# SUPPORTING INFORMATION

## Lanthanide Promoted Ethylation of Schiff Bases by Triethylaluminum

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### **Experimental Details**

**General Procedure for Ethylation of Schiff Bases**. A mixture of 1.7 mmol of the lanthanide catalyst, 33.5 mmol of the Schiff base and 30 mL of dry benzene was stirred at room temperature under an Ar atmosphere until a clear solution was obtained (~ 30 min). A 1 M hexane solution containing 33.5 mmol of Et<sub>3</sub>Al was added at 25°C and the stirring was continued at this temperature for 24 h. The reaction mixture was quenched with 60 mL of MeOH followed by 15 g of powdered NaOH. After the usual workup the resulting material was separated either by distillation or by column chromatography. The <sup>1</sup>H and <sup>13</sup>C NMR and EIMS spectra of the known products were compared with those of authentic samples prepared according to the literature. The new products were also subjected to elemental analyses.

**Ethylation of Aromatic Nitriles** was performed by the same procedure as the ethylation of the Schiff bases except that the quenching was performed with 60 mL of 10% aqueous HCl instead of with powdered NaOH.

#### Physical Data and Analyses of the New Products

**4-(1-Anilinopropyl)benzonitrile [NCC**<sub>6</sub>H<sub>5</sub>CH(C<sub>2</sub>H<sub>5</sub>)NHC<sub>6</sub>H<sub>5</sub>].  $\nu_{CN}$  (KBr) 2258 cm<sup>-1</sup>; 300 MHz <sup>1</sup>H NMR (CDCl<sub>3</sub>)  $\delta$  0.97 (t, 3, *J* = 7.5 Hz), 1.77, 1.82 (2ABq, 2, *J*<sub>1</sub> = *J*<sub>2</sub> = 7.5 Hz); 4.07 (br s, 1), 4.25 (t, 1, *J* = 7.5 Hz), 6.43 (d, 2, *J* = 7.5 Hz), 6.66 (t, 1, *J* = 7.5 Hz), 7.08 (t, 2, *J* = 7.5 Hz), 7.45 (d, 2, *J* = 8.0 Hz), 7.60 (d, 2, *J* = 8.0 Hz); 75 MHz <sup>13</sup>C NMR (CDCl<sub>3</sub>)  $\delta$  6.0, 25.0, 54.8, 106.1, 108.5, 113.1, 116.2, 122.5, 124.5, 127.8, 142.1, 145.1; EIMS (70 eV) *m*/*z* (rel intensity) 235 [(M-H)<sup>+</sup>, 15], 206 [(M-C<sub>2</sub>H<sub>6</sub>)<sup>+</sup>, 100], 104 (C<sub>7</sub>H<sub>6</sub>N<sup>+</sup>, 12), 93 (C<sub>6</sub>H<sub>5</sub>N<sup>+</sup>, 8) 77 (C<sub>6</sub>H<sub>5</sub><sup>+</sup>, 21). Anal. Calcd for C<sub>16</sub>H<sub>16</sub>N<sub>2</sub>: C, 81.32; H, 6.82; N, 11.85. Found: C, 81.13; H, 6.62; N, 11.59.

*N*-(1-Pyridin-2-ylpropyl)phenylamine(2- $C_5H_4N$ )CH( $C_2H_5$ )NHC<sub>6</sub> $H_5$ ]. Mp 100-103 °C (from hexane): 300 MHz <sup>1</sup>H NMR (CDCl<sub>3</sub>)  $\delta$  0.95 (t, 3, *J* = 7.5 Hz), 1.84, 1.95 (2ABq, 2, *J*<sub>1</sub> = *J*<sub>2</sub> = 7.5 Hz); 4.43 (br s and t, 2, *J* = 7.5 Hz), 6.57 (d, 2, *J* = 8.0 Hz), 6.64 (t, 1, *J* = 2 Hz), 7.11 (m, 3), 7.30

(d, 1, J = 8.0 Hz), 7.59 (t, 1, J = 2 Hz), 8.58 (d, J = 2 Hz); 75 MHz <sup>13</sup>C (CDCl<sub>3</sub>)  $\delta$  10.6, 25.2, 55.9, 108.6, 112.7, 116.5, 117.2, 124.4, 131.8, 142.7, 144.6, 158.1; EIMS (70 eV) m/z (rel intensity) 211 [(M-H)<sup>+</sup>, 11], 182 [(M-C<sub>2</sub>H<sub>6</sub>)<sup>+</sup>, 100], 80 (C<sub>5</sub>H<sub>6</sub>N<sup>+</sup>, 20), 77 (C<sub>6</sub>H<sub>5</sub><sup>+</sup>, 8). Anal. Calcd for C<sub>14</sub>H<sub>16</sub>N<sub>2</sub>: C, 79.20; H, 7.60; N, 13.20. Found: C, 79.08; H, 7.74; N, 13.39.

#### New Data for the Known Products

*N*-(4-Methylphenyl)-*N*-(1-phenylpropyl)amine  $[C_6H_5CH(C_2H_5)NHC_6H_4$ -4-CH<sub>3</sub>]<sup>17</sup>. Bp. 160-162 °C, 2 mm); 300 MHz <sup>1</sup>H NMR (CDCl<sub>3</sub>)  $\delta$  0.95 (t, 3, *J* = 7.5 Hz), 1.80 (dq, 2, *J*<sub>d</sub> = 7 Hz), *J*<sub>q</sub> = 7.5 Hz), 2.15 (s, 3), 4.20 (t, 1, *J* = 7 Hz), 6.64 (d, 2, *J* = 8 Hz), 6.89 (d, 2, *J* = 8 Hz), 7.27 (br s, 1), 7.32 (m, 4); 75 MHz <sup>13</sup>C NMR (CDCl<sub>3</sub>)  $\delta$  10.8, 20.3, 31.7, 60.0, 113.3, 126.2, 126.5, 126.8, 128.4, 129.5, 144.1, 145.2; EIMS (70 eV) *m*/*z* (rel intensity) 224 [(M-H)<sup>+</sup>, 18], 195 [(M-C<sub>2</sub>H<sub>6</sub>)<sup>+</sup>, 100], 118 (C<sub>8</sub>H<sub>8</sub>N<sup>+</sup>, 11), 106 (C<sub>7</sub>H<sub>8</sub>N<sup>+</sup>, 7), 91 (C<sub>7</sub>H<sub>7</sub><sup>+</sup>, 34), 77 (CH<sub>5</sub><sup>+</sup>, 7). [Anal. Calcd for C<sub>16</sub>H<sub>19</sub>N: C, 85.28; H, 8.50; N, 6.22. Found: C, 85.36; H, 8.54; N, 5.98].

**N-[1-(4-Methylphenyl)propyl)]phenylamine [4-CH<sub>3</sub>C<sub>6</sub>H<sub>4</sub>CH(C<sub>2</sub>H<sub>5</sub>)NHC<sub>6</sub>H<sub>5</sub>]<sup>7</sup>. Bp. 165 °C, 2 mm); 300 MHz <sup>1</sup>H NMR (CDCl<sub>3</sub>) \delta 0.95 (t, 3,** *J* **= 7.4 Hz), 1.78, 1.80 (2ABq, 2,** *J***<sub>1</sub> =** *J***<sub>2</sub> = 7.4 Hz); 2.32 (s, 3), 3.70 (br s, 1), 4.20 (t, 1,** *J* **= 7.4 Hz), 6.52 (d, 2,** *J* **= 8 Hz), 6.62 (t, 1,** *J* **= 8 Hz), 7.08-7.25 (m, 6); 75 MHz <sup>13</sup>C NMR (CDCl<sub>3</sub>) \delta 10.8, 23.4, 31.6, 59.4, 113.1, 117.0, 126.3, 127.6, 128.3, 136.3, 141.1, 145.5, 147.6; EIMS (70 eV)** *m/z* **(rel intensity) 224 [(M-H)<sup>+</sup>, 15], 195 [(M-C<sub>2</sub>H<sub>6</sub>)<sup>+</sup>, 100], 105 (C<sub>8</sub>H<sub>9</sub><sup>+</sup>, 20), 91 (C<sub>7</sub>H<sub>7</sub><sup>+</sup>, 12), [Anal. Calcd for C<sub>16</sub>H<sub>19</sub>N: C, 85.28; H, 8.50; N, 6.22. Found: C, 85.03; H, 8.64; N, 5.99].** 

*N*-[1-(4-Chlorophenyl)propyl)]phenylamine [4-ClC<sub>6</sub>H<sub>4</sub>CH(C<sub>2</sub>H<sub>5</sub>)NHC<sub>6</sub>H<sub>5</sub>]<sup>18</sup>. Bp. 178 °C, 4 mm); 300 MHz <sup>1</sup>H NMR (CDCl<sub>3</sub>) δ 0.96 (t, 3, *J* = 7.5 Hz), 1.76, 1.82 (2ABq, 2, *J*<sub>1</sub> = *J*<sub>2</sub> = 7.5 Hz); 4.02 (br s, 1), 4.22 (t, 1, *J* = 7.5 Hz), 6.47 (d, 2, *J* = 8 Hz), 6.64 (t, 1, *J* = 8 Hz), 7.08 (t, 2, *J* = 8 Hz), 7.28 (m, 4); 75 MHz <sup>13</sup>C NMR (CDCl<sub>3</sub>) δ 10.6, 27.0, 61.1, 108.5, 112.7, 122.7, 123.1, 123.9, 127.7, 137.8, 142.5; EIMS (70 eV) *m*/*z* (rel intensity) 246, 244 [(M-H)<sup>+</sup>, 10], 217, 215 [(M-C<sub>2</sub>H<sub>6</sub>)<sup>+</sup>, 100], 127, 125 (C<sub>7</sub>H<sub>6</sub>Cl<sup>+</sup>, 23), 104 (C<sub>7</sub>H<sub>6</sub>N<sup>+</sup>, 18), 77 (C<sub>6</sub>H<sub>5</sub><sup>+</sup>, 20), [Anal. Calcd for C<sub>15</sub>H<sub>16</sub>ClN: C, 73.31; H, 6.56; Cl, 14.43; N, 5.70. Found: C, 73.06; H, 6.76; Cl, 14.44; N, 5.48].