

Supporting Information for

**Ruthenium(III)-Catalyzed  $\beta$ -Alkylation of Secondary Alcohols with  
Primary Alcohols**

Qingfu Wang,<sup>†</sup> Kaikai Wu,<sup>†</sup> and Zhengkun Yu<sup>\*,†,‡</sup>

<sup>†</sup>Dalian Institute of Chemical Physics, Chinese Academy of Sciences, 457 Zhongshan Road, Dalian, Liaoning 116023, China; <sup>‡</sup>State Key Laboratory of Organometallic Chemistry, Shanghai Institute of Organic Chemistry, Chinese Academy of Sciences, 354 Fenglin Road, Shanghai 200032, China

zkyu@dicp.ac.cn

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## 1. General considerations

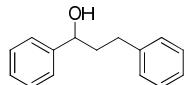
The spectroscopic features of known compounds **4a**,<sup>1</sup> **4b**,<sup>2</sup> **4c-4e**,<sup>1</sup> **4f**,<sup>3</sup> **4g**,<sup>4</sup> **4h-4j**,<sup>1</sup> **4k**,<sup>5</sup> **4l**,<sup>6</sup> **4m**,<sup>1</sup> **4n**,<sup>7</sup> **4o**,<sup>8</sup> **4p**,<sup>9</sup> **4q**,<sup>10</sup> **4r**,<sup>1</sup> **5j**,<sup>11</sup> **6a**,<sup>9</sup> **6b**,<sup>12</sup> **6c**,<sup>13</sup> **6d**,<sup>4</sup> **6e** and **6f**,<sup>14</sup> **6g** and **6h**,<sup>1</sup> **6i**,<sup>15</sup> **6j**,<sup>9</sup> **6k**,<sup>4</sup> **6l**,<sup>16</sup> and **8a**<sup>17</sup> are in good agreement with those reported in the literatures.

## References

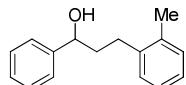
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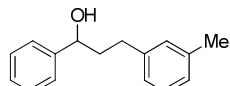
## 2. Analytical data



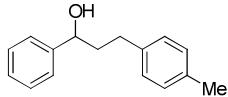
**1,3-Diphenylpropan-1-ol (4a):**<sup>1</sup> White solid. <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) δ 7.40 and 7.29 (m each, 7:3 H, aromatic CH), 4.72 (q, 1H, OCH), 2.80 and 2.15 (m each, 2:2 H, 2×CH<sub>2</sub>), 2.41 (s, 1H, OH). <sup>13</sup>C{<sup>1</sup>H} NMR (100 MHz, CDCl<sub>3</sub>) δ 144.6 and 141.8 (Cq each), 128.53, 128.50, 128.4, 127.6, 126.0 and 125.9 (aromatic CH), 73.8 (CHOH), 40.5 and 32.1 (CH<sub>2</sub>CH<sub>2</sub>).



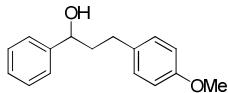
**1-Phenyl-3-o-tolylpropan-1-ol (4b):**<sup>2</sup> White solid. <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) δ 7.42, 7.35 and 7.19 (m each, 4:1:4 H, aromatic CH), 4.75 (q, 1H, OCH), 2.80, 2.68 and 2.08 (m each, 1:1:2 H, 2×CH<sub>2</sub>), 2.33 (s, 3H, CH<sub>3</sub>), 2.26 (br, 1H, OH). <sup>13</sup>C{<sup>1</sup>H} NMR (100 MHz, CDCl<sub>3</sub>) δ 144.6, 140.1 and 136.0 (Cq each), 130.3, 128.8, 128.6, 127.7, 126.05, 126.03 and 126.00 (aromatic CH), 74.2 (CHOH), 39.3 and 29.5 (CH<sub>2</sub>CH<sub>2</sub>), 19.3 (CH<sub>3</sub>).



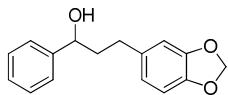
**1-Phenyl-3-m-tolylpropan-1-ol (4c):**<sup>1</sup> White solid. <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) δ 7.39, 7.32, 7.22 and 7.05 (m each, 4:1:1:3 H, aromatic CH), 4.71 (q, 1H, OCH), 2.70, and 2.10 (m each, 2:3 H, 2×CH<sub>2</sub> and OH), 2.38 (s, 3H, CH<sub>3</sub>). <sup>13</sup>C{<sup>1</sup>H} NMR (100 MHz, CDCl<sub>3</sub>) δ 144.7, 141.8 and 138.0 (Cq each), 129.3, 128.6, 128.4, 127.7, 126.7, 126.0 and 125.5 (aromatic CH), 74.0 (CHOH), 40.6 and 32.0 (CH<sub>2</sub>CH<sub>2</sub>), 21.5 (CH<sub>3</sub>).



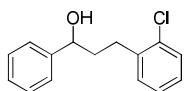
**1-Phenyl-3-p-tolylpropan-1-ol (4d):**<sup>1</sup> White solid. <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) δ 7.37, 7.30 and 7.10 (m each, 4:1:4 H, aromatic CH), 4.69 (q, 1H, OCH), 2.68 and 2.10 (m each, 2:2 H, 2×CH<sub>2</sub>), 2.34 (s, 3H, CH<sub>3</sub>), 1.90 (br, 1H, OH). <sup>13</sup>C{<sup>1</sup>H} NMR (100 MHz, CDCl<sub>3</sub>) δ 144.7, 138.8 and 135.4 (Cq each), 129.2, 128.6, 128.4, 127.7 and 126.1 (aromatic CH), 74.0 (CHOH), 40.7 and 31.7 (CH<sub>2</sub>CH<sub>2</sub>), 21.1 (CH<sub>3</sub>).



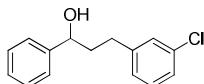
**3-(4-Methoxyphenyl)-1-phenylpropan-1-ol (4e):**<sup>1</sup> White solid. <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) δ 7.36 and 7.31 (m each, 4:1 H, aromatic CH), 7.14 and 6.86 (d each, J = 8.48 and 8.52 Hz, 2:2 H, aromatic CH), 4.67 (q, 1H, OCH), 3.80 (s, 3H, OCH<sub>3</sub>), 2.65 and 2.10 (m each, 2:2 H, 2×CH<sub>2</sub>), 2.22 (br, 1H, OH). <sup>13</sup>C{<sup>1</sup>H} NMR (100 MHz, CDCl<sub>3</sub>) δ 157.8, 144.7 and 133.9 (Cq each), 129.4, 128.5, 127.6, 126.0 and 113.9 (aromatic CH), 73.8 (CHOH), 55.3 (OCH<sub>3</sub>), 40.8 and 31.2 (CH<sub>2</sub>CH<sub>2</sub>).



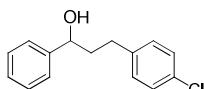
**3-(Benzo[d][1,3]dioxol-5-yl)-1-phenylpropan-1-ol (4f):**<sup>3</sup> White solid. <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) δ 7.38, and 6.72 (m each, 5:3 H, aromatic CH), 5.94 (s, 2H, OCH<sub>2</sub>O), 4.68 (q, 1H, OCH), 2.66 and 2.05 (m each, 2:2 H, 2×CH<sub>2</sub>), 2.22 (br, 1H, OH). <sup>13</sup>C{<sup>1</sup>H} NMR (100 MHz, CDCl<sub>3</sub>) δ 147.6, 145.6, 144.6 and 135.7 (Cq each), 128.6, 127.7, 126.0, 121.2, 109.0, and 108.2 (aromatic CH), 100.8 (OCH<sub>2</sub>O), 73.7 (CHOH), 40.8 and 31.8 (CH<sub>2</sub>CH<sub>2</sub>).



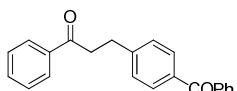
**3-(2-Chlorophenyl)-1-phenylpropan-1-ol (4g):**<sup>4</sup> White solid. <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) δ 7.41, 7.36 and 7.23 (m each, 5:1:3 H, aromatic CH), 4.74 (q, 1H, OCH), 2.94, 2.84 and 2.12 (m each, 1:1:2 H, 2×CH<sub>2</sub>), 2.46 (br, 1H, OH). <sup>13</sup>C{<sup>1</sup>H} NMR (100 MHz, CDCl<sub>3</sub>) δ 144.4, 139.5 and 134.0 (Cq each), 130.5, 129.5, 128.5, 127.7, 127.4, 126.8 and 126.0 (aromatic CH), 74.0 (CHOH), 38.7 and 30.1 (CH<sub>2</sub>CH<sub>2</sub>).



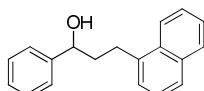
**3-(3-Chlorophenyl)-1-phenylpropan-1-ol (4h):**<sup>1</sup> White solid. <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) δ 7.38, 7.24 and 7.11 (m each, 5:3:1 H, aromatic CH), 4.67 (q, 1H, OCH), 2.70, and 2.10 (m each, 2:2 H, 2×CH<sub>2</sub>), 2.59 (br, 1H, OH). <sup>13</sup>C{<sup>1</sup>H} NMR (100 MHz, CDCl<sub>3</sub>) δ 144.4, 143.9 and 134.1 (Cq each), 129.6, 128.61, 128.57, 127.7, 127.0, 126.1 and 126.0 (aromatic CH), 73.6 (CHOH), 40.1 and 31.7 (CH<sub>2</sub>CH<sub>2</sub>).



**3-(4-Chlorophenyl)-1-phenylpropan-1-ol (4i):**<sup>1</sup> White solid. <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) δ 7.38 (m, 5 H, aromatic CH), 7.29 and 7.16 (d each, *J* = 8.44 and 8.28 Hz, 2:2 H, aromatic CH), 4.69 (q, 1H, OCH), 2.70, and 2.05 (m each, 2:2 H, 2×CH<sub>2</sub>), 1.94 (br, 1H, OH). <sup>13</sup>C{<sup>1</sup>H} NMR (100 MHz, CDCl<sub>3</sub>) δ 144.5, 140.3 and 131.7 (Cq each), 129.9, 128.7, 128.6, 127.9, and 126.0 (aromatic CH), 73.8 (CHOH), 40.4 and 31.5 (CH<sub>2</sub>CH<sub>2</sub>).

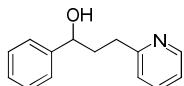


**3-(4-Benzoylphenyl)-1-phenylpropan-1-one (5j):**<sup>11</sup> White solid. <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) δ 7.98, 7.85, 7.78 and 7.59 (m each, 2:2:2:2 H, aromatic CH), 7.49 (m, 4 H, aromatic CH), 7.16 (t, *J* = 8.60 Hz, 2 H, aromatic CH), 3.93 and 3.46 (t each, *J* = 6.80 Hz, 2:2 H, 2×CH<sub>2</sub>). <sup>13</sup>C{<sup>1</sup>H} NMR (100 MHz, CDCl<sub>3</sub>) δ 196.5 and 191.3 (Cq, C=O), 143.3, 138.0, 134.9 and 132.2 (Cq each), 134.0, 130.4, 130.0, 129.04, 128.98, 128.93 and 128.3 (aromatic CH), 31.1 and 21.7 (CH<sub>2</sub>CH<sub>2</sub>).

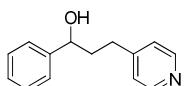


**3-(Naphthalen-1-yl)-1-phenylpropan-1-ol (4k):**<sup>1</sup> White solid. <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) δ 8.01, 7.88, 7.50 and 7.40 (m each, 1:1:2:7 H, aromatic CH), 7.75 (d, *J* = 8.08 Hz, 2 H, aromatic CH) 4.80 (q, 1H, OCH), 3.26, 3.15 and 2.20 (m each, 1:1:2 H, 2×CH<sub>2</sub>), 2.06 (s, 1H, OH). <sup>13</sup>C{<sup>1</sup>H} NMR (100 MHz, CDCl<sub>3</sub>) δ 144.6, 138.1, 134.0,

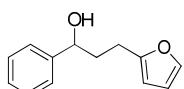
and 131.9 (Cq each), 128.9, 128.6, 127.8, 126.8, 126.1, 125.9, 125.6, 125.5, 123.9 and 115.0 (aromatic CH), 74.3 (CHOH), 39.9 and 29.2 (CH<sub>2</sub>CH<sub>2</sub>).



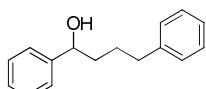
**1-Phenyl-3-(pyridin-2-yl)propan-1-ol (4l):**<sup>5</sup> White solid. <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) δ 8.47, 7.42 and 7.18 (d each, 1:2:1 H, aromatic CH), 7.60 and 7.12 (m each, 1:1 H, aromatic CH), 7.34 and 7.26 (t each, 2:1 H, aromatic CH), 5.43 (br, 1H, OH), 4.82 (q, 1H, OCH), 2.98 and 2.21 (m each, 2:2 H, 2×CH<sub>2</sub>). <sup>13</sup>C{<sup>1</sup>H} NMR (100 MHz, CDCl<sub>3</sub>) δ 144.6 and 141.8 (Cq each), 128.53, 128.50, 128.4, 127.6, 126.0 and 125.9 (aromatic CH), 73.8 (CHOH), 40.5 and 32.1 (CH<sub>2</sub>CH<sub>2</sub>).



**1-Phenyl-3-(pyridin-4-yl)propan-1-ol (4m):**<sup>6</sup> White solid. <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) δ 8.14 and 6.93 (d each, *J* = 6.0 Hz, 2:2 H, aromatic CH), 7.20 and 7.12 (m each, 4:1 H, aromatic CH), 4.88 (br, 1H, OH), 4.53 (m, 1H, OCH), 2.55 and 1.90 (m each, 2:2 H, 2×CH<sub>2</sub>). <sup>13</sup>C{<sup>1</sup>H} NMR (100 MHz, CDCl<sub>3</sub>) δ 151.6 and 144.9 (Cq each), 149.0, 128.4, 127.4, 125.9, and 124.0 (aromatic CH), 72.9 (CHOH), 39.4 and 31.3 (CH<sub>2</sub>CH<sub>2</sub>).

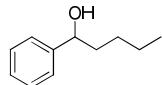


**3-(Furan-2-yl)-1-phenylpropan-1-ol (4n):**<sup>1</sup> White solid. <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) δ 7.39 and 6.36 (m each, 6:1 H, aromatic CH), 6.06 (d, *J* = 2.5 Hz, 1H, aromatic CH), 4.71 (m, 1H, OCH), 2.76 and 2.12 (m each, 2:2 H, 2×CH<sub>2</sub>), 2.56 (br, 1H, OH). <sup>13</sup>C{<sup>1</sup>H} NMR (100 MHz, CDCl<sub>3</sub>) δ 155.6 and 144.4 (Cq each), 141.0, 128.5, 127.6, 126.0, 110.2 and 105.0 (aromatic CH), 73.6 (CHOH), 37.1 and 24.4 (CH<sub>2</sub>CH<sub>2</sub>).

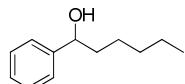


**1,4-Diphenylbutan-1-ol (4o):**<sup>7</sup> Colorless oil. <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) δ 7.16 and 7.02 (m each, 7:3 H, aromatic CH), 4.48 (q, 1H, OCH), 2.50 (t, *J* = 7.2 Hz, 1H,

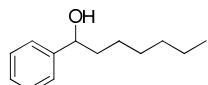
aromatic CH), 2.09 (br, 1H, OH), 1.06 (m, 4H,  $2 \times$ CH<sub>2</sub>). <sup>13</sup>C{<sup>1</sup>H} NMR (100 MHz, CDCl<sub>3</sub>) δ 144.8, and 142.3 (Cq each), 128.5, 128.3, 127.5, 126.0, and 125.8 (aromatic CH), 74.5 (CHOH), 38.6, 35.8 and 27.6 (CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>).



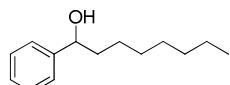
**1-Phenylpentan-1-ol (4p):**<sup>8</sup> Colorless oil. <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) δ 7.38 (m, 5H, aromatic CH), 4.68 (t, 1H, OCH), 2.00 (br, 1H, OH), 1.80 and 1.38 (m each, 2:4 H,  $3 \times$ CH<sub>2</sub>), 0.93 (t, *J* = 7.0 Hz, 3H, CH<sub>3</sub>). <sup>13</sup>C{<sup>1</sup>H} NMR (100 MHz, CDCl<sub>3</sub>) δ 145.1 (Cq), 128.5, 127.6, and 126.0 (aromatic CH), 74.8 (CHOH), 38.9, 28.1, and 22.7 (CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>), 14.1 (CH<sub>3</sub>).



**1-Phenylhexan-1-ol (4q):**<sup>9</sup> Colorless oil. <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) δ 7.38 and 7.30 (m each, 4:1 H, aromatic CH), 4.67 (t, 1H, OCH), 2.14 (br, 1H, OH), 1.76 and 1.34 (m each, 2:6 H,  $4 \times$ CH<sub>2</sub>), 0.93 (t, *J* = 6.4 Hz, 3H, CH<sub>3</sub>). <sup>13</sup>C{<sup>1</sup>H} NMR (100 MHz, CDCl<sub>3</sub>) δ 145.1 (Cq), 128.5, 127.5, and 126.0 (aromatic CH), 74.8 (CHOH), 39.2, 31.8, 25.6 and 22.7 (CH<sub>2</sub>(CH<sub>2</sub>)<sub>2</sub>CH<sub>2</sub>), 14.1 (CH<sub>3</sub>).

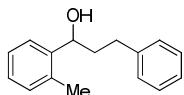


**1-Phenylheptan-1-ol (4r):**<sup>10</sup> Colorless oil. <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) δ 7.36 (m, 5H, aromatic CH), 4.66 (q, 1H, OCH), 2.25 (s, 1H, OH), 1.79 and 1.32 (m each, 2:8 H,  $5 \times$ CH<sub>2</sub>), 0.93 (t, *J* = 6.8 Hz, 3H, CH<sub>3</sub>). <sup>13</sup>C{<sup>1</sup>H} NMR (100 MHz, CDCl<sub>3</sub>) δ 145.1 (Cq), 128.4, 127.5, and 126.0 (aromatic CH), 74.7 (CHOH), 39.2, 31.9, 29.3, 25.9 and 22.7 (CH<sub>2</sub>(CH<sub>2</sub>)<sub>3</sub>CH<sub>2</sub>), 14.2 (CH<sub>3</sub>).

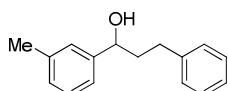


**1-Phenyloctan-1-ol (4s):**<sup>1</sup> Colorless oil. <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) δ 7.37 and 7.30 (m each, 4:1 H, aromatic CH), 4.67 (q, 1H, OCH), 2.10 (br, 1H, OH), 1.80 and 1.32 (m each, 2:10 H,  $5 \times$ CH<sub>2</sub>), 0.92 (t, *J* = 6.8 Hz, 3H, CH<sub>3</sub>). <sup>13</sup>C{<sup>1</sup>H} NMR (100

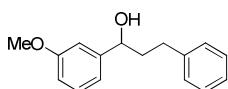
MHz, CDCl<sub>3</sub>) δ 145.1 (Cq), 128.5, 127.5, and 126.0 (aromatic CH), 74.8 (CHOH), 39.2, 31.9, 29.6, 29.3, 26.0 and 22.8 (CH<sub>2</sub>(CH<sub>2</sub>)<sub>4</sub>CH<sub>2</sub>), 14.2 (CH<sub>3</sub>).



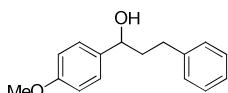
**3-Phenyl-1-*o*-tolylpropan-1-ol (6a):**<sup>9</sup> White solid. <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) δ 7.56 and 7.19 (d each, *J* = 7.5 Hz and 7.2 Hz, 1:1 H, aromatic CH), 7.36 and 7.26 (m each, 2:5 H, aromatic CH), 4.97 (q, 1H, OCH), 2.82 and 2.08 (m each, 2:2 H, 2 × CH<sub>2</sub>), 2.30 (s, 3H, CH<sub>3</sub>), 1.97 (br, 1H, OH). <sup>13</sup>C{<sup>1</sup>H} NMR (100 MHz, CDCl<sub>3</sub>) δ 142.8, 141.9 and 134.5 (Cq each), 130.5, 128.6, 128.5, 127.3, 126.4, 126.0 and 125.2 (aromatic CH), 70.0 (CHOH), 39.5 and 32.4 (CH<sub>2</sub>CH<sub>2</sub>), 19.0 (CH<sub>3</sub>).



**3-Phenyl-1-*m*-tolylpropan-1-ol (6b):**<sup>12</sup> White solid. <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) δ 7.40, 7.34, 7.22 and 7.06 (m each, 4:1:1:3 H, aromatic CH), 4.71 (q, 1H, OCH), 2.70 and 2.15 (m each, 2:3 H, 2 × CH<sub>2</sub> and OH), 2.38 (s, 3H, CH<sub>3</sub>). <sup>13</sup>C{<sup>1</sup>H} NMR (100 MHz, CDCl<sub>3</sub>) δ 144.7, 141.8 and 138.0 (Cq each), 129.3, 128.6, 128.4, 127.7, 126.7, 126.0 and 125.5 (aromatic CH), 74.0 (CHOH), 40.6 and 32.0 (CH<sub>2</sub>CH<sub>2</sub>), 21.5 (CH<sub>3</sub>).

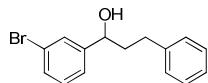


**1-(3-Methoxyphenyl)-3-phenylpropan-1-ol (6c):**<sup>13</sup> White solid. <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) δ 7.35, 7.28, 7.00 and 6.90 (m each, 3:3:2:1 H, aromatic CH), 4.69 (q, 1H, OCH), 3.85 (s, 3H, OCH<sub>3</sub>), 2.80 and 2.15 (m each, 2:2 H, 2 × CH<sub>2</sub>), 2.48 (br, 1H, OH). <sup>13</sup>C{<sup>1</sup>H} NMR (100 MHz, CDCl<sub>3</sub>) δ 159.8, 146.4 and 141.9 (Cq each), 129.5, 128.5, 128.4, 125.9, 118.3, 113.0 and 111.5 (aromatic CH), 73.7 (CHOH), 55.2 (OCH<sub>3</sub>), 40.4 and 32.0 (CH<sub>2</sub>CH<sub>2</sub>).

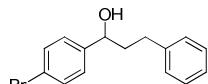


**1-(4-Methoxyphenyl)-3-phenylpropan-1-ol (6d):**<sup>4</sup> White solid. <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) δ 7.18 and 7.08 (m each, 4:3 H, aromatic CH), 6.80 (d, *J* = 8.5 Hz,

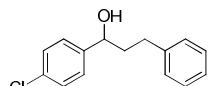
2H, aromatic CH), 4.53 (q, 1H, OCH), 2.26 (s, 3H, OCH<sub>3</sub>), 2.58 and 1.94 (m each, 2:2 H, 2×CH<sub>2</sub>), 1.80 (br, 1H, OH). <sup>13</sup>C{<sup>1</sup>H} NMR (100 MHz, CDCl<sub>3</sub>) δ 159.3, 142.0 and 136.9 (Cq each), 128.6, 128.5, 127.3, 125.9, and 114.0 (aromatic CH), 73.6 (CHOH), 55.4 (OCH<sub>3</sub>), 40.5 and 32.2 (CH<sub>2</sub>CH<sub>2</sub>).



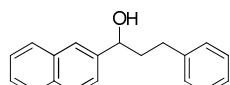
**1-(3-Bromophenyl)-3-phenylpropan-1-ol (6e):**<sup>14</sup> White solid. <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) δ 7.38, 7.27, 7.17 and 7.07 (m each, 1:1:3:4 H, aromatic CH), 4.50 (q, 1H, OCH), 2.60 and 1.90 (m each, 2:2 H, 2×CH<sub>2</sub>), 2.13 (br, 1H, OH). <sup>13</sup>C{<sup>1</sup>H} NMR (100 MHz, CDCl<sub>3</sub>) δ 147.1, 141.5 and 122.7 (Cq each), 130.7, 130.2, 129.1, 128.54, 128.51, 126.51 and 124.6 (aromatic CH), 73.2 (CHOH), 40.5 and 32.0 (CH<sub>2</sub>CH<sub>2</sub>).



**1-(4-Bromophenyl)-3-phenylpropan-1-ol (6f):**<sup>14</sup> White solid. <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) δ 7.66 and 7.48 (d each, *J* = 8.1 Hz, 2:2 H, aromatic CH), 7.35 and 7.25 (m each, 2:3 H, aromatic CH), 4.69 (q, 1H, OCH), 2.74 and 2.06 (m each, 2:3 H, 2×CH<sub>2</sub> and OH). <sup>13</sup>C{<sup>1</sup>H} NMR (100 MHz, CDCl<sub>3</sub>) δ 143.1, 141.6 and 133.3 (Cq each), 128.7, 128.6, 128.5, 127.4, and 126.1 (aromatic CH), 73.2 (CHOH), 40.6 and 32.0 (CH<sub>2</sub>CH<sub>2</sub>).

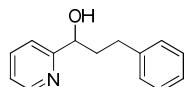


**1-(4-Chlorophenyl)-3-phenylpropan-1-ol (6g):**<sup>1</sup> White solid. <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) δ 7.33 and 7.23 (m each, 6:3 H, aromatic CH), 4.69 (q, 1H, OCH), 2.74 and 2.06 (m each, 2:3 H, 2×CH<sub>2</sub> and OH). <sup>13</sup>C{<sup>1</sup>H} NMR (100 MHz, CDCl<sub>3</sub>) δ 143.1, 141.6 and 133.3 (Cq each), 128.7, 128.6, 128.5, 127.4, and 126.1 (aromatic CH), 73.2 (CHOH), 40.6 and 32.0 (CH<sub>2</sub>CH<sub>2</sub>).

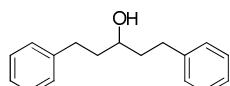


**1-(Naphthalen-2-yl)-3-phenylpropan-1-ol (6h):**<sup>1</sup> White solid. <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) δ 7.90, 7.55 and 7.28 (m each, 3:3:3 H, aromatic CH), 7.82 (s, 1H,

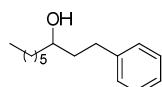
aromatic CH), 7.36 (t,  $J = 7.2$  Hz, 1H, aromatic CH), 4.88 (q, 1H, OCH), 2.80 and 2.20 (m each, 2:3 H,  $2 \times \text{CH}_2$  and OH).  $^{13}\text{C}\{\text{H}\}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  142.0, 141.8, 133.4 and 133.1 (Cq each), 128.6, 128.5, 128.4, 128.0, 127.8, 126.3, 125.97, 125.96, 124.8 and 124.2 (aromatic CH), 74.0 (CHOH), 40.4 and 32.1 ( $\text{CH}_2\text{CH}_2$ ).



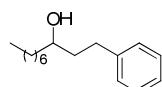
**3-Phenyl-1-(pyridin-2-yl)propan-1-ol (6i):**<sup>15</sup> White solid.  $^1\text{H}$  NMR ( $\text{CDCl}_3$ , 400 MHz)  $\delta$  8.55 (d,  $J = 4.7$  Hz, 1H, aromatic CH), 7.68, 7.30 and 7.22 (m each, 1:3:4 H, aromatic CH), 4.83 (q, 1H, OCH), 2.82 (t,  $J = 7.2$  Hz, 2H,  $\text{CH}_2$ ), 2.20 and 2.06 (m each, 1:1 H,  $\text{CH}_2$ ).  $^{13}\text{C}\{\text{H}\}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  162.3, and 142.0 (Cq each), 148.2, 136.8, 128.5, 128.3, 125.8, 122.3 and 120.3 (aromatic CH), 72.3 (CHOH), 40.2 and 31.7 ( $\text{CH}_2\text{CH}_2$ ).



**1,5-Diphenylpentan-3-ol (6j):**<sup>9</sup> Colorless oil.  $^1\text{H}$  NMR ( $\text{CDCl}_3$ , 400 MHz)  $\delta$  7.30 and 7.20 (m each, 4:6 H, aromatic CH), 3.70 (m, 1H, OCH), 2.82, 2.70 and 1.82 (m each, 2:2:4 H,  $4 \times \text{CH}_2$ ), 1.51 (br, 1H, OH).  $^{13}\text{C}\{\text{H}\}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  142.4 (Cq), 128.56, 128.53 and 126.0 (aromatic CH), 71.0 (CHOH), 39.3 and 32.2 ( $\text{CH}_2\text{CH}_2$ ).

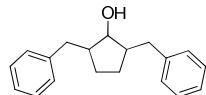


**1-Phenylnonan-3-ol (6k):**<sup>4</sup> Colorless oil.  $^1\text{H}$  NMR ( $\text{CDCl}_3$ , 400 MHz)  $\delta$  7.34 and 7.24 (m each, 2:3 H, aromatic CH), 3.66 (m, 1H, OCH), 2.82, 2.72, 1.80, 1.51 and 1.33 (m each, 1:1:2:4:7 H,  $7 \times \text{CH}_2$  and OH), 0.93 (t, 3H,  $\text{CH}_3$ ).  $^{13}\text{C}\{\text{H}\}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  142.3 (Cq), 128.50, 128.48 and 125.9 (aromatic CH), 71.5 (CHOH), 39.2, 37.7, 32.2, 31.9, 29.4, 25.7 and 22.7 ( $\text{CH}_2$ ), 14.2 ( $\text{CH}_3$ ).



**1-Phenyldecan-3-ol (6l):**<sup>16</sup> Colorless oil.  $^1\text{H}$  NMR ( $\text{CDCl}_3$ , 400 MHz)  $\delta$  7.34 and 7.26 (m each, 2:3 H, aromatic CH), 3.68 (m, 1H, OCH), 2.84, 2.75, 1.82, 1.53 and

1.35 (m each, 1:1:2:3:9 H,  $8 \times \text{CH}_2$ ), 1.76 (br, 1H, OH), 0.95 (t, 3H,  $\text{CH}_3$ ).  $^{13}\text{C}\{\text{H}\}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  142.4 (Cq), 128.50, 128.46 and 125.8 (aromatic CH), 71.4 (CHOH), 39.2, 37.7, 32.2, 31.9, 29.8, 29.4, 25.7 and 22.7 ( $\text{CH}_2$ ), 14.2 ( $\text{CH}_3$ ).

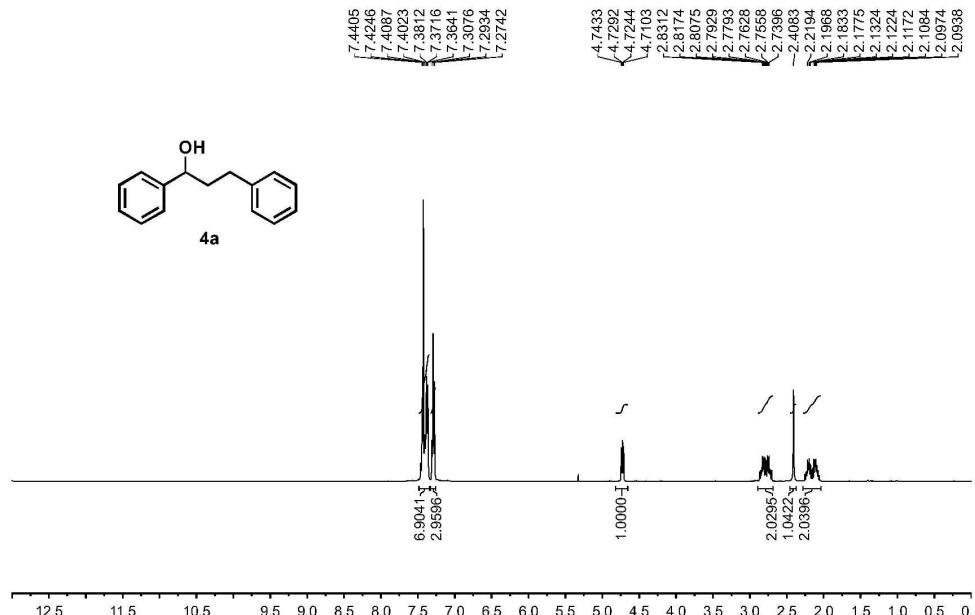


**2,5-Dibenzylcyclopentanol (8a):**<sup>17</sup> White solid.  $^1\text{H}$  NMR ( $\text{CDCl}_3$ , 400 MHz)  $\delta$  7.20 and 7.12 (m each, 4:6 H, aromatic CH), 3.37 (t,  $J = 8.3\text{Hz}$ , 1H, OCH), 2.82 and 2.50 (q each, 2:2 H,  $2 \times \text{CH}_2$ ), 1.97 (m, 2H,  $2 \times \text{CH}$ ), 1.65 and 1.19 (m each, 2:3 H,  $2 \times \text{CH}_2$  and OH).  $^{13}\text{C}\{\text{H}\}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  141.2 (Cq), 129.0, 128.6 and 126.1 (aromatic CH), 83.4 (CHOH), 48.8, 40.2 and 27.3.

### 3. Copies of NMR spectra for known compounds

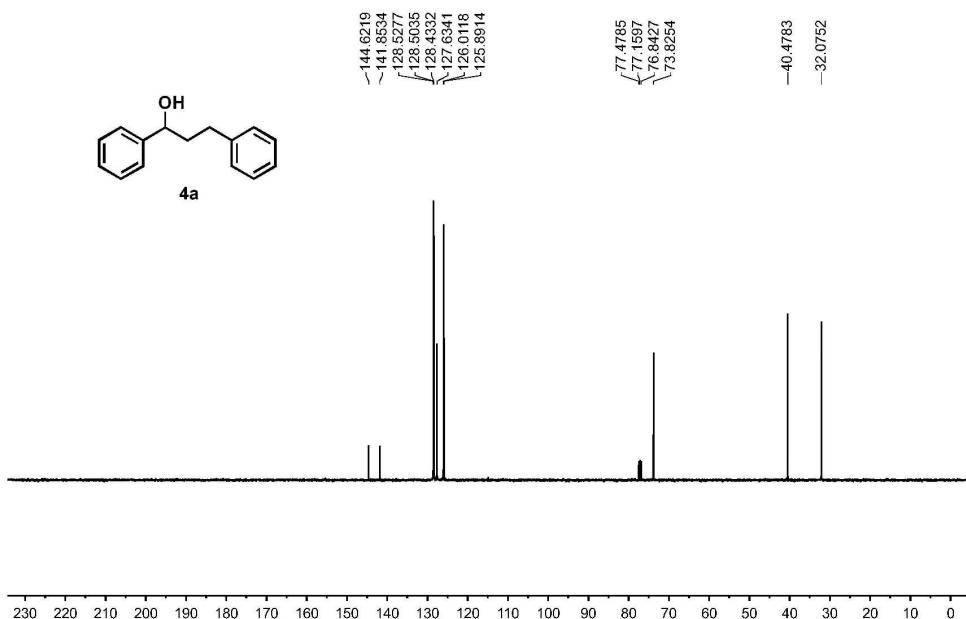
wqf-131

$^1\text{H}$  NMR wqf-131 in  $\text{CDCl}_3$



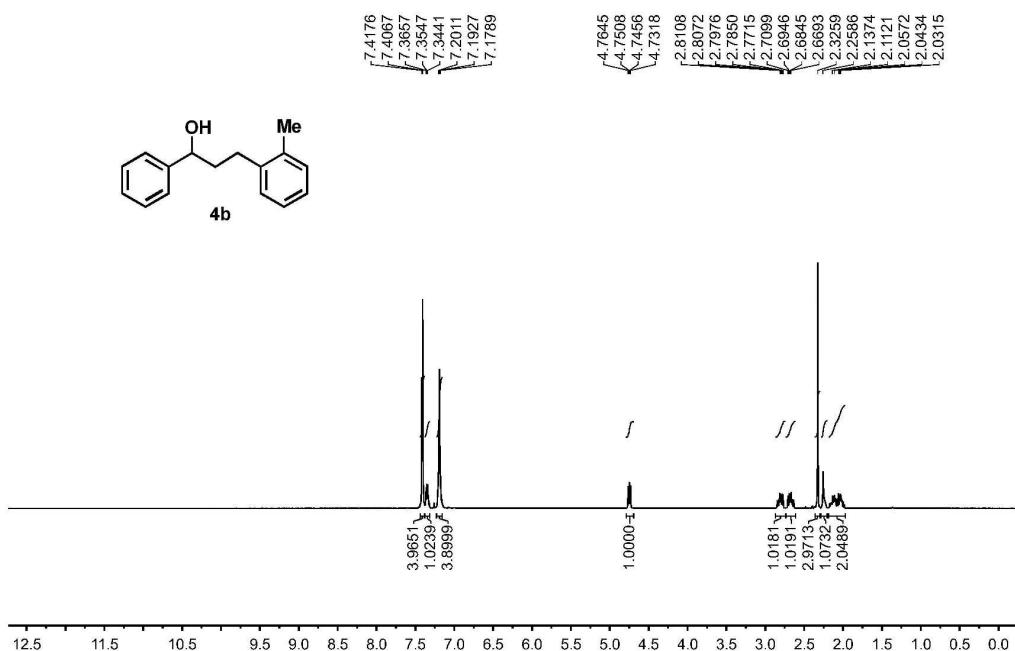
**Figure S1.**  $^1\text{H}$  NMR spectrum of **4a** in  $\text{CDCl}_3$ .

wqf-131  
13C NMR wqf-131 CDCl<sub>3</sub>



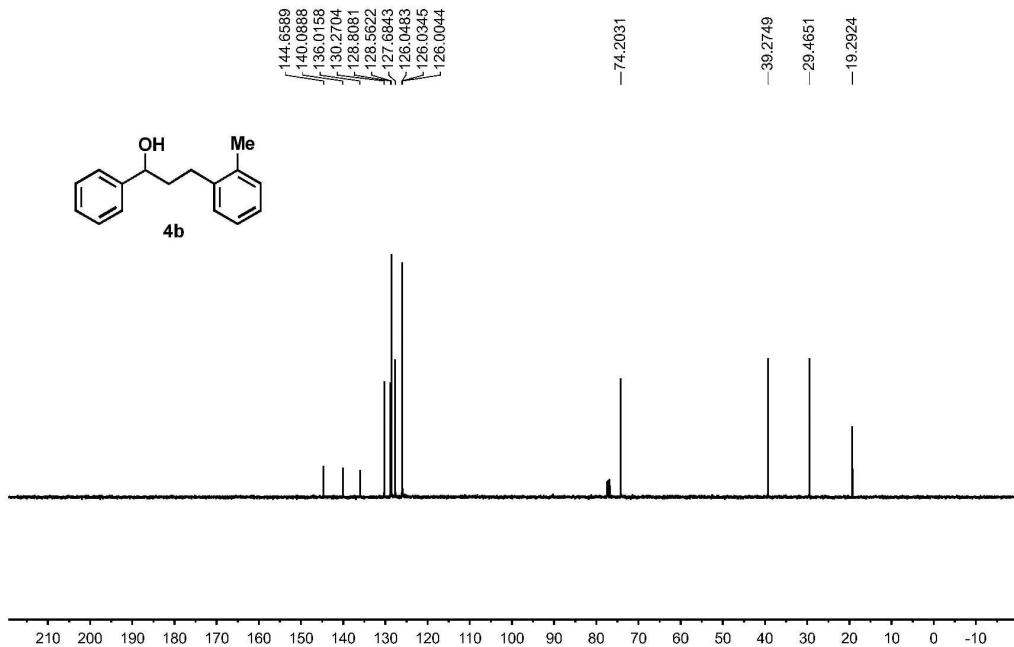
**Figure S2.** <sup>13</sup>C NMR spectrum of **4a** in CDCl<sub>3</sub>.

wqf-095  
1H NMR (wqf-095 in CDCl<sub>3</sub>)



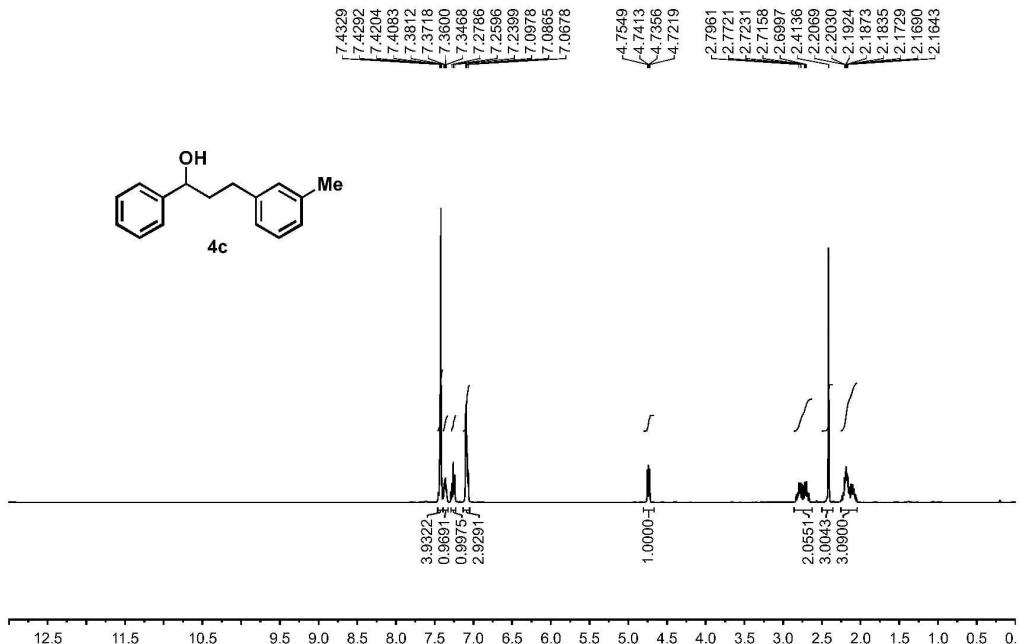
**Figure S3.** <sup>1</sup>H NMR spectrum of **4b** in CDCl<sub>3</sub>.

wqf-095  
13C NMR (wqf-095 in CDCl<sub>3</sub>)



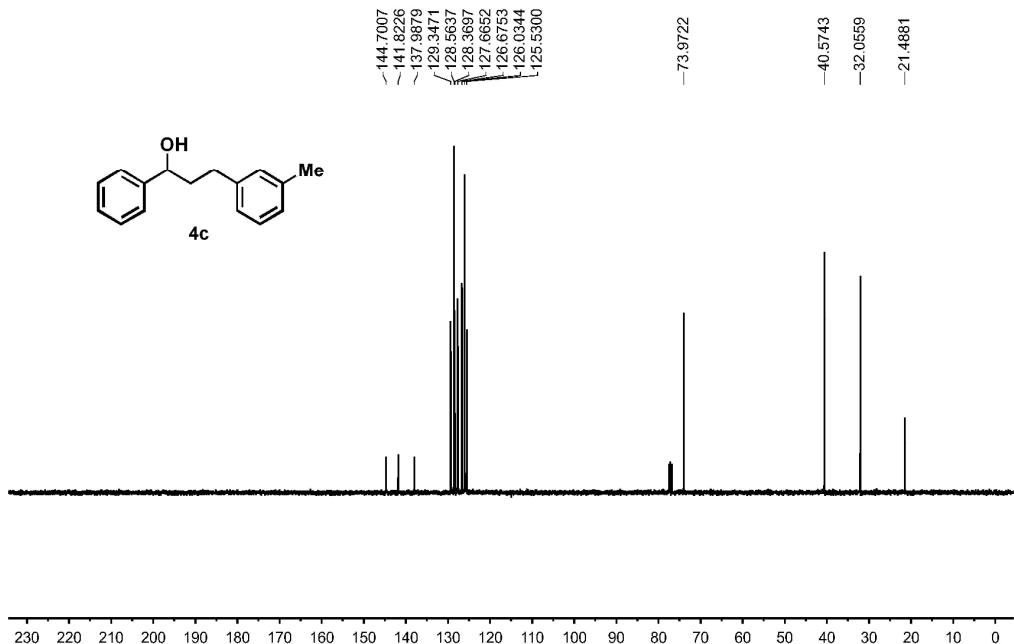
**Figure S4.** <sup>13</sup>C NMR spectrum of **4b** in CDCl<sub>3</sub>.

wqf154  
1H NMR wqf154 in CDCl<sub>3</sub>



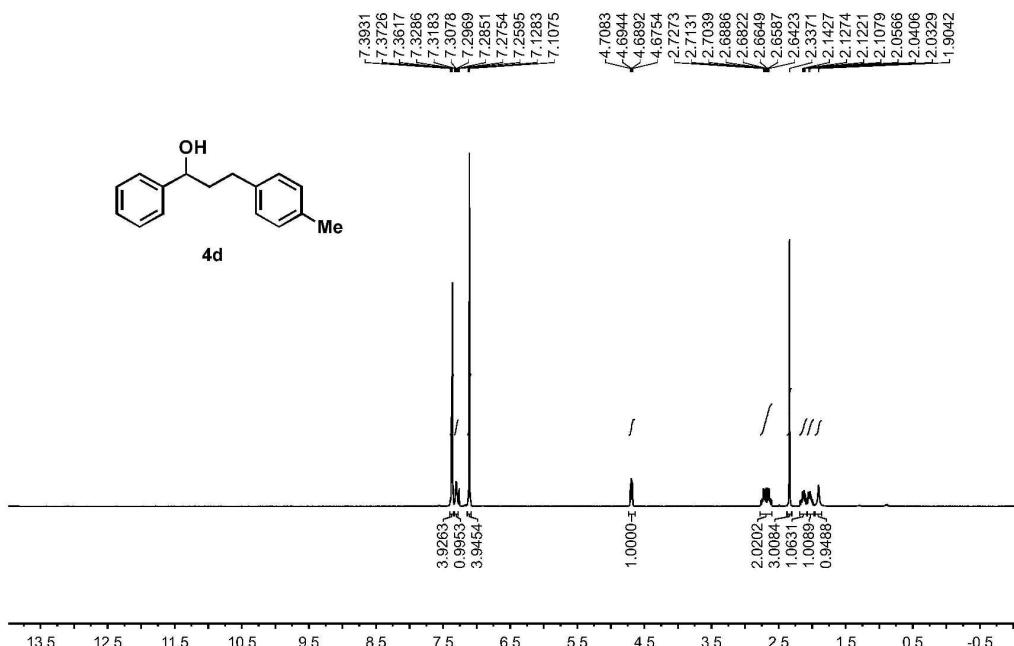
**Figure S5.** <sup>1</sup>H NMR spectrum of **4c** in CDCl<sub>3</sub>.

wqf154  
13C NMR wqf154 CDCl<sub>3</sub>



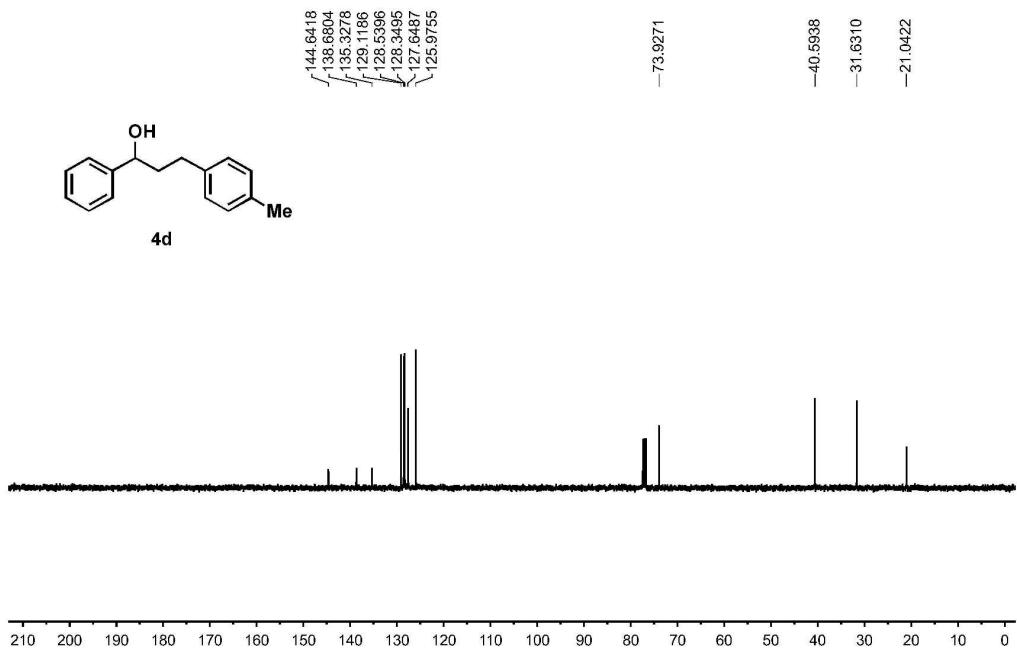
**Figure S6.** <sup>13</sup>C NMR spectrum of **4c** in CDCl<sub>3</sub>.

wqf-094-1  
1H NMR (wqf-094-1 in CDCl<sub>3</sub>)



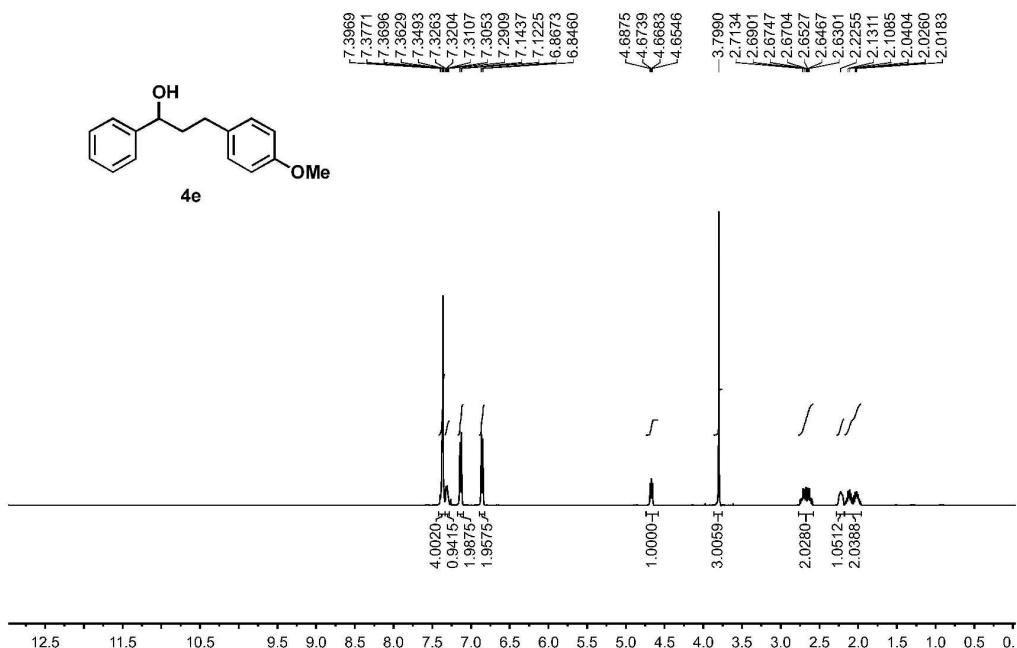
**Figure S7.** <sup>1</sup>H NMR spectrum of **4d** in CDCl<sub>3</sub>.

wqf-094-1  
13C NMR (wqf-094-1 in CDCl<sub>3</sub>)



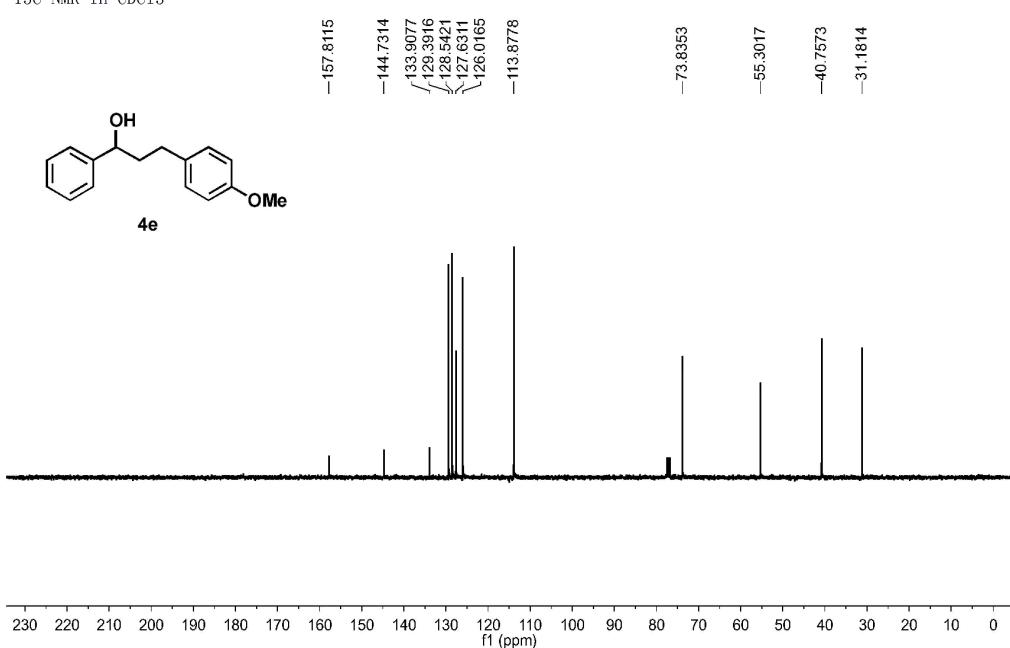
**Figure S8.** <sup>13</sup>C NMR spectrum of **4d** in CDCl<sub>3</sub>.

wqf-135  
1H NMR wqf-135 in CDCl<sub>3</sub>



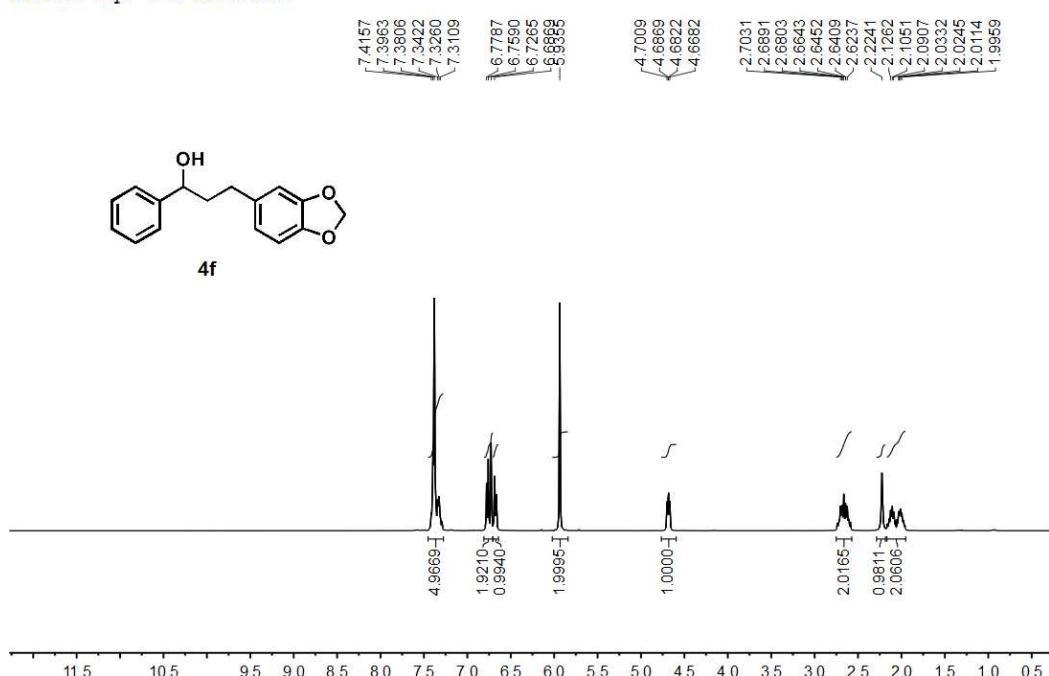
**Figure S9.** <sup>1</sup>H NMR spectrum of **4e** in CDCl<sub>3</sub>.

wqf-135  
13C NMR in CDCl<sub>3</sub>



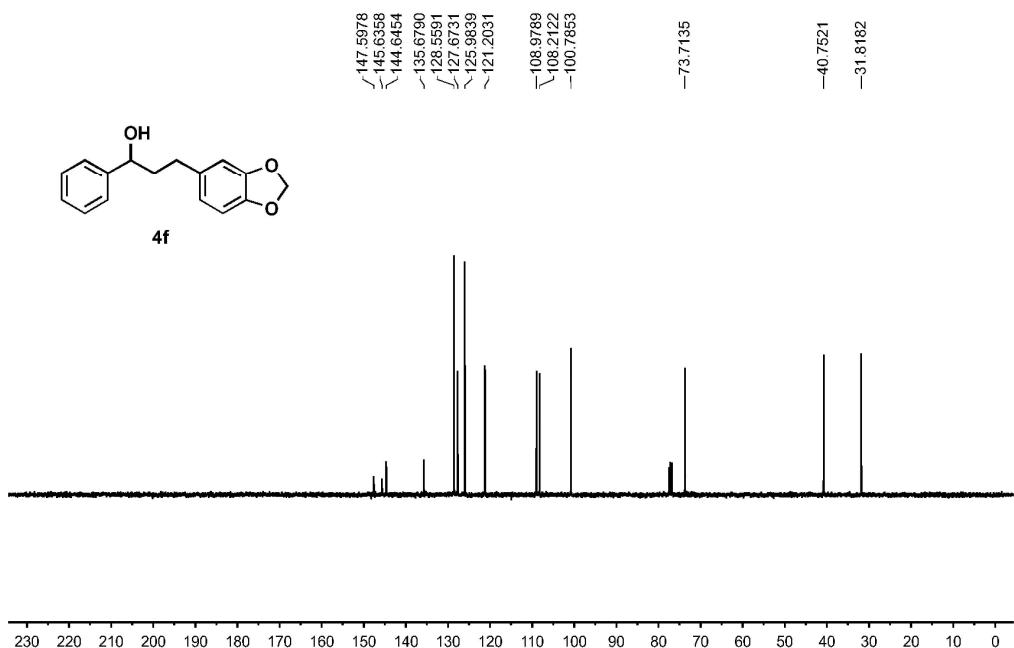
**Figure S10.** <sup>13</sup>C NMR spectrum of **4e** in CDCl<sub>3</sub>.

wqf-142  
1H NMR wqf-142 in CDCl<sub>3</sub>



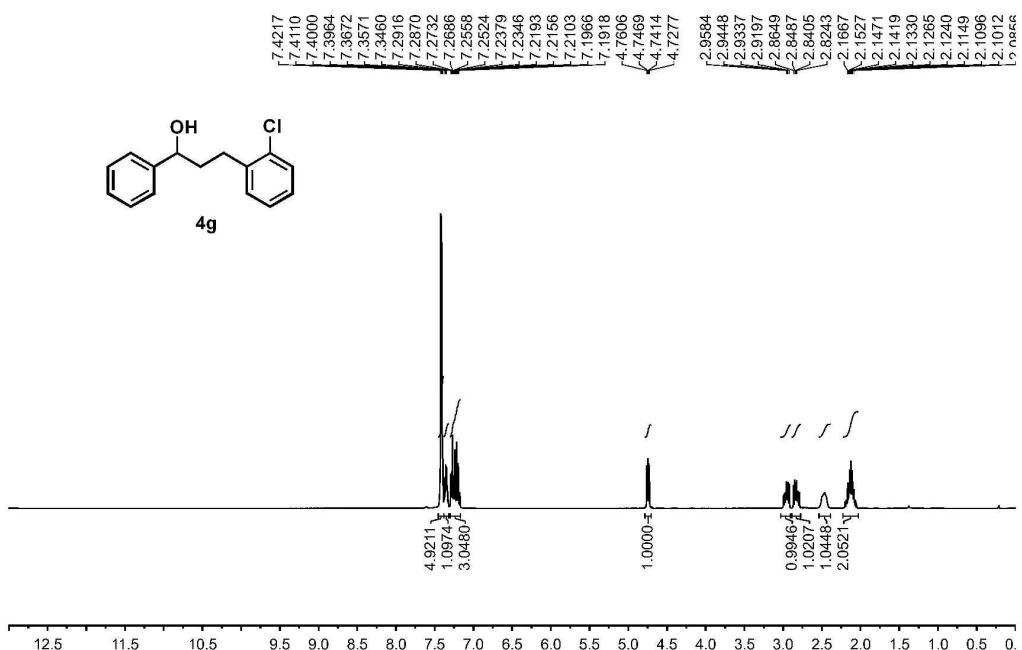
**Figure S11.** <sup>1</sup>H NMR spectrum of **4f** in CDCl<sub>3</sub>.

wqf-142  
13C NMR wqf-142 CDCl<sub>3</sub>



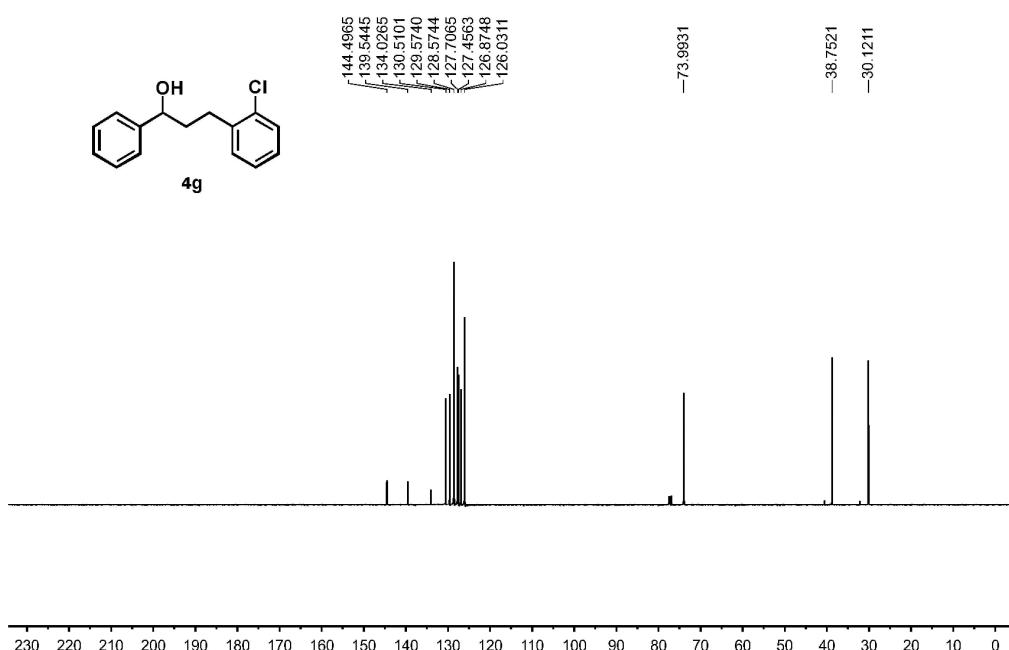
**Figure S12.** <sup>13</sup>C NMR spectrum of **4f** in CDCl<sub>3</sub>.

wqf147  
1H NMR wqf147 in CDCl<sub>3</sub>



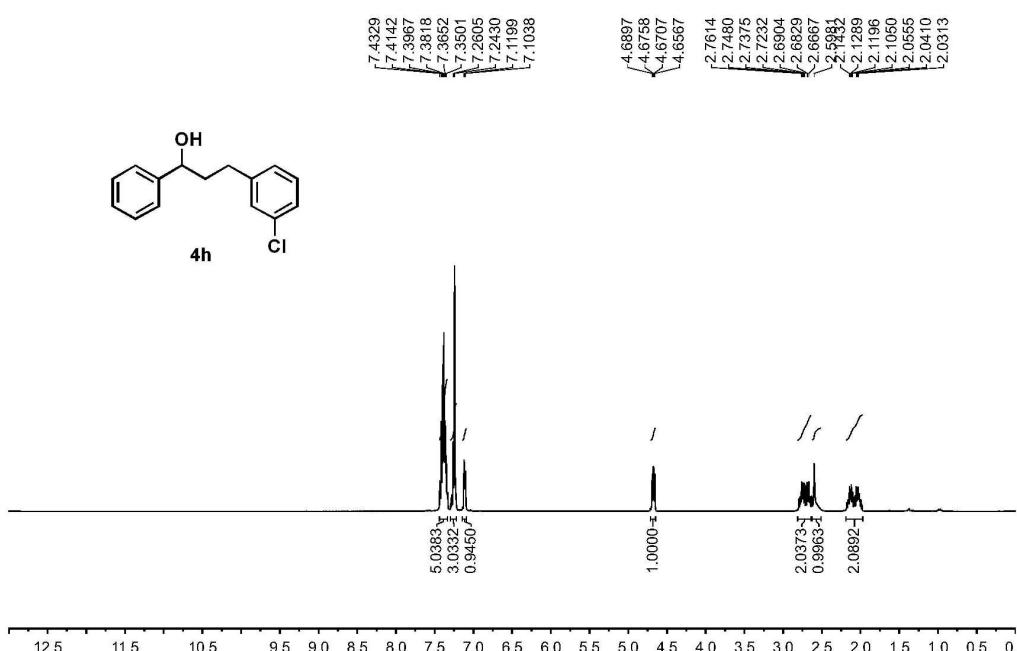
**Figure S13.** <sup>1</sup>H NMR spectrum of **4g** in CDCl<sub>3</sub>.

wqf147  
13C NMR wqf147 CDCl<sub>3</sub>



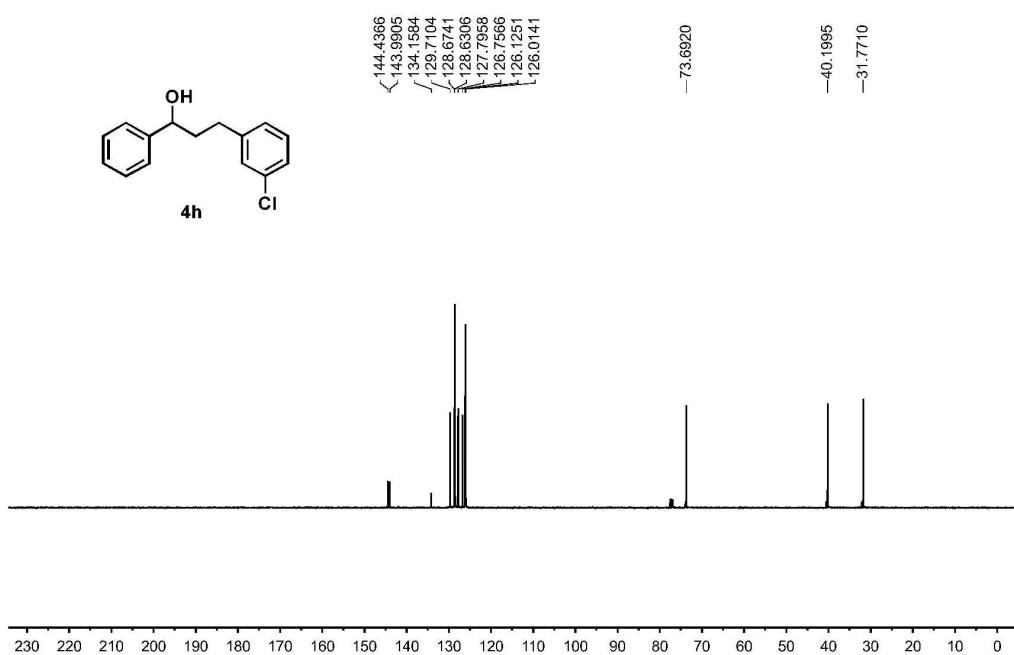
**Figure S14.** <sup>13</sup>C NMR spectrum of **4g** in CDCl<sub>3</sub>.

wqf-133  
1H NMR wqf-133 in CDCl<sub>3</sub>



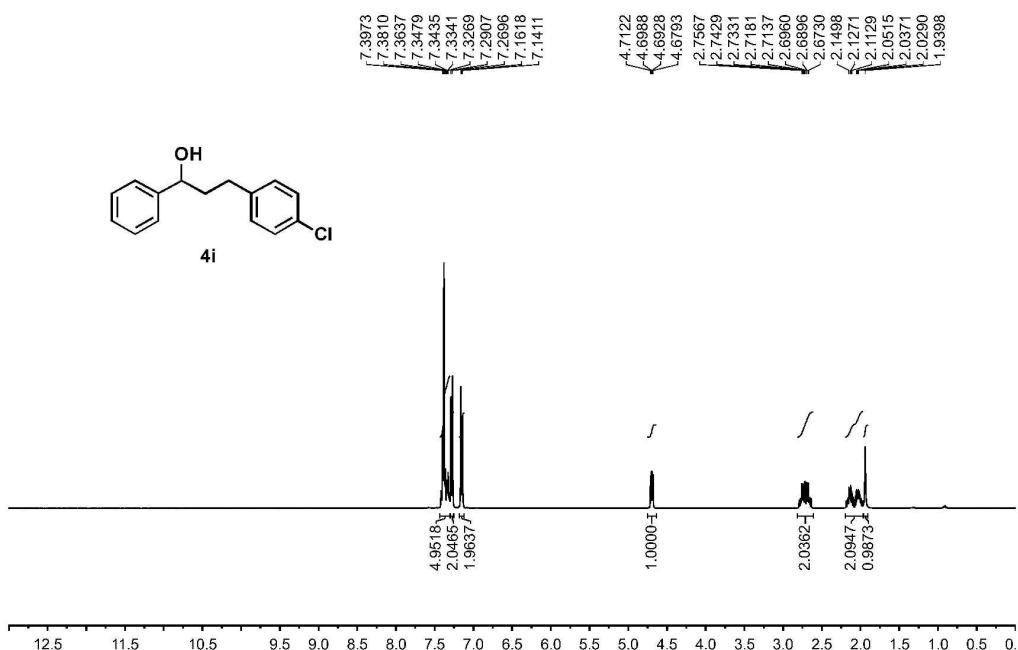
**Figure S15.** <sup>1</sup>H NMR spectrum of **4h** in CDCl<sub>3</sub>.

wqf-133  
13C NMR wqf-133 CDCl<sub>3</sub>



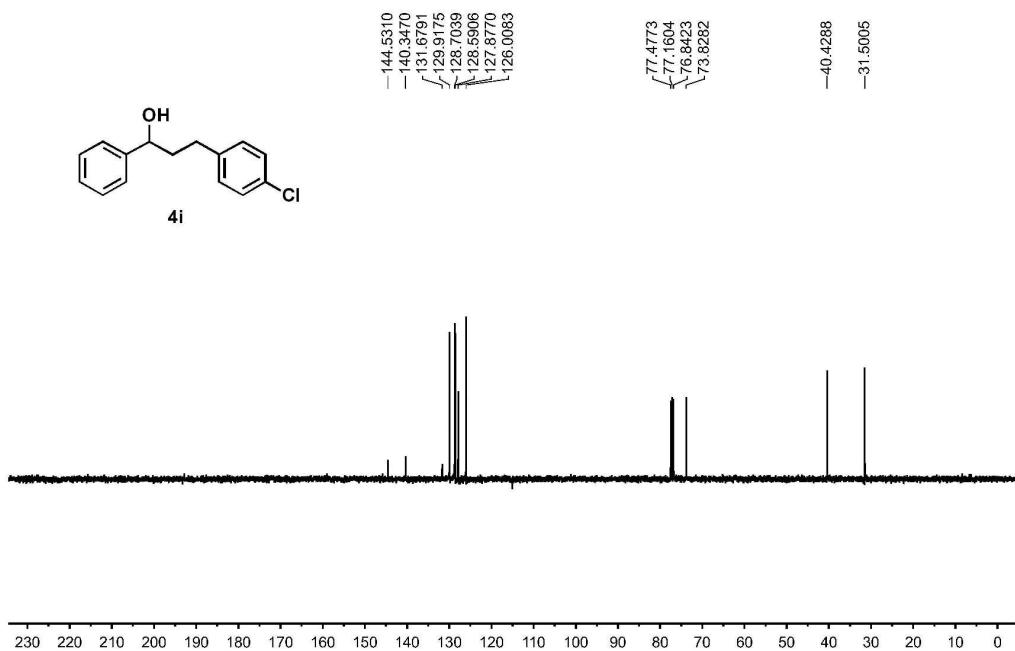
**Figure S16.** <sup>13</sup>C NMR spectrum of **4h** in CDCl<sub>3</sub>.

wqf-148  
1H NMR wqf-148 in CDCl<sub>3</sub>



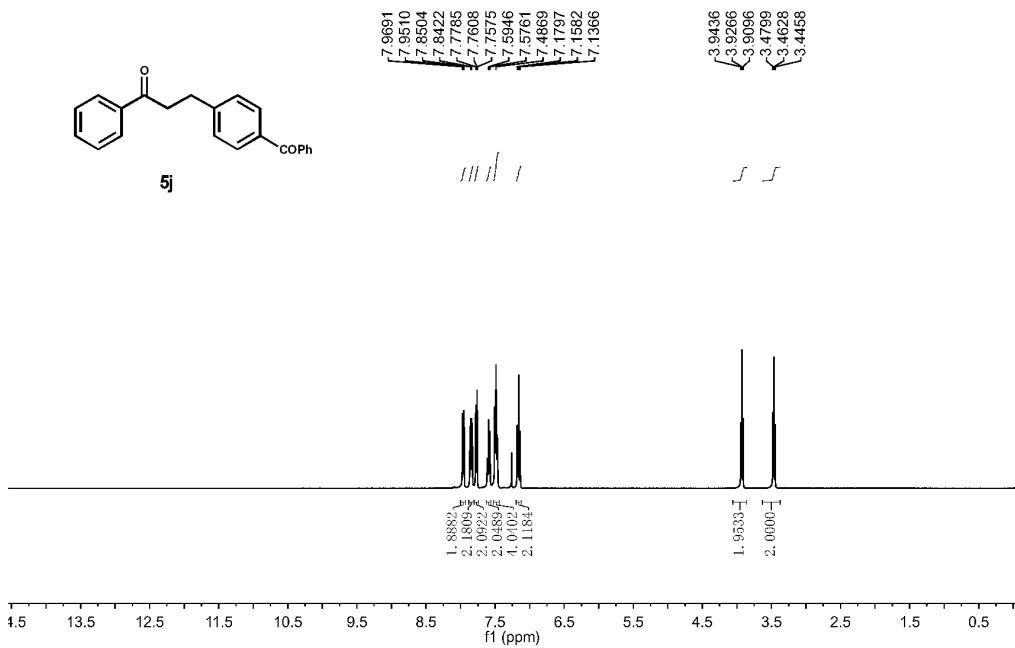
**Figure S17.** <sup>1</sup>H NMR spectrum of **4i** in CDCl<sub>3</sub>.

wqf-148  
13C NMR wqf-148 CDCl<sub>3</sub>

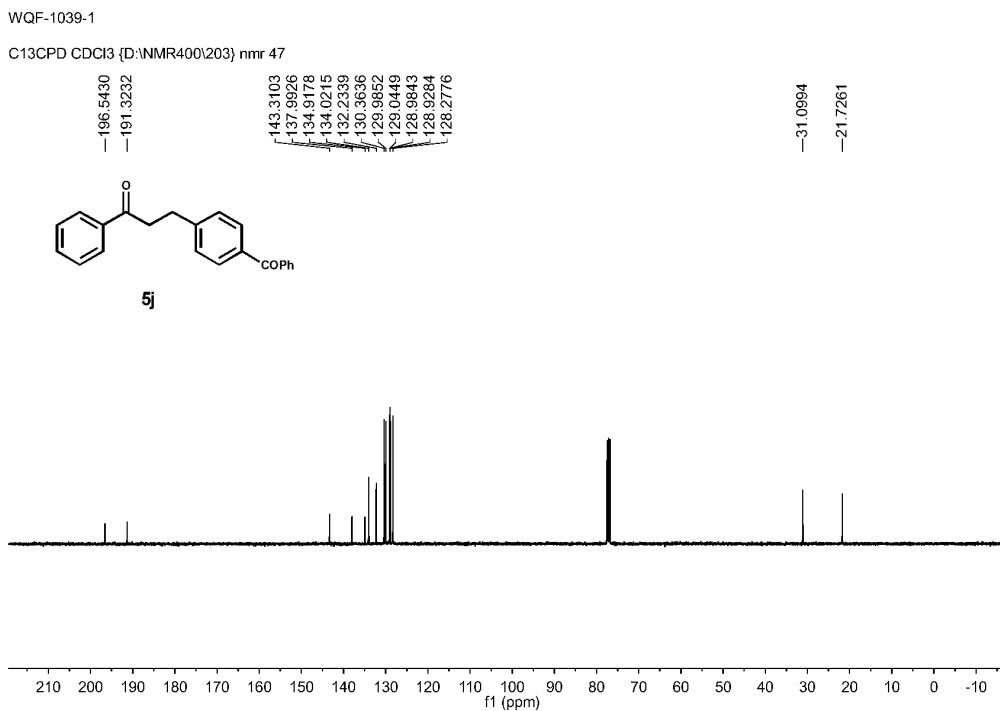


**Figure S18.** <sup>13</sup>C NMR spectrum of **4i** in CDCl<sub>3</sub>.

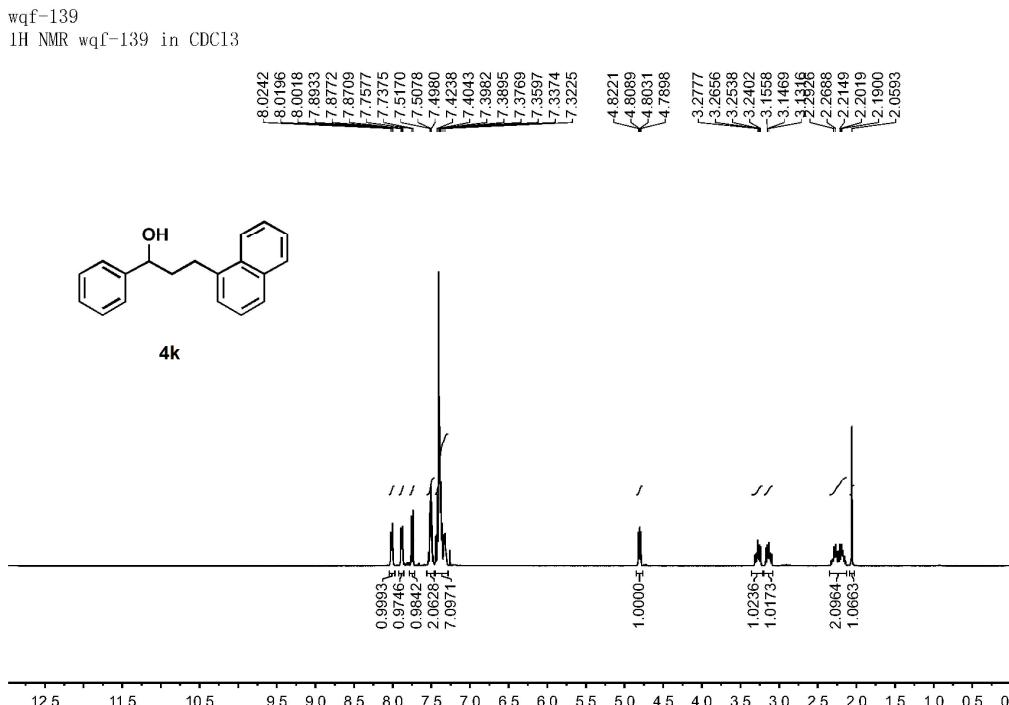
wqf-1039-d  
1H NMR wqf-1039-d in CDCl<sub>3</sub>



**Figure S19.** <sup>1</sup>H NMR spectrum of **5j** in CDCl<sub>3</sub>.



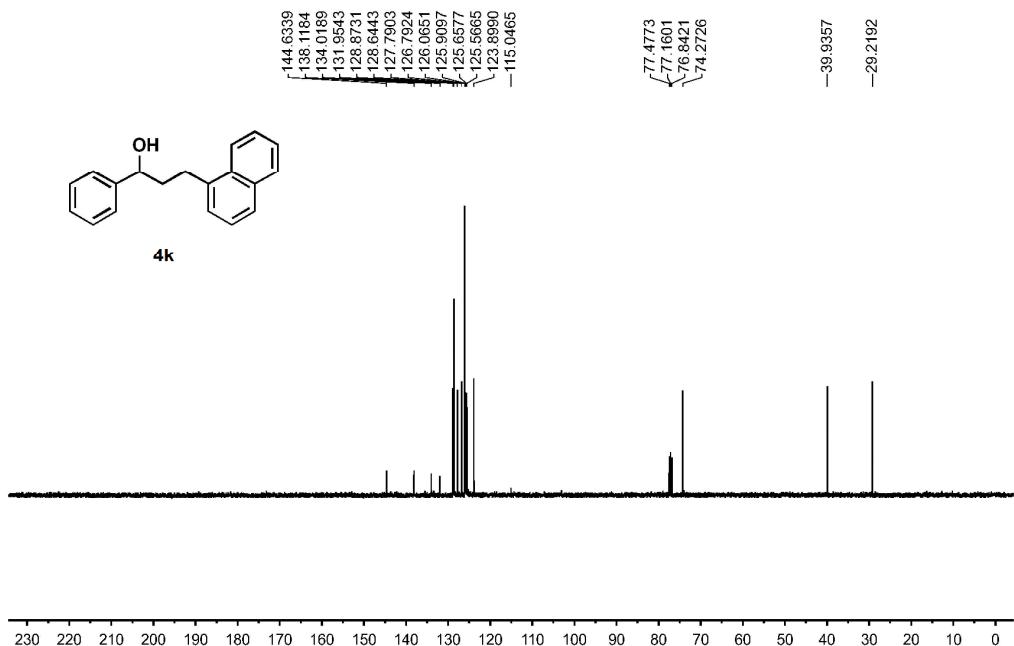
**Figure S20.**  $^{13}\text{C}$  NMR spectrum of **5j** in CDCl<sub>3</sub>.



**Figure S21.**  $^1\text{H}$  NMR spectrum of **4k** in CDCl<sub>3</sub>.

wqf-139

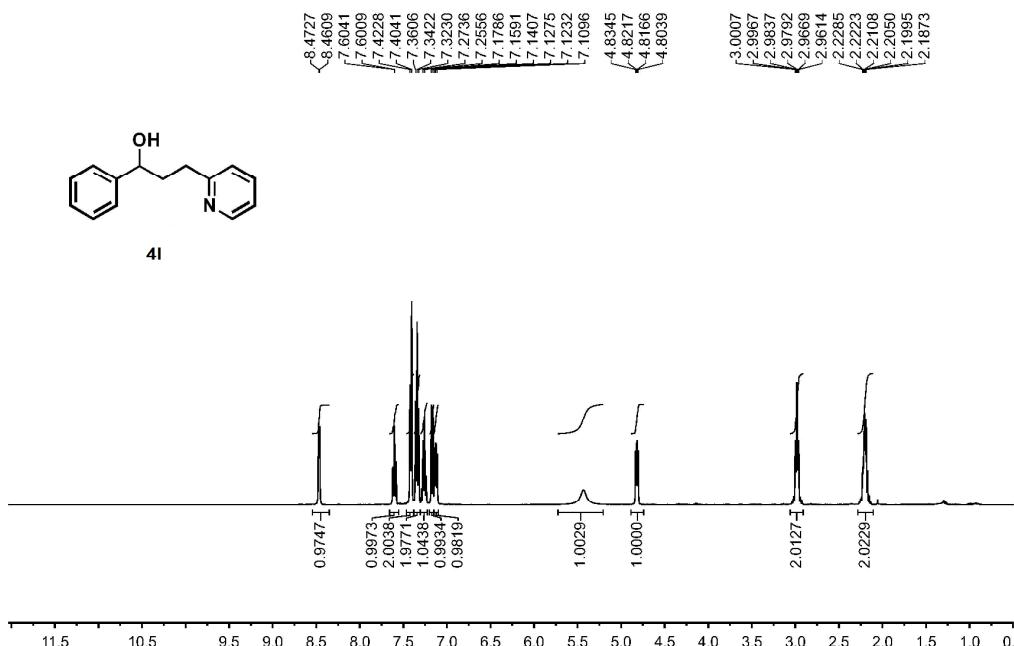
$^{13}\text{C}$  NMR wqf-139  $\text{CDCl}_3$



**Figure S22.**  $^{13}\text{C}$  NMR spectrum of **4k** in  $\text{CDCl}_3$ .

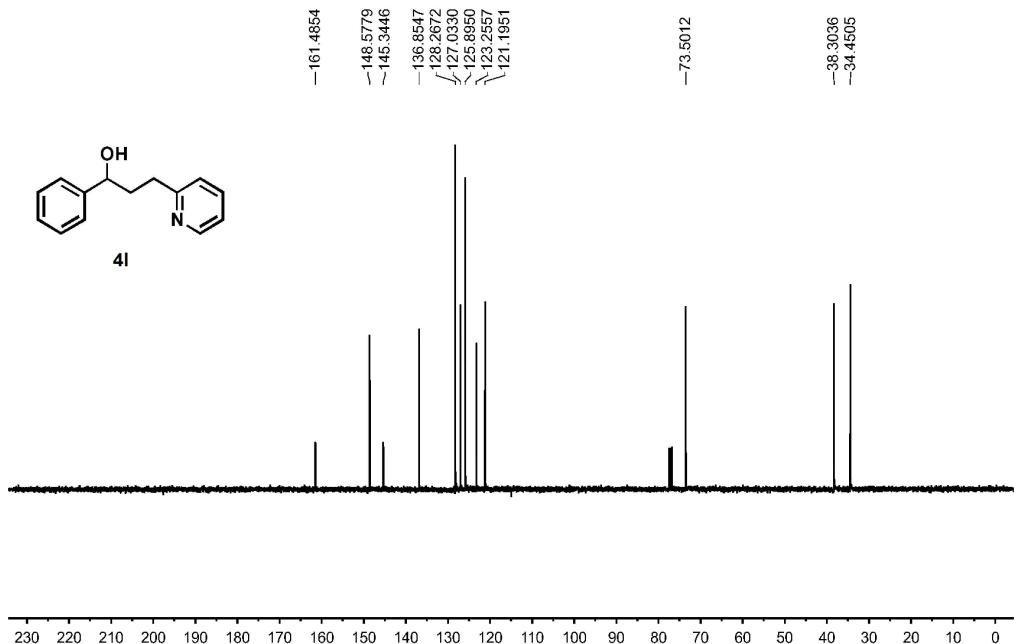
wqf-140

$^1\text{H}$  NMR wqf-140 in  $\text{CDCl}_3$



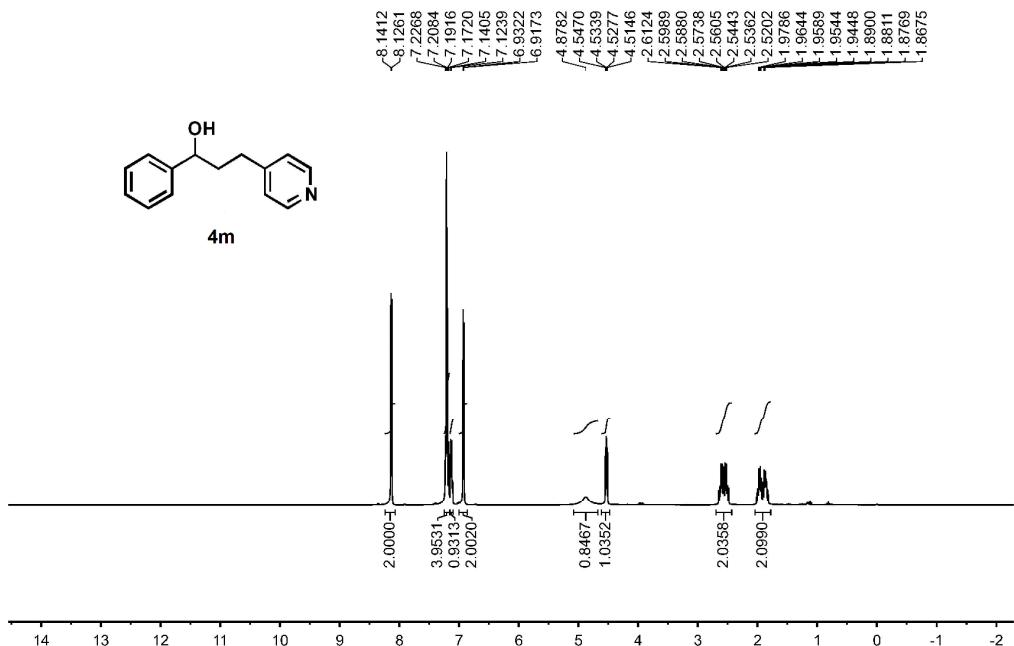
**Figure S23.**  $^1\text{H}$  NMR spectrum of **4l** in  $\text{CDCl}_3$ .

wqf-140  
13C NMR wqf-140 CDCl<sub>3</sub>



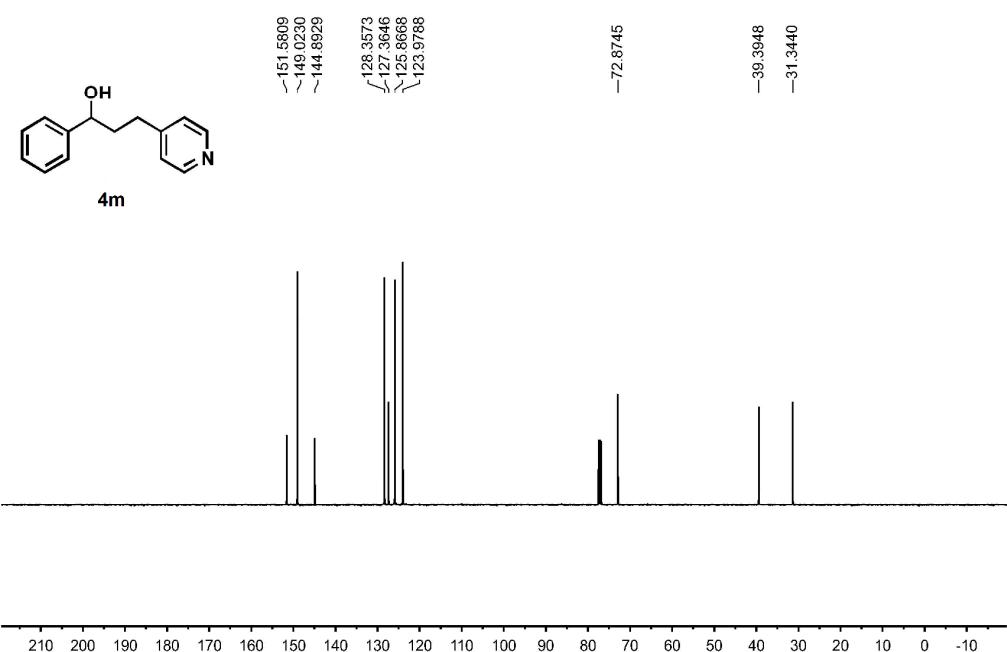
**Figure S24.** <sup>13</sup>C NMR spectrum of **4l** in CDCl<sub>3</sub>.

WQF-145-P  
1H NMR IN CDCl<sub>3</sub>



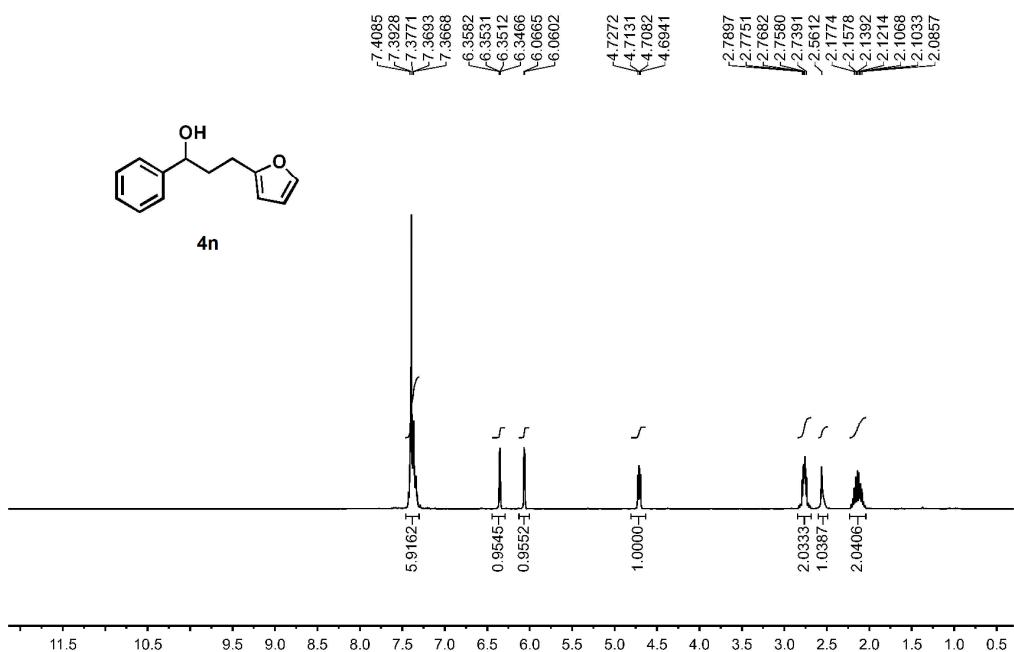
**Figure S25.** <sup>1</sup>H NMR spectrum of **4m** in CDCl<sub>3</sub>.

wqf-145-P  
13C NMR IN CDCl<sub>3</sub>



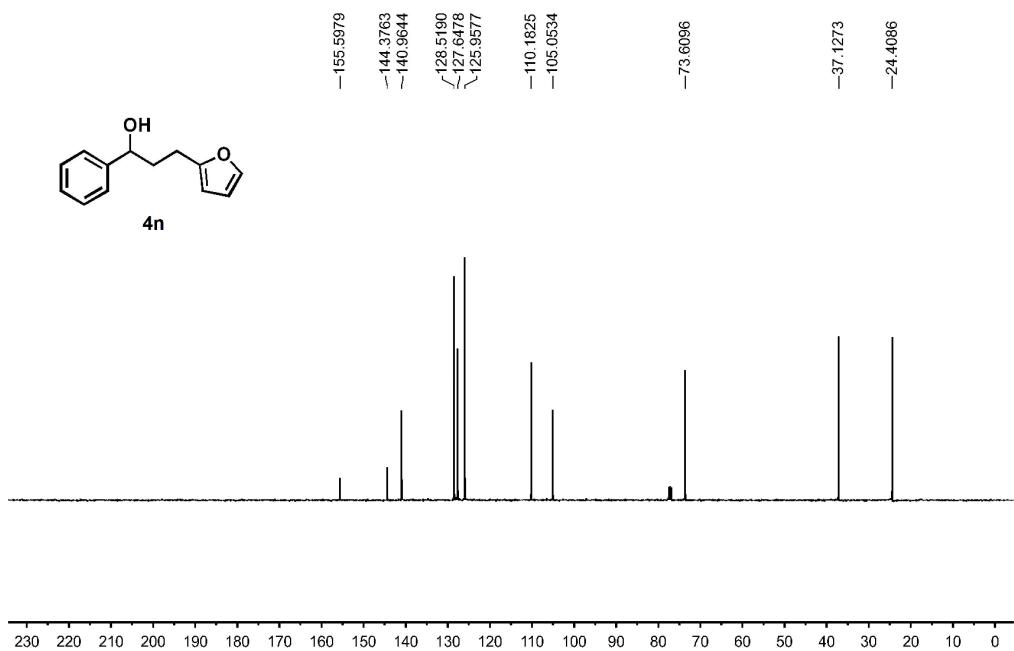
**Figure S26.** <sup>13</sup>C NMR spectrum of **4m** in CDCl<sub>3</sub>.

wqf-141  
1H NMR wqf-141 in CDCl<sub>3</sub>



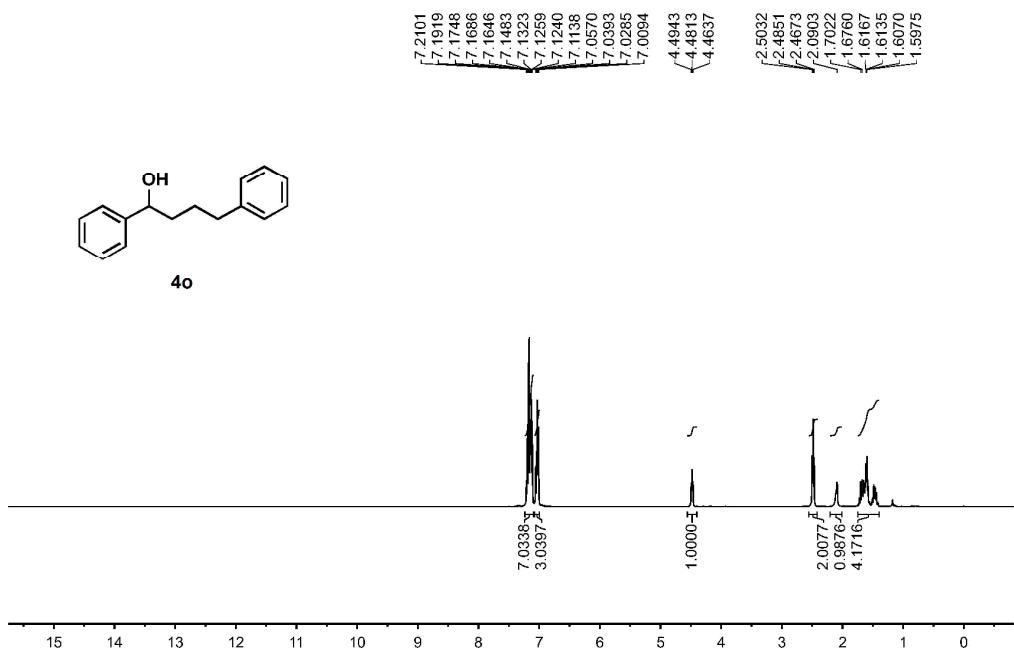
**Figure S27.** <sup>1</sup>H NMR spectrum of **4n** in CDCl<sub>3</sub>.

wqf-141  
13C NMR wqf-141 CDCl<sub>3</sub>



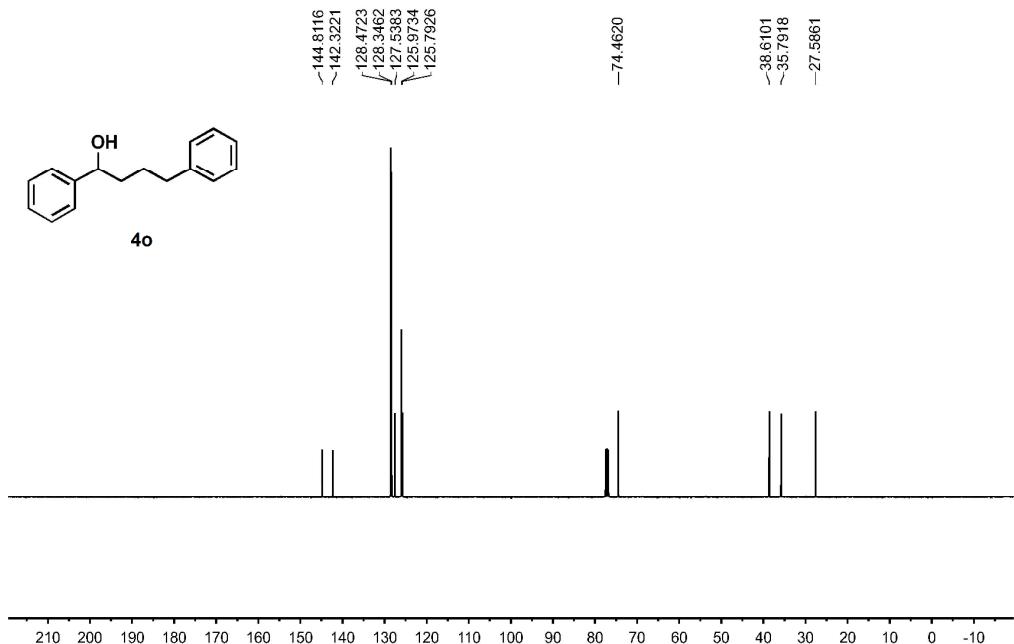
**Figure S28.** <sup>13</sup>C NMR spectrum of **4n** in CDCl<sub>3</sub>.

WQF-149-3  
1H NMR IN CDCl<sub>3</sub>



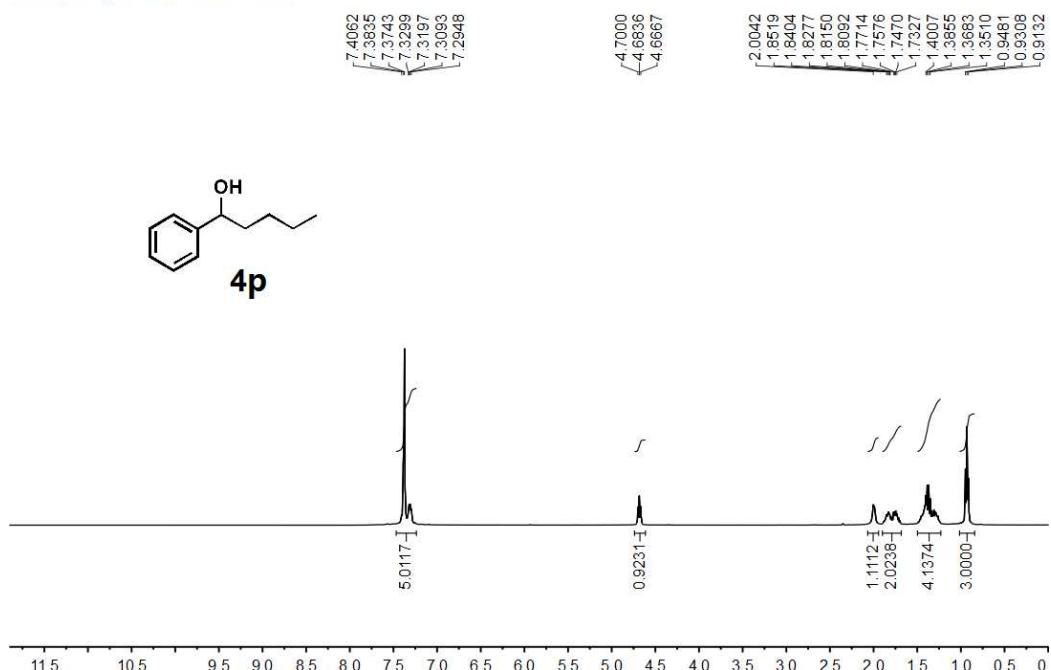
**Figure S29.** <sup>1</sup>H NMR spectrum of **4o** in CDCl<sub>3</sub>.

WQF-149-3  
13C NMR IN CDCl<sub>3</sub>



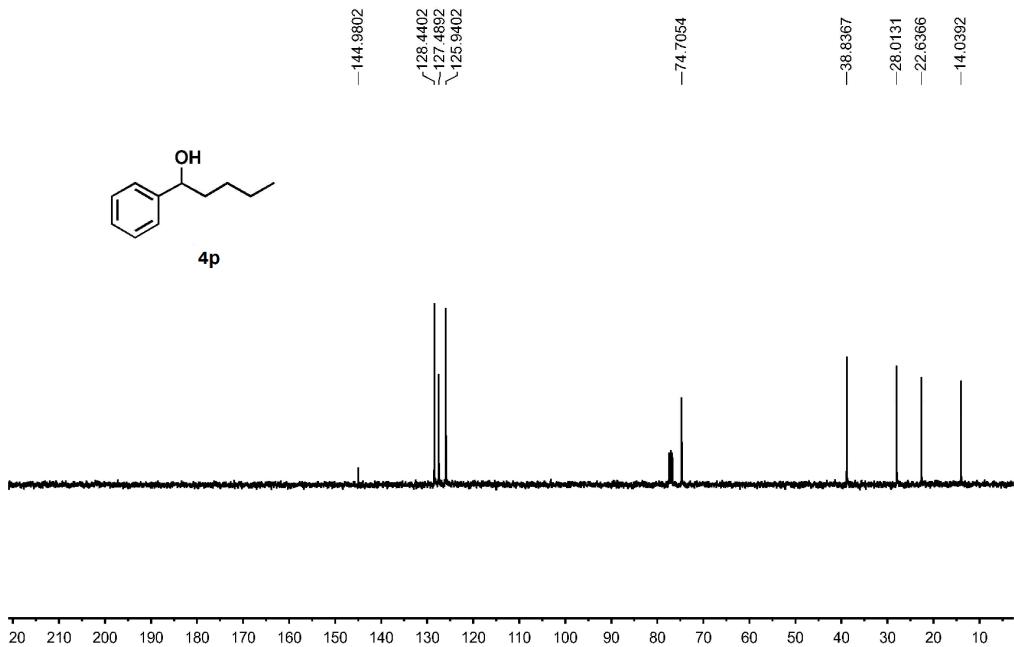
**Figure S30.** <sup>13</sup>C NMR spectrum of **4o** in CDCl<sub>3</sub>.

wqf-157  
1H NMR wqf-157 in CDCl<sub>3</sub>



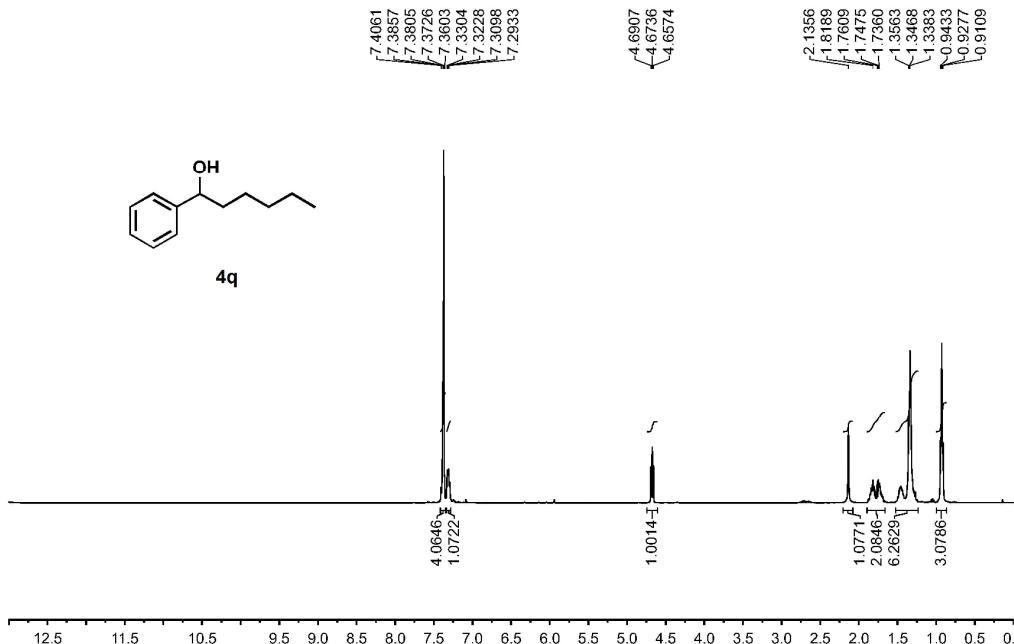
**Figure S31.** <sup>1</sup>H NMR spectrum of **4p** in CDCl<sub>3</sub>.

wqf-157  
13C NMR wqf-157 CDCl<sub>3</sub>



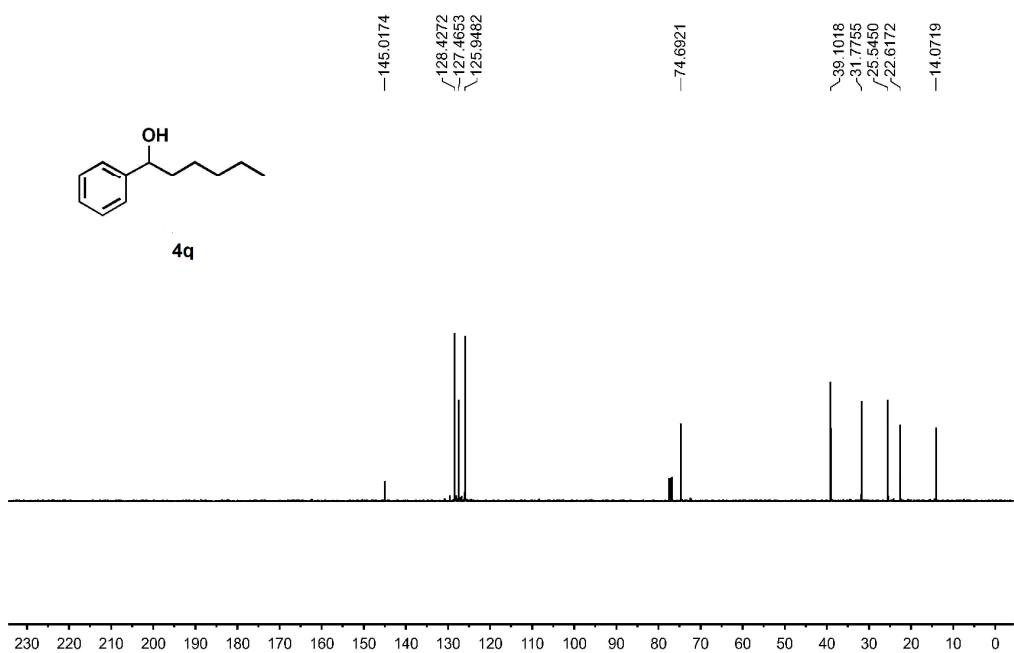
**Figure S32.** <sup>13</sup>C NMR spectrum of **4p** in CDCl<sub>3</sub>.

wqf-151  
1H NMR wqf-151 in CDCl<sub>3</sub>



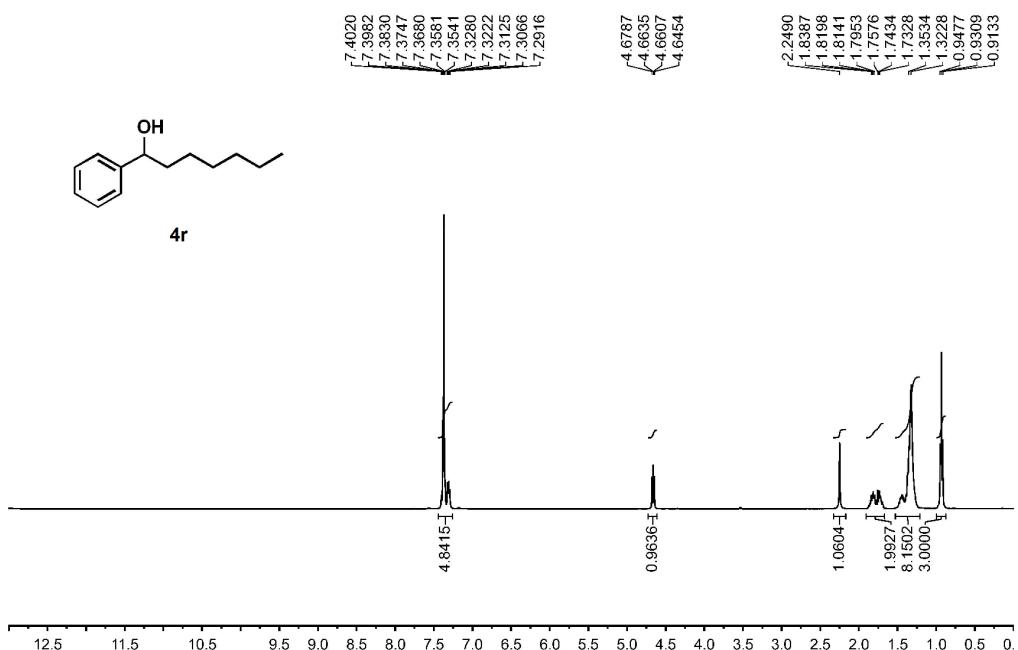
**Figure S33.** <sup>1</sup>H NMR spectrum of **4q** in CDCl<sub>3</sub>.

wqf-151  
13C NMR wqf-151 CDCl<sub>3</sub>



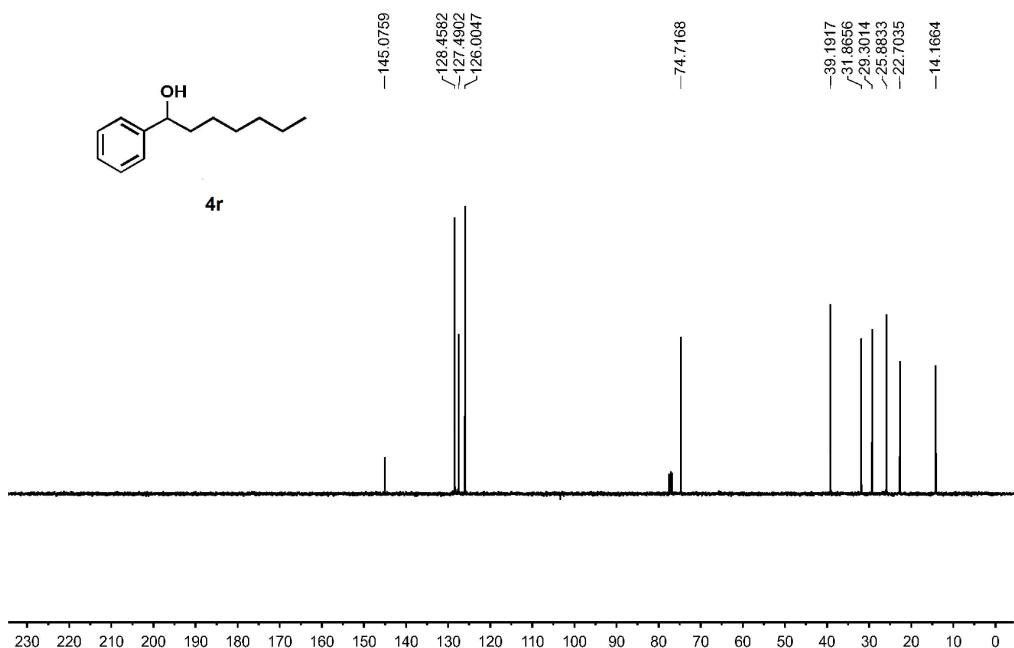
**Figure S34.** <sup>13</sup>C NMR spectrum of **4q** in CDCl<sub>3</sub>.

wqf-152  
1H NMR wqf-152 in CDCl<sub>3</sub>



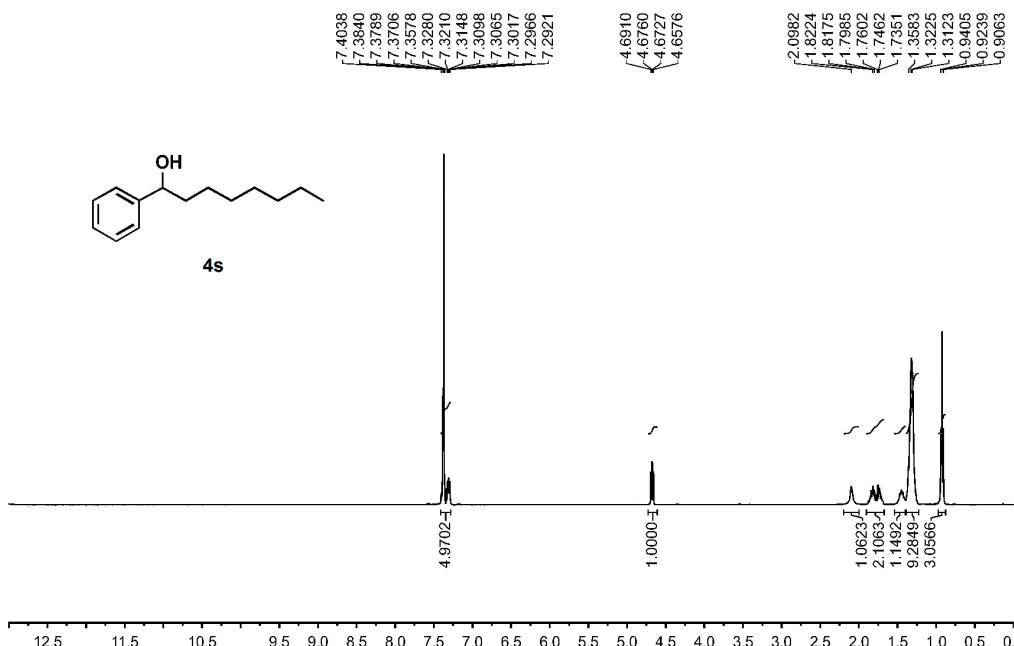
**Figure S35.** <sup>1</sup>H NMR spectrum of **4r** in CDCl<sub>3</sub>.

wqf-152  
13C NMR wqf-152 CDCl<sub>3</sub>



**Figure S36.** <sup>13</sup>C NMR spectrum of **4r** in CDCl<sub>3</sub>.

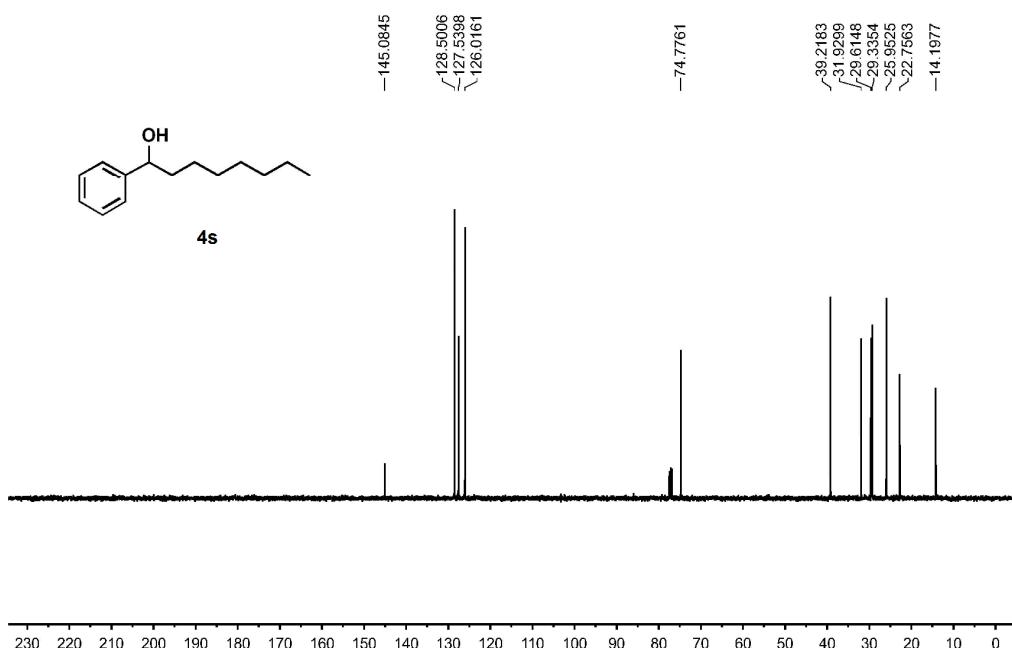
wqf-153  
1H NMR wqf-152 in CDCl<sub>3</sub>



**Figure S37.** <sup>1</sup>H NMR spectrum of **4s** in CDCl<sub>3</sub>.

wqf-153

13C NMR wqf-152 CDCl<sub>3</sub>



**Figure S38.** <sup>13</sup>C NMR spectrum of **4s** in CDCl<sub>3</sub>.

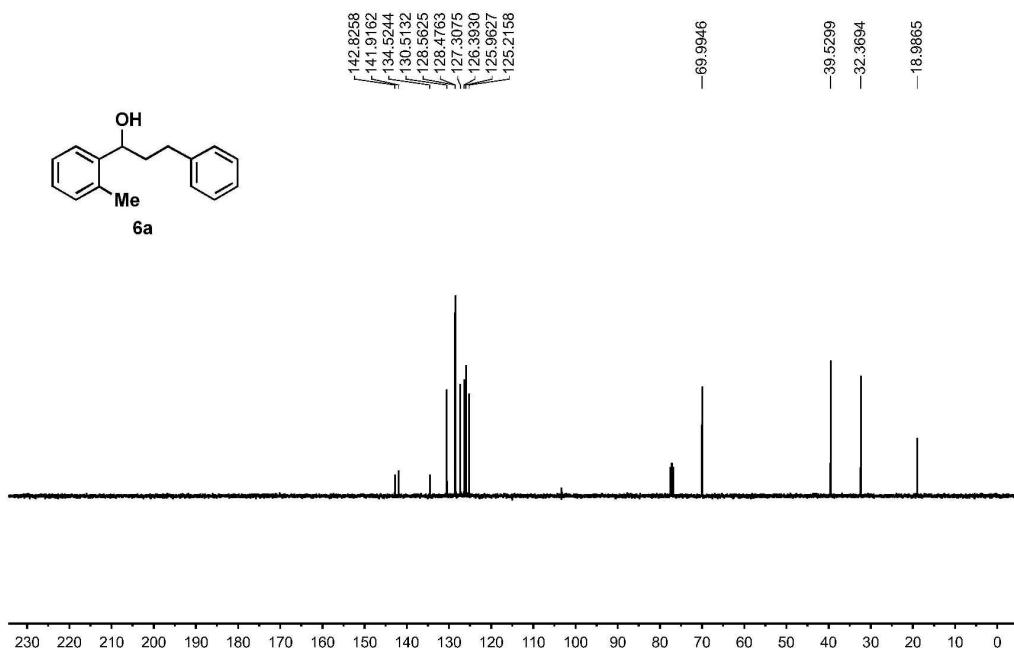
wqf-159

1H NMR wqf-159 in CDCl<sub>3</sub>



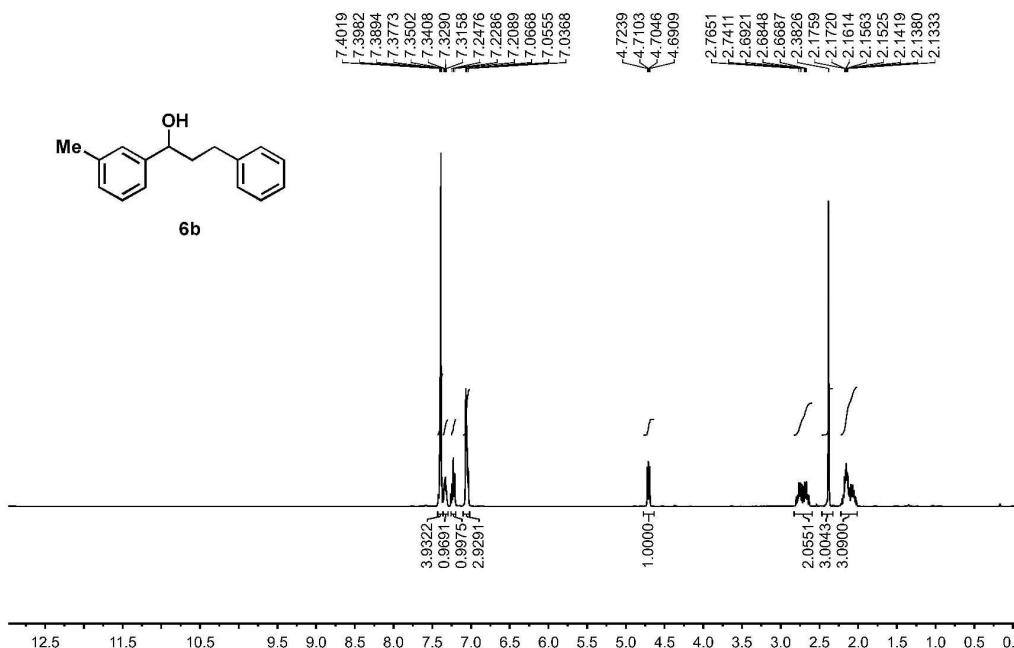
**Figure S39.** <sup>1</sup>H NMR spectrum of **6a** in CDCl<sub>3</sub>.

wqf-159-[2-Me]  
13C NMR wqf-159 CDCl<sub>3</sub>



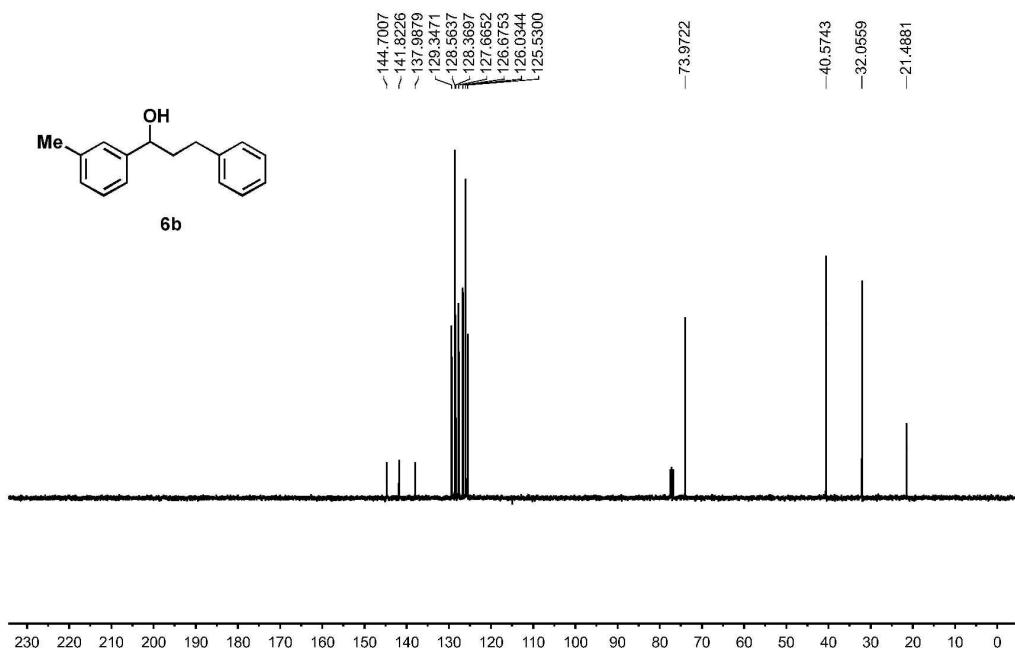
**Figure S40.** <sup>13</sup>C NMR spectrum of **6a** in CDCl<sub>3</sub>.

wqf154  
1H NMR wqf154 in CDCl<sub>3</sub>



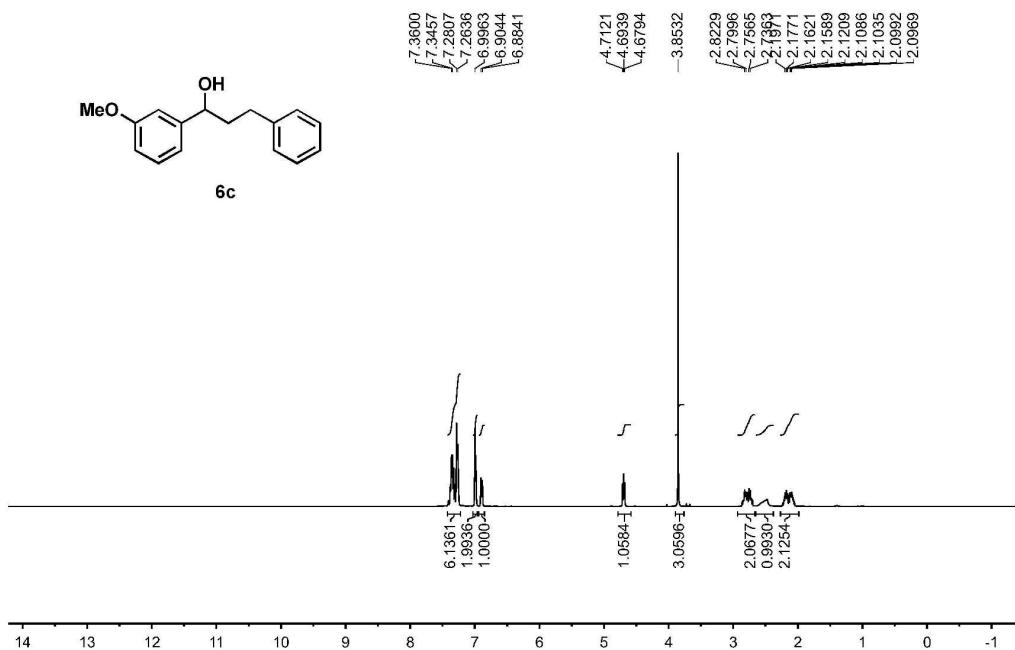
**Figure S41.** <sup>1</sup>H NMR spectrum of **6b** in CDCl<sub>3</sub>.

wqf154  
13C NMR wqf154 CDC13



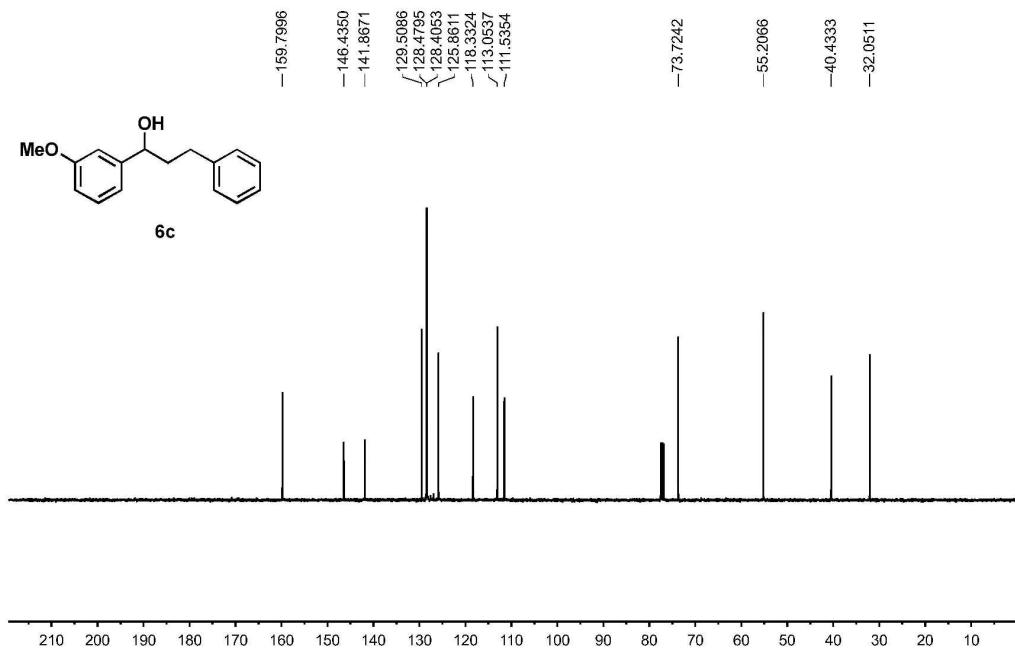
**Figure S42.** <sup>13</sup>C NMR spectrum of **6b** in CDCl<sub>3</sub>.

WQF-196-P  
1H NMR IN CDC13



**Figure S43.** <sup>1</sup>H NMR spectrum of **6c** in CDCl<sub>3</sub>.

WQF-196-P  
13C NMR IN CDCl<sub>3</sub>



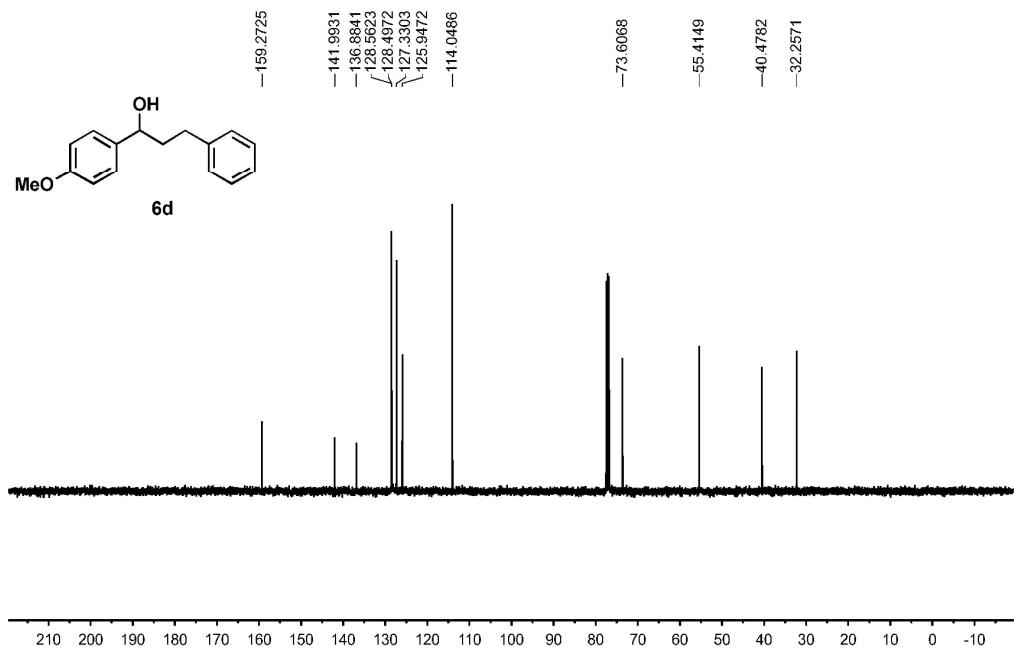
**Figure S44.** <sup>13</sup>C NMR spectrum of **6c** in CDCl<sub>3</sub>.

WQF-169-P  
1H NMR IN CDCl<sub>3</sub>



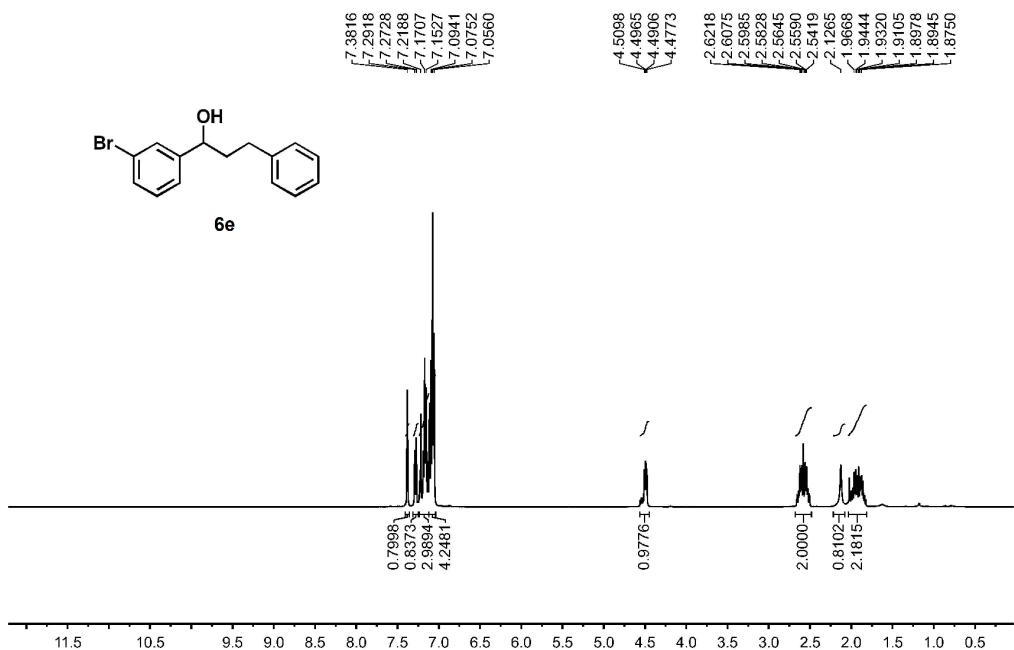
**Figure S45.** <sup>1</sup>H NMR spectrum of **6d** in CDCl<sub>3</sub>.

WQF-169-P  
13C NMR IN CDCl<sub>3</sub>



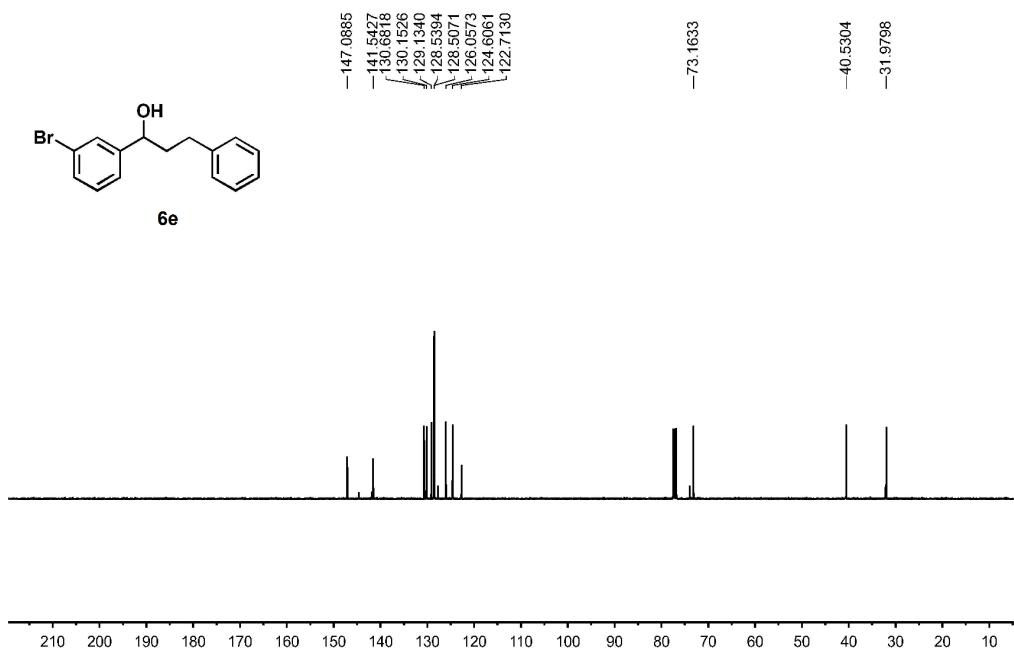
**Figure S46.** <sup>13</sup>C NMR spectrum of **6d** in CDCl<sub>3</sub>.

WQF-197-P  
1H NMR IN CDCl<sub>3</sub>



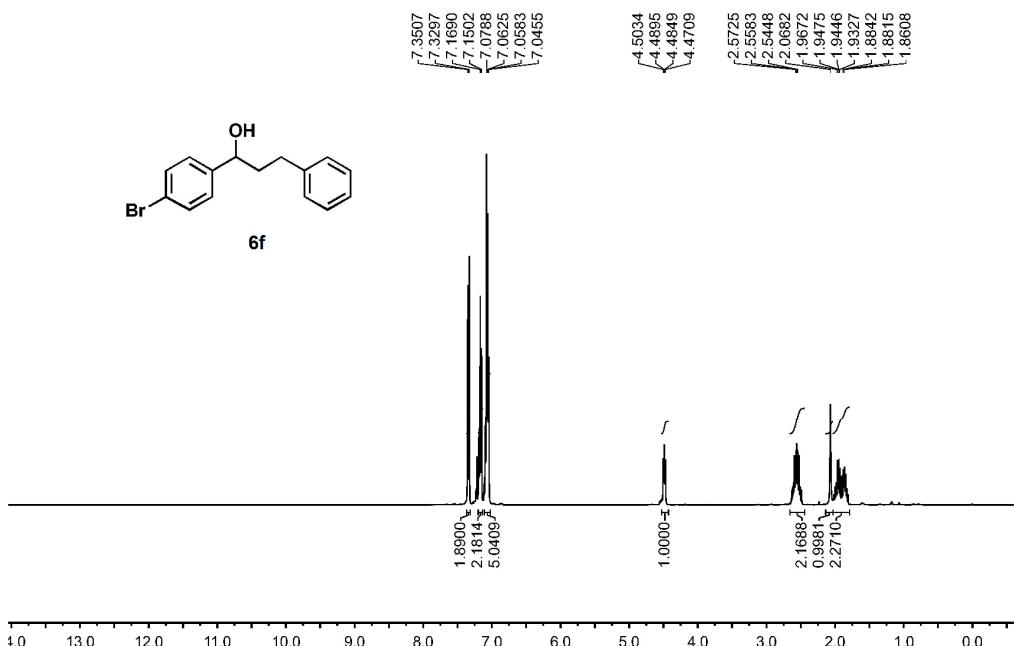
**Figure S47.** <sup>1</sup>H NMR spectrum of **6e** in CDCl<sub>3</sub>.

WQF-197-P  
13C NMR IN CDCl<sub>3</sub>



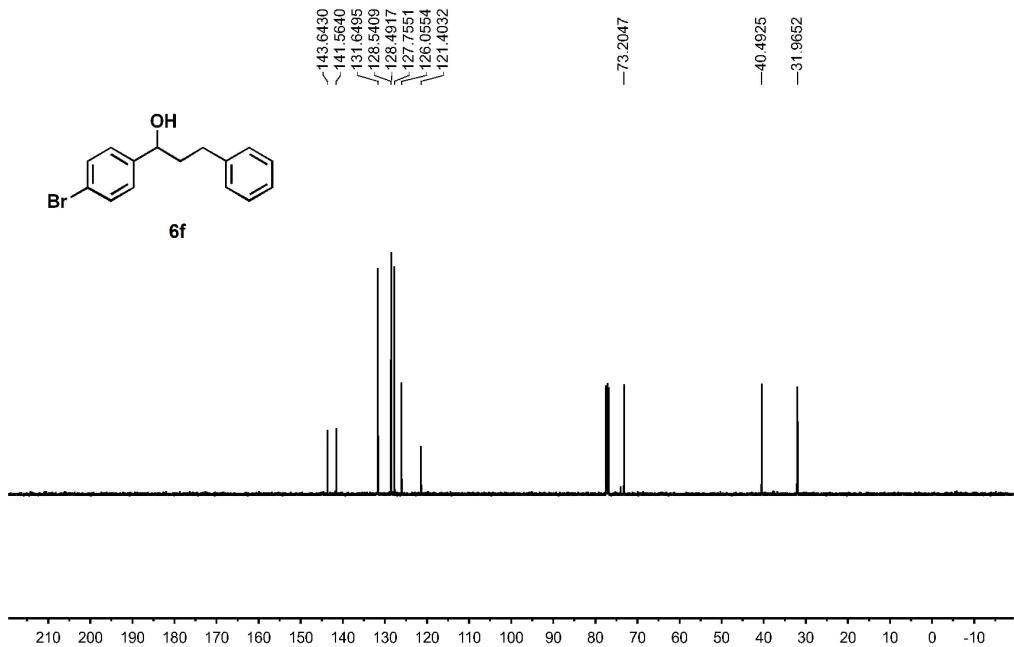
**Figure S48.** <sup>13</sup>C NMR spectrum of **6e** in CDCl<sub>3</sub>.

WQF-334  
1H NMR IN CDCl<sub>3</sub>



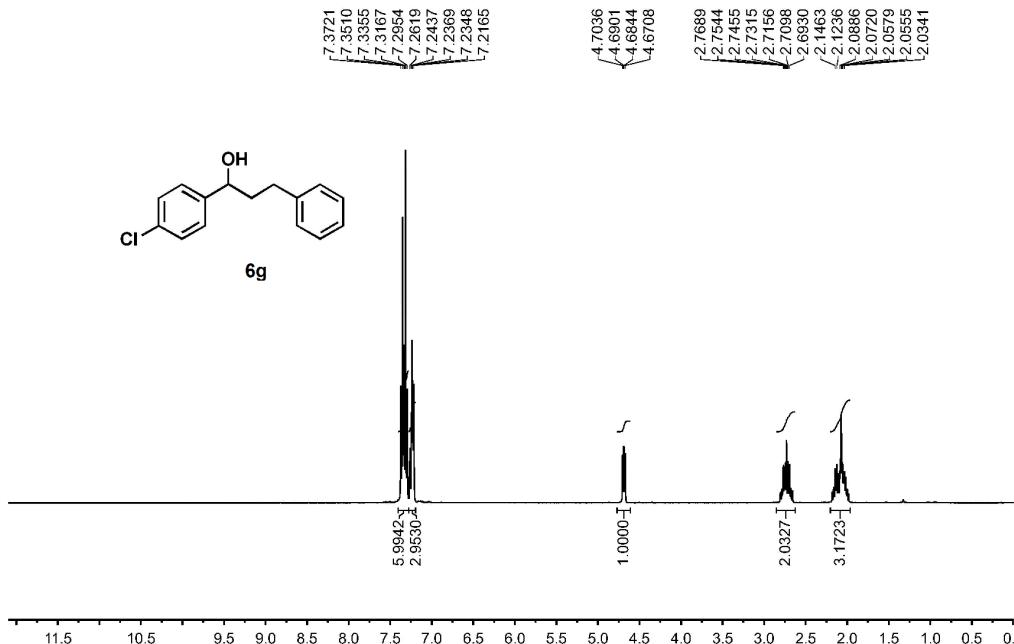
**Figure S49.** <sup>1</sup>H NMR spectrum of **6f** in CDCl<sub>3</sub>.

WQF-334  
13C NMR IN CDCl<sub>3</sub>



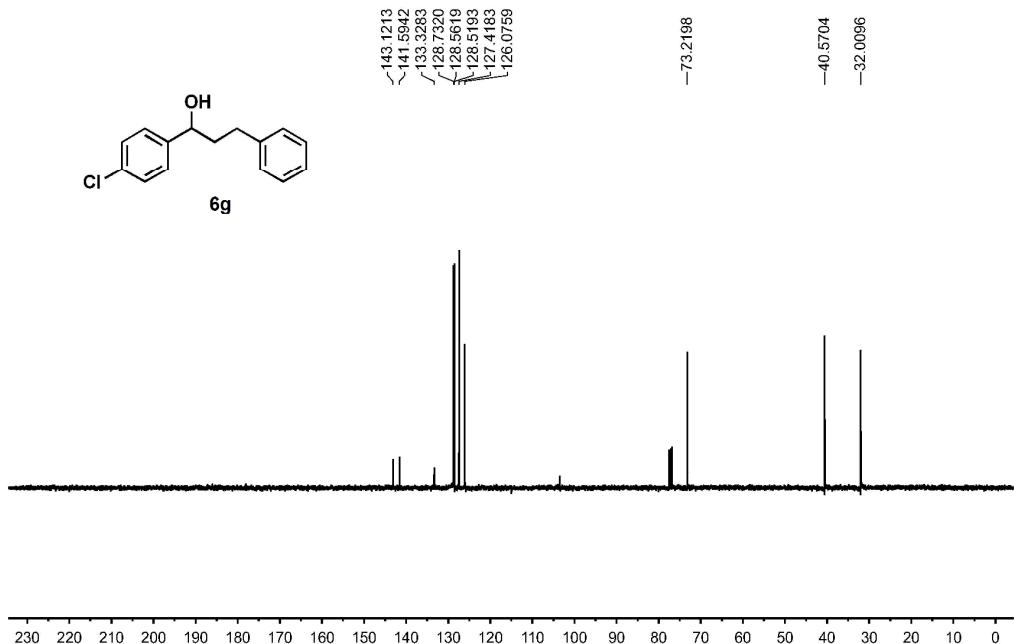
**Figure S50.** <sup>13</sup>C NMR spectrum of **6f** in CDCl<sub>3</sub>.

wqf-156  
1H NMR wqf-156 in CDCl<sub>3</sub>



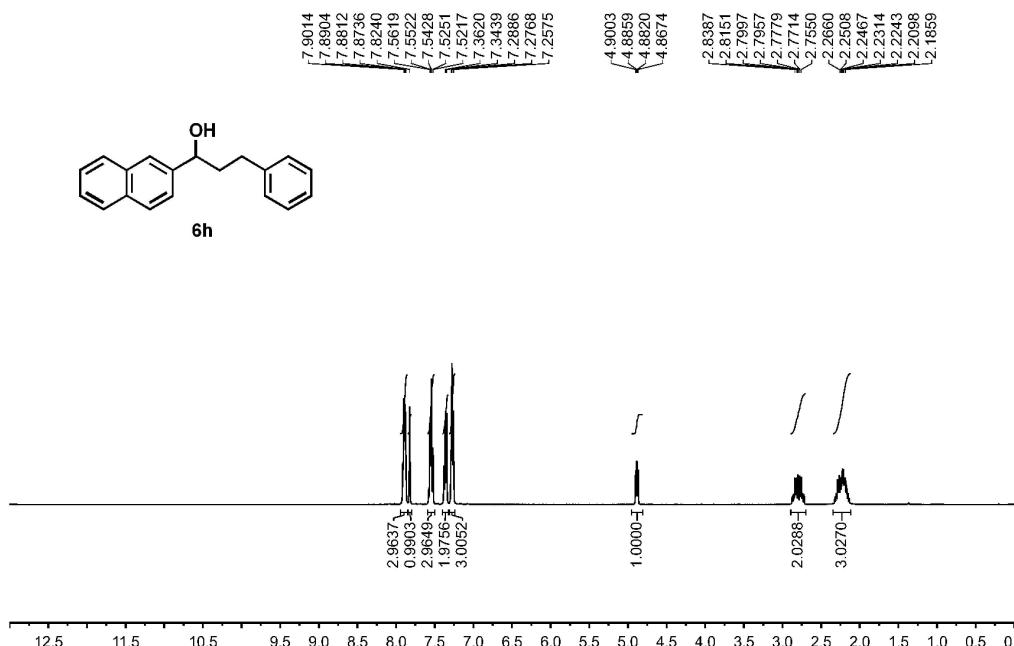
**Figure S51.** <sup>1</sup>H NMR spectrum of **6g** in CDCl<sub>3</sub>.

wqf-156  
13C NMR wqf-156 CDCl<sub>3</sub>



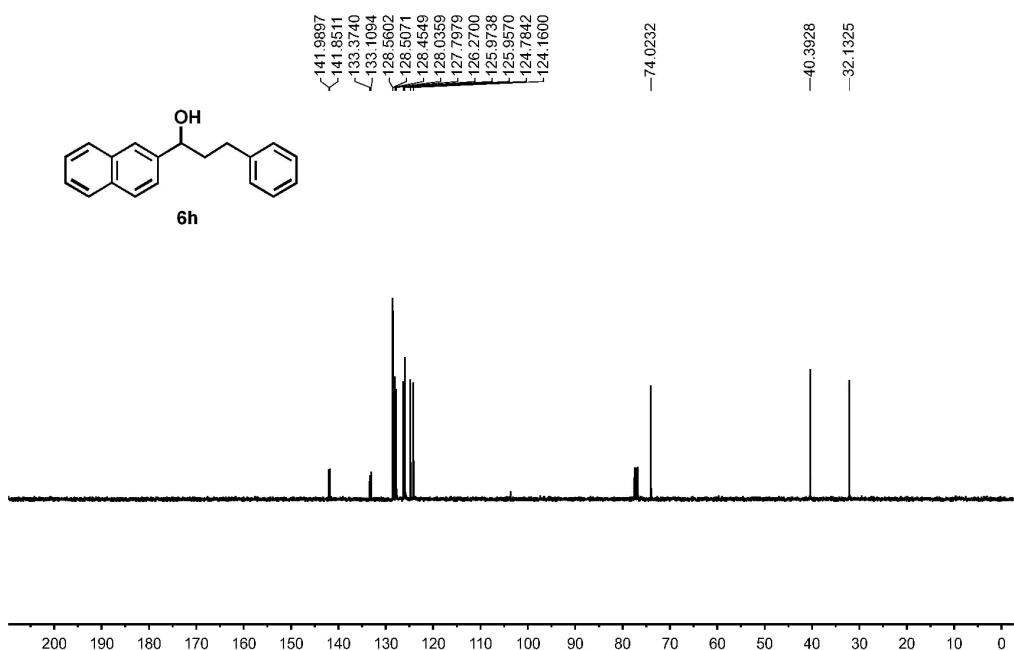
**Figure S52.** <sup>13</sup>C NMR spectrum of **6g** in CDCl<sub>3</sub>.

wqf-165  
1H NMR in CDCl<sub>3</sub>



**Figure S53.** <sup>1</sup>H NMR spectrum of **6h** in CDCl<sub>3</sub>.

wqf-165  
13C NMR in CDCl<sub>3</sub>



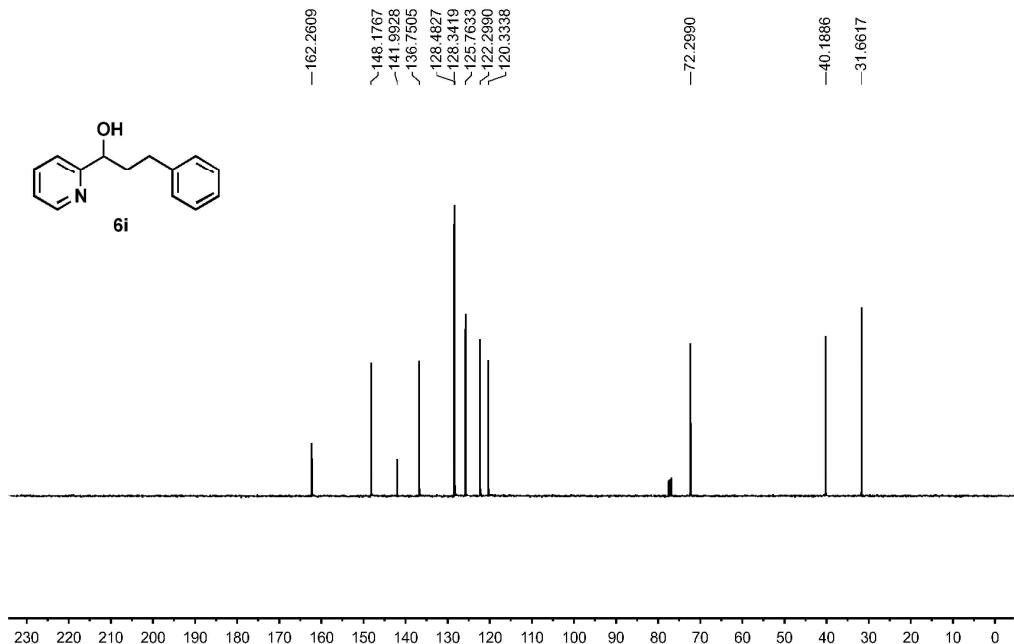
**Figure S54.** <sup>13</sup>C NMR spectrum of **6h** in CDCl<sub>3</sub>.

wqf-178  
1H NMR wqf-178 in CDCl<sub>3</sub>



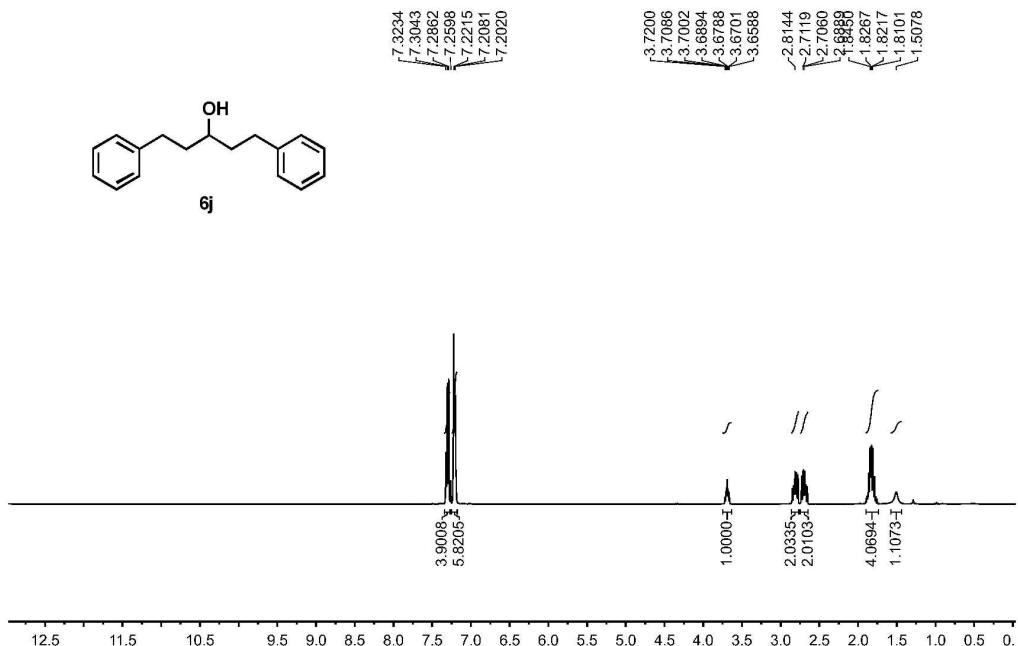
**Figure S55.** <sup>1</sup>H NMR spectrum of **6i** in CDCl<sub>3</sub>.

wqf-178  
13C NMR wqf-178 CDCl<sub>3</sub>



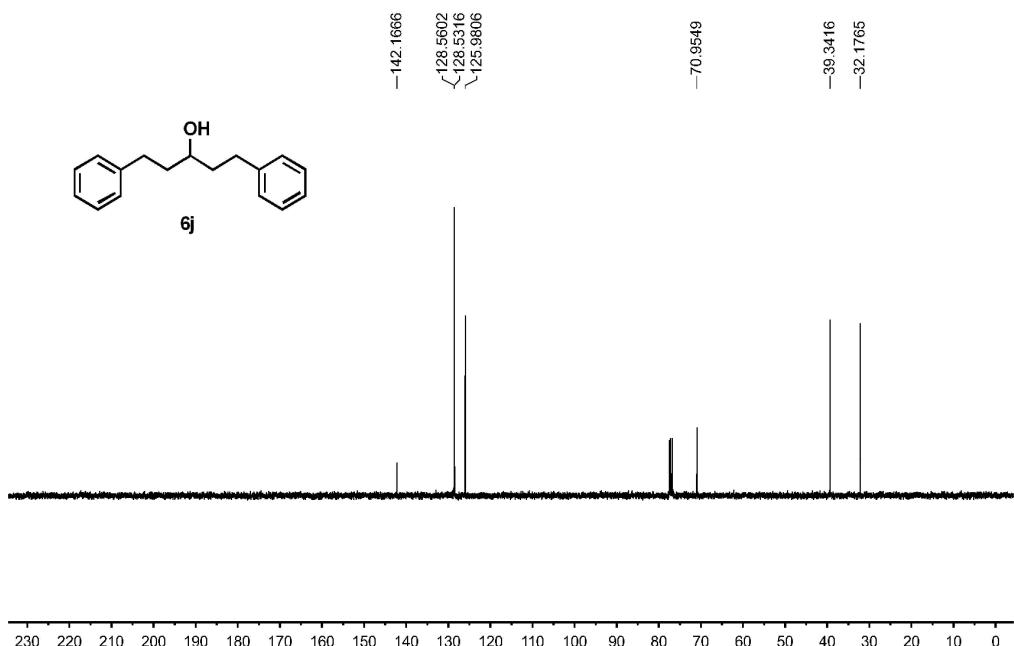
**Figure S56.** <sup>13</sup>C NMR spectrum of **6i** in CDCl<sub>3</sub>.

wqf-177  
1H NMR wqf-177 in CDCl<sub>3</sub>



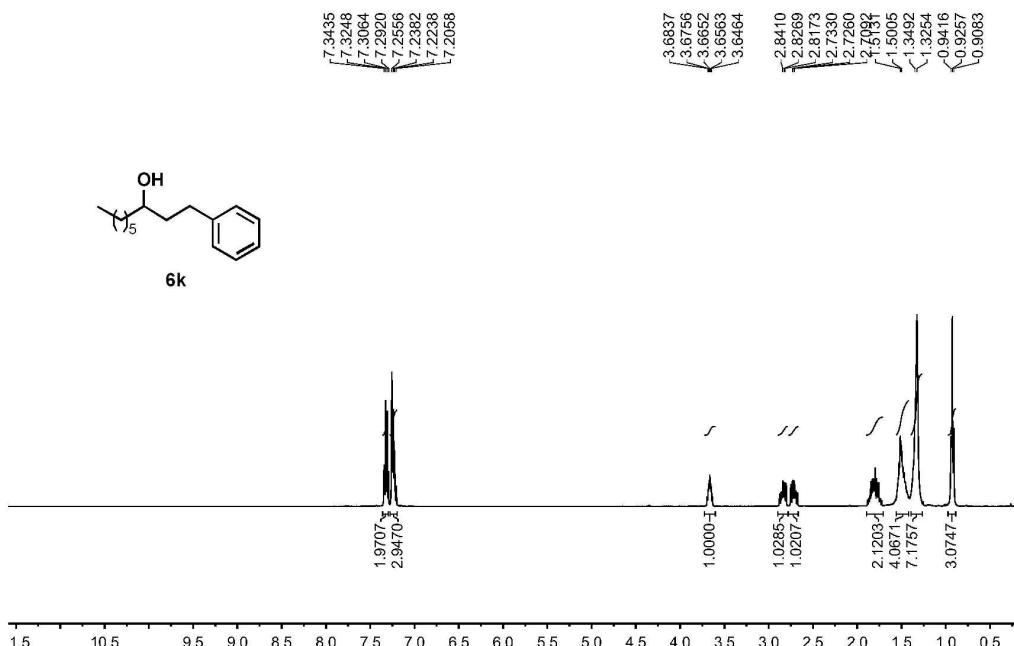
**Figure S57.** <sup>1</sup>H NMR spectrum of **6j** in CDCl<sub>3</sub>.

wqf-176  
13C NMR wqf-177 CDCl<sub>3</sub>



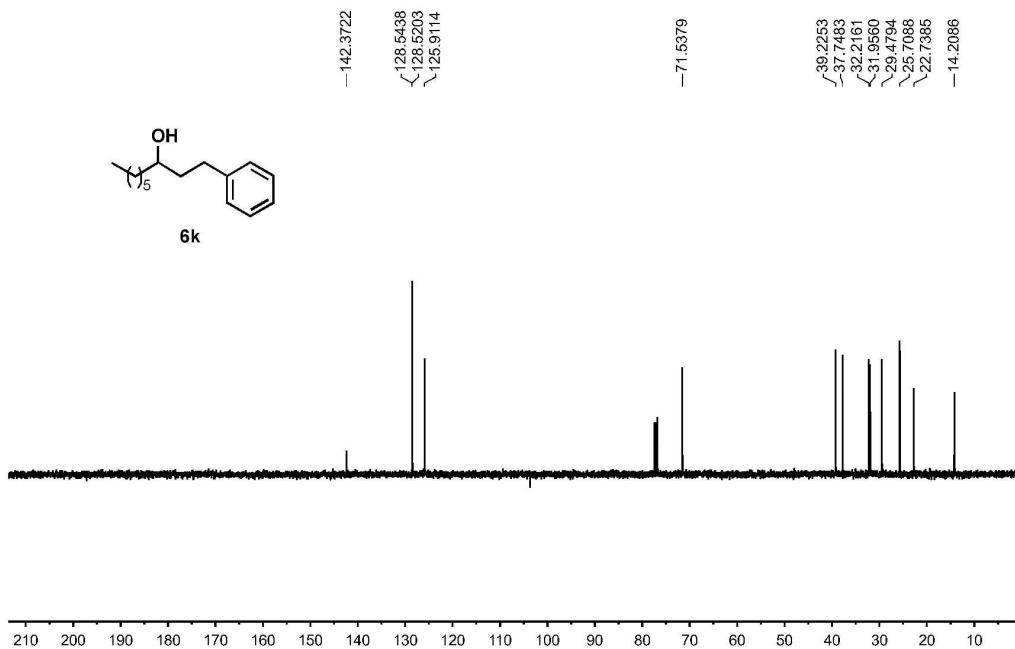
**Figure S58.** <sup>13</sup>C NMR spectrum of **6j** in CDCl<sub>3</sub>.

wqf-174  
1H NMR wqf-174 in CDCl<sub>3</sub>



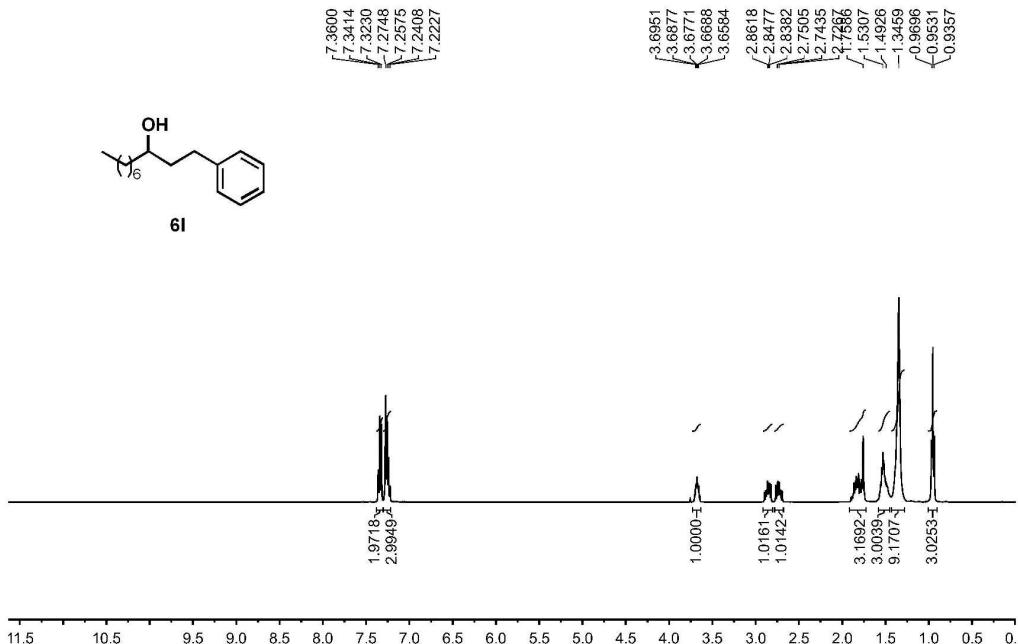
**Figure S59.** <sup>1</sup>H NMR spectrum of **6k** in CDCl<sub>3</sub>.

wqf-174  
13C NMR wqf-174 CDCl<sub>3</sub>



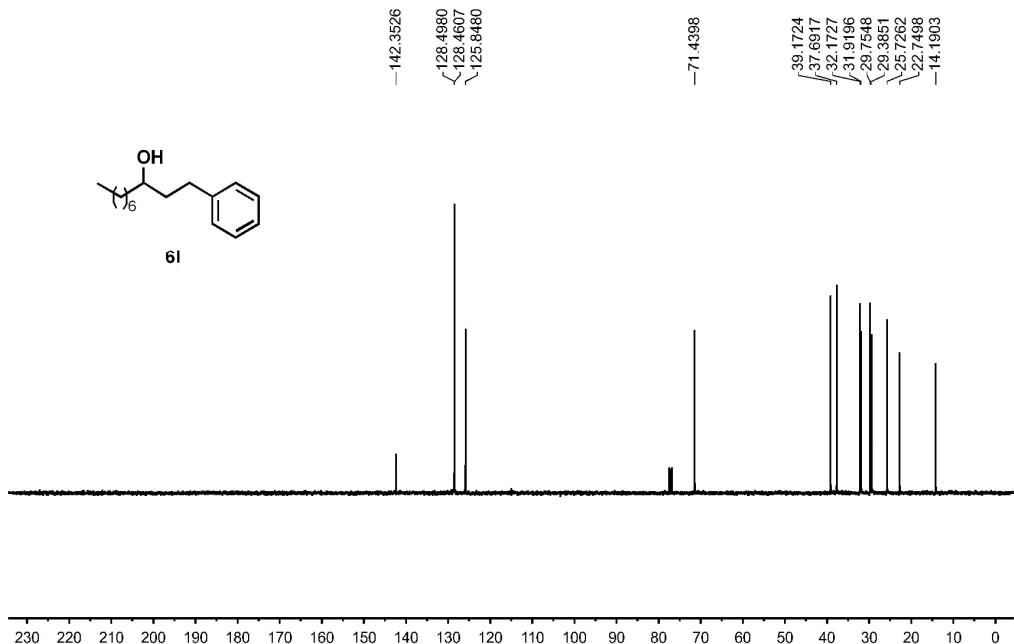
**Figure S60.** <sup>13</sup>C NMR spectrum of **6k** in CDCl<sub>3</sub>.

wqf-175  
1H NMR wqf-175 in CDCl<sub>3</sub>



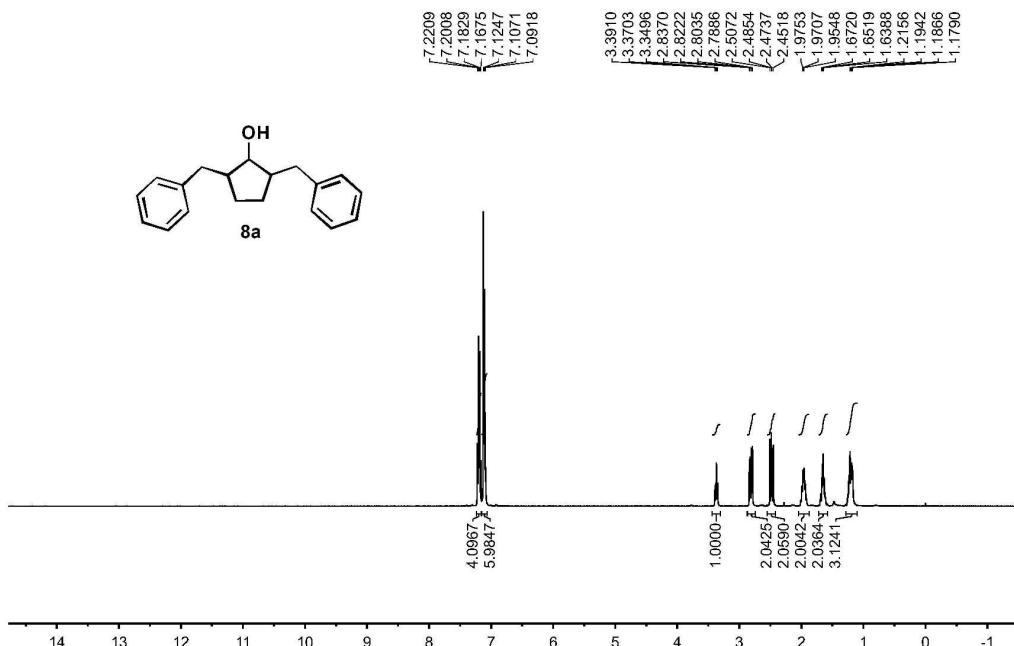
**Figure S61.** <sup>1</sup>H NMR spectrum of **6l** in CDCl<sub>3</sub>.

wqf-175  
13C NMR wqf-175 CDCl<sub>3</sub>



**Figure S62.** <sup>13</sup>C NMR spectrum of **6l** in CDCl<sub>3</sub>.

WQF-236-P  
1H NMR IN CDCl<sub>3</sub>



**Figure S63.** <sup>1</sup>H NMR spectrum of **8a** in CDCl<sub>3</sub>.

WQF-236-P  
13C NMR IN CDCl<sub>3</sub>

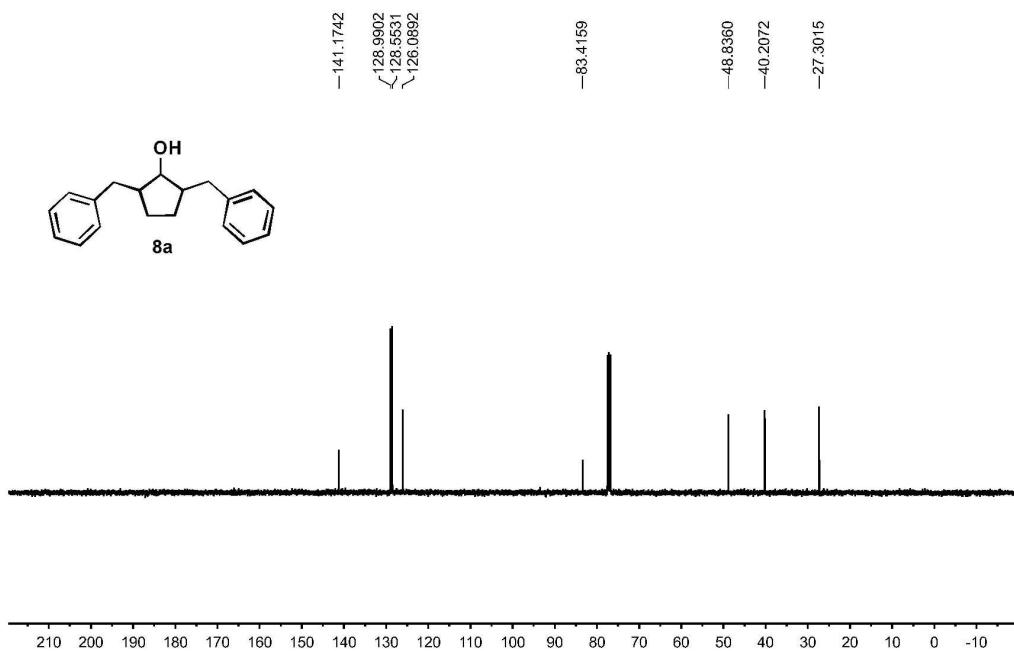


Figure S64. <sup>13</sup>C NMR spectrum of **8a** in CDCl<sub>3</sub>.

#### 4. Copies of NMR spectra for new compounds

wqf-214  
1H NMR wqf-214-2 in CDCl<sub>3</sub>

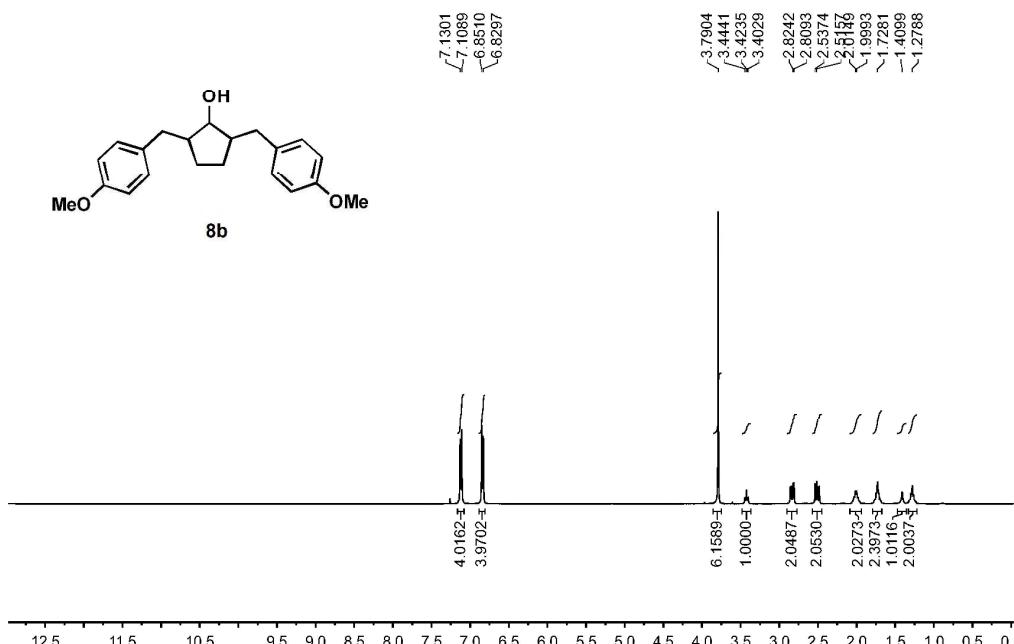
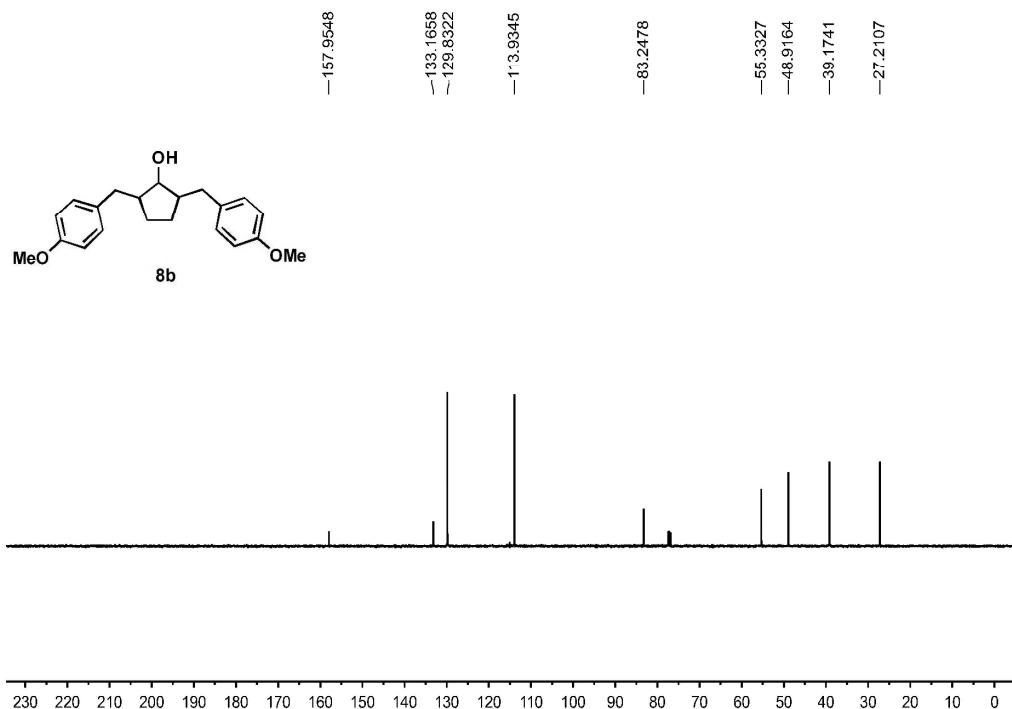


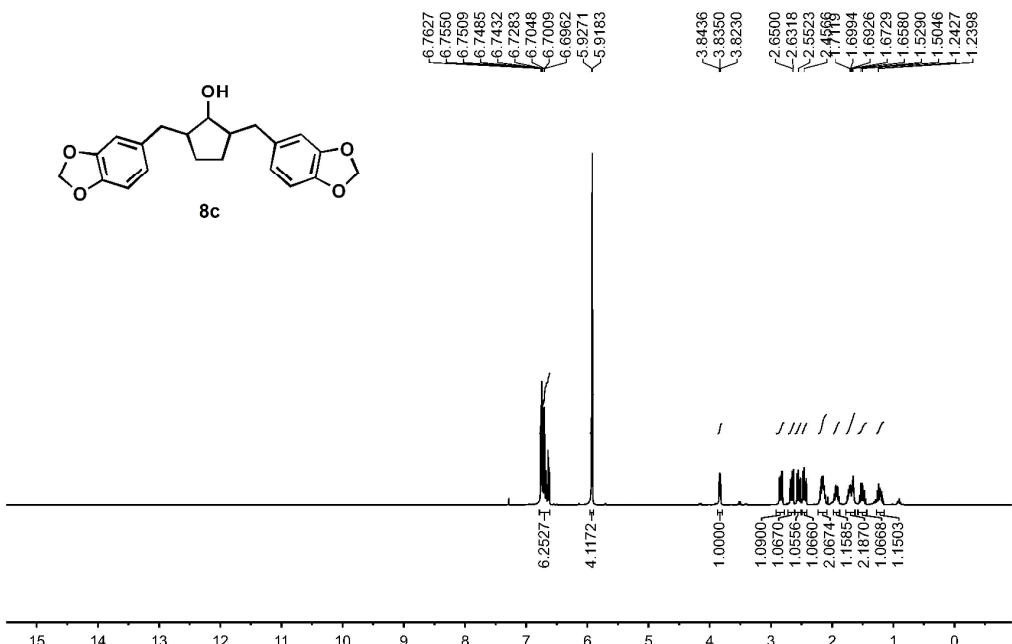
Figure S65. <sup>1</sup>H NMR spectrum of **8b** in CDCl<sub>3</sub>.

wqf-214  
13C NMR wqf-214-2 CDCl<sub>3</sub>



**Figure S66.** <sup>13</sup>C NMR spectrum of **8b** in CDCl<sub>3</sub>.

WQF-217-2  
1H NMR IN CDCl<sub>3</sub>



**Figure S67.** <sup>1</sup>H NMR spectrum of **8c** in CDCl<sub>3</sub>.

WQF-217-2  
13C NMR IN CDCl<sub>3</sub>

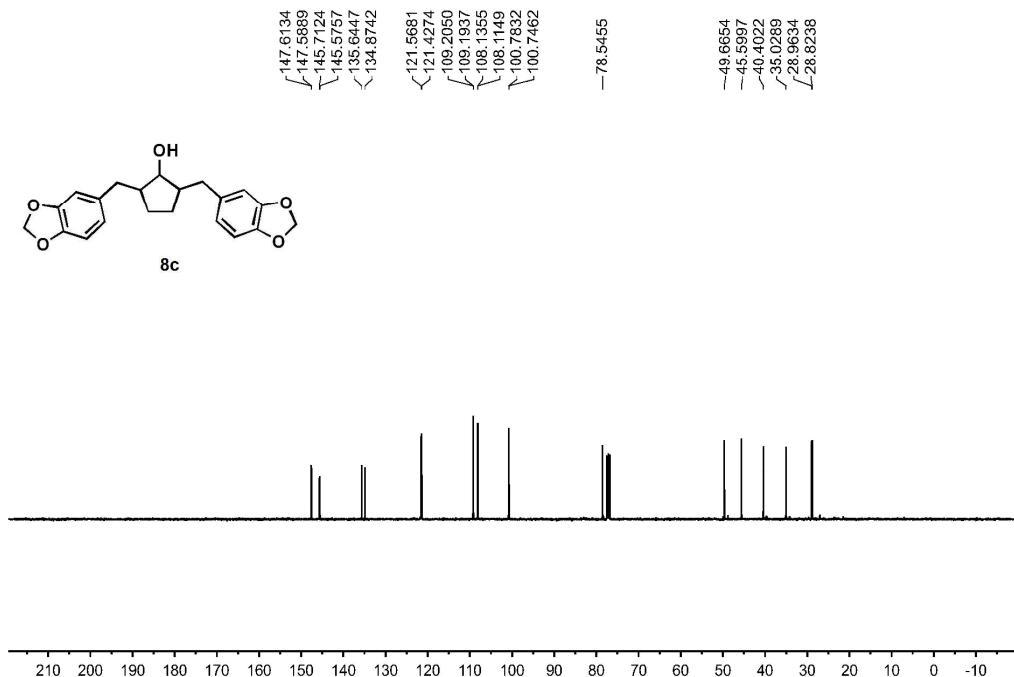


Figure S68. <sup>13</sup>C NMR spectrum of **8c** in CDCl<sub>3</sub>.

WQF-216-P  
1H NMR IN CDCl<sub>3</sub>

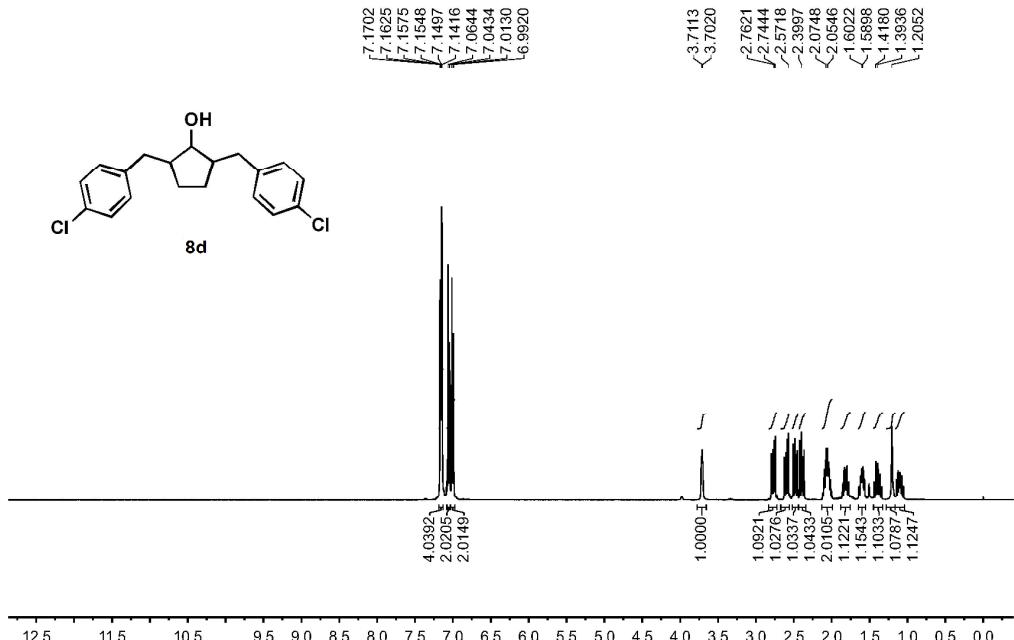
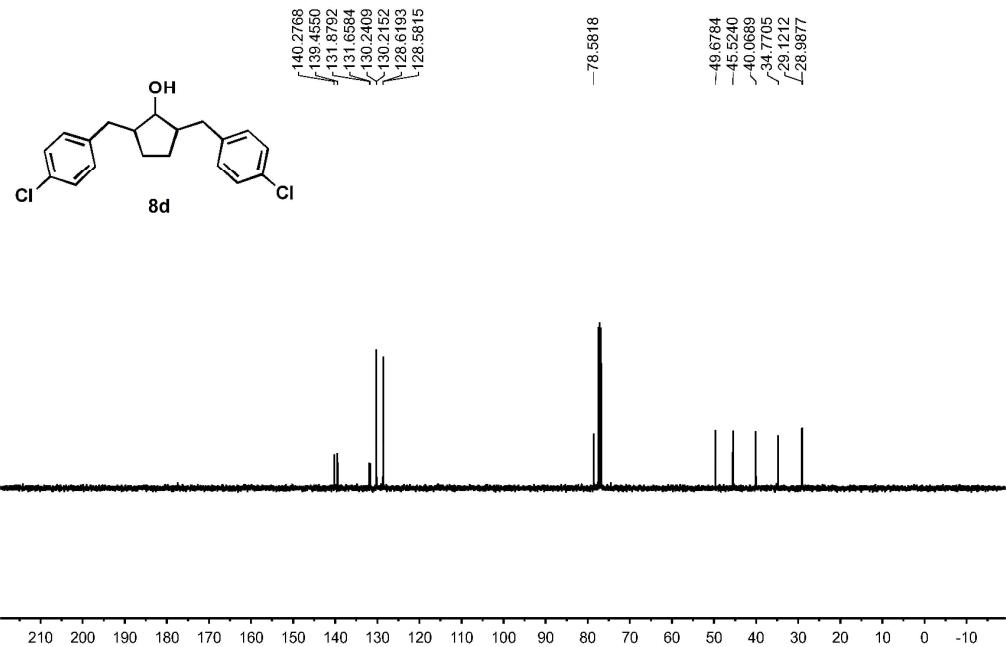


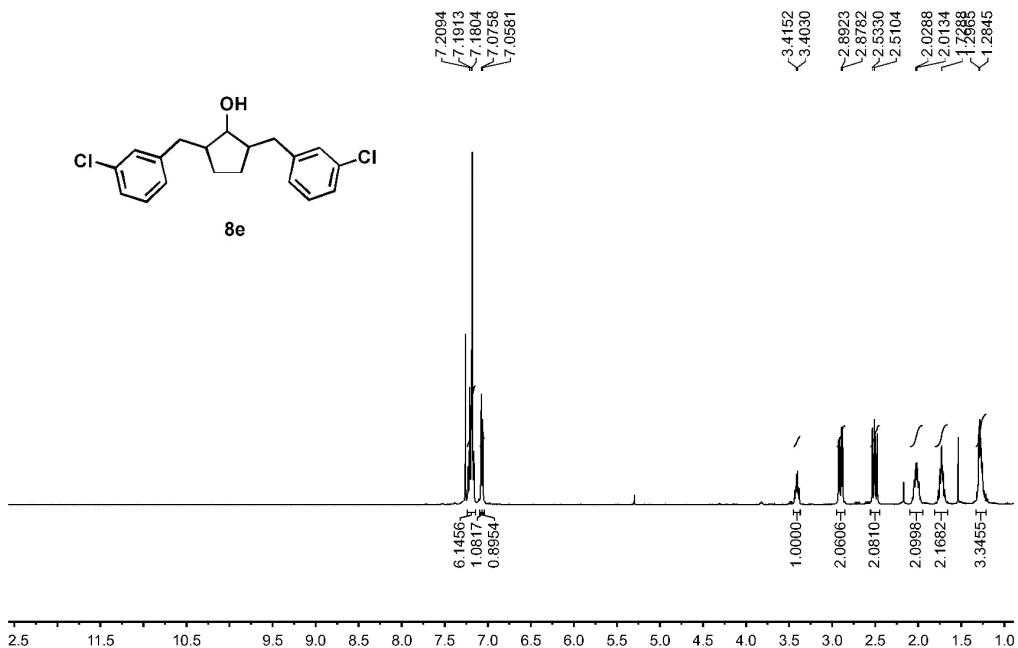
Figure S69. <sup>1</sup>H NMR spectrum of **8d** in CDCl<sub>3</sub>.

WQF-216-P  
13C NMR IN CDCl<sub>3</sub>



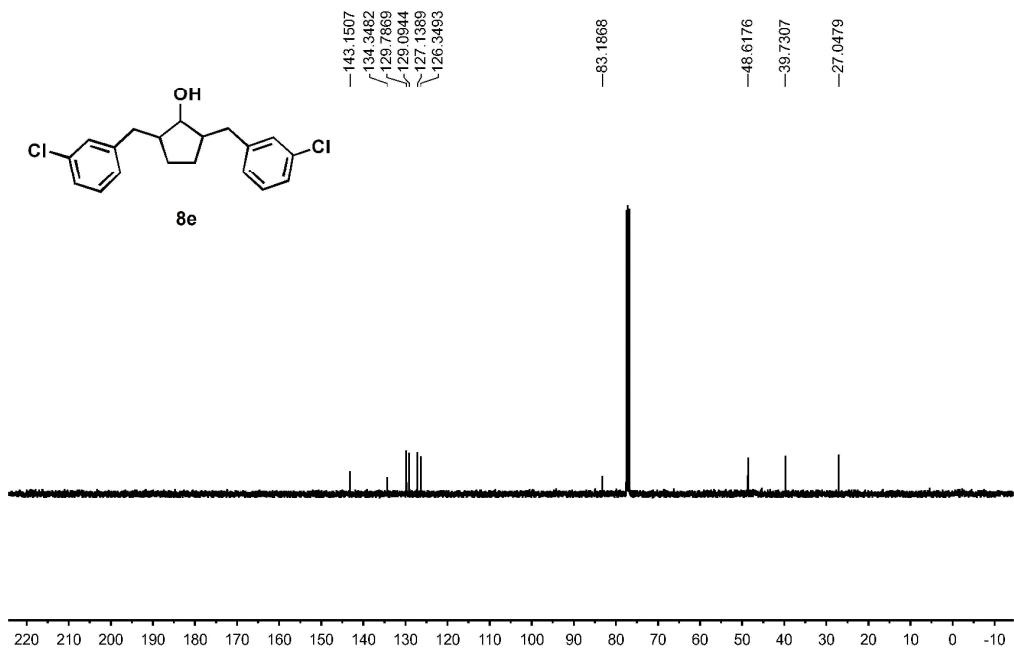
**Figure S70.** <sup>13</sup>C NMR spectrum of **8d** in CDCl<sub>3</sub>.

WQF-210-P  
1H NMR IN CDCl<sub>3</sub>



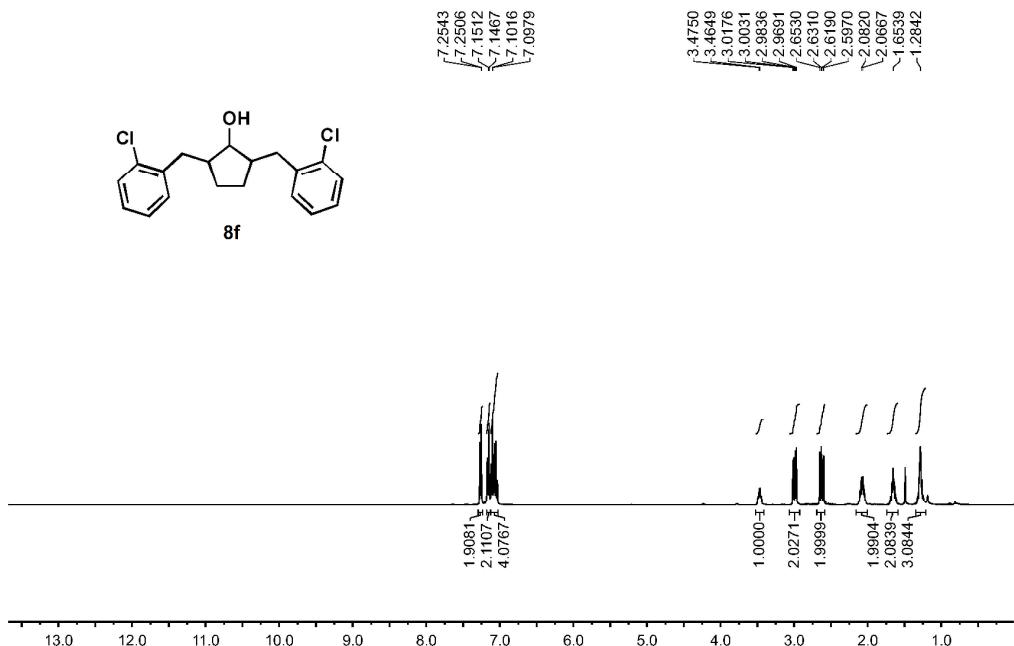
**Figure S71.** <sup>1</sup>H NMR spectrum of **8e** in CDCl<sub>3</sub>.

WQF-210-P  
13C NMR IN CDCl<sub>3</sub>



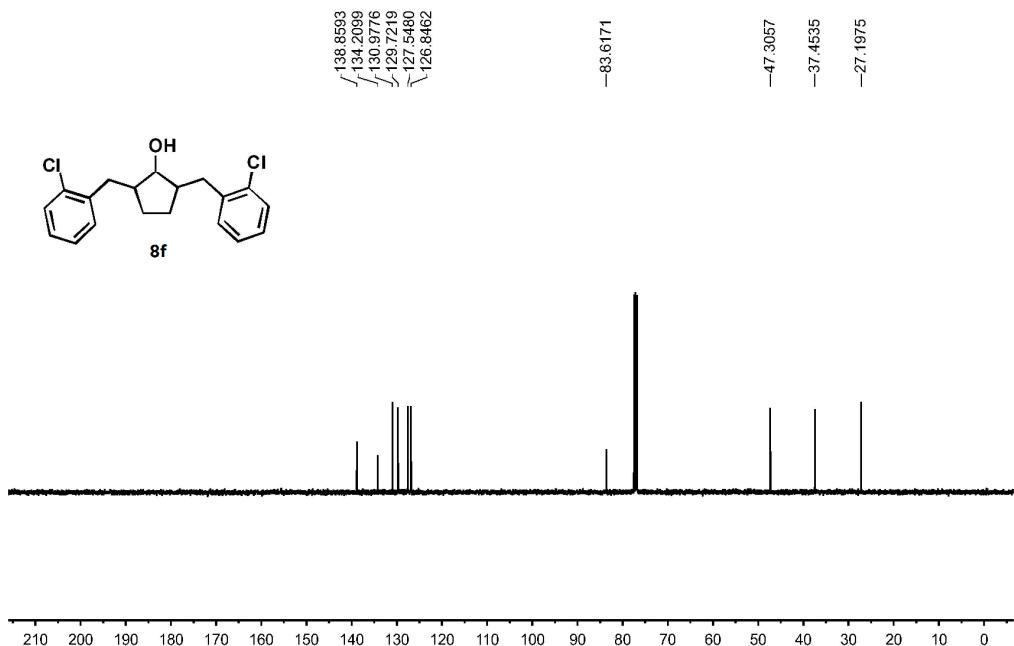
**Figure S72.** <sup>13</sup>C NMR spectrum of **8e** in CDCl<sub>3</sub>.

WQF-223-P  
1H NMR IN CDCl<sub>3</sub>



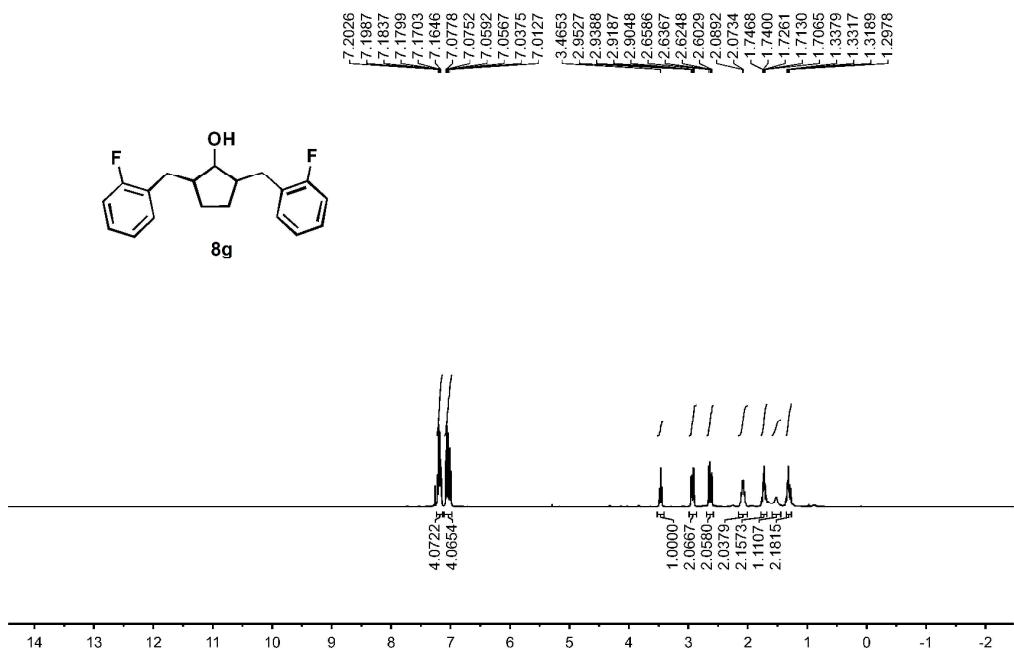
**Figure S73.** <sup>1</sup>H NMR spectrum of **8f** in CDCl<sub>3</sub>.

WQF-223-P  
13C NMR IN CDCl<sub>3</sub>



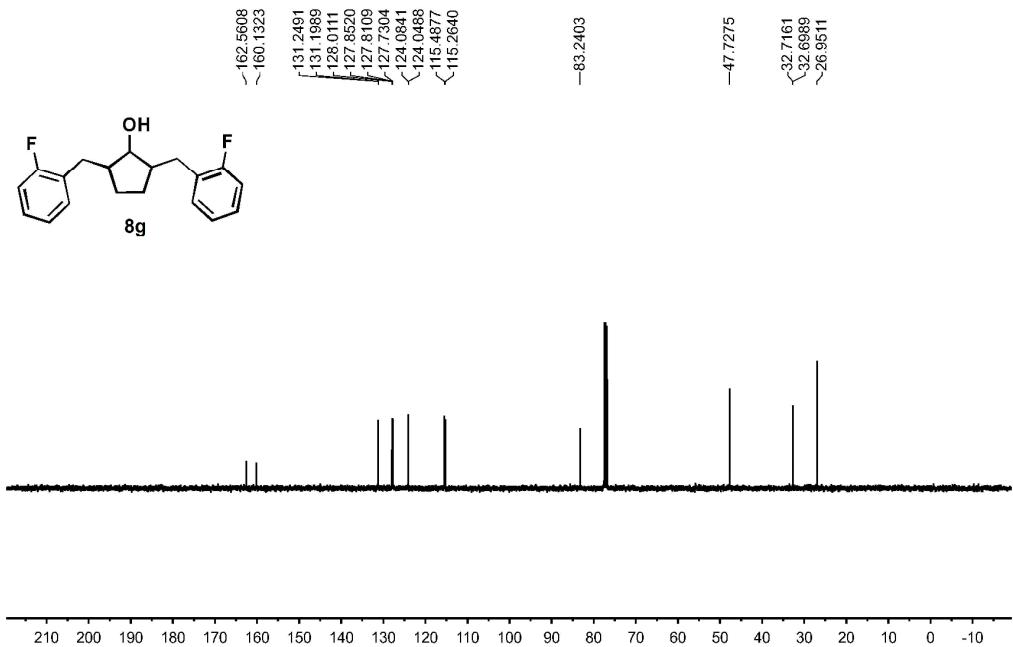
**Figure S74.** <sup>13</sup>C NMR spectrum of **8f** in CDCl<sub>3</sub>.

WQF228  
HNMR IN CDCl<sub>3</sub>



**Figure S75.** <sup>1</sup>H NMR spectrum of **8g** in CDCl<sub>3</sub>.

WQF228  
13C NMR in CDCl<sub>3</sub>



**Figure S76.** <sup>13</sup>C NMR spectrum of **8g** in CDCl<sub>3</sub>.