

## Supporting Information

### Synthesis of polysubstituted pyridines from oxime acetates using NH<sub>4</sub>I as dual-function promoter

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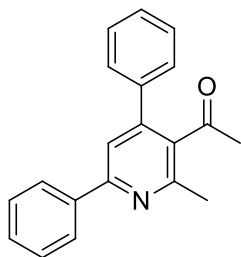
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### Table of Contents

|                                                                           |              |
|---------------------------------------------------------------------------|--------------|
| <b>Characterization data of pyridine products</b>                         | <b>2-23</b>  |
| <b>References</b>                                                         | <b>24</b>    |
| <b>Copies of <sup>1</sup>H and <sup>13</sup>C NMR spectra of products</b> | <b>25-83</b> |

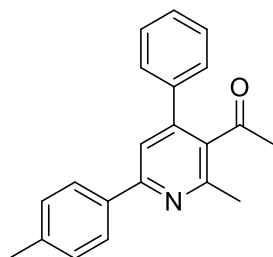
## Characterization data of pyridine products

### 1-(2-Methyl-4,6-diphenylpyridin-3-yl)ethanone (4a)<sup>1</sup>



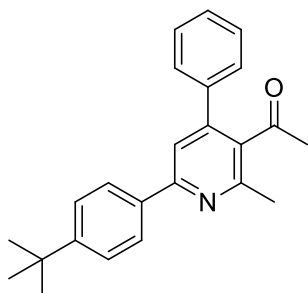
White solid, 87% yield. MP = 99 – 102 °C. <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>, ppm)  $\delta$  8.04 (d,  $J$  = 6.90 Hz, 2H), 7.58 (s, 1H), 7.58-7.43 (m, 8H), 2.64 (s, 3H), 2.02 (s, 3H); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>, ppm)  $\delta$  206.3, 157.0, 154.0, 147.3, 138.8, 138.3, 134.4, 129.3, 129.0, 128.9, 128.8, 128.5, 127.1, 118.5, 32.0, 23.0. MS (EI)  $m/z$  (%) 287 (100), 272, 210, 133, 77.

### 1-(2-Methyl-4-phenyl-6-(p-tolyl)pyridin-3-yl)ethanone (4b)



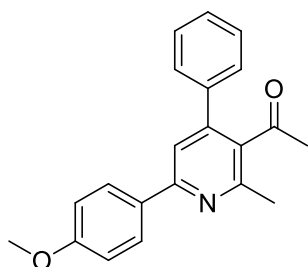
Yellow solid, 75% yield. MP = 130 – 133 °C. <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>, ppm)  $\delta$  7.94 (d,  $J$  = 8.20 Hz, 2H), 7.55 (s, 1H), 7.50-7.44 (m, 3H), 7.43-7.39 (m, 2H), 7.29 (d,  $J$  = 8.00 Hz, 2H), 2.62 (s, 3H), 2.41 (s, 3H), 2.00 (s, 3H); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>, ppm)  $\delta$  206.3, 157.0, 154.0, 147.3, 139.4, 138.5, 135.9, 134.2, 129.5, 128.98, 128.92, 128.5, 127.0, 118.2, 32.1, 23.0, 21.3. HRMS calcd. for: C<sub>21</sub>H<sub>20</sub>NO<sup>+</sup> [M+H]<sup>+</sup> 302.1539, found 302.1539.

### 1-(6-(4-(*tert*-Butyl)phenyl)-2-methyl-4-phenylpyridin-3-yl)ethanone (4c)



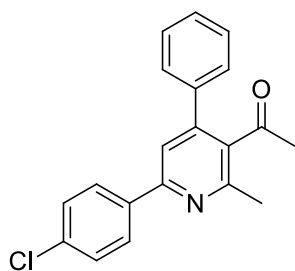
White solid, 72% yield. MP = 156 – 158 °C. <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>, ppm) δ 7.96 (d, *J* = 7.50 Hz, 2H), 7.56 (s, 1H), 7.53-7.45 (m, 5H), 7.42 (m, 2H), 2.64 (s, 3H), 2.01 (s, 3H), 1.36 (s, 9H); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>, ppm) δ 206.4, 157.1, 154.0, 152.5, 147.2, 138.5, 136.0, 134.1, 129.0, 128.9, 128.5, 126.8, 125.7, 118.3, 34.7, 32.1, 31.3, 23.1. HRMS calcd. for: C<sub>24</sub>H<sub>26</sub>NO<sup>+</sup> [M+H]<sup>+</sup> 344.2011 found 344.2004.

**1-(6-(4-Methoxyphenyl)-2-methyl-4-phenylpyridin-3-yl)ethanone (4d)**



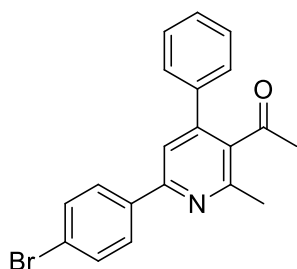
Yellow solid, 51% yield. MP = 97 – 100 °C. <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>, ppm) δ 8.02 (d, *J* = 7.70 Hz, 2H), 7.53 (s, 1H), 7.44 (m, 5H), 7.01 (d, *J* = 7.70 Hz, 2H), 3.87 (s, 3H), 2.64 (s, 3H), 2.00 (s, 3H); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>, ppm) δ 206.4, 160.8, 156.6, 153.9, 147.3, 138.5, 133.8, 131.3, 129.0, 128.9, 128.5, 128.4, 117.7, 114.15, 55.4, 32.1, 23.0. HRMS calcd. for: C<sub>21</sub>H<sub>20</sub>NO<sub>2</sub><sup>+</sup> [M+H]<sup>+</sup> 318.1489 found 318.1489.

**1-(6-(4-Chlorophenyl)-2-methyl-4-phenylpyridin-3-yl)ethanone (4e)**



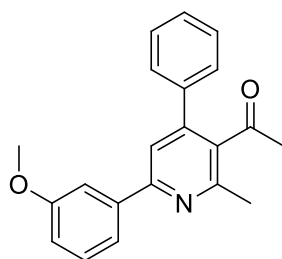
Yellow solid, 80% yield. MP = 163 – 165 °C. <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>, ppm) δ 8.03-7.96 (m, 2H), 7.55 (s, 1H), 7.51-7.45 (m, 4H), 7.45-7.43 (m, 1H), 7.41-7.39 (m, 2H), 2.62 (s, 3H), 2.01 (s, 3H); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>, ppm) δ 206.1, 155.6, 154.2, 147.4, 138.2, 137.1, 135.5, 134.7, 129.1, 129.0, 128.9, 128.5, 128.4, 118.3, 32.0, 23.0. HRMS calcd. for: C<sub>20</sub>H<sub>17</sub>ClNO<sup>+</sup> [M+H]<sup>+</sup> 322.0993, found 322.0992.

**1-(6-(4-Bromophenyl)-2-methyl-4-phenylpyridin-3-yl)ethanone (4f)**



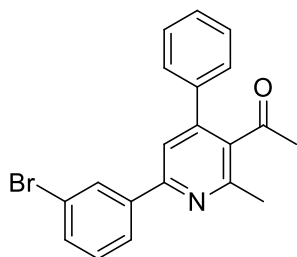
White solid, 69% yield. MP = 162 – 165 °C.  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  7.94 (d,  $J$  = 8.50 Hz, 2H), 7.61 (d,  $J$  = 8.50 Hz, 2H), 7.55 (s, 1H), 7.50-7.45 (m, 3H), 7.42-7.40 (m, 2H), 2.62 (s, 3H), 2.01 (s, 3H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  206.1, 155.7, 154.3, 147.4, 138.1, 137.6, 134.8, 131.9, 129.09, 129.06, 128.7, 128.5, 123.9, 118.3, 32.0, 23.0. HRMS calcd. for:  $\text{C}_{20}\text{H}_{17}\text{BrNO}^+$   $[\text{M}+\text{H}]^+$  366.0488, found 366.0490.

**1-(6-(3-Methoxyphenyl)-2-methyl-4-phenylpyridin-3-yl)ethanone (4g)**



Yellow oil, 73% yield.  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  7.65-7.61 (m, 1H), 7.61-7.57 (m, 1H), 7.56 (s, 1H), 7.49-7.44 (m, 3H), 7.43-7.36 (m, 3H), 6.99 (d,  $J$  = 8.20 Hz, 1H), 3.90 (s, 3H), 2.63 (s, 3H), 2.01 (s, 3H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  206.2, 160.1, 156.8, 154.0, 147.3, 140.2, 138.3, 134.6, 129.8, 129.0, 128.5, 119.5, 118.7, 115.3, 112.5, 55.4, 32.1, 23.0. HRMS calcd. for:  $\text{C}_{21}\text{H}_{19}\text{NO}_2^+$   $[\text{M}+\text{H}]^+$  318.1489, found 318.1487.

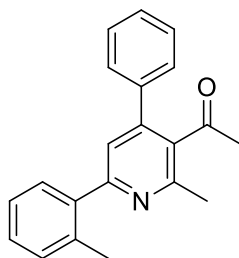
**1-(6-(3-Bromophenyl)-2-methyl-4-phenylpyridin-3-yl)ethanone (4h)**



Yellow oil, 60% yield.  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  8.21 (t,  $J$  = 1.80 Hz, 1H), 7.97 (dd,  $J$  =

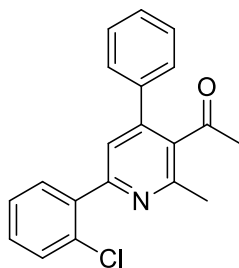
7.80, 1.20 Hz, 1H), 7.59-7.54 (m, 2H), 7.49-7.47 (m, 3H), 7.47-7.42 (m, 2H), 7.35 (t,  $J = 7.90$  Hz, 1H), 2.63 (s, 3H), 2.02 (s, 3H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  206.0, 155.2, 154.3, 147.6, 140.6, 138.0, 135.0, 132.3, 130.3, 130.2, 129.2, 129.1, 128.5, 125.7, 123.1, 118.7, 32.0, 23.0. HRMS calcd. for:  $\text{C}_{20}\text{H}_{16}\text{BrNO}^+ [\text{M}+\text{H}]^+$  366.0488, found 366.0475.

**1-(2-Methyl-4-phenyl-6-(o-tolyl)pyridin-3-yl)ethanone (4i)**



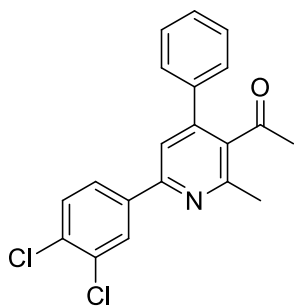
Yellow oil, 66% yield.  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  8.25 (d,  $J = 8.60$  Hz, 2H), 8.06 (d,  $J = 8.50$  Hz, 2H), 7.64 (s, 1H), 7.50-7.49 (m, 3H), 7.44-7.38 (m, 2H), 3.10 (s, 3H), 2.64 (s, 3H), 2.03 (s, 3H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  205.8, 154.7, 154.6, 147.6, 143.9, 140.8, 137.8, 135.6, 133.6, 130.1, 129.3, 129.1, 128.5, 128.0, 127.9, 119.2, 44.6, 32.0, 23.0. HRMS calcd. for:  $\text{C}_{21}\text{H}_{20}\text{NO}^+ [\text{M}+\text{H}]^+$  302.1539, found 302.1539.

**1-(6-(2-Chlorophenyl)-2-methyl-4-phenylpyridin-3-yl)ethanone (4j)**



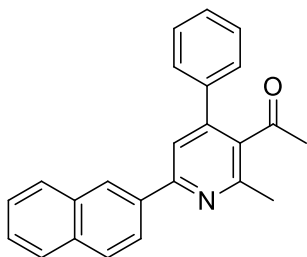
Yellow oil, 61% yield.  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  7.64 (dd,  $J = 7.40, 1.9$  Hz, 1H), 7.54 (s, 1H), 7.50-7.34 (m, 8H), 2.63 (s, 3H), 2.05 (s, 3H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  206.2, 156.3, 153.9, 146.3, 138.6, 137.9, 134.7, 132.2, 131.6, 130.2, 129.8, 129.04, 129.00, 128.6, 127.1, 122.9, 32.0, 22.8. HRMS calcd. for:  $\text{C}_{20}\text{H}_{16}\text{ClNO}^+ [\text{M}+\text{H}]^+$  322.0993, found 322.0992.

**1-(6-(3,4-Dichlorophenyl)-2-methyl-4-phenylpyridin-3-yl)ethanone (4k)**



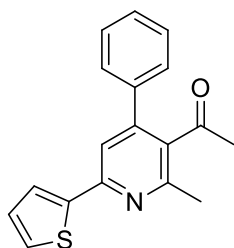
White solid, 88% yield. MP = 155 – 158 °C.  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  8.19 (d,  $J$  = 2.00 Hz, 1H), 7.90 (dd,  $J$  = 8.40, 2.10 Hz, 1H), 7.57-7.53 (m, 2H), 7.49-7.47 (m, 3H), 7.42-7.39 (m, 2H), 2.63 (s, 3H), 2.02 (s, 3H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  204.7, 156.7, 154.3, 143.6, 138.4, 135.5, 135.2, 134.7, 133.1, 132.0, 129.9, 129.5, 128.8, 127.4, 127.1, 119.2, 31.7, 23.3. HRMS calcd. for:  $\text{C}_{20}\text{H}_{15}\text{Cl}_2\text{NO}^+ [\text{M}+\text{H}]^+$  356.0603, found 356.0601.

#### 1-(2-Methyl-6-(naphthalen-2-yl)-4-phenylpyridin-3-yl)ethanone (4l)



Yellow solid, 48% yield. MP = 211 – 214 °C.  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  8.53 (s, 1H), 8.19 (dd,  $J$  = 8.60, 1.40 Hz, 1H), 7.97-7.92 (m, 2H), 7.89-7.86 (m, 1H), 7.73 (s, 1H), 7.53-7.44 (m, 7H), 2.68 (s, 3H), 2.03 (s, 3H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  206.4, 156.8, 154.2, 147.3, 138.3, 136.0, 134.4, 133.7, 133.4, 129.0, 128.8, 128.50, 128.48, 127.7, 126.7, 126.3, 124.6, 124.5, 118.9, 118.8, 32.1, 23.1. HRMS calcd. for:  $\text{C}_{24}\text{H}_{20}\text{NO}^+ [\text{M}+\text{H}]^+$  338.1539, found 338.1537.

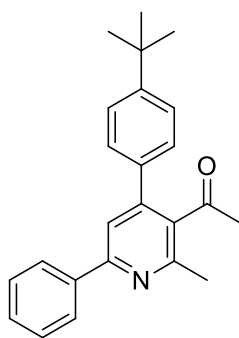
#### 1-(2-Methyl-4-phenyl-6-(thiophen-2-yl)pyridin-3-yl)ethanone (4m)



White solid, 49% yield. MP = 134 – 136 °C.  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  7.67 (s, 1H), 7.47-

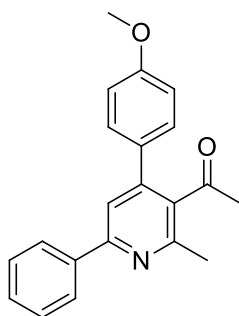
7.41 (m, 7H), 7.13 (s, 1H), 2.59 (s, 3H), 1.98 (s, 3H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  205.9, 154.2, 152.0, 147.3, 144.1, 138.1, 134.2, 129.03, 129.00, 128.4, 128.2, 128.1, 125.3, 116.7, 32.0, 22.8. HRMS calcd. for:  $\text{C}_{18}\text{H}_{16}\text{NOS}^+$   $[\text{M}+\text{H}]^+$  294.0947, found 294.0947.

**1-(4-(4-(*tert*-Butyl)phenyl)-2-methyl-6-phenylpyridin-3-yl)ethanone (5a)**



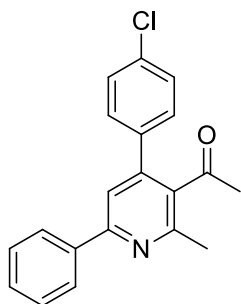
Yellow solid, 77% yield. MP = 137 – 139 °C.  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  8.04 (d,  $J$  = 6.90 Hz, 2H), 7.59 (s, 1H), 7.48 (m, 5H), 7.35 (d,  $J$  = 7.60 Hz, 2H), 2.65 (s, 3H), 2.03 (s, 3H), 1.36 (s, 9H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  206.6, 156.9, 153.9, 152.3, 147.3, 138.9, 135.3, 134.4, 129.2, 128.7, 128.2, 127.1, 125.9, 118.6, 34.7, 32.1, 31.3, 23.0. HRMS calcd. for:  $\text{C}_{24}\text{H}_{26}\text{NO}^+$   $[\text{M}+\text{H}]^+$  344.2009, found 344.2003.

**1-(4-(4-Methoxyphenyl)-2-methyl-6-phenylpyridin-3-yl)ethanone (5b) <sup>1</sup>**



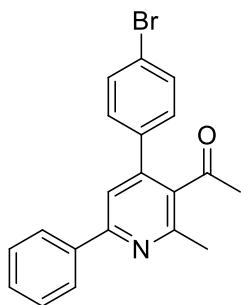
Yellow solid, 56% yield. MP = 99 – 102 °C.  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  8.04 (d,  $J$  = 6.00 Hz, 2H), 7.57 (s, 1H), 7.49 (d,  $J$  = 6.50 Hz, 3H), 7.36 (d,  $J$  = 7.20 Hz, 2H), 7.00 (d,  $J$  = 7.1 Hz, 2H), 3.87 (s, 3H), 2.66 (s, 3H), 2.04 (s, 3H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  206.6, 160.3, 156.9, 153.9, 147.0, 138.7, 134.4, 130.4, 129.8, 129.3, 128.8, 127.1, 118.6, 114.46, 55.4, 32.0, 22.9. MS (EI)  $m/z$  (%) 317 (100), 210, 133, 107, 77.

**1-(4-(4-Chlorophenyl)-2-methyl-6-phenylpyridin-3-yl)ethanone (5c)**<sup>1</sup>



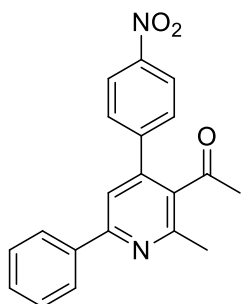
White solid, 85% yield. MP = 100 – 102 °C. <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>, ppm) δ 8.05-8.00 (m, 2H), 7.53 (s, 1H), 7.51-7.42 (m, 5H), 7.38-7.34 (m, 2H), 2.62 (s, 3H), 2.06 (s, 3H); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>, ppm) δ 206.0, 157.1, 154.1, 145.9, 138.5, 136.7, 135.3, 134.3, 129.8, 129.4, 129.3, 128.8, 127.1, 118.3, 32.2, 23.0. MS (EI) m/z (%) 321 (100), 210, 133, 111, 77.

**1-(4-(4-Bromophenyl)-2-methyl-6-phenylpyridin-3-yl)ethanone (5d)**<sup>1</sup>



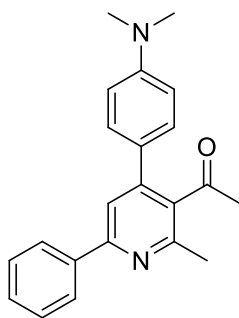
White solid, 80% yield. MP = 107 – 109 °C. <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>, ppm) δ 8.04 (d, *J* = 6.60 Hz, 2H), 7.62 (d, *J* = 7.30 Hz, 2H), 7.54 (s, 1H), 7.49 (d, *J* = 7.60 Hz, 3H), 7.30 (d, *J* = 7.40 Hz, 2H), 2.66 (s, 3H), 2.07 (s, 3H); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>, ppm) δ 205.9, 157.1, 154.2, 146.1, 138.4, 137.1, 134.3, 132.3, 130.1, 129.5, 128.8, 127.2, 123.6, 118.4, 32.2, 22.9. MS (EI) m/z (%) 365 (100), 210, 155, 133, 77.

**1-(2-Methyl-4-(4-nitrophenyl)-6-phenylpyridin-3-yl)ethanone (5e)**



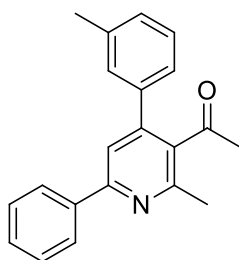
Yellow solid, 65% yield. MP = 137 – 140 °C. <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>, ppm) δ 8.35 (d, *J* = 7.60 Hz, 2H), 8.05 (d, *J* = 6.60 Hz, 2H), 7.61 (d, *J* = 7.7 Hz, 2H), 7.56 (s, 1H), 7.50 (d, *J* = 7.30 Hz, 3H), 2.68 (s, 3H), 2.10 (s, 3H); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>, ppm) δ 205.3, 157.4, 154.4, 148.1, 144.74, 144.71, 138.2, 134.2, 129.7, 129.6, 128.9, 127.1, 124.2, 118.0, 32.4, 23.1. HRMS calcd. for: C<sub>20</sub>H<sub>17</sub>N<sub>2</sub>O<sub>3</sub><sup>+</sup> [M+H]<sup>+</sup> 333.1234, found 333.1230

**1-(4-(4-(Dimethylamino)phenyl)-2-methyl-6-phenylpyridin-3-yl)ethanone (5f)**



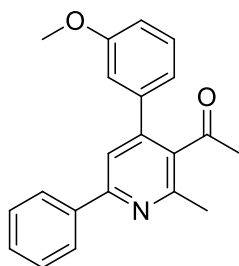
White solid, 74% yield. MP = 116 – 118 °C. <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>, ppm) δ 8.02 (d, *J* = 7.1 Hz, 2H), 7.56 (s, 1H), 7.50-7.41 (m, 3H), 7.30 (d, *J* = 8.80 Hz, 2H), 6.77 (d, *J* = 8.80 Hz, 2H), 3.03 (s, 6H), 2.61 (s, 3H), 2.06 (s, 3H); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>, ppm) δ 207.2, 156.8, 153.9, 150.8, 147.6, 139.1, 134.0, 129.4, 129.1, 128.7, 127.1, 125.4, 118.4, 112.3, 40.2, 31.9, 23.0. HRMS calcd. for: C<sub>22</sub>H<sub>23</sub>N<sub>2</sub>O<sup>+</sup> [M+H]<sup>+</sup> 331.1805, found 331.1799.

**1-(2-Methyl-6-phenyl-4-(m-tolyl)pyridin-3-yl)ethanone (5g)**



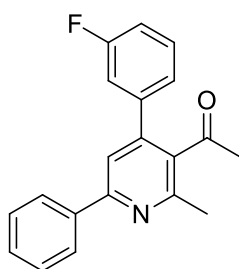
Yellow solid, 63% yield. MP = 108 – 111 °C. <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>, ppm) δ 8.07-7.99 (m, 2H), 7.57 (s, 1H), 7.47 (m, 6.9 Hz, 3H), 7.35 (m, 1H), 7.27 (s, 1H), 7.24-7.18 (m, 2H), 2.63 (s, 3H), 2.42 (s, 3H), 2.02 (s, 3H); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>, ppm) δ 206.2, 156.9, 154.0, 147.5, 138.8, 138.7, 138.3, 134.4, 129.7, 129.3, 129.1, 128.9, 128.8, 127.1, 125.6, 118.6, 32.0, 23.0, 21.4. HRMS calcd. for: C<sub>21</sub>H<sub>20</sub>NO<sup>+</sup> [M+H]<sup>+</sup> 302.1539, found 302.1540.

**1-(4-(3-Methoxyphenyl)-2-methyl-6-phenylpyridin-3-yl)ethanone (5h)**



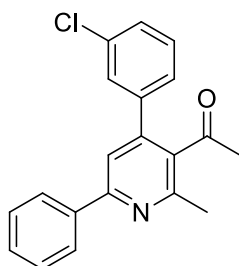
Yellow solid, 52% yield. MP = 101 – 104 °C.  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  8.06-8.01 (m, 2H), 7.58 (s, 1H), 7.51-7.42 (m, 3H), 7.39-7.34 (m, 1H), 7.01-6.93 (m, 3H), 3.84 (s, 3H), 2.63 (s, 3H), 2.05 (s, 3H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  206.2, 159.9, 157.0, 154.0, 147.2, 139.7, 138.7, 134.4, 130.1, 129.3, 128.8, 127.1, 120.9, 118.4, 114.7, 113.9, 55.4, 32.1, 23.0. HRMS calcd. for:  $\text{C}_{21}\text{H}_{19}\text{NO}_2^+ [\text{M}+\text{H}]^+$  318.1489, found 318.1489.

**1-(4-(3-Fluorophenyl)-2-methyl-6-phenylpyridin-3-yl)ethanone (5i)**



White solid, 66% yield. MP = 137 – 139 °C.  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  8.06-8.01 (m, 2H), 7.55 (s, 1H), 7.51-7.41 (m, 4H), 7.20-7.14 (m, 3H), 2.63 (s, 3H), 2.06 (s, 3H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  205.7, 162.8 (d,  $J$  = 241 Hz), 157.1, 154.2, 145.9, 140.3 (d,  $J$  = 7 Hz), 138.5, 134.3, 130.7 (d,  $J$  = 8 Hz), 129.5, 128.8, 127.1, 124.4 (d,  $J$  = 3 Hz), 118.3, 116.0 (d,  $J$  = 22 Hz), 115.6 (d,  $J$  = 22 Hz), 32.1, 23.0. HRMS calcd. for:  $\text{C}_{20}\text{H}_{16}\text{FNO}^+ [\text{M}+\text{H}]^+$  306.1289, found 306.1287.

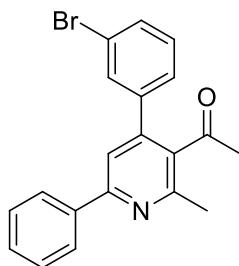
**1-(4-(3-Chlorophenyl)-2-methyl-6-phenylpyridin-3-yl)ethanone (5j)**



White solid, 73% yield. MP = 146 – 148 °C.  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  8.06-8.01 (m, 2H),

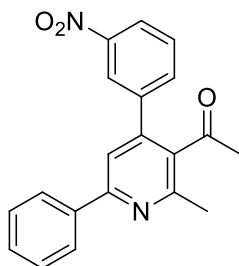
7.54 (s, 1H), 7.51-7.37 (m, 6H), 7.29-7.26 (m, 1H), 2.64 (s, 3H), 2.07 (s, 3H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  205.7, 157.2, 154.2, 145.8, 140.1, 138.5, 135.1, 134.3, 130.3, 129.5, 129.2, 128.9, 128.5, 127.2, 126.9, 118.4, 32.2, 23.0. HRMS calcd. for:  $\text{C}_{20}\text{H}_{16}\text{ClNO}^+$   $[\text{M}+\text{H}]^+$  322.0993, found 322.0992.

**1-(4-(3-Bromophenyl)-2-methyl-6-phenylpyridin-3-yl)ethanone (5k)**



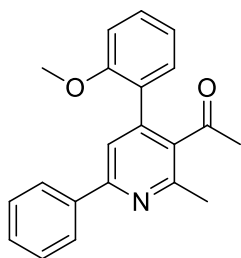
White solid, 65% yield. MP = 151 – 154 °C.  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  8.06-8.01 (m, 2H), 7.61-7.58 (m, 2H), 7.53 (s, 1H), 7.51-7.43 (m, 3H), 7.35-7.30 (m, 2H), 2.63 (s, 3H), 2.07 (s, 3H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  205.6, 157.1, 154.2, 145.6, 140.3, 138.4, 134.3, 132.0, 131.3, 130.5, 129.5, 128.8, 127.3, 127.1, 123.1, 118.3, 32.2, 23.0. HRMS calcd. for:  $\text{C}_{20}\text{H}_{16}\text{BrNO}^+$   $[\text{M}+\text{H}]^+$  366.0488, found 366.0481.

**1-(2-Methyl-4-(3-nitrophenyl)-6-phenylpyridin-3-yl)ethanone (5l)**



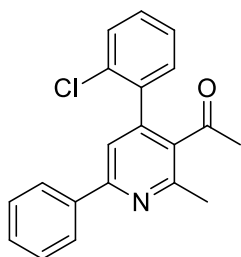
Yellow solid, 70% yield. MP = 163 – 165 °C.  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  8.91 (s, 1H), 8.44 (d,  $J$  = 7.50 Hz, 1H), 8.30 (d,  $J$  = 7.80 Hz, 1H), 7.70-7.66 (m, 2H), 7.47 (m, 5H), 2.66 (s, 3H), 2.04 (s, 3H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  205.8, 154.6, 154.1, 148.8, 147.7, 140.3, 137.7, 135.5, 132.9, 129.8, 129.3, 129.1, 128.5, 123.9, 122.0, 118.7, 32.0, 23.0. HRMS calcd. for:  $\text{C}_{20}\text{H}_{17}\text{N}_2\text{O}_3^+$   $[\text{M}+\text{H}]^+$  333.1234, found 333.1234.

**1-(4-(2-Methoxyphenyl)-2-methyl-6-phenylpyridin-3-yl)ethanone (5m)**



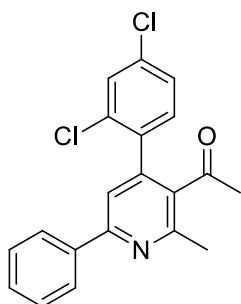
Yellow oil, 59% yield.  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  8.03-8.00 (m, 2H), 7.54 (s, 1H), 7.47-7.36 (m, 4H), 7.20 (dd,  $J = 7.50, 1.70$  Hz, 1H), 7.06-7.02 (m, 1H), 6.99-6.97 (m, 1H), 3.77 (s, 3H), 2.65 (s, 3H), 2.06 (s, 3H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  204.8, 156.6, 156.0, 154.0, 144.7, 139.0, 135.0, 130.7, 130.4, 129.1, 128.7, 127.2, 127.1, 121.0, 119.9, 111.0, 55.2, 31.2, 23.4. HRMS calcd. for:  $\text{C}_{21}\text{H}_{19}\text{NO}_2^+$   $[\text{M}+\text{H}]^+$  318.1489, found 318.1489.

**1-(4-(2-Chlorophenyl)-2-methyl-6-phenylpyridin-3-yl)ethanone (5n)**



Yellow solid, 72% yield. MP = 161 – 163 °C.  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  8.04 (dd,  $J = 8.10, 1.30$  Hz, 2H), 7.62-7.58 (m, 2H), 7.54 (s, 1H), 7.52-7.44 (m, 3H), 7.35-7.30 (m, 2H), 2.64 (s, 3H), 2.08 (s, 3H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  205.7, 157.2, 154.2, 145.6, 140.3, 138.4, 134.3, 132.1, 131.3, 130.5, 129.5, 128.8, 127.3, 127.1, 123.1, 118.4, 32.2, 23.0. HRMS calcd. for:  $\text{C}_{20}\text{H}_{17}\text{ClNO}^+$   $[\text{M}+\text{H}]^+$  322.0993, found 322.0999.

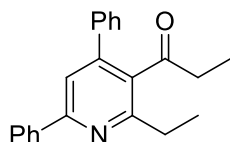
**1-(4-(2,4-Dichlorophenyl)-2-methyl-6-phenylpyridin-3-yl)ethanone (5o)**



White solid, 70% yield. MP = 152 – 154 °C.  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  8.03 (s, 1H), 8.01

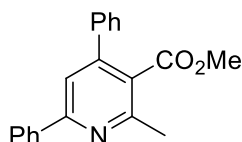
(s, 1H), 7.55 (d,  $J = 2.0$  Hz, 1H), 7.52-7.43 (m, 4H), 7.33 (dd,  $J = 8.2, 2.0$  Hz, 1H), 7.18 (d,  $J = 8.2$  Hz, 1H), 2.65 (s, 3H), 2.14 (s, 3H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  204.7, 156.7, 154.3, 143.6, 138.4, 135.5, 135.2, 134.7, 133.1, 132.0, 130.0, 129.5, 128.8, 127.4, 127.1, 119.2, 31.7, 23.2. HRMS calcd. for:  $\text{C}_{20}\text{H}_{15}\text{Cl}_2\text{NO}^+ [\text{M}+\text{H}]^+$  356.0603, found 356.0607.

#### 1-(2-Ethyl-4,6-diphenylpyridin-3-yl)propan-1-one (6a)



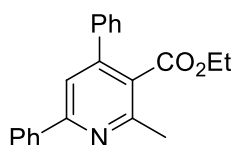
Yellow oil, 55% yield.  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  8.12-8.05 (m, 2H), 7.58 (s, 1H), 7.49-7.38 (m, 8H), 2.83 (q,  $J = 7.50$  Hz, 2H), 2.22 (q,  $J = 7.20$  Hz, 2H), 1.40 (t,  $J = 7.50$  Hz, 3H), 0.88 (t,  $J = 7.20$  Hz, 3H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  209.4, 158.9, 156.8, 147.1, 138.9, 138.5, 134.1, 129.2, 128.9, 128.8, 128.7, 128.5, 127.1, 118.3, 38.2, 29.2, 14.1, 7.9. HRMS calcd. for:  $\text{C}_{22}\text{H}_{21}\text{NO}^+ [\text{M}+\text{H}]^+$  316.1696, found 316.1699.

#### Methyl 2-methyl-4,6-diphenylnicotinate (6b)



Yellow solid, 72% yield. MP = 89 – 91 °C.  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  8.07-7.98 (m, 2H), 7.58 (s, 1H), 7.49-7.38 (m, 8H), 3.65 (s, 3H), 2.71 (s, 3H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  169.5, 157.5, 155.8, 148.9, 138.8, 138.7, 129.3, 128.8, 128.5, 128.5, 127.8, 127.2, 126.5, 118.5, 52.2, 23.1. HRMS calcd. for:  $\text{C}_{20}\text{H}_{17}\text{NO}_2^+ [\text{M}+\text{H}]^+$  304.1332, found 304.1331.

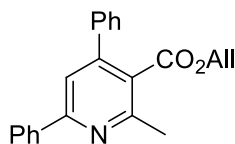
#### Ethyl 2-methyl-4,6-diphenylnicotinate (6c)



Yellow oil, 69% yield.  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  8.06-8.00 (m, 2H), 7.57 (s, 1H), 7.50-7.40 (m, 8H), 4.12 (q,  $J = 7.10$  Hz, 2H), 2.72 (s, 3H), 1.00 (t,  $J = 7.10$  Hz, 3H);  $^{13}\text{C}$  NMR (100 MHz,

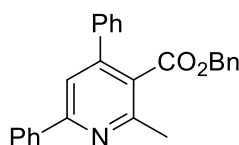
CDCl<sub>3</sub>, ppm)  $\delta$  168.9, 157.4, 155.7, 148.9, 138.8, 138.7, 129.3, 128.7, 128.5, 128.4, 127.9, 127.2, 126.7, 118.5, 61.3, 23.1, 13.6. HRMS calcd. for: C<sub>21</sub>H<sub>19</sub>NO<sub>2</sub><sup>+</sup> [M+H]<sup>+</sup> 318.1489, found 318.1491.

**Allyl 2-methyl-4,6-diphenylnicotinate (6d)**



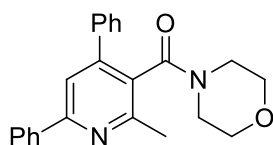
Yellow oil, 70% yield. <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>, ppm)  $\delta$  8.03 (dd, *J* = 8.10, 1.30 Hz, 2H), 7.58 (s, 1H), 7.51-7.41 (m, 8H), 5.67-5.57 (m, 1H), 5.19-5.09 (m, 2H), 4.55 (d, *J* = 6.00 Hz, 2H), 2.73 (s, 3H); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>, ppm)  $\delta$  168.7, 157.5, 155.8, 149.2, 138.8, 138.7, 131.2, 129.4, 128.8, 128.7, 128.5, 127.9, 127.2, 126.5, 119.0, 118.6, 66.0, 23.2. HRMS calcd. for: C<sub>22</sub>H<sub>19</sub>NO<sub>2</sub><sup>+</sup> [M+H]<sup>+</sup> 330.1489, found 330.1488.

**Benzyl 2-methyl-4,6-diphenylnicotinate (6e)**



Yellow oil, 64% yield. <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>, ppm)  $\delta$  8.01 (d, *J* = 6.90 Hz, 2H), 7.55 (s, 1H), 7.48-7.37 (m, 8H), 7.29-7.22 (m, 3H), 7.00 (dd, *J* = 7.40, 1.80 Hz, 2H), 5.08 (s, 2H), 2.70 (s, 3H); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>, ppm)  $\delta$  168.8, 157.5, 155.9, 149.0, 138.8, 138.7, 134.8, 129.3, 128.8, 128.7, 128.6, 128.5, 128.4, 128.3, 127.9, 127.2, 126.3, 118.6, 67.4, 23.2. HRMS calcd. for: C<sub>26</sub>H<sub>21</sub>NO<sub>2</sub><sup>+</sup> [M+H]<sup>+</sup> 380.1645, found 380.1646.

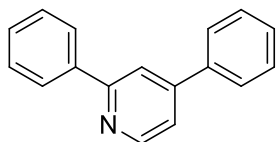
**(2-Methyl-4,6-diphenylpyridin-3-yl)(morpholino)methanone (6f)**



Yellow solid, 46% yield. MP = 134 – 137 °C. <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>, ppm)  $\delta$  8.03 (dd, *J* = 5.2, 3.2 Hz, 2H), 7.60 (s, 1H), 7.57-7.53 (m, 2H), 7.52-7.42 (m, 6H), 3.75-3.70 (m, 1H), 3.62 (m, 1H), 3.52 (m, 1H), 3.32 (m, 1H), 3.24 (m, 1H), 3.04 (m, 1H), 2.77 (m, 1H), 2.67 (s, 3H), 2.59 (m, 1H); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>, ppm)  $\delta$  167.9, 157.2, 155.4, 147.2, 138.6, 137.9, 129.3, 129.1, 128.82,

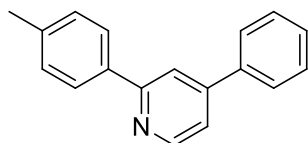
128.78, 128.5, 127.7, 127.1, 118.0, 66.2, 66.1, 46.5, 41.6, 22.8. HRMS calcd. for:  $C_{23}H_{22}N_2O_2^+$   
[M+H]<sup>+</sup> 359.1754, found 359.1753.

### 2,4-Diphenylpyridine (8a)<sup>2</sup>



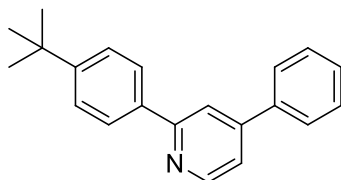
Yellow oil, 85% yield. <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>, ppm) δ 8.74 (d, *J* = 4.8 Hz, 1H), 8.06 (d, *J* = 6.8 Hz, 2H), 7.94 (s, 1H), 7.70 (d, *J* = 6.8 Hz, 2H), 7.54–7.40 (m, 7H); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>, ppm) δ 158.1, 150.1, 149.3, 139.5, 138.5, 129.1, 129.00, 128.99, 128.7, 127.1, 127.0, 120.2, 118.7. MS (EI) *m/z* (%) 231 (100), 202, 154, 102, 77.

### 4-Phenyl-2-(*p*-tolyl)pyridine (8b)<sup>2</sup>



Yellow oil, 75% yield. <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>, ppm) δ 8.72 (d, *J* = 5.00 Hz, 1H), 7.98–7.88 (m, 3H), 7.69 (d, *J* = 7.00 Hz, 2H), 7.54–7.41 (m, 4H), 7.31 (d, *J* = 7.90 Hz, 2H), 2.42 (s, 3H); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>, ppm) δ 158.0, 149.8, 149.3, 139.0, 138.5, 136.5, 129.5, 129.1, 129.0, 127.0, 126.9, 120.0, 118.4, 21.3. MS (EI) *m/z* (%) 245 (100), 230, 168, 91, 77.

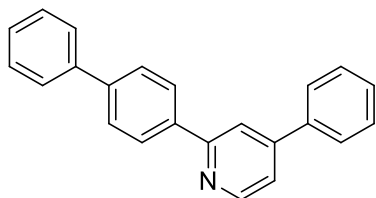
### 2-(4-(*tert*-Butyl)phenyl)-4-phenylpyridine (8c)<sup>2</sup>



Yellow oil, 79% yield. <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>, ppm) δ 8.73 (d, *J* = 4.80 Hz, 1H), 7.99 (d, *J* = 8.40 Hz, 2H), 7.92 (s, 1H), 7.70 (d, *J* = 7.20 Hz, 2H), 7.54–7.43 (m, 6H), 1.38 (s, 9H); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>, ppm) δ 157.9, 152.1, 149.9, 149.0, 138.5, 136.6, 129.0, 128.8, 126.9, 126.6, 125.6, 119.7, 118.3, 34.6, 31.2. MS (EI) *m/z* (%) 211 (100), 196, 181, 154, 57. MS (EI) *m/z* (%)

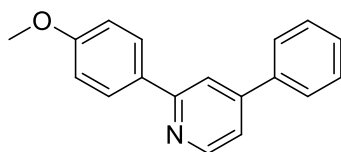
287 (100), 230, 210, 133, 77.

**2-([1,1'-Biphenyl]-4-yl)-4-phenylpyridine (8d)<sup>2</sup>**



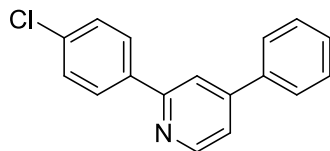
White solid, 91% yield. MP = 100–102 °C. <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>, ppm) δ 8.76 (d, *J* = 5.10 Hz, 1H), 8.15 (d, *J* = 8.20 Hz, 2H), 7.98 (s, 1H), 7.76–7.65 (m, 6H), 7.55–7.45 (m, 6H), 7.38 (t, *J* = 7.30 Hz, 1H); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>, ppm) δ 157.5, 150.0, 149.8, 141.9, 140.5, 139.2, 138.6, 138.3, 129.1, 128.8, 127.6, 127.5, 127.4, 127.1, 120.3, 118.7, 110.0. MS (EI) *m/z* (%) 307 (100), 230, 154, 153, 77.

**2-(4-Methoxyphenyl)-4-phenylpyridine (8e)<sup>2</sup>**



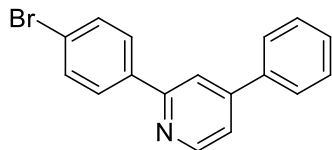
Yellow solid, 80% yield. MP = 63–65 °C. <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>, ppm) δ 8.71 (d, *J* = 5.20 Hz, 1H), 8.05–7.99 (m, 2H), 7.89 (d, *J* = 1.00 Hz, 1H), 7.73–7.66 (m, 2H), 7.56–7.45 (m, 3H), 7.42 (dd, *J* = 5.20, 1.70 Hz, 1H), 7.06–7.00 (m, 2H), 3.88 (s, 3H); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>, ppm) δ 160.7, 157.4, 154.9, 149.7, 149.4, 138.5, 131.5, 129.1, 128.4, 127.1, 119.7, 118.2, 114.2, 55.4. MS (EI) *m/z* (%) 261 (100), 246, 218, 96, 77.

**2-(4-Chlorophenyl)-4-phenylpyridine (8f)<sup>2</sup>**



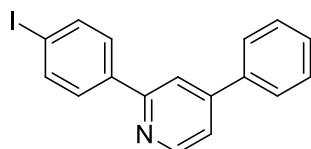
Yellow oil, 83% yield. <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>, ppm) δ 8.73 (d, *J* = 5.1 Hz, 1H), 8.03–7.97 (m, 2H), 7.90 (d, *J* = 0.9 Hz, 1H), 7.71–7.66 (m, 2H), 7.54–7.45 (m, 6H); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>, ppm) δ 156.7, 150.0, 149.63, 138.3, 137.7, 135.3, 129.19, 129.16, 128.9, 128.3, 127.1, 120.5, 118.6. MS (EI) *m/z* (%) 265 (100), 188, 154, 111, 77.

**2-(4-Bromophenyl)-4-phenylpyridine (8g)<sup>2</sup>**



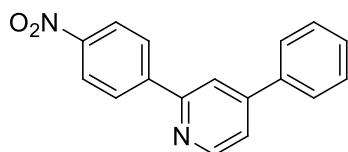
Yellow solid, 77% yield. MP = 85–87 °C. <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>, ppm) δ 8.73 (d, *J* = 5.10 Hz, 1H), 7.97-7.92 (m, 2H), 7.90 (d, *J* = 0.90 Hz, 1H), 7.71-7.66 (m, 2H), 7.65-7.60 (m, 2H), 7.54-7.45 (m, 4H); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>, ppm) δ 156.7, 150.0, 149.7, 138.2, 138.1, 131.9, 129.23, 129.17, 128.6, 127.1, 123.6, 120.6, 118.5. MS (EI) *m/z* (%) 309 (100), 229, 205, 154, 77.

**2-(4-Iodophenyl)-4-phenylpyridine (8h)<sup>2</sup>**



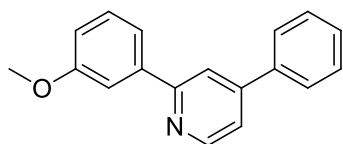
Yellow solid, 54% yield. MP = 99–101 °C. <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>, ppm) δ 8.74 (d, *J* = 5.00 Hz, 1H), 7.91 (s, 1H), 7.86-7.79 (m, 4H), 7.69 (d, *J* = 7.80 Hz, 2H), 7.55-7.48 (m, 4H); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>, ppm) δ 156.9, 150.1, 149.6, 138.8, 138.2, 137.9, 129.2, 129.1, 128.7, 127.1, 120.6, 118.4, 95.4. MS (EI) *m/z* (%) 357 (100), 230, 152, 115, 77.

**2-(4-Nitrophenyl)-4-phenylpyridine (8i)<sup>2</sup>**



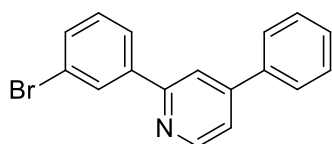
Yellow solid, 77% yield. MP = 150–152 °C. <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>, ppm) δ 8.81 (d, *J* = 5.10 Hz, 1H), 8.37 (d, *J* = 8.70 Hz, 2H), 8.26 (d, *J* = 8.70 Hz, 2H), 8.02 (s, 1H), 7.72 (dd, *J* = 7.90, 1.30 Hz, 2H), 7.60-7.50 (m, 4H); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>, ppm) δ 155.5, 150.5, 149.8, 148.2, 145.3, 138.0, 129.4, 129.3, 127.8, 127.1, 124.0, 121.6, 119.4. MS (EI) *m/z* (%) 276 (100), 199, 154, 122, 77.

**2-(3-Methoxyphenyl)-4-phenylpyridine (8j)<sup>2</sup>**



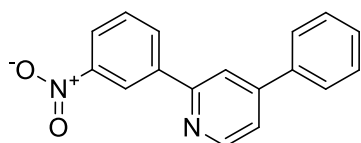
Yellow oil, 85% yield.  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  8.73 (dd,  $J = 5.10, 0.6$  Hz, 1H), 7.92 (dd,  $J = 1.60, 0.70$  Hz, 1H), 7.71-7.59 (m, 4H), 7.52-7.38 (m, 5H), 6.99 (ddd,  $J = 8.20, 2.60, 0.80$  Hz, 1H), 3.90 (s, 3H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  160.1, 157.8, 149.9, 149.3, 140.9, 138.4, 129.7, 129.1, 129.0, 127.0, 120.4, 119.4, 118.9, 115.1, 112.1, 55.3. MS (EI)  $m/z$  (%) 261 (100), 184, 154, 107, 77.

### 2-(3-Bromophenyl)-4-phenylpyridine (8k)<sup>2</sup>



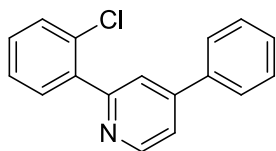
Yellow solid, 80% yield. MP = 69–71 °C.  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  8.74 (d,  $J = 5.10$  Hz, 1H), 8.22 (t,  $J = 1.80$  Hz, 1H), 7.98 (d,  $J = 7.80$  Hz, 1H), 7.90 (s, 1H), 7.69 (d,  $J = 7.00$  Hz, 2H), 7.59-7.46 (m, 5H), 7.37 (t,  $J = 7.90$  Hz, 1H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  156.4, 150.0, 149.7, 141.3, 138.2, 132.0, 130.3, 130.1, 129.24, 129.18, 127.1, 125.6, 123.1, 120.8, 118.9. MS (EI)  $m/z$  (%) 309 (100), 230, 154, 77.

### 2-(3-Nitrophenyl)-4-phenylpyridine (8l)<sup>2</sup>



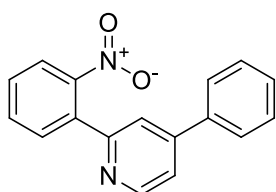
White solid, 81% yield. MP = 115–118 °C.  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  8.92 (t,  $J = 1.90$  Hz, 1H), 8.79 (d,  $J = 5.10$  Hz, 1H), 8.46 (d,  $J = 7.80$  Hz, 1H), 8.30 (dd,  $J = 8.10, 2.00$  Hz, 1H), 8.01 (d,  $J = 0.70$  Hz, 1H), 7.74-7.66 (m, 3H), 7.58-7.48 (m, 4H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  155.4, 150.4, 149.9, 148.8, 141.1, 138.0, 132.8, 129.7, 129.4, 129.2, 127.1, 123.6, 121.9, 121.4, 118.8. MS (EI)  $m/z$  (%) 276 (100), 246, 202, 115, 77.

### 2-(2-Chlorophenyl)-4-phenylpyridine (8m)<sup>2</sup>



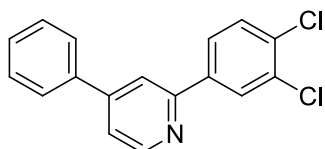
Yellow solid, 57% yield. MP = 67–69 °C.  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  8.78 (d,  $J$  = 5.20 Hz, 1H), 7.90 (s, 1H), 7.69 (dd,  $J$  = 12.00, 8.0 Hz, 3H), 7.57–7.45 (m, 5H), 7.43–7.34 (m, 2H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  157.0, 149.6, 148.7, 138.7, 138.0, 132.2, 131.6, 130.2, 129.8, 129.3, 129.2, 127.2, 127.1, 123.1, 120.5. MS (EI)  $m/z$  (%) 265 (100), 188, 154, 77.

### 2-(2-Nitrophenyl)-4-phenylpyridine (8n)<sup>2</sup>



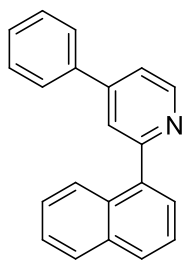
Yellow solid, 80% yield. MP = 101–103 °C.  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  8.69 (d,  $J$  = 5.20 Hz, 1H), 7.93 (d,  $J$  = 8.00 Hz, 1H), 7.70–7.65 (m, 5H), 7.59–7.46 (m, 5H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  156.0, 150.1, 149.4, 149.3, 137.8, 135.4, 132.4, 131.3, 129.3, 129.0, 127.1, 124.4, 120.8, 120.6, 120.3. MS (EI)  $m/z$  (%) 276 (100), 246, 202, 115, 77.

### 2-(3,4-Dichlorophenyl)-4-phenylpyridine (8o)<sup>2</sup>



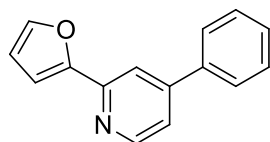
White solid, 93% yield. MP = 100–102 °C.  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  8.73 (d,  $J$  = 5.10 Hz, 1H), 8.18 (d,  $J$  = 1.90 Hz, 1H), 7.93–7.86 (m, 2H), 7.69 (d,  $J$  = 7.00 Hz, 2H), 7.59–7.46 (m, 5H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  155.5, 150.2, 149.7, 139.3, 138.1, 133.3, 133.1, 130.7, 129.3, 129.2, 128.9, 127.1, 126.1, 121.0, 118.6. MS (EI)  $m/z$  (%) 299 (100), 264, 228, 154, 77.

### 2-(Naphthalen-1-yl)-4-phenylpyridine (8p)<sup>2</sup>



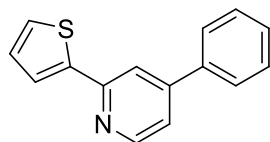
Yellow solid, 60% yield. MP = 107–109 °C.  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  8.85 (d,  $J$  = 5.10 Hz, 1H), 8.16–8.12 (m, 1H), 7.96–7.91 (m, 2H), 7.83 (s, 1H), 7.74–7.70 (m, 2H), 7.67 (dd,  $J$  = 7.10, 1.2 Hz, 1H), 7.60–7.55 (m, 2H), 7.53–7.45 (m, 5H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  159.7, 149.8, 149.0, 138.4, 138.2, 133.9, 131.2, 129.2, 129.2, 129.0, 128.4, 127.5, 127.1, 126.6, 125.9, 125.6, 125.3, 123.1, 120.1. MS (EI)  $m/z$  (%) 281 (100), 204, 154, 127, 77.

**2-(Furan-2-yl)-4-phenylpyridine (8q)<sup>2</sup>**



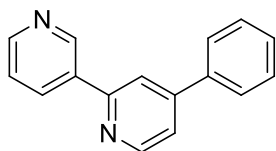
Yellow oil, 37% yield.  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  8.63 (d,  $J$  = 5.20 Hz, 1H), 7.92 (d,  $J$  = 0.80 Hz, 1H), 7.69 (d,  $J$  = 6.90 Hz, 2H), 7.58–7.54 (m, 1H), 7.52–7.45 (m, 3H), 7.37 (dd,  $J$  = 5.20, 1.70 Hz, 1H), 7.13 (d,  $J$  = 3.40 Hz, 1H), 6.61–6.53 (m, 1H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  153.6, 149.9, 149.8, 149.2, 143.3, 138.1, 129.1, 129.0, 127.0, 119.9, 116.5, 112.1, 108.8. MS (EI)  $m/z$  (%) 221 (100), 192, 165, 154, 125.

**4-Phenyl-2-(thiophen-2-yl)pyridine (8r)<sup>2</sup>**



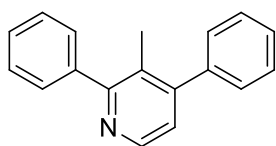
Yellow oil, 79% yield.  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  8.61 (d,  $J$  = 5.20 Hz, 1H), 7.86 (s, 1H), 7.67 (d,  $J$  = 4.80 Hz, 3H), 7.52–7.40 (m, 4H), 7.36 (d,  $J$  = 5.20 Hz, 1H), 7.14 (t,  $J$  = 4.20 Hz, 1H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  152.9, 149.8, 149.0, 144.7, 138.1, 129.0, 128.8, 127.9, 127.5, 126.9, 124.6, 119.8, 116.7. MS (EI)  $m/z$  (%) 237 (100), 204, 165, 127, 77.

**4-Phenyl-2,3'-bipyridine (8s)<sup>2</sup>**



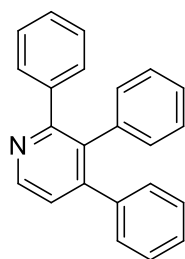
Yellow oil, 41% yield.  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  9.26 (s, 1H), 8.77 (d,  $J = 5.20$  Hz, 1H), 8.67 (s, 1H), 8.39 (d,  $J = 8.00$  Hz, 1H), 7.95 (s, 1H), 7.70 (d,  $J = 6.80$  Hz, 2H), 7.53–7.41 (m, 5H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  155.3, 150.4, 149.8, 149.6, 148.2, 138.1, 135.0, 134.5, 129.3, 129.2, 127.0, 123.5, 120.9, 118.7. MS (EI)  $m/z$  (%) 232 (100), 155, 154, 78, 77.

### 3-Methyl-2,4-diphenylpyridine (8t)<sup>2</sup>



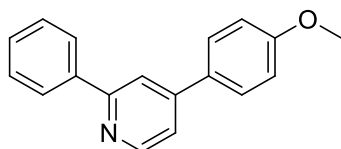
Yellow oil, 80% yield.  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  8.55 (d,  $J = 4.9$  Hz, 1H), 7.59–7.52 (m, 2H), 7.48–7.36 (m, 8H), 7.16 (d,  $J = 4.9$  Hz, 1H), 2.21 (s, 3H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  159.7, 151.0, 146.3, 140.9, 139.8, 129.1, 128.7, 128.5, 128.4, 128.1, 127.9, 127.9, 123.2, 18.0. MS (EI)  $m/z$  (%) 245 (100), 166, 139, 115, 77.

### 2,3,4-Triphenylpyridine (8u)<sup>2</sup>



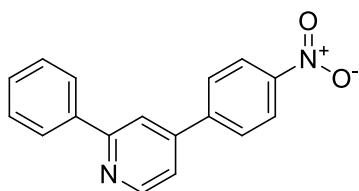
White solid, 76% yield. MP = 170–172 °C.  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  8.73 (d,  $J = 5.00$  Hz, 1H), 7.34 (d,  $J = 5.00$  Hz, 1H), 7.28–7.25 (m, 2H), 7.22–7.16 (m, 6H), 7.08–7.04 (m, 5H), 6.88 (dd,  $J = 7.80, 1.50$  Hz, 2H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  158.6, 145.0, 148.2, 140.7, 139.4, 137.7, 134.4, 131.4, 129.9, 129.3, 127.9, 127.7, 127.6, 127.3, 127.3, 126.6, 123.6. MS (EI)  $m/z$  (%) 307 (100), 202, 176, 152, 77.

### 4-(4-Methoxyphenyl)-2-phenylpyridine (9a)<sup>2</sup>



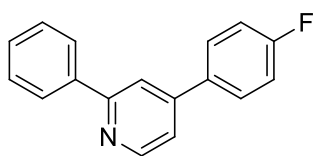
Yellow solid, 74% yield. MP = 77–79 °C.  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  8.70 (dd,  $J$  = 5.20, 0.60 Hz, 1H), 8.11–7.97 (m, 2H), 7.89 (dd,  $J$  = 1.70, 0.70 Hz, 1H), 7.67–7.64 (m, 2H), 7.50–7.36 (m, 4H), 7.08–6.95 (m, 2H), 3.87 (s, 3H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  160.5, 157.9, 149.9, 148.9, 139.4, 130.6, 129.0, 128.7, 128.3, 127.0, 119.7, 118.3, 114.5, 55.4. MS (EI)  $m/z$  (%) 261 (100), 246, 230, 189, 77.

#### 4-(4-Nitrophenyl)-2-phenylpyridine (9b)<sup>2</sup>



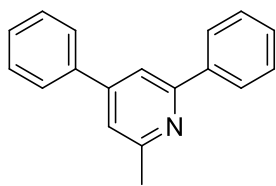
White solid, 66% yield. MP = 133–136 °C.  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  8.83 (d,  $J$  = 5.10 Hz, 1H), 8.43–8.34 (m, 2H), 8.10–8.04 (m, 2H), 7.94 (d,  $J$  = 0.90 Hz, 1H), 7.89–7.81 (m, 2H), 7.56–7.46 (m, 4H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  158.5, 150.3, 148.2, 147.2, 144.8, 138.6, 129.5, 128.9, 128.1, 127.1, 124.4, 120.2, 118.9. MS (EI)  $m/z$  (%) 276 (100), 230, 202, 101, 77.

#### 4-(4-Fluorophenyl)-2-phenylpyridine (9c)<sup>2</sup>



Yellow oil, 80% yield.  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  8.73 (dd,  $J$  = 5.10, 0.60 Hz, 1H), 8.09–7.99 (m, 2H), 7.88 (d,  $J$  = 1.00 Hz, 1H), 7.70–7.62 (m, 2H), 7.52–7.38 (m, 4H), 7.23–7.14 (m, 2H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  163.4 (d,  $J$  = 248 Hz), 158.1, 150.0, 148.3, 139.2, 134.6, 129.1, 128.9 (d,  $J$  = 9 Hz), 128.8, 127.0, 120.0, 118.6, 116.0 (d,  $J$  = 22 Hz). MS (EI)  $m/z$  (%) 249 (100), 172, 154, 95, 77.

#### 2-Methyl-4,6-diphenylpyridine (9d)<sup>2</sup>



Yellow oil, 55% yield.  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  8.04 (d,  $J = 7.20$  Hz, 2H), 7.74 (s, 1H), 7.69 (d,  $J = 7.20$  Hz, 2H), 7.53–7.40 (m, 6H), 7.35 (s, 1H), 2.73 (s, 3H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ , ppm)  $\delta$  158.8, 157.6, 149.6, 139.8, 138.7, 129.0, 128.9, 128.8, 128.7, 127.2, 127.1, 119.8, 116.2, 24.7. MS (EI)  $m/z$  (%) 245 (100), 230, 202, 168, 77.

## References

- 1 H. Jiang, J. Yang, X. Tang, J. Li and W. Wu, *J. Org. Chem.* 2015, **80**, 8763–8771.
- 2 H. Huang, J. Cai, L. Tang, Z. Wang, F. Li and Deng, G.-J. *J. Org. Chem.* 2016, **81**, 1499–1505.

# Copies of $^1\text{H}$ and $^{13}\text{C}$ NMR spectra of products

