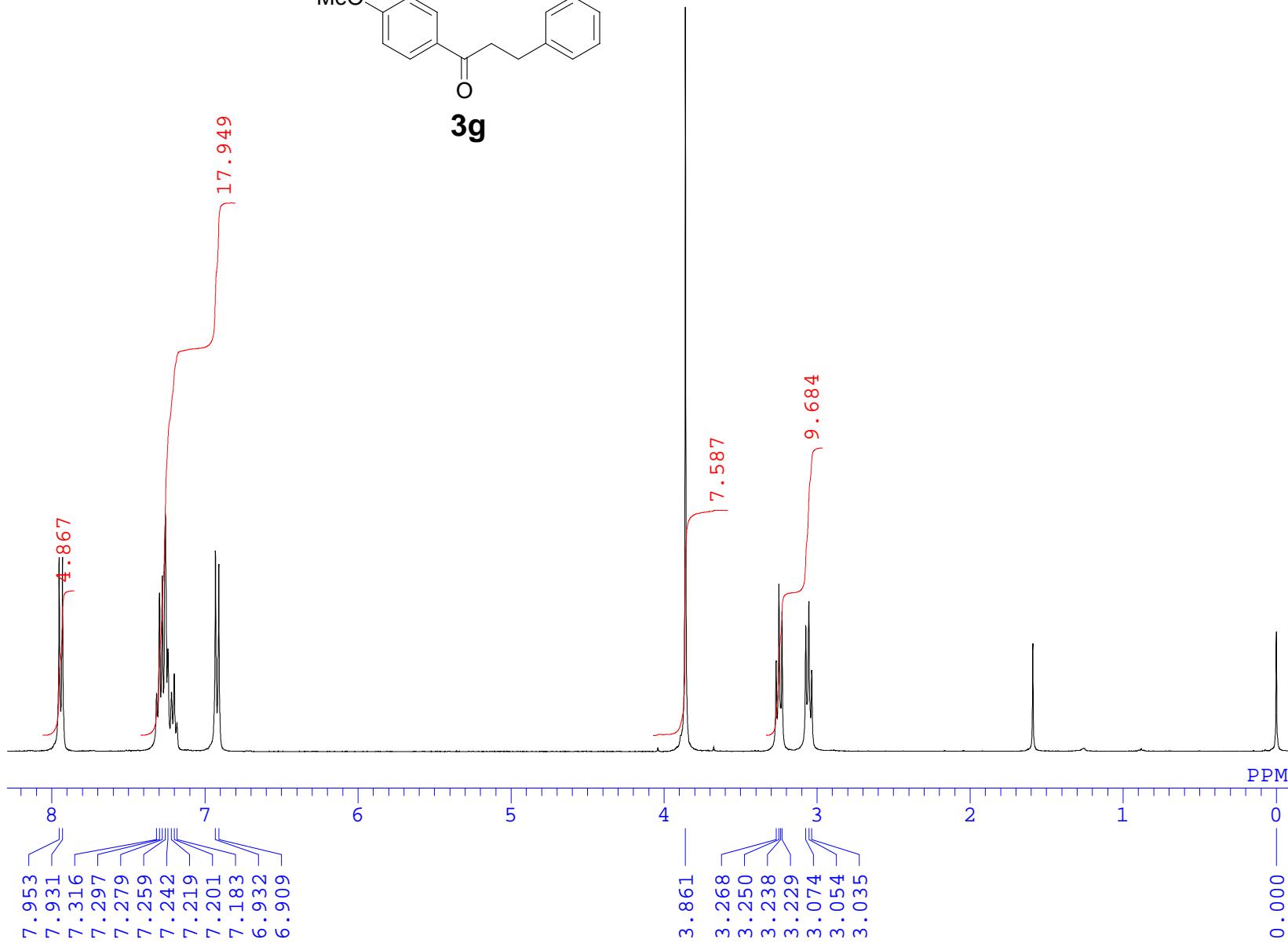
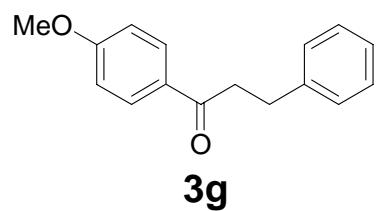


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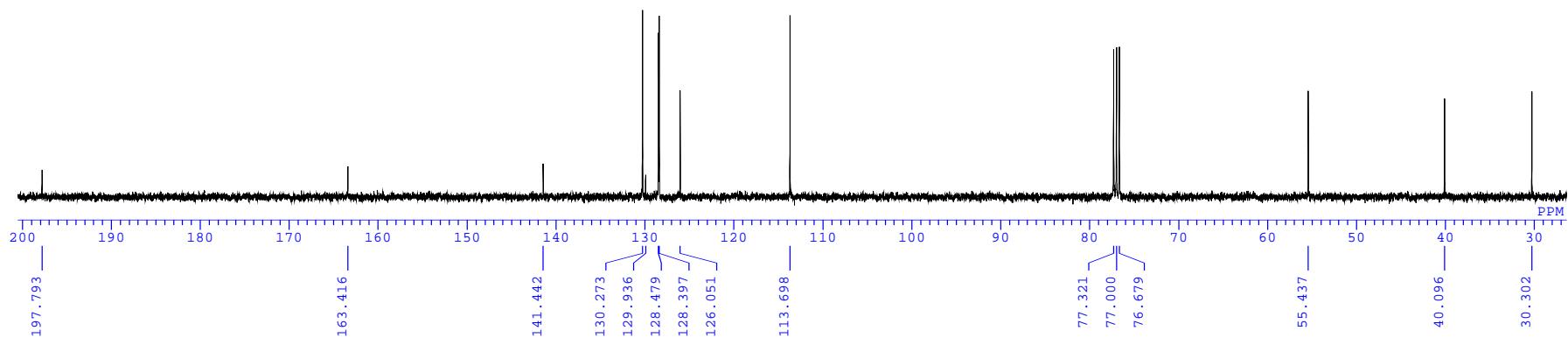
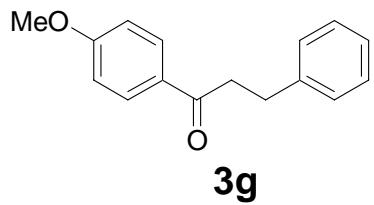


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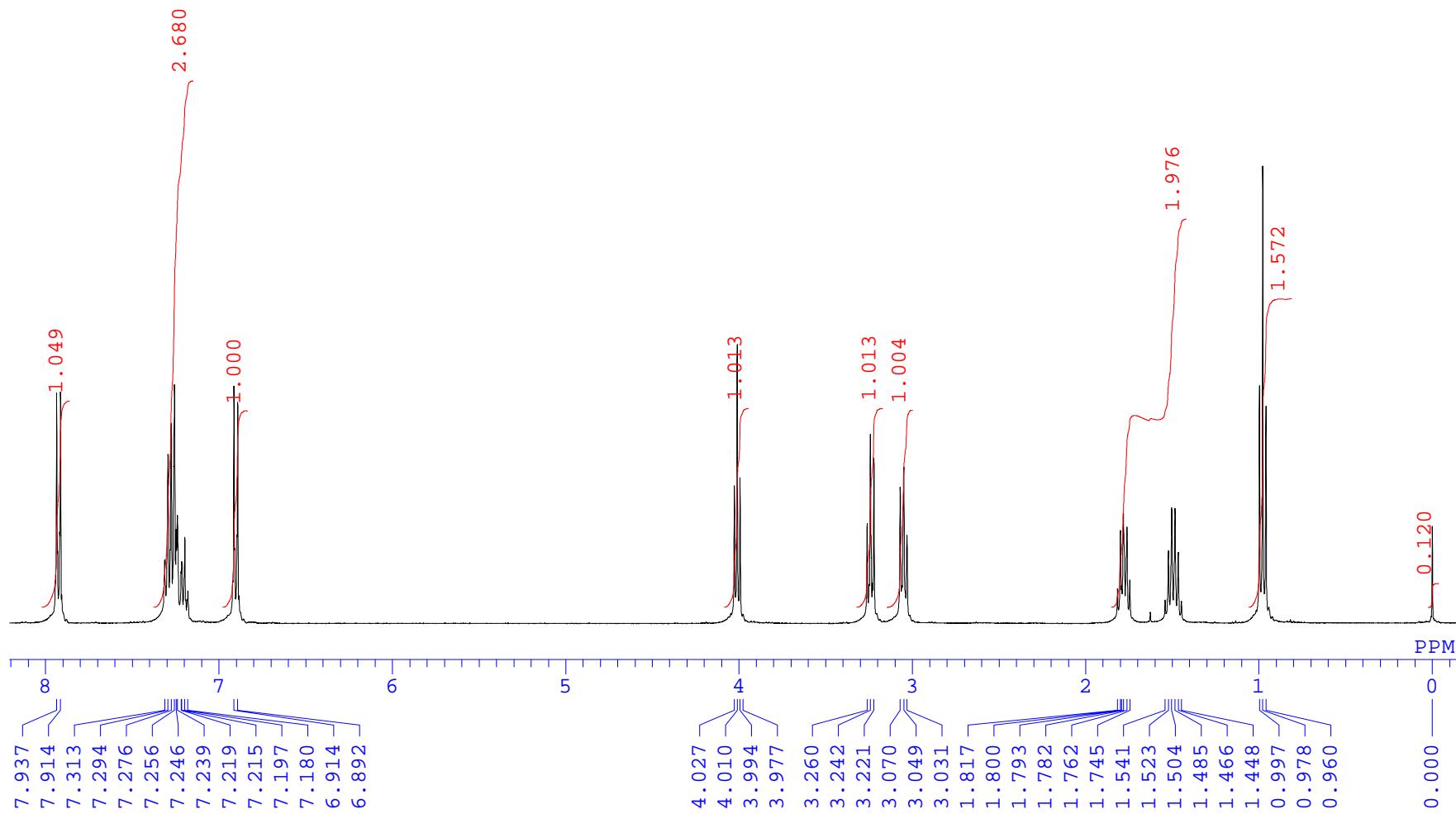
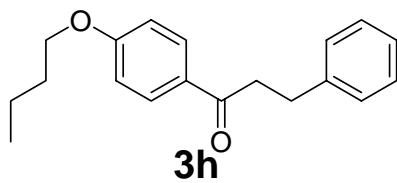




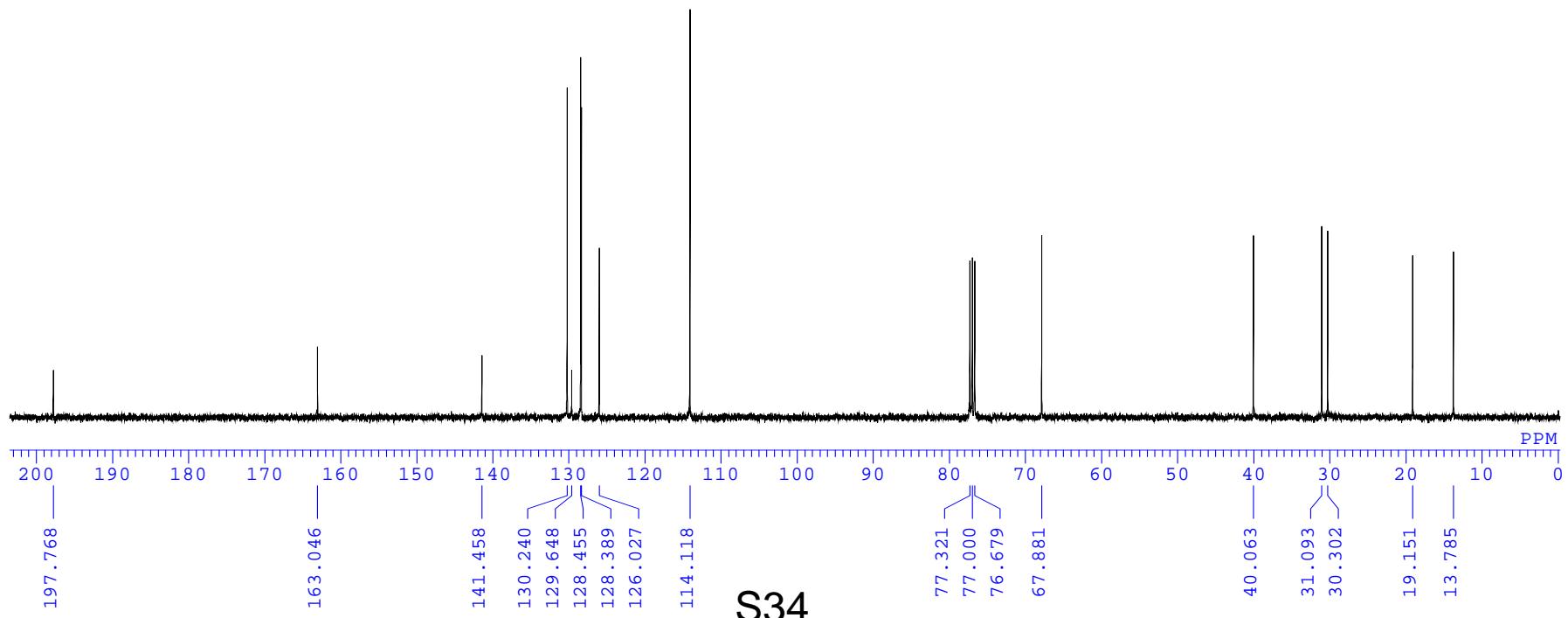
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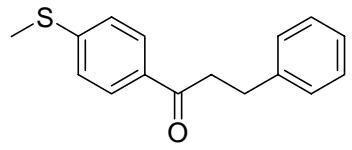
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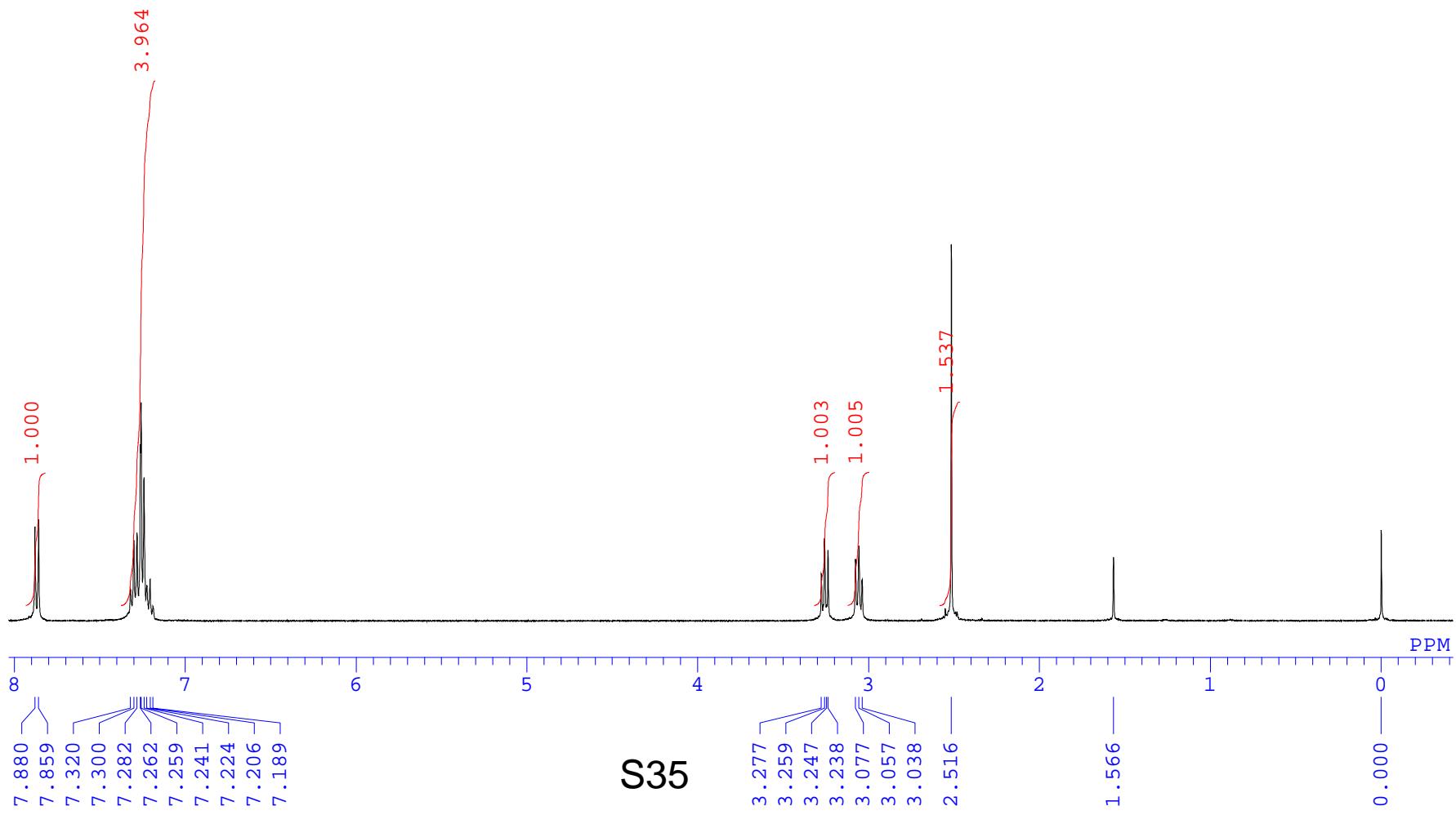
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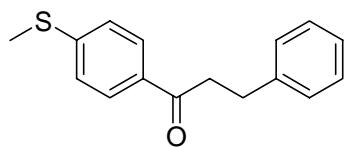


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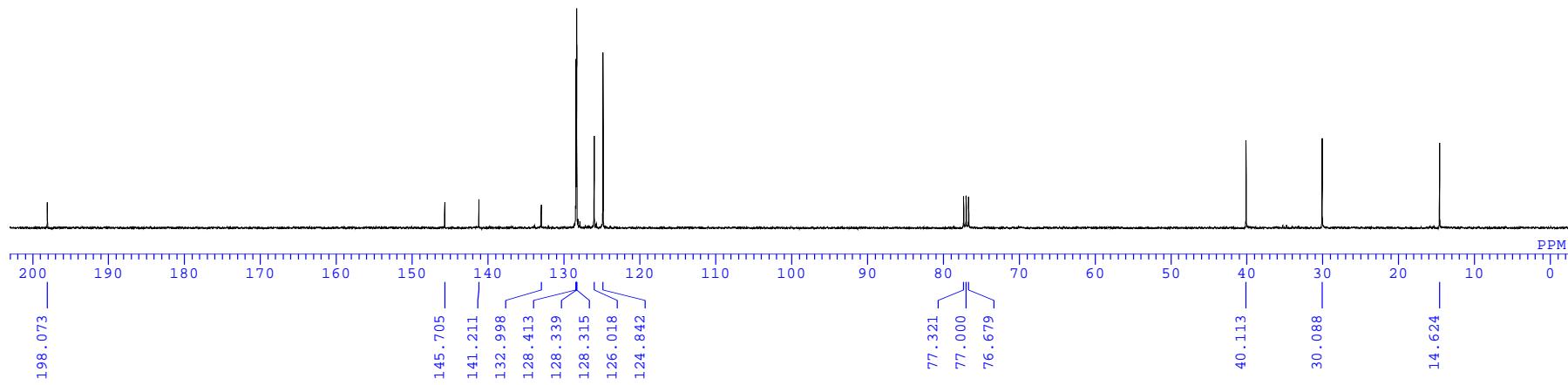


**3i**

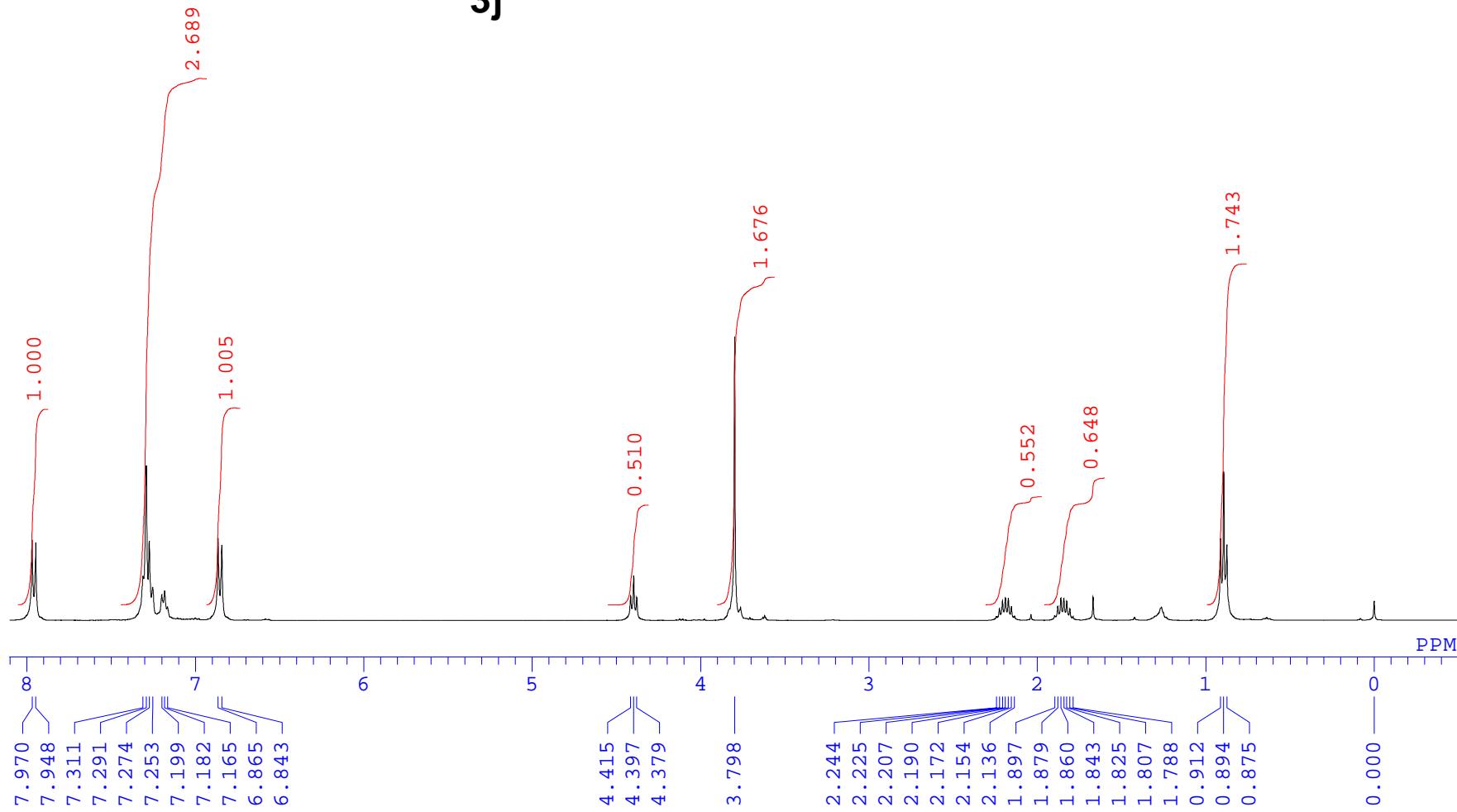
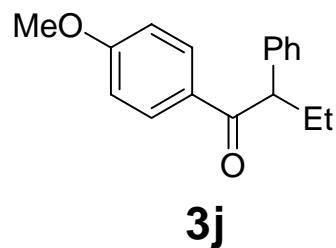




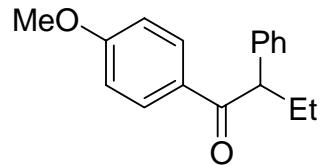
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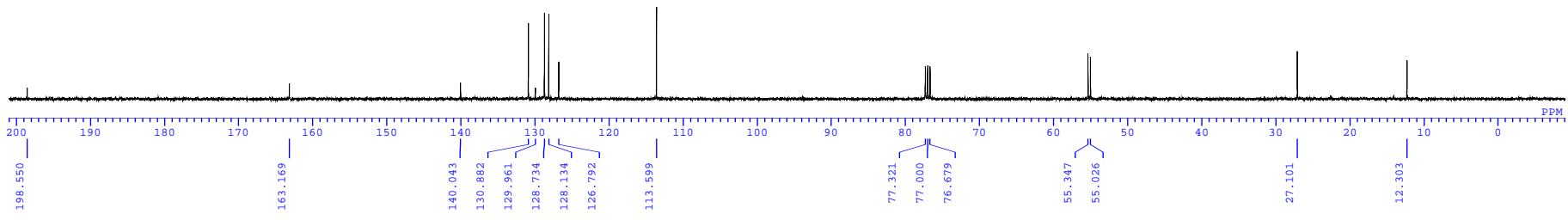
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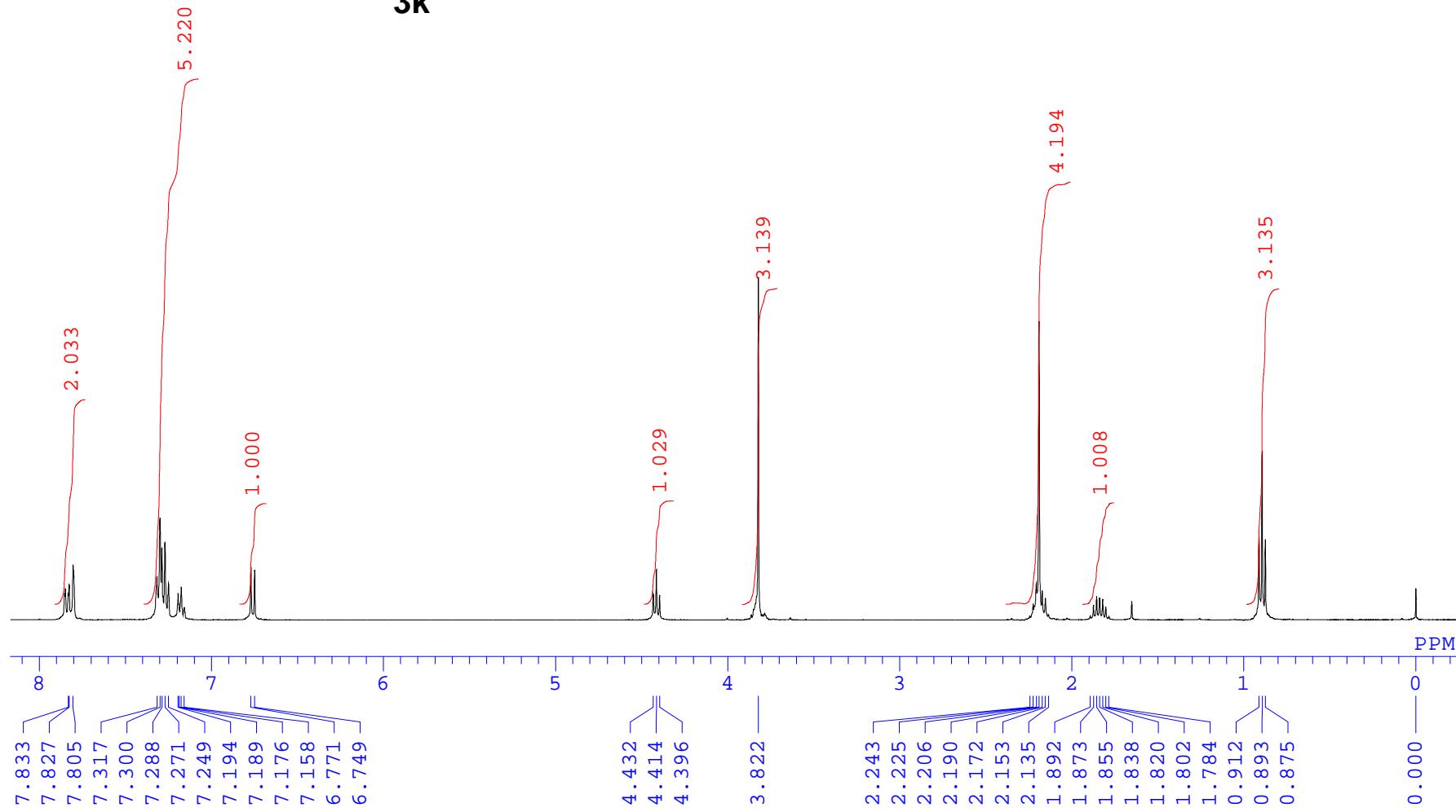
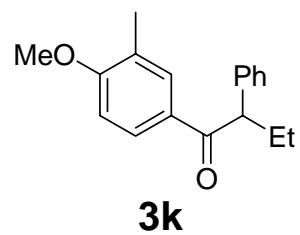
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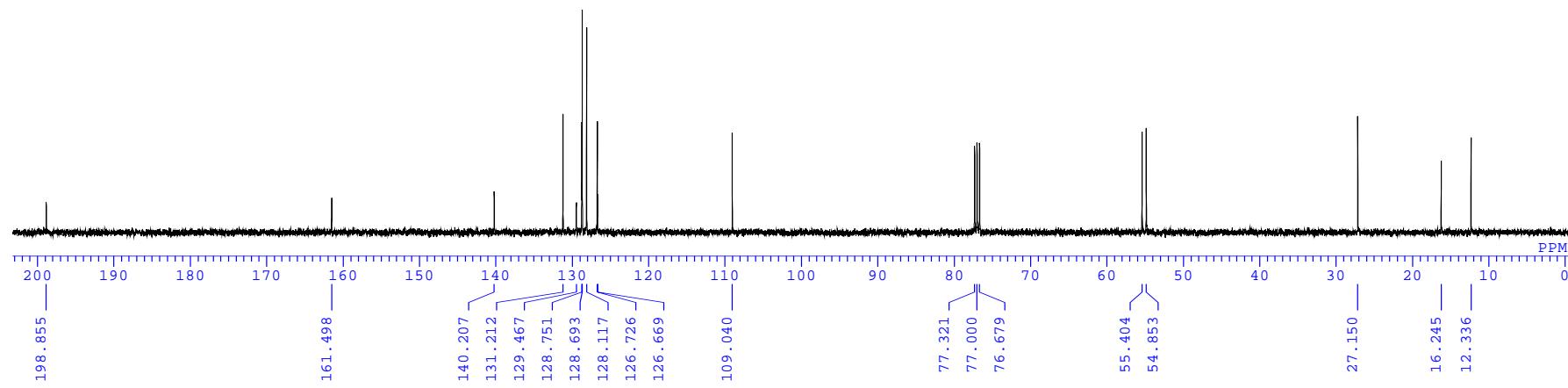
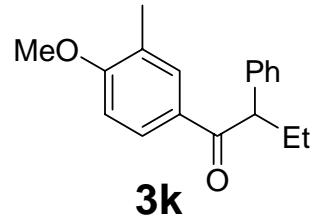
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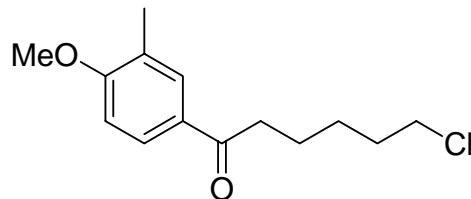
S38



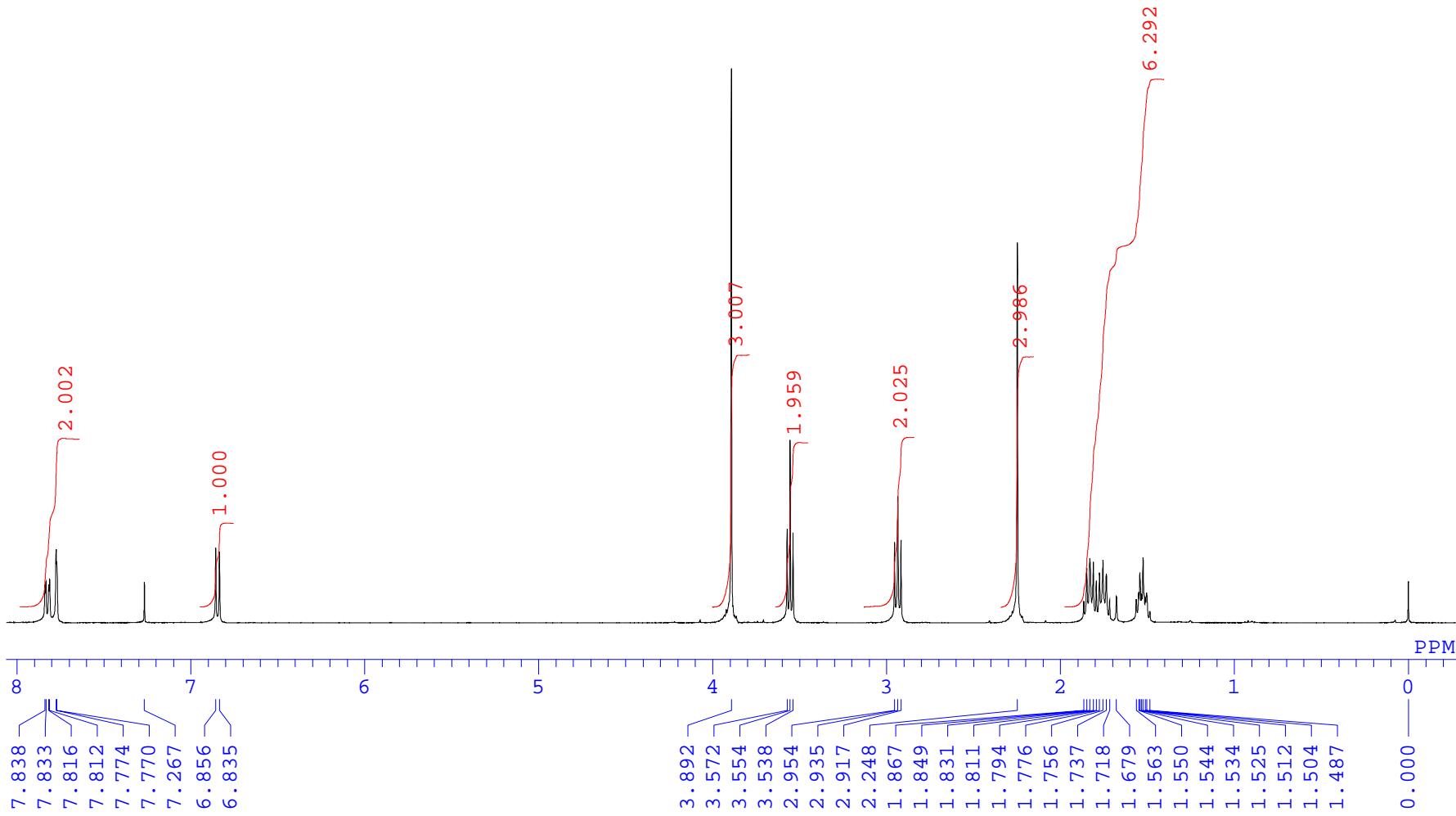
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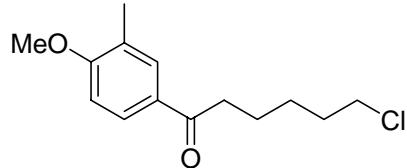
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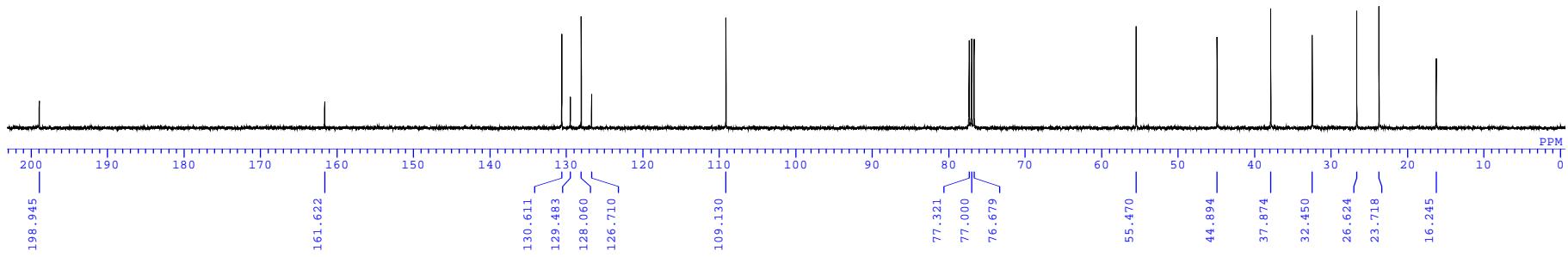
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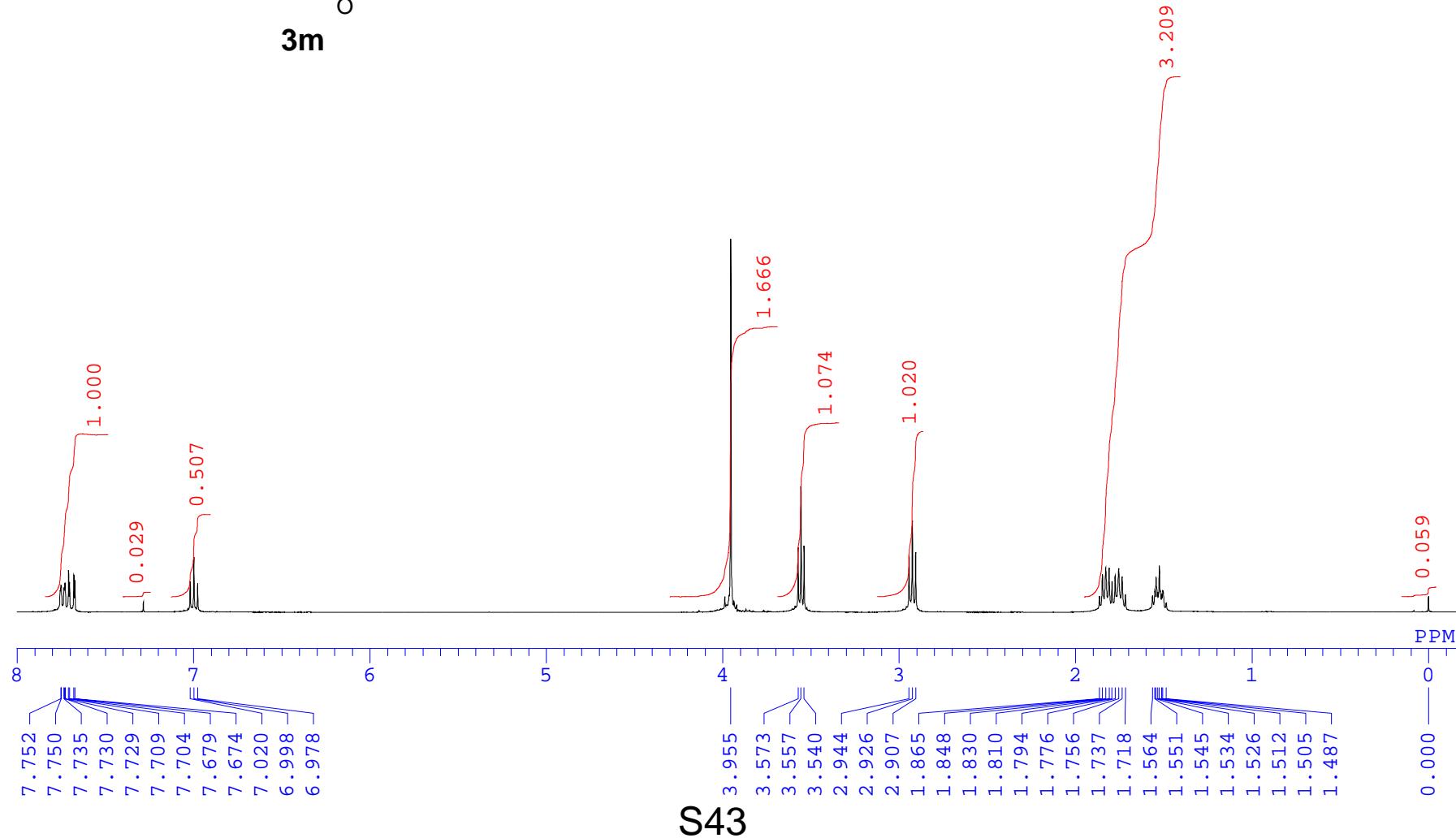
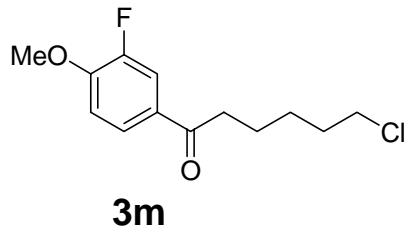
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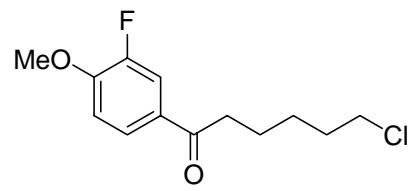


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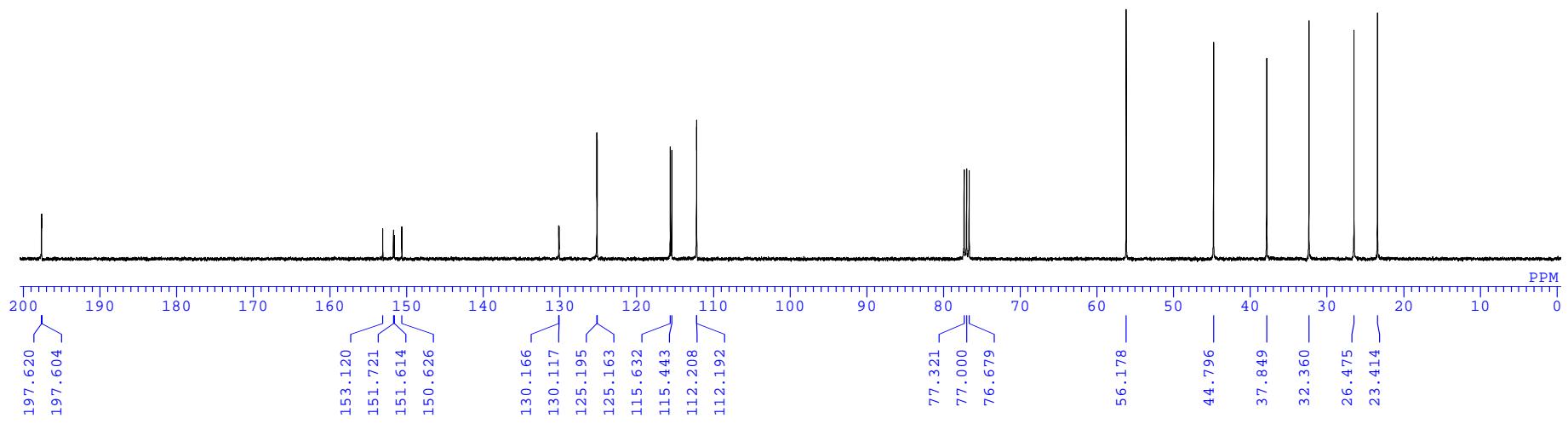


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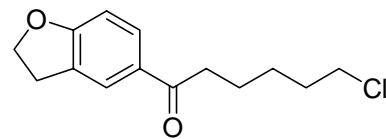




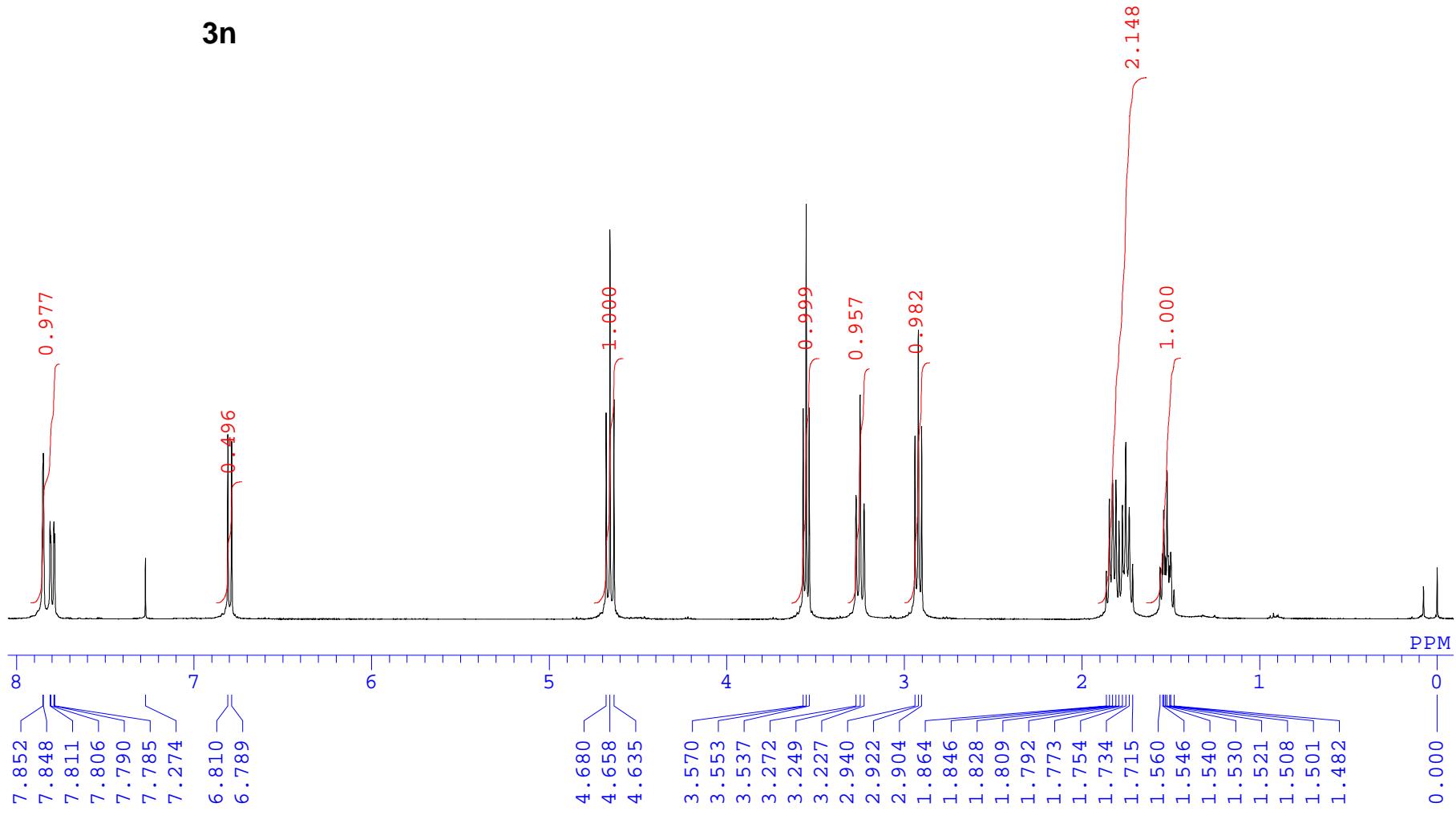
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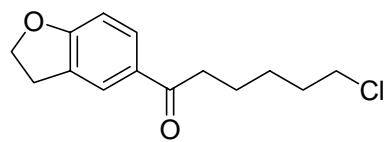
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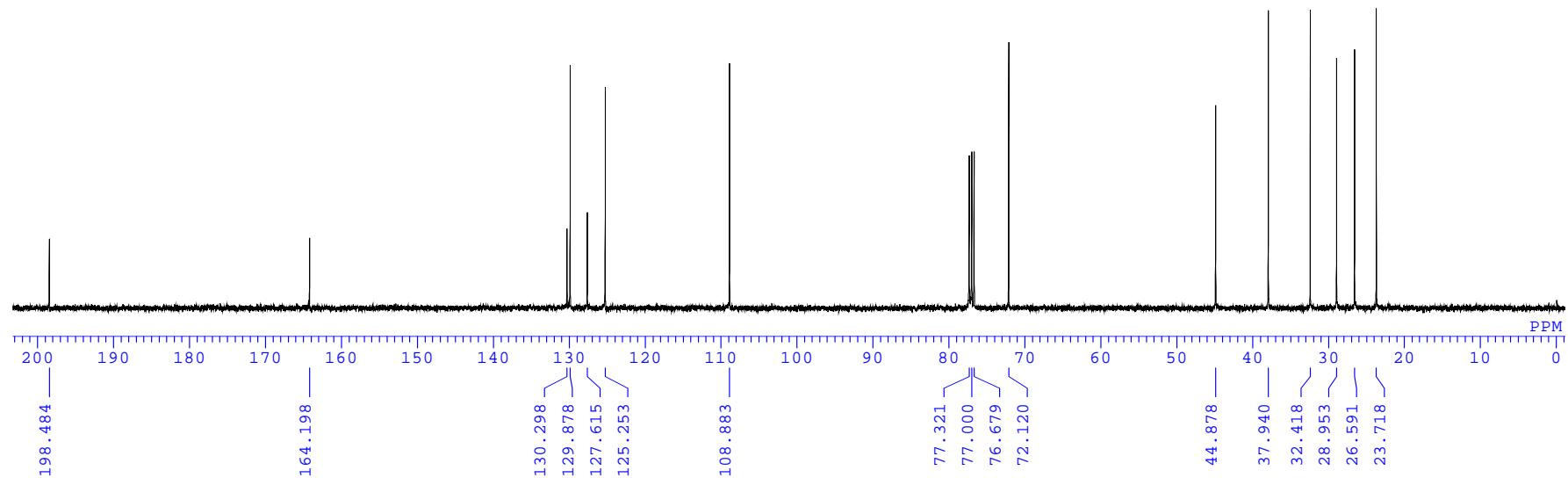
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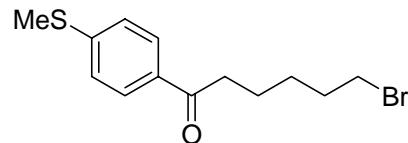
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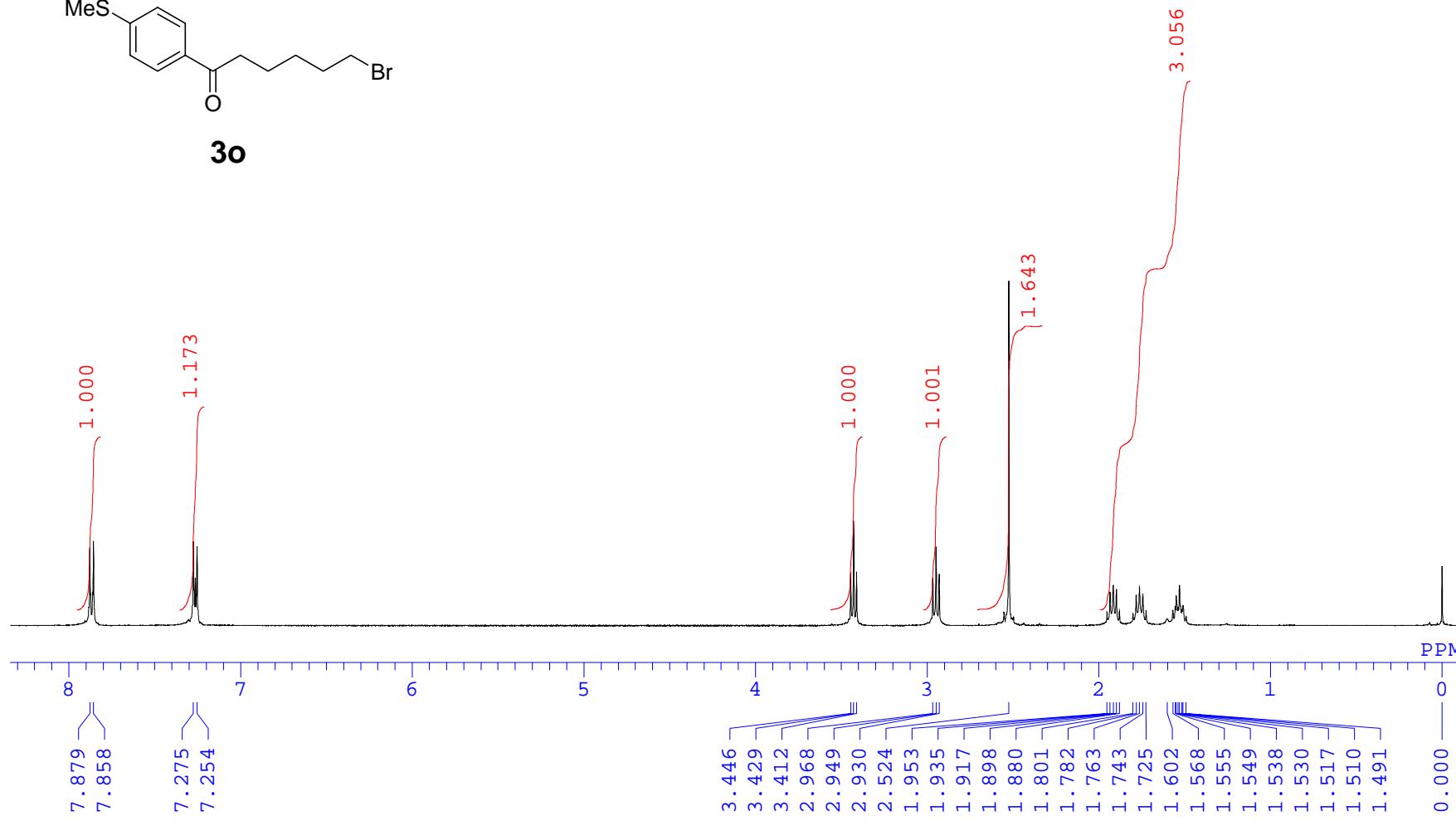
**3n**

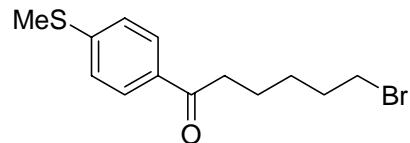


S46

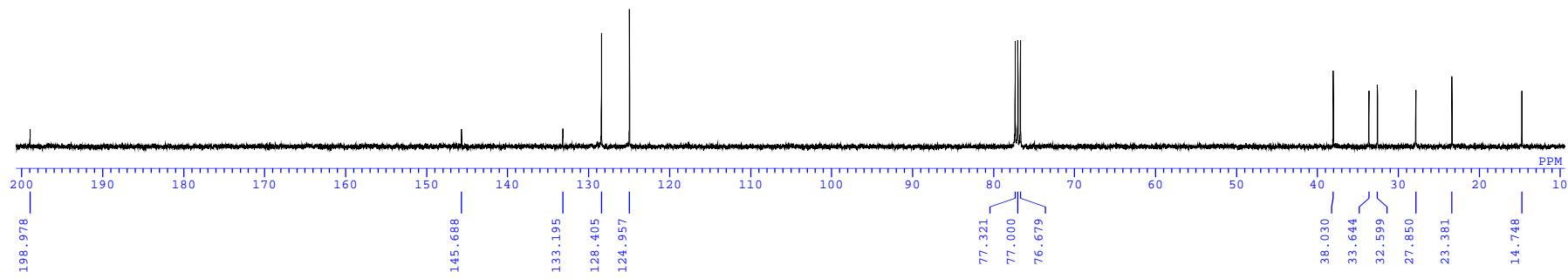


**3o**

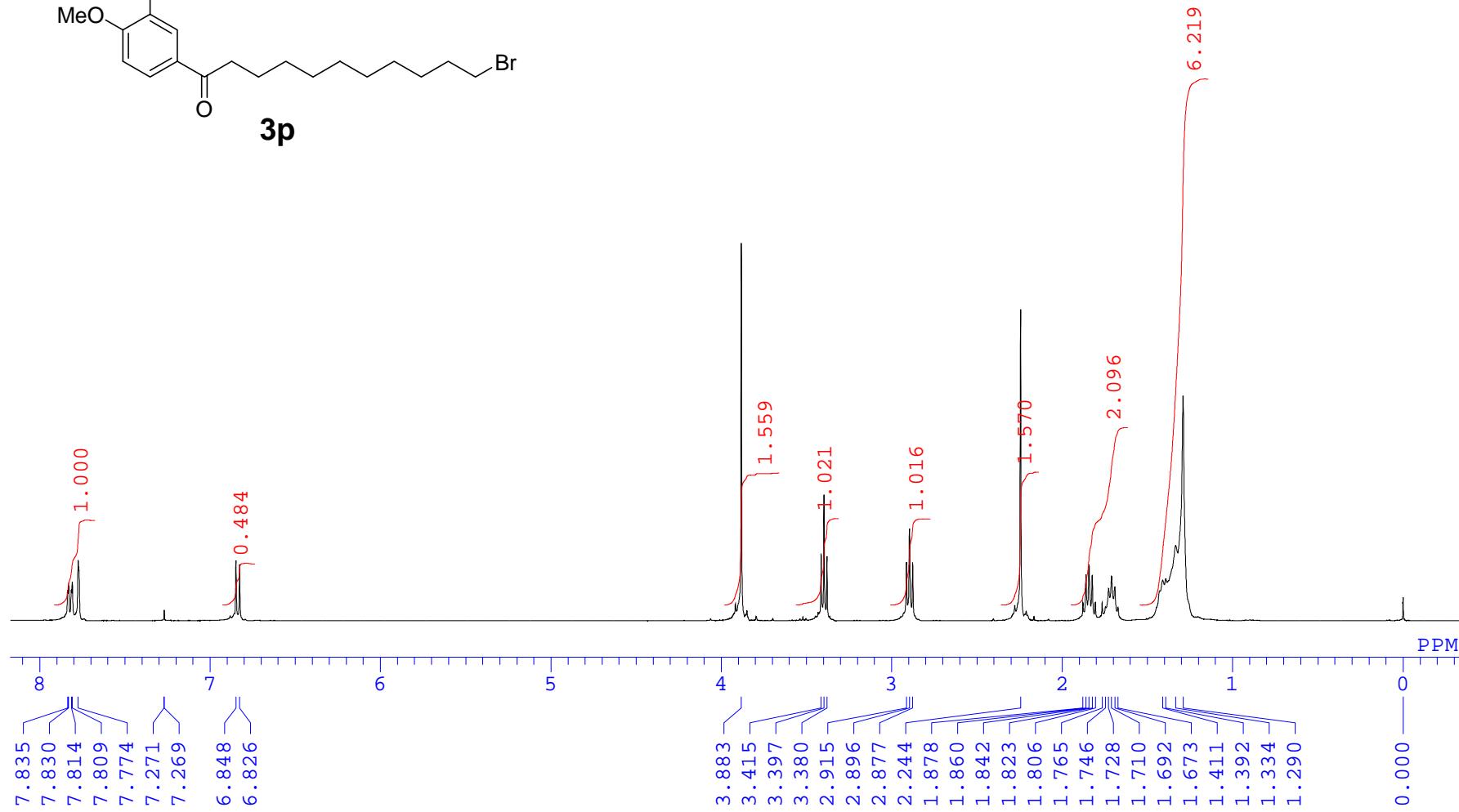
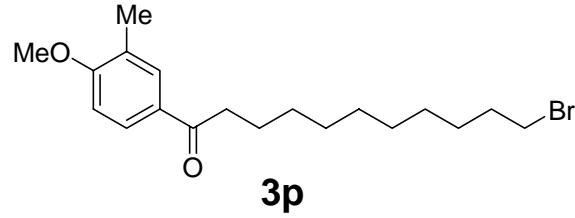




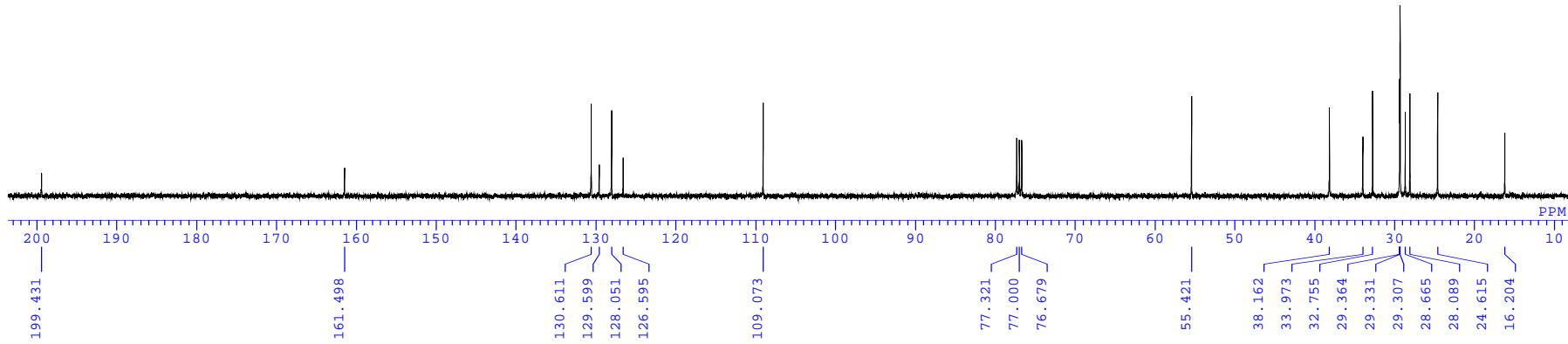
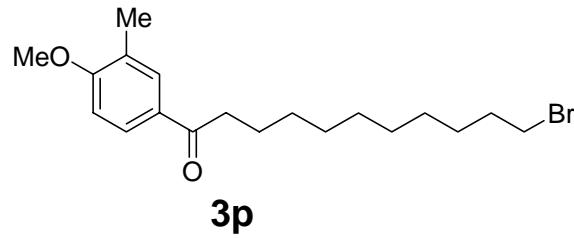
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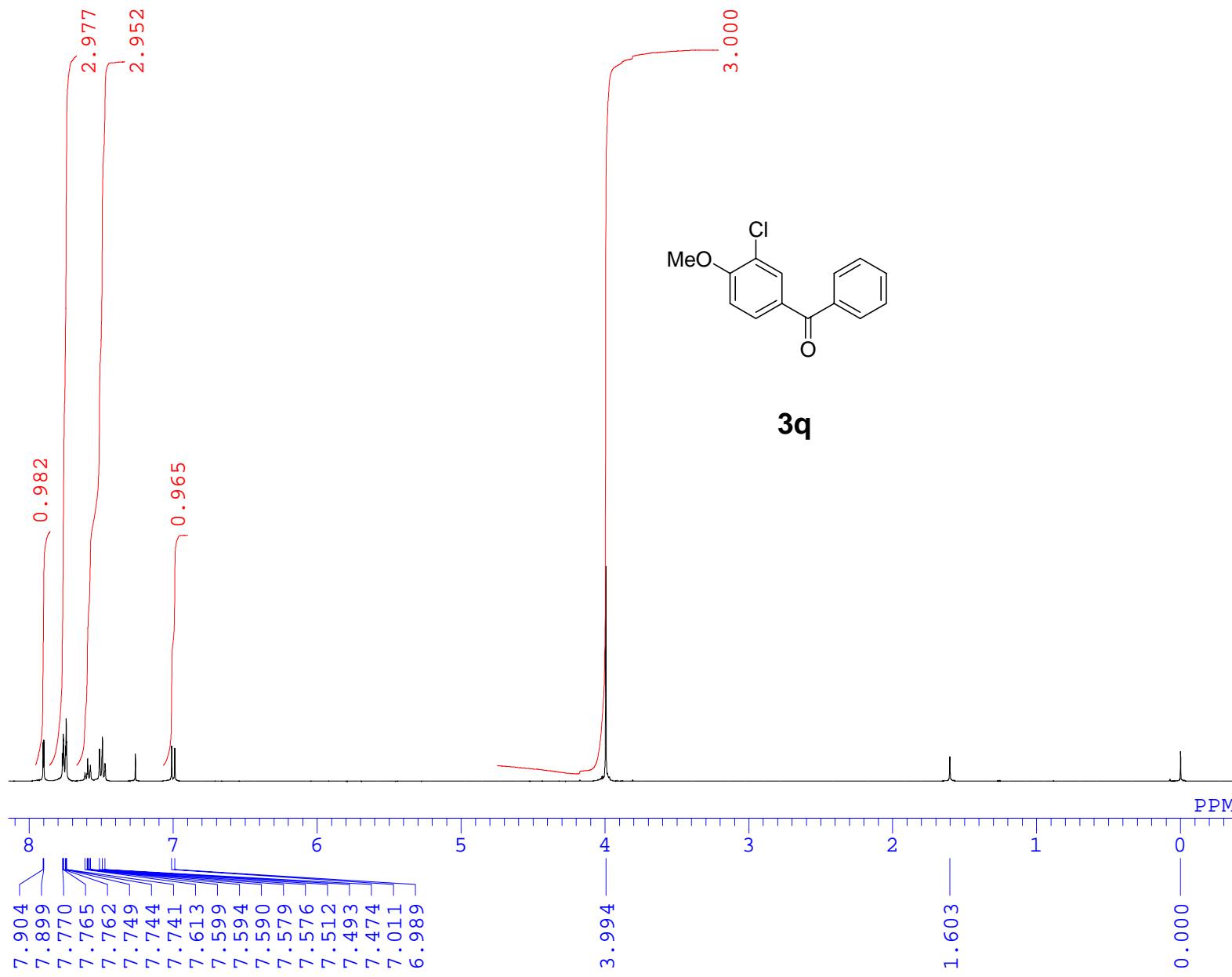
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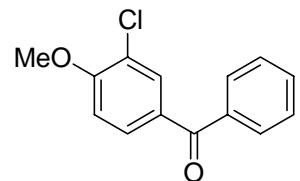
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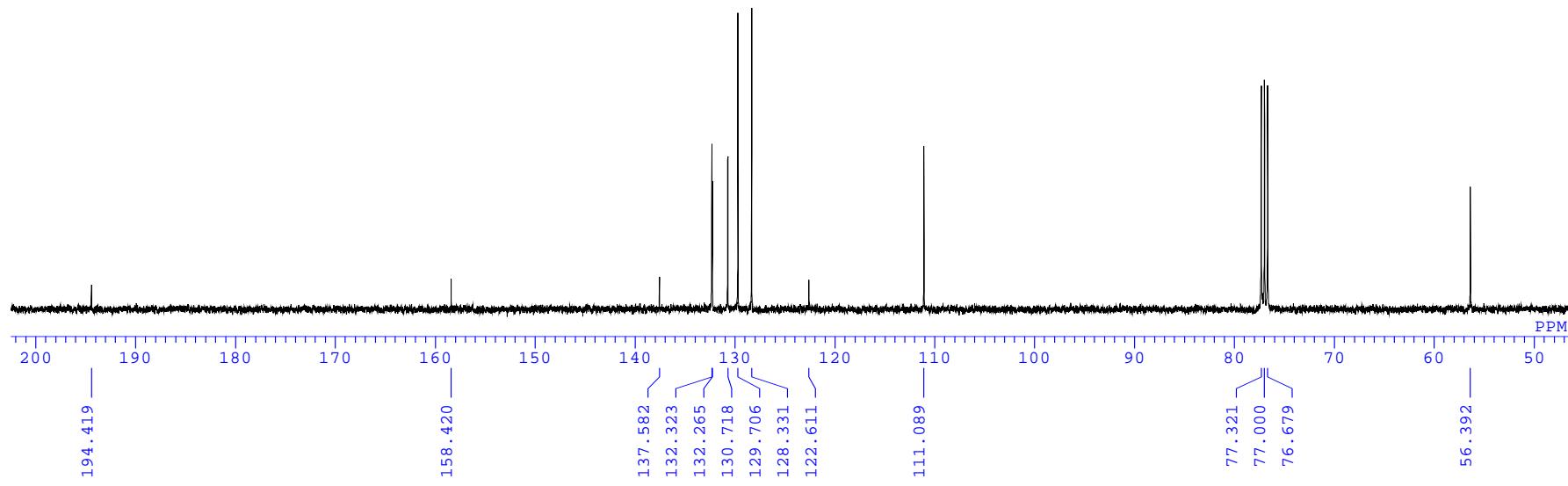
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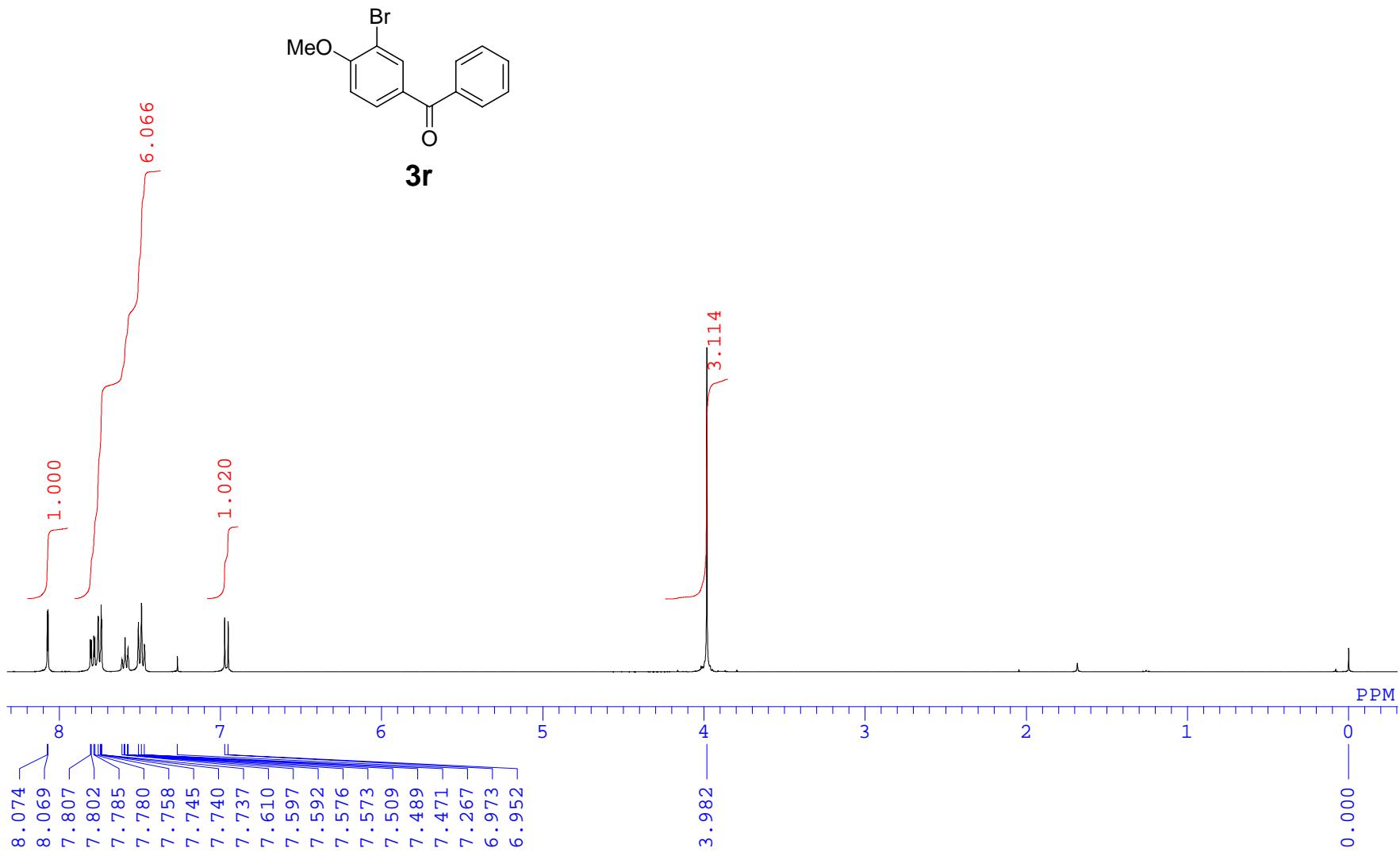
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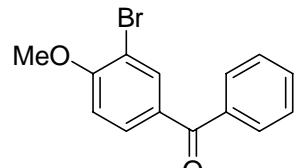
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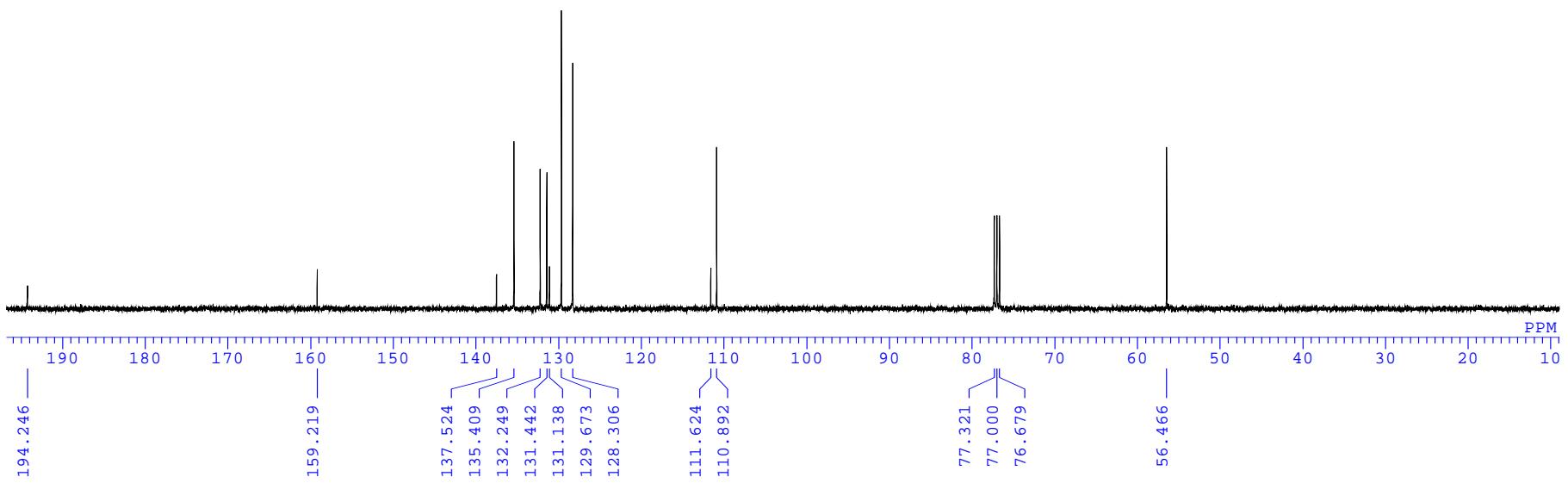
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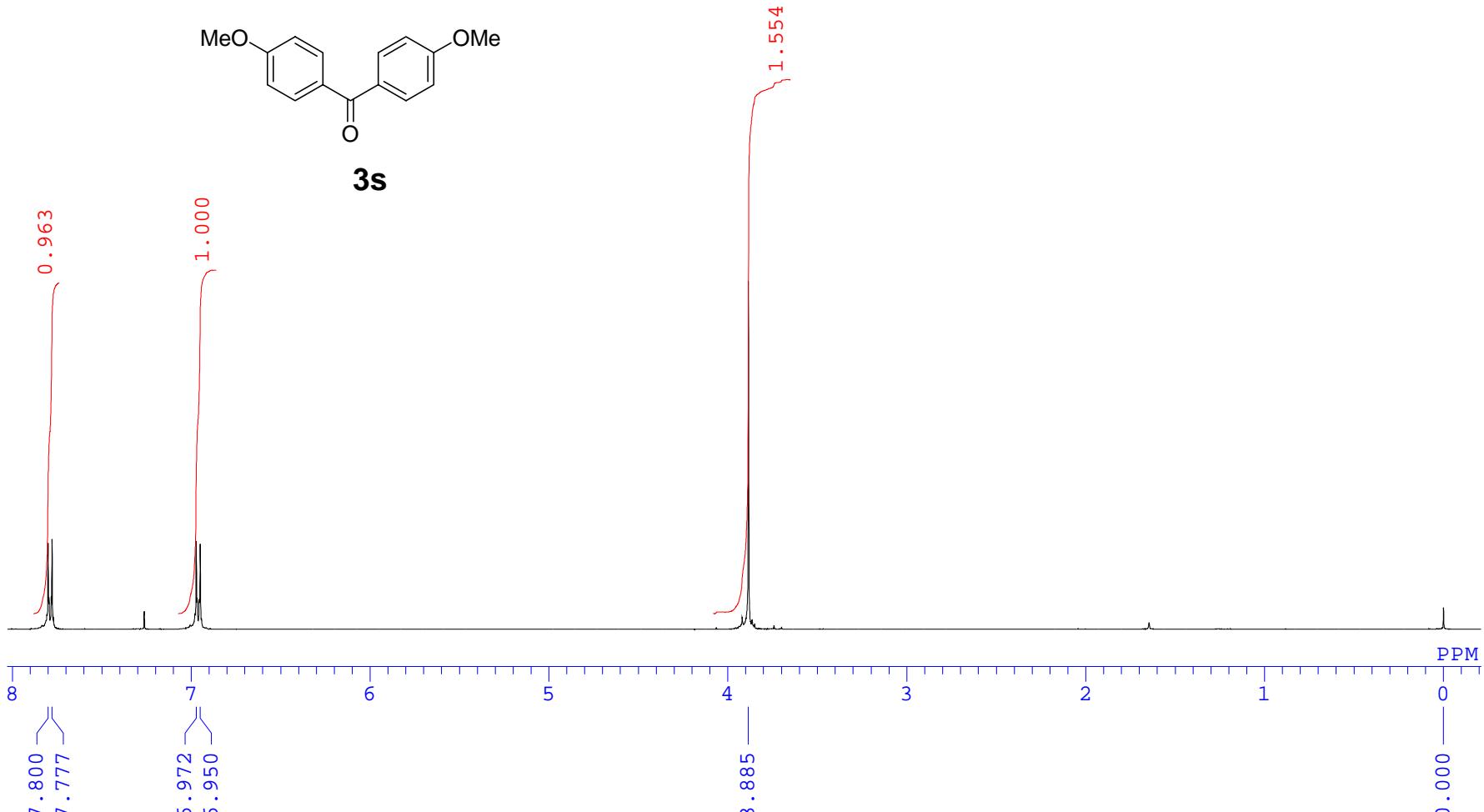
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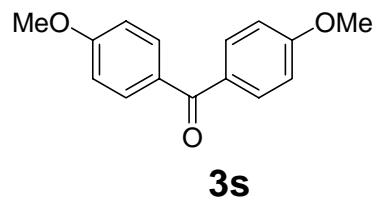
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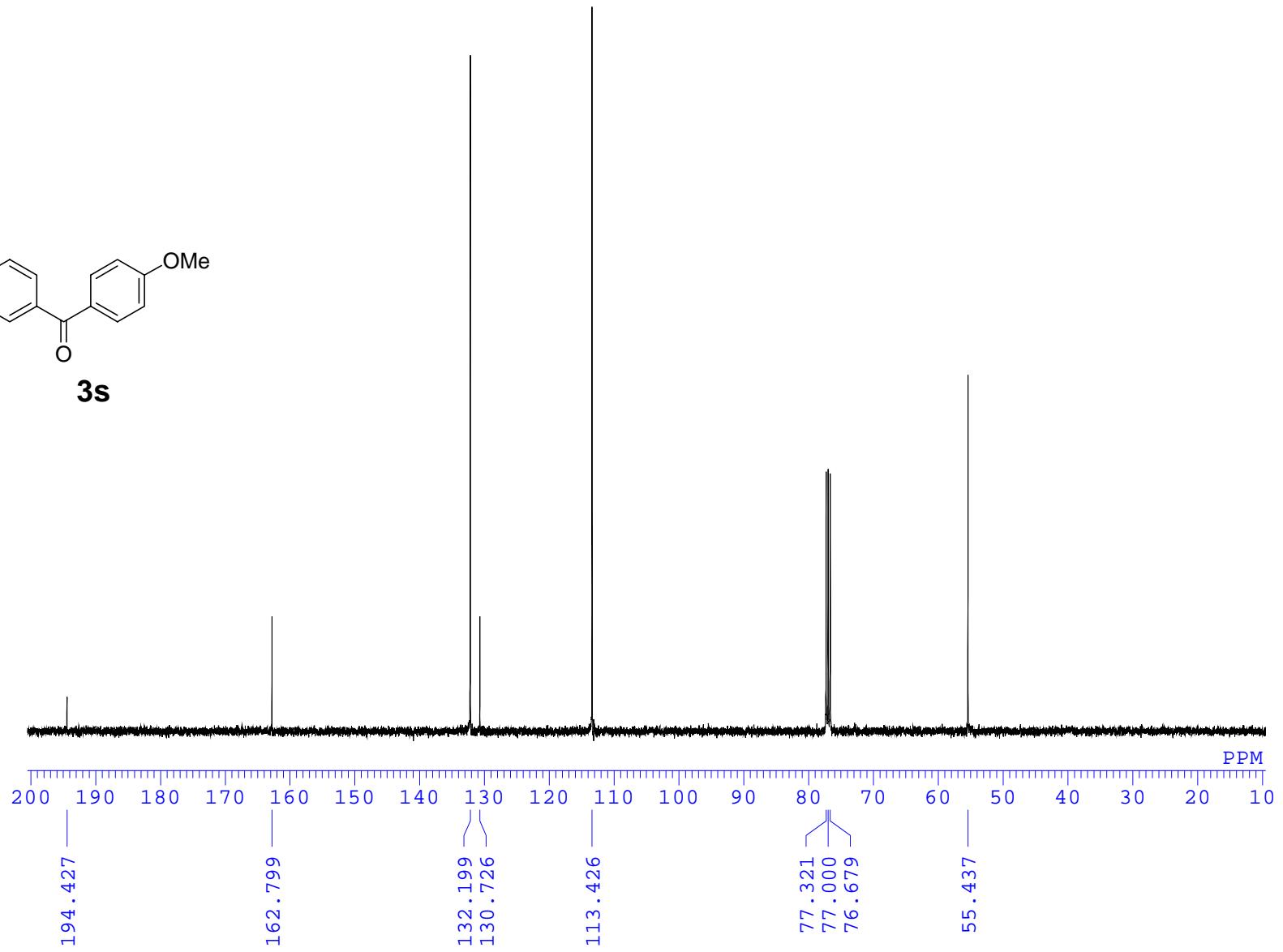
S54



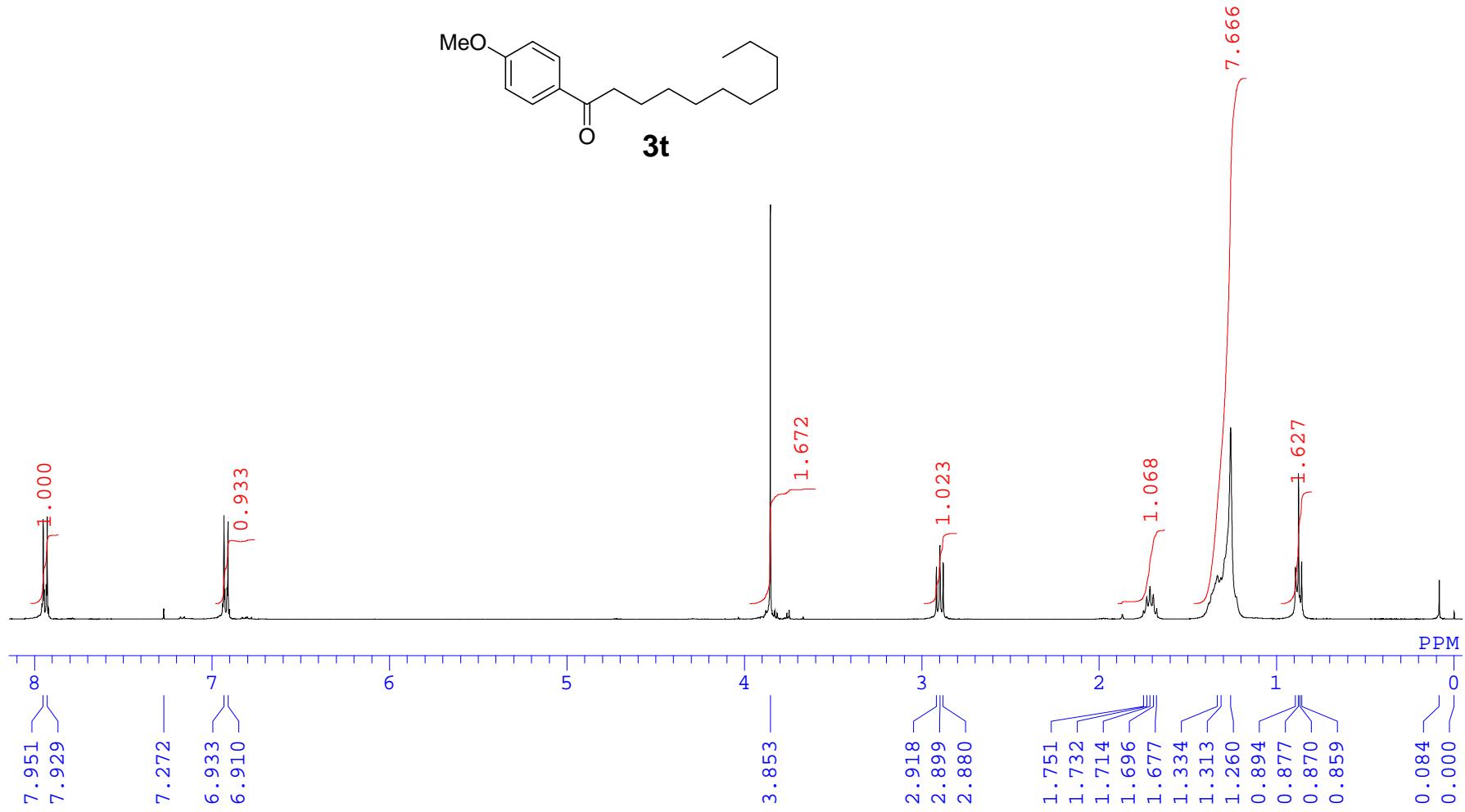
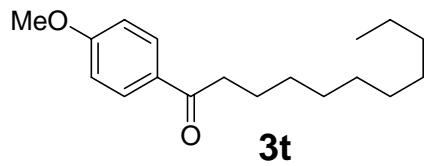
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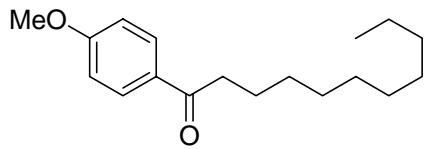
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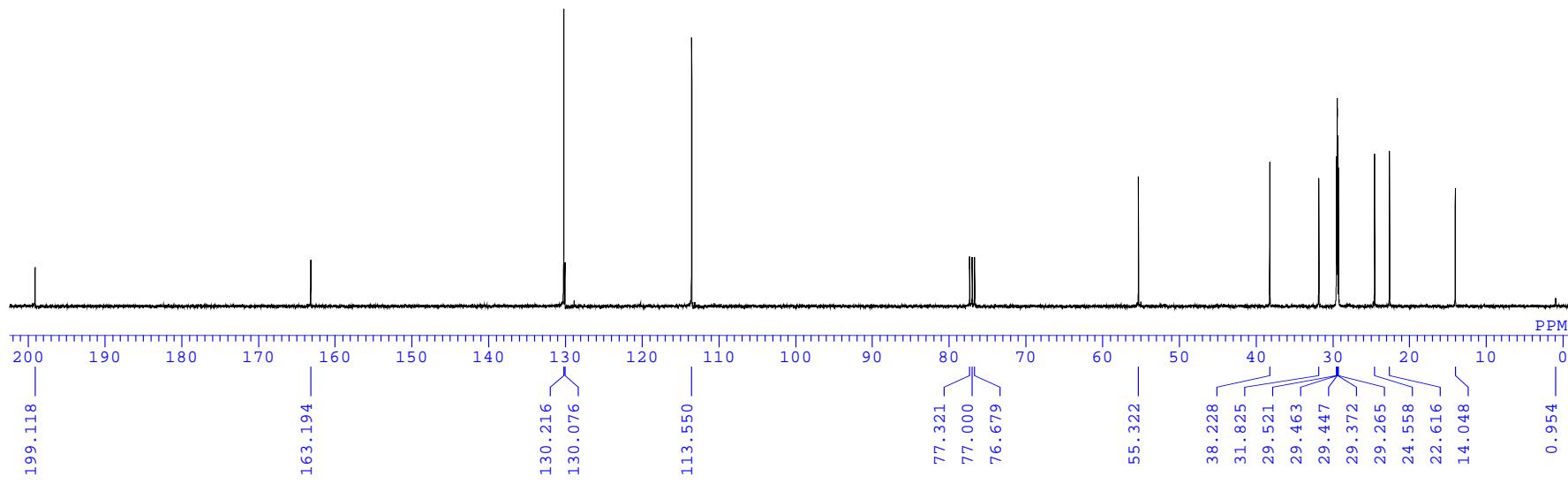
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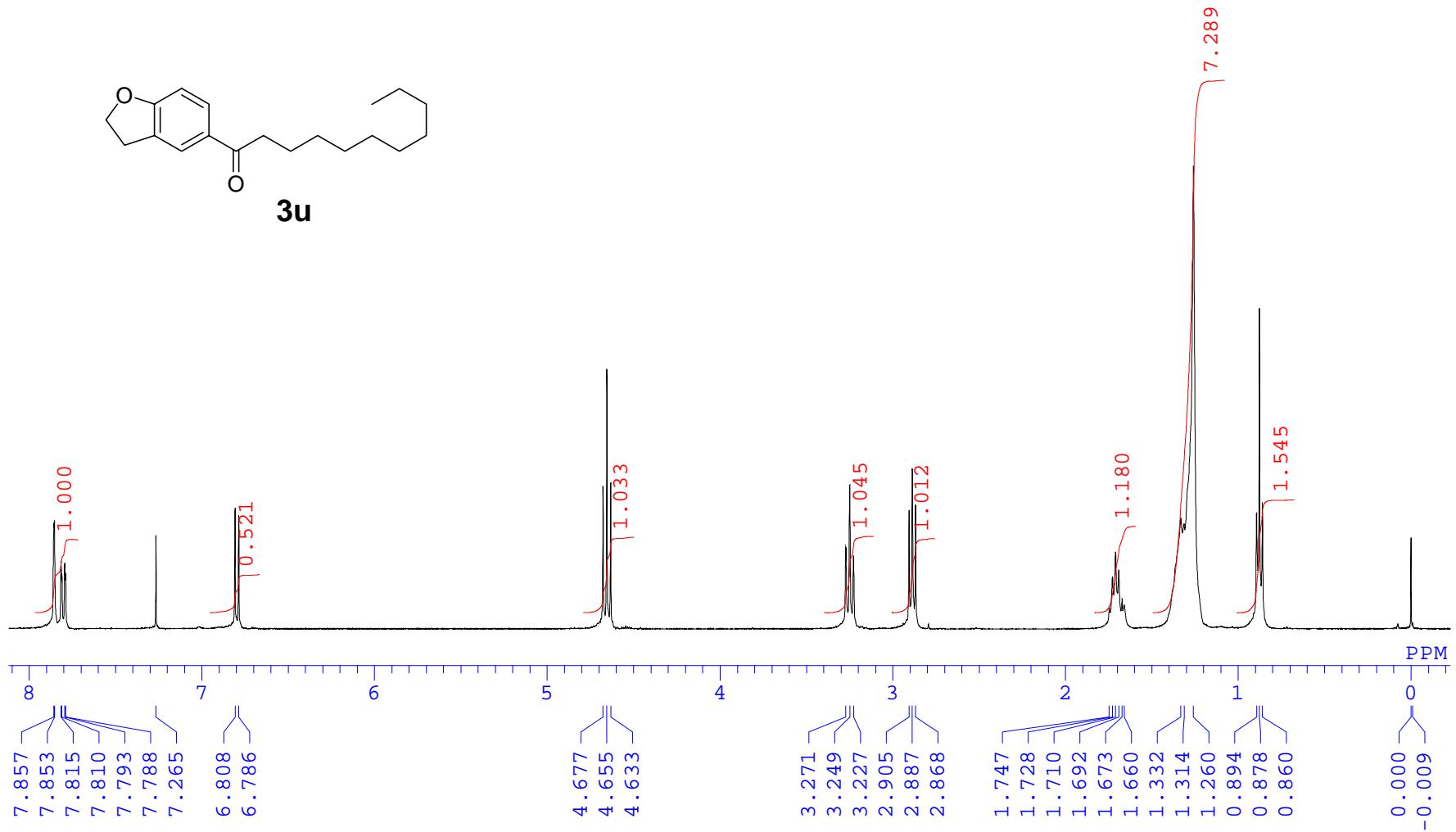
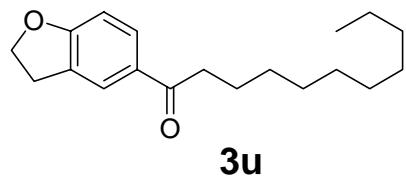


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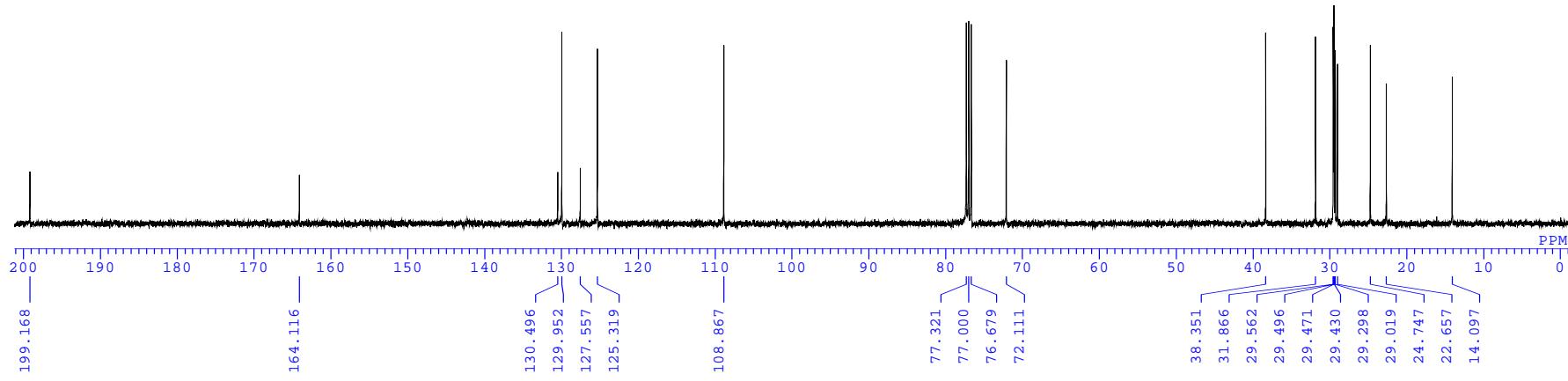
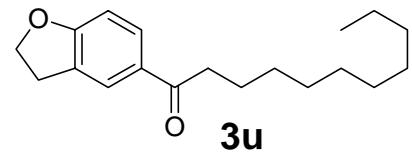


**3t**

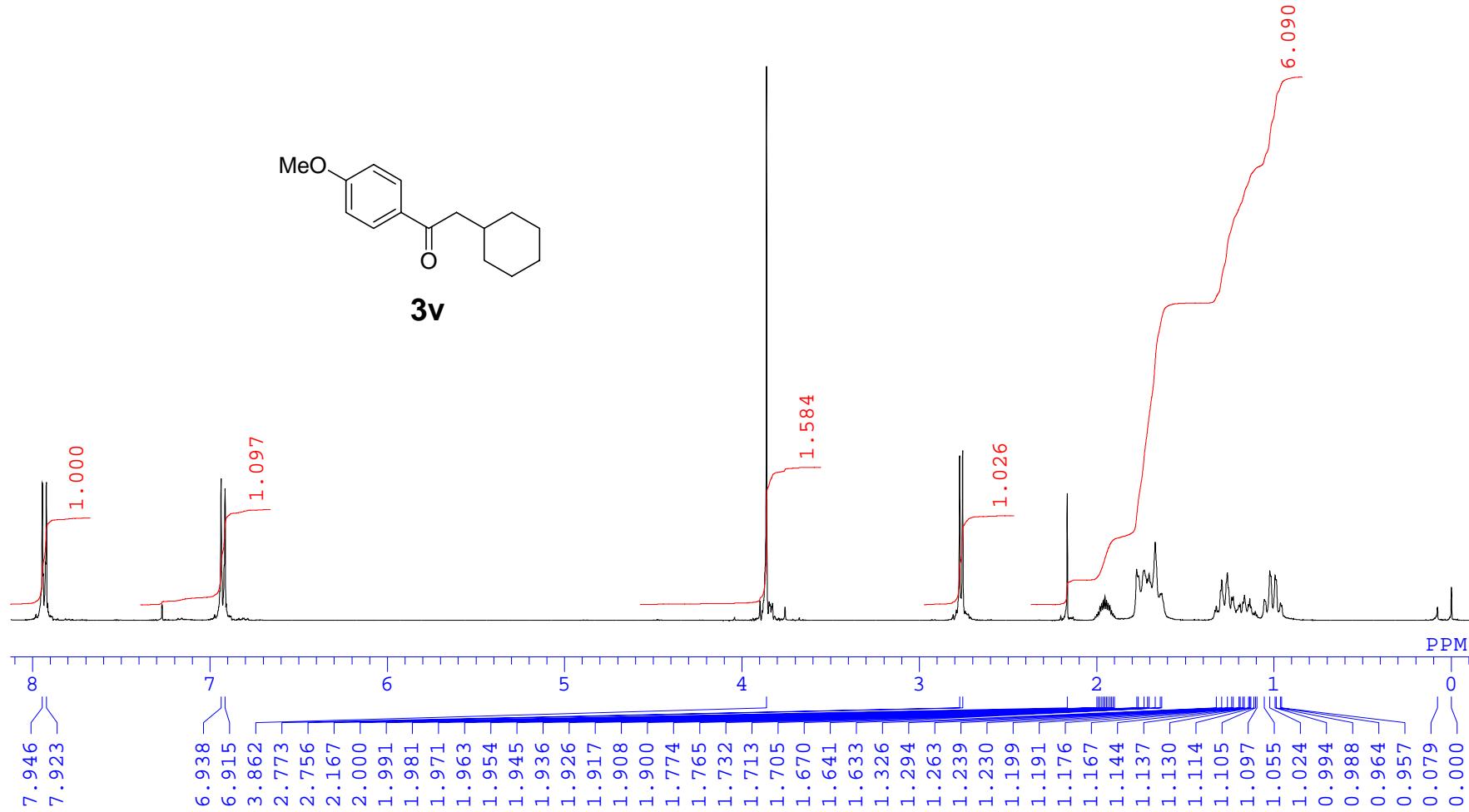




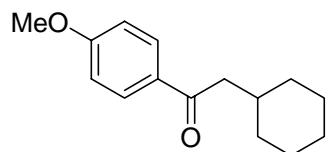
S59



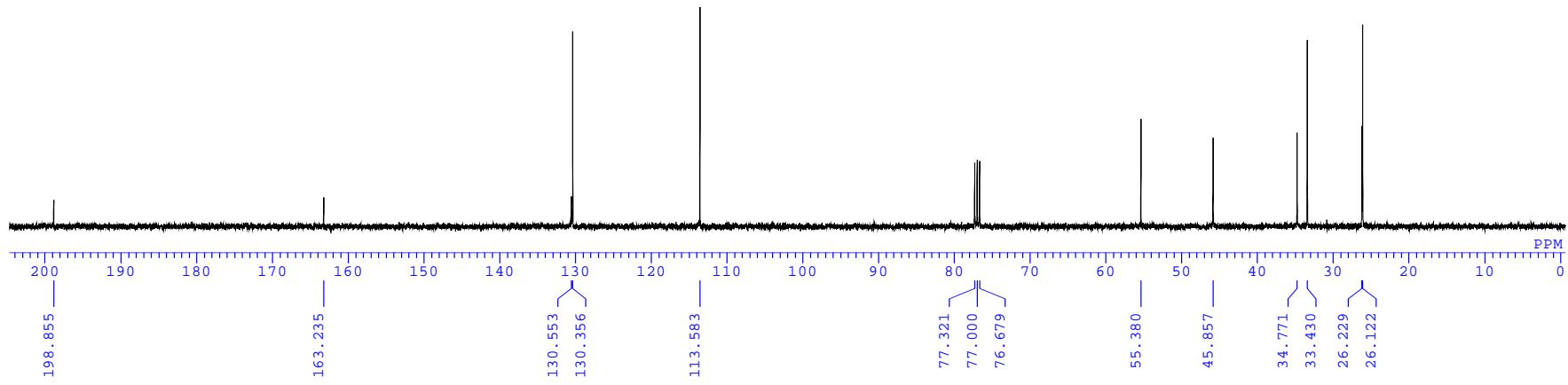
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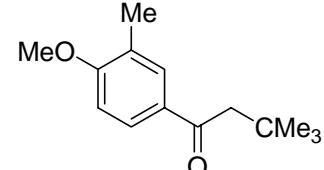
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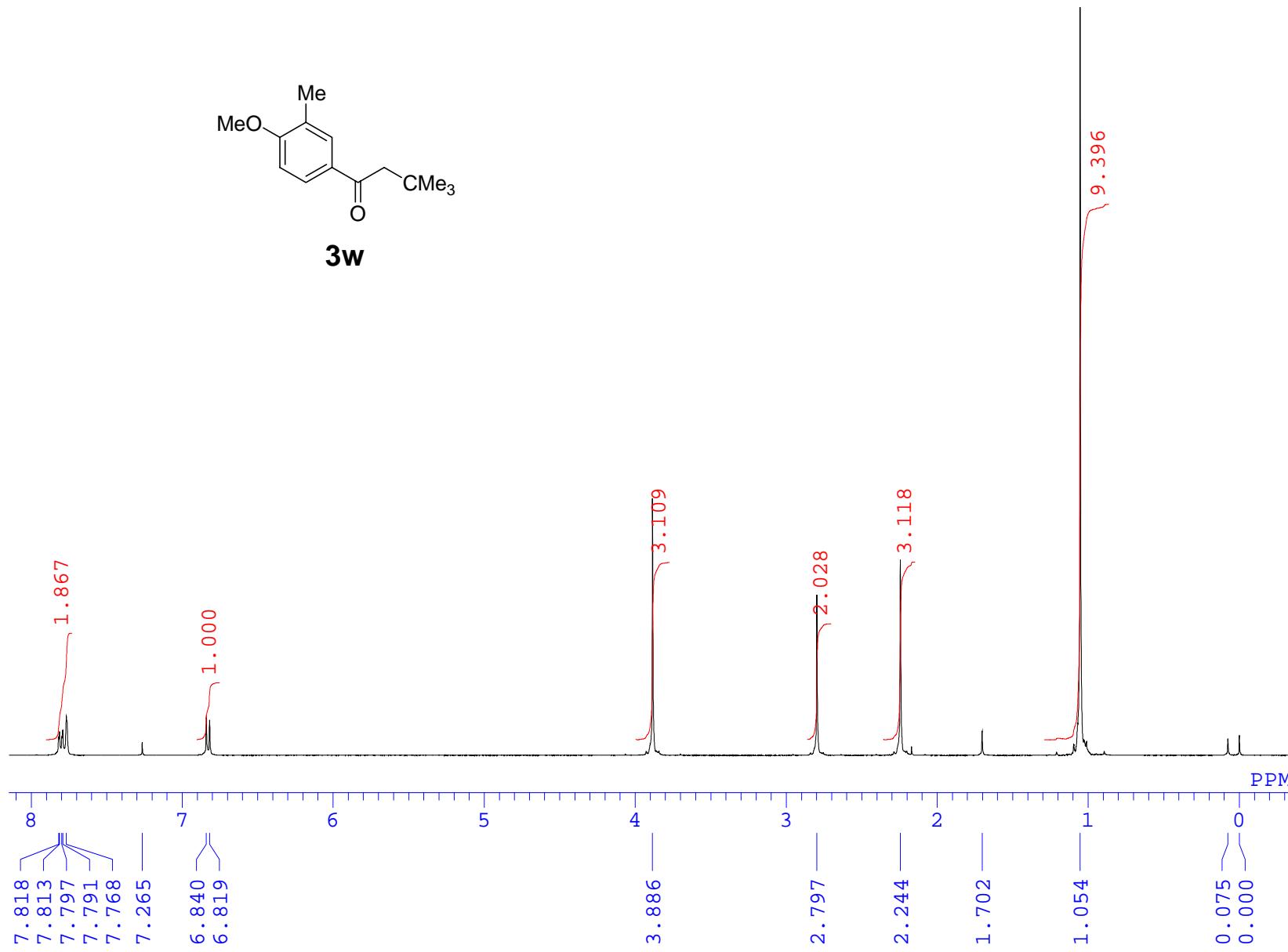
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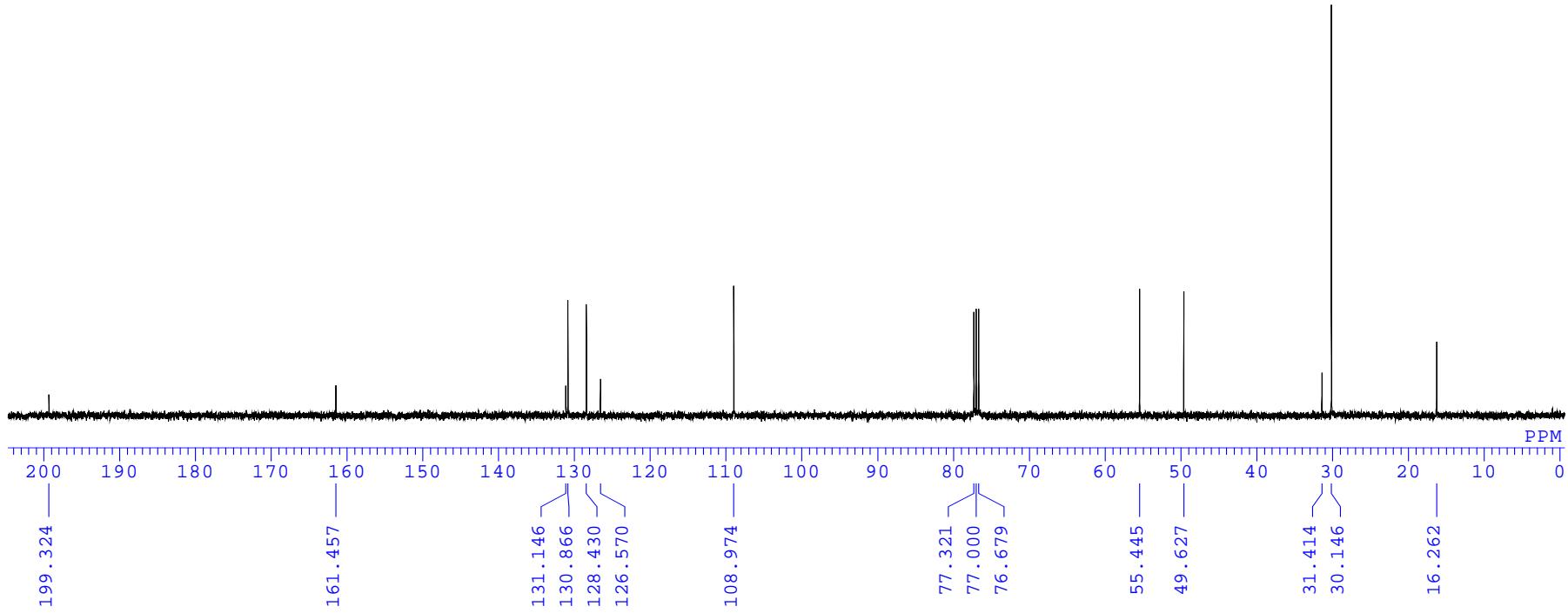
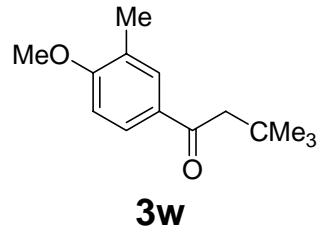
S62



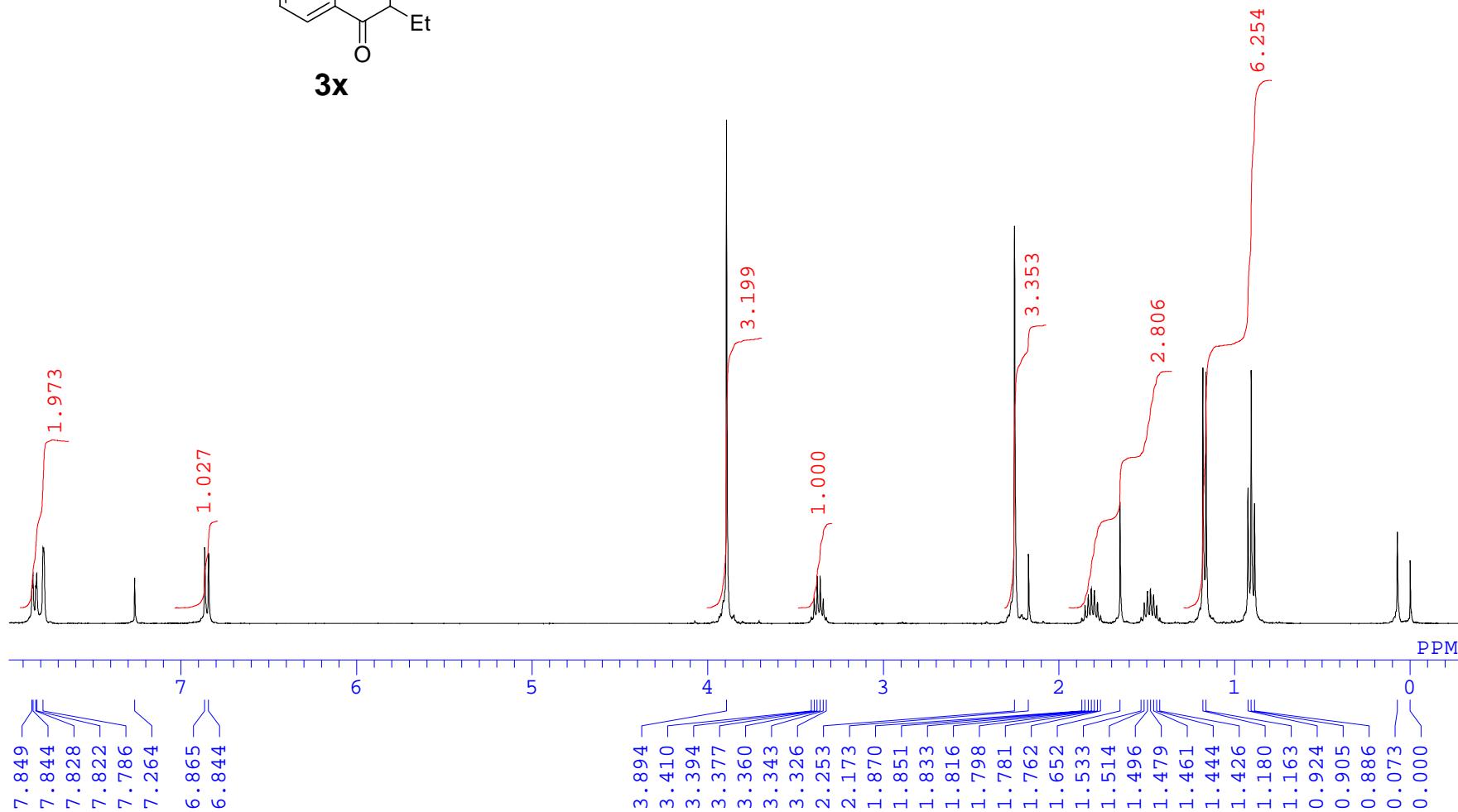
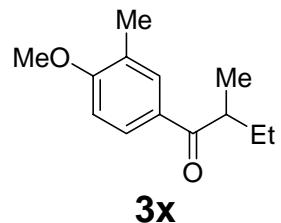
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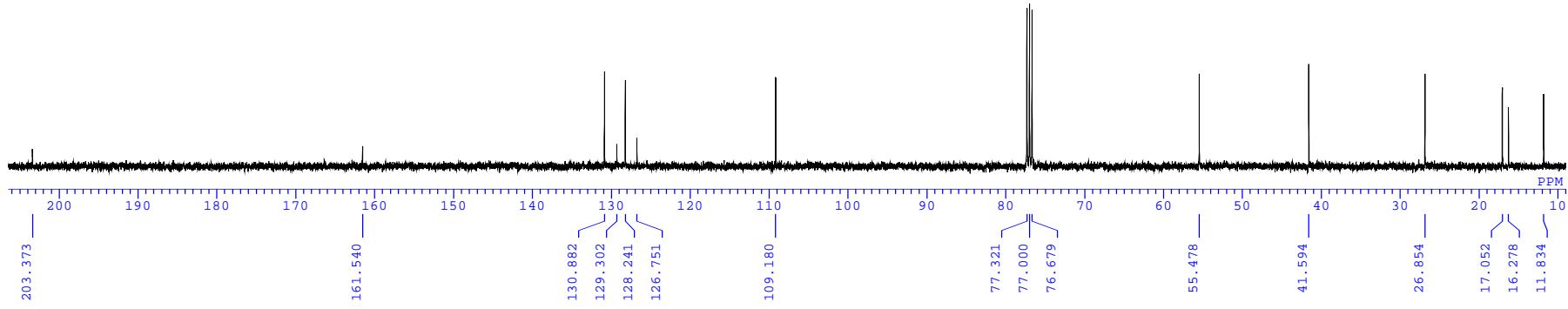
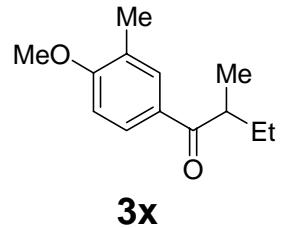


S63

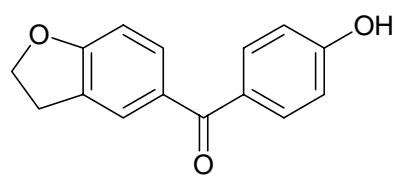


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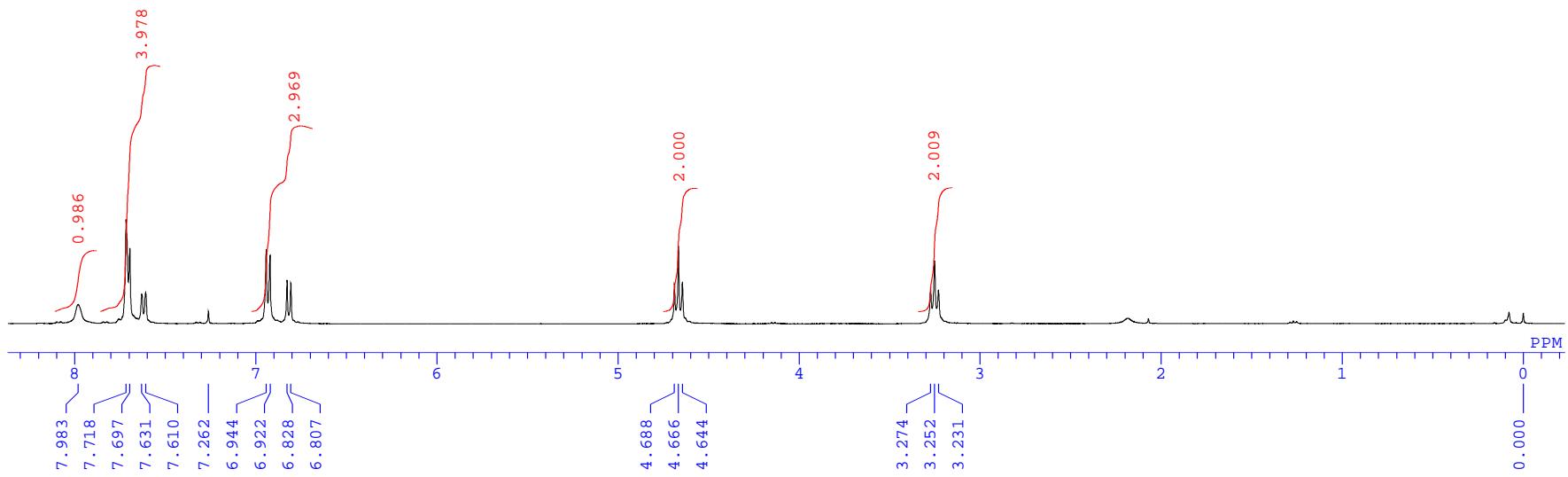




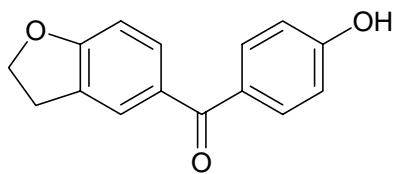
S66



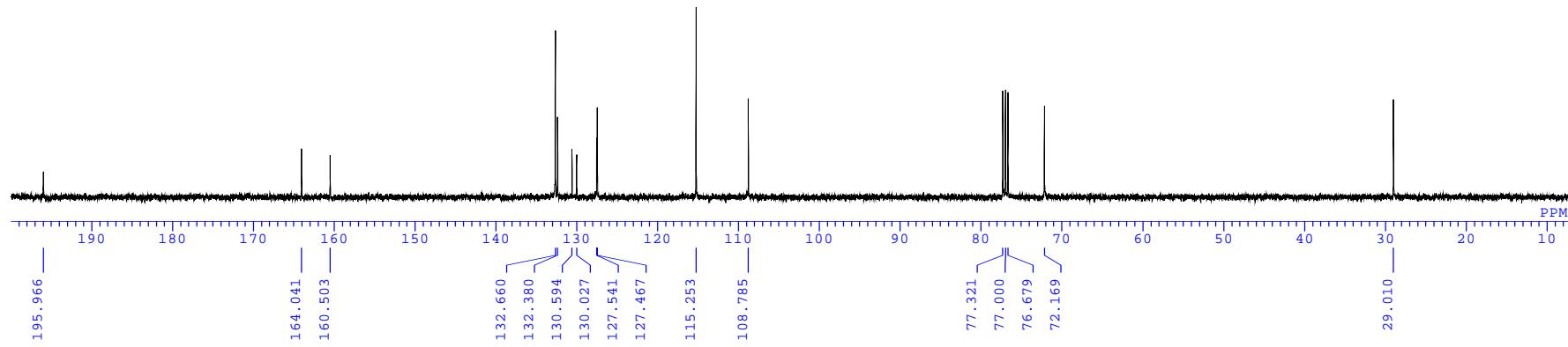
**4a**

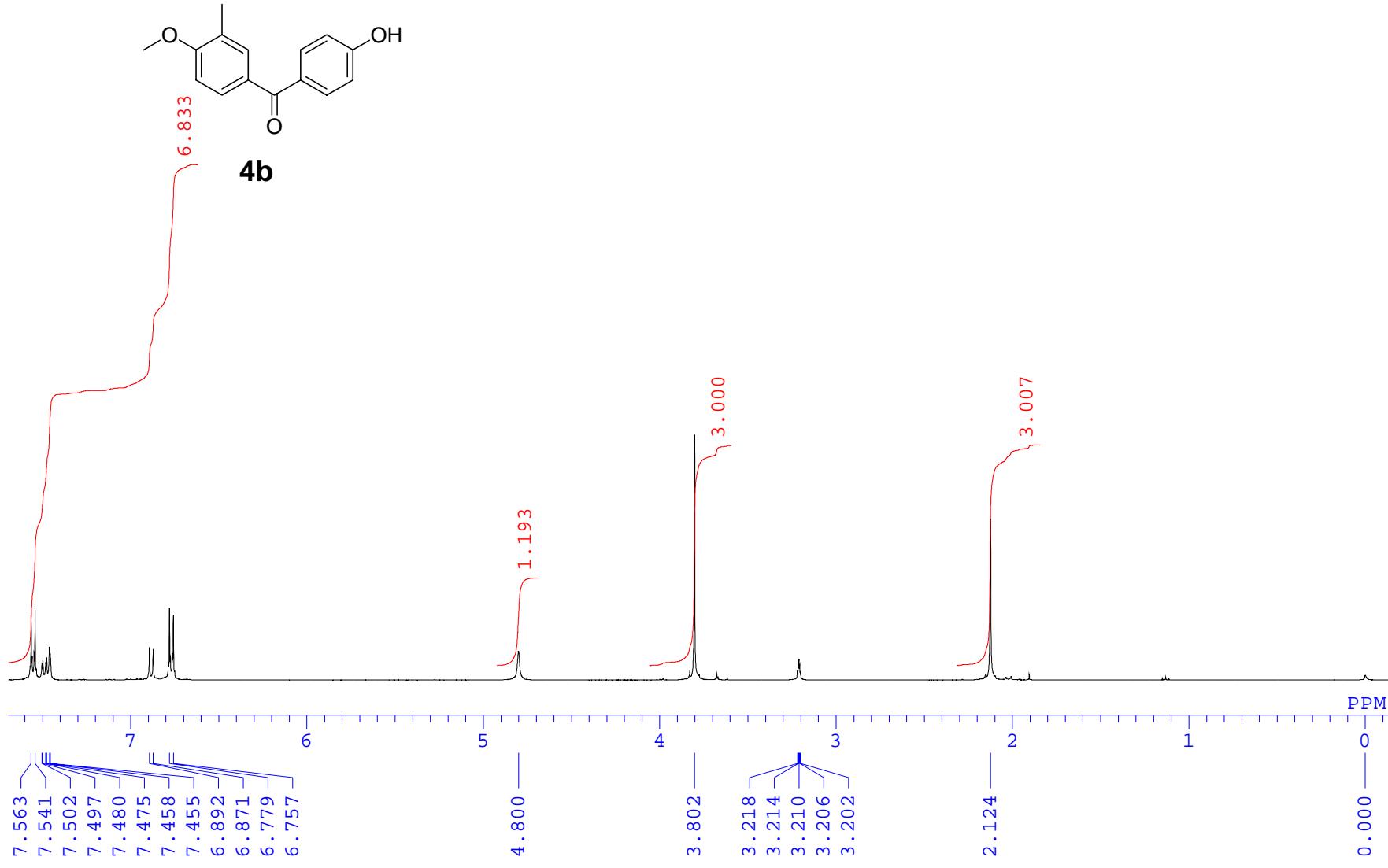


S67

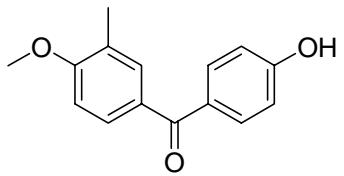


**4a**

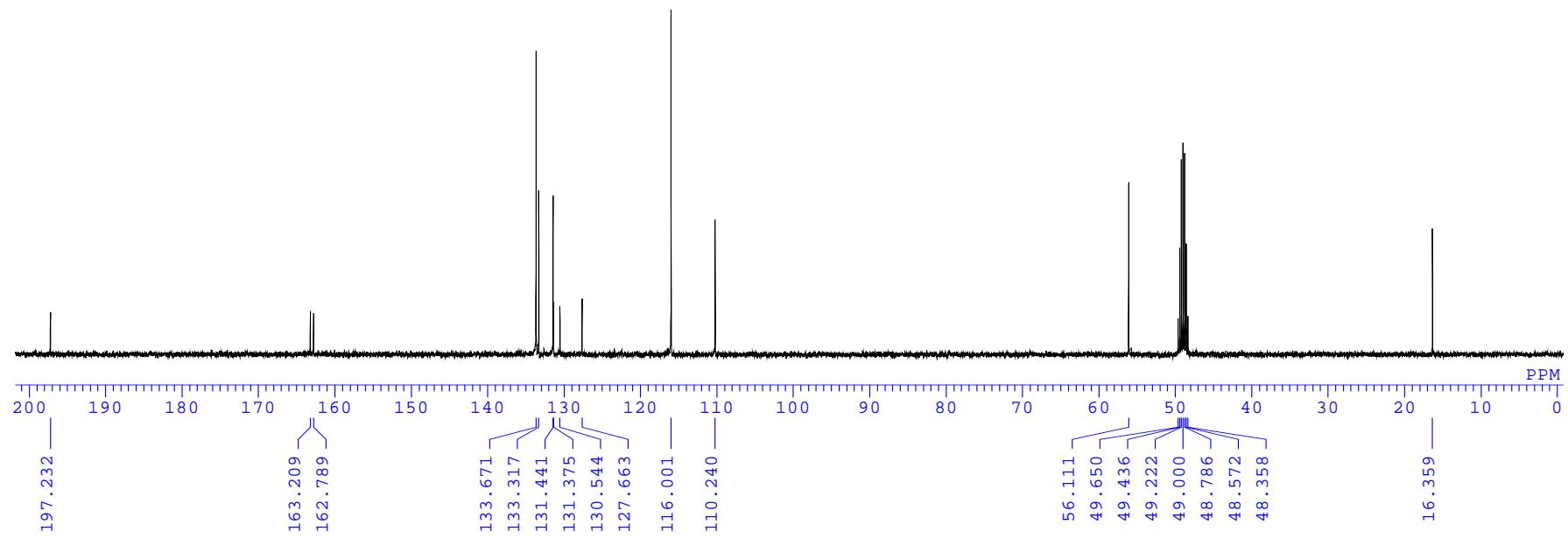




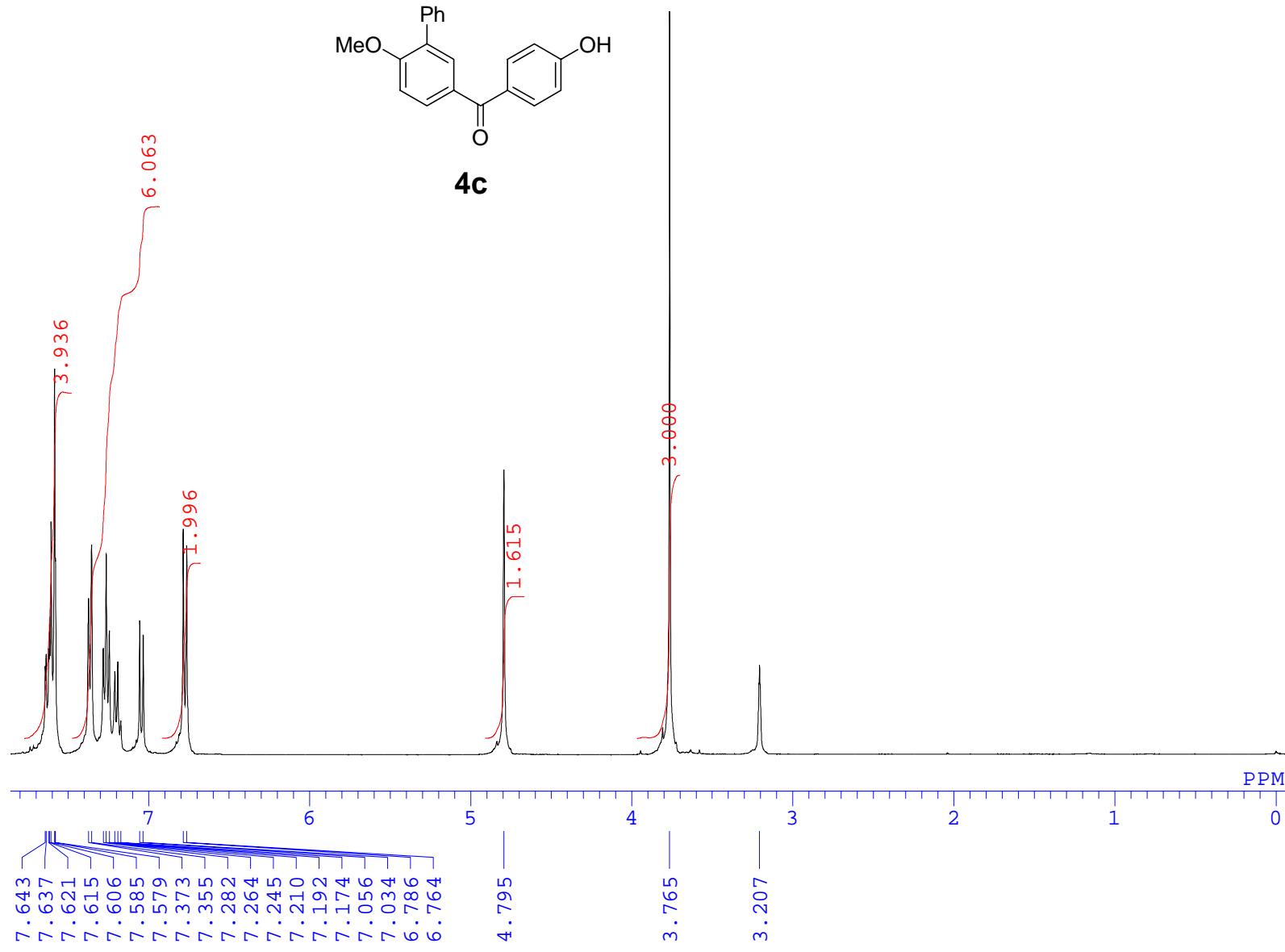
S69

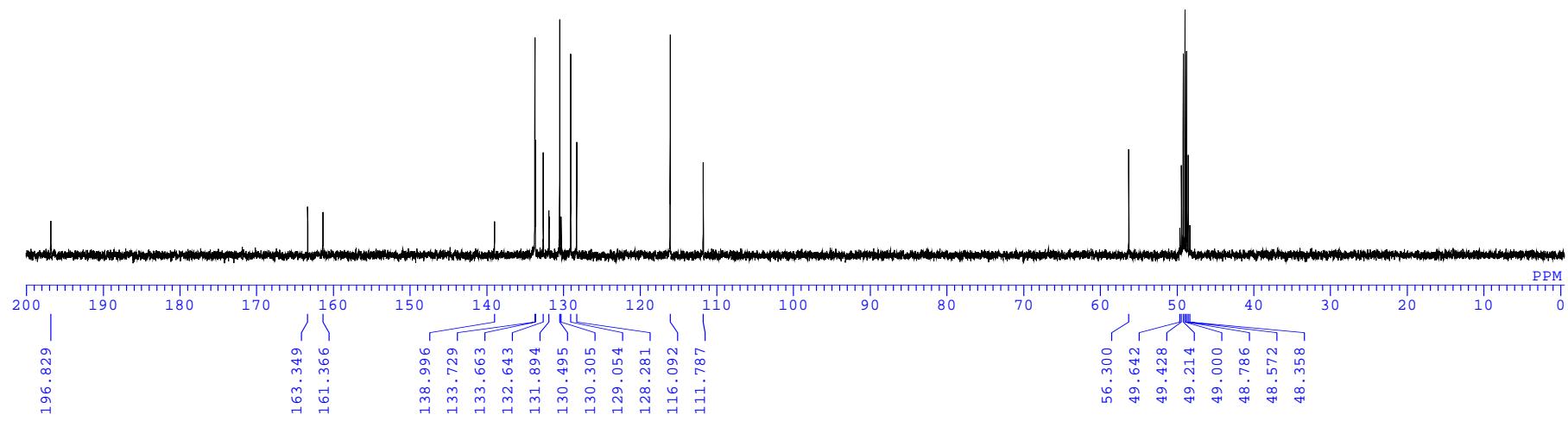
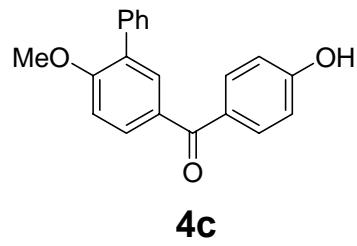


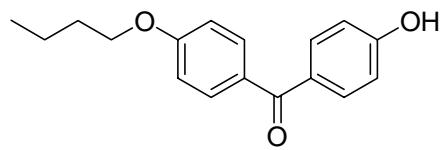
**4b**



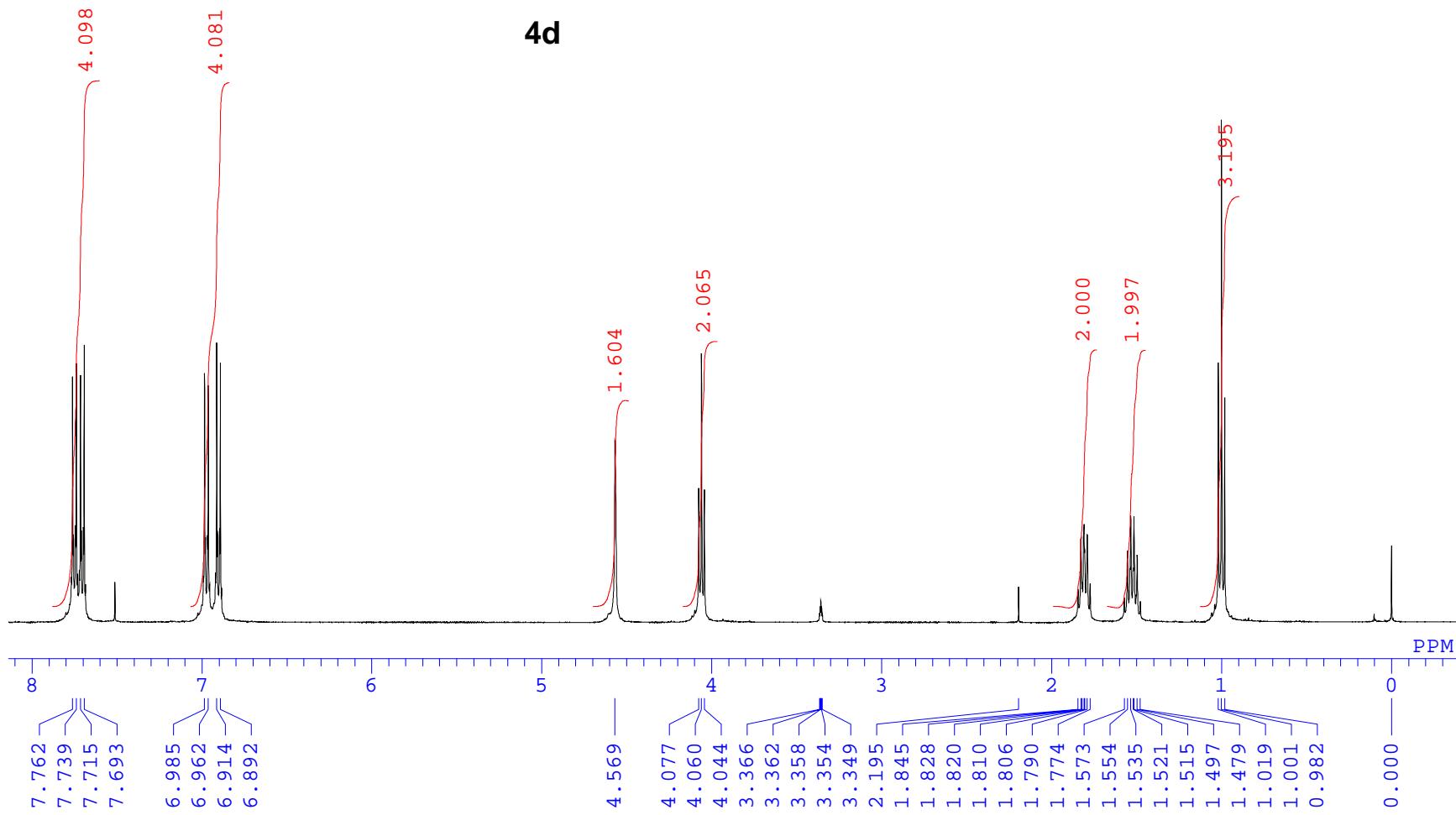
S70

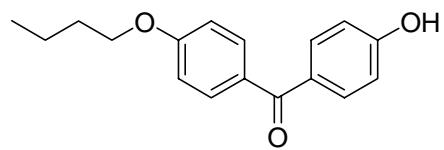




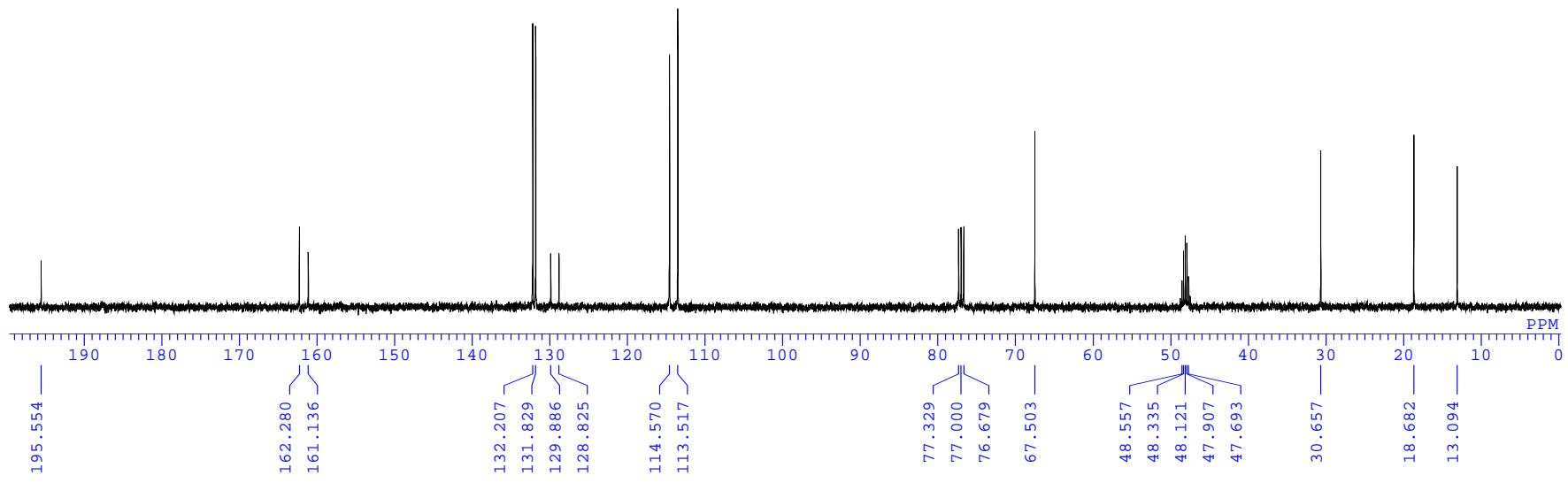


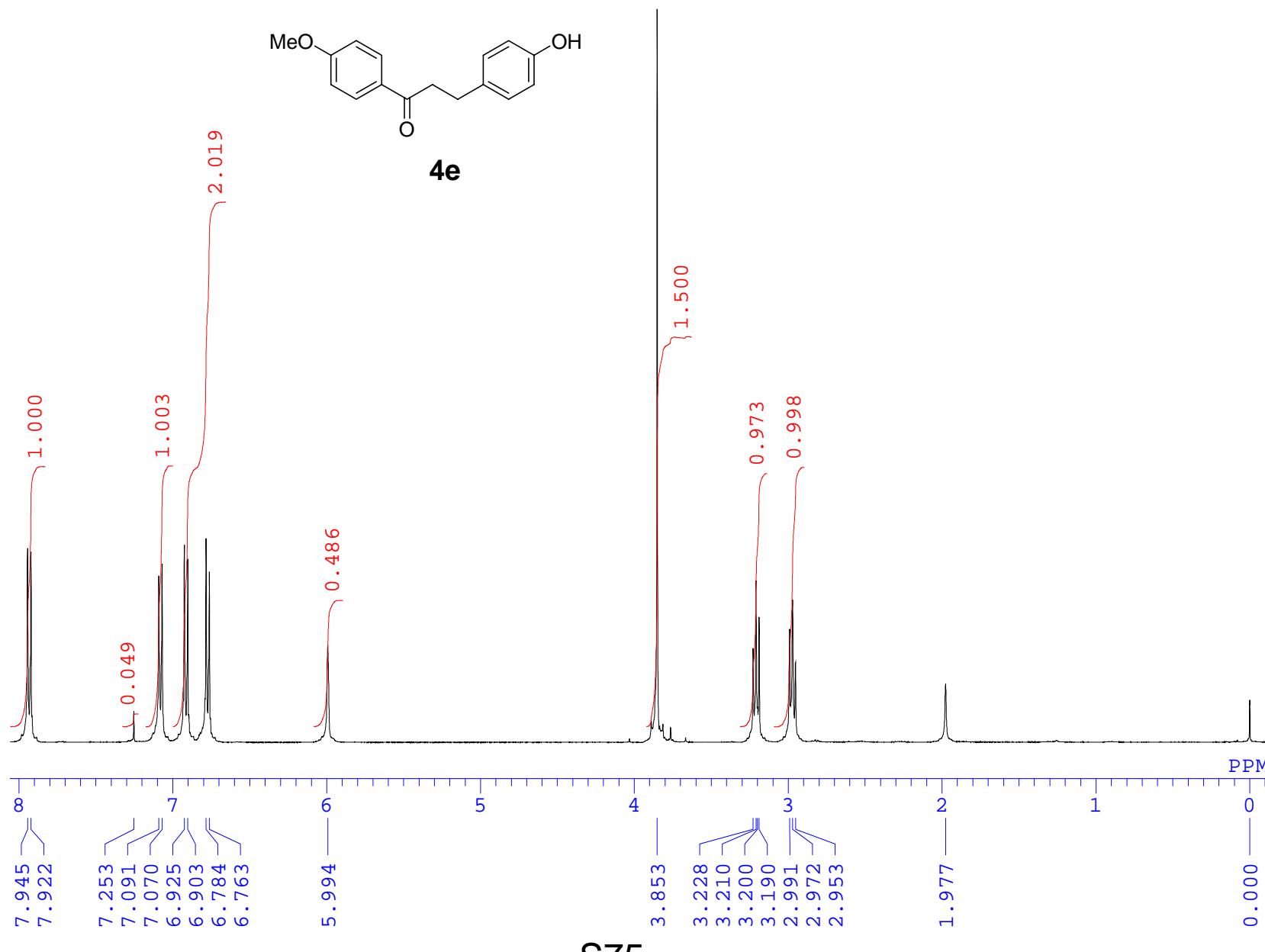
**4d**

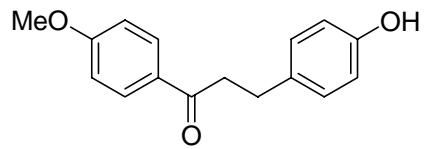




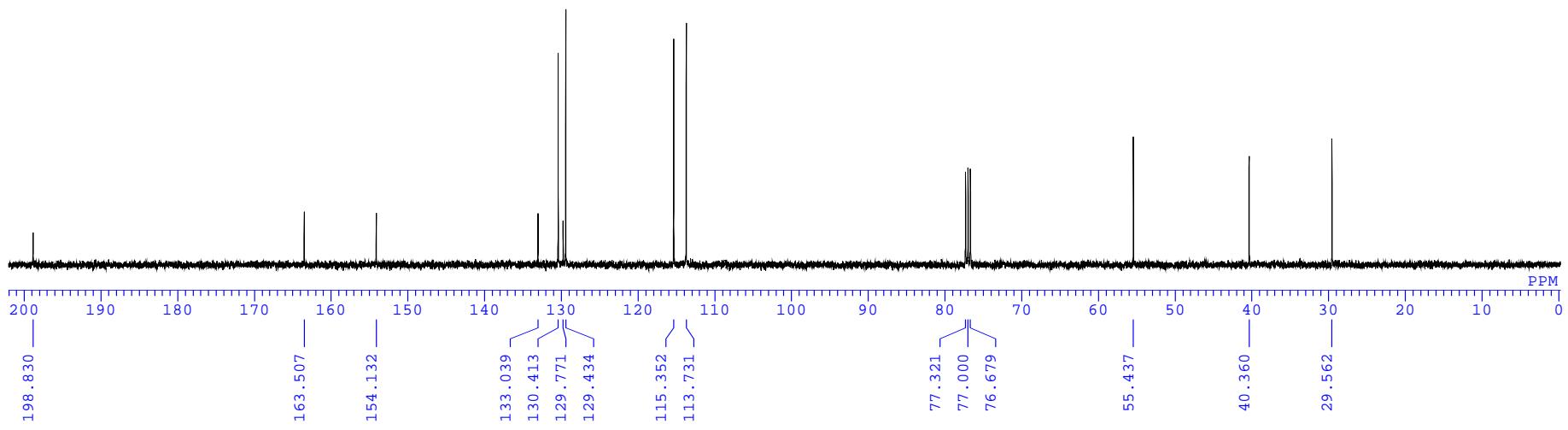
**4d**





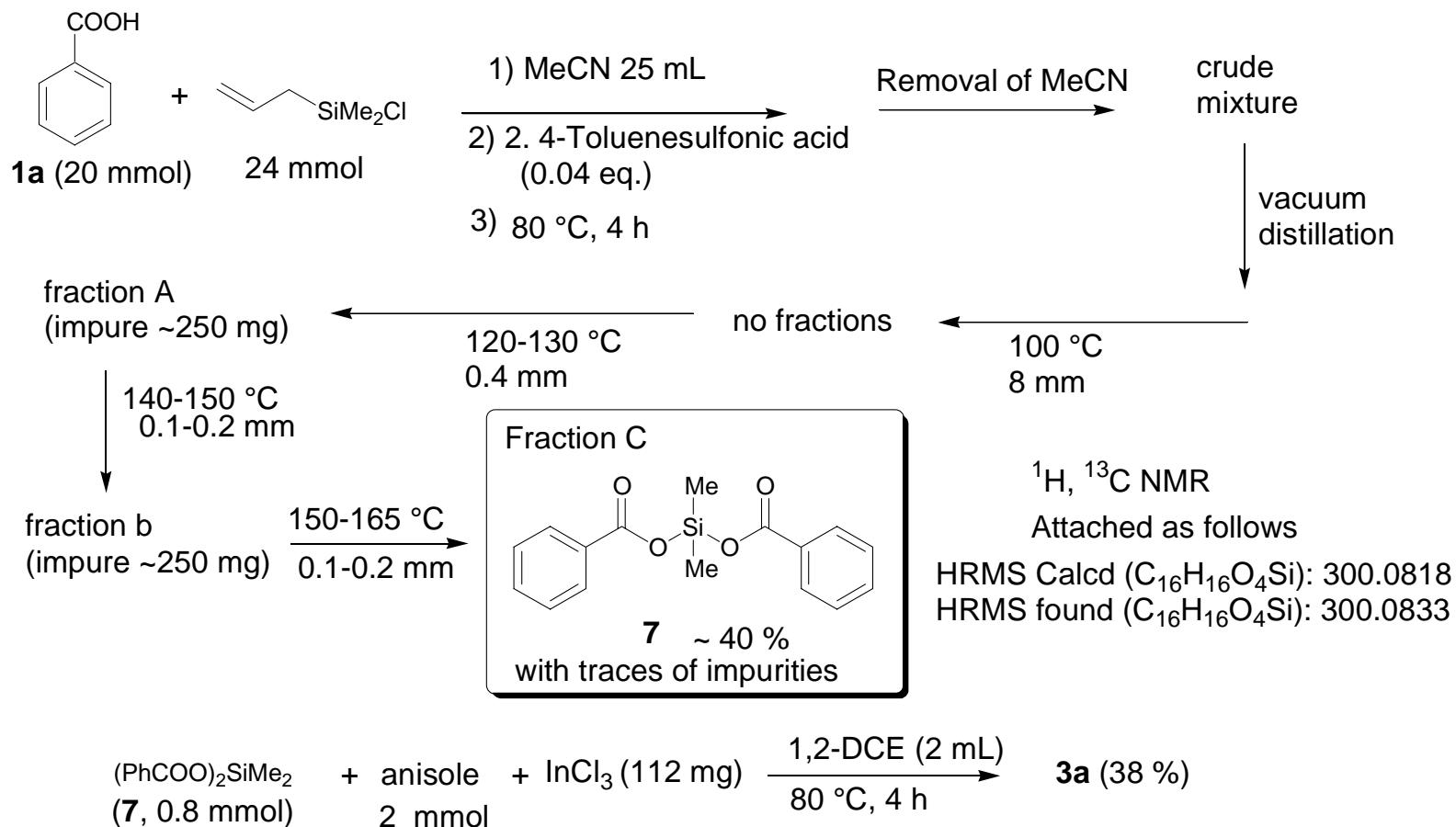


**4e**



**Experimental procedure for preparation of 7 and its reaction with anisole:**

a solution of **1a** (20mmol), allyldimethylchlorosilane (24 mmol) and 4-toluenesulfonicacid(0.04eq) in 25 mL of MeCN was heated at 80 °C for 4h. Then the solvent was distilled off under vacuum. The resulting crude mixture was subjected to the distillation under reduced pressure as shown below. The final fraction that distill at 150-165 °C/0.1-0.2 mm was the compound **7**. Next, treatment of **7** (0.8mmol) with anisole (2 mmol in the presence of InCl<sub>3</sub> (112 mg) in 1,2-DCE at 80 °C for 4 h was carried out to afford the product **3a** in 38% yield.

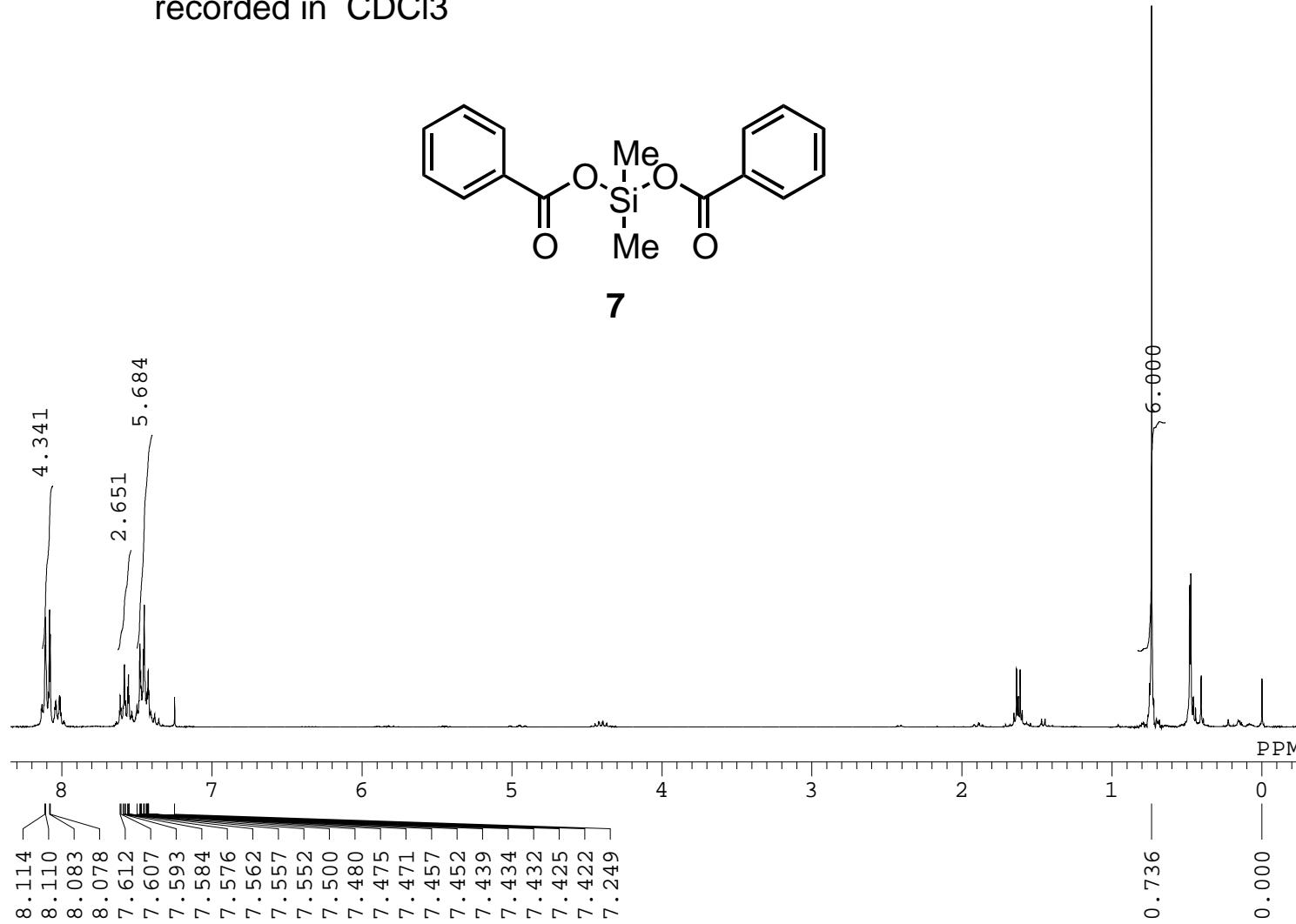


Reference for the compound **7**: Baburina, V. A.; Lebedev, E. P. *Zh. Obsch. Khim.*, **1976**, 46, 1782.

recorded in CDCl<sub>3</sub>

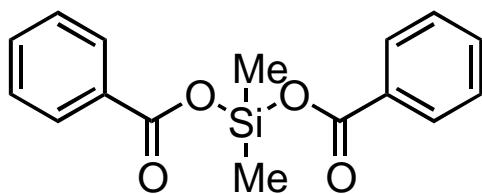


7

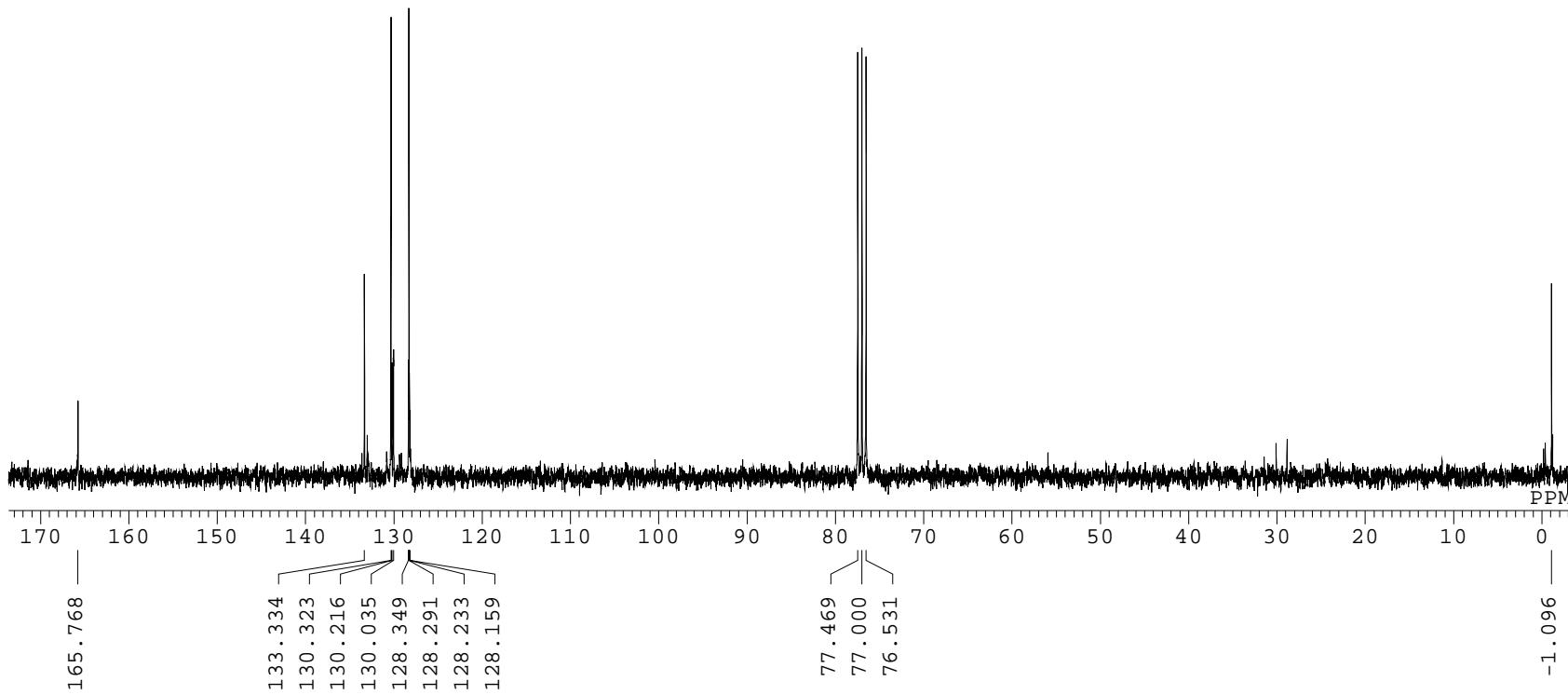


S78

recorded in CDCl<sub>3</sub>

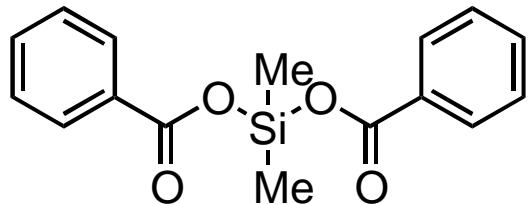


7

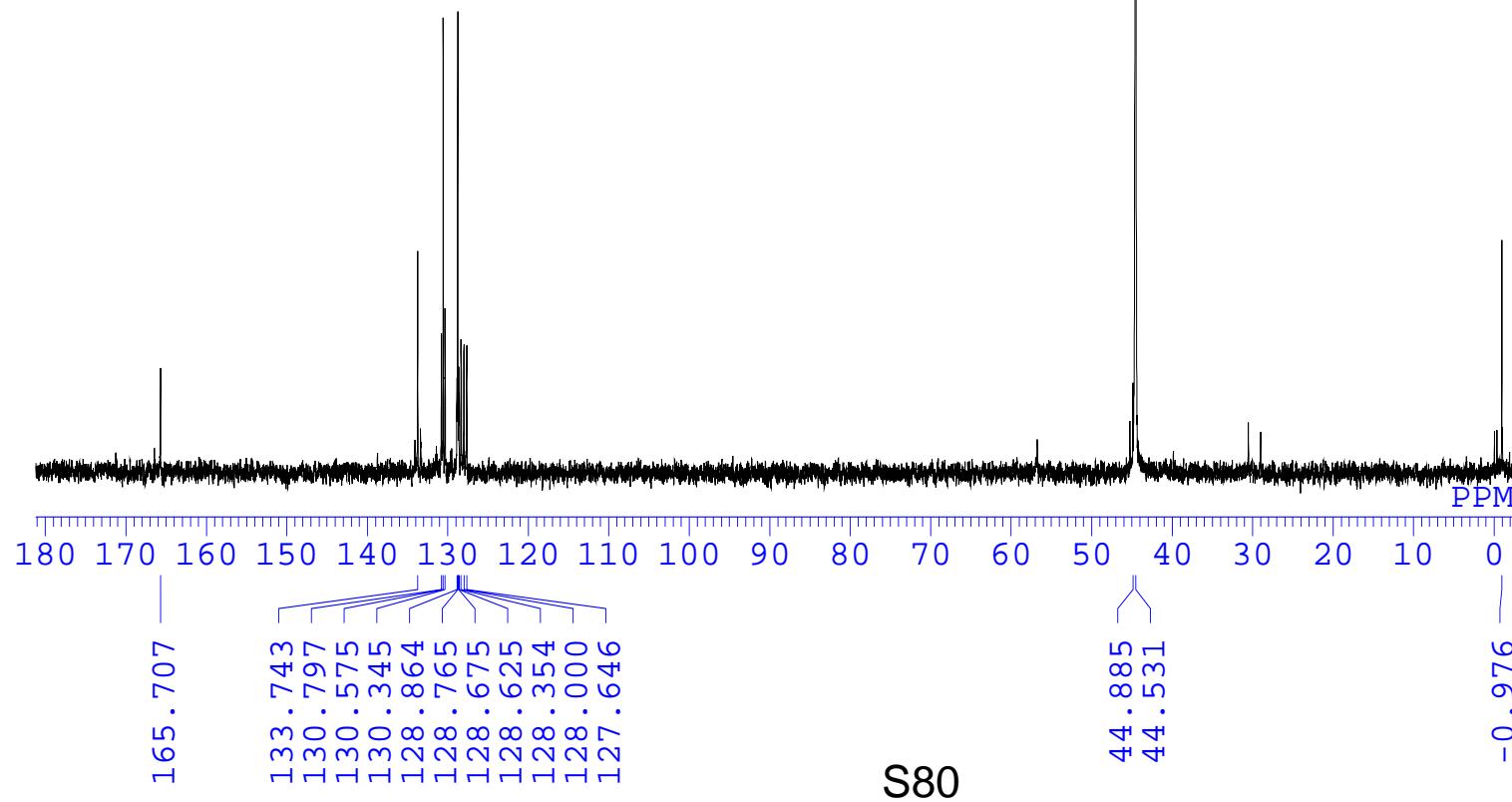


S79

recorded in 1,2-DCE-C<sub>6</sub>D<sub>6</sub> as an ext std

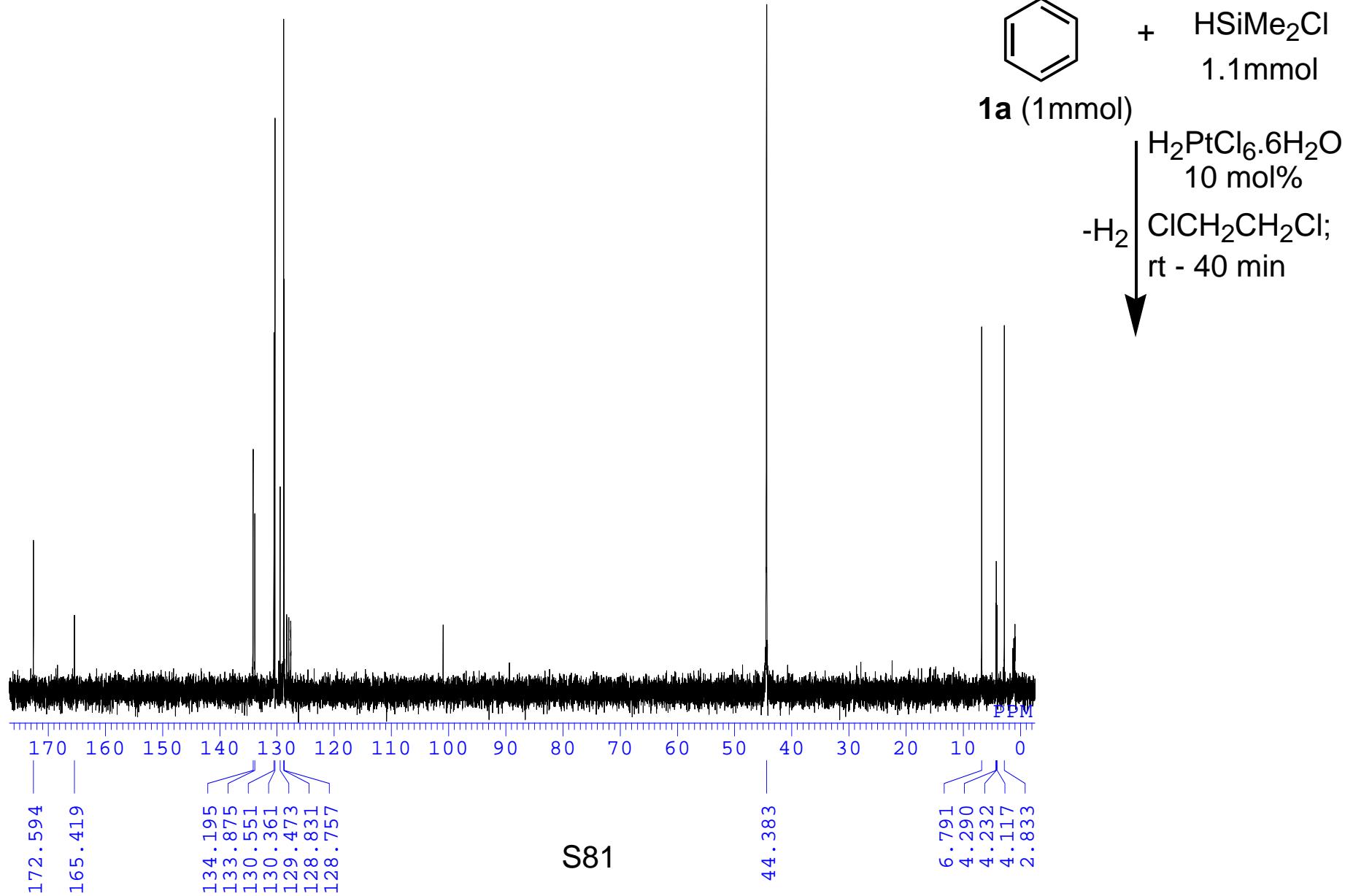


7

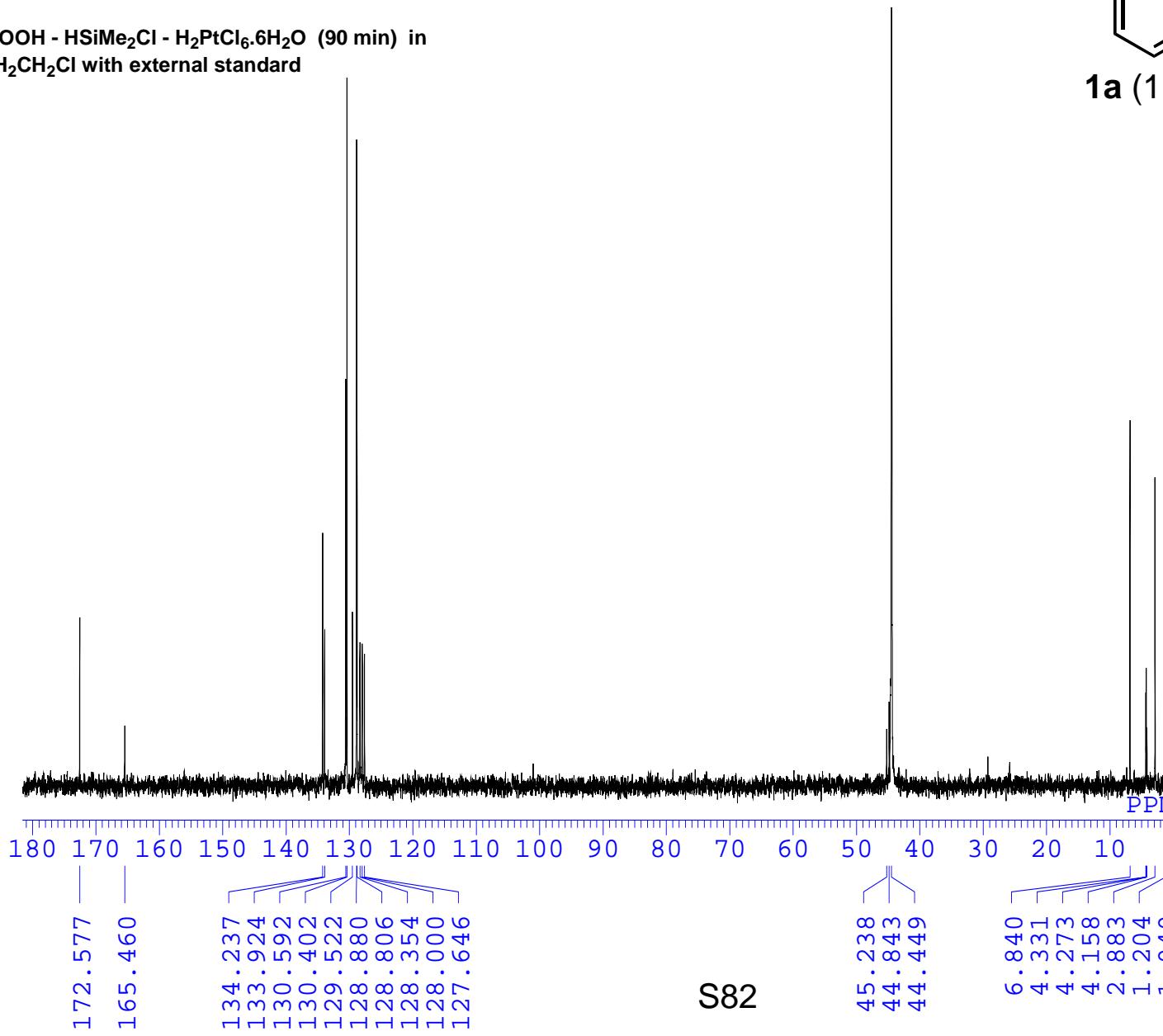


S80

PhCOOH - HSiMe<sub>2</sub>Cl - H<sub>2</sub>PtCl<sub>6</sub>.6H<sub>2</sub>O (40 min) in  
CICH<sub>2</sub>CH<sub>2</sub>Cl with external standard



PhCOOH - HSiMe<sub>2</sub>Cl - H<sub>2</sub>PtCl<sub>6</sub>.6H<sub>2</sub>O (90 min) in  
CICH<sub>2</sub>CH<sub>2</sub>Cl with external standard



S82