Supporting information

Aerobic Oxidative Synthesis of Aryl Nitriles and Primary Aryl Amides from Benzylic Alcohols Catalyzed by Polymer Supported Cu (II) Complex

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NMR Data of nitriles:

(Table 3, entry 1) benzonitrile: ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.67–7.54 (m, 3H), 7.45 (t, J = 7.7 Hz, 2H).

(Table 3, entry 2) 4-Methylbenzonitrile: ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.48 (d, J = 8.1 Hz, 2H), 7.23 (t, J = 7.1 Hz, 2H), 2.38 (s, 3H).

(Table 3, entry 3) 2-Methylbenzonitrile: ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.62-7.57 (m, 1H), 7.48 (td, *J*= 7.7, 1.4 Hz, 1H), 7.35-7.23 (m, 2H), 2.55 (s, 3H).

(Table 3, entry 4) 4-Methoxybenzonitrile: ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.59 (d, *J* = 8.8 Hz, 2H), 6.95 (d, *J* = 8.8 Hz, 2H), 3.86 (s, 3H).

(Table 3, entry 5) 2-Methoxybenzonitrile: ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.56-7.53 (m, 2H), 7.07-6.91(m, 2H), 3.93 (s, 3H).

(Table 3, entry 6) 3-Methoxybenzonitrile: ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.41-7.34 (m, 1H), 7.28-7.23 (m, 1H), 7.16-7.10 (m, 2H), 3.84 (s, 3H).

(Table 3, entry 7) 4-Chlorobenzonitrile: ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.61 (d, *J* = 8.2 Hz, 2H), 7.47 (d, *J* = 8.2 Hz, 2H).

(Table 3, entry 8) 2-Chlorobenzonitrile: ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.67 (dd, J = 7.7, 1.6 Hz, 1H), 7.61–7.48 (m, 2H), 7.39 (td, J = 7.4, 1.6 Hz, 1H).

(Table 3, entry 9) 3-Chlorobenzonitrile: ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.64 (t, *J* = 1.8 Hz, 1H), 7.62-7.54 (m, 2H), 7.44 (t, *J* = 7.9 Hz, 1H).

(Table 3, entry 10) 4-Bromobenzonitrile: ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.64 (d, *J* = 8.5 Hz, 2H), 7.53 (d, *J* = 8.5 Hz, 2H).

(Table 3, entry 11) 2-Nitrobenzonitrile: ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.41–8.33 (m, 1H), 7.97 (dt, J = 7.6, 3.8 Hz, 1H), 7.95–7.87 (m, 2H).

(Table 3, entry 12) 4-Trifluorobenzonitrile: ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.82 (d, *J* = 8.3 Hz, 2H), 7.77 (d, *J* = 8.3 Hz, 2H).

(Table 3, entry 13) 2-(Benzyloxy)benzonitrile: ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.59–7.24 (m, 7H), 7.05–6.88 (m, 2H), 5.14 (s, 2H).

(Table 3, entry 14) Nicotinonitrile: ^{1}H NMR (300 MHz, $CDCl_3$) δ 8.96–8.89 (m, 1H), 8.85 (dd, J = 5.0, 1.6 Hz, 1H), 8.01 (dt, J = 8.0, 1.9 Hz, 1H), 7.48 (ddd, J = 7.9, 5.0, 0.8 Hz, 1H).

(Table 3, entry 15) Thiophene-3-carbonitrile: ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.93 (s, 1H), 7.42 (s, 1H), 7.29 (d, J = 4.1 Hz, 1H).

(Table 3, entry 16) 2-Furonitrile: ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.60 (d, *J* = 1.7 Hz, 1H), 7.11 (d, *J* =3.6 Hz, 1H), 6.54 (dd, *J* = 3.6, 1.8 Hz, 1H).

(Table 3, entry 17) 1-Naphthonitrile: ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.23 (dd, *J* = 8.4, 1.0 Hz, 1H),8.09–8.05 (m, 1H), 7.94–7.87 (m, 2H), 7.68 (ddd, *J* = 8.4, 6.9, 1.3 Hz, 1H), 7.61 (ddd, *J* = 8.2,6.9, 1.2 Hz, 1H), 7.51 (dd, *J* = 8.3, 7.1 Hz, 1H).

(Table 3, entry 18) Cinnamonitrile: ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.50–7.19 (m, 6H), 5.84 (d, J = 16.7 Hz, 1H).

(Table 3, entry 19) 1,3-Dicyanobenzene: ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.97 (t, *J* = 1.6 Hz, 1H), 7.91 (dd, *J* = 8.0, 1.6 Hz, 2H), 7.66 (t, *J* = 7.9 Hz, 1H).

(Table 3, entry 20) 3-Phenylpropionitril: ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.56-7.06 (m, 5H), 2.95 (t, *J* = 7.4 Hz, 2H), 2.61 (t, *J* = 7.4 Hz, 2H).

(Table 3, entry 21) Octanenitrile: ^{1}H NMR (400 MHz, $CDCl_3$) δ 2.34 (t, *J* = 7.1 Hz, 2H), 1.66 (p, *J* =7.2 Hz, 2H), 1.50-1.39 (m, 2H), 1.37-1.24 (m, 6H), 0.89 (t, *J* =6.7 Hz, 3H).

NMR Data of Amides:

(Table 4, entry 1) Benzamide: ^{1}H NMR (300 MHz, DMSO-d6): δ = 7.40 (s, 1H), 7.47-7.59 (m, 3H), 7.92-7.95 (m, 2H), 8.10 (s, 1H).

(Table 4, entry 2) 2-Methylbenzamide: ^{1}H NMR (300 MHz, DMSO-d6): δ = 2.67 (s, 3H), 7.32-7.52 (m, 2H), 7.64-7.65 (m, 2H), 8.32- 8.44 (m, 2H).

(Table 4, entry 3) 3-Methylbenzamide: ^{1}H NMR (300 MHz, DMSO-d6): δ = 2.37 (s, 3H), 7.32-7.39 (m, 2H), 7.67-7.73 (m, 2H), 7.95 (s, 1H), 8.00-8.05 (m, 1H).

(Table 4, entry 4) 4-Methylbenzamide: ^{1}H NMR (300 MHz, DMSO-d6): δ = 2.36 (s, 3H), 7.27 (d, *J* = 8.23 Hz, 2H), 7.34 (s, 1H), 7.83 (d, *J* = 8.23 Hz, 2H), 7.96 (s, 1H).

(Table 4, entry 5) 4-Methoybenzamide: ^{1}H NMR (300 MHz, DMSO-d6): δ = 3.38 (s, 1H), 3.87 (s, 3H), 7.04 (d, *J* = 9.18 Hz, 2H), 7.92 (d, *J* = 9.18 Hz, 2H), 12.6 (s, 1H);

(Table 4, entry 6) 4-(Thiomethyl)benzamide ^{1}H NMR (300 MHz, DMSO-d6): δ = 3.31 (s, 3H), 7.70 (s, 1H), 8.01-8.09 (m, 2H), 8.10-8.16 (m, 2H), 8.25 (s, 1H).

(Table 4, entry 7) 2-Chlorobenzamide ^{1}H NMR (300 MHz, DMSO-d6): δ = 6.83-8.13 (m, 6H).

(Table 4, entry 8) 3-Chlorobenzamide ^{1}H NMR (300 MHz, DMSO-d6): δ = 7.50-7.55 (m, 1H), 7.57 (s, 1H, NH2), 7.60-7.64 (m, 1H), 7.85-7.89 (m, 1H), 7.94-7.96 (m, 1H), 8.12 (s, 1H,).

(Table 4, entry 9) 4-Chlorobenzamide ^{1}H NMR (300 MHz, DMSO-d6): δ = 7.49 (s, 1H), 7.54-7.58 (m, 2H), 7.91-7.95 (m, 2H), 8.08 (s, 1H).

(Table 4, entry 10) 4-Fluorobenzamide ^{1}H NMR (300 MHz, DMSO-d6): δ = 7.29-7.35 (m, 2H), 7.43 (s, 1H), 7.96-8.00 (m, 2H), 8.03 (s, 1H).

(Table 4, entry 11) 4-(Trifluoromethyl)benzamide ^{1}H NMR (300 MHz, DMSO-d6): δ = 7.69 (s, 1H), 7.85-7.89 (m, 2H), 8.10-8.13 (m, 2H), 8.26 (s, 1H).

(Table 4, entry 12) 4-(Trifluoromethoxy)benzamide ^{1}H NMR (300 MHz, DMSO-d6): δ = 7.43-7.49 (m, 2H), 7.58 (s, 1H), 8.03-8.08 (m, 2H), 8.16 (s, 1H).

(Table 4, entry 13) 4-Nitrobenzamide: ^{1}H NMR (400 MHz, DMSO-d_6, 25 ^{0}C): δ = 8.37-8.21 (3H, m), 8.11 (2H, d), 7.73 (1H, br. s).

(Table 4, entry 14) 4-Bromobenzamide ^{1}H NMR (300 MHz, DMSO-d6): δ = 7.53 (s, 1H), 7.66-7.71 (m, 2H), 7.83-7.89 (m, 2H), 8.10 (s, 1H).

(Table 4, entry 15) Picolinamide ^{1}H NMR (300 MHz, DMSO-d6): δ = 7.58-7.62(m, 1H), 7.71 (s, 1H), 7.98-8.03 (m, 1H), 8.07 (s, 1H, NH2), 8.07-8.09 (m, 1H), 8.17 (s, 1H), 8.64-8.66 (m, 1H).

(Table 4, entry 16) Nicotinamide ^{1}H NMR (300 MHz, DMSO-d6): δ = 7.48-7.53(m, 1H), 7.69 (s, 1H), 8.24-8.30 (m, 2H), 8.71-8.76 (m, 2H).

(Table 4, entry 17) Pyridine-4-carboxamide ^{1}H NMR (400 MHz, DMSO-d_6, 25 ^{0}C): δ = 8.43 (2H, d), 7.93 (2H, d), 5.95 (2H, br. s).

(Table 4, entry 18) Thiophene-2-carboxamide ^{1}H NMR (300 MHz, DMSO-d6): δ = 7.15-7.17 (m, 3H), 7.40 (s, 1H), 7.76-7.79 (m, 2H), 7.99 (s, 1H).

(Table 4, entry 19) Furan-2-carboxamide: ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.48–7.43 (m, 1H), 7.14 (d, J = 3.5 Hz, 1H), 6.50 (dd, J = 3.4, 1.7 Hz, 1H), 6.37 (s, br, 2H).

(Table 4, entry 20) Cinnamamide: ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.63 (d, J = 15.7 Hz, 1H), 7.54–7.49 (m, 2H), 7.37 (dd, J = 10.1, 5.7 Hz, 3H), 6.48 (d, J = 15.7 Hz, 1H), 5.90 (s, br, 2H).